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High Natural Gas Prices in Winter 2022-23: Part I

A STAFF WHITE PAPER SUPPORTING CPUC
INVESTIGATION I.23-03-008

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Executive Summary

High natural gas prices in winter 2022-2023 significantly burdened California ratepayers, leading to increased bills for both gas and electric utility customers. The California Public Utilities Commission (CPUC) took several immediate actions to address the situation and mitigate its impact.¹ First, the CPUC expedited the California Climate Credit on February 2, 2023, so that customers could see prompt bill discounts in February or March rather than April.² Second, the CPUC held an en banc hearing on February 7, 2023, to examine the causes and impacts of the high gas prices. Panelists largely agreed with the Energy Information Administration's (EIA) analysis that the following factors, in combination, contributed to the extremely high gas prices: 1) pipeline constraints; 2) reduced natural gas flows; 3) widespread, below-normal temperatures; and 4) low storage inventories in the West. Third, the CPUC opened an investigation, (I.) 23-03-002, on March 16, 2023, to continue its fact-finding mission regarding the events of winter 2022-2023.³

This White Paper seeks to address two of the Scoping Memo questions in I.23-03-008: 1) What factors caused or contributed to gas price increases beginning on November 1, 2022? This includes market fundamentals as well as other applicable factors; and 2) Did any of the entities under the Commission's regulatory jurisdiction play a role in causing or contributing to the gas price increase in California border prices between November 1, 2022, and March 31, 2023 (gas price spikes)?

Prior to the start of winter 2022-2023, several events occurred that altered natural gas supply and demand dynamics and impacted natural gas commodity prices. First, U.S. liquefied natural gas (LNG) exports increased due to a geopolitical shift caused by Russia's invasion of Ukraine on February 24, 2022. Second, El Paso Natural Gas Line 2000, which supplies natural gas to states in the Southwest, including California, ruptured in August 2021⁴ and remained out of service until February 2023.⁵ Third, gas storage **inventories (levels)** in the Pacific region were notably lower at the start of the winter than both the previous winter and the five-year average.⁶

Within California, gas storage levels at the start of winter differed by customer class and location. The gas utilities' core procurement departments, which purchase most of the gas used by residential and small commercial and industrial customers, met the CPUC's gas storage requirements prior to the start of winter. Pacific Gas and Electric Company's (PG&E) Core Gas Supply entered the winter with more than 90 percent of its contracted capacity full, and the Southern California Gas Company's (SoCalGas) storage

¹ On December 15, 2023, CPUC's Energy Division issued a directive to both PG&E and Sempra Energy to enhance their communication strategies, including opt-in text message alerts regarding high gas bills and energy savings tips. The Sempra letter can be found here: [communicationltr_sempra_20231215.pdf](#) and the PG&E letter can be found here: [enhancedcommunicationltrpge20231215.pdf](#)

² Decision 23-02-014: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M501/K925/501925501.PDF>.

³ EIA. "Natural Gas Weekly Update for week ending December 21, 2022": [Natural Gas Weekly Update \(eia.gov\)](#)

⁴ [El Paso force majeure cuts Permian westbound gas flows, pressuring output and prices | S&P Global Commodity Insights \(spglobal.com\)](#)

⁵ [Informational Postings :: EL PASO NATURAL GAS CO. L.L.C. \(kindermorgan.com\)](#)

⁶ EIA Data Analysis. The Pacific region includes California, Oregon, and Washington: [Notes and Definitions \(eia.gov\)](#).

inventory levels were above the five-year average.^{7, 8} In contrast, noncore customers, whose storage decisions are unregulated, did not fill the inventory capacity available at Northern California’s independent storage fields.⁹ Noncore, or large commercial and industrial, customers typically inject gas into storage if they see an economic reason to do so. In the hot summer of 2022, gas prices were higher than those forecasted for winter, so there did not appear to be a clear economic advantage to injecting gas into storage.¹⁰

Then cold temperatures hit the West in November, leading to high customer demand for natural gas and declines in storage inventory. Early winter drawdown of storage tends to increase gas market volatility due to concern that gas supplies might be insufficient to meet demand at the end of winter. In addition to there being less gas on hand, lower gas storage inventory results in reduced withdrawal capacity due to lower pressures, which in turn reduces the maximum amount of daily demand that can be served.

Winter 2022-2023 didn’t just start cold; it stayed cold. It was the coldest winter in the PG&E and SoCalGas service territories in the last 10 years measured by both average temperatures and heating degree days (HDDs).¹¹ Additionally, the prolonged drought increased gas-fired electric generation demand in the California Independent System Operator (CAISO) market and other Western markets due to lower hydroelectric imports.¹²

Pipeline constraints also worsened as the winter progressed. In addition to the Line 2000 outage on El Paso’s South Mainline, which delivers supplies to SoCalGas’ Southern System, several force majeure events reduced capacity on El Paso’s North Mainline in December and January, which reduced the total delivery

⁷ SoCalGas En Banc Presentation, February 7, 2023, p. 7: <https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/meeting-documents/20230207-en-banc/20230207-en-banc---socialgas-presentation.pdf>.

⁸ The CPUC first required PG&E to hold storage withdrawal capacity sufficient to meet 1-in-10-year peak day demand in D.06-07-010. The specific amount required has been updated in subsequent decisions.

https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/58338.PDF. In D.06-09-039, Ordering Paragraphs 2 and 6, the CPUC ordered both utilities to “plan their backbone and storage systems so as to meet the peak day criteria already in place for their local transmission systems” and “the probability of storage withdrawal and the deliverability of withdrawn gas during periods of peak demand”:

https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/60237.PDF.

⁹ Noncore customers in Southern California did not have access to storage capacity during winter 2022-23 because the limited inventory allowed was needed to support core customer peak demand and system balancing. For more information regarding storage limitations on the SoCalGas system, see section [Underground Gas Storage Safety and Reliability](#).

¹⁰ PG&E En Banc Presentation, February 7, 2023, p. 4: https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/meeting-documents/20230207-en-banc/20230207-en-banc---pge-presentation.pdf?sc_lang=en&hash=69FAF2D890D4A5C6F75785ECD7E575F1.

¹¹ Heating degree days are an indicator of space heating demand. The heating degree days for a single day equal 65 degrees Fahrenheit minus the average of the highest hourly temperature and the lowest hourly temperature for the day, if greater than or equal to zero. National Weather Service. “What Are Heating and Cooling Degrees Days?”:

https://www.weather.gov/key/climate_heat_cool.

¹² EIA. “Short-Term Energy Outlook Between the Lines: Improved water supply conditions in California and Southwest increase regional hydropower outlook,” May 9, 2023: <https://www.eia.gov/outlooks/steo/report/BTL/2023/05-westernhydro/article.php.1->

capacity by roughly 1,330 MMcf/d. (cubic feet per day), about a third of El Paso’s delivery capacity to California¹³ When pipeline outages occur, shippers can consider alternate delivery points. However, with restrictions affecting both the northern and southern sections of the El Paso system, customers seeking to bring gas into the SoCalGas service territory had fewer options for alternate routes.

Gas prices rose sharply and trended together at various Western hubs in mid-December. Comparing 2021 and 2022, average December spot market prices increased by 514 percent at the PG&E Citygate and 416 percent at the SoCal Citygate.¹⁴ In January 2023, the core procurement rate rose 80 percent and 313 percent for PG&E and SoCalGas customers, respectively.¹⁵

Gas prices were elevated in both the monthly and daily markets throughout the West in winter 2022-2023.¹⁶ For example, monthly index prices for January 2023 were between \$34 and \$54 per million British thermal units (MMBtu) at all California trading hubs as well as at key trading hubs in Oregon, Washington, New Mexico, and Wyoming compared to between \$7 and \$10 per MMBtu in January 2022.¹⁷ While the winter began with November and December daily gas prices averaging higher than the monthly index, January and February monthly price indices exceeded the average daily price in various parts of the West.

To address the second Scoping Memo question above, CPUC Staff (Staff) issued several data requests to PG&E Core Gas Supply and SoCalGas Gas Acquisition¹⁸ regarding their core purchasing decisions for winter 2022-2023. Staff analysis shows that both PG&E Core Gas Supply and SoCalGas Gas Acquisition had contracted for more than half of their winter gas supply before October 25, 2022, and nearly all these long-term contracts were priced based on monthly indices. Thus, a significant portion of gas purchases were tied to monthly index prices before the market price for those months was known. The remaining core customer gas demand was filled through monthly contracts or spot market purchases.

As noted above, monthly price indices were higher than daily average prices in January and February in several western regions. Staff analysis shows that PG&E Core Gas Supply relied more on spot market purchases throughout the winter for the portion of its supply not filled by long-term contracts while SoCalGas Gas Acquisition relied more on monthly contracts, which resulted in higher gas costs for the

¹³ [Informational Postings :: EL PASO NATURAL GAS CO. L.L.C. \(kindermorgan.com\)](#)

¹⁴ The PG&E and SoCalGas Citygates are gas commodity trading hubs inside California. In general, a citygate is any point at which the backbone transmission system connects to the distribution system. The citygate is not one specific, physical location and represents a virtual trading point on the natural gas system.

¹⁵ SoCalGas procurement data can be found here: [Natural Gas Prices | SoCalGas](#) and PG&E procurement data can be found here: [Gas Rates \(pge.com\)](#)

¹⁶ Natural gas can be bought using long-term, monthly, and spot or daily contracts. Monthly contracts are for the delivery of a set amount of gas every day during the subsequent month at a specific gas hub. Daily contracts are for delivery on the same or subsequent day or days, e.g., Saturday-Monday. Many long-term and monthly contracts are priced based on a monthly index price, which is in turn determined by calculating the volume-weighted average of fixed price monthly contracts sold during bidweek. Gas contracts are discussed in more detail in the [Core Purchasing](#) section below.

¹⁷ Data from Natural Gas Intelligence. For more information, see section Winter 2022-2023 Prices in Historical Context.

¹⁸ PG&E Core Gas Supply and SoCalGas Gas Acquisition are the divisions within each utility responsible for procuring the gas commodity for core customers. For more information, see the [Core vs. Noncore Customers](#) section below.

latter. Additionally, SoCalGas Gas Acquisition made several fixed-price purchases that were higher than the later-published bidweek index. This occurred for most months during the winter and was most pronounced for January.

Both PG&E Core Gas Supply and SoCalGas Gas Acquisition purchased most of their winter 2022-2023 gas supply outside California and transported the gas into the state. In addition, both utilities purchased less than 25 percent of their gas supply at their respective citygate locations, which is typically more costly than gas purchased outside of and transported into the state. However, SoCalGas Gas Acquisition relied more heavily on citygate purchases than PG&E Core Gas Supply. These purchasing decisions took place in a context of pro rata cuts to pipeline capacity caused by the outages on the El Paso interstate pipeline system.¹⁹

While PG&E Core Gas Supply did not report any affiliate transactions, SoCalGas Core Acquisition indicated that it conducted several blind transactions with affiliates for quantities totaling less than half a percent of their sales volume. Blind transactions are conducted via market exchanges or brokers, where neither party knows the identity of the counterparty until the deal is complete. Staff verified that these contracts were blind and that they were comparable in price to transactions made at similar times with non-affiliated counterparties.

High gas prices also impacted the electric market, with the CAISO estimating that wholesale electric energy costs in December 2022 were \$3 billion higher than they would have been had gas prices been similar to past years. Southern California Edison Company (SCE) also filed an Energy Resource Recovery Account (ERRA) Trigger Application (A.23-01-020) on January 31, 2023, to cover the cost of higher gas prices. The CPUC allowed SCE to recover an additional \$454 million in rates during the period June 1, 2023, through May 31, 2024. The impact to monthly residential bills was an increase of slightly over 3 percent.²⁰

Staff will issue a subsequent report (Part II) with additional analysis on winter 2022-2023 gas and electric market dynamics, as well as SoCalGas' Gas Cost Incentive Mechanism (GCIM) and PG&E's Core Procurement Incentive Mechanism (CPIM).^{21, 22}

¹⁹ Based on responses to data requests sent to SoCalGas and PG&E for data on curtailments to contracted gas supply during winter 2022-2023

²⁰ See SCE Advice Letter 5036-E: [TM2 - ELECTRIC 5036-E.pdf - All Documents \(sharepoint.com\)](#)

²¹ The objective of the gas procurement incentive mechanisms is to provide an incentive to the investor-owned utilities (IOUs) to reduce natural gas procurement costs. The major gas IOUs in California have incentive mechanisms: SoCalGas uses the Gas Cost Incentive Mechanism (GCIM), and PG&E uses the Core Procurement Incentive Mechanism (CPIM). Under both mechanisms, shareholders are rewarded if the utility is able to procure gas at prices below a predetermined benchmark, which is based on the actual commodity price of gas in markets in which the utility competes for supply.

²² On July 17, 2023, SoCalGas submitted A.23-07-005, its application for GCIM Year 29, in which it reported purchasing gas at \$417.6 million below the current GCIM benchmark. SoCalGas calculated a ratepayer benefit of \$354.8 million in lower gas costs and a shareholder reward of \$62.8 million using the standard GCIM calculation. However, due to the extremely high winter commodity prices that impacted customers' bills, SoCalGas proposed using a five-year average award for the months of December–February, resulting in a lower shareholder reward of \$25.4 million. A Decision has not yet been issued in this proceeding.

Introduction

Californians' gas and electric bills were notably high during winter 2022-2023 due to large increases in the commodity price of natural gas. Southern California Gas Company (SoCalGas) customers saw an average 147 percent increase in their January 2023 gas bills compared to January 2022. Pacific Gas and Electric (PG&E) customers saw an average 30 percent increase in their January 2023 gas bills compared to January 2022. The U.S. Energy Information Administration (EIA) posted its findings on the causes of the gas price spikes in December 2022, citing pipeline constraints; reduced natural gas flows; widespread, below-normal temperatures; and low storage inventories in the West as factors contributing to the high gas prices.²³

In response to these high gas prices, California Governor Gavin Newsom wrote to the Federal Energy Regulatory Commission (FERC) on February 6, 2023, requesting a formal investigation into whether market manipulation or other anomalies caused the winter gas price spikes.²⁴ Additionally, the CPUC held an En Banc hearing on February 7, 2023, with gas and electric utilities, sister agencies, and other market experts to discuss the causes and impacts of the high gas prices.²⁵ To help mitigate the impacts of the high gas prices on Californians' gas and electric bills, the CPUC promptly accelerated the timeline in which most utility customers received the California Climate Credit (Climate Credit). As such, customers saw bill discounts as early as February or March rather than April when the Climate Credit is usually applied to bills.²⁶ Additionally, on December 15, 2023, the CPUC Energy Division directed both gas utilities to implement improved communication strategies. These strategies include opt-in text message alerts for high gas bills and energy-saving tips.

The CPUC issued an Order Instituting Investigation (I.) 23-03-008 (OII) on March 16, 2023, to assess the potential causes of the extraordinarily high gas and electric prices in California and the western United States during winter 2022-2023.²⁷ An Assigned Commissioner's Scoping Memo and Ruling, issued on September 5, 2023, included 10 key issues for consideration. This White Paper seeks to provide insight on the first two Scoping Memo questions: 1) What factors caused or contributed to observed gas price increases beginning on November 1, 2022? This includes market fundamentals as well as other applicable factors; and 2) Did any of the entities under the Commission's regulatory jurisdiction play a role in causing or contributing to the gas price increase in California border prices between November 1, 2022, and March 31, 2023 (gas price spikes)?

To further develop the record on the first Scoping Memo question, this White Paper summarizes relevant discussions from the February 7, 2023, en banc hearing on the extent of, and reasons for, the high gas prices

²³ EIA. "Natural Gas Weekly Update for week ending December 21, 2022":

https://www.eia.gov/naturalgas/weekly/archivenew_ngwu/2022/12_22/

²⁴ February 6, 2023 Governor Newsom Letter to FERC: GSS_9534-1E-20230206122140 (ca.gov)

²⁵ CPUC Press Release Regarding High Gas Prices En Banc: [CPUC To Hold Hearing on Natural Gas and Electricity Prices \(ca.gov\)](#)

²⁶ CPUC Press Release Regarding Accelerated Climate Credits:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M501/K885/501885176.PDF>

²⁷ See Order Instituting Investigation Issued on March 20, 2023: [503823381.docx \(live.com\)](#)

of winter 2022-2023 and provides additional background information. To develop the record on the second Scoping Memo question, this White Paper shares findings from Energy Division Staff (Staff) analysis of the purchases and sales of gas for core customers by the utilities' core procurement departments: PG&E Core Gas Supply and SoCalGas Gas Acquisition.

Background

Pipelines and Storage

There are nearly 11.5 million gas public utility customers in California.²⁸ More than 90 percent of the gas demand in California homes is driven by water and space heating.²⁹ The state's peak gas demand occurs in the winter due to heating needs driven by cold weather. The gas utilities use a combination of flowing pipeline gas supplies and gas retained in storage facilities to meet customer demand. Approximately 90 percent of California's gas supply comes from out-of-state basins.³⁰ Gas supplies are brought in through the following interstate pipelines: Ruby Pipeline LLC, El Paso Natural Gas Company, Kern River Transmission Company, Mojave Pipeline Company, Gas Transmission Northwest (~~GTN, owned by TC Energy~~) ~~LLC~~ (GTN), Transwestern Pipeline Company, Tuscarora Pipeline, and the Baja Norte/North Baja.³¹

Figure 1 below shows the various gas production basins and interstate pipelines serving California. The gas transported to California gas utilities via the interstate pipelines, as well as some of the California-produced gas, is delivered to the PG&E and SoCalGas intrastate natural gas transmission pipeline systems (commonly referred to as California's "backbone" transmission system). Natural gas on the utilities' backbone transmission systems is then delivered to the local transmission and distribution pipeline systems or to natural gas storage fields.³²

²⁸ According to the 2022 California Gas Report, SoCalGas had 5.874 million customers, PG&E 4.5 million, and San Diego 0.9 million: [Joint Utility Biennial Comprehensive California Gas Report 2022.pdf \(socialgas.com\)](#). According to its 2022 Annual Report p. 33, Southwest Gas has over 0.2 million customers in California: <https://investors.southwestgas.com/static-files/1637f976-c82f-426b-b831-26b700e9676f>

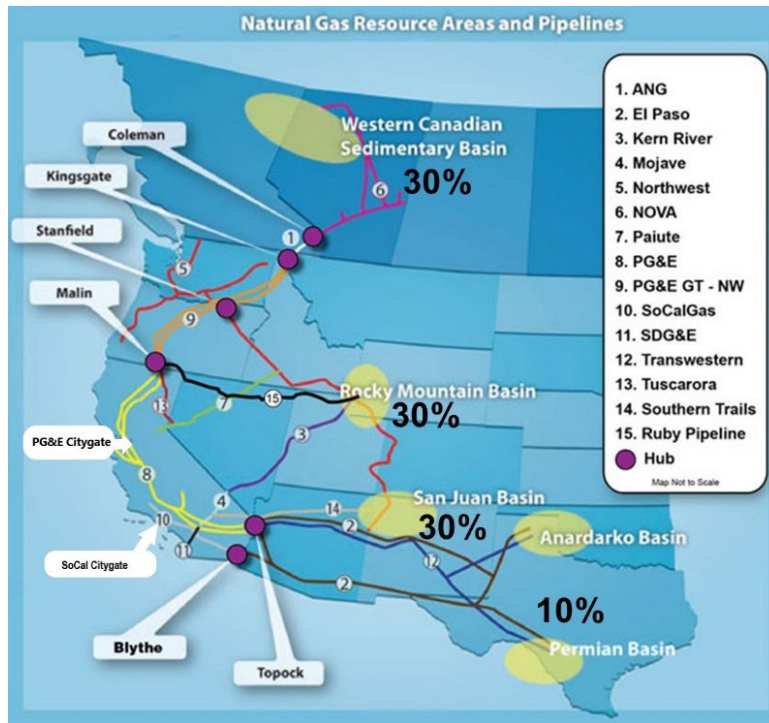
²⁹ Palmgren, Claire, Miriam Goldberg, Ph.D., Bob Ramirez, Craig Williamson, and DNV GL Energy Insights USA, Inc. 2019. 2019 California Residential Appliance Saturation Study. California Energy Commission. Publication Number: CEC-200-2021-005. <https://www.energy.ca.gov/sites/default/files/2021-08/CEC-200-2021-005-ES.pdf>

³⁰ <https://www.energy.ca.gov/data-reports/energy-almanac/californias-natural-gas-market/supply-and-demand-natural-gas-california>

³¹ 2022 California Gas Report, pg. 15: [Joint Utility Biennial Comprehensive California Gas Report 2022.pdf \(socialgas.com\)](#)

³² [Natural Gas and California](#)

Figure 1: Interstate Gas Pipelines and Supply Basins Serving California



Source: CPUC

Gas storage supplements the gas supply flowing through the pipelines and provides three critical services: the ability to meet daily and seasonal demand variation for reliability purposes and the opportunity to mitigate price spikes by providing an alternative to pipeline supplies when gas commodity prices are high. While gas generally flows ratably³³ and slowly via pipelines, gas in storage can respond to sudden peaks in demand much more rapidly because of the proximity of storage fields to demand centers. There are 12 gas storage facilities in California as shown in Figure 2 below. Five of these fields are owned by independent storage providers (ISPs), and the remaining seven are owned by PG&E and SoCalGas.

ISPs are public utilities pursuant to CPUC jurisdiction, but the CPUC has refrained from regulating the prices of their storage services, adopting a “let the market decide” policy³⁴ as ISPs have historically been considered to lack the market power to drive other public utilities out of business.³⁵ All five ISP storage

³³ Ratable gas flow refers to a consistent and steady flow of natural gas over a 24-hour period, with the same amount of gas flowed in each hour.

³⁴ D.00-05-048 (Lodi Gas Storage), 2000 Cal. PUC LEXIS 394 at *106 - 107, Finding of Fact 25: https://files.cpuc.ca.gov/LegacyCPUCDecisionsAndResolutions/Decisions/Decisions_D9901001_to_D0006092/D0005048_20000518_A9811012.pdf.

³⁵ See D.10-10-001 (Central Valley Storage CPCN), pp. 25-26, citing D.00-05-048 at 38–39: https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/125051.PDF. See also D.97-08-055, p. 10: “We

facilities are in Northern California and include: Wild Goose Gas Storage, Lodi Gas Storage, Kirby Hills Gas Storage (all owned by Rockpoint Gas Storage);³⁶ Central Valley Gas Storage (owned by Caliche Development Partners, LLC); and Gill Ranch Gas Storage facility (75 percent owned by Gill Ranch Storage, LLC and 25 percent owned by PG&E). The total working gas capacity of the fields owned by ISPs is 134.67 billion cubic feet (Bcf).

PG&E owns the following three gas storage facilities: McDonald Island, Los Medanos, and Pleasant Creek. The total working capacity of the PG&E storage fields is 51.10 Bcf. PG&E is currently requesting approval to sell the Pleasant Creek facility.³⁷ SoCalGas owns the following four storage facilities: Aliso Canyon, Honor Rancho, La Goleta, and Playa del Rey. The total working capacity of the SoCalGas storage fields is currently 119 Bcf.³⁸ However, during winter 2022-2023, the maximum inventory at the Aliso Canyon gas storage facility (Aliso Canyon) was capped at 41.16 Bcf, and SoCalGas' maximum storage capacity was 91.36 Bcf.

define market power as the ability to sustain revenues, through increased prices or sales, above competitive levels for a significant period of time.”

https://files.cpuc.ca.gov/LegacyCPUCDecisionsAndResolutions/Decisions/Decisions_D9507001_to_D9905055/D9708055_19970801_A9212043.pdf.

³⁶ While not shown on the map, Kirby Hills is owned and operated by Lodi Gas Storage LLC.

³⁷ A.23-07-007. PG&E was required to make a good faith effort to sell Pleasant Creek before the Commission would approve decommissioning the storage facility. See Gas Transmission and Storage Decision, D.19-09-025, p. 75.

³⁸ While the CPUC allowed SoCalGas to fill Aliso Canyon to 68.6 Bcf in D.23-08-050, in winter 2023-24, the field reached the maximum pressure allowed by the California Geologic Energy Management Division (CalGEM) at an inventory of roughly 59 Bcf. If this lower Aliso Canyon capacity is assumed, SoCalGas's total maximum storage inventory is 109.4 Bcf.

Figure 2: California Gas Storage Facilities



Source: 2020 California Gas Report

Natural Gas Regulatory Landscape

Various federal and state agencies oversee key aspects of the natural gas industry. At the federal level, these include the Pipeline and Hazardous Materials Safety Administration (PHMSA), the National Transportation Safety Board (NTSB), and the Federal Energy Regulatory Commission (FERC). In California, they include the CPUC and the California Geologic Energy Management Division (CalGEM, formerly DOGGR). An explanation of the relevant role of some federal and state agencies is included here because some of the events of winter 2022-23, which contributed to the price spikes, fall under the purview of other regulatory agencies than the CPUC.

Pipeline Safety

PHMSA, which is housed within the Federal Department of Transportation, oversees the safety of both the inter- and intrastate natural gas pipeline systems. It is charged with regulating the nation’s approximately 3.4 million miles of natural gas pipelines, including ensuring the safe design, construction, operation, and

maintenance of pipelines as well as leak response. More specifically, PHMSA enforces Pipeline Safety Regulations through Title 49, CFR Parts 190-199.³⁹ PHMSA also recently issued new regulations, colloquially known as the Mega Rule, which aim to enhance pipeline safety and reduce safety incidents.⁴⁰

PHMSA investigated the August 15, 2021, rupture on El Paso Line 2000 that connects Texas' Permian Basin to California. Within days of the fatal explosion, PHMSA issued a Corrective Action Order that required Kinder Morgan, the owner and operator, to isolate or shut down a 38.6-mile section of the pipeline. In addition, PHMSA directed the company to reduce the pressure on the rest of the pipeline while an investigation was completed and a plan for the safe resumption of operation was developed and approved by the agency.⁴¹

The National Transportation Safety Board is another federal agency tasked with investigating pipeline incidents. When the NTSB identifies safety issues during its investigations, it provides guidance to the relevant agency to avoid future accidents. The NTSB worked in conjunction with PHMSA on the Line 2000 incident. It publicly opened its docket on the incident on September 15, 2022, and issued its report on April 27, 2023.⁴²

Inside California, the CPUC and its Gas Safety and Reliability Branch ensures that intrastate natural gas pipelines are designed, constructed, operated, and maintained according to safety standards set by the CPUC and the federal government.⁴³

Underground Gas Storage Safety and Reliability

Underground gas storage facilities that serve interstate commerce and connect to interstate pipelines are regulated at the federal level by FERC. If a storage facility does not serve interstate commerce and connects to an intrastate pipeline system, it is regulated by the relevant state agencies.⁴⁴ In California, CalGEM, which is housed within the Department of Conservation, provides oversight of the oil, natural gas, and geothermal industries, including regulating the drilling, operation, and permanent closure of energy resource wells pursuant to California Resources Code Sections 3106, 3180, 3181, 3220, and 3403.5.⁴⁵

As part of this oversight, CalGEM has primary responsibility for ensuring the safe operation of California's natural gas storage fields. In 2018, CalGEM established new regulations related to underground natural gas

³⁹ [eCFR :: 49 CFR Chapter I Subchapter D -- Pipeline Safety](#)

⁴⁰ Alan Mayberry, PHMSA Presentation, Panel: Understanding Interstate Gas Pipeline Safety, Slide 6: <https://www.cpuc.ca.gov/-/media/cpuc-website/industries-and-topics/meeting-documents/20230207-en-banc/20230207-en-banc---phmsa-presentation.pdf>

⁴¹ PHMSA Corrective Action Order, August 19, 2021: <https://www.phmsa.dot.gov/news/phmsa-corrective-action-order-el-paso-natural-gas-company>.

⁴² NTSB Report on El Paso Line 2000 (Kinder Morgan) pipeline rupture: <https://www.nts.gov/investigations/Pages/PLD21FR003.aspx>,

⁴³ [Gas Safety and Reliability Branch \(ca.gov\)](#)

⁴⁴ [The Basics of Underground Natural Gas Storage - U.S. Energy Information Administration \(eia.gov\)](#)

⁴⁵ Requirements for California Underground Gas Storage Projects: [Microsoft Word - UGS Regulations - ISOR -- 05.10.17.docx \(ca.gov\)](#)

storage facilities in the state. These regulations aim to enhance safety standards, environmental protection, and operational integrity and were issued in response to the 2015 Aliso Canyon gas leak. The regulations mandate rigorous testing, monitoring, and maintenance requirements for gas storage wells, including regular inspections, mechanical integrity assessments, and leak detection protocols.⁴⁶ While increasing the safety of California’s natural gas storage facilities, these regulations have increased the cost of storage operations and decreased the withdrawal capacity of storage fields.⁴⁷

In the aftermath of the Aliso Canyon leak, the legislature passed SB 380, which granted the CPUC authority to determine the range of working gas needed at Aliso Canyon to ensure safety, reliability, and just and reasonable rates. The CPUC modified the maximum Aliso Canyon inventory several times over the subsequent years in response to changing conditions and improved analytics. The most recent adjustment prior to winter 2022-2023 was made on November 15, 2021, when the CPUC increased the maximum allowable inventory to 41.16 Bcf due to economic analysis from Energy Division that showed that reduced availability of Aliso Canyon increased price volatility for both gas and electric ratepayers.⁴⁸ Finally, the CPUC increased the maximum allowable inventory limit from 41 Bcf to 68.6 Bcf on August 31, 2023. Up until the August 2023 decision, noncore customers, such as electric generators, did not have access to storage capacity in Southern California since the limited inventory allowed was needed to support core customer peak demand and system balancing. In its decision to increase Aliso Canyon’s limit to 68.6 Bcf, the CPUC cited the high gas prices of winter 2022-2023 as one of the reasons for the increase. The decision noted that increasing the storage limit would allow SoCalGas to potentially buy cheaper gas during the summer months for use in the winter, which could help soften prices.⁴⁹

In the aftermath of the Aliso Canyon leak, the CPUC also implemented an Aliso Canyon Withdrawal Protocol that defined the circumstances in which gas could be withdrawn from the field. Over time, the CPUC made several changes to the Withdrawal Protocol in response to evolving safety and reliability assessments. In 2017, the Withdrawal Protocol imposed strict limitations on the withdrawal of natural gas from the facility and required SoCalGas to treat Aliso Canyon as an “asset of last resort.”⁵⁰ In July 2019, a revised version of the Withdrawal Protocol was issued, which lifted the asset-of-last-resort requirement but retained other limitations.⁵¹ Finally, the CPUC removed the Withdrawal Protocol in September 2023 to help mitigate the potential for future high gas prices.⁵²

⁴⁶ [Geologic Energy Management Underground Gas Storage Regulations \(ca.gov\)](https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-geologic-energy-management/underground-gas-storage-regulations.pdf)

⁴⁷ See 2023 SB 695 Report, Section, page 106: <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2023/2023-sb-695-report---final.pdf>

⁴⁸ D.21-11-008, pp. 4-7: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M421/K086/421086399.PDF>.

⁴⁹ D.23-08-050, Discussion pp. 13-15; Finding of Fact 5, p. 23

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M519/K806/519806122.PDF>

⁵⁰ CPUC. Aliso Canyon Withdrawal Protocol, November 2, 2017: [11-2protocol-public-utilities-commission.pdf \(ca.gov\)](https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/aliso-canyon/aliso-canyon-withdrawal-protocol-2017-11-02.pdf)

⁵¹ CPUC. Aliso Canyon Withdrawal Protocol, July 23, 2019: [Microsoft Word - UpdatedWithdrawalProtocol 2019-07-23 \(ca.gov\)](https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/aliso-canyon/aliso-canyon-withdrawal-protocol-2019-07-23.pdf)

⁵² CPUC Letter to Rodger Schwecke of SoCalGas re Aliso Canyon Withdrawal Protocol, September 15, 2023: <https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/natural-gas/aliso-canyon/aliso-canyon-withdrawal-protocol-letter-2023-09-15.pdf>.

Transmission and Sales of Natural Gas

FERC regulates interstate gas transportation. Its regulatory authority stems from the Natural Gas Act (NGA) of 1938, followed by Natural Gas Policy Act of 1978 (NGPA), which Congress enacted in response to natural gas shortages at the time. The NGPA granted FERC authority to regulate inter- and intrastate gas production and transmission. It also set ceiling prices for the wellhead sale of natural gas.⁵³ However, through the enactment of the Natural Gas Wellhead Decontrol Act of 1989 (NGWDA), Congress repealed the regulation of wellhead gas prices. This deregulation applied to all first sales from the wellhead to a pipeline, to a local distribution company, and to end users.⁵⁴ The sale price of the natural gas commodity was thus not to be regulated or set by FERC.

FERC regulates the rates, terms, and conditions for the interstate transmission of natural gas by interstate pipelines.⁵⁵ This includes approving the construction and operation of new pipelines as well as setting rates for pipeline capacity to ensure that they are just and reasonable.

FERC's regulatory authority over natural gas commodity sales covers various aspects of the natural gas industry to ensure fair competition, reliability, and consumer protection. While FERC does not set rates for gas commodity sales, it oversees wholesale transactions of natural gas to ensure that these sales do not result in undue discrimination or preferential treatment. As part of its authority, FERC monitors natural gas markets to detect and prevent market manipulation, anti-competitive behavior, and other market abuses. It also oversees the operation of natural gas trading platforms and exchanges.⁵⁶ FERC can impose penalties, fines, and other corrective measures to ensure compliance with regulatory requirements. FERC possesses broad powers under the Natural Gas Act Section 4A, which were added to by the Energy Policy Act of 2005 (EPAct), to investigate and penalize anticompetitive behavior in the interstate natural gas transportation pipelines under its jurisdiction. FERC can open investigations on its own initiative or based on tips from market participants and others. But FERC's NGA Section 4A jurisdiction does not extend to areas in the exclusive jurisdiction of other Federal agencies, such as futures contracts regulated by the Commodity Futures Trading Commission.⁵⁷

While FERC does not discuss ongoing investigations publicly, in a recent report, the agency indicated that it had conducted enhanced surveillance of the winter 2022-2023 high gas prices event. The report also indicated that it made referrals to its Division of Investigations (DOI) for investigation.⁵⁸ However, at the time of the writing of this White Paper, FERC has not released a report on the high gas prices in the West

⁵³ [H.R.5289 - 95th Congress \(1977-1978\): Natural Gas Policy Act | Congress.gov | Library of Congress](#)

⁵⁴ [Natural Gas Wellhead Decontrol Act of 1989 \(ferc.gov\)](#)

⁵⁵ [Natural Gas Pipelines | Federal Energy Regulatory Commission \(ferc.gov\)](#)

⁵⁶ See Title 18, Chapter I, Subchapter A, Part 1C: Prohibition of Energy Market Manipulation: <https://www.ecfr.gov/current/title-18/chapter-I/subchapter-A/part-1c>

⁵⁷ See *Hunter v. FERC*, 711 F.3d 155, 157-158 (D.C. Cir. 2013).

⁵⁸ FERC 2023-2023 Report on Winter Energy Market and Electric Reliability, pp. 80-81: <https://www.ferc.gov/media/fy2023-report-enforcement>

during winter 2022-2023 nor announced any formal investigation of improper market behavior by any party related to winter 2022-2023 events.

Natural Gas Commodity Prices

Natural gas commodity prices are largely a result of supply and demand-side variables. Neither the FERC nor the CPUC regulates the price of the natural gas commodity. Natural gas production, storage inventory levels, and import/export levels are major supply-side factors that can impact the gas commodity price.⁵⁹ Infrastructure constraints, such as major pipeline outages, can also have a significant impact on gas market prices, because they reduce the amount of supply that can be transported to customers. Abundant supplies can help lower gas commodity prices, while a reduction in supplies can have the opposite effect.

On the demand side, customer consumption, weather patterns, and economic conditions can impact commodity prices.⁶⁰ During the spring and fall, commodity prices are typically lower than in summer and winter because of lower demand.⁶¹ As a result, customers have an opportunity to buy gas at these lower prices and fill storage for use during summer and winter peak demand periods. The combination of cold weather and high customer demand in the winter typically causes that season to have the highest commodity prices, particularly if supply is scarce.

Extreme winter weather patterns can affect supply levels by disrupting production or causing well freeze-offs.⁶² This pattern was observed in 2021 when Winter Storm Uri hit Texas and the South-Central United States. Well freeze-offs in Texas caused major supply disruptions and extreme price volatility in February 2021, as illustrated in Figure 3 below.⁶³

⁵⁹ [Factors affecting natural gas prices - U.S. Energy Information Administration \(EIA\)](#)

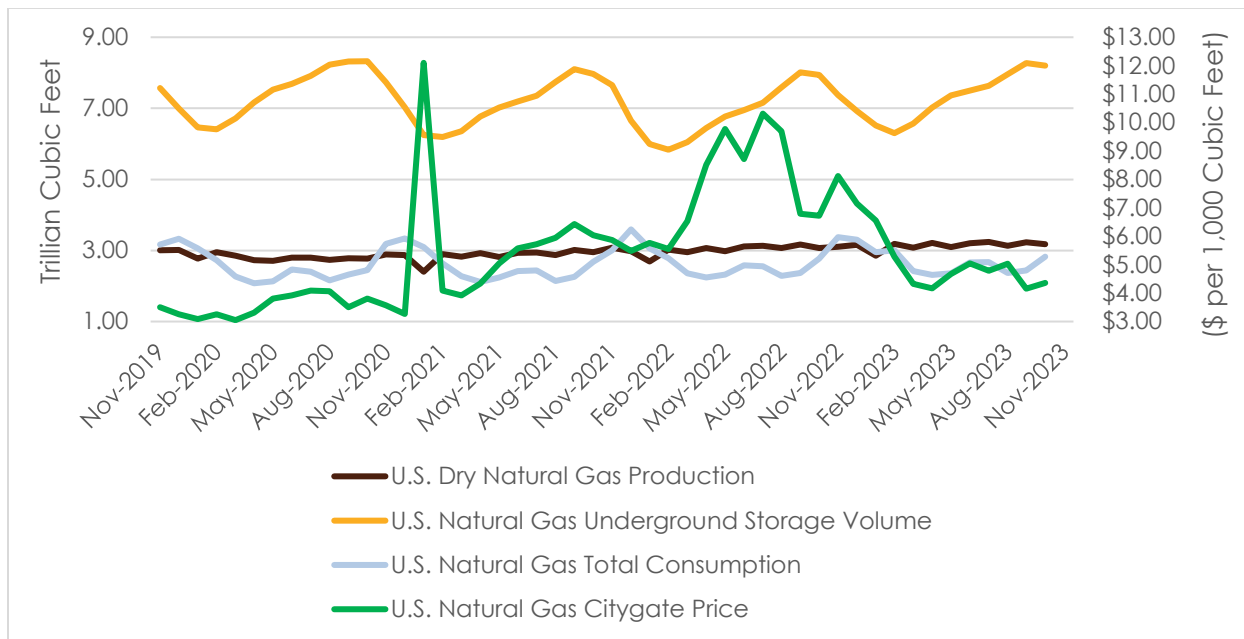
⁶⁰ Id.

⁶¹ Spring and fall are often referred to as “shoulder” seasons.

⁶² A natural gas well freeze-off typically occurs when water vapor in natural gas freezes inside a well or pipeline, leading to a blockage of gas flow. See [Winter storms have disrupted U.S. natural gas production - U.S. Energy Information Administration \(EIA\)](#) (March 13, 2024) for more information for the period Jan 6, 2021 - Jan. 31, 2024).

⁶³ The February 2021 Cold Weather Outages in Texas and the South Central United States | FERC, NERC and Regional Entity Staff Report, pg. 13: <https://www.ferc.gov/media/february-2021-cold-weather-outages-texas-and-south-central-united-states-ferc-nerc-and>

Figure 3: Nov. 2019-Nov. 2023 U.S. Monthly Supply, Demand, and Prices



Source: EIA

California is not immune to price shocks due to events outside of the state since the U.S. gas system is an integrated network. For example, during Winter Storm Uri, gas production from the Permian Basin,⁶⁴ a major supply region for Southern California, dropped by 25 percent.⁶⁵ This drop contributed to average gas prices at the SoCal Citygate⁶⁶ skyrocketing from \$11/million British thermal units (MMBtu) on February 11, 2021, to \$144/MMBtu on February 16, 2021.

At the same time, despite the integration of the U.S. pipeline system, localized surges in demand or pipeline limitations can cause prices to diverge. In winter 2022-2023, the eastern United States had a mild winter overall and low demand⁶⁷—with the exception of the brief period during Winter Storm Elliot⁶⁸—while the western United States experienced prolonged cold and high demand. The difference in weather and demand between the two regions caused prices to diverge as the winter progressed. In addition, the lengthy outage on the El Paso Line 2000 interstate pipeline connecting Texas’ Permian Basin to Southern California contributed to low prices in the Permian and high prices in Southern California. While this divergence may

⁶⁴ The Permian Basin is a natural gas-producing region located primarily in western Texas and southeastern New Mexico.

⁶⁵ Winter 2020-2021 Southern California Gas Conditions and Operations Report: [winter-2020-21-gas-report.pdf \(ca.gov\)](https://www.socalgas.com/wp-content/uploads/2021/02/winter-2020-21-gas-report.pdf).

⁶⁶ The citygate is any point at which the backbone transmission system connects to the distribution system. The citygate is not one specific, physical location and represents a virtual trading point on the natural gas system.

⁶⁷ EIA, Today in Energy, February 15, 2023, “The Henry Hub natural gas spot price declined 41% in January”: <https://www.eia.gov/todayinenergy/detail.php?id=55539>.

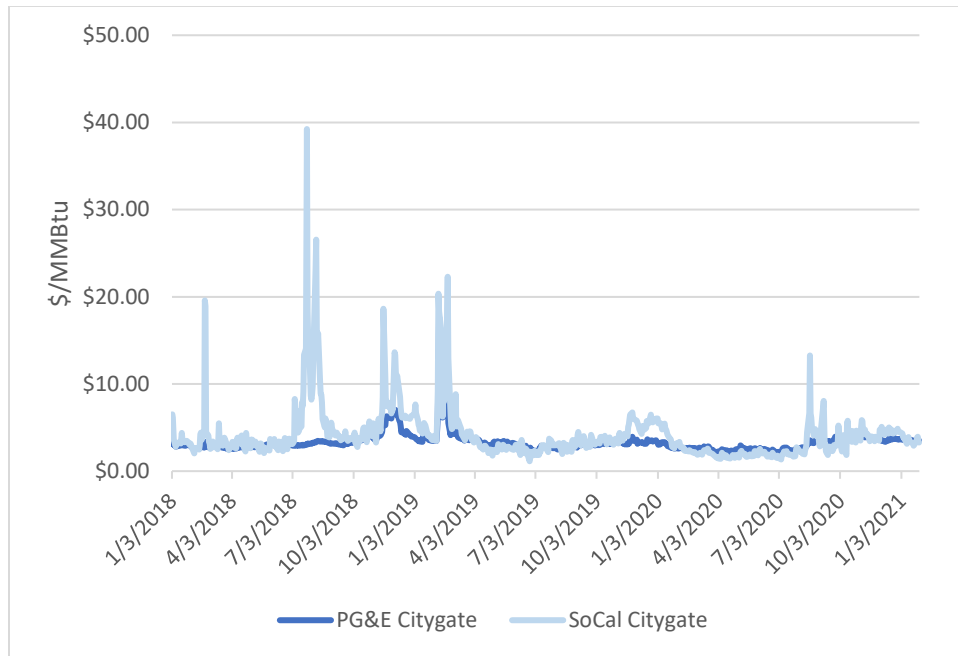
⁶⁸ Inquiry into Bulk-Power System Operations During December 2022 Winter Storm Elliott: [FERC, NERC Release Final Report on Lessons from Winter Storm Elliott | Federal Energy Regulatory Commission](https://www.ferc.gov/2023/01/10/ferc-nerc-release-final-report-on-lessons-from-winter-storm-elliott).

seem counterintuitive, the same pipeline outage that increased scarcity and prices in California led to oversupply and low prices in Texas.⁶⁹

Supply and demand constraints within the state have also impacted commodity prices in recent years. A common feature of in-state infrastructure problems is that, being more localized, they increase the citygate but not the border price. As discussed above, after the Aliso Canyon leak in October 2015, there were significant restrictions placed on the amount of gas that could be stored at the facility and the circumstances under which it could be withdrawn. Unexpected intrastate transmission pipeline outages on the SoCalGas system further compounded the supply issue. During times of high or low temperatures, there was less reliable supply in Southern California than Northern California. The thin margins between supply and demand during notable weather events, including during a summer heatwave in 2018, a 15-day cold stretch in winter 2018-2019, and the extreme heat-related rolling blackouts of summer 2020, resulted in high gas prices in the southern half of the state as shown in Figure 4 below. On the other hand, in recent years customers in PG&E's service territory have had more access to gas storage services, no significant transmission pipeline outages, less exposure to freeze-off prone Texas production basins, and more access to weather-proofed Canadian gas supply sources, so gas prices in Northern California have been relatively tame in comparison to Southern California.

⁶⁹ Much of the gas produced in the Permian Basin is associated gas, meaning it is produced along with oil, so production levels are driven by oil prices. When there is insufficient pipeline capacity to take the gas, prices at the Permian's Waha hub can drop or even go negative because the alternative to selling low is flaring the gas. See related discussions: "Can El Paso South Pipeline Save Waha from Negative Outright Pricing?" <https://btuanalytics.com/natural-gas-pricing/can-el-paso-south-pipeline-save-waha-from-negative-outright-pricing/> and "Natural Gas Prices Go Negative in Texas. Who Wins and Loses?" <https://www.msn.com/en-us/money/markets/natural-gas-prices-go-negative-in-texas-who-wins-and-loses/ar-BB1kV7vx>.

Figure 4: Average PG&E Daily Citygate and SoCalGas Citygate Gas Prices



Source: NGI

Core vs. Noncore Customers

Gas customers are divided into two major categories: core and noncore. Core customers are made up of residential and small business and industrial customers. Most core customers receive “bundled” service, meaning an independent division of the local distribution utility procures the gas commodity on their behalf and delivers it to their premises. Gas customers also have the option to purchase the gas commodity from Core Transport Agents (CTAs) in lieu of their local utility.⁷⁰ In contrast, noncore, or large commercial and industrial customers, either purchase the gas commodity and needed inter- and intrastate transmission pipeline transportation capacity themselves or use a third-party marketer to do it for them.

Within the gas utilities, core procurement departments purchase the gas commodity, pipeline capacity, and storage capacity on behalf of core customers. These departments—Core Gas Supply at PG&E and Gas Acquisition at SoCalGas—are separated by a firewall from the rest of the company. This means that they only have access to public information about gas system operations.

⁷⁰ CTAs are non-utility gas suppliers who purchase gas on behalf of residential and small commercial end-use customers. The CPUC does not regulate the rates CTAs charge, but following the passage of SB 656, CTAs are required to register with the CPUC prior to being active in the state. For more information, see: [Core Transport Agents \(CTAs\) - List and Registration \(ca.gov\)](#).

The CPUC imposes high reliability standards for core customers⁷¹ in large part because interruption of gas service requires each individual pilot light to be relit by a trained professional. Thus, residential outages can last several days or even weeks and be very expensive to remedy, sometimes requiring the import of technicians from throughout the nation to assist the local utility. To protect core customer reliability and to mitigate commodity price volatility, the CPUC requires PG&E Core Gas Supply and SoCalGas Gas Acquisition to fill gas storage to specified levels⁷² and to buy firm gas pipeline capacity contracts⁷³ ahead of the peak winter season.⁷⁴

While there are fixed requirements for firm, long-term interstate pipeline⁷⁵ and storage capacity, the core procurement departments have flexibility in making commodity purchases. To encourage them to get the best price for customers, the CPUC created a gas cost incentive mechanism for each utility that allows them to share in the savings if they buy gas at prices lower than a comparative market index. Aside from this opportunity to earn an incentive, gas commodity costs are a “pass-through” cost, meaning the core procurement departments pass the price they pay for the commodity directly through to customers without a markup.

As noted above, noncore customers are responsible for procuring their own gas supplies and scheduling delivery on the inter- and intrastate systems. They are also different from core customers in that the utility is held to a lower standard for noncore transportation reliability.⁷⁶ In a series of decisions in the late 1980s and early 1990s, the FERC⁷⁷ and the CPUC⁷⁸ unbundled firm pipeline transportation from sales of gas, providing noncore customers access to unbundled firm interstate pipeline capacity and the ability to purchase the natural gas commodity on their own. Noncore customers are large commercial and industrial customers, including electric generators, as well as gas marketers who bring gas to the citygate to sell to other customers.

In Northern California, noncore customers have access to gas storage through independent storage providers. In Southern California, which has no ISPs, noncore customers did not have direct access to new

⁷¹ The core reliability standard is one outage in 35 years for SoCalGas and one in 90 years for PG&E.

⁷² The CPUC first required PG&E to hold storage withdrawal capacity sufficient to meet 1-in-10-year peak day demand in D.06-07-010. The specific amount required has been updated in subsequent decisions.

https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/58338.PDF. In D.06-09-039, Ordering Paragraphs 2 and 6, the CPUC ordered both utilities to “plan their backbone and storage systems so as to meet the peak day criteria already in place for their local transmission systems” and “the probability of storage withdrawal and the deliverability of withdrawn gas during periods of peak demand”:

https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/60237.PDF.

⁷³ D.04-09-022 established interstate pipeline capacity contract requirements.

⁷⁴ SoCalGas’ Gas Acquisition Department procures gas for SoCalGas and San Diego Gas & Electric (SDG&E) core customers.

⁷⁵ For winter, the CPUC requires the utilities to hold firm interstate capacity equal to a specified percentage of average seasonal core demand: 100-162 percent for SoCalGas and 100-120 percent for PG&E. The utilities use this transportation capacity to bring gas purchased outside the state to California.

⁷⁶ The noncore reliability standard is one outage every two years for PG&E and one every 10 years for SoCalGas.

⁷⁷ See, e.g., Order Nos. 436, 500, and 636

⁷⁸ See D.91-11-025.

gas storage contracts between October 23, 2015, and August 31, 2023, due to restrictions on the maximum inventory at Aliso Canyon put in place after the 2015 leak. In August 2023, the CPUC increased the Aliso Canyon maximum inventory from 41 Bcf to 68.6 Bcf, and noncore customers regained access to storage in Southern California.⁷⁹

Core Purchasing

Since core customers constitute about one-third of gas consumption in California,⁸⁰ and 40-50 percent during winter months,⁸¹ PG&E Core Gas Supply and SoCalGas Gas Acquisition (together “the gas utilities”) are among the largest purchasers of gas in the state and are major participants in Western gas markets. They buy and sell contracts for gas delivery, participating in the same gas commodity markets that serve noncore customers.

Gas is traded on publicly noticed market exchanges and through bilateral transactions. The major gas market exchanges used by California gas utilities are the Intercontinental Exchange (ICE) and the New York Mercantile Exchange (NYMEX), which are primarily online. Bilateral transactions may be conducted more directly by phone or instant message. Gas utilities may also hire brokers to buy and sell gas on their behalf. The market exchanges and brokerages enable “blind” transactions, wherein the buyer and seller do not know each other’s identity until after they have agreed to the transaction. If the buyer and seller know each other’s identity, the transaction is not blind. For example, gas utilities may reach out to known sellers to solicit offers, in which case the resulting transaction, if it occurs, will not be blind.

Gas is sold under long-term, monthly, and spot market contracts. Because the gas market is volatile, every type of contract comes with its own benefits and risks.

- *Long-term contracts* are longer than monthly contracts, with the length set by contracting parties, and can be signed at any time, even a year or more in advance of gas delivery. They typically involve delivery of the same amount of gas every day, with buyers being obligated to “take or pay,” meaning they must pay for the gas even if they don’t need it. Therefore, the risk for buyers of long-term contracts is that their demand for gas will decline below the amount agreed to in the contract or that it will vary significantly from day to day. On the other hand, long-term contracts can provide more certainty and reliability than monthly and spot markets transactions. Most of the gas utilities’ long-term commodity contracts for winter gas are transacted during the year leading up to gas delivery as the utility builds its portfolio of gas contracts for the winter.
- *Monthly contracts* are generally purchased during the month (or two) preceding gas delivery and provide the same amount of gas every day for the subsequent month. Often monthly contracts are bought

⁷⁹ <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M519/K806/519806122.PDF>

⁸⁰ Joint Agency Staff Gas Transition White Paper, pg. 47.

<https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M525/K660/525660391.PDF>.

⁸¹ Based on responses to CPUC Energy Division Data Requests on Gas Demand 2010-2023, sent on March 15, 2024, responded to on March 22, 2024, by PG&E and on March 29, 2024, by SoCalGas.

during “bidweek,” defined as the first three of the last five gas trading days before the new month begins. For buyers, monthly contracts provide more flexibility and demand-responsiveness than long-term contracts, since the time commitment is shorter, but they may also be more expensive.

- *Spot market contracts*, sometimes known as daily or cash market contracts, are typically short, often for one or several days of gas delivery. The gas utilities usually make their spot market gas purchases no more than five days of the gas being received, and often on the day before. Some spot market transactions occur after the gas has been received—that is, buyers and sellers are balancing the books for gas already consumed.^{82, 83} Spot market contracts are the most flexible, but they are also the most volatile. Prices can reach dramatic highs unexpectedly, as during Winter Storm Uri in 2021, when gas prices in Oklahoma peaked at \$1,250/MMBtu.⁸⁴

While contracts are transacted at different times, the price is not necessarily set at the time the contract is confirmed. It may be set at that time, i.e., “fixed;” or it may be “indexed,” i.e., pegged to a monthly market index.

- *Fixed-price contracts* provide absolute certainty to a buyer and seller. However, for the buyer they entail the risk that the market price of gas may drop below the agreed-upon price in the future. For the seller, the risk is that the price of gas increases significantly, and the seller is bound by the contract to deliver the agreed-upon amount of gas at a loss.
- *Indexed contracts* avoid the need to guess what a “good” price would be and, in the case of long-term contracts, reduce the risk of sustained losses for the seller. Buyers and sellers can commit to indexed contracts long in advance with the mutual understanding that the price will be “fair” i.e., consistent with the market. For the buyer, the risk of indexed-price contracts is that the market price increases significantly in the future with the buyer still bound to take or pay.

While indexed contracts are more common, fixed-price contracts are used to calculate the price indices on which indexed contracts depend.

Common price indices are published by Natural Gas Intelligence or in Platts’ *Gas Daily*, Platts’ *Inside FERC*, or for Canadian locations, Platts’ *Canadian Gas Price Reporter*. These indices are based on trades voluntarily

⁸² Spot market transactions can occasionally include negative prices, i.e., a seller with excess gas compared to their consumption pays the recipient to receive its gas. High Operational Flow Orders, which penalize buyers for bringing more gas onto the system than they consume, can contribute to this practice.

⁸³ An Operational Flow Order (OFO) is a mechanism that requires shippers to balance their deliveries with their demand within a specified tolerance band. Shippers are subject to financial penalties if the difference between their deliveries and demand falls outside of the specified tolerance band.

⁸⁴ Utility Dive, February 19, 2021, “FERC investigates possible market manipulation during Winter Storm Uri”: <https://www.utilitydive.com/news/ferc-investigates-market-manipulation-winter-storm-uri-enforcement/610333/>.

reported to the indexing companies by market participants.⁸⁵ All four of these sources are used in contracts by both utilities.

Each indexing company uses its own methodology to compose its indices and charges substantial fees for access to its indices and other market data.

- *Monthly index prices* are based on a volume-weighted average of all fixed-price transactions conducted during bidweek for daily delivery throughout the subsequent month at the index’s pricing location(s).⁸⁶
- *Daily index prices* are based on fixed-price spot market transactions.

The gas price paid under indexed contracts commonly consists of the price index published by a specified company at a given location plus a fixed cost (in cents) per MMBtu.

Gas is bought and sold at trading hubs throughout the country, each of which represents a physical location connected to gas transmission pipelines or a utility’s citygate, discussed below. PG&E Core Gas Supply and SoCalGas Gas Acquisition purchase gas primarily at locations in the western states and Canada, at the California border, within the state, and at their own and each other’s citygates. For out-of-state sources, they buy in the Permian and San Juan Basins in Texas and New Mexico (trading hubs: El Paso San Juan, El Paso Permian, Transwestern Permian, and subsidiary locations such as Waha); in the “Rockies” of Wyoming and parts of Colorado (trading hubs: Northwest Rockies/Opal, Ruby, Colorado Interstate Gas etc.); and from western Canada including via Oregon (Alberta Energy Company (AECO NOVA), Gas Transmission Northwest (GTN) locations, etc.).

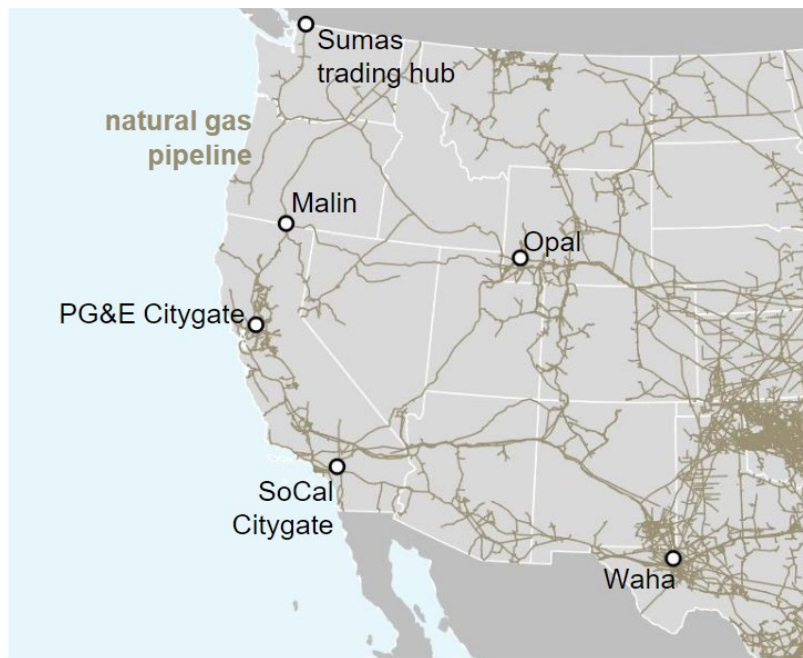
Gas moves from production basins to the California border via interstate pipelines. From there, the intrastate “backbone” transmission system brings gas into the state. To bring gas molecules into California, a customer must purchase capacity on both an interstate pipeline and from the relevant utility’s backbone transportation service to get it to the “citygate.” The citygate is the point at which gas is transferred from the intrastate transmission pipeline to the local distribution network.⁸⁷ From the citygate, the gas utility delivers the gas to end users. Although gas sold at the citygate is purchased within California, it is typically produced outside the state and brought to the citygate by a shipper hoping to make a profit in the citygate market. If a customer purchases gas at the citygate that means that the seller has paid for all the transportation costs to get it there.

⁸⁵ Natural gas buyers and sellers are not required to report their transactions to publishers of price indices, but if they do, the FERC requires that they consistently report their daily and/or monthly transactions. See FERC, “FERC Approves Natural Gas Price Indices Updates,” April 2022, <https://www.ferc.gov/news-events/news/ferc-approves-natural-gas-price-indices-updates>.

⁸⁶ The publishers of index prices calculate them using data on negotiated fixed-price transactions, including transactions on ICE and those reported directly by transacting parties. See Natural Gas Intelligence, *NGI Price Index Methodology, Code of Conduct & Point Descriptions*, Updated January 1, 2024, <https://www.naturalgasintel.com/wp-content/uploads/2020/05/NGIMethodology.pdf>. Platts and S&P Global, *Methodology and Specifications Guide US and Canada Natural Gas*, March 2024, <https://www.spglobal.com/commodityinsights/en/our-methodology/methodology-specifications/natural-gas/us-and-canada-natural-gas-methodology>.

⁸⁷ Definition of citygate: <https://www.naturalgasintel.com/what-is-a-natural-gas-citygate/>.

Figure 5: Natural Gas Trading Hubs and Pipelines in the Western United States (2022)



Source: U.S. Energy Information Administration.

Citygate prices are almost always higher than California border prices for ~~several~~two reasons. First, they entail more transportation costs.⁸⁸ ~~Second, the market at a citygate is often “thinner,” meaning there are fewer buyers and sellers to choose from. Third~~Second, outages on the intrastate transmission system can create scarcity within California that does not impact the border price.⁸⁹ Despite these disadvantages, the citygate is a convenient location for buyers to make “last-minute” purchases since no further transmission-level transportation arrangements are required. ~~The high volume of trading at PG&E Citygate that winter is also discussed in the “Monthly Pricing Impacts” section below. CAISO also discusses the relationship between prices at California citygates and other hubs in their February 2023 report on *Gas Conditions and CAISO Markets*.~~⁹⁰

Gas utilities’ core procurement departments primarily buy and sell gas to match the amount needed to serve forecast core demand. However, because reliability is such a high priority for core customers, they also buy somewhat above forecast to ensure they have enough gas in case demand is higher than expected. If the gas

⁸⁸ EIA, “Market dynamics vary at key natural gas pricing hubs,” October 23, 2024: <https://www.eia.gov/todayinenergy/detail.php?id=63504>

⁸⁹ At times citygate prices are lower than those at the border. This typically happens when there is a supply disruption outside the state, and there is plenty of storage inside California. Since customers can withdraw gas from storage rather than pay for pipeline gas, citygate sellers have less leverage and must accept lower prices.

⁹⁰ CAISO, *Gas Conditions and CAISO Markets*, February 2023: <https://www.caiso.com/Documents/Gas-Conditions-and-CAISO-Markets-Report-for-Dec2022-Jan2023.pdf>.

is not needed, they either sell the excess or inject it into storage. They may also buy and sell to reduce core customer costs.

PG&E Core Gas Supply and SoCalGas Gas Acquisition determine their own balance of long-term, monthly, and spot market gas purchases; the locations from which they buy gas; the manner of purchase, i.e., from a known counterparty or on a blind trading platform like ICE; and the contract structure, e.g., fixed or indexed. Prior to 1993, the CPUC conducted after-the-fact reasonableness review on all core gas purchases in a formal proceeding, often spending months or years in the process. Beginning in 1994, the CPUC replaced reasonableness reviews with gas price incentive mechanisms, known as the Core Procurement Incentive Mechanism (CPIM) for PG&E and the Gas Cost Incentive Mechanism (GCIM) for SoCalGas.⁹¹ As noted above, the CPUC also requires the utilities to purchase firm, long-term interstate pipeline contracts and specifies minimum storage holdings.

Core Customer Rates

The CPUC regulates the rates that gas utilities charge customers through a regulatory process with the goal to provide safe, reliable service at just and reasonable rates. A core customer's bill consists of the following rate components:

- *Core procurement rate:* covers the various costs of buying gas supplies and getting those supplies to the utility's transmission pipeline system. The main component of those costs is the price of the gas itself. The procurement rate is changed every month to reflect fluctuations in gas prices. Updating the core procurement rate monthly provides a relatively timely price signal to customers when commodity prices are high and it is important to conserve. At the same time, passing commodity prices through every month doesn't provide much warning to customers when gas prices increase suddenly or allow the impact of short-term price spikes to be spread out over several months.
 - » While the utilities pass on their gas procurement costs to customers without a mark-up, they have the opportunity to earn a financial incentive if gas supplies were purchased at below market benchmark prices (see discussion of GCIM and CPIM above).
- *Transportation rate:* covers the utilities' costs of delivering gas to customers through their major intrastate pipeline systems, including Operations & Maintenance (O&M) expenses, Administrative & General (A&G) expenses, taxes, etc., as well capital costs, on which a utility has the opportunity to earn a rate of return. Transportation rates are changed at least every January 1 but may be changed during the calendar year as well.

⁹¹ The CPUC approved SoCalGas' first GCIM in D.94-03-076. PG&E's CPIM was formally approved in D.97-08-055 https://files.cpuc.ca.gov/LegacyCPUCDecisionsAndResolutions/Decisions/Decisions_D9507001_to_D9905055/D9708055_19970801_A9212043.pdf.

»The CPUC approves most utility costs that it determines to be reasonable on a forecast basis in its General Rate Case process or through other proceedings. Such costs are recovered in the transportation rates that are charged to customers.

- *Gas Public Purpose Program (PPP) Surcharge*: covers the costs of mandated public purpose programs, including a subsidy for low-income customers, energy efficiency programs, and a gas research and development program. The Gas PPP surcharge is also changed every January 1 and typically is not changed during the calendar year.

Winter 2022-2023 High Gas Prices

Gas Market Trends in 2022

While high California gas prices started to receive widespread attention in December 2022, there were several notable trends that impacted gas markets prior to winter. International, national, and regional events caused the price of natural gas to rise. Russia's invasion of Ukraine in February 2022 disrupted global natural gas markets, leading to increased exports of U.S. liquefied natural gas (LNG). For example, approximately 34 percent of U.S. LNG cargos went to Europe in 2021 compared to 75 percent in 2022, with total U.S. exports to Europe increasing from 1,218 billion cubic feet (Bcf) to 2,662 Bcf. Total U.S. exports also increased from 6,652 Bcf in 2021 to 6,904 Bcf in 2022.⁹² This geopolitical situation put pressure on U.S. gas markets, increasing competition and gas prices. As a result, U.S. customers had less financial incentive to ramp up gas storage injections during the spring and summer because prices were comparable—or even higher—than winter prices were expected to be. Despite those incentives, PG&E Core Gas Supply and SoCalGas Gas Acquisition filled gas storage per the CPUC's requirements. However, in aggregate, California's noncore customers chose to inject considerably less gas into the available ISP storage than in a typical year.

One of the most impactful regional events on price trends was the El Paso Line 2000 interstate pipeline outage, which started after a fatal explosion on August 15, 2021, and lasted until February 15, 2023. The map (Figure 6) below displays the location of the outage. The pipeline failure exacerbated conditions in the Southwest and led to supply disruptions impacting Southern California.⁹³ The resulting loss in capacity amounted to approximately 591 MMcf through the area served by the ruptured segment. The impact of the Line 2000 outage on Southern California specifically was an approximately 468 MMcf, or 21 percent, delivery loss to the Ehrenberg receipt point located on the SoCalGas Southern System.⁹⁴ SoCalGas relies on the El Paso natural gas pipeline system for deliveries, especially for its Southern System where there are no gas storage fields.⁹⁵

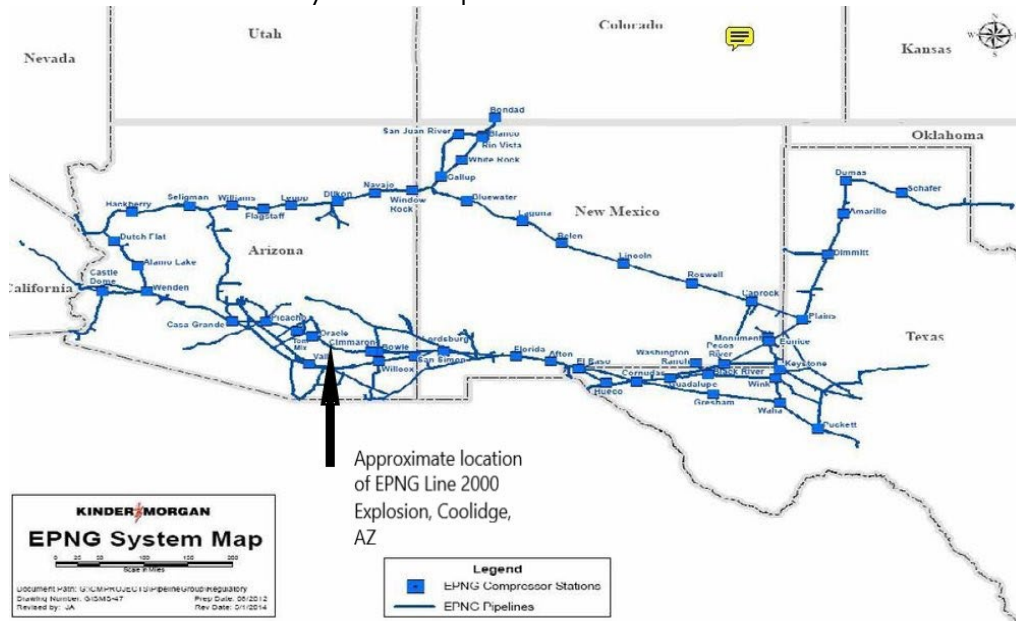
⁹² [EIA expects U.S. natural gas prices to remain high through 2022 - U.S. Energy Information Administration \(EIA\)](#)

⁹³ Rodger Schwecke, SoCalGas Presentation, Panel: Current Gas Market Conditions and Prices: [10 - Pipelines Template \(ca.gov\)](#)

⁹⁴ [Natural Gas Weekly Update \(eia.gov\)](#)

⁹⁵ Rodger Schwecke, SoCalGas Presentation, Panel: Current Gas Market Conditions and Prices: [10 - Pipelines Template \(ca.gov\)](#)

Figure 6: El Paso Natural Gas System Map



Source: CEC En Banc Presentation

As part of its regular monitoring of gas prices, Staff became aware of certain price trends in summer 2022 when winter price forecasts were around \$12/MMBtu.⁹⁶ Staff requested information from PG&E and SoCalGas in August 2022 about the potential impact from anticipated high gas prices on winter 2022-2023 residential customer gas bills.⁹⁷ Furthermore, although the CPUC does not have authority over natural gas commodity prices, Staff asked PG&E and SoCalGas about actions the utilities had taken or planned to take to help mitigate the impact of gas commodity price spikes and to alert customers to potentially high winter bills. Both PG&E and SoCalGas indicated that their winter customer message campaigns would include information about natural gas costs and tips on how customers could save on winter gas bills.

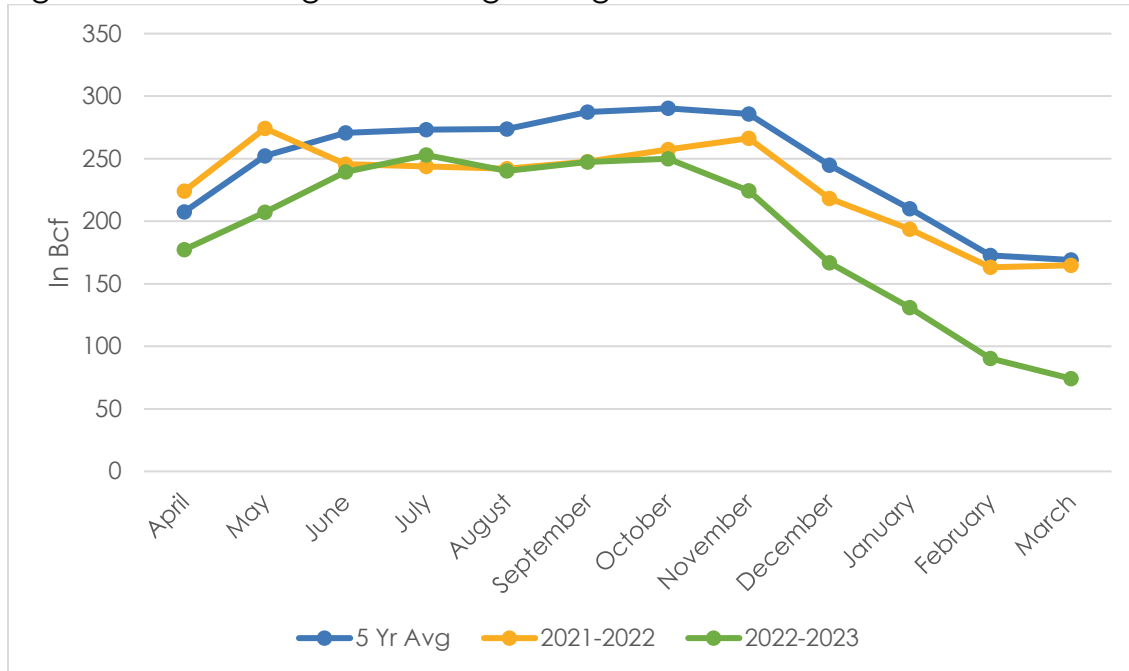
Pacific storage levels heading into winter 2022-2023 were below the previous year and the five-year average, which contributed to price volatility. As illustrated in Figure 7 below, inventory levels on April 1, 2022, were significantly lower than both April 1, 2021, and the five-year average. While storage levels during the spring 2022 “shoulder” season climbed above the previous year’s storage levels, they were still lower than the five-year average. By the start of the winter (November 1, 2022), storage levels in the Pacific region were notably low compared with November 1, 2021, and the five-year average.

⁹⁶ Actual winter prices were much higher than forecasted, reaching a peak of \$57/MMBtu at the PG&E Citygate and \$49/MMBtu at the SoCal Citygate as shown in Figure 11 below.

⁹⁷ August 10, 2022, emails from Staff to SoCalGas and PG&E.

A significant dip is observed in June 2021 due to PG&E’s reclassification of 51 Bcf of working gas to base gas on June 11, 2021.⁹⁸ This change also created uncertainty in the gas market. In a June 24, 2021, Natural Gas Weekly Update, the EIA reported on PG&E’s reclassification, noting that it was the “largest single day reduction in working gas ever reported at the PG&E storage facility.”⁹⁹ While the reclassification did not physically reduce the amount of gas in PG&E’s storage, it affected the data that EIA uses to calculate working gas levels, hence the unusual drop in storage levels observed in the June 2021 timeframe.

Figure 7: Pacific Region Working Storage Levels



Source: EIA

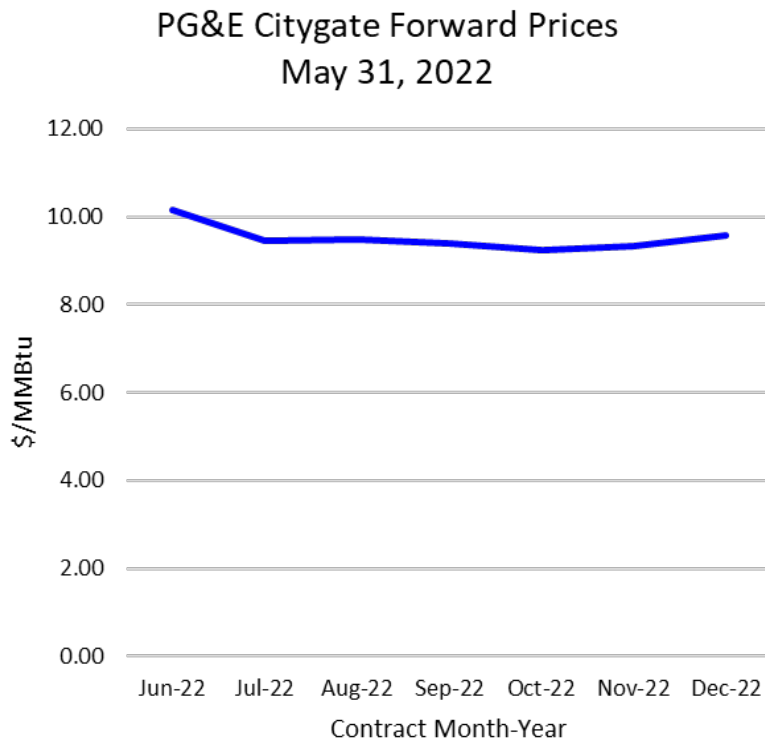
While market participants often store gas for price protection, the price spread between spring and winter prices generally dictates how much gas they buy ahead of the winter season. A large spring-winter spread was not observed in 2022; in other words, spring prices were not notably lower than forecasted winter prices. Thus, injection season forward prices discouraged market participants from filling gas ahead of the winter season.¹⁰⁰ An example of this price trend is illustrated in Figure 8 below, which displays PG&E Citygate Forward Prices as of May 31, 2022, for June through December 2022.

⁹⁸ Working gas is the volume of gas in a storage facility that can be withdrawn for use while base gas is the volume of gas that needs to remain in a storage facility to provide adequate pressure and thus withdrawal deliverability. For more information, see: [The Basics of Underground Natural Gas Storage – U.S. Energy Information Administration \(eia.gov\)](https://www.eia.gov/naturalgas/weekly/archivenew/ngwu/2021/06_24/)

⁹⁹ June 23, 2021 Natural Gas Weekly Update: [https://www.eia.gov/naturalgas/weekly/archivenew_ngwu/2021/06_24/](https://www.eia.gov/naturalgas/weekly/archivenew/ngwu/2021/06_24/)

¹⁰⁰ Gillian Clegg, PG&E Presentation, Panel: Current Gas Market Conditions and Prices, Slide 4: [PG&E Presentation Template \(ca.gov\)](#)

Figure 8: PG&E Citygate Forward Prices May 31, 2022



Source: PG&E En Banc Presentation

Winter 2022-2023

The natural gas winter begins on November 1, and cold temperatures swept across the West shortly thereafter, with California experiencing its coldest November since 2000.¹⁰¹ With cold weather came high early-season demand for natural gas. Additionally, the prolonged drought increased gas-fired electric generation demand in the CAISO and other western markets due to lower hydroelectric imports and in-state hydropower. For example, electric generation demand on the PG&E system was 19 percent higher from November 2022 through January 2023 compared to November 2021 through January 2022.¹⁰²

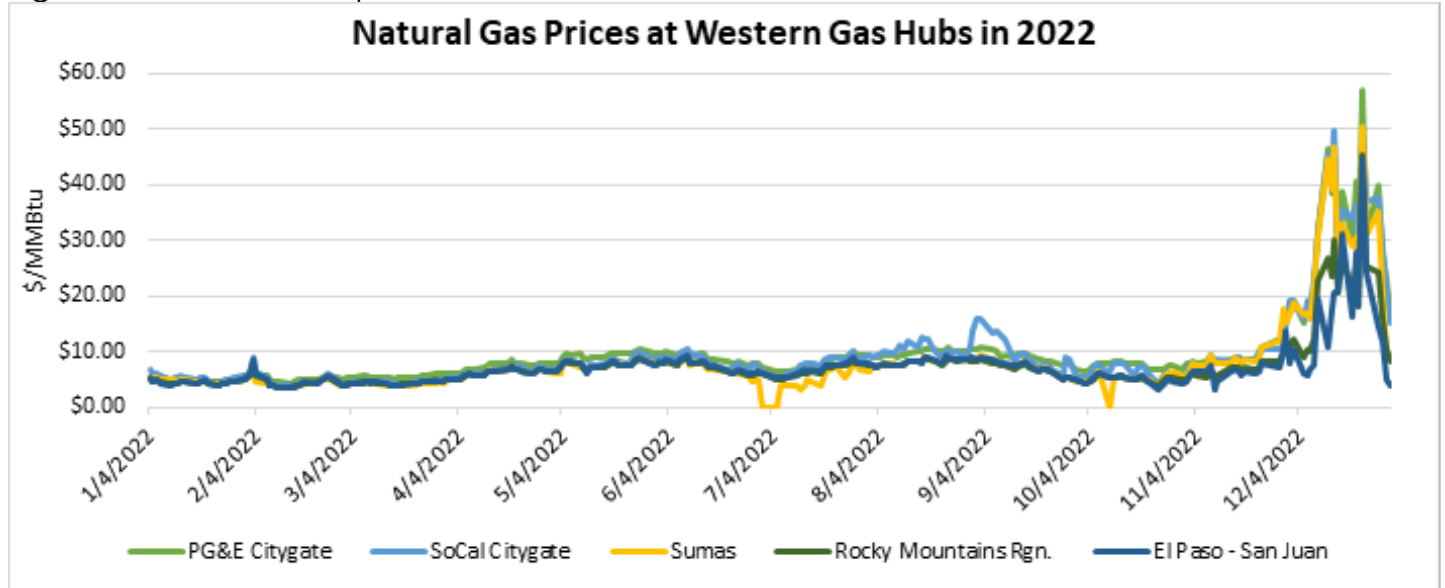
Gas prices started to rise sharply in mid-December at gas hubs across the West, including in California, Washington, Oregon, Wyoming, Arizona, Nevada, and Colorado. Figure 9 below illustrates natural gas wholesale prices at the PG&E and SoCalGas Citygates. The three other regional hubs in the figure serve California. As shown in the figure, the PG&E and SoCal Citygate natural gas prices trended very closely

¹⁰¹ EIA, Today in Energy, March 25, 2024, “December natural gas price in Southern California was the lowest since 2015,” <https://www.eia.gov/todayinenergy/detail.php?id=61644>.

¹⁰² Gillian Clegg, PG&E Presentation, Panel: Current Gas Market Conditions and Prices, Slide 3: [PG&E Presentation Template \(ca.gov\)](#).

with regional prices. Between 2021 and 2022, average spot prices for December increased by 514 percent at the PG&E Citygate and 416 percent at the SoCal Citygate.

Figure 9: Natural Gas Spot Prices at Western Gas Hubs in 2022



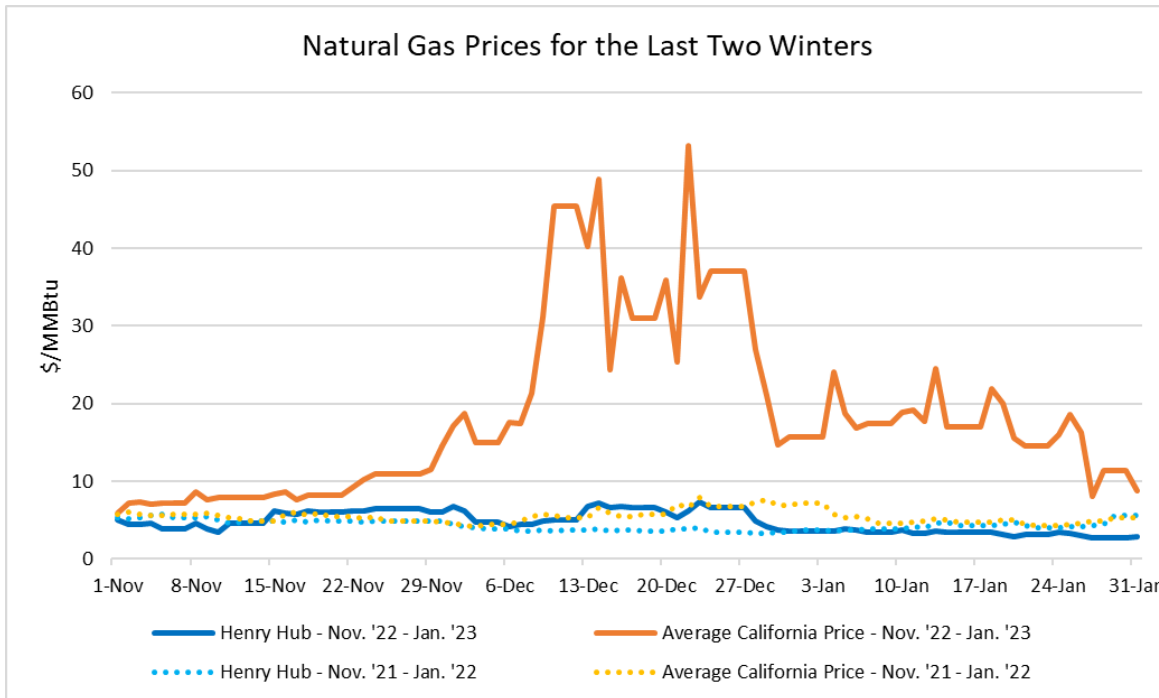
Source: NGI

Average California spot market gas prices started to climb in early November and hit a peak of \$53.11 on December 22, which was seven times higher than the price at Henry Hub¹⁰³ on the same date, as shown in Figure 10 below.¹⁰⁴ Price spikes were not unique to California but also experienced in other Western and Southwestern hubs, as shown in Figure 9 above.

¹⁰³ Henry Hub is a well-known gas trading hub in Louisiana, which serves as a good comparative price point when studying market prices.

¹⁰⁴ Aleecia Gutierrez, California Energy Commission, Panel 1 Presentation: [CEC Official PowerPoint Template 2022 \(ca.gov\)](#)

Figure 100: Average Natural Gas Prices for November-January 2021-2022 and 2022-2023



Source: CEC En Banc Presentation

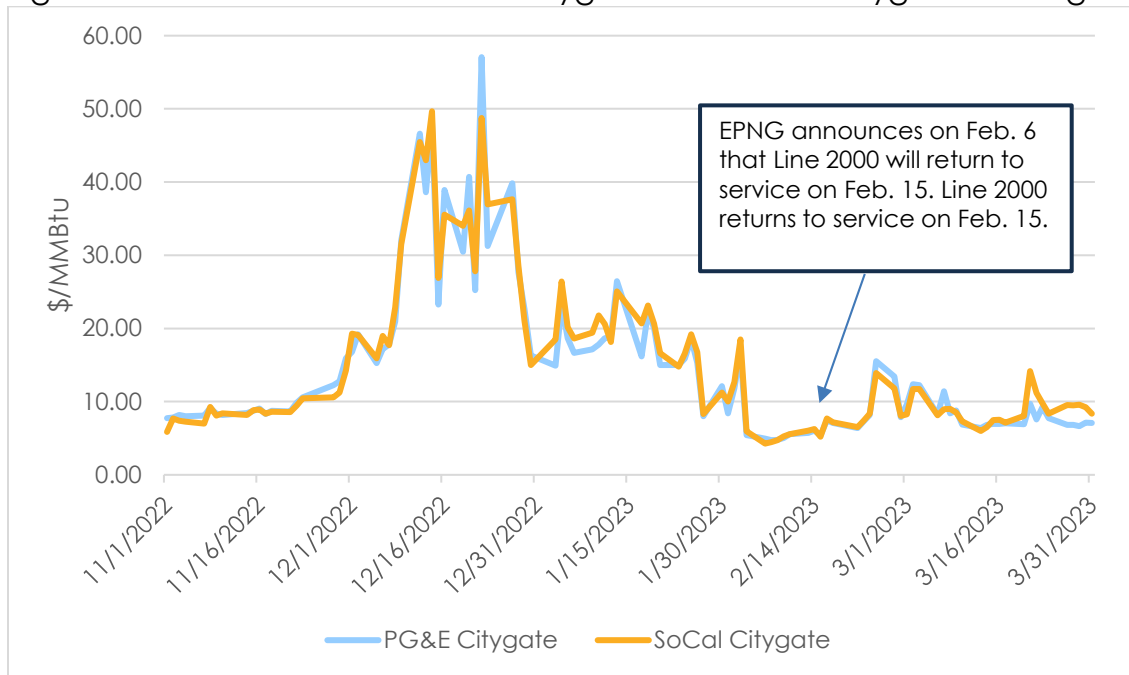
The Line 2000 outage on the El Paso South Mainline, coupled with other force majeure and planned pipeline maintenance events, led to reduced interstate pipeline capacity in the Western region in December 2022 and affected regional pricing.¹⁰⁵ There were multiple maintenance activities on the El Paso North Mainline, which brings supplies to SoCalGas’ Northern System and can provide an alternative path to the El Paso and SoCalGas Southern Systems via the Mojave Pipeline and Line 1903. There was a pipeline capacity reduction of approximately 739 MMcf/d due to El Paso North Mainline maintenance throughout December 2022 as well as a roughly 500 MMcf/d capacity reduction throughout January 2023.¹⁰⁶ Coupled with the 591 MMcf/d of capacity loss from the El Paso Line 2000 outage, the total capacity reduction from El Paso’s outages significantly impacted how much supply was able to come into Southern California and particularly SoCalGas’ Southern System. Additionally, the GTN system, which brings supplies to the PG&E system, experienced maintenance activity at Kingsgate. The maintenance decreased takeaway capacity by 8 percent on December 6 and December 7 and limited supply to GTN-Stanfield.¹⁰⁷

¹⁰⁵ Aleecia Gutierrez, CEC Presentation, Panel: Current Gas Market Conditions and Prices: [CEC Official PowerPoint Template 2022 \(ca.gov\)](#)

¹⁰⁶ See El Paso Natural Gas Maintenance posting for more information: [Informational Postings :: EL PASO NATURAL GAS CO. L.L.C. \(kindermorgan.com\)](#)

¹⁰⁷ Platts Gas Daily December 5, 2023.

Figure 111: Winter 2022-23 SoCal Citygate and PG&E Citygate Average Daily Prices



Source: NGI

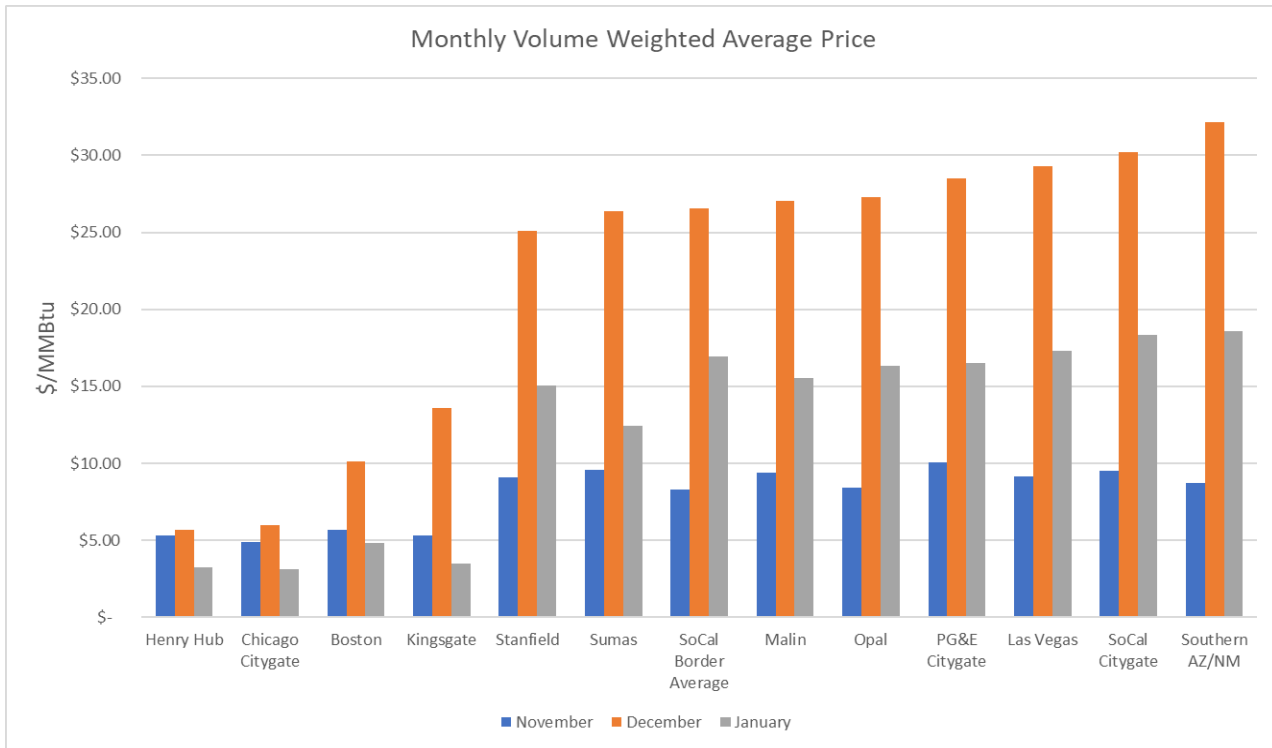
In comparison, prices in eastern hubs, like Chicago and Boston were generally lower than California¹⁰⁸ but higher than normal from December 21 to December 26, 2022, due to Winter Storm Elliot. The storm caused record cold temperatures across the Northeast, Midwest, and Southeast, which interrupted natural gas production and shut down dozens of power plants, while simultaneously increasing demand to an all-time United States daily record level on December 23.¹⁰⁹ As a result, natural gas prices increased in various parts of the U.S. during the last week of December but particularly in the Northeast region.¹¹⁰

¹⁰⁸ See *Id.*

¹⁰⁹ FERC, NERC Winter Storm Elliot Report, pg. 112-113: [Winter Storm Elliott Report: Inquiry into Bulk-Power System Operations During December 2022 | Federal Energy Regulatory Commission \(ferc.gov\)](#). The all-time level daily demand level has since been exceeded on January 16, 2024. [U.S. natural gas consumption established a new daily record in January 2024 - U.S. Energy Information Administration \(EIA\)](#).

¹¹⁰ FERC, NERC Winter Storm Elliot Report, pg. 54.

Figure 12: Average Daily Prices for November-January 2022-2023 Weighted by Volume¹¹¹



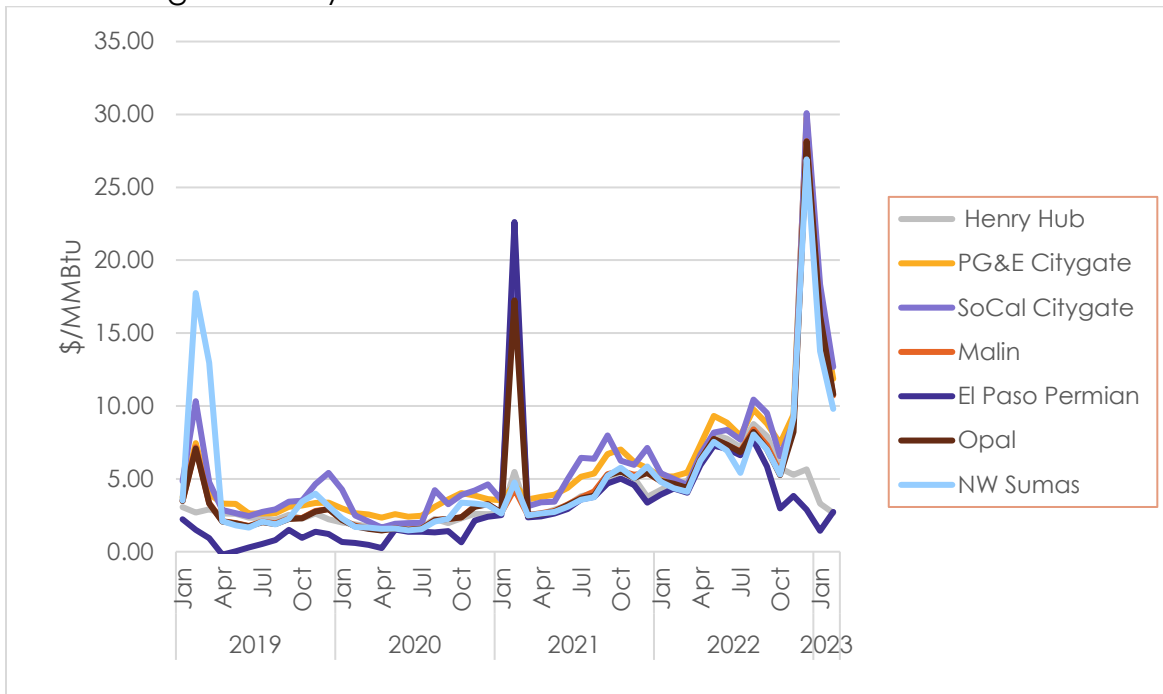
Source: CEC En Banc Presentation

Figure 13 below shows the monthly average of daily spot market prices at various hubs from January 2019 through January 2023. During winter 2022-2023, there is a notable deviation between prices at the Western hubs compared with Henry Hub and Permian, the former due to diverging weather patterns and the latter due to the fact that the El Paso pipeline outage caused a loss of offtake capacity in the Permian as described in the [Natural Gas Commodity Prices](#) section above, lowering the market price in the production basin. In general, Figure 13 below shows the relative stability of the PG&E’s Citygate price compared to other regional indices during previous spike events, which is in part due to the availability of storage resources in Northern California.¹¹² Additionally, while there have been price spike events during previous winters, the high gas prices of winter 2022-2023 occurred uniquely over an extended period lasting two months. In comparison, the high gas prices observed during Winter Storm Uri (February 2021) lasted approximately a week.

¹¹¹ Henry Hub is a gas trading hub in Louisiana, which serves as the national benchmark; Kingsgate is located at the Canadian border; Sumas is in Washington; Stanfield and Malin are in Oregon; and Opal is in southern Wyoming.

¹¹² Amelia Blanke, CAISO DMM, Panel on Impacts on the Electric Market from High Gas Prices, Slide 2: [20230207-en-banc---caiso-dmm-presentation.pdf](#)

Figure 13: Average Monthly Natural Gas Prices



Source: NGI

California receives 30 percent of its gas supplies from Western Canada, 30 percent from the Rockies region, 30 percent from San Juan, and 10 percent from the Permian Basin. The proportions for individual utilities are different, with PG&E receiving significantly more gas from Canada and SoCalGas more from the Permian Basin. Since it is dependent on out-of-state supplies, California is vulnerable to natural disasters or other events resulting in pipeline outages or supply reductions.¹¹³ Thus, the El Paso Line 2000 and North Mainline outages impacted supplies into Southern California, which drove up prices.

In the SoCalGas service territory, storage inventory was at a six-year high on November 1, 2022 (the official start of the gas winter) despite limitations on how much gas could be stored at Aliso Canyon at the time.¹¹⁴ However, as shown in Figure 14 below, storage levels on the SoCalGas system dropped quickly due to early season cold weather that led to exceptionally high demand. Average daily demand for November, December, and January was more than 200 MMcf/d over the five-year average, and the December demand profile intensified in the middle of the month.¹¹⁵

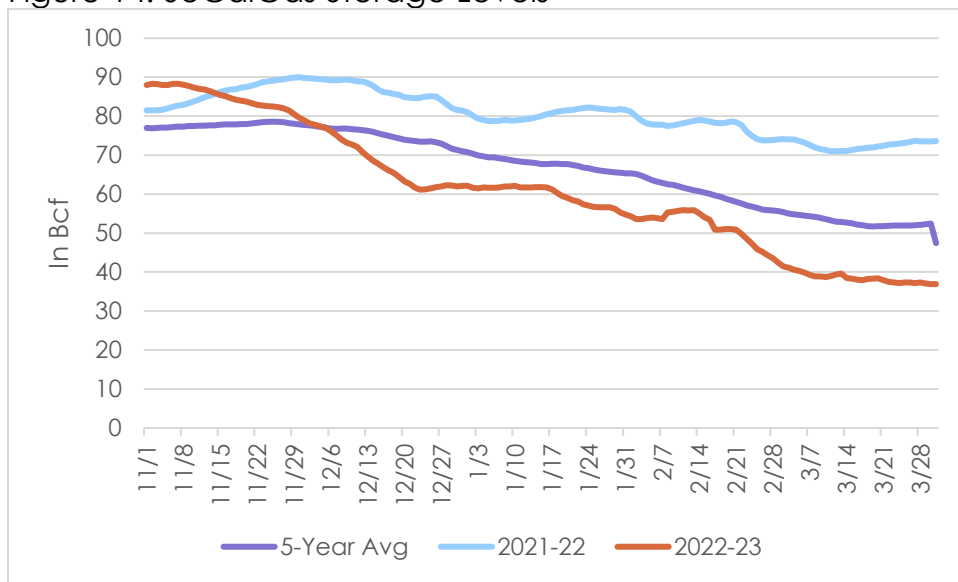
¹¹³ Aleecia Gutierrez, CEC Presentation, Panel on Current Gas Market Conditions and Prices: [CEC Official PowerPoint Template 2022 \(ca.gov\)](#)

¹¹⁴ See section, “Underground Gas Storage Safety” for more information about regulatory changes regarding the use of Aliso Canyon.

¹¹⁵ [EIA Natural Gas Weekly Update December 22, 2022](#)

The cold winter storm that hit Southern California during the week of December 11, 2022, resulted in the season’s peak demand and also corresponded with significant price spikes at SoCalGas Citygate. In the Pacific Northwest and California, the widespread, below-normal temperatures led to a 23 percent higher demand profile in the first three weeks of December for core customers compared to the second half of November.¹¹⁶ For example, customer demand on the SoCalGas system peaked on December 12, 2022, at 3,846 MMcf,¹¹⁷ and the SoCal Citygate price reached \$42.96/MMbtu on the same day. As a result, SoCalGas storage levels dropped noticeably throughout December as shown in Figure 14 below.

Figure 14: SoCalGas Storage Levels



Source: SoCalGas Envoy

With regard to PG&E, Core Gas Supply entered the winter with more than 90 percent of its contracted capacity full. This core contracted capacity is spread across a combination of PG&E-owned and independent storage provider (ISP) fields.¹¹⁸ The role of an ISP is to sell available storage capacity to market participants, such as PG&E’s Core Gas Supply Department and noncore customers including marketers and gas-fired power plants.¹¹⁹ However, noncore customers did not fill the independent storage fields with their natural gas by the start of winter. On November 1, PG&E’s fields had 5.5 Bcf of working gas in inventory,

¹¹⁶ [Daily natural gas spot prices in western United States exceed \\$50.00/MMBtu in December - U.S. Energy Information Administration \(EIA\)](#)

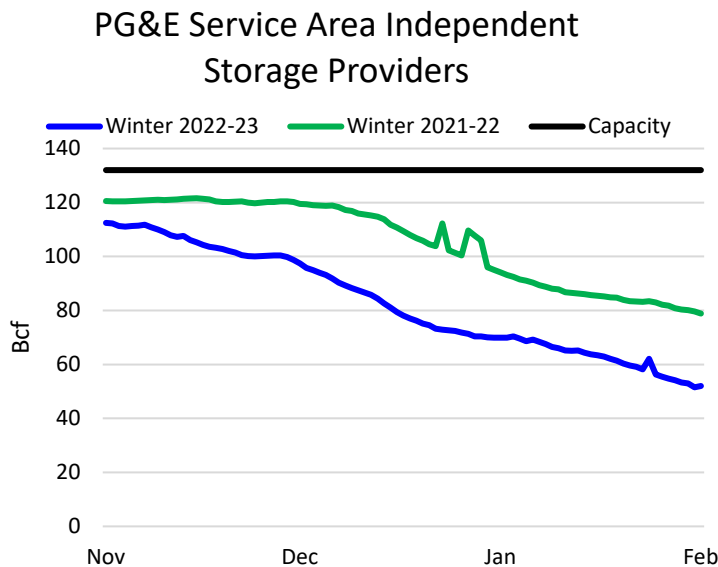
¹¹⁷ See SoCalGas Envoy Daily Operations Archive: https://www.socalgas-envoy.com/index.jsp#nav=/Public/ViewExternalArchive.showArchive?archiveType=daily_operations

¹¹⁸ Gillian Clegg, PG&E Presentation, Panel: Current Gas Market Conditions and Prices, Slide 4: [PG&E Presentation Template \(ca.gov\)](#)

¹¹⁹ Id

or 50 percent, of the 11 Bcf in working gas capacity approved as part of its Natural Gas Storage Strategy.¹²⁰ The independent storage providers had a combined inventory of an estimated 113.5 Bcf, or 83 percent, of their 137 Bcf in total capacity.¹²¹ There was thus unfilled storage capacity. It is unclear whether that capacity was available for purchase, or whether it had been purchased, but not filled, by noncore customers. ~~available for noncore customers who wished to purchase it.~~ As discussed above, while there was ample unfilled storage capacity available for purchase at the ISP fields, forward prices during the 2022 injection season did not incentivize noncore customers to inject gas into storage ahead of the peak winter season.

Figure 15: PG&E Service Area Independent Storage Providers



Source: PG&E En Banc Presentation

At the en banc, PG&E noted that it redefined its storage service offerings as part of its Natural Gas Storage Strategy (NGSS), which was approved as part of the 2019 Gas Transmission and Storage Decision.¹²² Among those changes was the reclassification of 51 Bcf of working gas at the McDonald Island storage facility as base gas, as discussed above. At the en banc, PG&E described the reclassification as an

¹²⁰ The 11 Bcf of total working gas capacity is allocated as follows: 5 Bcf for core customer firm services, 1 Bcf for reserve capacity, and 5 Bcf for inventory management. See Slide 5 [PG&E Presentation Template \(ca.gov\)](#). The CPUC first approved PG&E's Natural Gas Storage Strategy in D.19-09-025:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M314/K894/314894934.pdf>.

¹²¹ The estimate of ISP inventory is based on the CEC's November 3, 2022, Natural Gas Update email. The CEC has provided the CPUC with its method for estimating ISP inventory based on data provided by PG&E's Pipe Ranger and the U.S. Energy Information Administration, but its estimates are not currently public. The CEC is planning to create a public gas dashboard by summer 2024 that will include its estimates of aggregate ISP storage.

¹²² Lucy Redmond, PG&E Presentation, Panel: Current Gas Market Conditions and Prices, Slide 5: [PG&E Presentation Template \(ca.gov\)](#).

accounting adjustment since the change had no impact on the total physical gas in storage.¹²³ PG&E further noted that, prior to the reclassification, the 51 Bcf of gas that was classified as working gas was effectively acting as base gas. Over the last 10 years, there were only two times that any of the 51 Bcf of gas was withdrawn.¹²⁴

According to PG&E, increasing the amount of base gas was intended to help compensate for reductions to withdrawal capacity that resulted from the 2018 CalGEM regulations. While these regulations focus on improving safety, they reduce the amount of withdrawal capacity available at a given inventory level in two ways. First, they require all wells to have dual barriers, which reduces the amount of gas that can flow through a converted well and thus impacts overall well deliverability. Second, they require periodic well inspections, which take the wells out of service more frequently. Having more gas in storage increases the pressure in the storage field, which in turn increases the amount of gas that can be withdrawn from storage per day. Thus, the reclassification of 51 Bcf of working gas to base gas has enabled PG&E to maintain a higher minimum withdrawal capacity in the context of the CalGEM regulations.¹²⁵ While PG&E explains the reclassification as solely an accounting change, some stakeholders viewed it as contributing factor to the high gas prices.¹²⁶

The high gas prices also greatly pushed up wholesale electricity costs. Figure 16 below shows the correlation between the SoCal and PG&E Citygate prices and the electric prices in the wholesale energy markets. As gas prices peaked in December, electric prices also surged. The *Gas Conditions and CAISO Markets* report estimates that wholesale energy costs in December alone were \$3 billion higher than they would have been had gas prices been similar to past years.¹²⁷ Based on the winter 2022-2023 gas and power premiums, Southern California Edison (SCE) filed an Energy Resource Recovery Account (ERRA) Trigger Application (A.23-01-020) on January 31, 2023, requesting up to a \$595.6 million rate increase effective June 1, 2023.¹²⁸ Decision, (D.) 23-04-012, issued on April 6, 2023, authorized rate recovery of up to \$595.6 million, though the actual recovery was \$454 million, which went into rates starting June 1, 2023, and ended May 31, 2024. The impact to SCE's monthly residential bills was an increase of slightly over 3 percent.¹²⁹

¹²³ See *Id.*

¹²⁴ See *Id.*

¹²⁵ See *Id.*

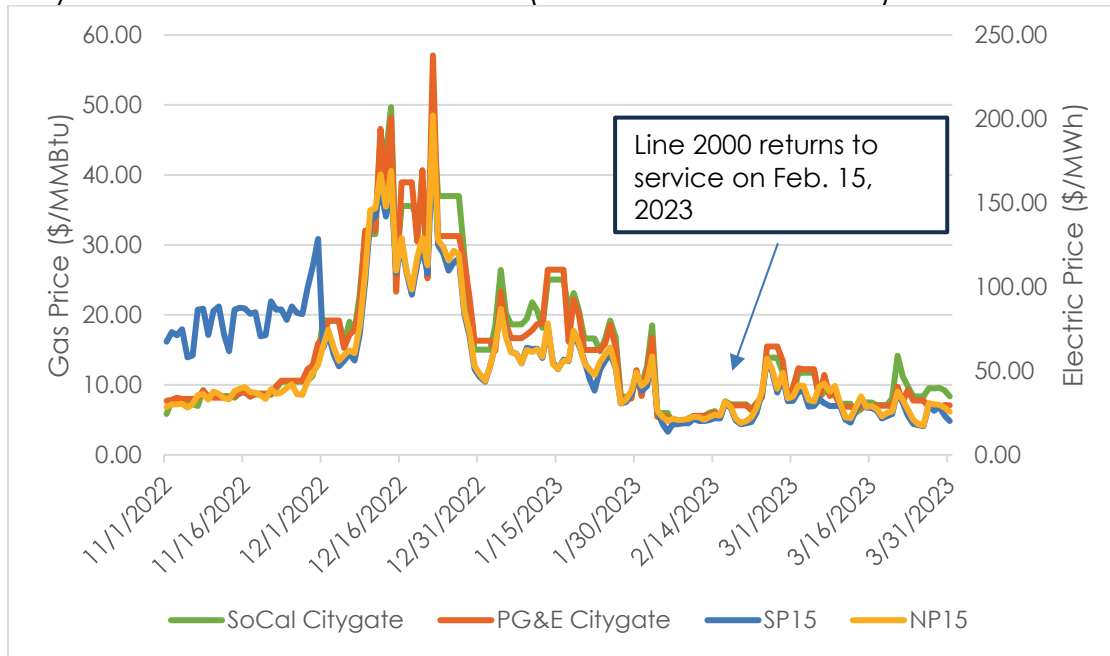
¹²⁶ Michael Williamson, Williamson Energy, Panel: Current Gas Market Conditions and Prices, Slide 2: [PowerPoint Presentation \(ca.gov\)](#)

¹²⁷ <https://www.prod.caiso.com/Documents/Gas-Conditions-and-CAISO-Markets-Report-for-Dec2022-Jan2023.pdf>

¹²⁸ William Walsh, SCE, Panel Three: Impacts on the Electric Market from High Gas Prices, Slide 5: [PowerPoint Presentation \(ca.gov\)](#)

¹²⁹ See, e.g., SCE Advice Letter 5036-E: <https://www.sce.com/regulatory/advice-letters/approved>.

Figure 16: Average Daily SoCal and PG&E Citygate Natural Gas Prices and Average Day-Ahead CAISO Electric Prices (Nov. 2022-March 2023)



Source: NGI and CAISO Oasis

Weather and Demand in Historical Context

Because weather was a significant part of the story in winter 2022-2023, the following section examines its impact on demand in detail, with comparisons to the previous year and the most recent unusually cold year. This section focuses in particular on core gas demand, which typically constitutes about 40-50 percent of winter demand from November through March.¹³⁰

The winter of 2022-2023 was the coldest winter in the PG&E and SoCalGas territories in the last 10 years in terms of average temperatures and thus in heating degree days.¹³¹ California typically has an unusually cold winter approximately every decade. In this case, the last such event occurred 11 years ago in winter 2012-2013. Temperatures during that winter were unusually cold and were accompanied by high gas demand, making it the last comparable cold spell in California. As discussed in the next section, winter 2012-2013 did not see high gas prices comparable to winter 2022-2023. However, many gas system changes have occurred

¹³⁰ Based on responses to CPUC Energy Division Data Requests on Gas Demand 2010-2023, sent on March 15, 2024, responded to on March 22, 2024, by PG&E and on March 29, 2024, by SoCalGas.

¹³¹ Heating degree days are an indicator of space heating demand. The heating degree days for a single day equal 65 degrees Fahrenheit minus the average of the highest hourly temperature and the lowest hourly temperature for the day, if greater than or equal to zero.

since then including post-San Bruno transmission pipeline work and post-Aliso Canyon changes to gas storage capacity and regulations.

For SoCalGas, winter 2012-2013 had a daily average of 10.4 heating degree days compared to 9.1 in winter 2022-2023. For PG&E, winter 2022-2023 saw a daily average of 15.6 heating degree days, colder even than 11 years prior when it saw a daily average of 13.7 heating degree days. While other winters within the last decade saw colder individual days, what characterized the weather of winter 2022-2023 was its sustained cold, beginning in November and lasting into March. One mitigating factor in winter 2022-2023 was that December and January, which are typically the coldest months of the year, were not as abnormally cold as the other winter months. This winter also saw high precipitation levels, which can increase gas heating demand as wet buildings lose heat more quickly than dry ones.

Winter 2022-23 did not see any single days with particularly high demand; rather it saw many cold days. Because gas systems are designed to meet peak cold day demand, the system was strained by prices but not reliability.

Table 1: Daily Heating Degree Days and Coldest Days in Gas Utility Areas

PG&E Territory					SoCalGas Territory				
	10-Year Average (2013-2023 Winters) ¹³²	Winter 2012-2013	Winter 2021-2022	Winter 2022-2023		10-Year Average (2013-2023 Winters)	Winter 2012-2013	Winter 2021-2022	Winter 2022-2023
Coldest Date	-	Jan-12	Jan-01	Dec-18	Coldest Date	-	Jan-13	Dec-15	Feb-25
Coldest Day Temperature (F)	40.8	38.7	40.8	41.8	Coldest Day Temperature (F)	46.2	39	48	47
Coldest Day HDDs	24.2	26.3	24.2	23.2	Coldest Day HDDs	18.8	26	17	18
Average HDDs	12.7	13.7	12.8	15.6	Average HDDs	7.3	10.4	6.0	9.1
Standard Deviation of Daily HDDs	4.9	5.9	4.8	3.7	Standard Deviation of Daily HDDs	4.6	5.9	4.8	3.6
November Av. HDDs	10.7	9.1	9.5	14.5	November Average HDDs	4.7	6.1	1.8	6.1
December Average HDDs	16.1	16.0	17.1	17.5	December Average HDDs	10.3	13.3	10.7	9.1
January Average HDDs	14.6	19.3	15.6	14.8	January Average HDDs	8.7	15.2	7.1	10.6
February Average HDDs	12.4	15.5	12.9	17.0	February Average HDDs	7.6	12.7	6.8	10.5
March Average HDDs	9.5	8.7	8.7	14.2	March Average HDDs	5.1	4.9	3.6	8.9

¹³² In this and subsequent tables, the 10-Year Average (2013-2023 Winters) column includes data for the winters of 2013-2014 through 2022-2023 (November through March).

Source: Data reported by utilities, also available on their respective gas operations websites.¹³³

Consistent with cold temperatures, core gas demand in the PG&E and SoCalGas territories in winter 2022-2023 was the highest in 10 years. Both utilities also saw high core demand during the cold winter of 2012-2013. For PG&E, the winter of 2022-2023 was colder and saw more core demand than 11 years earlier. SoCalGas also saw higher core demand than 11 years earlier, even though 2022-2023 was slightly less cold. These findings are particularly notable given the broader trend of forecasted declining core demand.¹³⁴ This finding may indicate that the relationship between core demand and temperature is not linear and may be influenced by other factors such as precipitation. For example, while forecasts favored average winter 2022-2023 precipitation levels in California, actual conditions in the state were much wetter than average.¹³⁵ For PG&E, winter 2022-2023 had 23 percent more heating degree days than the 10-year average and 17 percent more core demand. SoCalGas had 24 percent more heating degree days and 14 percent more core demand. For each winter, the coldest month also saw the highest demand.

Table 2: Daily Core Demand in Gas Utility Areas (MMcfd)

PG&E Territory					SoCalGas Territory				
	10-Year Average (2013-2023) ¹³⁶	Winter 2012-2013	Winter 2021-2022	Winter 2022-2023		10-Year Average (2013-2023)	Winter 2012-2013	Winter 2021-2022	Winter 2022-2023
Coldest Date	-	Jan-12	Jan-01	Dec-18	Coldest Date	-	Jan-13	Dec-15	Feb-25
Coldest Day Temperature	40.8	38.7	40.8	41.8	Coldest Day Temperature	46.2	39	48	47
Coldest Day Demand	1,818	2,025	1,757	1,780	Coldest Day Demand	2,171	2,769	2,354	2,271
Highest Demand Date	-	Jan-13	Dec-20	Feb-27	Highest Demand Date	-	Jan-14	Dec-15	Feb-24
Highest Demand Date Temperature	43.0	39.2	43.9	44.1	Highest Demand Date Temperature	47.6	43	48	50
Highest Demand	1,956	2,266	1,761	1,942	Highest Demand	2,435	3,058	2,354	2,297
Average Winter Daily Demand	1,134	1,211	1,094	1,326	Average Winter Daily Demand	1,410	1,552	1,399	1,612

¹³³ PG&E Pipe Ranger Daily Operations Archive: [Historical Archives | Supply and Demand Search Results | Pipe Ranger \(pge.com\)](#). SoCalGas Envoy Daily Operations Archive: https://www.socalgas-envoy.com/index.jsp#nav=/Public/ViewExternalArchive.showArchive?archiveType=daily_operations.

¹³⁴ The 2022 California Gas Report projected that California residential customer gas demand would decline by an average of 2.4 percent per year through 2035, p. 6: [https://www.socalgas.com/sites/default/files/Joint Utility Biennial Comprehensive California Gas Report 2022.pdf](https://www.socalgas.com/sites/default/files/Joint%20Utility%20Biennial%20Comprehensive%20California%20Gas%20Report%202022.pdf).

¹³⁵ See NOAA forecasted precipitation vs. actual, Dec. 2022-Feb. 2023: [WinterOutlook-forPrecipitation_VerificationPredictedObserved_2022.png | NOAA Climate.gov](#)

¹³⁶ The average includes winter 2013-2014 through winter 2022-2023.

Standard Deviation of Daily Demand	322	406	332	263	Standard Deviation of Daily Demand	353	482	377	298
November Average Demand	906	875	803	1,118	November Average Demand	1,102	1,155	1,018	1,313
December Average Demand	1,365	1,353	1,389	1,451	December Average Demand	1,606	1,688	1,735	1,660
January Average Demand	1,330	1,676	1,310	1,398	January Average Demand	1,600	2,002	1,573	1,763
February Average Demand	1,139	1,303	1,143	1,413	February Average Demand	1,477	1,729	1,499	1,761
March Average Demand	915	834	812	1,244	March Average Demand	1,253	1,178	1,157	1,560

Source: Data reported by utilities. Assumes a gas heat content of 1,038 MMBtu/MMcf, per 2023 EIA data.¹³⁷

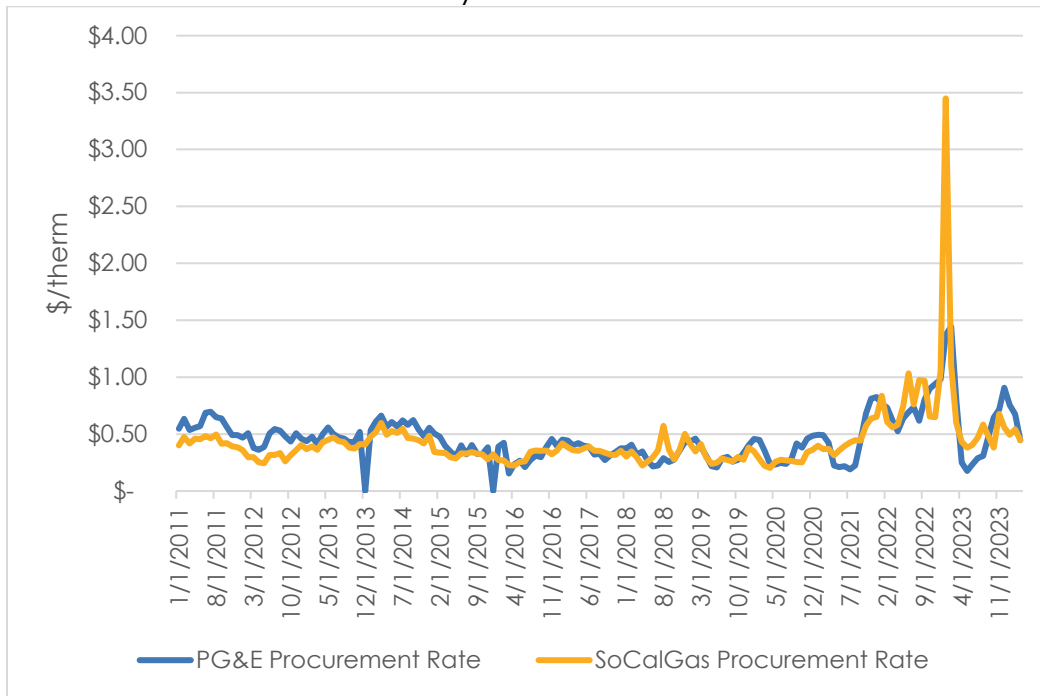
Winter 2022-2023 Prices in Historical Context

As discussed above, the procurement component of core customer gas rates¹³⁸ pays for the gas utility's costs to procure gas for their customers. These rates vary among customer classes. For simplicity, this discussion focuses on residential baseline rates for customers who do not participate in the California Alternate Rates for Customers (CARE) program. CARE rates are based on these rates minus a discount. Gas procurement rates for January and February 2023 were historically high for PG&E and especially for SoCalGas, as shown in Figure 17.

¹³⁷ Data are from responses to CPUC Energy Division Data Requests on Gas Demand 2010-2023, sent on March 15, 2024, responded to on March 22, 2024, by PG&E and on March 29, 2024, by SoCalGas.

¹³⁸ Core gas rates consist of the procurement rate, which pays for the procurement of gas; the transportation rate, which pays for the costs of the utility's infrastructure which transports the gas to the customer, also known as depreciation costs, which the Commission reviews and approves via General Rate Cases for each utility; and a surcharge for public purpose programs.

Figure 17: 2011-2023 Residential Monthly Gas Procurement Rates



Source: Utility procurement rates as published by SoCalGas¹³⁹ and PG&E¹⁴⁰

For PG&E, rates peaked in February 2023 at \$1.45/therm, as compared to an average of \$0.59/therm during the previous 10 Februaries. For SoCalGas, rates peaked in January at \$3.45/therm, as compared to an average of \$0.73/therm during the previous 10 Januaries. The table below shows monthly rates and follows a similar format to Tables 1 and 2 above for ease of comparison.

Table 3: Monthly Core Procurement Rates (Residential Non-CARE) (\$/therm)

PG&E Territory					SoCalGas Territory				
	10-Year Average (2013-2023 Winters)	Winter 2012-2013	Winter 2021-2022	Winter 2022-2023		10-Year Average (2013-2023 Winters)	Winter 2012-2013	Winter 2021-2022	Winter 2022-2023
Coldest/Highest Core Demand Month	Dec	Jan	Dec	Jan	Coldest/Highest Core Demand Month	Dec	Jan	Dec	Dec
Coldest/Highest Core Demand	\$0.53	\$0.44	\$0.83	\$1.37	Coldest/Highest Core Demand	\$0.49	\$0.37	\$0.65	\$1.05

¹³⁹ SoCalGas Core Procurement Rates: <https://www.socalgas.com/for-your-business/energy-market-services/gas-prices>.

¹⁴⁰ PG&E Residential Procurement Rates: <https://www.pge.com/tariffs/en/rate-information/gas-rates.html#accordion-80734fc416-item-011aaaffe1>.

Month Procurement Rate					Month Procurement Rate				
Highest Procurement Rate Month	Feb	Nov	Dec	Feb	Highest Procurement Rate Month	Jan	Dec	Jan	Jan
Highest Procurement Rate	\$0.59	\$0.51	\$0.83	\$1.45	Highest Procurement Rate	\$0.73	\$ 0.40	\$0.84	\$3.45
Average Winter Procurement Rate	\$0.53	\$0.46	\$0.75	\$1.11	Average Winter Procurement Rate	\$0.49	\$0.38	\$0.66	\$1.37
Standard Deviation of Procurement Rate	\$0.05	\$0.03	\$0.07	\$0.25	Standard Deviation of Monthly Procurement Rate	\$0.12	\$0.02	\$0.09	\$1.06
November Procurement Rate	\$0.51	\$0.51	\$0.81	\$0.94	November Procurement Rate	\$0.40	\$0.36	\$0.64	\$0.65
December Procurement Rate	\$0.53	\$0.46	\$0.83	\$0.98	December Procurement Rate	\$0.49	\$0.40	\$0.65	\$1.05
January Procurement Rate	\$0.58	\$0.44	\$0.76	\$1.37	January Procurement Rate	\$0.73	\$0.37	\$0.84	\$3.45
February Procurement Rate	\$0.59	\$0.48	\$0.73	\$1.45	February Procurement Rate	\$0.46	\$0.39	\$0.61	\$1.11
March Procurement Rate	\$0.45	\$0.41	\$0.62	\$0.80	March Procurement Rate	\$0.40	\$0.36	\$0.56	\$0.60

Source: Data reported by utilities, see footnotes 86 and 87.

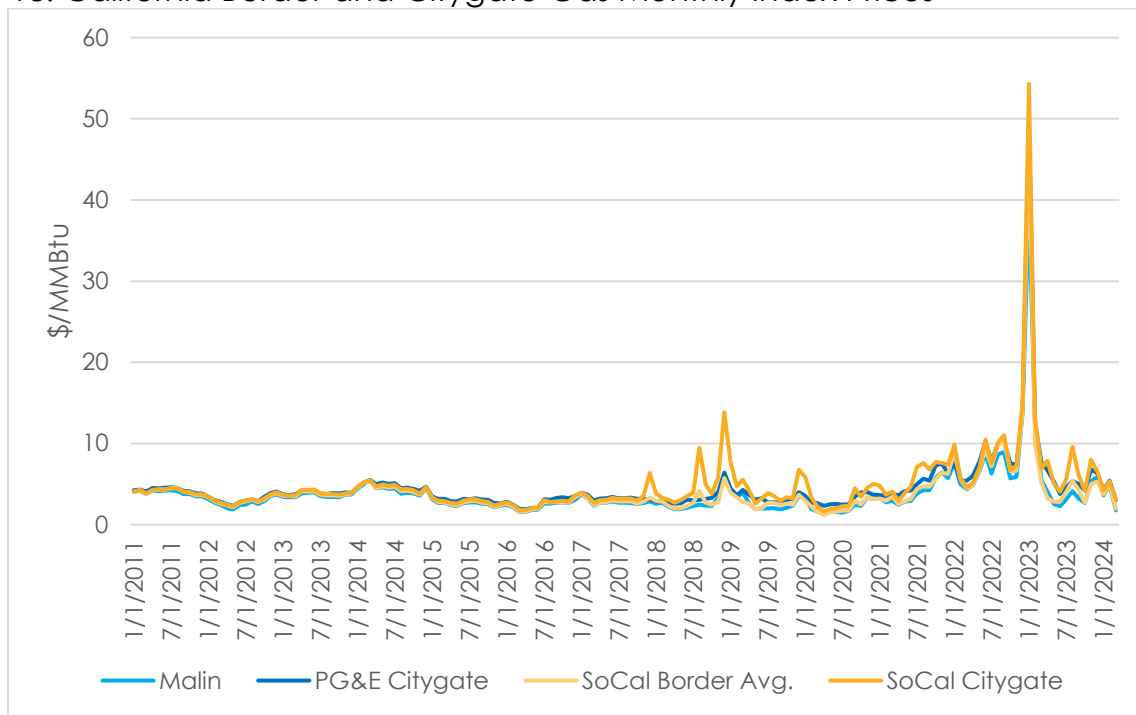
PG&E and SoCalGas calculate their core procurement rates each month based on their forecasted costs for the month, plus a true-up of the previous month's difference between forecast and actual costs. Thus, costs for the gas consumed in a month feed into prices for that month and potentially subsequent months via the true-up.

Gas prices in the monthly and spot markets were unusually high throughout the West in winter 2022-2023. Historically, wholesale winter monthly index prices in California have been around \$2-\$6/MMBtu.¹⁴¹ Monthly index prices at the PG&E and SoCalGas Citygates and at the California border (Malin, Oregon and the Southern California Border Average) and for the El Paso San Juan area (New Mexico) and Opal (Wyoming) were all between \$35 and \$50 per MMBtu for January 2023, while their highs for the preceding 10 years were below \$14.¹⁴² The spike for the four California price points is shown in Figure 18 below, with the January monthly index price at the PG&E Citygate reaching \$49.52/MMBtu and the SoCalGas Citygate price reaching \$54.31/MMBtu. The monthly index border prices at Malin and SoCal Border Average reached \$39.31 and \$46.92 for January, respectively. Opal was similar at \$51.33, and even the ordinarily cheaper El Paso San Juan index reached \$34.07. As discussed in detail in the [Core Purchasing](#) section above, monthly index prices are set during bidweek, which takes place on the first three of the last five gas trading days (i.e., not weekends or holidays) of the month before the month the gas is delivered. Monthly index prices are therefore also referred to as bidweek prices.

¹⁴¹ The wholesale market typically reports gas prices per MMBtu while residential customers are charged per therm. One MMBtu is roughly equivalent to one dekatherm or 10 therms.

¹⁴² All prices in this paragraph are from Natural Gas Intelligence, Inc., i.e., they reflect NGI's Bidweek Survey price indices.

Figure 18: California Border and Citygate Gas Monthly Index Prices



Source: Natural Gas Intelligence, Inc.

For most months during winter 2022-2023, the average of daily gas prices was higher than the monthly index at the same location. This trend is unsurprising because gas bought in the daily market fulfills shorter-term needs and may be considered less elastic, i.e., consumers are less likely to reduce their demand in response to higher prices, and the buyer has less time to consider other options. Thus, urgent demand for gas in the daily market can drive higher prices. However, for January, monthly price indices well exceeded the daily average at points throughout the West, including at the PG&E and SoCal Citygates.

One explanation for the higher January monthly prices may be the timing of bidweek. Monthly index prices are set at the end of the preceding month, so they often reflect price expectations during that period. Bidweek for January 2023 took place December 23-28, 2022, just after the California spot market hit its winter peak of \$53.11 on December 22 and during Winter Storm Elliot (December 21-26). Additionally, in mid-December, SoCalGas’ storage inventory levels dropped sharply below the five-year average. This decline was driven by increased customer demand amid ongoing outages on El Paso’s North and South Mainlines.

Meanwhile, at the national benchmark location of Henry Hub, monthly prices were more moderate throughout the winter, peaking in December at \$7.30. Thus, this winter was characterized by unusually high prices in the West, with unusual monthly price dynamics in January.

PG&E and SoCalGas Core Purchasing Decisions

Both PG&E Core Gas Supply and SoCalGas Gas Acquisition procured diverse portfolios of contracts for winter 2022-2023, including long-term, monthly, and spot contracts across multiple pricing points. SoCalGas Gas Acquisition relied more heavily on monthly contracts, fixed-price contracts, and purchases at its own citygate, each of which contributed to higher core procurement rates in December and January. SoCalGas Gas Acquisition's decisions took place in a context of pro rata cuts to El Paso interstate pipeline capacity due to the pipeline outages.¹⁴³

Contract Timing and Pricing

PG&E Core Gas Supply and SoCalGas Gas Acquisition buy most of their gas for core customers under long-term contracts, some under monthly contracts, and the rest under spot market contracts.¹⁴⁴ Often, long-term contracts are cheapest, monthly are next, and spot prices are the most expensive, but this pattern does not always hold. In particular, as discussed above regarding price indices, monthly contracts were particularly expensive for January 2023.

Both PG&E Core Gas Supply and SoCalGas Gas Acquisition had contracted for more than half of their core gas for winter 2022-2023 before October 25, 2022, the start of November bidweek. Nearly all—between 80 percent and 95 percent—of these long-term contracts were indexed to either monthly or daily indices.

The gas utilities purchased gas to meet some of the remaining demand through monthly contracts. They filled the rest of their gas demand using spot market purchases.

PG&E Core Gas Supply and SoCalGas Gas Acquisition differed substantially in their use of monthly vs. spot market contracts in winter 2022-2023. PG&E relied more on spot market purchases, especially for December and January, while SoCalGas relied more on monthly contracts. Setting aside long-term contracts, SoCalGas purchased most of its remaining winter 2022-2023 gas under monthly contracts, with a moderate increase in the percentage of its total gas purchased under monthly contracts during the high-demand months of December, January, and February. Thus, after netting out sales, SoCalGas purchased little spot market gas, often functioning as a net seller in the spot market.

In terms of sales, both PG&E Core Gas Supply and SoCalGas Gas Acquisition sold between 5 and 10 percent of their net core gas purchases this winter on the spot market.¹⁴⁵ This pattern reflects that the utilities purchase more gas than their estimated core demand in order to ensure they will not be short, and

¹⁴³ Based on responses to data requests sent to SoCalGas and PG&E.

¹⁴⁴ PG&E and SoCalGas purchasing information discussed in this report is from their responses to CPUC Energy Division Data Requests on gas purchases and sales sent and responded to during March 2023 through April 2024.

¹⁴⁵ See *id.*

then sell off excess gas, an approach consistent with the utilities' assigned purpose to reliably serve core demand.

PG&E Core Gas Supply and SoCalGas Gas Acquisition bought 80 to 95 percent of their gas for winter 2022-2023 under indexed-price contracts, with the remainder bought under fixed-price contracts. The prices paid under fixed-price and indexed-price contracts both ranged widely, with fixed and indexed having roughly similar average prices and price ranges. Long-term, monthly, and spot market contracts are all commonly indexed.

Gas prices under individual contracts are extremely variable by contract type, place, purchase date, and seller. Even within a single contract type, purchase day, and delivery day, prices can vary substantially as the utility confirms multiple contracts with different sellers to meet demand. Gas prices paid by PG&E and SoCalGas for gas delivered in winter 2022-2023 ranged from occasional negative prices to around \$70/MMBtu.

Monthly Pricing Impacts

As discussed above, monthly indexed prices for January were unusually high in California and at several other Western gas trading hubs. Given its comparatively limited use of monthly contracts, this had less impact on PG&E Core Gas Supply, although it was still impacted through its long-term contracts. Given SoCalGas Gas Acquisition's monthly-focused purchasing strategy, high monthly indexed prices resulted in higher gas costs for SoCalGas Gas Acquisition. Monthly indexed prices for most months in winter 2022-2023 were likely also higher due to SoCalGas Gas Acquisition's fixed-price monthly purchases. While these results are clear after the fact, both monthly and spot market purchases carry risks as discussed in the [Core Purchasing](#) section above, and market participants must make decisions before price outcomes for the month are known.

A notable difference between the bidweek markets for the two utilities was that there were far more trades at the PG&E Citygate than at the SoCal Citygate, as shown in Table 4 below. In a "liquid" market, meaning a market in which there are many transactions, buyers have more options, and each individual deal has less of an impact on the monthly index price. In December 2022, there were 108 percent more monthly trades at the PG&E Citygate than the SoCal Citygate. In January 2023, there were 82 percent more trades at the PG&E than the SoCal Citygate. The PG&E Citygate was also more liquid than other Western hubs during bidweek throughout most of the winter compared to the previous year. Factors that may have contributed to PG&E's more liquid bidweek market include fewer disruptions to interstate pipeline supplies than in Southern California and noncore customers' ability to access storage through the ISPs.

Table 4: Percent Change in Number of Bidweek Trades by Month, Winter 2021-22 vs. Winter 2022-2023

	SoCal Citygate	PG&E Citygate	Malin	Opal	San Juan
Nov-21/Nov-22	-46%	262%	-70%	7%	79%
Dec-21/Dec-22	-46%	1050%	-65%	-10%	263%
Jan-22/Jan-23	-37%	1%	-15%	-78%	-69%
Feb-22/Feb-23	-53%	-15%	-61%	-32%	410%
Mar-22/Mar-23	-42%	88%	500%	43%	191%

Source: Natural Gas Intelligence, Inc.

SoCalGas Gas Acquisition made many fixed-price purchases during the winter, including for December and January delivery. SoCalGas purchased more fixed-price gas for December delivery but given lower prices and more transactions by other parties, those purchases had less influence on December indexed prices. SoCalGas Gas Acquisition's trades constituted a substantial portion of the trades used to calculate monthly indexed prices at several delivery points including the SoCal Citygate. Many of SoCalGas' fixed-price purchases during this time were at prices above the later-published bidweek index. This occurred for most months during the winter and was most pronounced for January. PG&E Core Gas Supply made far fewer fixed-price monthly purchases, and those they made were at below-index prices.¹⁴⁶

Gas Purchasing Locations

Both PG&E Core Gas Supply and SoCalGas Gas Acquisition purchase most of their gas in regional markets throughout the West, some at delivery points near the California border or within California, and some at their own citygates.

Because nearly all gas consumed in California is produced outside the state, the gas utilities buy transportation rights on interstate pipelines to bring gas to California. For winter, the CPUC requires the utilities to hold firm interstate capacity equal to a specified percentage of average seasonal core demand: 100-162 percent for PG&E, reducing to 80-162 percent for March, SoCalGas and 100-120 percent for SoCalGasPG&E.¹⁴⁷ These firm transportation contracts are typically multi-year and are included in the

¹⁴⁶ PG&E and SoCalGas purchasing information discussed in this report is from their responses to CPUC Energy Division Data Requests on gas purchases and sales sent and responded to during March 2023 through April 2024.

¹⁴⁷ See D.22-07-002, pp. 23-24: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M495/K983/495983692.PDF>.

utilities' GCIM and CPIM reports, respectively.¹⁴⁸ Pipeline capacity transactions may be posted for more limited lengths of time on pipeline owners' websites.¹⁴⁹

Both utilities purchased most of their winter gas at these outside-California locations and transported it into California. Although prices varied depending on location, the commodity price for this gas was typically cheaper than gas at the citygate or border. Gas purchased out of state¹⁵⁰ was still cheaper when including pipeline transportation costs to bring the gas to California, which totaled less than 5 percent of the cost of the transported gas. Because transportation is bought under long-term contracts, its price is constant and became a smaller percentage of total costs as other costs went up. However, firm, long-term capacity contracts can be pro-rated when there are significant outages, such as the El Paso Line 2000 and North Mainline outages. The owners of pro-rated pipeline capacity would then need to find alternative sources of gas to meet demand. As noted above in the section [Gas Market Trends in 2022](#), receipts at the Ehrenberg location in Southern California, across all recipients, were reduced by 21 percent due to the Line 2000 outage.

As discussed above, prices at both utilities' citygates were high in winter 2022-2023, particularly for January. Both utilities purchased less than a quarter of their gas for winter 2022-2023 at their respective citygates. However, for January, PG&E Core Gas Supply reduced its citygate usage dramatically, while SoCalGas purchased slightly more at its citygate. SoCalGas Gas Acquisition's reliance on citygate purchases at this expensive time contributed to its high costs for January gas. However, this purchasing strategy took place in a context of pro rata cuts to El Paso pipeline capacity due to the Line 2000 and North Mainline outages.¹⁵¹

Affiliate Transactions

Utilities are required to report on their transactions with corporations affiliated with them, per CPUC Decision (D.) 06-12-029.¹⁵² To generate this report, CPUC staff requested that utilities report whether transaction counterparties were affiliates. PG&E Core Gas Supply reports that none of its gas purchases during winter 2022-2023 were with affiliates. SoCalGas Gas Acquisition reports several blind purchases and blind sales transactions with its affiliates Sempra Gas & Power Marketing, LLC and San Diego Gas and Electric Company (which purchases gas for gas-fired power plants). These blind transactions, which were carried out via exchanges or brokers, so that buyers and sellers do not know each other's identity until after

¹⁴⁸ A discussion regarding GCIM and CPIM will be included in Part II of this White Paper.

¹⁴⁹ Pipeline capacity contracts are made available in advance to Cal Advocates, The Utility Reform Network (TURN), and Energy Division Staff for review and approval and must be approved via the CPUC's advice letter process before being finalized by the utility.

¹⁵⁰ "Out of state" refers to where the gas is purchased, not where it is produced. Most gas purchased in California is also produced outside of the state, meaning it was transported here by other market participants for sale at California delivery points.

¹⁵¹ Based on responses to data requests sent to SoCalGas and PG&E for data on reductions to contracted gas pipeline capacity during winter 2022-2023

¹⁵² See [Affiliate Rules and Holding Company Issues \(ca.gov\)](#), and utility webpages [Affiliate Transactions \(pge.com\)](#) and [Affiliate Transactions | SoCalGas](#) for more recent reports.

the deal is signed, totaled less than half a percent of their sales volume.¹⁵³ Staff verified both that these transactions were blind and that the prices paid were comparable to transactions made at similar times with non-affiliated counterparties.

Forthcoming Analysis

This report will be followed by a second report containing additional analyses of gas market dynamics during winter 2022-2023. The second report may include comparison with earlier years' patterns in order to develop a more detailed picture. It will include sections on GCIM and CPIM, hedging, use of storage, influence of gas prices and net electric imports on electricity prices, and impacts to customers and demand.

(END ATTACHMENT A)

¹⁵³ For a discussion of blind transactions see the [Core Purchasing](#) section above.