APPENDIX A: System Data

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A.1 Existing Generation

Table A1-1: Existing generation capacity within the CAISO planning area

PTO	Existing Generation Nameplate Capacity (MW)										
	Nuclear	Natural Gas	Hydro	Solar	Wind	Biogas	Biomass	Geo-thermal	Battery Storage	Other	Total
PG&E	2300	12780	8825	4467	1768	126	451	1028	1267	3302	36314
SCE	0	13923	3564	9898	5745	152	4	283	2918	4123	40610
SDG&E	0	2133	40	2452	702	10	0	0	825	1781	7942
VEA	0	0	0	114	0	0	0	0	0	0	114
Total	2300	28836	12429	16931	8215	288	455	1311	5010	9206	84981

For detailed resource information, please refer to Master Control Area Generating Capability List in OASIS under ATLAS REFERENCE tab at the following link:
http://oasis.caiso.com/mrioasis

A.2 Announced Generation Retirements

See the Announced Retirement and Mothball List on the ISO website.

http://www.caiso.com/Documents/AnnouncedRetirementAndMothballList.xlsx

A.3 OTC Generation

Table A.3-1: Once-through cooled generation in the California ISO Balancing Authority Area

Generating Facility	Owner	Existing Unit/ Technology[1] (ST=Steam CCGT=Combine-Cycled Gas Turbine)	State Water Resources Control Board (SWRCB) Compliance Date	Retirement Date (If already retired or have plans to retire)	Net Qualifying Capacity (NQC) (MW)	Repowering Capacity[2] (MW) and Technology[3] (approved by the CPUC and CEC)	In-Service Date for CPUC and CEC-Approved Repowering Resources	Notes
Humboldt Bay	PG&E	1 (ST)	12/31/2010	9/30/2010	52	163 MW (10 ICs)	9/28/2010	Retired 135 MW and repowered with 10 ICs (163 MW)
		2 (ST)	12/31/2010		53			
Contra Costa	GenOn	6 (ST)	12/31/2017	April 30, 2013	337	Replaced by 760 MW Marsh Landing power plant (4 GTs)	May 1, 2013	New Marsh Landing GTs are located next to retired generating facility.
		7 (ST)	12/31/2017		337			
Pittsburg	GenOn	5 (ST)	12/31/2017	12/31/2016	312	Retired (no repowering plan)	N/A	
		6 (ST)	12/31/2017		317			
Potrero	GenOn	3 (ST)	10/1/2011	2/28/2011	206	Retired (no repowering plan)	N/A	
Moss Landing	Dynegy	1 (CCGT)	12/31/2020* (see notes at far right column)	N/A	510	The State Water Resources Control Board (SWRCB) approved mitigation plan (Track 2 implementation plan) for Moss Landing Units 1 & 2.	N/A	The State Water Resources Control Board (SWRCB) approved OTC Track 2 mitigation plan for Moss Landing Units 1 & 2.
		2 (CCGT)	12/31/2020* (see notes at far right column)	N/A	510			
		6 (ST)	12/31/2020 (see notes)	1/1/2017	754	Retired (no repowering plan)	N/A	
		7 (ST)	12/31/2020 (see notes)	1/1/2017	756	Retired (no repowering plan)	N/A	

[1] Most of the existing OTC units, with the exception of Moss Landing Units 1 and 2, are steam generating units.

[2] The CAISO, through Long-Term Procurement Process and annual Transmission Planning Process, worked with the state energy agencies and transmission owners to implement an integrated and comprehensive mitigation plan for the southern California OTC and SONGS generation retirement located in the LA Basin and San Diego areas. The comprehensive mitigation plan includes preferred resources, transmission upgrades and conventional generation.

[3] IC (Internal Combustion), GT (gas turbine), CCGT (combined cycle gas turbine)

Generating Facility	Owner	Existing Unit/ Technology[1] (ST=Steam CCGT=Combine-Cycled Gas Turbine)	State Water Resources Control Board (SWRCB) Compliance Date	Retirement Date (If already retired or have plans to retire)	Net Qualifying Capacity (NQC) (MW)	Repowering Capacity[2] (MW) and Technology[3] (approved by the CPUC and CEC)	In-Service Date for CPUC and CEC-Approved Repowering Resources	Notes
Morro Bay	Dynegy	3 (ST)	12/31/2015	2/5/2014	325	Retired (no repowering plan)	N/A	
		4 (ST)	12/31/2015	2/5/2014	325	Retired (no repowering plan)	N/A	
Diablo Canyon Nuclear Power Plant	PG&E	1 (ST)	12/31/2024	11/2/2024	1122		N/A	The proposed amendment from The State Water Resources Control Board would also include a change without regulatory effect to revise the compliance date for Diablo Canyon Nuclear Power Plant (Diablo Canyon) Units 1 and 2 to October 31, 2030, to comport with the extension provided by Senate Bill 846.[4]
		2 (ST)	12/31/2024[5]	8/26/2025[6]	1118			
Mandalay	GenOn	1 (ST)	12/31/2020	2/6/2018	215	Retired (no repowering) SCE plans to replace with renewable energy and storage		Mandalay generating facility was retired on February 6, 2018.
		2 (ST)	12/31/2020	2/6/2018	215			
Ormond Beach	GenOn	1 (ST)	12/31/2020	12/31/2023[7]	741	To be retired (no repowering)	N/A	The State Water Resources Control Board is proposing amendment to extend compliance dates for Units 1 and 2 to 12/31/2026.
		2 (ST)	12/31/2020	12/31/2023[8]	775			

[4] Notice for Public Comment Period, Public Board Workshop, Public Hearing, and Consideration of Adoption OTC Policy Amendment at https://www.waterboards.ca.gov/board_info/calendar/docs/notice_otc_010423.pdf

[5] Ibid.

[6] Ibid.

[7] Ibid.

[8] Ibid.

Generating Facility	Owner	Existing Unit/ Technology[1] (ST=Steam CCGT=Combine-Cycled Gas Turbine)	State Water Resources Control Board (SWRCB) Compliance Date	Retirement Date (If already retired or have plans to retire)	Net Qualifying Capacity (NQC) (MW)	Repowering Capacity[2] (MW) and Technology[3] (approved by the CPUC and CEC)	In-Service Date for CPUC and CEC-Approved Repowering Resources	Notes
El Segundo	NRG	3 (ST)	12/31/2015	7/27/2013	335	560 MW El Segundo Power Redevelopment (CCGTs)	August 1, 2013	Unit 3 was retired on 7/27/2013.
		4 (ST)	12/31/2015	12/31/2015	335	Retired (no repowering)	N/A	Unit 4 was retired on December 31, 2015.
Alamitos	AES	1 (ST)	12/31/2020	1/1/2020	175	640 MW CCGT on the same property	4/1/2020	Units 1, 2 and 6 were retired on January 1, 2020 to provide emission offsets to repowering project (non-OTC units). The State Water Resources Control Board is proposing amendment to extend compliance dates for Units 3, 4 and 5 to 12/31/2026.
		2 (ST)	12/31/2020	1/1/2020	175			
		3 (ST)	12/31/2020	12/31/2023[9]	332			
		4 (ST)	12/31/2020	12/31/2023[10]	336			
		5 (ST)	12/31/2020	12/31/2023[11]	498			
		6 (ST)	12/31/2020	1/1/2020	495			
Huntington Beach	AES	1 (ST)	12/31/2020	1/1/2020	226	644 MW CCGT on the same property	3/1/2020	Unit 1 was retired to provide emission offsets to repowering project (non-OTC units). The State Water Resources Control Board is proposing amendment to extend compliance dates for Unit 2 to 12/31/2026.
		2 (ST)	12/31/2020	12/31/2023[12]	226			
		3 (ST)	12/31/2020	11/1/2012	227			Units 3 and 4 were retired in 2012 and converted to synchronous condensers in June 2013 to operate on an interim basis. On December 31, 2017, these two synchronous
		4 (ST)	12/31/2020	11/1/2012	227			

[9] Ibid.

[10] Ibid.

[11] Ibid.

[12] Ibid.

Generating Facility	Owner	Existing Unit/ Technology[1] (ST=Steam CCGT=Combine-Cycled Gas Turbine)	State Water Resources Control Board (SWRCB) Compliance Date	Retirement Date (If already retired or have plans to retire)	Net Qualifying Capacity (NQC) (MW)	Repowering Capacity[2] (MW) and Technology[3] (approved by the CPUC and CEC)	In-Service Date for CPUC and CEC-Approved Repowering Resources	Notes
								condensers were retired.
Redondo Beach	AES	5 (ST)	12/31/2020	12/31/2023	179	To be retired	N/A	Unit 7 was retired to provide emission offsets to repowering project at Huntington Beach. On December 23, 2021, the SWRCB officially amended the compliance schedule for Units 5, 6 and 8.
		6 (ST)	12/31/2020	12/31/2023	175			
		7 (ST)	12/31/2020	10/1/2019	493			
		8 (ST)	12/31/2020	12/31/2023	496			
San Onofre Nuclear Generating Station	SCE/ SDG&E	2 (ST)	12/31/2022	June 7, 2013	1122	Retired (no repowering)	N/A	
		3 (ST)	12/31/2022		1124			
Encina	NRG	1 (ST)	12/31/2017	3/1/2017	106	500 MW (5 GTs or peakers) Carlsbad Energy Center, located on the same property as the Encina Power Plant.	New resources (Carlsbad Energy Center) achieved commercial operation on 12/11/2018	OTC Unit 1 was retired on 12/31/2017. Units 2-5 were retired on 12/31/2018.
		2 (ST)	12/31/2017	12/31/2018[13]	103			
		3 (ST)	12/31/2017	12/31/2018	109			
		4 (ST)	12/31/2017	12/31/2018	299			
		5 (ST)	12/31/2017	12/31/2018	329			
South Bay (707 MW)	Dynegy	1-4 (ST)	12/31/2011	12/31/2010	692	Retired (no repowering)	N/A	Retired 707 MW (CT non-OTC) – (2010-2011)

[13] The State Water Resources Control Board approved extending the compliance date for Encina Units 2 to 5 for one year to December 31, 2018 due to delay of Carlsbad Energy Center in-service date.

A.4 Planned Generation

See section F.4 in Appendix F

A.5 Reactive Resources

Table A.5-1: Summary of key existing reactive modeled in ISO reliability assessments

Substation	Capacity (MVAr)	Technology
Gates	225	Shunt Capacitors
Los Banos	225	Shunt Capacitors
Gregg	150	Shunt Capacitors
McCall	132	Shunt Capacitors
Mesa (PG&E)	100	Shunt Capacitors
Metcalf	350	Shunt Capacitors
Olinda	200	Shunt Capacitors
Table Mountain	454	Shunt Capacitors
Devers	156 & 605 (dynamic capability)	Static VAr Compensator
Rector	200	Static VAr Compensator
Santiago	3x81	Synchronous Condensers
Mira Loma 230kV	158	Shunt Capacitors
Mira Loma 500kV	300	Shunt Capacitors
San Luis Rey	63	Shunt Capacitors
Bay Boulevard	100	Shunt Capacitors
Miguel	126	Shunt Capacitors
Escondido	126	Shunt Capacitors
Suncrest	126	Shunt Capacitors
Penasquitos	276	Shunt Capacitors
San Luis Rey	2x225	Synchronous Condensers
Talega	2x225	Synchronous Condensers
Miguel	2x225	Synchronous Condensers
San Onofre	225	Synchronous Condensers
Suncrest	300	Static VAr Compensator

A.6 Remedial Action Schemes

Table A.6-1: Existing key Remedial Action Schemes in the PG&E area

PTO	Area	RAS Name
PG&E	Central Coast / Los Padres	Mesa and Santa Maria Undervoltage RAS
	Central Coast / Los Padres	Divide Undervoltage RAS
	Central Coast / Los Padres	Temblor-San Luis Obispo 115 kV Overload Scheme
	Central Coast / Los Padres	Paso Robles 70 kV Undervoltage RAS
	Central Coast / Los Padres	Coburn Transfer trip
	Central Coast / Los Padres	Carrizo RAS
	Bulk	COI RAS
	Bulk	Colusa RAS
	Bulk	Diablo Canyon RAS
	Bulk	Midway 500/230 kV Transformer Overload RAS
	Bulk	Path 15 IRAS
	Bulk	Path 26 RAS North to South
	Bulk	Path 26 RAS South to North
	Bulk	Table Mt 500/230 kV Bank #1 RAS
	Central Valley	Drum (Sierra Pacific) Overload Scheme (Path 24)
	Central Valley	Stanislaus – Manteca 115 kV Line Load Limit Scheme
	Central Valley	Vaca-Suisun 115 kV Lines Thermal Overload Scheme
	Central Valley	West Sacramento 115 kV Overload Scheme
	Central Valley	West Sacramento Double Line Outage Load Shedding RAS Scheme
	Greater Fresno Area	Ashlan RAS
	Greater Fresno Area	Atwater RAS
	Greater Fresno Area	FRTRAS
	Greater Fresno Area	Helms RAS
	Greater Fresno Area	Henrietta RAS
	Greater Fresno Area	Herndon-Bullard RAS
	Greater Fresno Area	Kerckhoff 2 RAS
	Greater Fresno Area	Reedley RAS
	Greater Fresno Area	Hatchet Ridge RAS
	Greater Fresno Area	Exchequer Legrand 115kV RAS

PTO	Area	RAS Name
	Greater Bay Area	Metcalf RAS
	Greater Bay Area	SF RAS
	Greater Bay Area	South of San Mateo RAS
	Greater Bay Area	Metcalf-Monta Vista 230kV OL RAS
	Greater Bay Area	San Mateo-Bay Meadows 115kV line OL
	Greater Bay Area	Moraga-Oakland J 115kV line OL RAS
	Greater Bay Area	Grant 115kV OL RAS
	Greater Bay Area	Oakland 115 kV C-X Cable OL RAS
	Greater Bay Area	Oakland 115kV D-L Cable OL RAS
	Greater Bay Area	Sobrante-Standard Oil #1 & #2-115kV line
	Greater Bay Area	Gilroy RAS
	Greater Bay Area	Transbay Cable Run Back Scheme
	Humboldt	Humboldt – Trinity 115kV Thermal Overload Scheme
	North Valley	Caribou Generation 230 kV RAS Scheme #1
	North Valley	Caribou Generation 230 kV RAS Scheme #2
	North Valley	Cascade Thermal Overload Scheme
	North Valley	Hatchet Ridge Thermal Overload Scheme
	North Valley	Coleman Thermal Overload Scheme

Table A.6-2: Existing key Remedial Action Schemes in SCE area

PTO	Area	RAS Name
SCE	Northern Area	Antelope-RAS
	Northern Area	Big Creek / San Joaquin Valley RAS
	Northern Area	Whirlwind AA-Bank RAS
	Northern Area	Pastoria Energy Facility RAS (PEF RAS)
	Northern Area	Midway-Vincent RAS (SCE MVRAS)
	North of Lugo	Bishop RAS
	North of Lugo	High Desert Power Project RAS (HDPP RAS)
	North of Lugo	Kramer RAS (Retired)
	North of Lugo	Mojave Desert RAS
	North of Lugo	Victor Direct Load Tripping Scheme
	East of Lugo	Ivanpah RAS
	East of Lugo	Lugo - Victorville RAS
	Eastern Area	Devers RAS
	Eastern Area	Colorado River Corridor RAS
	Eastern Area	Inland Empire Area RAS (Retirement pending)
	Eastern Area	Blythe Energy RAS
	Eastern Area	MWD Eagle Mountain Thermal Overload Scheme
	Eastern Area	Mountain view Power Project Remedial Action Scheme
	Metro Area	El Nido LCR RAS (Replaced with El Nido/El Segundo N-2 CRAS Analytic)
	Metro Area	El Segundo RAS (Replaced with El Nido/El Segundo N-2 CRAS Analytic)
	Metro Area	South of Lugo (SOL) N-2 RAS
	Metro Area	Mira Loma Low Voltage Load Shedding (LVLS)

Table A.6-3: Existing Remedial Action Schemes in the SDG&E

PTO	Area	RAS Name
SDG&E	SDG&E	69kV TL 695A at TA
	SDG&E	69kV TL 682 RAS (currently disabled and will not be enabled until it is reevaluated)
	SDG&E	69kV TL 600 RAS
	SDG&E	69kV TL 684 RAS
	SDG&E	69kV TL 686 RAS
	SDG&E	69kV TL 649 RAS
	SDG&E	Crestwood RAS – Remedial Action Scheme for Kumeyaay Wind Generation (currently disabled and will be removed from service in the future)
	SDG&E	Valley Center RAS
	SDG&E	Avocado RAS
	SDG&E	138kV TL 13835A RAS
	SDG&E	138kV TL 13810A RAS
	SDG&E	CENACE Valley Area Trip for Imperial Valley – La Rosita 230kV (TL 23050) Overload (CFE-5A RAS)
	SDG&E	TL23040 IV 500 kV N-1 RAS
	SDG&E	Overload of CENACE's Valle – Costa Path RAS
	SDG&E	230kV Otay Mesa Gen Drop RAS
	SDG&E	TL 23041 / TL 23042 RAS
	SDG&E	TL 23054 / TL 23055 RAS
	SDG&E	230kV TL 23066 RAS
	SDG&E	Miguel BK 80 / BK 81 RAS
	SDG&E	500kV TL 50001 Gen Drop RAS
	SDG&E	500kV TL 50003 Gen Drop RAS
	SDG&E	500kV TL 50004 Gen Drop RAS
	SDG&E	500kV TL 50005 Gen Drop RAS
	SDG&E	South of San Onofre Safety Net