

# Zero Carbon<sup>®</sup> Zero Bills

**Now includes IRA subsidies**

**Free webinar. Free book. Free zero carbon plan.**

**How to save money by cutting carbon**

**By someone who has done it: David Green**

# 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”
- “Insulation is only for the north”
- “You have to take short showers”

**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 and the IRA!
- For most MA homeowners a new heating/AC system (heat pump) is free or 80% off with NO INCREASE IN BILLS
- For most MA homeowners, a new heat-pump hot-water tank is either free or 60% 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 40% off and cut your electric bill about 50-75% with an ROI of 10-15%

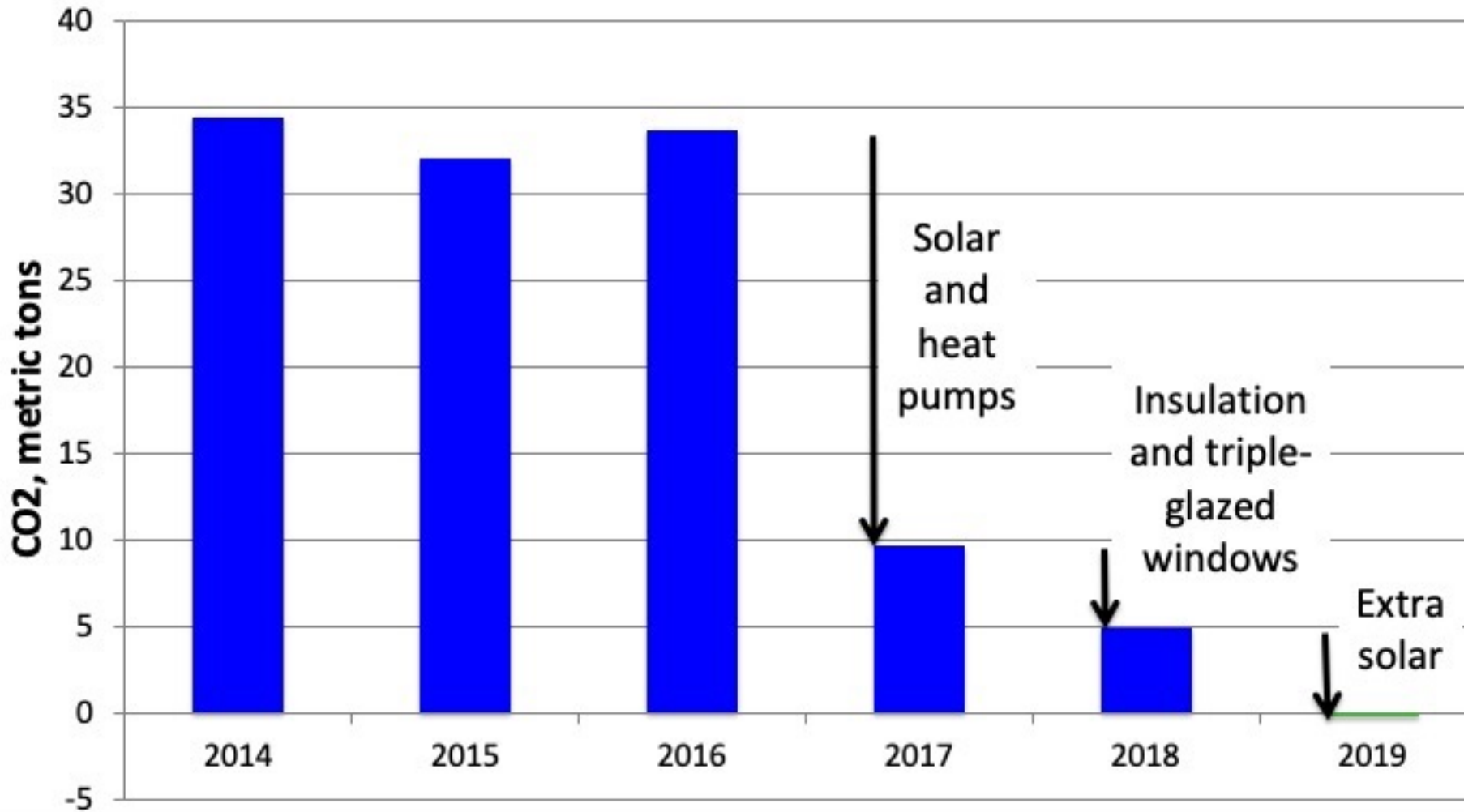
You can “save a lot of green by going green!”

## ***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.

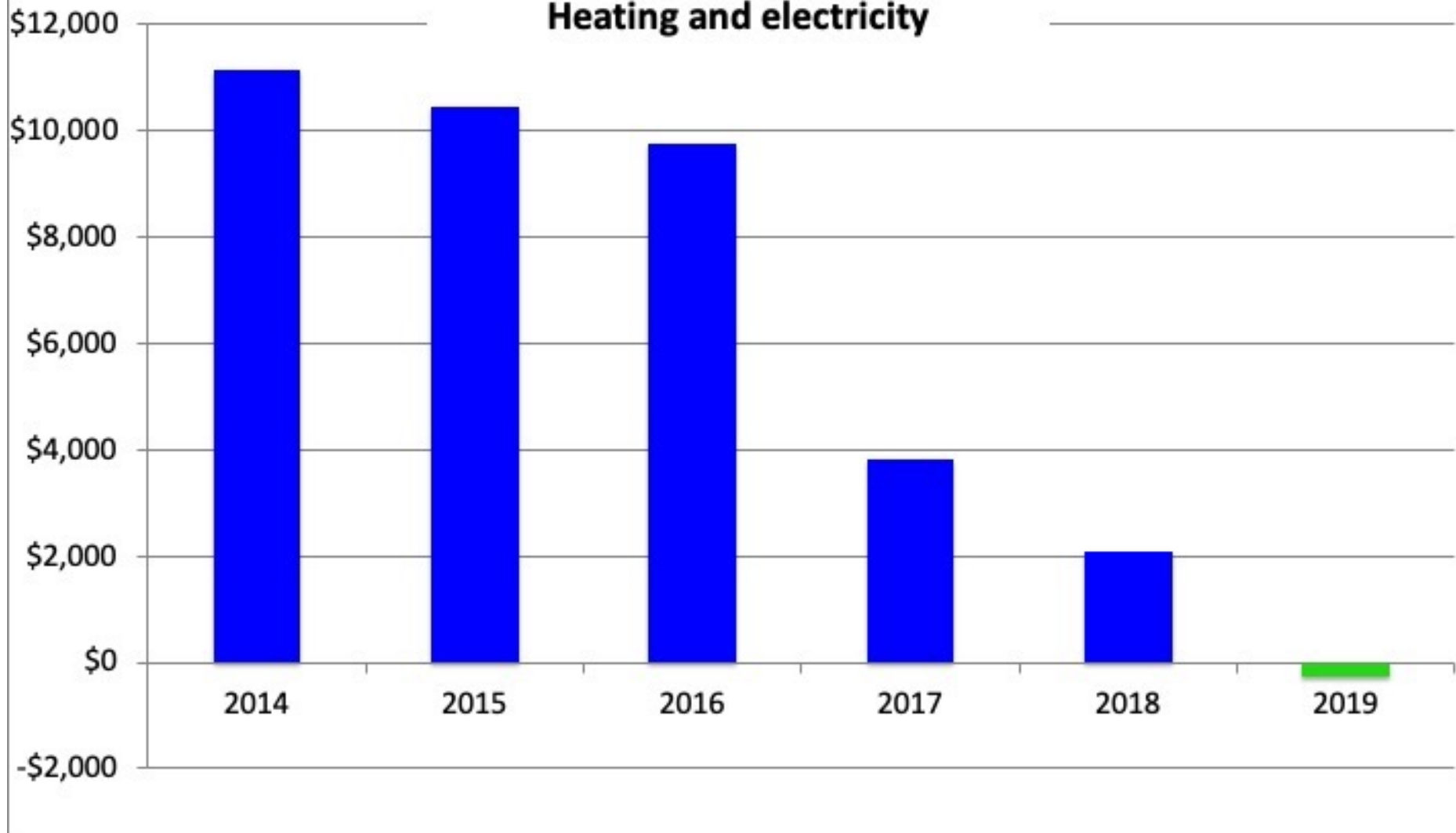
# Home Carbon Footprint

## 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 free or 80% off with NO INCREASE IN BILLS
  - MassSave rebate on ASHP is up to \$10,000
  - IRA Part A tax credit is \$2,000 (each year) for any income level
  - IRA Part B Electrification Rebate up to \$8,000 (varies by income level)
  - IRA Part C Energy-Efficiency Rebate \$4,000 to \$8,000 (varies by income)
- Keep your furnace/boiler and use when below about freezing
  - Ensures no increase in bills, or add solar
- Heat pumps are electric heating which is R3 rate
  - About 1.5c/kWh (6%) lower than Basic Rate. Just call and ask! Also, NexAmp is 100% solar, 100% MA for 12.5% off Basic Rate
  - Or add solar at 8c/kWh vs Eversource at 34c/kWh
- A heat-pump hot-water tank is free or 60% off
  - Will lower bills vs. even natural gas
- Get multiple quotes. Any questions so far?

# 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.
- IRA tax credit up to \$1,200 per year for all income levels.
  - Additional up to \$1,600 based on income.
  - Additional up to \$8,000 based on energy savings and income.

**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<sup>®</sup> 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.
- Any questions on insulation and air sealing?

# Results for Solar Panels

## Effect on:

Carbon Footprint

Money saved per year

Investment (net)

Years to pay for itself

Return on investment

Electricity cost (LCOE)

## Impact:

Cut 32% (14 tons)

\$5,572

\$42,791

7.2

13% (after tax)

5-8c/kWh (ES 34c)

# HITS - Solar Panels

- Most homes in MA need 15-25kW to go zero after heat pumps:
  - With IRA and MA subsidies, solar panels are 40% off and reduce your electric bill about 50-75% with an ROI of 10-15%
  - 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. Get the R3 rate for heat pumps.
- Add 3kW (8 panels) for an EV and 1kW (3 panels) for a HPHWT

Any questions on solar panels?

# 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 inserts, window-mounted heat pumps (\$750 on Amazon) and community-sourced solar (e.g., NexAmp)



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

# 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](http://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 TA25. 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](mailto:dgreen@greenzerocarbon.com)



# High gas bills?

# Save Money With Clean Heat

**25/26 Legislative Campaign**

**Saves the average homeowner \$2,500 every year. No new taxes.**

**Gets all MA homes to net zero by 2050**

**Campaign kick-off meeting this Thursday 20<sup>th</sup> March 7pm.**

**Scan code or search “350 mass” click on 350mass website,  
click “take action”, click “events”**



# GASp \$#!+

**EVERSOURCE**  
 Account Number: 0000 000 0000  
 Statement Date: MM/DD/YY  
 Service Provided To: JOHN J CUSTOMER

Payment will be sent to bank for processing on MM/DD/YY **\$432.15**  
 Amount Due On MM/DD/YY \$299.19  
 Last Payment Received On MM/DD/YY -\$299.19  
 Balance Forward \$0.00  
 Total Current Charges \$432.15

**Current Charges for Gas**  
 Delivery **\$282.46**  
 Cost to deliver gas from Eversource



**nationalgrid**  
 SERVICE FOR ██████████  
 ESSEX MA 01929

BILLING PERIOD: Feb 4, 2022 to Mar 7, 2022  
 ACCOUNT NUMBER: ██████████  
 PLEASE PAY BY: Apr 3, 2022  
 AMOUNT DUE: \$ 207.47

**Enrollment Information**  
 To enroll with a supplier or change to another supplier, you will need the following information about your account:  
 Loadzone: NEMA/BOST  
 Acct No: ██████████ Cycle: 8, MACC

**Supply Services ?**  
 SUPPLIER: National Grid

|                              |                   |                  |
|------------------------------|-------------------|------------------|
| Basic Service Fixed          | 0.14821 x 699 kWh | 103.60           |
| <b>Total Supply Services</b> |                   | <b>\$ 103.60</b> |

Electric Usage History  
 Month kWh Month kWh

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 -0.36  
**-\$ 0.36**

# Gas bills are up 73%

# Save Money with Clean Heat in the Legislature



- 1) SD 1937/HD 2527 – “MassSave Reform”, adds solar and concierges, triples scale to 75,000 homes a year, no new taxes
- 2) SD 1476 - “Municipal Voices”, enforces ‘24 Climate Bill
- 3) SD 1924 – “Transition to Clean Energy”, permits utilities and towns to install large-scale solar and networked geothermal
- 4) SD 1984/HD 3216 “Climate Bank”, cheap heat pump & solar loans
- 5) SD 2305/HD 2787 “Air Quality”, induction stoves improve IAQ
- 6) SD2303/HD2368 “Green Schools” Bill
- 7) Electric rate reform – current DPU case and further legislation, e.g, peak shifting/TOU, storage, discounts for heat pump use

**Sen. Cynthia Creem is lead sponsor.**

**Action: co-sponsor the bills, talk with colleagues, discuss with constituents. 350 will support talks/webinars/press/social media.**