

# **Grid for the Future: A Solution to Today's Overlapping Energy Crises**

## **Business Network Breakfast**

Kurt Johnson  
July 31, 2024

# California is Behind on its Climate Goals

Transitioning California's power supplies presents a unique opportunity to help California meet its climate goals while also addressing reliability and affordability.

☰ CAL MATTERS Climate Change | California isn't on track to meet its climate change mandates — and a new analysis says it's not even close Donate

## California isn't on track to meet its climate change mandates — and a new analysis says it's not even close

BY ALEJANDRO LAZO  
MARCH 14, 2024



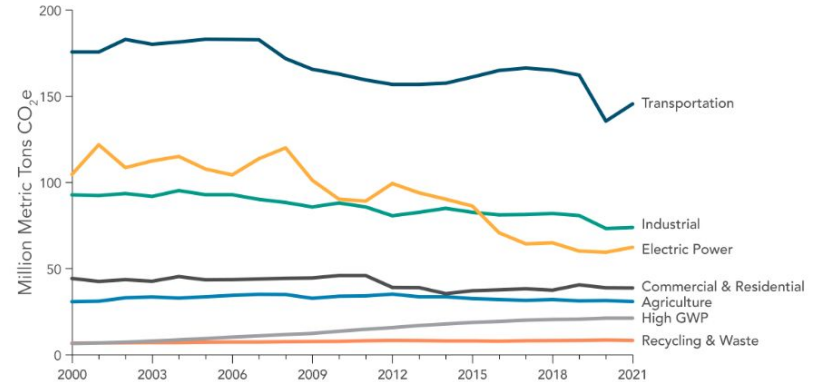
The AES power plant in Redondo Beach on Jan. 28, 2021. Natural gas power plants, like this one, are among the state's largest sources of greenhouse gases. California is not on track to meet its climate change goals, according to a new analysis. Photo by Shae Hammond for CalMatters

the climate center

# California is Behind on its Climate Goals

California must **triple** the rate at which it cuts greenhouse gas emissions to meet its 2030 target of emitting less than 40% of 1990 levels

2000–2021 GHG Emissions by Category as Defined in the Scoping Plan

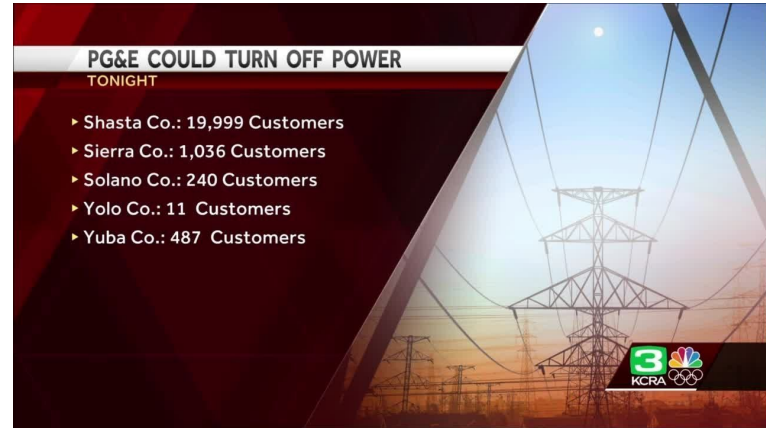


Source: California Air Resources Board

# Electricity Reliability Crisis

## Inconvenient for all, deadly for some

“Californians have grown unhappily familiar with the term ‘Public Safety Power Shutoff.’ Residents receiving a PSPS warning brace themselves for power outages that could last days – a prospect triggering annoyance in many and serious, justified anxiety in others.”



# Environmental Equity Challenges

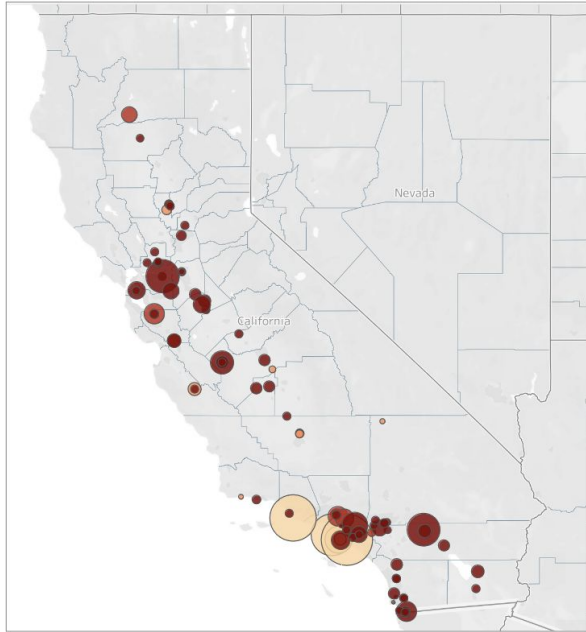


Figure 1: Peaker plants across California



Peaker Plant in Yuba City, CA

**Half of CA's peaker plants are located in disadvantaged communities**

# Skyrocketing Electricity Costs

The San Francisco Standard [Newsletters](#)

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## Ignoring public outcry over soaring bills, regulators approve another PG&E rate hike



Richard Becker, 77, of San Francisco, leads a chant after making decrying proposed PG&E rate hikes at the California Public Utilities Commission meeting Thursday in San Francisco | Jungho Kim for The Standard



By [Kevin Truong](#)  
Published Mar. 07, 2024 • 3:18pm

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After nearly two hours of vociferous—at times enraged—opposition to planned PG&E rate hikes during a meeting of the California Public Utilities Commission on Thursday, commissioners took five minutes to issue their decision.

The regulators would allow PG&E to raise rates. Again.

KPBS Here and Now Economy

## Month after reporting record profits, SDG&E hikes up rates in March

By Erik Anderson / Environment Reporter  
Published March 18, 2024 at 6:00 AM PDT



LISTEN • 1:01



San Diego Gas & Electric is raising rates in March just a month after the utility reported record profits. KPBS Environment Reporter Erik Anderson says the rate hike eliminates some savings from January.

San Diego Gas & Electric's rates are going up in March, just a month after the utility reported record profits for 2023.



# Solutions are Obvious

## After Hurricane Beryl, Microgrid-Equipped Grocery Stores and Homes Weathered Outages for More Than a Week in Houston

Microgrids went to work during the southern Texas outages caused by Hurricane Beryl, proving their value in a crisis. They served as sanctuaries, providing hundreds of megawatts of power to customers while the main grid was down. And they can provide additional help as virtual power plants serving the grid.

[Lisa Cohn](#)

July 19, 2024



Storm damage in Houston in the wake of Hurricane Beryl. (Photo Courtesy: Sunrun)

### LATEST IN CRITICAL SERVICES



**Enchanted Rock Delivers 148 MW of Gas-fired Power for California Water Districts**

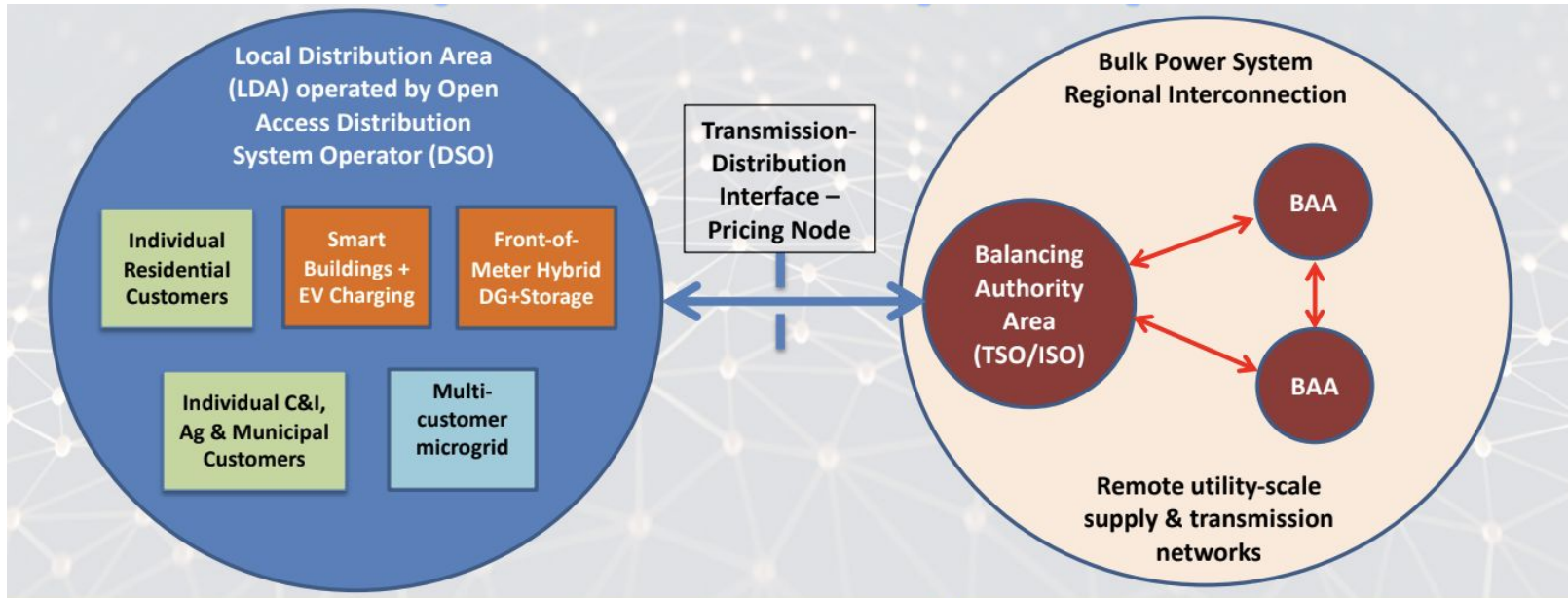


**U.S. Army Improves Resilience at Fort Cavazos with New Microgrid**



**FEMA to Fund Net-Zero Energy Projects - Including Solar Microgrids - in Disaster Areas**

# Nested Architecture for Grid for the Future



Graphic Source: Lorenzo Kristov, Ph.D.



# Solar is Cheap and Getting Cheaper

The price of solar panels is at an all-time low

Price in \$ per watt



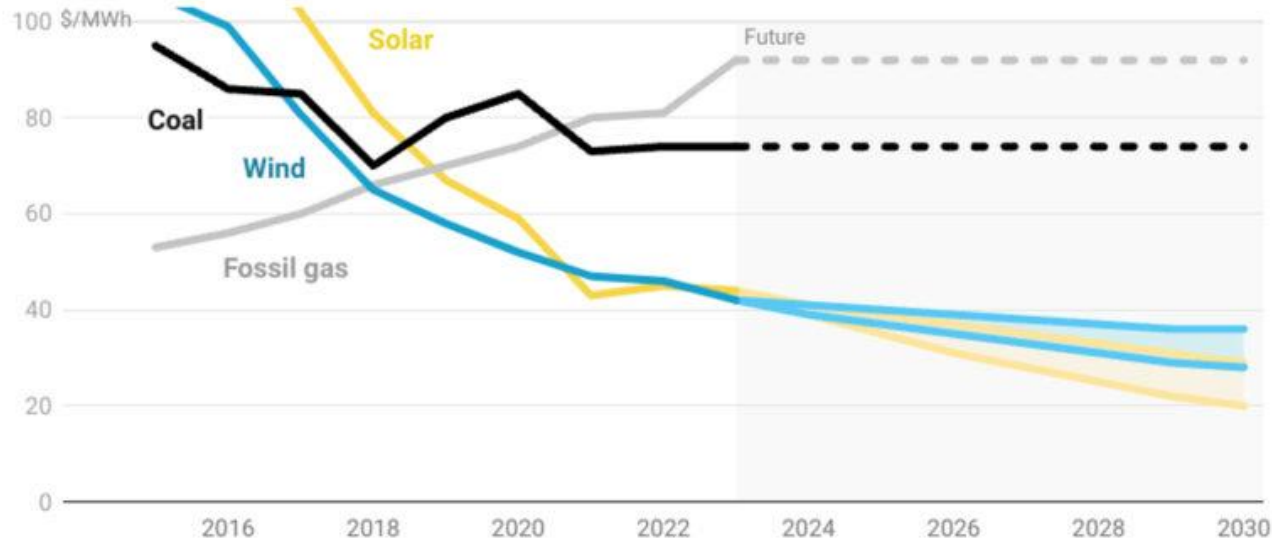
Three-month rolling average, price of monocrystalline silicon modules

Source: BloombergNEF

© FT

# Renewables Will Keep Beating Fossil Fuels on Cost

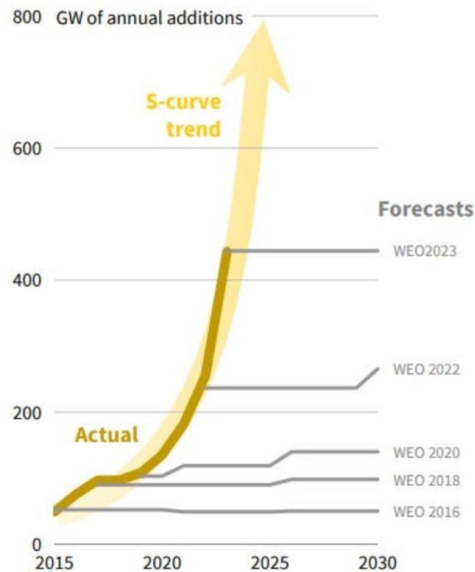
Analysts project that wind and solar will continue to get cheaper, falling further below coal and gas costs globally this decade.



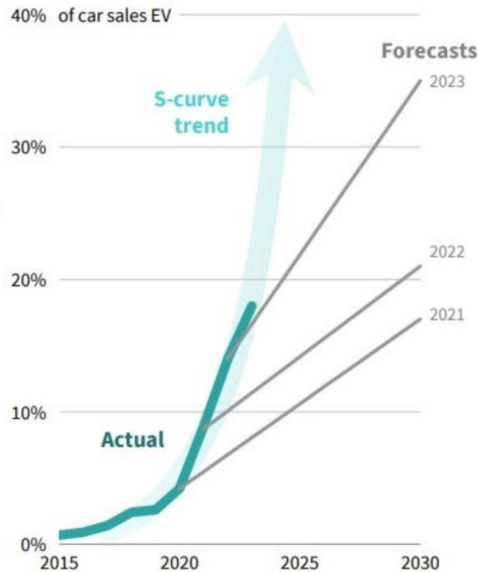
# Global Exponential Growth in Clean Energy Resources

Even neutral actors modeled in **linear** terms. But change has been exponential

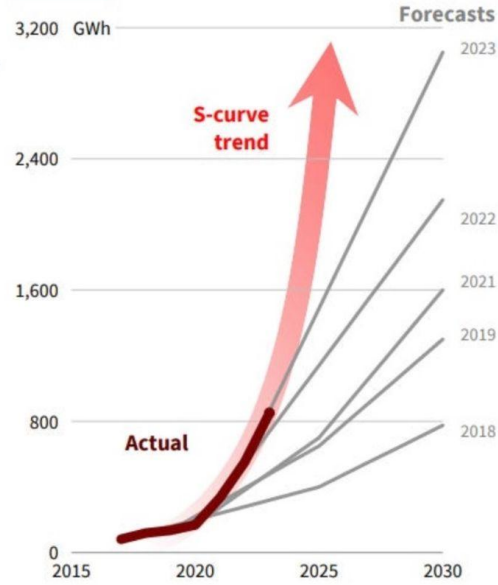
### New solar additions



### EV share of sales

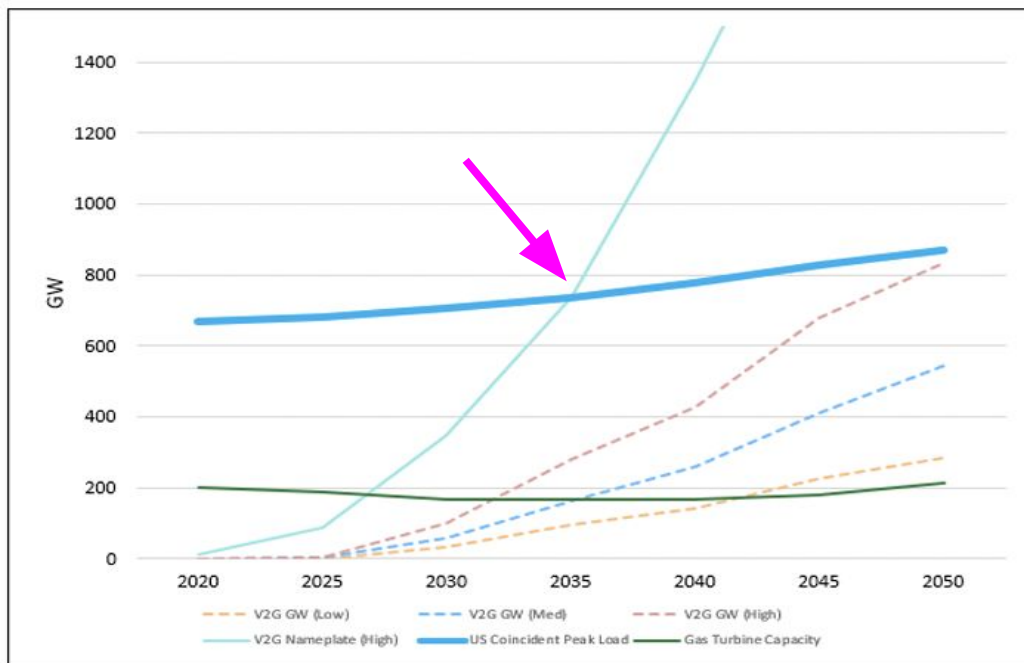


### Battery sales



Source: BNEF (solar and battery actuals), IEA STEPS for WEO forecasts, RMI annotation.

# Electric Vehicle Growth



Total nationwide EV battery capacity will exceed peak U.S. electricity demand in 2035.<sup>1</sup>

<sup>1</sup> Presented at an October 2022 EPRI Webex. Based on EIA projections of EV populations

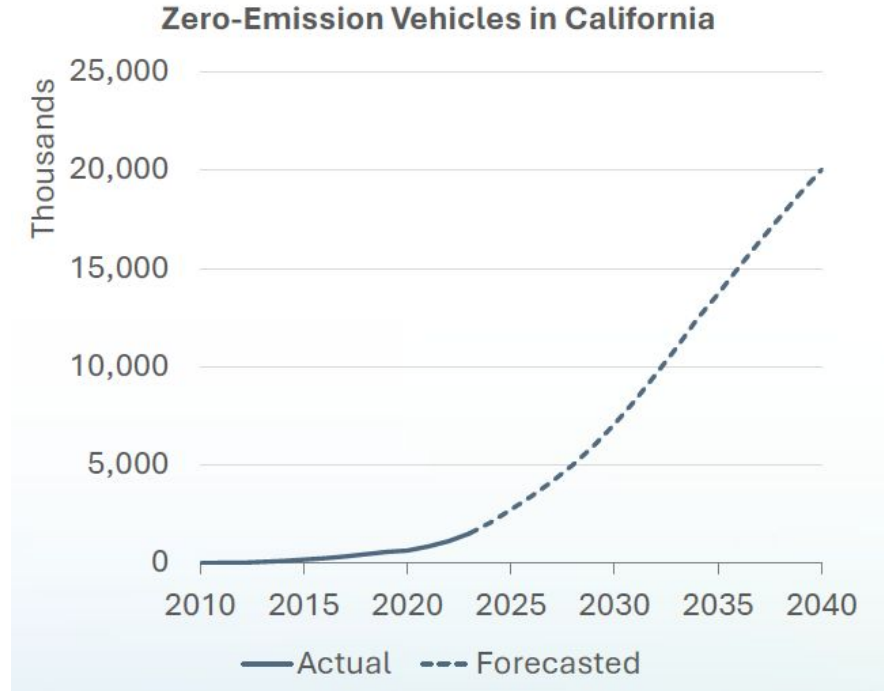
# New Policy Needed to Enable Energy Planning from the Bottom Up

- Build local energy planning capability to co-optimize local power production with tree canopies, local land use, public space, etc at the neighborhood level
- Compensate customers to over-size rooftop solar+battery systems to provide energy to their neighbors
- Enable locally-owned co-op businesses to supply electricity & electric vehicle charging as integral components of the local economy



# New Policy Needed (Cont.)

- Create clean-energy powered neighborhood resilience centers to provide emergency shelter, warmth or cooling, phone/internet service etc
- Take advantage of massive untapped energy storage capacity of electric vehicles



Data Source: California Energy Commission

# Price Signals for Demand Flexibility



...leading to a reduction in peak loads, energy prices, and required infrastructure...



Lower peak load means less infrastructure cost..

...and customers buy more electricity when it is cheaper



- Widespread adoption of demand flexibility solutions
- Reduced peak loads, energy prices, infrastructure needs
- Reduced cost of service

# SB 59 (Skinner)

SB 59 would authorize the California Air Resources Board to require that electric vehicles sold in California have bidirectional capability if it determines there is a sufficiently compelling beneficial bidirectional-capable use case to the EV owner and the electrical grid.





# Next Step: Build a Coalition to Overcome Status Quo

