

PS # 5

1. Carbon Footprint of my Family of 3.5 people - Tekuru spends half her time with her mama.

a) $\sim 3000 \text{ mi/year} \left(\frac{\text{gal}}{38 \text{ mi}} \right) \left(\frac{8 \text{ kg CO}_2}{\text{gal}} \right) = 1 \text{ Ton CO}_2 \text{ yr}$

b) Wafly to Phoenix Once/yr. +
 Tekuru goes to Buffalo this year
 $(1000 \text{ mi} \times 2) \times 4 = 8000 \text{ mi (Phoenix)}$
 $3500 \text{ mi} \times 2 = 7000 \text{ mi (Buffalo)}$
 $15000 \text{ mi} \left(\frac{\text{gal}}{100 \text{ mi}} \right) \left(\frac{8 \text{ kg CO}_2}{\text{gal}} \right) = 1200 \text{ kg CO}_2 \text{ yr}$
 Per Person mileage of a 747

We don't always fly in 747 to Phoenix so I'll assign 2 Tons CO₂ for air travel

c) Electricity bill $\approx \frac{\$14}{\text{month}} \approx \frac{\$200}{\text{yr}} \approx \frac{\$150}{\text{yr}}$
 $\left(\frac{\$150}{\text{yr}} \right) \left(\frac{1}{15 \text{ kWh}} \right) \left(\frac{1}{2} \text{ kg} \right) = \frac{1}{2} \text{ Ton}$

assume largely NGCC $\sim \frac{1}{2} \text{ kg/kWh}$

d) Natural gas $\approx \frac{\$12}{\text{month}} \approx \frac{\$150}{\text{year}} = \$150/\text{yr}$
 $\left(\frac{\$150}{\text{year}} \right) \left(\frac{1 \text{ Therm}}{\$0.8} \right) \left(\frac{100 \text{ MJ}}{1 \text{ Therm}} \right) \left(\frac{15 \text{ kg C}}{1 \text{ MJ}} \right) = \frac{300 \text{ kg C}}{\text{yr}} \left(\frac{44 \text{ g CO}_2}{12 \text{ g C}} \right)$
 $\approx 1 \text{ Ton CO}_2$

e) food - we ~~spend~~ eat a lot, spending about \$1,000/month and almost never eating out. We eat mostly vegetarian. From the graph, I'd estimate the carbon intensity of our food dollar to be $\sim 1.2 \text{ kg}/\text{\$}$

$$\sim (12,000 \frac{\text{month}}{\text{year}}) \left(\frac{1.2 \text{ kg CO}_2}{\text{\$}} \right) = 14 \frac{\text{T}}{\text{yr}} \underline{\text{CO}_2}$$

f) We spend about \$1000/yr on clothes @ $\frac{1}{2} \text{ kg}/\text{\$}$, this yields $\frac{1}{2} \text{ Ton CO}_2/\text{yr}$

Total :	Electricity	Food	
1T + 2T + $\frac{1}{2}$ T + 1T + 14T + $\frac{1}{2}$ T = 19T			yr
(car)	(air Travel)	NG	clothes

We are close to the world average

$19 \frac{\text{T}}{\text{yr}} \div 3.5 = ?$ well, Neil is only 6 yrs old, so maybe we should divide by a smaller number.

2 e) The two calculations gave about the same value, but the calc Berkeley calculator had a huge potential increase for health insurance and education. My kids go to public school, and I get health insurance with my job - how do I count this?