



| Gas Stoves and Your Health

Consumers aren't being told about the potential health risks of cooking with gas

U.S. PIRG
Education Fund



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**SIERRA
CLUB**



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| EXECUTIVE SUMMARY

GAS STOVES ARE POLLUTING AMERICAN HOMES AND PUTTING OUR HEALTH AT RISK.

A growing body of research finds [gas stoves use emits health-harming pollutants inside homes](#) and - alarmingly - gas stoves leak toxic chemicals and carcinogens even while off.

A [study](#) from Boston, Massachusetts, recently found 21 hazardous air pollutants - including benzene - leaking into homes from unburned gas. A [similar study](#) conducted in California kitchens found hazardous air pollutants accumulating in homes through leaking gas, again including benzene, a known carcinogen linked to blood disorders and leukemia. Researchers measured concentrations up to seven times California's recommended exposure limit - levels comparable to [living with a smoker](#). It is likely this situation is occurring in kitchens across the country.

More pollutants are released during the cooking process due to gas combustion. A [meta-analysis](#) of 41 studies found that simply using a gas stove releases significant nitrogen dioxide (NO₂) pollution at concentrations that would exceed EPA outdoor air quality standards. The health impacts of this NO₂ exposure are numerous. Children living in homes with gas stoves have a 42% increased risk of

experiencing asthma symptoms, and a 24% increased risk of ever being diagnosed with asthma by a doctor over their lifetime.

Proper overhead ventilation that exhausts outdoors [can help reduce exposure](#) to pollutants from gas stoves and cooking activities. However, ventilation alone does not significantly reduce risk. In fact, one [study](#) found even whole home mechanical ventilation is not adequate to reduce NO₂ pollution indoors. Worse yet, while national data for how many homes have proper stove ventilation is lacking, [researchers have found](#) gas stoves without properly vented exhaust hoods are common, as many vents for gas ranges merely recirculate air and do not vent outdoors. Ventilation can also often be used improperly and does not always eliminate indoor air pollutants, nor does it address toxins released when the stoves are off. That said - it is an important tool to reduce risks in lieu of replacing the stove.

This recent surge of evidence about the risks of gas stove use has sparked mainstream public discussion about gas stoves, but knowledge that outdoor ventilation is needed to reduce harm from gas stove is not actually new.

Consumer Reports stated in 1982 that studies indicate, "Children from gas-stove homes have a greater incidence of

respiratory illness and impaired lung function than those from homes with electric stoves.” In a 1984 article, Consumer Reports further stated that, “the evidence so far suggests that emissions from a gas range do pose a risk — though probably not a major one — of impairing the health of some people in some homes. If you are buying a new range and can choose between electric and gas, that fact, added to other advantages of electric ranges may make you choose an electric one.”

Nearly forty years later, consumers and public health organizations with questions about gas stove pollution and health are met with a lack of meaningful action from federal agencies including the U.S. Consumer Product Safety Commission and the U.S. Environmental Protection Agency. And while concern is growing among the general public about gas stove pollution, the risks are not new to these federal agencies or the gas industry. In fact, [the EPA and CPSC](#) were aware of gas stove pollution and its connection to asthma for nearly 40 years, yet each has yet to act.

Today, indoor air quality in homes remains unregulated by any federal agency and the CPSC has yet to take meaningful action on gas stove pollution. This information vacuum has left consumers unaware of the health concerns of gas stove pollution for decades, as well as what they might do to mitigate health risks, such as proper outdoor ventilation in homes with gas stoves.

In lieu of action by federal agencies to protect public health from gas stove pollution or federal standards requiring outdoor ventilation, there is a clear opportunity for consumer education at point of sale.

The retailer opportunity

As the source of much of the information consumers consider when purchasing an appliance, retailers have an opportunity to educate Americans on safely using a gas stove, including the need for proper ventilation.

Most people shopping for a new stove, oven or cooking appliance have very little information about the potential health risks of cooking with gas, the need for outdoor ventilation when purchasing a gas range, or alternatives to entirely avoid gas stove pollution with electric or induction cooking.

Retailers who are concerned about protecting the health and safety of their customers can do a better job of educating consumers and ensuring that they have all the information necessary to protect themselves and their families.

Surveys of retail locations

To better understand what information consumers are currently getting at the point of sale regarding gas stoves, pollution and ways to mitigate risks, staff and volunteers engaged in a survey. We surveyed 38 locations of Lowe's, Home Depot and Best Buy in 10 states, and found that consumers get little to no information about the potential health harms of gas stove pollution or the need for ventilation.

KEY FINDINGS

Knowledge of gas stove pollution and health impacts

- **74%** of store associates shared there were no concerns or they were not aware of any details about gas stove pollution and health risks.



Susanne Helmer (CCO 1.0)

Knowledge of ways to mitigate risks

- When asked if an externally venting range hood was needed when buying a gas stove, **more than 6 in 10 (65%)** said it was not necessary.
- **Half (50%)** of stores visited did not display vent hoods next to gas stove displays.



Oregon State University (CC BY-SA 2.0)

Cooking options: On display & knowledge

- **More than 18%** of stores did not have induction cooking on the showroom floor.
- While **74%** of sales associates were knowledgeable about how induction works, **13.5%** of sales associates recommended gas over induction.



Sebastian Wallroth (CC BY-SA 3.0)

The Retailer Opportunity: Recommendations

These surveys revealed several opportunities for retailers to do a better job of protecting their customers from gas stove pollution, especially as manufacturers are not currently required by the CPSC to include warning labels. Lowe's, Home Depot, Best Buy and other retailers of ranges and cooktops can and should take the following steps to better protect their customers from the health risks associated with cooking with gas:

- **Train sales people to answer questions about indoor air pollution and gas stoves.** Most of the sales people we talked to as a part of our survey hadn't heard anything about the health risks of gas stove pollution, and none were able to provide comprehensive information about the topic. Nor were they able to provide advice about the need for proper, ducted ventilation that leads outdoors. All retailers of gas stoves should implement a training program to educate their workforce about how to talk to customers about the issue. Retailers can partner with organizations that have expertise on the subject matter and training experience, such as [Physicians for Social Responsibility](#).
- **Package and display vent hoods in a way that makes it clear outdoor ventilation is needed for gas stoves.** In stores, retailers should make sure that to the extent possible, gas stoves are displayed with vent hoods above them, or that vent hoods are displayed near the ranges in a way that makes it obvious they are meant to go together. There should also be customer education materials that suggest what type of vent hood is necessary for specific ranges and why. Online, retailers

should make it easier for customers to see suggested vent hood options for each specific range, as well as a guide to ensure customers understand how to vent outdoors.

- **Design signage, labels and customer education materials that promote the clean air benefits of cooking with electric appliances such as induction ranges or cooktops.** Cleaner and healthier indoor air is a benefit of induction and electric ranges which retailers should highlight with signs and other materials next to the appliance on the showroom floor and displayed online as well. For example:

[See next page]



Smart Energy Solutions: Electrify your cooking

Welcome to the future. Induction cooking is steadily winning over Americans as the latest and greatest in cooking technology. Efficient, precise and safe, cooking on induction provides numerous benefits not just for passionate chefs and food lovers, but for the overall health and wellbeing on American families.

Switching to electric

- You may be eligible for up to \$840 in incentives to help pay for an electric or induction cooktop or stove under the federal Inflation Reduction Act.
- To switch to electric, you may need to update your electrical panel, but you may be eligible for incentives or credits to help alleviate those costs under the Inflation Reduction Act as well.

Did you know? Children who live in homes with gas stoves have an increased risk of experiencing symptoms of asthma.

- **Ensure that brick and mortar stores have induction ranges or cooktops available for display.** Given that it is a new technology for many Americans, people may be more comfortable with considering induction if they can see it in person and get a better feel for how it works. Not all of the stores we surveyed had them available for display. This presents an opportunity for video tutorials on how to use induction cooking technology both online and with an in store video display.
- **Make readily available information about local, state and federal rebates and tax credits for electrification both in stores and online.** The recently passed [Inflation Reduction Act](#) included several incentives, rebates and tax credits that can help Americans go electric – including potential rebates for electric and induction ranges, as well as any electrical upgrades that might be necessary for the installation. States and local governments may also provide additional incentives. Retailers should have information about these rebates and incentives available for customers as they are considering what type of range or cooktop to purchase.
- **Retailers should call for federal agencies such as CPSC to take action on gas stove pollution.** In addition to retailers taking the above steps to ensure consumers understand gas stove pollution risks and ways to protect their health, retailers can also call for strong, meaningful health protective standards and awareness campaigns from federal agencies such as from the CPSC.

| Introduction

Many Americans love their gas stoves, but there's a hidden danger seeping out of them: air pollution.

Cooking with gas can [produce](#) air pollution levels indoors that would exceed outdoor standards. That means that doing something as simple and innocuous as making a meal can release pollutants into our homes that some studies show lead to the development of [asthma](#), especially in children, and may [worsen asthma symptoms](#) for those with preexisting respiratory illnesses. One report [compared](#) the effects of using a gas stove around kids to exposing kids to secondhand smoke.

And yet, most people still think cooking with gas is the best option – until they try cooking on induction. Still, in many instances, gas stoves are cheaper, though the reduced sticker price is sometimes driven by [subsidies](#) that still exist for gas appliances and infrastructure.

But perhaps most significantly, people are largely unaware of the health and safety risks associated with gas stoves.

That's because gas companies have [marketed](#) the products in ways that extol the virtues of gas stoves, without adequately acknowledging the potential health and safety risks.

As a result, consumers are not warned of the risks when they purchase a gas stove. While proper ventilation is important for reducing exposure to indoor air pollution, it's often [not required](#) for gas stove installations and even in households with sufficient external ventilation, homeowners don't often use it.

Today, [nearly a third](#) of Americans have a gas stove in their home. That's millions of households potentially being exposed to toxic pollutants every time they make a meal – and running a gas stove for even [just one hour](#) can lead to pollutant levels that exceed health-based standards.

Greater public awareness of gas stove pollution is urgently needed, including how to mitigate risks with the proper ventilation, as well as how to entirely avoid these risks with electric cooking alternatives.

Whether ceramic cooktops, induction ranges or toaster ovens, cooking with electric does not emit or leak the chemicals that come from the methane gas piped into our homes. However, with induction there is a big opportunity to advance the adoption of electric cooking alternatives. Already popular in [Europe and Australia](#), induction cooking is [steadily winning over](#) Americans as the [latest and greatest](#) in cooking technology. Efficient, precise, and safe, cooking on induction cooktops provides numerous benefits not just for [passionate chefs](#) and food lovers, but for the overall health and wellbeing of American families.

That's where retailers come in.

Many people get the information they need to make a decision on what appliance to purchase by visiting a store, looking at the product and asking questions. The ways major retailers advertise, package and display their products have a large impact on consumer choice.

A survey of various locations across the country of the three [largest retailers](#) of home appliances - Lowe's, Home Depot and Best Buy - reveals that there are many opportunities for them to better educate and protect their customers.

Retailers that sell cooking appliances should take on the responsibility of educating consumers, not only because it's the right thing to do, but because it's good business. By promoting the healthy air benefits of induction and electric options, and by ensuring that staff are well-versed and able to talk about the risks, and the need for ventilation, when using gas, retailers can help protect their customers from health-harming pollution.



*Gas Stoves on display at a Lowe's in Maryland
Staff photo*

GAS STOVE POLLUTION IS HARMING AMERICAN FAMILIES

GAS STOVES ARE POLLUTING AMERICAN HOMES AND PUTTING OUR HEALTH AT RISK.

Gas stoves emit [several pollutants](#), [sometimes](#) even when [not combusting gas](#). These include: nitrogen dioxide (NO₂), carbon monoxide (CO), and formaldehyde.

None of these pollutants are released from electric stoves. While cooking food on any type of stove emits [fine particulate matter](#) (PM_{2.5}), gas stoves can emit nearly double the amount of particulate matter as electric stoves. Recent studies in [California](#) and [Boston](#) have found that gas stoves, even when not in use, can leak high levels of benzene.

FIGURE 1: HEALTH IMPACTS OF GAS STOVE POLLUTANTS

| Pollutant | Health Impacts |
|------------------------------------|---|
| Nitrogen Dioxide | Increased inflammation of the airways, worsened cough and wheezing, reduced lung function, increased asthma attacks, cardiovascular harm. |
| Carbon Monoxide | Tightness of the chest, headache, fatigue, dizziness, nausea, brain and heart toxicity, reproductive risks, death. |
| Formaldehyde | Respiratory and skin irritation, coughing, wheezing, nausea, cancer. |
| Particulate Matter | Increased asthma attacks, bronchitis, increased risk of heart attack, death. |
| Benzene | Dizziness, headaches, skin and respiratory irritation, blood disorders and increased risk of leukemia. |

Indoor air pollution from gas stoves can reach levels that exceed outdoor air quality standards. An RMI [report](#) found that NO₂ emissions from gas stoves can reach peak levels indoors that nearly triple the [current EPA one-hour standard for outdoor air](#), which is 100 parts per billion (ppb). The report cites that activities such as baking a cake in a gas oven range, boiling water on the stove, and just running a gas cooktop on its own resulted in peak NO₂ emissions of 230, 184, and up to 300 ppb, respectively.

Gas stoves have been explicitly linked to increased risk of childhood asthma.

[Children](#) who live in homes with gas stoves have an [increased risk](#) of respiratory illnesses. A meta-analysis of 41 studies found that children living in homes with gas stoves have a 42% increased risk of experiencing asthma symptoms, and a 24% increased risk of ever being diagnosed with asthma by a doctor over their lifetime. Another [report](#) by the Australian Climate Council suggests that a child living in a home with a gas stove faces a similar risk of asthma to a child living in a home with cigarette smoke.

Ventilation is important, but not always enough to address the health effects.

Proper overhead ventilation that exhausts outdoors can [help reduce exposure](#) to pollutants from gas stoves and cooking activities. However, ventilation alone is not a perfect solution, due to a worrisome lack of public awareness and regulation. Many households either [don't have exhaust hoods, don't use them regularly](#), or their hoods don't vent outside and merely recirculate air. Additionally, the performance of hoods on the market varies greatly in quality, with some capturing less than [15% of emissions](#).

A recent study by Enterprise Community Partners and the National Center for Healthy Housing found that while whole-home mechanical ventilation systems clear out many indoor air pollutants, they did not protect residents from gas stove pollution. Researchers did not observe significant changes in the levels of NO₂ from the use of whole home mechanical ventilation systems, "[countering the misconception that opening windows or increasing ventilation is enough to address the health impacts of \[gas\] appliances](#)." The study's authors recommend builders and owners install continuous mechanical ventilation systems in all homes, while eventually phasing out gas stoves altogether.

If even the best ventilation won't solve gas stove pollution exposure, consumers can still mitigate risk by choosing an electric stove or induction range - eliminating their exposure to NO₂ and associated health risks.

Electric cooking offers a healthier alternative.

Electric cooking does not require combustion and therefore does not emit toxics and NO₂ as from the blue flame of a gas stove. Cooking with an electric slow cooker, ceramic top electric stove or induction stove will result in healthier air quality than cooking with gas. While many decry the older electric "coil" model of stoves from decades past, electric cooking technology has evolved tremendously with the advent of induction cooktops and ranges in the U.S., which offers both healthier air benefits as well as higher performance, making induction a popular option for those wishing to upgrade from their gas stove.

Because induction cooktops are highly efficient and powered by electricity, they also present a more sustainable alternative than gas. Electric-powered appliances have the potential to run cleaner and greener as America's energy system is progressively powered by [more renewable energy sources](#) than ever before.

Induction cooktops use [magnetism](#) to heat metal cookware. When you turn an induction range or cooktop on, electric currents underneath the smooth cooking surface create a magnetic current within the cookware being used. This direct transfer of energy results in instant, efficient heating; in fact, induction cooktops heat up [faster](#) than both gas and electric smoothtop cooktops, with some models boiling a pot of water in just [2 minutes](#). Induction also results in unbeatable and [precise control and consistent levels of heat](#), as the appliance responds immediately to changes in temperature by adjusting the strength of the electric currents. Induction is great for homes in hot places, as only heating the pan means that lost heat energy won't contribute to warming up your kitchen. It's also safer, since there's no open flames or hot surfaces involved, and the smooth cooking surface makes cleaning up a breeze.

Induction cooking works for [all types of cuisines](#) – whether you're cooking with a wok, making cooktop breads like tortillas or naan, or if you need to steam, char, sear or boil. Induction can do it all.

The retailer opportunity

To improve public health, consumers need to be aware of the health harms of gas stove pollution and the ways to mitigate those risks. With federal agencies such as the CPSC and EPA failing to act to protect public health and consumers, a critical opportunity arises for education at the point of sale.

Staff and volunteers engaged in a survey to better understand what information consumers are currently getting at the point of sale regarding gas stoves, pollution and ways to mitigate risks.

Surveys of retail locations reveal opportunities to protect consumers

IN SEPTEMBER AND OCTOBER, 2022, WE CONDUCTED SURVEYS of various locations of the three largest appliance retailers in the U.S. -- Lowe's, Home Depot and Best Buy -- in an effort to determine:

- How gas and induction ranges are being marketed at the stores.
- What information, if any, on gas stove pollution is being shared at the point of sale.
- What information is being shared on ways to mitigate risk at point of sale.

We surveyed 38 locations in 10 states, and each surveyor reported the following information about the set up of the store's section containing ranges:

- How is the section organized?
- Where are the gas stoves? Near vent hoods?
- Where are the electric and induction stoves?
- What do the marketing materials show/say?

Each surveyor also asked the following questions of a staff person working the section:

- I've heard that gas stoves may emit pollutants that can be harmful to health, especially for kids. Is that something I should worry about? Do they offer methods to reduce harm?
- Do I need an external venting hood if I'm getting a gas stove?
- How does induction work?
- Do induction stoves work as well as gas?

While this is a small sample size compared to the total number of Lowe's, Home Depot, and Best Buy locations in the nation, the surveys do reveal some trends and opportunities for improving how these products are marketed in the stores.

SURVEY FINDINGS

Knowledge of gas stove pollution and health impacts

- **Nearly three-quarters (74%) of store associates shared there were no concerns or they were not aware of any details about gas stove pollution and health risks.**
- Related to this question, surveyors reported the following:

"She brushed off my question when I asked about indoor air pollution from gas stoves and said that people are more concerned about grease splatter and smoke from burning food."
-Best Buy in Washington

"He said that gas is clean burning."
-Home Depot in Pennsylvania

"They have had no employer or vendor training on indoor health quality aspects. This idea was new. "
-Lowe's in Maryland

"Employee disregarded concerns about health hazards from gas stoves. 'Lots of people have them.'"
-Home Depot in California

Vent hoods: on display and knowledge

- **When asked if an externally venting range hood was needed when buying a gas stove, more than 6 in 10 (65%) said it was not necessary.** We gave credit for this question whether the associate said it was required by local laws or codes, because it helped alleviate pollution, or for any other reason. Some of associates seemed to recommend vent hoods, even if they said they were not strictly necessary.
- Related to this question, surveyors reported the following:

"[They] seemed confused when I asked about pollutants, but when I asked more about venting they said it wasn't required but some people wanted them to keep the house clean."
-Home Depot in Illinois

"Again, according to the employee, health problems weren't an issue."
-Home Depot in California

"[They] recommended them to help keep cooking smoke from staining cabinets."
-Lowe's in Colorado

Compounding the confusion about ventilation is that most locations had far fewer vent hoods on display than stoves, and they often were off to the side and not displayed above or with the gas stoves.

- **Half of the stores visited did not display any vent hoods next to gas stove displays, some had no hoods on display at all.**
- Related to this question, surveyors reported:

"The [vent] hoods were about 40 feet away tucked in the back aisle -- dusty, too."

-Lowe's in Maryland

"I didn't see any hoods that were of the large, obviously external variety at all."

-Best Buy in Colorado

"No vent hoods were up for public display."

-Home Depot in Pennsylvania

"There were several aisles with only stoves/cooktops, no vents, and a smaller area that had some cooktops displayed with microwaves and vent hoods."

-Lowe's in Texas

Cooking options: on display and knowledge

One important strategy to mitigate risks of gas stove pollution is to choose an electric stove or induction cooktop as a healthier option when it comes to indoor air quality. Given this, the survey included what was present on the showroom floor and what information was shared regarding these alternatives.

- Most locations had gas, electric and induction options available for display. **Some stores (18%) didn't have any induction options, and surveyors were told they would have to look online and wouldn't be able to see the range in person before purchase.**
- Related, to this question, surveyors reported:

"Just one induction [range], about 5 other electric, and about 15-20 gas."

-Best Buy in California

"There were 3 rows fully of gas stoves, and only one row that was half gas stoves and half induction stoves. Advertising was skewed towards the gas stoves with discounts and sales on gas stoves, but no similar marketing for induction stoves. Their 'model kitchen' also had a gas stove."

-Home Depot in Pennsylvania

Sales staff across all three retailers were generally knowledgeable about how each option worked, including induction, and could explain the cooking-related benefits of induction. Some indicated that many people prefer gas, but they generally did not indicate a preference for one technology over the other.

- **Most (74%) of sales associates were knowledgeable about how induction works.**
- **Some (13.5%) sales associates recommended gas over induction.**
- Related to this question, surveyors reported:

"There was only one induction stove -- it took awhile for her and I to find it.

She said it's not worth the money - people are just getting the induction stoves to Keep up with the Jones's."

-Home Depot in Colorado

"Very knowledgeable! Explained the science, pointed out less burn risk for kids, easier to clean; but that you may need new pots/pans and the cost of the stove itself may be more."

-Best Buy in Colorado

Online sales provide additional opportunities to protect consumers

THE SURVEYS REVIEWED THE BRICK AND MORTAR MARKETING OF COOKTOPS AND RANGES at Lowe's, Home Depot and Best Buy locations across the country, but these retailers also have major e-commerce operations. All three are among the [top five](#) online retailers of home appliances.

The three websites are set up similarly. Ranges and cooktops can be viewed in the "appliance" section of the sites, and they can be sorted in a variety of different ways, including by fuel source, finish and features. It is easy to find induction, electric or gas options. None of the websites make it obvious that gas stoves should be used with ventilation, and none of the websites highlight the healthy air benefits of electric or induction cooking.

On all three websites, range hoods are sold in a different section than ranges and cooktops. Lowe's does show overhead microwaves with fans and range hoods in "Regularly Bought Together," but it also includes items like refrigerators and dishwashers, which, unlike ventilation, are things that are not necessary to safely operate a gas range. Best Buy, similarly, includes overhead microwaves with fans, as well as dishwasher, in a section called "[Frequently Bought Together](#)," on a page selling a gas stove. So it is not obvious from these pages that ventilation is important. Home Depot has a section called "Get Everything You Need," that does not include ventilation.

REGULARLY BOUGHT TOGETHER

| Product | Price | Rating |
|---|-----------------------------------|------------|
| Samsung 2.1-cu ft 1000-Watt Over-the-Range Microwave w... | \$429.00 (Save 10% from \$479.00) | ★★★★☆ 551 |
| Samsung StormWash Top Control 24-in Built-In Dishwasher... | \$899.00 | ★★★★☆ 1134 |
| Samsung 19.5-cu ft French Door Refrigerator with Ice... | \$1,799.00 | ★★★★☆ 90 |
| Samsung 30-in Gas and Electric Range Back Guard Kit (Black) | \$197.96 | ★★★★☆ 18 |
| Samsung 36-in Ducted Stainless Steel Wall-Mounted Rang... | \$1,449.00 | ★★★★☆ 91 |
| Samsung 1.9-cu ft 1000-Watt Over-the-Range Microwave w... | \$439.00 | ★★★☆☆ 7 |

An example from [Lowe's website](#) (visited December 1, 2022).



30 in. 5.0 cu. ft. Gas Range in Stainless Steel with Griddle

by GE ★★★★★ (15837) ❤️ 18.7k

[Product Details](#)

[Specifications](#)

[Questions & Answers](#)

× Get Everything You Need (4)



GE
Gas Range Grate

★★★★★ (506)

\$78⁰⁰

[Add to Cart](#)



BrassCraft
4 ft. Gas Range Connector Kit
with Auto Shut Off

★★★★★ (328)

\$41⁹⁸

[Add to Cart](#)



Cerama Bryte
28 oz. Glass-Ceramic Cooktop
Cleaner

★★★★★ (644)

\$10⁹⁸

[Add to Cart](#)



Cerama Bryte
16 oz. Stainless Steel Cleaning
Polish and Conditioner

★★★★★ (92)

\$5⁹⁸

[Add to Cart](#)

An example from [Home Depot's website](#) (visited December 1, 2022).

When you open a page to view an induction stove for sale, all three store websites include good information about the product from the manufacturer, which highlights many of the benefits of induction cooking, including energy efficiency, temperature precision and safety. However, none of them highlight the indoor air quality benefits.

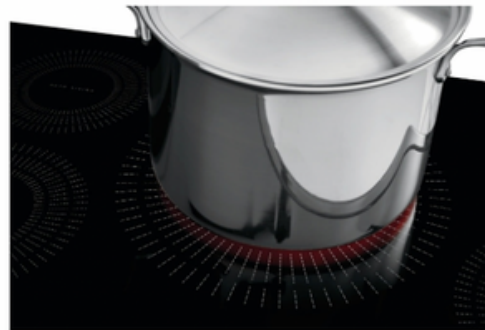
Lowes has a “[Range, Oven and Cooktop Buying Guide](#)” available online. It contains a lot of information about ranges, ovens and cooktops of all fuel sources, but does not contain any information about ventilation needs, or the clean air benefits of induction or electric cooking.

From the Manufacturer



Safe Surface

The Safe Surface – Induction only heats pans and the food in them, the area around the pans stays cool to the touch.



Energy Efficiency

Since induction only heats your cookware and not your kitchen, less energy is lost throughout the cooking process.

An example from [Best Buy's website](#) (visited December 1, 2022).

The Retailer Opportunity: Recommendations

THESE SURVEYS REVEALED SEVERAL OPPORTUNITIES for retailers to do a better job of protecting their customers from gas stove pollution, especially as manufacturers are not currently required by the CPSC to include warning labels. Lowe's, Home Depot, Best Buy and other retailers of ranges and cooktops can and should take the following steps to better protect their customers from the health risks associated with cooking with gas:

- **Train sales people to answer questions about indoor air pollution and gas stoves.** Most of the sales people we talked to as a part of our survey hadn't heard anything about the health risks of gas stove pollution, and none were able to provide comprehensive information about the topic. Nor were they able to provide advice about the need for proper, ducted ventilation that leads outdoors. All retailers of gas stoves should implement a training program to educate their workforce about how to talk to customers about the issue. Retailers can partner with organizations that have expertise on the subject matter and training experience, such as [Physicians for Social Responsibility](#).
- **Package and display vent hoods in a way that makes it clear outdoor ventilation is needed for gas stoves.** In stores, retailers should make sure that to the extent possible, gas stoves are displayed with vent hoods above them, or that vent hoods are displayed near the ranges in a way that makes it obvious they are meant to go together.

There should also be customer education materials that suggest what type of vent hood is necessary for specific ranges and why. Online, retailers should make it easier for customers to see suggested vent hood options for each specific range, as well as a guide to ensure customers understand how to vent outdoors.

- **Design signage, labels and customer education materials that promote the clean air benefits of cooking with electric appliances such as induction ranges or cooktops.** Cleaner and healthier indoor air is a benefit of induction and electric ranges and cooktops which retailers should highlight with signs and other materials next to the appliance on the showroom floor and displayed online as well. For example:

[See next page]



Smart Energy Solutions: Electrify your cooking

Welcome to the future. Induction cooking is steadily winning over Americans as the latest and greatest in cooking technology. Efficient, precise and safe, cooking on induction provides numerous benefits not just for passionate chefs and food lovers, but for the overall health and wellbeing on American families.

Switching to electric

- You may be eligible for up to \$840 in incentives to help pay for an electric or induction cooktop or stove under the federal Inflation Reduction Act.
- To switch to electric, you may need to update your electrical panel, but you may be eligible for incentives or credits to help alleviate those costs under the Inflation Reduction Act as well.

Did you know? Children who live in homes with gas stoves have an increased risk of experiencing symptoms of asthma.

- **Ensure that brick and mortar stores have induction ranges or cooktops available for display.** Given that it is a new technology for many Americans, people may be more comfortable with considering induction if they can see it in person and get a better feel for how it works. Not all of the stores we surveyed had them available for display. This presents an opportunity for video tutorials on how to use induction cooking technology both online and with an in store video display.
- **Make readily available information about local, state and federal rebates and tax credits for electrification both in stores and online.** The recently passed [Inflation Reduction Act](#) included several incentives, rebates and tax credits that can help Americans go electric – including potential rebates for electric and induction ranges, as well as any electrical upgrades that might be necessary for the installation. States and local governments may also provide additional incentives. Retailers should have information about these rebates and incentives available for customers as they are considering what type of range or cooktop to purchase.
- **Retailers should call for federal agencies such as CPSC to take action on gas stove pollution.** In addition to retailers taking the above steps to ensure consumers understand gas stove pollution risks and ways to protect their health, retailers can also call for strong, meaningful health protective standards and awareness campaigns from federal agencies such as from the CPSC.

Appendix I: Methodology & Survey Results

IN SEPTEMBER AND OCTOBER, 2022, WE CONDUCTED SURVEYS of various locations of the three largest appliance retailers in the U.S. -- Lowe's, Home Depot and Best Buy. We visited 38 locations in 10 states -- Massachusetts, New York, Pennsylvania, North Carolina, Illinois, Colorado, Texas, California, Oregon and Washington.

Surveyors were directed to observe the following:

- How is the section set up?
- Where are the gas stoves? Are they near vent hoods?
- Where are the electric and induction stoves?
- What do the marketing materials show/say?

Surveyors were also directed to speak to an employee and ask the following questions:

- I've heard that gas stoves may emit pollutants that can be harmful to health, especially for kids. Is that something I should worry about?
 - If they answer "yes" - do they offer methods to reduce harm?
- Do I need an external venting hood if I'm getting a gas stove?
- How does induction work?
- Do induction stoves work as well as gas?

Surveyors were then asked to report responses to the follow questions:

- Were gas stoves displayed right beside vent hoods?
- Did they have induction stoves on the floor?
- Did the employee you spoke to recognize concerns or share information about indoor air pollution from gas stoves?
- Did the employee share that an external vent hood was necessary to protect health?
- Was the employee knowledgeable about how induction works?
- Did the employee encourage or suggest gas stove over induction?

We counted each valid "yes" or "no" answer for each question, and calculated the percentages using the total number of valid answers for the question. In addition to answering "yes" or "no" to each question, surveyors could provide additional information, which is where we got the quotes listed in the "Survey Findings" section.

Survey Results

Were gas stoves displayed right beside vent hoods?

- Total Answers: 38
- Yes: 19
- No: 19

Did they have induction stoves on the floor?

- Total Answers: 38
- Yes: 31
- No: 7

Did the employee you spoke to recognize concerns or share information about indoor air pollution from gas stoves?

- Total Answers: 38
- Yes: 10
- No: 28

Did the employee share an external vent hood was necessary to protect health?

- Total Answers: 37
- Yes: 13
- No: 24

Was the employee knowledgeable about how induction works?

- Total Answers: 38
- Yes: 28
- No: 10

Did the employee encourage or suggest gas stove over induction?

- Total Answers: 37
- Yes: 5
- No: 32

Appendix II: Health Studies on Gas Stove Pollution

THE FOLLOWING IS A SAMPLING OF HEALTH STUDIES AND SOURCES ON GAS STOVE POLLUTION

- Andee Krasner and T Stephen Jones, “Cooking with Gas Can Harm Children: Cooking with gas stoves is associated with increased risk of childhood respiratory illnesses, including asthma,” Mothers Out Front & HEET, July 15, 2019, <https://heetma.org/wp-content/uploads/2019/07/Gas-can-harm-children-July-15-2019-Final.pdf>.
- Brett C. Singer et al, Pollutant Concentrations and Emission Rates from Scripted Natural Gas Cooking Burner Use in Nine Northern Californian Homes, Lawrence Berkeley National Laboratory, 2016, p. 5, <https://escholarship.org/uc/item/859882pw>.
- “Carbon Monoxide Levels & Risks,” National Comfort Institute, 2015, https://www.myhomecomfort.org/wp-content/uploads/2015/09/CO_Levels_Risk_Chart.pdf.
- Chao, Julie (2013) Pollution in the Home: Kitchens Can Produce Hazardous Levels of Indoor Pollutants. Lawrence Berkeley National Laboratory.
- Climate Council of Australia (2021) Kicking the gas habit: How gas is harming our health.
- Dustin Poppendieck and Mengyan Gong, Simmering Sauces! Elevated Formaldehyde Concentrations from Gas Stove Burners, National Institute of Standards and Technology, Abstract & Poster International Society of Indoor Air Quality and Climate 2018 Proceedings, 2018, https://www.isiaq.org/ia_2018_proceedings_page.php.
- Drew R. Michanowicz, Archana Dayalu, Curtis L. Nordgaard, Jonathan J. Buonocore, Molly W. Fairchild, Robert Ackley, Jessica E. Schiff, Abbie Liu, Nathan G. Phillips, Audrey Schulman, Zeyneb Magavi, and John D. Spengler. Home is where the pipeline ends: Characterization of Volatile Organic Compounds present in natural gas at the point of residential end user.
- Health Canada, Human Health Risk Assessment for Ambient Nitrogen Dioxide, May 2016, p. 40, <https://www.canada.ca/en/health-canada/services/publications/healthy-living/human-health-risk-assessment-ambient-nitrogen-dioxide.html>.

- Jennifer M Logue et al, “Pollutant Exposures from Natural Gas Cooking Burners: A Simulation-Based Assessment for Southern California,” *Environmental Health Perspectives* Volume 122, 2014, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3888569/>.
- Kathleen Belanger et al, “Household levels of nitrogen dioxide and pediatric asthma severity,” *Epidemiology* 24(2), March 2013, p. 320–330, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3686297/>
- Lebel, Eric D., Colin J. Finnegan, Zutao Ouyang, and Robert B. Jackson. Methane and NOx Emissions from Natural Gas Stoves, Cooktops, and Ovens in Residential Homes. *Environmental Science & Technology*. 2022, 56, 4, 2529-2539. <https://doi.org/10.1021/acs.est.1c04707>
- Lin W, Brunekreef B, Gehring U. (2013) Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children. *Int J Epidemiol*. 42(6): 1724-37. doi: 10.1093/ije/dyt150. Epub 2013 Aug 20. PMID: 23962958.
- Martine Vrijheid, “Commentary: Gas cooking and child respiratory health—time to identify the culprits?,” *International Journal of Epidemiology*, Volume 42, Issue 6, December 2013, <https://doi.org/10.1093/ije/dyt189>.
- “Massachusetts Medical Society Resolution Recognizing Health Link Between Gas Cooking and Asthma,” Greater Boston Physicians for Social Responsibility, December 7, 2019, <https://gbpsr.org/2020/01/06/massachusetts-medical-society-resolution-recognizes-health-link-between-gas-cooking-and-asthma/>.
- Molly L Kile et al., “A cross-sectional study of the association between ventilation of gas stoves and chronic respiratory illness in US children enrolled in NHANESIII,” *Environmental Health* 13:71, 2014, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4175218/>.
- Patrick N. Breyse et al., “Indoor Air Pollution and Asthma in Children,” *Proceedings of the American Thoracic Society* Volume 7 Issue 2, 2010, p. 104, <https://www.atsjournals.org/doi/full/10.1513/pats.200908-083RM>.
- Roy Fortmann, Peter Kariher, and Russ Clayton, *Indoor Air Quality: Residential Cooking Exposures, Final Report*. ARCADIS Geraghty & Miller, Inc., Research Triangle Park, NC. Prepared for California Air Resources Board, 2001, p. 131 – 133, https://ww3.arb.ca.gov/research/single-project.php?row_id=60171.

- Seals, Brady Anne and Krasner, Andee (2020) Health effects from gas stove pollution. RMI, Mothers Out Front, Physicians for Social Responsibility, Sierra Club.
- The Inside Story: A Guide to Indoor Air Quality, 2019, <https://www.epa.gov/indoor-air-quality-iaq/inside-story-guide-indoor-air-quality>.
- The ‘WHO global air quality guidelines’ were updated in 2021, recommended new air quality levels, based on more recent evidence on how air pollution affects different health aspects. World Health Organization. (2021). WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. World Health Organization. <https://apps.who.int/iris/handle/10665/345329>. License: CC BY-NC-SA 3.0 IGO.
- US Department of Health & Human Services, Health Data: Asthma Prevalence, CHIS Data- Current Asthma Prevalence by County, 2019, <https://healthdata.gov/dataset/asthma-prevalence>.
- Weiwei Lin, Bert Brunekreef, and Ulrike Gehring, “Meta-analysis of the effects of indoor nitrogen dioxide and gas cooking on asthma and wheeze in children,” *International Journal of Epidemiology*, Volume 42, Issue 6, (December 2013): 1724–1737, <https://doi.org/10.1093/ije/dyt150>.
- World Health Organization (Regional Office for Europe), WHO Guidelines for Indoor Air Quality: Selected Pollutants, 2010, <https://apps.who.int/iris/handle/10665/260127>.
- Zhu, Y., Connolly, R., Lin, Y., Matthews, T., & Wang, Z. (2020). Effects of Residential Gas Appliances on Indoor and Outdoor Air Quality and Public Health in California. UCLA Fielding School of Public Health. Retrieved September 21, 2021, from <https://ucla.app.box.com/s/xyzt8jc1ixnetiv0268qu704wu0ihif7>