

Municipal Zero Net Energy

Project Engineering as Reach Code Technical Assistance

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Presentation Overview




- San Francisco Bay Area Regional Context
 - Codes & Standards Program
- Municipal ZNE Technical Assistance offering
- Municipal ZNE Case Studies
 - City of Berkeley
 - City of Oakland
 - City of Hayward
 - City of Dublin
 - County of Marin
 - County of Alameda

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Introductions

- Bay REN is a local government (LG) collaborative
 - 9 Association of Bay Area Governments (ABAG) Counties
- Utility (PG&E) rate-payer funded efficiency programs
 - 2013 CPUC set historical precedent for LGs to administer rate-payer funding
- Alameda County is 1/9 County partners
 - leading Municipal ZNE pilot w/ BKi & DNV-GL as consultants



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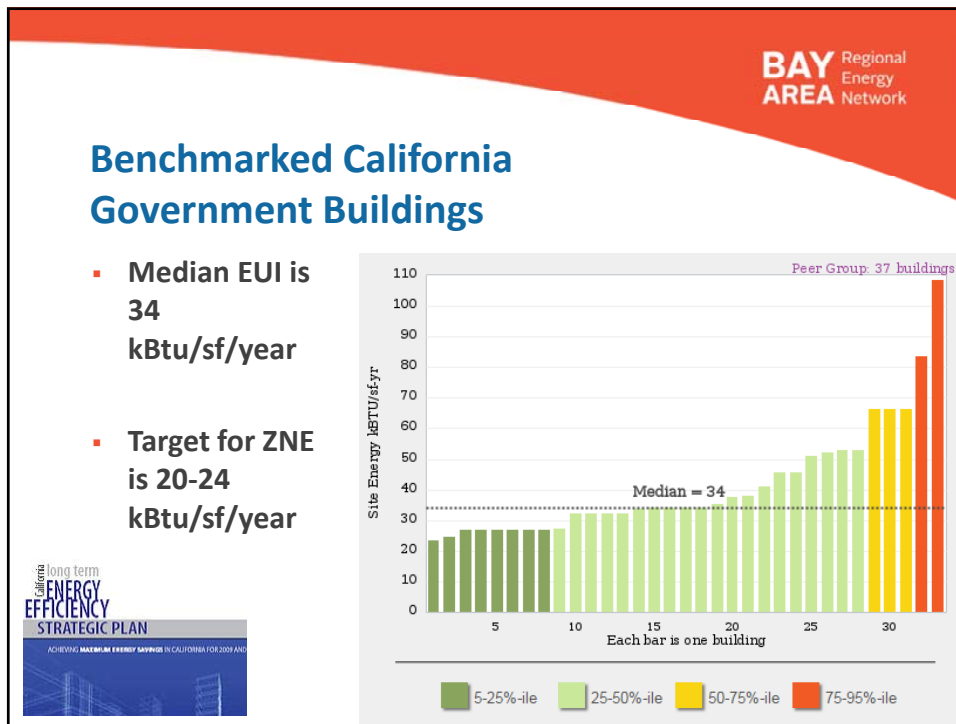


Regional Context

- San Francisco Bay Area spans from Napa wine country to Silicon Valley
- Fastest growing region in the state
 - ~7 million population (22% of State)
 - 9 Counties
 - 101 Cities (65 < 50,000 population)
 - 607 Special Districts
 - 2,132 K-12 Schools
- Bay Area spans 5 CA Building Energy Code Climate Zones (Zones 1, 2, 3, 4 & 12)

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Green Building Grants & Technical Assistance

- Historical Reach Codes in Alameda County (2000-2015)
 - Prior to CAL Green State Code taking effect
 - Climate Action Plans adopted in all 15 jurisdictions, first/only County in State
 - Civic green building reach-code policies in every jurisdiction
 - Majority of jurisdictions had private sector reach code green building requirements

Built Environment Services for Local Governments in Alameda County

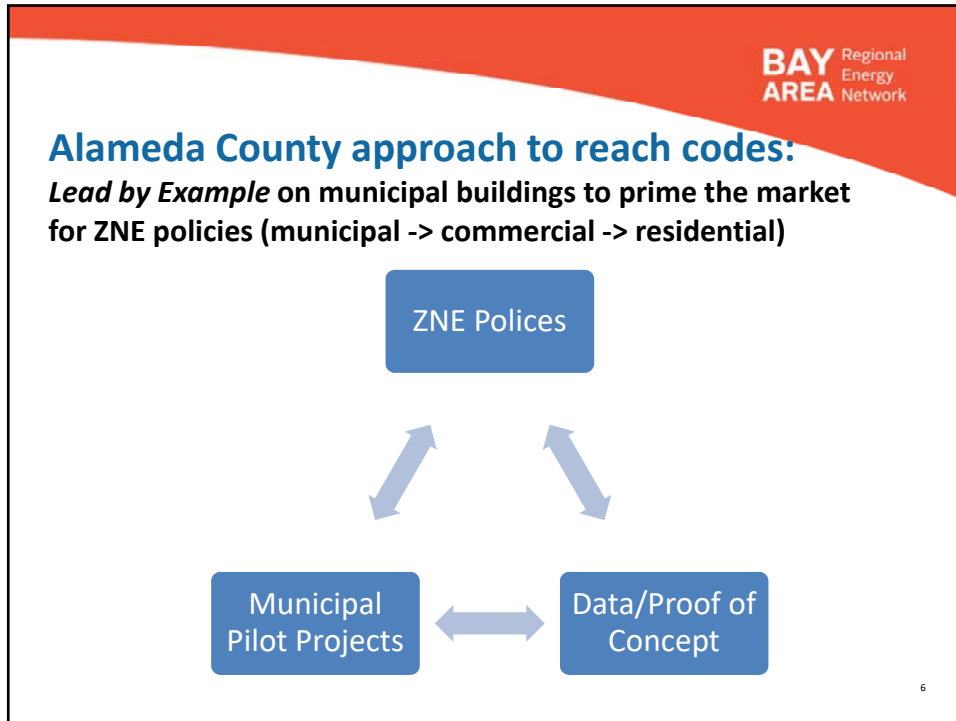
Policy 5 Regulatory Support

Project Implementation Assistance

Professional Development Services

County of Alameda • Alameda • Alameda • Berkeley • Castro Valley • Hayward District • Dublin • Emeryville • Fremont • Hayward • Livermore • Newark • Oakland • Chico-Loma Sanitary District • Piedmont • Pleasanton • San Leandro • Union City

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BAY AREA Regional Energy Network

2016 ZNE Reach Code projects led by 3 counties

- San Francisco
 - ZEPI Non-Residential Definition
- San Mateo
 - ZNE policy templates & City engagement
- **Alameda**
 - Municipal ZNE Technical Assistance
 - Engineering
 - Cost estimating
 - Portfolio review
 - Training

150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
-10
-20

Scale extends indefinitely for really inefficient and poorly managed buildings

Average energy consumption adjusted for neutral variables

Minimum code compliance

CEC adopted "reach" standard

Ultimate goal of zero net energy

Scale may extend below zero for net-energy producers

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Technical Assistance to address lack of in-house LG engineering capacity

- Project-specific systems engineering & cost analysis to lower energy use intensities (EUI), size renewables & integrate storage
 - Modeling for optimized gas vs. electric system design
- Portfolio ZNE strategies, community scale ZNE defined by a jurisdiction's municipal energy usage portfolio
 - Monitoring performance of buildings/portfolios
- Local government trainings (2 audiences):
 - Targeted to code enforcement staff
 - Targeted to public works, engineering & facilities staff who will be designing & operating municipal ZNE facilities

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Case Studies- Placeholder for content on 3-4 of these jurisdictions

- Municipal ZNE Projects and Policies
 - City of Berkeley
 - City of Dublin
 - City of Hayward
 - City of Oakland
 - County of Marin
 - County of Alameda

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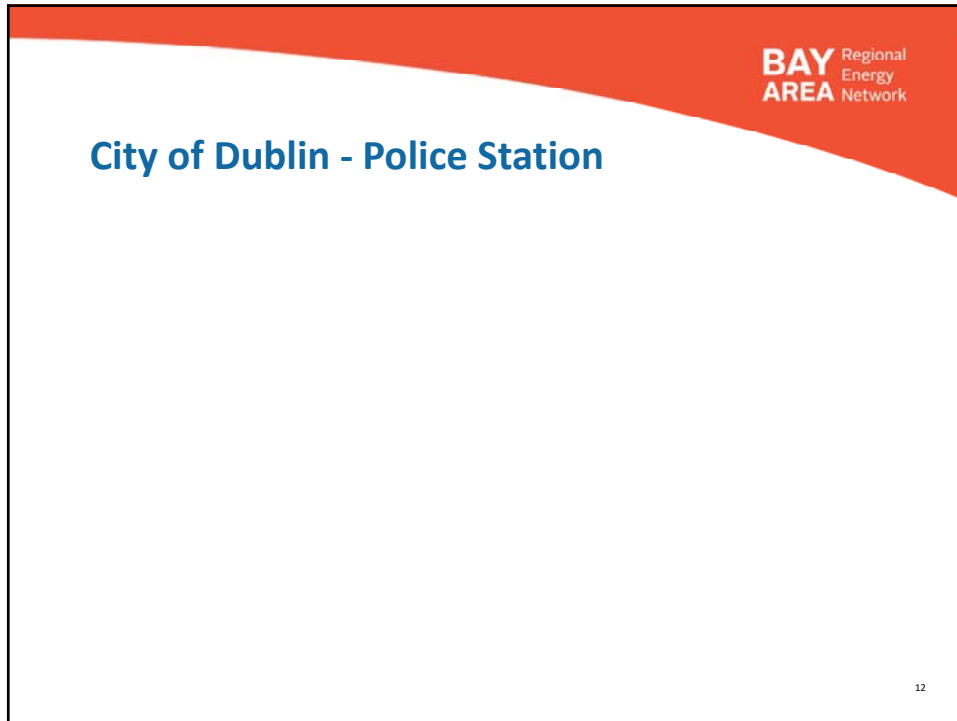
City of Hayward passed a Municipal ZNE Ordinance April 2016

- City of Hayward is 1 of 3 total jurisdictions in CA to Pass a ZNE ordinance as of Q3 2016 (Santa Barbara & Palo Alto)
- Community Scale ZNE for Municipal Portfolio
- Current municipally owned generation (Solar + co-gen at wastewater treatment plant = 12,387,000 kWh per year) meets ~1/2 of municipal energy usage
- Using Connected Cities Tool to monitor portfolio performance

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Hayward that all new City buildings that begin design after January 1, 2017, shall be zero net energy; and

BE IT FURTHER RESOLVED that all existing City buildings for which renovations exceeding 50% of the building's value and that begin design after January 1, 2017, be zero net energy; and

City of Berkeley- Recreation Building

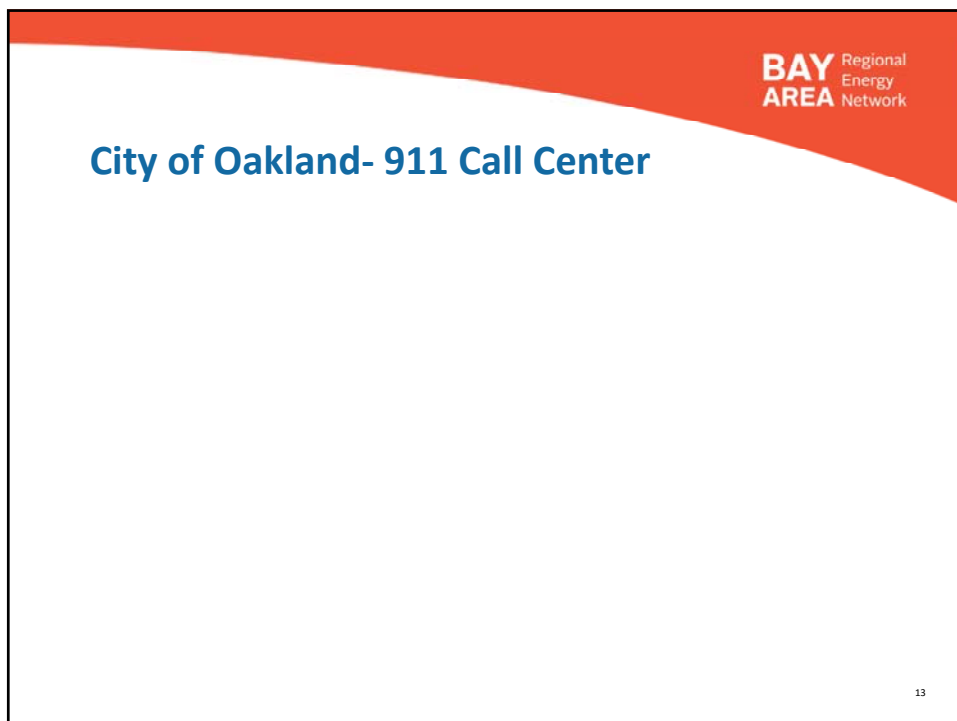


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City of Dublin - Police Station

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City of Oakland- 911 Call Center

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County of Marin- Admin Building

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Questions?



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