



Yorktown 100
Zero Net Carbon Emissions

Residential Rooftop Solar in Yorktown 2026 and Beyond: Does it Pay?

Bob DeAngelis



US Demand Outpaces Savings



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B B C

Cold weather and data centres drive up US greenhouse gas emissions

3 hours ago

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Matt McGrath
Environment correspondent



America's greenhouse gas emissions increased by 2.4 percent in 2025 after two years of decline.

U.S. electricity demand grew at an unusually fast pace, driven in part by an expansion of power-hungry data centers for artificial intelligence. To meet that demand, electric utilities burned about 13 percent more coal last year than they did in 2024.

At the same time, colder winter temperatures led many buildings and homes to burn more natural gas and fuel oil for heating last year.

Source: Brad Plumer - New York Times Jan 13th based on research by the Rhodium Group.

Yorktown100 and CURE100



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Who are we?

- Yorktown100 is a group of concerned local citizens
 - 100% volunteer, diverse, informed, non-partisan, caring
- Members of CURE100 (Communities United to Reduce Emissions 100%)
 - Yorktown, Croton, Rye, Peekskill, Federated Conservationists of Westchester County, Sustainable Westchester, Austerlitz and growing

What do we do?

- Advocate and Educate
 - YCSD, Town of Yorktown, Local Paper, Website...

What is our goal?

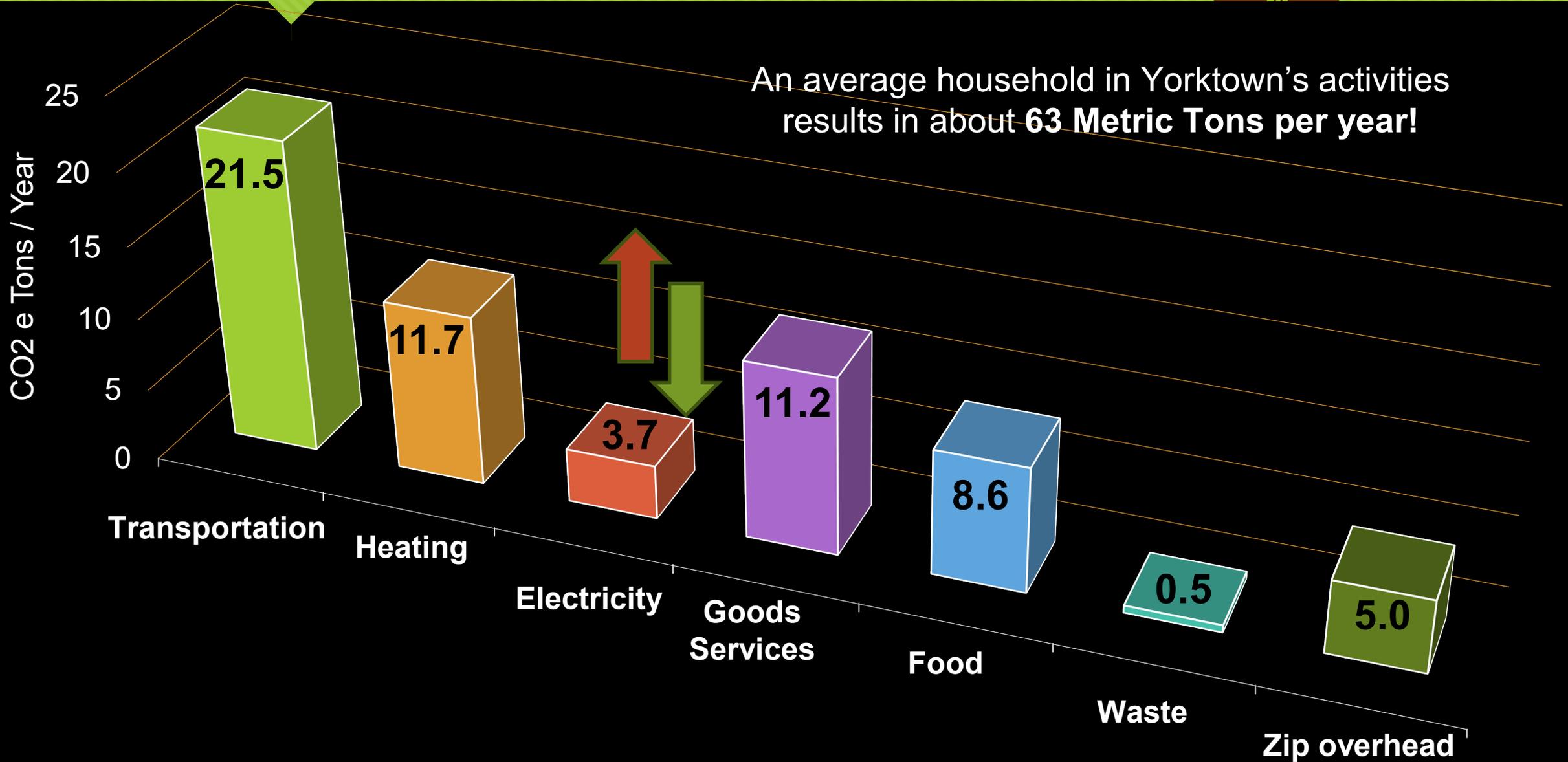
- Zero Carbon emissions for the entire Town of Yorktown
- Help you understand what YOU can do



Profile of average household emissions for Yorktown NY



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Why Rooftop Solar?



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Globally

- Reduce the Greenhouse Gas Emissions caused while generating the electricity you use
- Energy needs continue to grow locally and globally
 - Total energy : Population ↑ Standard of living ↑
 - Clean energy ↑ Electrification of heating & transportation etc.

Personally

- **Financial payback**
- **Freedom from rate increases**
- Consider the options for solar (in priority):
 - Rooftops, parking, fields, forests
- Sleep at night

Background - General



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How much does residential electricity currently cost?

	Flat Fee (\$/mo)	Usage and Delivery (\$/ kw-hr)	Typical Usage (kw-hrs)	Typical Annual Cost (\$)
Con Ed	20	.33	7,500	2,533
NYSEG	19	.23	7,500	1,744

- Utility rates have been rising and will continue to rise
- Con Ed has some of the highest rates in the country
- What size system is right for you?
 - Find your annual usage (kw-hrs)
 - What % of your usage to cover?
 - Consider how big your roof is
 - Think about future growth (EV, Heat Pump)



Background – General (cont'd)

- Solar panel degradation
 - All systems degrade over time (about 0.5% / year)
 - Lose about 2-15% after 25-30 years
 - Still produce power after that
- Roof condition
 - Should have remaining life > solar system (say 25+ years)
 - Panels need good solar exposure
 - Shade
 - South-facing is best
- Warranties
 - 25 years on panels
 - Inverter systems 10-25 years
 - Roof leaks?

Bob's Rooftop System

- Cost about \$12,700 in 2020 (after rebates and incentives)
- Covers ~ half my roof - SSW exposure
- Found vendors, obtained quotes, finalized size
 - (note: they may use different production estimating models – **buyer beware!**)
 - Back then, typically 320 watts per panel. *Today 440 is typical.*
- Paid <\$3 per installed watt (prior to rebates) *Now mostly between \$2.90 and \$3.60 / watt*
- Saved ~ \$2000/year the first two years, now saving ~5,000/year
- Added a heat pump and 2 EV's - ↑ savings, ↓ carbon (and rates keep increasing)
- Say ~ 5-year payback
- Mostly free electricity for the following 20+ years!
- *Major carbon reduction!*



How does the output vary with seasons?



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Comparative
Production

Month

Quarter

Year

My System

Production:

10,400 kw-hrs

Demand:

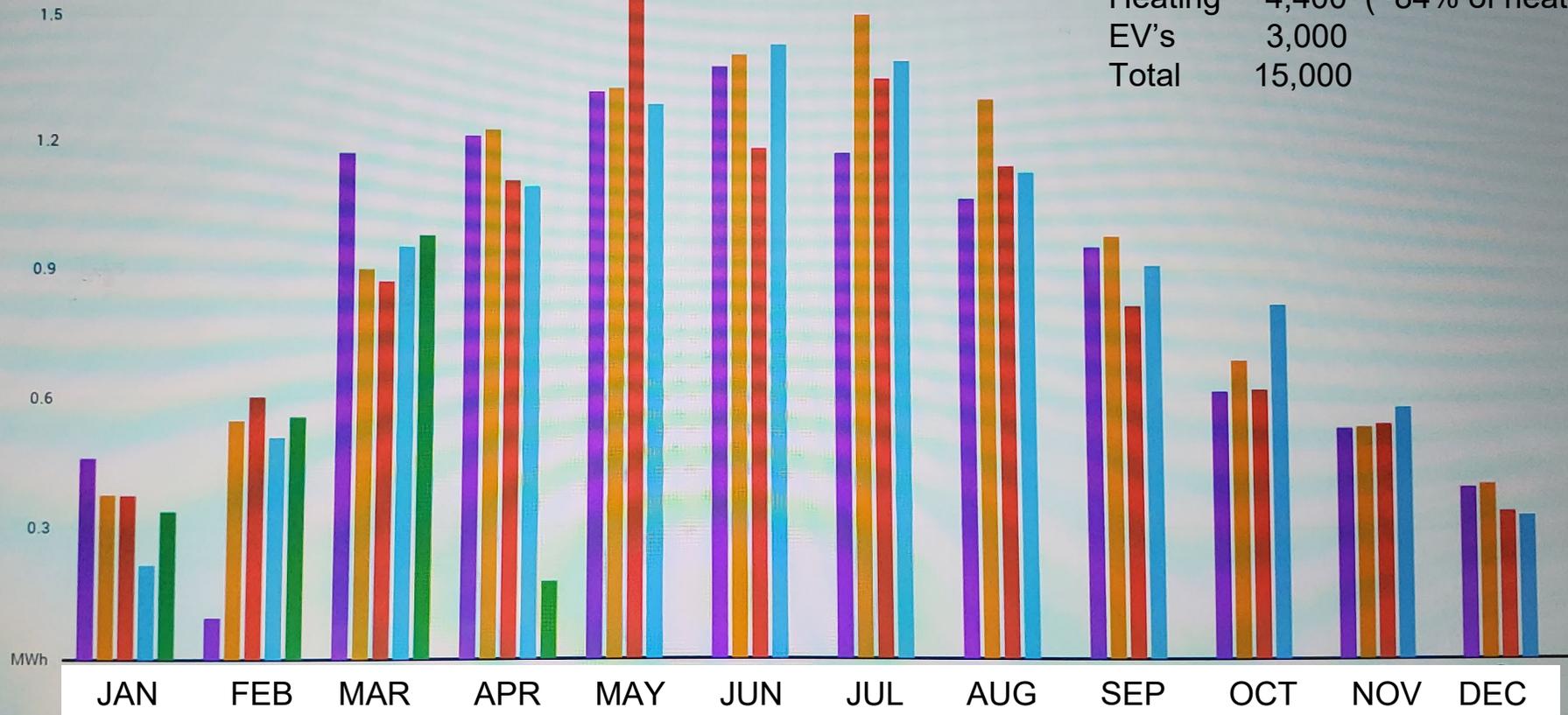
Baseline 7,600

Heating 4,400 (~84% of heat)

EV's 3,000

Total 15,000

- 2021
- 2022
- 2023
- 2024
- 2025



Savings and Payback



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- How do I estimate my savings?
 - Use the CURE100 Carbon Tracker for a high-level approximation
 - Get quotes from several suppliers – no visit required
- Factors affecting payback
 - Roof orientation (angle and rotation towards due south)
 - Shade from trees (1/3 of applicants to Sustainable Westchester fall short)
 - Market conditions and possibly tariffs
 - Incentives (NYS)
 - How much you pay for the system (\$ / watt)
 - Electricity rates will continue to increase!

What Incentives are there? How does Net Metering work?



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- NYS: Incentives to the installer (passed on to you)
 - 25% system cost tax credit (capped at \$5,000)
 - 20 cents per installed watt
- Con Ed Net Metering
 - Accumulate kw-hrs in your account (typically during summer)
 - Use them as needed
 - Roll them over indefinitely

Finances without Federal 30% ConEd



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For utility rate of \$0.33 / kw-hr (ConEd) and installation cost of \$2.90 / watt and good sun exposure

	Annual Use	Utility Rate	Annual Bill	System Size	System Unit Cost	Cost prior to incentives	NYS Incentives	Total Cost	Payback
	kw-hrs	\$/kw-hr	\$	kw	\$/kw	\$	\$	\$	Yrs
House with heat pump and EV	16,000	0.33	5,280	15,238	2.90	44,190	-8,048	36,143	6.8
House +	10,000	0.33	3,300	9,524	2.90	27,619	-6,905	20,714	6.3
Small User	5,000	0.33	1,650	4,762	2.90	13,810	-5,952	9,405	5.7

Other Potential Savings – Case 1	Annual Dollars
Vehicle fuel	1,800
Vehicle Charging Program	700
Fuel Oil	4,000
Total	6,500



Finances without Federal 30% NYSEG



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For utility rate of \$0.23 / kw-hr (NYSEG) and installation cost of \$2.90 / watt and good sun exposure

	Annual Use	Utility Rate	Annual Bill	System Size	System Unit Cost	Cost prior to incentives	NYS Incentives	Total Cost	Payback
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House +	10,000	0.23	2,300	9,524	2.90	27,619	-6,905	20,714	9.0
Small User	5,000	0.23	1,150	4,762	2.90	13,810	-5,952	9,405	8.2

Other Potential Savings – House with EV and heat pump	Annual Dollars
Vehicle fuel	1,800
Vehicle Charging Program	100
Fuel Oil	4,000
Total	5,900



What Steps should I take?



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Get a free home energy audit (for everyone!)

- Gather your electric usage data
- Think about potential growth (EV, heat pump..)
- Get references for Solar Installers and contact at least 3
or use Residential Solarize thru Sustainable Westchester
- Review bids:
 - Net price & **price / installed watt**
 - Panel and inverter brands and warranties
 - Sketch of where they will be located – consider access
- NOTE: **models for production factors vary!**
- Decide what you want (nameplate capacity) to normalize bids and re-bid
- Select one installer (note then they schedule the work and apply to town and utility co. etc.)
- Save!

What Steps should I take?



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Residential Solarize Program:

- Solar Feasibility Study
 - ❖ Potential solar layout for your property
 - ❖ Estimated economic impact
 - ❖ System size
 - ❖ Estimated system production
 - ❖ Economic Incentives
- Up to 3 pre-qualified installers
- Support throughout the process

How does Residential Solarize program work?

STEP 1:



Interested homeowners fill short intake form on our website

STEP 2:



SW prepares & sends homeowner a preliminary solar assessment with information on basic state and federal incentives

- Followed up by a call with homeowner to discuss the solar assessment & review electric usage, roof and electric service panel

STEP 3:



SW refers homeowners to our **Certified Installer Partners**

- We conduct weekly check-ins with our Certified Installer Partners
- We follow up with homeowners throughout process



What other options do I have



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- If you decide purchase of solar panels is not a good option:
 - Sign up for [Community Solar](#) (on Sustainable Westchester site)
 - Consider financing options (occasionally very low interest loans available)
 - Consider a “green” Energy Services Company (ESCO) but **watch out for high rates and increases!**
-
- Consider power purchase agreement (PPA)
 - Consider lease agreement



What other programs should I consider?



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Peak energy use can cause polluting “peaker plants” to start generating electricity

- Join “[Grid Rewards](#)” or similar program
 - Get notified on cell when there is a peak period
 - Receive annual payments for voluntarily reducing usage during peaks (like not using oven, dryer, less AC etc.)
- If you have an EV, join:
 - In ConEd Territory: [Smart Charge NY](#) - Get paid 10 cents per kw-hr to charge between midnight and 8AM and earn bonuses!
 - In NYSEG Area: [OptimizEV](#) for initial bonus and monthly \$

Summary & Questions



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o Summary

- There is a growing need for clean energy
- Rooftops are the preferred location
- Financial picture is good – best in ConEd area
 - ❑ Paybacks of roughly 5 to 10 years, then almost free electricity for 20 more years!
 - ❑ Additional savings can really add up (heating & driving)
 - ❑ Make sure you compare systems based on **\$/watt**

o Questions?



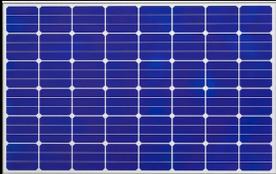
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BACKUP/EXTRA charts





Explain \$/ watt and watt-hours?

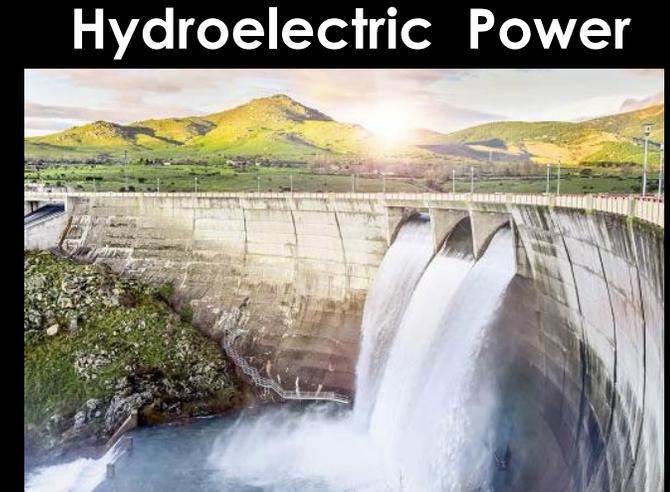
- You use electricity in watts x time. For example, a 100-watt bulb for 10 hours = 1,000 watt-hours or 1 kw-hr. Homes use say 5,000 to 25,000 kw-hrs / year.
- You are purchasing hardware  +  + wiring + installation
- Each panel has a rating (say 400 watts) – that means they produce 400 watts when exposed to a standard amount of light – but how much will they make in a year in your specific installation? A solar panel makes maximum energy when aimed directly at the sun – orientation. The panels produce electricity only when sun is shining. Annual production is calculated using a model considering orientation, exposure time (daytime only, some % of cloudy days, any applicable shading) to arrive at estimated production. These estimates can vary and are in kw-hrs / year.
- Price / watt = Total install cost / watts/panel x number of panels
- Example: \$20,000 / 400 watts / panel x 20 panels = \$2.50 per watt installed

In 2021, how much of our electricity in the US was from renewable sources?



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- A. None
- B. 10%
- C. 20%**
- D. 50%
- E. 90%



Are all these statements about a heat pump correct? (answer Y or N)



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- A. It cools your house
- B. It can replace an existing central air conditioner at about the same cost as a new air conditioner (after rebates)
- C. Heat pumps can handle the coldest days in the Northeast without backup heat
- D. If you put 1000 watts of energy in, you may get 3000 watts of heating out!

YES!

Heating and Air Conditioning



Traditional Home

Oil, Gas, Propane

9-12 annual metric tons CO₂



Net Zero Energy Home

Heat Pump

0 annual metric tons CO₂

Bills with and w/o Rooftop Solar

Con Ed March 27th, 2025

Your Delivery Charges

Basic service charge

Delivery @17.104¢/kWh

System Benefit Charge @0.689¢/kWh

Subtotal

GRT & other tax surcharges

Subtotal

Sales tax @4% \$3.59

Total electricity delivery charges

Your Supply Charges

Supply 386.00 kWh @10.440¢/kWh

Merchant Function Charge \$1.91

GRT & other tax surcharges \$0.00

Subtotal

Sales tax @4% \$1.69

Total electricity supply charges

March Bill for 386 kw-hr

ConEd

RT solar

\$ 19.33

\$ 19.33

\$ 66.02

\$ 2.66

\$ 88.01

\$ 1.80

\$ 0.40

\$ 89.81

\$ 19.73

\$ 3.59

\$ 0.79

\$ 93.40

\$ 20.51

\$ 137.30

\$ 20.51

\$ 117.97

Total variable costs

\$ 0.31

* per kw-hr

Full year (avg house)

ConEd

RT solar

12 \$ 231.96

8000 \$ 1,368.32

8000 \$ 55.12

\$ 1,655.40

\$ 33.86

\$ 1,689.26

\$ 67.57

\$ 1,756.83 \$ 246.17

8000 \$ 835.20

\$ 39.58

\$ -

\$ 874.78

\$ 34.99

\$ 909.78 \$ -

\$ 2,666.60 \$ 246.17

\$ 2,420

Annual Savings

* 0.33 in November 2025

Think about that next vehicle...



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Ford F-150

6.7 annual metric tons CO₂

VS

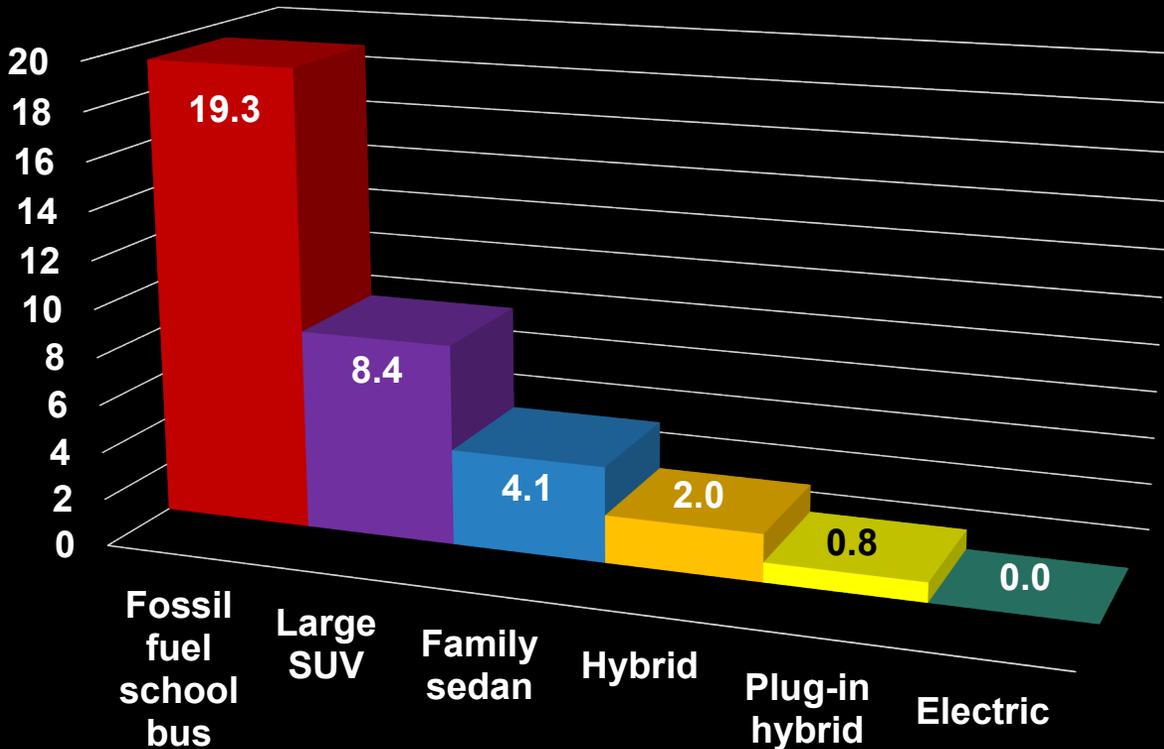
Ford F-150 Lightning

0.0 annual metric tons CO₂



Top Sellers:

1. Tesla Y, 3, X, S
2. Ford Mach-E
3. Chevy Bolt
4. Hyundai Ioniq 5/6
5. Kia 6
6. VW ID.4
7. Rivian R1T



How many mature trees would it take to offset the average person's emissions?



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That's 305,440,000,000 for the USA!

- A. 1 tree per person
- B. 29 trees per person
- C. 92 trees per person
- D. 920 trees per person**
- E. 9,200 trees per person



That's 34,040,000 for the Town of Yorktown (170,000 acres)
(and the town is only 25,000 acres)!