

Electrification for Residential Decarbonization

WHAT IS ELECTRIFICATION?

Residential electrification is the process of transitioning a home's systems to run entirely on electricity. In many cases, this means replacing fossil fuel-powered equipment with electrically-powered equipment. In addition to being powered by electricity, homes can directly produce that electricity with generation technologies like solar photovoltaic (PV), commonly known as solar panels, and then store it in energy storage systems for measured use.

WHAT DOES ELECTRIFICATION ENTAIL?

A large potential area for electrification improvements is home heating and cooling systems. Many homes, particularly in the Northeast, still heat with furnaces or boilers that burn natural gas, fuel oil, or propane. Air source and ground source heat pumps are leading-edge electric systems on the market today, providing space heating and cooling with a single connected system. Heat pumps hold the number one spot in terms of efficiency (units of heat energy output per unit of energy input). Domestic hot water (DHW) systems that provide heated water to showers, faucets and appliances are commonly fueled by fossil fuels but can be electrified with technologies such as heat pump water heaters or solar thermal systems.

Stoves and lawn care equipment are other items in the average household that can be electrified. Induction stoves are especially useful in homes with children as they emit no pollution and heat is only transferred into conductive objects (i.e. pots & pans, not body parts). Electric lawn care equipment and snowblowers are relatively competitive in a market of fossil fuel-burning tools, while at the same time requiring less maintenance and operating quietly.

Clean Heating and Getting to Net Zero

Clean heating and cooling technologies are a great way to increase home comfort and decrease our carbon footprint.

Buildings in Cambridge are responsible for over 75% of our carbon emissions, and heating and cooling our buildings with clean energy will be an important part of getting to net zero. The technology is here, it is market ready, and it is affordable. Cambridge Clean Heat is here to support you along the way.



PLANNING FOR AN ALL-ELECTRIC FUTURE

Home electrification results in increased electricity demand. Upgrading an existing electric panel is in many cases a necessary investment to enable a home to go fully electric. The return on investment (ROI) period of upgrading an electric panel may not be as clearly evident as the ROI period for solar PV and heat pump systems, but making the upgrade to a higher capacity panel will enable the adoption of more electric systems as the market evolves over the coming years—for example, as electric vehicles (EVs) and EV chargers become the norm. Think of an electric panel upgrade as laying a stronger foundation for your home.

WHY SHOULD I ELECTRIFY MY HOME?

Buildings in Cambridge are responsible for over 75% of the city's carbon emissions, and improving this at a large scale requires building-specific attention. Massachusetts has mandated that utilities “green the grid” and generate more electricity from renewable sources such as offshore wind and large-scale solar installations. As this happens, the carbon emissions associated with electrically-powered residential equipment will continue to fall toward zero, meaning that electrification technologies will only continue to get greener with time. Additionally, electricity prices are less price-variable and more predictable than prices for fossil fuels. Finally, there are many rebates and tax incentives currently available that encourage adopting these technologies. These incentives may diminish with time, so immediate action is advisable.

ABOUT ABODE

Abode Energy Management is an energy consulting firm driving efficiency improvements for New England's built environment. We are passionate about helping our industry grow through a training-based, collaborative approach. Our collective experience in building performance, renewables, clean energy financing, utility program implementation, community engagement, and workforce development form the foundation that enables us to deliver data-driven results for our partners and clients.

