Introducing ENERGY STAR NextGen Certified Homes and Apartments

Presented on

September 24, 2023

EPA United States Environmental Protection Agency

Introduction

- Reducing emissions in residential construction requires us to expand beyond energy efficiency to also include:
  - Strategic electrification
  - Connected equipment to aid in demand response
  - Supporting EV-charging

- EPA's goal: to coalesce the industry around the primary features needed to reduce operational decarbonization in a national platform

- ENERGY STAR NextGen is NOT intended to replace ENERGY STAR Homes, nor DOE's Zero Energy Ready Homes

ENERGY STAR NextGen Certified Homes and Apartments

1. Highly energy-efficient construction
2. Multi-stage ENERGY STAR certified connected heat pump
3. ENERGY STAR certified connected heat pump water heater
4. Clean electric cooking
5. Electric vehicle charging capability

NextGen™ CERTIFIED HOMES & APARTMENTS

Agenda

1. Background
   - Why you should pay attention
   - Emissions reductions analysis
2. Overview of Program Requirements
3. Feature Specific Messaging
   - Crash course on cooking pollutants

Builder Value Proposition

1. Benefits that can attract customers
   - Indoor air quality improvements
   - Environmental benefits
   - Cutting edge technologies

2. Simplified construction process if not installing gas utility infrastructure

3. Prepare for the future / get rewarded for staying ahead of codes
   - Utility incentives
   - 45L
   - HEERA (Home Efficiency and Home Electrification and Appliance Rebates)

Four distinct client profiles

True Believers

- High-income, well-educated professionals.
- Driven by quality/brand.

Concerned Parents

- Middle-income buyers, often married with children.
- Driven by concern for family.

Cautious Conservatives

- Older professionals and retirees; majority 60+ years old.
- Desires to be comfortable and not waste resources.

Working Class Realists

- Younger, lower-income buyers; often blue-collar.
- Driven by affordability.

Client profile: True Believers

Client Profile
True Believers

- Most are 45+.
- Equally likely to be men or women.
- White-collar workers, professionals, and retired.
- Well-educated.
- High income ($75k+).
- Homeowners.
- Married.
- Likely to not have children present in the household.
- Environmentalists.
- Highest # of energy conservation activities.

Connecting with True Believers:

1. Communicate that an ENERGY STAR certified home purchase offers an important opportunity to embrace/live out their environmental values.
2. They are quality/brand driven. Communicate that ENERGY STAR certified homes are higher-quality homes.
3. They are likely to be early adopters of technology, so stress that ENERGY STAR certified homes have the "latest/greatest" features and incorporate "smart home" technology if possible.
4. Communicate YOUR environmental initiatives and message around protecting the environment and saving natural resources.
5. They are likely to want ENERGY STAR certified appliances, a smart thermostat, and a home automation platform in their home.
6. They are the most likely to want an overall ENERGY STAR certification for their home.

Client profile: Concerned Parents

Client Profile
Concerned Parents

- Somewhat more likely to be women (54%).
- Age 25–44.
- White-collar and homemakers.
- Mid to high household income ($50,000-$99,999).
- Some college or a bachelor's degree.
- Married with children.
- Somewhat less likely to currently own home.
- More likely to live in urban areas.

Connecting with Concerned Parents:

1. Make the connection between energy efficiency and resale value.
2. Communicate that ENERGY STAR certified homes have lower utility bills.
3. They're really busy, but feel guilty if they're not being responsible and a good steward of their family's money. Connect to this by communicating that ENERGY STAR certified homes, by design, are energy efficient. It won't take extra effort to "avoid wasting energy."
4. Connect to their concern for their kids, both short-term (the comfort and health benefits of ENERGY STAR certified homes) and long-term: buying an ENERGY STAR certified home helps them do their part to preserve the quality of life for future generations.
5. Position energy-efficient features as beautiful and stylish.

NextGen CERTIFIED HOMES & APARTMENTS
BUILT FOR A CLEAN ENERGY FUTURE

A home for tomorrow, built today.

The ENERGY STAR® NextGen program offers an additional level of recognition for homes and apartments that go above and beyond the core ENERGY STAR Residential New Construction program requirements and incorporate advanced electric technologies that will help to build our clean energy future.

Advanced technologies, with high performance, premium features.

ENERGY STAR NextGen homes and apartments deliver all the comfort, quality, and durability that homeowners and residents have come to expect from the ENERGY STAR label—and so much more. These homes come with leading-edge equipment, such as:

- **Multi-speed ENERGY STAR certified heat pumps**: More efficient than furnaces or boilers, heat pumps serve double duty with heating and cooling, making them usable year-round.
- **ENERGY STAR certified heat pump water heaters**: Heat pump water heaters that earn the ENERGY STAR label are up to four times more efficient, and use 70 percent less energy, than a standard model.
- **Electric cooktops and ovens**: Electric cooktops and ovens eliminate the emissions of indoor air pollutants associated with gas combustion, including carbon monoxide and nitrogen dioxide, and contribute to a healthier indoor living environment.
- **Electric vehicle (EV) charging capability**: In homes with private parking, a heavy-duty power outlet is wired in and ready to charge an electric vehicle or have a Level 2 EV charger installed.

Creating a clean energy future for everyone.

EPA United States Environmental Protection Agency

Learn more about ENERGY STAR NextGen homes and apartments at **energystar.gov/nextgenhomes**.

NextGen homes feature advanced efficient electric technologies that provide high performance and premium experiences, along with improved indoor air quality and up to 20 percent more energy efficiency than homes built to typical code levels.

Built with energy-efficient construction.

ENERGY STAR NextGen homes and apartments meet the U.S. Environmental Protection Agency's (EPA) most advanced ENERGY STAR program requirements for energy efficiency and performance and are at least 20 percent more energy-efficient than homes built to typical code levels, delivering comfort and savings you can count on.

Creating a healthier, safer indoor living environment.

The advanced electric and hybrid equipment found in ENERGY STAR NextGen homes and apartments can reduce or eliminate emissions associated with natural gas combustion and contribute to reduced indoor air pollutants.

Built on the trusted foundation of EPA's ENERGY STAR program.

ENERGY STAR NextGen homes and apartments are built on EPA's 25+ year history of delivering energy savings and environmental benefits through the ENERGY STAR program.

Using less fossil fuel to operate helps ENERGY STAR NextGen homes and apartments make a big impact, reducing greenhouse gas emissions by up to 80 percent when compared to homes built to the latest code.

NextGen CERTIFIED HOMES & APARTMENTS

Built for a clean energy future.

Choosing an ENERGY STAR NextGen home helps to create a clean energy future for everyone and provides an important step toward reducing carbon pollution while providing energy savings, greater comfort, and advanced features. Learn more at **energystar.gov/nextgenhomes**.

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ES NextGen 09/01/23

The right choice, for today and tomorrow.

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NextGen CERTIFIED HOMES & APARTMENTS
BUILT FOR A CLEAN ENERGY FUTURE

A home for tomorrow, built today.

EPA United States Environmental Protection Agency

Modern efficient electric and hybrid technologies, along with energy-efficient construction, provide the premium home features you want while delivering high performance, comfort, and enhanced health and safety benefits.

Multi-speed ENERGY STAR® certified heat pumps

- More efficient than furnaces or boilers, heat pumps serve double duty with heating and cooling, making them usable year-round.
- Multi-stage or variable speed technology is quieter and delivers more consistent temperatures for greater comfort.
- Newer cold-climate heat pumps can deliver 70 to 80 percent of their rated heating capacity at temperatures as low as 5 degrees F.
- Connected features allow for remote adjustments and alerts, and enable participation in utility demand-response programs (where available and residents choose to opt-in).

ENERGY STAR certified connected heat pump water heaters

- A typical water heater uses more energy than a refrigerator, clothes washer, dishwasher, and dryer combined.
- A heat pump water heater that earns the ENERGY STAR label is up to four times more efficient, and uses 70 percent less energy, than a standard model, saving hundreds of dollars every year in energy costs.
- Connected features allow for remote adjustments and alerts, and enable participation in utility demand-response programs (where available and residents choose to opt-in).

Electric cooktops and ovens

- About three times more efficient than gas ranges.
- Eliminates the emissions of indoor air pollutants associated with gas combustion, including carbon monoxide and nitrogen dioxide, and contribute to a healthier indoor living environment.
- Children living in homes with gas stoves have a 42 percent increased risk of having asthma, according to a meta-analysis of 19 studies.
- Optional induction cooktops help you cook like a pro, with fast heating, precise control, easy cleaning, and surfaces that remain cool to the touch, making them safer to work with.

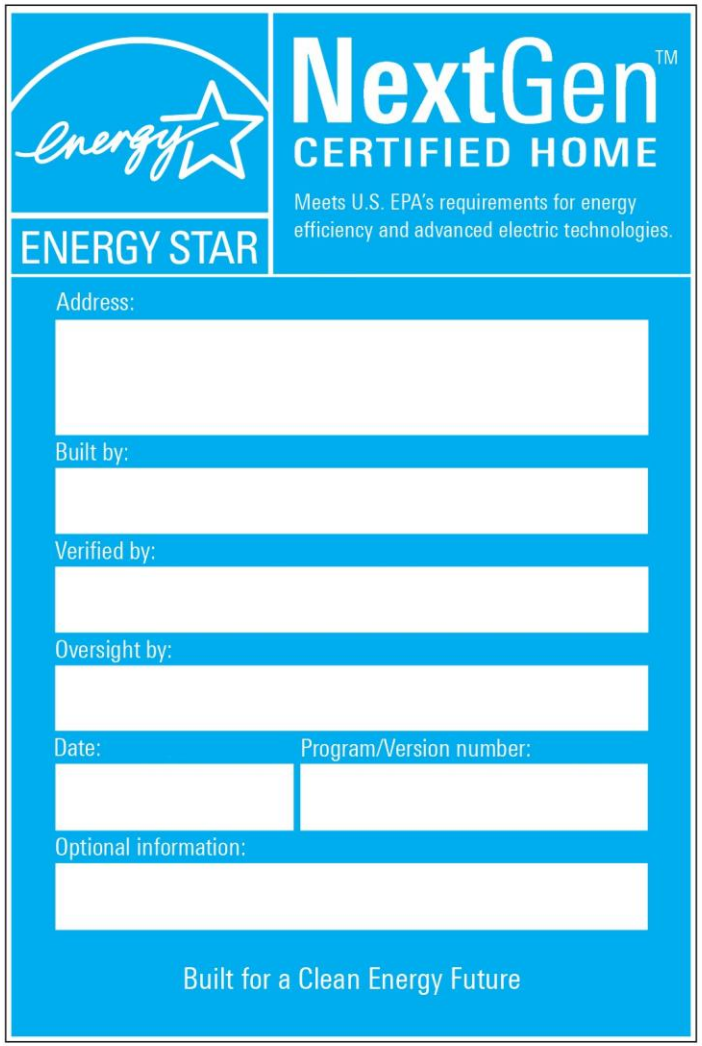
Electric vehicle (EV) charging capability

- With the steady increase of EVs on the road, preparing for an electric transportation future is just smart.
- In homes with private parking, a heavy-duty power outlet is wired in and ready to charge an electric vehicle or have a Level 2 EV charger installed.
- And even if you don't have an EV today, having the necessary wiring installed will make it quicker and easier to go electric if you're ready to make the change in the future.
- In apartment complexes with shared parking, up to five ENERGY STAR certified EV chargers are provided, with additional capacity to add more.

Highly energy efficient construction

- Meet the U.S. Environmental Protection Agency's (EPA) most advanced ENERGY STAR program requirements for energy efficiency and performance.
- At least 20 percent more energy efficient than homes built to typical code levels (2018 IECC).
- Savings, comfort, durability, and many lifestyle benefits compared to typical homes.

Learn more about ENERGY STAR NextGen homes and apartments at **energystar.gov/nextgenhomes**.



ENERGY STAR

NextGen™ CERTIFIED HOME

BUILT FOR A CLEAN ENERGY FUTURE

Builder/Developer: Gamble Builders
Permit Date/Number: 4 April 2011
Home/Unit Address: 1310 L Street
Washington DC 20005
Rating Company: G Force Testing
Rater ID Number: 2345678
Rating Date: 6 July 2011
Oversight By: Passe Inspections
Program/Version Number: v3

NextGen Home Features

- Highly energy-efficient construction that meets ENERGY STAR's most rigorous requirements
- Multi-speed ENERGY STAR certified connected heat pump
- ENERGY STAR certified connected heat pump water heater
- Electric cooktop and oven
- Electric vehicle charging capability

Standard Features of ENERGY STAR Certified New Homes and Apartments

Your ENERGY STAR certified new home or apartment has been designed, constructed, and independently verified to meet rigorous requirements for energy efficiency set by the U.S. Environmental Protection Agency (EPA), including:

Thermal Enclosure System

A complete thermal enclosure system that includes comprehensive air sealing, quality-installed insulation, and high-performing windows to deliver improved comfort and lower utility bills.

Air Infiltration Test: 4 ACH50

Primary Insulation Levels:
Ceiling: R-30 **Floor:** R-10
Wall: R-19 **Slab:** R-6

Primary Window Efficiency:
U-Value: 0.60 **SHGC:** 0.27

Water Management System

A comprehensive water management system to protect roofs, walls, and foundations.

Flashing, a drainage plane, and site grading to move water from the roof to the ground and then away from the home or building.

Water-resistant materials on below-grade walls and underneath slabs to reduce the potential for water entering the home or building.

Management of moisture levels in building materials during construction.

Heating, Cooling, and Ventilation System

A high-efficiency heating, cooling, and ventilation system that is designed and installed for optimal performance.

Total Duct Leakage: 6 CFM25 per 100 sq.ft.
Duct Leakage to Outdoors: 4 CFM25 per 100 sq.ft.

Primary Heating (System Type • Fuel Type • Efficiency):
Fuel-fired Hydronic Distribution • Natural Gas • 90 AFUE

Primary Cooling (System Type • Fuel Type • Efficiency):
Ground-source Heat Pump • Electric • 14.5 SEER

Whole-House Ventilation Type (System Type):
Balanced

Energy Efficient Lighting and Appliances

Energy efficient products to help reduce utility bills, while providing high-quality performance.

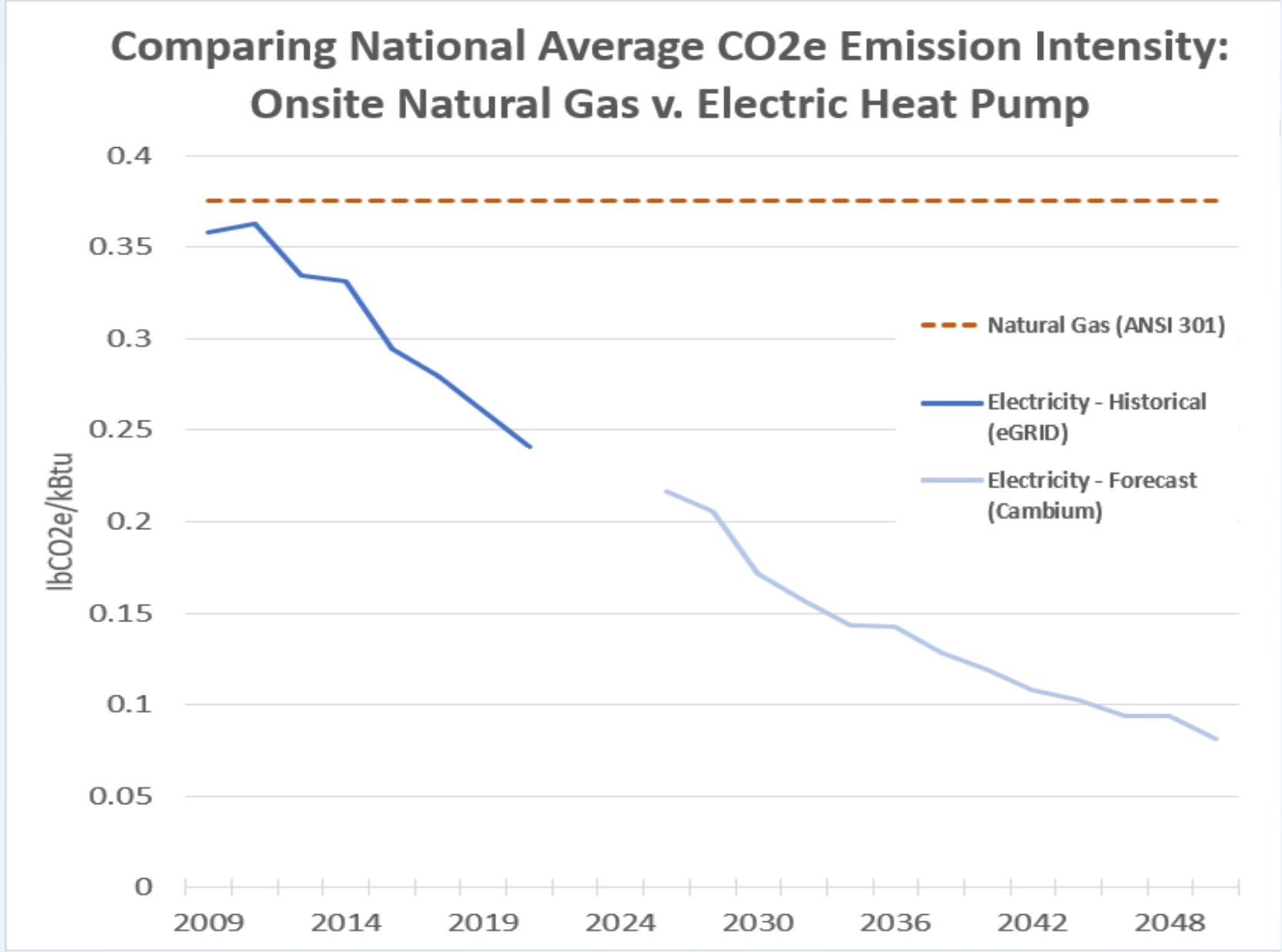
Energy Efficient Lighting: 75%

ENERGY STAR Certified Appliances and Fans:
Refrigerators: 1 **Dishwashers:** 1
Ceiling Fans: 4 **Exhaust Fans:** 3

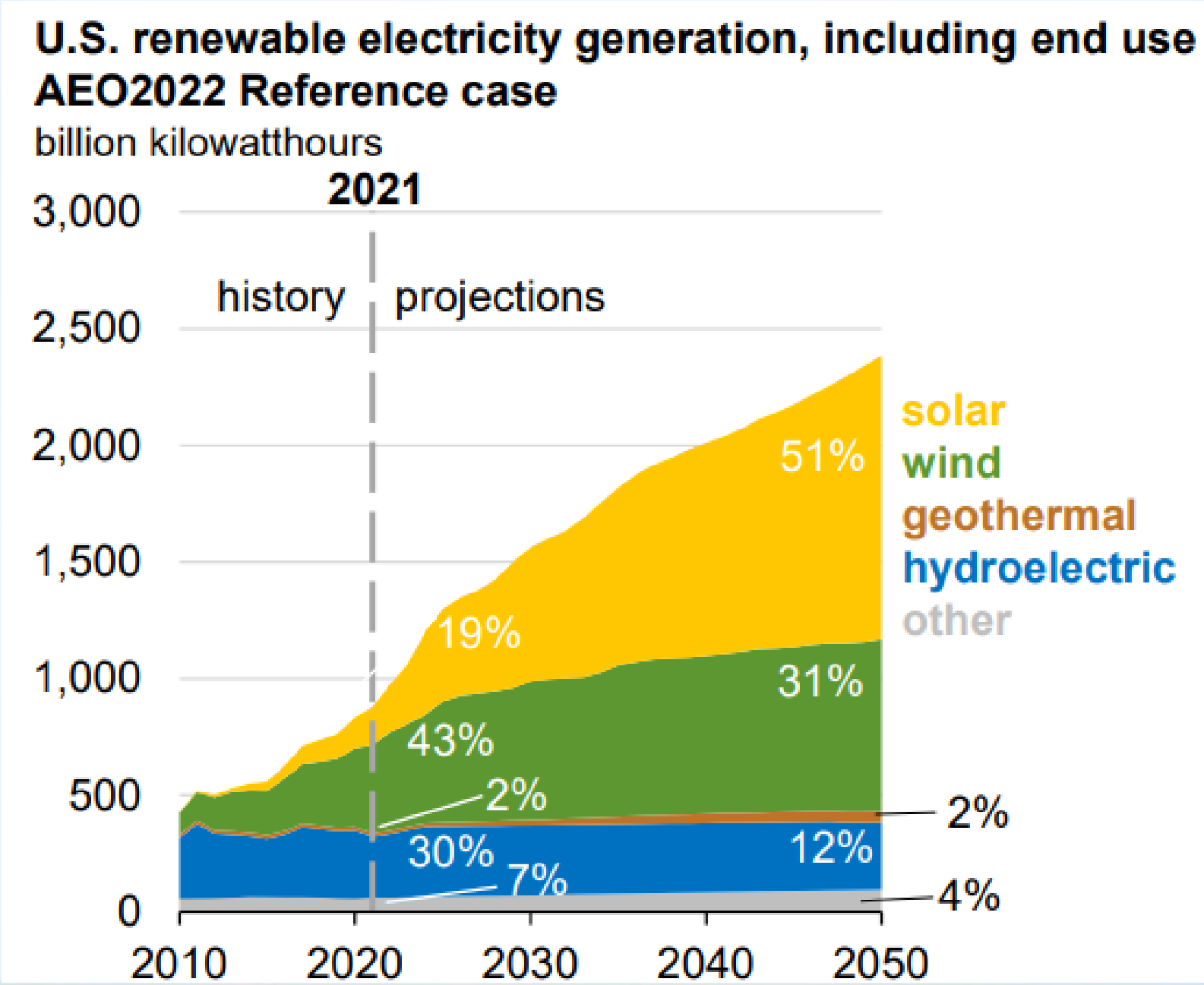
Primary Water Heater (System Type • Fuel Type • Efficiency):
Electric Resistance Heater • Electric • 0.94 EF

About this certificate

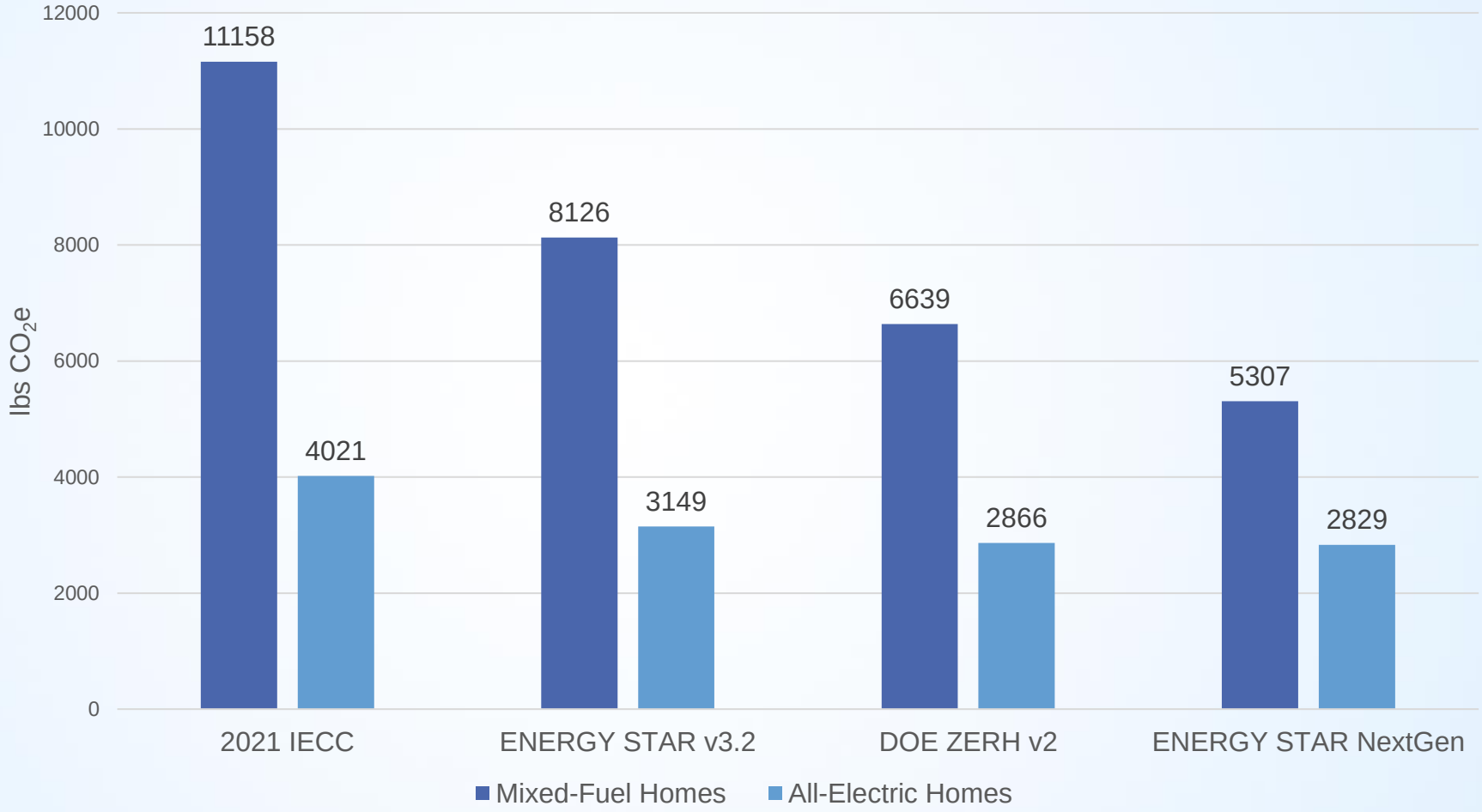
The certificate provides a summary of the major energy efficiency and other construction features that contribute to this home or apartment earning the ENERGY STAR, as determined through independent inspection and verification performed by a trained professional. The Energy Rating Index or HERS index for this home, if reported, is calculated in accordance with ANSI/RESNET/ICC Standard 301, with any exceptions approved by EPA. Because the version of Standard 301 used to calculate this index may not align with the version referenced by code, this value is not intended to be used to demonstrate compliance with code. Note that when a home or apartment contains multiple performance levels for a particular feature (e.g., window efficiency or insulation levels), the predominant value is shown. Also, homes and apartments may be certified to earn the ENERGY STAR using a sampling protocol, whereby one home or apartment is randomly selected from a set for representative inspections and testing. In such cases, the features found in each home or apartment within the set are intended to meet or exceed the values presented on this certificate. The actual values for your home or apartment may differ, but offer equivalent or better performance.



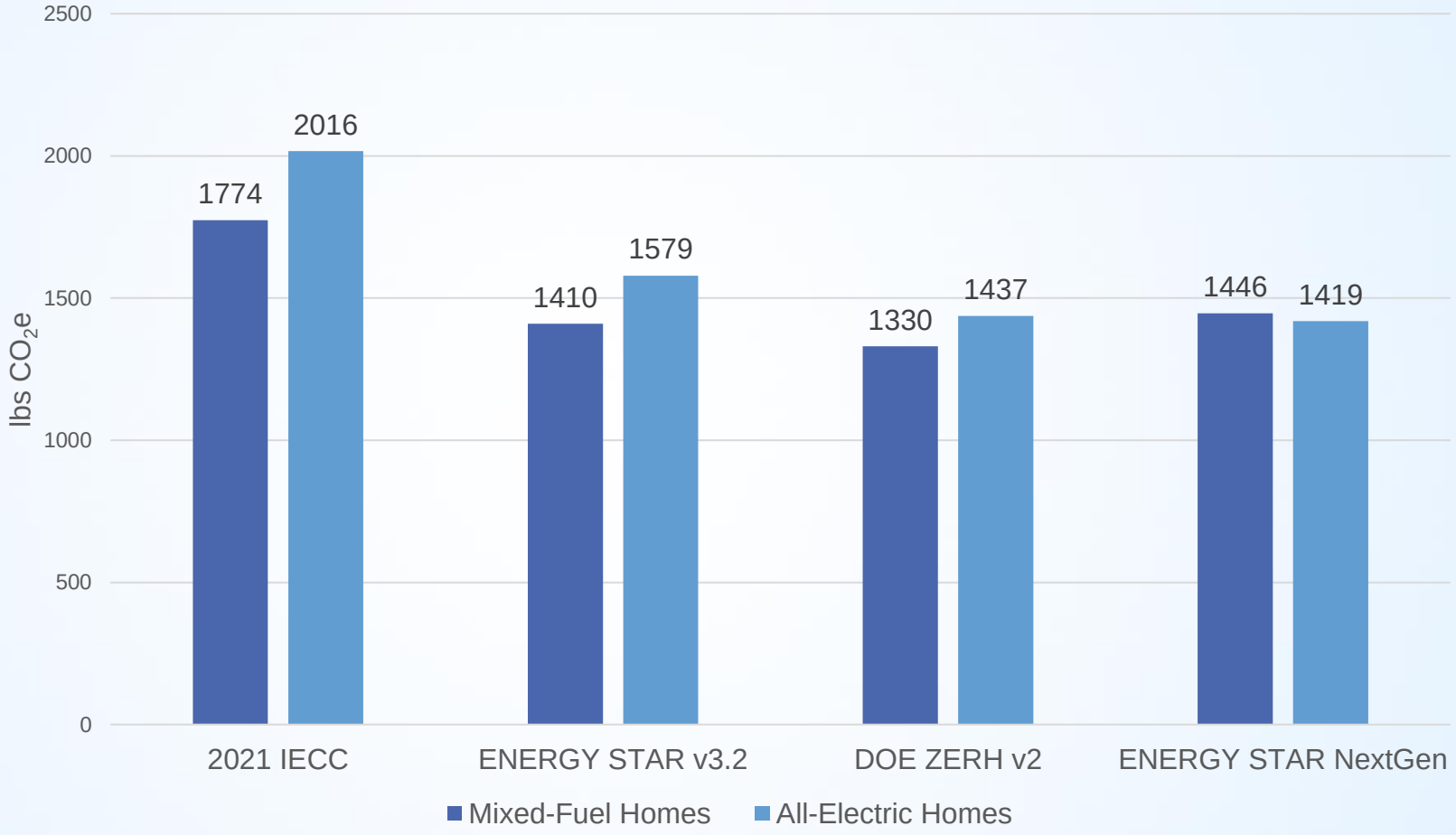
Sources: EPA eGRID; ANSI 301; Cambium AER Low RE. Assumptions: 98% AFUE furnace; 2.5 COP heat pump


U.S. renewable electricity generation, including end use
AEO2022 Reference case
billion kilowatthours
2021
history
projections
3,000
2,500
2,000
1,500
1,000
500
0
2010
2020
2030
2040
2050
solar
wind
geothermal
hydroelectric
other
51%
19%
31%
43%
2%
2%
30%
12%
7%
4%

Emissions Comparison of Single Family New Homes in Denver

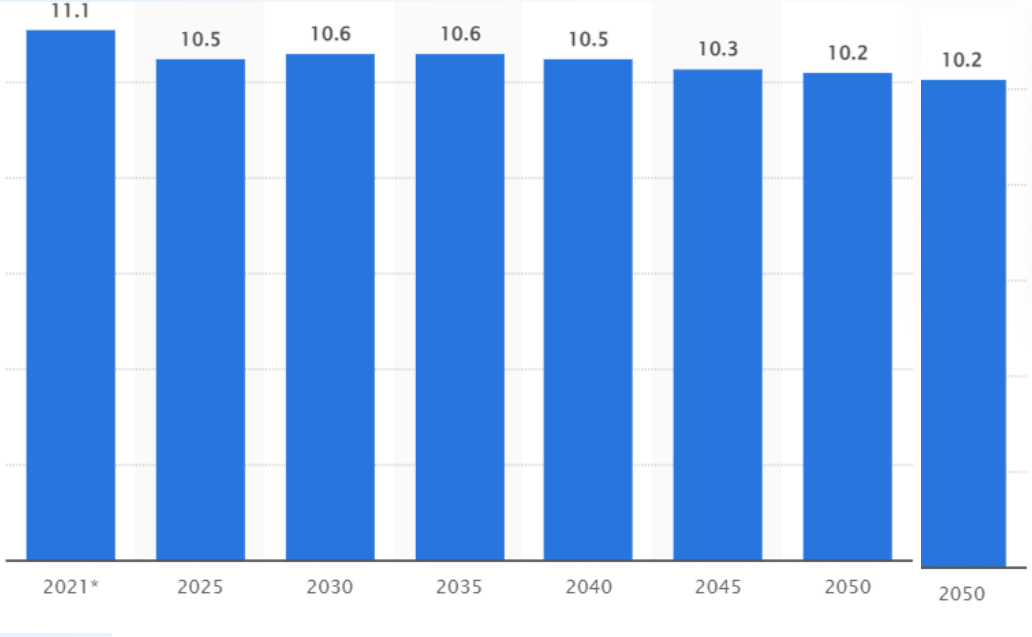


Energy Cost Comparison of Single Family New Homes in Denver

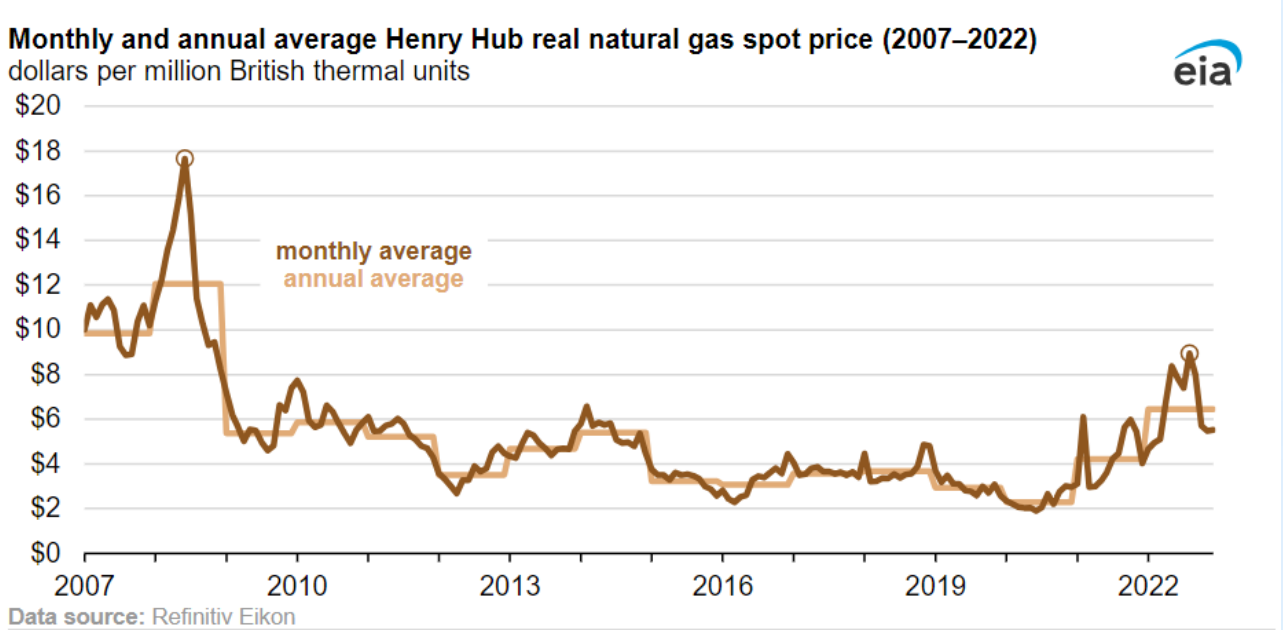


Take the Energy Cost Comparison with a grain of salt

Electricity price forecast



Historic natural gas prices



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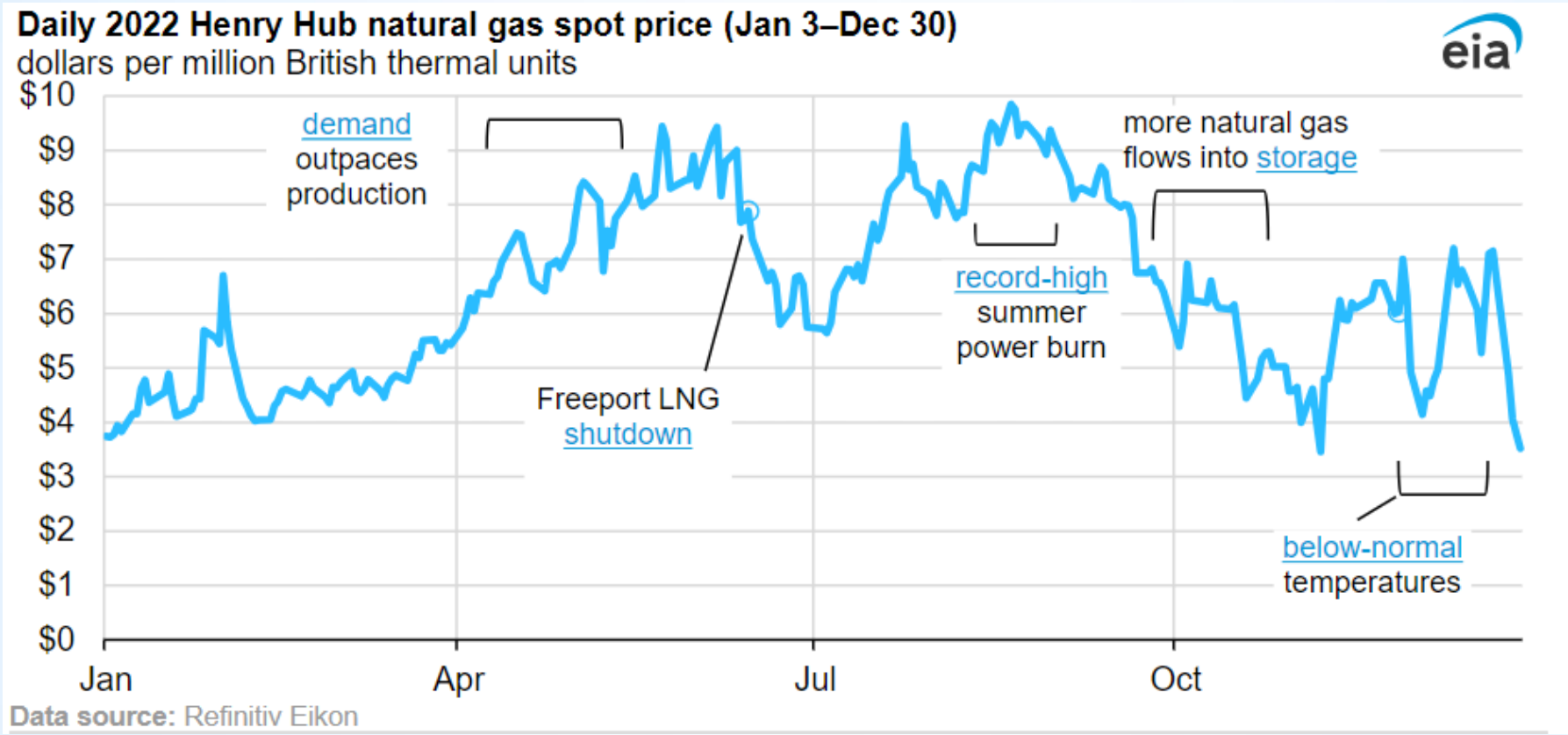
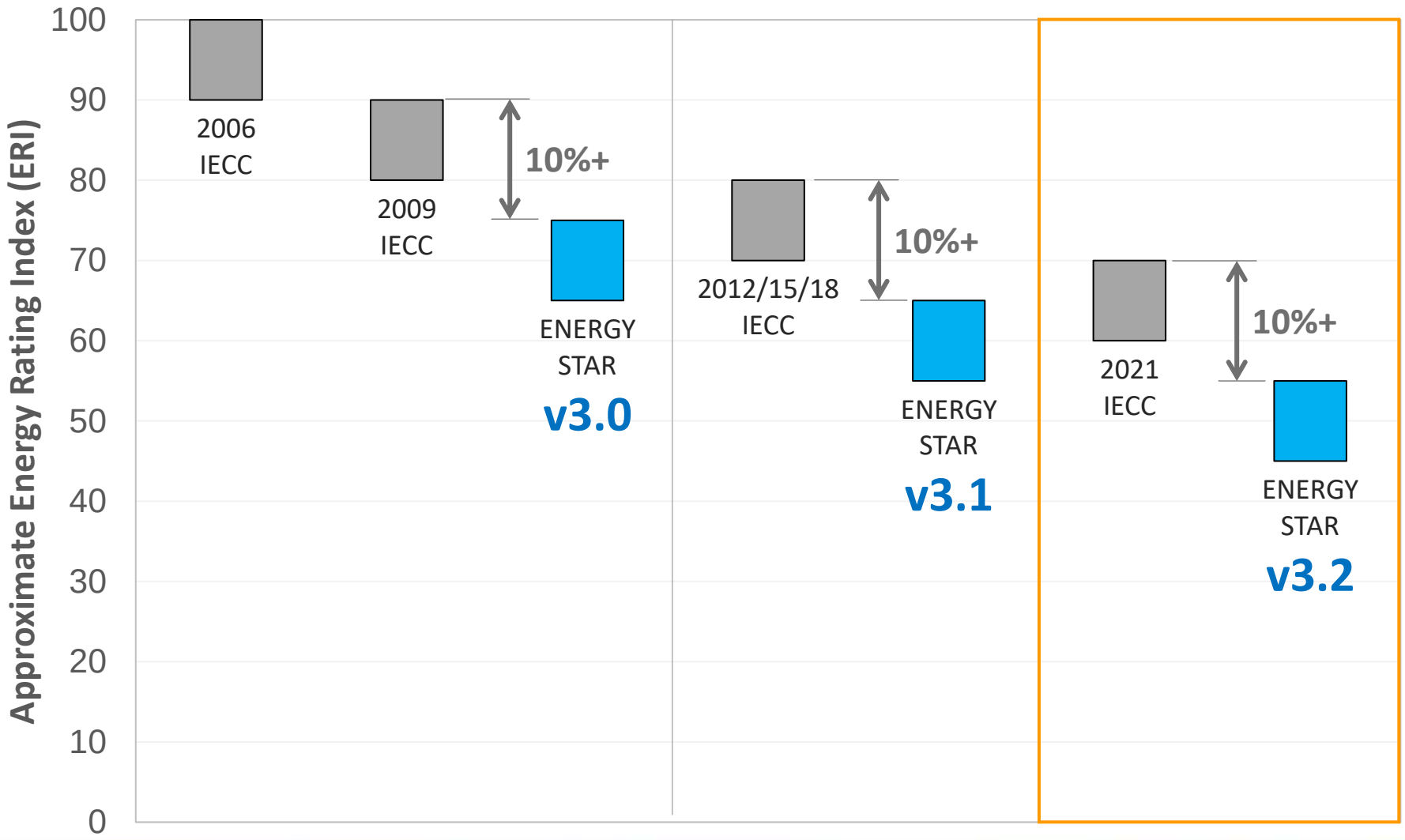


Overview of Program Requirements

1. Energy Efficiency Prerequisite

- Home or building certified to the most rigorous ENERGY STAR New Construction program requirements
  - National v3.2/Multifamily v1.2
  - This requirement applies in states that would not otherwise be subject to these versions of the program requirements due to state code adoption

Modern code evolution



2. ENERGY STAR Certified Multi-Speed Heat Pumps

- ENERGY STAR certified two-speed or variable-speed heat pump installed that serves the design load of each heated zone
  - In Climate Zones 5-8, installed heat pumps are ENERGY STAR Cold Climate certified
  - Each heat pump must also meet EPA's 'connected' criteria or is controlled by an ENERGY STAR certified smart thermostat or wifi thermostat
  - For air-source heat pumps, blower fan volumetric airflow, blower fan watt draw, and refrigerant charge are Grade I per ANSI / RESNET / ACCA Std. 310

HVAC grading update

The Five Key Sequential Tasks in Standard 310

Task 1	Task 2	Task 3	Task 4	Task 5
Design Review	Total Duct Leakage	Blower Fan Airflow	Blower Fan Watt Draw	Refrigerant Charge

HVAC grading makes it easier to certify ENERGY STAR homes and apartments:

- Integrates most ENERGY STAR HVAC requirements into an ERI rating
- Does not require a credentialed HVAC contractor
- Eliminates the HVAC Commissioning Checklist
- Rewards proper installation with ERI points and helps meet the 45L tax credit

“I live on the top of a mountain in Waterford, Maine, where it gets pretty windy. That’s not a challenge for my heat pumps, which during the February cold snap kept me warm without backup even during -49 °F wind chill! I’m also saving around $300 a month using heat pumps instead of propane.”

Frank D., Waterford, ME

“I’ve saved thousands of dollars by heating my entire home with two heat pumps. I’ve kept my oil-burning furnace as backup, but it rarely gets used. In fact, I haven’t had an oil delivery since the fall of 2021.”

Paul N., Van Buren, ME

2. ENERGY STAR Certified Multi-Speed Heat Pumps

What we know:

- Heat pumps have been successfully heating homes for decades
- Heat pumps reduce emissions compared to gas furnaces everywhere in the US
- HVAC grading improves ERI scores for rated homes

What we are still working on:

- Determining which locations heat pumps (including dual-fuel) reduce energy *costs*
- Creating best practices on sizing and selecting heat pumps for very cold climates

Fun fact: Air at 0°F has 85% of the thermal energy as air at 70°F

3. ENERGY STAR Certified Heat Pump Water Heaters

- ENERGY STAR certified heat pump water heater that meets EPA's 'connected' criteria

- Each heat pump water heater is 208/240 volts, with minimum tank capacity as follows:

Bedrooms	0-1	2	3	4+
Tank Capacity	36	45	59	72

- Each heat pump water heater located within occupiable space has a sone rating ≤ 55 dBA

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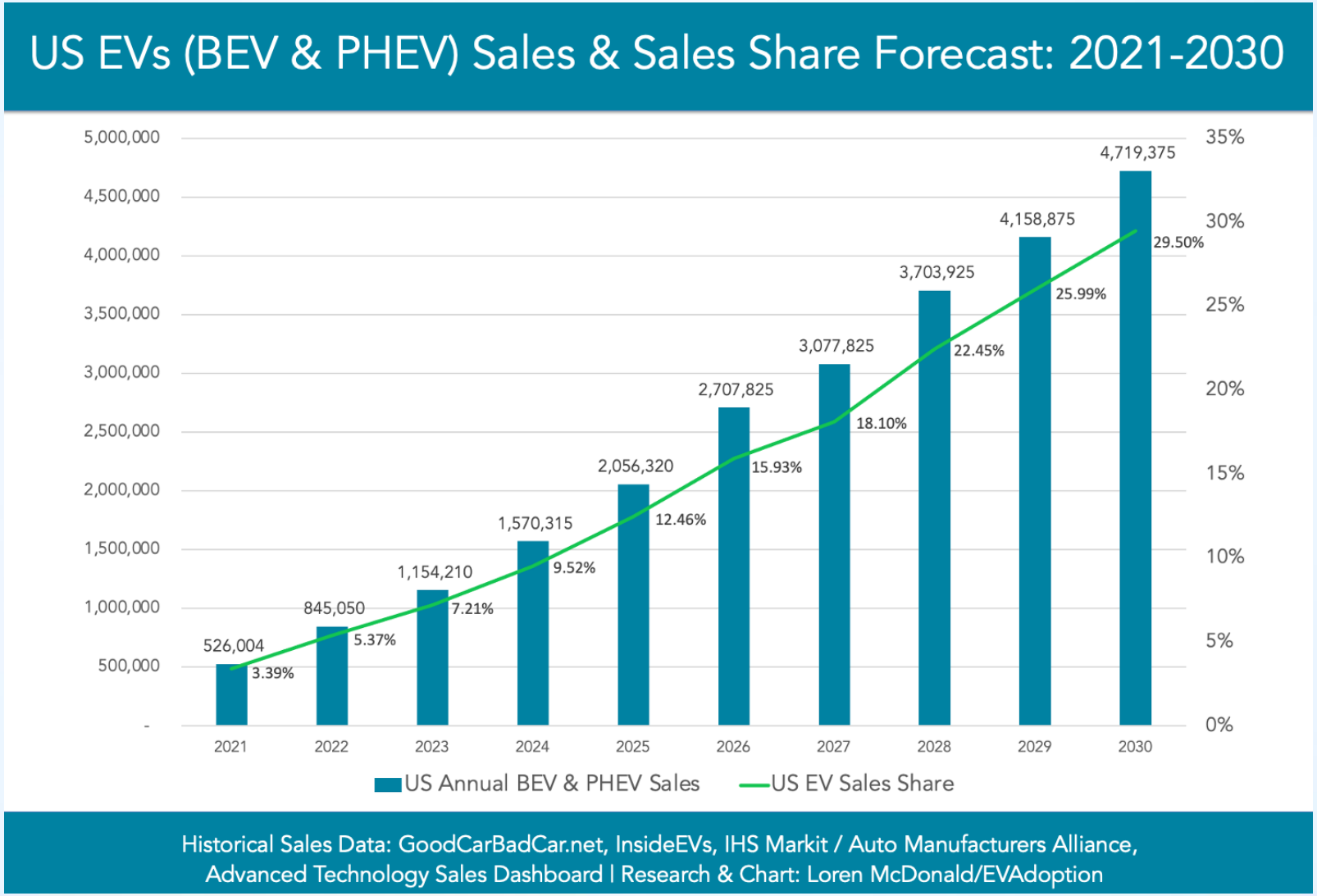
4. Electric Cooking

Cooktops and ovens are electric. Induction range elements / burners are recommended, but not required.

Footnote:

This requirement does not apply for sleeping units without kitchens but does apply to kitchens in common spaces. This requirement does not apply to cooking appliances located outside the building thermal envelope, (e.g. grills or outdoor kitchens).

5. Electric Vehicle Charging Capability



5. Electric Vehicle Charging Capability

- For one- and two-family dwellings with dedicated parking:
  - **EV-Ready:** One parking space is provided per dwelling unit that includes:
    - A powered 208/240 receptacle is installed in garage or within 3 feet of driveway or dedicated parking space
    - The electric service panel includes a 40-amp **(or greater)** breaker and panel directory identifies the branch circuit as “Electric vehicle charging”

5. Electric Vehicle Charging Capability

- For all other dwellings, comply with either EV-Ready or both of the below:
  - **EV Charger:** Install (at a minimum) the following number of ENERGY STAR certified EV-Chargers that meet EPA's 'connected' criteria as follows:

Parking Spaces:	1-10	11-20	21-30	31-40	41+
EV Chargers:	1	2	3	4	5

  - **EV-Capable:** Conduit is installed that runs continuously from the electrical panel to a junction box that terminates within 3 feet of at least 20% of the development's parking spaces

NextGen overlay with select ZERH v2 requirements

DOE ZERH v2 Requirements

- ENERGY STAR v3.2
- Heat Pump Space Heater Ready
- Heat Pump Water Heater Ready
- Electric Vehicle Ready
- (Nothing on electric cooking)

Feature Specific Messaging

1. Energy Efficiency Prerequisite

ENERGY STAR is one of the most trusted brands in the US, and nearly 80% of homebuyers identify ENERGY STAR certification as a highly desirable feature.

ENERGY STAR NextGen homes and apartments meet EPA's most advanced ENERGY STAR program requirements for energy efficiency and performance. They are 20% more energy efficient than homes built to typical code levels (2018 IECC).

2. ENERGY STAR Certified Multi-Speed Heat Pumps

ENERGY STAR NextGen homes and apartments allow you to take control of your comfort with a quiet and responsive heating and cooling system

3. ENERGY STAR Certified Heat Pump Water Heaters

A typical water heater uses more energy than a refrigerator, clothes washer, dishwasher, and dryer combined

Connected features allow for remote adjustments and alerts from anywhere, and enable residents to further lower electric bills through optional participation in utility demand-response programs (where available)

4. Induction/Electric Cooking

Electric cooktops and ovens eliminate the emissions of indoor air pollutants associated with gas combustion, including carbon monoxide and nitrogen dioxide, and contribute to a healthier indoor living environment.

> Children living in homes with gas stoves have a 42% increased risk of having asthma, according to a meta-analysis of 19 studies.[1]

Optional induction cooktops have precise temperature control, boil water quickly, and have cooktop surfaces that remain cool to the touch, making them easier to clean.

Cooking Pollutants 101

1. All cooking emits unhealthy particulates PM2.5
2. Cooking with gas also emits combustion pollutants (NO_2 & CO), often at elevated and hazardous levels
    - NO_2 exposure is associated with asthma severity, wheeze, night symptoms, rescue medication.
    - Exposure and hazard is higher in smaller homes and with more cooking.
3. Vented range hoods can remove a significant portion of all cooking-related contaminants.
    - Many people don't use range hoods because they think they are not needed.
4. Gas piping can also emit methane and benzene into homes, regardless of appliance use
5. Shifting from gas to electric eliminates combustion byproducts such as NO_2 and CO and reduces ultrafine particles, but does not affect pollutants from cooking itself (PM2.5).
6. Filtration via central forced air or portable air cleaners can remove fine & ultrafine particles (from cooking), but not NO_2 or CO (from gas).

NO_2 Pollutant Levels

There is no regulation of indoor air quality

Our best approximation for exposure limits is using EPA's National Ambient Air Quality Standards

NAAQS 1-hour exposure of NO_2 is 100 ppb, not to be exceeded more than once a year

An LBNL study estimates that 38-64% of homes in SoCal exceed this level at least once per week using a single cooktop (without a range hood)

Number drops to 9-24% of homes with range hood use

Final Policy Directive, Policy Number 20225

"Natural" gas stoves generate a number of harmful air pollutants, with nitrogen dioxide (NO2) most consistently identified in scientific literature. Multiple high-quality scientific studies have shown that NO2 concentrations are higher in homes that use gas stoves, and that cooking with gas stoves without ventilation can result in NO2 concentrations in the home that are above EPA ambient air quality standards. The EPA has determined that NO2 is "causal" of more severe respiratory symptoms in people with asthma and that long term exposure to NO2 is "likely causal" of respiratory illnesses, like asthma. Further, epidemiological studies show that gas stoves are associated with increased risk of asthma in children and more severe asthma symptoms in children. Despite this evidence, there are few safeguards in place to protect the health of the public from gas stove emissions, particularly for communities that are overburdened and underserved. While comprehensive federal law regulates outdoor air quality in the U.S., there are no federal indoor air quality guidelines, and few state or local policies addressing indoor air pollution. Those living in smaller, older, less-ventilated homes are at higher risk from the effects of indoor air pollutants from a variety of sources, introducing a disproportionate risk of illness for lower-income populations and people of color. Along with other healthy home improvements, health experts should advocate for an equitable, multi-pronged approach to combat indoor air pollution from gas stoves, including policy change, program development, education about emissions mitigation, and investment.

Final Policy, D-135.964

- RESOLUTION 439 – INFORMING PHYSICIANS, HEALTH CARE PROVIDERS, AND THE PUBLIC THAT COOKING WITH A GAS STOVE INCREASES HOUSEHOLD AIR POLLUTION AND THE RISK OF CHILDHOOD ASTHMA
- RESOLVED, That our American Medical Association recognize the association between the use of gas stoves, indoor nitrogen dioxide levels and asthma (New HOD Policy); and be it further
- RESOLVED, That our AMA inform its members and, to the extent possible, health care providers, the public, and relevant organizations that use of a gas stove increases household air pollution and the risk of childhood asthma and asthma severity; which can be mitigated by reducing the use of the gas cooking stove, using adequate ventilation, and/or using an appropriate air filter (Directive to Take Action); and be it further
- RESOLVED, That our AMA advocate for innovative programs to assist with mitigation of cost to encourage the transition from gas stoves to electric stoves in an equitable manner.

More detailed problem statement can be found here.

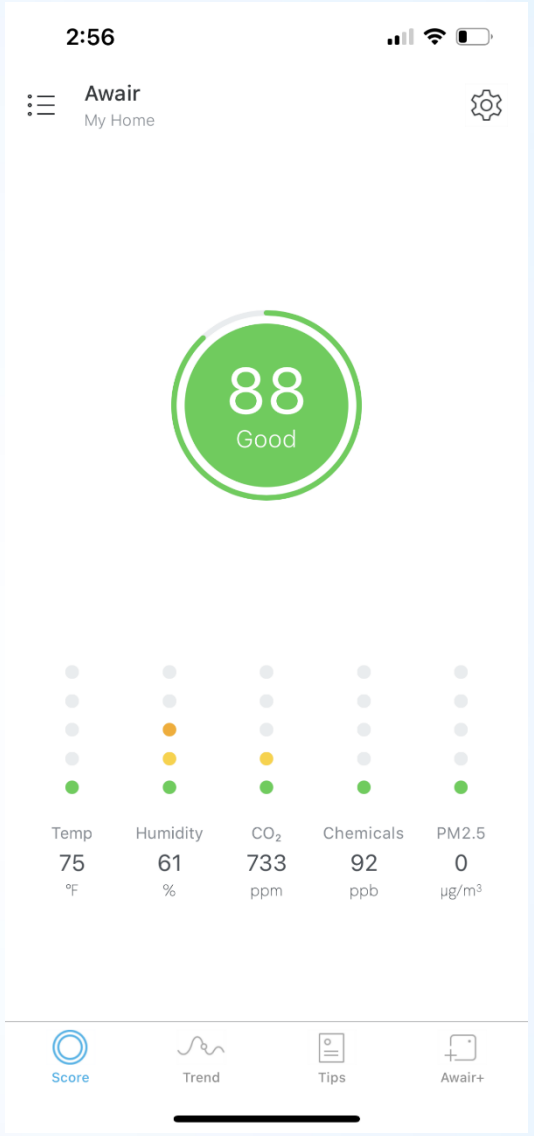
Health Impacts of Combustion in Homes, a comprehensive literature review released by the American Lung Association.

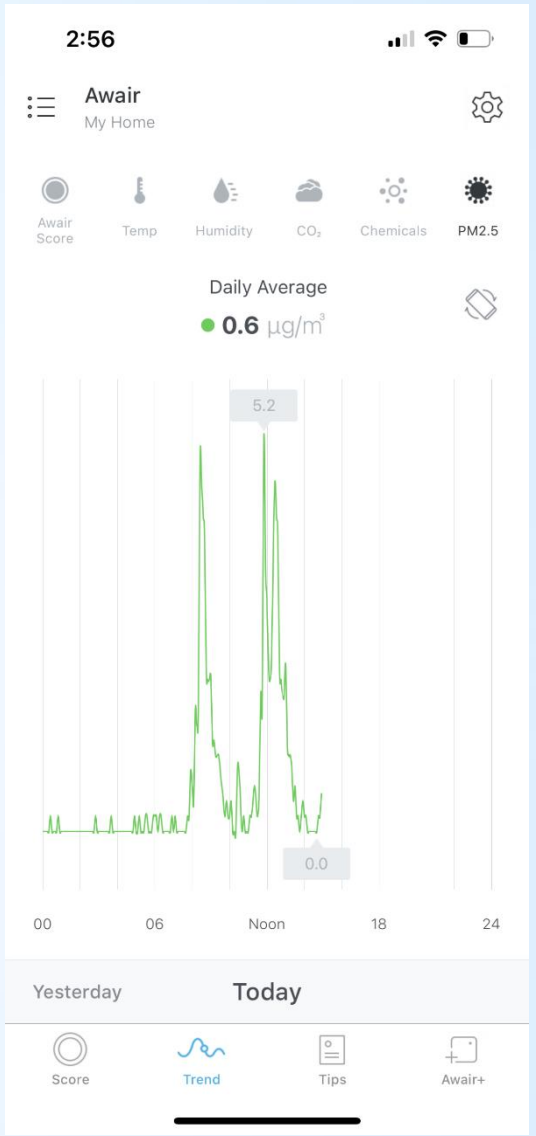
- Appliances using combustion to create energy can increase asthma symptoms in children and other vulnerable populations. Studies show consistent associations between higher pollution levels and detrimental respiratory effects in children, including worse lung function for children with asthma.
- Indoor exposure to emissions from cooking on gas stoves can worsen asthma symptoms, cause wheezing, and result in reduced lung function in children, particularly in the absence of ventilation and for children living with asthma or allergies.

Approved Statements for NextGen Homes

- The advanced electric and hybrid equipment found in ENERGY STAR NextGen homes and apartments can reduce or eliminate emissions of indoor air pollutants associated with gas combustion, including carbon monoxide, nitrogen dioxide, and particulates, and contribute to a healthier indoor living environment.
- Gas-fueled equipment is a source of carbon monoxide, which at elevated levels, can cause fatigue, headaches, confusion, dizziness, and in some cases, death.
    - People with cardiovascular disease, fetuses, infants, and the elderly may be especially sensitive to carbon monoxide.
- Gas-fueled equipment is a source of nitrogen dioxide, which can cause or worsen respiratory health conditions, including asthma.
- ENERGY STAR NextGen homes and apartments come with induction cooktops and electric ovens, reducing exposure to common combustion by-products, including carbon monoxide, nitrogen dioxide, and particulates.

Learn in your own home w/ an IAQ monitor





5. Electric Vehicle Charging Capability

In homes with private parking, a heavy-duty power outlet is wired in and ready to charge an electric vehicle

Even if you don’t have an EV today, having the necessary wiring installed or access to a charger will make it quicker, easier, and less expensive to go electric if you’re ready to make the change in the future.

November 2023 Program Launch

Learn more at:
www.energystar.gov/NextGenHomes

Or contact me at: foss.asa@epa.gov