Aligning Municipal Policies and Actions with Energy and Carbon Goals
Today’s Presenters

Cathy Higgins
New Buildings Institute

Sharon Grant
EcoEdge

Mike Grimm
City of Carlsbad

Susan Freed
County of San Diego
Efficiency delivered.

NBI is responding to increasing urgency to reduce carbon emissions increased demand for improved energy performance of new and existing buildings.

NBI’s Theory of Market Change:

Our Program Areas
(1) Building & Program Innovation
(2) Zero Energy Leadership & Market Development
(3) Advancing Codes & Policy

VanDusen Botanical Gardens Visitor Centre, Vancouver, BC
Source: Nic Lehoux
Today’s Agenda

1. Making the Case for Alignment
   • Cities in Leadership Role (Cathy Higgins)
   • Overview of Current Cities Support (Sharon Grant)
   • Discussion

2. Local Efforts and Outcomes
   • City of Carlsbad Perspective (Mike Grimm)
   • County of San Diego Perspective (Susan Freed)
   • Discussion
1) Leading by Example

Local Governments: Energy and Climate Leaders

Cathy Higgins
Research Director
NBI
In 2015: Paris – an Unprecedented Agreement!
Now – says a lot
But there’s a new ‘Now’ – still in!

WE ARE **3,788** LEADERS STRONG

<table>
<thead>
<tr>
<th>Representing</th>
<th>Across</th>
<th>Totaling</th>
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<tbody>
<tr>
<td>155.0 million people</td>
<td>50 states</td>
<td>$9.45 trillion in GDP</td>
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**Businesses & Investors**
- 2,192

**Cities & Counties**
- 287

**Colleges & Universities**
- 351

**Cultural Institutions**
- 59

**Health Care Organizations**
- 28

**Faith Groups**
- 44

**States**
- 10

**Tribes**
- 10

Entry to Bonn Germany UN Climate Change Conference 2017
City Action

City’s Direct Influence:
• Municipal Buildings
• Fleet Operations
• Transit
• Water and Waste Utilities
• Streetlights and Signals

City Efforts:
• Zero Cities
• 2030 Districts
• Eco-Districts
• C40 Cities
• Climate Action Plans

Source: IMT, 2015
CA Cities Action toward ZNE

City of Santa Monica NEWS

Posted on 10/27/2016

Santa Monica City Council Votes in the World’s First Zero Net Energy Building Requirement; Implementation Begins in 2017

Other California Jurisdictions with ZNE Policies:
– Santa Barbara County – City of Palo Alto – City of Hayward
City of Lancaster -
Cities and Counties Getting to Zero

Carbon Neutral Polices – 37 cities targeting carbon neutral

Zero Energy Buildings – 11 cities with zero ordinances and propositions

- New York City, NY
- Washington DC
- Pima County, AZ
- Santa Monica, CA
- Austin, TX
- Cambridge, MA
- Lancaster, CA
- Boulder, CO
- Palo Alto, CA
- Park City, UT
- Hayward, CA
- CCAs in CA

100% Renewables – > 90 cities, ten counties and two states have goals for energy to be supplied by 100% renewable energy but this is gaining traction as more cities look to adopt similar goals.

- Six cities in the U.S. - Aspen, Burlington, Georgetown, Greensburg, Rockport, and Kodiak Island - have already hit their targets and now generate 100% of the energy used community-wide from clean, non-polluting and renewable sources.

Source: https://www.sierraclub.org/ready-for-100/commitments
Trend - DISTRICTS: Going Beyond the Building

districts, communities, grids, aggregation, resilience, storage, fuel access & price, energy transactions, resources, scale, utility
Market Action

Building The Capacity To Increase Net Zero Construction

The net zero building movement (where buildings produce as much or more energy than they consume) remains a nascent phenomenon. As of this time last year, the New Buildings Institute—the organization that tracks such things—had recognized only 41 buildings as net zero structures. Only two of these exceeded 15,000 square feet. The concept of net zero

Sunnyvale Net Zero Success Spurs a Second Act

The Bullitt Center is a six-story, 50,000 square-foot building that is utilizing never-before-seen technology to be the most sustainable building ever built.
Disclosure Ordinances

- Cities increasingly leveraging disclosure
- Data allows assessment of code impact and climate goal progress
- Targets Buildings for Programs

- Building Performance Range by Type
- Target Mapping
NBI Getting to Zero Buildings Database

Use the filters on the left to filter projects in the map, and/or add a bubble on the map to filter the table below. Click on the Analysis tab above to see the big picture and create customized charts.

<table>
<thead>
<tr>
<th>ZE Status</th>
<th>Count</th>
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<tr>
<td>Emerging</td>
<td>230</td>
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<tr>
<td>Verified</td>
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State or Province
- Alabama
- Alberta
- Arizona
- Arkansas
- British Columbia
- California
- Colorado
- Connecticut

Building Type
- All
- Education
- Food Sales
- Food Service
- Health Care (Inpatient)
- Health Care (Outpatient)
- Lodging
- Mercantile (Enclosed)
- Mercantile (Retail)

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<tr>
<th>ZE Status</th>
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<th>Name</th>
<th>Certifications</th>
<th>City</th>
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<td>3,500</td>
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<td>0</td>
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Resources, Guides and Events

• Getting to Zero National Forum
  Oct. 9-11 in Oakland
2) Public Buildings Portfolio Planning

A Replicable Framework for Municipal Strategic Energy Planning

Sharon Grant
Eco-Edge
Reference Cities

Boise, ID
Eugene, OR
Missoula, MT
Tacoma, WA
Providence, RI
Grand Rapids, MI

Typical City Struggles

- The path towards achieving carbon emission reduction goals is not clearly defined
- Departments tend to operate in silos
- Decision maker drivers are not well understood
- Data is scattered and not clean
- Presentation of data doesn’t tell the story effectively
- Budgets are based on lowest first cost not ROI
The Solution for Cities
Define the Path

- Establish a clear baseline
- Define SMART goals
- Track performance
- Document in a SEMP
Engage the Right Team

- Empower the energy champion
- Ensure cross-departmental representation on an energy team
- View utilities as partners
- Meet regularly
- Present to City Council
- Consider a citizen advisory group
Understand Drivers

• Who established carbon emission reduction targets?
• What motivated them?
• Do they understand the significance of buildings?
• How can you create opportunities to educate them?
Explore New Financing Mechanisms

• Enable long-term energy planning with a sustainable funding stream
• Help achieve carbon emission reduction targets
• Reinvest savings to create a virtuous circle
• Empower those that know the most about their buildings to identify opportunities
• Expedite approval processes for energy upgrades – remove red tape
Developing an Energy Revolving Fund

• Start with seed funding
• Develop a strategy for sustained funding
• Determine how the fund will be managed
• Establish criteria for selecting projects
• Measure and track the results

https://betterbuildingssolutioncenter.energy.gov/solution-roundup/green-revolving-funds
Streamlining Data Collection and Cleansing

• Ensure there is a master facility list
• If automated upload to PM, check for building name and address consistency
• If not automated, consider ways to consolidate data streams
• Run data through Maalka’s “data cleansing” tool
Create Visuals to tell the Story

The goal is “data-based decision making”

• Conduct virtual energy audits
• Make relevant comparisons
• Track the impact of energy upgrades
• Share success stories
• Show progress on a trajectory towards targets
FirstView Diagnostics

[Graph showing the relationship between mean monthly outside air temperature (°F) and average energy (kBtu/sf) for heating, cooling, thermal baseload, and electric baseload.]
Building/Portfolio Context

• Best practice context leads to change in procurement strategies
Comparison Spectrums on Like Buildings
Progress on a Trajectory

This chart shows your energy efficiency progress to-date, based on [METRIC NAME]. In order to reach your 20% Retrofit Chicago commitment by [TARGET YEAR], your building must reduce energy use intensity by a simple average of [X]% per year.
Discussion
3) City of Carlsbad ZNE Challenges and Strategies

Mike Grimm
Climate Action Plan Administrator
City of Carlsbad
Carlsbad Community Vision

- Active, healthy lifestyles
- Walking, biking, public transit
- Sustainability
- Community design and livability
Climate Action Plan

• Approved with General Plan Update and Program EIR on Sept. 22, 2015
• Serves as CEQA tiering document
• 15 Measures with 41 Actions
• Annual monitoring and reporting
2011 Community Emissions

Note: Municipal operations represent only 1.2% of all emissions
CAP Strategy Areas

- Energy efficiency
- Renewable energy
- Transportation
- Water
- Public outreach and education
New Buildings Institute developed five Action Paths for jurisdictions that provide “the most effective options for cities and states to systematically plan and make progress toward comprehensive ZNE policy”

California ZNE Communications Toolkit, May 2017
Carlsbad’s Actions Paths to Zero

• Adopted ordinances:
  – Energy efficiency for all major renovations and new non-residential
  – Alternative water heating
  – PV on new and existing non-residential
  – EV infrastructure in all new construction and existing residential
Carlsbad’s Actions Paths to Zero

- Designed microgrid at City’s Safety and Service Center complex
- Studied PV solar array at city site to offset municipal electricity use
- Participated in North County CCA feasibility study
Challenges and Strategies

Challenge

• Finding microgrid project funding
• Restarting solar array capacity study
• Overcoming effect of CCA uncertainty

Strategy

• Piecemeal project in current CIP
• Use pending CCA to reengage leaders
• Highlight CAP measures and actions
Carlsbad’s Actions Paths to Zero

• Designing new maintenance and operations center as ZNE and all-electric facility
• Benchmarking all city buildings
• Updating facilities infrastructure plan
<table>
<thead>
<tr>
<th><strong>Challenge</strong></th>
<th><strong>Strategy</strong></th>
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<tbody>
<tr>
<td>City-related</td>
<td>City-related</td>
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<tr>
<td>– CAP measures</td>
<td>– Remind about CAP intent</td>
</tr>
<tr>
<td>– Leadership changes</td>
<td>– Keep CAP in spotlight</td>
</tr>
<tr>
<td>– Funding</td>
<td>– Stress municipal leadership</td>
</tr>
<tr>
<td>Utility-related</td>
<td>Utility-related</td>
</tr>
<tr>
<td>– Data portals</td>
<td>– In-house energy monitoring</td>
</tr>
<tr>
<td>– Incentive programs</td>
<td>– Constant communication</td>
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</tbody>
</table>
Key Strategies

- Separate municipal CAP measures and actions for higher visibility
- Perform costing studies early
- Identify roles and responsibilities
- Set interim milestones
- Maintain enthusiasm!
4) County of San Diego
Perspective

Susan Freed,
Project Manager,
Energy and Sustainability Division
Struggles and Solutions

The County of San Diego’s Zero Net Energy Portfolio Plan

SEEC Forum 2019
Summary

- 10,000,000 GSF
- 1,000 facilities
- How to reach 50% energy reduction goal by 2030
Implementation

Strategy #1 – Proactive Energy Management

• Establish baselines for tracking energy use
  • End use submeters
  • Energy model for baseline
  • BAS for tracking

Challenge: Submetering is very complicated and fraught with pain points
Implementation

Strategy #2 – PPA for renewable energy

- 7 contracts executed
  - 1 completed in 2018
  - 3 will be completed in 2019
  - 3 will be completed in 2020

Challenge: PPA delivery reliability is subject to industry and economy variables, such as trade tariffs

Past 6 Months
Renewable Production at 1st Installation (1.4MW array)

Lifetime Energy Solar Production
- 1,074,847 kWh

Lifetime Environmental Savings
- 1,633,982 lb co2e
Strategy #3 – ZNE for new construction

- Capital program best practice
  - 4 occupied
  - 2 in construction
  - 4 in solicitation/design

Challenge: Inexperienced AEC teams, budget shortfalls

I have budget issues. Can’t I just take out the ZNE part?
Implementation

Strategy #4 – Purchase community solar

- Contracted for 300 accounts
  - Completed in January 2018
  - 100% renewable with RECs
  - Net cost savings

Challenge: None! Easy, quick, cost effective
Implementation

Strategy #5 – Increase energy efficiency

• Received $2M from general fund for EE projects
  • HVAC improvements
  • RCx
  • LED replacements

Projects totaling $600,000 annual savings since 2018

Challenge: Purchasing/contracting, coordination, implementation
Discussion
JOIN US IN OAKLAND!

Join us at the premier global event dedicated to creating a zero energy, zero carbon future for the built environment.

October 9-11
OAKLAND MARRIOTT
Oakland, CA

gettingtozeroforum.org