Induction cooking uses a magnetic field to heat cookware ~50% faster with substantially less energy than conventional electric and gas stoves.

Induction Cooking Uses:
- Lower greenhouse gas emissions
- Improved air quality
- Easier cooking
- Safer

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Your Guide To Induction Cooking was published in 2021.
An induction stovetop heats cookware directly using the principle of electromagnetic induction, unlike conventional electric or gas stoves, which heat cookware indirectly using an open flame or electric resistance coils. This magnetic field isn’t hot on its own, but when a piece of metal cookware enters this magnetic field, the molecules within the metal become agitated, generating heat within the cookware itself. Induction cooking wastes less energy, requires no open heating elements, and offers you precise control over the temperature of each pan. Induction cooktops have been around for decades, especially among professional chefs, and they’ve recently become more popular among US households. As you’ll see in this guide, induction cooking is a great way to convert the centerpiece of your kitchen to a cleaner, more efficient, safer way to cook.
With **induction cooking**, electricity flows through a tightly wound coil (1), which generates a magnetic field (2) at the surface of the stovetop. When a pot or pan made of ferrous (or magnetic) material meets the magnetic field, it agitates the molecules within the bottom and sides of the pan (3). The excited molecules result in heat (4)—but only within the material of the cookware itself. Any food in the pan will cook as expected, but all the heat comes directly from the pan rather than a heating element underneath.

Because no heat has to transfer between the heating element and the cookware, induction cooktops are incredibly efficient. This not only saves energy during cooking—it also saves time. Unlike a traditional electric stove, there is no need to wait for the heating element to warm up; the induction reaction begins immediately. Since all the heat is generated directly in the cookware, that energy is delivered to the food faster, too. A pot of water should come to a boil about 50% faster through induction cooking versus a traditional electric or gas stove.

Since non-magnetic materials aren’t affected by the magnetic field, the only part of an induction cooktop that gets hot is the area directly under the cookware. With no open flames or exposed heating elements, induction cooktops reduce the risk of fire and accidental burns in the kitchen—making them an excellent choice for families with small children.
TECHNOLOGIES FOR YOUR CLEAN ENERGY HOME: INDUCTION COOKING

The Technology

TYPES OF INDUCTION COOKTOPS:

• **Range:** A combination of an oven with a built-in induction cooktop.

• **Built-in cooktop:** Usually available in standard 30” or 36” sizes. Typically installed directly within the countertop.

• **Portable cooktop:** A less expensive, smaller option, often with only one or two heating elements. Consider trying one out before committing to a full replacement.

LOOK BELOW THE SURFACE:

Though they might look the same, induction cooktops are different from modern conventional electric stoves with a glass-ceramic surface. Conventional electric stoves transfer heat from below the surface using electric resistance elements. Double-check that any stovetop you consider says “induction,” not just “electric.”

Electricity Requirements

Most full-size induction units require a 240-volt outlet, which you will need to have installed if you don’t have one already. If you are replacing an electric range, you likely already have the necessary 240-volt connection.

Pro-tip: Most portable induction units only need 120 volts. By replacing your existing electric stove with one or more portable units, you could enjoy the same benefits of induction cooking without changing your 120-volt outlets.

You Probably Already Have Induction-Friendly Cookware

To make direct heat transfer between the two surfaces possible, induction cooking requires magnetic cookware. Simply put, this means it must contain iron. Most cast iron or stainless-steel pans should be compatible. To test your cookware in advance, try to place a magnet on the bottom of the pan. If it sticks, the pan is good for induction cooking.

No matter its material, your cookware must have a flat bottom to work with induction cooking. If it doesn’t—or if the magnet trick doesn’t work, as with a copper-bottom pan—an iron or steel plate can be added to the bottom to make it compatible with induction.

Additional Features

When comparing induction cooktops, think about the features that matter to you. Some induction cooktops may generate heat slightly faster, but most options come down to personal preference. Features may include:

• More induction zones to cook more items simultaneously

• Manual knobs instead of digital buttons for a more tactile feel

• Faux blue flame indicators to indicate that an induction zone is active

• Extra safety features such as an automatic shut-off when water spills or the pan leaves the surface
TECHNOLOGIES FOR YOUR CLEAN ENERGY HOME: INDUCTION COOKING

Is Induction Cooking a Good Fit for My Home?

If you answer yes to ANY of the following questions, then induction cooking may be a good fit for your home.

☐ Do you have a gas stove?
Induction cooktops have several health benefits compared to gas stoves. Gas stoves produce twice as much 2.5 micron particulate matter (PM2.5) as electric stoves. They also emit nitrogen oxide (NO), nitrogen dioxide (NOx), nitrogen dioxide (NO2), carbon monoxide (CO), and formaldehyde (CH2O or HCHO).
Studies have shown that children in homes with gas stoves are more likely to develop ailments such as asthma than those with electric stoves. Gas stoves leak carbon monoxide (CO), an odorless gas that kills 500 people a year in the U.S.
Induction cooking is more efficient and it runs on electricity instead of burning methane gas (which is commonly called natural gas) to cook your food. Methane is a greenhouse gas, so by lowering your use of it you can reduce your home’s greenhouse gas emissions.

☐ Is your existing cooktop reaching the end of its useful life? Has it had maintenance issues or are you concerned about it failing?
Now would be a good time to replace it—and enjoy the benefits of induction-cooking technology.

☐ Are you worried about your children’s safety around your stove?
Now is a good time to upgrade to an induction cooktop.
With a toddler running around the house, Jamaica Plain triple-decker resident, Meg, was looking for ways to make her home safer and more efficient. When she learned about induction stoves, and the many benefits they provide, she knew it was the right fit: “Especially because we have a child, we’re interested in safety and air quality. Induction is the leader in those categories. Also, of course, we wanted to get one more fossil fuel appliance out of our home!” Meg was already in the market for a new stove, since her old gas stove was in bad shape. The induction stove was the perfect replacement, because it removed the risks of indoor air pollution and fire that come along with cooking with an open gas flame: “Even if my toddler somehow climbed up and turned on the knobs without me seeing, the burners wouldn’t put out heat unless there was a pot on the burner.” Aside from the stove’s safety features, Meg appreciates that it heats up quickly and is easy to clean.

The transition to the new stove was simple! A contractor came to cap the gas line and install a new, higher-voltage outlet to accommodate the new model. Most of Meg’s pots and pans were already compatible with the stove, so she only had to make a few replacements. Now Meg and her family can enjoy spending time in the kitchen together, knowing they are safer and have taken a step towards reducing their home’s emissions.
INDUCTION COOKING

Benefits of Induction Cooking

SAFER
• Surface doesn’t get hot, so you and your family won’t burn yourselves
• Lower risk of fire

LOWER GREENHOUSE GAS EMISSIONS
• Uses electricity rather than gas or propane to cook your food
• More energy efficient than conventional electric stoves

EASIER COOKING
• More efficient, faster cooking; water boils 50% faster
• Precise control over specific temperatures
• More even cooking since induction heats the entire pan
• Easy to clean

IMPROVED INDOOR AIR QUALITY
• Reduced level of gaseous toxic contaminants compared to gas or propane stoves
• Less ambient heat makes the kitchen more comfortable, especially during warmer months
INDUCTION COOKING

Costs, Incentives, & Financing

ESTIMATED COST
Average Prices:
• **Range:** $900–$3,000
• **Built-in cooktop:** $500–$2,000
• **Portable cooktop:** $50–$500

Induction cooktops continue to get more affordable over time. We’d expect prices to further decrease as more models become available.

Remember: if you want to try out an induction cooktop before purchasing a new cooktop, you could start with a portable one at a lower price point.

Installation will cost roughly $100–$300—about the same as you’d pay to install a conventional electric or gas range. You may need to install a new 240-volt outlet to accommodate the induction cooktop, which should cost an extra $300 on average.

OPERATIONAL COST
• For the average family, the cost to operate an induction cooktop will be about $50 per year.
• Using utility rates from Fall 2021 in Massachusetts, induction saves about $5 annually over an electric resistance cooktop and costs about $15 more per year to operate than a natural gas cooktop.

INCENTIVES & LOANER PROGRAMS
• If you are served by a municipal light plant (MLP), visit your electricity provider’s webpage to see if it offers incentives or rebates for induction cooktops.
• If you’d like to try out induction cooking without an upfront commitment, many municipalities and public libraries loan portable induction cooktops to residents. Check your local area for similar programs.

FINANCING
• Induction cooktops can be financed like any other home appliance.
Induction Cooking
Making the Switch

1. Confirm that induction cooking is the right fit for your home and your home clean energy priorities.

2. Understand the costs and plan how you will finance the project. Check out the Cost, Incentives, & Financing section to understand the typical costs to install an induction cooktop or range.

3. Select your product and plan your installation. Some installation professionals that may need to be involved are an electrician, a tradesperson to modify your countertop, and/or a plumber, if you are capping a gas line. Referrals from family, friends, or neighbors are another great way to find industry professionals.

4. Prepare your home. If necessary, take preliminary measures to get your home ready for a new induction cooktop or range, such as upgrading your electrical service or making changes to your kitchen configuration.

5. Install the induction cooktop or range. Talk to a professional about how long installation will take.
Determine whether your home has adequate electrical service for an induction cooktop or range and make an upgrade if necessary.

Most full-size induction cooktops require a 240-volt connection. When switching from gas stove to induction, wiring a new dedicated, high power circuit and 240-volt plug for the stove can add $300.

Consider rearranging the kitchen.

While you could simply replace the entire range, you could also use the opportunity to reconfigure your kitchen. Place the induction cooktop and your oven in separate areas for a more versatile cooking area.

If replacing a gas stove, remember to cap the gas line.

You’ll want to hire a plumber to cap and seal the gas line to prevent leaks.

Check that your existing cookware is compatible with induction.

As long as your cookware has a flat bottom and some iron content, it should work with an induction cooktop. Anything from a stainless-steel skillet to a cast-iron Dutch oven—even one coated in ceramic—should work. To see if your cookware is compatible, try the magnet test: take a standard refrigerator magnet and touch it to the bottom. If it sticks, the pan will work on an induction cooktop. In any case, an iron or steel plate can always be added to the bottom to make it compatible with induction.

Consider ventilation over or near the stove.

Induction stoves don’t produce the gaseous toxins—including methane, carbon monoxide and nitrogen oxides—that gas stoves do, but that doesn’t mean you should forget about ventilation. Induction cooking still produces some steam, smoke, grease vapors, and other particles. You won’t need the same level of ventilation as a gas stove, but it’s still a good idea to ensure the best indoor air quality. An appliance store can recommend ventilation options that work best for your kitchen layout.
Questions to Ask Your Installer

During your conversation with installers, consider asking the following questions:

**CONFIGURATION**
What type of induction cooktop is best for my kitchen and my needs?
Induction cooktops come in many shapes and sizes, so make sure you are selecting the best one for your home.

**What will it take to reconfigure my kitchen (if necessary)?**
If you’re using this opportunity to rearrange your kitchen, a contractor may be able to help you determine the appropriate steps and cost.

**Do I need to add a 240-volt outlet?**
Most induction cooktops are only compatible with a 240-volt outlet. If you don’t have one available, one will have to be installed by a licensed electrician.

**Do I need to install a ventilation hood over my stove?**
You won’t need the same level of ventilation as a gas stove, but it’s still a good idea to ensure the best indoor air quality. An appliance store can recommend ventilation options that work best for your kitchen layout.
QUESTIONS TO ASK YOUR INSTALLER (CONT.)

How do I prepare the counter for a new induction cooktop?
Installing a full-size induction cooktop involves properly measuring, cutting, and wiring the counter to accommodate the new appliance. A professional installer can help ensure this is done safely.

COST
What is the installation price and what incentives are available?
Make sure that you understand upfront the appliance and installation cost.
Average Appliance Prices:
- **Range:** $900–$3,000
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- **Portable cooktop:** $50–$500

Installation will cost roughly $100–$300—about the same as you’d pay to install a conventional electric or gas range. You may need to install a new 240-volt outlet to accommodate the induction cooktop, which should cost an extra $300 on average.

TIMING
What should I do to prepare for the installation?
Make sure you understand from your installer if there is anything you need to do to prepare to have them working in your home.

How long is my induction cooktop expected to last?
Check with your installer or manufacturer for the model’s expected hours of use and compare it to your needs.
INDUCTION COOKING

Getting the Most From Your New Cooktop

OPERATION

• Ceramic-glass cooktops are beautiful and long lasting. Consult your manufacturer’s recommendations about cleaning and maintenance.

• Like any electric appliance, the induction cooktop or range must be plugged in and your home must be receiving electricity for the cooktop to work.

• Under normal operation, induction cooking can emit a slight hum or buzz from the magnetic field. Operating at a lower power or using heavier, higher-end cookware can help decrease the noise.

• Like smartphones, induction stovetops give off electromagnetic signals; if you have a pacemaker, consult a physician about your options for using an induction stove.

PROFESSIONAL MAINTENANCE

• If the ceramic-glass stovetop breaks, it will need to be replaced by a professional. Contact the manufacturer to see if they have local preferred vendors who can replace the glass top.

HOMEOWNER MAINTENANCE

• Induction cooktops are easy to clean because of the smooth, flat surface. Follow the manufacturer’s guidance and use a damp cloth and mild soap to clean the surface.

• Avoid abrasive cleaners or any materials that will scratch the surface of the stove.