

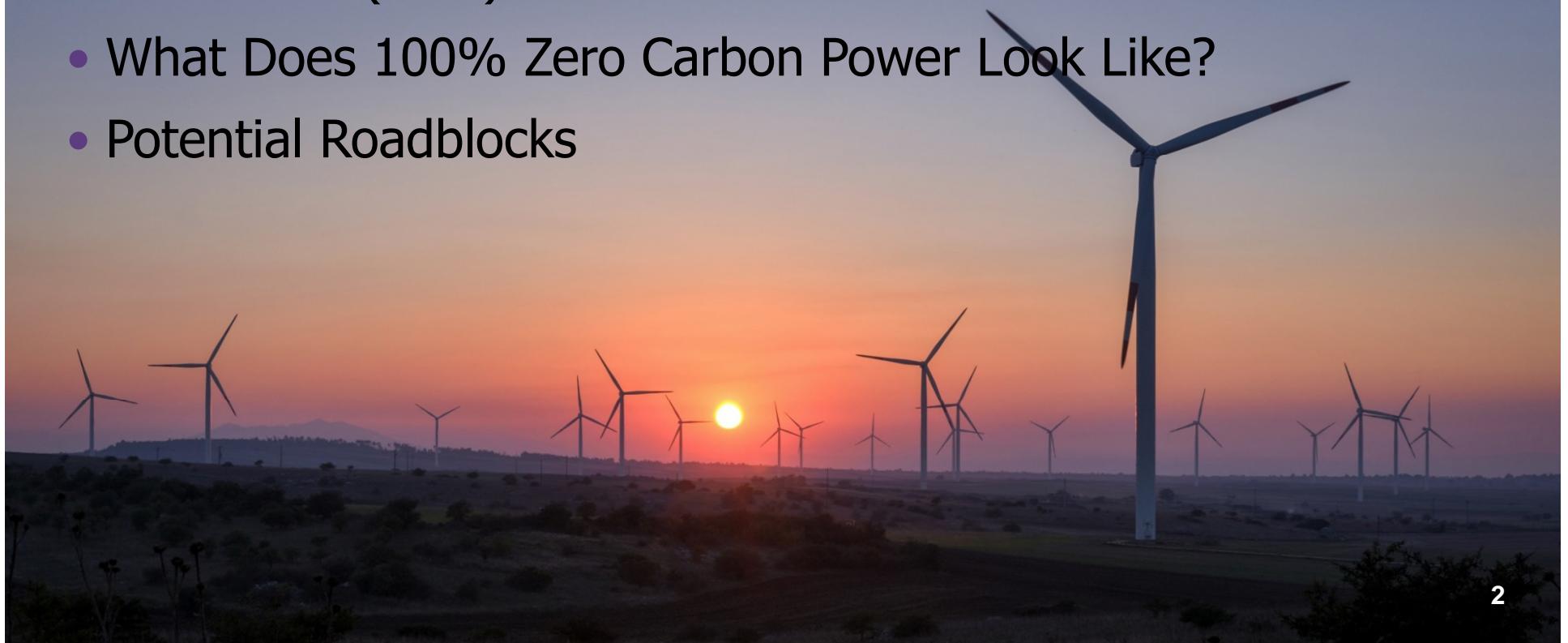
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CALIFORNIA: CARBON-FREE POWER BY 2045?

Bill Kissinger and Jack Stoddard
April 23, 2019

Agenda

- Senate Bill ("SB") 100
- What Does 100% Zero Carbon Power Look Like?
- Potential Roadblocks



SENATE BILL (“SB”) 100

California Climate and Renewable Energy Policy Framework

- AB 32 – California Global Warming Solutions Act
- California's RPS program requires “Load Serving Entities” to deliver specified amounts of renewable power
 - Established in 2002
 - Accelerated in 2006
 - Expanded in 2011
 - Enhanced in 2015
- SB 100 passed in 2018

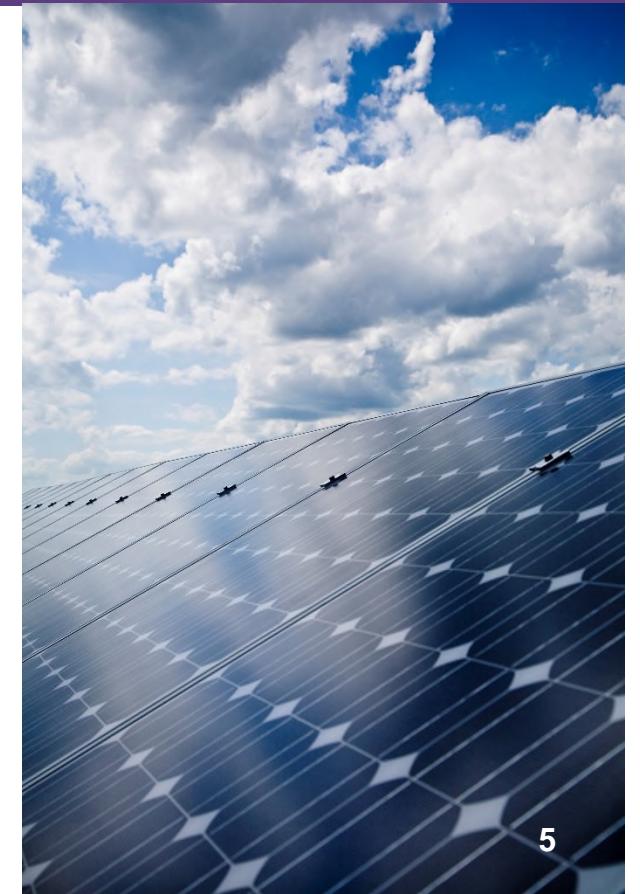


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SB 100 Basics.

- Introduced by Senator De León.
- Titled “The 100 Percent Clean Energy Act of 2017.”
- Amended and added sections of the Public Utilities Code related to California’s Renewable Portfolio Standard Program.
 - Amends Sections 399.11, 399.15, and 399.30;
 - Adds Section 454.53.

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SB 100—What Does it Change?

- RPS Standards Before SB 100.
 - Required all retail sellers to procure a minimum quantity of electricity from eligible renewable energy resources to achieve:
 - 25% by December 31, 2017
 - The three large IOUs surpassed this target: PG&E 33%; SCE 32%; and SDG&E 44%.
 - 33% by December 31, 2020,
 - 40% by December 31, 2024,
 - 45% by December 31, 2027, and
 - 50% by December 31, 2030.

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SB 100—What Does It Change?

- Requires retail sellers and local publicly owned electric utilities procure eligible renewable energy resources to achieve:
 - 44% of retail sales by December 31, 2024,
 - 52% by December 31, 2027, and
 - 60% by December 31, 2030.
- States that it is the policy of the state that eligible renewable energy resources and zero-carbon resources supply 100% of retail sales of electricity to serve California end-use customers and electricity procured to serve all state agencies no later than **December 31, 2045**.
- Requires achievement of 100% policy without increasing carbon emissions elsewhere in the western grid, and disallows resource shuffling.

SB 100—What Does It Not Do.



- Provides 100% carbon-free energy as target, but does not mandate achievement of that goal.
 - Instead, it requires state agencies to incorporate into existing climate programs the planning goal and regulatory requirement of achieving 100-percent reliance on renewable energy resources or zero-carbon resources by the end of 2045.
- Did not define “zero-carbon resources.”
 - which generating facilities are eligible?

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SB 100—A Closer Look...

- What does 100% RPS actually mean?
 - 60% of California's electricity would be generated by RPS-eligible renewables (solar, wind, geothermal, biomass, small hydro, renewable methane, ocean wave or thermal, or fuel cells using renewable fuels);
 - The remaining 40% would be generated by additional renewables or other electricity generation that do not qualify under RPS, but do not burn fossil fuels.
 - Example: large hydroelectric power facilities are not RPS-eligible, but are “zero carbon.”
 - Answer to SB 100 FAQs provides: “this latter provision leaves the door open to new technologies we may not know about today that could meet future state needs while protecting the environment.” (<http://focus.senate.ca.gov/sb100/faqs>)
 - What about: nuclear power, and gas-fired power plants that capture their carbon emissions?

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Pathway to passage

- 2017 bill failed due to :
 - Opposition from State's largest IOUs (raised concerns about potential cost for consumers);
 - Opposition from Labor;
 - Linkage with CAISO expansion bill.
- 2018 bill addressed and overcame these barriers

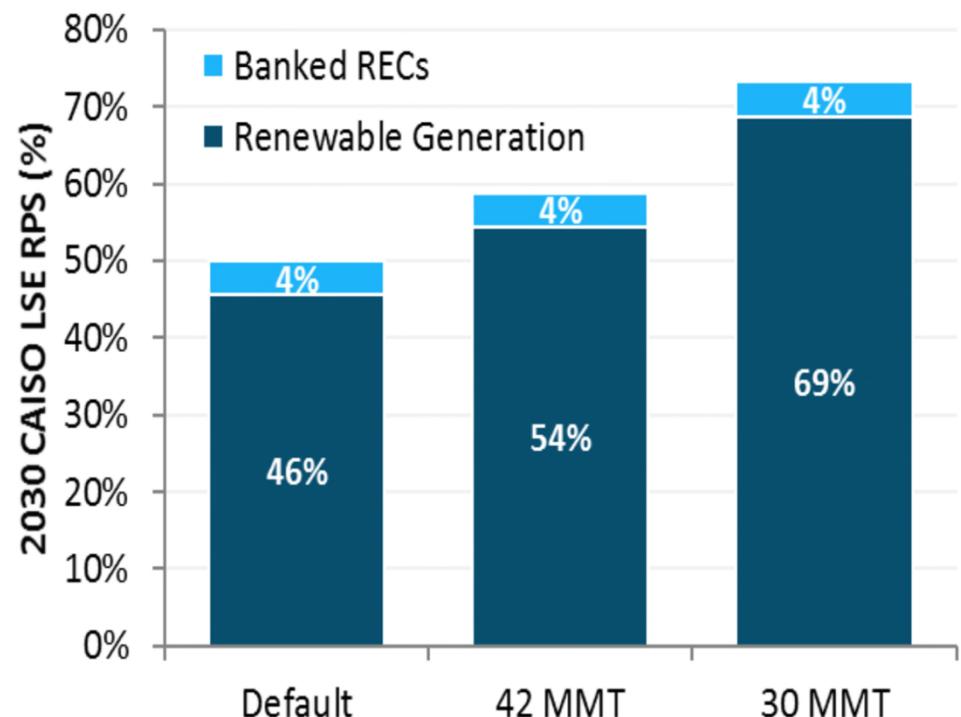
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WHAT DOES 100% LOOK LIKE?

What does 100% RPS Look Like?

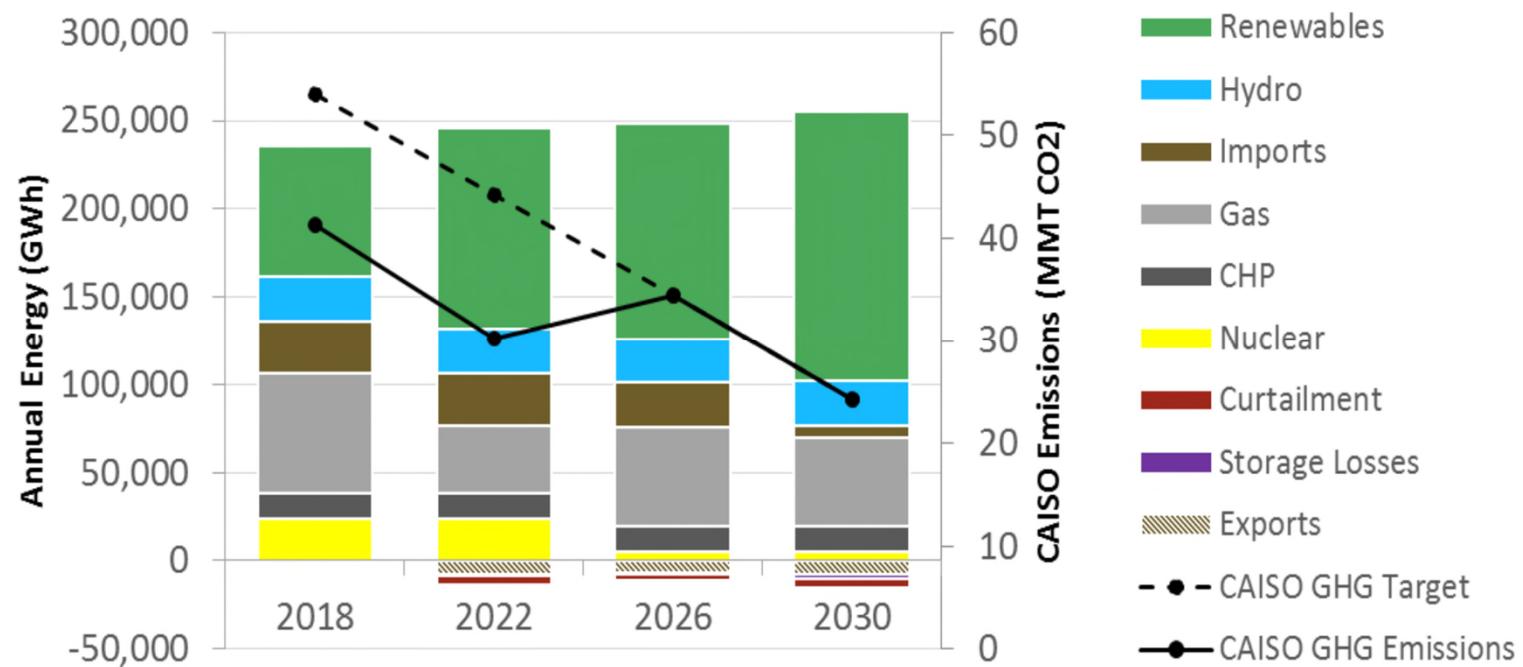
- CPUC IRP modeling, while focused on GHG, is instructive
- 42 MMT case = ~58% renewable in 2030
 - Represents a 50% reduction in electric section GHG emissions from 2015 levels, and a 61% reduction from 1990 levels.
- Commission adopted 42 MMT target in D.18-02-018.



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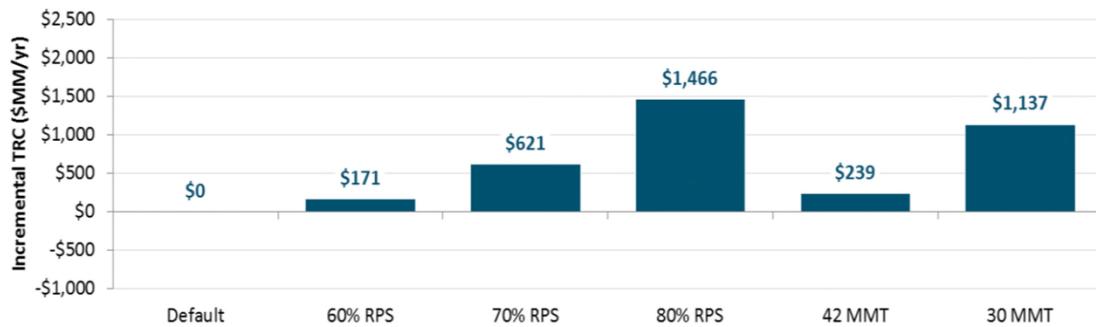
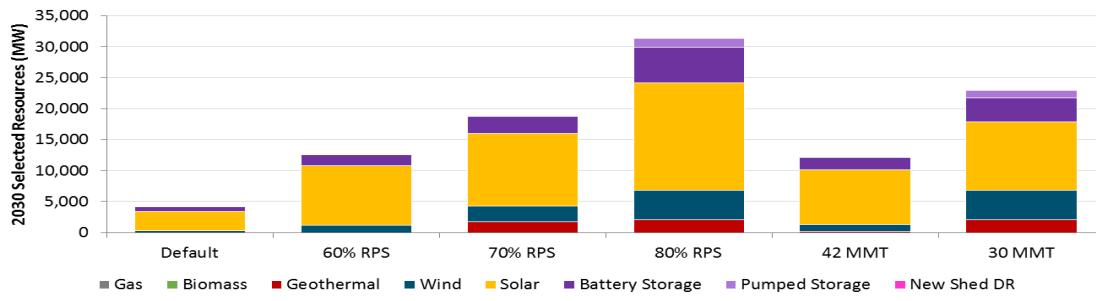
What Does 100% Look Like?

- If optimizing for least cost GHG reductions, gas stays in the mix

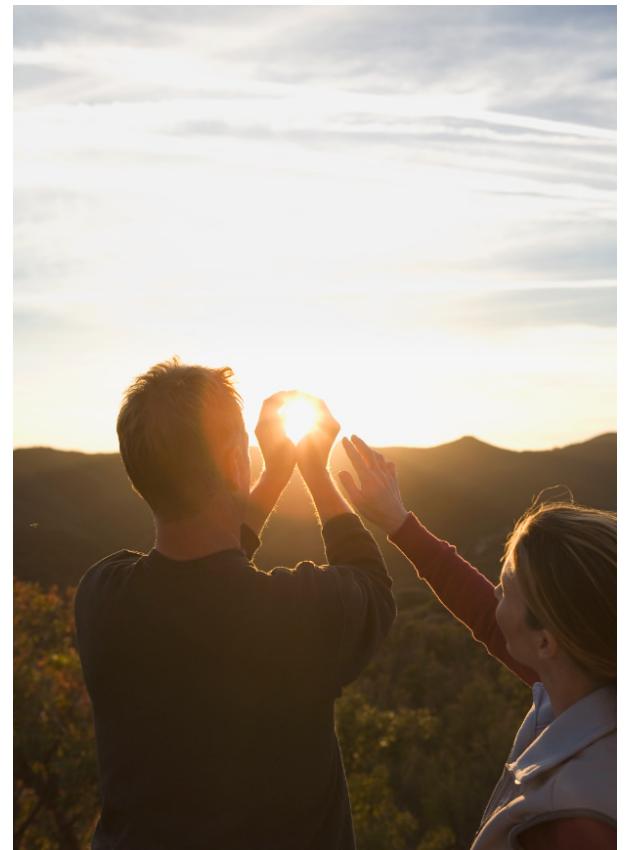


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What does 100% RPS Look Like?



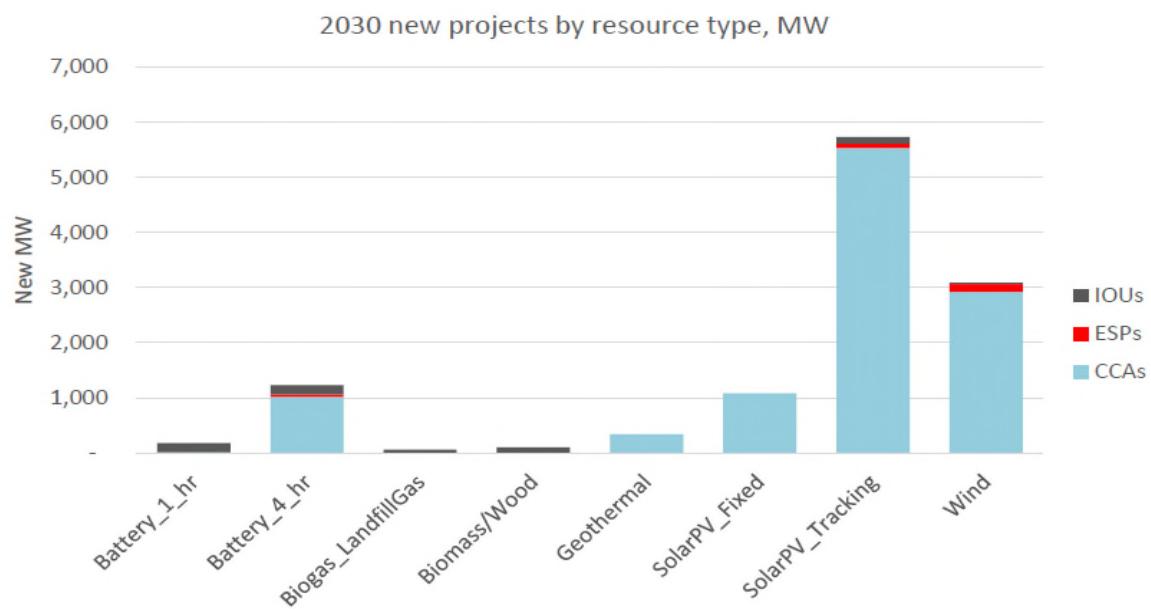
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What does 100% RPS Look Like?

The majority of proposed new* capacity is solar, wind, and 4-hour batteries

- CCAs' IRPs collectively showed a preference towards solar, wind resources, as well as four-hour batteries.
- Commission noted that, between now and 2030, the resource balance will need a mix of renewable, storage, and conventional fossil-fueled resources.



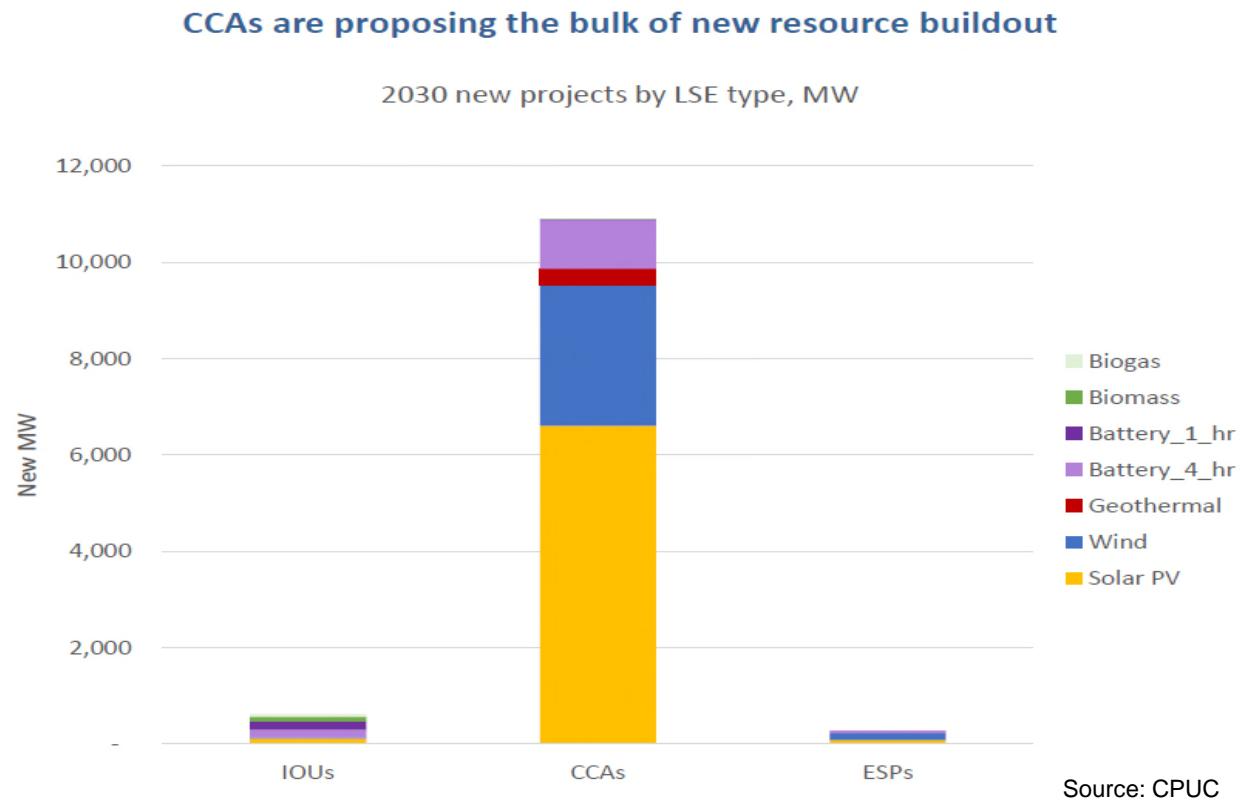
*New resources refers to resources that do not yet exist and are not yet contracted or planned as of 2018, but are included in LSE IRP portfolios and could be built. The CPUC has not formally reviewed or approved the procurement of these resources.

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Source: CPUC

What does 100% RPS Look Like?

- In aggregate, CCAs propose to invest more than 10,000 in new resources by 2030, compared with 1,000 MW from IOUs and ESPs.
- Of that total, 60% is planned solar PV; another 10% is expected from battery storage; with the remainder split between biogas, biomass, geothermal and wind.



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POTENTIAL ROADBLOCKS

Potential Roadblocks

- Cost
- Fragmentation of retail market
- Overbuild / Land Use
- Regulatory uncertainty
- Technology risks

Potential Roadblocks

- Uncertainties about CCA participation in IRP process.
 - CCAs criticized in recent IRP decision for cautioning Commission not to use their submitted 2018 LSE plans for statewide planning, but wait for their “internal” or local IRPs are prepared and submitted.
 - Certain CCAs opted not to complete certain section the LSE Plan template, such as the “Cost and Rate Analysis” section, claiming that the Commission does not have authority to dictate what specific actions the CCAs must take.
 - Other CCAs argued that the Commission’s IRP processes do not fit with their individual resource procurement plans.
 - Because the majority of new resources in California are expected to be acquired by CCAs in the next decade, additional focus on their IRPs is critical to the Commission’s ability to evaluate and plan for a reliable and affordable procurement by all LSEs that will achieve the State’s GHG emissions reduction requirements.

Biography



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Since 2003, William (Bill) D. Kissinger has focused his practice on energy matters in California and nationally along with related environmental issues. He developed this practice after spending two years working as senior deputy legal affairs secretary to Gov. Gray Davis and serving as the primary legal contact for the Office of the Governor with Cal EPA, Cal Health and Human Services Agency, and the Resources Agency. Bill previously spent four years in Washington, DC working in senior positions at the White House and the US State Department.

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Biography



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F. Jackson Stoddard represents and advises clients on energy regulatory matters and proceedings before state and federal agencies, including the California Public Utilities Commission, the California Air Resources Board, the California Energy Commission, and the Federal Energy Regulatory Commission. Jack also represents clients in matters involving the California Independent System Operator (CAISO), including the Transmission Planning Process, Interconnection Process, and CAISO stakeholder processes.

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QUESTIONS?



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