

Zero Carbon[®] Zero Bills

How to save money by cutting carbon
By someone who has done it: David Green
For Marion, 29th October 2025

The Conventional Wisdom on Net Zero is all Wrong

- “You can’t do net zero on an existing building”
- “It will never pay for itself”
- “Heat pumps will double your bills”
- “Solar panels reduce the price of your house”

All wrong. I have done it!

New Green Wisdom

- Most MA homeowners can cut bills 50-100%, save \$5-10k pa with 15-20% ROI, cut energy & carbon emissions 50-100%. Work MassSave, get solar and cheap financing!
- For most MA homeowners a new heating/AC system (heat pump) is about 50% off with NO INCREASE IN BILLS
- For most MA homeowners, a new heat-pump hot-water tank is about 35% off and will cut your bills by about 30%
- For all MA homeowners, insulation and draft sealing are almost free
- For all MA homeowners, solar panels are about 10% off and cut your electric bill about 70% with an ROI of 10-15%

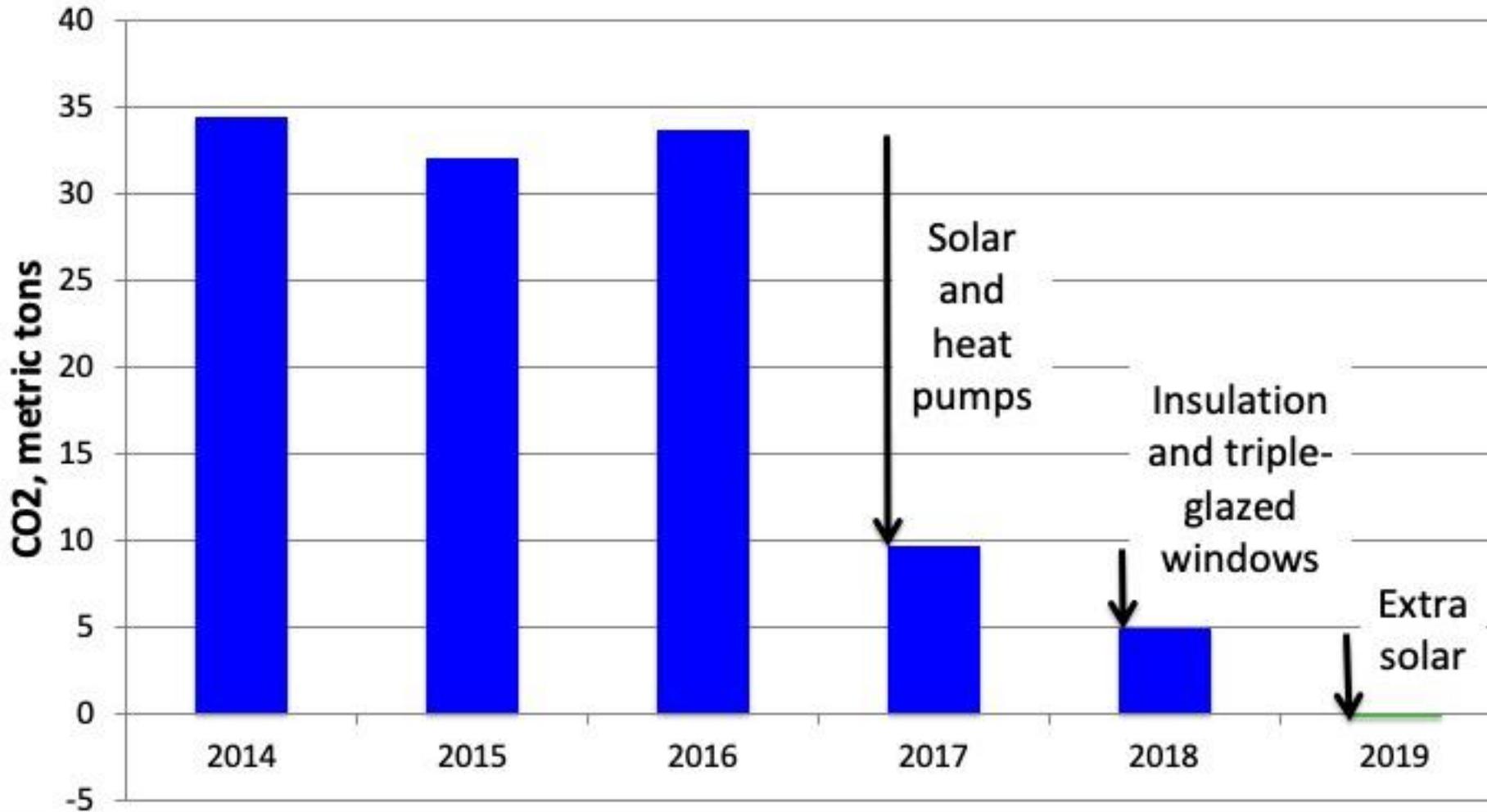
You can “save a lot of green by going green!”

About David Green:

- BA physics (Oxford), MBA (HBS)
 - Did things that made **both** energy **and** financial sense
 - HITS: heat pumps, insulation, triple-pane windows and solar panels
 - Not HITS: geothermal, solar hot water, wall insulation or super-tight building envelope
 - Worked on my house and about 50 others
- Science based, financially sound, independent
- Free book [Zero Carbon Home](#), free webinar, free cost-effective decarbonization plan for your house
- I am not going to tell you to eat vegan, lower your thermostat, bike to work, have fewer children or vote for Al Gore.

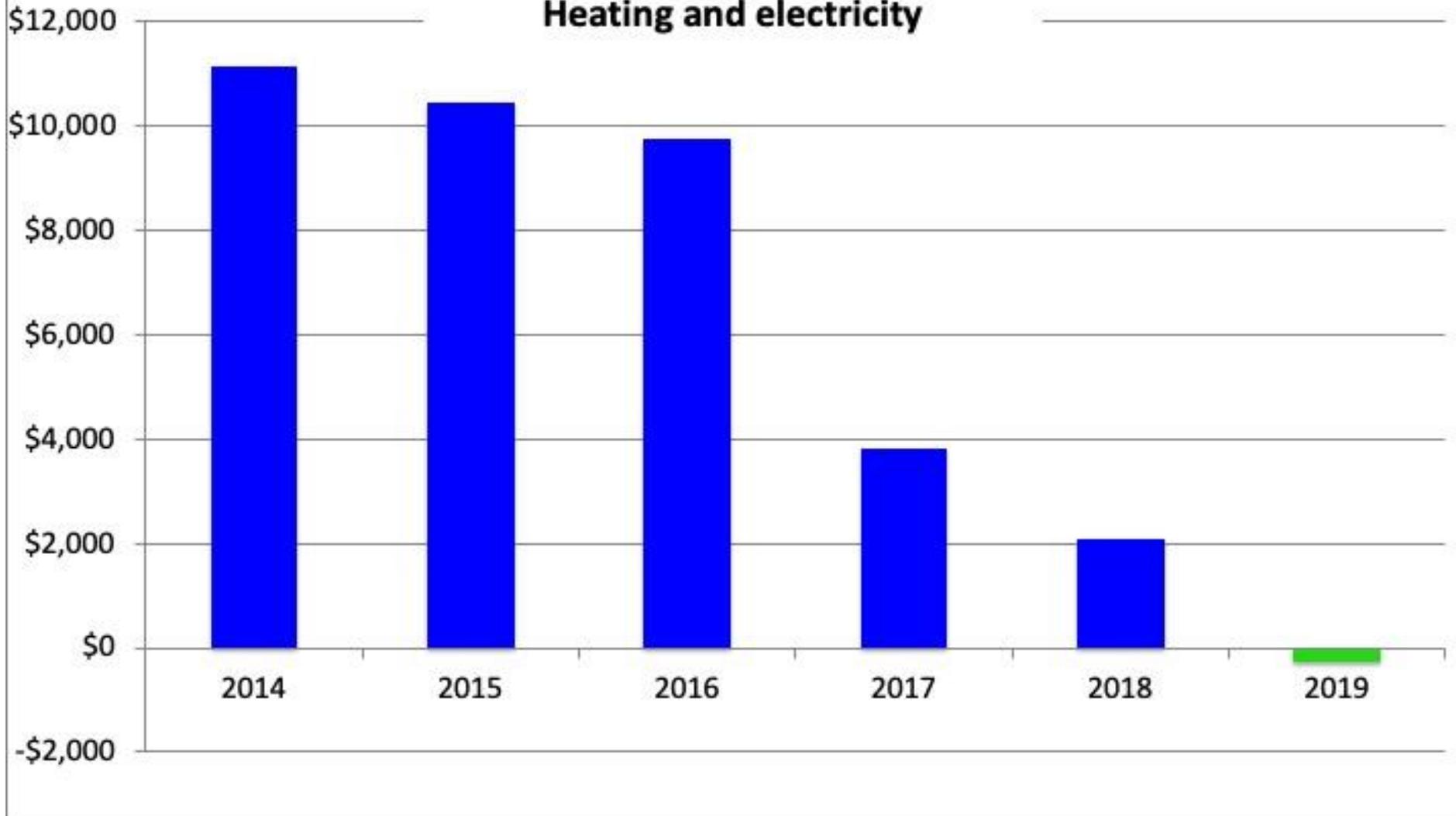
Home Carbon Footprint

Heating and electricity



Home Total Energy Bill

Heating and electricity



Results for Heat Pumps

<u>Effect on</u>	<u>Impact</u>
Carbon Footprint	Cut 47% (20 tons)
Money saved per year	\$2,888
Investment (net)	\$26,250
Years to pay for itself	9.1
Return on investment	9% (after tax)

Our heat pumps replaced our AC units, but both heat and cool the house



Heat pumps heat with 2.5x the efficiency of a furnace or boiler
and cool with the same efficiency as an AC unit

HITS - Heat Pumps

- For most MA homeowners a new heating/AC system (heat pump) is about 50% off with NO INCREASE IN BILLS
 - MassSave rebate on ASHP is up to \$10,000 (up to \$16,000 if low income)
 - IRA Part B Electrification Rebate up to \$8,000 (varies by income level)
 - MA has the money but has not implemented the program yet
- Keep your furnace/boiler and use when below about freezing
 - Ensures no increase in bills, or add solar
- Heat pumps get 6c/kWh (about 20%) discount Nov-Mar
 - Or add solar at 10c/kWh vs Eversource at 34c/kWh
 - NexAmp is 100% solar, 100% MA for 12.5% off Basic Rate
- For most MA homeowners, a new heat-pump hot-water tank is about 35% off and will cut your bills by about 30%
 - Will lower bills vs. even natural gas
- Get multiple quotes.

Results for Insulation

<u>Effect on</u>	<u>Impact</u>
Carbon Footprint	Cut 16% (7 tons)
Money saved per year	\$2,923
Investment (net)	\$1,000
Years to pay for itself	0.3
Return on investment	100% (after tax)

Insulation: what we did

Our flat roof



10" fiberglass plus 4" ISO board
– R50 total.

MA code minimum is now R49

Our basement ceiling



12" fiberglass –
R38 total.

MA code minimum is now R37

Insulation - Subsidies



- MassSave will pay 75% of the cost of insulation up to \$2,000 and 100% of the cost of draft sealing.
 - They will not pay for spray foam.

Insulation is the lowest hanging ripest fruit in the garden. Pick it!

HITS - Insulation

Insulation and draft sealing are heavily subsidized, will cut your bills and carbon emissions substantially and often have a return on investment of over 100% pa (beats my 401k!)

- For which type of insulation to put where in your house, occasions to insulate walls profitably, and how much of it to install, see Chapter 1 in Zero Carbon[®] Home.
- I do not recommend taking off your siding, adding insulation and replacing your siding. It will cut your carbon footprint, but it is far too expensive compared to insulating your roof and basement.
- It is not necessary to get to Passive House levels of drafts (0.6 ACH50) to get to zero carbon. My house is 4.6.

Results for Solar Panels

<u>Effect on:</u>	<u>Impact:</u>
Carbon Footprint	Cut 32% (14 tons)
Money saved per year	\$5,572
Investment (net)	\$42,791
Years to pay for itself	7.2
Return on investment	13% (after tax)
Electricity cost (LCOE)	10c/kWh (ES 34c)

LCOE is at current MA panel pricing without 30% federal tax credit.

HITS - Solar Panels

- Most homes in MA need 15-25kW to go zero after heat pumps:
 - With net metering and MA subsidies, solar panels reduce your electric bill about 70% with an ROI of 15%
 - Solar saves money even on roofs in part shade (like my garage), or roofs facing east or west, or flat roofs (like ours)
 - Solar panels increase the price of your house 4-7%
- Get multiple quotes, use EnergySage.com. Financing with a loan is usually better than leasing (there are loan sharks in leasing!)
- If your roof cannot do solar, try NexAmp (or other community-source solar) which is 100% solar, 100% MA for 12.5% off Basic Rate
 - even tenants can do this.
- Add 3kW (8 panels) for an EV and 1kW (3 panels) for a HPHWT

The key to getting to net zero is to add heat pumps, insulation and solar, and get all the subsidies

- Cut your home's energy use so much you can generate it all from solar panels on the roof
 - Cut energy use with insulation and draft sealing
 - Cut energy use with heat pumps
 - Generate zero-carbon electricity with solar panels
- Tenants can add window-mounted heat pumps (\$750 on Amazon) and community-sourced solar (e.g., NexAmp) – I use both and they are great!

New Green Wisdom

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You can “save a lot of green by going green!”

How to move forward?

1. Make a plan:

<https://greenzerocarbonhome.com/zero-carbon-analysis-and-recommendations-report-request-form/>

Or scan this:



This is a free service that I created that gives you a detailed, 10-page report on how to save money by cutting your carbon emissions customized to your house. It only works on detached homes without solar or heat pumps. It uses current prices for heating fuel and electricity, current prices for heat pumps and solar panels, current subsidies (including net metering), and current financing terms. It has an AI chatbot user interface which allows you to “chat” with me (OK, chat with my expertise) that makes it very easy to use.

2. Educate your Selectboard or Mayor about the Save Money with Clean Heat (SMCH) legislation, which will help you save money for you and your Town. Ask them to endorse the SMCH legislation.

3. Establish a Marion node of 350.MA

Free “Zero Carbon, Zero Bills” Stuff:

- A pdf file of the slides for this webinar,
- A YouTube recording of a previous webinar,
- Searchable, written Q&A (300) from previous webinars,
- And the free book are all available at:

www.greenzerocarbonhome.com (Google: zero carbon home)

For the free iPad / Kindle copy of Zero Carbon Home, visit my website, order the book & use the code Marion25. If this doesn't work, email me!

Heat Smart Alliance does volunteer consulting on heat pumps.

<https://heatsmartalliance.org>

Abode has \$150 paid consulting service (mostly on heat pumps):

<https://abodeem.com/homeowners/paid-consulting-service/>

My free decarbonization plan for your house (used to cost \$1-2k) is here:

<https://greenzerocarbonhome.com/zero-carbon-analysis-and-recommendations-report-request-form/>

Only for detached MA homes. No existing solar or heat pumps.

My email address: dgreen@greenzerocarbon.com



Save Money with Clean Heat in the MA Legislature



- 1) S.2247 – “MassSave Reform”, adds solar, concierges, and vetted installer network, triples scale to 75,000 homes a year, no new taxes
- 2) S.2248 - “Municipal Voices”, empowers Towns vs utilities
- 3) S.2249 – “Transition to Clean Energy”, permits utilities and towns to install large-scale solar and networked geothermal
- 4) S.786 “Climate Bank”, cheap loans

This saves the average homeowner \$2,500 every year and cuts their emissions to net zero. Saves MA \$5bn a year. This is roughly the same as cutting the state income tax rate from 5% to 4%.

Sens. Cynthia Creem and Michael Barrett are lead sponsors.

Action: call your reps and senators to ask them to support.

We will provide email and phone scripts.

Call your Selectboard and ask for a letter of support.