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Proceeding: 2024 General Rate Case
Application: A.22-05-015/-016 (cons.)
Exhibit: SDG&E-239-E

**REBUTTAL TESTIMONY
OF EDUARDO J. MARTINEZ
(GAS CUSTOMER FORECAST)**

ERRATA

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA**



June 2023

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**ERRATA REBUTTAL TESTIMONY OF
EDUARDO J. MARTINEZ
(GAS CUSTOMER FORECAST)**

I. SUMMARY OF DIFFERENCES

**TABLE EM-1
RESIDENTIAL GAS CUSTOMER FORECAST**

	Base Year 2021	Test Year 2024	Total % Change
SDG&E	873,304	896,990	2.7%
CAL ADVOCATES	873,304	876,462	0.4%
TURN	873,304	885,996	1.5%

The San Diego Gas & Electric Company (SDG&E) direct testimony included forecasts for residential, commercial, and industrial customer groups. Cal Advocates and TURN only contest residential, as shown in the tables above.

II. INTRODUCTION

This rebuttal testimony (1) adopts the direct testimony of Scott Wilder¹ regarding SDG&E’s request for Gas Customer Forecast, (2) addresses the following testimony from other parties:

- The Public Advocates Office of the California Public Utilities Commission (Cal Advocates) as submitted by Maricela Sierra (Ex. CA-18-E (Sierra)), dated April 2023.
- The Utility Reform Network (TURN), as submitted by Jaime McGovern (Ex. TURN-14 (McGovern)), dated March 2023.
- Small Business Utility Advocates (SBUA), as submitted by Richard McCann and Stephen Moss (Ex. SBUA (McCann/Moss)), dated March 2023.
- Environmental Defense Fund (EDF) as submitted by Michael Colvin, Richard McCann, and Joon Hun Seong (Ex. EDF-01 (McCann/Seong)), dated March 2023.

¹ May 2022, Prepared Direct Testimony of Scott Wilder, Ex. SDG&E-39, adopted by Eduardo J. Martinez.

- 1 • Utility Consumers Action Network (UCAN) as submitted by Dr. Charles
2 Woychik (Ex. UCAN (Woychik)), dated March 2023.

3 As a preliminary matter, the absence of a response to any particular remaining issue in
4 this rebuttal testimony does not imply or constitute agreement by SDG&E with the proposal or
5 contention made by these or other parties. The gas customer forecasts contained in SDG&E's
6 direct testimony are based on the data available at the time of the General Rate Case (GRC)
7 application filing. This approach is consistent with the Rate Case Plan, which does not
8 contemplate forecasts being updated continuously.

9 In SDG&E's view, the company submitted sensible and reasonable customer forecasts in
10 its direct testimony, based on tested statistical relationships between realized customer additions
11 and economic explanatory variables (*i.e.*, housing starts, employment). This tested methodology
12 helps to ensure that reasonable customer forecasts are produced for rate setting and other
13 purposes. As discussed further below, the California Public Utilities Commission (Commission
14 or CPUC) should reject Cal Advocates and TURN's recommendations to replace tested
15 statistical-based forecast modeling with an alternative based on a crude and unrepresentative
16 historical average, which they then weigh down, and arbitrarily apply to only a subset of
17 customer class forecasts. Additionally, the Commission should likewise reject the unfounded
18 and unsupported recommendations of EDF, SBUA, and UCAN that there should be no increase
19 in residential customers for Test Year (TY) 2024.

20 **III. SUMMARY OF PARTY POSITIONS**

21 **A. Cal Advocates**

22 The following is a summary of Cal Advocates' position(s) on the SDG&E Gas Customer
23 forecast:²

- 24 • Cal Advocates asserts that economic vendor forecasts over-forecast
25 housing starts leading to over forecast of meters (or customers) for
26 residential. Notably, however, Cal Advocates does not object to the use of
27 economic vendor forecasts of employment for Commercial customers.
28 • To replace SDG&E's customer growth forecasts for the residential class,
29 which SDG&E calculated using econometric modelling, Cal Advocates

² Ex. CA-18-E (Sierra) at 2.

1 attempts to transform both the history and forecast of housing starts using
2 a moving ten-year average. Cal Advocates further recommends that
3 average customer growth should then be discounted by 50% as of July
4 2023 to account for the Commission’s Decision (D.) 22-09-026, which
5 eliminated gas pipeline extensions’ allowances, refunds, and discounts for
6 all new applications submitted on or after July 1, 2023, for all customers
7 in all customer classes, unless otherwise exempted.

- 8 • Cal Advocates challenges SDG&E’s use of an add-factor in its model as
9 not a standard practice and suggests that it be disallowed.
- 10 • For the next GRC, Cal Advocates argues that SDG&E should not use the
11 AREMOS software in favor of up-to-date econometric software and,
12 relatedly, should provide its raw data for variables in Microsoft Excel
13 format including active cells, source, and links.

14 **B. TURN**

15 The following is a summary of TURN’s position(s) on the SDG&E Gas Customer
16 Forecast:³

- 17 • Like Cal Advocates, TURN argues that economic vendors over-forecast
18 housing starts and are therefore unreliable as a forecast input.
- 19 • TURN argues to replace SDG&E’s customer growth forecasts for only
20 residential customer classes, which SDG&E calculated using econometric
21 modelling.
- 22 • TURN recommends alternative forecasts based on a backward-looking
23 ten-year moving average for customer growth rate.
- 24 • For 2024, TURN recommends adjusting the rate of gas customer growth
25 downward by 50% in 2024 to account for the D.22-09-026 to disallow gas
26 line extensions’ allowances, refunds, and discounts, effective July 1, 2023.
- 27 • Echoing Cal Advocates again, TURN alleges that SDG&E and SDG&E’s
28 add-factor in residential gas customer model is not standard practice.

³ Ex. TURN-14 (McGovern) at 4.

- TURN suggests that SDG&E and SDG&E should explore whether using housing completions would eliminate the need to use lagged housing starts for gas customer forecasts.
- TURN argues that the Commission should establish a one-way balancing account to refund residential customers any cost savings generated by unrealized customer counts.
- TURN states that all workpapers for customer forecast numbers should be filed in electronic spreadsheet workable format and customer forecasts should be modeled using publicly available data and Microsoft Excel.

C. EDF

The following is a summary of EDF’s position on the SDG&E Customer Forecast:⁴

- EDF alleges that SDG&E customers will decline in conjunction with declining gas usage because of California’s decarbonization policies.

D. SBUA

The following is a summary of SBUA’s position to the SDG&E Customer Forecast⁵:

- SBUA alleges that SDG&E customer growth should largely disappear as a result of California Air Resources Board’s (CARB) new regulations ending the purchase of new and replacement gas-fueled appliances and furnaces.

E. UCAN

The following is a summary of UCAN’s position on the SDG&E Customer Forecast:⁶

- UCAN asserts that SDG&E natural gas customers are likely to decline due to economic conditions and rate increases.
- Section II of this rebuttal testimony rebuts the assertions by EDF, SBUA, and UCAN regarding the effect on customer counts due to policies driving declining gas demand. Section III of this rebuttal testimony demonstrates

⁴ Ex. EDF-01 (McCann/Seong) at 9.

⁵ Ex. SBUA-01 (McCann/Moss) at 5-6.

⁶ Ex. UCAN-01 (Woychik) at 19-20.

1 that the critiques of SDG&E’s forecast methodology by Cal Advocates
2 and TURN lack merit and that SDGE’s methodology produces reasonable
3 forecast results. Finally, Section IV of this rebuttal testimony addresses
4 alternative forecast methodologies proposed by Cal Advocates and TURN,
5 demonstrating that they are unreasonable and should not be adopted in this
6 proceeding. Finally, Section V of this rebuttal testimony addresses certain
7 other issues raised in parties’ testimony.

8 **IV. GENERAL REBUTTAL TO INTERVENOR ARGUMENTS THAT DECLINING**
9 **GAS DEMAND WILL NECESSARILY LEAD TO A DECLINE IN CUSTOMER**
10 **COUNTS**

11 Three intervenors—EDF, SBUA, and UCAN—argue generally that SDG&E’s customer
12 growth and perhaps even total customer counts will experience declines by TY 2024 for reasons
13 related to reduced demand for natural gas or rate hikes. As discussed below, SDG&E believes
14 these arguments are unsupported and inconsistent with historical experience.

15 **A. EDF**

16 EDF states that SDG&E’s customers will decline along with falling demand for natural
17 gas as result of California’s decarbonization goals and policies.⁷ SDG&E disagrees with EDF’s
18 assertion that its customer count and demand for natural gas will both decline by the 2024 GRC
19 test year.

20 Declining gas demand does not necessarily mean that the utility will experience a decline
21 in its customer growth, let alone an actual loss of customers. In fact, history points to a contrary
22 conclusion. SDG&E has experienced downward trending demand while simultaneously gaining
23 customers since 2001 despite California’s aggressive energy efficiency goals and policies during
24 this time period. For instance, over the period 2001 to 2021, SDG&E system total-throughput
25 declined from 424 MMCF/day to 265 MMCF/day while residential customer meters increased
26 from 739,874 to 873,304.⁸ Based on this history, SDG&E does not believe that it is reasonably
27 foreseeable that there will be a decline in customer growth due to decline in demand for natural
28 gas for the TY 2024. To the contrary, given the history cited immediately above, SDG&E
29 believes the more reasonable conclusion is that it will continue to experience customer growth

⁷ Ex. EDF-01 (McCann/Seong) at 9.

⁸ See 2002 California Gas Report, p. 86; 2022 California Gas Report, p. 222; SDG&E-39-WP p. 3

1 through TY 2024 even if demand declines during the period governed by the forecasts adopted in
2 this proceeding. In any event, EDF fails to provide any analysis to support its predictions of
3 declining customers, much less quantify the magnitude of the claimed decline. Instead, EDF's
4 gas customer forecast rests entirely on an unsupported assertion.

5 **B. SBUA**

6 SBUA's position is as follows:

7 For the gas utilities, the recent Commission decision related to line
8 extensions and the California Air Resources Board's (CARB) new
9 regulations ending the purchase of new and replacement gas-fueled
10 appliances and furnaces suggest that customer growth should largely
11 disappear.⁹

12 SDG&E disagrees with SBUA's assertion that customer growth will largely disappear by
13 TY 2024. As a threshold matter, SBUA fails to provide any analytical basis or evidence to
14 support its assertion. In addition, SBUA ignores the fact that a sizable amount of new residential
15 construction and gas-fueled appliances will not be impacted by CPUC and CARB decisions and
16 regulations by TY 2024, thereby limiting any impact on SDG&E's customer growth for this GRC.
17 The CPUC's disallowance of gas line extensions' allowances, refunds, and discounts does not go
18 into effect until July 1, 2023. CARB's regulations have not yet been developed or adopted.
19 Moreover, as pointed out in the previous subsection with respect to a similar argument from
20 EDF, SDG&E, in fact, has experienced customer growth even with declining demand for natural
21 gas as the state aggressively pursues energy efficiency goals and policies. Thus, SBUA's
22 arguments about the future impacts of policies that have yet to be implemented are not only
23 unsupported and speculative, but they are also inconsistent with historical experience. As such,
24 they do not detract from the reasonableness of the forecasts proposed by SDG&E.

25 **C. UCAN**

26 UCAN states a declining gas customer for SDG&E already exists and that due to
27 economic conditions, gas rate increases, and a decline in natural gas demand, the number of gas
28 customers are "more likely to decline."¹⁰

⁹ Ex. SBUA (McCann/Moss) at 5-6.

¹⁰ Ex. UCAN-01 (Woychik) at 20.

1 SDG&E disagrees with UCAN’s assertion. UCAN alludes to an existing “declining
2 customer forecast for SDG&E.”¹¹ UCAN appears to be equating declining demand for natural
3 gas with negative natural gas customer additions. SDG&E has not sponsored a customer
4 forecast with negative customer additions. As outlined in the rebuttal for EDF above, SDG&E
5 has experienced two decades of declining demand while experiencing positive customer
6 additions even during periods of economic recessions and gas rate increases. UCAN fails to
7 provide robust analysis to support its claims that SDG&E gas customer growth is likely to
8 decline.

9 **V. SDG&E’S PROPOSED RESIDENTIAL CUSTOMER FORECASTS ARE**
10 **REASONABLE**

11 Cal Advocates and TURN offer a variety of critiques of the methodology SDG&E used
12 to develop its proposed gas customer forecasts for use in this TY 2024 GRC. Additionally, on
13 based on these critiques, Cal Advocates and TURN propose an alternative forecast methodology
14 that produces lower customer forecasts for SDG&E. SDG&E’s rebuttal to the critiques is set
15 forth in this section of this testimony. In Section IV, SDG&E then demonstrates that the
16 alternative methodology proposed by Cal Advocates and TURN is unreasonable and should be
17 rejected. Before proceeding to the substance of the arguments, however, it is important to note
18 that while Cal Advocates and TURN both challenge SDG&E’s methodology for customer
19 forecasts and propose an alternative methodology, they do not criticize SDG&E for using the
20 same methodology or propose to use their alternative methodologies to forecast Commercial
21 customers, which similarly incorporate economic vendor forecasts. It thus appears that the Cal
22 Advocates and TURN posture of selectively challenging SDG&E’s forecasts is results-oriented
23 given the nominal growth SDG&E forecasted for the non-residential customer classes.

24 **A. SDG&E’s Reliance On Economic Vendor Forecast Data is Reasonable**

25 Cal Advocates and TURN take issue with SDG&E’s customer forecast methodology,
26 including the use of economic vendor forecasts.

27 Both Cal Advocates and TURN cite a history of alleged consistent over-forecasting of
28 housing-related data by S&P Global (formerly known as both Global Insight and IHS Global) in
29 past GRC applications as the basis for rejecting SDG&E’s 2024 GRC customer forecast. As

¹¹ *Id.* at 19.

1 discussed below, the entirety of their factual support for this assertion is a flawed analysis that
2 purports to calculate the magnitude of the alleged consistent over forecasting. Therefore, for
3 various reasons, SDG&E does not agree with Cal Advocates and TURN's rejection of economic
4 vendor forecasts.

5 First, intervenors use stale forecasting data for 2020 and 2021 that was included in
6 SDG&E's TY 2019 GRC workpapers. Using this data in the way Cal Advocates and TURN do
7 is inappropriate because the data prepared for 2020 and 2021 had not taken into account COVID-
8 19 related shocks to the economy that would occur years after the relevant workpapers were
9 prepared. Specifically, the Cal Advocates and TURN analysis of economic vendor forecast
10 variance for 2020 to 2022 rely on data provided in the 2019 GRC Customer Forecast workpaper
11 (Ex. SDGE-37-WP, TY 2019 GRC), which was prepared in 2017.¹² SDG&E did not formally
12 sponsor a customer forecast beyond 2019 in its TY 2019 GRC application, notwithstanding the
13 fact that 2020 and 2021 forecast data were included in workpapers. SDG&E provided 2020 and
14 2021 forecast data in the TY 2019 GRC workpapers because it had that information from its
15 2018 California Gas Report (CGR).

16 In 2017, when SDG&E prepared the customer forecast for the 2019 GRC and 2018 CGR,
17 the economic vendor forecasts upon which SDG&E relied, did not reflect the fact that a world-
18 wide pandemic would occur in 2020 that would trigger a brief but sharp recession and that these
19 historic events would have lingering impacts in housing-related industries for the following
20 years. Housing developers delayed planned construction during the pandemic amid economic
21 uncertainty. It is unreasonable to take economic vendor forecasts prepared in 2017 for 2020 and
22 2021 as the basis for measuring economic vendor forecast variance for the 2020-2021 COVID-
23 19-impacted period.

24 In addition, TURN and Cal Advocates' analysis are flawed because they failed to
25 consider that in 2020, SDG&E's GRC cycle was extended from three to four years with two
26 attrition years added to its TY 2019 GRC cycle.¹³ As a result, SDG&E submitted its TY 2024
27 GRC application in 2022 instead of submitting in 2020 a GRC application for a 2022 test year.
28 Between its 2019 and 2024 GRC applications, however, SDG&E updated its customer forecast

¹² Ex. CA-18-E (Sierra) at 6-8, and Ex. TURN-14 (McGovern) at 15-18.

¹³ D.20-01-002 at 3.

1 for the 2020 California Gas Report and in fact used more recent economic vendor forecasts of
2 housing starts that were available at the time. The fact that the analyses by TURN and Cal
3 Advocates purporting to show over-forecasting by the economic vendor forecasts did not
4 calculate variances using forecasts of housing starts for 2020 to 2022 from the 2020 CGR and
5 instead used the forecasts from the 2019 GRC workpaper renders the results of their analyses
6 biased and unreliable.

7 Table EM-2 presents forecasted and actual housing starts from 2014 to 2022 and the
8 variance from actual values using published and submitted data from the 2016 GRC, 2019 GRC,
9 2020 CGR, and the 2024 CGR. As demonstrated in Table EM-2, Cal Advocates' and TURN use
10 of outdated forecasts as their starting points yields an inflated picture of the true variance of the
11 economic vendor forecasts. As shown in Table EM-2, the variance for the 2020 through 2022
12 period has decreased since the 2014 to 2019 period. Thus, both intervenors overstate the
13 variance between both periods by more than threefold.¹⁴ Cal Advocates calculates housing starts
14 forecast variance of 87% and 45% for 2020 and 2021 respectively. Using the more recent
15 economic vendor forecasts used by SDG&E for its 2020 CGR, the variance plummets to 24%
16 and -4% for total starts in 2020 and 2021.¹⁵ If Cal Advocates and TURN had used accurate data
17 (rather than stale data), they would have seen that the economic vendors have not consistently
18 over forecasted as they incorrectly argue. Contrary to the inflated variances shown by Cal
19 Advocates and TURN, using accurate data (rather than stale data) as depicted in Table EM-2, it
20 is clear that the forecasts by economic vendors have for the 2020-2022 period have proven to be
21 remarkably close to actuals. This track record is particularly noteworthy given impacts from the
22 COVID-19 pandemic.

23

¹⁴ Ex. CA-18-E (Sierra) at 6-8, and Ex. TURN-14 (McGovern) at 15-18.

¹⁵ Cal Advocates appears to have summed up all four quarters of housing starts data for each year to calculate an annual figure its testimony (Ex. CA-18-E (Sierra) at 7-8). SDG&E notes that actual and forecasted housing starts presented in its 2024 GRC Customer Forecast workpaper (Ex. SDG&E-39-WP) are seasonally adjusted annual rates (SAAR). To convert from quarterly SAAR to an annual figure, SDG&E averages the four quarters for each year. SDG&E was able to replicate Cal Advocates' variance calculations on page 7 and 8 of its workpaper using the annual average methodology. Table EM-2 was calculated using SDG&E's annual average methodology.

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**TABLE EM-2
HOUSING STARTS FORECAST**

Period	Total Housing Starts		
	Forecast	Actual	Variance
2014	11,017	7,414	49%
2015	14,259	8,548	67%
2016	15,362	9,707	58%
2017	12,046	8,552	41%
2018	12,668	9,675	31%
2019	13,275	7,089	87%
2020	9,146	7,385	24%
2021	9,539	9,886	-4%
2022	10,795	8,025	35%

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Table EM-2 Note: 2014-2016 forecasts are from 2016 GRC, 2017-2019 forecasts are from 2019 GRC, 2020-2021 forecasts are from 2020 CGR, and 2022 forecast is from 2024 GRC

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B. Contrary to Cal Advocates and TURN’s Critiques, SDG&E Customer Forecasts Are Not Biased or Flawed

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Both Cal Advocates and TURN extend their critique of SDG&E’s customer forecast by asserting that supposedly flawed economic vendor forecasts result in SDG&E producing inaccurate customer growth forecasts. For the reasons discussed below, SDG&E does not agree with Cal Advocates and TURN’s contentions that the utility’s customer growth forecasts are inflated.

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Cal Advocates’ and TURN’s critique of SDG&E’s results that relied on economic vendor forecasts is flawed for the same reason as their critiques of the economic vendor forecasts themselves. Simply put, Cal Advocates and TURN rely on outdated residential customer forecasts for 2020 and 2021, to criticize the historic accuracy of SDG&E’s customer forecast track record. As outlined in detail above, SDG&E updated its customer forecasts for 2020 and 2021 for the 2020 California Gas Report. The variance between forecasted and actual residential customers for 2020 and 2021 is markedly lower both from the 2014 to 2019 period and from the outdated forecast for those two years that both intervenors rely upon for their critiques. Table EM-3 below reflects variances for residential customers for 2020 and 2021 well below Cal

1 Advocates' numbers in their testimony.¹⁶ In other words, it is Cal Advocates' calculation of the
2 variances that is overstated.

3 **TABLE EM-3**
4 **RESIDENTIAL CUSTOMERS (METERS) FORECAST**

Period	Total		
	Forecast	Actual	Variance
2014	838,671	835,745	2,926
2015	848,964	839,988	8,976
2016	861,283	845,278	16,005
2017	849,856	850,136	-280
2018	855,820	855,716	104
2019	861,541	861,502	39
2020	865,119	867,407	-2,288
2021	871,443	873,304	-1,861
2022	880,418	877,557	2,861

5 *Table EM-3 Note: 2014-2016 forecasts are from 2016 GRC, 2017-2019 forecasts are from 2019*
6 *GRC, 2020-2021 forecasts are from 2020 CGR, and 2022 forecast is from 2024 GRC*

7 **VI. REBUTTAL TO PARTIES' ALTERNATIVE FORECAST METHODOLOGY**

8 To replace SDG&E's supposedly flawed customer forecasts, Cal Advocates and TURN
9 both call for the use of a moving ten-year average as the basis to forecast SDG&E customer
10 additions through the 2024 test year, instead of relying on an econometric model using
11 explanatory variables (i.e., housing starts). Cal Advocates takes the initial step of "normalizing"
12 the history of residential customers by applying a ten-year moving average to the history. Cal
13 Advocates and TURN would then discount the resulting figures by 50% for 2023 and 2024.
14 These proposals are unreasonable and should be rejected.

15 **A. TURN's Proposed Ten-Year Average Introduces Bias Into the Forecasting**
16 **Process**

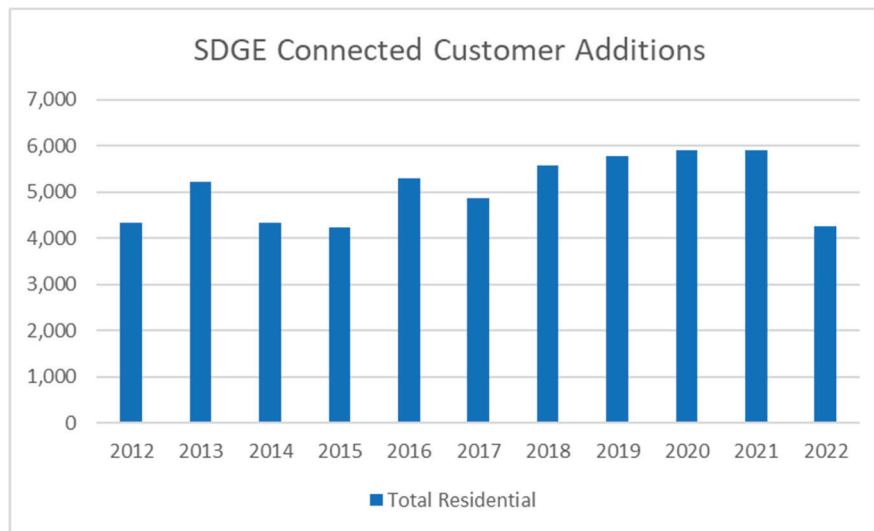
17 TURN proposes to use a moving ten-year average of residential customers in lieu of
18 forecasts based on statistical relationships between customers and explanatory variables such as
19 housing forecasts. SDG&E does not agree with this drastic change in forecasting methodology
20 for two fundamental reasons.

21 First, TURN's use of ten-year averages for its proposed forecasts biases its forecast
22 downward by relying on periods coming out of the 2007-2009 recession when housing activity

¹⁶ Ex. CA-18-E (Sierra) at 11.

1 and customer additions were especially weak for single family housing construction. The
2 oversupply of housing that marked the years following the housing crash of 2007-2009, with
3 impacts that persisted in the moving averages through most of the ten-year period specified by
4 the intervenor largely dissipated by the end of the decade as builders increased activity. TURN's
5 selection of a ten-year average unreasonably includes an exceptionally weak period for
6 homebuilding and customer activity at the beginning of the previous decade to decrease growth
7 forecasts for the future period governed by this proceeding. The weak homebuilding and
8 customer activity reflected in TURN's selected forecasts reflect conditions that no longer exist,
9 as shown in chart EM-1. Thus, not only does TURN's ten-year rolling average approach include
10 a significant carry-forward of lingering effects of the housing crash, but it also discounts the
11 more recent period of relatively robust growth that have not yet had time to work through
12 because of the way rolling averages by their nature work.

13 **CHART EM-1**
14 **RESIDENTIAL CUSTOMER ADDITIONS**



15
16 Secondly, Cal Advocates and TURN's use of a ten-year average demographic drivers that
17 are the underpinning of housing demand, which continues to drive customer additions. A
18 skewed ten-year average will not adequately reflect drivers like the largest age cohort of
19 Millennials approaching and reaching the peak of demand for first-time home purchases.¹⁷

¹⁷ "Millennial Homebuyers' Share Continues to Rise in 2022 (December 28, 2022)," attached as Appendix D at EJM-D-2.

1 Finally, SDG&E notes that the TURN proposal is selective and appears to be results-
2 oriented in that it would only apply to residential customer growth, while they accept SDG&E'
3 forecasts for non-residential customer classes. In contrast SDG&E's residential forecasts,
4 SDG&E's non-residential forecasts in this TY 2024 GRC are comparatively flat.

5 For all of these reasons, TURN's ten-year rolling average approach is unreasonable and
6 should not be adopted.

7 **B. Cal Advocates' Transformation of Residential Housing Starts History**
8 **Produces a Distorted Forecast**

9 Cal Advocate differs from TURN's use of a moving average. However, Cal Advocates
10 attempt to further lower SDG&E's residential customers forecast by rewriting the history of
11 housing starts. Cal Advocates attempts to accomplish this by replacing actual quarterly starts
12 with a ten-month moving average of starts.

13 Cal Advocate's attempt to lower SDG&E's residential customer forecast by rewriting
14 SDG&E's residential housing starts should be rejected. By recreating SDG&E's residential
15 housing starts history, Cal Advocates' forecast is no longer based on actual history but rather its
16 preferred history. The use of a moving average for residential housing starts history while
17 keeping actual quarterly residential customers does not reflect reality but rather introduces a
18 distorted relationship between housing starts and residential customers. SDGE notes that instead
19 of calculating a moving ten-year average of residential housing starts history and forecast values,
20 Cal Advocates calculated a moving ten-period or two-and-a-half-year period average in its work
21 paper.¹⁸

22 Finally, SDG&E notes that the Cal Advocates' proposal is selective and appears to be
23 results-oriented in that it would only apply to residential customer growth, while they accept
24 SDG&E' forecasts for non-residential customer classes. In contrast to SDG&E's residential
25 forecasts, SDG&E's non-residential forecasts in this TY 2024 GRC are comparatively flat.

26 For all of the above reasons, Cal Advocates' recreation of SDG&E's housing starts
27 history is unreasonable and should not be adopted.

¹⁸ Ex. CA-18-WP Gas SDG&E, screenshot of tab METRESSF CAL ADV, attached as Appendix B at EJM-B-2.

1 **C. There is No Basis for Cal Advocates and TURN’s 50 Percent Reduction to**
2 **the 2023 and 2024 Forecasts.**

3 Not content with overvaluing periods of housing distress and undervaluing recent growth,
4 Cal Advocates and TURN further propose to cut the resulting values to account for a policy
5 change the impact of which remains uncertain. Specifically, Cal Advocates recommends that
6 SDG&E’s Residential meter forecast, should be discounted by 50% as of July 2023 to account
7 for the Commission’s D.22-09-026 to disallow gas line extensions’ allowances, refunds, and
8 discounts.¹⁹ TURN argues that SDG&E’s 2024 GRC customer forecast should be discounted by
9 50% in 2024, citing D.22-09-026 and also claiming that local ordinances calling for new
10 residential buildings to be “all-electric” in the future. TURN states, “[r]ecently, at least 10 cities
11 within the service territory of SCG and SDG&E and Los Angeles and Ventura counties have
12 decided to ban new gas construction and to require all-electric ready infrastructure for new
13 homes.”²⁰

14 Cal Advocates and TURN’s proposal should be rejected. For one thing, both TURN and
15 Cal Advocates’ proposals fail to account that an unknow at present share of housing units that
16 will start construction in those two years will have had their permits pulled prior to the CPUC
17 decision disallowing gas line extensions’ allowances, refunds, and discounts (D. 22-09-026)
18 going into effect in July 2023. In addition, it is possible that home builders may choose to cover
19 the cost of gas line extensions to accommodate demand for gas appliances, as evidenced by
20 consumers’ preference for gas appliances for cooking and high residential electricity prices.²¹
21 Whatever effects the policies cited by Cal Advocates and TURN may have are uncertain at this
22 time. Applying a discount to future growth forecasts based on speculation as to the impacts of
23 future policies is unreasonable.

24 Beyond the question of whether any discount should be applied based on theorized future
25 impacts of policies, SDG&E also notes that neither of these testimonies presented any analysis

¹⁹ Ex. CA-18-E (Sierra) at 11-12.

²⁰ Ex. TURN-14 (McGovern) at 20.

²¹ Natural Gas in New Homes (A Survey of Single-family Home Builders) (September 2021), attached as Appendix C at EJM-C-27 to EJM-C-28. *See also*, Energy Institute Blog, UC Berkely, Three Facts about Electric Heating in California (May 8, 2023) available at <https://energyathaas.wordpress.com/2023/05/08/three-facts-about-electric-heating-in-california/>.

1 whatsoever regarding how they determined the level of the discount they chose to apply—50
2 percent—let alone why that discount level might be appropriate in their view. Simply put, the
3 proposed 50% is arbitrary, without any support, and unreasonable. Therefore, a blanket and
4 unsupported 50% reduction to the gas customer forecast in 2023 and 2024 should be rejected.

5 **VII. REBUTTAL AS TO OTHER ISSUES**

6 **A. TURN’s Proposed Balancing Account is Unexplained, Unreasonable, and** 7 **Should be Rejected**

8 TURN calls for a one-way balancing account ostensibly to protect customers in the case
9 of unrealized customer counts.²² TURN’s entire support for this proposal consists of two
10 sentences in its testimony and is void of any explanation, “[f]or the gas customer forecasts,
11 TURN recommends a one-way balancing account to protect customers from the uniquely
12 unfamiliar circumstances and timing of this GRC and the changes in gas policy.”²³ Then in the
13 conclusion, TURN states:

14 Finally, TURN, in recognition of the large amount of change in the
15 underlying fundamentals of the residential gas market, recommends that
16 the Commission establish a one-way balancing account to refund
17 residential customers any cost savings that are generated by unrealized
18 customer count.²⁴

19 SDG&E opposes TURN’s balancing account proposal. For one thing, a one-way
20 balancing account is unreasonable and administratively burdensome. It would be difficult, if not
21 impossible to try to quantify total company cost savings or increases due to actual changes in
22 customer count. Further, TURN provides zero explanation as to what would be recorded to this
23 proposed one-way balancing account or how such an account would function. The one-way
24 aspect of this proposal is particularly troubling, as it would effectively penalize the utility for
25 customer growth that exceeds the utility’s forecasts. Thus, the Commission should reject
26 TURN’s proposal for a one-way balancing account not only for its lack of support but, more
27 fundamentally, because it is unworkable and unreasonable.

²² Ex. TURN-14 (McGovern) at 4.

²³ *Id.*

²⁴ *Id.* at 29.

1 **B. SDG&E’s Use of Econometric Software is Reasonable.**

2 The testimonies of Cal Advocates and TURN criticize SDG&E’s use of a specific
3 forecasting software package and the various claims regarding model.²⁵ Neither of these
4 contentions detract from the reasonableness of SDG&E’s forecasts.

5 With respect to the software package issue, SDG&E used AREMOS/32 Large Bank
6 Version econometric package to prepare its 2024 GRC customer forecasts. The AREMOS
7 software is no longer commercially available and, as such, SDG&E understands that Cal
8 Advocates and TURN may not have independent access to it. But as a third-party developed
9 software package, SDG&E does not believe that it has authority to provide Cal Advocates and
10 TURN with a copy for their own use. Because of this, SDG&E demonstrated the software’s use
11 and performed model runs using updated or alternative forecast scenarios as requested by Cal
12 Advocates and TURN in response to the following data requests: PAO-SDGE-185, questions
13 1a-d, 2a-d, 3a-d; TURN-SEU-038, question 1a; and TURN-SEU-040, question 1a.

14 SDG&E is open to exploring the use of alternative software packages in the future, but
15 SDG&E believes that we provided intervenors with reasonable cooperation and data through the
16 discovery process. As far as SDG&E is aware, the Commission has not prescribed that utilities
17 must use any particular software package or methodology; but in past cases, it has approved
18 forecasts that, as here, were developed using the AREMOS software using a methodology
19 consistent with the approach used here by SDG&E.

20 Additionally, SDG&E believes it is important to point out that neither Cal Advocates nor
21 TURN suggest that the calculations actually performed by the software itself are anything other
22 than accurate based on the source data and instructions. Old or not, the software worked and it
23 produced forecasts that, as demonstrated above, are reasonable and should be adopted. Thus,
24 any implication or attempt to undermine the reasonableness of SDG&E’s forecasts based on the
25 software should be rejected.

26 **C. Use of Add-Factor is Consistent With Modeling Practices**

27 Cal Advocates takes issue with SDG&E’s use of add-factors describing this
28 practice as arbitrarily adding or subtracting values to the customer forecast. SDG&E rejects Cal
29 Advocates’ description of its add-factors. Use of add-factors based on the observed variance

²⁵ Ex. CA-18-E (Sierra) at 4-6, and Ex. TURN-14 (McGovern) at 27-28.

1 between forecasted and actual values is not unprecedented in econometric modeling like
2 SDG&E's customer forecast model. In fact, the Commission has approved SDG&E's use of add
3 factors in prior GRCs.

4 **D. Other Items Discussed by Cal Advocates and TURN**

5 SDG&E notes that it is open to exploring measures to refine its customer forecasts in the
6 future. Examples of such measures could possibly include adjusting the number of observations
7 used to calculate forecast equations, experimenting with alternative explanatory economic
8 variables, averaging of different economic vendor forecasts, and incorporating economic
9 vendors' more conservative forecast scenarios. In addition, SDG&E is open to exploring the
10 feasibility of using housing completions instead of housing starts and Excel instead of AREMOS
11 in future.

12 **VIII. CONCLUSION**

13 As discussed above, the Commission should find SDGE's forecasts and requests to be
14 reasonable and supported by the following analysis:

- 15 1. Economic vendor forecast variance has been declining, particularly when the
16 vendor forecast used for the 2020 California Gas Report are taken into
17 consideration rather than outdated forecasts prepared prior to the COVID-19
18 pandemic.
- 19 2. Variances in SDG&E's customer forecast has fallen in recent years.
- 20 3. A ten-year rolling average of customer additions would include several years
21 following the 2007-2009 recession and housing crash when an oversupply of
22 housing weighed down on housing starts and customer additions, which would
23 lead to an artificially suppressed forecast, and would fail to account for drivers
24 like strong Millennial demand for housing.
- 25 4. A sizable amount of new residential construction will not fall under the CPUC's
26 disallowance of gas line extensions' allowances, refunds, and discounts that will
27 go into effect in July 2023, this making the proposed 50% discount of SDG&E's
28 residential customer additions inappropriate.
- 29 5. For more than two decades, SDG&E has experienced both simultaneously
30 downward trending gas usage and increasing customer counts under the state's
31 aggressive energy efficiency policies. Any impacts of recent and yet-to-be-fully

1 implemented policies or regulations are speculative and SDG&E believes will
2 likely not result in declining or flat customer addition growth by 2024.
3 Therefore, the Commission should adopt SDG&E's gas meter forecasts without revision.
4 This concludes my prepared rebuttal testimony.

1 **IX. WITNESS QUALIFICATIONS**

2 My name is Eduardo J. Martinez. I assumed sponsorship of this area from Scott Wilder.
3 My business address is 555 West 5th Street, Los Angeles CA 90013. My title is Gas Demand
4 Forecast Manager. I work in the Gas Regulatory Affairs Department for Southern California
5 Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E). I joined
6 SoCalGas in August 2022. Prior to assuming my current position, I was the Senior Load
7 Forecaster for Southern California Edison Company (SCE) from 2014 to 2022 and a Senior
8 Economist for Moody's Analytics from 2008 to 2014. Additional economist positions include
9 Los Angeles County Economic Development Corporation (LAEDC) from 2006 to 2008, U.S.
10 State Department from 2002 to 2006, and the Bureau of Labor Statistics from 1999 to 2002. I
11 am a current member of the national and Los Angeles chapters of the National Association for
12 Business Economics (NABE).

13 I received my Bachelor of Arts in International Business from California State University
14 Fullerton and my Masters of Arts in Economics from California State University Long Beach.

15 I have not previously testified before the Commission.

APPENDIX A
GLOSSARY OF TERMS

ACRONYM	DEFINITION
Cal Advocates	Public Advocates Office of the California Public Utilities Commission
CARB	California Air Resources Board
CGR	California Gas Report
Commission	California Public Utilities Commission
EDF	Environmental Defense Fund
GRC	General Rate Case
SBUA	Small Business Utility Association
SDG&E	San Diego Gas & Electric Company
TURN	The Utility Reform Network
TY	Test Year
UCAN	Utility Consumers Action Network

APPENDIX B

**SCREENSHOT FROM CAL ADVOCATES' WORKPAPERS FOR EX. CA-18-E,
TITLED: "A2205015 *et al* PUBLIC ADVOCATES OFFICE (SIERRA) CA-18-WP GAS
SDG&E," TAB "3-METRESSD." SEE ROWS 5 to 14.**

SUM     =AVERAGE(D5:D14)

	C	D	E	F	G	H	I
1							
2							
3		HOUSING STARTS					
4	QUARTER	ABRTUNS_SD	SEASON2	SEASON3			
5	201101	4014	0	0		#N/A	
6	201102	6463	1	0		#N/A	
7	201103	5176	0	1		#N/A	
8	201104	5461	0	0		#N/A	
9	201201	3719	0	0		#N/A	
10	201202	6299	1	0		#N/A	
11	201203	6475	0	1		#N/A	
12	201204	4472	0	0		#N/A	
13	201301	6211	0	0		#N/A	
14	201302	7798	1	0		D14)	
15	201303	5718	0	1		5779	
16	201304	9836	0	0		6117	
17	201401	8332	0	0		6432	
18	201402	7006	1	0		6587	
19	201403	8068	0	1		7022	
20	201404	6493	0	0		7041	
21	201501	6749	0	0		7068	
22	201502	10603	1	0		7682	
23	201503	8737	0	1		7934	
24	201504	8334	0	0		7988	
25	201601	9374	0	0		8353	
26	201602	9752	1	0		8345	
27	201603	8839	0	1		8396	
28	201604	10834	0	0		8778	

APPENDIX C

"Natural Gas in New Homes (A Survey of Single-family Home Builders)"

Natural Gas in New Homes

(A Survey of Single-family Home Builders)



September 2021

Economics & Housing Policy Group

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INTRODUCTION

For more than 30 years, the National Association of Home Builders (NAHB) has conducted a monthly survey of single-family builder members in order to generate the NAHB/Wells Fargo Housing Market Index (HMI). The HMI survey asks builders to rate market conditions for the sale of new homes at the present time and expected over the next 6 months, as well as the traffic of prospective buyers. The results are combined into a single composite index that measures the overall strength of the market for new single-family housing. Throughout its history, the HMI has become a leading indicator of single-family housing starts and is widely reported in business media and used by the Federal Reserve Bank, government agencies, and Wall Street analysts.

In August 2021, a set of special questions were included in the HMI survey regarding the average sales price of comparable homes with and without natural gas as well as the number of days each spent on the market before going under contract. The survey also asked whether there has been a change in buyers' preference for natural gas and how likely buyers are to request that specific appliances be installed for natural gas. The final two questions asked builders about the level of influence several factors have on their decision to install gas vs. electric appliances and their preference for fuel type based on each one of those factors.

The survey questionnaire (Appendix I) was sent electronically to a panel of approximately 3,000 builder members. A total of 360 builders responded to the survey, for a response rate of 12 percent, but not all questions were answered by every respondent. This report analyses responses by the four Census regions and by the number of for-sale units started by the builder in 2020. Any breakdown with fewer than 10 responses was removed to ensure the statistical reliability of cross-sectional analysis. In addition, the analysis comparing the price of homes with and without natural gas only includes homes with prices below \$1 million.

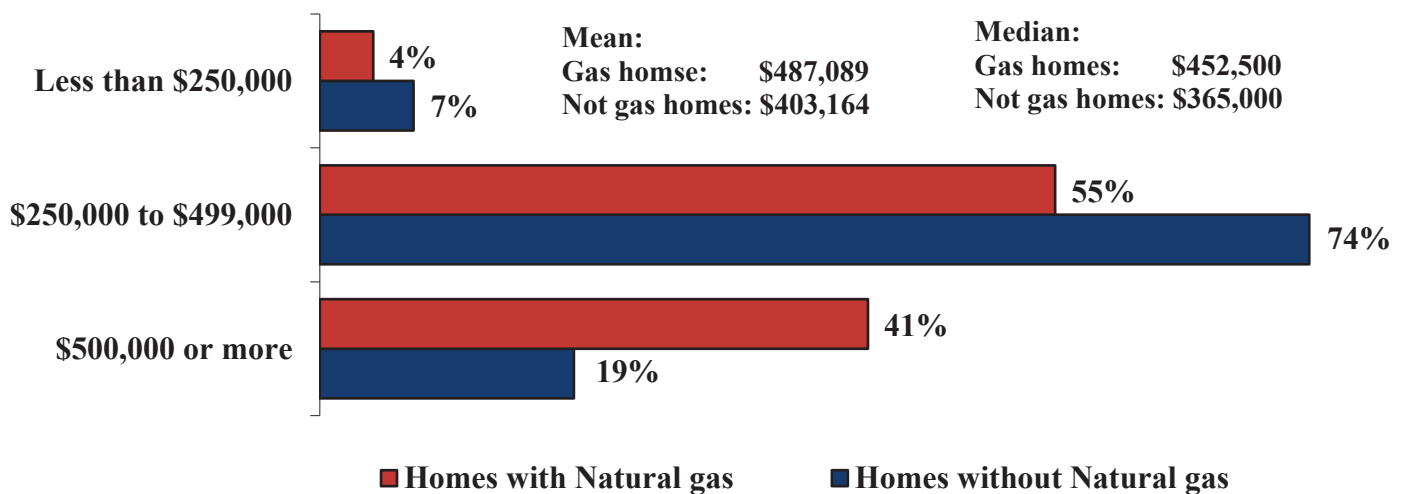
SURVEY FINDINGS

Builders were asked to report the average sales price for comparable single-family homes with and without natural gas built for-sale in the prior year. A total of 200 builders provided average prices: 140 reported the price of only one of these two types of homes and 60 reported the prices of both types of homes. At the request of the Energy Solutions Center, all observations showing prices of \$1 million or more were excluded from the analysis below. After the exclusion, results are based on responses from 170 builders, 119 of whom reported the price of only one type of home and 51 who reported the prices of both homes with and without natural gas. The price comparison is done first among all 170 respondents, regardless of whether they reported one or two of the prices asked, and then among the 51 common respondents who reported prices for both types of homes.

All Respondents

When all responses are aggregated, the price of a new home with natural gas averages \$487,089, about 21 percent higher than the average \$403,164 for a home without natural gas (Exhibit 1). An important finding to highlight is that 41 percent of builders reported their gas homes sold for at least \$500,000, more than double the share who reported that price point for homes without gas (19 percent).

**Exhibit 1: Sales price for homes with & without natural gas – ALL RESPONDENTS
(Percent of Respondents)**



The average sales price of homes with natural gas was higher than of those without gas in all regions of the country and across categories of builder size for which enough data were collected. For example, in the South, the average home with gas sold for \$464,719, a 22 percent premium over a comparable home without gas (\$382,098). In the Midwest, homes with natural gas sold for an average \$467,475, 11 percent higher than those without gas (\$423,000). In the West, the average gas home sold for \$537,696, but not enough builders provided price data for homes without gas to produce a reliable estimate for them in this region. The latter was also the case for both types of homes in the Northeast.

Meanwhile, across builder size categories, builders who started at least 100 units in 2020 reported their average gas home sold for \$433,333, 25 percent more than their average non-gas home (\$346,600). The price difference was significantly lower among smaller builders. Builders with 6 to 24 starts sold their average gas home for \$505,299, 11 percent more than their average non-gas home (\$454,174). Among builders with 25 to 99 housing starts, the price difference amounted to only 8 percent: \$468,973 for gas homes vs. \$435,653 for homes without natural gas (Exhibit 2).

**Exhibit 2. Sales price for homes with & without natural gas – By Region and Firm Size:
ALL RESPONDENTS
(Percent of Respondents)**

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
HOME WITH NATURAL GAS									
Less than \$250,000	4		5	6		5	5	5	5
\$250,000-\$499,999	55		62	58	43	52	50	61	67
\$500,000 or more	41		33	36	57	43	45	34	29
Mean	\$487,089		\$467,475	\$464,719	\$537,696	\$494,619	\$505,299	\$468,973	\$433,333
Median	\$452,500		\$450,000	\$450,000	\$500,000	\$430,000	\$475,000	\$450,000	\$450,000
Min	\$190,000		\$200,000	\$190,000	\$317,157	\$230,000	\$200,000	\$190,000	\$235,000
Max	\$950,000		\$950,000	\$850,000	\$950,000	\$925,000	\$950,000	\$950,000	\$700,000
Responses	148		39	72	30	21	42	41	21
HOME WITHOUT NATURAL GAS									
Less than \$100,000	7			10				6	10
\$250,000-\$499,999	74		80	76			70	65	90
\$500,000 or more	19		20	14			30	29	
Mean	\$403,164		\$423,000	\$382,098			\$454,174	\$435,653	\$346,600
Median	\$365,000		\$371,000	\$350,000			\$400,000	\$375,000	\$312,500
Min	\$190,000		\$279,000	\$190,000			\$285,000	\$190,000	\$200,000
Max	\$875,000		\$800,000	\$800,000			\$800,000	\$875,000	\$470,000
Responses	73		10	50			23	17	10

The HMI survey has asked builders about the average price of homes they build with natural gas three times in the past. Not adjusted for inflation, the average price builders reported for this type of home was \$302,922 in December 2002, \$361,362 in October 2010, \$407,185 in August 2016, and now \$487,089 in August 2021 (Exhibit 3)¹.

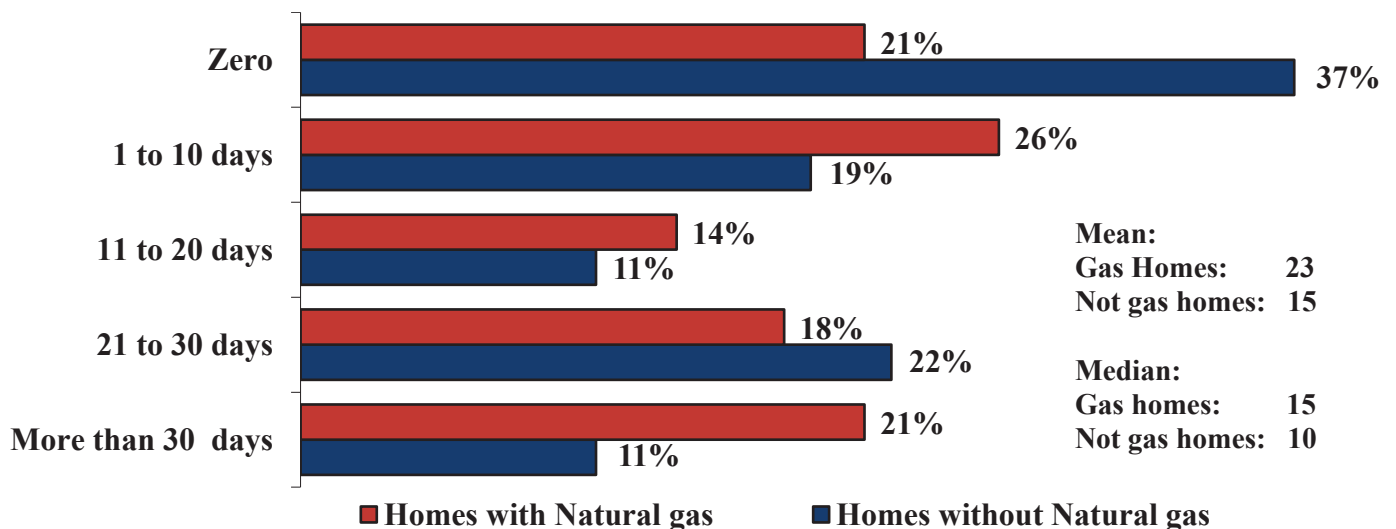
¹ Tabulations in 2002 and 2010 did not exclude homes with prices of \$1 million or more.

**Exhibit 3: History of sales price for homes with natural gas – ALL RESPONDENTS
(Percent of Respondents)**

	Dec. 2002	Oct. 2010	Aug. 2016	Aug. 2021
Less than \$100,000	3	1		
\$100,000-\$149,999	22	4	1	
\$150,000-\$174,999	8	6	1	
\$175,000-\$249,999	15	24	12	4
\$250,000-\$499,999	39	48	58	55
\$500,000 or more	14	17	28	41
Mean	\$302,922	\$361,362	\$407,185	\$487,089
Median	\$250,000	\$289,975	\$350,000	\$452,500
Min	\$15,000	\$50,000	\$130,000	\$190,000
Max	\$1,200,000	\$2,200,000	\$975,000	\$950,000

The same question that asked builders for the average price of comparable homes with and without natural gas also asked (for the first time in HMI history) about the number of days each type of home was on the market before going under contract. When aggregated across all responses, gas homes stayed on the market for an average of 23 days (median=15 days), compared to only 15 days for homes without natural gas (median=10 days). A point to note is that 21 percent of builders reported their gas homes stayed on the market for more than 30 days, compared to a smaller 11 percent share for homes without gas (Exhibit 4).

**Exhibit 4: Number of days for homes with & without natural gas – ALL RESPONDENTS
(Percent of Respondents)**



The average number of days homes with natural gas were on the market was higher than for homes without natural gas in all regions and across categories of builder size for which enough data were collected. In the Midwest and South regions, builders reported that homes with natural gas stayed on the market an average of 25 days, compared to 11 and 16 days, respectively, for homes without gas. Among builders with 5 or fewer starts, homes with gas were on the market for an average of 31 days vs. 13 days for those without. The comparison is 18 days vs. 12 days for builders with 6 to 24 starts, and 21 days vs. 17 days for builders with 25 to 99 starts (Exhibit 5).

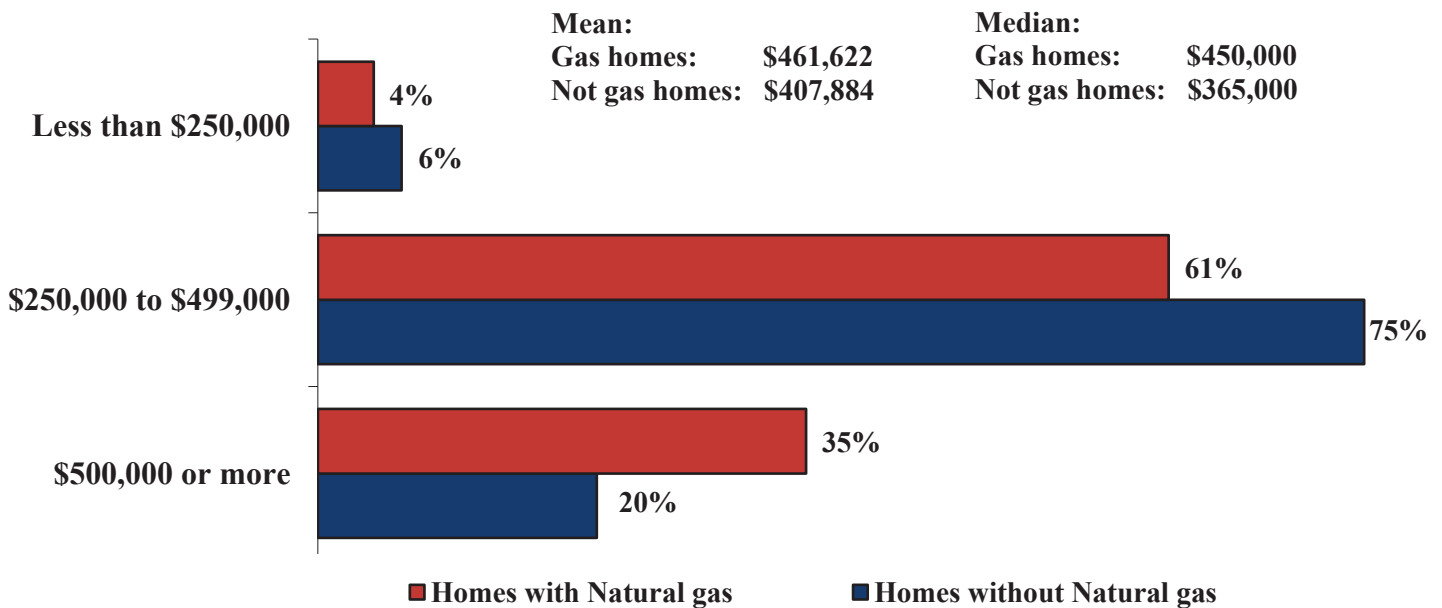
**Exhibit 5. Number of days for homes with & without natural gas – By Region and Firm Size:
ALL RESPONDENTS
(Percent of Respondents)**

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
HOME WITH NATURAL GAS									
Zero	21		25	21	16	17	34	20	10
1 to 10 days	26		19	24	35	22	20	33	25
11 to 20 days	14		11	10	26	13	12	8	25
21 to 30 days	18		19	22	10	17	15	18	20
More than 30 days	21		25	24	13	30	20	23	20
Mean	23		25	25	16	31	18	21	23
Median	15		15	20	10	20	10	10	15
Min	0		0	0	0	0	0	0	0
Max	180		100	180	60	180	90	110	60
Responses	145		36	72	31	23	41	40	20
HOME WITHOUT NATURAL GAS									
Zero	37		36	37		40	48	41	
1 to 10 days	19		18	20		10	17	12	
11 to 20 days	11		27	8		20	9	6	
21 to 30 days	22		18	22		30	17	24	
More than 30 days	11			12			9	18	
Mean	15		11	16		13	12	17	
Median	10		10	7		12	1	5	
Min	0		0	0		0	0	0	
Max	60		30	60		30	60	60	
Responses	73		11	49		10	23	17	

Common Respondents

When only common respondents are considered (builders reporting prices for homes with natural gas and also for those without gas), the average price for homes with gas was \$461,622, 13 percent higher than the \$407,884 average for homes without gas. This 13-point price difference among common respondents is significantly smaller than the 21-point price difference described earlier among all respondents. Within the subset of common respondents, 35 percent reported their gas homes sold for \$500,000 or more, compared to only 20 percent who reported that price point for homes without natural gas (Exhibit 6).

**Exhibit 6. Sales price for comparable homes with & without gas - COMMON RESPONDENTS
(Percent of Respondents)**



When only common respondents are analyzed by region and builder size, results show that the average price of a gas home is higher than that of a home without gas in every instance where data are available. For instance, builders in the South who sold both gas homes and non-gas homes reported an average price of \$459,875 for the former and \$377,844 for the latter, a difference of 22 percentage points. Among builders with 6 to 24 housing starts, the price difference was 7 percentage points: \$470,833 for

gas homes vs. \$438,917 for non-gas homes. Among builders with 25 to 99 starts, the difference was 5 percentage points: \$464,914 for gas homes vs. \$443,074 for non-gas homes (Exhibit 7).

**Exhibit 7. Sales price for comparable homes with & without gas – By Region and Firm Size:
COMMON RESPONDENTS
(Percent of Respondents)**

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
HOME WITH NATURAL GAS									
Less than \$250,000	4			6				7	
\$250,000-\$499,999	61			56			67	53	
\$500,000 or more	35			38			33	40	
Mean	\$461,622			\$459,875			\$470,833	\$464,914	
Median	\$450,000			\$450,000			\$427,000	\$450,000	
Min	\$190,000			\$190,000			\$300,000	\$190,000	
Max	\$875,000			\$850,000			\$750,000	\$875,000	
Responses	51			32			12	15	
HOME WITHOUT NATURAL GAS									
Less than \$100,000	6			9				7	
\$250,000-\$499,999	75			78			75	60	
\$500,000 or more	20			13			25	33	
Mean	\$407,884			\$377,844			\$438,917	\$443,074	
Median	\$365,000			\$337,500			\$381,000	\$375,000	
Min	\$190,000			\$190,000			\$285,000	\$190,000	
Max	\$875,000			\$700,000			\$800,000	\$875,000	
Responses	51			32			12	15	

Exhibit 8 shows the price history available for homes with gas as reported by the smaller subset of builders who at the same time provided an average price for a different type of home². Among this group of respondents, and not adjusted for inflation, the average price for a home with natural gas was \$220,800 in December 2002, \$328,549 in October 2010, \$354,928 in August 2016, and now \$461,622 in August 2021.

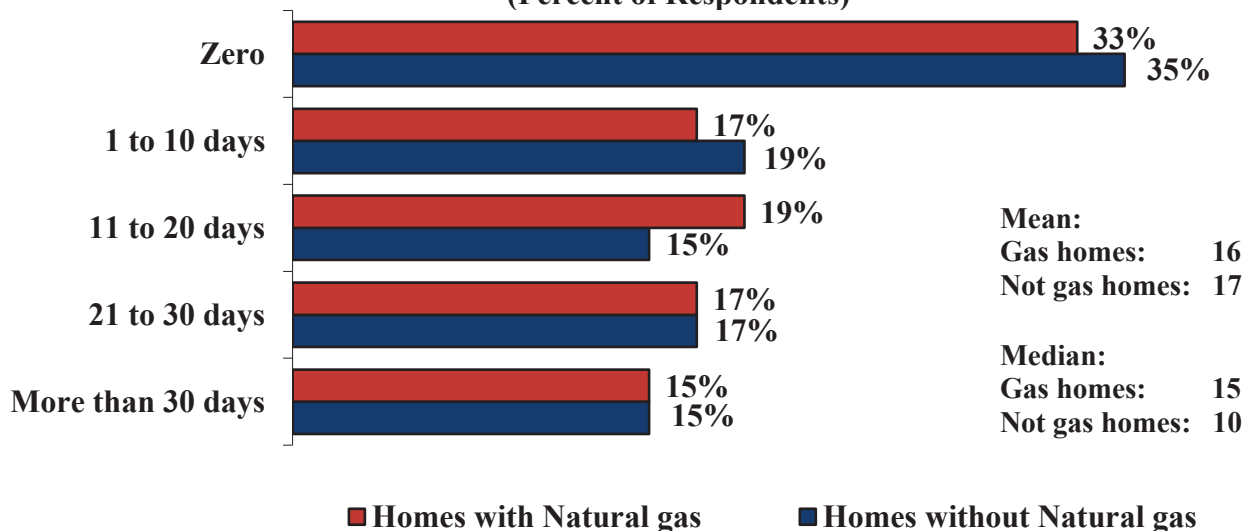
² Prior to 2021, the survey asked specifically about the average price of an ‘electric’ home. In 2021, the comparison home became a broader “home without natural gas.”

**Exhibit 8. History of sales price for homes with natural gas – COMMON RESPONDENTS
(Percent of Respondents)**

	Dec. 2002	Oct. 2010	Aug. 2016	Aug. 2021
Less than \$100,000	3	2		
\$100,000-\$149,999	33	5	2	
\$150,000-\$174,999	8	6		
\$175,000-\$249,999	11	33	16	4
\$250,000-\$499,999	44	44	63	61
\$500,000 or more		10	18	35
Mean	\$220,800	\$328,549	\$354,928	\$461,622
Median	\$186,450	\$250,000	\$325,000	\$450,000
Min	\$40,000	\$50,000	\$130,000	\$190,000
Max	\$450,000	\$2,200,000	\$825,000	\$875,000

Looking at the average number of days on the market only among common respondents (builders who provided a response for both homes with and without natural gas) reveals very little difference. According to these builders, gas homes stayed on the market for an average of 16 days, only 1 day less than the average 17 days for homes without gas. The plurality of these builders – around one-third – reported that both types of homes were on the market for zero days, meaning they sold even before being formally offered for-sale (Exhibit 9).

**Exhibit 9: Number of days on the market for homes with & without natural gas –
COMMON RESPONDENTS
(Percent of Respondents)**



When only considering common respondents, the average number of days homes with or without natural gas were on the market was about the same for any of the regional or builder size breakdowns available. In the South, for example, both homes stayed on the market for the exact same average number of days: 19. Among builders with 6 to 24 starts, homes with gas were on the market an average of 11 days vs. 12 days for those without gas. The comparison is 16 days vs. 17 days, respectively, for builders with 25 to 99 starts (Exhibit 10).

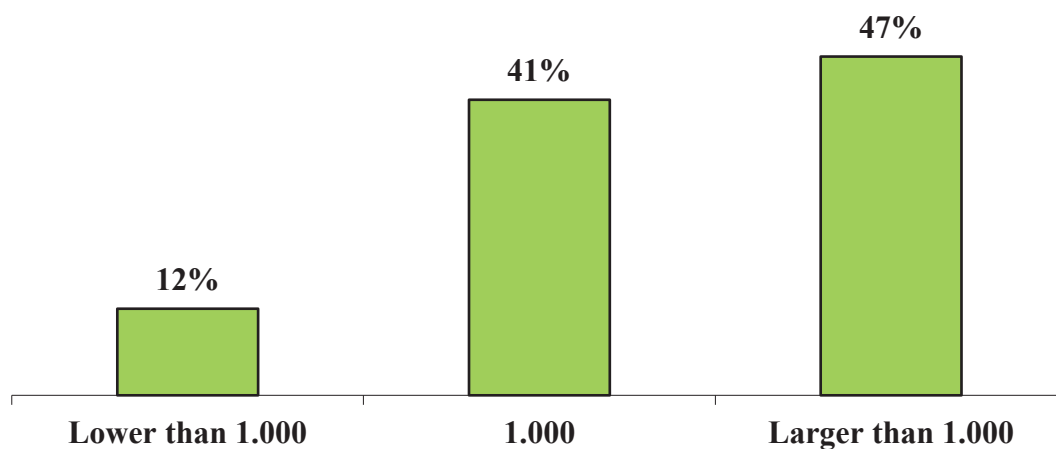
Exhibit 10. Number of days on the market for homes with & without natural gas – By Region and Firm Size: COMMON RESPONDENTS (Percent of Respondents)

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
HOME WITH NATURAL GAS									
Zero	33			27			42	43	
1 to 10 days	17			20			25	14	
11 to 20 days	19			10			25	7	
21 to 30 days	17			23			8	14	
More than 30 days	15			20				21	
Mean	16			19			11	16	
Median	15			18			5	5	
Min	0			0			0	0	
Max	60			60			30	60	
Responses	48			30			12	14	
HOME WITHOUT NATURAL GAS									
Zero	35			33			50	43	
1 to 10 days	19			20			17	14	
11 to 20 days	15			10			8	7	
21 to 30 days	17			20			17	14	
More than 30 days	15			17			8	21	
Mean	17			19			12	17	
Median	10			13			3	5	
Min	0			0			0	0	
Max	60			60			40	60	
Responses	48			30			12	14	

Ratio of sales price of homes with natural gas vs. homes without natural gas

About 41 percent of common respondents reported identical sales prices for a home with natural gas as for one without it (for a sales price ratio of 1.0). A small minority of 12 percent reported a lower price for gas homes than for non-gas homes, which produced sales price ratios lower than 1.0. Meanwhile, 47 percent reported higher sales prices for gas homes, producing price ratios larger than 1.0 (Exhibits 11 and 12).

Exhibit 11. Ratio of sales price of homes with natural gas over homes without natural gas (Percent of Common Respondents)



**Exhibit 12. Ratio of sales price of homes with natural gas over homes without natural gas – By
Region and Firm Size
(Percent of Common Respondents)**

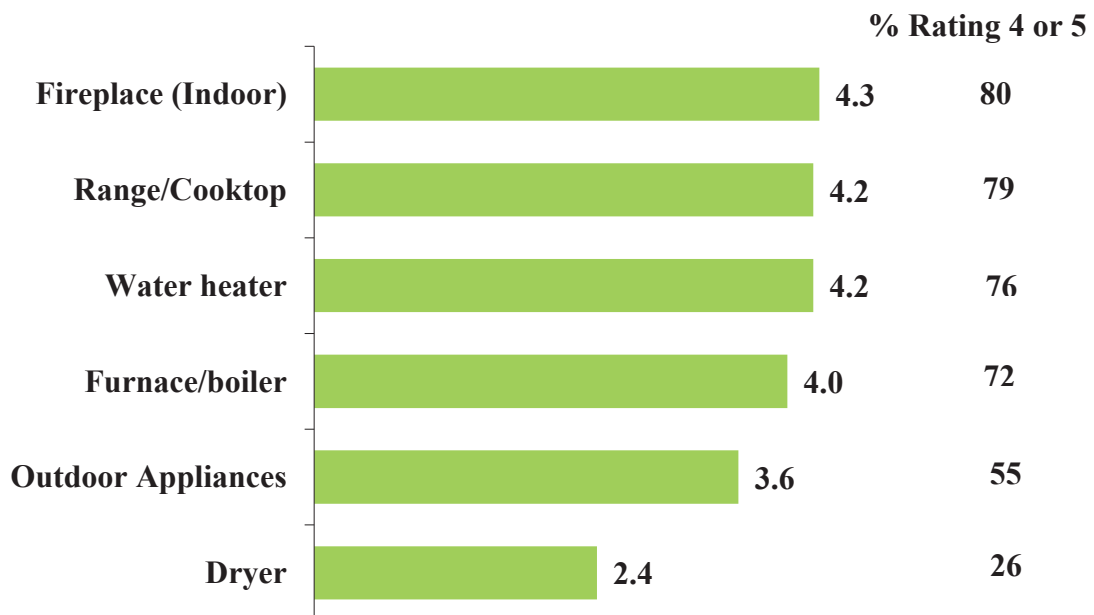
	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
0.61	1.96			3.13				6.67	
0.93	1.96								
0.94	3.92						8.33	6.67	
0.95	1.96								
0.95	1.96							6.67	
1.00	41.18			43.75			58.33	40.00	
1.00	1.96								
1.00	1.96						8.33		
1.01	1.96			3.13					
1.02	1.96			3.13					
1.03	1.96			3.13					
1.03	1.96								
1.03	1.96						8.33		
1.05	1.96			3.13					
1.05	1.96							6.67	
1.14	1.96			3.13				6.67	
1.16	1.96							6.67	
1.19	1.96			3.13			8.33		
1.25	1.96			3.13				6.67	
1.33	1.96			3.13					
1.38	3.92			6.25				6.67	
1.50	1.96			3.13				6.67	
1.53	1.96								
1.72	1.96			3.13					
1.89	1.96			3.13					
2.00	1.96			3.13					
2.09	1.96			3.13			8.33		
2.26	1.96			3.13					
2.50	1.96			3.13					
Mean	1.17			1.26			1.10	1.07	
Median	1.00			1.01			1.00	1.00	
Min	0.61			0.61			0.94	0.61	
Max	2.50			2.50			2.09	1.50	
Responses	51			32			12	15	

Buyers' Preferences for Natural Gas

Builders were also asked about how likely it is for prospective home buyers to specifically request that certain appliances be installed or plumbed for natural gas. On a scale from 1 to 5, where 1=not at all likely and 5=very likely, the indoor fireplace is the most likely appliance buyers request be plumbed for gas, with an average rating of 4.3 (80 percent rated it likely or very likely, 4 or 5). The range/cooktop and the water heater tie in second place, with an average rating of 4.2 (79 and 76 percent, respectively, rated them 4 or 5). The only other appliance with an average rating of 4.0 or higher was the furnace/boiler.

The two appliances buyers are least likely to request be plumbed for gas are outdoor appliances and the dryer. Outdoor appliances received an average rating of 3.6 (55 percent rated it 4 or 5) and the dryer a 2.4, as only 26 percent of builders rated it likely or very likely (Exhibit 13).

**Exhibit 13: Likelihood prospective home buyers request appliances be installed or plumbed for natural gas (1= Not at all likely and 5=Very likely)
(Average Rating)**



Looking at results across regions of the country reveals that in the Northeast the range/cooktop and the furnace tie in first place as the most likely appliance buyers will request be plumbed for gas (3.9 average rating for both). In the Midwest, the title goes to the furnace (4.6 average rating), while in the South, the fireplace and the range/cooktop tie as the most likely (4.2 average rating for both). In the West, the fireplace and the water heater are the likeliest appliances buyers will request be plumbed for gas (4.6 average rating for both).

According to builders who start fewer than 5 units, the range/cooktop and the water heater are the most likely appliances buyers want to be plumbed for gas, while among those who start 6 to 99 units, the fireplace ranks at the top. For builders starting 100+ units, the furnace is the most likely appliance their buyers will request be plumbed for gas (Exhibit 14).

Exhibit 14. Likelihood prospective home buyers request appliances be installed or plumbed for natural gas - By Region and Firm Size (Percent of Respondents)

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
Dryer									
1:Not at all likely	42	56	30	51	28	33	42	47	35
2	21	8	19	19	34	18	24	23	19
3	11	12	18	9	10	16	12	7	13
4	8	4	8	7	10	9	3	7	19
5:Very likely	18	20	25	15	17	24	19	17	13
<i>Average Rating</i>	2.4	2.2	2.8	2.2	2.6	2.7	2.3	2.2	2.6
Responses	317	25	73	161	58	85	93	60	31
Fireplace (Indoor)									
1:Not at all likely	9	24	7	10	2	6	8	8	20
2	3	8	1	4	2	2	3	5	3
3	8	16	11	6	7	9	3	7	13
4	14	4	16	13	19	16	13	14	20
5:Very likely	66	48	65	67	71	66	72	66	43
<i>Average Rating</i>	4.3	3.4	4.3	4.2	4.6	4.3	4.4	4.2	3.6
Responses	322	25	75	163	59	85	97	59	30

Exhibit 14. Likelihood prospective home buyers request appliances be installed or plumbed for natural gas - By Region and Firm Size

(Percent of Respondents) – continued

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
Furnace/boiler									
1:Not at all likely	16	16	4	24	7	13	19	13	13
2	3	8		5		2	5	3	
3	10	4	7	14	5	12	6	12	20
4	11	12	7	10	16	16	10	8	7
5:Very likely	61	60	83	47	72	56	60	63	60
<i>Average Rating</i>	4.0	3.9	4.6	3.5	4.5	4.0	3.9	4.1	4.0
Responses	322	25	75	164	58	85	97	60	30
Range/cooktop									
1:Not at all likely	5	16	3	5	3	4	6	5	6
2	4	4	9	3	2	1	6	3	13
3	11	12	13	13	3	8	10	18	19
4	23	8	33	20	25	24	25	28	13
5:Very likely	56	60	41	58	66	64	53	46	48
<i>Average Rating</i>	4.2	3.9	4.0	4.2	4.5	4.4	4.1	4.1	3.8
Responses	325	25	75	166	59	85	97	61	31
Water heater									
1:Not at all likely	7	20	5	7	3	4	9	7	6
2	6	16	4	7		1	5	7	16
3	12	8	11	15	5	14	8	11	19
4	13	4	12	13	17	12	18	16	6
5:Very likely	63	52	68	58	75	69	60	59	52
<i>Average Rating</i>	4.2	3.6	4.3	4.1	4.6	4.4	4.1	4.2	3.8
Responses	323	25	74	165	59	84	97	61	31
Outdoor Appliances (grills, firepits, tiki torches, outdoor fireplaces, etc.)									
1:Not at all likely	11	24	12	9	8	6	13	10	16
2	14	28	16	13	8	11	13	13	23
3	20	20	26	19	19	14	23	25	23
4	17	8	14	17	24	11	19	18	16
5:Very likely	38	20	32	43	41	58	32	33	23
<i>Average Rating</i>	3.6	2.7	3.4	3.7	3.8	4.1	3.4	3.5	3.1
Responses	323	25	73	166	59	84	97	60	31

Builders had been asked about which appliances were most likely for buyers to request be plumbed for gas once before. In 2016, the indoor fireplace was the single most likely appliance buyers specifically requested gas plumbing for, with an average rating of 4.5. In 2021, the fireplace remained at the top of the list, with an average rating of 4.3. The dryer, on the other hand, has been the least likely item buyers request gas for both times, with average ratings of 2.6 in 2016 and 2.4 in 2021 (Exhibit 15).

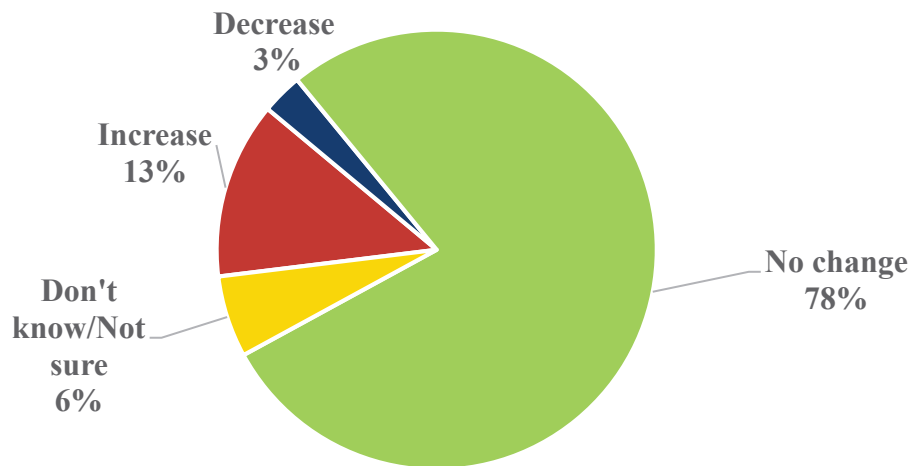
**Exhibit 15. History of average likelihood prospective home buyers request appliances be installed for natural gas
(1=not at all likely, 5=very likely)**

	Aug. 2016	Aug. 2021
Fireplace (Indoor)	4.5	4.3
Range/cooktop	4.1	4.2
Water heater	4.3	4.2
Furnace/boiler	4.2	4.0
Outdoor Appliances (grills, firepits, tiki torches, outdoor fireplaces, etc.)	<i>n/a</i>	3.6
Dryer	2.6	2.4

Change in buyers' preference for natural gas in the last year

When asked if they had noticed any change in home buyers' preference for natural gas in the past year, more than three-fourths of builders reported seeing 'no change' (78 percent). A minority of 13 percent noticed an increase, while a small fraction of only 3 percent noticed a decrease in buyers' preference for gas (Exhibit 16).

Exhibit 16: During the past year, have you noticed an increase or decrease in buyers' preference for natural gas? (Percent of Respondents)



Seventeen percent of builders in the West reported noticing an increase in buyers' preferences for natural gas during the past year, about the same share as in the Northeast (16 percent). Builders in the South and Midwest were somewhat less likely to report increased preferences for gas, with those shares at only 10 percent and 13 percent, respectively.

A breakdown of results by number of starts shows that builders with 25 to 99 starts were the most likely to notice an increase in gas preferences (23 percent). Fewer than 15 percent of builders in all other size categories noticed more buyers interested in natural gas (Exhibit 17).

**Exhibit 17: During the past year, have you noticed an increase or decrease in buyers' preference for natural gas? By Region and Firm Size
(Percent of Respondents)**

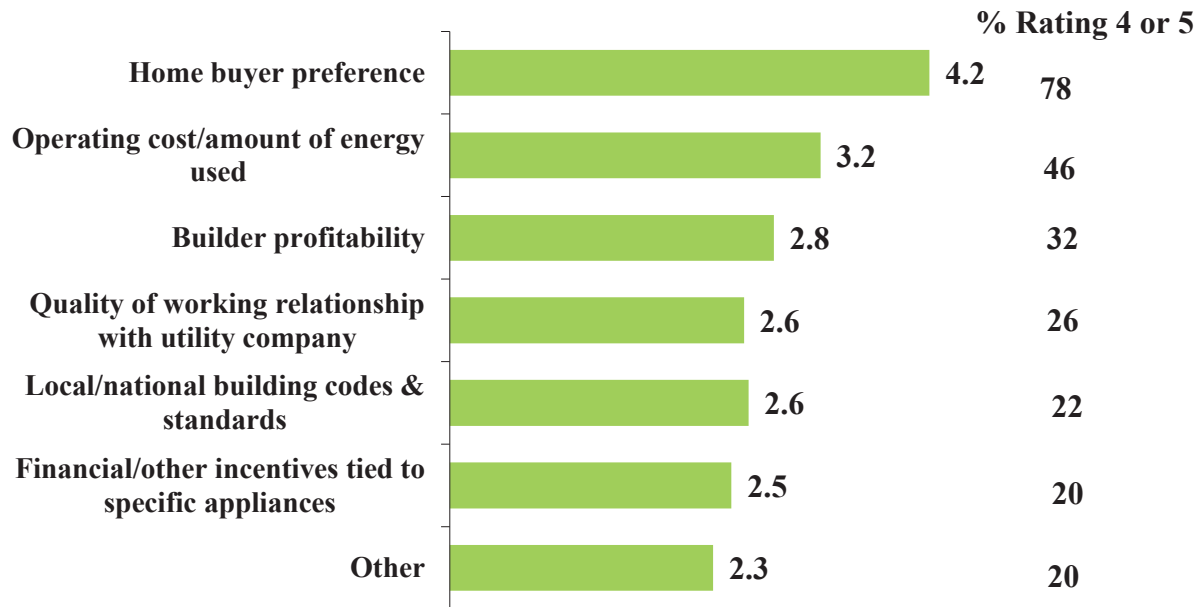
	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
Increase	13	16	13	10	17	9	12	23	10
Decrease	3	8	1	3	2	2	3		
No change	78	68	83	78	76	79	76	74	83
Don't know/Not sure	6	8	3	8	5	9	8	3	7
Responses	325	25	75	166	59	85	97	62	30

Influence of Factors on Installation of Gas vs. Electric Appliances

Another question asked builders to rate the level of influence six different factors have on their decision to install electric vs. natural gas appliances in the new homes they build, using a scale from 1 to 5 where 1='not at all influential' and 5='very influential.' By far, the most influential factor on this decision is 'home buyer preference,' with an average influence rating of 4.2 and 78 percent of respondents rating it influential to very influential (4 or 5). In second place is 'operating cost/amount of energy used,' with an average rating of 3.2 and 46 percent of respondents rating it a 4 or 5.

All other factors are far less influential, with average ratings below 3.0. For example, 'builder profitability' received an average influence rating of 2.8, with only 32 percent rating it 4 or 5. 'Quality of working relationship with utility company' and 'local/national building codes & standards' have even less influence, both with average ratings of 2.6. At the very bottom in terms of influence on a builder's decision to install electric vs. gas appliances is 'financial/other incentives tied to specific appliances,' which only received an average rating of 2.3 (Exhibit 18).

Exhibit 18: Influence of factors on decision to install electric vs. gas appliances
1=Not at all influential and 5=Very Influential.
(Average Rating)



Builders across the four census regions agreed the same two factors, and in the same order, have the most influence on their decision to install electric or natural gas appliances. First and foremost, it is ‘home buyer preferences,’ with an average influence rating of 4.4 in the Northeast, 4.2 in the Midwest, 4.1 in the South, and 4.4 in the West. The second factor in every region is ‘operating cost/amount of energy used,’ with average ratings ranging from 3.1 to 3.5 (Exhibit 19).

Interestingly, although ‘home buyer preference’ ranks as the most influential factor for builders of all sizes, its influence does decline a bit as the number of starts rises: from an average rating of 4.4 among builders with 5 or fewer starts to only 3.8 among those with 100+ starts. The second most influential factor on what type of appliances to install is ‘operating cost/amount of energy used’ for all builders who start fewer than 100 units. For those with 100+ starts, on the other hand, ‘builder profitability’ ranks second most influential, with an average rating of 3.3.

**Exhibit 19: Influence of factors on decision to install electric vs. gas appliances –
By Region and Firm Size
(Percent of Respondents)**

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
Home buyer preference									
1=Not at all Influential	4	4	3	6	4	1	5	7	3
2	5	4	4	6	4	2	4	7	16
3	13	4	15	14	9	13	8	19	19
4	23	21	27	23	18	22	23	17	19
5=Very Influential	55	67	51	51	66	61	60	51	42
<i>Average Rating</i>	4.2	4.4	4.2	4.1	4.4	4.4	4.3	4.0	3.8
Responses	316	24	74	162	56	85	92	59	31
Builder profitability									
1=Not at all Influential	27	29	32	26	23	32	29	22	10
2	12	13	9	15	7	11	12	14	10
3	28	25	34	25	33	34	20	34	42
4	15	21	11	18	12	18	16	12	23
5=Very Influential	17	13	14	17	25	6	23	19	16
<i>Average Rating</i>	2.8	2.8	2.6	2.9	3.1	2.6	2.9	2.9	3.3
Responses	317	24	74	162	57	85	92	59	31
Quality of working relationship with utility company									
1=Not at all Influential	33	42	32	32	32	36	35	25	19
2	13	29	7	14	14	11	14	17	19
3	28	13	38	26	25	31	24	27	35
4	17	13	16	19	18	18	21	19	10
5=Very Influential	9	4	7	10	12	5	7	12	16
<i>Average Rating</i>	2.6	2.1	2.6	2.6	2.7	2.5	2.5	2.8	2.8
Responses	316	24	74	161	57	84	92	59	31
Financial/other incentives tied to specific appliances									
1=Not at all Influential	30	29	32	32	21	32	34	27	10
2	21	25	20	18	30	19	18	27	39
3	29	25	32	27	32	32	32	27	29
4	13	13	8	15	12	15	11	14	16
5=Very Influential	7	8	7	7	5	2	5	5	6
<i>Average Rating</i>	2.5	2.5	2.4	2.5	2.5	2.4	2.4	2.4	2.7
Responses	317	24	74	162	57	85	92	59	31

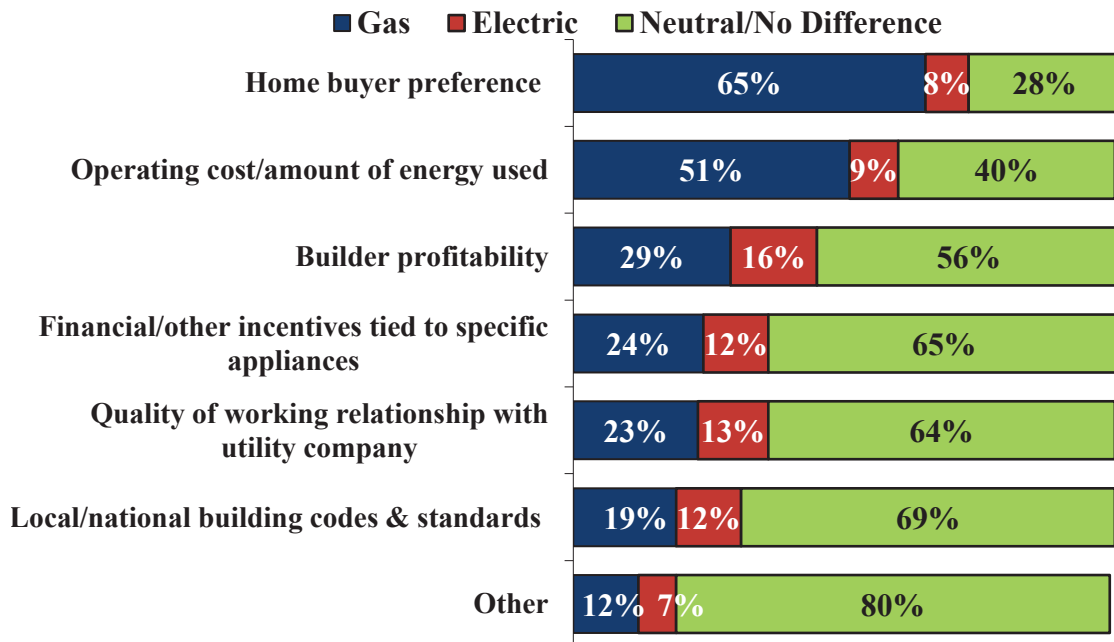
**Exhibit 19: Influence of factors on decision to install electric vs. gas appliances –
By Region and Firm Size
(Percent of Respondents) – continued**

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
Operating cost/amount of energy used									
1=Not at all Influential	15	13	14	18	7	13	17	17	13
2	13	17	9	14	12	6	11	20	26
3	27	29	32	24	30	25	27	29	29
4	25	21	16	29	26	35	21	24	19
5=Very Influential	21	21	28	15	25	21	24	10	13
<i>Average Rating</i>	3.2	3.2	3.4	3.1	3.5	3.5	3.2	2.9	2.9
Responses	317	24	74	162	57	85	92	59	31
Local/national building codes & standards									
1=Not at all Influential	30	33	38	32	16	33	42	22	10
2	10	17	8	11	7	10	7	14	16
3	38	17	36	39	44	35	38	41	42
4	12	21	14	9	12	14	9	14	10
5=Very Influential	10	13	4	9	21	8	4	10	23
<i>Average Rating</i>	2.6	2.6	2.4	2.5	3.2	2.6	2.3	2.8	3.2
Responses	315	24	74	160	57	84	92	59	31
Other									
1=Not at all Influential	49	58	59	49	30	47	58	50	27
2	2			3			3	4	
3	30	8	33	26	50	34	33	21	45
4	9	8	4	9	15	9	3	13	9
5=Very Influential	11	25	4	13	5	9	5	13	18
<i>Average Rating</i>	2.3	2.4	1.9	2.3	2.7	2.3	2.0	2.3	2.9
Responses	128	12	27	69	20	32	40	24	11

A final question asked builders about the fuel type they would install if they could choose based solely on each individual factor mentioned above. As Exhibit 20 shows, if builders could choose what type of appliances to install based exclusively on ‘home buyer preferences’, 65 percent would install gas, 8 percent electric, and 28 percent would be neutral or indifferent between the two fuel types. If the only consideration were ‘operating cost/amount of energy used,’ 51 percent of builders would install gas, 9 percent electric, and 40 percent would be neutral.

Most builders would be indifferent to the choice of gas vs. electric appliances if the decision was based on any of the other factors individually. For example, 56 percent report the choice of fuel type would make no difference if analyzed from the perspective of ‘builder profitability.’ Even larger majorities report fuel type would make no difference to them if the only consideration was ‘financial/other incentive tied to specific appliances’ (65 percent), ‘quality of working relationship with utility company’ (64 percent), or ‘local/national building codes & standards’ (69 percent).

Exhibit 20: If you could choose fuel type based solely on each one of these factors individually, which one would you install? (Percent of Respondents)



Most builders in every region and size category would choose to install gas appliances if the decision was based entirely on ‘home buyer preferences.’ In fact, the share rises with builder size, from 57 percent of those with 5 or fewer starts to 74 percent of those with at least 100 starts. In the Midwest and South, 61 percent of builders would install gas appliances if ‘home buyer preference’ was the only consideration. The shares are higher in the West (75 percent) and Northeast (76 percent) (Exhibit 21). ‘Operating cost/amount of energy used’ is the only other individual factor that would lead a majority (or large plurality) of builders in every region and size category to choose gas as fuel type.

**Exhibit 21: If you could choose fuel type based solely on each one of these factors individually,
which one would you install? By Region and Firm Size
(Percent of Respondents)**

	Total	Region				Total No. of Units Started in 2020			
		NE	MW	S	W	5 or Fewer	6 to 24	25 to 99	100+
Home buyer preference									
Gas	65	76	61	61	75	57	68	68	74
Electric	8	12	7	9	4	7	4	8	6
Neutral/No Difference	28	12	32	30	21	36	28	24	19
Responses	316	25	74	160	57	84	94	59	31
Builder profitability									
Gas	29	28	28	26	37	21	40	27	23
Electric	16	16	7	22	9	12	14	19	19
Neutral/No Difference	56	56	65	52	54	67	46	54	58
Responses	315	25	74	159	57	84	93	59	31
Quality of working relationship with utility company									
Gas	23	12	25	21	30	16	35	19	26
Electric	13	16	12	15	9	13	9	17	10
Neutral/No Difference	64	72	63	64	61	71	56	64	65
Responses	315	25	75	159	56	83	94	59	31
Financial/other incentives tied to specific appliances									
Gas	24	16	24	24	25	14	29	20	33
Electric	12	12	11	11	14	14	9	15	3
Neutral/No Difference	65	72	65	65	61	71	62	64	63
Responses	313	25	74	158	56	83	92	59	30
Operating cost/amount of energy used									
Gas	51	60	56	47	51	44	63	46	48
Electric	9	16	7	9	9	12	7	8	3
Neutral/No Difference	40	24	37	44	40	44	30	46	48
Responses	317	25	75	160	57	84	94	59	31
Local/national building codes & standards									
Gas	19	28	17	15	28	18	26	15	16
Electric	12	20	7	14	11	14	9	15	6
Neutral/No Difference	69	52	76	71	61	68	66	69	77
Responses	316	25	75	159	57	84	94	59	31
Other									
Gas	12	22	15	8	18	9	21	4	
Electric	7	22	3	5	14	6	5	4	
Neutral/No Difference	80	56	82	86	68	84	74	92	100
Responses	138	9	34	73	22	32	42	24	14

Appendix I: Survey Questionnaire: HMI Special Questions for August 2021

1. Of the typical single-family homes you built for-sale in the past 12 months, please indicate the average sales price for comparable homes with and without natural gas. On average, about how many days was each type of home on the market before going under contract?

	Sales Price	Avg. # of Days on the Market	Did not build this type of home in last 12 months
Home <u>with</u> natural gas	_____	_____	<input type="checkbox"/>
Home <u>without</u> natural gas	_____	_____	<input type="checkbox"/>

2. In your experience, how likely are prospective home buyers to request that the following appliances be installed or plumbed for natural gas? Use a scale from 1 to 5, where 1= not at all likely and 5=very likely.

	1=Not at all likely	2	3	4	5=Very likely
Dryer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fireplace (indoor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Furnace/boiler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Range/cooktop	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water heater	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor Appliances (grills, firepits, tiki torches, outdoor fireplaces, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. During the past year, have you noticed an increase or decrease in buyers' preference for natural gas?

Increase
 Decrease
 No change
 Don't know/Not sure

4. Please rate the level of influence each of the following factors has on the decision of which appliances to install (electric or natural gas) in the new homes you build. Use a scale from 1 to 5, where 1=Not at all influential and 5=Very Influential.

	Not at all Influential: 1	2	3	4	Very Influential: 5
Home buyer preference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Builder profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of working relationship with utility company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial/other incentives tied to specific appliances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operating cost/amount of energy used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local/national building codes & standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. If you could choose fuel type based solely on each one of these factors individually, which one would you install?

	Gas	Electric	Neutral/ No Difference
Home buyer preference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Builder profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quality of working relationship with utility company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Financial/other incentives tied to specific appliances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Operating cost/amount of energy used	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Local/national building codes & standards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix D

“Millennial Homebuyers’ Share Continues to Rise in 2022”

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December 28, 2022

Millennial Homebuyers' Share Continues to Rise in 2022

The youngest cohort, known as Gen Z, is also entering the housing market

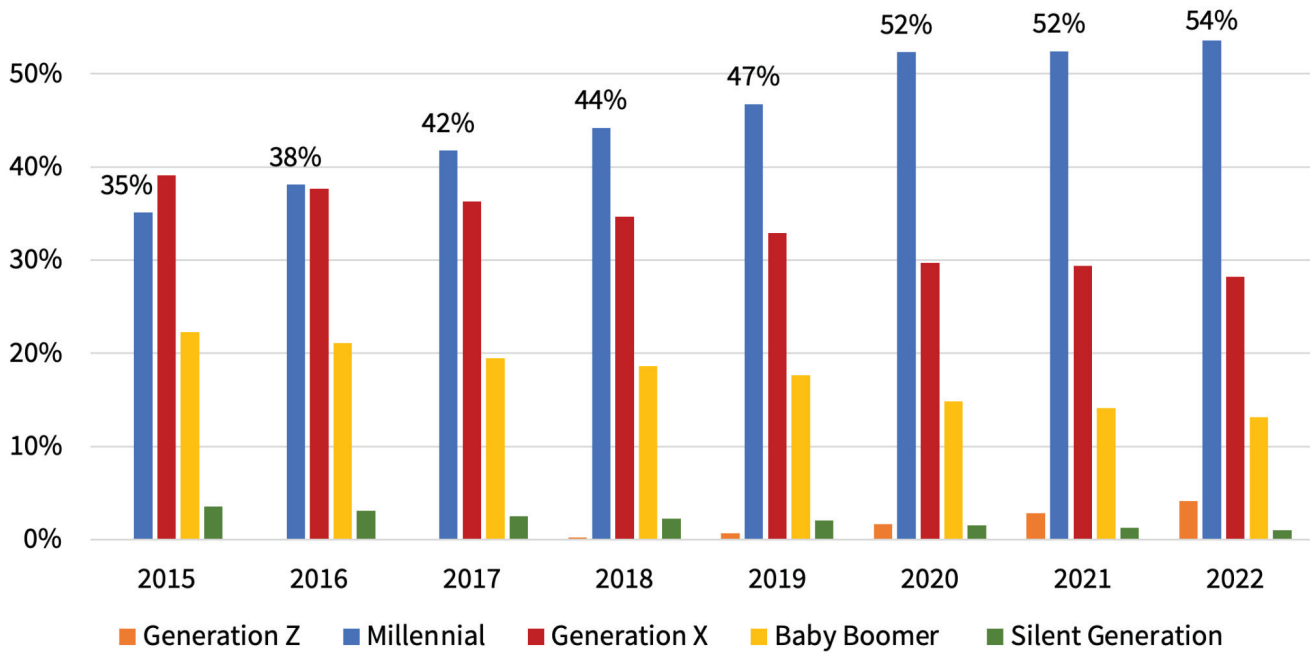
Quick Takes:

- Millennials continue to lead the pack for the number of home purchases, comprising 54% of overall home-purchase applications in 2022.
- For the first time, the youngest Gen Z cohort represents 9% of first-time home purchase applications.
- Millennial demand for houses is likely to remain strong in the coming years since this generation represents the largest number of first-time homebuyers, as well as a substantial number of move-up purchasers.

Millennials have made up the largest share of home purchase mortgage applications for the last six years. According to the CoreLogic Loan Application Database^[1], Millennial homebuyer share rose to its highest level in 2022, comprising about 54% of overall home-purchase applications (Figure 1). The Millennial home purchase share has steadily increased since 2015, rising about two to three percentage points per year.^[2] At the same time, Gen Z — the generation succeeding Millennials whose members were born after 1997 — is entering the housing market. This year, the cohort comprised about 4% of overall home-purchase applications.

Figure 1: Millennial Home Purchase Applications Share Largest Since 2016

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Source: CoreLogic Fraud Consortium Loan Application data.

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Note: Birth years by cohort – Generation Z, after 1997;

Millennial 1981-1997; Generation X 1965-1980; Baby Boomer

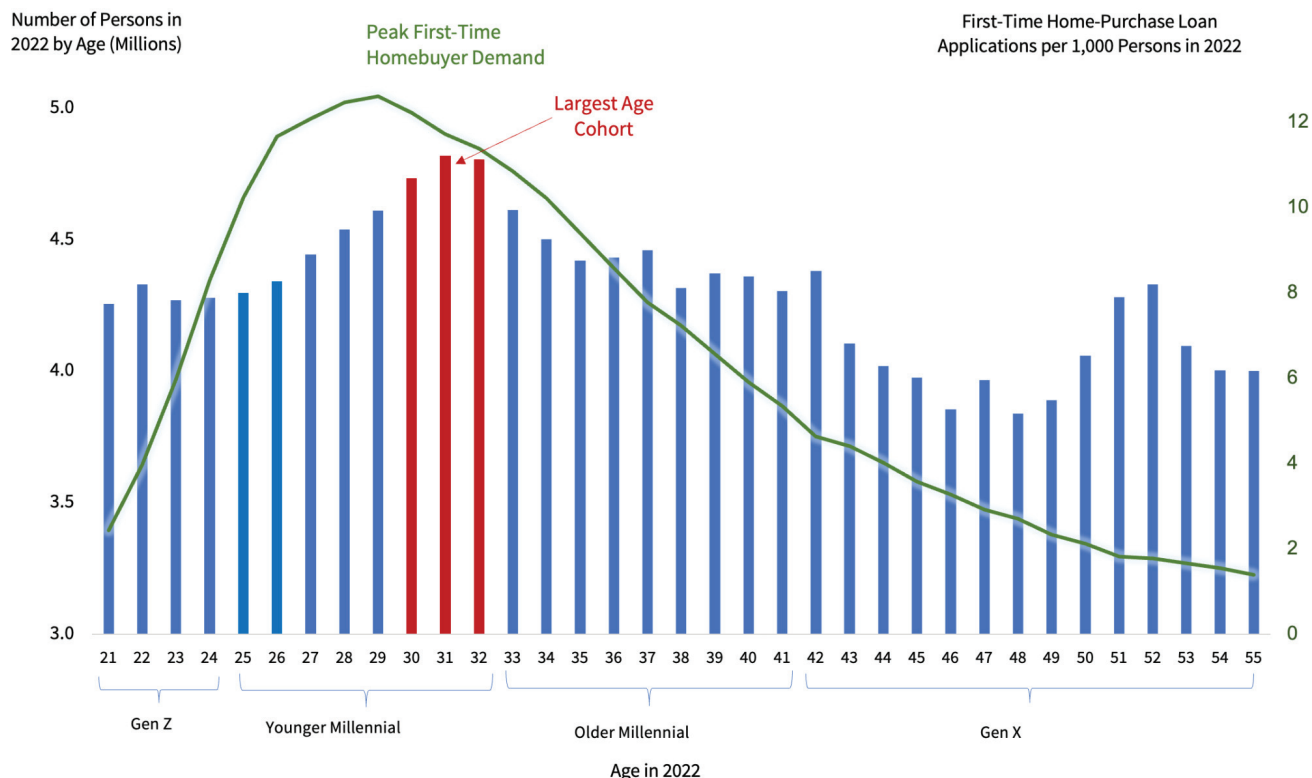
1946-1964; Silent Generation, before 1946

The share of Millennial first-time homebuyer (FTHB) mortgage applications is even higher than the share of overall Millennial home purchase applications, a figure that comprises both FTHB and repeat buyers. About 72% of all the FTHB home-purchase applications in 2022 were from Millennial applicants. This is not surprising, as the largest cohort of the Millennial generation has already approached the peak age of first-time homeownership.

Gen Z, the youngest cohort, made up 9% of the first-time home purchase applications in 2022, up three percentage points from 2021. Their share is likely to increase in the coming years.

Figure 2: Largest Age Cohort Enters the Peak of First-Time Homebuyer Wave





Source: CoreLogic Fraud Consortium Loan Application data and U.S. Census Bureau

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Figure 2 shows the U.S. population distribution by age, and the left axis highlights the largest demographic cohort reaching the peak age of FTHB. The right axis of the chart, displayed by the green line, represents first-time home-purchase loan applications per 1,000 individuals in 2022. For example, the highest share of FTHB is among younger Millennials who are aged 29. Data shows that more than 12 in 1,000 Millennials at age 29 were FTHBs in 2022.

There are still many younger Millennials under 30 who have yet to become homeowners, so the demand from these Millennials is likely to remain strong in the coming years. At the same time, older Millennials are more likely to become repeat homebuyers. The share of Millennial repeat buyer home-purchase applications was already 43% in 2022, eight percentage points higher than Gen X's share.

That said, while the demographic tailwind remains favorable for the home purchase market, historically low for-sale inventories along with sky-high home prices and higher mortgage interest rates create affordability challenges. These headwinds may slow the influx of new Millennials entering the home purchase market. In addition to younger Millennials, Gen Z members are also likely to fuel the demand for housing over the next couple of years, especially if affordability improves.



[1] This analysis is based on all home-purchase mortgage applications, accepted or not, from January 2015 to October 2022. Investors and second-home buyers were excluded from the analysis.

[2] In 2020, the growth in Millennial share was more than five percentage points from 2019. The additional half of the 2020 jump was likely driven by the pandemic. The increase was likely accelerated by record-low mortgage interest rates and the flexibility to work remotely.

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