

# SCE's Pathway to Beneficial Building Electrification

## **For Pachamama or Mother Earth!**

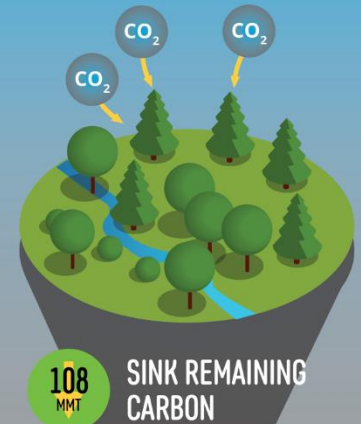
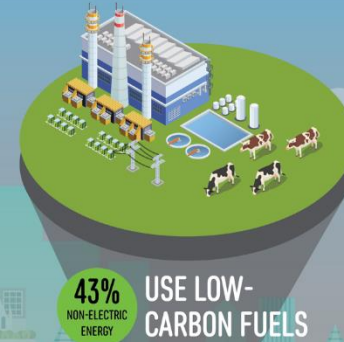
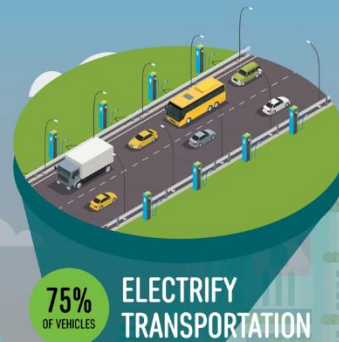
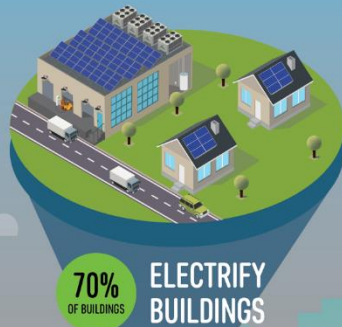
A literal translation would be "World Mother" in the Aymara and Quechua languages of South America

Edwin Hornquist

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# PATHWAY 2045

Meeting California's Climate Change Goals

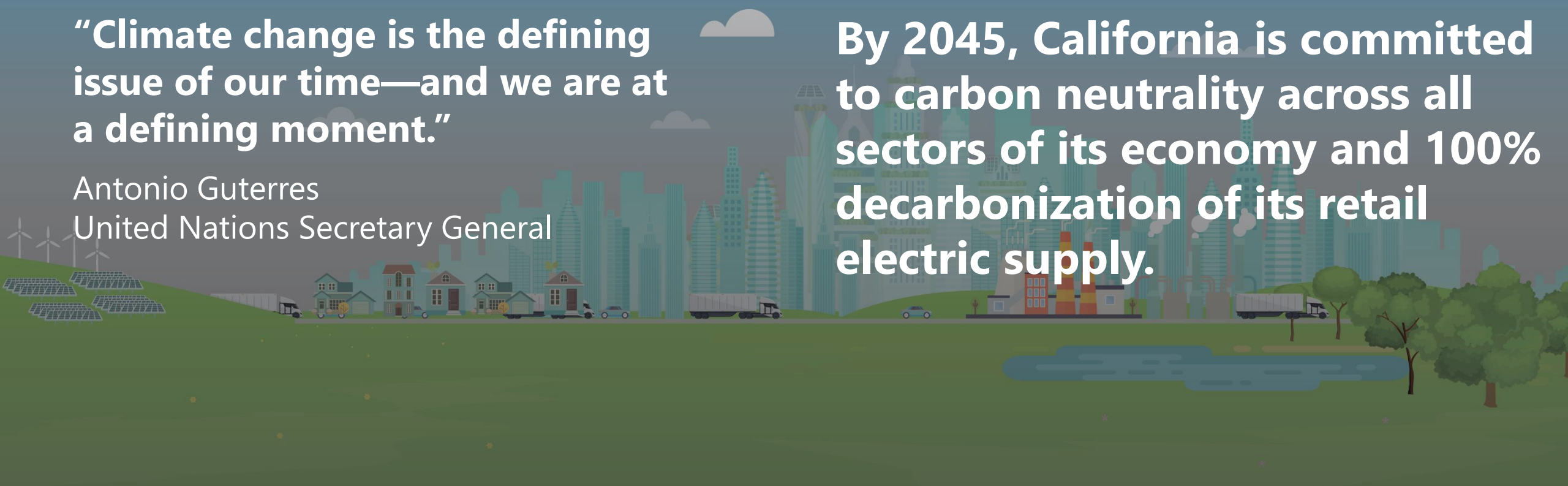


# Pathway 2045 is Southern California Edison's roadmap to carbon neutrality.

**“Climate change is the defining issue of our time—and we are at a defining moment.”**

Antonio Guterres  
United Nations Secretary General

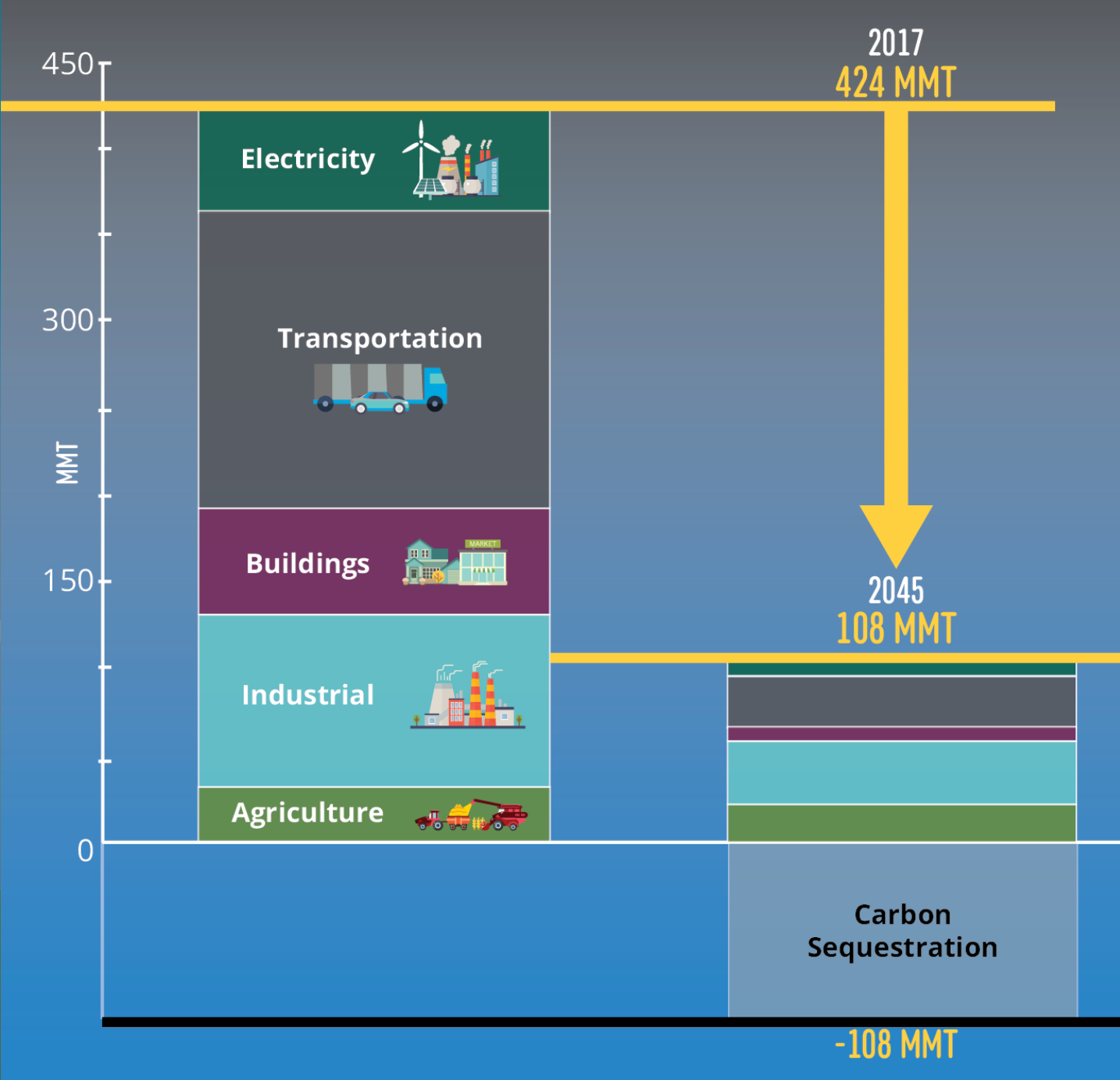
**By 2045, California is committed to carbon neutrality across all sectors of its economy and 100% decarbonization of its retail electric supply.**



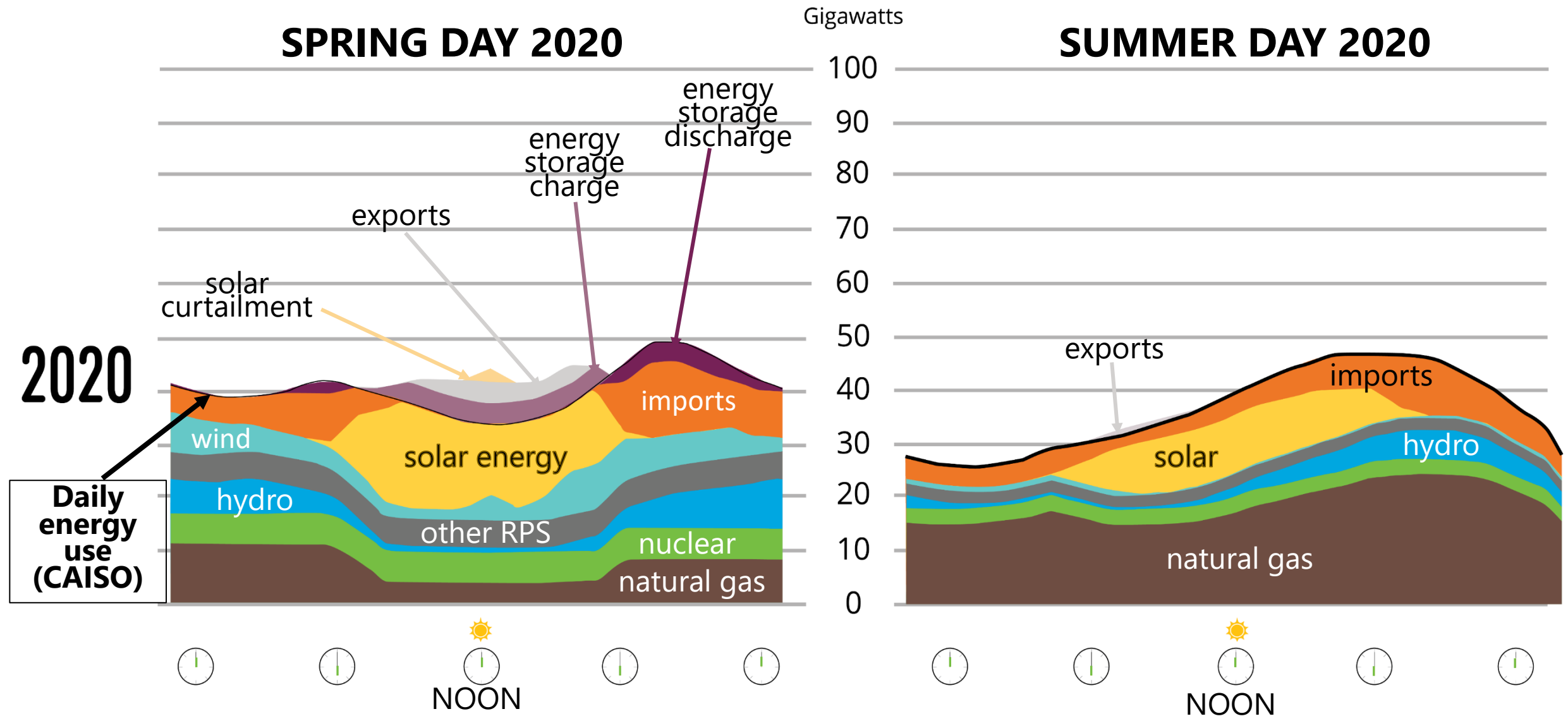
# In Pathway 2045, economy-wide decarbonization is achieved through:

- Deep decarbonization of the **electric sector**
- Significant electrification of **transportation** and **buildings** coupled with advanced **energy efficiency**
- Use of **low-carbon fuels** for hard-to-electrify applications such as **industrial** and **heavy-duty transportation**.

The remaining carbon is sequestered, either biologically or physically, to reach carbon neutrality.



# The electric supply changes dramatically over the next 25 years.



2045 sees a 60% increase in electricity from the grid and 40% increase in peak load.

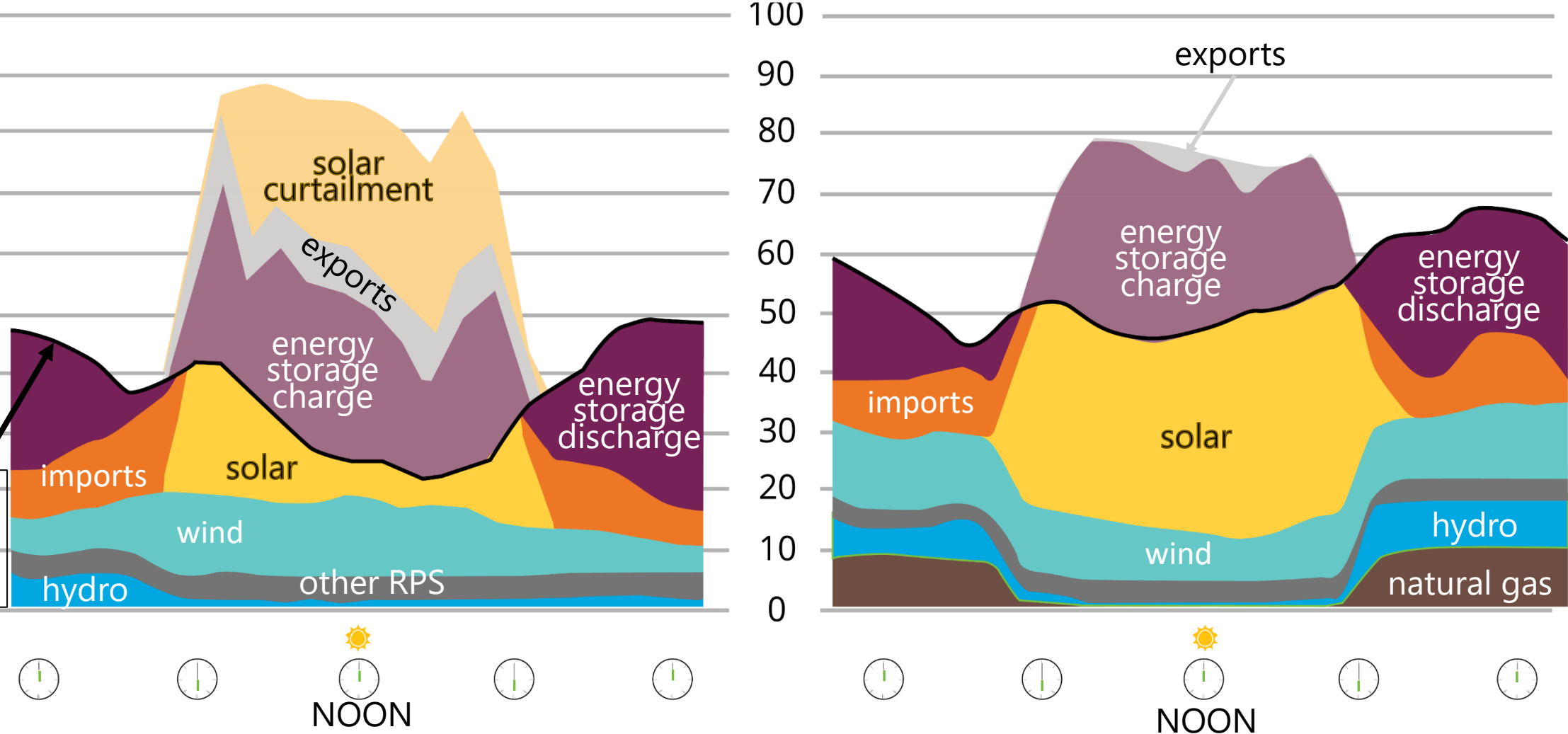
### SPRING DAY 2045

Gigawatts

### SUMMER DAY 2045

2045

Daily energy use (CAISO)



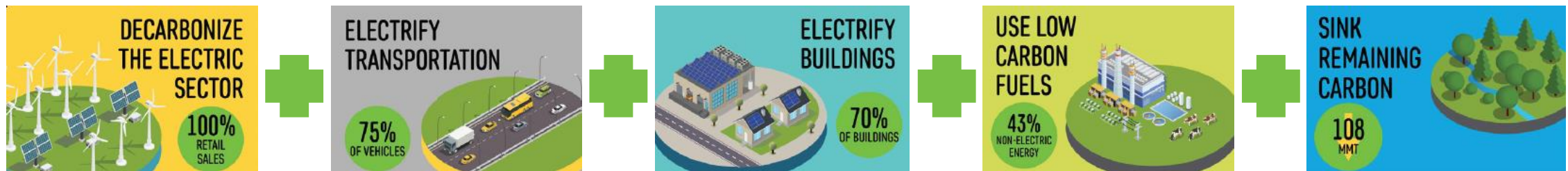


# Pathway 2045 builds on the 2030 pathway and presents a vision for reaching carbon neutrality in California

- The 2017 Clean Power and Electrification Pathway whitepaper, proposed least-cost pathways to meet California’s 2030 greenhouse gas reduction goals, including:
  - Provide 80% carbon-free electricity by 2030 (effectively a 70% RPS)
  - Electrification of 7 million light-duty vehicles and 1/3 of space and water heating
- In 2018, California advanced its policy targets to 2045
  - Governor Brown’s Executive Order B-55-18 requires the California economy to become carbon neutral by 2045
  - SB 100 requires 100% of electricity retail sales to come from carbon-free resources by 2045, and updates the RPS requirement to 60% in 2030
- **SCE’s updated whitepaper is a vision for reaching California’s 2045 climate goals**
  - It establishes that economy-wide carbon neutrality by 2045 will require a transformation of how the state sources and uses energy, especially in transportation and buildings
  - It describes how an electric-led pathway is feasible and relatively cost-effective in achieving these goals
  - It increases the sense of urgency to achieve 2030 goals, which keeps California on a path to success in 2045

# SCE's Pathway to 2045: Carbon neutrality in 2045 is achieved through electrification, deep decarbonization of electricity, and the use of low-carbon fuels for hard-to-electrify sectors

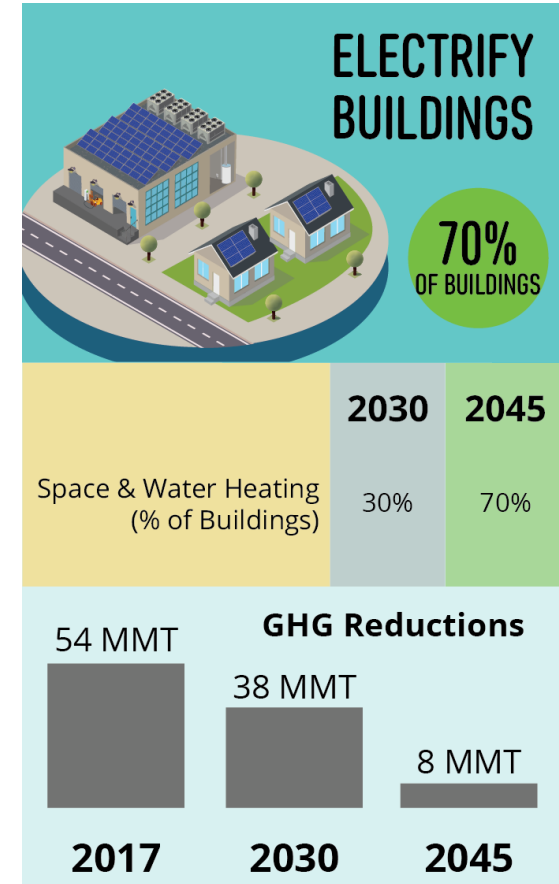
- Utilities provide 100% carbon-free electricity retail sales per SB 100
- Electrify 75% of transportation
- **Building electrification** will include 70% of space and water heating, enabled through retrofits and new building codes and standards
- **Natural gas use falls by half**, with roughly 40% of remaining gas sourced with biomethane (RNG) or hydrogen. **Low-carbon fuels target hard-to-electrify applications**
- Carbon emissions can fall nearly 75% to 108 MMT, and **reach neutrality through offsets or sequestration by 2045**



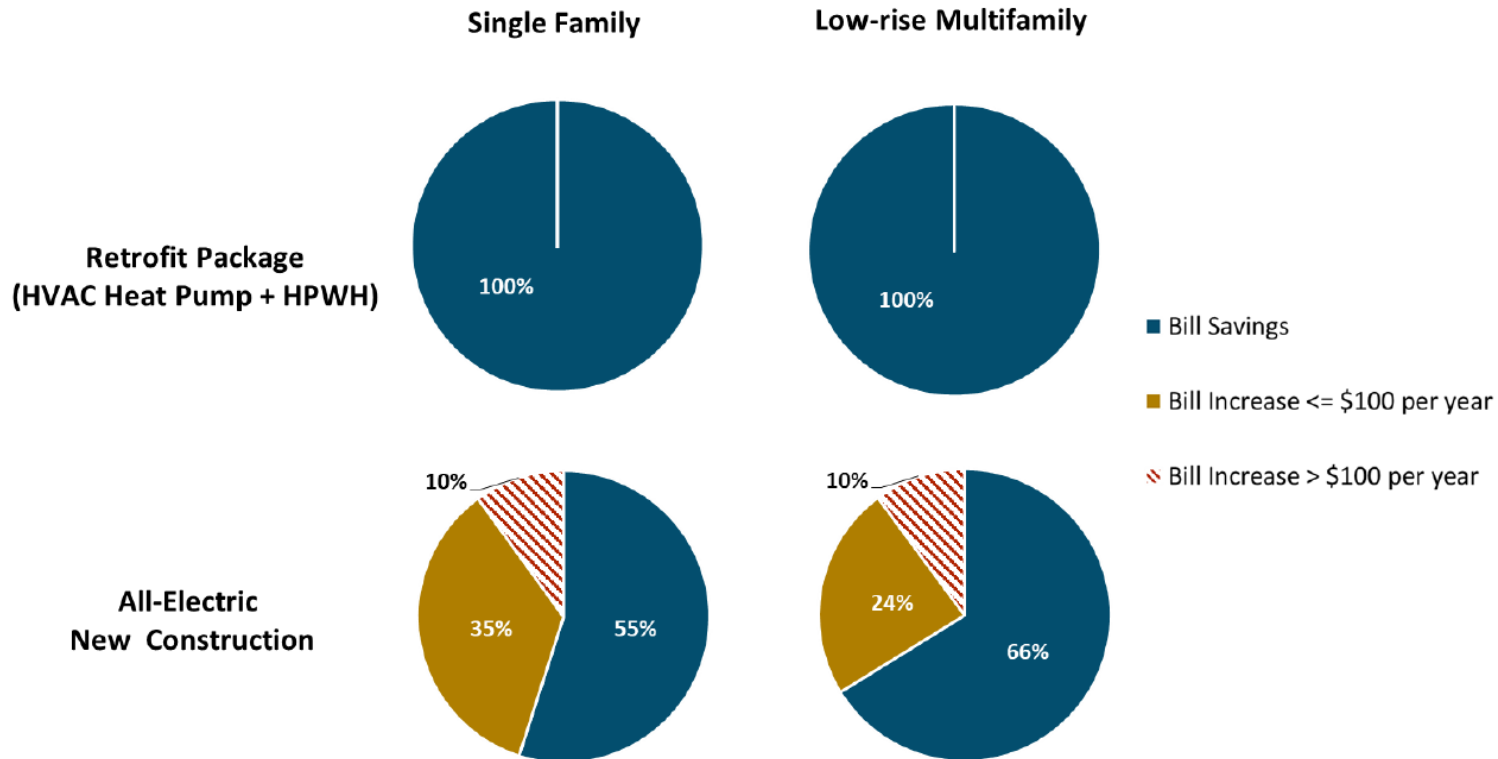


# SCE's Pathway to 2045: Building Electrification

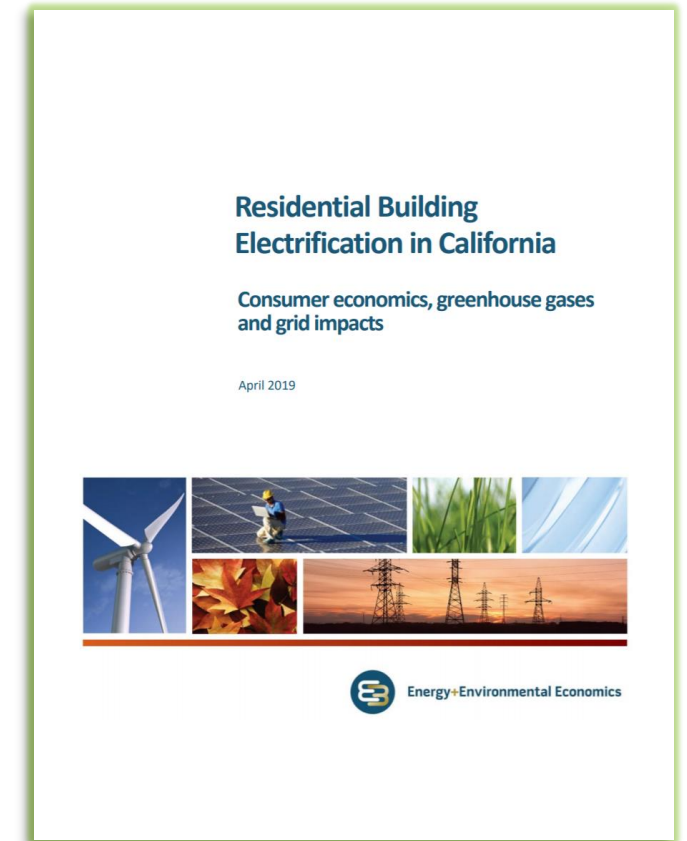
- Electrify almost three-quarters of space and water heating by 2045.
- Building electrification today reduces total GHG emissions in single-family homes by 30% to 60% relative to a natural gas-fueled home.
  - **As electricity gets cleaner, these reductions are estimated to increase to almost 90% by 2050.**
- In addition to health benefits, all-electric homes can provide overall cost savings to most customers.
- Building Electrification will contribute to better utilization (higher load factor) of the grid.
- Building costs for all-electric homes can be less than mixed-fuel homes. Plus, electrified homes also provide overall energy savings for the average customer.



# Bill Savings from BE for households across CA



Share of simulated households with bill savings from adopting electric end uses; results are weighted by the estimated share of households in each climate zone and utility service territory



# What is SCE Doing?

- **Today**
  - Residential Upstream Space and Water Heating Heat Pump Incentives
  - California Advanced Homes Program - electric (CAHPe)
  - Clean Energy and Resiliency Program (CLEAR)
  - San Joaquin Valley Disadvantaged Community Pilot
  - Energy Codes & Standards
  - Support CPUC's BUILD and TECH Pilots (SB 1477)
- **Tomorrow**
  - Proposed Building Electrification Pilots in Energy Savings Assistance Application
  - Self Generation Incentive Program (SGIP)
  - Proposed a Smart Heat Pump Water Heater Pilot in Energy Savings Procurement & Investment Plan (ESP & IP) Application
  - Continue Leveraging EE Programs Where it Makes Sense
- **Longer Term Transformational**
  - Leverage Programs Across Proceedings
  - Learn from Pilots
  - Identify Gaps and Barriers
  - Push to Advance Code to All-Electric
  - Consider Rate Design
  - Other Incentive and Financing Programs

*Thank you!*



Imagine a world where the energy that powers our lives and propels us forward is provided by the Earth's clean resources.

**THIS IS OUR CLEAN ENERGY FUTURE.**