

A Climate Change-Fighting Household

We are retirees determined to do all in our power to pass onto our grandchildren and their generation worldwide a healthy green earth. The prosperity and consumerism of our generation and of our parents and grandparents have brought the earth to the brink of destruction. It was not their intent. They and we did not see this coming, but the crisis is here now. Already the global population is stressed by scorching heat, fires, droughts, rising sea levels, and catastrophic floods. Mass migrations and political upheaval are certain to follow.



Dennis and Janet Nordmoe

Solutions are within our grasp, but we must all pull together as citizens of the earth answerable to God and to history. We must move quickly to stop spewing gases into the atmosphere that are heating the globe. We must, with a sense of urgency, begin to move our lifestyles in a sustainable direction.

Our choices have been guided by these principles:

1. We must reduce our own family's carbon footprint dramatically, beginning with changes that provide the most benefit for the least cost.
2. For our example to be motivational to others, our initiatives at this stage of history must be attractive, financially prudent, and comfortable.
3. Our decisions are driven by spiritual responsibility to God, history, and all of earth's living creatures, not just by financial savings. However, financial assessments of each step enables us to get the greatest benefit out of our resources while also making our experiments credible to others as they assess their own opportunities for responsible action.
4. Electrification of all appliances is a sound long-term strategy for reducing one's carbon footprint.

Here is what our family is doing.



Transportation

1) In 2014, we invested in a fuel-efficient small used Ford Fiesta and boosted daily commuting mileage to forty miles per gallon. Now, 100,000 miles later, we demoted the Fiesta to backup duty for local trips when our plug-in hybrid is not available.

2) In 2019, we retired our V6 minivan that got 18 MPG in family trips and errands around town. We replaced it with a used Ford C Max plug-in hybrid that averages 70 MPG of gasoline usage over the life of the car. This has been a delight to own and drive. The charging cost for the electric-powered miles is the equivalent of paying \$1.25/gallon for gas. Now, after four years and 32,000 miles of use, the car has the same market value as what we paid for it: zero depreciation! We plan to apply that trade-in value to a new plug-in hybrid with upgraded safety features and greater electric range. Someone else, who is a regular commuter, will then benefit from our current, high-in-demand, super-saver car.

The house

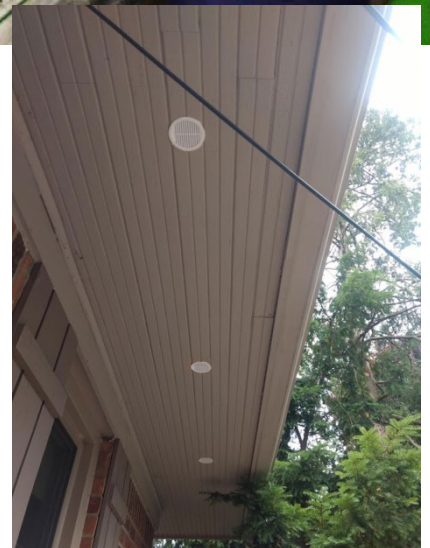
1) In 2018, we purchased our dream retirement home, a 1951 ranch house. Through immediate changes such as LED lighting, we achieved a 50% reduction of electricity consumption over the previous homeowner. Our outside lighting uses Phillips 8 watt LED bulbs that automatically turn on only in darkness, aiding home security and safety for neighborhood walkers.



2) After LED, adding insulation was the next low-hanging fruit! After installing protection for soffit ventilation in this home, we blew five pallets of cellulose insulation¹ onto our attic floor and over the sun room ceiling to achieve an insulation depth of 18" and an estimated R value of 60. Cost: about \$900. (Blower rental was free with the purchase of supplies).



3) We installed plastic soffit vents, adding air circulation to our attic to reduce summer cooling expense). Cost: About \$40 for materials. This required use of a hole saw accessory that we already had for our



electric drill. *Most people would prefer to hire out this project because of the possibility of injury.*

¹ The quantity discount on cellulose insulation was significant. Adding the last 6 inches cost us very little.

- 4) In 2019, we replaced leaky jalousie windows on our sun room with tight double-glazed low e windows. This buffers a section of our house from the winter cold, enhances the beauty and utility of this space, and allows us enjoyment of a direct view of nature 12 months a year. This created year-around play space for the grandchildren and an enjoyable area for entertaining guests. Cost: \$6,000.



- 5) In 2020, we hired a contractor to blow in cellulose insulation into the brick veneer

walls of our home to achieve greater comfort and energy savings. Cost: about \$1200.

- 6) We also insulated the 2-car attached garage (door, outside walls, and ceiling), reducing home heating costs and improving the efficiency of battery-powered cars. Cost: about \$300.

- 7) In 2020, we added 1.5 inches of foam R7.5 insulation to 170 square feet of a basement wall as part of a project creating a pantry. Cost: \$1.60/sq. ft.



8) In 2021 we added 1.5 inches of foam insulation and a 2.5 inch air gap with a 2x3 stud wall to another 360 square feet of cement block basement walls to achieve energy savings while creating attractive guest and hobby room spaces in our house. The insulation part of the project cost about \$1.60/sq. ft. We did the design, insulating and framing ourselves.



Increasing habitable space within a small house is much more energy-efficient than moving into a bigger house! We made one a main floor small bedroom convertible between a nursery play area and guest room by creating toy storage benches that flip into a double bed when needed.

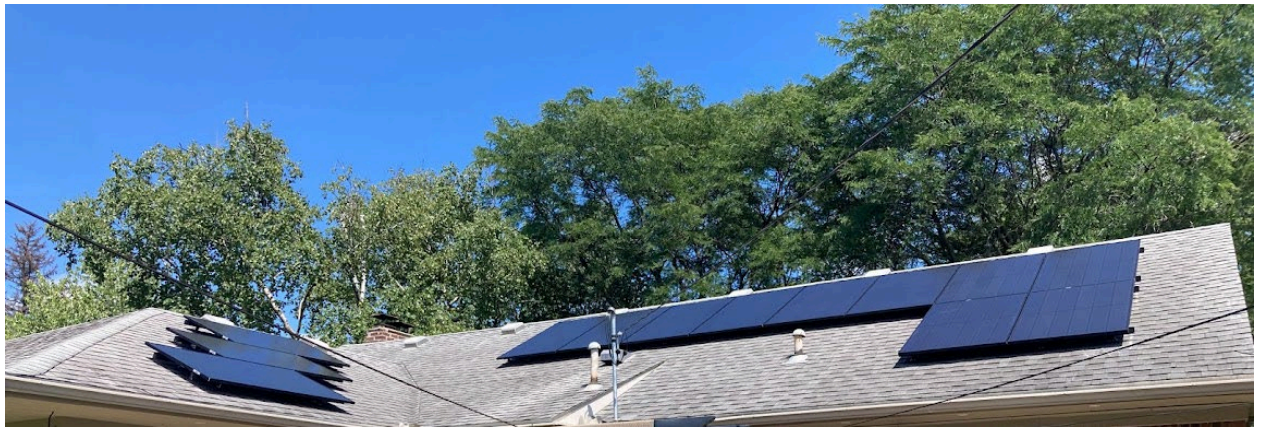


9) In 2022, we prepared for becoming a solar-powered household by replacing our gas range with an electric stove to improve indoor air quality while reducing our carbon footprint. We had already installed an electric water heater to resolve a gas exhaust venting issue. We replaced the ventless gas heater in the sunroom with an electric baseboard heater. We installed an electric fireplace/space heater in our living room for smokeless cozy evenings without the expense of heating the whole house during those pre-bedtime hours. Without solar, these conversions would increase monthly household expenses. With solar as our energy source, going green this way reduced monthly utility bills and carbon dioxide emissions.

10) To maximize efficiency of the solar project, we cut down a 40 ft. fir tree that was shading the roof. We replaced it with five arborvitae cedar trees and two shrubs for privacy, beauty, and carbon sequestration. We planted them ourselves.



11) In 2022, we installed 21 solar panels to replace coal and natural gas as sources for most of our electric power. The project cost was significant, but it was entirely financed by the Michigan Saves credit union collaborative. Monthly payments will be mostly paid for by electric billing cost savings and tax credits. After the loan is amortized in 15 years, the project is expected to continue to replace 65% of electrical billings (and 90% of grid costs) for decades to come. The REC brand 400 Watt panels are rated to retain 92% of initial effectiveness after 25 years.



The lot

- 12) In 2018, we replaced an aging and polluting gas-powered snow blower with a battery-powered snow blower that clears 4-6" of snow on 300 feet of sidewalk and driveway on a single charge. It did not cost any more than a gas powered blower.
- 13) Mindful of the fact that gas-powered lawn equipment produces considerably more pollution than automobiles, beginning in 2019, we converted 1,000 square feet of previously mowed lawn to landscaping that provides additional carbon sequestration as well as edible berries and vegetables, and plants designed to attract and nurture birds, butterflies, and bees. (They also attract deer on a regular basis, which we enjoy although they present some challenges.) In 2019, we installed a rain barrel system to furnish water to our gardens. Cost: about \$80.



All plantings were a family project. We supplemented our bird and bee habitat with a mason bee house and a \$12 solar pump-powered bird bath. We had 15 cubic yards of low cost mulch delivered by truck to our home. We spread it ourselves after covering grass with free cardboard from our hardware store.

Practices and Lifestyle

- 1) We use air conditioning sparingly and only at night when discounted electricity generation is primarily wind-based, and the AC unit operates more efficiently in the cooler air. Now with solar, hot sunny afternoons will also produce plenty of electricity for the AC. This well-insulated house only

heats up by two or three degrees during the day without the AC running. We set back winter heating at night. We keep the house at comfortable temperatures throughout the year.

- 2) We prepare low-meat meals.
- 3) We schedule the charging of our car to use either sunlight or late night discounted energy.
- 4) We avoid petroleum-based recreational activities.
- 5) We plant trees in national forests as funeral memorials instead of giving flowers flown in from South America.

Future Plans

- 1) Programmable thermostat.
- 2) Battery-powered lawn mower to replace the gas-driven lawn tractor when major repairs come due.
- 3) Trade-in our plug-in hybrid car to gain current safety features and improve all-electric range for local travel.
- 4) Replace the gas clothes dryer with an electric dryer. The current



dryer burns two-thirds as much gas in a year as the furnace. Solar makes electric appliances both green and efficient.

- 5) Landscaping our 2000 sq. ft. front berm to eliminate lawn mowing there. Further enrich existing plantings. Reseed lawn with mini-clover and drought-resistant grass.
- 6) Provide power outage backup either by battery or by natural gas powered generator—a green strategy compromise.
- 7) Switch to an electric heat pump installation when our

high efficiency gas furnace reaches the end of its life.

Advocacy

In 2019, Dennis has written policy recommendations to DTE proposing an alternative method of investing in DTE solar energy farms that would attract capital for a more rapid transition to grid-based solar power. (Community solar plans now before the state legislature would have the same advantage.) Dennis serves on a DTE advisory panel.

Community Action

1. Before retirement, Dennis facilitated 100 low-income southwest Detroit families in getting their homes insulated, thereby increasing their disposable income through reducing energy consumption.
2. In pre-retirement years, Dennis initiated partnership projects with Greening of Detroit that added 500 trees in a southwest Detroit neighborhood.
3. We challenge our congregation to recruit other members to reduce their energy-consumption profile.
4. We are making our experience available to friends and neighbors through social media and public presentations.
5. We will respond to additional conversation via a note to dnordmoe@gmail.com

Resources

- Pope Francis. Laudato Si: On Care for Our Common Home. Addresses scientific, moral, and religious rationales for action on climate change. Book version available on Amazon. PDF available at: https://www.vatican.va/content/dam/francesco/pdf/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si_en.pdf
- Memorial trees: <https://give.americanforests.org/ways-to-give/memorial-gift-trees/> or https://support.nationalforests.org/give/351518/#!/donation/checkout?c_src=WEB&c_src2=TRP0000WEBTPLinkSidebar
- Calculate your household’s carbon footprint at <https://www3.epa.gov/carbon-footprint-calculator/index2.html>
- [Www.Energysage.com](http://www.energysage.com): Get competing solar quotes on line plus consultation.
- <https://laudatosiactionplatform.org/> A good general framework for family and community action. However, the carbon footprint calculator did not give reliable results when tested. The EPA calculator is recommended instead.
- Consumers Power and DTE Energy websites offer programs, ideas, and rebates.

The top lessons from our experience in order of benefits to earth and budget:

1. First and cheapest: Stop air leaks around doors and windows .
2. Convert all lighting to LED
3. Insulate to the maximum for major savings.
4. Replace aging, “dirty” lawn equipment with battery powered equipment
5. Landscape to capture carbon and reduce emissions
6. Solar when practical followed by electrification of all gas appliances
Solar rooftop installations are of maximum initial social benefit for larger homes and businesses.

2021 Carbon Footprint Summary, 27265 Lathrup (BEFORE SOLAR)			
Sources	Electricity	Natural Gas	Gasoline
Quantity	8,465 M (thousand) KWH	54.4 MCF (thousand Cu. Ft.)	243 est. gallons
Cost	\$2,022	\$570	\$730
\$ amount of gas attributable to heating (year)		\$378 (\$31.51 per month, annualized	
Metric Tons of CO2	6	3	2.2
Total Metric Tons of CO2 Produced		11.2	
Metric Tons of CO2 targets for 2023 (Post solar installation)	1	2.5	2.0