

# **Leitner Green Home**

A 29-year journey

# Initial Conditions

- ~2400 square foot one-story home
- Built in 1948
- Current owners purchased in 1994
- Original equipment: natural gas heat, water heater, and dryer; electric stove and A/C.
- Gasoline-powered car
- Some dual-pane windows, basic attic insulation

# Improvements and Features Added

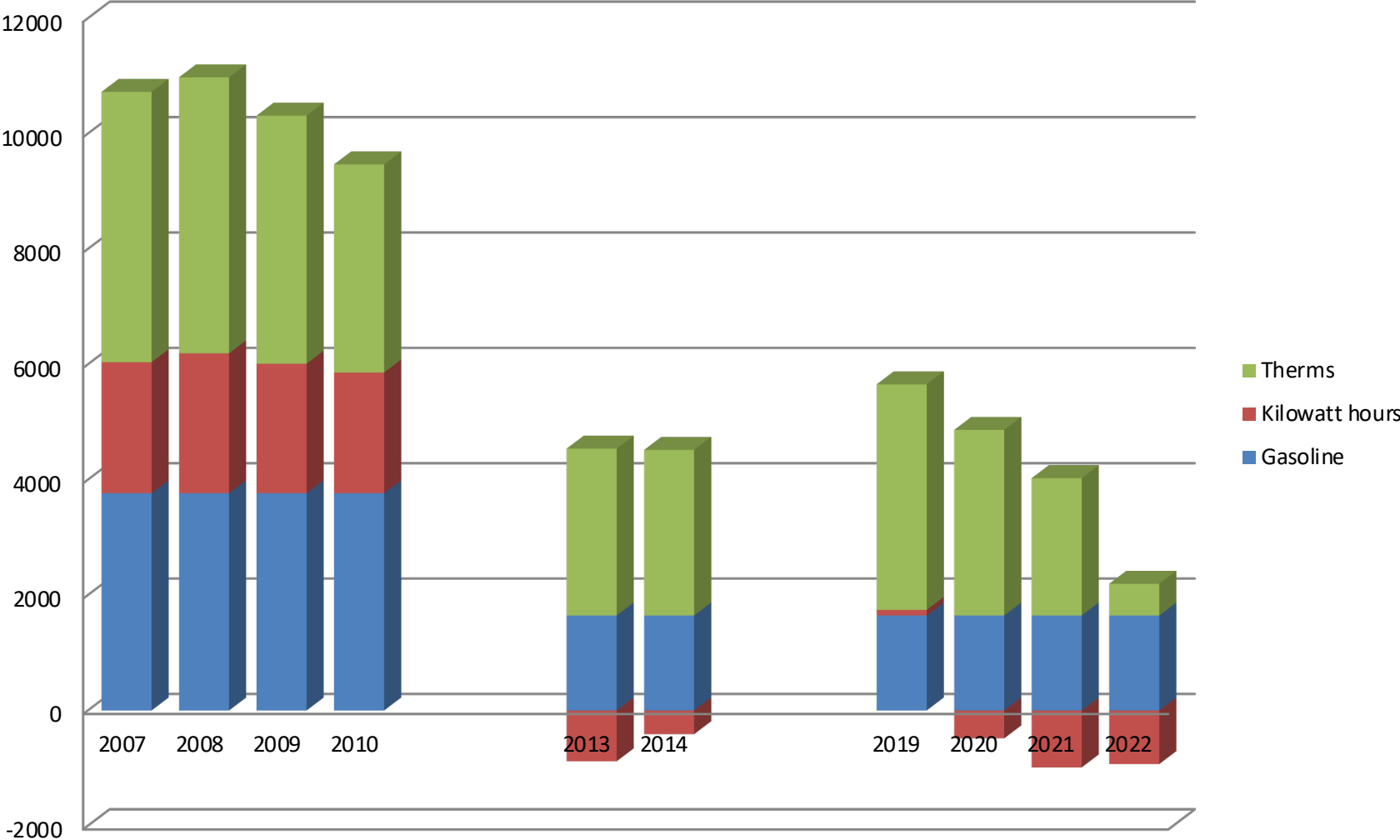
- Energy audit 2010; added insulation, fixed air leaks
- 2012—installed solar panels, 5 kW output
- 2013—purchased plug-in hybrid car
- 2022—replaced heating/air conditioning with heat pump
- 2022—replaced eleven 30+ year old windows

# Carbon Footprint Analysis

- Always 3-4 people living in home
- Overall carbon footprint includes transportation because plug-in hybrid draws power from home
- Assume car driven 15,000 miles/yr.
- Older car: 35 mpg; plug-in hybrid, 80 mpg net
- Assume kWh from grid is from fossil fuel sources
- Will present three periods showing changes in carbon footprint

**Summary: 88 percent  
reduction in carbon  
footprint from 2007-9 to  
2022**

**Carbon footprint in selected years, 2007-2022, in kg**  
Negative kilowatt hours are excess capacity returned to grid  
See narrative for description of improvements



# 2007-2010 Carbon Footprint

- Baseline (2007-9): 10,670 kg carbon/year avg
- Carbon footprint was 9,500 kg in 2010
- 20% drop in 2010 natural gas use was the result of energy audit and resulting improved insulation and reduced air leakage

# 2013-4 Carbon Footprint

- Carbon footprint averaged 3,900 kg carbon/year
- Plug-in hybrid (Chevy Volt) cut gasoline demand by 56%
- Solar panels resulted in net export of electricity to the grid
- Continued improvements in insulation (walls, attic, windows) resulted in 34% reduction in natural gas usage



# 2022 Carbon Footprint

- Carbon footprint in 2022: net 1270 kg/yr
- Heat pump reduced natural gas use by 88%
- Car usage now largest element in carbon footprint
- Good insulation means we don't use AC
- Solar array has capacity to support future EV and replacement water heater and dryer

# Tips

- Improving insulation and stopping air leaks is highly cost-effective
- Install/purchase and run your transportation and heating/cooling, then size your solar array appropriately
- Synchronize your roof replacement and solar panel installation
- When the time comes, replace your car with an EV!