

## Carbon Calculator Methodology

### Transportation Calculations

*Transportation Emissions = Flight Emissions + Car Emissions + Public Transport Emissions*

#### Flight Emissions

Forevergreen uses the amount of long and short flights as the two inputs for calculating the emissions attributed to a passenger on a typical commercial flight. Short flights are classified as less than 10 hours, whereas long flights are more than 10 hours. The calculator multiplies the number of short flights by a coefficient of .9 and long flights by 1.35, as provided by [C Level Carbon Consultancy](#).

$$\text{Flight Emissions} = (1.35 * \# \text{ of Long Flight}) + (.9 * \# \text{ of Short Flights})$$

#### Car Emissions

Forevergreen uses car type and the distance driven in miles each week to calculate the emissions attributed to a person's car. The calculator multiplies the miles driven per week by a coefficient based on the emissions of the selected car type. Gas car's coefficient is 300 (signifying 300g of Co2 emissions per mile), while hybrids are 250 and electric vehicles are 200, as provided by [MITClimatePortal](#). The user's weekly input is annualized and converted from grams of Co2 to Tons.

$$\text{Car Emissions} = ((\text{Car Type} * \text{Miles Per Week}) * 52) * 1e^6$$

#### Public Transport Emissions

Forevergreen uses the amount of weekly bus and train rides as the two inputs to calculate the emissions attributed to public transit use. The calculator multiplies the average distance of a public transit ride, 5.6 miles, by the kg CO2/passenger mile each emits. For rail travel, this coefficient is 0.02912. For bus rides, this is 0.05824 as provided by the [ATPA](#) and [US Department of Transportation F.R.A](#). The sum of these two numbers is a user's total public transportation emissions.

$$\begin{aligned} &\text{Public Transport Emissions} \\ &= \\ &(\text{Train Rides Per Week} * .02912) + (\text{Bus Rides Per Week} * .05824) \end{aligned}$$

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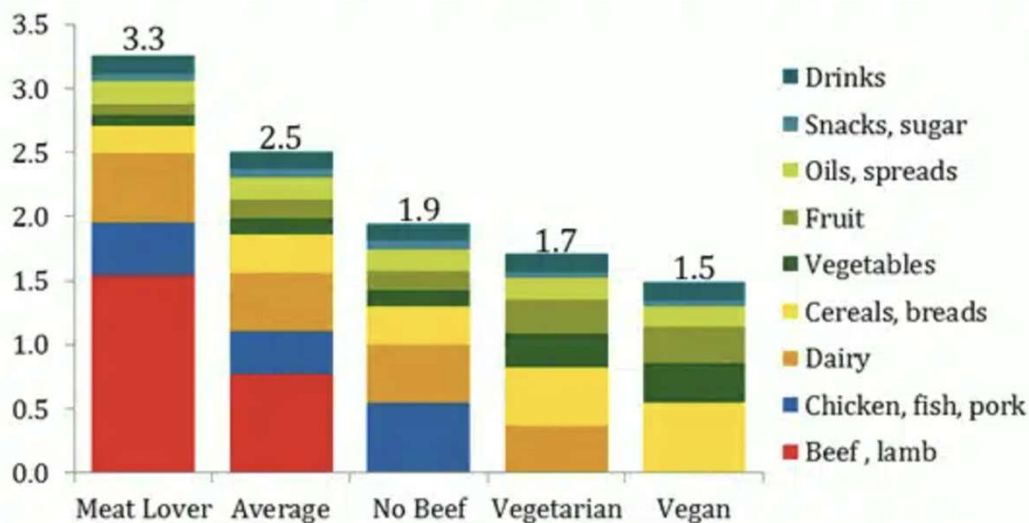
## Diet Emissions Calculation

### Meat Consumption

Forevergreen uses the input of diet type to calculate the user's diet emissions. The largest source of dietary emissions comes from meat consumption. The average diet is responsible for 2.5 tons of Co2 per year, with it fluctuates depending on the amount of meat consumed, with numbers provided by [Shrink That Footprint](#)

$$\text{Diet Emissions} = \begin{cases} 3.3 & \text{if Diet Type = "Meat Lover"} \\ 2.5 & \text{if Diet Type = "Average"} \\ 1.9 & \text{if Diet Type = "No Beef or Lamb"} \\ 1.7 & \text{if Diet Type = "Vegetarian"} \\ 1.5 & \text{if Diet Type = "Vegan"} \end{cases}$$

Foodprints by Diet Type: t CO<sub>2</sub>e/person



Note: All estimates based on average food production emissions for the US. Footprints include emissions from supply chain losses, consumer waste and consumption. Each of the four example diets is based on 2,600 kcal of food consumed per day, which in the US equates to around 3,900 kcal of supplied food.

Sources: ERS/USDA, various LCA and EIO-LCA data



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## Utility Calculations

$$\text{Utility Emissions} = \frac{\text{Energy Emissions} + \text{Water Emissions} + \text{Propane} + \text{Natural Gas Emissions}}{\text{Household Members}}$$

### Energy Emissions

Forevergreen uses the state of residence and energy bill cost as the two inputs for calculating the emissions attributed to energy usage. The state of residence GRID Value, provided by the [EPA](#), is then divided by 2000 to convert this number from lb/MWh to tons/MWh. This is then multiplied by the Energy usage factor, calculated by dividing the user's electric bill cost by the average cost in the state provided by [Save on Energy](#).

$$\text{Electricity Emissions} = \text{State eGRID Value} * \text{Energy Usage Factor}$$

### Water Emissions

Forevergreen uses the state of residence and the water bill cost as the two inputs for calculating the emissions attributed to energy usage. The user's water bill is divided by their state average to find their water usage factor. The usage factor is multiplied by a coefficient of .0052, the emissions attributed to the average electric bill. [Forbes](#) provides the information on the average bill, and emissions data is available on [Brightest.io](#).

$$\text{Water Emissions} = \frac{\text{Water Bill}}{\text{Average State Bill}} * .0052$$

### Propane & CNG Emissions

Forevergreen uses the state of residence and cost of propane & CNG bills as the three inputs for calculating the emissions attributed to gas usage. To find their usage factor, the user's Propane & CNG bills are divided by their state average. The usage factor for Propane is multiplied by a coefficient of .24, as provided by [Forbes](#), and CNG is multiplied by a coefficient of 2.12, as provided by [Forbes](#). These coefficients are determined as the emissions attributed to the average state bill.

$$\text{Propane \& CNG Emissions} = \left( \frac{\text{Propane Bill}}{\text{Average State Bill}} * .24 \right) + \left( \frac{\text{CNG Bill}}{\text{Average State Bill}} * 2.12 \right)$$