Zero Is A Many-Splendored Thing

NBI Getting to Zero
Oakland, CA
October 11, 2019

Commissioner J Andrew McAllister, PhD
California Energy Commission

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Policy Drivers

- Double energy efficiency savings by 2030
- Clean electricity: 60% by 2030; 100% by 2045
- Equitable low-carbon solutions for low-income residents & disadvantaged communities
- Electrify transportation
- Decarbonize buildings & industry

Carbon-neutral economy by 2045

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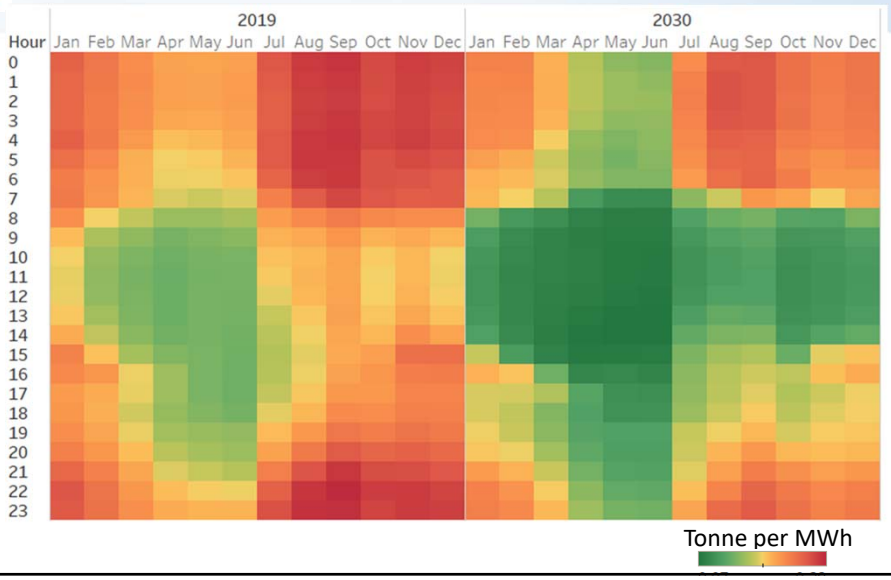
Electricity CO2 Emission Intensities



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Zero (Net) Energy is Not Zero Emissions

..but it's a great set of tools, platform, and a nice start for socializing quality building practices.

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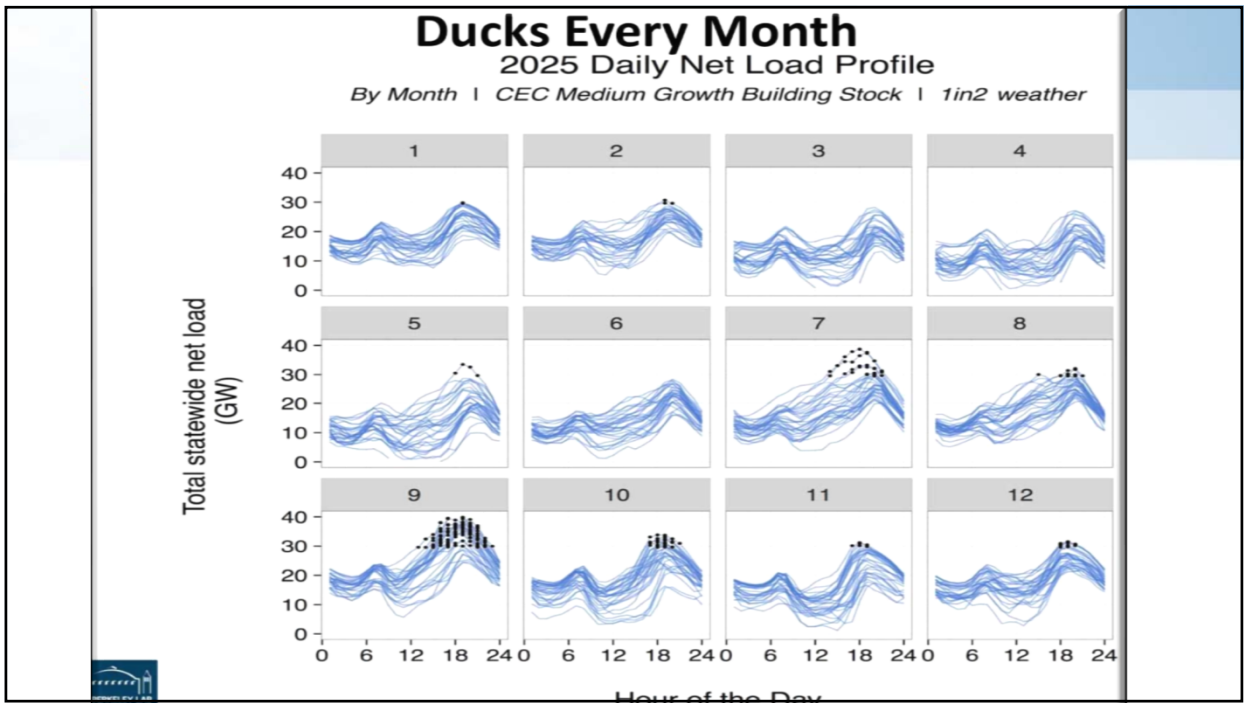
Ducks Every Month
2025 Daily Net Load Profile
By Month | CEC Medium Growth Building Stock | 1in2 weather
Total statewide net load (GW)
1
2
3
4
5
6
7
8
9
10
11
12
0
10
20
30
40
0
6
12
18
24
Hour of the Day

6

COMMIT THIS TO MEMORY

CLEAN SUPPLY
- RPS / SB100 / All-Scale Storage
- Vehicle Electrification & LCFS

+

DEEP EFFICIENCY
- EE Portfolios / Procurement
- T24 building energy standards
- Local "Beyond" Codes
- AB 758 / SB 350 (EE x 2)
- Pay-For-Performance

+

DEMAND FLEXIBILITY
- Utility Programs (DRAM); CAISO
- RATES – time & location
- T24 building standards
- Load Management Standards
- SB 49 – signed into law!!

=

DECARBONIZATION
- **Clean, Least-Cost Reliability**
- Better AQ, Health, New Jobs
- ….and A FIGHTING CHANCE AGAINST CLIMATE CHANGE

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Efficiency + Flexibility

Emerging consensus:

- Alliance to Save Energy: "Active Efficiency"
- NASEO–NARUC effort on Grid-Interactive Efficient Buildings
- Deeper thinking by Gridworks, E3, Recurve, Rahus, Kevala
- NY, HI, MA, RI, MD…many other states

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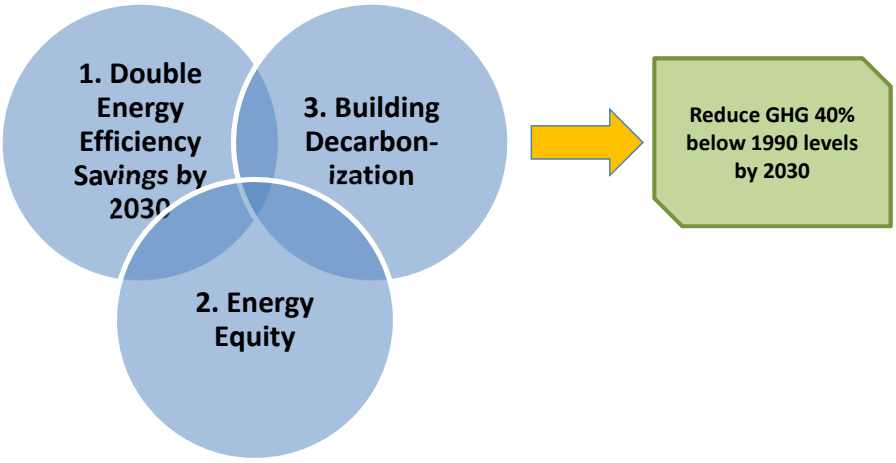
CA EE Action Plan: Please Comment!



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2019 T24 Energy Code

- High performance envelopes
- On-site PV requirements to offset expected annual electricity (of a dual-fuel home)
- All-electric performance baseline (optional) for low-rise residential & performance credits for high performance HPWHs
- Performance credit for behind-the-meter batteries

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2022 T24 Part 6 Discussion

- Focused on Commercial & Multifamily
- Improvements to Shell, Lighting, Mechanical, Hot Water, and Grid-responsiveness
- Update TDV to align better with emissions
- Improve usability for multifamily projects
- Platform for ongoing industry collaborations, such as…

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….Thin Center Glass Triple-Pane Windows

- Envelope efficiency is key for building decarb
  - HPA, HPW, QII are part of this evolution
  - Windows are best opportunity for additional savings
- In 2018 CEC/CBIA/LBNL/IOUs/window manufacturers co-founded the California High Performance Collaborative (C-PAW) to “mainstream” skinny triple pane windows
- Same dimension, weight, labor as traditional windows
- PG&E / CBIA new incentives for CZ 11, 12, 13
- A classic MT opportunity with huge upside.

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Load Management Standards

WAA (1974): "…the commission shall consider**, but need not be limited to**, the following load management techniques:

(1) Adjustments in **rate structure** to encourage use of electrical energy at off-peak hours or to encourage control of daily electrical load….

(2) End use **storage systems** which store energy during off-peak periods for use during peak periods.

(3) Mechanical and **automatic devices** and systems for the control of daily and seasonal peak loads."

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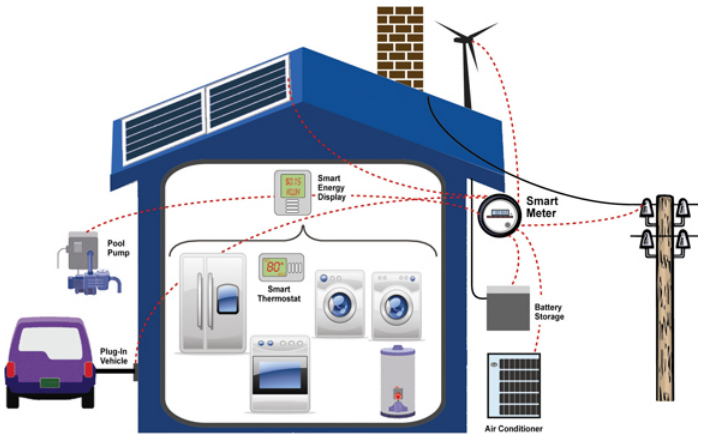
Appliance Standards for Demand Flexibility

Legislation SIGNED 10/10/19! – AB 49 (Skinner) grants CEC authority to develop & implement Demand Flexibility Standards for Appliances



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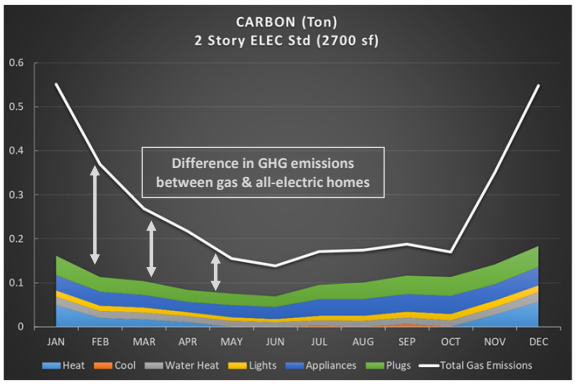
SB 1477: BUILD & TECH

SB1477 allocates **$200M over four years** to support new construction and retrofitting projects that **decarbonize California's building sector.**

BUILD
- Incentive program
- New residential & non-residential buildings
- Low-income housing focus

TECH
- Market transformation program
- Existing residential buildings
- Space and water heating focus



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Onward!

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