

## Further Explanation of Differences in Differences Results

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To estimate the economic impact of Aliso Canyon limitations on core customers, Energy Division uses an econometrics technique called “Difference in Differences” (DID). In the DID model, outcomes are observed for two groups, a treatment and a control group, during two distinct time periods. In this case, the Southern California Gas Company (SoCalGas) customers exposed to the Aliso Canyon impacts are the treatment group. The treatment group was not exposed to the Aliso Canyon impact in the first time period but was exposed to the Aliso Canyon impact in the second period. The other group, the control group, was not exposed during either period. The key assumption in DID is the parallel trend assumption,<sup>1</sup> which states that the average outcome for the treated and control groups would have moved in parallel if the Aliso Canyon incident had not occurred.

CPUC staff used the gas commodity procurement data from customers’ bills<sup>2</sup> in places where the SoCalGas and Pacific Gas and Electric Company (PG&E) service territories overlap because these households have similar geography and weather patterns.<sup>3</sup> CPUC staff compared the commodity cost data from SoCalGas customers, the treatment group, and PG&E customers, the control group, before and after the Aliso Canyon leak.

CPUC staff used data from 2013 to 2018. The years 2013 through 2015 represent the period before the Aliso Canyon incident, or before the treatment occurred. The period after the Aliso incident, 2016-2018, captures the impact after the treatment occurred.

To separate the economic impact of Aliso and pipeline outages, CPUC staff compared the bills of SoCalGas and PG&E core customers<sup>4</sup> before and after the leak. CPUC staff estimated four DID regressions using procurement costs for the years 2013-2015 to represent the period before the Aliso Canyon incident and four different time periods to represent the period after the Aliso Canyon incident. The four post-Aliso time periods included:

- 1) The years 2016-2018, which combined represent the period after Aliso Canyon incident;
  - a. Result: Average gas procurement costs for SoCalGas customers increased by \$1.82/bill in 2016-2018;
- 2) 2016 to represent the period after the Aliso Canyon incident and before the pipeline outages;

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<sup>1</sup> See slides 18 and 19 in November 13, 2019, presentation:

[https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News\\_Room/NewsUpdates/2019/11702002%20-%20Econometric%20Modeling%20-%202011-13-2019\\_Final.pdf](https://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/News_Room/NewsUpdates/2019/11702002%20-%20Econometric%20Modeling%20-%202011-13-2019_Final.pdf).

<sup>2</sup> Note: customer bills include commodity and transportation costs. This study looked only at commodity costs.

<sup>3</sup> These communities include: Arvin, Bakersfield, Fellows, Fresno, Del Ray, Fowler, Paso Robles, Selma, Taft, Tehachapi, and Templeton.

<sup>4</sup> The data includes both California Alternate Rates for Energy (CARE) customers, who receive a discount on their energy bills based on their income, and non-CARE customers.

- a. Result: Average gas procurement costs for SoCalGas customers increased by \$1.32/bill in 2016 ;
- 3) 2017, which was after the Aliso Canyon incident and includes bills from both before and after the October 1, 2017, rupture of Line 235-2;
  - a. Result: Average gas procurement costs for SoCalGas customers increased by \$1.89/ Bill in 2017;
- 4) 2018 to represent a period after the Aliso Canyon incident and with pipeline outages the entire year;
  - a. Result: Average gas procurement costs for SoCalGas customers increased by \$2.25/ Bill in 2018.

In 2016, the pipeline outages on Lines 235-2 and 4000 had not happened yet, meaning the impact of the Aliso Canyon event on average gas procurement costs was likely around \$1.32 per bill. In 2017 and 2018 bills for the treatment group conflated the effects of pipeline outages and the Aliso Canyon event making differentiation between the two factors impossible to quantify precisely. In the place of precise impacts in 2017 and 2018, staff concluded that together these two factors resulted in bill impacts that were higher in 2017 and 2018. Since the purpose of this analysis is to study the impact of Aliso Canyon in particular on ratepayers, and it was impossible to be precise about these impacts, CPUC staff could conclude that the Aliso Canyon event caused average bills for SoCalGas customers to increase by roughly \$1.32/bill because in 2016 there were no pipeline outages.<sup>5</sup> In 2017, bill impacts are likely primarily the result of the Aliso event since the rupture of Line 235-2 did not happen until October 1, but in 2018 bill impacts are completely combined.

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<sup>5</sup> The 2016 estimate may slightly undercount the impact of Aliso Canyon because the field was on maximum withdrawal until January 24, 2016, to reduce the pressure in the field and thereby decrease the amount of gas leaking. Therefore, gas commodity costs would not have been impacted by a lack of Aliso Canyon withdrawals in January, which is one of the two coldest months of the year and thus can have an outsize impact on average commodity costs.