



LSEs' September 2019 Responses to Procurement Progress Data Request --Results--



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Executive Summary

- This document presents analysis of the procurement planning data received from LSEs in September 2019 as required by D.19-04-040
- LSEs are generally planning for resource volumes in-line with the 2018 Preferred System Plan (PSP)
- Only 40% of the PSP's volume of new solar resources due to be online in 2022 is contracted
- Nearly all of the PSP's volume of new wind resources expected through 2026 are either online or contracted
- 70% of Development (i.e. contracted) resources have completed interconnection studies and permitting, and are reported as on track to meet their reported online dates
- Battery procurement on track to meet storage mandate plus new resources selected in the PSP through 2026
- LSEs are planning to exceed the storage mandate through 2030; however, they were still short on planning to meet the 2030 storage amount selected in the 2018 PSP
- CCAs are driving much of new procurement for solar and wind and generally report higher viability for their Development resources than the other LSEs

Background on LSE Data Requirement (1 of 2)

- Decision 19-04-040 requires all Load Serving Entities (LSEs) to provide to CPUC Staff:
 - Detailed information about the contractual status and development status of each individual electricity resource included in their resource portfolios.
 - Information must be submitted by August 16, 2019 (subsequently extended to September 2019) and thereafter in each subsequent IRP filed
- Staff issued a data request on July 12, 2019, with the requested format for data
 - In September 2019, Staff received procurement planning data from LSEs that submitted Standard Plans in the 2017-2018 IRP cycle, but not from non-Standard Plan LSEs, amounting to approx. 3% of system load in 2030

Background on LSE Data Requirement (2 of 2)

- Instructions to LSEs and Excel Templates available at <https://www.cpuc.ca.gov/General.aspx?id=6442451195>
- Required LSEs to “mark up” August 2018 plan filings
 - Identify changes since August 2018
 - Provide Contract Status of each resource (Online, Development, Review, Planned, Canceled); definitions on subsequent slide
 - Provide viability information about each resource that is not online
- Responses
 - All 26 of the LSEs required to report did so (refer to Appendices for list)
 - Widely varying data practices in LSE submissions, making automated aggregation difficult
 - *All data herein predates Decision 19-11-016 “Electric System Reliability Procurement” and this analysis will updated/refreshed after LSEs’ September 2020 IRP filings are received*

Aggregation Process (1 of 2)

- Staff aggregated LSEs' responses (refer to Appendices for further detail of data processing)
- Issues found during aggregation of LSEs' responses
 - Energy and capacity not consistently reported, or reported at all for some resources
 - Different resource naming convention made it difficult to uniquely identify a resource and count capacity
 - Identifiers changed between August 2018 and September 2019 data
 - Plans for resources with online dates in 2025-2030 may not be current
 - LSEs were only required to report Planned resources with online dates prior to 2025, however many included resources with online dates for 2025-2030
 - Likely due to LSEs misreading instructions, or because it was easier to leave 2018 data unchanged than to review and revise their planning

Aggregation Process (2 of 2)

- Staff made the following assumptions made to address issues
 - Performed manual cleaning and filling in of missing data
 - Used RESOLVE solar and wind capacity factors to estimate MW for new resources if only energy reported
 - Validated data versus publicly available datasets and LSE press releases
- MW amounts reported here include numerous Staff assumptions, however should be accurate to within +/-100MW at the aggregate system level
- Lessons learned from analyzing this data have been be incorporated into the data template for the current cycle of IRP
 - New template will be easier to use for LSEs and easier to analyze for staff
 - It incorporates standardized generating unit lists and automatic error checking to decrease the probability of errors and nonstandard entries

Definitions

- 2018 PSP is used as the benchmark for monitoring procurement progress (candidate resources selected by RESOLVE, excludes baseline resources)
- LSEs' September 2019 data uses the following definitions for contract status of new resources, listed in descending order of certainty (refer Appendices for detail):

Online	Was included in LSE's August 2018 plan filing and has since come online
Development	LSE-contracted/owned but not yet online
Review	Not yet contracted/owned nor online, but contract is under review by LSE's board
Planned	Resource does not yet meet any of the above definitions
Canceled	Was included in LSE's August 2018 plan filing but has since been canceled

- Each of these data sets is a snapshot at different points in time; comparison challenges include:
 - LSEs' plans at September 2019 include some resources that would have been baseline resources as at formation of 2018 PSP: i.e., were contracted but not yet online
 - For like-for-like comparison to the 2018 PSP, such resources would need to be added to the 2018 PSP volumes

Definitions

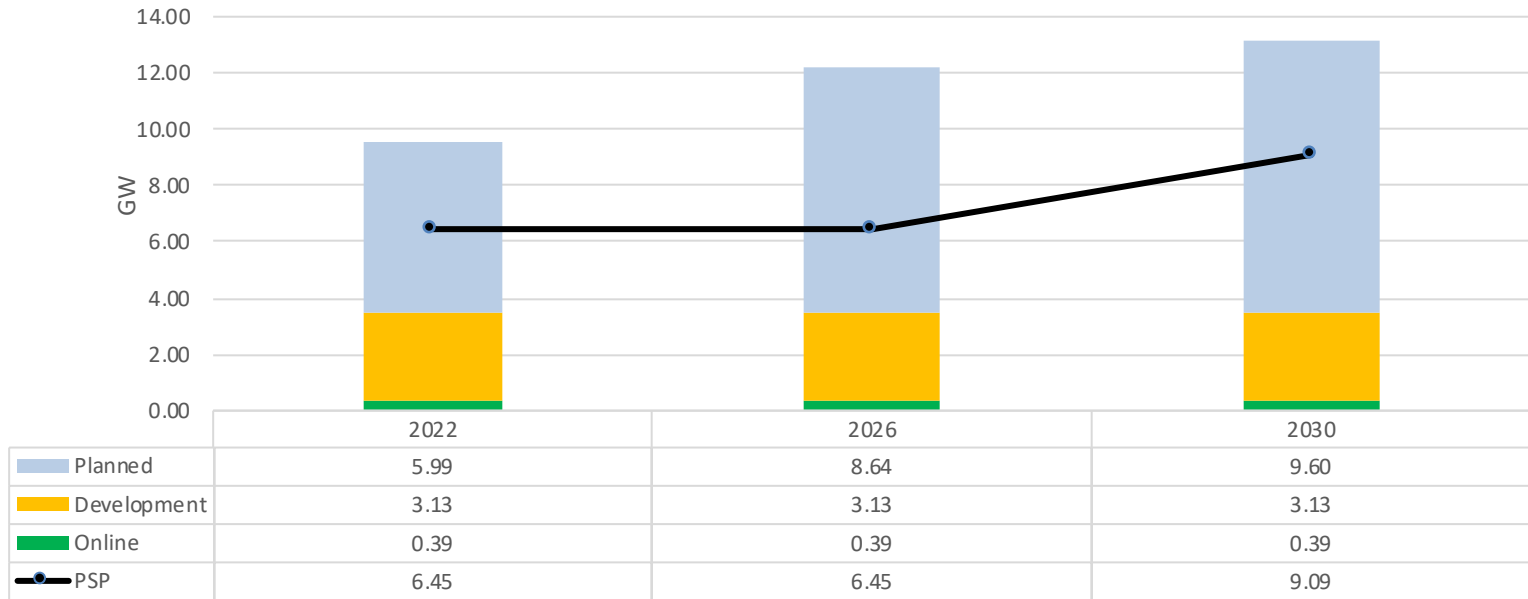
- LSEs' September 2019 data uses the following definitions for four key viability categories:

Viability Category	Allowable Values
Commercial Operation Date (COD) Reasonableness	(1) Interconnection Phase II study complete; permitting application approved; these support reported COD; (2) Interconnection Phase II study in progress; permitting application in progress; LSE has plan that supports reported COD; (3) One or more of criteria for rating "2" not in place.
Technical Feasibility	(1) Project will use a commercialized technology solution that is currently in use at a minimum of two operating facilities of similar or larger size; (2) Criteria for rating 1 not in place
Resource Sufficiency	(1) Project-specific independent engineering assessment is complete and supports the delivery profile (capacity and/or production); (2) Criterion for rating 1 not in place.
Financing	(1) All Financing Secured; (2) Partial Financing Secured; (3) Seeking Financing. (4) Not Yet Seeking Financing; (N/A-No) Financing Required.

- In our analysis herein Staff uses these definitions for H/M/L Viabilities:
 - High(H) Viability:** All four categories above have been reported with value 1
 - Low(L) Viability:** All four categories have been reported with the lowest viability values and/or not reported at all
 - Medium(M) Viability:** Criteria for rating high or low are not in place

Status Update on LSE Planning and Procurement: Renewables

Cumulative total capacity (GW) in LSE 2019 update versus 2018 PSP by year



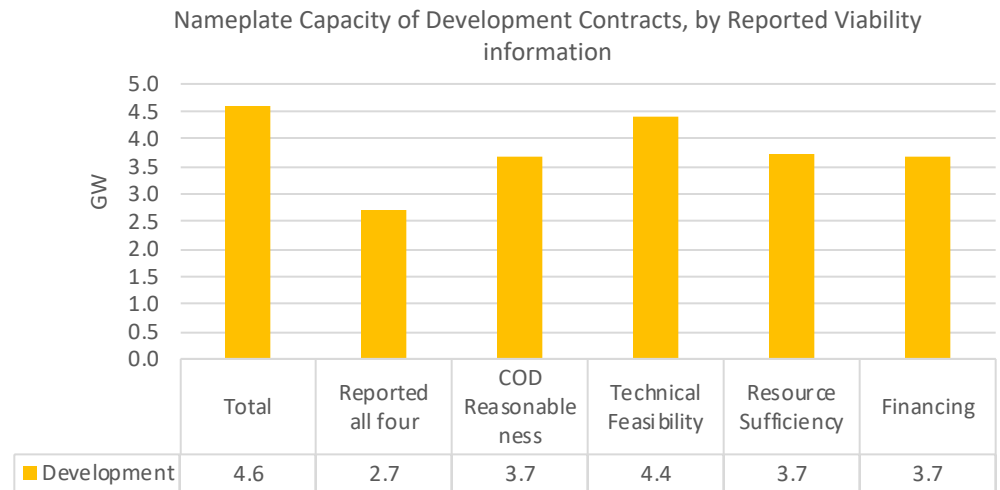
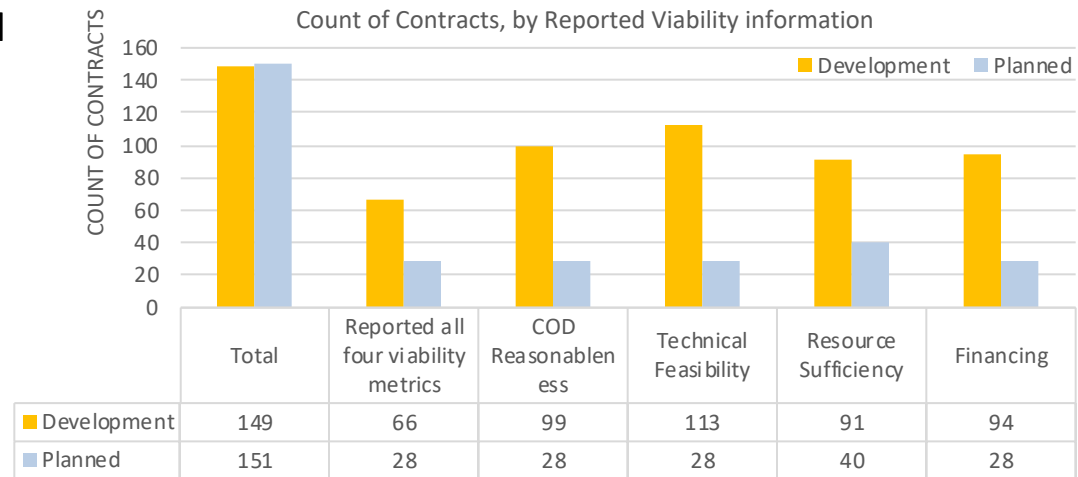
Based on procurement planning data received from LSEs in September 2019

This chart include solar, wind, biomass, and geothermal

- LSEs are generally planning for resource volumes in-line with the 2018 PSP
- Charts above exclude storage because that requires more complex accounting; more detail follows on the next slides

LSEs reported viability information with various levels of completeness

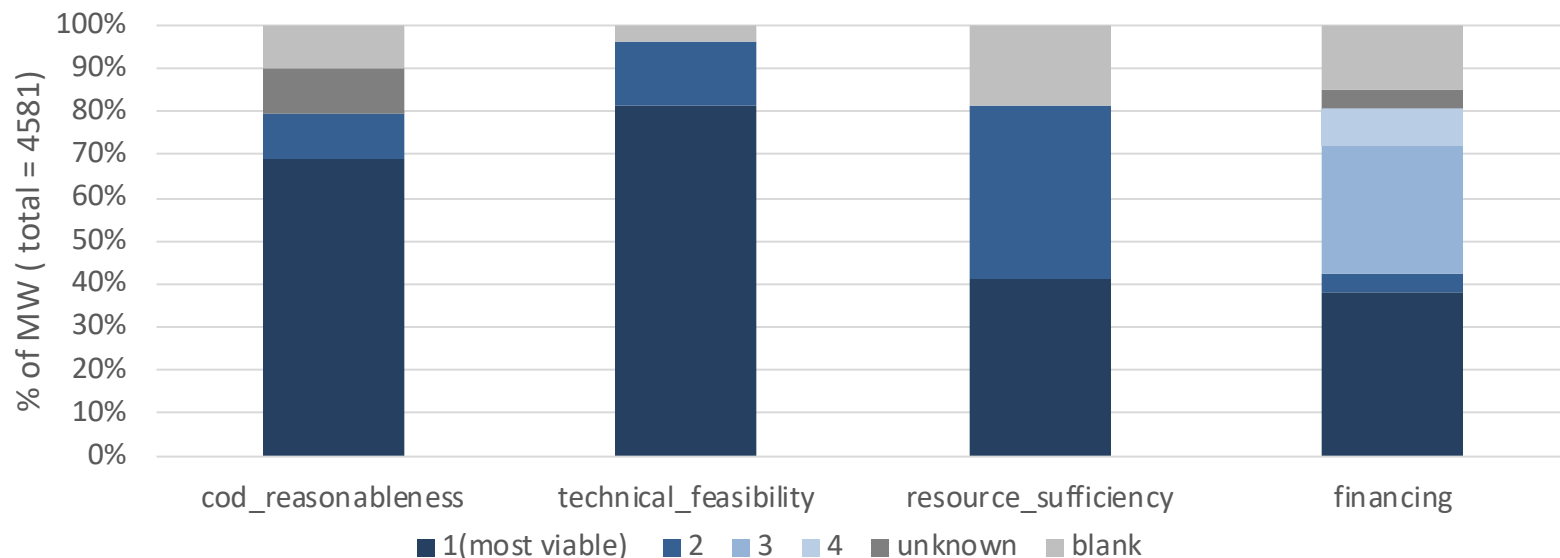
- Viability reporting requirements introduced to provide better visibility of development risk
- LSEs reported 300 resources with Development or Planned status
- Almost no resources were reported with Review status
- Of these, LSEs reported complete viability information for only 94 resources
- Viability fields were new to IRP data, although drew on established definitions from RPS
- Development resources were better reported (66 resources with complete viability information, out of 149) than Planned resources (28 out of 151)
- Absence of reporting of viability information may be an indicator of viability risks



Based on procurement planning data received from LSEs in September 2019.

Viability Status of Development Resources

- Staff analysis is focused on the 4.6 GW of resources identified as Development (i.e. contracted)
- Per earlier slide, resources with value “1” (dark blue color) indicates higher viability across each of the categories
 - COD reasonableness: approx. 70% have permitting approved and interconnection studies complete, supporting their reported online date
 - Technical feasibility: approx. 80% will use technology that is proven at least two other sites already in operation
 - Resource sufficiency: approx. 40% have engineering studies complete (e.g. wind and energy assessment)
 - Financing: approx. 40% have some or all financing secured

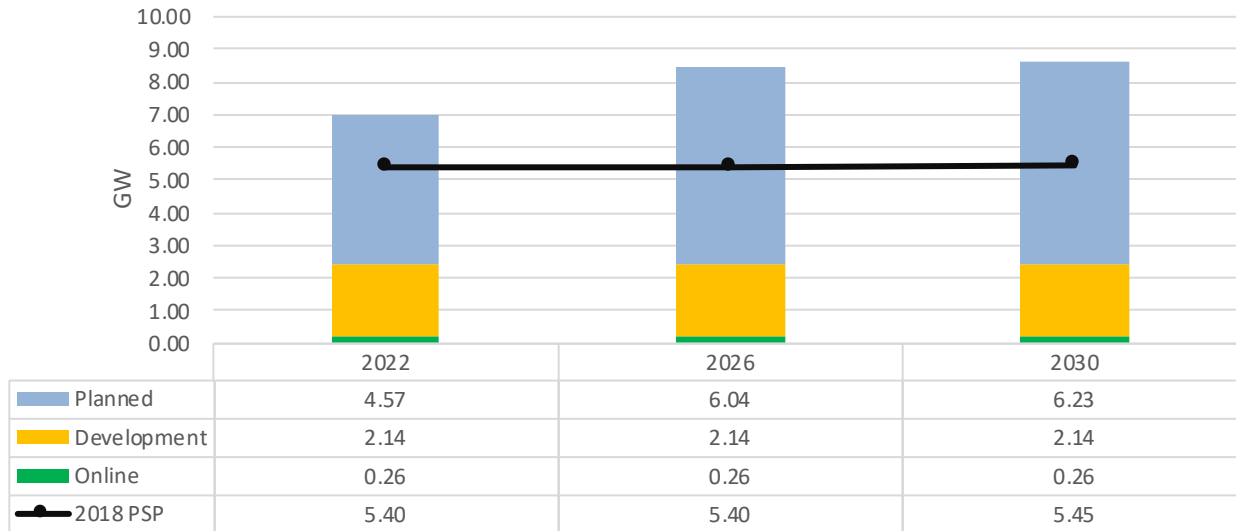


Based on procurement planning data received from LSEs in September 2019

Where LSEs did not provide an allowable value in a field, some reported “Unknown”, whereas some left the field blank

Solar Projects Dashboard

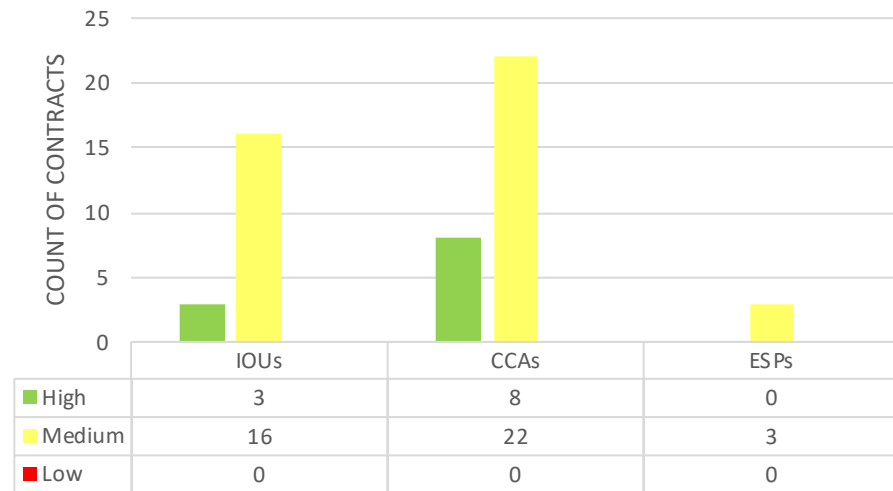
Cumulative total solar capacity (GW) in LSE 2019 update versus 2018 PSP by year



Cumulative planned solar capacity (GW) versus development by LSE type by year



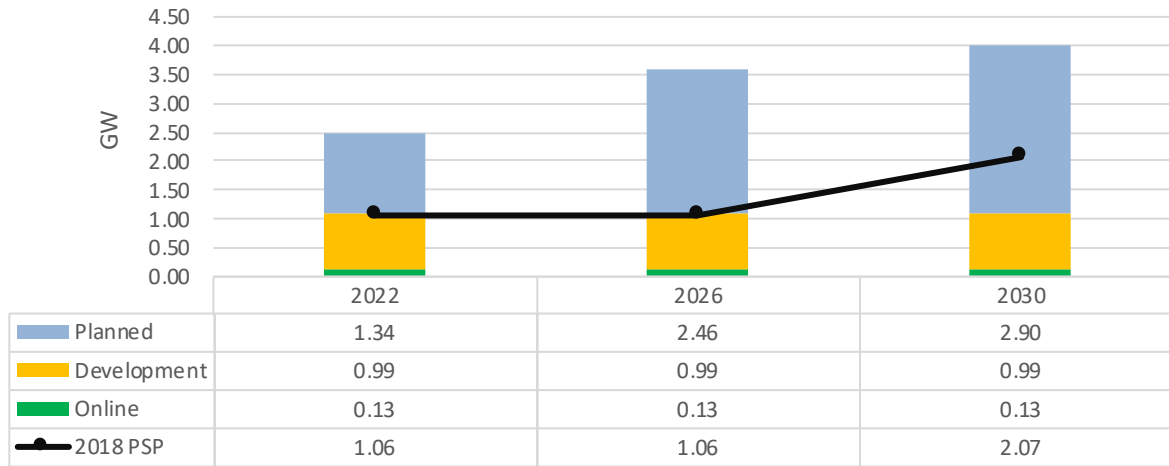
Viability status of solar development resources



Based on procurement planning data received from LSEs in September 2019

Wind Projects Dashboard

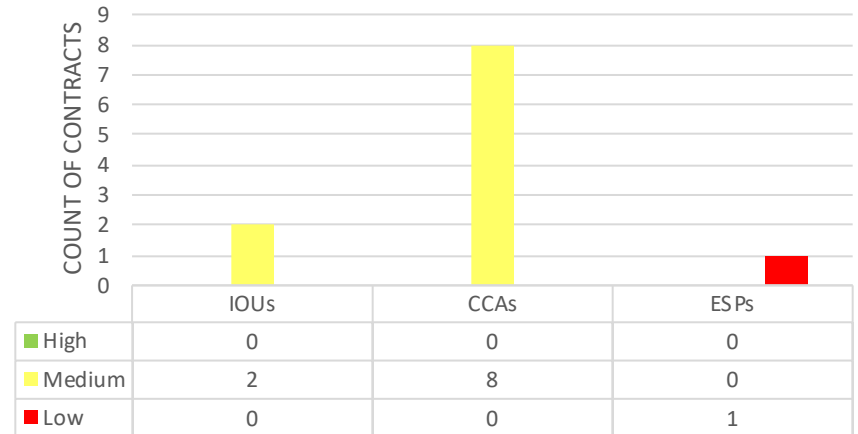
Cumulative total wind capacity (GW) in LSE 2019 update versus 2018 PSP by year



Cumulative planned wind capacity (GW) versus development by LSE type by year



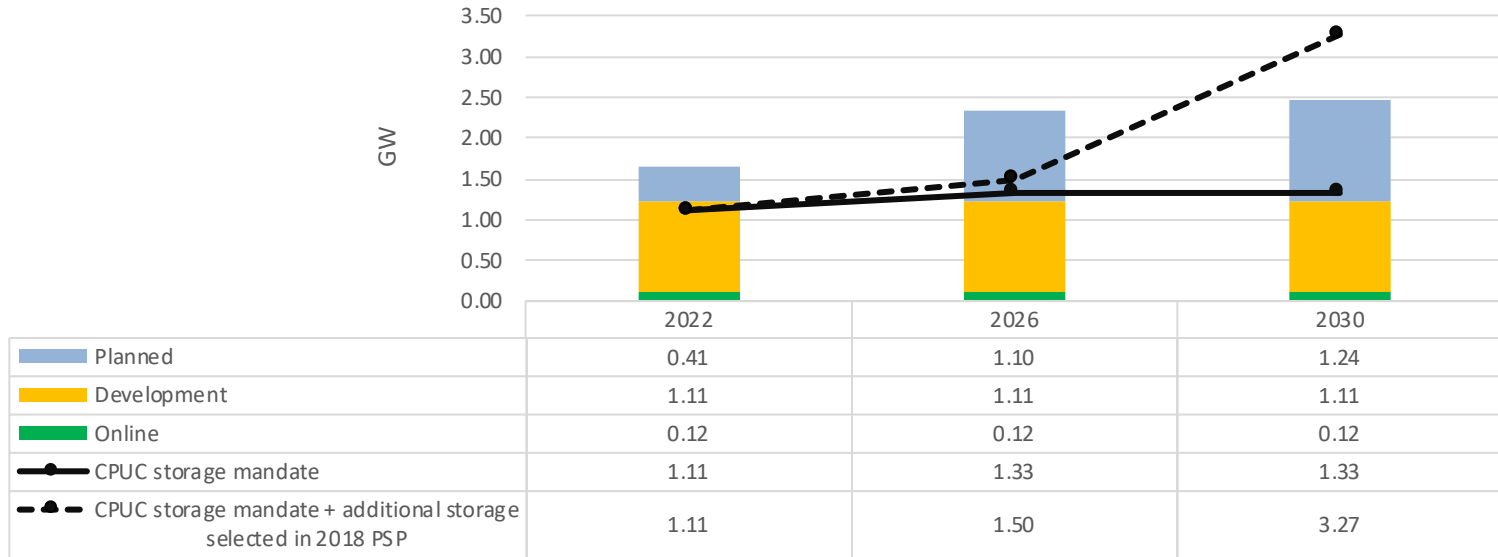
Viability status of wind development resources



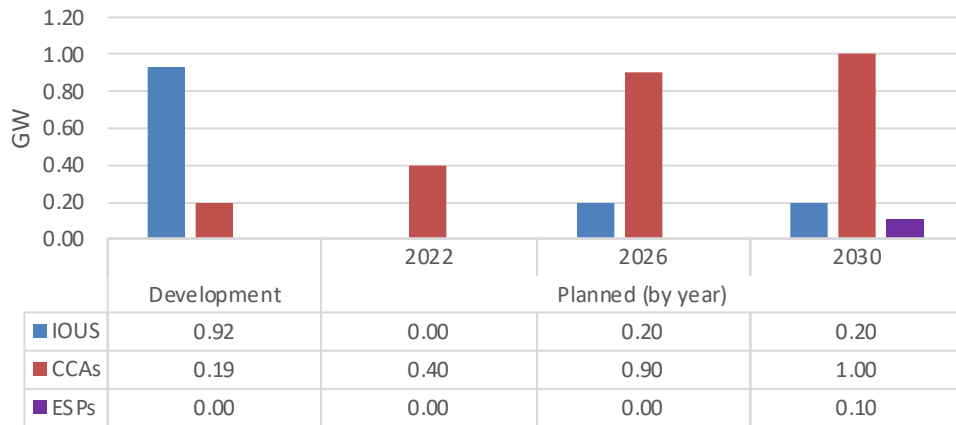
Based on procurement planning data received from LSEs in September 2019

Battery Project Dashboard

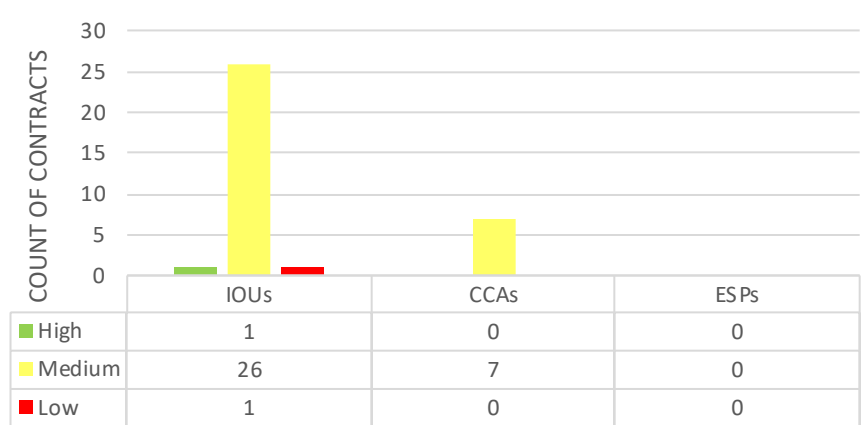
Cumulative total battery capacity (GW) in LSE 2019 update versus 2018 PSP by year



Cumulative planned battery capacity (GW) versus development by LSE type by year



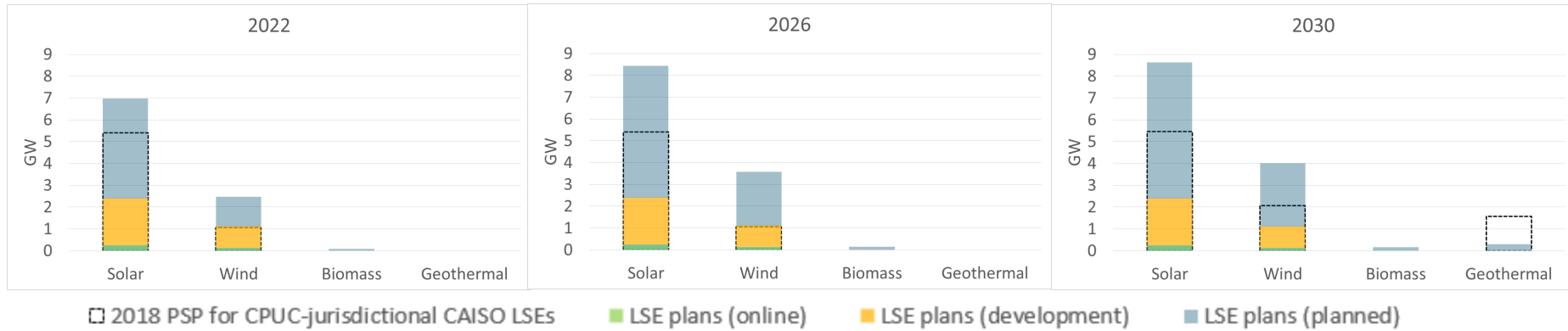
Viability status of battery development resources



Based on procurement planning data received from LSEs in September 2019
 These graphs include the battery portion of hybrid resources reported by LSEs

Planned Resources (by Year)

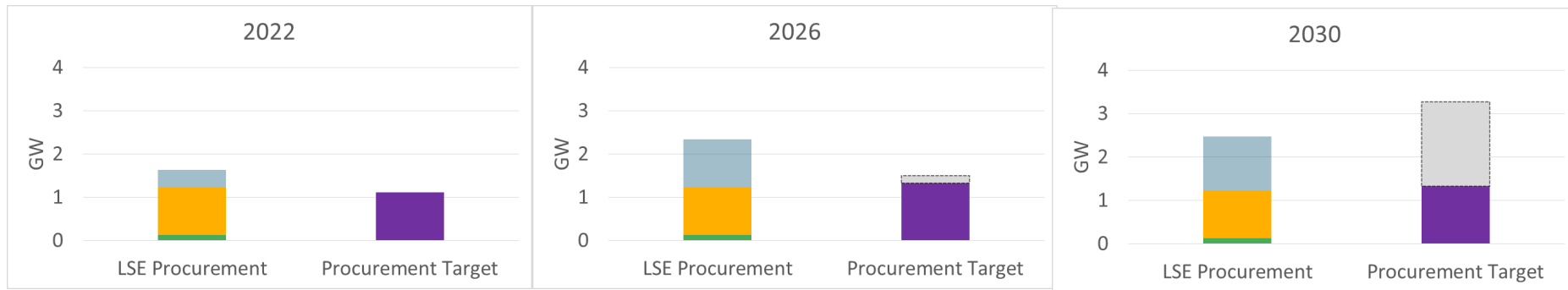
Cumulative total capacity (GW) in LSE 2019 data update versus 2018 PSP, by year and resource type



Based on procurement planning data received from LSEs in September 2019.
Refer Appendices for this data in table format

- LSEs are generally planning for resource volumes in-line with the 2018 PSP
- Charts above exclude storage because that requires more complex accounting; more detail follows on the next slide

Planned Storage by Year vs. Target



LSE Procurement

- LSE plans (planned)
- LSE plans (development)
- LSE plans (online)

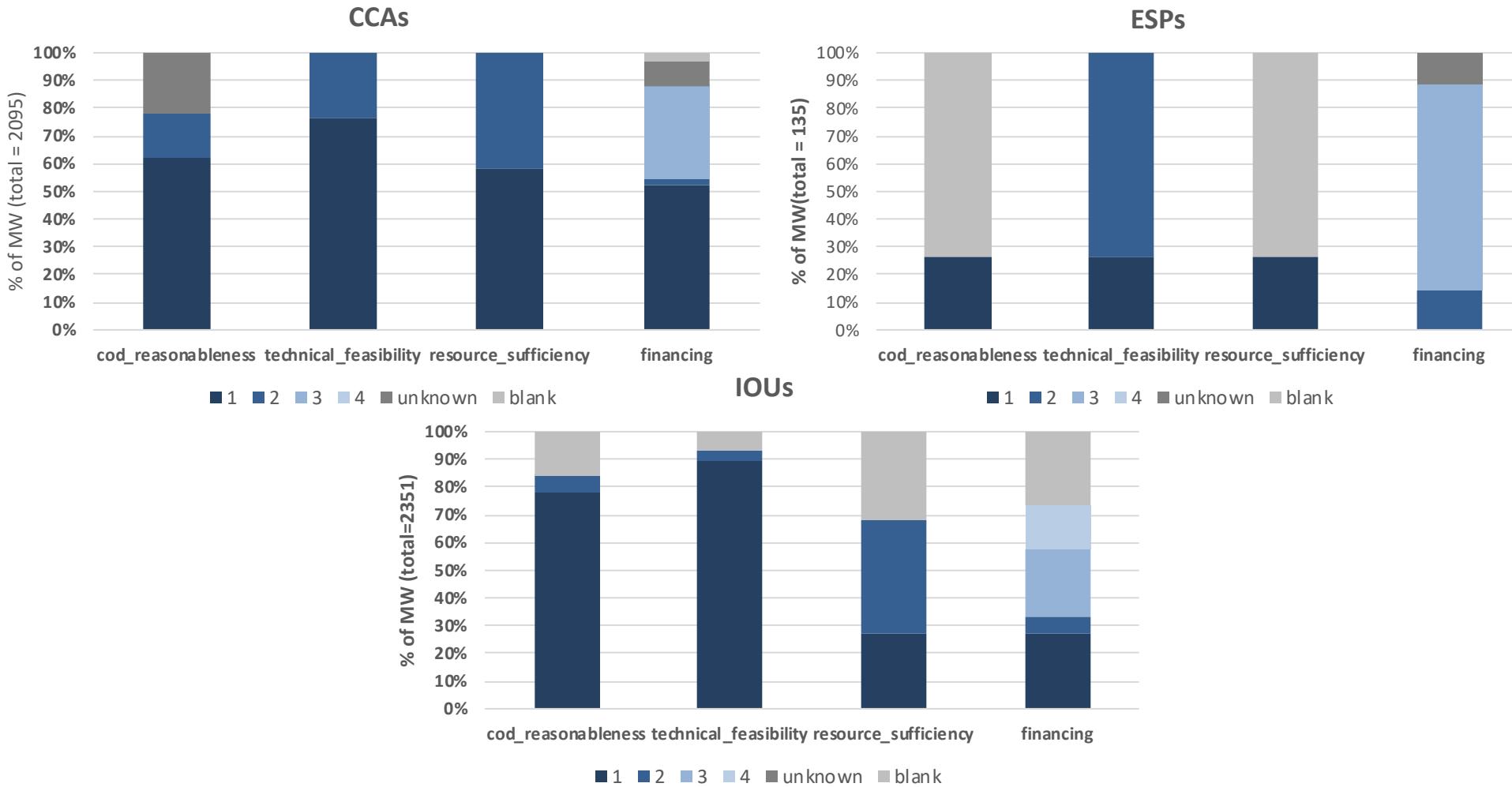
Procurement Target (2018 PSP)

- CPUC Storage Mandate
- ▤ Additional storage selected in 2018 PSP

Based on procurement planning data received from LSEs in September 2019.
Refer Appendices for this data in table format

- PSP's storage resources comprise the baseline (assumes AB2514 mandate is met) plus the RESOLVE-selected amounts of candidate storage resources
- Note that in 2022, RESOLVE did not select any additional energy storage MW (i.e., incremental to the storage mandate)
- This graph includes the battery portion of hybrid resources reported by LSEs

CCAs generally report higher viability for their Development resources than the other LSEs



Based on procurement planning data received from LSEs in September 2019

Data Observations

- Resource updates:
 - Battery procurement on track to meet storage mandate plus new resources selected in the PSP through 2026
 - LSEs are planning to exceed the storage mandate through 2030; however, they were still short on planning to meet the 2030 storage amount selected in the 2018 PSP as of September 2019
 - Solar: only 40% of the PSP's volume of new solar resources due to be online in 2022 is contracted
 - Nearly all of the PSP's volume of new wind resources expected through 2026 are either online or contracted
 - 70% of Development (i.e. contracted) resources have completed interconnection studies and permitting, and are reported as on track to meet their reported online dates
- LSE-specific observations:
 - CCAs are driving much of new procurement for solar and wind
 - ESPs' planned resources have low viability in general
- Significant challenges in collecting and analyzing this data
 - Strategy of seeking for LSEs to only identify changes to August 2018 data was problematic
 - Learnings are being addressed in updated Data Template, released in December 2019, ahead of LSEs' IRP plan and Procurement Decision filings due May 1, 2020 (since extended to September 1)



APPENDICES

Data for procurement charts

Solar, wind, biomass, and geothermal capacity (GW)

		2018 PSP for CPUC-jurisdictional CAISO LSEs	LSE plans (online)	LSE plans (development)	LSE plans (planned)
2022	Solar	5.40	0.26	2.14	4.57
	Wind	1.06	0.13	0.99	1.34
	Biomass	0.00	0.00	0.00	0.08
	Geothermal	0.00	0.00	0.00	0.00
2026	Solar	5.40	0.26	2.14	6.04
	Wind	1.06	0.13	0.99	2.46
	Biomass	0.00	0.00	0.00	0.15
	Geothermal	0.00	0.00	0.00	0.00
2030	Solar	5.45	0.26	2.14	6.23
	Wind	2.07	0.13	0.99	2.90
	Biomass	0.00	0.00	0.00	0.16
	Geothermal	1.57	0.00	0.00	0.31

Battery capacity (GW)

	2022	2026	2030
LSE plans (online)	0.12	0.12	0.12
LSE plans (development)	1.11	1.11	1.11
LSE plans (planned)	0.41	1.10	1.24
CPUC Storage Mandate	1.11	1.33	1.33
Additional storage selected in 2018 PSP	0.00	0.17	1.94

Based on procurement planning data received from LSEs in September 2019

Responses to Data Request

All 26 of the LSEs required to report did so:

1	Apple Valley Choice Energy
2	Calpine Energy Solutions
3	Calpine PowerAmerica CA
4	Clean Power Alliance of Southern California
5	CleanPower San Francisco
6	Constellation NewEnergy
7	Desert Community Energy
8	Direct Energy Business
9	East Bay Community Energy
10	Lancaster Choice Energy
11	Marin Clean Energy
12	Monterey Bay Clean Power Authority
13	Pacific Gas and Electric
14	Peninsula Clean Energy Authority
15	Pico Rivera Innovative Municipal Energy
16	Pilot Power Group
17	Pioneer Community Energy
18	Rancho Mirage Energy Authority
19	San Diego Gas & Electric
20	San Jacinto Power
21	San Jose Clean Energy
22	Shell Energy
23	Silicon Valley Clean Energy Authority
24	Sonoma Clean Power Authority
25	Southern California Edison
26	Valley Clean Energy (VCE)

Definitions

- LSEs' September 2019 data uses the following definitions

Table 1: Contract Status Categories

Status	Description
online	Contract has been signed (or LSE owns the resource) and the resource is online.
development	Contract has been signed and approved by CPUC or LSE's highest decision-making authority (or LSE owns the resource), but resource is still under development and not yet online. If the resource is planned to come online in phases, report Commercial Operating Date for each phase in the Notes column.
review	Contract has been selected and is under review by LSE's highest decision-making authority (e.g. board of directors). For LSE-owned resources, this means that the decision-making authority is reviewing whether to authorize an LSE-owned resource. This includes contracts shortlisted as a result of an RFO or a similar procurement method. It can also include bilateral contracts not resulting from a Request for Offer (RFO).
planned	Contract (or decision to own resource) is planned for the future, and is not captured by the previous categories. Report both planned bilateral contracts and planned RFOs here. Only report resources with an expected online date prior to January 1, 2025.
canceled	Contract (or LSE-owned resource) was originally planned as of August 2018 data submission, but has since been canceled.

https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/DemandModeling/Data_Request_Instructions_Final-OUT.pdf

Notes on LSE Planning and Procurement Update Slides

- “Online” resources were under development at time of 2018 filings
- Small amount of contracts were reported as canceled since August 2018: approx. 140 MW in 2022 (120 MW battery not approved by CPUC, 20 MW solar)
- Comparison of nameplate capacity of new resources in LSE plans (September 2019 data) vs. 2018 PSP is not quite like-for-like
 - 2018 PSP = candidate resources selected by RESOLVE (RSP assuming 2017 IEPR); excludes baseline resources
 - 2019 LSE data includes some resources that would have been baseline resources as at formation of 2018 PSP
 - Note 2019 LSE data shows some resources that were under development at time of 2018 filings but have since come online
- The 2018 PSP for CPUC-jurisdictional CAISO LSEs (dotted lines on bar chart) are adjusted downwards by approx. 8% from the original RESOLVE-produced values to account for in-CAISO POUs, which did not participate in the 2019 data request

Adjusting 2018 PSP to account for in-CAISO POU's

- The CPUC IRP process accounts for in-CAISO IOUs, CCAs and ESPs only, serving a total of 92% of CAISO load in 2018
- However, the RESOLVE model produces a portfolio for 100% of CAISO load, which includes in-CAISO POU's
- Therefore, for the 2018 PSP comparison shown in this deck, the Staff de-rated the RESOLVE-produced values to 92% of their original values