

# ET Summit 2019

Presented by



# Decarbonizing Building Codes

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# Decarbonization = Electrification of Transportation & Buildings



## State's Leadership



- SB100
  - 60% renewable electricity by 2030, 100% by 2045
- SB1477
  - Provides \$50M in annual incentives to jumpstart market for low-emission heating tech
- 2019 CA Building Standards Code “Title 24”
  - Increased efficiency, all-electric pathways, and solar PV required for low-rise residential

## Why Decarbonize and Electrify?



All-electric affordable housing  
2121 Lincoln Blvd. Santa Monica, CA

- ✓ Electrification improves indoor air quality and safety
- ✓ Electrification provides immediate efficiency and GHG reduction
- ✓ All-electric buildings are generally less expensive
  - Cost-savings during construction
  - Cost-neutral for appliances and mechanical systems



## Santa Monica's Leadership



Sustainable City Plan (1994, 25yrs ago!)

Mandatory solar on all new buildings (2016)



Energy Reach Code (2017, in effect until Dec 31, 2019)

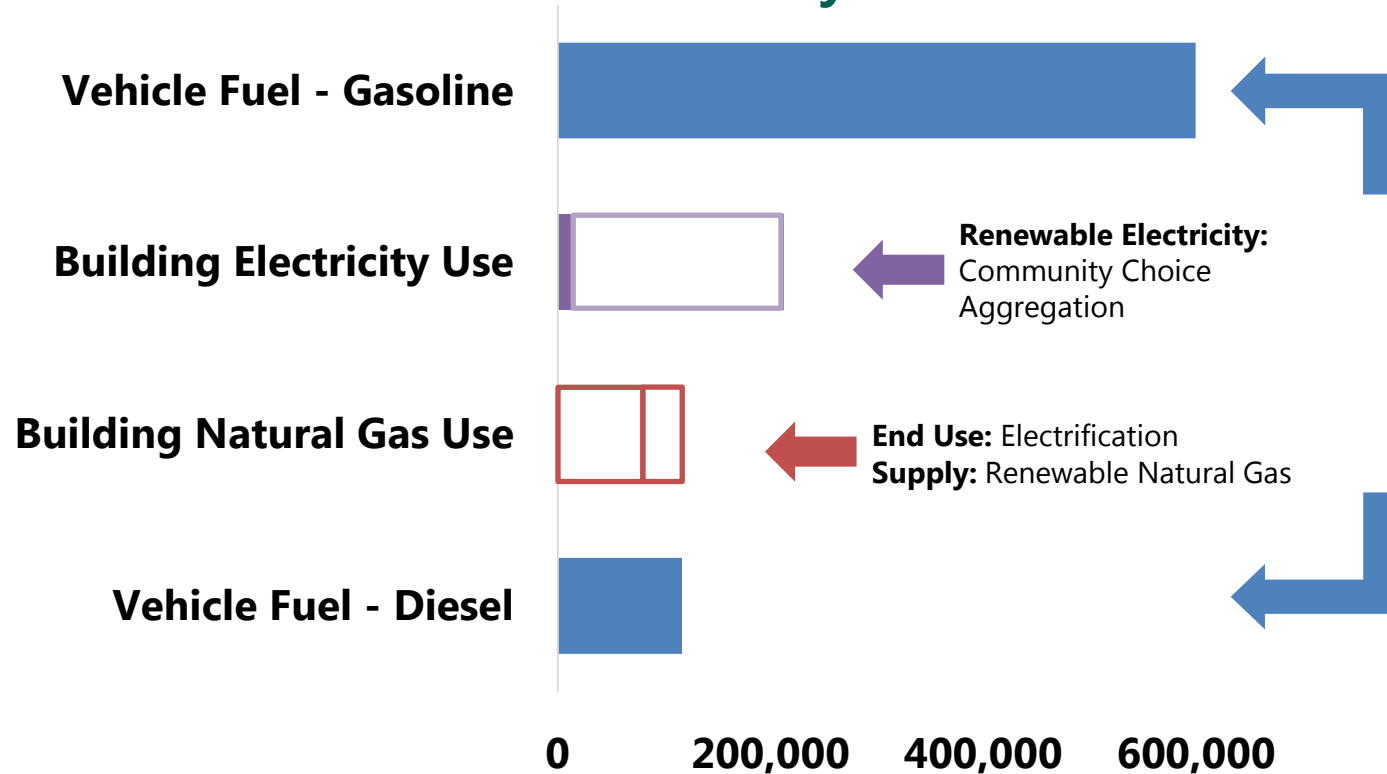
Municipal Sustainable Building A.I. (2017)

Climate Action & Adaptation Plan (2019)

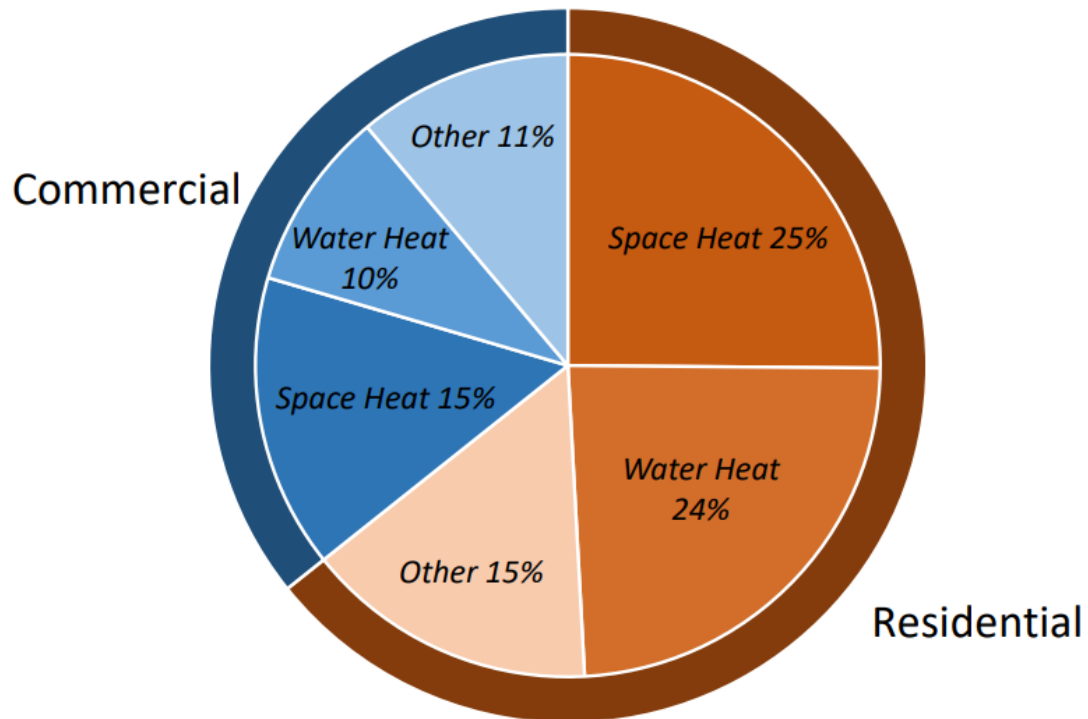
Clean Power Alliance (2019)



## Santa Monica Emissions by Source



## Focusing on Electrifying End-Uses





# Heat Pumps & Electric Options for all Uses

## Commercial

1. Heat pump space heating & cooling
2. Heat pump water heater

1.



2.



3.



4.



## Residential

3. Heat pump space heating & cooling
4. Electric fireplace
5. Heat pump water heater
6. Heat pump pool heater
7. Heat pump clothes dryer
8. Induction stove
9. Electric BBQ

5.



6.



7.



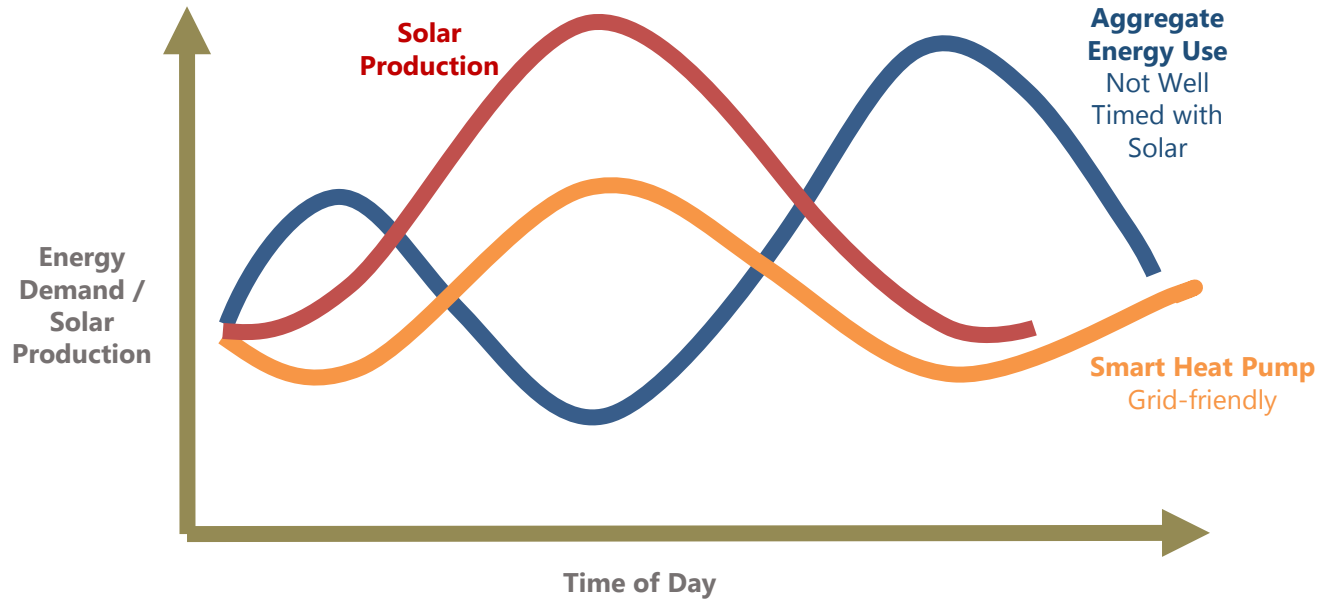
8.



9.



## Smart Grid Integration



## Building Decarbonization Strategies




New Construction	Existing Buildings	Education
Building Codes	Carbon Reduction Programs	Supply Chain & Workforce Development
Gas Ban or Fees	Retrofit Accelerator	Model Projects
	Smart Grid Integration	Outreach
	Financial Incentives	

# New Construction Reach Codes

## Must be:

- More aggressive efficiency requirements than state code
- Requires cost-effectiveness study
- CA Energy Commission (CEC) approval

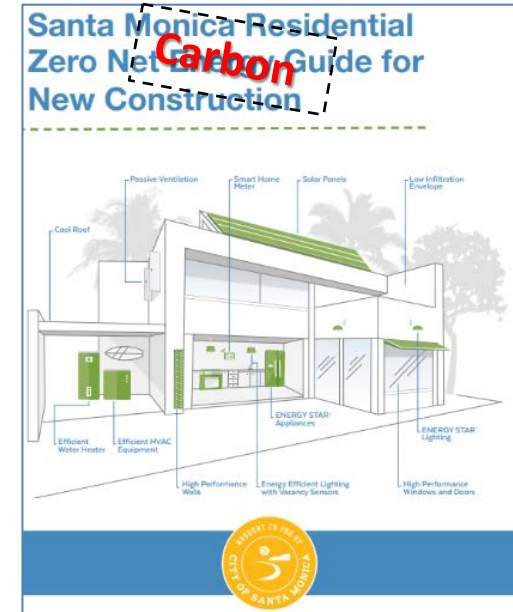
Jurisdiction	Status	Approach			Systems			Building Types						Add-Ons		
		Ban	All-Electric Reach	Electric-Preferred	Whole Building	Water Heating	Space Heating	Low Rise Residential	High Rise Residential	Hotel	Retail	Office	Restaurant	Additional Solar	Electric Vehicles	Natural Gas In Lieu Fee
Berkeley	Approved	X			X			X	X	X	X	X	X			
Carlsbad	Approved		X			X		X						X		
Davis	Second Reading			X	X			X								
Marin County	Second Reading			X	X			X	X	X	X	X	X		X	
Menlo Park	Approved	X	X			X	X	X	X	X	X	X	X	X		
San Jose	Second Reading			X	X			X	X	X	X	X	X	X	X	
San Luis Obispo	Second Reading			X	X			X	X	X	X	X	X	X		X
San Mateo	Approved			X	X			X				X		X	X	
Santa Monica	Approved			X	X			X	X	X	X	X	X	X		
Windsor	Second Reading		X		X			X								

Santa Monica Reach Code		Code Compliance Pathways*	
		All-Electric	Mixed-Fuel
Single Family & Low-Rise MF 		<b>Efficiency + Solar:</b> Meet State Code (no reach)	<b>Efficiency + Solar:</b> CalGreen Tier 1 <ul style="list-style-type: none"> <li>High-performance efficiency</li> <li>Total Energy Design Rating of <math>\leq 10</math></li> </ul>
High Rise MF & Hotel 		<b>Efficiency:</b> Meet State Code <b>Solar:</b> 2 watts/sq. ft. of bldg. footprint	<b>Efficiency:</b> 5% better than State code <b>Solar:</b> 2 watts/sq. ft. of bldg. footprint
Non-Residential 		<b>Efficiency:</b> Meet State Code <b>Solar:</b> 2 watts/sq. ft. of bldg. footprint	<b>Efficiency:</b> 10% better than State code <b>Solar:</b> 2 watts/sq. ft. of bldg. footprint
New Heated Pools		Heat-pump and/or Solar	N/A
Major Additions		<b>Solar for SF/Duplexes:</b> 1.5 watts/sq. ft. of addition <b>Solar for all others:</b> 2 watts/sq. ft. of addition's footprint	

\* Title 24 Certificate of Compliance must be prepared by a Certified Energy Analyst

# Ensuring Success During Implementation

- Update City Websites
- Trainings & Workshops
- Engage with suppliers, local plumbers, HVAC technicians, and building contractors to build awareness, identify barriers and opportunities
- Zero Emission, All-Electric Construction Guide





## What are the challenges? Retrofits

- Planning and design
- Limited electrical capacity or supply in existing/older buildings
- Low priority for property owners (unless equipment fails)
- Growing awareness & acceptance by consumers and installers



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