DECARBONIZE YOUR LIFESTYLE

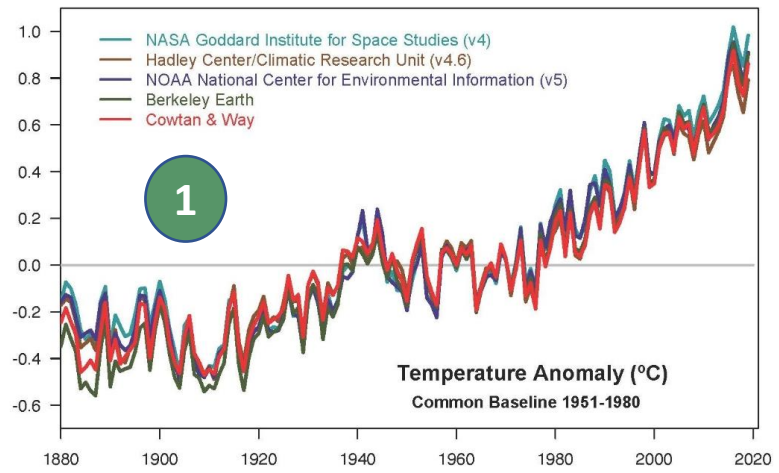
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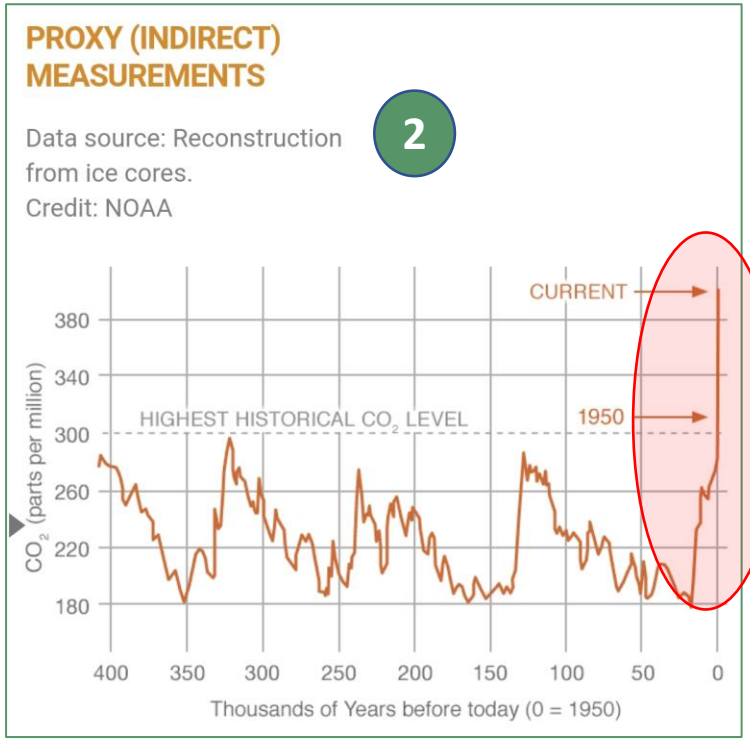


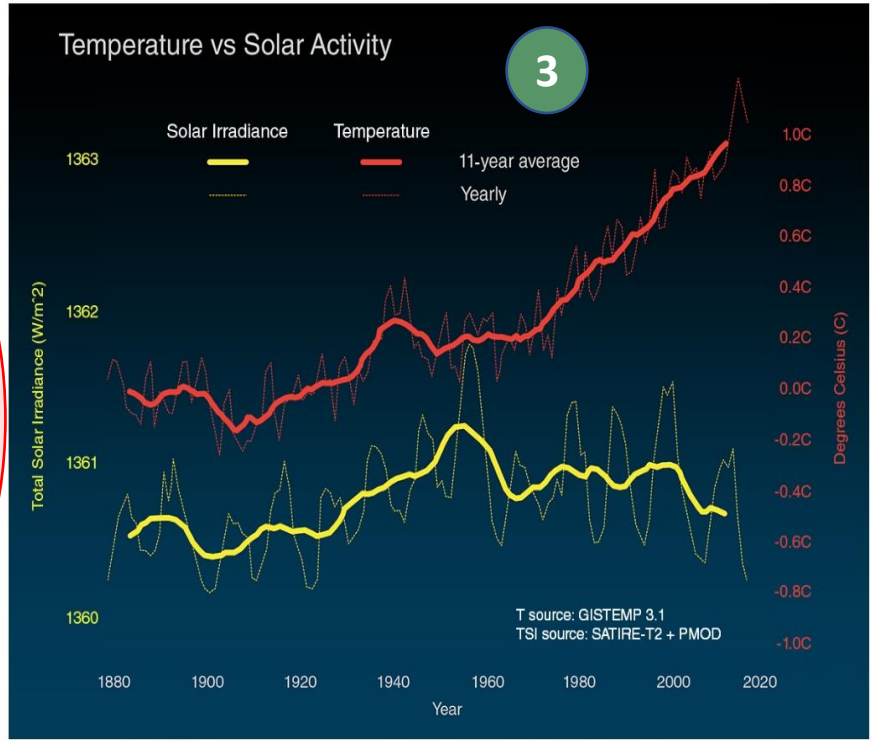
10/15/2026

Why Decarbonize - Climate Change requires Everyone's Action Today



Temperature data showing rapid warming in the past few decades. According to NASA data, 2016 was the warmest year since 1880, continuing a long-term trend of rising global temperatures. The 10 warmest years in the 140-year record all have occurred since 2000, with the six warmest years being the six most recent years. Credit: NASA/NOAA.





1. Global mean temperatures continue to raise year over year (NASA) *(NJ 2x higher than average)*
2. Atmospheric CO2 is above 400 ppm (up from 280 ppm 1850s) (NOAA) *(May 2022 421ppm)*
3. Anthropogenic green house gas emissions are the cause (not sun activity) *(IPCC)*

Switching to 100% Renewable Power

Why 100% Renewable?

- **Energy Independence** — Solar + storage reduces grid reliance
- **Lower Lifetime Costs** — 6–9 year payback in NJ
- **Health & Comfort** — No indoor combustion
- **Future-Proofing** — Aligns with evolving building codes

Core System Components

Solar PV — Primary clean generation
Battery Storage — Backup + load shifting
Ground/Air Heat Pump HVAC — Efficient heating/cooling
Induction Cooking — Clean, fast, safe
EV Charging — Electrifies transportation
100% Renewable Supply — Clean imports (3rd party supplier)

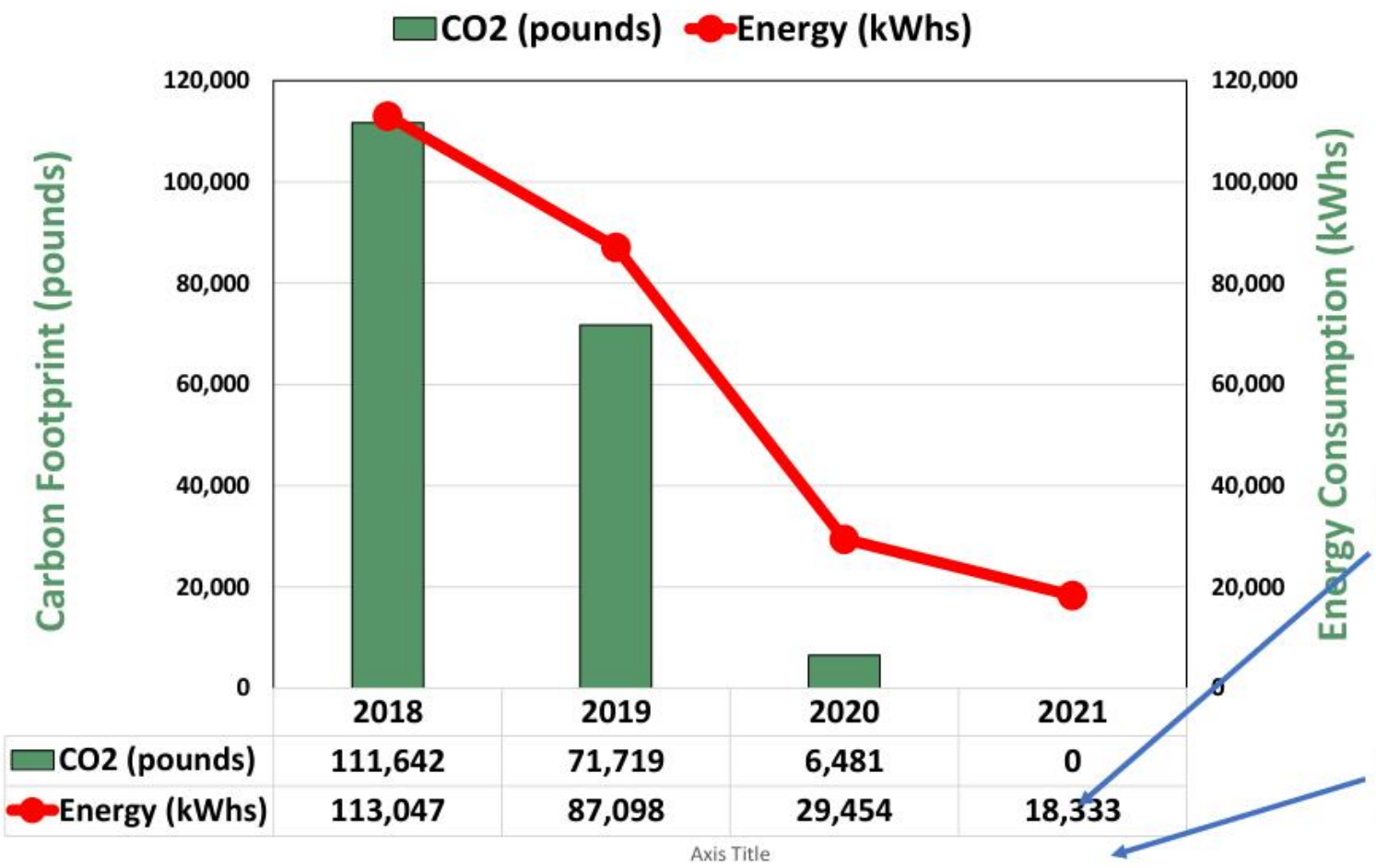
Drivers

- **30% Federal Clean Energy Tax Credit**
- **NJ Clean Energy Program rebates**
- **20–25 years** of low-cost, predictable energy
- Increases home value and resilience
- Comfort and energy independence



Switching to 100% Renewable Power – Carbon and Energy

Kavanagh Energy Master Plan - Renewable Energy Transition (Energy and Carbon) & Microgrid



	2018	2019	2020	2021
CO2 (pounds)	111,642	71,719	6,481	0
Energy (kWhs)	113,047	87,098	29,454	18,333

Includes electric, heating/cooling, transportation and lawn care energy demands

- *2018-2019 drop = Solar PV installation*
- *2019-2020 drop = geothermal installation*

1. *Zero (0) energy carbon footprint within 3 years*



2. *>80% energy consumption reduction*



Switching to 100% Renewable Power - Financial

Renewable Transition Cash Flow Data

	Annual	Cummulative	Annual	Cummulative	Annual Savings	Cumulative	Carbon Savings (lbs)
2020	$ 6,417	$ 6,417	$ 8,822	$ 8,822	(2,405)	(2,405)	96,519
2021	$ 6,610	$ 13,027	$ 8,822	$ 17,644	(2,212)	(4,617)	96,519
2022	$ 6,808	$ 19,834	$ 8,835	$ 26,479	(2,027)	(6,644)	111,642
2023	$ 7,012	$ 26,846	$ 8,848	$ 35,327	(1,836)	(8,480)	111,642
2024	$ 7,222	$ 34,069	$ 8,861	$ 44,188	(1,639)	(10,119)	111,642
2025	$ 7,439	$ 41,508	$ 1,375	$ 45,563	6,064	(4,056)	111,642
2026	$ 7,662	$ 49,170	$ 1,390	$ 46,953	6,273	2,217	111,642
2027	$ 7,892	$ 57,062	$ (36)	$ 46,918	7,928	10,145	111,642
2028	$ 8,129	$ 65,191	$ (20)	$ 46,897	8,149	18,294	111,642
2029	$ 8,373	$ 73,564	$ (5)	$ 46,893	8,377	26,671	111,642
2030	$ 8,624	$ 82,188	$ 3,267	$ 50,159	5,357	32,028	111,642
2031	$ 8,883	$ 91,070	$ 3,283	$ 53,442	5,599	37,628	111,642
2032	$ 9,149	$ 100,219	$ 3,300	$ 56,743	5,849	43,477	111,642
2033	$ 9,424	$ 109,643	$ 3,318	$ 60,061	6,106	49,582	111,642
2034	$ 9,706	$ 119,349	$ 3,336	$ 63,397	6,370	55,953	111,642
2035	$ 9,997	$ 134,847	$ 3,355	$ 66,752	6,643	68,095	111,642
2036	$ 10,297	$ 145,144	$ 3,374	$ 70,126	6,923	75,018	111,642
2037	$ 10,606	$ 155,750	$ 3,394	$ 73,520	7,212	82,231	111,642
2038	$ 10,925	$ 166,675	$ 3,414	$ 76,934	7,510	89,741	111,642
2039	$ 11,252	$ 177,927	$ 3,436	$ 80,370	7,817	97,558	111,642
2040	$ 11,590	$ 189,517	$ -	$ 80,370	11,590	109,147	111,642
2041	$ 11,938	$ 201,455	$ -	$ 80,370	11,938	121,085	111,642
2042	$ 12,296	$ 213,750	$ -	$ 80,370	12,296	133,380	111,642
2043	$ 12,665	$ 226,415	$ -	$ 80,370	12,665	146,045	111,642
2044	$ 13,044	$ 239,459	$ -	$ 80,370	13,044	159,089	111,642
	$ 239,459		$ 80,370		Lbs CO2	Pound CO2	2,760,802
	$ 9,578		$ 3,215		Tons CO2	Tons CO2	1,380

Notes

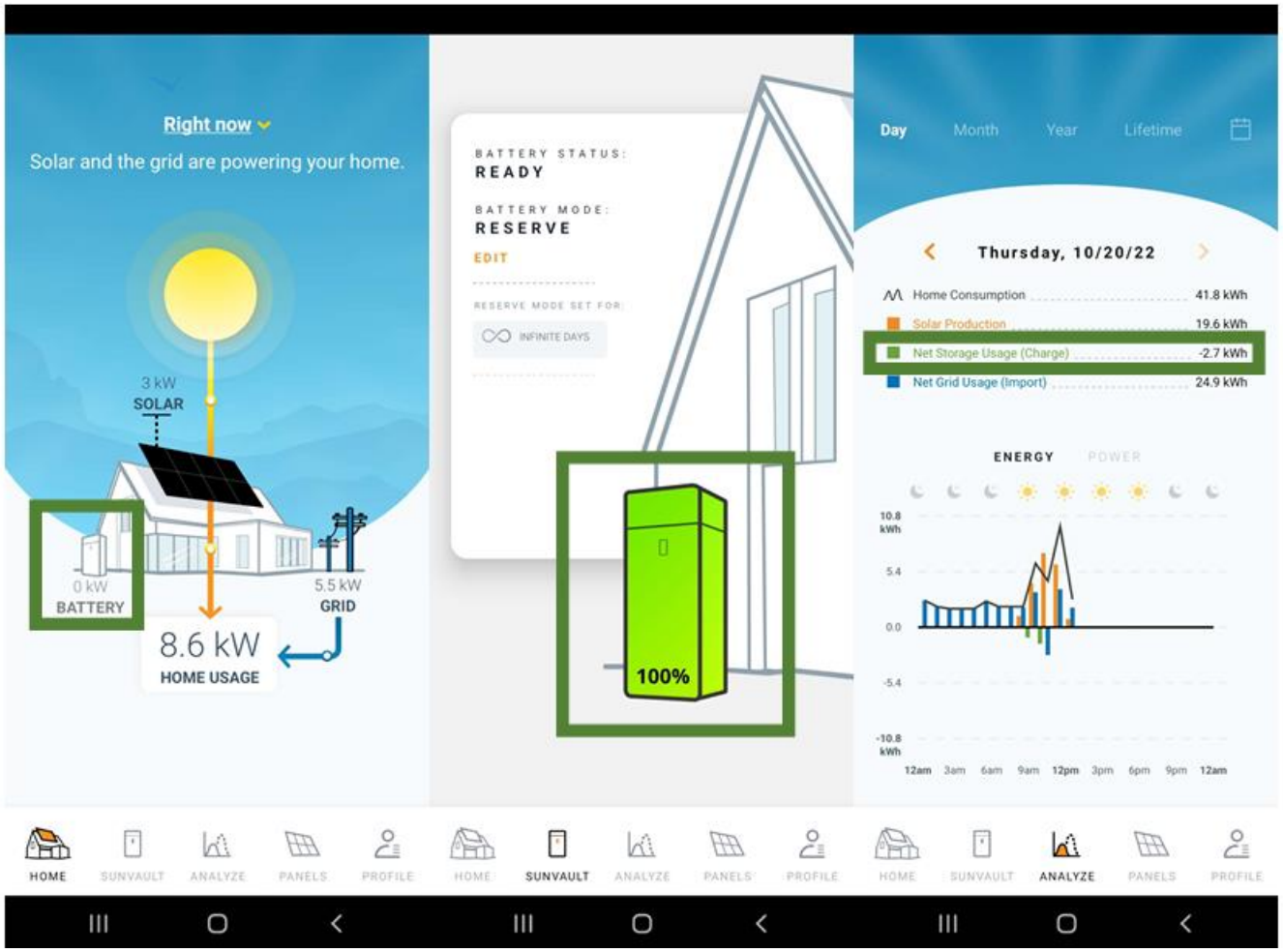
- Positive cash by year 5.5
- $159k in net cash
- Hedged against inflation
- ~1400 Tons of lifetime carbon savings
- ROI ~8%
- 20 yr. solar loan
- 5 yr. geothermal loan
- Investment tax credits pay down loans

Assumptions

- 3% escalator on utilities
- $210/SREC (10 yrs.) (old program)
- Typical replace furnace at 15yrs

Switching to 100% Renewable Power – My BESS

SunPower SunVault© Energy Storage System (ESS)



- 2022 installed 52-kilowatt hour energy storage system
- Whole house back up in event of outage
- Pairs with solar system and recharges during the day
- Indefinite back up at reduced load
- 10-year warranty on battery capacity

Mega SunVault™ Storage Install – YouTube

SunVault the Solar Battery Storage System for Homeowners | SunPower



Smart Home Features

- **Switch to LEDs –** More efficient with less heat and longer lifespan
- **Upgrade home insulation –** Check attics, basements and leaky walls
- **Install new thermal windows –** High R values are available
- **Use window film insulation –** Several options of this in the market
- **Smart Thermostats** — Optimize heating/cooling schedules; reduce HVAC energy use by 10–20%.
- **Smart Heat Pump Controls** — Automate load shifting to off-peak or solar-powered hours.
- **Smart Plugs & Appliance Controls** — Eliminate phantom loads and automate high-draw devices.
- **Smart Lighting** — LED + occupancy sensors reduce lighting energy by up to 70%.
- **Home Energy Monitors** — Real-time visibility into usage and carbon intensity.
- **Smart EV Charging** — Charge when solar is abundant or grid carbon intensity is low.

Smart Home Features

Carbon & Cost Impact

- Automated HVAC optimization delivers **10–30% energy savings**.
- Smart load shifting reduces emissions by charging/operating during **low-carbon grid hours**.
- Whole-home monitoring identifies **high-impact electrification opportunities**.

Implementation Roadmap

1. **Improve Insulation and upgrade to LEDs –** highest ROI actions.
2. **Install Smart Thermostat** — Immediate HVAC efficiency gains.
3. **Add Smart Plugs & Lighting** — Quick wins for plug loads and lighting.
4. **Deploy Home Energy Monitor** — Identify carbon-intensive loads.
5. **Integrate Heat Pump & EV Controls** — Automate major loads for maximum decarbonization.



Decarbonize Transportation (Very High Impact)

Strategic Levers

- **Electrify Your Vehicle** — Shift from internal combustion to battery-electric or plug-in hybrid.
- **Charge With Renewable Energy** — Pair EV charging with rooftop solar or 100% renewable electricity plans.
- **Optimize Trip Efficiency** — Reduce unnecessary miles, combine trips, and maintain efficient driving habits.
- **Shift Modes** — Replace short car trips with walking, biking, or e-bikes or motorcycles.
- **Use Public Transit** — Leverage buses, rail, and micro-mobility to reduce per-mile emissions.

Emissions Impact

- EVs powered by renewable electricity reduce lifecycle emissions by **70–100%**.
- Replacing 20% of short car trips with biking/walking cuts personal transport emissions by **10–15%**.
- Mode shifting + electrification delivers the fastest path to net-zero mobility.

Decarbonize Transportation (Very High Impact)

Implementation Roadmap

- **Assess Your Driving Profile** — Annual miles, trip types, charging access.
- **Select an EV or Hybrid** — Match range, budget, and use case.
- **Install Home Charging** — Level 2 charger + renewable electricity.
- **Adopt Low-Carbon Modes** — E-bike, transit, car-free trips.

Incentives & Savings

- **NJ Charge Up incentives** for EVs
- **Lower operating costs**: EV fueling = ~$0.03–0.05 per mile in NJ
- **Lower maintenance costs**: No oil changes for BEVs

Decarbonize Transportation (My Vehicles)

Volt Plug in Hybrid (PHEV) Savings Analysis

#/Gallon	$/kWh
$ 3.00	$ 0.15

	Fuel Economy:	Electric Consumption (kWh/100mi):	Mi/kWh	Electric Miles:	kWh used (estimated)	Gas Miles:	Total Miles:	Percentage on Electric:	Percentage on Gas:	Estimated Gallons of Fuel Saved:	East Coast Cost per Gal Per US EIA	Gas Savings	Gallons Burned	$ Spent on Gas	Estimated CO2 Avoided (lbs):	(lbs) CO2 per Gallon of Fuel	
March	123 mpg	41	2.4	462	189	132	593	78%	22%	21	$ 2.55	$ 53.47	4	$ 11.20	407	19.4	
April	250+ mpg	31	3.2	539	167	48	588	92%	8%	24	$ 2.77	$ 66.48	2	$ 4.43	473	19.7	
May	74 mpg	32	3.1	810	259	865	1,675	48%	52%	50	$ 2.81	$140.70	29	$ 81.14	973	19.5	
June	200 mpg	33	3.0	659	217	147	805	82%	18%	31	$ 2.67	$ 82.80	5	$ 13.09	601	19.4	
July	101 mpg	36	2.8	687	247	356	1,043	66%	34%	35	$ 2.73	$ 95.41	12	$ 32.35	680	19.4	
August	108 mpg	35	2.9	956	335	529	1,485	64%	36%	51	$ 2.61	$133.31	18	$ 46.09	986	19.3	
September	250+ mpg	31	3.2	1,041	323	132	1,173	89%	11%	48	$ 2.57	$123.12	4	$ 11.29	923	19.2	
October	74 mpg	37	2.7	702	260	833	1,535	46%	54%	46	$ 2.55	$117.25	28	$ 70.78	894	19.4	
November	151	38	2.6	664	252	176	840	79%	21%	31	$ 2.54	$ 78.83	6	$ 14.92	601	19.4	
December	73	39	2.6	347	135	251	840	58%	42%	18	$ 2.55	$ 45.94	8	$ 21.35	346	19.2	
TOTAL		35.3	2.9	6,867	2,385	3,469	10,577	65%	35%	355		$937.31	116	$306.64	6884	19.4	Net Savings $ 580

Electric Costs	$ 358	Gas Costs Saved	$ 937
Electric Cost/Mile	$ 0.052	Gas Costs / Mile	$ 0.136
Estimated Total kWhs	3674		
Full Electric			

Cost per mile is 3X lower for EVs - **~$750 savings / yr** + maintenance savings

*Savings even higher with increasing gas prices 2021 onward >> Avg gas costs > $3.75/gallon 4.18.24

Decarbonize Transportation (My Vehicles)

My Current Arrangement:

- Ford F150 Lightning with 110 kWh of energy stored (9000W back up power to house capable, average 2.2 mi/kWh or 6.8 Cents/mile, 230-mile range
- Chrysler Pacifica with 34 kWh of energy stored
- Level 2 Juicebox Charger



Outlets in the Frunk and bed







Thank You!

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