



Transmission Planning 20 Year Transmission Outlook

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California Air Resources Board - 2022 Scoping Plan Update

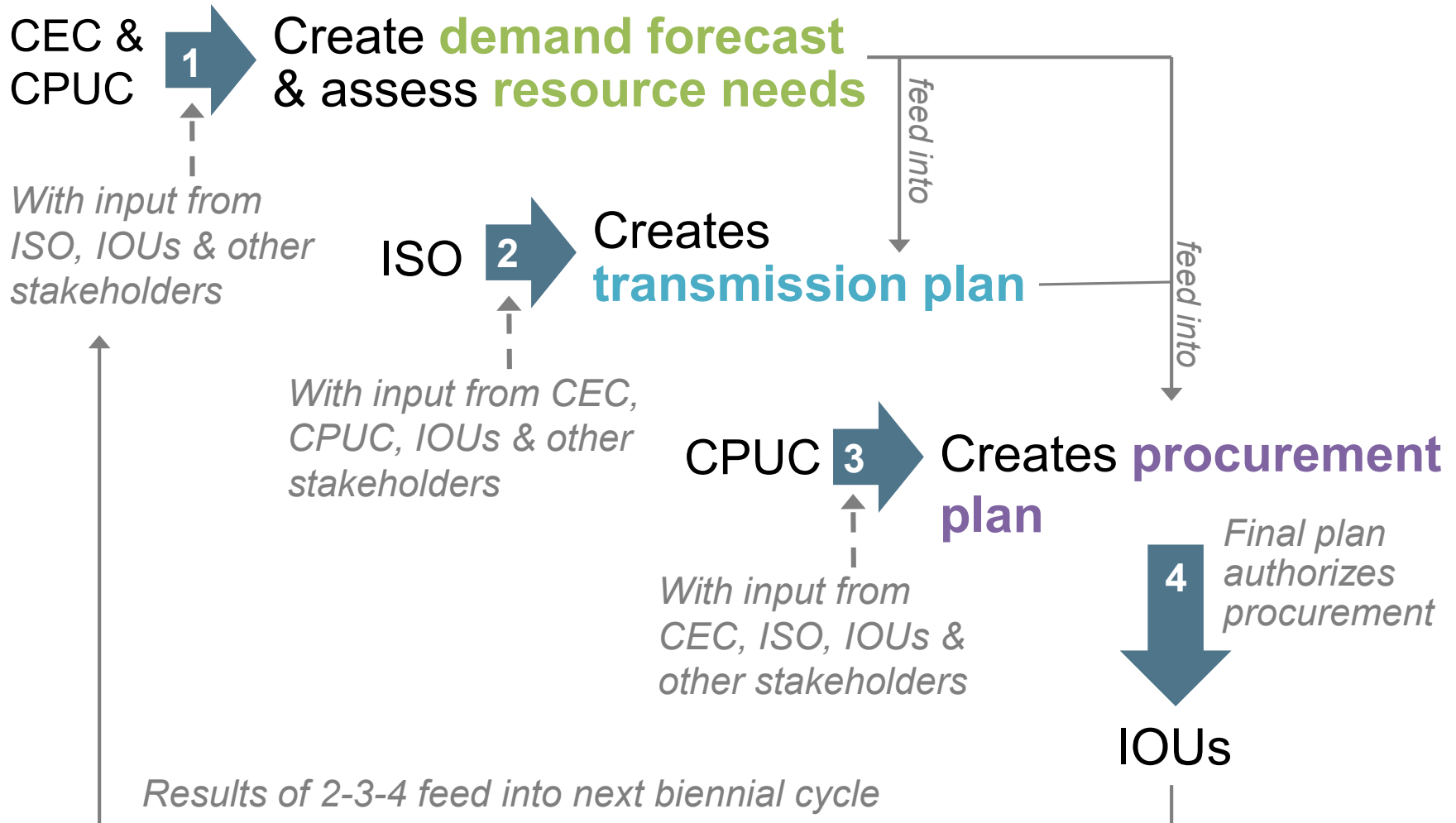
Kick-off Focus Area Workshop: Electricity Sector

The ISO currently conducts an Annual Transmission Planning Process

- 10 year horizon
- Tariff based process (section 24 CAISO tariff)
- Approval of transmission projects based on:
 - Reliability driven need
 - Policy driven need
 - Economic driven need
- Additional studies are conducted within each planning cycle
 - Other reliability studies (such as frequency response, flexible deliverability)
 - 10 year local capacity technical study (every 2 years)
 - Interregional transmission planning (2 year cycle)
 - Informational special studies

<http://www.caiso.com/planning/Pages/TransmissionPlanning/Default.aspx>

The process is coordinated with state agency activities



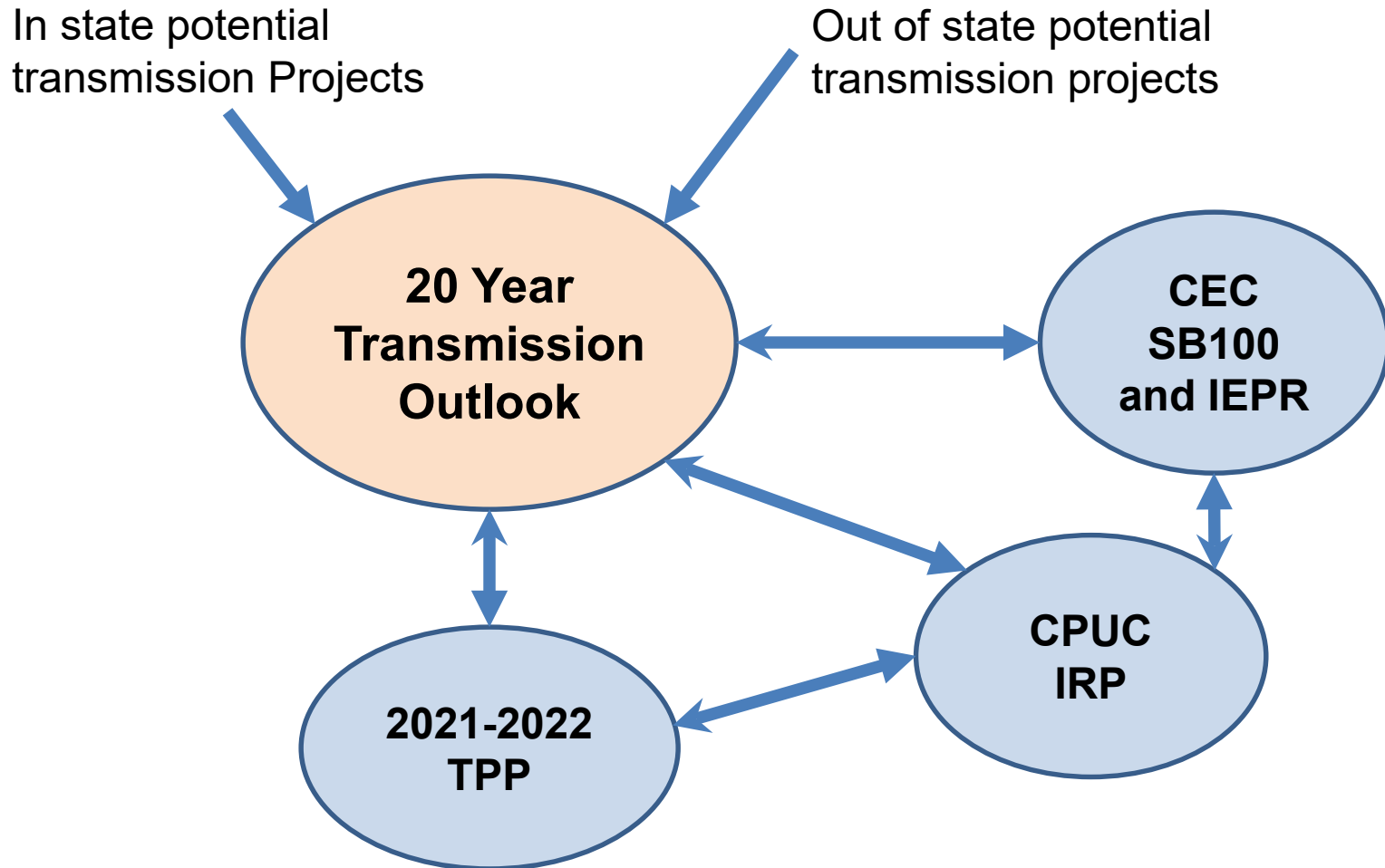
This year, the ISO has introduced a new 20-Year Transmission Outlook initiative

- To explore longer term grid requirements and options for meeting the State's greenhouse gas reduction and renewable energy objectives reliably and cost-effectively,
- To run in parallel with the 2021-2022 annual tariff-based 10-year transmission planning process.
- To engage in meaningful discussion without focusing on specific project approvals

The 20-Year Transmission Outlook initiative will provide:

- A less structured framework for open discussion outside of the tariff-based 10-Year Transmission Plan that focuses on transmission project needs and approvals over the 10 year planning horizon
- Longer term context for and framing issues in the 10-Year Transmission Plan
- A transparent process to develop transmission information responsive to supporting and informing the CPUC's Integrated Resource Planning processes, and the CEC's SB 100 and Integrated Energy Policy Report efforts.

Primary Paths for Coordination with Other Initiatives



The initiative will consider:

- Long-term load forecasts such as an emphasis on potential impacts from increased electrification in other sectors,
- Broader ranges of resource transitions including potentially more aggressive gas-fired generation fleet retirement, and
- Increased emphasis on inter-regional opportunities.

The ISO intends to use an SB 100 scenario as the Starting Point for Assumptions

Resources	Scenarios		
	60 RPS (GW)	SB100 Core (GW)	SB100 Study (GW)
Onshore Wind (in state)	4.3	4.3	4.3
Onshore Wind (out of state)	2.2	8.2	11.9
Offshore Wind		10	10
Utility-Scale Solar	36	70	86
Battery Storage	30	49	55
Pumped Storage	1.7		
Long Duration Storage		4	4
Geothermal		0.135	2.3
Shed DR	0.44		
New Gas	2.6		
Total New Resources	77.2	145.6	173.5
Retirement of Gas		-4.7	-7.2

Scenarios are from SB100 Report - Central Core and Study Scenarios

Informational and not scenario we would be studying in Outlook

Need to develop principle for resources to retire

Further outreach on the scenarios is expected with the CEC, CPUC and stakeholders

The new initiative will be coordinated with 2021-2022 transmission planning process

- The process is expected to include higher level technical studies to test feasibility of alternatives, and not the detailed level of comprehensive analysis that underpins the 10-Year Transmission Plan
- Accordingly we will coordinate with currently scheduled 10-Year Transmission Plan stakeholder sessions to the extent possible, and hold separate stakeholder sessions as appropriate.
- The process welcomes and will incorporate stakeholder input and consultation.

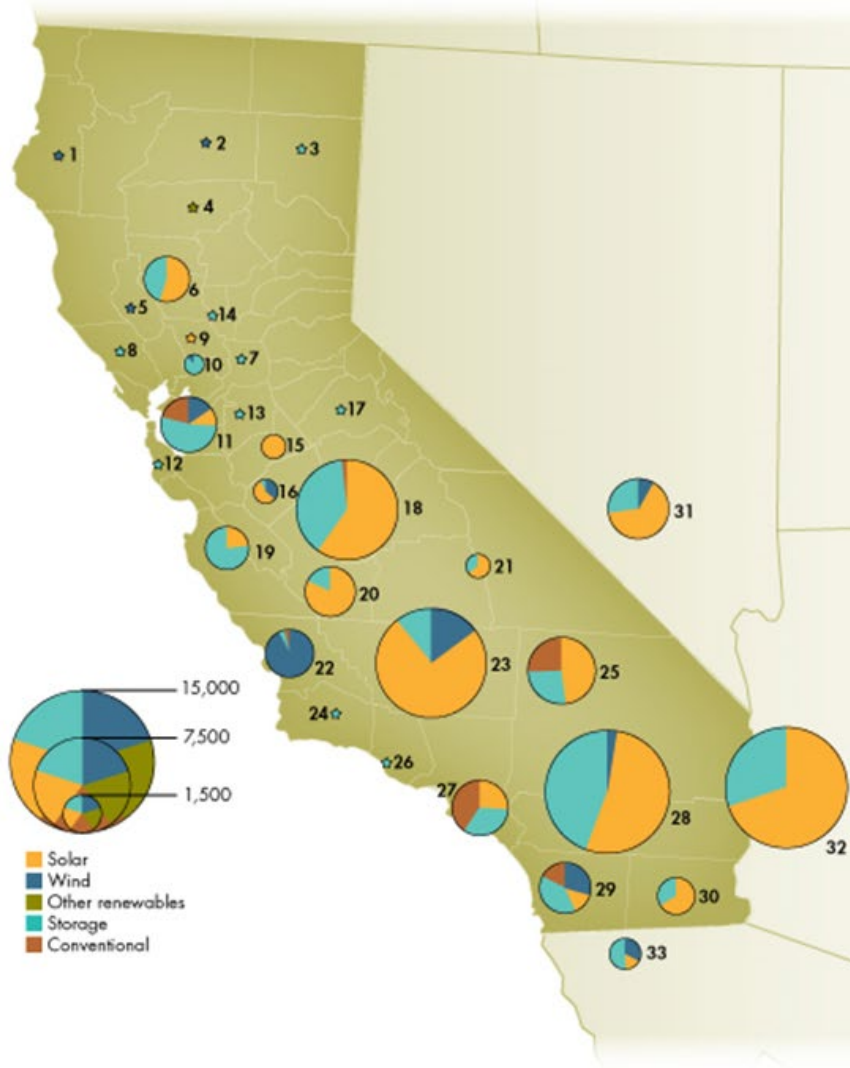
20 Year Transmission Outlook Milestones

- Stakeholder call initiating Outlook on May 14
 - Comments to be submitted by May 28
- Coordination with CEC workshops on SB100
 - SB 100 Workshop on June 2
 - Stakeholder call on potential transmission projects in June/July
- Update at 2021-2022 TPP Stakeholder call on September 27 and 28
 - Comments to be submitted by October 12
- Update at 2021-2022 TPP Stakeholder call on November 18
 - Comments to be submitted by December 6
- Draft 20 Year Transmission Outlook as standalone document together with draft 2021-2022 Transmission Plan to be posted on January 31, 2022
- Stakeholder meeting in February

Generation Interconnection to the transmission system under ISO operational control

- Ensuring the safe and reliable interconnection of new resources is an integral part of the CAISO.
- The bulk of new interconnections proceed through the cluster study approach
 - Interconnection requests submitted April 1st – April 15th each year are studied together – in the same cluster
- In the last decade the CAISO has received an average of 113 queue cluster interconnection requests per year.

There are high levels of interest in generator interconnection



Interconnection queue by county

County	# of Projects	Megawatts			Total
		Renewables	Storage	Conventional	
1 Humboldt	3	268	28		296
2 Shasta	1	200			200
3 Lassen	2	21	27		48
4 Tehama	2	6			6
5 Lake	3	145	39		184
6 Colusa	7	1,261	1,035		2,296
7 Sacramento	1		59		59
8 Sonoma	1		100		100
9 Yolo	1	12			12
10 Solano	4	92	668		760
11 Alameda-Contra Costa-Santa Clara	27	891	1,818	723	3,432
12 San Mateo	1		40		40
13 San Joaquin	6	51	376		427
14 Sutter	3		171		171
15 Stanislaus	5	898			898
16 Merced	10	814	69		883
17 Tuolumne	1		10		10
18 Fresno-Madera	46	4,827	3,118	123	8,068
19 San Benito-Monterey	6	520	1,709		2,229
20 Kings	14	2,123	465		2,588
21 Tulare-Kern	5	551	310		861
22 San Luis Obispo	4	2,582	106	100	2,788
23 Kern	65	8,210	974		9,184
24 Santa Barbara	1		32		32
25 San Bernardino	22	2,156	1,202	38	3,396
26 Ventura	1		100		100
27 Los Angeles-Orange	10	820	1,032	1,270	3,122
28 Riverside	31	6,115	4,875		10,990
29 San Diego	21	1,137	1,036	457	2,630
30 Imperial	7	1,025	525		1,550
31 Nevada	12	2,714	1,014		3,728
32 Arizona	22	7,549	3,246		10,795
33 Mexico	3	601	628		1,229
In-state Totals	311	34,725	19,924	2,711	57,360
Out-of-state Totals	37	10,864	4,888		15,752
TOTAL ALL PROJECTS	347	45,289	24,184	3,711	73,112

Cluster 14 - April 2021 – exceeded all previous levels and expectations

- 363 Interconnection Requests (almost 2.5 times last year)
- 106 GW
- This volume is creating staffing resource challenges for the ISO and, in particular, for the participating transmission owners
- CAISO exploring with stakeholders study approach for Cluster 14

<http://www.caiso.com/Pages/documentsbygroup.aspx?GroupID=E4AE7EB1-914F-47B3-8DCD-0AF05B513BD2>