

PUBLIC UTILITIES COMMISSION

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Aliso Canyon Mitigation Measures Impact Report (May 2018 Update)

Executive Summary

A major gas leak was discovered at the Southern California Gas Company's (SoCalGas) Aliso Canyon natural gas storage facility (Aliso Canyon) on October 23, 2015. On January 6, 2016, the governor ordered SoCalGas to maximize withdrawals from Aliso Canyon to reduce the pressure in the facility. The California Public Utilities Commission (CPUC/Commission) subsequently required SoCalGas to leave 15 Billion cubic feet (Bcf) of working gas in the facility that could be withdrawn in an emergency. On May 10, 2016, Senate Bill (SB) 380 was approved, prohibiting the reinjection of gas into the facility until a comprehensive safety review was completed.

On July 19, 2017, the Division of Oil, Gas, and Geothermal Resources (DOGGR) certified, and the Commission concurred, that the required inspections and safety improvements had been completed and injections could resume at Aliso Canyon. DOGGR authorized Aliso Canyon to operate at pressures up to 2,926 pounds per square inch absolute (psia), which translates into an inventory of 68.6 Bcf.¹

The current maximum Aliso inventory is lower than the DOGGR-authorized amount due to another provision of SB 380, which added Section 715 to the Public Utilities Code. Section 715 requires the CPUC to determine "the range of working gas necessary to ensure safety and reliability for the region and just and reasonable rates in California." The CPUC released a series of "715 Reports" in response to changing conditions on the SoCalGas system. The most recent report, issued on November 30, 2017, set a cap of 24.6 Bcf on Aliso Canyon inventory.²

¹ Based on information provided to the CPUC by DOGGR on April 19, 2018.

² Aliso Canyon Working Gas Inventory, Production Capacity, Injection Capacity, and Well Availability for Reliability: Supplemental Report for Winter 2017-18 (715 Report):

http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/News_Room/News_and_Updates/Draft%20Update%20o%20Aliso%20Canyon%20Working%20Gas%20Inventory%20-%20201715%20Report%20-%2020113017.pdf.

Gas storage is used to meet peak daily and seasonal gas demand and to hedge against price volatility in natural gas commodity markets. Storage can also help compensate for maintenance activities on the gas system's pipelines. This feature has become more salient due to the rupture of Line 235-2 on October 1, 2017, the ongoing maintenance on Lines 3000 and 4000, and the expiration of a right-of-way on Line 2000. SoCalGas has released no estimate of when these pipeline outages will be resolved, with the exception of Line 3000, which is expected to return to service on September 17, 2018. The reduced availability of Aliso Canyon combined with significant, ongoing pipeline outages on the SoCalGas system continue to threaten gas and electric reliability in Southern California.

In response to the Aliso gas leak and resulting restricted use of the storage facility, the CPUC enacted, and continues to implement, a series of policies to increase reliability by reducing demand for natural gas. This report provides an update of the mitigation measures the CPUC has undertaken and the impacts of these efforts on summer and winter gas peak demand.

Because it is difficult to determine whether and to what extent electricity reductions would translate directly into gas transmission reductions in the Aliso-impacted area (as opposed to gas reductions on the system as a whole), to be conservative, this report does not assume that electricity reductions in the winter result in gas reductions in the Aliso-impacted area. During peak summer days, the report assumes that electricity reductions in all of Southern California Edison's (SCE's) territory except Big Creek/Ventura and all of San Diego Gas & Electric's (SDG&E's) territory reduce gas demand. Estimates of the impact on gas demand resulting from electricity reductions on peak summer days use heat rates of the marginal electric generation facilities, including a 10% line loss.³ Additional resource-specific simplifying assumptions are described throughout the document.

In addition to estimating the impacts of our Aliso-related efforts, this report also provides information on resources that have been added to Aliso-impacted areas since 2010 that reduce summer and winter gas demand, as well as future resources that have been authorized and are anticipated to be procured within the next five years. The purpose of this additional information is to provide a better understanding of the wide breadth of customer-facing resources already installed or planned to reduce reliance on natural gas, which in turn impacts the number of additional opportunities that exist to achieve further reductions.⁴

³ These assumptions result in a conversion factor of 12 MMbtu/MWh. MMbtu are in turn converted to MMcf by dividing MMbtu by 10³.

⁴ Note that this report focuses on demand-side reductions. Significant additional efforts to reduce California's reliance on fossil fuels are also being implemented on the supply side — most notably the increasingly aggressive renewable goals that are dramatically reducing demand for natural gas in the state.

In fact, some resources whose installation dates were accelerated in response to the Aliso leak can no longer be considered “Additional Aliso-Related Resources” since they would have come on line by now absent the Aliso-related acceleration. Consequently, some of the impacts identified in the “Additional Aliso-Related Resources” category in previous reports are now included in the “Existing/Previously Planned Resources” category. Also, because many of the significant Aliso mitigation measures are now in place, they are embedded in updated peak demand assessments.

Given these factors, one significant change from past reports is that this Executive Summary does not include a table that summarizes Aliso-specific mitigation measure impacts and a calculation of the portion of peak demand being met by mitigation efforts. Instead, Table 1 summarizes estimated peak day gas demand reductions resulting from mitigation measures since 2010, and Table 2 summarizes estimated impacts of proposed or anticipated future mitigation resources that may come on line over the next five years.

Table 1: Estimated Peak Day Gas Demand Reductions Resulting from Mitigation Measures since 2010 (MMcf)

Mitigation Measures	Summer	Winter
Gas Balancing Rules	536.5	72.3
Energy Efficiency	263.3	77.3
Energy Savings Assistance Program	6.8	2.5
California Solar Initiative: Thermal Program	0.9	0.9
Customer-Side Solar PV Electricity Generation	72.4	0
Marketing Education and Outreach ⁵	NA	NA
Electricity Storage	8	0
Electric Demand Response	63	0
Gas Demand Response ⁶	NA	NA
Total	950.8	153

⁵ ME&O programs encourage customers to take immediate reduction actions and to adopt demand-side measures that result in savings identified in other sections of this report. Because of this, as well as the wide disparity of reported savings from CAISO and those found by Opinion Dynamics and the fact that it is uncertain which ME&O programs will be authorized in 2018, the CPUC is not estimating direct savings from these programs in this report.

⁶ As the “first of its kind” gas demand response program developed specifically as an Aliso mitigation measure, only the gas impact field of the “Additional Aliso-Related Resource” row of the savings estimate table is relevant for this resource, and as noted in the text, evaluation results for the 2017-18 winter season Gas Demand Response program are expected in summer 2018. Consequently, the summary table is not applicable to this resource.

For comparison purposes, these gas demand reductions represent approximately 27% of the current estimated summer peak day gas demand of 3,500 MMcf and approximately 3% of winter peak day gas demand of 4,955 MMcf.⁷

Table 2: Proposed/Anticipated Future Aliso Canyon Mitigation Measure Peak Day Impacts (MMcf)

Mitigation Measures	Summer	Winter
Gas Balancing Rules	0	20.9
Energy Efficiency	279.2	140
Energy Savings Assistance Program	3	1.4
Customer-Side Solar PV Electricity Generation	61	NA
Marketing Education and Outreach	NA	NA
Electricity Storage	21.1	NA
Electric Demand Response	62.9	NA
Gas Demand Response	NA	NA
Total	427.2	162.3

Again, for comparison purposes, these gas demand reductions represent approximately 12% of the current estimated summer peak day gas demand of 3,500 MMcf and approximately 3% of winter peak day gas demand of 4,955 MMcf.

Finally, it is important to note that this report only looks at the impacts of mitigation measures ordered by the Commission and/or implemented by entities overseen by the Commission. It does not look at the success of mitigation measures adopted by the publicly owned electric utilities such as the Los Angeles Department of Water and Power (LADWP) except in limited instances in which SoCalGas partnered with LADWP on combined electric and gas reduction efforts, nor does the report review the ability of these entities to implement mitigation measures similar to some of the successful measures outlined in it.

⁷ Again, since these measures are now in place, they are embedded in peak demand assessments. Representing them as percentages of peak demand are provided for comparative purposes and should not be interpreted as opportunities in additional reductions in gas demand. Rather, these estimates reflect the amount of additional peak gas demand that would have existed absent these programs and efforts.

I. Gas Balancing Rules

Estimated Peak Day Reductions (Therms)

	Summer	Winter
Existing/Previously Planned Resources Online by 2018	5,364,504	723,500
Additional Aliso-Specific Resources Online by 2018	0	0
Authorized/Anticipated Future Resources	0	209,000

Background

Gas balancing is the need for gas supply to match gas demand. For natural gas pipeline systems to remain physically “in balance,” they must operate within a set range of pressures. If there is not enough gas in the system, the pressure falls and gas does not flow properly. If there is too much gas, the pressure rises, posing a risk to the structural integrity of the pipelines.

SoCalGas is responsible for maintaining the system’s balance, but it does not control all gas procurement. A division of the utility known as the Gas Acquisition Department purchases gas for most of the residential and small business customers known as core customers.⁸⁹ The remainder of the gas is procured by ‘noncore customers.’ – large gas users such as electric generation plants, refineries, and some manufacturers. Noncore customers purchase their own gas and pay the utility to transport it to their facilities.

Historically, customers only had to balance their gas deliveries to within 10% of their gas usage by the end of the month. In the winter, additional balancing rules applied, but they were relatively lax, in most cases requiring customers to supply at least 50% of their burn over a five-day period. SoCalGas was able to support these flexible balancing requirements due to its ample gas storage facilities, which allowed the utility to quickly withdraw gas to remedy a shortage or inject gas to reduce a surplus.

Even before the Aliso Canyon gas leak, SoCalGas initiated several policies to reduce customers’ daily imbalances. In the aftermath of the leak, the CPUC further tightened those new policies through the Summer and Winter Balancing Settlement Agreements.¹⁰

⁸ The Gas Acquisition Department is not allowed to communicate with the SoCalGas System Operator and only has access to the same publicly available system information that noncore customers use.

⁹ Some core customers are supplied by core wholesale customers or core transport agencies.

¹⁰ The Summer Settlement Agreement (D.16-06-021) became effective June 1, 2016, and expired November 30, 2016. The Winter Settlement Agreement (D.16-12-015) went into effect December 1, 2016. It was initially set to

Tighter balancing rules do not result in less natural gas usage. They do, however, reduce the need for storage by lessening the utility's need to inject and withdraw gas to balance the system.

Existing or Previously Planned Resources Online by 2018

A. Implementing Low Operational Flow Order Procedures: The CPUC approved Low Operational Flow Order (OFO) procedures on June 16, 2015, which went into effect on December 3, 2015.¹¹ Under these rules, a Low OFO is triggered when there is not enough gas forecasted to be coming into the system to meet demand. The Low OFO procedures allow SoCalGas to require customers to deliver up to 95% of their daily gas usage and to impose increasingly severe financial penalties for noncompliance.

B. Reducing the Monthly Balancing Requirement: The monthly balancing requirement was reduced from 10% to 8% in a non-Aliso-related decision that went into effect on September 1, 2016.¹²

Additional Aliso-Related Resources Online by 2018

A. Implementing the Summer and Winter Balancing Settlement Agreements: On June 1, 2016, a settlement agreement went into effect that temporarily reduced the High OFO band of permissible overdeliveries from 110% to 105% of a customer's actual burn¹³ and acknowledged that SoCalGas' existing rules allow the utility 1) to call simultaneous High and Low OFOs and 2) to set the OFO trigger, i.e. the amount of allowable gas imbalance, based on operational conditions rather than using a constant number. In practice, the latter provision allowed SoCalGas to reduce the trigger from .348 Bcf to as low as .137 Bcf depending on conditions. The Winter Balancing Settlement Agreement extended these terms, which are now set to expire on November 30, 2018.

Results

Tightening the gas balancing rules has had a profound effect on the SoCalGas system. Customers have changed their behavior, more closely matching their gas deliveries with their burn even on days when no Operational Flow Orders are called. Customers have also improved their balancing on high sendout days, as can be seen in the analysis below. It

expire on March 31, 2017, but the deadline has been repeatedly extended. It is currently set to expire on November 30, 2018.

¹¹ Decision (D.) 15-06-004 and Resolution G-3511, respectively.

¹² D.16-06-039.

¹³ High OFOs are the inverse of Low OFOs. Customers are subject to penalties if they bring in more than 105% of their actual (noncore) or forecast (core) gas burn.

should be noted that disaggregating the incremental impacts of each individual policy is beyond the scope of this report. Since the policies build on each other, only their combined impact is analyzed.

This year, compared to the 2017 report, changes were made to calculating the impact of tighter gas balancing rules. First, the threshold for a winter high sendout day was reduced from 4 Bcf to 3.5 Bcf. This is due to the fact that there were no days during winter 2017-2018 when sendout was at least 4 Bcf. The threshold for a summer high sendout day remained unchanged at 3.2 Bcf. Second, instead of using data from only one year, a five year average of highout days was used to compare the impact of changing the balancing rules. Both of these changes increased the number of data points available, making the results more robust.¹⁴ For comparison, this year’s report looked at 180 winter days and 62 summer days, while the 2017 report only examined 11 winter days and 20 summer days. Last, when providing the relevant data, SoCalGas counted the gas used by Core Transport Agents in the noncore rather than the core category, causing core totals to change compared to last year.

Table 3: Number of High Sendout Days Per Season

Winter		Summer	
Year	High Sendout Days	Year	High Sendout Days
2010-11	36	2011	1
2011-12	30	2012	15
2012-13	40	2013	12
2013-14	16	2014	4
2014-15	12	2015	14
2015-16	22	2016	6
2016-17	18	2017	10
2017-18	6		
Total	180		62

Despite the expanded dataset used this year, the available data on post-Aliso high sendout days remains limited to only three winter seasons and two summer seasons since the October 2015 Aliso Canyon gas leak and the December 2015 institution of the new Low OFO rules. In addition, since the winter of 2015-16 was highly atypical, data from that season was not

¹⁴ In the 2017 report, only data for winters 2014-15, 2015-16, and 2016-17 were examined. Only four days met the 4 Bcf high sendout threshold in 2014-15 and 2015-16 and three in 2016-17. For summer, a comparison between the summers of 2015 and 2016 was used. There were 14 high sendout days in summer 2015 and six in 2016.

included in the averages cited below.¹⁵ Between December 2015 and January 2016 To reduce pressure in the field, Aliso Canyon was on emergency withdrawal between December 2015 to January 2016. The large amounts of gas withdrawn changed the normal supply dynamics during the coldest months of the year, resulting in only three Low OFOs being called out of the 22 high sendout days that winter.

Results are presented separately for summer and winter because the characteristics of gas usage vary significantly by season. In the summer, noncore customers account for roughly 79% of total high sendout day demand; in the winter, they account for about 44% of high sendout day demand.

Summer

Average combined core and noncore deliveries changed from 12% *less* than scheduled burn in the summers 2011-15 to 4% *more* than burn on high sendout days in 2016-17 when a Low OFO was called. This change is equivalent to an average reduction in the need to withdraw gas from storage of 5.36 million therms. This shift was driven in part by a change in behavior by the core, which went from underdelivering by an average of 28% on 2011-15 peak days to overdelivering by 8% on high sendout/Low OFO days in 2016-17. The noncore also improved significantly, going from average peak day underdeliveries of 6% in 2011-15 to overdeliveries of 5% in 2016-17.

Table 4: Average Imbalances on Summer High Sendout Days¹⁶

Year	Core + Noncore	Core	Noncore
2011-2015	-12%	-28%	-6%
2016	6%	8%	7%
2017	3%	9%	2%

The new gas rules also reduced the volatility of deliveries. On high sendout days in summers 2011-15, combined core and noncore deliveries ranged from a low of -28% to a high of 2%. Deliveries on high sendout/Low OFO days in summer 2016-17 ranged from -1% to 14%.

Winter

¹⁵ Averages are used because all disaggregated daily information for core and noncore customers was deemed confidential by SoCalGas.

¹⁶ For summers 2016-17, only high sendout days when a Low OFO was called are included.

Under the new rules, average combined core and noncore underdeliveries decreased from 5% for the winters 2010-11 through 2014-15 to 4% on high sendout/Low OFO days during the winters 2016-17 through 2017-18.¹⁷ This change equates to an average reduction in the need to withdraw gas from storage of 723,500 therms on winter high sendout days.

Table 5: Average Imbalances on Winter High Sendout Days¹⁸

Year(s)	Core + Noncore	Core	Noncore
2010-11 to 2014-15	-5%	-6%	-4%
2015-16	7%	0%	23%
2016-17	-4%	-8%	6%
2017-18	-3%	-3%	7%

Tighter balancing rules also greatly reduced volatility in customer deliveries: core and noncore customers combined swung between 45% overdeliveries and 45% underdeliveries in the five winters before the Low OFO rules were introduced. In the winters 2016-17 and 2017-18, imbalances on high sendout/Low OFO days ranged from 11% underdeliveries to 6% overdeliveries.

Authorize/Anticipated Future Resources

A. Changing Core Balancing Rules: The Winter 2016 Action Plan identified several mitigation measures intended to help compensate for the unavailability of Aliso Canyon. Among them was a measure to change balancing rules for core customers. Currently, on OFO days, core customers served by the utility¹⁹ have to balance to a forecast of the day’s gas use rather than to actual use. This means that on a Low OFO day, these core customers do not incur financial penalties as long as they bring in 95% of their forecasted burn. There is no penalty for the forecast being wrong. Noncore customers, in contrast, must balance to their actual use.

As part of the Winter Balancing Settlement Agreement, SoCalGas filed Application (A.) 17-10-002 on September 30, 2017, addressing the feasibility of incorporating Advanced Metering Infrastructure data into the core balancing process. The Scoping Memo issued on April 25, 2017,²⁰ found that the issue of the core balancing to actuals was within the scope of

¹⁷ Winter 2015-16 data is not included in this comparison due to the emergency withdrawals at Aliso Canyon.

¹⁸ For winters 2015-16 through 2017-18, only high sendout days when a Low OFO was called are included.

¹⁹ Core wholesale customers and core transport agents have to balance to actual, not forecasted, burn.

²⁰ A.17-10-002 Scoping Memo: <http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M213/K120/213120542.PDF>.

the proceeding. This means that the proceeding could have the outcome of changing the current core balancing rules.

If the core is required to balance to actuals, there would likely be little change to summer deliveries, since the core is already overdelivering on average on high sendout/Low OFO summer days. However, over the past two winters, the core has underdelivered by an average of 6% on high sendout/Low OFO days. While significantly more consistent than in the era of loose balancing rules, the core's deliveries remain more volatile than the noncore deliveries noncore customers have never underdelivered on a high sendout/Low OFO winter day since the new rules were put in place. If the core was required to balance to actuals, underdeliveries would likely decrease at least enough to meet the -5% imbalance tolerance. This change, from -6% to -5% average underdeliveries would result in a reduction in storage withdrawals of about 209,000 therms. If the core reduced average imbalances to zero, the savings would be roughly 1.25 million therms on a high sendout/Low OFO day.

B. Refinement of High OFO Rules: In a 2016 decision,²¹ the CPUC conditionally approved permanent High OFO rules that allow the utility to call a High OFO that reduces the permitted band of overdeliveries to up to 105% of burn. These permanent rules, which will go into effect once the Aliso Canyon Turbine Replacement Project (ACTR) is in service, provide for different levels of penalties ranging from \$.025 per therm up to \$2.50 per therm plus the daily balancing standby rate. Currently, there is a single penalty: the buyback rate.

The ACTR was originally anticipated to go online by January 1, 2017. However, the Aliso Canyon leak and its aftermath cause the project to be delayed, and SoCalGas has temporarily suspended injection at Aliso Canyon. Once injection resumes, the ACTR is likely to go into service, causing the new High OFO rules to go into effect. Since the Daily Balancing Settlement Agreements already reduced the overdelivery band to 105%, Energy Division (ED) staff does not anticipate that the permanent rules will lead to a large change in delivery patterns. However, the more nuanced and potentially steeper High OFO penalties available to SoCalGas under the permanent High OFO rules may create more financial incentives for customers to match deliveries to burn on High OFO days.

²¹ D.16-06-039 in proceeding A.14.12-017, the Phase 1 Triennial Cost Allocation Proceeding.

II. Energy Efficiency

Estimated Peak Day Reductions

	Summer/Winter (therms)	Summer (MWh)
Existing or Previously Planned Resources Online	766,000	15,500
Additional Aliso-Related Resources Online	6,850	*See DR section
Authorized/Anticipated Future Resources	1,400,000	11,600

Background

The CPUC authorizes approximately \$89 million per year for the SoCalGas energy efficiency portfolio. The majority of gas-saving energy efficiency projects installed are due to codes and standards, which are not directly related to the Aliso Canyon efforts but help to alleviate demand load growth in the Los Angeles Basin.

In response to Aliso Canyon, the CPUC directed SoCalGas to accelerate overall energy efficiency activities by expanding deemed program offerings as well as introducing new innovative programs to the portfolio.

Existing or Previously Planned Resources Online

Peak day savings resulting from energy efficiency efforts vary by program and measure, and summer peak day savings vary from winter peak day savings. However, it was not possible to calculate peak day savings for the efficiency portfolio, so estimated impacts represent daily averages of the cumulative annual energy savings of efficiency measures installed through June 2018 (March through June 2018 savings values are a projection based on the Program Administrators' forecasted savings).²² In addition, electricity savings have been discounted by 50% to reflect the electric savings that reduce gas demand from Aliso-impacted electric generation facilities between the hours of 1 pm and 9 pm on peak summer demand days. While this represents only one third of the day, it also represents the period of peak energy consumption. Energy efficiency measures therefore generate higher energy savings during these

²² This likely represents a conservative estimate. For many of these measures, more energy is saved when more energy is used. On the other hand, some of these measures have effective useful lives that are shorter than seven years, so some of the savings from the early years of this calculation may not be persisting.

hours, so a two-thirds reduction would underestimate savings. Consequently, a 50% adjustment is applied instead.²³

In addition, estimated savings from the California Energy Commission's updated codes and standards since 2013 within SoCalGas, SCE and SDG&E's territories are included in this update, after adjusting for naturally occurring adoption of measures that went into code and estimated compliance rates.²⁴

Additional Aliso-Related Resources Online

Resources reported here are tracked starting from the same time period as resources reported above and represent additional actions undertaken and extending through the period covered by this report. The savings provided below represent annual savings reported by utilities. For the purposes of the peak day savings estimates in the table at the beginning of this section (and in the Executive Summary), all values were divided by the number of days over the reporting period and electric savings were reduced by an additional 50%, consistent with the methodology described above.

Program: SoCalGas launched a robust effort over Winter 2017 and 2018 to provide Home Energy Reports to customers to help them save energy. This behavior-based energy efficiency activity, which included monthly Home Energy Reports.

Results: Home Energy Reports reached over 815,000 higher usage customers. Based on past impacts of these programs, we estimate that this program resulted in more than 5 million therms saved.

Program: SoCalGas Smart Control Thermostat downstream rebate program and Save Power Days program provides energy efficiency incentives (and demand response incentives) for the installation and activation of intelligent thermostat devices that are utilized for daily home energy management.

Results: Verified over 22,000 thermostats installed under this program. Based on engineering calculations that use energy consumption from basic programmable thermostats as a baseline, we estimate this effort resulted in 164,000 therms saved. Energy savings for smart thermostat measures are reported within the Demand Response

²³ Electric efficiency savings in SCE's Big Creek/Ventura local reliability area have been removed from the savings estimates since electric demand savings in this area would not impact electricity generation that takes gas from the Aliso facility.

²⁴ Electricity savings from the Big Creek/Ventura area were notable to be backed out of the codes and standards savings estimates for this update.

section of this report.

Authorized/Anticipated Future Resources

Utility and Community Choice Aggregator (CCA) Energy Efficiency Business Plans continue to be under review within CPUC proceeding Application (A).17-01-013 through 017, generally in the latter stages of the regulatory process, final resolution on all Business Plan filings is expected before the end of calendar year 2018.

SoCalGas forecast an additional 140 million therms of savings through program year 2022, the end of the fifth year since the business plan kickoff. SCE and SDG&E forecast an additional 2,600 GWh of savings over the same time frame. For the purposes of the peak day savings estimates in the table at the beginning of this section and in the Executive Summary, these annual values were divided by 365, and electric savings were reduced by an additional 50%, consistent with the methodology described in the existing resources subsection above.

In addition, estimated savings from the California Energy Commission's updated codes and standards through 2022 within SoCalGas, SCE and SDG&E's territories as forecasted in the CPUC's EE Potential and Goals study are included in this update, after adjusting for naturally occurring adoption of measures that went into code and estimated compliance rates.²⁵

²⁵ Electricity savings from the Big Creek/Ventura area were notable to be backed out of the codes and standards savings estimates for this update.

III. Energy Savings Assistance Program Measures

Estimated Peak Day Reductions

	Summer/Winter Gas (therms)	Summer Electric (MWh)
Existing or Previously Planned Resources Online by 2018	25,290	352
Additional Aliso-Related Resources Online by 2018	0	0
Authorized/Anticipated Future Resources	13,800	130

Background

The Energy Savings Assistance (ESA) Program provides no-cost weatherization, energy efficient appliances, and energy education services to low income households that meet the income and program guidelines. Services provided may include attic insulation, energy efficient refrigerators, evaporative coolers, air conditioners, weather stripping, caulking, low-flow showerheads, water heater blankets, and door and building envelope repairs. The program’s objective is to help income-qualified customers reduce their energy consumption and costs while increasing their health, comfort, and safety in the home.

Existing or Previously Planned Resources Online by 2018

SoCalGas, SCE, and San Diego Gas & Electric (SDG&E) collectively have treated approximately 1.3 million households with ESA Program services since 2010. The cumulative average savings attributed to these existing or previously planned resources is approximately 25,290 therms and 352 MWh per day. Similar to the estimates of the peak day savings from the mainstream energy efficiency portfolio, these savings estimates represent the total of daily average savings resulting from these programs, and electric savings have been reduced by 50%.

Additional Aliso-Related Resources Online by 2018

In response to the Aliso Canyon gas leak, the CPUC directed SoCalGas and SCE to take immediate steps to intensify existing Energy Savings Assistance programmatic efforts in affected low-income communities. Specifically, the CPUC initially authorized the use of unspent funds (\$158.6 million for SoCalGas and \$89.7 million for SCE) and also suspended the “three measure minimum” and “go back” program rules in the impacted area to facilitate deeper energy savings.

Beginning in 2017, the revised rules that were used to support the intensified Aliso efforts have been adopted for the entire ESA portfolio. Consequently, there were no additional Aliso-related resources anticipated for 2018 since these savings apply to the entire portfolio and are therefore now captured in the “Existing or Previously Planned Resources Online by 2-18” savings estimates.

Authorized/Anticipated Future Resources

Decision (D.) 16-11-022 eliminated “three measure minimum” and “go back” rules statewide across all service territories and credited Aliso Canyon ESA response efforts for this decision. This decision authorized funding, adopted new ESA program measures, and established annual savings targets for the ESA Program through 2020. The total daily average savings attributed to these authorized future resources by 2020 is approximately 13,800 therms and 130 MWh per day (electric savings estimates have been reduced by 50%).

IV. California Solar Initiative: Thermal Program

Estimated Peak Day Reductions (therms)

	Summer / Winter
Existing or Previously Planned Resources Online by 2018	8,687
Additional Aliso Canyon-Related Resources Online by 2018	0
Authorized/Anticipated Future Resources	N/A

Background

Assembly Bill (AB) 797 (Irwin) was signed into law in October 2017. Among other things, the bill extended the California Solar Initiative (CSI) Thermal program to July 31, 2020, allocated 50 percent of remaining program funds for the installation of solar thermal systems in low-income residential housing or building in disadvantaged communities (DACs).²⁶ Another 10 percent of remaining funds is reserved for the industrial category, defined as larger systems that do not consume solar hot water but instead use to a medium to carry heat for a manufacturing end process. For the purposes of this report, all data provided here are for systems installed before 2018, under existing (pre-AB 797) program rules and budgets.

At the request of the CPUC, SoCalGas implemented temporary changes to its CSI -Thermal Program budget to reduce natural gas use in the area impacted by the Aliso Canyon gas leak. These changes provided higher incentives for SoCalGas service territory customers who installed natural gas-displacing solar water heating systems by June 2017. No other Aliso Canyon related measures were put in effect beyond the June 2017 deadline.

The CSI Thermal Program's annual natural gas savings calculations presented below are based on a number inputs including OG-100²⁷ collector data, California climate zones, gallons per day for various load profiles, and other configurations. As a result, seasonal energy savings for solar thermal systems are highly variable. For example, while a system may collect more heat energy on a peak summer day, it is possible for that same system to actually offset more natural gas on a peak winter day when there is more demand for hot water and ground water temperatures are

²⁶ Per AB 797, the CSI Thermal program uses the definition of DACs as determined by the California Environmental Protection Agency pursuant to Section 39711 of the Health and Safety Code.

²⁷ OG-100 is the Solar Rating & Certification Corporation (SRCC) certification for solar thermal collectors.

colder. For the purposes of this report, natural gas savings are given for an average day for both summer and winter 2018.

Existing or Previously Planned Resources Online by 2018

Established in 2010, the CSI-Thermal Program provides financial incentives for solar water heating installations to retail customers. By the end of 2017, 4,099 solar water heating projects were completed in the SoCalGas service territory. The following sections provide a breakdown of the resulting daily natural gas savings generated by these projects for the following CSI-Thermal sub-programs: single-family, commercial/multifamily, low income, and solar pool heating.

- A. Single-Family, Multifamily, and Commercial Programs:** By the end of 2017, 2,122 single-family residential and 397 commercial/multifamily residential solar water heating systems have been installed, which are expected to yield a natural gas savings of 3,180 therms per day in 2018.

- B. Low-Income Program:** The CSI-Thermal program includes a \$50 million budget allocated to low-income single- and multifamily residential projects. By the end of 2017, 620 low-income single-family and 381 low income multi-family residential projects had been installed. These projects are expected to reduce natural gas demand in the SoCalGas service territory by 1,877 therms per day in 2018.

- C. Solar Pools Program:** AB 2249 (Buchanan, 2012) expanded the definition of solar water heating systems to include solar pool heating systems, although single-family residential solar pool heating systems were specifically excluded.²⁸ By 2018, 579 project installations were completed under the SoCalGas Solar Pools program, which represent an expected natural gas savings of 3,630 therms per day in 2018.

²⁸ The Commission implemented this change with D.13-08-004, which allowed non-single-family solar pool heating systems into the CSI- Thermal Program.

V. Customer-Side Solar PV Electricity Generation

Estimated Peak Day Reductions (MWh)

	Summer
Existing or Previously Planned Resources Online by 2018	6,034
Additional Aliso Canyon-Related Resources Online by 2018	0
Authorized/Anticipated Future Resources	5,083

Background

Customer-side solar photovoltaic (PV) systems offset the need for conventional natural gas peaker plants by providing clean renewable electricity generation to customers directly or to the grid. In 2007, the Commission established the California Solar Initiative (CSI) Program to incentivize customer-side solar PV installations in the state's three major IOU territories. The CSI Program later expanded its scope to provide solar PV incentives to low-income households through the Single-Family Affordable Solar Homes (SASH) and Multifamily Affordable Solar Homes (MASH) programs. Although the CSI General Market Program closed to applications on December 31, 2016, solar customers continue to be eligible for the State's Net Metering Program (NEM), which provides financial credit for customer-generated power fed back to the electric grid.

Existing or Previously Planned Resources Online by 2018

From 2010 to 2018, there were 342,102 NEM interconnected solar PV systems installed in the Aliso Canyon impacted region, including those installed under the CSI General Market, MASH, and SASH Programs and under only the NEM tariff. The 2018 estimated energy production for systems installed since 2010 is 12,067 MWh per day. Given that the hours these facilities generate electricity only partially overlap with the 1 to 9 p.m. summer peak hours,²⁹ this generation is reduced by 50% to provide an approximate, conservative estimate of the peak day avoided electricity resulting from the deployment of these resources.

Additional Aliso-Related Resources Online by 2018

²⁹ San Diego Gas & Electric's (SDG&E) 4-9pm peak period went into effect on 12/1/2017. The same peak period for Southern California Edison's (SCE) service territory is pending Commission review and approval.

Due the success and continued growth of the PV programs that were already in place, no additional Aliso Canyon targeted programs to accelerate PV adoptions were developed.

Authorized/Anticipated Future Resources

Using data from the 2016 Integrated Energy Policy Report (IEPR), we can estimate that the customer-side PV market in California is expected to grow at around 13 percent per year. At this growth rate, solar production from newly installed solar PV systems over the next five years (systems installed between 2019 and 2023) is anticipated to equal 10,166 MWh per day. As with the existing PV resources, this generation is reduced by 30% to provide a conservative estimate of the peak day avoided electricity resulting from the deployment of these resources since the hours these facilities generate electricity only partially overlap with the summer peak hours.

VI. Marketing and Outreach

Estimated Peak Day Reductions: ME&O programs encourage customers to take immediate reduction actions and to adopt demand-side measures that result in savings identified in other sections of this report. Because of this, as well as the wide disparity of reported savings from CAISO and those found by Opinion Dynamics and the fact that it is uncertain which ME&O programs will be authorized in 2018, the CPUC is not estimating direct savings from these programs in this report.

Background

Marketing and Outreach campaigns can be used to encourage customers to change behavior during extreme events to help avoid energy supply shortages or to support customer adoption of the various demand-side resources described in this report.

The statewide *Flex Your Power* outreach program that was developed during the 2000-2001 energy crisis that followed California's electricity restructuring effort is an example of a Marketing and Outreach campaign. This campaign was eventually divided into two different efforts: the *Energy Upgrade California* program,³⁰ which endeavors to educate energy customers about a variety of opportunities available to them to reduce or re-shape their energy usage, and the *Flex Alert* program, which focused on peak summer demand reduction to avoid outages, and consisted of both earned (unpaid) and paid media.

Similar to *Spare the Air* days, *Flex Alerts* are called by the California Independent System Operator (CAISO) on anticipated high use days, usually as a result of hot weather. Alerts are broadcast by the news media, advertised, and sent directly to people who sign up for them through the *Flex Alert* website. They ask people to reduce their electricity usage, especially in the late afternoon and early evening.

Existing or Previously Planned Resources Online by 2018

Energy Upgrade California and the *Flex Alert* earned media campaign are the primary statewide Marketing and Outreach programs supporting demand-side activities.

Because *Energy Upgrade California* encourages customers to participate in specific resource programs, savings resulting from these efforts are captured within those individual programs. As described in the following subsection, the CPUC authorized funding for additional paid media in Southern California in 2016 and 2017 due to the Aliso leak.

³⁰ Formerly Engage 360.

Additional Aliso-Related ME&O Resources

As a result of the Aliso gas leak and resulting summer electricity reliability concerns, the CPUC authorized \$11 million in marketing, outreach, and education programs per year in response to Aliso Canyon-related natural gas supply reductions. These were funded to run starting in Summer of 2016 through winter (March) of 2018. Two strategies were deployed. First, paid media support for *Flex Alerts* was authorized for summer electricity demand in Aliso-impacted areas. Second, a general education campaign, “Conserve Energy SoCal” was authorized with strategies to get residents to use less energy and to raise awareness of the need to conserve in the summer and winter as a result of the Aliso Canyon gas leak.

A. *Flex Alerts*: Three *Flex Alert* days were called in summer 2016: on June 20, July 27, and July 28. Four were called in summer 2017: on June 20 and 21, August 29, and September 1. The CAISO estimates that the 2017 *Flex Alerts* resulted in peak demand reductions of 500 MW on June 20, and 250 MW on June 21. CAISO does not have demand reduction estimates for the other two Flex Alert days. However, an evaluation³¹ done by Opinion Dynamics shows far less savings can be attributed to Flex Alerts, at 5.5 MWh, which is a fraction of the savings estimated by CAISO.

B. *Conserve Energy SoCal*: In 2017, \$6 million was allocated for a general electricity and gas reduction campaign to fund activities running through March 2018. SoCalGas was ordered to lead an advisory committee of 10 local governments and utilities in a coordinated campaign. Strategies included social media, earned media (news coverage), and event outreach. Information can be found at: www.conserveenergysocal.com. (Note: This effort is separate from the Natural Gas Conservation Notification Campaign supporting gas demand response described in the Gas Demand Response section of this document.)

Tactics included the above-referenced website; outreach on social media; promotion at events such as outdoor movie screenings; sponsoring a weekly energy conservation theme at Pacific Park on the Santa Monica Pier; and the “Hot Days, Hot Deals” and “Cool Days, Cool Deals” promotions that encouraged people to get out of their homes and into local businesses offering special deals. These were made “open source” for local governments and public utilities to use. Appendix A provides screen shots and images of collateral developed for the Conserve Energy So Cal campaign in 2017.

Opinion Dynamics evaluated the impacts of the program using a split panel survey of residents in the Los Angeles Area during summer and fall 2016. A total of 1,200 residents were surveyed in each of two survey waves, with half of the first wave repeated in the second

³¹ Opinion Dynamics, “Aliso Canyon Marketing, Education, and Outreach Effectiveness Study, June 2017. http://www.calmac.org/publications/Aliso_Canyon_ME%26O_Campaign_Evaluation_Report_FINAL_2017-06-28ES.pdf

wave (meaning 1,800 were surveyed). The final evaluation was published in August of 2017.³²

Results

Flex Alert: Over 25% of respondents who heard about *Flex Alert* alerts signed up for them.

- About 97% of respondents reported taking at least one action.
- The most common action taken was turning off a power strip when not in use.
- The average number of total reported actions per respondent was just over nine.
- Flex Alert customers reduced electricity demand by 0.024 kilowatts during peak periods on average during Flex Alert events. This resulted in a reduction of 5.5 megawatts during peak periods across the total population of 223,378 residential customers in the targeted zip code areas (this figure excludes residential customers participating in other demand response and net energy metering programs). Demand reduction estimates for the July events are statistically significant at a 95% confidence level. However, given the awareness of Flex Alerts stayed constant throughout the campaign, it is unclear how much of this reduction is due to the Flex Alert brand equity and how much is due to the Conserve Energy SoCal Campaign.

Conserve Energy So Cal: Savings estimates for the Conserve Energy So Cal campaign are not available as savings are not attributed to ME&O efforts. However, an evaluation of 2016 activities demonstrated the following results:

- The Conserve Energy SoCal Campaign utilized 5 key messaging buckets, developed 90 unique pieces of campaign content, and disseminated content via seven channels, or media outlets. The Conserve Energy SoCal Campaign targeted individuals residing in 299 zip codes that are directly impacted by the closure of the Aliso Canyon Storage Facility near Porter Ranch, California. No additional targeting was undertaken.
- The Conserve Energy SoCal Facebook posts grew in popularity throughout the campaign. Recall of Facebook posts increased throughout the Conserve Energy SoCal campaign. Respondents' preference for Facebook as a source of energy conservation information showed the largest increase throughout the campaign as compared to other channels. The historical Facebook memes proved especially popular with respondents.

³² Opinion Dynamics. Aliso Canyon Marketing, Education and Outreach Effectiveness Study. June 2017.
http://www.calmac.org/publications/Aliso_Canyon_ME%26O_Campaign_Evaluation_Report_FINAL_2017-06-28ES.pdf

- Respondent awareness of the Conserve Energy SoCal brand increased throughout the campaign. Overall, the campaign succeeded in raising awareness of the Conserve Energy SoCal brand. Respondent awareness of the brand increased from 55% shortly after the campaign began to 61% at the close of the campaign.
- Overall, the campaign influenced more people to take energy saving actions. When respondents were surveyed two months after the campaign began, 22% of respondents reported taking at least one new energy-saving action directly as a result of the campaign.
- Using the Aliso Canyon emergency appeared to be an effective campaign strategy and self-reported conservation behaviors increased two and a half months into the campaign as compared to pre-campaign levels. However, incremental effects on behavior were not observed four months and six months into the campaign.
- Overall, respondents' level of knowledge about how to save energy in their homes was high and stayed constant throughout the campaign. Respondents were asked about their level of knowledge regarding energy saving actions in the home. Respondents reported a high level of knowledge when we conducted our first survey two and a half months after the start of the campaign (4.01 on a five-point scale where one is "not at all knowledgeable" and five is "very knowledgeable"). This indicated that the campaign had little room for influence on respondents' knowledge about energy conservation behaviors in the home. Since the energy tip calls to action remained similar throughout the campaign, it is not surprising that the mean knowledge level stayed constant in subsequent surveys.

Authorized/Anticipated Future Resources

It is unknown at this time whether *Flex Alerts* or other marketing and outreach programs will be authorized for summer 2018 and beyond. The Commission issued a ruling calling on stakeholders for comments regarding continuation of Conserve Energy So Cal, and to further fund Flex Alerts. A CPUC decision is expected in May, 2018. Given the uncertainty of attributing savings to these efforts, the CPUC is not projecting any savings from future ME&O, regardless of which marketing platform is deployed.

V. Electricity Storage

Estimated Peak Day Reductions (MWhs)

	Summer
Existing or Previously Planned resources On-line by 2018	669 ³³
Additional Aliso-Related Resources Online by 2018	0 ³⁴
Authorized/Anticipated Future Resources	1,757 ³⁵

Background

Electricity storage can reduce demand for natural gas during periods of peak electricity demand by charging the storage resource during off-peak times and discharging the resource during peak hours, reducing the demand for conventional natural gas-powered peaking generation. Between SCE and SDG&E, a total of 190.9 MWs of storage is already on-line, 98.5 MW of which was brought online on an accelerated schedule in response to the Aliso leak. Under the California Energy Storage program, SCE has an obligation to procure a total of 580 MWs by 2020, and SDG&E has an obligation to procure a total of 165 MWs by 2020.

Existing or Previously Planned Resources Online by 2018

When the Commission established the storage program, SCE had 33.24 MWs of existing projects, and SDG&E had 59.15 MWs of existing projects. 10 MWs of SCE’s LCR storage procurement has come on-line since 2017. (Note that while some of these projects were originally accelerated in response to the Aliso leak, they would have come on line by this time, so their impacts have been moved from “Aliso-Related Resources” to this category.)

A. Expedited Storage Procurements: In 2016, the CPUC ordered SCE to hold an expedited energy storage procurement solicitation to mitigate potential Aliso Canyon-related reliability problems. The resolution required that storage resources solicited in the expedited storage

³³ Assumptions: 40 MWs pumped hydro, 150.9 MWs batteries, and 9 MWs ice storage. Based on actual procurement. MWh estimate based on maximum dispatch in August. Assumed maximum 100 hours/month for pumped hydro and batteries, and 8 hours/day weekday dispatch of ice. Divided by 31 to estimate August Day.

³⁴ No additional solicitations have occurred that are not accounted for in the first row.

³⁵ This includes the remaining obligation for SCE and SDG&E, including approved contracts for SCE that have not yet come on-line, and excluding contracts that have been submitted for approval but have not yet been approved. It assumes that the total is made up with batteries. Assumed maximum 100 hours/month for batteries. Divided by 31 to estimate August Day.

procurement be located in front of the meter; be operational by December 31, 2016; interconnect in a location that helps to alleviate electric reliability concerns associated with Aliso Canyon; qualify for Resource Adequacy credit; be price competitive with previous solicitations; and have a contract term of 10 years or less.

Results

- 22 MWs of in-front-of-the-meter storage through capacity-only contracts with two different suppliers, AltaGas Pomona Energy Storage, Inc. (20 MW)³⁶ and Grand Johanna LLC (2 MW).
- 20 MWs of storage from two 10 MW projects installed by Tesla at the Mira Loma 1 and 2 peaker power plants.
- 20 MWs of storage (for ~1 MW of incremental resource adequacy capacity) integrated at two existing peaker plants (Grapeland and Center).

B. SDG&E Accelerated Deployment of Electricity Storage: SDG&E sought bidders from its existing 2016 Preferred Resources Local Capacity Requirement Request for Offer who could bring energy storage projects online by the end of the year. Due to lead times for ordering necessary equipment, the deadline was extended to January 31, 2017. SDG&E sought and received Commission approval for two lithium-ion battery energy storage facilities to be located at two SDG&E substations. The projects are being constructed on a turnkey basis with AES Energy Storage and came online in February 2017.

Results: 37.5 MW from two projects

C. Expedited Customer Storage Interconnection: In order to accelerate installation of customer-owned storage that could reduce electric demand at peak times, Energy Division worked with SCE to identify projects that should be given expedited interconnection review in order to be online by the end of 2016. This effort resulted in at least 18 MW customer-owned energy storage projects online by the end of 2016.

Results: 18 MW of behind-the-meter storage

Authorized/Anticipated Future Resources

A. Remaining Procurement Obligation — SCE and SDG&E: At time of writing, both Southern California electric utilities have a total remaining procurement obligation of 305.13 MWs. By statute, storage resources procured pursuant to the storage mandate must be brought online by 2024. SCE's remaining procurement obligation is 236.8 MWs. SDG&E's

³⁶ A third, 5 MW project by Western Grid Development, LLC was initially approved by the CPUC but was later cancelled due to a permitting delay.

remaining procurement obligation is 68.4 MWs. These totals only account for procurement that has been approved by the Commission. Several procurements have concluded and are pending approval by the Commission: the 2016 procurement for SCE, the local capacity requirement procurement by SDG&E, and contracts resulting from SCE's Preferred Resources Pilot. The IOUs are still required to hold 2018 and 2020 storage solicitations.

B. Approved Resources with COD in Future Years: The CPUC has approved 249.64 MWs of contracts for SCE with storage facilities that will come on-line between 2018 and 2020.

VI. Electric Demand Response

Estimated Peak Day Reductions (MWh)³⁷

	Summer
Existing or Previously Planned Resources for 2018	5,113
Additional Aliso-Related Resources Online for 2018	132
Authorized / Anticipated Future Resources	5,245

Background

Demand response programs provide financial incentives to end-use electricity customers to reduce their electricity demand on certain days and hours. These programs can be separated into two broad categories: emergency programs and economic (or price-responsive) programs. Emergency demand response programs are used when grid reliability is threatened, such as when demand is forecasted to exceed existing supply or if a local contingency occurs such as a failed transmission line.

Economic demand response programs are primarily used by utilities to reduce procurement costs of wholesale power, but they can also be used to help alleviate stress on the grid or to respond to emergency situations. The utilities have traditionally operated demand response programs, but a growing amount of demand response is now offered by third party providers known as “Demand Response Providers” (DRPs) or “aggregators” who are under contracts with the utilities to acquire certain amounts of demand response capacity. Customers from all sectors (residential, commercial, etc.) can participate in demand response, but the program details will vary in terms of eligibility, expectations, and incentives. The CPUC authorizes the funding for demand response programs, which are eventually recovered through retail rates.

Existing or Previously Planned Resources Online by 2018

SCE’s and SDG&E’s 2018 demand response portfolio of programs were approved and authorized by the CPUC in June 2017. SCE’s entire demand response portfolio for 2018 can provide a maximum of approximately 787 MWs across the LA Basin territory during a typical system peak. SDG&E’s demand response portfolio is expected to provide a maximum of 43 MWs in its entire territory during a typical system peak.

³⁷ Assumptions: Demand response resource is dispatched under 1-in-10 system peak conditions between the hours of 1:00 to 9:00 PM. Values provided here reflect one day of load reduction within the assumed scenario.

For a one-day heat wave during the peak period in 2018,³⁸ SCE’s emergency programs can deliver approximately 4,194 MWh of load reduction in the LA Basin. SDG&E’s emergency programs can deliver approximately 3.6 MWh of load reduction throughout its territory.

For that same extended heat wave, SCE’s price responsive programs can deliver approximately 1,085 MWhs of load reduction in the LA Basin, while SDG&E’s price-responsive programs can deliver 167 MWh in load reduction.

In addition to the utility-operated demand response programs, third party DRPs/aggregators can also provide additional MWhs of demand response via capacity contracts they hold with SCE and SDG&E via the Demand Response Auction Mechanism (DRAM). To date SCE’s 2018 DRAM is projected to provide approximately 89 MW in load reduction while SDG&E’s DRAM is projected to provide 14 MW of load reduction. It should be noted, however, that the dispatch of DRAM resources is dependent on their price bid as these resources are bid directly into CAISO wholesale markets and are therefore not dispatched by the utilities. Consequently, megawatt hours cannot be calculated at this time due to the lack of detail on program implementation.

Additional Aliso-Related Resources Online by 2018

In response to the Aliso Canyon outage, the CPUC took additional actions (such as authorizing additional funding) to intensify SCE’s demand response portfolio. Specifically, SCE was directed to take the following actions:

- Targeted marketing to increase enrollment in its air conditioner (AC) cycling program, also known as “Summer Saver.” This program delivers approximately 43 MWh in load reductions.
- Increase enrollment in its Base Interruptible Program (BIP) and Agricultural and Pumping — Interruptible (AP-I), its two main emergency demand response programs. Load reductions from these two programs provide approximately 71 MWh.
- Offer a \$50 rebate for participants who already own smart thermostats (also known as a “downstream rebate”) and \$75 for participants who do not yet own smart thermostats to sign up for its Peak Time Rebate program (“upstream rebate”). This program delivers 12 MWh in load reductions.

The resulting total values from these actions are reflected in the second row of the Estimated Peak Day Impacts Table at the beginning of this section.³⁹

³⁸ SCE’s system typically reaches its peak in August, while SDG&E reaches its peak in September.

³⁹ All of the values provided, with the exception of those for Demand Bidding Program (DBP) are incremental. The continuance of DBP beyond its originally-planned retirement avoids a loss of MWh. These MWh are captured in the “Existing or Previously Planned Resources for 2017” row of the Estimated Peak Reductions Table at the top of this section.

In addition to the efforts above, the CPUC may be able to further increase enrollment in SCE's Emergency demand response programs, if it applied more flexible interpretations to certain restrictions on the growth of such programs (there is a MW cap in place for Emergency Demand Response programs). The specifics on this issue are still being analyzed. Therefore no MW estimate is available at this moment.

Authorized/Anticipated Future Resources

Both SCE and SDG&E have applications pending before the CPUC for demand response portfolios for 2018-22. These proposed portfolios contain many of the same type of programs described earlier (emergency and price-responsive). In addition to ensuring that the proposed programs are cost-effective, the CPUC has signaled that it will be evaluating the portfolios in terms of location (i.e. are the program located in areas of highest value to the grid that could defer investment in traditional generation/distribution/transmission resources). To the extent that Aliso Canyon remains a concern for reliability, the CPUC could require changes to the proposed portfolio to address those concerns.

SCE and SDG&E completed one DRAM solicitation conducted for delivery of third party demand response MWs in 2018 and 2019. The confirmed amount and location of the upcoming 2019 demand response MWs will not be known until the end of June 2018.

Given all these uncertainties, the value of anticipated future resources estimated for this report is set equal to the existing demand response resources. This is likely to be a conservative assumption given the likelihood that this resource will increase over time.

VII. Gas Demand Response

Estimated Peak Day Reductions: As the “first of its kind” gas demand response program developed specifically as an Aliso mitigation measure, only the gas impact field of the “Additional Aliso-Related Resource” row of the savings estimate table is relevant for this resource, and as noted in the text, evaluation results for the 2017-18 winter season Gas Demand Response program are expected in summer 2018. Consequently, the summary table is not applicable to this resource.

Background

On November 16, 2017, the Energy Division director sent a letter to Southern California Gas Company (SoCalGas) directing them to file a Tier 2 Advice Letter (AL) for a device-based demand response program by November 28, 2017. The letter stated that the program should provide for several natural gas reduction events per season during early morning and evening peak periods through March 31, 2018 by enrolling customers with smart thermostats throughout the entire SoCalGas territory. The letter stated that the objective of the program was to contribute to mitigating any natural gas reliability issues in Southern California during the winter of 2017-2018. The reliability issues stemmed from the outage of three pipelines responsible for importing 42 percent of the natural gas import capacity into the Los Angeles region.

Existing or Previously Planned Resources Online by 2018

SoCalGas did not continue the natural gas demand response initiatives reported on in the previous version of this report. They operated only during the 2016-2017 season.

Additional Aliso-Related Resources Online by 2018

SoCalGas filed AL 5223 proposing a \$3.5 million program to partner with thermostat manufacturers Nest and ecobee to enlist their customers in a dispatchable event-based program to reduce natural gas heating load during periods of system constraint from December to March during the 2017-2018 season. During a natural gas conservation event Nest and ecobee would lower participants’ thermostat set points no more than four degrees to reduce natural gas consumption while continuing to keep customers comfortable. Event windows were 5 a.m. to 9 a.m. and 5 p.m. to 9 p.m. Energy Division approved the AL on December 21, 2017.

SoCalGas provided an incentive of \$50 to participants who enrolled in the program, and an additional \$25 for staying in the program until the end of the winter period, allowing Nest or ecobee to adjust their thermostat during events - and not opting out of an event. Some of those customers were also eligible for an energy efficiency device incentive if they purchased a Nest or ecobee thermostat to participate in the program.

The advice letter proposed a winter 2018-2019 program but said SoCalGas would file a formal budget request with program details in 2018 for approval to operate the 2018-2019 program.

SoCalGas began enrolling customers in the program in January of 2018 and by the time it called the first event on February 20, 2018, there were approximately 8,000 customers enrolled in the program. There were 8,340 enrollments by the time SoCalGas called the last event of the season on March 2, 2018.

SoCalGas called the following program events due to a cold snap in Southern California.

Table 6: 2018 DR Events

DR Events Called Date	Time
2/20	5am-9am
2/20	5pm-9pm
2/21	5am-9am
2/21	5pm-9pm
2/22	5am-9am
2/22	5pm-9pm
2/23	5am-9am
2/26	5pm-9pm
2/27	5am-9am
2/28	5pm-9pm
3/1	5am-9am
3/1	5pm-9pm
3/2	5am-9am

SoCalGas has hired an evaluation firm to calculate ex post therm savings from the program. Those results will be ready in the summer of 2018.

At this time, Energy Division has requested that SoCalGas: 1) file an Advice Letter for a budget to continue this program for the winter of 2018-19 and 2) an application to operate a winter natural gas DR program, for the winter of 2019-20 and beyond.

Appendix A: Marketing, Education, and Outreach Collateral and Screenshots

Summer Infographic

STAY COOL AT HOME WITH THESE ENERGY SAVING TIPS

Temperatures are heating up! As temperatures rise, let's make sure our homes are ready for summer's heat.

Using these tips will help prepare your home to stay cool this summer, without sending your energy bill through the roof.

-  **Schedule an Air Conditioning Checkup.**
-  **Use ceiling fans in high-trafficked rooms.**
-  **Install a programmable thermostat.**
-  **Clean your refrigerator coils.**
-  **Keep your doors and windows closed.**

To learn more about conserving energy this summer, visit **ConserveEnergySoCal.com.**



Holiday Infographic

A Tale of Two Light Strands

80%
LEDs consume 80 percent less energy than incandescent lights and tend to last 25 times longer.¹

4,000 Hours
LED bulbs are great for decorating your home – even after 4,000 hours, they keep shining strong.²

\$0.22
With LED lights, your monthly energy bill only increases an average of 0.22 cents. You've saved more than \$13.00.⁴

6 Weeks of Power
With incandescent lights, the cost of powering your annual light display can add up to what it takes to heat and power an average-sized home for 6 weeks.¹

2,000 Hours
Incandescent lights have one or more bulbs burn out before 2,000 hours.²

\$13.65
With incandescent lights, your monthly energy bill will increase an average of \$13.65 versus just 0.22 cents with LEDs.⁴

1 Source: <http://www.hetv.com/>
 2 Source: <http://www.TheChristmasLightEmporium.com>
 3 Source: <https://energy.gov/energysaver/led-lighting>
 4 Source: <http://www.denverpost.com>

Learn more at ConserveEnergySoCal.com

Winter Infographic

Save money by conserving energy in

Ring in the New Year in Style! 2018

Temperature



Set your thermostat to 68 degrees to save energy and account for the natural body heat guests emit in a confined space.

Lights Off



Before you leave the house, turn off lights and unplug unused appliances to prevent energy use when you're not at home!

Stove-top



Don't use the stove-top to heat up the party! Let the furnace do that! It's dangerous to leave high heat unattended.

Furnace Filters



A few days before guests arrive, check your furnace filters to ensure clean air and optimal efficiency when guests arrive.

Windows



Weather proof windows to keep warm air in and keep cool air out!

Dishwasher



Wait until the party ends, and the dishwasher is full to run a load!

