Getting to Zero: Local Government Buildings

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Who’s NBI?

- NBI is a non-profit “think tank” devoted to being a driving force for efficient buildings

- We focus on “What’s Next” for small and mid-size commercial buildings: research, guidance and policy

- Interest areas include:
  - Advancing effective building codes
  - Design guidance for new buildings
  - Optimal operation of existing buildings

- Based in Vancouver WA, NBI works across the US and Canada
Background on ZNE Involvement

• Worked on ZNE for about 6 years
• On the Board of International Living Futures Institute, USGBC, Seattle 2030
• Consultant to the CA Public Utility Commission on ZNE “Big Bold” for commercial buildings
• Worked with NASEO on Commercial Buildings Collaborative and to accelerate efforts at the state level.
First national status report

Includes:
- lists of buildings
- building characteristics
- design strategies
- technologies
- costs
- energy savings
- project profiles
Definitions

• **ZNE Buildings:**
  - **ZNE-Actual** - 1 year or more of measured energy data at ZNE performance (renewable energy generated onsite equals other energy); reviewed by a third party
  - **ZNE-Emerging** – net zero targets but early in design, operations or data not yet reviewed

• **Ultra-low Energy**
  - Low-energy building compared to peer energy use. **Not currently targeting net-zero** performance through onsite renewables. May be pursuing ZNE through district or renewable energy credits.
Number of ZNE Projects from 2012 to 2014

Number of ZNE Projects from 2012 to 2014

- 2012:
  - ZNE Verified Buildings and Districts: 21
  - ZNE Emerging Buildings and Districts: 39
  - Ultra-low Energy Buildings: 39

- 2014:
  - ZNE Verified Buildings and Districts: 33
  - ZNE Emerging Buildings and Districts: 127
  - Ultra-low Energy Buildings: 53

Note: (2012 report used label “ZNE-Capable”)

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ZNE and Ultra-Low Buildings are Possible in Many Building Types Across the US

- Small-Med Commercial Offices
- K-12 Schools
- Large Office Facilities
- Environmental Centers
- Higher Education Institutions
- Government Offices

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Locations:
2014 ZNE Buildings

~ 147 buildings in 37 states!
Insights

- ZNE offers a clear and **aspirational** target
- It is hard - a **process** not a static outcome
- **High performance first** – lower energy use lowers PV cost
- Growth and opportunities in repeatable buildings (**schools, banks, small offices**)
- **District**, community, campus level offer cost and scaling efficiencies
- Actual ZNE happens **downstream of design** - operational focus, tenant behavior focus
So, how much does this ZNE stuff cost anyway?
“The study’s central finding is that ZNE buildings will be technically feasible for much of California’s new construction market in 2020.”
low-rise office building
statistical analysis

$ / SF

BUILDINGS MEASURED

Lisa Matthiessen, Peter Morris and Laura Lesniewski
community centers
statistical analysis

BUILDINGS MEASURED
Lisa Matthiessen, Peter Morris and Laura Lesniewski
PV cost trend makes ZNE accessible

Source: P. Mints, Navigant Solar Services Program, 2011
Report Findings:

• Costs for getting to zero are difficult to distinguish from overall project costs

• 1-12% premium for energy efficiency

• 5-19% for net zero energy

• ROI for energy efficiency alone 5-12%

• ROI for net zero up to 30%

www.newbuildings.org
21 - 5 = 16

BUILDING'S TOTAL EUI

RENEWABLE PRODUCTION EUI

BUILDING'S NET EUI

Site Energy Use Index (EUI) kBTU/ft²/yr

Nat. avg. Office EUI (CBECs)

Ultra-low Energy Bldg.

Iowa Utilities Bldg. Total EUI

Iowa Utilities Bldg. Net EUI

Net Positive
KITSAP TIME CAPSULE | A WEEKLY LOOK AT THE PAST

Fifth Street | The Sears upper annex and automotive garage on Fifth Street in the early 1950s. The property now is being developed by Rice Fergus Miller.
What can you do?
Selected Policies

• Codes Roadmap
• Benchmarking
• Rate Policies
• Utility Program
• Tax Incentives (density bonuses, fast permitting)
• ZNE Goals for Public Buildings
• Target Markets (Schools, redevelopment districts)
• District Scale Renewables
NBI Resources

www.newbuildings.org

• Nine Policies to advance ZNE for state and local governments w/ examples
• Communications Tool Kit
• Database and Case Studies
• District of Columbia Study
• Early Adopters Workshop: Date October TBD
  – UC San Diego – Venter Institute’s ZNE building
    – Sponsorship in conjunction with SDG&E