

Energy Law and Regulation



Brian Cragg

415.848.4813

bcragg@downeybrand.com

Introduction

- The electric utility industry has undergone a substantial transformation over last half-century
- Today, the industry operates in an environment that is a mix of regulation and market mechanisms
- The electric industry has a major role in achieving California's approach to combating climate change and other environmental goals

Cast of Characters

- U.S. Congress, California Legislature
 - Bills shape energy policy, set goals and standards
- Federal Energy Regulatory Commission (FERC)
 - Federal-state jurisdictional allocation:
 - » Transmission (federal) v. distribution (state)
 - » Wholesale sales (federal) v. retail sales (state)
 - » Jurisdictional boundary can get blurred; different utilities define transmission at different voltage levels
 - » FERC jurisdiction is over interstate transmission; excludes Alaska, Hawaii, parts of Texas, Puerto Rico, U.S. Virgin Islands

Cast of Characters

➤ California Public Utilities Commission (CPUC)

- Regulates investor-owned electric utilities (plus gas, water, some transportation, some telecommunications)
- Created by the California Constitution
 - » Not subject to the Administrative Procedures Act
 - » Almost no true regulations
 - » Has its own rules and procedures
 - » Headquarters in San Francisco, not in Sacramento
- For many years, appeals of the CPUC's decisions could only be made to the State Supreme Court, and review was discretionary
- Now intermediate appellate courts have the authority to grant discretionary review, but caselaw is still sparse

Cast of Characters—CPUC Continued

- Proceedings can be conducted through written comments or can require trial-type hearings with sworn witnesses and cross-examination
 - Proceedings can have scores of parties and dozens of issues
 - Proceedings can be initiated by parties, usually utilities, or by the Commission

Examples of work related to CPUC:

Helping clients avoid or pursue public utility status

Evaluating regulatory and permitting risk for projects

Representing customers in rate cases

Cast of Characters

➤ California Energy Commission (CEC)

- Develops official electricity demand forecast
- Determines eligible renewable resources for meeting Renewables Portfolio Standard goals
- Sets standards for energy efficiency standards, building electrification

➤ California Air Resources Board (CARB)

- Oversees cap and trade program for GHG emission reductions
- Sets requirements for zero emission vehicles (EVs and hydrogen)
- Implements Low-Carbon Fuel Standard

Cast of Characters

- California Independent System Operator (CAISO)
 - Not a governmental agency but FERC-regulated
 - Operates the transmission system for 80% of California
 - Responsible for balancing loads and resources (supply and demand) on the electric grid
 - Operates energy markets
 - Develops annual Transmission Plan
 - » Authorizes new facilities and upgrades to transmission system

- **Authorizes interconnection of generators to the transmission grid**
 - Major obstacle to increasing generation capacity nationwide and in California
 - In California, 542 GW are in the interconnection queue; record peak system demand is about 60 GW
 - The interconnection study process takes two years, then may be subject to construction of network upgrades, further delays

Energy Law and Regulation in Action: California's Response to Climate Change

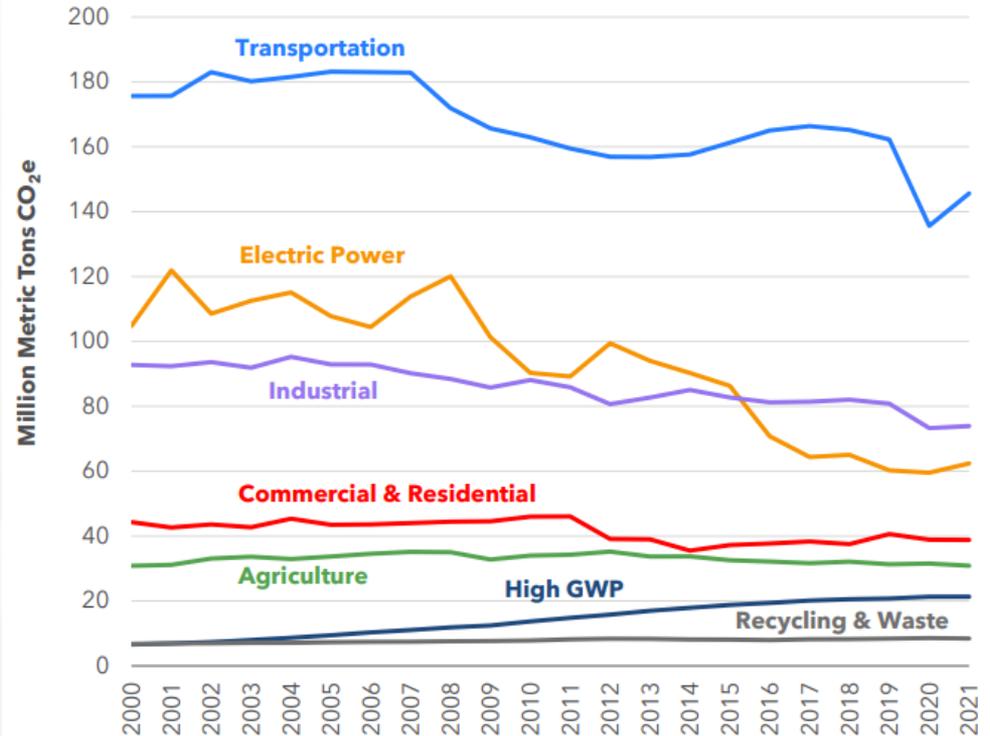
The Challenge of Climate Change

SB 100

100% of retail electric sales in California must come from renewable or zero-carbon resources by 2045

GHG emissions attributed to electric power have declined by around 50% since 2008, so reducing the remaining 50% by 2045 should be easy, right?

Figure 5. Trends in California GHG Emissions.



The Challenge of Climate Change

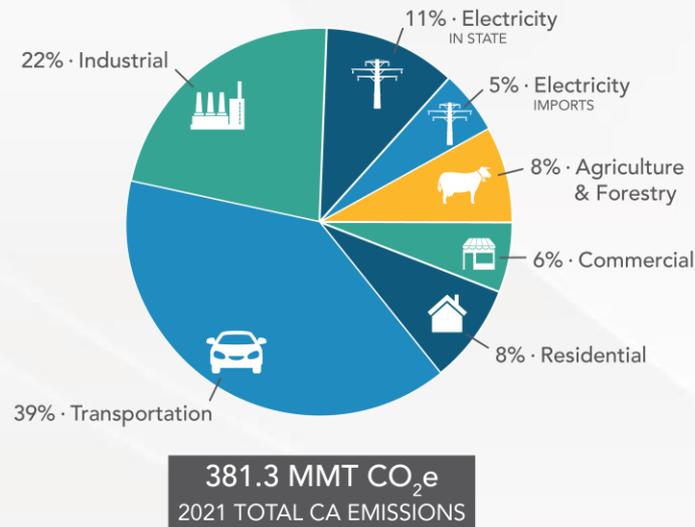
Meeting SB 100 Goals Requires Electrification

Wrong!

Reducing emissions associated with the transportation, residential, commercial, and industrial sectors will require extensive electrification.

- Electric vehicles—charging requirements
- Heat pumps for water heating and HVAC

Total generating capacity will need to increase while gas-fueled units are replaced with clean resources.



The Challenge of Climate Change

How do we get there from here?

Current plan relies on cooperative effort involving the CEC, CPUC, and CAISO to develop the resources needed to meet the 2045 goal.

- CEC develops load forecast
- CPUC identifies amount and types of resources that will be needed
- CAISO identifies the transmission improvements needed to connect new resources to load



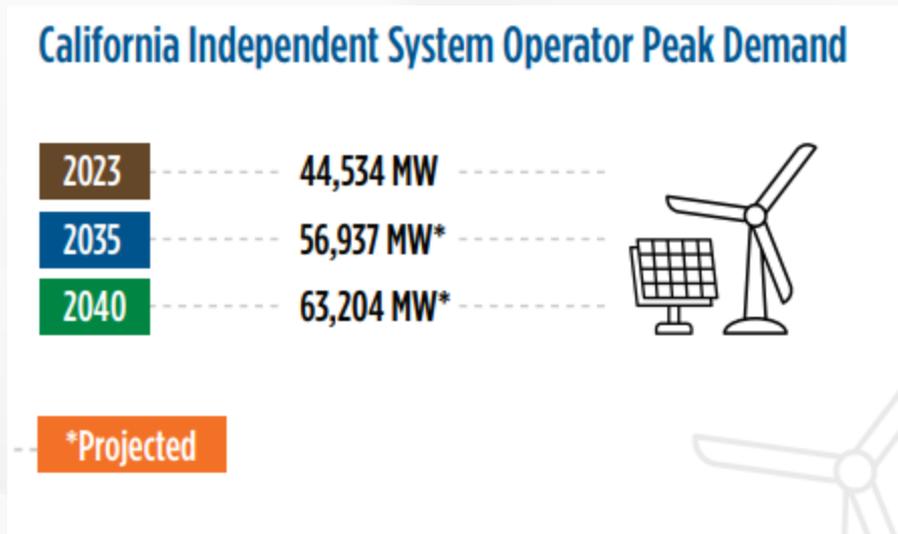
The Challenge of Climate Change

The CEC's Demand Forecast

CEC projects that peak electric demand will increase by 42% by 2040.

This forecast might understate SB 100 needs:

- Doesn't include 2040-2045
- Peak in 2022 was 52,061 MW
- Concerns about revised forecast approach



The Challenge of Climate Change

The CPUC's Preferred Resource Plan

Mix of added resources needed to limit GHG emissions to 25 million metric tons per year in 2035

Electricity share is currently 61 MMT

Resource Category	2024	2025	2026	2028	2030	2032	2033	2034	2035	2039	2040	2045
Geo-thermal	0.0	0.0	0.8	1.1	1.5	1.8	2.0	2.0	2.0	2.0	2.0	2.0
Biomass	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
In-State Wind	0.3	0.4	0.8	1.1	5.0	6.1	6.1	6.1	7.0	7.0	7.0	8.3
Out-of-State Wind	0.0	0.6	1.7	3.4	5.3	5.3	5.3	6.1	7.1	9.1	9.1	12.7
Offshore Wind	0.0	0.0	0.0	0.0	0.0	2.7	3.3	3.9	4.5	4.5	4.5	4.5
Solar	3.0	6.0	6.9	9.9	14.8	15.7	17.9	19.0	19.0	30.7	35.0	57.5
Li-ion Battery (4-hr)	4.3	6.3	8.0	9.0	11.6	12.7	14.0	15.0	15.7	15.7	15.7	15.7
Li-ion Battery (8-hr)	0.0	0.0	0.4	1.0	1.2	1.4	1.4	1.7	2.8	7.2	9.0	19.5
Pumped Hydro Storage	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Long Duration Storage	0.0	0.0	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
Shed Demand Response	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gas Capacity Not Retained	-2.2	-2.2	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7	-2.7	-6.6
Total	5.4	11.1	16.0	23.8	37.7	44.0	48.3	52.1	56.6	74.7	80.9	114.8

The Challenge of Climate Change

The CPUC's Preferred Resource Plan—Sensitivity Portfolio

Used to study effect on the resource mix and transmission upgrades of retiring about 50% of existing gas-fired capacity

Resource Category	2024	2025	2026	2028	2030	2032	2033	2034	2035	2039	2040	2045
Geothermal	0.0	0.0	0.8	1.1	1.5	1.8	2.0	2.0	2.0	2.0	2.0	2.0
Biomass	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
In-State Wind	0.3	0.4	0.8	1.1	5.0	6.1	6.1	6.1	7.0	7.0	7.0	8.3
Out-of-State Wind	0.0	0.6	1.7	3.4	5.3	5.3	5.3	6.1	7.1	9.1	9.1	12.7
Offshore Wind	0.0	0.0	0.0	0.0	0.0	2.7	3.3	3.9	4.5	4.5	4.5	4.5
Solar	3.0	6.0	6.9	9.9	14.8	15.7	17.9	19.0	19.0	30.7	35.0	57.5
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Li-ion Battery (8-hr)	0.0	0.0	0.4	1.0	1.2	1.4	1.4	1.7	2.8	7.2	9.0	19.5
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Total	5.4	11.1	16.0	23.8	37.7	44.0	48.3	52.1	56.6	74.7	80.9	114.8

The Challenge of Climate Change

The CAISO's 2022-2023 Transmission Plan

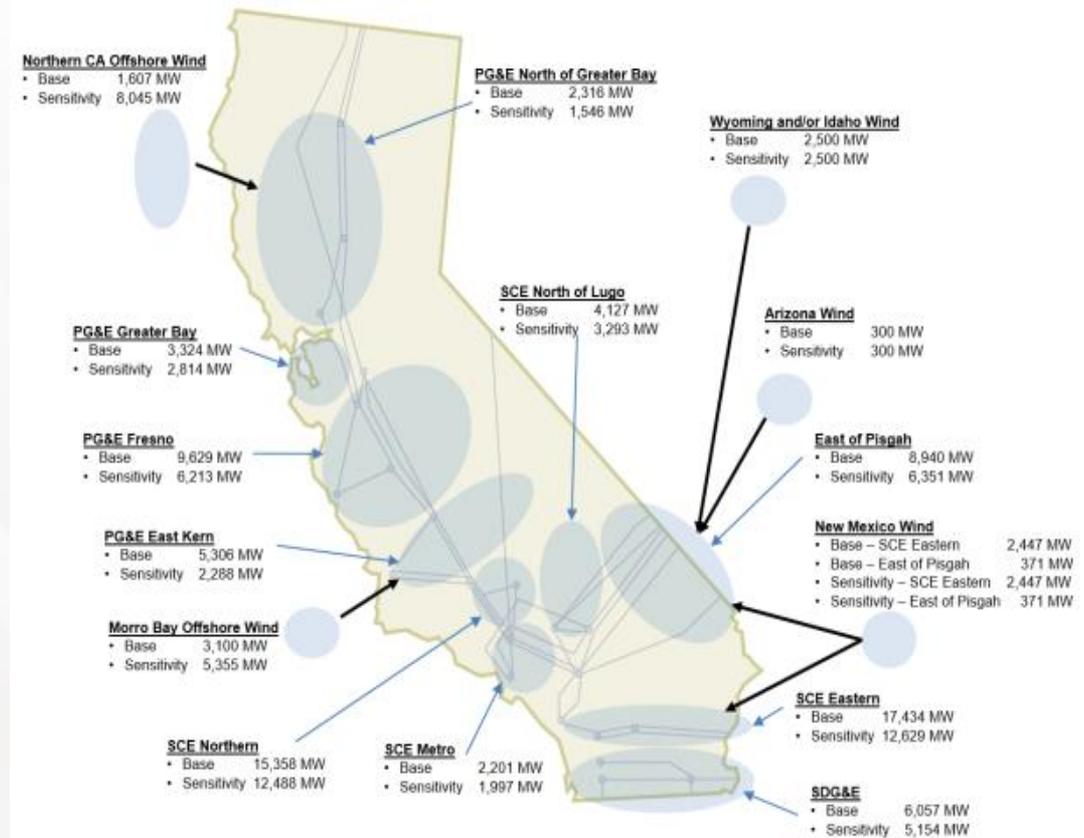
Authorizes 26 projects at a total cost of \$6.1 billion over the 10-year forecast period.

Policy-driven projects (primarily to meet SB 100 goals) will cost \$4.6 billion.

Focus on solar, storage, out-of-state wind, and offshore wind.

- First large lines to North Coast wind area.

20-year outlook estimated transmission costs needed to meet SB 100 goals would cost \$30.5 billion



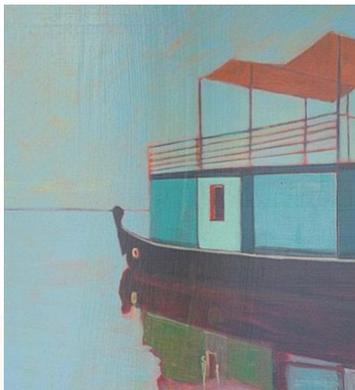
Hopeful Headlines?

➤ California Hits 'Historical' Renewable Energy Milestone

- Renewable energy has supplied 100 percent of California's energy demand for between 15 minutes and six hours in 30 of the last 38 days.

➤ Adoption of EVs cuts area carbon dioxide

- New research shows that the Bay Area's embrace of electric cars is having a measurable impact on the region's carbon footprint.
- UC Berkeley scientists tracked a modest but steady decrease in carbon dioxide emissions between 2018 and 2022, a trend that held true even when factoring outside impacts like pandemic traffic reductions and seasonal differences.
- The researchers concluded the 1.8% average annual decrease can be attributed to cleaner transportation options like hybrid and electric cars plus improved fuel-efficiency standards.



San Francisco

455 Market Street | Suite 1500

San Francisco, CA 94105

tel: [415.848.4800](tel:415.848.4800)

www.downeybrand.com

Thank You

Brian Cragg



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bcragg@downeybrand.com

› APPENDIX

- › Milestones: Key Events in the Transformation of the Electric Utility Industry

Milestones

➤ 1978—Public Utility Regulatory Policies Act (PURPA)

(16 U.S.C 824a-3)

- Framework for non-utility generation
- Qualifying Facilities
 - » Cogeneration (combined heat and power)
 - » Small power producers
 - 80 megawatts (MW) or less
 - hydro, wind, solar, biomass, waste, or geothermal
 - » Exempt from federal regulation as public utility
 - » Utility must buy power and provide certain services

› Energy Policy Act of 1992

(Pub. L. 102-486, § 711, 106 Stat. 2905)

- Created Exempt Wholesale Generator (EWG) status
 - » Generation facilities that exclusively sold power at wholesale were exempt from federal regulation as public utilities
 - » Not limited to renewable technologies or cogeneration

› 1996--Federal Energy Regulatory Commission (FERC) Order 888 (75 FERC 61,080)

- Requires nondiscriminatory open access to transmission lines
- Gave broader access to potential customers

Milestones

- **1996—California deregulation—Assembly Bill 1890**
 - Required large utilities to divest 50% of their fossil-fueled generation facilities
 - » Utilities divested nearly all of these facilities; new entrants into generation sector
 - Introduced limited retail competition
 - Created the California Independent System Operator (CAISO)
- **2002—California Renewables Portfolio Standard—SB 1078**
(Cal. Pub. Utilities Code §§ 399.11-399.33)
 - Required 20% or retail electric sales to come from renewable sources by 2017
 - Current goal is 60% by 2030

Milestones

- 2006—California Global Warming Solutions Act, AB 32 (Cal. Health & Safety Code §§ 38500-38599)
 - Reduce greenhouse gas emissions to 1990 levels by 2020
- 2018—SB 100
 - 100% of retail electric sales from zero-carbon resources by 2045