

SOLAR  
PANELS

1.79tCO<sub>2</sub>e

HYBRID  
CAR

3.65tCO<sub>2</sub>e

HANDS-  
FREE  
WOOD  
PELLET  
FURNACE

6.25tCO<sub>2</sub>e

## Carbon Footprint Reduction of Common Green Energy Upgrades

### SUPPORTING DATA:

tCO<sub>2</sub>e: Tons of carbon dioxide equivalent, which is a measure that allows you to compare the emissions of other greenhouse gases relative to one unit of CO<sub>2</sub>. It is calculated by multiplying the greenhouse gas's emissions by its 100-year global warming potential.

#### INSTALL PV SOLAR ARRAY TO REDUCE USE OF GRID POWER - 1.79 tCO<sub>2</sub>e Annual Reduction

(1.99 tCO<sub>2</sub>e without solar to 0.198 tCO<sub>2</sub>e with solar =  
1.79 tCO<sub>2</sub>e reduction)

Assumption:

- Average VT home uses 6,822.54 kWh<sup>[4]</sup>

#### BUY A PRIUS TO REPLACE AN AVERAGE VERMONT VEHICLE - 3.65 tCO<sub>2</sub>e Annual Reduction

(5.74 tCO<sub>2</sub>e average Vermont vehicle - 2.09 tCO<sub>2</sub>e with Prius =  
3.65 tCO<sub>2</sub>e reduction)

Assumptions:

- Combined Prius MPG: 50<sup>[1]</sup>
- Average LDV MPG 18.2<sup>[2]</sup>
- Average VMT ~12,000<sup>[3]</sup>

#### SWITCH FROM #2 HEATING OIL BOILER TO PELLET BOILER = 6.01 tCO<sub>2</sub>e Annual Reduction

(7.18 tCO<sub>2</sub>e with heating oil - 1.169 tCO<sub>2</sub>e with pellets =  
6.01 tCO<sub>2</sub>e reduction)

Assumptions:

- Average VT home used 700 gallons heating oil<sup>[5]</sup>
- 84.2% system efficiency for oil boiler
- 82% system efficiency for pellet boiler
- 16 MMBtu/short ton pellets
- Pellets required to offset oil consumption and meet existing load: 5.85 tons
- Biomass Energy Resource Center emissions factor for pellets<sup>[6]</sup>



sustainableheating.org

[1] <http://fuelconomy.gov>

[2] [http://vtransplanning.vermont.gov/sites/aot\\_policy/files/VTEPAugust%2028%202013%20FINAL.pdf](http://vtransplanning.vermont.gov/sites/aot_policy/files/VTEPAugust%2028%202013%20FINAL.pdf)

[3] The Vermont Transportation Energy Profile. 2015 October. VT Agency of Transportation Highway Research Division. <http://vtrans.vermont.gov/sites/aot/files/planning/documents/planning/Vermont%20Transportation%20Energy%20Profile%202015.pdf>

[4] <https://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3> (average residential electricity consumption

[5] <http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=consumption#end-use-by-fuel> ; CE4.16 End-use expenditures by fuel, Averages, U.S. homes

[6] <http://www.biomasscenter.org/pdfs/veic-carbon-emission-and-modern-wood-heating-summary.pdf>