

# DESIGNING AN ALL-ELECTRIC NEW HOME ON A POND



The Aleys chose all-electric for their new home in West Concord to reduce their carbon footprint.

Homeowner: Allison and Tom Aley

Year Built: 2019

Style: 3-story

classic/contemporary

Size: 4,800 square feet

Electric home features:

- Geothermal (aka ground-source) heat pump
- Level 2 electric vehicle charging station
- 2 heat pump hot water heaters

Over their family's 25 or so years in Concord, the Aleys have built two other homes from the ground up. But this one, newly built and bordering lovely Warners Pond in West Concord, was going to be different. This one would be electric!



## Choosing to go electric

Like many Concordians, Allison and Tom had become increasingly concerned about fossil fuel use and wanted to take advantage of new technologies and money-saving rebates in order to reduce their own carbon footprint with their new build. Building this time around, Allison says their family was much more attuned to climate challenges. This meant that electric components would be high on their must-have list for their new home. Being right on Warners Pond also factored into the Aleys choices. "We love being on the water and feel so fortunate to have all this amazing nature right on our doorstep. We join our neighbors now in being stewards of this beautiful part of Concord. It was important to us to significantly reduce our carbon footprint and geothermal heating and cooling, which eliminates fossil fuels, allowed us to do that." said Allison.

## Heat pumps for heating, cooling, and hot water

Tom and Allison want this to be their forever home, so for heating and cooling, they went big with a geothermal (ground-source) heat pump, a solid and reliable investment for their 4,800 square feet of living space. The pump required 3 bore holes 400' deep to install the closed loop system. Allison has been pleasantly surprised by how comfortable her home is now that it's heated and cooled by geothermal. The Aleys also installed two heat pump hot water heaters, but since they cannot have a basement (they are too close to the pond), the tanks are in the garage. As you would expect, home-building is full of surprises, and the Aleys found they then had to install a small heater in the garage in order to maintain the temperature for the hot water tanks to work efficiently. This is not a problem when the water tanks can sit in a heated basement. Tom and Allison are looking forward to writing off a good chunk of their electric bills once they install solar someday.

***“Solar roof tiles is the fantasy,” said Allison. “We designed the house so that these can be added in time. Battery storage too. And we know the upfront cost of that will be offset over time by the significant reduction in our electric bill.” Their solar plan will offer additional financial benefits because the Aleys own a fully electric Chevy Bolt and a level 2 charger.***



"It feels like we are now part of the solution rather than being part of the problem and that feels good."

**\$40,000**  
Incentives and rebates for heat pumps

**2**

Heat pump hot water heaters provide hot water to the home

### **Adding proper insulation was key to success**

Allison and Tom took full advantage of the best methods of energy-efficient home insulation. Post-build, the home easily surpassed the HERS rating (Home Energy Rating System, the industry standard for measuring the energy efficiency for a home) and the “blower test” which measures how airtight the home is. The Aleys do maintain a modest propane tank for cooking and grilling simply out of personal preference.

### **Choosing a contractor and taking advantage of rebates**

The Aleys chose a contractor who had already installed a geothermal system at a key Town site, and they credit their contractor with making the process of installing geothermal smooth and for managing the complex business of rebates. “There are a lot of great rebates out there,” Allison said, “Town, state and federal. But it’s a full-time job managing the applications, documentation and deadlines. We were very thankful that our contractor handled all this for us.” The Aleys received \$40,000 in total rebates for their geothermal system which Allison said covered the cost of drilling and made the cost of geothermal comparable and competitive with fossil fuel heating/cooling systems.

### **An investment in the future and for their kids**

Allison feels that the decision to go fossil-fuel free with their new home was important to her and Tom as well as for the environment. But there’s another message too -- for the next generation.

“Our kids went through the Concord school system and they each did energy assessments of our family’s carbon footprint. When we were in a home that was heated with fossil fuels and cooled by traditional (inefficient) air conditioning, our carbon footprint was huge. Now, even though our house is large, our carbon footprint is relatively small. It feels like we are now part of the solution rather than being part of the problem and that feels good.”



Interested in how heat pumps can make your home more comfortable and sustainable? Visit [ConcordCleanComfort.org](https://ConcordCleanComfort.org) for information about coaching, rebates, and more.