

# APPENDIX A: System Data

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## A.1 Existing Generation

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

|   |                        | PG&E          | SCE           | SDG&E        | VEA        | Total         |
|---|------------------------|---------------|---------------|--------------|------------|---------------|
| Existing Generators Max Generation (MW) | <b>Nuclear</b>         | 2,300         | 0             | 0            | 0          | <u>2,300</u>  |
|   | <b>Natural Gas</b>     | 12,901        | 13,909        | 3,129        | 0          | <u>29,938</u> |
|   | <b>Hydro</b>           | 9,320         | 3,237         | 40           | 0          | <u>12,597</u> |
|   | <b>Solar</b>           | 5,423         | 11,060        | 3,044        | 239        | <u>19,766</u> |
|   | <b>Wind</b>            | 2,002         | 5,802         | 702          | 0          | <u>8,506</u>  |
|   | <b>Biogas</b>          | 101           | 178           | 10           | 0          | <u>289</u>    |
|   | <b>Biomass</b>         | 430           | 4             | 0            | 0          | <u>434</u>    |
|   | <b>Geothermal</b>      | 1,130         | 552           | 0            | 0          | <u>1,682</u>  |
|   | <b>Battery Storage</b> | 2,272         | 5,777         | 1,153        | 65         | <u>9,267</u>  |
|   | <b>Hybrid</b>          | 257           | 1,844         | 0            | 0          | <u>2,101</u>  |
|   | <b>Other</b>           | 2,304         | 1,161         | 785          | 0          | <u>4,250</u>  |
|   | <b>Total</b>           | <u>38,440</u> | <u>43,523</u> | <u>8,863</u> | <u>304</u> | <u>91,130</u> |

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

<sup>1</sup> Most of the existing OTC units, with the exception of Moss Landing Units 1 and 2, are steam generating units.

<sup>2</sup> 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.

<sup>3</sup> IC (Internal Combustion), GT (gas turbine), CCGT (combined cycle gas turbine)

| Generating Facility               | Owner  | Existing Unit/ Technology <sup>1</sup><br>(ST=Steam<br>CCGT=Combine-<br>Cycled Gas<br>Turbine) | State Water<br>Resources<br>Control Board<br>(SWRCB)<br>Compliance<br>Date | Retirement<br>Date<br>(If already<br>retired or<br>have plans to<br>retire) | Net Qualifying<br>Capacity<br>(NQC) (MW) | Repowering Capacity <sup>2</sup><br>(MW) and Technology <sup>3</sup><br>(approved by the<br>CPUC and CEC) | In-Service Date<br>for CPUC and<br>CEC-Approved<br>Repowering<br>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 <sup>4</sup>  | 1122                                     |   | N/A  | On September 2, 2022, Governor Newsom signed SB 846 into law, which set a new OTC Policy compliance date for Diablo Canyon Units 1 and 2, conditioned upon the U.S. Nuclear Regulatory Commission extending the plant's operating licenses. <sup>5</sup> |
|                                   |        | 2 (ST)   | 12/31/2024 <sup>6</sup>  | 8/26/2025 <sup>7</sup>  | 1118                                     |   |  |  |
| Mandalay                          | GenOn  | 1 (ST)   | 12/31/2020   | 2/6/2018  | 215                                      | Retired (no repowering)<br>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)   | 12/31/2026   | 12/31/2026 <sup>8</sup>   | 741                                      | To be retired (no repowering)   | N/A  | The SWRCB has adopted an amendment to extend OTC compliance dates for Units 1 and 2 to 12/31/2026. <sup>9</sup>  |
|                                   |        | 2 (ST)   | 12/31/2026   | 12/31/2026 <sup>10</sup>  | 775                                      |   |  |  |
| 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.   |

<sup>4</sup> Senate Bill 846 (Dodd)

<sup>5</sup> Ibid.

<sup>6</sup> Ibid.

<sup>7</sup> Ibid.

<sup>8</sup> State Water Resources Control Board's Once-Through Cooling Policy ([https://www.waterboards.ca.gov/water\\_issues/programs/ocean/cwa316/docs/otc-policy-2023/otc-policy-2023.pdf](https://www.waterboards.ca.gov/water_issues/programs/ocean/cwa316/docs/otc-policy-2023/otc-policy-2023.pdf))

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

| Generating Facility | Owner | Existing Unit/<br>Technology <sup>1</sup><br>(ST=Steam<br>CCGT=Combine-<br>Cycled Gas<br>Turbine) | State Water<br>Resources<br>Control Board<br>(SWRCB)<br>Compliance<br>Date | Retirement<br>Date<br>(If already<br>retired or<br>have plans to<br>retire) | Net Qualifying<br>Capacity<br>(NQC) (MW) | Repowering Capacity <sup>2</sup><br>(MW) and Technology <sup>3</sup><br>(approved by the<br>CPUC and CEC) | In-Service Date<br>for CPUC and<br>CEC-Approved<br>Repowering<br>Resources | Notes  |
|---------------------|-------|---|--|---|--|---|--|--|
|                     |       | 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 SWRCB has adopted an amendment to extend compliance dates for Units 3, 4 and 5 to 12/31/2026. <sup>11</sup>  |
|                     |       | 2 (ST)  | 12/31/2020   | 1/1/2020  | 175                                      |   |  |  |
|                     |       | 3 (ST)  | 12/31/2026   | 12/31/2026 <sup>12</sup>  | 332                                      |   |  |  |
|                     |       | 4 (ST)  | 12/31/2026   | 12/31/2026 <sup>13</sup>  | 336                                      |   |  |  |
|                     |       | 5 (ST)  | 12/31/2026   | 12/31/2026 <sup>14</sup>  | 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 SWRCB has adopted an amendment to extend the compliance date for Unit 2 to 12/31/2026. <sup>15</sup><br><br>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 condensers were retired. |
|                     |       | 2 (ST)  | 12/31/2026   | 12/31/2026 <sup>16</sup>  | 226                                      |   |  |  |
|                     |       | 3 (ST)  | 12/31/2020   | 11/1/2012   | 227                                      |   |  |  |
|                     |       | 4 (ST)  | 12/31/2020   | 11/1/2012   | 227                                      |   |  |  |
| Redondo Beach       | AES   | 5 (ST)  | 12/31/2023   | 12/31/2023  | 179                                      |   |  |  |

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

| Generating Facility                   | Owner      | Existing Unit/ Technology <sup>1</sup><br>(ST=Steam CCGT=Combine-Cycled Gas Turbine) | State Water Resources Control Board (SWRCB) Compliance Date | Retirement Date<br>(If already retired or have plans to retire) | Net Qualifying Capacity (NQC) (MW) | Repowering Capacity <sup>2</sup> (MW) and Technology <sup>3</sup><br>(approved by the CPUC and CEC)       | In-Service Date for CPUC and CEC-Approved Repowering Resources                     | Notes  |
|---------------------------------------|------------|--|---|---|------------------------------------|---|--|--|
|                                       |            | 6 (ST)   | 12/31/2023  | 12/31/2023  | 175                                | Retired (no repowering)   | N/A  | Unit 7 was retired to provide emission offsets to repowering project at Huntington Beach. On December 31, 2023, Units 5, 6 and 8 were retired. |
|                                       |            | 7 (ST)   | 12/31/2020  | 10/1/2019   | 493                                |   |  |  |
|                                       |            | 8 (ST)   | 12/31/2023  | 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 <sup>17</sup>  | 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)  |

<sup>17</sup> 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<br>(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       |
| Mesa 500/230 kV | 405                               | 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       |
| Capistrano      | 150                               | 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  |
|------------|---------------|---|
| <b>SCE</b> | Northern Area | Big Creek / San Joaquin Valley RAS                |
|            | Northern Area | Whirlwind C-RAS                                   |
|            | Northern Area | Tehachapi C-RAS                                   |
|            | Northern Area | Pastoria Energy Facility RAS (PEF RAS)            |
|            | Northern Area | Midway-Vincent Path RAS (SCE MVRAS)               |
|            | North of Lugo | Bishop RAS  |
|            | North of Lugo | High Desert Power Project RAS (HDPP RAS)          |
|            | North of Lugo | Mojave Desert RAS                                 |
|            | East of Lugo  | Ivanpah Area RAS                                  |
|            | East of Lugo  | Lugo - Victorville RAS                            |
|            | Eastern Area  | West of Colorado River Corridor C-RAS             |
|            | Eastern Area  | Blythe Energy RAS                                 |
|            | Metro Area    | El Nido N-2 C-RAS Analytic                        |
|            | Metro Area    | South of Lugo (SOL) N-2 RAS                       |
|            | Metro Area    | Mira Loma Low Voltage Load Shedding (LVLS) Scheme |

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

| PTO   | Area  | RAS Name  |
|-------|-------|---|
| SDG&E | SDG&E | 69kV TL 695 at TA   |
|       | SDG&E | 69kV TL 680C at SM  |
|       | 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 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 (currently disabled and will be removed from service upon completion of the Southern Orange County Reliability Enhancement) |
|       | SDG&E | 138kV TL 13810A RAS   |
|       | SDG&E | CENACE Valley Area Trip for Imperial Valley – La Rosita 230kV (TL 23050) Overload (CFE-5A RAS) (CENACE Internal RAS related to TL23050)         |
|       | SDG&E | TL23040 IV 500 kV N-1 RAS   |
|       | SDG&E | Overload of CENACE's Valle – Costa Path RAS (CENACE Internal RAS related to TL23050)  |
|       | 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 | 230kV TL 23003 / TL 23011 RAS   |
|       | SDG&E | 230kV TL 23006 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  |

Table A.6-4: Existing Key Remedial Action Schemes in GridLiance West/VEA area

| <b>PTO</b>       | <b>Area</b> | <b>RAS Name</b>                    |
|------------------|-------------|------------------------------------|
| <b>GLW / VEA</b> | GLW         | Innovation RAS                     |
|                  | GLW / VEA   | Innovation RAS (VEA-GLW portion)   |
|                  | GLW / VEA   | Sloan Canyon RAS (VEA-GLW portion) |