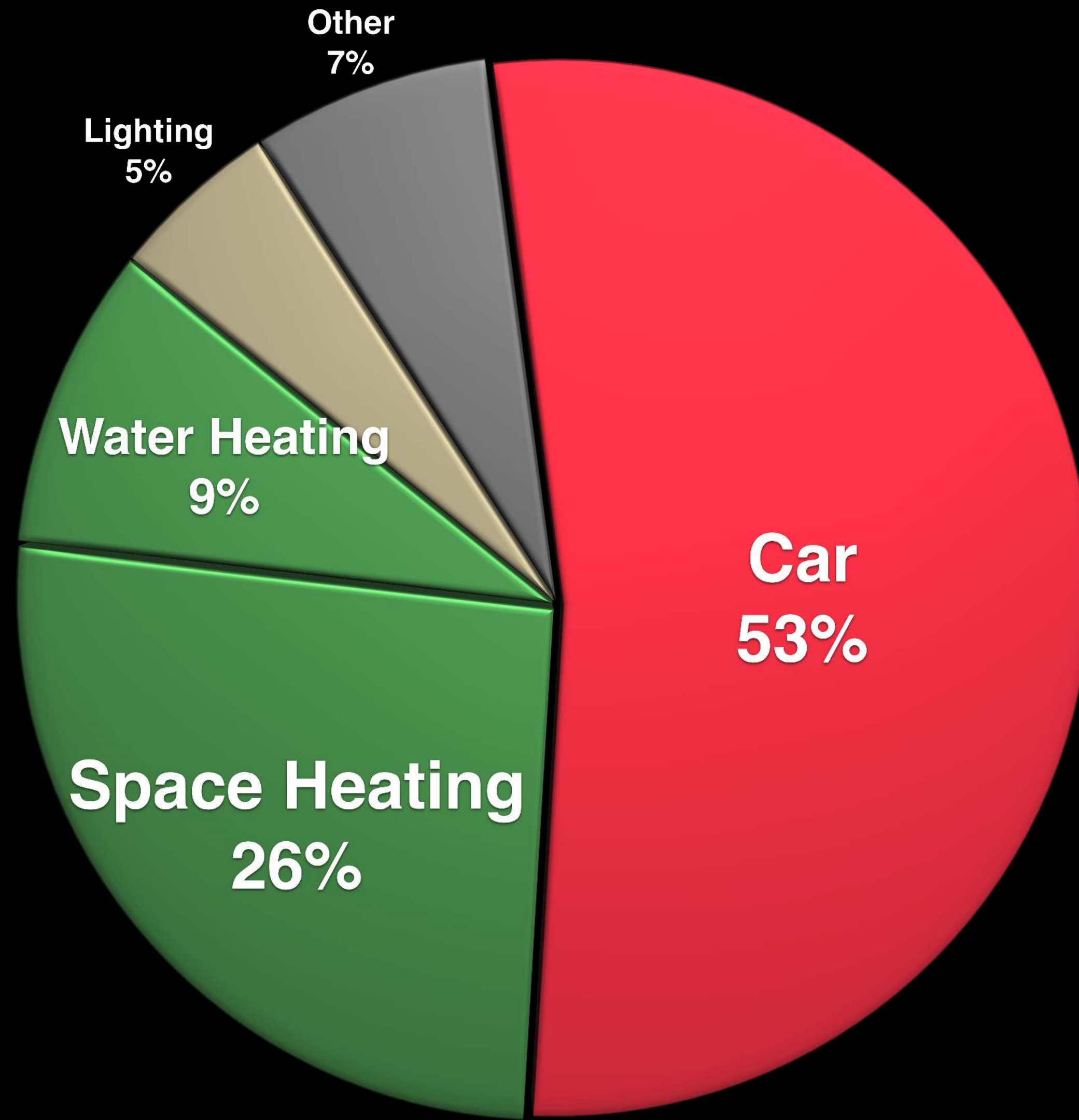


# How To Reduce Your **TOTAL** Energy Bill

Things you can do to save more than \$1,000 per year

# Avg. San Juan County Residential Primary Energy Use



*Over 80% of energy used in a typical San Juan County home is for transportation and heating.*

*In the US, the electrification of transportation and heating is accelerating and in the coming decades, most people will be driving and heating with electricity.*

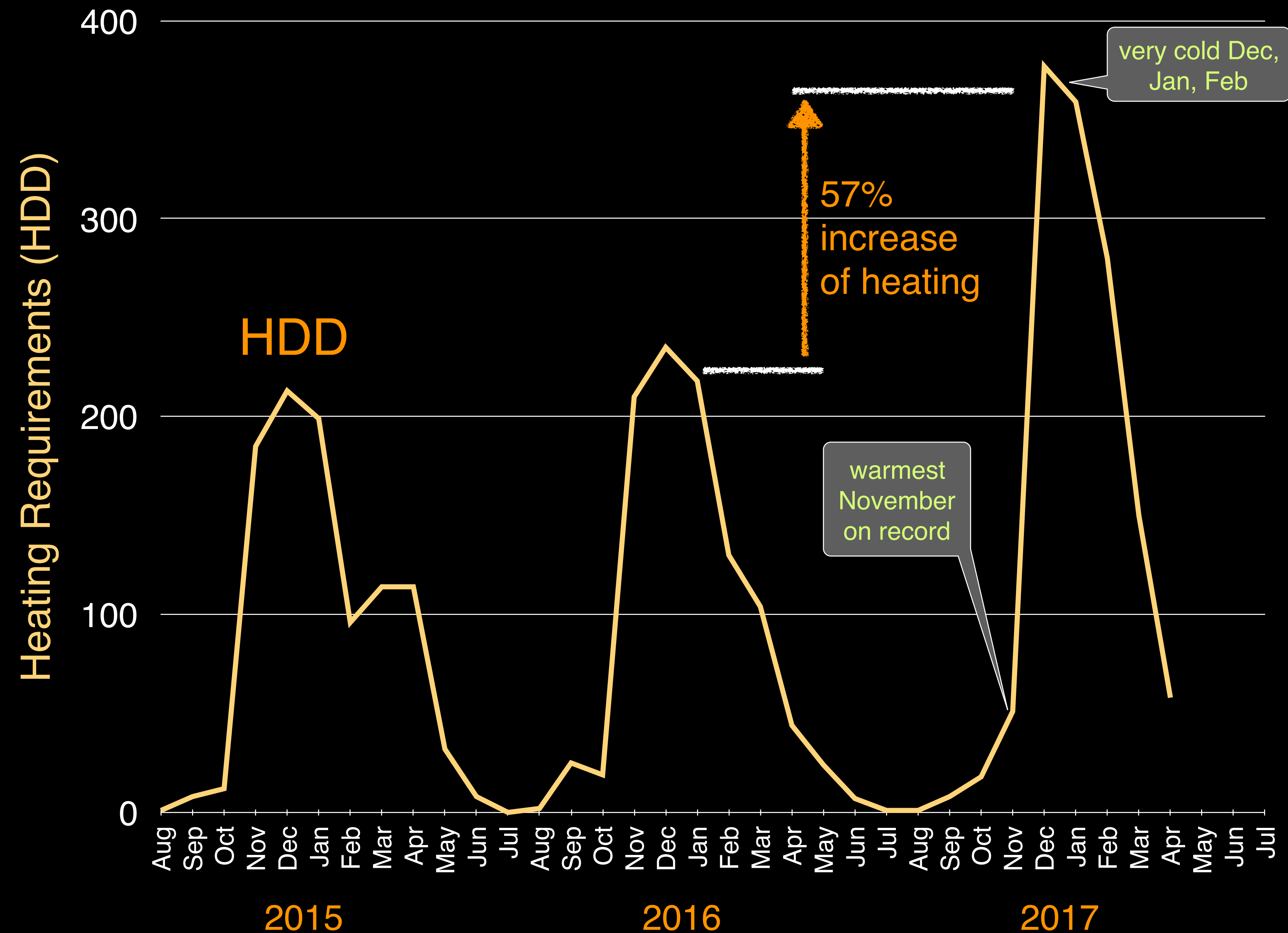
*Electricity in San Juan County is lower cost and cleaner than fossil fuels, in essentially every case.*

The next few slides show how driving and heating with electricity can reduce your TOTAL energy bill by over \$1,000 per year.

First, let's look at *heating cost*.

The next slide shows how cold it was last winter.

# 2016/17 Winter Was Much Colder Than Previous Two Winters



*“This was the coldest winter in a generation.”*

Cliff Mass

## Notes

- Heating Degree Days (HDD) are a measure of how cold it is in a given month. The colder it is, the bigger the HDD and the more heat needed to keep your home warm.

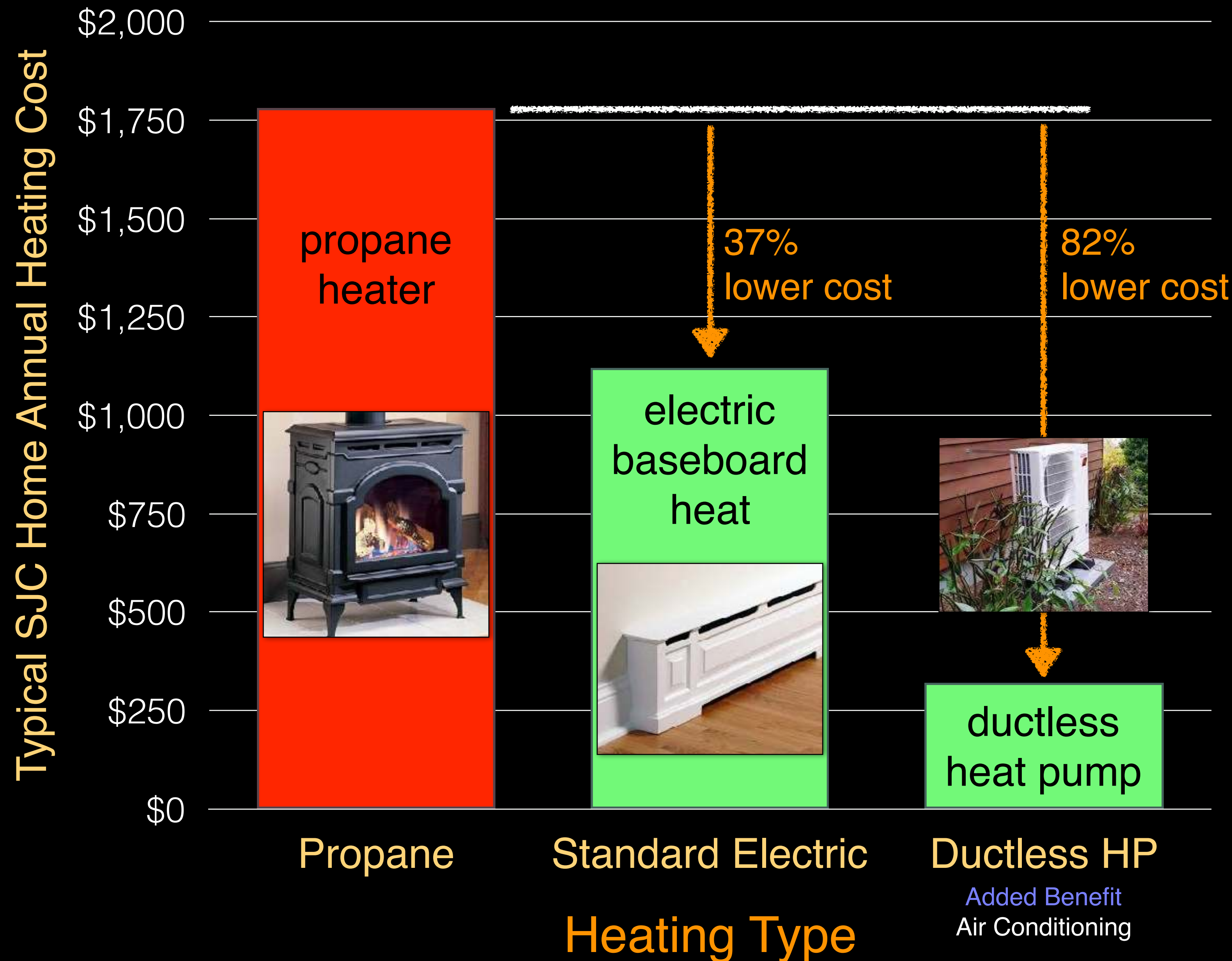
*When we have a very cold winter, whatever energy you use to heat - electricity, propane, heating oil - your energy bills will go up more than usual.*

*But if you are heating with electricity, your TOTAL energy bill goes up less.*

The next slide shows how much you save with electric heat, compared to propane.



# Heating with Electricity Costs Less than Fossil Fuels



## Notes

- Typical San Juan County Home
  - 40 million BTU annual heat load
- 2017 Winter Fuel Cost
  - Electricity: \$.0959/kWh
  - Propane: \$3.00/gallon
- Propane heater is typically furnace or stove. Fuel cost could be higher due to lower energy efficiency.
- Ductless heat pumps are about three to four times more energy efficient than baseboard and propane heaters
- Propane is a fossil fuel with higher carbon footprint than OPALCO electricity



Joe Thoron and Lisl Thomsen of Orcas Island made the move to an all-electric Nissan Leaf with four kids and an exchange student in tow. In their first month after switching from a gas to an electric vehicle, the family logged 1,000 miles on Orcas island. The family made as many as four round trips a day between home, work and school, plus 4H meetings, sports practice and games, Cascade Lake for crew practice, and weekend activities. Joe has calculated that on gas expense alone, they saved \$100 in the first month. At that rate, their total energy bill will be lower by \$1,200 in a year, plus additional savings in avoided car maintenance and repairs.

*“The Leaf is the perfect island car,”* said Joe. *“We can get everywhere we need to each day on a single charge, and it’s easy to charge up at home overnight. As much as we drive our kids around, I’m more comfortable knowing I’m not putting out tailpipe emissions.”*

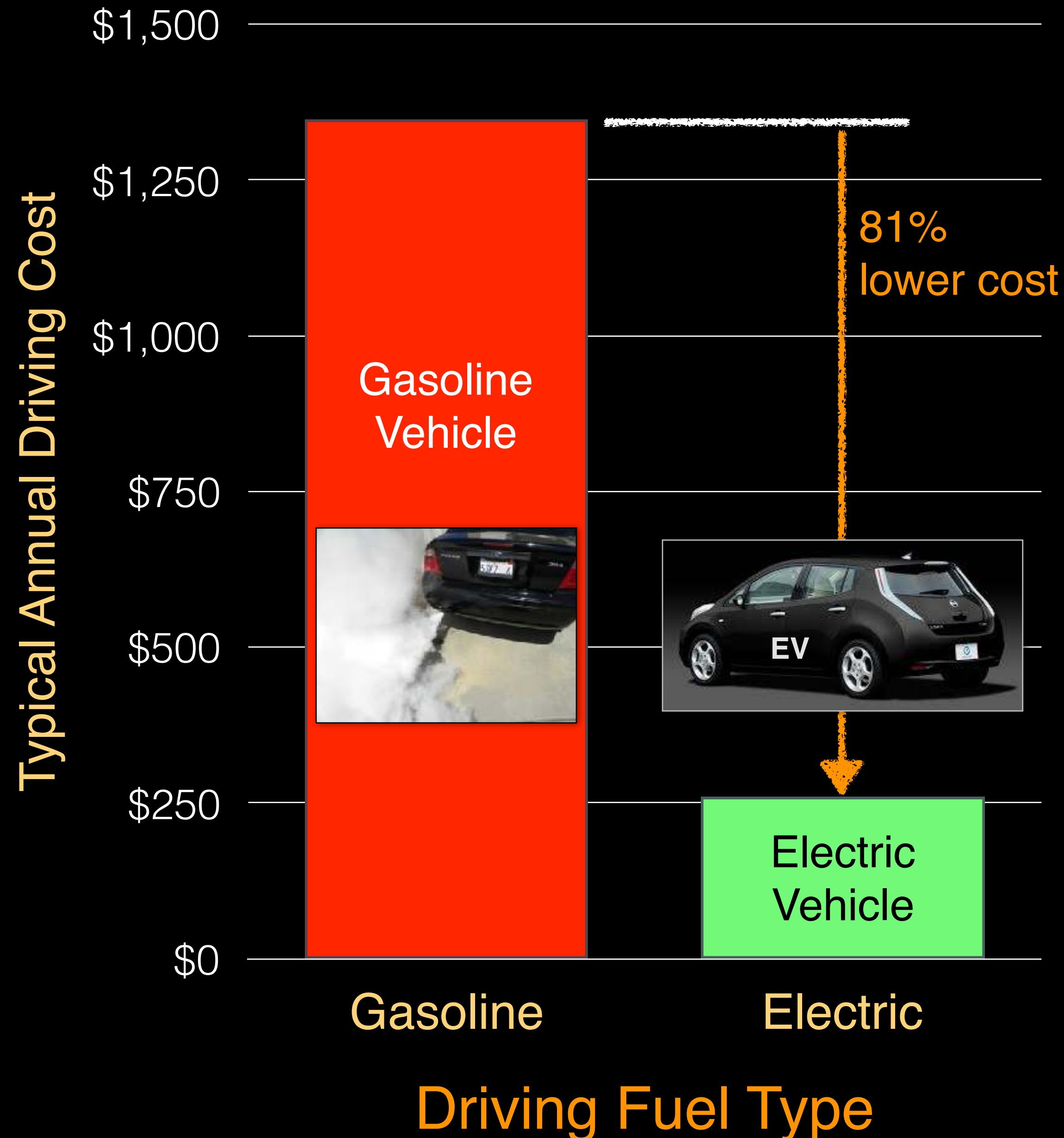


Now let's look at driving cost in San Juan County. The number of Electric Vehicles (EVs) in the county grew 55% last year.

The next slide shows how much you save driving EVs compared to gasoline vehicles.



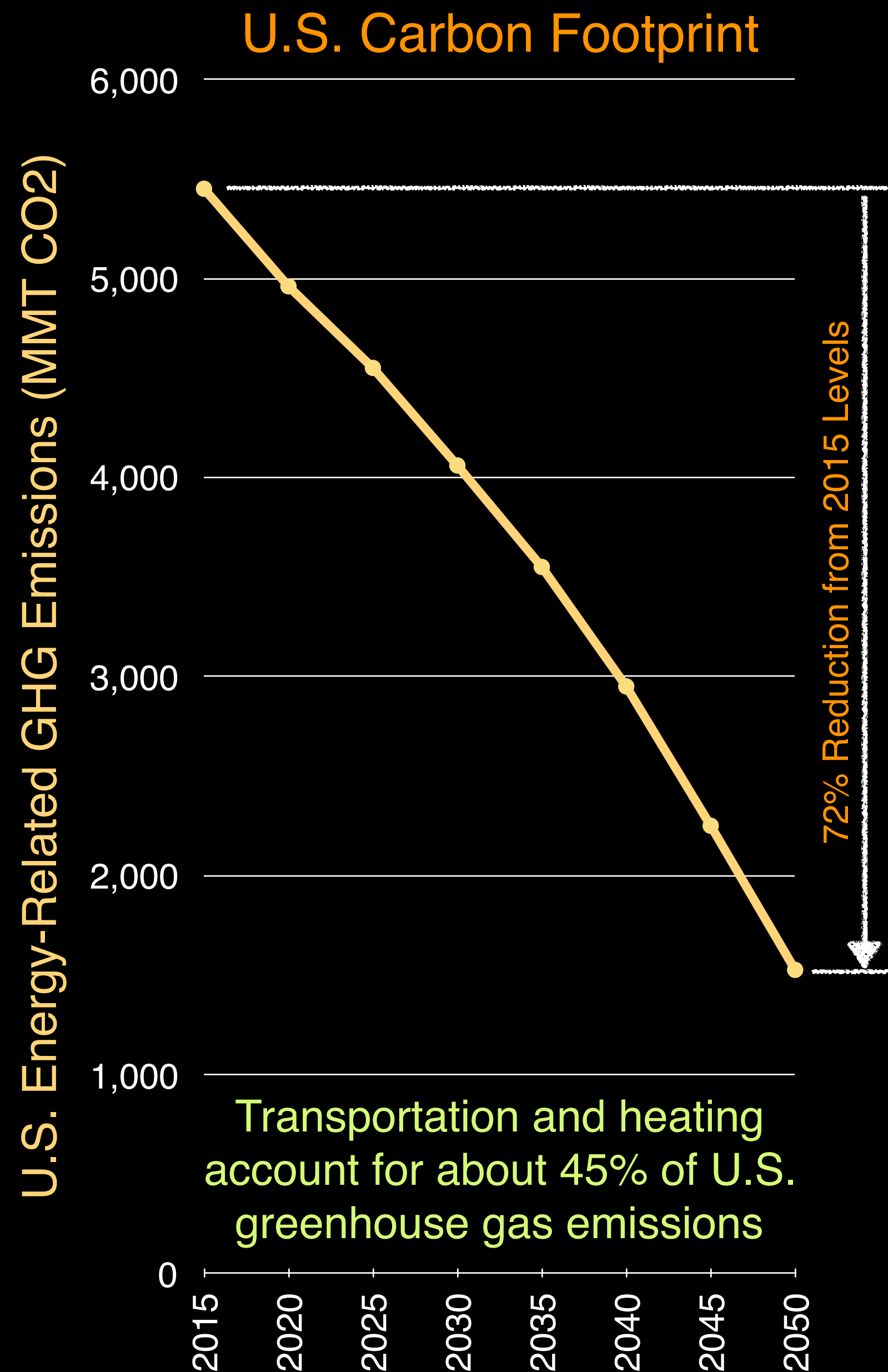
# Driving Electric Costs Less than Fossil Fuels



## Notes

- Driving 10,000 miles per year
- Typical Vehicle Fuel Consumption
  - Electric Vehicle: 2.4¢/mile (such as Nissan Leaf)
  - Gasoline Car: 13.5¢/mile (US national average 26 MPG)
- 2017 Fuel Cost
  - Electricity: \$.0959/kWh
  - Gasoline: \$3.50/gallon
- Gasoline is a fossil fuel with about 100 times higher carbon footprint than OPALCO electricity
- EV driving range is typically 100 to 250 miles between charges. Most members who drive EVs call it the perfect island car thanks to our shorter daily commutes, low cost of electricity and high cost of gasoline.
- EVs are simpler to maintain with lower annual maintenance costs compared to gasoline cars.





In the US, electricity is continually getting cleaner.

By 2050, most transportation and heating will be electric.

This will help reduce Greenhouse Gas Emissions by 72%.

*“Electricity is cleaner than liquid fuels in essentially every case.  
So we need to shift from liquid and fossil fuels toward electricity.  
The mantra is “Electrify everything.”*

**Dan Kammen**    Director of the Renewable and Appropriate Energy Laboratory

# OPALCO Energy Rebates Help You Save

*If you have a fossil fuel heater that has failed, or you want to upgrade it to a more efficient heat pump, OPALCO has rebates to help you do that.*

*If you are shopping for a car, there are a variety of new and used EVs on the market. OPALCO has rebates for home EV chargers.*

To learn more, visit: [opalco.com/rebates](https://opalco.com/rebates)



# Appendix

*The following slides provide additional data showing the cost and carbon footprint of heating and driving, using electricity versus fossil fuels such as propane, heating oil and gasoline.*

# OPALCO Electricity: Lowest Cost, Cleanest, Most Sustainable

	Annual Heating Cost	Annual Driving Cost	Low Carbon	Energy Efficiency Programs	Energy Assistance Programs	Member-owned Nonprofit	Local Sustainable Options
OPALCO	\$320 (ductless HP)	\$260 (Nissan Leaf EV)	✓	✓	✓	✓	Solar, Wind, Micro-hydro
Propane	\$1,779		✗	✗	✗	✗	✗
Fuel Oil	\$1,326		✗	✗	✗	✗	✗
Gasoline		\$1,346	✗	✗	✗	✗	✗

Assumptions

Cost

Electricity 9.59¢/kWh; Propane \$3/ gallon; Fuel Oil \$3 per gallon; Gasoline \$3.50 per gallon

Heating

40 million BTU per year; Electric Ductless Heat Pump 350% eff.; Propane heater 80% eff.; Fuel Oil Furnace 82% eff.

Driving

10,000 miles per year; Electric 4 MPkWh EV; Gasoline 26 MPG car (US national average)

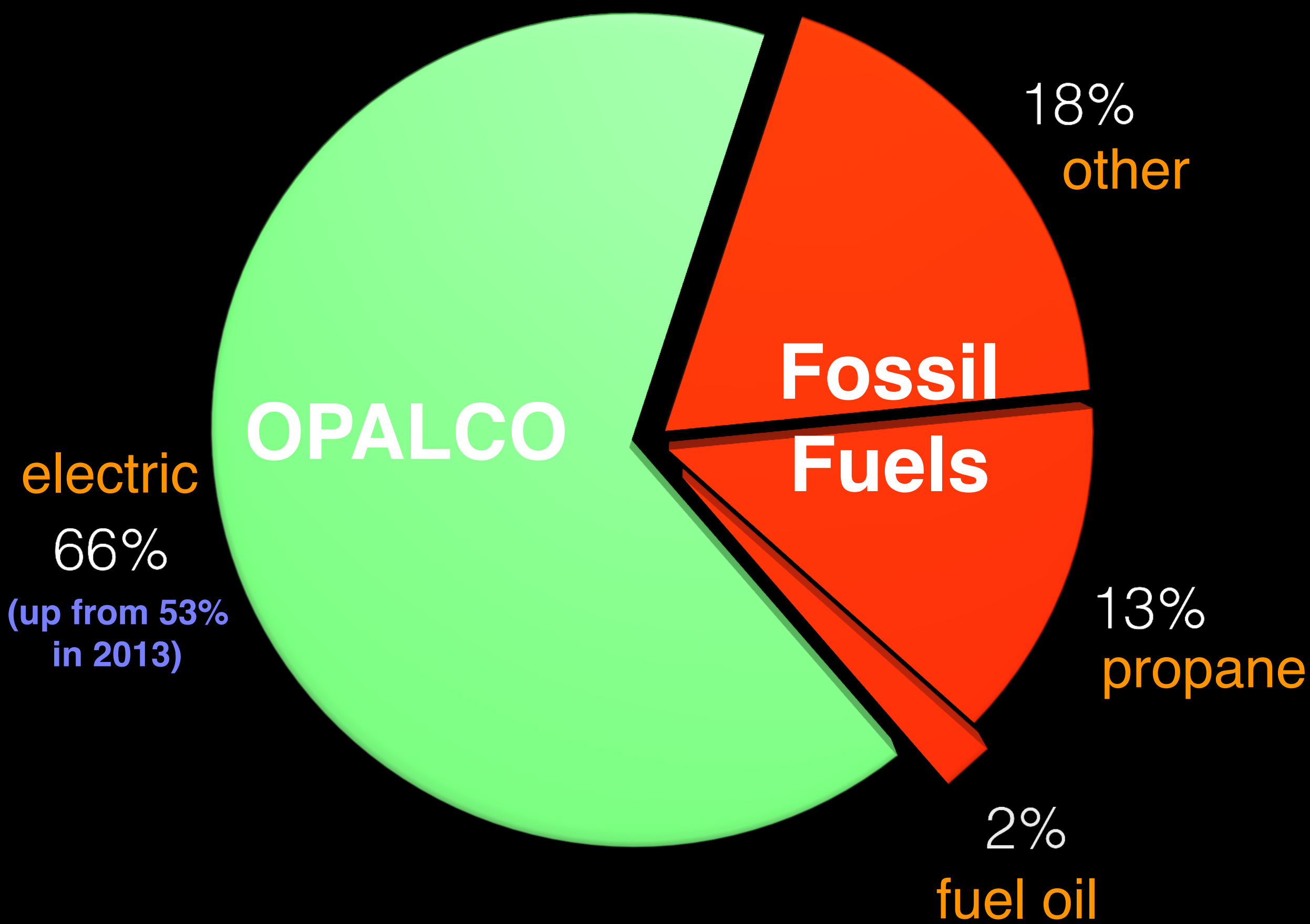


# Electricity is the most popular form of heating in San Juan County

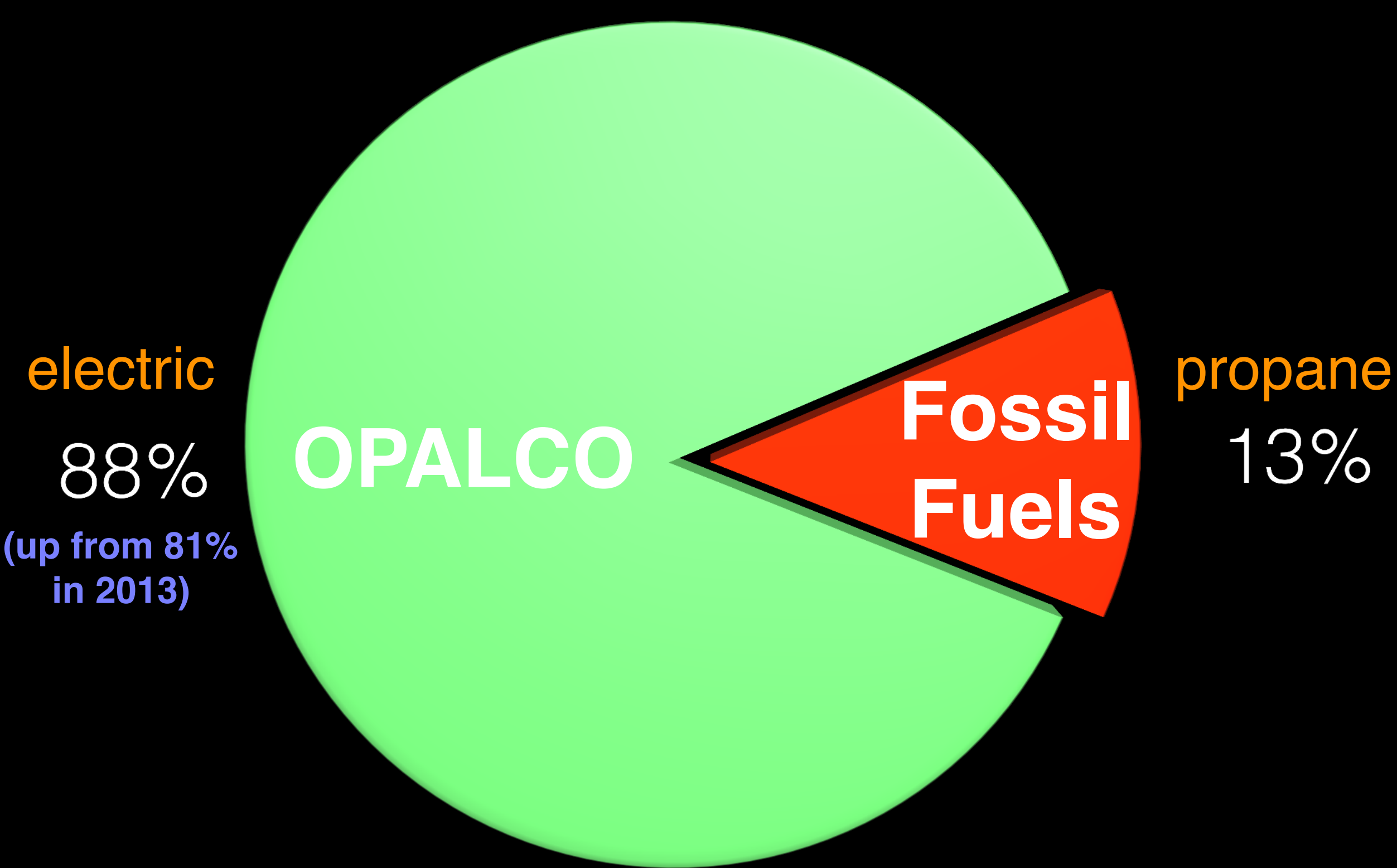
## 2016 Heating Fuels Market Share

*More people are converting to electric heating each year*

### Heating



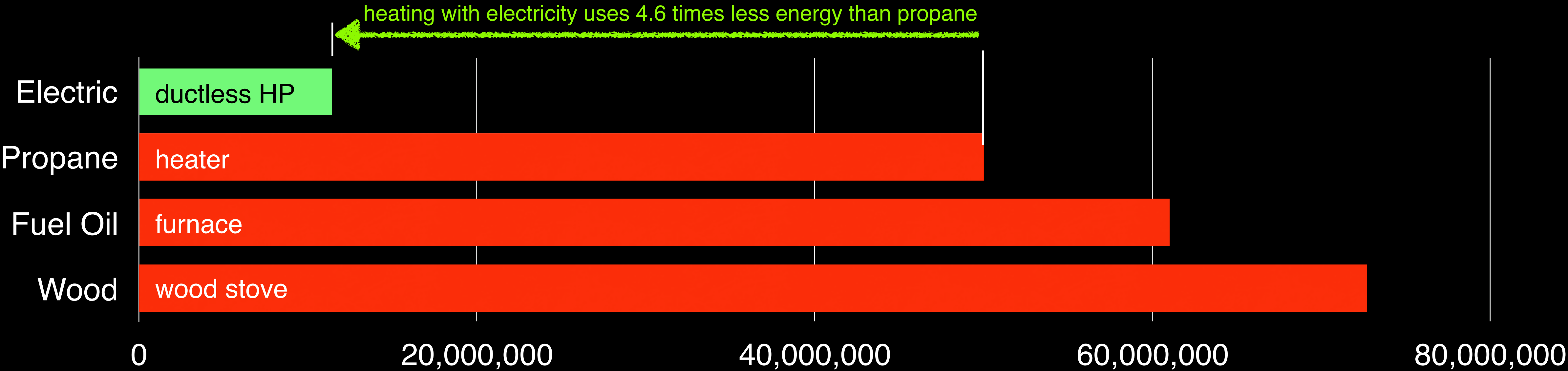
### Water Heaters



**Total Efficiency Comparison:** *Fuel Switching to Electricity uses over 4 times less energy for heating*

*Heating efficiency is important. It's a measure of the energy output (heat) compared to the energy input (electricity, propane, etc.). The more efficient the heater, the less fuel needed to power the heater.*

**Electric heat reduces members TOTAL energy bill and carbon footprint.**



**Annual BTUs needed to heat a 40 million BTU home**

BTU is a measure of heat energy. We use BTUs when comparing different forms of energy. Different fuels produce different amounts of heat energy when burned, and the heaters that use the fuel vary in how efficiently they use the fuel. Electric heat pumps are very efficient.

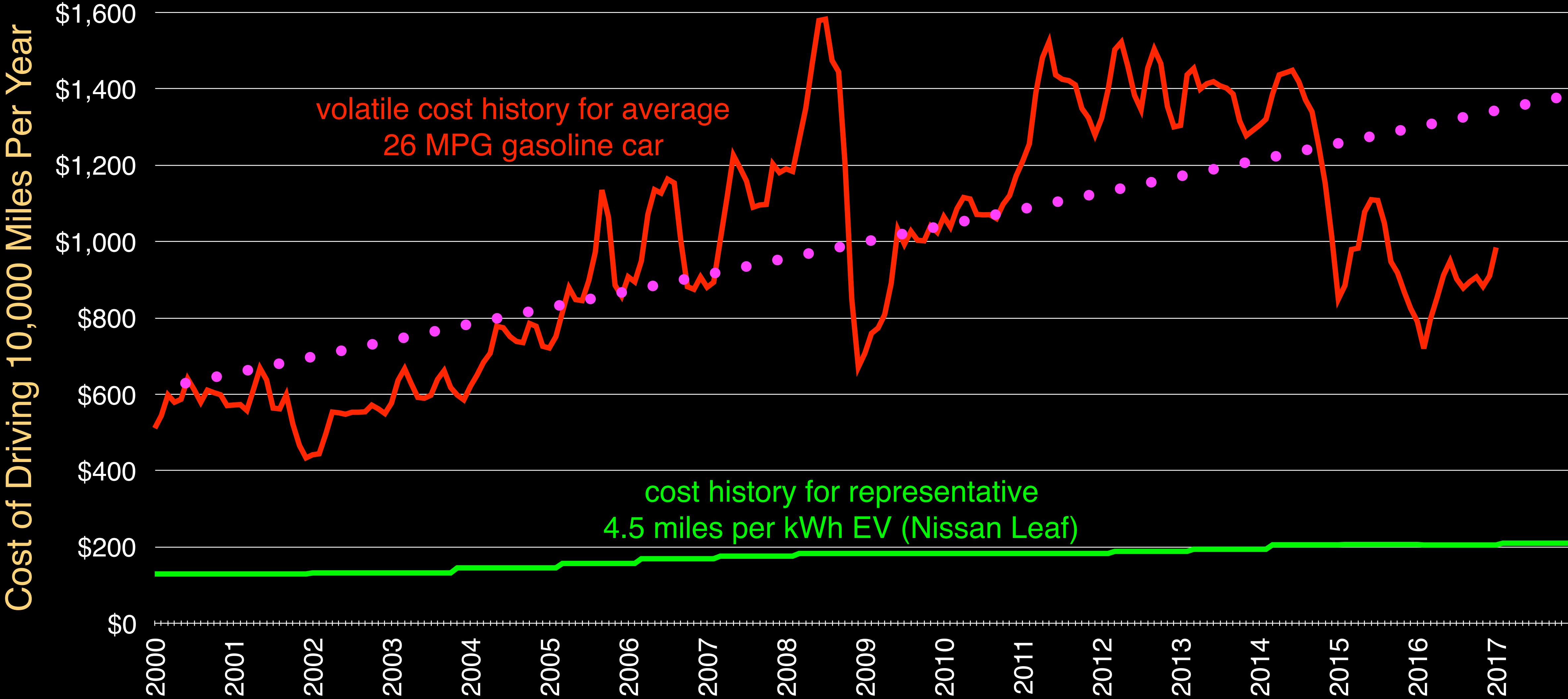
**Assumptions**

**Efficiency** Convert all fuels to BTU to compare fuel required for given heat load  
**Heating** 40 million BTU per year; Electric Ductless Heat Pump 350% eff.; Propane heater 80% eff.; Fuel Oil Furnace 82% eff.



# Annual Fuel Cost of Driving a Gas Car Versus Electric Vehicle (EV)

Driving 10,000 miles each year - gasoline car versus EV

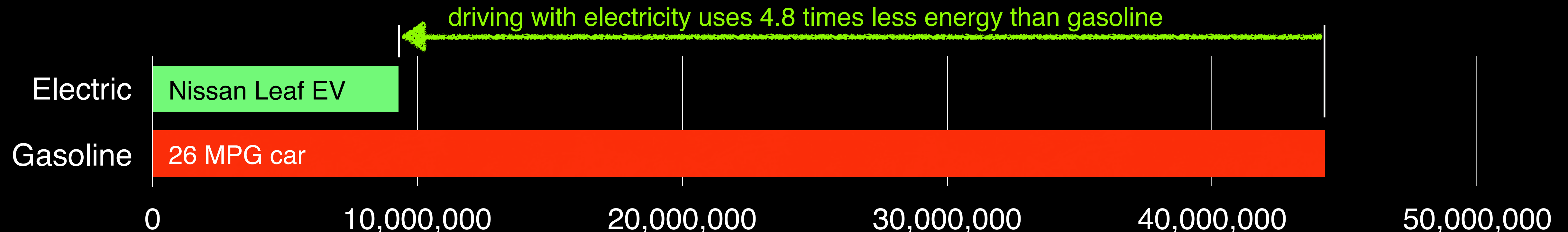


Electric price based on OPALCO rate plan to 2017. Representative EV gets 4.5 miles per kWh. Regular octane gasoline average US price. Island gas prices tend to be 10%+ higher. Representative gasoline car gets US average 26 MPG.

# Total Efficiency Comparison: *Electric Vehicles (EVs) uses over 4 times less energy for driving*

*Vehicle efficiency is important. It's a measure of the energy output (miles drive) compared to the energy input (electricity, gasoline.). The more efficient the car, the less fuel needed to drive a given distance.*

**Electric cars reduce members TOTAL energy bill and carbon footprint.**



**Energy used to drive 10,000 miles per year (BTUs)**

BTU is a common measure of energy. We use BTUs when comparing different forms of energy such as gasoline and electricity. Different fuels produce different miles per energy consumed, and the cars that use the fuel vary in how efficiently they use the fuel. Electric cars are very efficient.

## Assumptions

**Efficiency** Convert all fuels to BTU to compare fuel required for given driving distance

**Driving** 10,000 miles per year; Electric 4 MPkWh EV; Gasoline 26 MPG car (US national average)



# Carbon Footprint of Various Forms of Energy

OPALCO Electricity is much cleaner than fossil fuels

