

October 29, 2014

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

**Re: California Independent System Operator Corporation
Docket No. ER13-2296
Informational Filing**

Dear Secretary Bose:

Pursuant to the Commission's October 29, 2013 order in the above-captioned docket, the Commission directed the California Independent System Operator Corporation ("CAISO") to submit an informational filing one year from the date of its order to evaluate the effectiveness of the 150% cap on projected proxy costs for resources electing the registered cost option for start-up and minimum load cost compensation. The attached report sets forth the CAISO's evaluation, comparing the impact of reducing the cap from 200% to 150% on projected proxy costs, while increasing the costs components included within proxy cost calculation.

Respectfully submitted,

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Informational Filing
In Compliance With October 29, 2013 Order
Docket No. ER13-2296

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1. Background

The California Independent System Operator Corporation (CAISO)¹ submits this informational filing in compliance with the Commission order issued in this proceeding on October 29, 2013.²

Pursuant to its tariff, the CAISO performs optimized economic commitment and dispatch of generating resources in the markets it operates based on the resources' market bids as well as any generated bids and default energy bids and their commitment costs, which consist of the costs of starting up the resources (start-up costs) and the costs of running the resources at their minimum operating levels (minimum operating costs). On a 30-day basis, scheduling coordinators for resources may choose either the proxy cost option or the registered cost option for specifying their start-up costs and minimum load costs to be used for the resources in the CAISO markets.³ The proxy cost option uses cost-based information to calculate variable start-up and minimum load costs, and its commitment-cost values are based on a daily natural gas price index.⁴ The registered cost option allows scheduling coordinators to register fixed start-up and minimum load cost values of their choosing in the Master File, subject to a registered cost cap set at a specified percentage of the projected proxy cost, and its commitment-cost values are based on averaged natural gas futures prices.⁵

In 2012, the CAISO initiated a stakeholder process called Commitment Costs Refinements 2012 that led to the filing and Commission acceptance in this docket of the following revisions to the CAISO tariff:

- i) Inclusion of allowance costs associated with greenhouse gas (GHG) incurred under California's cap-and-trade program in the calculations for commitment costs, default energy bids, and generated bids ;
- ii) Inclusion of grid management charge (GMC) components in proxy cost calculations for start-up and minimum load costs, default energy bids, and generated bids;
- iii) Inclusion of fixed adders for major maintenance expenses (MMA) in proxy start-up and minimum load costs; and

¹ Capitalized terms not otherwise defined herein have the meanings set forth in appendix A to the CAISO tariff.

² See *Cal. Indep. Sys. Operator Corp.*, 145 FERC ¶ 61,082, at P 22 (2013) (October 29, 2013 Order).

³ CAISO tariff section 30.4.

⁴ CAISO tariff section 30.4.1.1.

⁵ CAISO tariff sections 30.4.1.2, 39.6.1.6, 39.6.1.6.1. The projected proxy includes a gas price component, a major maintenance expense component, a volumetric grid management charge component, and, if eligible, a projected greenhouse gas allowance price component. CAISO tariff section 39.6.1.6.

- iv) Reduction of the registered cost cap from 200 percent to 150 percent of the projected proxy cost.⁶

With regard to item (iv) above, the Commission stated in its October 29, 2013 order in this docket that “due to the current lack of data regarding the impact of the new adders [*i.e.*, items (i)-(iii) above] on a resource’s projected proxy cost and, as a result, on cost recovery under the registered cost option, we direct CAISO to file a report one year after the date of issuance of this order, that evaluates the effectiveness of the 150 percent cap and its effect on cost recovery.”⁷ The Commission noted that the report would be “for informational purposes only and will neither be noticed nor require Commission action.”⁸ The CAISO interprets the Commission’s directive to mean that the CAISO should evaluate the effectiveness of the cap and its effect on cost recovery with regard to gas-fired resources, as it was market participants with gas-fired resources that raised the issue the Commission resolved by directing the CAISO to submit this informational filing.

⁶ See *Cal. Indep. Sys. Operator Corp.*, 141 FERC ¶ 61,237, at PP 29-39 (2012); October 29, 2013 Order at PP 21-25. The Commission accepted item (i) above effective January 1, 2013 and accepted items (ii)-(iv) above effective November 1, 2013.

⁷ *Id.* at P 22 (citation omitted).

⁸ *Id.* at P 22 n.32.

2. Methodology for the CAISO's evaluation

To evaluate the effectiveness of the 150-percent registered cost cap and its effect on cost recovery by gas-fired generating resources, the CAISO compared the start-up and minimum load costs of resources under the registered cost option when the cap was 200 percent and after the cap was reduced to 150 percent. The CAISO compiled and compared the data for the same time period to account for seasonal variations: the period from November 2012 through September 2013 when the cap was 200 percent, and the period from November 2013 through September 2014 when the cap was 150 percent.

3. Evaluation of reducing the registered cost cap from 200 percent to 150 percent

As explained above, the registered cost cap was reduced from 200 percent to 150 percent at the same time that other cost components (GHG, GMC, and MMA) were added to the calculation of proxy cost. The CAISO's evaluation indicates that this conjunction of tariff revisions actually increased the "head room" for resources subject to the registered cost option even though the registered cost cap was lowered. Specifically, the evaluation shows that for the market overall, reducing the registered cost did not decrease scheduling coordinators' ability to recover commitment costs for resources subject to the registered cost option. This was more specifically analyzed for natural gas-fired resources. For gas-fired resources, gas prices played a large role in the increase in registered costs after the cap was reduced to 150 percent. The evaluation shows that such resources are highly sensitive to gas price fluctuations. The use of averaged gas futures prices in the calculations for the registered cost option resulted in a delayed impact on price volatility. For instance, gas price volatility experienced in February 2014 was not fully reflected in the registered cost option until March 2014 due to the inherent timing of the futures price.

The following figures illustrate the cost comparison for the studied timeframes where the 200-percent cap and then the 150-percent cap were in effect. The focus of the evaluation is on gas-fired resources and a comparison of costs on a normalized basis. This normalization is done to take into account the effect of the different resource sizes, and is performed by dividing the applicable cost by the minimum generation level (PMin) of each unit, which results in an average-dollar-per-megawatt cost. For example, if a resource unit has a minimum load cost of \$1000 and a PMin of 50 MW, the normalized cost will be \$20/MW.

Figure 1 shows the minimum load costs for all resources under the registered cost option; the appendix in section 4 of this informational filing shows similar figures for gas-fired units grouped by technology type, including combined cycle, gas turbine, reciprocating generation, and steam turbine units. The y-axis on the left-hand side of each figure shows the normalized cost in \$/MW. The y-axis on the right-hand side of each figure shows the daily gas price indices used in the CAISO market for gas regions PGE2 and SCE1. These two regions are reflective of the other gas regions because only gas transportation costs differ among regions using the same hub price.

Figure 1: Minimum load cost comparison for all resources under registered cost option

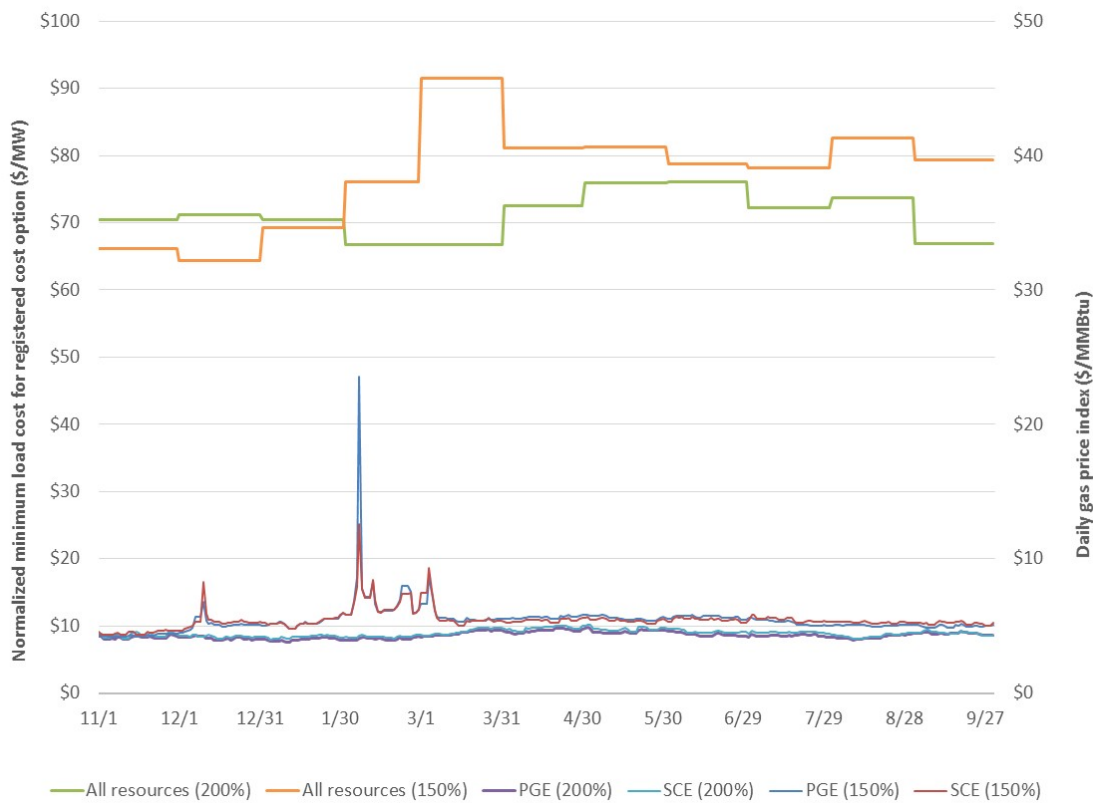
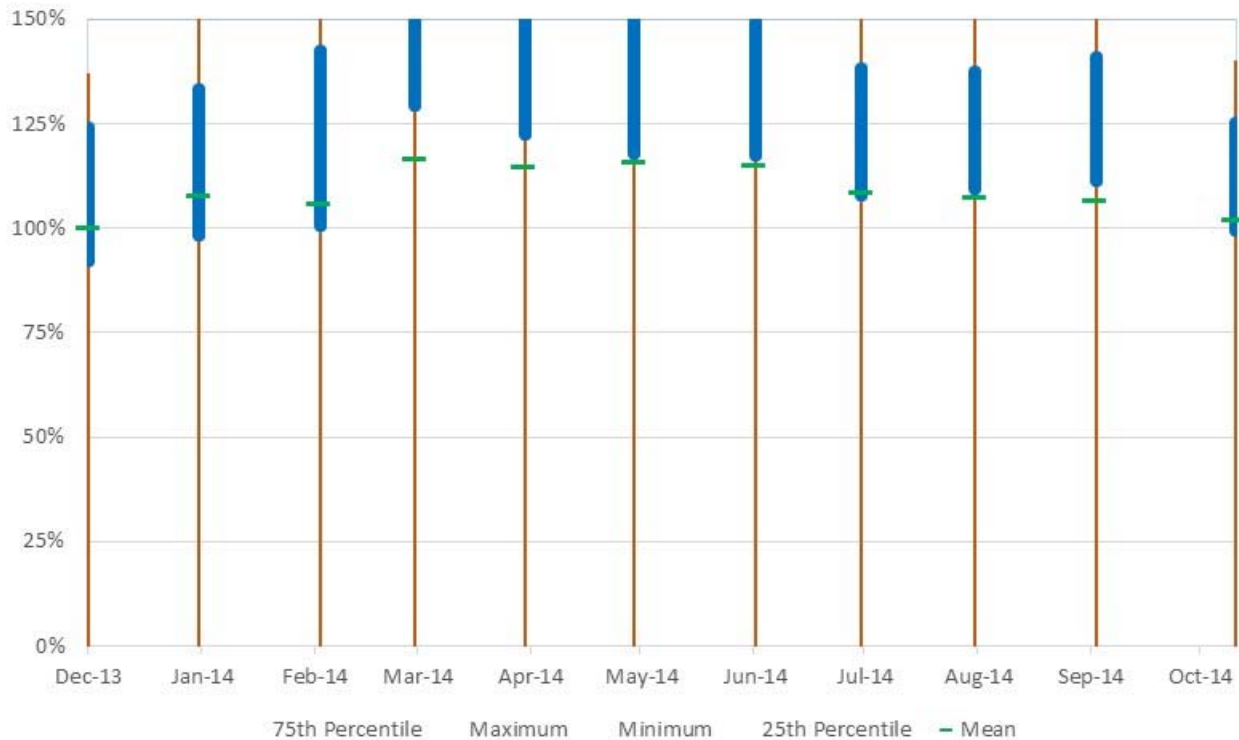


Figure 1 shows the comparison of normalized costs between the two cap values for all resources that used the registered cost option for their minimum load costs. Because many of the resources under the registered cost option are gas-fired, the gas price variations had a direct influence on the comparison. The gas price fluctuation in February 2014 affected the cost for subsequent gas prices, resulting in a high gas futures price index in March 2014 and consequently in higher minimum load costs even under the registered cost option. After April, gas prices were more stable for both periods the CAISO evaluated, and the overall average cost under the 150-percent registered cost cap was higher than it was under 200-percent cap. This trend can serve as a reference of the effectiveness of lowering the cap to 150 percent. In relative terms, gas prices were mildly higher for the period where the 150-percent cap was in effect, and thus the minimum load costs were also higher. At relatively similar gas prices, the minimum load cost for resources under the 150-percent cap still remained above the minimum load cost under the 200-percent cap. If it were the case that the 150-percent cap had been set at a level too low to allow resources to recover their costs, one would expect the minimum load cost to be consistently lower under the 150-percent cap. But the evaluation shows that this is not the case.

The CAISO also evaluated the effectiveness of using a 150-percent cap by estimating its effect on resources under the registered cost option. If the cap were set too low such that this mechanism did not allow resources to recover their minimum load costs, the CAISO would expect that resources under the registered cost option would consistently register minimum load

cost values in the Master File right up to the maximum capped level of 150 percent. But the CAISO’s estimates, reflected in Figure 2, show that most of the time the majority of resources under the registered cost option did not register minimum load cost values at the 150-percent cap level.

Figure 2: Percentages of minimum load costs requested for resources under registered cost option

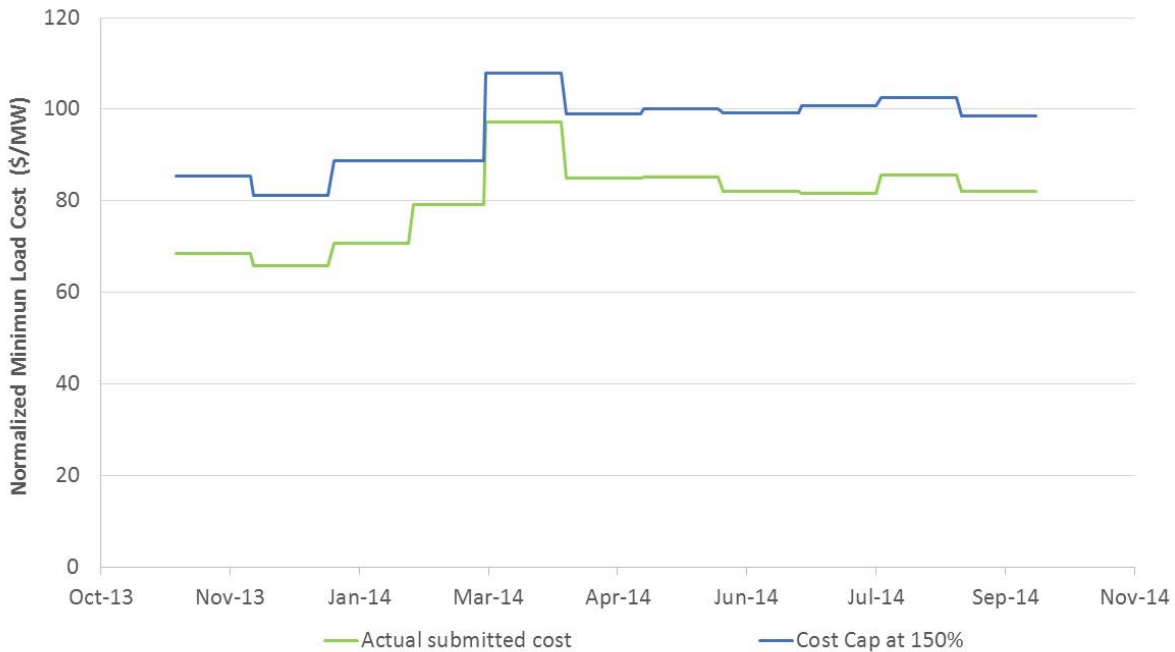


The y-axis in Figure 2 shows the frequency of the sample. The maximum and minimum percentages are depicted by the high and low ends of each vertical bar. Thus, the percentages of the registered cost can be anywhere between 0 and 150 percent. The 25th and 75th percentile values are represented by the low and high ends of the blue segment in each vertical bar; this means that the length of the blue segment of the bar represents half of the sample of the percentages submitted (*i.e.*, the 25th through the 75th percentiles). The horizontal bar in green in each vertical bar represents the mean of the data sample and indicates the average of all the cost percentages submitted for resources. For instance, in December 2013, the 25th percentile of the sample registered values that were up to 90 percent of the cap, the 50th percentile of the sample registered values were 100 percent of the cap, the 75th percentile of the sample registered values that were 125 percent of the cap, and the highest percentile of the sample registered values that were 139 percent of the cap. Only in the months of March through June 2014, following the high gas prices observed in the winter, did the highest percentile of the sample register values that were the maximum 150 percent of the cap.

As shown in Figure 3, the CAISO performed a more tailored and targeted analysis for gas-fired units for minimum load cost to reinforce the concept behind Figure 2. Figure 3 compares the

registered minimum load cost values for gas-fired resources and the 150-percent cap. Figure 3 shows that in every month the registered values were below the cap. These results indicate that the 150-percent cap did not limit the minimum load cost values that gas-fired resources could register.

Figure 3: Comparison of 150-percent cap and registered costs submitted for minimum load for gas-fired resources



As shown in Figure 4, the CAISO also compared the applicable cost with the 150-percent cap in place versus the minimum load cost actually registered when the 200-percent cap was in effect, taking into account adjustments in the gas price indices to eliminate the effect of irrelevant data introduced by variations in gas prices between the first period comprising 2012/2013 and the second period comprising 2013/2014. The comparison in Figure 4 also assumes that gas-fired resources could recover their GHG, GMC, and MMA costs in the 2012/2013 period using the cost cap of 200 percent. The CAISO made this comparison to show how the gas prices of 2012/2013 would have been affected by use of a 150-percent cap (instead of the 200-percent cap actually in place during that period) and recovery of GHG, GMC, and MMA costs.

Figure 4: Comparison of registered cost in 2012 and 150-percent cap adjusted for gas price variations

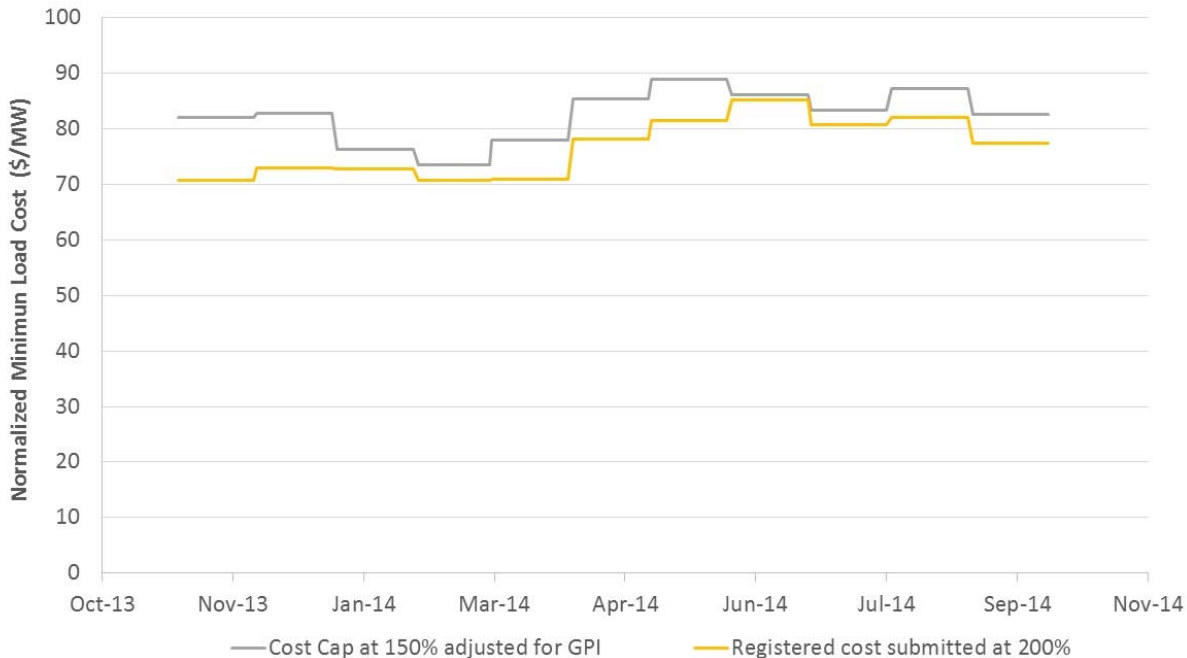


Figure 4 shows that recovery of GHG, GMC, and MMA costs and the use of a 150-percent cap instead of the 200-percent cap would not have reduced the ability of gas-fired resources to recover their minimum load costs.

In addition, as shown in Figures 5 and 6, the CAISO compared the start-up costs for all resources under the registered cost option. Figure 5 shows results that are similar to those for minimum load costs as depicted in Figure 1. The CAISO normalized the registered start-up costs by dividing the costs by the minimum generation (PMin) of each unit to produce a \$/MW metric as shown in the y-axis on the left-hand side of Figure 5.⁹ The CAISO calculated the metric in a manner consistent with the calculation of minimum load costs depicted in Figure 1, but in practice the start-up cost is allocated over the entire commitment period of the resource. The y-axis on the right-hand side of Figure 5 shows the daily gas price indices used in the CAISO market for gas regions PGE2 and SCE1. Figure 6 shows the percentiles of the start-up cost requested in terms of the percentages of cost by reference to the 150-percent cap. Similar to the minimum load costs reflected in Figure 2, Figure 6 depicts start-up costs submitted in a wide range of percentages that were usually below the 150-percent cap. Thus, in most cases the 150-percent cap did not impede the ability of resources to recover their start-up costs.

⁹ In Figure 5, the metric for multi-stage generators was calculated using only start-able configurations using the configuration's specific PMin and start-up cost.

Figure 5: Start-up cost comparison for all resources under registered cost option

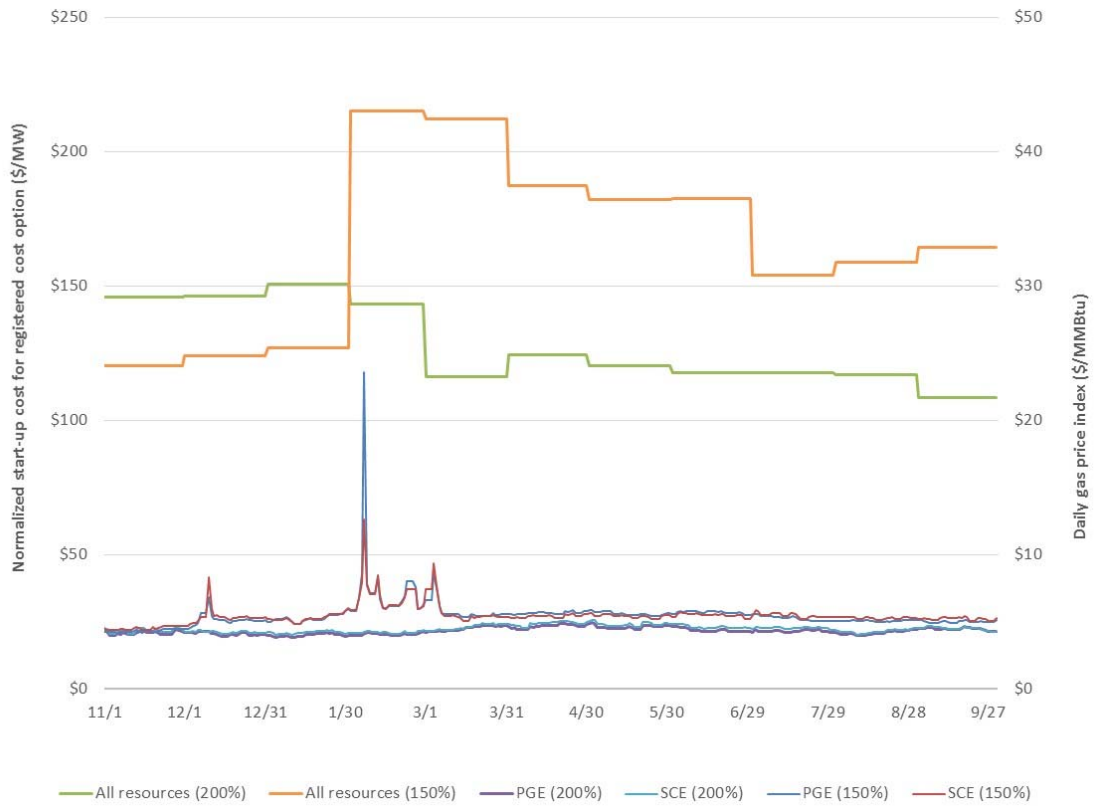
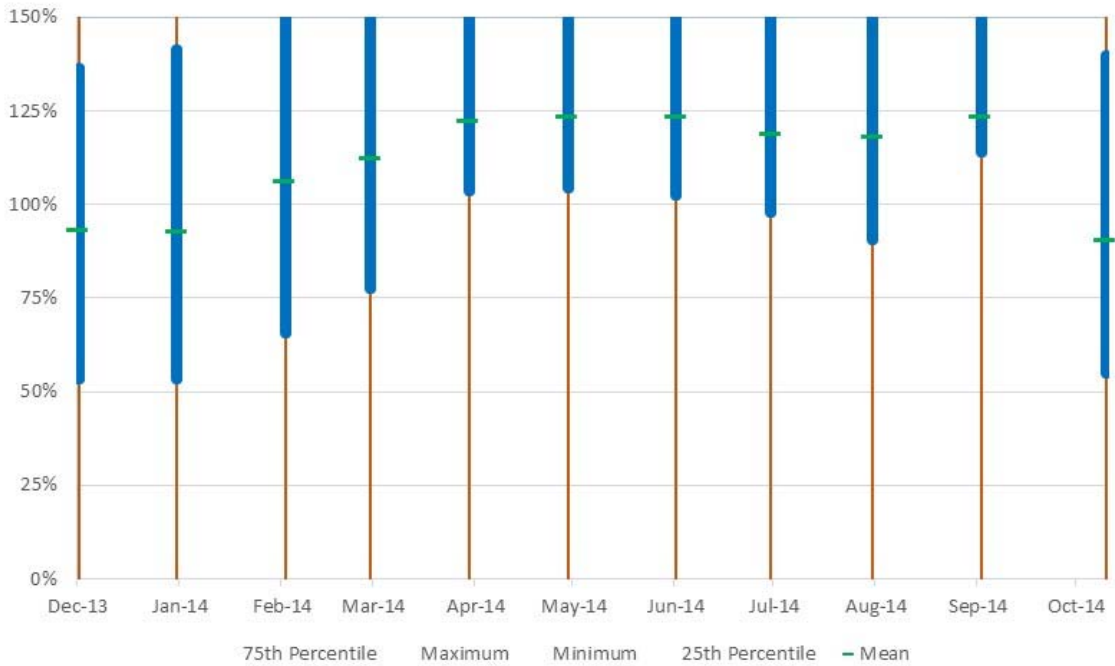


Figure 6: Percentages of start-up costs requested for resources under registered cost option



4. Appendix

In this appendix, the CAISO provides Figures 7 through 14 to compare minimum load costs and start-up costs when the registered cap is 150 percent and 200 percent. Figures 7-14 contain comparisons for different types of gas-fired resources.

Figure 7: Minimum load cost comparison for combined cycle resources under registered cost option

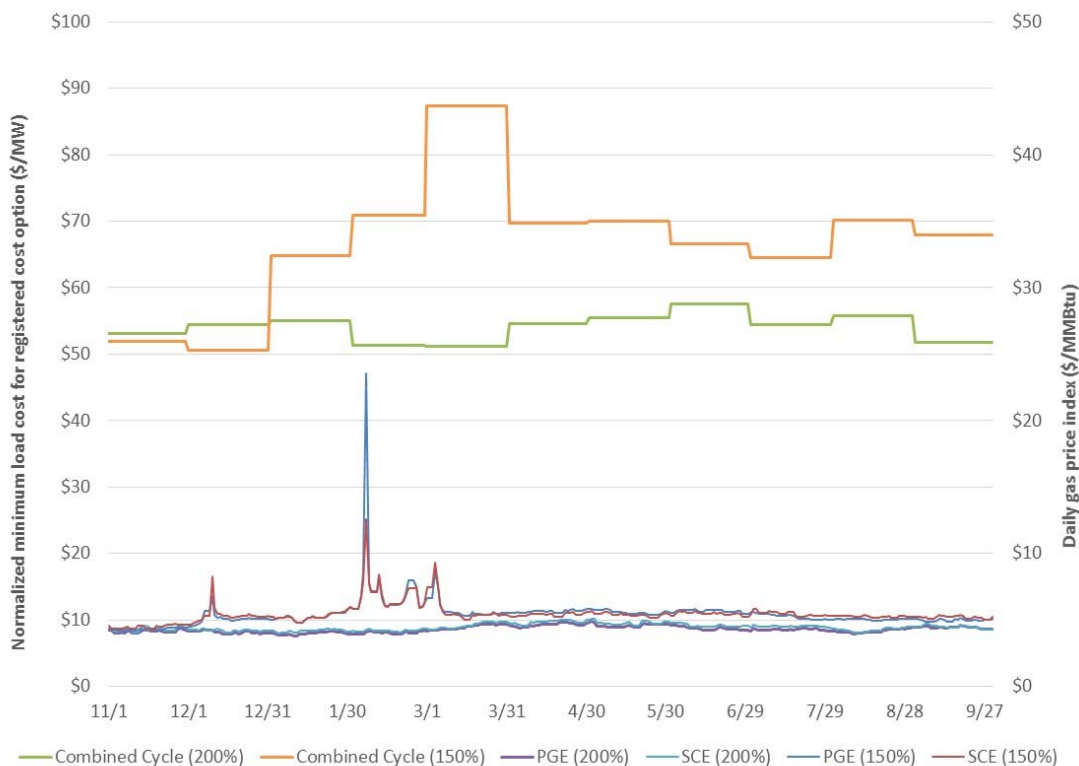


Figure 8: Minimum load cost comparison for gas turbine resources under registered cost option

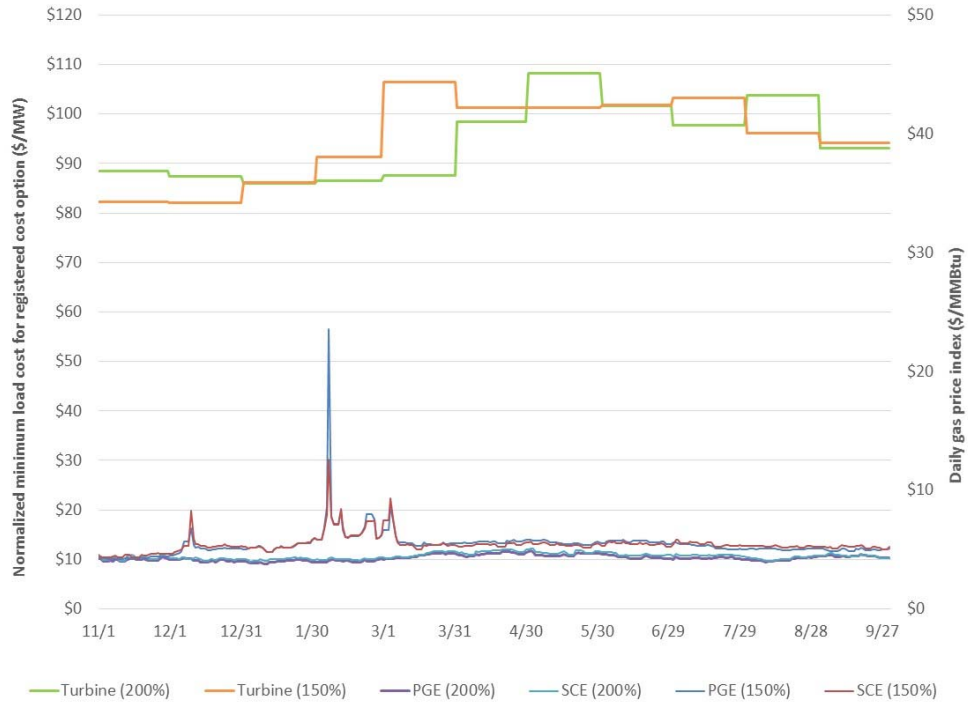


Figure 9: Minimum load cost comparison for reciprocating resources under registered cost option

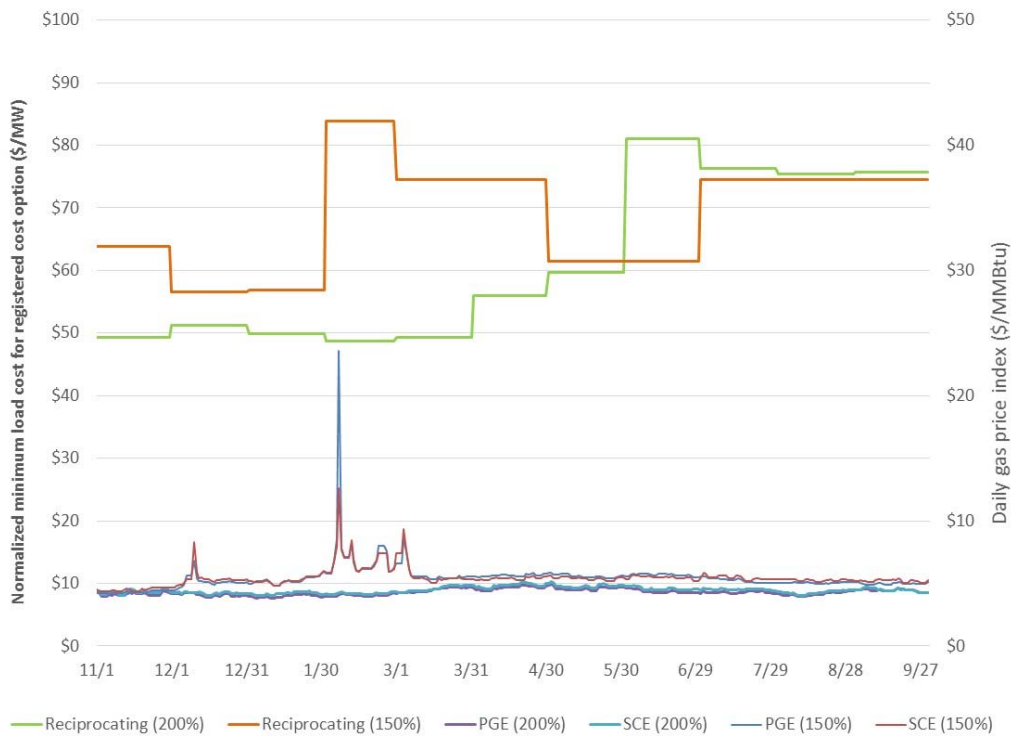


Figure 10: Minimum load cost comparison for steam turbine resources under registered cost option

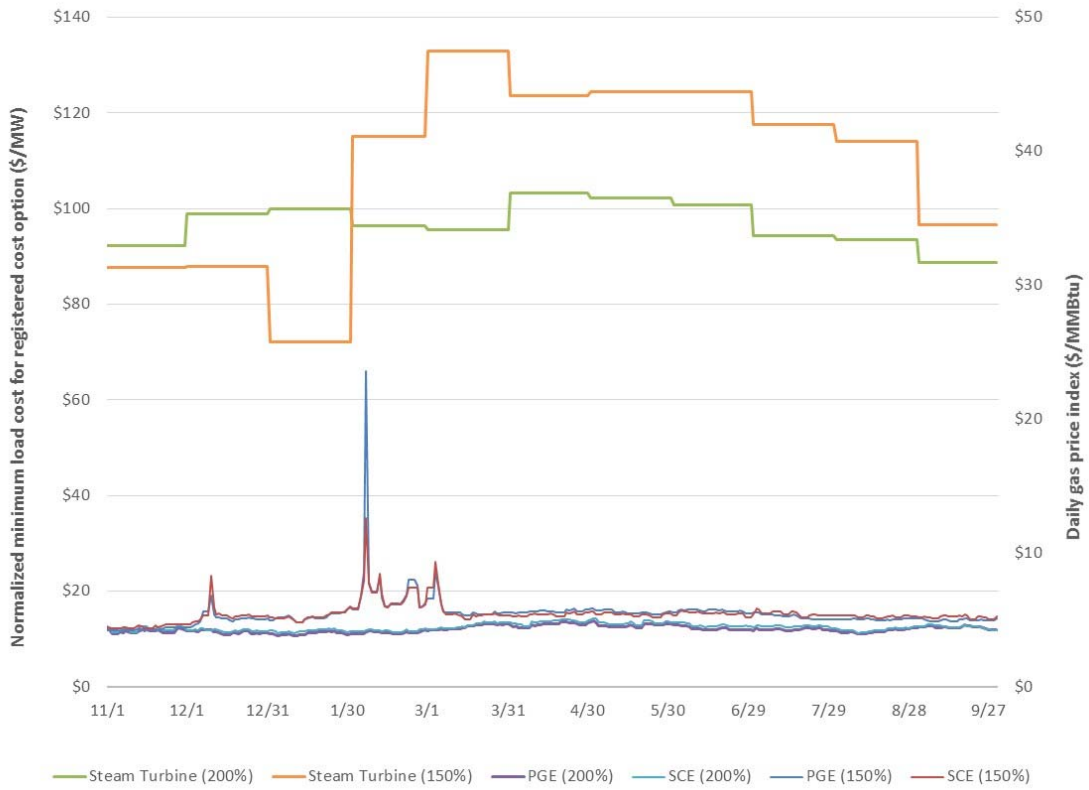
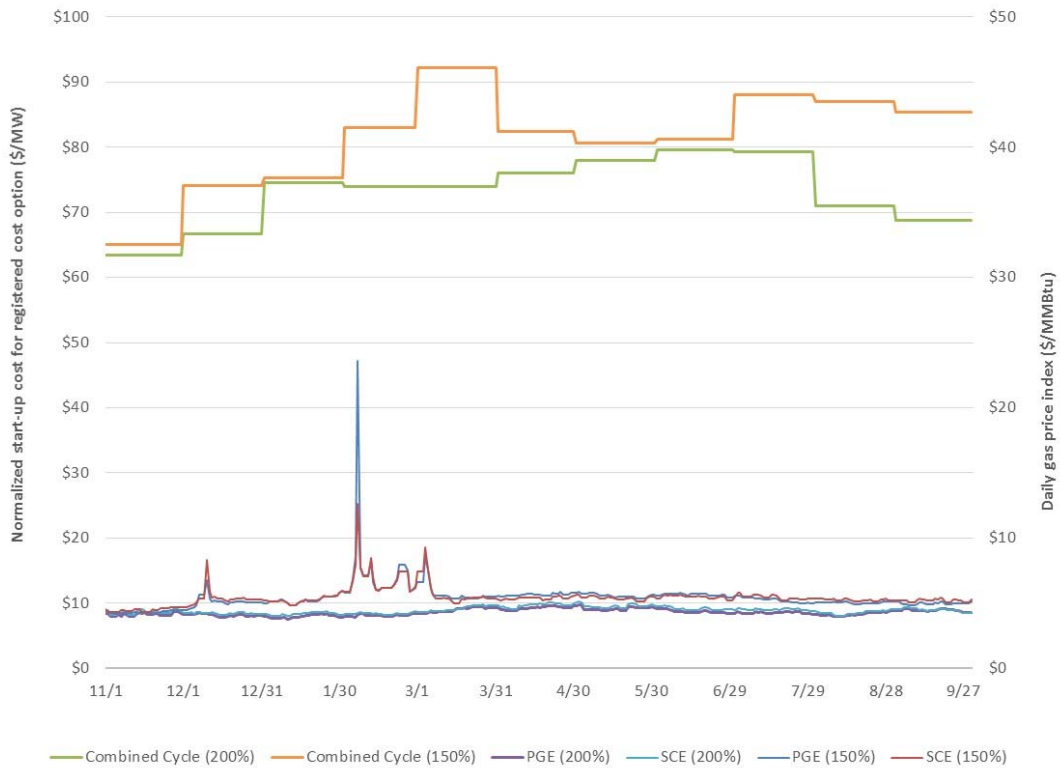


Figure 11: Start-up cost comparison for combined cycle resources under registered cost option



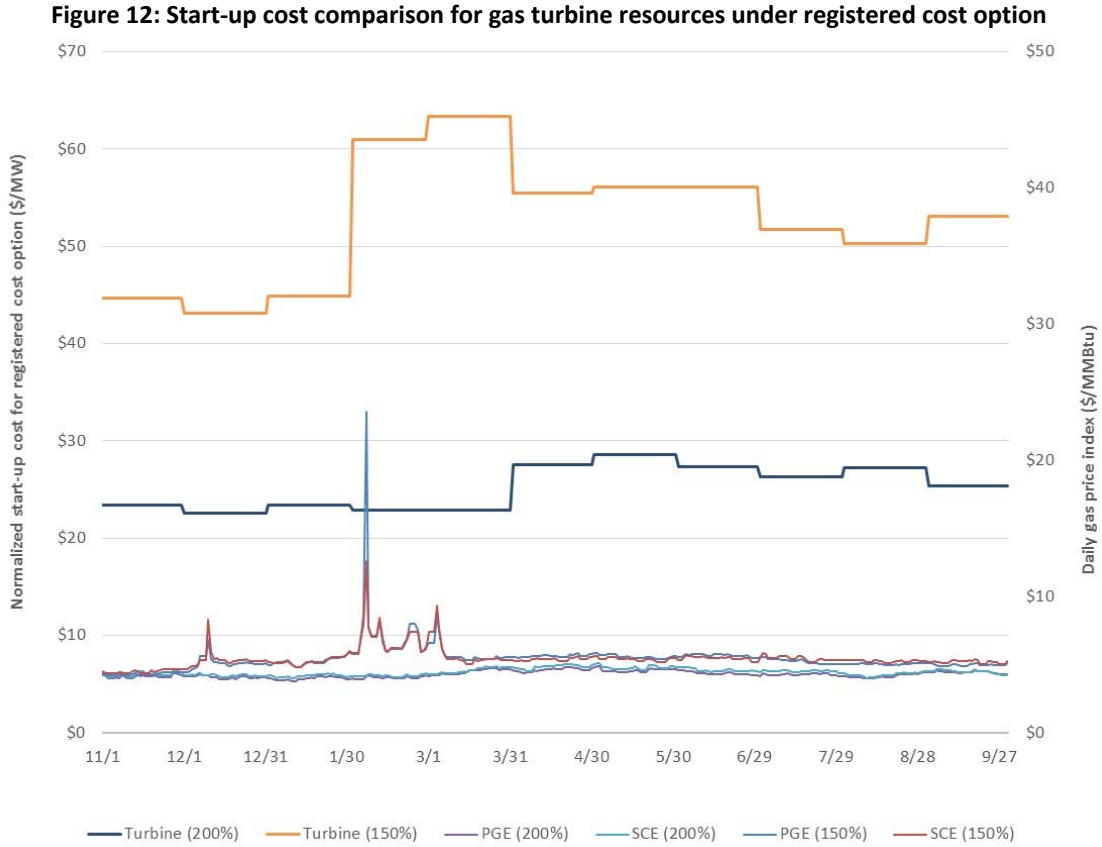


Figure 13: Start-up cost comparison for reciprocating resources under registered cost option

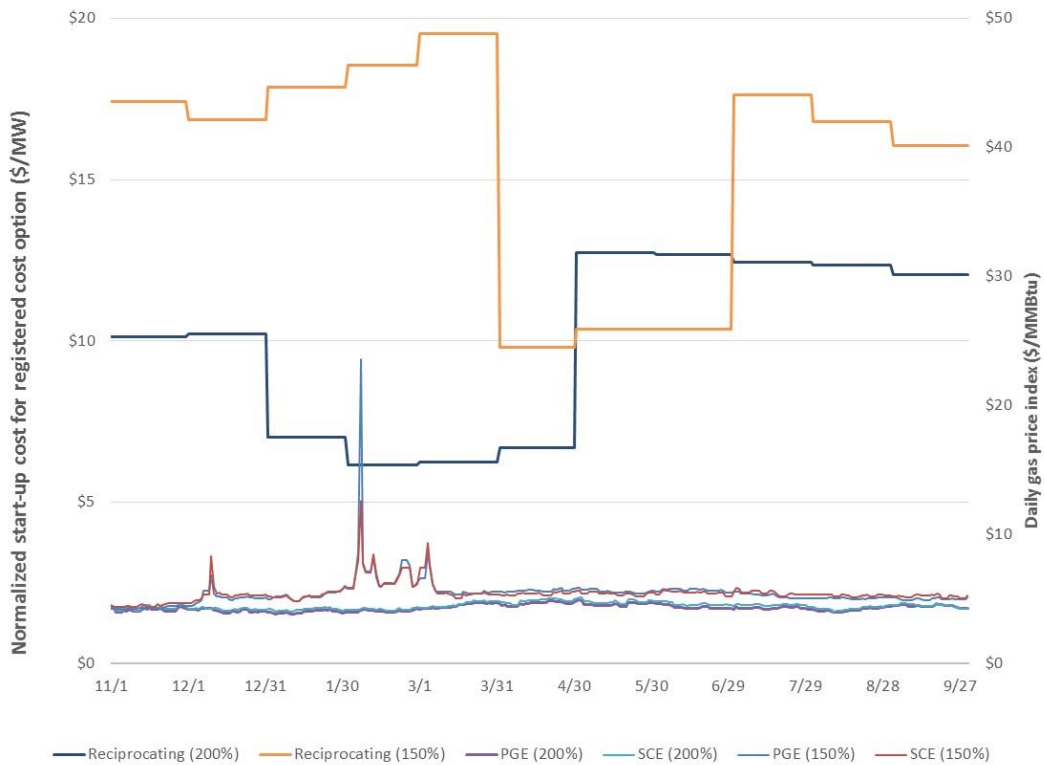
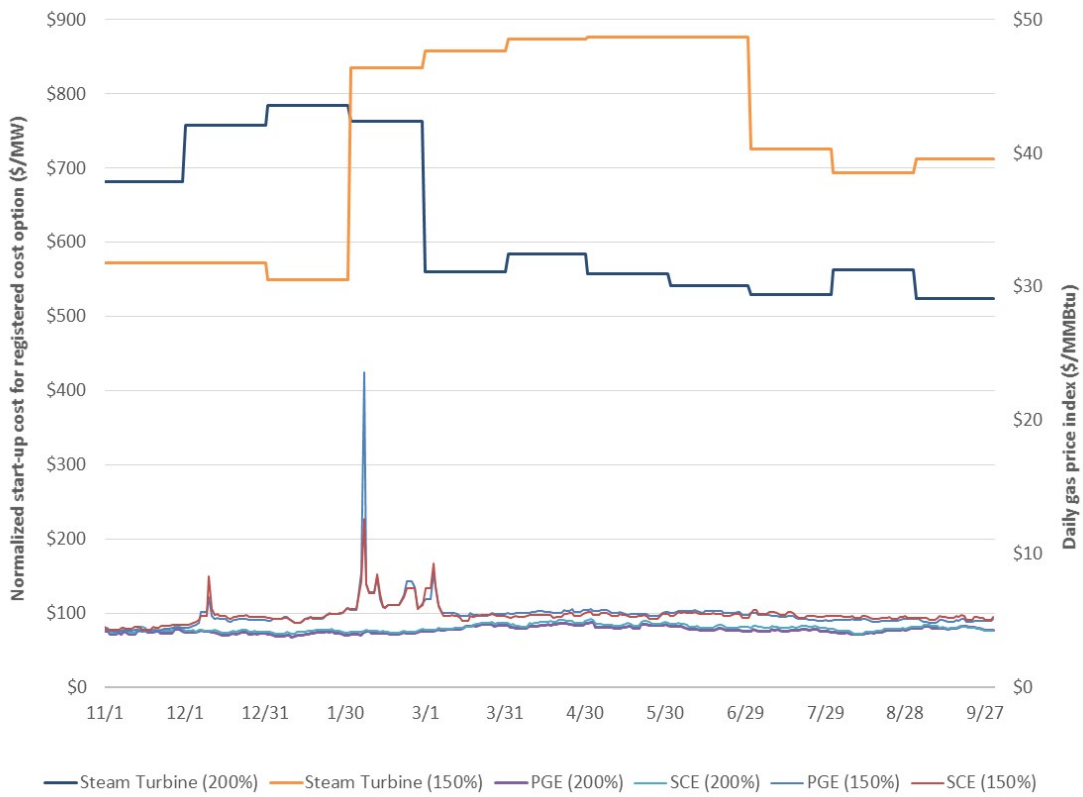


Figure 14: Start-up cost comparison for steam turbine resources under registered cost option



CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon the parties listed on the official service lists in the above-referenced proceedings, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 29th day of October 2014.

/s/ Anna Pascuzzo
Anna Pascuzzo