



February 22, 2017

REPORT #E17-347

Natural Gas Segmentation Study

Prepared by:

Illume

851 SW 6th Ave.

Portland, OR 97204

503-427-1333

Northwest Energy Efficiency Alliance

PHONE

503-688-5400

FAX

503-688-5447

EMAIL

info@neea.org

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I. EXECUTIVE SUMMARY

The Northwest Energy Efficiency Alliance (NEEA) contracted with Illume Advising, LLC (ILLUME) to conduct a Natural Gas Consumer Market Characterization and Segmentation Study. The primary research objective of this study is to provide NEEA and its natural gas sponsoring organizations with market insights to support the development of new high efficiency natural gas initiatives in the Northwest. This study focused on the attitudes and behaviors of consumers living in areas of the region funded by: Northwest Natural, Puget Sound Energy, Avista Utilities, and Cascade Natural Gas Corporation and the Energy Trust of Oregon.

To complete this work, ILLUME conducted three core research activities: (1) a literature review of existing natural gas market studies, (2) nineteen video-enabled online ethnographic interviews, and (3) 1600 surveys of natural gas consumers. The results were then analyzed to inform key findings, described below.

WHO IS THE NATURAL GAS CONSUMER?

- Among the sponsoring utilities, natural gas consumers live in primarily suburban (52%) and urban (31%) homes under 2,000 square feet in size (72%). Most live in households with at least two or more people (79%).
- 40% of natural gas consumers would not have purchased their home without natural gas because of a strong preference for natural gas's low cost (relative to other fuels) and for natural gas for specific appliances.
- Most natural gas consumers report having natural gas for their space heating (78%) and water heating (70%) needs. Next most, customers use natural gas for cooking (44%), their fireplace (43%), and for clothes drying (16%).

HOW DO NATURAL GAS CONSUMERS SHOP FOR NEW EQUIPMENT?

| Conclusion | Recommendation |
|---|---|
| <ul style="list-style-type: none">• Since consumers consider natural gas to be a low cost commodity, they are slightly less concerned about conserving natural gas resources compared to electric resources (26% indicate they make little to no effort to conserve natural gas). | <ul style="list-style-type: none">• For this reason, program administrators (PAs) in the northwest should avoid using the common message of "saving money." Instead, consider developing messaging points that are true for high efficiency products and that also align with consumers' core purchase drivers: the desire for durable, reliable, well-made products that create a comfortable home and give them more control over their heating, cooking, and home. |
| <ul style="list-style-type: none">• The majority of natural gas consumers begin their shopping online for all end use technologies (64%). | <ul style="list-style-type: none">• Work to develop regional digital messaging strategies on sites such as Consumer Reports, big box retailers, as well as local retail chains.• Digital strategies such as geo-fencing and geo-targeting, strategic redirects, and other cost-effective online targeting strategies may be very effective in promoting high efficiency initiatives. |

| Conclusion | Recommendation |
|--|--|
| <ul style="list-style-type: none"> As many as 20% of natural gas consumers indicate they do nearly all home improvements themselves (DIY) and 54% indicate a mix of DIY and contractor-led home improvements. | <ul style="list-style-type: none"> Explore ways to place high efficiency natural gas options on popular local DIY resources, such as blogs and DIY networks to capitalize on this opportunity. |
| <p>Natural gas consumers report key differences in shopping behavior, depending on the equipment:</p> | |
| <ul style="list-style-type: none"> Natural gas consumers report relying on contractors and installers (57%) when purchasing space or water heating equipment. | <ul style="list-style-type: none"> For this reason, train trade ally networks on how to develop, and maintain, their online presence with a focus on widely used review sites such as Yelp, Angie’s list, and google reviews to ensure they rise to the top of the list when consumers search for contractors online. |
| <ul style="list-style-type: none"> For end uses that consumers interact with daily, “seeing it for themselves” (56%) was an important stage in their decision-making process. | <ul style="list-style-type: none"> Consider working with local and big box retailers to develop in-store displays that feature the product in real-life settings for ranges and dryers. In addition, sales associate training will be critical in directing consumers toward high efficiency products as they were also cited as a source of information (28%). |
| <ul style="list-style-type: none"> Natural gas consumers rely on a mixture of installers (40%) and seeing it for themselves (36%) when selecting a natural gas fireplace. | <ul style="list-style-type: none"> For this particular end use, consider building trade ally networks for natural gas fireplaces and encourage installers to maintain a showroom to help consumers in their decision-making process. |

WHO ARE THE NATURAL GAS CONSUMER SEGMENTS?

ILLUME’s research found four key natural gas consumer segments, each with their own specific drivers and barriers to high efficiency natural gas product adoption: Doug, the Natural Gas Pragmatist (30%), Kyle, the New Urban Traditionalist (6%), Erica, the Middle American (9%), and Rose, the Day-to-Day (55%).

Among these segments, Doug is the most avid consumer of natural gas and also the most likely to invest in higher quality products. For these reasons, Doug is an optimal target for high efficiency natural gas initiatives followed next by Kyle, who will seek out higher quality water heating and cooking equipment. Both Erica and Rose are convenience-driven shoppers and will make easy choices for their homes and may be best described as your “Majority, “Late Majority,” and “Laggard” segments. Thus, we recommend targeting them in the later stages of efficient natural gas product initiatives. The table below summarizes our key recommendations.



**DOUG:
THE NATURAL
GAS
PRAGMATIST**



**KYLE:
THE YOUNG
URBAN
TRADITIONALIST**



**ERICA:
THE MIDDLE
AMERICAN**



**ROSE:
THE DAY-TO-
DAY**

| | | | | |
|--|---|--|---|--|
| TENDS TO BE... | Mostly male 40's-mid 60's, high income, conservative | Mostly male Late 20's early 30's, moderate income, liberal | Mostly female 30-40's, second highest income, liberal | Male/female 50's+, lower income, conservative |
| TARGET WITH ... | All natural gas initiatives, including higher- cost items | Ranges & water heaters, possibly new furnaces | Rangers, water heaters, and fireplaces | Water heaters |
| VALUES... | Quality, Reliability, & Comfort | New tech, Environment, & "Feel good" factor | Convenience, Comfort, & Ease of use | Durability, Reliability, Least cost/price |
| TENDS TO LIVE... | Large suburban homes, some new construction. Has a long tenure in home. | Modest first homes in urban areas. Likely to be new construction & may move soon. Lives with young kids. | Modest suburban existing homes. Lives with older kids in the home. | Small suburban and rural homes. Has lived in the home the longest (10+ years). |
| PREFERS NATURAL GAS BECAUSE.... | Dependable Comfort Burns clean Low cost Efficient | Environment Likes the sensate benefits of cooking, hot showers | Rates NG lowest on all attributes | No fuel preference Least cost |

II. METHODOLOGY

STUDY APPROACH – OVERVIEW

The Northwest Energy Efficiency Alliance (NEEA) contracted Illume Advising, LLC (ILLUME) to characterize the Northwest’s natural gas consumer to support NEEA in natural gas-focused market transformation initiatives. ILLUME conducted three discrete research and data collection tasks to complete this study, describe below.

NATURAL GAS STUDY LITERATURE REVIEW:

A literature review of regional natural gas end use market penetration, saturation studies, and potential studies as well as energy efficiency customer segmentation studies.

WEB-FACILITATED ETHNOGRAPHIC RESEARCH:

ILLUME conducted an online ethnographic research study with 19 natural gas consumers. In this work, ILLUME researchers engaged in a home “tour” to discuss barriers and drivers to natural gas service, appliances in the home, and conservation and efficiency measures.

A SURVEY OF NATURAL GAS CONSUMERS.

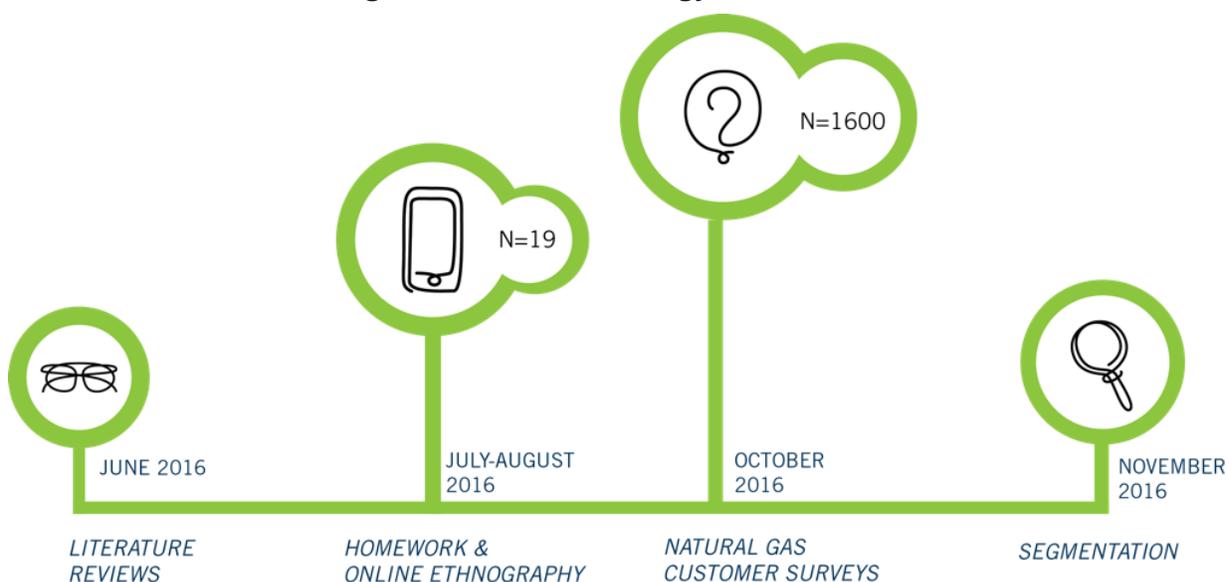
ILLUME surveyed natural gas consumers living within NEEA’s natural gas sponsors’ territories. The goal of this study was to understand consumers’ preferences for natural gas service to their households, appliances, and equipment as well as barriers and drivers to adoption of energy efficiency measures.

GOAL

TO CHARACTERIZE THE NORTHWEST’S NATURAL GAS CONSUMER AND PERSONIFY CONSUMER SEGMENTS TO HELP DRIVE ENERGY EFFICIENCY MARKET TRANSFORMATION.

Drawing on these efforts, the ILLUME team created four customer segments and associated personas that are described throughout this report. Customers were grouped into clusters using hierarchical cluster analysis, which segments customers with similar response patterns. ILLUME then created personas to bring the segments to life and illustrate the “voice” of a single segment. The “voices” are creative renderings of the personas based on actual customer comments but are an amalgamation of sentiments and ideas expressed throughout the study. Individuals in the segments can be male or female, but persona voices are gendered to help bring them to life.

Figure 1: Our Methodology and Timeline



III. WHO IS THE NATURAL GAS CUSTOMER?

This study examined the behaviors of natural gas consumers in the Northwest with a focus on consumers served by four natural gas utilities: Avista Utilities, Cascade Natural Gas Corporation, Northwest Natural, and Puget Sound Energy. The natural gas customers surveyed are centralized in predominantly two states in the northwest, namely Washington (55%) and Oregon (41%). Just four percent live in Northwestern Idaho.

NATURAL GAS CONSUMERS . . .

- Are likely to live in urban (31%) and suburban (53%) regions of these states.
- Are likely to live in two-person families or more (79%), be married (68%).
- May have kids living in their homes (17%).
- Tend to be middle-income households (earning between \$40,000 and \$79,999 a year) and have attained a bachelor's degree or more education (44%).

NATURAL GAS CONSUMERS' HOMES . . .

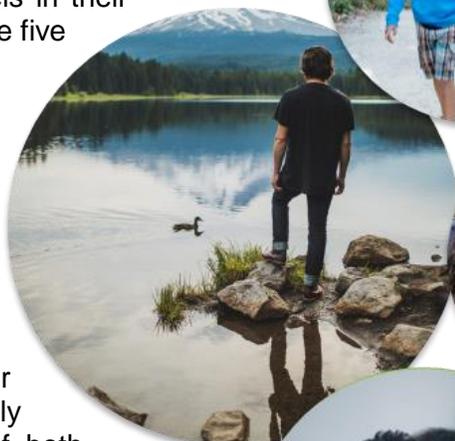
- Are modestly sized, with most consumers living under 1,999 square feet (72%) and built in 1970 or later (65%).
- Have natural gas service for their space and water heating needs (78% and 70% respectively) and, to a lesser extent, for their ranges (44%) and fireplaces (43%). Just 16% report having natural gas clothes dryers.

NATURAL GAS CONSUMERS ARE DRAWN TO NATURAL GAS BECAUSE . . .

- It is affordable, comfortable, and cleaner than other fuels in their minds (78%, 78%, and 74% agree on a scale of 1-5 where five is strongly agree).
- Natural gas provides them with greater control over their appliances and their appliances' performance.

WHEN MAKING CHANGES TO THEIR HOMES, NATURAL GAS CONSUMERS . . .

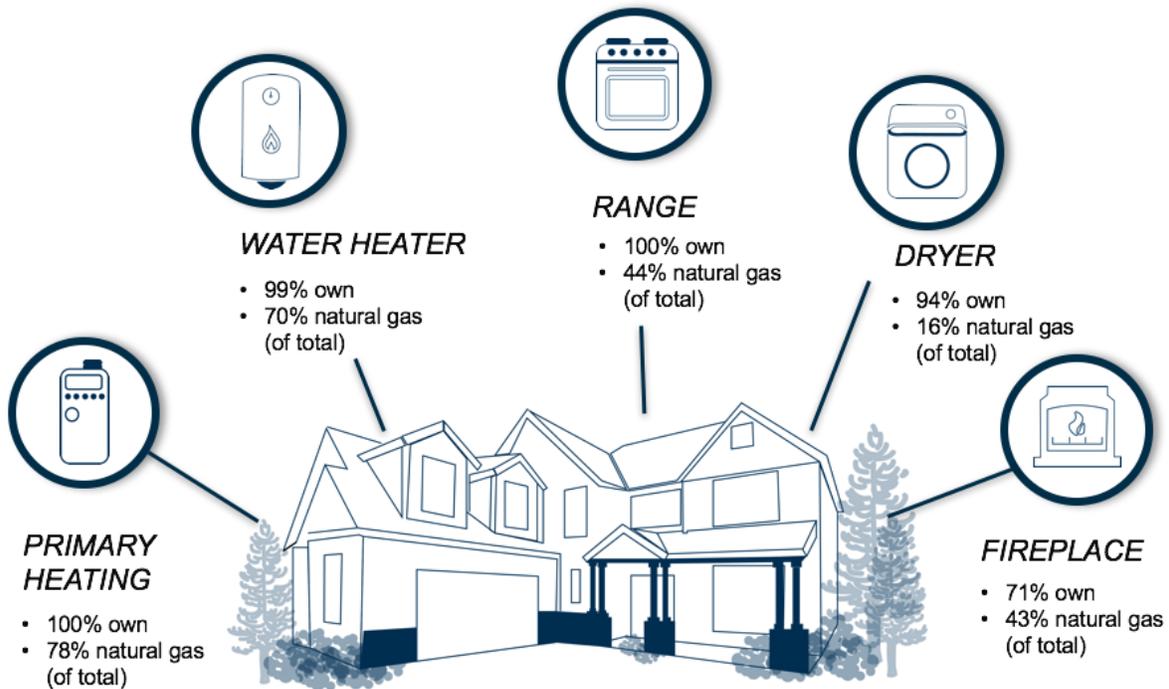
- Are likely to have painted their home (61%), repaired or replaced their roofs (43%), replaced windows (37%), or insulate or weatherized their homes (36%).
- Are nearly as likely to report making all changes to their homes themselves (DIY) (20%) as they are to exclusively use contracts (26%). Fifty-four percent report a mix of both. Therefore, consider expanding outreach and marketing placements to DIY-focused channels such as advertising in popular blogs or exploring placements in DIY publications or shows.
- Prioritize their investments on replacing and/or fixing what is broken (54%) or improving the functionality (59%), comfort (60%), or aesthetics of their homes (58%). Notably, improving energy efficiency and reducing their utility bills follow closely at 52% and 48% respectively.
- However, natural gas consumers report making a greater effort to reduce their electricity costs (58% report making a moderate to great effort) than their natural gas costs (49%), suggesting that the low cost of natural gas may present a barrier to efficiency investments. Consider focusing on the drivers to efficiency improvements such as quality, durability and longevity that are not directly aimed at reducing the cost of service.





The low cost of natural gas is a barrier to energy efficiency. Downplay cost savings when promoting efficient natural gas appliances & focus instead on other product benefits.

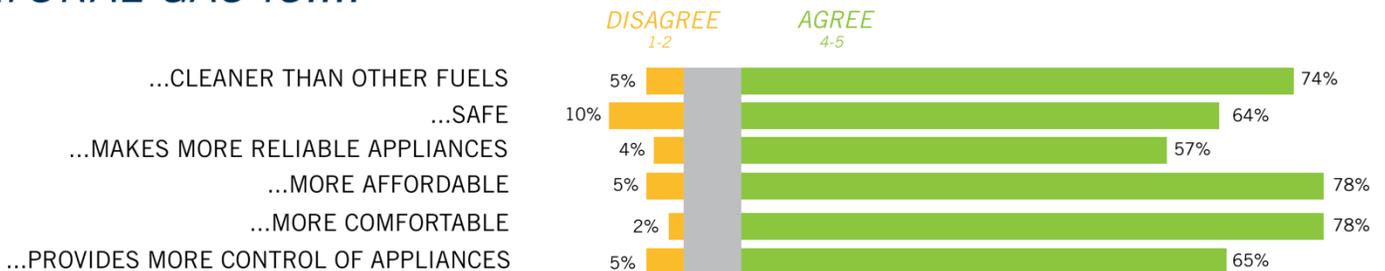
Figure 2: Reported Penetration of Natural Gas Appliances in the Home



HOW MUCH EFFORT YOU TAKE TO REDUCE YOUR...



NATURAL GAS IS....



Easy Wins

DOUG THE NATURAL GAS PRAGMATIST [30% of the population]



"I have worked my whole life to have what I have. At this point I want to be comfortable and have peace of mind. I buy exactly what I need and I am willing to spend a little more for quality and reliability so I don't have to worry. It's called being smart with my money. That's why I love natural gas – it's dependable and keeps me comfortable. It even saves me some money. It's a no-brainer."

KYLE THE NEW URBAN TRADITIONALIST [6% of the population]



"I want to feel good in my home and have an environment for positive experiences – great meals, hot showers, beautiful to look at. We don't have a ton of expendable income, but when I do spend my money, it's on things that enhance the quality of my life. That's why we pay more to live in a walkable city, we try to have products with smart designs, or spending a little more to make sure I make socially responsible purchases. Even though we might move to have more space for our growing family, it's important that we feel like our home reflects our values and tastes. We'll do it ourselves if that's what it takes to have the home we want."

Hard Wins

ERICA THE MIDDLE AMERICAN [9% of the population]



"I love my place. We live in a great neighborhood close to friends. It's an easy commuting distance from work and we are close to great schools. We're not extravagant people but we like to keep up with what's out there as long as the price is right and it's been proven to work well. I don't really care about the product details or the fuel, I just want it to get the job done and keep my life simple. Isn't that what we all want? Enough money and time to relax and do the things we love. I don't sweat the small stuff, like my energy costs. If I'm comfortable and I can afford it, we're all set."

ROSE THE DAY-TO-DAY [55% of the population]



"I love my home, and even though it's small, it's just right for me. I take good care of my things but don't waste on buying fancy new stuff. If it ain't broke, don't fix it. I like to go and talk to people I know, like the guys down at Ike's, and learn more about the appliances I buy. They're honest and let me see things for myself. I want things that will last me. I don't want anything fancy – just something to meet my needs."

**These quotes are creative personifications of the segments drawing on qualitative and quantitative data.

II. SEGMENT PERSONAS & INSIGHTS

ILLUME found that natural gas consumers fall into four primary segments: The Natural Gas Pragmatist (Doug, 30%), The New Urban Traditionalist (Kyle, 6%), The Middle American (Erica, 9%), and The Day-to-Day (Rose, 55%).

Of these four segments, **Doug, The Natural Gas Pragmatist** is the easiest, most immediate target for efficient natural gas products as this segment is both willing to invest in home upgrades and has a vested interest in durable, high-quality, efficient equipment that has a low cost to operate. This segment is best targeted through online reviews and trade allies. This segment will likely invest in all natural gas products.

The next greatest opportunity, **Kyle, The New Urban Traditionalist**, represents a younger, value-driven segment that is willing to pay more for quality products that are socially responsible and enhance the comfort and value of their home. While this is a small segment, this group will grow in importance as more people within the segment enter in to homeownership. For this reason, consider priming this market by leveraging popular DIY and design media channels while also focusing on generating word-of-mouth buzz with an emphasis on high tech measures as well as water heating and gas ranges.

While more challenging, the **Erica Middle American** segment may offer wins on emergency or early appliance replacement behaviors at point of purchase by focusing on their core values: comfort, convenience, and product popularity. This segment will rely on big box stores, manufacturer specifications, and sales associates to make a decision. Program materials should be in place to capitalize on this moment.

Finally, **Rose The Day-to-Day** will likely only replace when products fail and will be looking to local chain stores for information on good, durable equipment that has a low cost to operate. While this segment may consider efficient equipment, the incremental cost must be small because this segment is most likely to live paycheck to paycheck.

DOUG

THE NATURAL GAS PRAGMATIST



Doug...

- **Has a home that is:** large, located in a suburb, and meticulously maintained, and shared with his life-long partner.
- **Buys products because:** they are well-rated, known for exceptional quality, and are made domestically or by a reputable company.
- **Prioritizes home upgrades based on:** the integrity of the home/structure, enhance craftsmanship, increased efficiency.
- **Will pay a little more for:** American made equipment, brands with a long-standing reputation, equipment known for quality and durability.
- **Likes natural gas because:** it is reliable, inexpensive, improves the efficiency of his heating and cooking, and is domestically sourced.
- **Will respond well to messages that:** speak to his desire to have high quality items that contribute to his need to care for and protect his loved ones yet provide a sound rational, payoff.
- **Feels confident in information if:** the product claims are backed by a reputable source or person.
- **Is best reached through:** contractors, home shows, Consumer Reports.

Figure 3: Idea Starters for Doug

| | | | | |
|--|---|---|--|--|
|   |  | Focus on these purchase triggers: <ul style="list-style-type: none">• Performance enhancements• Avoiding emergency situations | Lead with these messages: <ul style="list-style-type: none">• Losing money on old stuff• Optimize your home• Purchasing the finest quality• Lasts a lifetime | Use these channels: <ul style="list-style-type: none">• Consumers reports• Online reviews• Well-placed articles in home improvement or design magazines• General contractors |
|  |  | Focus on these purchase triggers: <ul style="list-style-type: none">• Interested in a finer, high-quality range• Remodels | Lead with these messages: <ul style="list-style-type: none">• Greater control & precision• Quality, world-class range | Use these channels: <ul style="list-style-type: none">• Consumers reports• Well-placed articles• Reno. contractors |
|  |  | Focus on these purchase triggers: <ul style="list-style-type: none">• Equipment failure• Remodel or improve performance | Lead with these messages: <ul style="list-style-type: none">• Efficient, safe• Faster drying times, less static | Use these channels: <ul style="list-style-type: none">• Consumers reports• Online reviews• Sales associates |
|  |  | Focus on these purchase triggers: <ul style="list-style-type: none">• Wood fireplace replacement• Inefficient older equipment | Lead with these messages: <ul style="list-style-type: none">• Efficient equipment• Clean burning• Auxiliary/zonal heating | Use these channels: <ul style="list-style-type: none">• Contractor• Showrooms• Online reviews |

DOUG

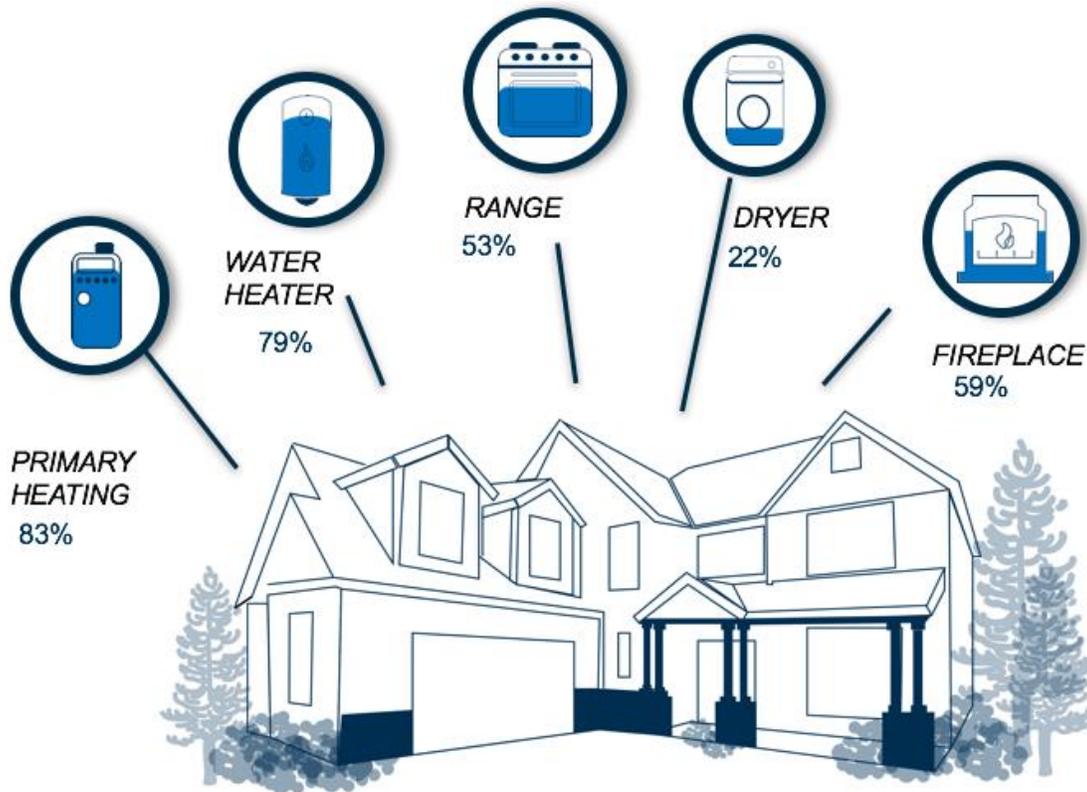
THE NATURAL GAS PRAGMATIST



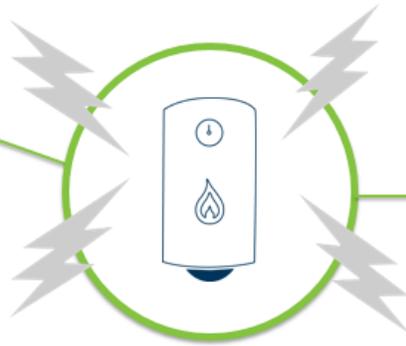
“ I have worked my whole life to have what I have. At this point I want to be comfortable and have peace of mind. I buy exactly what I need and I am willing to spend a little more for quality and reliability so I don't have to worry. It's called being smart with my money. That's why I love natural gas – it's dependable and keeps me comfortable. It even saves me some money. It's a no-brainer. ”

- 45% of this seg. have \$80k + household income
- Large, suburban
• Washington
• Long tenure
• 2 person
- Leans conservative (likely fiscally),
• Less educated
- Male
• Ages 40's-50's

Figure 4: Reported Natural Gas Appliances in Doug's Home



DOUG'S JOURNEY



Equipment replacement

76% would consider replacing equipment before it fails:

- To avoid an emergency situation (44%)
- To improve energy efficiency (39%)
- To improve performance (37%)

24% will only replace equipment when it fails:

- Not important to have new equipment (8%)
- Too expensive (7%)
- It is wasteful/bad for the environment (4%)

Trusted Sources



Appliance Selection



PRODUCT MUST BE

- Durable and last a life time (68%)
- Known for exceptional performance (55%)

PREFERRED CHANNEL

Sources used to make purchase decisions:

- Contractor (65%)
- Internet (61%)

PREFERRED INTERNET SOURCES

- Online reviews (42%)
- Consumer Reports (38%)

NEEDS TO HEAR

Durable, reliable, a good investment, performance

NEEDS TO FEEL

Comfortable, informed/smart, protected

KYLE

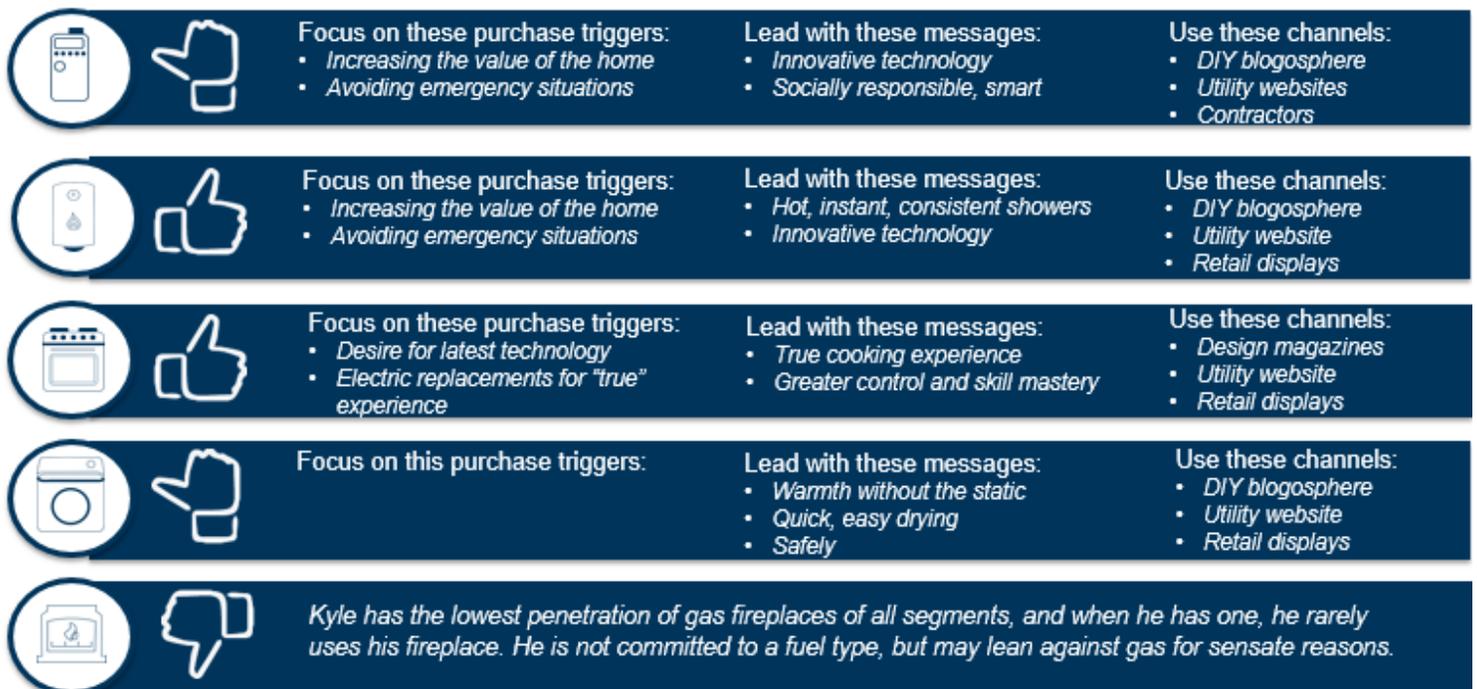
THE NEW URBAN TRADITIONALIST



Kyle...

- **Has a home that is:** modestly sized, newer construction and one he is quickly growing out of, located in an urban area. The home is smartly designed, informed by popular design and DIY sources.
- **Buys products because:** they have a simple, minimal design, are well designed, are socially responsible.
- **Prioritizes home upgrades based on:** aesthetics, the “feel” of the home, family health and safety. Increase home value, as he’s looking to sell in the near future.
- **Will pay a little more for:** cutting-edge technology, high quality and have a clear sensate benefit (such as hot showers, a nice range).
- **Likes natural gas because:** it provides greater control for his range, speedy and constant water heating as a lower GHG impact relative to electricity.
- **Will respond well to messages that:** speak to his sense of design and staying up on new technologies. That acknowledge his young family and speak to his social and environmental values.
- **Feels confident in information if:** the source is from reputable organizations, such as the utility, ENERGY STAR®, or from go-to home sources.
- **Is best reached through:** DIY resources, design and DIY blogs and content, Amazon, local stores.

Figure 5: Idea Starters for Kyle



KYLE

THE NEW URBAN TRADITIONALIST



“I want to feel good in my home and have an environment for positive experiences – great meals, hot showers, beautiful to look at. We don’t have a ton of expendable income, but when I do spend my money, it’s on things that enhance the quality of my life. That’s why we pay more to live in a walkable city, we try to have products with smart designs, or spending a little more to make sure I make socially responsible purchases. Even though we might move to have more space for our growing family, it’s important that we feel like our home reflects our values and tastes. We’ll do it ourselves if that’s what it takes to have the home we want.”



46% of this seg. earn between 40k and 120k HH



- Urban
- First home
- Newer construction
- With kids
- Will move

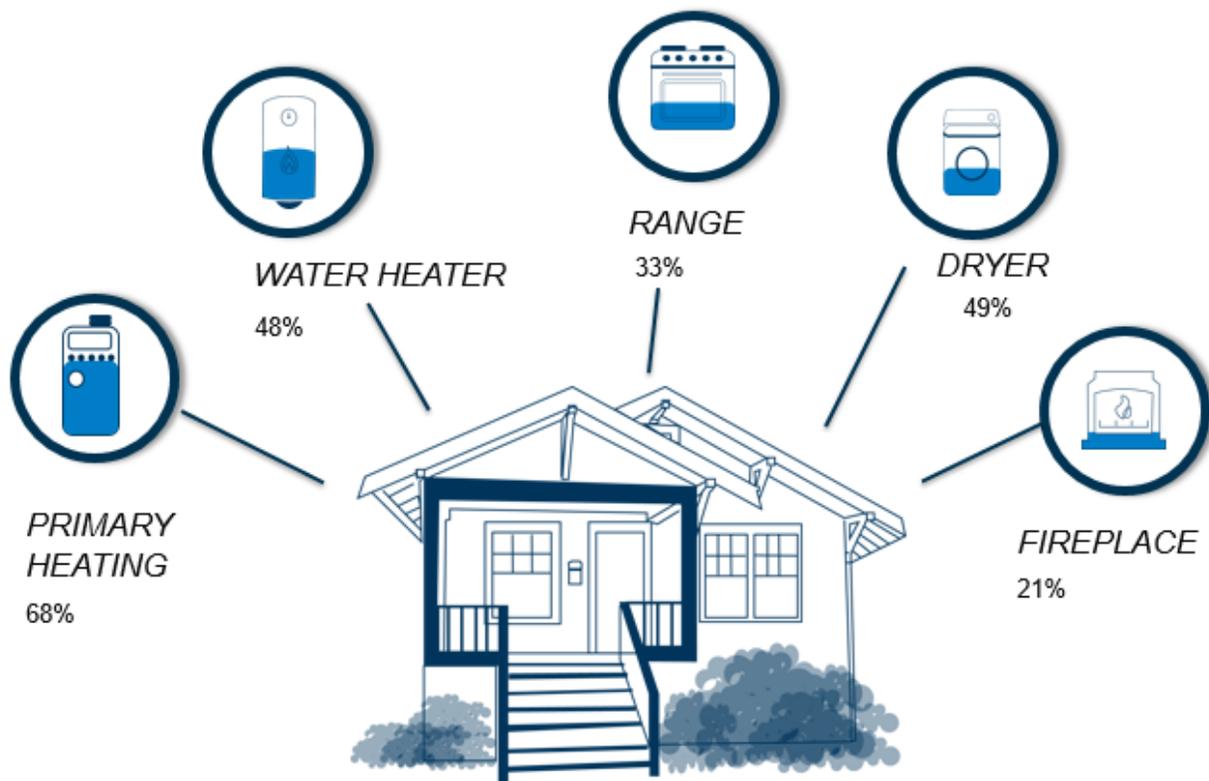


- Most liberal
- Most educated

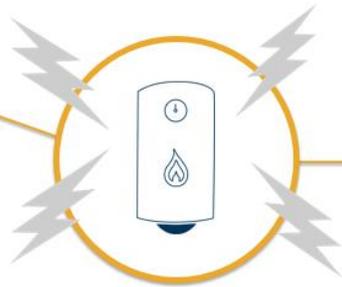


- Mostly Male
- Late 20’s-early 30’s

Figure 6: Reported Natural Gas Appliances in Kyle's Home



KYLE'S JOURNEY

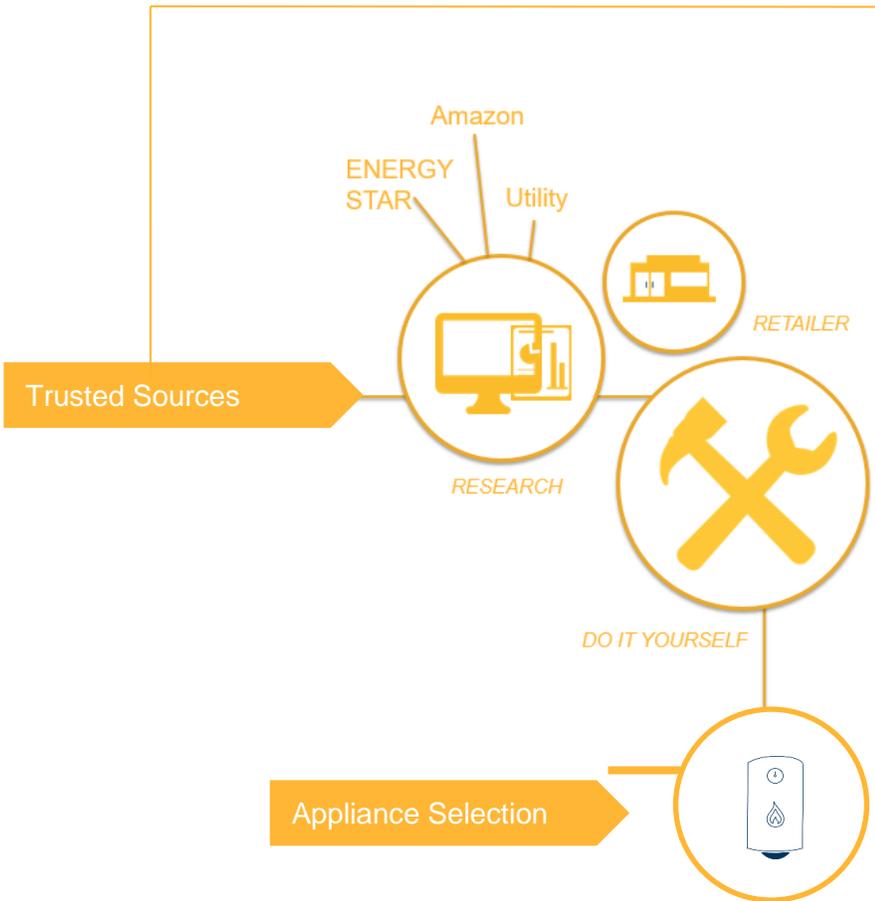


Equipment replacement

97% would consider replacing equipment before it fails

- To increase the value of home (32%)
- When new technology is available (29%)
- To improve energy efficiency (25%)

3% will only replace equipment when it fails



PRODUCT MUST BE

- Durable and last a lifetime (30%)
- Attractive and enhance the appearance of my home (24%)
- Well designed and not overly complicated (24%)

PREFERRED CHANNEL

Sources used to make purchase decisions

- Internet (74%)
- Word of mouth (70%)

PREFERRED INTERNET SOURCES

- Utility websites (26%)
- Retailer websites (26%)

NEEDS TO HEAR

Innovative, smart design, simple, environmentally friendly

NEEDS TO FEEL

On top of trend, has quality products, is being socially responsible

ERICA

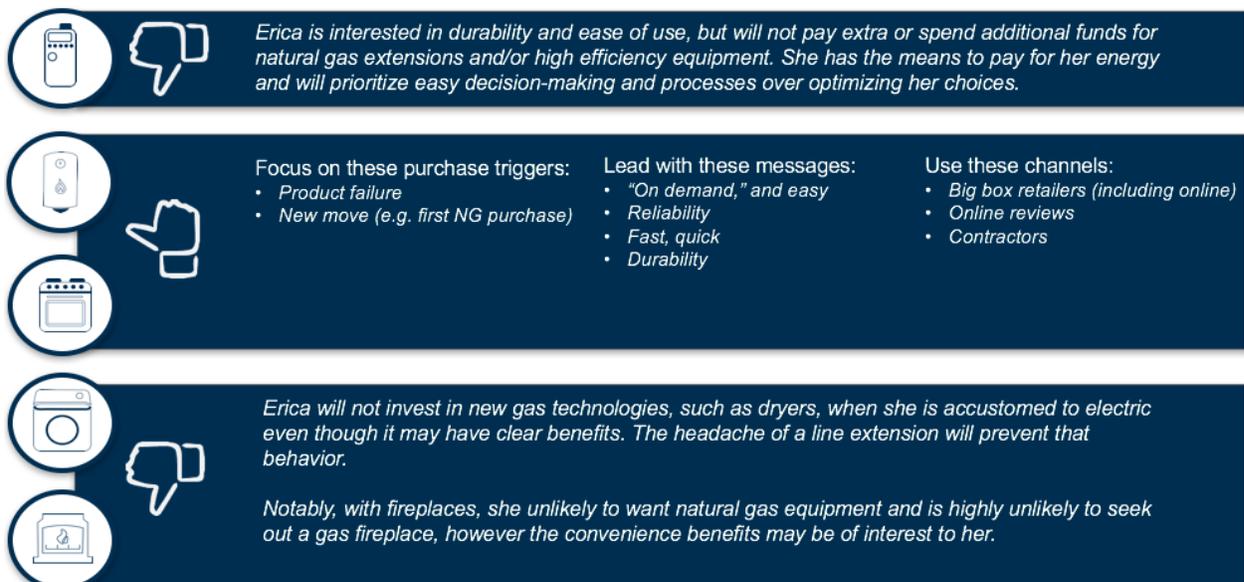
THE MIDDLE AMERICAN



Erica...

- **Has a home that is:** mid-sized to large, existing construction, located in a suburb commuting distance to “the city.” Least likely to upgrade home.
- **Buys products because:** they are simple and create a more comfortable and easy life, part of popular culture/widely adopted, and proven in the marketplace, and qualify as “nice” things.
- **Prioritizes home upgrades based on:** how much they enhance comfort, are easy to use, and enhance her sense of well-being.
- **Will pay a little more for:** technologies that are “fun” and enjoyable and make her house a great place to live, and high performance equipment.
- **(DIS)likes natural gas because:** she assumes electric is generally better but is admittedly under informed and not interested in the topic.
- **Will respond well to messages that:** speak to her sense of providing for her household and her desire to live a “good life” and have “nice” things.
- **Feels confident in information if:** the product is something her friends and family are talking about as well as things trending on social media. She also trusts big box retailer sites and reviews.
- **Is best reached through:** big box retailers, retail “experts” such as those at stores like Best Buy.

Figure 7: Idea Starters for Erica



ERICA

THE MIDDLE AMERICAN



“I love my place. We live in a great neighborhood close to friends. It’s an easy commuting distance from work and we are close to great schools. We’re not extravagant people but we like to keep up with what’s out there as long as the price is right and it’s been proven to work well. I don’t really care about the product details or the fuel, I just want it to get the job done and keep my life simple. Isn’t that what we all want? Enough money and time to relax and do the things we love. I don’t sweat the small stuff, like my energy costs. If I’m comfortable and I can afford it, we’re all set.”



44% of seg. have \$80k+ HH income



- Suburban
- Existing homes
- With older kids

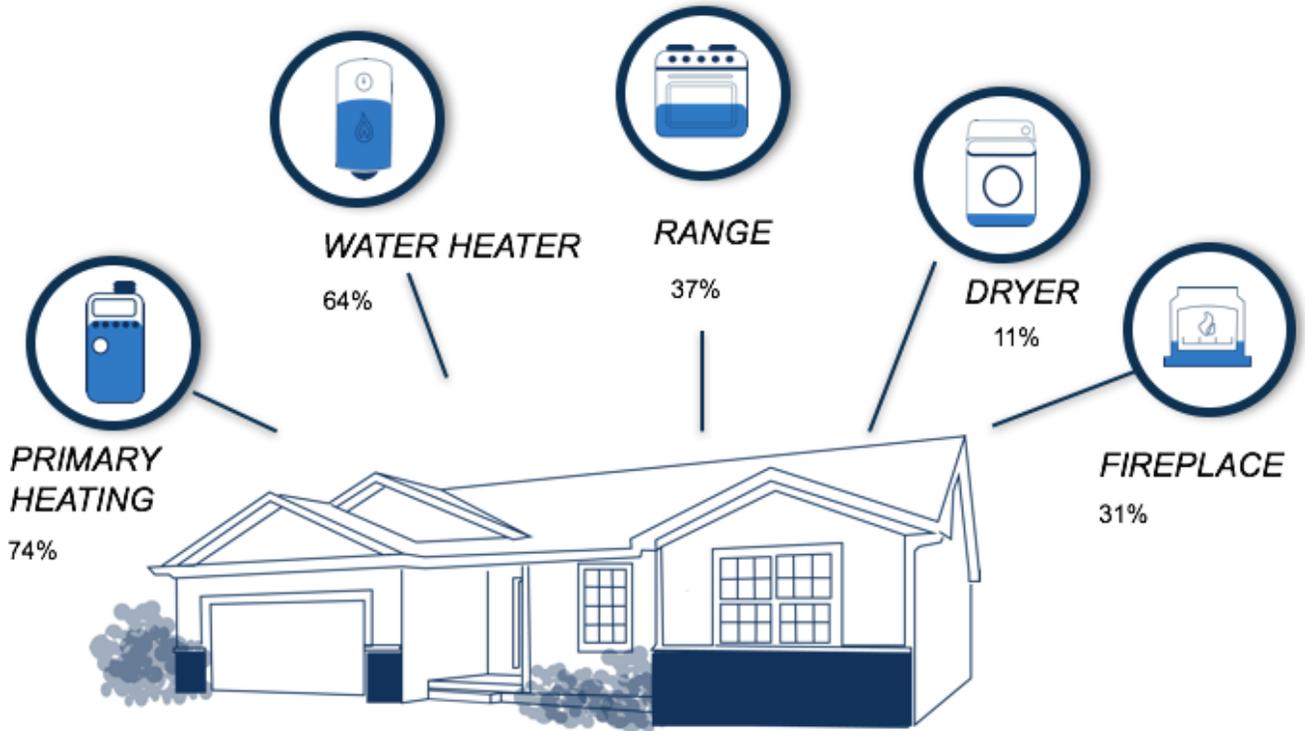


- Next-most liberal
- Somewhat educated



- Mostly Female
- 30-40’s

Figure 8: Reported Natural Gas Appliances in Erica's Home



ERICA'S JOURNEY



Equipment replacement

77% Will consider replacing an appliance before it breaks

- To improve energy efficiency (52%)
- To avoid an emergency situation (40%)
- To improve performance (40%)

23% Will only replace equipment when it fails

- Too expensive (10%)
- Not important to have new equipment (9%)

Trusted Sources

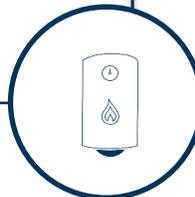


RETAILER



SEE IT FIRST

Appliance Selection



PRODUCT MUST BE

- Durable and last a lifetime (59%)
- Well designed and without overly complicated mechanisms (45%)

PREFERRED CHANNEL

Sources used to make purchase decisions

- Internet (69%)
- Seeing in person (58%)

PREFERRED INTERNET SOURCES

- Online reviews (44%)
- Product specification/information (33%)

NEEDS TO HEAR

Easy, comfortable, no-brainer, well-tested

NEEDS TO FEEL

With the pack, up-to-speed, comfortable, purchases contribute to a good life

ROSE

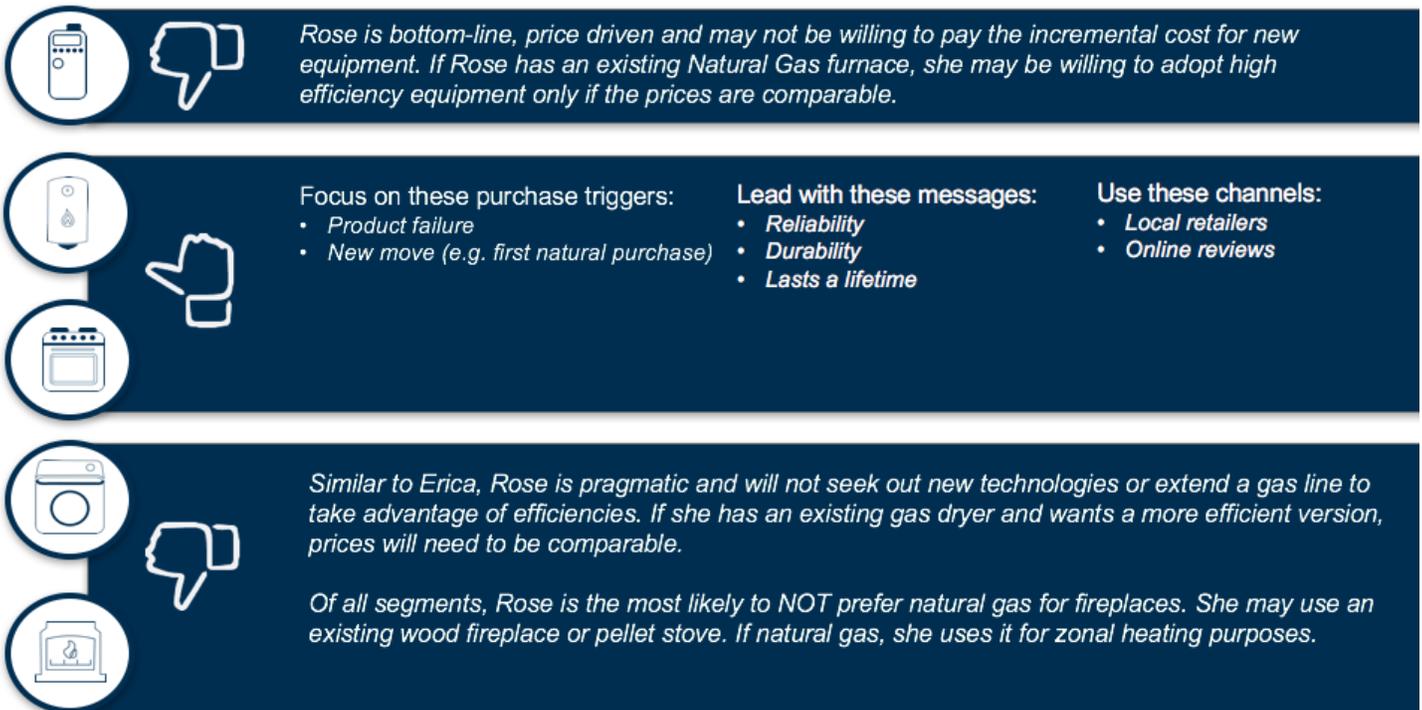
THE DAY-TO-DAY



Rose....

- **Has a home that is:** small, existing construction, located in suburban and rural areas.
- **Buys products because:** they will last and won't fail on her. She doesn't have much money to spare so she will purchase only those things that are a necessity.
- **Prioritizes home upgrades based on:** necessity only and to minimize uncertainty or impending emergency situations.
- **Will pay a little more for:** products she can trust will last a lifetime and come recommended from someone she knows.
- **Likes natural gas because:** it is least cost, but she does not have a strong fuel preference.
- **Will respond well to messages that:** reassure her that the products are high quality, won't require maintenance, and come with warranties and lifetime guarantees.
- **Feels confident in information if:** if it comes from long-trusted community members and local store owners or friends and family experts.
- **Is best reached through:** Some online research with a greater emphasis on face-to-face interactions.

Figure 9: Idea Starters for Rose



ROSE

THE DAY-TO-DAY



“ I love my home, and even though it’s small, it’s just right for me. I take good care of my things but don’t waste on buying fancy new stuff. If it ain’t broke, don’t fix it. I like to go and talk to people I know, like the guys down at Ike’s, and learn more about the appliances I buy. They’re honest and let me see things for myself. I want things that will last me. I don’t want anything fancy – just something to meet my needs. ”



66% of this seg. earn under 80k HH, 40% less than 40k HH



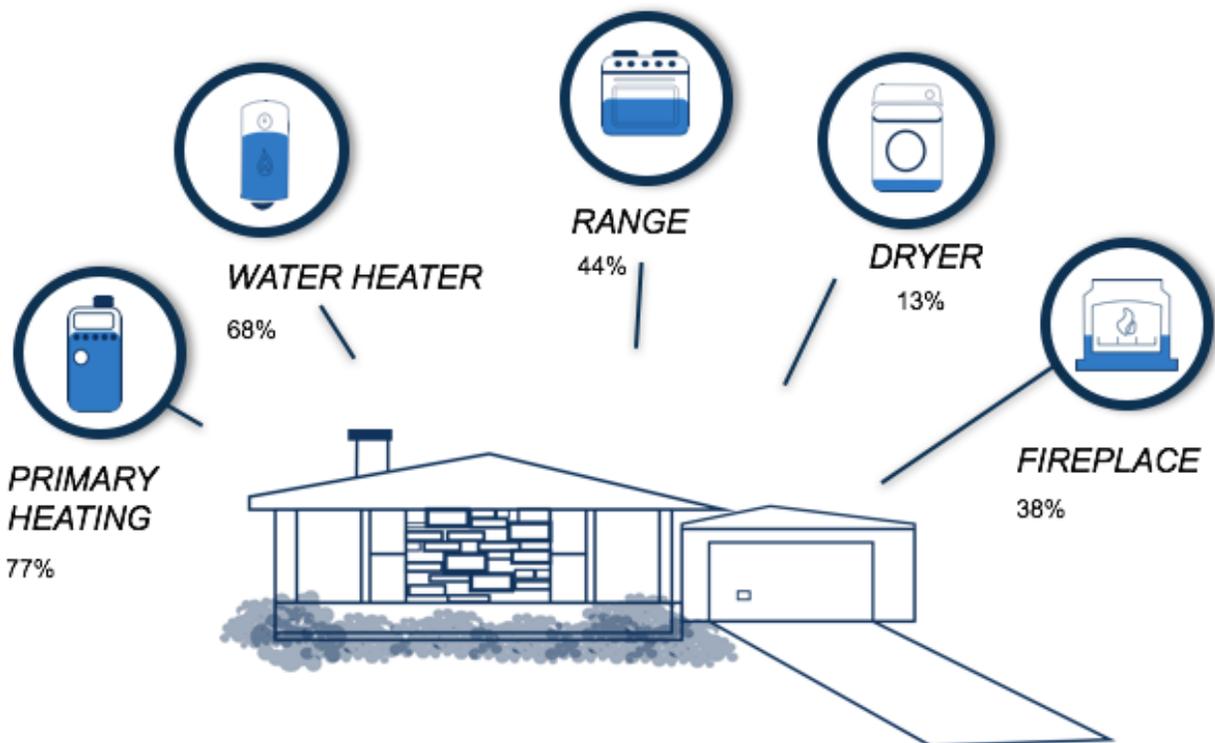
- Suburban homes with the highest % of rural,
- Lives in smaller homes, longest tenure
- May live alone



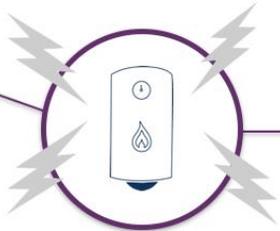
- Most conservative
- Higher percent retired



- Male/Female
- 50's+



ROSE'S JOURNEY



Equipment replacement

65% Will consider replacing equipment before it breaks

- Avoid an emergency situation (43%)
- To improve energy efficiency of equipment (35%)
- Improve performance of equipment (30%)

35% Will only replace equipment when it fails

- Too expensive (10%)
- Not important to have new equipment (10%)

Trusted Sources

RESEARCH



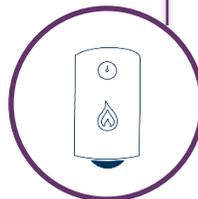
LOCAL STORES



SEE IT FIRST



Appliance Selection



PRODUCT MUST BE

- Durable and last a lifetime (72%)
- Known for exceptional performance (41%)

PREFERRED CHANNEL

Sources used to make purchase decisions

- Internet (63%)
- Seeing in person (62%)

PREFERRED INTERNET SOURCES

- Consumer Reports (40%)
- Online reviews (38%)

NEEDS TO HEAR

From people she trusts, that they had a positive experience with the product, it won't cost her more or fail

NEEDS TO FEEL

Confident the product will last, that she will not be stuck with unexpected bills

IV. MESSAGING STRATEGY INSPIRATION

In addition to targeted messages by segment, consider strategies to target multiple segments with a single message in any outreach activities. In the figure below, the ILLUME team has identified areas of potential messaging overlap between segments that can be considered. A few key idea starters include:

- Nearly all segments appear receptive to efficient water heaters (to varying degrees) and the benefits associated with water heaters tend to be universally held. Consider using messaging strategies that emphasize the durability and reliability of the equipment where they overlap with high efficiency products, as well as the benefits of a hot, consistently heated shower.
- The older segments, Doug and Rose, have favorable opinions of natural gas fireplaces for their cleanliness and ease of use. Target these segments with efficiency attributes of low cost to operate as well as easily controlled zonal heat.
- Younger segments, Kyle and Erica tend to have young families and index higher on convenience and control. Products such as natural gas ranges and smart thermostats will likely appeal to both segments due to convenience factors (cooking speed and control for ranges, remote and “smart” controls for thermostats).
- Finally, Doug and Kyle share a mutual appreciation for high quality products. Natural gas ranges appeal to these two segments because natural gas ranges allow for chef-quality cooking experiences.

Figure 10: Segment Targeting and Messaging Intersections

| | | | |
|---|--|---|--|
| <p>DOUG</p> <p>Natural Gas Heating: high performance, reliable, low cost, efficient</p> | <p>Gas Ranges: “true” cooking experience, control, convenience.</p> | <p>KYLE</p> <p>Natural Gas Heating: improves home value</p> | |
| <p>Natural Gas Fireplaces: clean, convenient (do not target Rose, but messages will capture her if interested)</p> | <p>Water Heaters: durable, reliable, lasts a lifetime, hot & consistent showers</p> | <p>Gas Ranges: convenient, fast, easy</p> | <p>Smart T-Stats: Convenient, trendy, saves money</p> |
| <p>ROSE</p> | | <p>Gas Ranges: easy, fast, durable</p> | <p>ERICA</p> |

V. NATURAL GAS FIREPLACES

Fireplaces have a strong emotional and social connection for natural gas consumers. Of all surveyed natural gas consumers, 23% have a strong fuel preference for their fireplaces, with 15% favoring natural gas fireplaces, 6% favoring wood burning fireplaces and the remaining favoring electric. Among consumers who prefer wood, the aesthetic quality of the fire and the authenticity of the experience are key drivers. Those who prefer natural gas do so because of the cleanliness, comfort, and convenience. Of the four consumer segments, Doug has the greatest penetration of natural gas fireplaces and prefers them for the same reasons.

Notably, most customers who use natural gas fireplaces do so for zonal heating (37%) or zonal heating and aesthetics equally (35%). One quarter state they use the fireplace for aesthetics only. When considering a fireplace upgrade or installation, as many as 11% report extending a natural gas to do so and, overall, most rely on internet research, contractors, and in-person interactions to determine which fireplace to purchase.

Drawing on these insights, PAs and utility program managers may want to consider promoting thermostat controlled natural gas fireplaces as zonal heating options. When doing so, promote the combined value they provide of ambiance and efficiency while also serving as reliable, safe, and clean auxiliary heat.

Determine ways to position natural gas fireplaces as equally authentic and traditional.



15% PREFER GAS FOR FIREPLACE FUEL:

- Cleaner than wood (57%)
- Comfortable heating (52%)
- Convenient (51%)

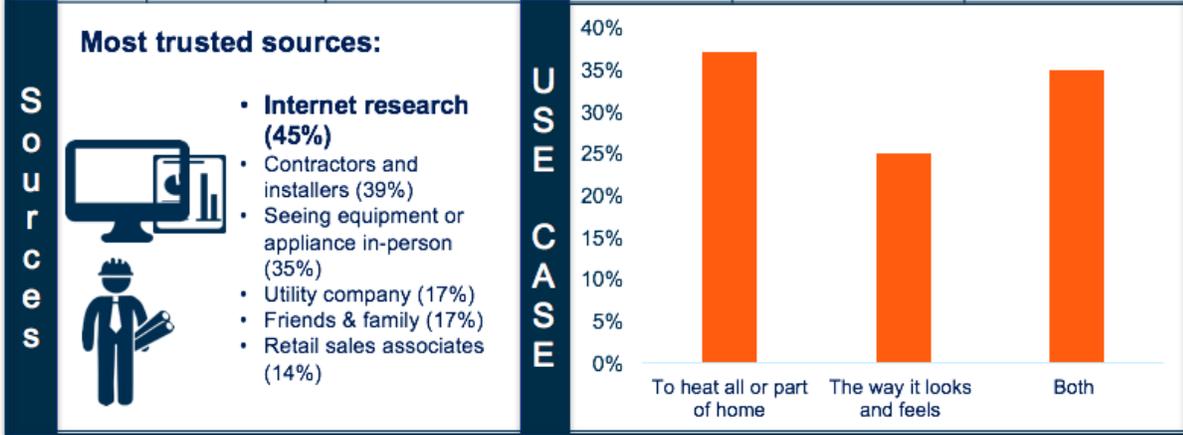
8% PREFER SOMETHING ELSE:

- Aesthetics (23%)
- Wood is more readily available or cheaper (21%)
- Perception of wood fire as authentic or traditional (20%)

Leverage the internet and installers to promote clean burning and auxiliary heating.



| % Natural Gas | % Extended Gas to fireplace | Drivers for Natural Gas fireplaces | % Replaced since purchase | % Who would replace early | % Plan to replace in the next year |
|---------------|-----------------------------|--|---------------------------|---------------------------|------------------------------------|
| 43% | 11% | *Cleaner than wood *Comfortable heat *Convenient | 16% | n/a | 4% |



Determine ways to position high efficiency fireplaces as a clean and an equally authentic alternative to wood.



23% HAVE A FUEL PREFERENCE FOR THEIR FIREPLACE

15% PREFER GAS:

- Cleaner than wood (57%)
- Comfortable heating (52%)
- Convenient (51%)

8% PREFER ANOTHER FUEL:

- Aesthetics (23%)
- Wood is more readily available or cheaper (21%)
- Perception of wood fire as authentic or traditional (20%)

Figure 11: Idea Starters for Natural Gas Fireplaces by Segment



59% own NG FP

TARGET DOUG WITH EFFICIENT NATURAL GAS FIREPLACES

- Doug likes his natural gas fireplace because it is clean, provides ambiance, and is used as a heating source
- He is most likely to prefer a NG fireplace and to use it multiple times a week during the warmer months.



38% own NG FP

Rose is not a strong target in spite of her higher penetration of natural gas fireplaces

- Rose likes her natural gas fireplace because it is clean and convenient.
- However most of Rose's segment does not own one and has a strong preference against natural gas.



31% own NG FP

Erica is not a strong target in spite of her higher penetration of NG fireplaces.

- Erica likes natural gas because it is clean and convenient
- That said, she may be more likely to invest than Rose because she enjoys having nicer things and may like the convenience improvements of a newer NG fireplace.



21% own NG FP

Do not target Kyle's segment with natural gas fireplaces

- This segment has the lowest penetration and may be unlikely to use them regularly to realize efficiency and is unlikely to install them.

VI. NATURAL GAS FURNACES

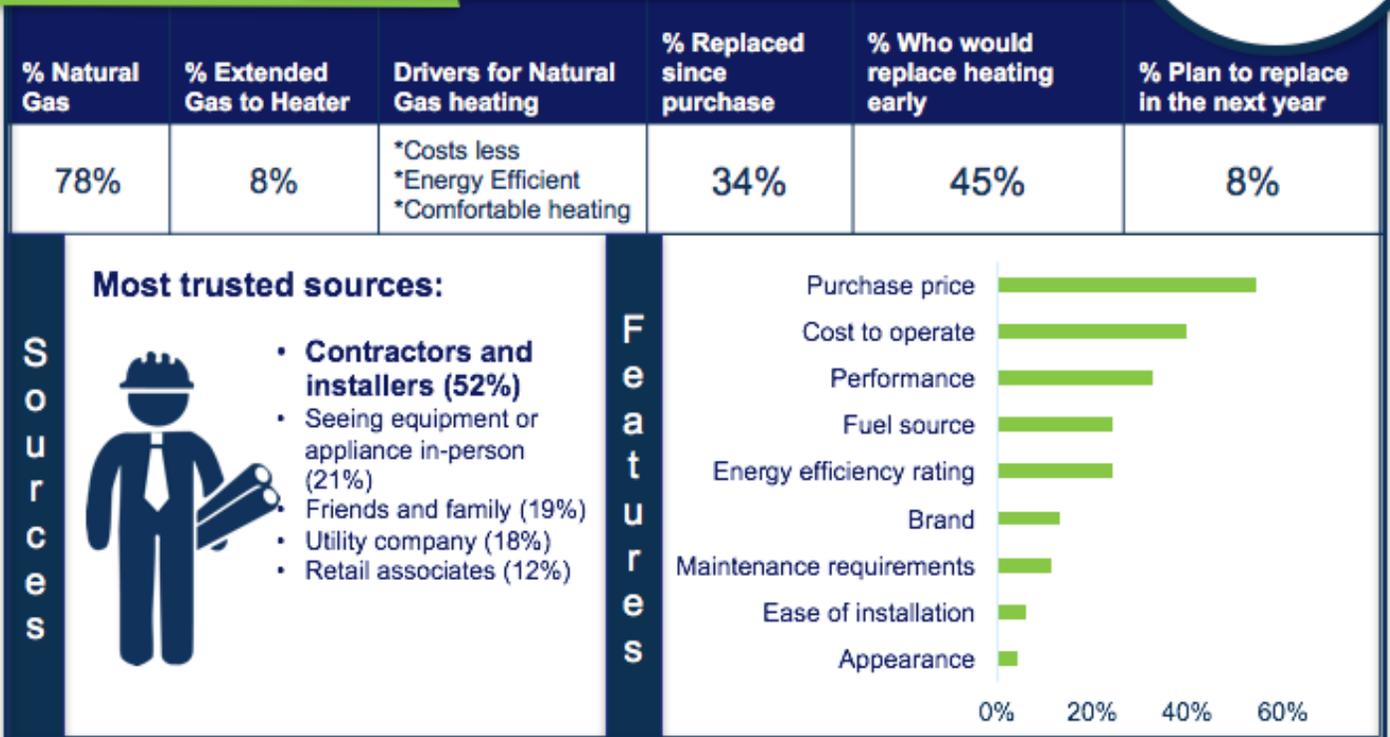
Seventy-eight percent of natural gas consumers have natural gas primary heat and eight percent extended a natural gas line for that heating system. The purchase price and the cost to operate are the primary purchase drivers, followed closely by the performance of the equipment. Notably, 52% rely on contractors to direct them to the right piece of equipment followed by in-person experiences. Drawing on these insights, we recommend the following:

- Promoting natural gas furnaces for their durability and lifetime performance through trade allies.
- To the extent that efficient products enhance the quality of the equipment, this should be promoted above its relatively low cost to operate as consumers see natural gas as an inherently low cost fuel. Thus, the incentive to purchase a high efficiency furnace may be diminished.
- Doug and Kyle are the ideal targets for high efficiency furnaces due to their low cost to operate (Doug) and the value they may add to the home (Kyle).

Leverage contractors to promote low-cost, & comfortable heating in a durable, reputable product.



FURNACE

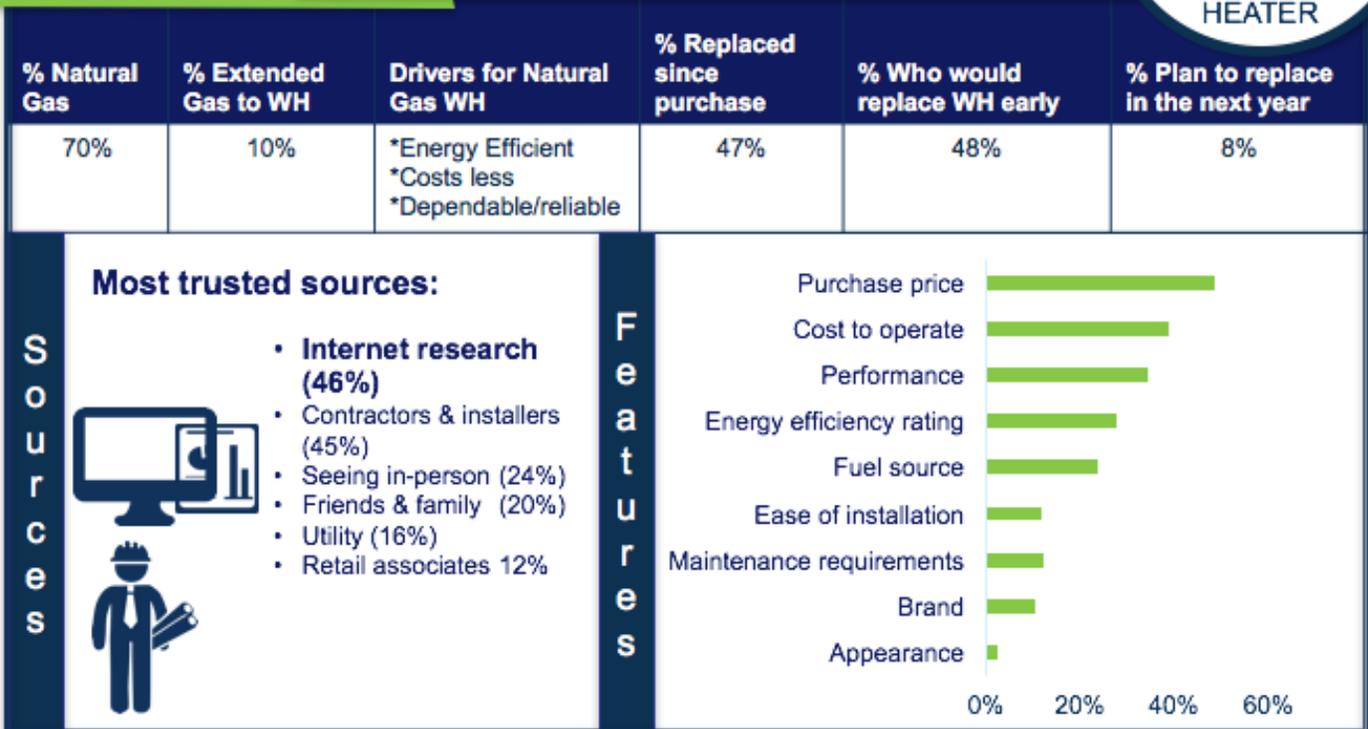


VII. NATURAL GAS WATER HEATERS

Seventy percent of natural gas consumers have a natural gas water heater and ten percent extended a natural gas line to have it (second only to ranges). Similar to furnaces, the purchase price and the cost to operate are the primary purchase drivers, followed closely by the performance of the equipment. However, internet research is the primary source of information (46%) followed by contractors. This indicates that water heaters could be promoted further “upstream” through online outlets such as reviews and product-specific performance sites such as Consumer Reports.

- Promote natural gas water heaters for their durability and lifetime performance online and via partnering trade allies.
- Like furnaces, the quality of the equipment should be promoted above its relatively low cost to operate as consumers see natural gas as an inherently low cost fuel and may not feel the benefit of efficiency is worth the incremental cost.
- All segments appear to be receptive to efficient hot water heaters; consider leveraging the universal messages discussed earlier to promote water heaters.

Leverage online searches and reviews to point customers to water heaters and your trade-ally network. Emphasize low cost to operate.



VIII. NATURAL GAS WATER RANGES

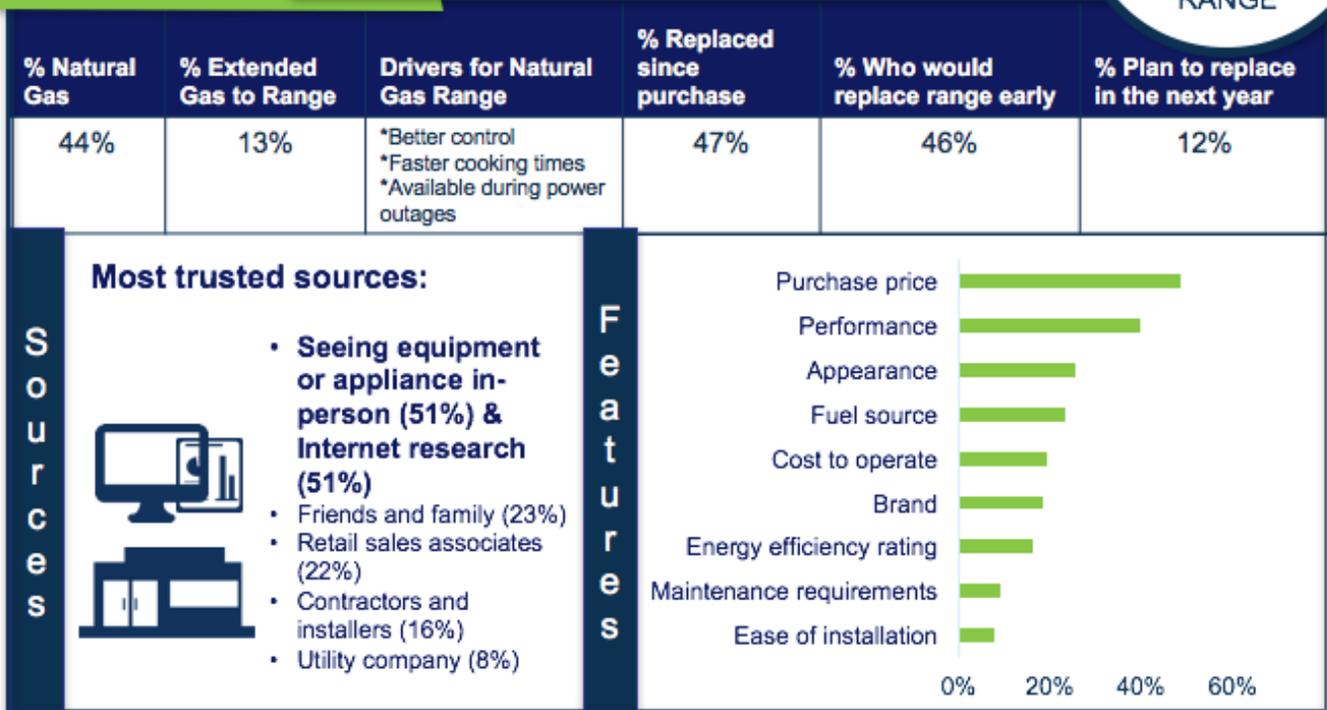
While only forty-four percent of natural gas consumers own a natural gas range, they represent the greatest driver for a natural gas line extension, with thirteen percent indicating they extended their service to have a gas range. Like other equipment, purchase price and performance are drivers, with aesthetics also rating highly. Notably, the cost to operate ranges is a low consideration in the purchase process, suggesting that messaging efficiency alongside “high performance” may be the most impactful way to promote high efficiency ranges.

- In-person interactions are a critical touch point for range purchases. Consider marketing high efficiency ranges in showrooms and at big box and local stores through eye-capturing and interactive displays.
- Consider online advertisements that help customers “see” the product in their homes to capture them in the research phase while also meeting their desire for an interactive experience.
- Among segments, Doug and Kyle are the most likely to seek out natural gas ranges for their high quality and “chef-like” experiences and should be the primary targets for high efficiency equipment.

Leverage PoP and online reviews to promote cooking control, classic appearance, & cost to operate.



RANGE

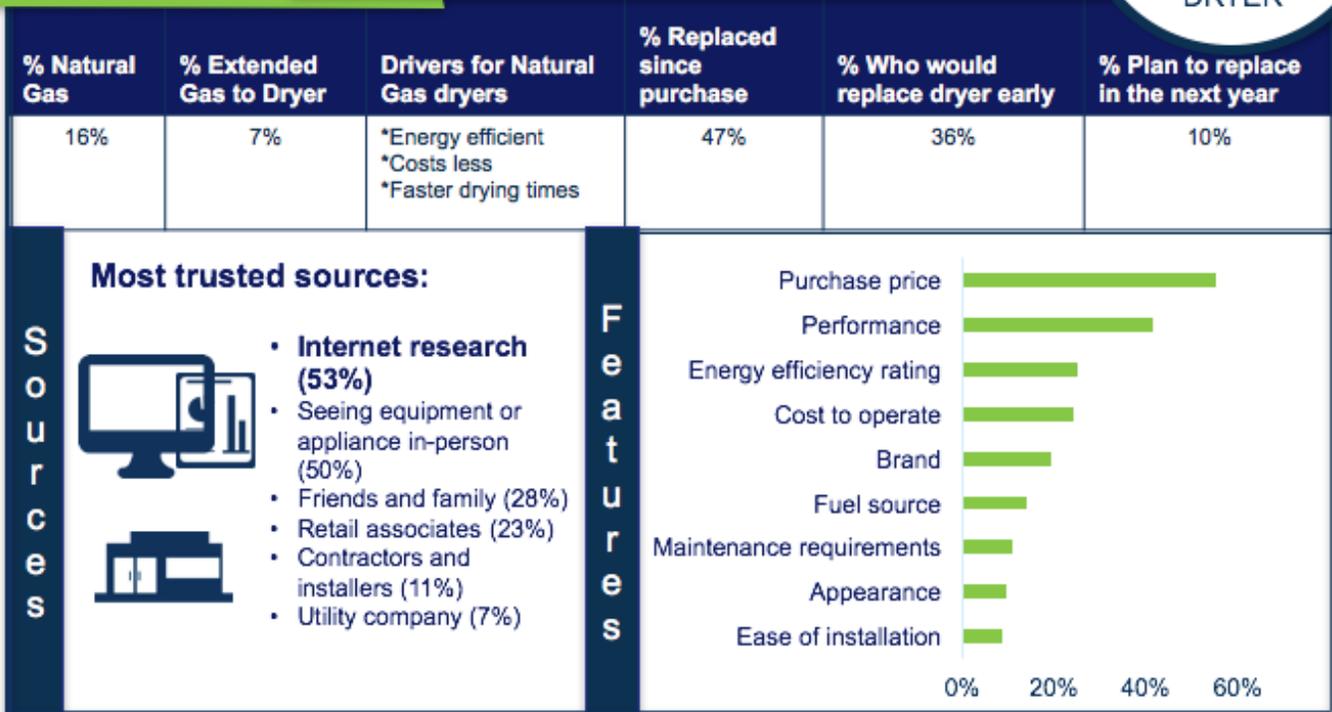


IX. NATURAL GAS DRYERS

Just sixteen percent of natural gas consumers have a natural gas dryer, with nearly half of these customers indicating they extended their natural gas line to have it. Our qualitative research suggested that if the dryer is placed near other natural gas equipment (such as the furnace or water heater), customers are more receptive to extending service to try this technology. The cost to operate and faster drying times were key drivers in selecting a natural gas dryer. Interestingly, the energy efficiency rating rated higher in this category than any others, suggesting early adopters of natural gas dryers may be more aware of the benefits of energy efficiency and the cost to operate dryers in general. And, even though the dryers are in plain sight, few customers cite aesthetics as a purchase criterion (in contrast to ranges).

- Our qualitative research suggests that safety concerns represent a strong barrier to natural gas dryer purchases. Many consumers felt as though “flames” and “lint” or “fabric” should not be “near each other”.
- Just over half reported beginning their research process online followed closely by in-person interactions. Like ranges, we recommend interactive online and instore experiences to promote this product.
- We also suggest targeting Doug, the earliest adopting natural gas segment, to gain greater acceptance of the product in the marketplace. Consider ways to encourage online reviews when customers have positive experiences to help gain market confidence.

Leverage online searches & PoP to promote energy efficiency and quick drying times.



X. CONCLUSION

In sum, there is significant opportunity for high efficiency natural gas initiatives in the Northwest. Of all opportunities, natural gas heating (both space and water) present the greatest opportunity as consumers are most receptive to investing in these products. Further, the key segments of Doug and Kyle are the most receptive to natural gas high efficiency measures.

That said the low cost of natural gas may serve as a critical barrier to high efficiency product adoption if the incremental cost remains high. Our research suggests consumers are slightly less concerned about conserving natural gas resources compared to electric resources. As a result, consider developing messaging points that are true for high efficiency products and that also align with consumers' core purchase drivers: the desire for durable, reliable, well-made products that create a comfortable home and give them more control over their heating, cooking, and home.

It is also important to consider positioning these messages well upstream of the purchase decision. The majority of natural gas consumers begin their shopping online for all end use technologies and savvy digital marketing campaigns may be very successful in directing consumers toward high efficiency equipment.

Further, nearly one quarter of all natural gas consumers interviewed indicated that they do nearly all home improvements and considerably more are willing to do some. Consider exploring ways to place high efficiency natural gas options on popular local DIY resources, such as blogs and DIY networks to capture this market.

Once interested in a product, natural gas consumers report key differences in shopping behavior, depending on the equipment. Natural gas consumers report relying on contractors and installers for space or water heating equipment compared to end uses that consumers interact with daily, where "seeing it for themselves" emerged as an important stage in their decision-making process.

XI. APPENDIX A - INSTRUMENTS

QUALITATIVE INSTRUMENTS

PRE-INTERVIEW HOMEWORK

Introduction

Thank you participating in our research study! We are excited to learn more about you and your preferences. As you know, this study has a homework assignment so we can learn more about you in advance of your one-on-one interview.

Please complete this brief 'homework' exercise in advance of your online interview. We expect it to take about 60 minutes and you will be able to save your progress and complete the assignment over time if you wish. We appreciate your time in writing thoughtful responses to our questions.

You will receive a \$40 incentive for completing this before your scheduled interview. All incentives will be paid after completion of the online interview.

Warm-up: Home Tour Exercise (imagined housewarming party)

Goal of this exploration: We hypothesize that appliance and other home investments are “competing” for residents’ budget against other remodeling efforts in the home and that natural gas appliances that have a low social visibility will be deprioritized in upgrade and replacement decisions. This exercise will help us understand what participants are focused on for each room in the house. We can then probe on why this is the case in the virtual in-home interviews.

1. Imagine that you *just* moved into your current home and you’re having a housewarming party! When your friends and family ask for a tour, you want to point out the things that influenced your purchase (things you liked), and things you weren’t so thrilled about.
 - a. Please write a few sentences to a paragraph about things in each of the following rooms that you liked when you bought the house - things that influenced your purchase in a positive way, or in other words, the things that were in the “Pros” list when you were making your purchase decision.
 - Kitchen,
 - living/family room
 - Bedroom
 - Utility room or basement (Optional).
 - [separate text boxes will be provided for each room]
 - b. Now, please write a few sentences to a paragraph about things in each of the same rooms that you did not like - things that influenced your purchase in a negative way, or in other words, the things that were in the “Cons” list when you were making your purchase decision.
 - Kitchen,
 - living/family room
 - Bedroom
 - Utility room or basement (Optional).
 - [separate text boxes will be provided for each room]

Emotional Satisfaction with Home Appliances: Winter/Summer Picture Tiles and Follow-up

Goal of this exploration: We hypothesize that there are two primary dimensions on which customers rate their satisfaction with a product – technical and emotional. For the purposes of this work, we want to identify the appliances that bring them comfort and feelings of contentment in the home. We hypothesize that the emotional satisfaction customers have with items in their home will bring forward latent barriers and drivers to natural gas and natural gas end uses.

2. Think about all of the equipment or appliances you use in your home in the winter – What equipment or items in your home make you feel comfortable and content in your home?

You can select up to five of the images below, or type in key words. If you don't see the item you want, you can write it in below.

Image options (we can have a lot of pictures as people can narrow in with keywords; captions will be included with each image)

- Pictures of how heat comes out & into your home (baseboard heaters, floor or ceiling vents, ductless mini split vent)
- Pictures of point-source systems – electric space heater / portable space heater, gas point source heater (e.g., Rinnai)
- Pictures of the heating system itself
- Water heater (Gas and electric)
- Fireplace (Wood-burning, gas and electric)
- Potbelly stove (Wood-burning, gas and electric)
- Insulation & windows
- Cup of coffee / tea
- Electric blanket
- Blankets/comforters
- Slippers
- Steamy shower or bath
- Cooking stove/range (Gas and electric)
- Hot tub
- Clothes dryer (Gas and electric)

3. For each of the items you selected, please tell us how it makes you happy or comfortable. [Fill with responses to Question 2]

4. Think about all of the equipment or appliances you use in your home in the summer - What equipment or appliances in your home help you feel comfortable and content in your home?

You can select up to five of the images below, or type in key words. If you don't see the item you want, you can write it in below.

Image options (we can have a lot of pictures as people can narrow in with keywords; captions will be included with each image)

- Open windows
- Outdoor grill (Charcoal, natural gas hookup and propane)
- Pictures of how central AC comes out & into your home (floor or ceiling vents, ductless mini split vent)
- Fans – floor & overhead
- Pictures of central AC air compressor
- Ice tray or ice-maker in refrigerator

- Cooking stove/range (Gas and electric)
- Outdoor fireplace (Wood burning, gas and electric)
- Outdoor pool
- Clothes dryer (Gas and electric)
- Window AC

5. For each of the items you selected, please tell us how it makes you happy or comfortable. [Fill with responses to Question 3]

Feelings Toward Natural Gas: Couples Therapy Exercise

Goal of this exploration: We hypothesize that customers will have specific options about certain natural gas end uses that bring forth certain emotions. The MadLibs format gives customers a semi-structured way to engage in a creative thought exercise about how they use natural gas. By prompting them to think about actions and feelings, we will be able to determine top-of-mind associations with natural gas end uses and direct them to think about ways they might benefit from natural gas service expansion.

6. *All relationships require a little work at times. Please think about your relationship to natural gas in your home (and all of the appliances it powers). Fill in the blanks to tell natural gas how you feel.*

Natural gas, you're perfect for [ACTION] because you help me [ACTION]. I rely on you to [ACTION] during [Fill in the blank] to help me [ACTION]. Also, when you supply power to my [APPLIANCE] it makes me feel [EMOTION] and [EMOTION].

That said, I think you can do more. I want you to help me [Fill in the blank]. I think you'd do a great job at [ACTION] and would really improve my [fill in the blank]. I think the only thing keeping us from achieving that goal is [fill in the blank].

I would also like to see you improve on [ACTION] so I can do a better job of [ACTION] and feel more [EMOTION]. If you did this, I think it would improve our relationship because [Fill in the blank].

Latent Barriers to Energy Efficiency: Unique Ways You Use Your Home

Goal of this exploration: We hypothesize that there are many ways customer use (or misuse) their appliances that may be solved by natural gas end use appliances or improvements on natural gas end use appliances. The goal of this effort is to unearth behavior-based barriers to efficiency in the home. Note this is purposefully left open to ensure we do not miss opportunities for insight by directing the discussion to specific end uses or fuel sources.

7. We all use our homes a little differently. Tell me about some ways that you use equipment or appliances, like the ones we have been discussing, in your home *differently* than most people. [1-2 paragraph open response]

8. Many people like to save money on their utility bills, but sometimes we just need to do things to make life easier or feel more comfortable. What do you think are the little things you do in your home that may drive your utility bill up, but make your life easier or more comfortable?

Home History

Goal of this exploration: We hypothesize that previous experience with natural gas shapes customer preference and loyalty. This exercise will help us understand how previous experience affected the decisions participants made in purchasing their new home to see if this is the case.

9. Think about the places you've lived in the past. Did any others have natural gas?

- a. [If yes] Please explain which appliances used natural gas in your previous home(s) and what you liked and/or disliked about them.
- b. [If yes] How did that past experience affect what features you looked for when you were shopping for your current home? Did it influence your selection of a home with natural gas service?
- c. [If no] Were you specifically looking for a home with natural gas when you purchased your current home? Please explain why or why not.

[OPTIONAL] Natural Gas Instagram: We've talked a lot about your home and the appliances in your home that use natural gas. If you would like to share some of your creativity and photography skills with us, please download the Instagram app and take a photo of the one natural gas appliance that brings you the most joy and include a caption. Have fun with it – go crazy on filters.

When you post it, tag @illum advisors. Please write in your Instagram handle below and we'll look for your picture:

[Open Text Box for Instagram handle]

We will select the most creative caption on our feed and provide the winner with an additional \$50 gift card.

This is an optional task only so if you do not have Instagram or do not wish to participate, please select the "Next" button below (">") to complete your homework assignment.

Closing

Thank you for completing your homework assignment! You will receive your \$40 incentive after participating in the interview. If you haven't already received a calendar invite for your interview it should be coming soon!

Thanks again for your participation in our research project, we look forward to speaking with you in person.

If you have any questions about the study or wish to reschedule, please contact research@illumadvising.com.

VIDEO INTERVIEW GUIDE

INTRODUCTION/HOUSEKEEPING (5 MIN)

1. Thank you for taking the time to speak with me today. My name is [INTERVIEWER NAME] and I work for a national research firm called Illume Advising. We are conducting a market research study to learn about how people use major equipment and appliances in their homes. I actually live in [STATE], so I'm very interested in seeing and hearing more about your home!

[If prompted to reveal sponsor] We are not at liberty to give a specific name, but we'd like to hear who they think is sponsoring it.

2. Before we get started, I want to mention a few housekeeping items:
 - a. If you experience any issue with the connection to the video session, please log back in by following the same link in the calendar invitation you received.
 - b. If you are unable to reconnect you can reach me by phone at [INTERVIEWER PHONE NUMBER]
3. We are recording audio and video from our session so I can refer back to what you said when I write up a summary of findings from the research. My client is also going to review some of the interviews, both to check my interviewing and hear some of your responses verbatim. No parts of the video will ever be distributed publicly, and neither your name nor any identifying information will ever be associated with what you say. Do I have your consent to start recording? [Wait for verbal consent and start recording]

Do you have any questions we get started?

WARM-UP AND HOME OVERVIEW (5 MIN)

Today we're going to talk about major equipment and appliances you have in your home, how you use them, and any plans you might have to replace them.

Please keep in mind, there are no right or wrong answers, we are interested in hearing your thoughts and opinions.

1. I'd like you to take me on a walk through your home to check out some of the things you mentioned in the homework assignment. But first, I'd like to verify a few housing-related questions. [Confirm what they reported in the screener using the questions below]
 - a. How long have you been in this home?
 - b. Is this your first home purchase?
 - c. Did you have this home built or purchase it as an existing home?
2. Who else lives in this house with you? [Throughout guide, probe on any differences in priorities, preferences, etc., between household decision-makers - for example, do other decision-makers in the house have the same priorities about what equipment should be replaced?]
3. What do you love most about your home? Why?
4. Is there anything that really "bugs" you about it? If so, what? Why?

HOME WALK-THROUGH (60 MIN)

[Begin with a walk-through of the kitchen, living/family room, utility room or basement, laundry area, and optionally a bedroom or bathroom]

I read through what you wrote in the "homework" assignment as areas that you liked (the "Pros") and you didn't like (the "Cons") when you purchased the home. Now, I'd like to get a tour of your home! I am curious to know more about you and your feelings about certain types of equipment, and I'll probably ask you to share more about specific things as we walk through.

I'd like to cover the kitchen, living/family room, the utility room or basement (wherever your heater and hot

water heater is), your laundry area, and any other areas where you spend a lot of time, like a home office or bedroom. You can decide where we start.

Please talk openly as we walk through your home. In each room, give me a “tour” what you love and don’t love about the space and the appliances and equipment you have in the space.

[For each room, the researcher will prompt the participant to begin talking about the items in the room using the following questions:]

1. Tell me about this room. What do you love about it? What do you dislike about it? [If needed: Do you enjoy spending time in this space? Why or why not?]
2. When you moved in to the house, did you make any major changes, such as renovating the space or replacing equipment?
 - a. If so, what did you do? Why?
 - b. If not, why didn’t you make any changes?
3. Were there any changes that you did not do but would like to do?
 - a. If so, what?
 - b. Why didn’t you make the changes? [Probe for trade-offs in decision-making]

[After this general discussion, researcher will begin room-appropriate drill downs in to specific equipment]

APPLIANCE-SPECIFIC DRILLDOWN (WHERE PRESENT IN THE HOME)

For each appliance or system we encounter in the walk-through, either electric or gas, we will dig into the following topic areas, starting with unaided (non-leading) questions and prompting as needed)

- What customers love and don’t love about their appliances or systems, with a specific emphasis on the emotional satisfaction they do/do not provide and the technical satisfaction they do/do not provide.
- Replacement history and future replacement considerations (e.g., drivers to replacement and importance of replacement vs. other priorities they may have in the space or the home that “compete” with their decision to replace the equipment)

Follow-up questioning on the benefits that are specific to natural gas end uses (such as clean burning fire places, more cooking control, etc)

Throughout, the researcher will verify presence and/or fuel source of relevant equipment (heating system, heating vents or baseboard, portable space heater, water heaters, central AC, room/window AC, stovetop, fireplace, dryer, gas grill)

WATER HEATING DRILL-DOWN

[Note that we will discuss this section with everyone, including customers with electric water heaters, to understand their consideration of gas system]

1. **[Location]** *[Interviewer record location of water heater – basement, garage, utility room/closet; finished vs. unfinished space]*
2. **[Equipment confirmation]** What kind of water heater is it? Probe for:

- a. Type: Tank, tankless/on-demand, heat pump water heater? [ASK THEM TO SHOW YOU IF THEY ARE UNSURE]
- b. Fuel source: Gas or electric? [ASK THEM TO SHOW YOU IF THEY ARE UNSURE]
2. [Equipment characteristics] Do you know the brand and size (in gallons?) [ASK THEM TO SHOW YOU IF THEY ARE UNSURE]
3. [Benefits] What do you like about your water heater? Why?
 - a. Listen for benefits on unaided basis: Hot water is always available, temperature is well-controlled/consistent, [INSERT FROM EMAIL ONCE FINALIZED]
4. [Benefits] What don't you like about your water heater? Why?
5. [Replacement] [IF NOT COVERED ALREADY] Was the water heater in your home when you purchased your home, or did you add/replace it?
 - a. [If replaced] Why did you add/replace it?
 - b. [IF natural gas and replaced] Were additional lines or hook-ups necessary to install it?
 - i. [If yes] Why did you put this effort in for your water heater?
6. [Benefits] How does the water heat in your home now compare with other places you've lived? [Probe for what they liked about previous homes/systems and how those systems were different]
7. [Homework-stated benefits] In the homework assignment, you selected [insert items related to **this** end-use] as something that makes you happy in the [winter/summer]. [Probe for details, priority, triggers, timing, etc.]
8. [Homework-related questions] [INSERT OTHER INDIVIDUALIZED QUESTIONS FROM HOMEWORK ABOUT END-USE]
9. [Replacement] [IF NOT ADDED/REPLACED ALREADY] Have you ever considered replacing your water heater?
 - a. Why or why not? [Probe for: Age, efficiency, noise level, maintenance needs, fear it might break soon]
 - b. If you were going to replace your water heater, what would you look for? Probe for:
 - i. Type: Same type or new technology (like tankless?) Why or why not?
 - ii. Other factors: Purchase price, Brand, Ease of installation, How much energy it uses, Reliability/Durability, Appearance/aesthetics, Cost of fuel to operate, Maintenance requirements, Performance, Fuel source
 - iii. Would you consider a different fuel source than what you currently use? Which fuel source(s) would you consider? Why?
10. [Reasons for not connecting natural gas IF electric water heating] Have you considered running a gas line for the water heater you currently have?
 - a. Why or why not? [IF MULTIPLE REASONS GIVEN] If you had to pick one reason why you did not do it, what would it be?
11. [Priorities] If you had to pick one feature you must have (had) for a water heater (either newly replaced or replacing in the future), what would it be? Why?
 - a. Are there others in your household who feel/felt differently? IF yes, why? How did you come to a decision/how do you think you would come to a decision?

10. SPACE HEATING DRILL-DOWN (PRIMARY AND SECONDARY)

[Note that we will discuss this section with everyone, including customers with electric space heating, to understand their consideration of gas system]

1. **[Equipment confirmation]** What type of equipment do you use to heat this area of your home? Probe for:
 - a. Type: Furnace, boiler, heat pump [ASK THEM TO SHOW YOU IF THEY ARE UNSURE]
 - b. Fuel source: Gas or electric? [ASK THEM TO SHOW YOU IF THEY ARE UNSURE]
2. **[Secondary sources]** Besides the [primary space heat], do you use anything else to heat [this room/area/your home]? [Probe for: portable electric space heaters, secondary electric system, fireplace or stove]
 - a. [IF YES] When do you turn these on? Why? [Probe for the scenarios in which they use secondary heat, and why the primary heating system isn't enough. For example: Do they want better zone control, point-source heat?]
2. **[Benefits]** What do you like about your heating system? Why? [If they use secondary heaters, encourage them to think about all of the ways in which they heat their home]
 - a. Listen for benefits on unaided basis: Heat is warm and consistent, heats quickly, heat is even throughout the home, likes the thermostat [INSERT FROM EMAIL ONCE FINALIZED]
3. **[Benefits]** What don't you like about your system? Why?
4. **[Replacement of primary system]** [IF NOT COVERED ALREADY] Was this heating system in your home when you purchased your home, or did you add/replace it?
 - a. [If replaced] Why did you add/replace it?
 - b. [IF natural gas and replaced] Were additional lines or hook-ups necessary to install it?
 - i. [If yes] Why did you put this effort in for your heater?
5. **[Benefits]** How does the heating system in your home now compare with other places you've lived? [Probe for what they liked about previous homes/systems and how those systems were different]
6. **[Homework-stated benefits]** In the homework assignment, you selected [insert items related to **this** end-use] as something that makes you happy in the [winter/summer]. [Probe for details, priority, triggers, timing, etc.]
7. **[Homework-related questions]** [INSERT OTHER INDIVIDUALIZED QUESTIONS FROM HOMEWORK ABOUT END-USE]
8. **[Replacement]** [IF NOT ADDED/REPLACED ALREADY] Have you ever considered replacing your heater?
 - a. Why or why not? [Probe for: Age, efficiency, noise level, maintenance needs, fear it might break soon]
 - b. If you were going to replace your heating system, what would you look for? Probe for:
 - iv. Type: Same type or new technology? Why or why not?
 - v. Other factors: Purchase price, Brand, Ease of installation, How much energy it uses, Reliability/Durability, Appearance/aesthetics, Cost of fuel to operate, Maintenance requirements, Performance, Fuel source
 - vi. Would you consider a different fuel source than what you currently use? Which fuel source(s) would you consider? Why?
 - vii. [IF HEAT PUMPS NOT MENTIONED] Have you ever heard of heat pumps? [IF NOT] These are systems that can provide both heat and air conditioning. Most of them use electricity to run, but some can use other fuel sources like gas to run.
 - (1) If your [furnace/boiler/heater] were to break, would you consider installing a system like this (a heat pump) that can provide both heating and air conditioning? What else would you need to know to figure out if this were a good decision?

(2) [IF CENTRAL AIR] How about your air conditioning - If your air conditioner were to break, would you consider installing a system like this (a heat pump) that can provide both heating and air conditioning? What else would you need to know to figure out if this were a good decision?

9. [Reasons for not connecting natural gas IF no gas heat] Have you considered running a gas line for heat?
 - b. Why or why not? [IF MULTIPLE REASONS GIVEN] If you had to pick one reason why you did not do it, what would it be?
10. [Priorities] If you had to pick one feature you must-have (had) for a heating system (either newly replaced or replacing in the future), what would it be? Why?
 - a. Are there others in your household who feel/felt differently? IF yes, why? How did you come to a decision/how do you think you would come to a decision?

11. FIREPLACE/HEARTH DRILL-DOWN

[Ask questions for participants that indicated they have a fireplace, hearth or space-heating stove, regardless of fuel type]

1. [Confirm functionality, if not mentioned] Does that fireplace or stove work?
2. [Equipment characteristics] [If not clarified already] You wrote in one of the online surveys that it's a [FUEL TYPE] hearth – can you confirm that?
 - a. [IF NATURAL GAS] Do you happen to know how it vents? Is it direct vent? Or no vent? [ASK THEM TO SHOW YOU PARTS OF IT IF THEY DON'T KNOW]
3. [Use cases] How often do you use it? [Prompt for frequency and listen for use cases]
 - b. What prompts you to [turn it on, start a fire, etc.]? [Listen for use cases or triggers – temperature, social events, ambience, power outage, etc.]
 - c. Can you show or tell me what you do when you want to use the [hearth/fireplace]? What do you first? Then what do you do? [Probe as needed to see if they turn on a pilot light, etc.]
 - i. [IF NOT CLEAR FROM DEMO and GAS HEAT] Do you ever shut off the pilot lot? If so, for how long? [IF NEEDED: for example, from the spring through fall?]
4. [Benefits] What do you like about your fireplace/stove? Why?
5. [Benefits] What don't you like about your fireplace/stove? Why?
 - a. [IF GAS] Have you had any issues with it?
6. [Replacement] [IF NOT COVERED ALREADY] Was the fireplace/stove in your home when you purchased your home, or did you add/replace it?
 - d. [If replaced] Why did you add/replace it?
 - e. [IF GAS AND REPLACED] [Ask additional questions about replacement process]
 - i. Were additional lines or hook-ups necessary to install it? [IF YES] Why did you put this effort in for your fireplace?
 - ii. I have a few questions about how you selected that fireplace. How did you know what you wanted? Who was involved in picking it out? How did you pick a specific model – Did you go to a showroom? Look online? [Probe as needed]
7. [Homework-stated benefits] In the homework assignment, you selected [insert items related to **this** end-use] as something that makes you happy in the [winter/summer]. [Probe for details, priority, triggers, timing, etc.]
8. [Homework-related questions] [INSERT OTHER INDIVIDUALIZED QUESTIONS FROM HOMEWORK

ABOUT END-USE]

9. **[Replacement]** [IF NOT ADDED/REPLACED ALREADY] Have you ever considered replacing your fireplace?
 - a. Why or why not? [Probe for: Age, efficiency, noise level, maintenance needs, fear it might break soon]
 - b. If you were going to replace your fireplace, what would you look for? Probe for:
 - i. Fuel: Wood-burning? Gas? Electric? **[IF NOT GAS]** Would you ever consider replacing your fireplace with a natural gas fireplace? Why or why not?
 - ii. Other factors: Purchase price, Brand, Ease of installation, How much energy it uses, Reliability/Durability, Appearance/aesthetics, Cost of fuel to operate, Maintenance requirements, Performance
10. **[Priorities]** If you had to pick one feature you must-have (had) for a fireplace (either newly replaced or replacing in the future), what would it be? Why?
 - c. Are there others in your household who feel/felt differently? IF yes, why? How did you come to a decision/how do you think you would come to a decision?

12. "NO FIREPLACE" DRILL-DOWN

[Ask these questions if you do not see a fireplace or space heating stove in tour]

1. **[History]** Did you have a fireplace in any other places you've lived?
 - a. [IF YES] Did you use it? When? What did you like about it?
2. **[Purchase consideration]** Have you ever considered installing a fireplace?
 - a. [IF YES] Why would you like a fireplace? [Probe for: extra heat source, ambience, particular use-cases]
 - b. [IF YES] If you were going to install a fireplace, would you want a wood-burning fireplace, gas-burning fireplace, or something else?
 - c. [IF NO] Why haven't you considered installing a fireplace?

13. CLOTHES DRYER DRILL-DOWN

[Note that we will discuss this section with everyone with a clothes washer, regardless of fuel]

1. **[Equipment confirmation]** Does your clothes dryer use gas or electricity to dry?
 - a. [Record type: Stacked or stand-alone?]
2. **[Benefits]** What do you like about your dryer? Why?
3. **[Benefits]** What don't you like about your dryer? Why?
4. **[Replacement]** [IF NOT COVERED ALREADY] Was the dryer in your home when you purchased your home, or did you add/replace it?
 - a. [If replaced] Why did you add/replace it?
 - b. [IF natural gas and replaced] Were additional lines or hook-ups necessary to install it?
 - i. [If yes] Why did you put this effort in for your dryer?
5. **[Benefits]** How does the dryer in your home now compare with other places you've lived? [Probe for what they liked about previous dryers and how those dryers were different]
6. **[Homework-stated benefits]** In the homework assignment, you selected [insert items related to **this** end-use] as something that makes you happy in the [winter/summer]. [Probe for details, priority, triggers, timing, etc.]

7. [Homework-related questions] [INSERT OTHER INDIVIDUALIZED QUESTIONS FROM HOMEWORK ABOUT END-USE]
8. [Replacement] [IF NOT ADDED/REPLACED ALREADY] Have you ever considered replacing your dryer?
 - a. Why or why not? [Probe for: Age, efficiency, noise level, maintenance needs, fear it might break soon]
 - b. If you were going to replace your dryer, what would you look for? Probe for:
 - iii. Non-fuel factors: Purchase price, Brand, Ease of installation, How much energy it uses, Reliability/Durability, Appearance/aesthetics, Cost of fuel to operate, Maintenance requirements, Performance,
 - iv. Fuel source: Would you consider a different fuel source than what you currently use? Why?
9. [Reasons for not connecting natural gas IF gas dryer] Have you considered running a gas line for a dryer?
 - a. Why or why not? [IF MULTIPLE REASONS GIVEN] If you had to pick one reason why you did not do it, what would it be?
10. [Priorities] If you had to pick one feature you must have (had) for this equipment (either newly replaced or replacing in the future), what would it be? Why?
 - a. Are there others in your household who feel/felt differently? IF yes, why? How did you come to a decision/how do you think you would come to a decision?

14. GAS RANGE/STOVETOP DRILL-DOWN

[Note that we will discuss this section with everyone, regardless of fuel]

1. [Equipment confirmation] Does your range use electricity, gas or propane? [If oven is separate, ask about oven too]
 - a. [Record type: Combination or separate cooktop?]
2. [Benefits] What do you like about your [range/oven/cooktop]? Why?
3. [Benefits] What don't you like about your [range/oven/cooktop]? Why?
4. [Replacement] [IF NOT COVERED ALREADY] Was the [range/oven/cooktop] in your home when you purchased your home, or did you add/replace it?
 - a. [If replaced] Why did you add/replace it?
 - b. [IF natural gas and replaced] Were additional lines or hook-ups necessary to install it?
 - i. [If yes] Why did you put this effort in for your [range/oven/cooktop]?
5. [Benefits] How does the [range/oven/cooktop] in your home now compare with other places you've lived? [Probe for what they liked about previous systems and how those systems were different]
6. [Homework-stated benefits] In the homework assignment, you selected [insert items related to **this** end-use] as something that makes you happy in the [winter/summer]. [Probe for details, priority, triggers, timing, etc.]
7. [Homework-related questions] [INSERT OTHER INDIVIDUALIZED QUESTIONS FROM HOMEWORK ABOUT END-USE]
8. [Replacement] [IF NOT ADDED/REPLACED ALREADY] Have you ever considered replacing your [range/oven/cooktop]?
 - a. Why or why not? [Probe for: Age, efficiency, even cooking, control, quick heating, maintenance needs, fear it might break soon]
 - b. If you were going to replace your [range/oven/cooktop], what would you look for? Probe for:

- v. Non-fuel factors: Purchase price, Brand, Ease of installation, How much energy it uses, Reliability/Durability, Appearance/aesthetics, Cost of fuel to operate, Maintenance requirements, Performance
 - vi. Fuel source: Would you consider a different fuel source than what you currently use? Why?
9. [Reasons for not connecting natural gas IF gas range] Have you considered running a gas line for the [range/oven/cooktop]?
- a. Why or why not? [IF MULTIPLE REASONS GIVEN] If you had to pick one reason why you did not do it, what would it be?
10. [Priorities] If you had to pick one feature you must have (had) for this equipment (either newly replaced or replacing in the future), what would it be? Why?
- a. Are there others in your household who feel/felt differently? IF yes, why? How did you come to a decision/how do you think you would come to a decision?

15. OUTDOOR GRILL DRILL-DOWN

[Note that we will discuss this section with everyone, regardless of fuel]

1. [Equipment confirmation] What kind of grill do you have?
 - b. [Record fuel: gas, propane, charcoal]
2. [Use cases] How often do you use it? [prompt for frequency] What prompts you to [turn it on, start a fire, etc.]? [Prompt for use cases or triggers – temperature, social events, ambience, power outage, etc.]
2. [Benefits] What do you like about your grill? Why?
3. [Benefits] What don't you like about your grill? Why?
4. [Replacement] [IF NOT COVERED ALREADY] Was the grill in your home when you purchased your home, or did you add/replace it?
 - c. [If replaced] Why did you add/replace it?
 - d. [IF natural gas and replaced] Were additional lines or hook-ups necessary to install it?
 - i. [If yes] Why did you put this effort in for your grill?
5. [Benefits] How does the grill in your home now compare with other places you've lived? [Probe for what they liked about previous systems and how those systems were different]
6. [Homework-stated benefits] In the homework assignment, you selected [insert items related to **this** end-use] as something that makes you happy in the [winter/summer]. [Probe for details, priority, triggers, timing, etc.]
7. [Homework-related questions] [INSERT OTHER INDIVIDUALIZED QUESTIONS FROM HOMEWORK ABOUT END-USE]
8. [Replacement] [IF NOT ADDED/REPLACED ALREADY] Have you ever considered replacing your grill?
 - a. Why or why not? [Probe for: Age, efficiency, noise level, maintenance needs, fear it might break soon]
 - b. If you were going to replace your [range/oven/cooktop], what would you look for? Probe for:
 - vii. Non-fuel factors: Purchase price, Brand, Ease of installation, How much energy it uses, Reliability/Durability, Appearance/aesthetics, Cost of fuel to operate, Maintenance requirements, Performance,
 - viii. Fuel source: Would you consider a different fuel source than what you currently use? Why?

- ix. [IF NOT GAS] Would you consider running a natural gas line outdoors for your grill or outdoor stove? Why or why not?
9. [Priorities] If you had to pick one feature you must-have (had) for this equipment (either newly replaced or replacing in the future), what would it be? Why?
- a. Are there others in your household who feel/felt differently? IF yes, why? How did you come to a decision/how do you think you would come to a decision?

16. AIR CONDITIONING DRILL-DOWN

[Note that we will discuss this section with everyone in some room of the house – living/family room, office or bedroom]

1. [Equipment confirmation] How do you cool this area of your home? Probe for:
 - b. Equipment: Central AC, room or wall AC
 - c. Behaviors: Managing windows, shades
2. [Use cases] When do you turn the AC on? Why? [Probe for the scenarios in which they use central and window/wall AC]
3. [Benefits] What do you like about your air conditioning system? Why? [If they have no AC but have “management behaviors” encourage them to think about that]
4. [Benefits] What don’t you like about your system? Why?
5. [Replacement of primary system] [IF NOT COVERED ALREADY] Was this air conditioning system in your home when you purchased your home, or did you add/replace it?
 - c. [If replaced] Why did you add/replace it?
6. [Benefits] How does the air conditioning system in your home now compare with other places you’ve lived? [Probe for what they liked about previous homes/systems and how those systems were different]
7. [Homework-stated benefits] In the homework assignment, you selected [insert items related to **this** end-use] as something that makes you happy in the [winter/summer]. [Probe for details, priority, triggers, timing, etc.]
8. [Homework-related questions] [INSERT OTHER INDIVIDUALIZED QUESTIONS FROM HOMEWORK ABOUT END-USE]
9. [Installation and Replacement] [IF NOT ADDED/REPLACED ALREADY] Have you ever considered replacing your air conditioner? [IF NO SYSTEM] Have you ever considered installing air conditioning?
 - c. Why or why not? [Probe for: Age, efficiency, noise level, maintenance needs, fear it might break soon]
 - d. If you were going to [replace or get a new] your air conditioning system, what would you look for? Probe for:
 - i. Type: Same type or new technology (like heat pump?)
11. Other factors: Purchase price, Brand, Ease of installation, How much energy it uses, Reliability/Durability, Appearance/aesthetics, Cost of fuel to operate,
12. [Priorities] If you had to pick one feature you must have (had) for this equipment (either newly replaced or replacing in the future), what would it be? Why? [Listen for: Maintenance requirements, Performance, Fuel source]
 - a. Are there others in your household who feel/felt differently? IF yes, why? How did you come to a decision/how do you think you would come to a decision?

17. COMBINATION SYSTEM INTEREST

[ONLY ASK THIS SECTION AFTER COMPLETING THE HEAT & WATER HEAR SECTIONS]

While we're on the topic of [heat or water heat, depending on what you discussed last], I have a couple of questions about replacing multiple types of equipment at the same time.

10. **[Combi Space / Water Heat]** Some people have "combination" heat and hot water equipment, where their heater and hot water heater are part of the same system. Together, the equipment is more efficient than the separate heaters, so it saves you money in the long run. But, you need to buy & install the equipment all of the equipment at the same time.
 - a. If your water heater were to break, would you consider replacing your furnace at the same time, if you could just buy one combined system, and it would save you money over the long run?
 - b. How about the other way - If your furnace were to break, would you consider replacing your water heater at the same time, if you could just buy one combined system, and it would save you money over the long run?
 - c. What else would you need to know to make a decision? [Listen for: Price; features/capabilities; ease of installation; payback]
 - d. [IF PAYBACK OR ROI MENTIONED] I'd like to understand the payback period you'd need to see to do this. In other words – What would you expect the "breakeven" point to be between (a) just replacing ONE system (either the heat or hot water), which is cheaper to install but has higher operating costs, and (b) replacing the combined system, which would be more expensive to install but would have lower operating costs? (i.e., lower energy costs) [PROBE FOR: How many years? 1? 2? 5? 10?]
 - e. [If uncertain or hesitant] Would this option be more appealing to you if it provided air conditioning? How about if there was an option for emergency power?

WALK-THROUGH WRAP-UP (15 MIN)

Thank you so much for a tour of your home! For the next set of questions, you don't need to show me anything, so feel free to find a comfortable place to sit and we can keep talking.

1. **[Purchase priorities]** Is there anything we missed in another room that was a major selling feature of the home? Anything else that was a major downside to the home?
2. **[Upgrade and renovation priorities]** You mentioned a number of things you have changed in your home or would like to change in your home, like [DESCRIBE SOME OF PROJECTS OR PRIORITIES THEY'VE MENTIONED], and I just want to review to make sure I have everything.
 - a. Can you summarize the major purchases you've made, projects you've done or improvements you've made since purchasing your home? [IF NEEDED: Clarify that they can include any type of purchase or project – furniture, décor, aesthetics, structural improvements, additions, equipment, etc.]
 - b. What's on your to-do list? Can you tell me the next set of improvements or projects you're considering?
 - c. If you had to prioritize changes, what would you change? Why does this rate highly for you? Why are the others a lower priority?
3. **[Overall importance of gas in home purchase]** We talked a little bit about whether appliances or systems in your home use electricity, gas or another fuel as we walked through.
 - a. [EXISTING HOMES] Thinking back to when you bought your home, do you remember whether the type of fuel your heater, water heater or other appliances used was important to you when buying the home? Why/why not? [If needed: what was more/less important?]
 - b. [NEW CONSTRUCTION] Thinking back to when you built/designed your home, how did they decide on using natural gas for [heating, hot water heating, cooking, dryer, etc.]?
4. **[Interest in EE]** Are you interested in taking steps to lower your electric or gas bills, or are you okay with

your current bills? [Probe for: Concerned about electric? Concerned about gas? Why or why not?]

- a. [If interested in lowering bills] What actions have you considered as ways to lower your electric bills? [If they mentioned anything previously, reference here and ask for other actions]
- b. [If interested in lowering bills] What actions have you considered as ways to lower your gas bills? [If they mentioned anything previously, reference here and ask for other actions]
- c. [If interested in lowering bills] Why is [reducing bills/saving money] important to you? [Probe for reasons related to saving money, environment, technology, etc.]

That's all of the questions I had written down for you – Is there anything else you'd like to tell me before we jump off this call? Is there anything you'd like to add to topics we discussed?

Thanks again for spending time talking with me today, and the time you put into the written homework assignment. You should receive the \$115 incentive (\$40 for the homework plus \$75 for this interview) from YouGov within [# of DAYS]. If you don't see anything in that amount of time, please reply to any of the emails you've received about this study and we'll check on it for you.

SURVEY INSTRUMENT

Email Introduction

ILLUME Advising LLC, is conducting a market research study on consumer preferences and usage of home appliances and equipment. We invite you to take a brief survey to share your experience. Your input is very important to us, and will be kept strictly confidential and used for research purposes only.

If you have any questions about the study, please contact ILLUME at research@illumeadvising.com.

Please click [\[here\]](#) to access the survey. It will take about 15 minutes. If you are unable to complete the survey in one sitting, you can return to the link in your email at any time and continue from where you left off.

Thank you,

ILLUME Advising, LLC

A. SCREENING QUESTIONS

A1. Do you own your home? **[SINGLE RESPONSE]**

1. Yes **[Continue]**
2. No **[Thank and terminate]**

A2. Do you have natural gas service in your home? **[SINGLE RESPONSE]**

1. Yes **[Continue]**
2. No **[Thank and terminate]**

A3. Who is your natural gas service provider? **[SINGLE RESPONSE]**

1. Avista Utilities
2. Cascade Natural Gas
3. NW Natural
4. Puget Sound Energy
97. Other (Please specify) **[Thank and terminate]**
98. Don't know **[Thank and terminate]**

A4. Are you the person (or one of the people) in your home responsible for making decisions about buying new appliances or heating/cooling equipment for your home? **[SINGLE RESPONSE]**

1. Yes **[Continue]**
2. No **[Thank and terminate]**

B. EQUIPMENT IN HOME

B1. What is the main type of equipment used to heat your home? [SINGLE RESPONSE]

1. Forced air furnace
2. Baseboards
3. Wall heaters
4. Electric radiant heat
5. Fireplace or wood-burning stove (including natural gas)
6. Ductless heat pump (sometimes called a mini-split)
7. Heat pump(s), not ductless (ducted heat pumps have an outside unit that extracts heat from the air and distributed through the home through ducts)
8. Ceiling heat
9. Pellet stove
97. Other (Specify)
98. Don't Know

B2. Do you use a secondary, or back up, heating system to heat your home? [SINGLE RESPONSE]

1. Yes
2. No
3. Don't know

[ASK IF B2=1]

B3. What type of equipment do you use for your secondary, or back up, heating system?

1. Forced air furnace
2. Baseboards
3. Wall heaters
4. Electric radiant heat
5. Fireplace or wood-burning stove (including natural gas)
6. Ductless heat pump (sometimes called a mini-split)
7. Heat pump(s), not ductless (ducted heat pumps have an outside unit that extracts heat from the air and distributed through the home through ducts)
8. Ceiling heat
9. Pellet stove
10. Electric space heater
97. Other (Specify)
98. Don't Know

B4. What type of water heater does your home have? [SINGLE RESPONSE]

1. Conventional storage water heater (tank). It might look something like this: [DISPLAY PHOTO B4_1-Tank water heater.jpg]
2. Tankless (or Instantaneous) water heater (also called “on demand” water heaters). It might look something like this: [DISPLAY PHOTO B4_2-Tankless water heater.jpg]
3. Heat pump water heater (heat pump water heaters use an electric heat pump to transfer heat from outside of the unit; heat pump water heaters have cylinder-shaped tanks like conventional water heaters). It might look something like this: [DISPLAY PHOTO B4_3-Heat-Pump water heater.jpg]
4. Solar water heater
5. My home doesn't have a water heater
98. Don't Know

B5. Do you have any of the following equipment at home? [ROTATE; MULTIPLE RESPONSE]

1. Fireplace or space heating stove
2. Clothes dryer
3. Central air conditioner
96. None of these

[ASK FOR EACH APPLIANCE CONFIRMED IN B1, B3, B4, B5 ABOVE]

B6. Please indicate the fuel source of each appliance. [ROTATE; ALLOW MULTIPLE RESPONSE]
[TERMINATE IF NONE ARE NATURAL GAS]

| | Electricity | Natural Gas | Something Else | Don't Know |
|--|-------------|-------------|----------------|------------|
| a. Fireplace or space heating stove | | | | |
| b. Water heater | | | | |
| c. Primary heating system (B1) | | | | |
| d. Secondary heating system (B3) | | | | |
| e. [READ IN OTHER RESPONSE FROM HEATER TYPE, B1 or B3 including unknown] | | | | |
| f. Clothes Dryer | | | | |
| g. Range/cooktop/oven | | | | |

[ASK IF THEY HAVE AC + FURNACE (B1 or B3) BUT NOT A HEAT PUMP]

B7. Is the central AC part of the same unit as your heating unit? (i.e., do you have one piece of equipment that both heats and cools your home?) [SINGLE RESPONSE]

1. Yes
2. No
98. Don't know

[ASK IF B1 in (1,5,6,7,9,97)]

B8. Where is your [PRIMARY HEATING EQUIPMENT, READ IN B1 RESPONSE] located? [SINGLE RESPONSE]

1. Basement
2. Attic
3. Utility/Mechanical room (not located in basement)
4. Crawl space
5. Laundry room
6. Living or family room (including great room)
7. Kitchen or dining room
8. Bedroom
9. Garage
10. Hallway
97. Other (specify)

[ASK IF B3 in (1,5,6,7,9,97)]

B9. Where is your [SECONDARY HEATING EQUIPMENT, READ IN B3 RESPONSE] located? [SINGLE RESPONSE]

1. Basement
2. Attic
3. Utility/Mechanical room (not located in basement)
4. Crawl space
5. Laundry room
6. Living or family room (including great room)
7. Kitchen or dining room
8. Bedroom
9. Garage
10. Hallway
11. Sunroom
12. Three season room
97. Other (specify)

[ASK IF B4 <=4]

B10. Where is your [READ IN B4 RESPONSE] water heater located? [SINGLE RESPONSE]

1. Basement
2. Attic
3. Utility/Mechanical room (not located in basement)
4. Crawl space
5. Laundry room
6. Garage
97. Other (specify)

[ASK IF B5 = 1]

B11. Where is your fireplace or space heating stove located? [MULTIPLE RESPONSE]

1. Basement
2. Living or family room (including great room)
3. Kitchen or dining room
4. Bedroom
5. Sunroom
6. Three season room (unheated covered porch)
97. Other (specify)

B12. Approximately how old is your...

| | Heating Equipment | [ASK IF B5 = 1] Fireplace or space heating stove | [ASK IF B5 = 3] Central AC | [ASK IF B2 <=4] Water Heater |
|------------------|-------------------|---|-------------------------------|---------------------------------|
| 1. < 1 year | | | | |
| 2. 1 to 5 years | | | | |
| 3. 6 to 10 years | | | | |
| 4. > 10 years | | | | |
| 98. Don't know | | | | |

C. ATTITUDE TOWARD HOMEOWNERSHIP

C1. Was this home new when you purchased it, or did you purchase it as an existing home? [SINGLE RESPONSE]

1. New construction
2. Existing home

[ASK FOR NEW CONSTRUCTION, C1=1]

C2. Thinking back to when the home was built, which of the following appliances were you involved in selecting at the time? [MULTIPLE RESPONSE]

1. Heating system
2. [IF B5=3] Air conditioning system
3. [IF B5=1] Fireplace or space heating stove
4. Cooking oven/cooktop/range
5. [IF B5=2] Clothes dryer
96. None of these

C3. What were the three most important factors in your decision [IF EXISTING, C1=2: to purchase] [IF NEW CONSTRUCTION, C1=1: to build] your home? [ROTATE; ALLOW 4 RESPONSES]

1. Purchase price/affordability
2. Location
3. Appearance or character of the home
4. School district
5. Size of the home
6. Land or lot that house is on
7. Construction quality
8. Finish quality (level of quality you can see; for example, the cabinets, counters, flooring or fixtures)
9. Fuel source/hook-ups for specific appliances
97. Other (specify)

C4. How long do you intend to stay in your current home? [SINGLE RESPONSE]

1. Less than a year
2. 1 -5 years
3. 6-10 years
4. 11-15 years
5. 15 years or more
98. Don't know

D. PURCHASE AND REPLACEMENT HISTORY

D1. Please pick the top two statements that best describe your values toward purchasing equipment for your home. [ROTATE; ALLOW 2 RESPONSES]

"I purchase items that . . .

1. Are attractive and enhance the appearance of my home.
2. Are well designed and do not have overly complicated mechanisms.
3. Are durable and will last a lifetime.
4. Make me feel good when I use them.
5. Are the newest technology on the market.
6. Are known for exceptional performance.
7. I can maintain myself.

D2. What type of equipment or appliances have you replaced since moving into your home or are you planning to replace in the next 12 months?¹ [ROTATE]

| | Have done in current home | Plan to do in next 12 months | Have not done/No plans to do in next 12 months |
|--|---------------------------|------------------------------|--|
| a. Replace heating equipment | | | |
| b. Replace cooling system | | | |
| c. Replace water heater | | | |
| d. Replace range/cooktop/oven | | | |
| e. Replace refrigerator or dishwasher | | | |
| f. Replace washing machine | | | |
| g. Replace clothes dryer | | | |
| h. Purchase, replace, or install a fireplace | | | |

[ASK IF any D2 = Have done in current home]

D3. You mentioned that you replaced equipment in your home. What phrase best reflects why you replaced the equipment? [SINGLE RESPONSE]

1. Equipment was already broken
2. Expected equipment to break in next 12 months
3. Replaced with equipment that performs better
4. Replaced with equipment that is more energy efficient
5. Replaced for aesthetic or appearance reasons

[ASK IF any D2 = Plan to do in next 12 months]

D4. You mentioned that you plan to replace equipment in your home. What phrase best reflects why you are planning to replace equipment? [SINGLE RESPONSE]

¹ This question will be used to identify attitudes toward home ownership and the "do nothing" segment. Renovations will be classified as: None or minor improvements, aesthetic improvements, major renovation (e.g. additions), energy efficiency improvements and equipment change-outs.

1. Equipment has already broken
2. Expect equipment to break in next 12 months
3. Replacing with equipment that performs better
4. Replacing with equipment that is more energy efficient
5. Replacing for aesthetic or appearance reasons

[ASK IF ANY D2 = Have done in current home or Plan to do in next 12 months]

D5. [IF ANY D2 = Have done in current home] You mentioned that you replaced equipment in your home, thinking about the equipment you replaced most recently, how important were each of the following factors in the decision to replace?

[IF ANY D2 <> Have done in current home but any D2 = Plan to do in next 12 months] You mentioned that you plan to replace equipment in your home in the next 12 months, thinking about the equipment you plan to replace, how important are each of the following factors in the decision to replace? [ROTATE]

| | Not at all Important (1) | Somewhat Unimportant (2) | Neutral (3) | Somewhat Important (4) | Very Important (5) |
|---|-----------------------------|-----------------------------|----------------|---------------------------|-----------------------|
| a. Aesthetics / improving the way my home looks | | | | | |
| b. Making my home more functional/ work better than it did | | | | | |
| c. Replacing broken equipment or appliances | | | | | |
| d. Making my home more comfortable than it was | | | | | |
| e. Making my home more energy efficient than it was/using more energy efficient appliances than I was | | | | | |
| f. Improving the market value of my home | | | | | |
| g. Restoring my home to maintain its historic integrity | | | | | |
| h. Reducing my utility bills | | | | | |

D6. What type of remodeling or renovation work have you done since moving into your home or are you planning to do in the next 12 months?² [ROTATE]

| | Have done in current home | Plan to do in next 12 months | Have not done/No plans to do in next 12 months |
|---|---------------------------|------------------------------|--|
| a. Painting | | | |
| b. Change layout of house (e.g., add or remove walls) | | | |
| c. Add rooms or spaces | | | |
| d. Replace roof and/or siding | | | |
| e. Replace windows | | | |
| f. Insulation and/or weatherization | | | |
| g. Install solar or another renewable energy source | | | |

² This question will be used to identify attitudes toward home ownership and the “do nothing” segment. Renovations will be classified as: None or minor improvements, aesthetic improvements, major renovation (e.g. additions), energy efficiency improvements and equipment change-outs.

[ASK IF D6 a, b, c, d = Have done in current home]

D7. You mentioned that you did some remodeling, renovating, or painting in your current home, thinking about the most recent remodeling, renovating or painting you did, how important were each of the following factors in the decision to do that work? [ROTATE]

| | Not at all Important (1) | Somewhat Unimportant (2) | Neutral (3) | Somewhat Important (4) | Very Important (5) |
|--|-----------------------------|-----------------------------|----------------|---------------------------|-----------------------|
| a. Aesthetics / improving the way my home looks | | | | | |
| b. Making my home more functional/ work better than it did | | | | | |
| c. Replacing broken equipment or appliances | | | | | |
| d. Making my home more comfortable than it was | | | | | |
| e. Making my home more energy efficient than it was | | | | | |
| f. Improving the market value of my home | | | | | |
| g. Restoring my home to maintain its historic integrity | | | | | |
| h. Reducing my utility bills | | | | | |

D8. Thinking about all of the work you've done on your home since moving in, as well as the work you plan to do, please indicate how much work you (or others in your household) typically do yourselves, versus how much you hire contractors or other professionals (e.g., electricians, plumbers) to do.

1. I/we do nearly all work ourselves
2. It's a mix – it depends on the work or project
3. I/we hire people to do nearly everything

E. EARLY REPLACEMENT

E1. For each type of equipment, please indicate whether you would consider replacing the equipment before it broke.

| | 1. I would not consider replacing this before it broke | 2. I would consider replacing this before it broke | 98. Don't know |
|-----------------------|--|--|----------------|
| a. Heating equipment | | | |
| b. Cooling equipment | | | |
| c. Water heater | | | |
| d. Range/cooktop/oven | | | |
| e. Washing machine | | | |
| f. Clothes dryer | | | |

[ASK IF ANY EARLY REPLACEMENT RESPONSE, E1 = 2]

E2. What are your top three reasons for replacing equipment before it breaks? [ROTATE] [MULTIPLE RESPONSE; SELECT UP TO 3]

1. Avoid emergency situation
2. Have more time to make informed decision
3. Improve performance of equipment
4. Improve energy efficiency of equipment
5. Improve aesthetics
6. As part of an update or remodel a room
7. Increase value of home
8. Availability of rebates or incentives
9. Availability of new technology
10. Additional benefits or features not currently provided

[ASK IF ANY EARLY REPLACEMENT RESPONSE, E1 =1 or 98]

E3. What is your primary reason for NOT replacing equipment before it breaks? [ROTATE] [SINGLE RESPONSE]

1. Too expensive
2. Not important to have new equipment
3. It is wasteful/bad for the environment
4. Don't have time to think about it
97. Other (specify)

F. OVERALL IMPORTANCE OF NATURAL GAS

- F1. When you were looking for your current home, did you specifically look for homes that used a particular fuel source (electricity, natural gas, wood) for certain appliances? (For example, did you look for homes that used natural gas for heat or electricity for the range) Did you look for a particular fuel source for your...[ROTATE]

| | 1. Yes | 2. No | 98. Don't know |
|-------------------------------|--------|-------|----------------|
| a. Heat | | | |
| b. Water heat | | | |
| c. Fireplace [IF B5=1] | | | |
| d. Range/cooktop/oven | | | |
| e. Clothes dryer [IF B5=2] | | | |
| f. Air conditioning [IF B5=3] | | | |

[ASK IF ANY F1=1]

- F2. What fuel source did you prefer for your...? [SINGLE RESPONSE]

| | Electricity | Natural gas | Renewable fuel source (e.g., solar or wind) | Other fuel source (e.g., oil, propane, wood) |
|----------------------------------|-------------|-------------|---|--|
| a. Heat [IF F1a=1] | | | | |
| b. Water heat [IF F1b=1] | | | | |
| c. Fireplace [IF F1c=1] | | | | |
| d. Oven/cooktop/range [IF F1d=1] | | | | |
| e. Clothes dryer [IF F1e=1] | | | | |
| f. Air conditioning [IF F1f=1] | | | | |

[ASK FOR ALL F2<> Natural Gas]

- F3. Why were you looking for [INSERT F2 FUEL SOURCE] for your [INSERT F2 APPLIANCE]? [OPEN RESPONSE]

[ASK FOR EXISTING HOMES, C1=2]

- F4. Was your home's natural gas line already hooked up when you purchased it? [SINGLE RESPONSE]

- A. Yes
- B. No

[ASK IF THEY INSTALLED NATURAL GAS, F4=2]

F5. Why did you decide to have natural gas installed? [Open End]

[ASK IF HOME ALREADY HAD NATURAL GAS, F4=1]

F6. Would you have purchased your home if it did not have natural gas service? [SINGLE RESPONSE]

1. Yes; Why? [Open End]
2. No; Why? [Open End]

F7. Have you expanded your natural gas service to more equipment or appliances since moving into your home? [SINGLE RESPONSE]

1. Yes
2. No

[ASK IF EXPANDED SERVICE, F7=1]

F8. To what appliances did you expand natural gas service? (Select all that apply) [ROTATE; MULTIPLE RESPONSE]

1. Clothes dryer
2. Range/cooktop/oven
3. Heating system
4. Water heater
5. Natural gas fireplace or gas insert
6. Outdoor grill
7. Other (specify)

[ASK IF EXPANDED SERVICE, F7=1]

F9. Why did you decide to expand natural gas service to the equipment or appliances you did? [Open End]

[ASK IF THEY EXPANDED NATURAL GAS SERVICE, F7=1]

F10. Who did you have install the natural gas piping to the additional equipment or appliances? [SINGLE RESPONSE]

1. Friend or family member
2. Plumber
3. Heating/Cooling Contractor
4. Gas Utility
97. Other (Please specify)

F11. Thinking back to when you [IF EXISTING, C1=2: purchased] [IF NEW CONSTRUCTION, C1=1: built] your home, how important was it for your home to have natural gas?

| | | | | |
|----------------------|----------------------|---------|--------------------|----------------|
| Not at all Important | Somewhat Unimportant | Neutral | Somewhat Important | Very Important |
| 1 | 2 | 3 | 4 | 5 |

[ASK IF NATURAL GAS HEAT PREFERRED, F2a=Natural Gas]

F12. Why do you prefer natural gas for your heat? Please select your top three reasons. [ROTATE; MULTIPLE RESPONSE; ALLOW UP TO 3]

1. Energy efficient
2. Environmentally friendly
3. Costs less than other fuels
4. Comfortable heating
5. Convenient
6. Dependable/Reliable
7. Cleaner than other fuels
8. Provides consistent heat
9. Less wasteful than other fuels
10. Available during power outages
11. Safer than other fuels
96. None of these
97. Other

[ASK IF NATURAL GAS WATER HEAT PREFERRED, F2b=Natural Gas]

F13. Why do you prefer natural gas for your water heat? Please select your top three reasons. [ROTATE; MULTIPLE RESPONSE; ALLOW UP TO 3]

1. Energy efficient
2. Environmentally friendly
3. Costs less than other fuels
4. More immediate water heat
5. Convenient
6. Dependable/Reliable
7. Less wasteful than other fuels
8. Available during power outages
96. None of these
97. Other

[ASK IF NATURAL GAS FIREPLACE PREFERRED, F2c=Natural Gas]

F14. Why do you prefer natural gas for your fireplace? Please select your top three reasons. [ROTATE; MULTIPLE RESPONSE; ALLOW UP TO 3]

1. Energy efficient
2. Environmentally friendly
3. Costs less than other fuels
4. Comfortable heating
5. Convenient
6. Dependable/Reliable
7. Cleaner than wood
8. Less wasteful than other fuels
96. None of these
97. Other

[ASK IF NATURAL GAS DRYER PREFERRED, F2e=Natural Gas]

F15. Why do you prefer natural gas for your clothes dryer? Please select your top three reasons. [ROTATE; MULTIPLE RESPONSE; ALLOW UP TO 3]

1. Energy efficient
2. Environmentally friendly
3. Costs less than other fuels
4. Faster drying times
5. Dependable/Reliable
6. Less wasteful than other fuels
7. Available during power outages
96. None of these
97. Other

[ASK IF NATURAL GAS RANGE PREFERRED, F2d=Natural Gas]

F16. Why do you prefer natural gas for your range? Please select your top three reasons. [ROTATE; MULTIPLE RESPONSE; ALLOW UP TO 3]

1. Energy efficient
2. Environmentally friendly
3. Costs less than other fuels
4. Better control over cooking
5. Convenient
6. Dependable/Reliable
7. Faster cooking times
8. Available during power outages
96. None of these
97. Other

[ASK IF ANY F12 THROUGH F16 = 1, ENERGY EFFICIENT]

F17. You mentioned that energy efficiency is one of the reasons you prefer natural gas. What is the main reason it is important to you? [SINGLE RESPONSE]

1. Saving money/lowering bills
2. Better for the environment/reducing my carbon footprint
97. Other (specify)

F18. Please rate the extent to which you agree with each of the following statements on a scale of 1 through 5 where 1 is completely disagree and 5 is completely agree. [ROTATE]

| | Completely Disagree (1) | Somewhat Disagree (2) | Neutral (3) | Somewhat Agree (4) | Completely Agree (5) |
|---|----------------------------|--------------------------|----------------|-----------------------|-------------------------|
| a. Natural gas is cleaner than other fuels | | | | | |
| b. Natural gas is safe | | | | | |
| c. Natural gas appliances are more reliable | | | | | |
| d. Natural gas is more affordable than other fuels | | | | | |
| e. Natural gas makes my home more comfortable | | | | | |
| f. Natural gas provides me with better control of my appliances | | | | | |

[ASK IF F18b<3]

F19. You disagreed with the statement that natural gas is safe, what about using natural gas in your home do you consider unsafe? [OPEN END]

G. IMPORTANCE OF ENERGY EFFICIENCY

G1. Thinking about how you buy equipment or appliances in your home, how much do you typically spend when purchasing or replacing equipment?

1. I usually buy the least expensive option
2. I usually buy a mid-range option
3. I usually buy the most expensive option

G2. What do you (or would you) consider the top three most important factors when purchasing the equipment listed below? ³[ROTATE] [Allow up to three responses per equipment type]

| | Heating system | Water heater | Clothes washer and dryer | Range/cooktop /oven |
|------------------------|----------------|--------------|--------------------------|---------------------|
| Purchase price | | | | |
| Brand | | | | |
| Ease of installation | | | | |
| Reliability/Durability | | | | |
| Appearance | | | | |

³ This is adapted from a McKinsey energy efficiency segmentation study.

| | | | | |
|--|--|--|--|--|
| Maintenance requirements (including ability to repair or maintain oneself) | | | | |
| Cost to operate (including the cost of fuel) | | | | |
| Performance | | | | |
| Fuel Source (e.g. electricity or natural gas) | | | | |
| Energy Efficiency Rating | | | | |
| Other | | | | |

G3. How much effort do you put into reducing your electric and natural gas bills?

| | Absolutely no effort (1) | A little effort (2) | Some effort (3) | A moderate amount of effort (4) | A great deal of effort (5) |
|----------------|-----------------------------|------------------------|--------------------|------------------------------------|-------------------------------|
| a. Natural gas | | | | | |
| b. Electricity | | | | | |

H. FIREPLACE USAGE AND PREFERENCES

[ASK SECTION H FOR NATURAL GAS FIREPLACES, B5=1 and B6a = Natural Gas]

If you have multiple fireplaces, please answer the following questions about your natural gas fireplace or stove, or the natural gas fireplace or stove that you use most frequently.

H1. How frequently do you use your natural gas fireplace or stove? [SINGLE RESPONSE]

1. Do not use it [Go to question H2]
2. 1 or 2 times per year [Go to question H3]
3. Approximately once per month during cooler months [Go to question H3]
4. Approximately once per week during cooler months [Go to question H3]
5. Several times per week or more during cooler months [Go to question H3]

[ASK IF H1 = 1]

H2. Why don't you use your natural gas fireplace or stove? [OPEN END] [Go to Question I1]

[ASK IF H1 between 2 and 6]

H3. What is the primary reason you use your natural gas fireplace or stove? [SINGLE RESPONSE]

1. To heat all or part of my home
2. The way it looks and feels
3. Equally for both (of the above)
97. Other (Specify)

H4. Does the room ever get too hot while you are using your natural gas fireplace or stove?

1. Yes
2. No

[ASK IFH4 =1]

H5. What do you do when the room gets too hot? [ROTATE]

1. Open a window
2. Move to a different room
3. Turn the fireplace or stove off
97. Other (Specify)

H6. Is your natural gas fireplace or stove connected to a thermostat? In other words, does it shut down automatically?

1. Yes
2. No

[ASK FOR GAS FIREPLACES IN USE, B5=1 and B6a = Natural Gas AND H1 between 2 and 5]

H7. What type of pilot light does your natural gas fireplace or stove use? [SINGLE RESPONSE]

1. Intermittent pilot ignition (automatically lights the fireplace when switched on and there is no visible flame) [DISPLAY PHOTO H7-Intermittent Pilot Ignition] [Go to question H9]
2. Standing pilot light (always on, constant small blue flame) [DISPLAY PHOTOS H7-Standing Pilot Light-1 and H7-Standing Pilot Light-2] [Go to question H8]
3. Match-lit fireplace (common in log sets) [Go to question H10]
98. Don't know [Go to question 10]

[ASK IF H7 = 2]

H8. Do you turn off your standing pilot light for portions of the year? [SINGLE RESPONSE]

1. Yes
2. No [IF NO ASK] Why don't you turn your pilot light off?
98. Don't know

[ASK IF H7 = 1 or 2]

H9. Have you disabled an intermittent pilot ignition system so that it runs in standing pilot mode instead? [SINGLE RESPONSE]

1. Yes
2. No
98. Don't know

[ASK FOR ALL FIREPLACES, B5=1]

H10. What, if any, problems have you experienced with your natural gas fireplace? [MULTIPLE RESPONSE]

1. Condensation on the glass
2. Pilot light not starting
3. Corrosion or rust
97. Other (Please specify)
96. I haven't experienced any problems

I. RESEARCH PROCESS AND DECISION-MAKING

11. Now please think about how you make decisions on major equipment and appliances in your home. For each appliance type, what sources do you use/would you use to help you make decisions about what to purchase or install? **[ROTATE, MULTIPLE RESPONSE]**

| | Heating and Air Conditioning | Water Heating | Range/cooktop /oven | Clothes washer and dryer | Natural Gas Fireplace |
|--|------------------------------|---------------|---------------------|--------------------------|-----------------------|
| a. Contractors and installers (including professionals like plumbers and electricians) | | | | | |
| b. Friends and family | | | | | |
| c. Internet research | | | | | |
| d. Utility company | | | | | |
| e. Retail sales associates | | | | | |
| f. Seeing equipment or appliance in-person | | | | | |
| g. Other (specify) | | | | | |

[ASK IF I1 = "Internet research" for any product]

12. Which types of information from the Internet do you use to make decisions about equipment and appliances? **[ROTATE] [Allow up to 3 responses]**

1. Online reviews (e.g. retailer/manufacture websites, Google, Yelp)
2. Product information/specification pages
3. Retailer websites (e.g., Home Depot, Sears)
4. Amazon.com
5. Consumer Reports
6. Social media
7. Utility website
8. ENERGY STAR website
97. Other (specify)

13. Which of these sources do you trust the MOST when it comes to choosing equipment for your home? [ROTATE; SINGLE RESPONSE] [DISPLAY ALL I1 RESPONSES AND ALL I2 RESPONSES]

1. Contractors and installers (including plumbers and electricians)
2. Friends and family
3. Utility company
4. Retail sales associates
5. Seeing equipment or appliance in-person
6. Online reviews (e.g. on retailer/manufacture websites, Google, Yelp)
7. Product information/specification pages
8. Retailer websites (e.g., Home Depot, Sears)
9. Amazon.com
10. Consumer Reports
11. Social media
12. Utility website
13. ENERGY STAR website
97. <READ IN I1 Other>
98. <READ IN I2 Other>

13. Where do you prefer to purchase each of the following products? [ROTATE]

| | Online | Local stores | Big box stores like Best Buy, Home Depot, etc. | Through a contractor | Other (specify) | Don't Know / No Preference |
|--------------------------|--------|--------------|--|----------------------|-----------------|----------------------------|
| Water heater | | | | | | |
| Clothes washer and dryer | | | | | | |
| Range/cooktop/oven | | | | | | |
| Natural gas Fireplace | | | | | | |

14. Thinking about how you find *people* to work on your home, such as contractors, installers, electricians or plumbers, which of the following sources do you use? [ROTATE; MULTIPLE RESPONSE]

1. Friends and family
2. Internet research
3. Utility company
4. Retail sales associates
5. Newspaper ads
6. Home products shows/expos
97. Other (specify)

[ASK IF I4 = 2]

15. Which types of Internet resources do you use when looking for people to work on your home? [ROTATE]
[Allow up to 3 responses]
1. Google reviews
 2. Yelp
 3. Angie's list
 4. Better Business Bureau
 5. Contractor websites
 6. Social media
 7. Utility website
 8. Other (specify)
16. Some people like to be the first people to try out a new product while others like to wait & see what works well or what becomes popular before making a purchase. Thinking about how soon you buy new technologies, which of the following best describes you? (You can think of things like electronics or appliances) [SINGLE RESPONSE]
1. I'm a risk-taker and I like to try new things as soon as possible, even if they are untested.
 2. I typically purchase new technology sooner than a lot of my friends.
 3. I'm typically in the middle of the group when purchasing new technology.
 4. I purchase new technology *after* most of my friends have purchased it.
 5. I am one of the last people to purchase new technology.
 6. I prefer to use simple technologies that have been proven to work for many years.

J. HOUSING CHARACTERISTICS

- J1. Which of the following best describes your home?⁴ [SINGLE RESPONSE]
1. Manufactured or mobile home
 2. Single-family, detached
 3. Duplex, triplex or four-plex
 4. Apartment or condo with five or more units
 5. Townhouse or row house
 98. Don't know
- J2. In what year was your home built? Your best guess is fine if you are unsure.⁵ [SINGLE RESPONSE]
1. 2010 or later
 2. 2001 - 2009
 3. 1993 - 2000
 4. 1987 - 1992
 5. 1980 - 1986
 6. 1970 - 1979
 7. Before 1970
 98. Don't know

⁴ Matches RBSA response categories

⁵ Matches RBSA response categories

- J3. What is your best estimate of the square footage of the living area in your home?⁴ [SINGLE RESPONSE]
1. Less than 500 square feet
 2. Between 500 and 999 square feet
 3. Between 1,000 and 1,499 square feet
 4. Between 1,500 and 1,999 square feet
 5. Between 2,000 and 2,499 square feet
 6. Between 2,500 and 2,999 square feet
 7. Between 3,000 and 3,999 square feet
 8. Between 4,000 and 4,999 square feet
 9. More than 5,000 square feet
 98. Don't know
- J4. Is this the first home you have purchased? [SINGLE RESPONSE]
1. Yes
 2. No
- J5. How long have you lived in this home? [SINGLE RESPONSE]
1. One year or less
 2. 2-3 years
 3. 4-5 years
 4. 6-10 years
 5. More than 10 years
- J6. How long have you lived in the Northwest? (Washington, Oregon, Idaho, Montana) [SINGLE RESPONSE]
1. One year or less
 2. 2-3 years
 3. 4-5 years
 4. 6-10 years
 5. More than 10 years
- J7. How many of your previous homes have had natural gas service? [SINGLE RESPONSE]
1. All of them
 2. The majority of them, but not all
 3. Some of them, but most have not
 4. None of them
- J8. How many bedrooms are in your home? [Allow numeric entry between 1 and 10]

K . DEMOGRAPHICS

- K1. What is your gender? [SINGLE RESPONSE]
1. Male
 2. Female
 88. Prefer not to say
- K2. Which of the following best describes your age range? [SINGLE RESPONSE]
1. 18 to 24
 2. 25 to 44
 3. 45 to 64
 4. 65 and over
 88. Prefer not to say
- K3. What is your race? Please select all that apply. [MULTIPLE RESPONSE]
1. White
 2. Black or African American
 3. American Indian or Alaska Native
 4. Asian
 5. Native Hawaiian or Other Pacific Islander
 6. Hispanic or Latino
 97. Other (Please specify)
 88. Prefer not to say
- K4. What is your approximate annual household income before taxes? [SINGLE RESPONSE]
1. Less than \$40,000
 2. \$40,000 to \$79,999
 3. \$80,000 to \$119,999
 4. \$120,000 or more
 98. Don't know
 88. Prefer not to say

K5. What is the highest level of education you have completed? [SINGLE RESPONSE]

1. Less than 9th grade
2. Some high school, no diploma
3. High school diploma or GED
4. Associates degree
5. Bachelor's degree
6. Graduate or professional degree
88. Prefer not to say

K6. Including yourself, how many people live in your household full time? [SINGLE RESPONSE]

1. 1
2. 2
3. 3
4. 4
5. 5
6. 6
7. 7
8. 8
9. 9
10. 10 or more
88. Prefer not to say

K7. How many children under the age of 18 live in your household? [SINGLE RESPONSE]

1. 0
2. 1
3. 2
4. 3
5. 4
6. 5 or more
88. Prefer not to say

K8. URBAN/RURAL DESIGNATION [INCLUDE URBAN/RURAL DESIGNATION]

XII. APPENDIX B – SEGMENTATION TYPING TOOL

The NEEA Natural Gas Segmentation Study identified four distinct customer segments, summarized in the table below:

| Name | Persona Name | Percent of Population |
|--------------------------|--------------|-----------------------|
| Natural Gas Pragmatist | Doug | 30% |
| New Urban Traditionalist | Kyle | 6% |
| Middle American | Erica | 9% |
| Day-to-Day | Rose | 55% |

In order to identify these customer segments in future customer research, ILLUME developed a “typing tool” to predict segment membership based on a limited number of survey questions.

This battery of questions can be used in future surveys, and the rules for assigning segments (following the battery of questions) can be used to assign segment membership.

A. SCREENING QUESTIONS

Note that segmentation is only applicable to homeowners who currently have natural gas service. Survey respondents who are renters or who do not have natural gas service in their homes should not be classified into the natural gas segments.

The questions we used to screen natural gas homeowners are:

A1. Do you own your home? [SINGLE RESPONSE]

1. Yes [ASK SEGMENT TYPING QUESTIONS]
2. No [SKIP SEGMENT TYPING QUESTIONS]

A2. Do you have natural gas service in your home? [SINGLE RESPONSE]

1. Yes [ASK SEGMENT TYPING QUESTIONS]
2. No [SKIP SEGMENT TYPING QUESTIONS]

B. SEGMENT TYPING QUESTIONS

B1. Was this home new when you purchased it, or did you purchase it as an existing home? [SINGLE RESPONSE]

1. New construction
2. Existing home

PROGRAMMING NOTE: This can be placed elsewhere in the survey – it is only needed to create logic for F4.

B2. Please pick the top two statements that best describe your values toward purchasing equipment for your home. [ROTATE; ALLOW 2 RESPONSES]

“I purchase items that . . .

1. Are attractive and enhance the appearance of my home.
2. Are well designed and do not have overly complicated mechanisms.
3. Are durable and will last a lifetime.
4. Make me feel good when I use them.
5. Are the newest technology on the market.
6. Are known for exceptional performance.
7. I can maintain myself.

ANALYSIS INSTRUCTIONS: Create set of (0,1) dummy variables, coded 1 if they selected the factor in their top two factors:

value_appearance
value_design
value_durable
value_feelgood
value_newtech
value_performance
value_maintenance

The “design” and “performance” variables will be used in the typing tool, but it’s important to ask ALL factors in the question so that customers can select among them.

B3. When you were looking for your current home, did you specifically look for homes that used a particular fuel source (electricity, natural gas, wood) for certain appliances? (For example, did you look for homes that used natural gas for heat or electricity for the range) Did you look for a particular fuel source for your...[ROTATE]

| | 1. Yes | 2. No | 98. Don't know | 96. Not applicable (don't have equipment)* |
|-----------------------------------|--------|-------|----------------|--|
| a. Heat | | | | |
| b. Water heat | | | | |
| c. Fireplace [IF PRESENT]* | | | | |
| d. Range/cooktop/oven | | | | |
| e. Clothes dryer [IF PRESENT]* | | | | |
| f. Air conditioning [IF PRESENT]* | | | | |

*PROGRAMMING NOTE: If there are earlier questions that establish whether they have each end use, use those responses to limit this list to items they have, and DO NOT include the "not applicable" column. If there is not a question about whether they have these end-uses, ask about all end-uses, and INCLUDE a "not applicable" question.

[ASK IF ANY 0=1]

B4. What fuel source did you prefer for your...? [SINGLE RESPONSE]

| | Electricity | Natural gas | Renewable fuel source (e.g., solar or wind) | Other fuel source (e.g., oil, propane, wood) |
|--------------------------------|-------------|-------------|---|--|
| g. Heat [IF a=1] | | | | |
| h. Water heat [IF b=1] | | | | |
| i. Fireplace [IF c=1] | | | | |
| j. Oven/cooktop/range [IF d=1] | | | | |
| k. Clothes dryer [IF e=1] | | | | |
| l. Air conditioning [IF f=1] | | | | |

ANALYSIS INSTRUCTIONS: Create a count variable of natural gas preferences:
gas_pref_count is count of all end-uses where natural gas is preferred (range of 0-6)

[ASK FOR EXISTING HOMES, 0=2]

B5. Was your home's natural gas line already hooked up when you purchased it? [SINGLE RESPONSE]

- C. Yes
- D. No

[ASK EVERYONE]

B6. Have you expanded your natural gas service to more equipment or appliances since moving into your home?
[SINGLE RESPONSE]

- Yes
- No

ANALYSIS INSTRUCTIONS: Create a variable for whether they installed or expanded natural gas.
ng_install_expand=1 if F4=2 OR F7=1; 0 for everyone else

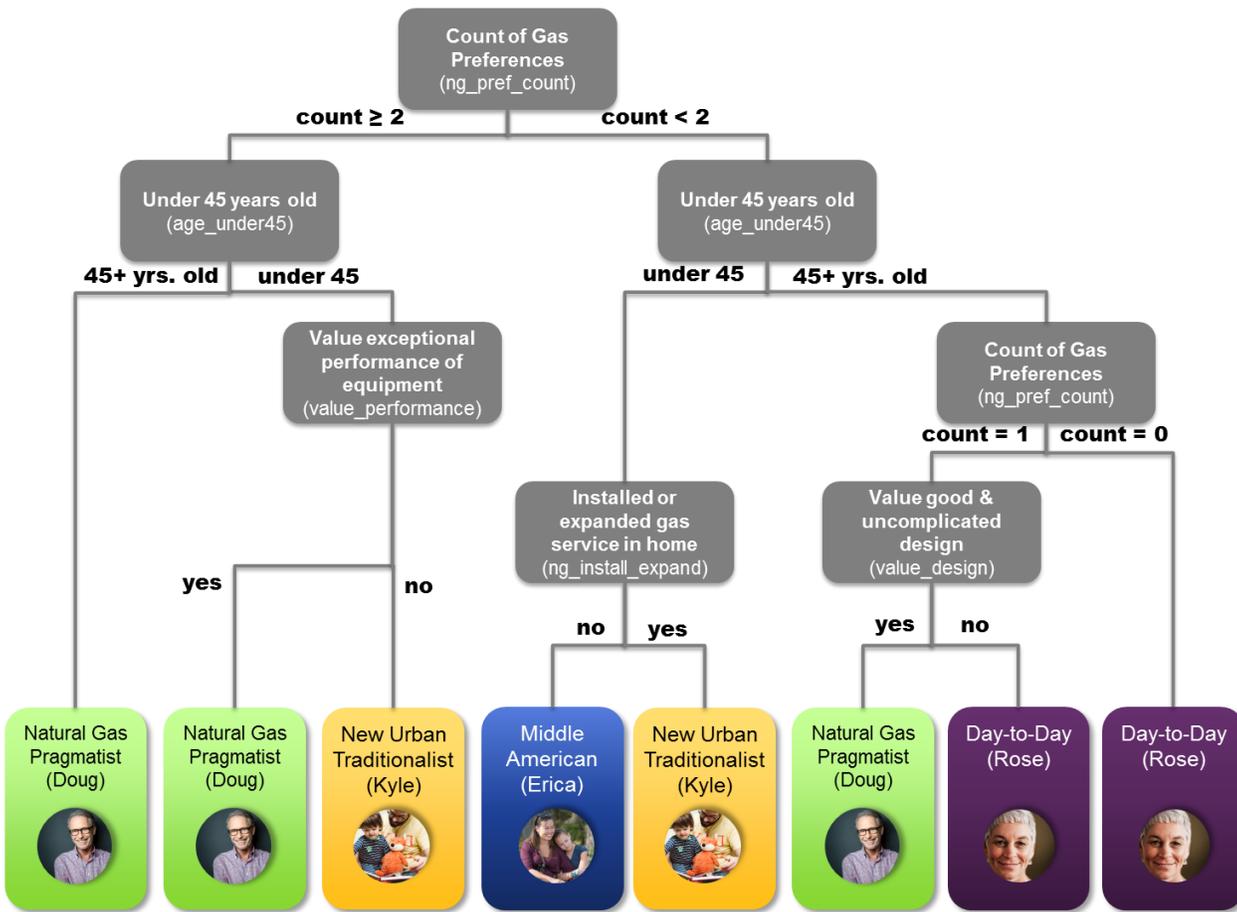
B7. Which of the following best describes your age range? [SINGLE RESPONSE]

- 1. 18 to 24
- 2. 25 to 44
- 3. 45 to 64
- 4. 65 and over
- 88. Prefer not to say

ANALYSIS INSTRUCTIONS: Create dummy variable for being under 45 years old:
age_under45=1 if 0<3, else 0

C. CLASSIFICATION RULES

The figure below contains the results of the Classification and Regression Tree (CART) analysis that was used to develop a typing tool to predict segment membership.



The table below contains logic-based classification rules based on a Classification and Regression Tree above. These rules can be used to assign segment membership after customers complete the battery above.

| Segment | Classification Rules (using survey variable names defined above) |
|--|--|
| Natural Gas Pragmatist (Doug) (30% of population) | <i>high natural gas preferences & over 45</i> gas_pref_count>=2 & age_under45=0 |
| | <i>high natural gas preference, under 45, and values equipment performance</i> gas_pref_count>=2 & age_under45=1 & value_performance=1 |
| | <i>over age 45, prefers natural gas for one appliance/equipment, and values high-quality but uncomplicated design</i> gas_pref_count=1 & age_under45=0 & value_design=1 |
| Middle American (Erica) (9% of population) | <i>low natural gas equipment preferences, under age 45, and has not installed or expanded natural gas service</i> gas_pref_count<2 & age_under45=1 & ng_install_expand=0 |
| New Urban Traditionalist (Kyle) (6% of population) | <i>high natural gas preference, under age 45, but does not value equipment performance</i> gas_pref_count>=2 & age_under45=1 & value_performance=0 |
| | <i>low natural gas equipment preferences, under age 45, but HAS installed or expanded natural gas service</i> gas_pref_count<2 & age_under45=1 & ng_install_expand=1 |
| Day-to-Day (Rose) (55% of population) | <i>over age 45, prefers natural gas for one appliance/equipment, and does NOT value high-quality but uncomplicated design</i> gas_pref_count=1 & age_under45=0 & value_design=0 |
| | <i>over age 45 and does not prefer natural gas for any equipment/appliances</i> gas_pref_count=0 & age_under45=0 |