

# All-electric buildings

## Electric heating technologies have improved

Most Massachusetts homes are heated with gas or oil, but clean heating technologies powered by electricity are an increasingly viable alternative.<sup>66</sup>

Air-source and geothermal heat pumps are several times more efficient than fossil fuel heating. Due to recent advances in technology, air-source heat pumps can operate in temperatures as low as -12 °F, making them a viable option in nearly every part of the United States.<sup>67</sup>

## Cost-effective option

Using heat pumps in new construction is more cost-effective than fossil fuel heating, saving residents between \$2,000 and \$13,700 for space and water heating over 15 years.<sup>68</sup>

Retrofitting an existing building with heat pumps can also be cost-effective, particularly when switching from heating oil or propane.<sup>69</sup>

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**Buildings with efficient, modern electric heating are being built today in Massachusetts at a similar cost to buildings heated with fossil fuels.**

**Existing office buildings can be retrofitted to be zero energy with a payback period as low as 5–6 years.**

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Other technologies, such as solar thermal and district heating powered by renewable energy, can also provide efficient, clean heating and cooling.

## Replacing other fossil fuel uses

Technologies to replace other uses of fossil fuels in homes are available. Heat pump water heaters are up to five times as efficient as gas-powered heaters, and generally save customers money over the long term.<sup>70</sup>

Induction stovetops use electricity to cook food, while providing greater temperature control and shorter cooking times than gas ranges.<sup>71</sup>

## Health benefits

Moving to all-electric buildings can reduce indoor and outdoor pollution that is harmful to our health.<sup>72</sup>

A study in Southern California found that gas stoves add 21–39% to the level of indoor pollutants like nitrogen dioxide and carbon monoxide.<sup>73</sup>

## **All-electric buildings are cost-effective**

By pairing clean heating technologies with renewable electricity, we can provide power, heating, and cooling for our homes and businesses without the use of fossil fuels. A zero energy building is a highly efficient building where on-site renewable electricity generation, from sources like rooftop solar panels, produces enough energy to power the building on an annual basis.<sup>74</sup>

A study from the Massachusetts Chapter of the U.S. Green Building Council found that zero energy buildings are being built in Massachusetts today at a comparable cost to conventional buildings, and that existing buildings can be retrofitted to be zero energy with a payback period of as little as 5–6 years.<sup>75</sup>