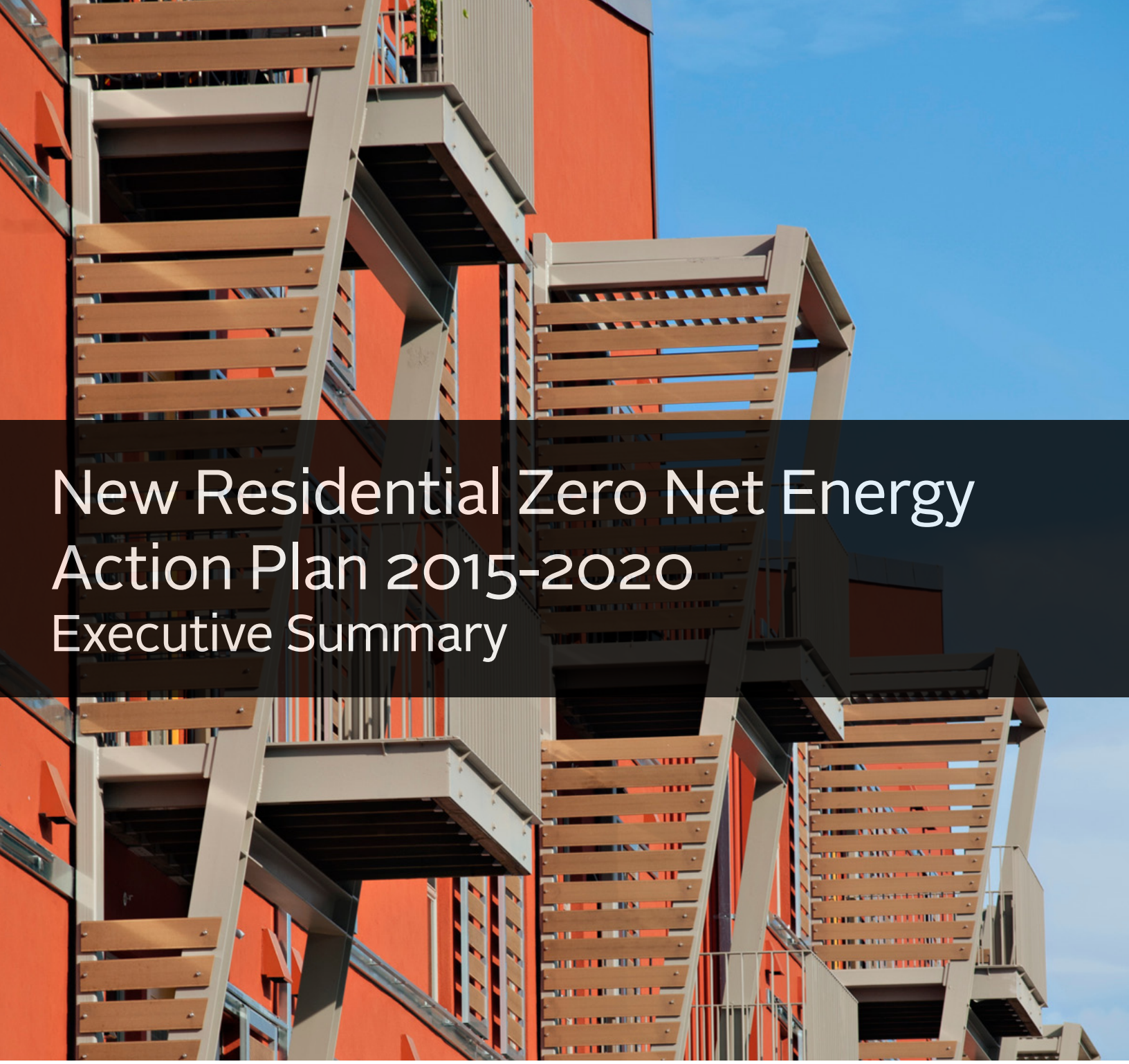


New Residential Zero Net Energy Action Plan 2015-2020

Executive Summary

Photo Credit: UC Davis West Village

California Public Utilities Commission
Energy Division

California Energy Commission
Efficiency Division

Introduction

Photo Credit: Lawrence Berkeley Labs, Energy Technologies Area

The Residential New Construction Zero Net Energy (ZNE) Action Plan (Action Plan or the Plan) is designed to operationalize the California Long-term Energy Efficiency Strategic Plan's (CEESP) goal to have 100% of new homes achieve ZNE beginning in 2020. The Action Plan provides a foundation for the development of a robust and self-sustaining ZNE market for new homes over the next five years, supports future codes and standards for ZNE, and inspires voluntary actions to meet California's goal. Further, the Action Plan will be a living document subject to ongoing updates and refinements to help address the changing environment, technology advances, and the State's needs. In order to do this, the Plan must be supported by multiple market actors; act as a guide for state agencies, local government, and the utilities; and motivate industry.

To develop the Action Plan, a comprehensive stakeholder outreach process was employed. While a benefit of this process will be increasing activity and potential advocates to implement the Plan, the purpose of the stakeholder engagement was to ensure that strategies and metrics are feasible and that the overall plan will stimulate independent action and provide a higher level of certainty and understanding for the market to build their own path to ZNE.

The following are the key stakeholder activities:

- In Fall 2012, a stakeholder survey was conducted to better understand the market, key actors, potential issues, and gaps and opportunities.
- From Fall 2012 to Fall 2013, four public stakeholder workshops were held; three in San Francisco at the CPUC and one at the Energy Commission in Sacramento. Each workshop built on the information of the previous meeting. The process began with goal setting and visioning and progressed to the development of strategies and metrics.
- Two rounds of five separate subcommittee meetings were conducted and organized by the six Action Plan goals. Each meeting was used to refine and develop the Plan.
- Additional stakeholder engagement included meeting with builders at the Pacific Coast Builders Conference (PCBC) and in Sacramento and conducting a local government statewide webcast.

A planning website was launched to share information about the plan, solicit case studies, and share documents and information about relevant events: **www.CaliforniaZNEhomes.com**

Approach

For this Action Plan to be successful it is critical that the strategies and tactics identified are responsive to the needs, interests, and ideas of industry leaders, key actors, partner agencies, and utilities. This means that the Plan is focused on achieving milestones and being as feasible as possible in the breadth and depth of the proposed strategies and tactics. The "ZNE Action Plan: Commercial Building Sector" focuses on activating champions for implementation. However, this Plan has been developed with an expectation that the state agencies, specifically the CPUC and Energy Commission, or the utilities, will initiate or lead a majority of the strategies. At the same time, this realistic approach is designed to encourage and inspire other market actors to participate and leverage the action taken by state agencies and utilities to achieve the 2020 goal.

This Action Plan provides both immediate term strategies, as well as some strategies that are more high level and provide a solid foundation for the future. A three-year work plan is being developed separately to direct Plan implementation, identify resources, and enable a more dynamic and streamlined process for updating the specific actions.

Finally, this Action Plan is focused on new residential construction, including single-family and low-rise multifamily (3 stories or less) buildings, as well as low and moderate income housing within these categories. Multifamily projects have a number of unique requirements that differ to some extent from single-family construction. The Action Plan has devoted Chapter 4 to outline and focus on the key multifamily building areas that are not covered within the main goals section in Chapter 3. It is anticipated that many of the differences in the markets will be addressed in specific implementation activities. For example, a key strategy is to launch ZNE awareness and outreach activities. This strategy applies to both housing types, but will look different and address different audiences for single-family and low-rise multifamily.

Action Plan Framework

The **Action Plan Vision Framework** on the facing page is a guiding structure for the Plan to achieve the State's 2020 goal and key objectives. Additional details on the Plan Goals, Principles and Critical Path Timeline are provided on the following pages.

ACTION PLAN GOALS

Each goal area was identified in collaboration with stakeholders and verified through the planning process as a key area for action and focus. Each goal is critical to ultimate success of reaching the 2020 goal, and priorities for implementing each goal are reflected in the Overall Critical Path diagram on page 7. Following is a brief summary of the purpose for each goal.

1 Demand and Awareness

Demand and awareness is one of the key goals for this plan, particularly over the next few years as a foundation for ZNE is developed. It is recognized that there is a lack of understanding of the benefits of zero net energy among potential homeowners and critical sectors of the housing industry, including real estate professionals, the financial community (most notably underwriters and loan officers), developers, and building trades organizations.

2 Technical Training & Education

This goal focuses on creating a robust and well-trained industry that is able to implement and adapt to the technological innovations and integrated business strategies that are required to effectively meet the ZNE goals. In addition, this goal seeks to develop a well-informed support industry including building inspectors, financial and real estate professionals, and other industries central to the advancement of ZNE.

3 Technical Tools

While there are a number of design and modeling technical tools available on the market, it is critical to develop an integrated suite of tools specific to ZNE that provides consistent data, informs all steps of the design and construction of ZNE homes, and translates that data into homeowner feedback tools to improve performance of the ZNE homes.

4 Financing, Affordability & Value

Develop specific approaches and standards to quantify the value of ZNE homes, support a robust financing market and ensure that ZNE homes are affordable. To reach scale, it is important to ensure there are mechanisms to appropriately value ZNE homes and to ensure long-term affordability of ZNE. This goal incorporates the need for a labeling system for built homes, as well as efforts to develop an acceptable appraisal standard that will remove a major barrier to market adoption. Finally, this goal informs the creation of various financing and incentive products that will support the market.

5 Future Infrastructure

An underlying need for mainstream ZNE is a grid and infrastructure that can effectively manage distributed generation energy. This goal informs research and the direction for utilities and state agencies to update policies and programs to meet this need.

6 Alignment

Aligning and coordinating all of the agencies, municipalities, and market actors that are involved in achieving the ZNE goal is critical to the success of this Plan and is a constant throughout the Plan's implementation. In addition, the goal for ZNE to be regulated by Codes and Standards beginning in 2020 provides the coordination and steps to reach that important step. Finally, this goal encourages the alignment of state goals with local policies and planning.

zero net energy

CA Energy Efficiency Strategic Plan

VISION

100% of all New Homes in California will be Zero Net Energy starting in 2020

GUIDING PRINCIPLES

Market Driven

Flexible

Leverage

Consistency

Measurable

Multiple Paths

GOALS & GOAL RESULTS

Builders and homeowners are inspired to voluntarily adopt ZNE through a market driven process starting in 2014 and increasing steadily until 2020.

1. Create awareness of the value and benefits of ZNE and build demand

4. Quantify value of ZNE, support robust financing and ensure affordability

By 2017, create a systematic way to value ZNE homes to enable underwriters, appraisers and financial institutions to support financing and a strong and affordable ZNE housing market.

Industry workforce and professionals (existing and entering) are equipped to create quality ZNE homes at a production scale starting in 2015 and increasing steadily to 2020.

2. Increase participation and improve the quality of ZNE education and training

5. Drive future grid infrastructure and technological improvements

By 2017, investor owned utility distribution resources plans to evaluate locational benefits and costs of distribution resources are adopted, as directed in Assembly Bill 327. These plans support the goal that ZNE buildings connect and integrate with the grid effectively.

By mid-2016, designers, builders and developers have access to an integrated suite of technical tools that facilitates their ability to bring ZNE homes to market successfully.

3. Ensure availability, effectiveness and efficiency of technical tools

6. Align regulations, policies, incentives and codes

By 2015, California has a consistent, integrated and clear ZNE policy framework (regulations, incentives and codes) due to continuous multi-agency coordination and collaboration efforts.

Guiding Principles

Photo Credit: DeYoung Properties - Zero Net Energy Home

To reach the Plan's vision, the following guiding principles are important crosscutting concepts reflected in all of the plan's strategies that stakeholders and policy makers identified during this process to ensure the Plan's feasibility and broad adoption.

Market Driven

To achieve a mainstream ZNE Building Future, support a robust industry by empowering key market actors through appropriate policies, regulation, incentives and effective program design. This will drive innovation, new projects, workforce development, marketing and awareness.

Flexible

Technology, policy and understanding about ZNE buildings are evolving at a rapid pace. The Action Plan will be a "living document" that will allow for the evolution in business models, rate structures, construction techniques, demand and consumer needs over the coming years.

Leverage

Existing programs, projects and information on techniques, training, incentives and industry products related to zero net energy are recognized as important resources, and should be leveraged to achieve the Action Plan's goals.

Consistent

The number of state and local agencies involved in implementation, and the diversity and number of private industry and utility companies engaged, complicates the path to ZNE. The Action Plan supports strategies that achieve the highest level of consistency possible in policy, regulations, and incentives to reach the State's goals.

Measureable

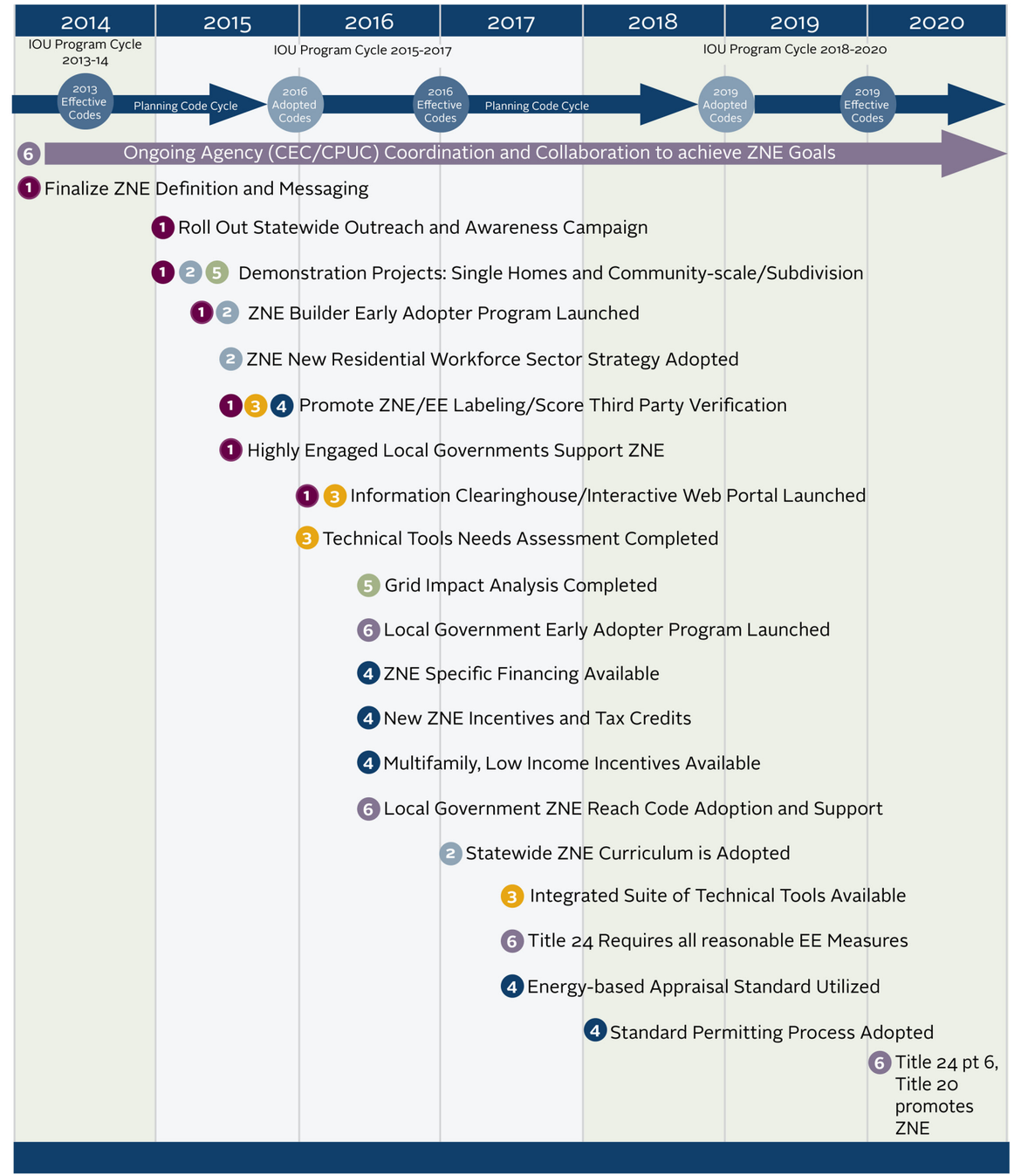
Quantifying the impacts, costs and value of ZNE is essential to its long-term support by consumers, legislators, utilities, the financial market, and the industry as a whole. The Plan should inform the development of transparent and broadly accepted mechanisms for measuring the value of ZNE.

Multiple Paths

The diversity of housing stock in California and trends for more compact land use scenarios, multi-family housing and community-scale renewables, requires that future ZNE building policies and programs support multiple paths and approaches.

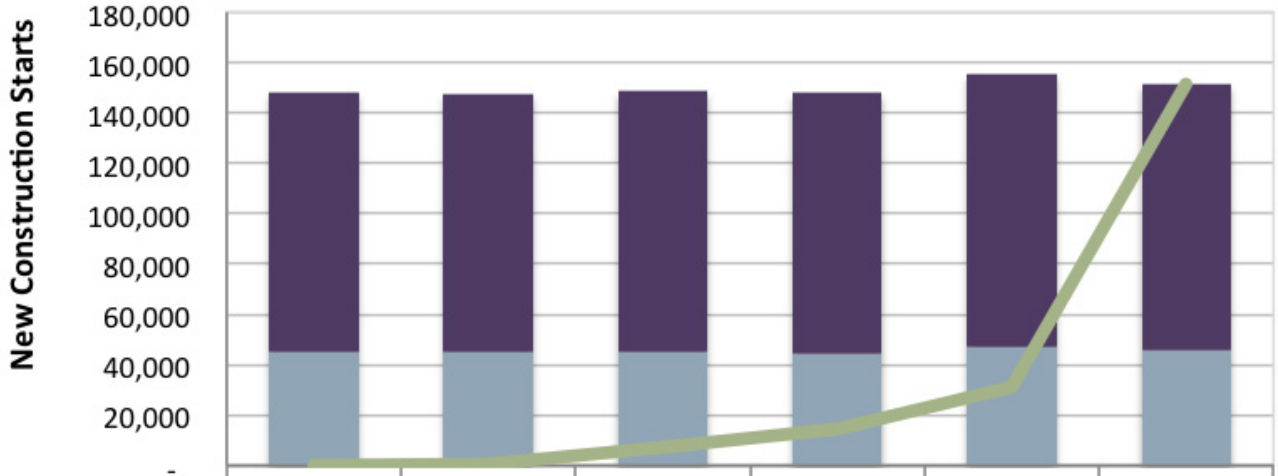
zero net energy residential

Critical Path and Priorities



Benchmarks

Estimated Number of ZNE Homes Per Year Compared to New Construction Starts



	2015	2016	2017	2018	2019	2020
Est. Single Family	103,077	102,847	103,542	103,181	108,189	105,450
Est. Multifamily	45,354	44,906	45,107	44,708	47,159	45,982
ZNE Projections	140	480	7,432	14,789	31,070	151,342

To measure the effectiveness and provide clear benchmarks for progress of the Action Plan, the following overarching benchmarks have been developed.

- By 2020, all new homes are ZNE Code or ZNE Ready homes (single-family and low-rise multi-family).
- By early 2016, utility new construction activities include fully subscribed ZNE Builder Early Adopter Programs that address incentives, training, market adoption, and demonstration projects, etc.
- An Updated California Residential Building Rating and/or Labeling System (Updated HERS or equivalent) is in place by 2016.
- Between 2013 and 2017, California sees a 5 to 10% decrease in the cost of implementing ZNE on production homes.
- By 2017, a nationally recognized appraisal standard, accepted by underwriters and funders for ZNE homes is in place and utilized in California.
- An adequate pool of trained and educated professionals in design, engineering and construction to support ZNE demand in California is in place by 2018.

To download the full plan, to get involved or find out more information, go to: **www. CaliforniaZNEhomes.com** or the **www.CPUC.ca.gov**