

# Zero Energy Performance Index (zEPI) and Outcome Based Energy Code

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**ABAG**  
ASSOCIATION  
OF BAY AREA  
GOVERNMENTS

**nbi** new buildings  
institute

**BAY  
AREA** Regional  
Energy  
Network

# Thank You

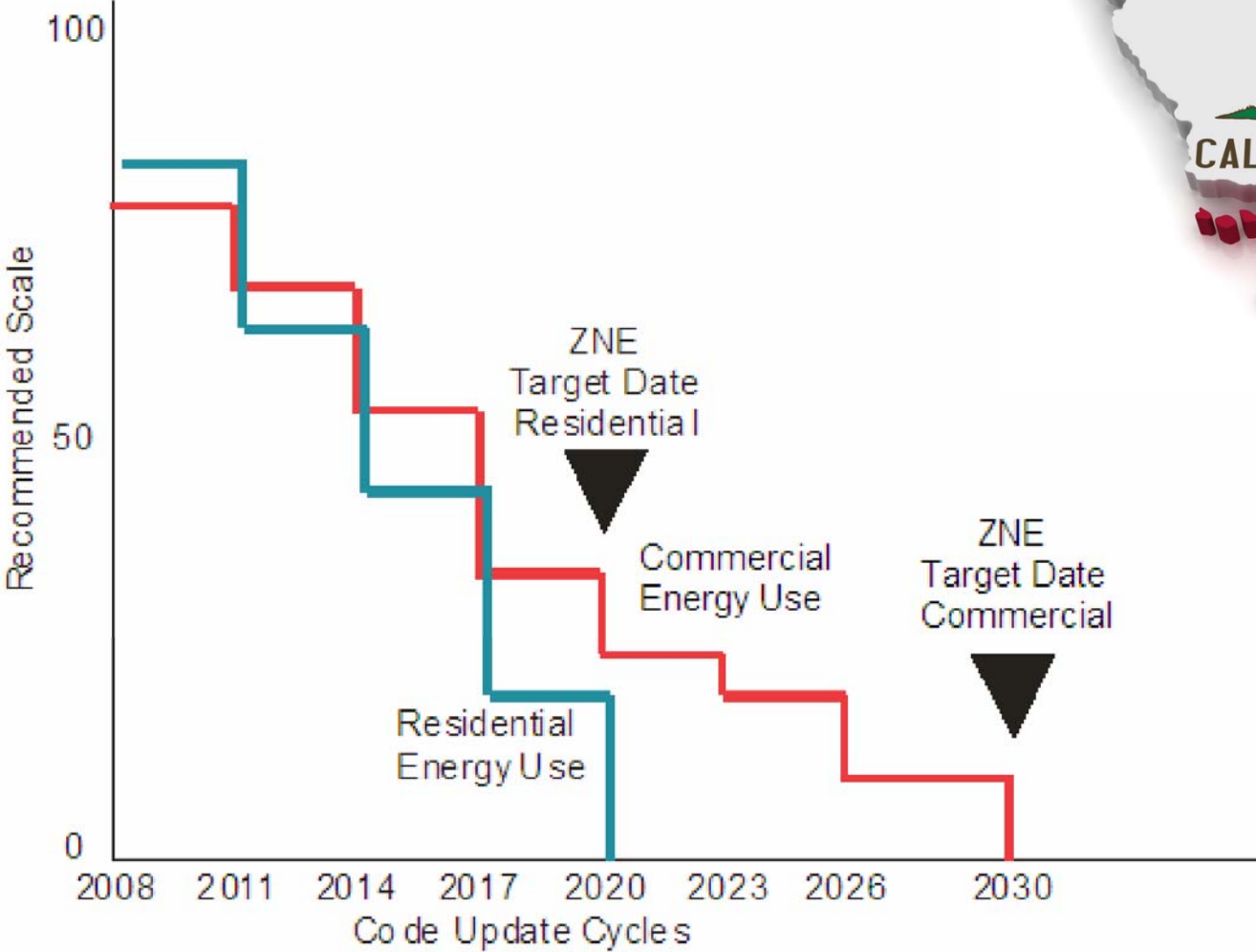
Green codes in San Francisco are supported by

- San Francisco Energy Watch Strategic Energy Resources
- BayREN Codes and Standards Program
- Investor Owned Utility Statewide Codes and Standards Program

... and the ongoing development of an Outcome Based Energy Code proposal incorporates content from each.

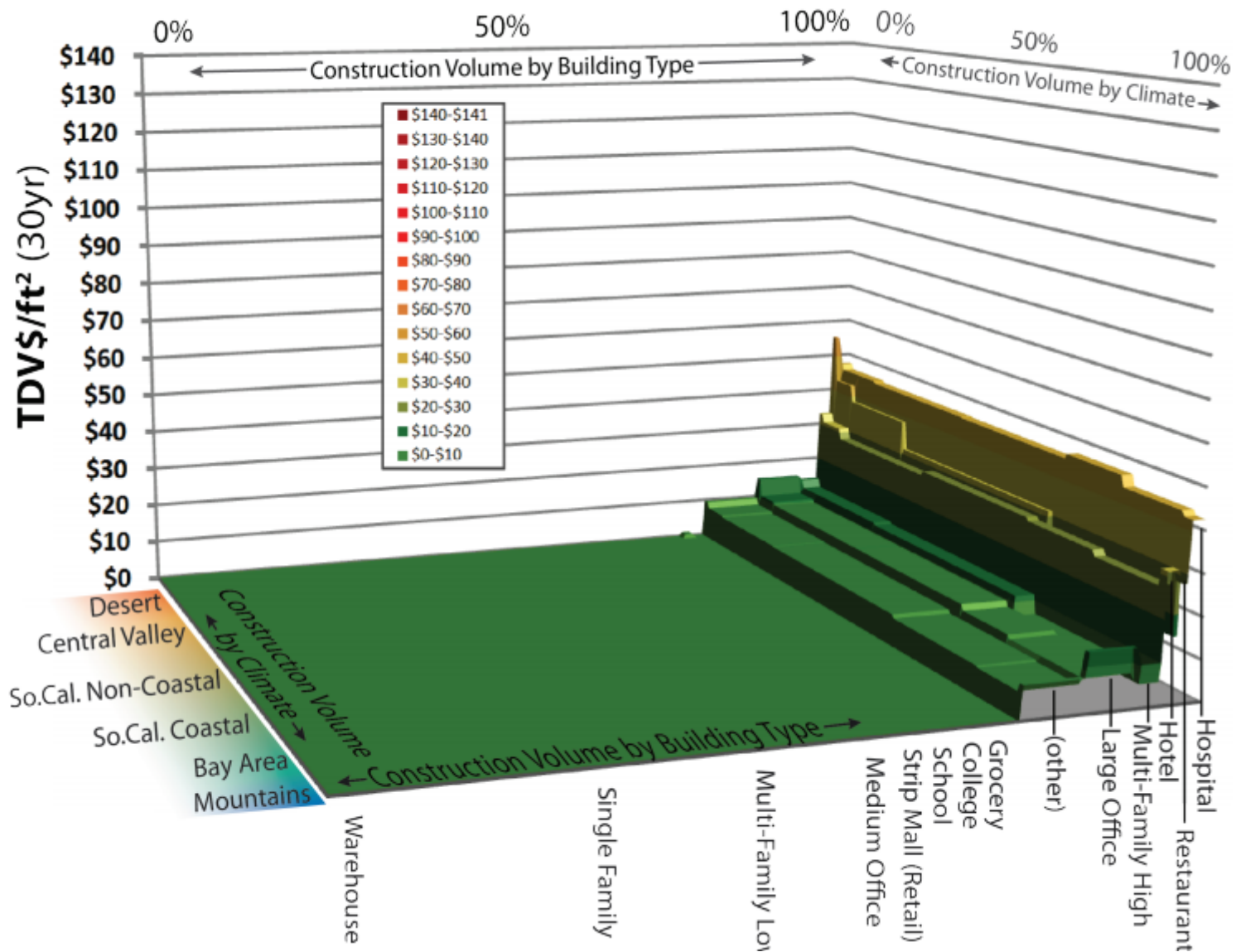


# Zero Net Energy Goals & California Codes



Reference: SCE & AEC, "Rethinking Percent Savings", 2009

# Combine Efficiency with Solar – and ZNE is Achievable



## Can this inform a reach code?

- Continue with 15% T24 margin?
- ZNE = 100% margin??
- Just add solar?



Image: Eddie Codel



Image: Paul Howard

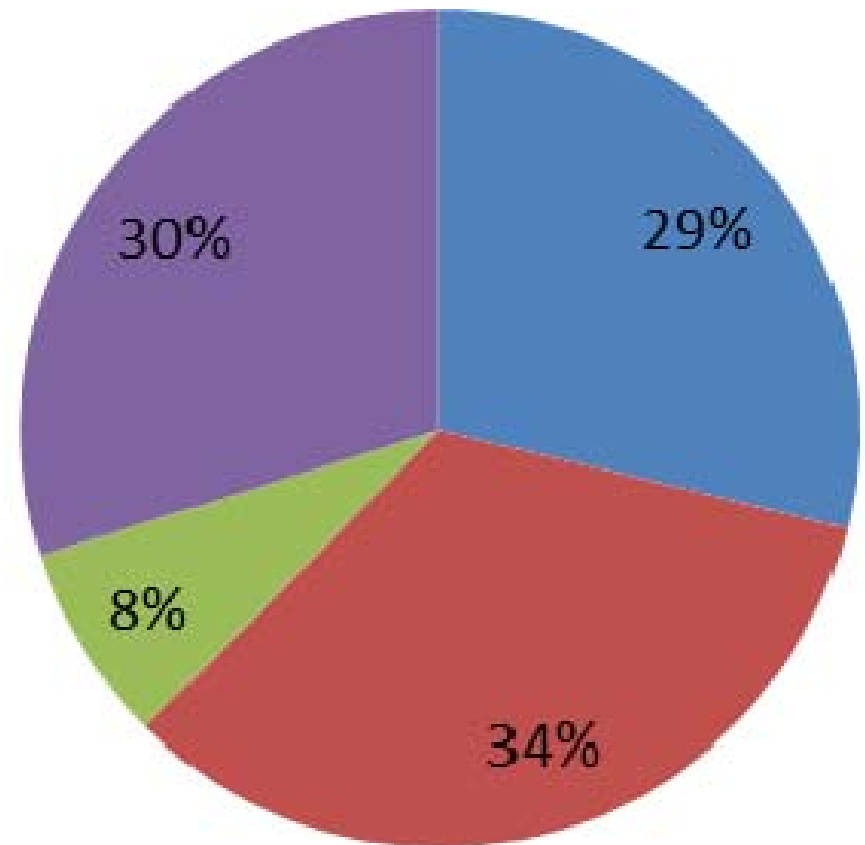
## Was T24 2013 The End of the Line for multifamily reach codes in CZ3?

- Unregulated
- Preempted
- Mandatory
- Performance

- A 15% cut in whole building energy from regulated loads required cutting modeled 'Performance' loads *in half*

OR:

- 15% cut in modeled 'Performance' loads cut expected energy use *only 4.5%*



Source: ARUP (2014)

# Need a New Approach

Current reach codes have structural limitations.

*Unregulated building loads form a bigger part of total energy consumption.*

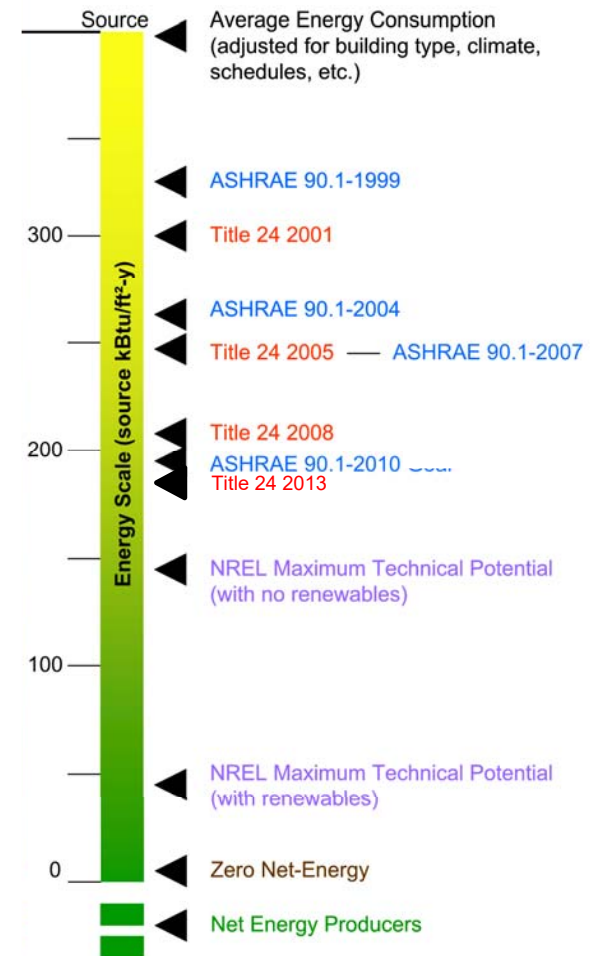
*Design codes are limited in scope.*

*Design  $\neq$  Reality*

*Code baseline “moves” with each update.*

Must enable pathways to Zero Net Energy goals.

*“Percent better” is relative, but “zero net energy” is absolute*



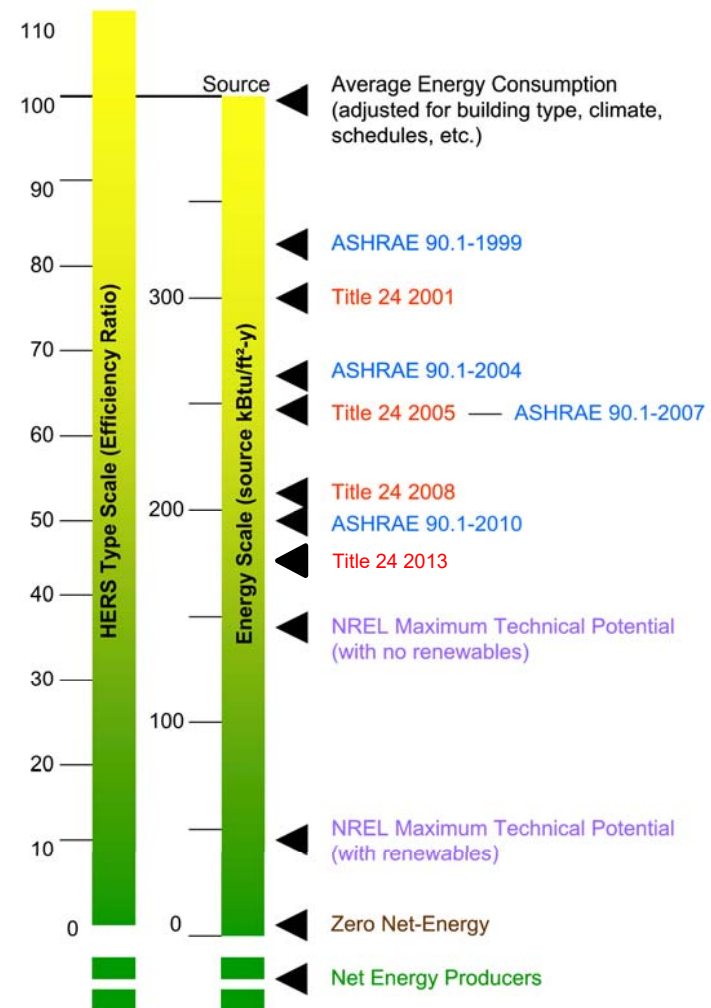


# Zero Energy Performance Index (zEPI)

- “HERS-style” 0-100 scale
- Based on measured energy consumption (not estimated)

## Goals

- Simple
- Absolute, “Zero = 0”
- Fair
- Stable
- Applicable to common building uses



## Outcome Based Code

*Measures **actual energy consumption** of the building in operation. Compares building's consumption to a **code target maximum**.*

# Outcome Based Code Concept for San Francisco/California

Energy Code  
Title 24 Part 6

Mandatory Efficiency

San Francisco Green  
Building Code

Renewables or Green Roof

Binding  
Performance Target AND  
0% T24 Margin

Non-Binding  
Performance Target AND  
-10% T24 Margin

# BayREN 2016 Project

- Test zEPI target-setting online tool against actuals
- Update zEPI target-setting tool for T24 2016, in Climate Zones 2,3,4,12
- Peer review draft code
- Share results

