

## Reaching Towards Zero: Local Energy Ordinances Forge a Path

SEEC Forum 2017

6/14/2017

Moderator from County of San Mateo:

This workshop discusses implementing policies, and how to apply these in your own organizations.

Misti Bruceri of Misti Bruceri & Associates, LLC was not able to attend and moderate.

[Chris Kuch: Engineer, Codes and Standards Program, Southern California Edison](#)  
State of ZNE from prospective of CEC and IOUs, Reach code program.

What is the state of CA residential ZNE?

Origin of ZNE, and theory. CA strategic plan layed out a definition about a decade ago. Represented in a simple graph, energy consumption of buildings decreases while renewable energy increases over time, and they eventually meet and are equal.

In reality, **things aren't so simple**, but we're working it out as a state.

Decreasing value of rooftop PV:

- Supply and demand: mid-day over generation. PV used to be more valuable during mid-day, but now it **causes over-generation**. We even have to curtail (turn them off) sometimes.
- Changes to net energy metering (NEM) compensation: Compensation for giving energy back to grid has decreased.
- Diminished Carbon reduction benefits: Policies demand that IOUs have certain percentage of renewables

Now it's **harder to achieve cost effectiveness of ZNE**

Increasing need for electric grid harmonization. ZNE theory promotes oversized solar PV, in order to offset home electric and natural gas use.

?Duck Curve?

2019 Title 24 Developments:

- Prescriptive requirement to size PV to displace ONLY annual site kWh
  - Cost-effective, grid-friendly
- Energy code compliance based on an Energy Design Rating (EDR) score
- Battery Storage
  - Not prescriptively required for 2019 cycle code
  - Potential viable path to reach ZNE (EDR = 0)
  - Area for Reach Code research and Development

**How can CA reach ZNE? Reach Codes.** They accelerate adoption of ZNE

Statewide Codes and Standards Reach Code Program: Develops cost effectiveness studies, coordinate with LGC & Regional energy networks, develops tools

[Rachael DiFranco: Sustainability Manager, City of Fremont](#)

Discussing Background on Fremont, Case for residential solar, adoption process.

Fremont: 4<sup>th</sup> largest city in Bay Area. Pop 232,206. Transforming from suburban to sustainable urban.

Has General Plan (2011) and Climate Action Plan (November 2012)

Transportation makes up 58% of emissions. Car emits over 4 MTCO<sub>2e</sub> and homes emit over 3 MTCO<sub>2e</sub> per year. Larger homes tend to use most energy, and many have solar installations and EV ownership.

Solar installs have grown.

San Diego survey on EV-PV connection showed that of EV owners, 93% of residents responding own their home. 32% have PV installed on their home. 16% plan to install solar.

Fremont EV ownership: EV can double footprint.

75,000 new housing units coming soon. These need a solar requirement.

New 2016 cost effectiveness study:

Finds solar PV in new residential developments are feasible and cost effective in all 16 California climate zones. Fremont is climate zone 3.

Cities can pass a local ordinance.

**CET template ordinance.** Fremont used this and made local modifications. Included all residential types, allowed for alternative compliance options. Account for possible expanded system sizes – require developer to offer expanded system to buyer, make system able to expand size.

Alignment with CA goals: All new res by 2020, all new non-res and 50% existing res by 2050

[Garrett Wong: City of Santa Monica](#)

Santa Monica ZNE Reach Code

Bold goals in Santa Monica: Already 20% below 1990 levels in 2015.

Demonstrating that planet and prosperity are complimentary. Has seen growth in all sectors while reducing emissions.

Building energy is 31% of total Santa Monica's GHG emissions.

2016: Mandatory solar requirement

2017: 2016 CAL Green & California Energy Code requires solar

May 2017: Santa Monica Mandatory Solar Requirement & Reach Code

2020: Statewide ZNE requirement (single family)

Now the only city in the world with a residential ZNE ordinance.

2012 solar ready requirements, 2016 Solar required.

Based on building footprint, not height etc. Exceptions made for trees.

Developing the Reach Code: Timing, coordination issues.

Time Dependent Value (TDV): Values vary throughout the day, like Time-of-Use. TDV considers value to consumers, utility grid, and society. **TDV-sized PV system is smaller.**

Energy Design Rating: algorithm, rating

Santa Monica Energy Efficiency Reach Code: residential and commercial standards.

Putting the code to work:

- Outreach
- Training
- Energy Code Coach + office hours

Lessons learned

- Early collaboration with Planning, Building, Safety staff
- Consider alternative projects, i.e. pre-fab
  - Pre-fab is built off site so can't be inspected.
- Establish tracking systems early. Get to know building/safety team and know how to get reports and follow up
- Be prepared to be flexible
- Outreach, engage, and educate!
  - Make sure community is aware.

[Kim Springer: Office of Sustainability, County of San Mateo](#)

[Zero Net Energy Action in San Mateo County](#)

Office of Sustainability: (has a job opening currently) 35 people in Office of Sustainability, working on many projects.

**San Mateo County Energy Watch ZNE Framework and Strategic Plan:**

Bay Area Regional Energy Network (BayREN):

- RFP template language
- Engineering analysis for municipal construction

- ZNE building department training

San Mateo County Energy Watch: website has resources

CPUC Pilot Project:

Found that there was very little consistency between cities across the county in applying building codes. Much education needed to happen in preparation for 2020 ZNE code. Resources are available to build ZNE buildings, but how to do get there?

Had discussion between various departments to find best strategies. Included departments like Budgeting. Looked at long-term improvements and costs.

CPUC Pilot Project:

- ZNE policy for new construction and renovations
- Developed toolkit for jurisdictions interested in starting a ZNE plan.

Progress:

- City of San Mateo Mandatory Solar Ordinance
- City of Brisbane Mandatory Solar Ordinance
- Half Moon Bay Library ZNE

Q&A:

Q: There are peak solar times with too much generation. Have you thought about shutting down a natural gas plant during those times.

A: Not sure, but it may be easier to curtail generation from renewables than fossil fuels.

Q: What do you see as Edison's role going forward in State codes and standards?

A: Codes and standards are here to stay. Makes up over 50% of energy savings. We're not backing away. We're going to be even more aggressive. Interestingly, 50% of codes and standards comes from appliance standards. Some of our savings may be jeopardized in the future.

A: We're not doing anything with appliances or lighting in ZNE code. Cities could lead in this area, having more stringent requirements on plug loads.'

Q: San Mateo County and all 20 Cities launched sustainability program Peninsula Clean Energy. Anything you'd like to say about it?

A (Kim): Launched out of our office, and it was amazing to watch. Many customers haven't heard of Peninsula Clean Energy yet. They will work more on ZNE and efficiency as time goes on.

Q: Kim, how do you get your municipal staff to show up (other than bribes) when they're busy?

A (Kim): Planning ahead, providing food, inviting good speakers, something fairly new to discuss, provide transportation. People enjoy time away from office to attend. Success in picking good topics and speakers. Also food. A committed boss helps too.

Q: You mentioned the duck curve. How cost-effective is it, with all the barriers?

A (Rachael): Incentives through city or CCA. Put pressure on CPUC or CEC to consider cost-effectiveness.

A: The duck turns into a turkey. Certain climate zones won't give you enough heat. Battery storage can come into play to store and dispatch energy at certain times.

San Francisco, June 27<sup>th</sup> is an event with BayREN and others.

Late September is an event about fuel switching.