

CALIFORNIA ENERGY COMMISSION

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California's 2003 Electricity Supply and Demand Balance And Five-Year Outlook

The Energy Commission has updated its outlook for California's electricity supply and demand balance by revising the baseline demand forecast, and incorporating new completion dates for plants under construction. In addition, a projected operating reserve is now calculated for the five year outlook. The overall assessment remains positive as electricity supplies are expected to be adequate for at least the next two years. For the remaining three years, our projected outlook predicts a declining reserve margin. Because planning, permitting, and construction of power plants typically takes 3 to 5 years, now is the time to plan for 2005 resources and beyond.

Six figures are attached:

Figure 1: California Statewide table of the 2003 peak summer months,

Figure 2: California Independent System Operator area table of the 2003 peak summer months

Figure 3: California Statewide graph of the 2003 peak summer months with normal weather (1-in-2)

Figure 4: California Statewide graph of the 2003 peak summer months with hot weather (1-in-10)

Figure 5: 2003-2008 Annual Summer Peak table with projected operating reserves

Figure 6: 2003-2008 Annual Summer Peak graph

The purpose of this outlook is to illustrate whether existing power resources and new capacity additions in progress will be sufficient to meet the State's demand needs. This analysis focuses on the adequacy of electricity generation capacity under moderate and adverse conditions that might strain the resources of the system.

For this analysis, the Commission assumes:

- No unusual disruptions in the supply and delivery of natural gas to power plants.
- No catastrophic transmission or system-wide reliability issues.
- No significant gaming (manipulation) of the ISO decrement market that could affect dispatch decisions or promote transmission congestion on transmission line capacity.

- One third (approximately 1300 megawatts) of the voluntary conservation achieved during the 2001 electricity crisis will persist in 2003, but will decline in subsequent years.
- Dry hydro conditions reflecting a 1-in-5 year probability that give a conservative rating for power from the Pacific Northwest and for instate hydro power facilities.
- Generation capacities from thermal power plants are de-rated to reflect reduced operating conditions and dependable capacity during summer months.
- Imports available from the spot market assume dry hydro conditions.
- Only power plants deemed as having a 75 percent or greater probability of coming on-line were included in generation estimates.
- Power plants within the South Coast Air Quality Management District (SCAQMD) that were retired as a result of the owners' decisions not to upgrade required emission controls will not be available to meet peak demand.

As indicated in Figure 1, even under extremely hot conditions (1-in-10 year weather probability), and excluding spot market imports, the State should have at least an 8 percent operating reserve during the critical months of July, August and September in 2003. If expected spot market purchases are added, the operating reserve increases to 13 percent.

In a normal (1-in-2 year weather probability) scenario, the operating reserve increases to 14 percent, climbing to 20 percent with the addition of probable spot market purchases.

The 2004-2008 Statewide Supply/Demand outlook provides a look-ahead comparison of supply and demand for the summer peaks. Peak demand days are assumed to occur in August but could occur any day during the summer months.

Summary

While electricity supply resources appear to be sufficient for this summer and the next two years, there is an ongoing need to monitor new capacity proposed for the period starting 2006 and beyond. Because it normally takes 2 to 4 years to license and build a new power plant, the Commission will continue to focus on programs that improve efficiency and reduce demand and support policies that ensure that new generation is brought to the market.

California Energy Commission
2003- California Electricity Supply - Peak Demand Balance (MW) On First Of The Month

2003 California Electricity - Peak Demand Balance (MW) On The First Of The Month

	January	February	March	April	May	June	July	August	September	October
1 CEC 2003 Baseline Demand Forecast (1-in-2 Weather) ^{1,2}	37,891	36,697	36,512	37,686	40,776	46,806	51,956	51,956	51,956	42,146
2 1-in-10 Weather Adjustment ¹					1,473	2,844	3,157	3,157	3,157	1,522
3 1-in-2 Operating Reserve (MORC)	2,378	2,294	2,289	2,340	2,524	2,920	3,280	3,280	3,280	2,676
4 1-in-10 Reserve Adjustment ¹ (MORC)					103	199	221	221	221	107
5 California Statewide Peak Demand + Operating Reserve	40,269	38,991	38,801	40,027	44,875	52,769	58,614	58,614	58,614	46,451
6 ISO Control Area Merchant Thermal	23,065	23,062	23,072	23,094	23,051	23,319	23,309	23,295	23,289	23,043
7 ISO Municipal Utility Thermal Resources	1,084	1,084	1,084	1,056	1,055	1,052	1,052	1,052	1,052	1,056
8 ISO Control Area Hydro (derated)	8,134	8,139	8,142	8,143	8,171	8,783	8,782	8,779	8,854	8,115
9 IOU Retained Generation	5,291	5,291	5,291	5,291	5,291	5,291	5,291	5,291	5,291	5,291
10 Net Imports ISO Control Area	3,924	3,924	3,814	4,253	4,724	5,095	5,095	5,095	5,095	3,920
11 QF Capacity (dependable)	5,714	5,744	5,794	5,917	5,923	5,623	5,597	5,573	5,535	5,754
12 LADWP Control Area Resources (hydro derated)	7,841	7,841	7,841	7,841	7,841	7,910	7,910	7,910	7,910	7,841
13 Imperial Irrigation District + Other Non ISO Municipals	992	992	994	991	980	988	1,005	1,005	1,005	985
14 SMUD Control Area Resources (hydro derated)	1,409	1,409	1,409	1,409	1,409	1,811	1,811	1,811	1,711	1,409
15 Dependable Capacity	57,453	57,485	57,440	57,995	58,445	59,871	59,851	59,810	59,741	57,414
16 Estimated Nuclear Refueling Outage	(1,435)	(1,435)	-	-	-	-	-	-	-	-
17 Economic Outages	(5,000)	(3,000)	(3,000)	(3,000)	(2,000)	-	-	-	-	(3,000)
18 Retirements due to plant owner's decision not to install SCR ³	(1,234)	(1,234)	(1,234)	(1,234)	(1,234)	(1,234)	(1,234)	(1,234)	(1,234)	(1,234)
19 Estimated Forced and Planned Outages	(5,144)	(6,450)	(7,622)	(6,920)	(6,825)	(3,750)	(3,750)	(3,750)	(3,750)	(6,140)
20 Estimated Forced & Scheduled Outages	(12,813)	(12,119)	(11,856)	(11,154)	(10,059)	(4,984)	(4,984)	(4,984)	(4,984)	(10,374)
21 Available Capacity	44,639	45,365	45,584	46,841	48,386	54,887	54,867	54,826	54,757	47,040
22 Resource Surplus/Deficit Before Additions⁴	4,370	6,374	6,783	6,814	3,510	2,119	(3,747)	(3,788)	(3,857)	589
23 Generation Additions (dependable) @ 75% Probability	160	747	1,245	1,814	2,891	3,548	3,817	4,042	4,052	4,052
24 Sempra DWR Contract Obligation ⁵	220	220	220		800	800	800	800	800	800
25 Total Available Capacity	45,020	46,332	47,050	48,655	51,276	59,235	59,484	59,669	59,609	51,892
26 Resource Surplus/Deficit Before Spot Market⁶	4,751	7,341	8,249	8,628	6,401	6,466	870	1,054	995	5,442
27 Expected Spot Market Imports ⁵	2,700	2,700	2,700	3,200	3,200	2,700	2,700	2,700	2,700	2,700
28 Resource Surplus/Deficit With Spot Market Imports⁷	7,451	10,041	10,949	11,828	9,601	9,166	3,570	3,754	3,695	8,142
29 Estimated Operating Reserve (1-in-2 Weather)¹	19%	26%	29%	29%	26%	27%	14%	15%	15%	23%
30 Estimated Operating Reserve (1-in-2 Weather) w/Spot Market Imports¹	26%	34%	36%	38%	34%	32%	20%	20%	20%	30%
31 High Temperature Operating Reserve (1-in-10 Weather)¹					21%	19%	8%	8%	8%	19%
32 High Temperature Operating Reserve w/Spot Market Imports¹					29%	25%	13%	13%	13%	25%
33 Emergency Response Programs										
34 Interruptible/Emergency Programs ⁸	915	915	915	915	915	1,102	1,102	1,102	1,102	915
35 Existing Voluntary/Emergency Programs	726	726	729	729	733	738	741	743	745	747
36 Emergency Response Program Total	1,641	1,641	1,644	1,644	1,648	1,839	1,842	1,845	1,847	1,662
¹ July-Sept are constant because peak could occur in any month; May and October are 1-in-5 scenarios.										
² Forecasted peak demand has embedded within 1,515 MW of ongoing peak reduction programs (AB970, SB5X and SB29X).										
³ Plant owners chose to retire capacity rather than add SCR; except for 77MW which are being retired due to loss of lease- see 2003 Generation Retirements table for details.										
⁴ Resource balance calculated by subtracting line 5 from line 21										
⁵ Sempra is obligated to provide an additional 800 MW capacity on peak that is likely to be met by its out-of-state-plants currently under construction.										
⁶ Resource balance calculated by subtracting line 5 from sum of lines 25 & 27										
⁷ Spot market estimate is conservative: assumes dry hydro year and is based on historical observations.										
⁸ Subscribed load reduction discounted to reflect expected load reduction.										
DWR contracted capacity total by month (MW)	8,777	8,282	8,082	7,417	7,865	10,360	12,440	13,000	12,815	12,345

California Energy Commission
2003- California ISO Control Area Electricity Supply - Peak Demand Balance (MW) On First Of The Month

2003 California ISO Control Area Electricity - Peak Demand Balance (MW) On The First Of The Month

	January	February	March	April	May	June	July	August	September	October
1 CEC 2003 Baseline Demand Forecast (1-in-2 Weather) ¹	31,040	30,061	29,910	30,872	33,403	38,342	42,561	42,561	42,561	34,525
2 1-in-10 Weather Adjustment ¹					1,173	2,380	2,642	2,642	2,642	1,212
3 1-in-2 Operating Reserve (MORC)	2,173	2,104	2,094	2,161	2,338	2,684	2,979	2,979	2,979	2,417
4 1-in-10 Reserve Adjustment ¹ (MORC)					82	167	185	185	185	85
5 California ISO Control Area Demand + Operating Reserve	33,212	32,166	32,004	33,033	36,996	43,573	48,368	48,368	48,368	38,239
6 ISO Control Area Merchant Thermal	23,065	23,062	23,072	23,094	23,051	23,319	23,309	23,295	23,289	23,043
7 ISO Municipal Utility Thermal Resources	1,084	1,084	1,084	1,056	1,055	1,052	1,052	1,052	1,052	1,056
8 ISO Control Area Hydro (derated)	8,134	8,139	8,142	8,143	8,171	8,783	8,782	8,779	8,854	8,115
9 IOU Retained Generation	5,291	5,291	5,291	5,291	5,291	5,291	5,291	5,291	5,291	5,291
10 Net Imports ISO Control Area	3,924	3,924	3,814	4,253	4,724	5,095	5,095	5,095	5,095	3,920
11 QF Capacity (dependable)	5,714	5,744	5,794	5,917	5,923	5,623	5,597	5,573	5,535	5,754
12 Dependable Capacity	47,211	47,243	47,196	47,754	48,215	49,163	49,126	49,085	49,116	47,179
13 Estimated Nuclear Refueling Outage	(1,570)	(1,570)	-	-	-	-	-	-	-	-
14 Economic Outages	(5,000)	(3,000)	(3,000)	(3,000)	(2,000)	-	-	-	-	(3,000)
15 Retirements due to plant owner's decision not to install SCR ²	(1,180)	(1,180)	(1,180)	(1,180)	(1,180)	(1,180)	(1,180)	(1,180)	(1,180)	(1,180)
16 Estimated Forced and Planned Outages	(4,644)	(5,950)	(7,122)	(6,420)	(6,325)	(3,250)	(3,250)	(3,250)	(3,250)	(5,640)
17 Estimated Forced & Scheduled Outages	(12,394)	(11,700)	(11,302)	(10,600)	(9,505)	(4,430)	(4,430)	(4,430)	(4,430)	(9,820)
18 Available Capacity	34,817	35,543	35,894	37,154	38,710	44,733	44,696	44,655	44,686	37,359
19 Resource Surplus/Deficit Before Additions³	1,605	3,377	3,890	4,121	1,714	1,160	(3,672)	(3,713)	(3,682)	(880)
20 Generation Additions (dependable) @ 75% Probability	160	747	747	1,316	2,392	3,049	3,319	3,544	3,554	3,554
21 Sempra DWR Contract Obligation ⁴	220	220	220			800	800	800	800	800
22 Total Available Capacity	35,197	36,510	36,861	38,469	41,102	48,582	48,814	48,999	49,040	41,712
23 Resource Surplus/Deficit Before Spot Market⁵	1,985	4,344	4,857	5,437	4,106	5,009	447	631	672	3,473
24 Expected Spot Market Imports ⁶	2,200	2,200	2,200	2,700	2,700	2,200	2,200	2,200	2,200	2,200
25 Resource Surplus/Deficit With Spot Market Imports⁷	4,185	6,544	7,057	8,137	6,806	7,209	2,647	2,831	2,872	5,673
26 Estimated Operating Reserve (1-in-2 Weather)⁸	13%	21%	23%	25%	23%	27%	15%	15%	15%	21%
27 Estimated Operating Reserve (1-in-2 Weather) w/Spot Market Imports⁹	20%	29%	31%	33%	31%	32%	20%	20%	20%	27%
28 High Temperature Operating Reserve (1-in-10 Weather)¹⁰					19%	19%	8%	8%	8%	17%
29 High Temperature Operating Reserve w/Spot Market Imports¹¹					27%	25%	13%	13%	13%	23%
30 Emergency Response Programs										
31										
32 Interruptible/Emergency Programs	915	915	915	915	915	1,102	1,102	1,102	1,102	915
33 Existing Voluntary/Emergency Programs	726	726	729	729	733	738	741	743	745	747
34 Emergency Response Program Total	1,641	1,641	1,644	1,644	1,648	1,839	1,842	1,845	1,847	1,662

¹ July-Sept are constant because peak could occur in any month; May and October are 1-in-5 scenarios

² Announced probable shutdowns to comply with air quality rules; except for 77MW which are being retired due to loss of lease- see 2003 Generation Retirements table for details.

³ Resource balance calculated by subtracting line 5 from line 18

⁴ Sempra is obligated to provide an additional 800 MW capacity on peak that is likely met by its out-of-state-plants currently under construction.

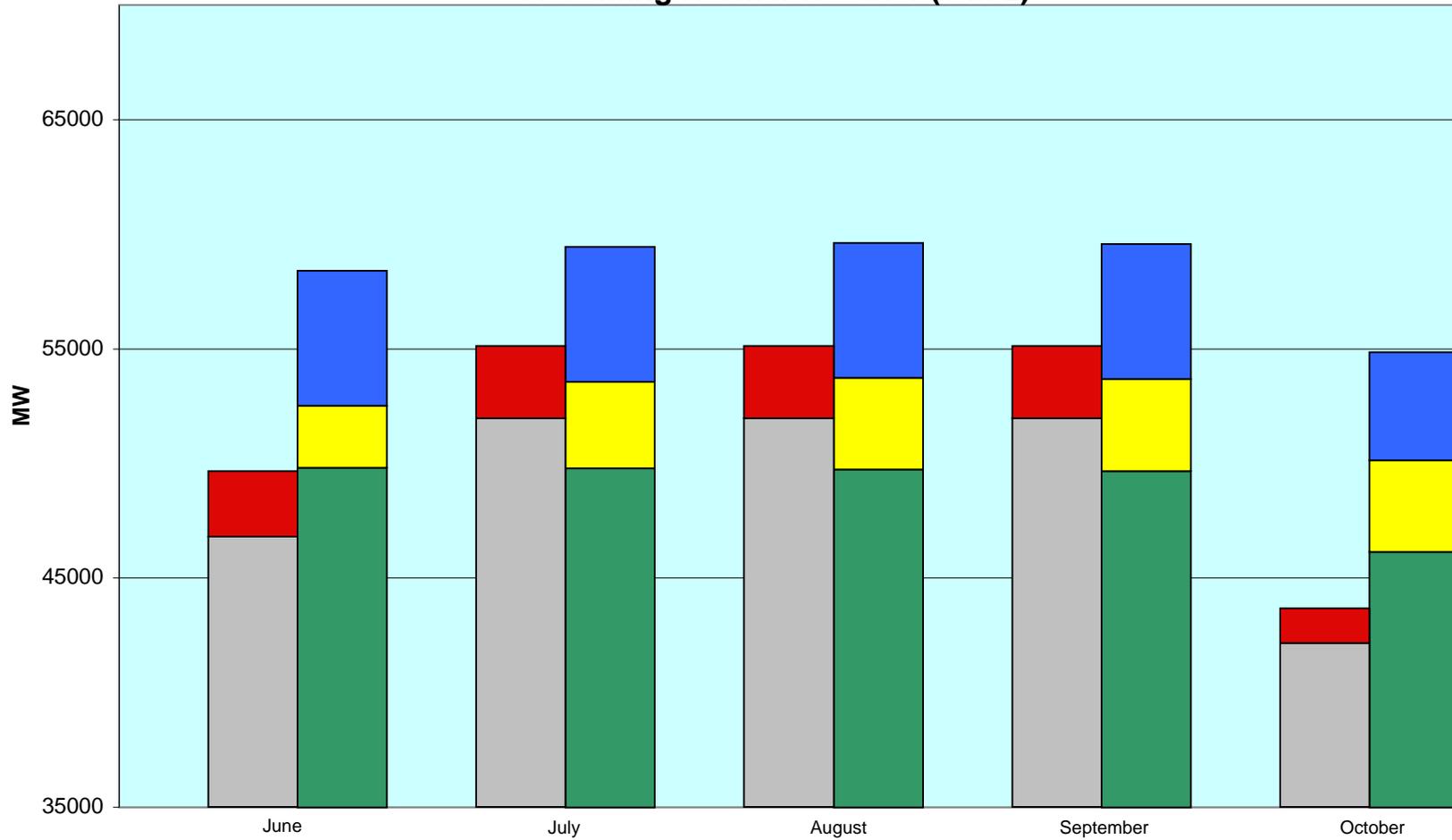
⁵ Resource balance calculated by subtracting line 5 from line 22

⁶ Spot market estimate is conservative: assumes dry hydro year and is based on historical observations.

⁷ Resource balance calculated by subtracting line 5 from sum of lines 22 & 24

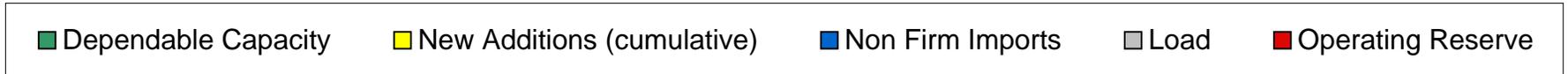
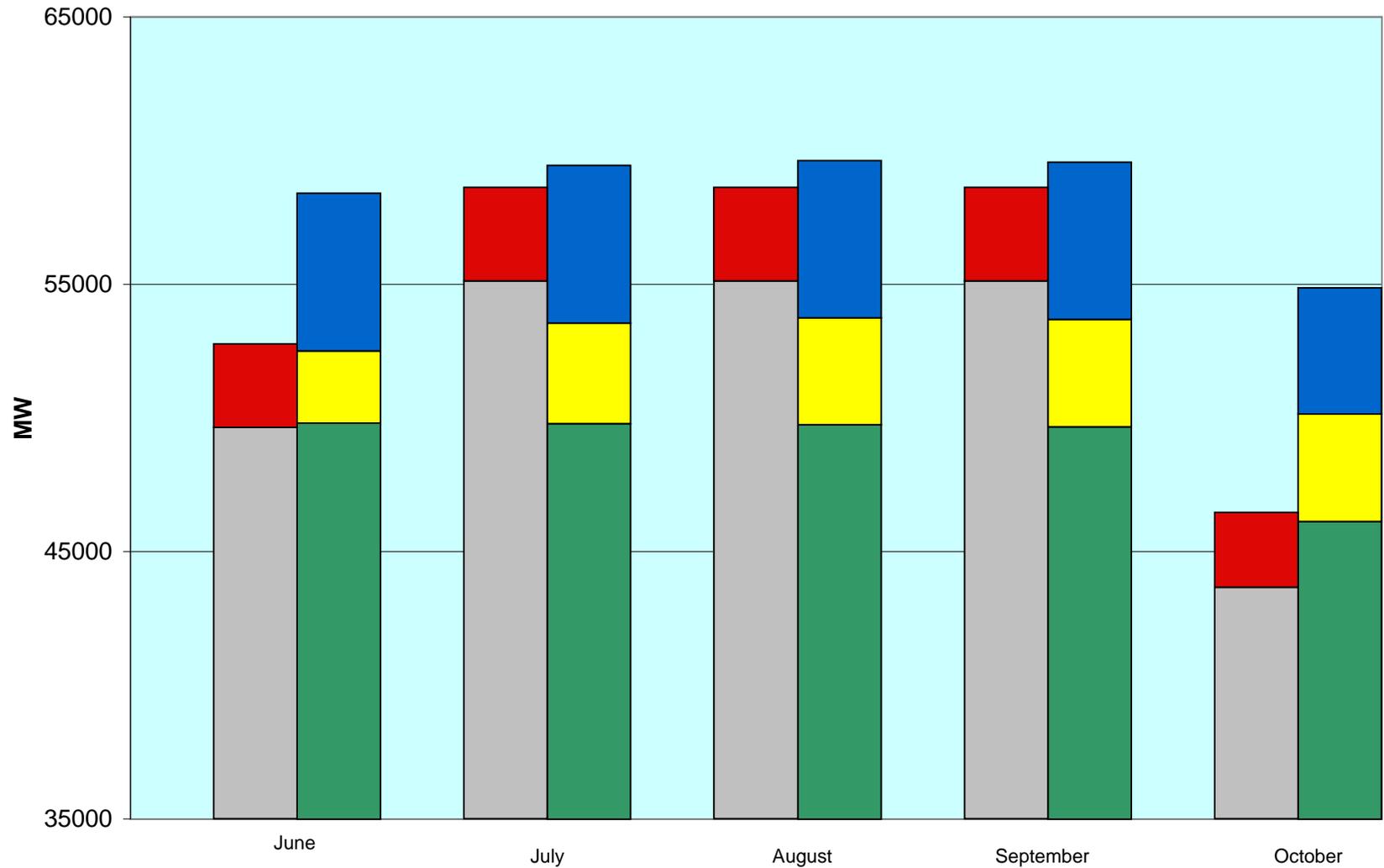
DWR contracted capacity total by month (MW)	8,777	8,282	8,082	7,417	7,865	10,360	12,440	13,000	12,815	12,345
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Summer 2003 Peak Demand - Supply Balance Assuming Normal Weather (1 in 2)



■ Dependable Capacity
 ■ New Additions (cumulative)
 ■ Non Firm Imports
 ■ Load
 ■ Operating Reserve

Summer 2003 Peak Demand - Supply Balance Assuming Hot Weather (1 in 10)



2003-2008 Statewide Supply / Demand Balance

	<u>Aug 2003</u>	<u>Aug 2004</u>	<u>Aug 2005</u>	<u>Aug 2006</u>	<u>Aug 2007</u>	<u>Aug 2008</u>
Existing Generation	54,715	57,523	57,061	60,219	59,917	60,135
Forced and Planned Outages	-3,750	-3,750	-3,750	-3,750	-3,750	-3,750
Retirements	-1,234	-708	0	-916	0	0
Net Firm Imports	5,895	5,895	5,895	5,748	5,848	5,648
High Probability CA Additions	4,042	246	3,158	614	218	229
Spot Market Imports	2,700	2,700	2,700	2,700	2,700	2,700
Total Supply (MW)	62,368	61,906	65,064	64,615	64,933	64,962
Demand (revised Mar 2003):						
1-in-2 Summer Temperature Demand (Normal)	51,956	53,464	54,893	56,135	57,089	58,256
Projected Operating Reserve (1-in-2)	20.0%	15.8%	18.5%	15.1%	13.7%	11.5%
Demand (revised Mar 2003):						
1-in-10 Summer Temperature Demand (Hot)	55,113	56,712	58,229	59,548	60,560	61,798
Projected Operating Reserve (1-in-10)	13.2%	9.2%	11.7%	8.5%	7.2%	5.1%
Emergency Response Programs/ Interruptables	1,102	1,102	1,102	1,102	1,102	1,102

Notes:

Net firm imports and forced and planned outages estimates are based on 2003 estimate. No new firm imports are assumed so contract expirations reduce net firm imports over time with exception of 2007 where 100MW export contract expires. This causes Net Firm Imports to increase 100MW in 2007.

Supply Demand Balance for 2003 - 2008

