CA Building Energy Policy

CALIT2 Igniting Technology
California Electrification

November 29, 2018

Bryan Early
Advisor to Commissioner McAllister
CA Decarb Guiding Lights

• Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016)
  – Established a GHG emissions reduction goal of 40 percent below 1990 levels by 2030, building on the 2006 landmark legislation (Assembly Bill 32, Núñez, Chapter 488, Statutes of 2006), requiring GHG emissions be reduced to 1990 levels by 2020.

• Executive Order B-55-18
  – Establishes a new statewide goal to achieve carbon neutrality by 2045, then achieve and maintain net negative carbon emissions thereafter.

• Senate Bill 100 (de León, Chapter 312, Statutes of 2018)
  – Sets a planning target of having renewable resources and zero-carbon electricity resources serve 100 percent of California’s electricity use by 2045
  – Increases the 2030 Renewables Portfolio Standard target from 50 percent to 60 percent.
CA GHG Emissions

- Transportation: 26%
- Industry: 37%
- Agriculture: 9%
- Buildings: 27%
Senate Bill 350
The Clean Energy and Pollution Reduction Act of 2015

- EE: Double energy efficiency savings by 2030
- Renewables: 50% renewable energy by 2030
- Equity: Address barriers for low-income residents & disadvantaged communities
- EVs: Encourage widespread transportation electrification
- IRPs: Integrated resource planning to reduce greenhouse gas emissions
Energy Use Reductions needed to meet SB 350
Energy Savings (Quad BTUs)

SB350 Doubling Goal

Voluntary EE Programs

Building Codes

Appliance Standards

PACE Financing

Other *

*Other* includes federal appliance standards; local government ordinances; air quality districts; Proposition 39; industrial and agricultural sectors; Behavioral, Retrocommissioning, Operational Energy Efficiency (BROs); benchmarking; energy asset rating; smart meter and controls; & electrification.
2019 Residential Standards
Path to the Future

➢ Increases cost effective building energy efficiency and indoor air quality

➢ Contributes to the State’s GHG reduction goals

➢ Promotes demand flexibility and self-utilization of PV generation
2019 Residential Standards Approach
Priorities:
1. Envelope efficiency,
2. Reasonable options for all-electric homes,
3. Appropriately sized PVs, and
4. Grid harmonization strategies - maximize self-utilization of the PV

PV – prescriptive requirement
Battery – compliance credit
Thermal Storage – compliance credit
Policy Direction: Building Decarbonization

- *Thermal Decarbonization Working Group of the* Pacific Coast Collaborative (West Coast states, province, cities)
- 2018 legislation: new construction & upstream product incentives (SB 1477), plans to meet statewide building decarb targets (AB 3232), 100% RPS (SB 100)
- 2019 EE / Building Decarb Action Plan – AB 758 / SB 350 / AB 3232
- Several cities working on decarbonization reach codes for 2020
2016 Energy Use in California Buildings (MMBtu)

- **Natural Gas (48%)**
  - Residential: 429,751,048
  - Commercial: 197,812,601
- **Electricity (52%)**
  - Residential: 310,115,814
  - Commercial: 358,225,905
Electricity CO\textsubscript{2} Intensity

Electric Emissions (Tons/MWh), 2019-2030
## Electricity CO₂ Intensity

### Monthly Emissions Intensity, 2019 & 2030

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  - Dec

- **2030**
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Buildings Perspective: 2019

Emissions Intensity Relative to Natural Gas
Buildings Perspective: 2030

Emissions Intensity Relative to Natural Gas
Policy Direction: Building Standards

- Adopt an energy metric that aligns with GHG emissions (applied to all fuel types)
- Adopt a secondary demand flexibility metric (applied only to electricity)
- Implement performance trade-offs that prioritize & protect the building envelope
Emission reductions: Mixed Fuel to All Electric

- Appliances: 6%
- Space Heat: 65%
- Water Heat: 28%

Remaining emissions: All Electric

- Refrigerants: 37%
- Heating: 20%
- Plug Loads: 20%
- Appliances: 19%
- Water Heating: 8%
- Heating: 8%
- Lights: 8%
- Cooling: 3%

Sacramento

Los Angeles
Retail Store with Refrigeration

- 24,000 sf, ½ with refrigeration
- 1.3 W/sf refrigeration load
- Gas water heating
- Gas space heating