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## Quantifying the Role of Education on Behavior Programs

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# Quantifying the Role of Education on Behavior Programs

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# UN Framework Convention on Climate Change (1992)

“Education is an essential element for mounting an adequate global response to climate change”

# Clean Technology



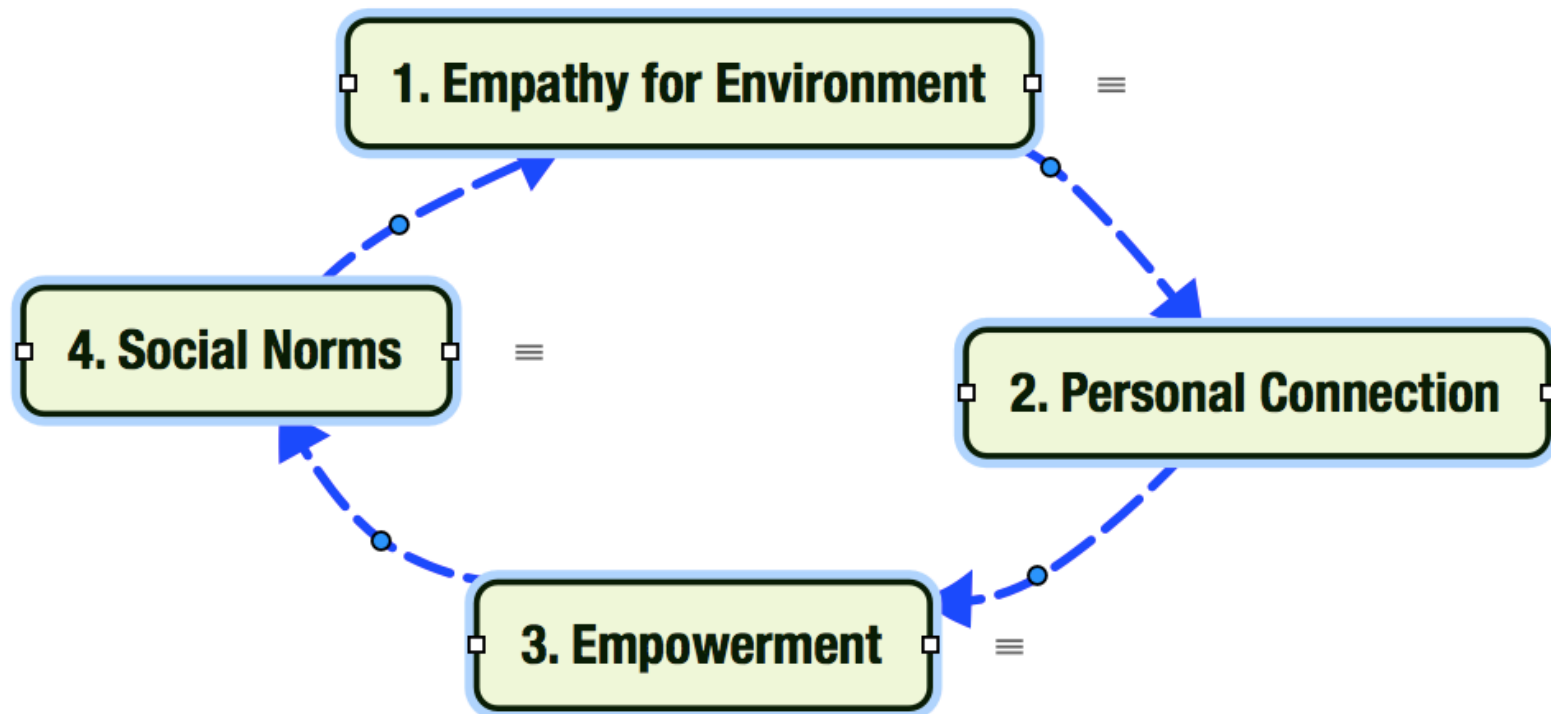


# Question

Can we quantify the potential role of education as a mitigation tool?

# University Climate Change Course

- 500 students between 2007-2011
- Employ a behavior change strategy



# Survey

- Participants completed survey at least 5 years after taking the class.
- Over 100 responses
- Two categories of questions
  - A:** Course engagement and climate literacy
  - B:** Behavior change attributed to class



# Results – engagement/literacy

- Class popular and memorable (96% would recommend the class to their friends)
- Climate change is personal (80% report having personally experienced the effects of climate change)
- Climate change is fixable (66% think that individual actions can make a difference in reducing climate change)

# Results – behavior change

As a result of my participation in this course, I have

- Transportation
- Food
- Home Energy
- Waste



Intro



Travel



Housing



Food



Shopping



Take Action

Start with a quick carbon footprint estimate

Next

Zipcode

City

County

State

95192



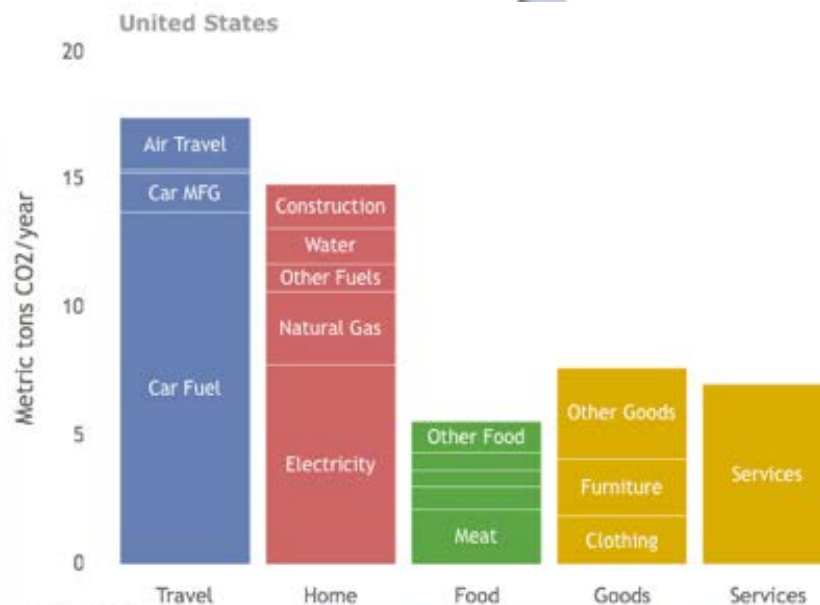
How Many people live in

Two



What is your gross annual income

\$60,000 to \$79,999



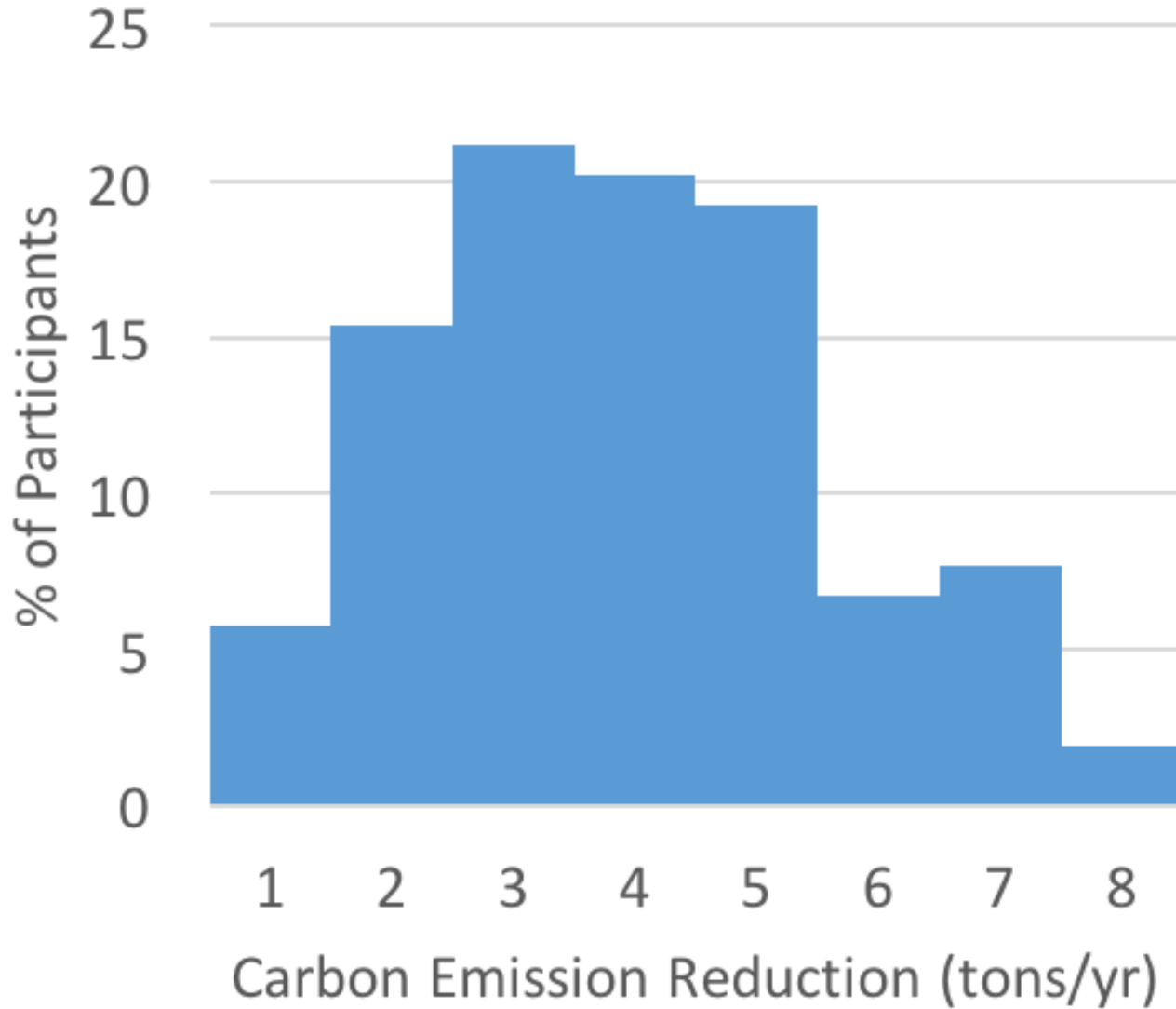
Total  
**52.6**  
tons CO<sub>2</sub>/year

The footprint of the average household in United States with 2 people and similar income.

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# Carbon Footprint Calculator

# Carbon Reduction (tons/yr)



Avg: 3.6 tons/yr

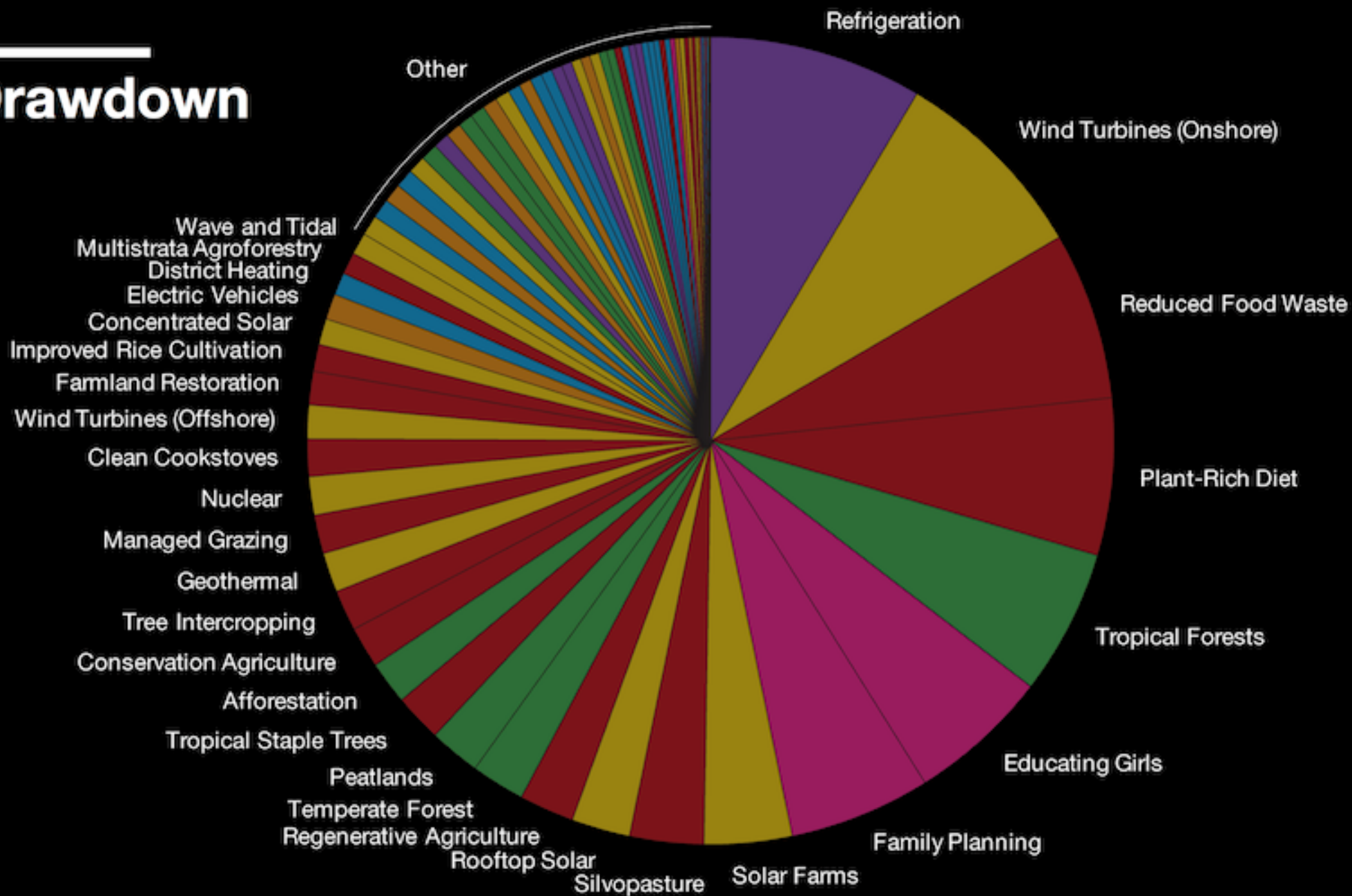
CA: 0.7 tons/yr

Class: 2.9 tons/yr

# **DRAWDOWN**

**THE MOST COMPREHENSIVE  
PLAN EVER PROPOSED TO  
REVERSE GLOBAL WARMING  
EDITED BY PAUL HAWKEN**

# Drawdown

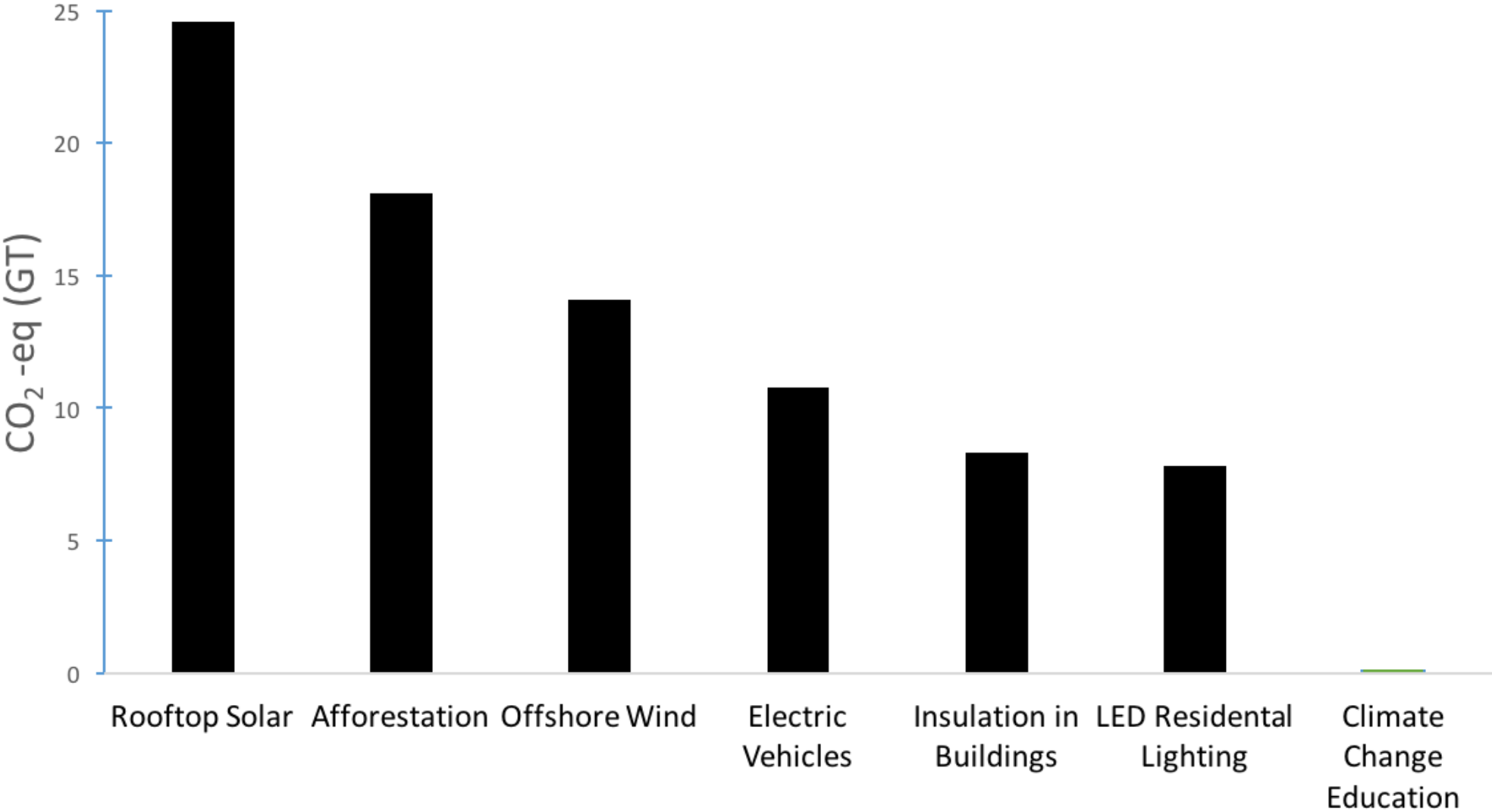


# Climate Change Education Scenario

- Each student reduces carbon at 2.9 tons/year
- Number of secondary students grows from >1% in 2020 to 10% by 2050.

***Only students from high income and upper middle income countries***

# Carbon Reduction Scenarios by 2050



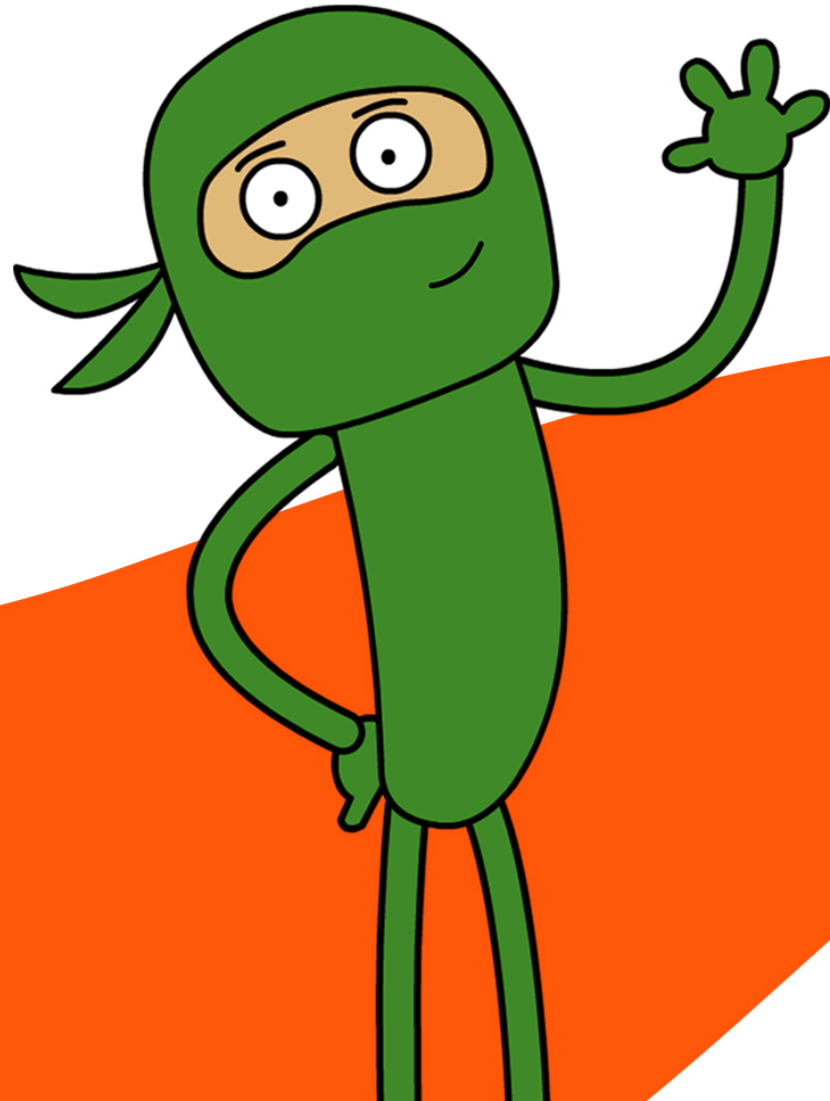


# Green Ninja

Story

Science

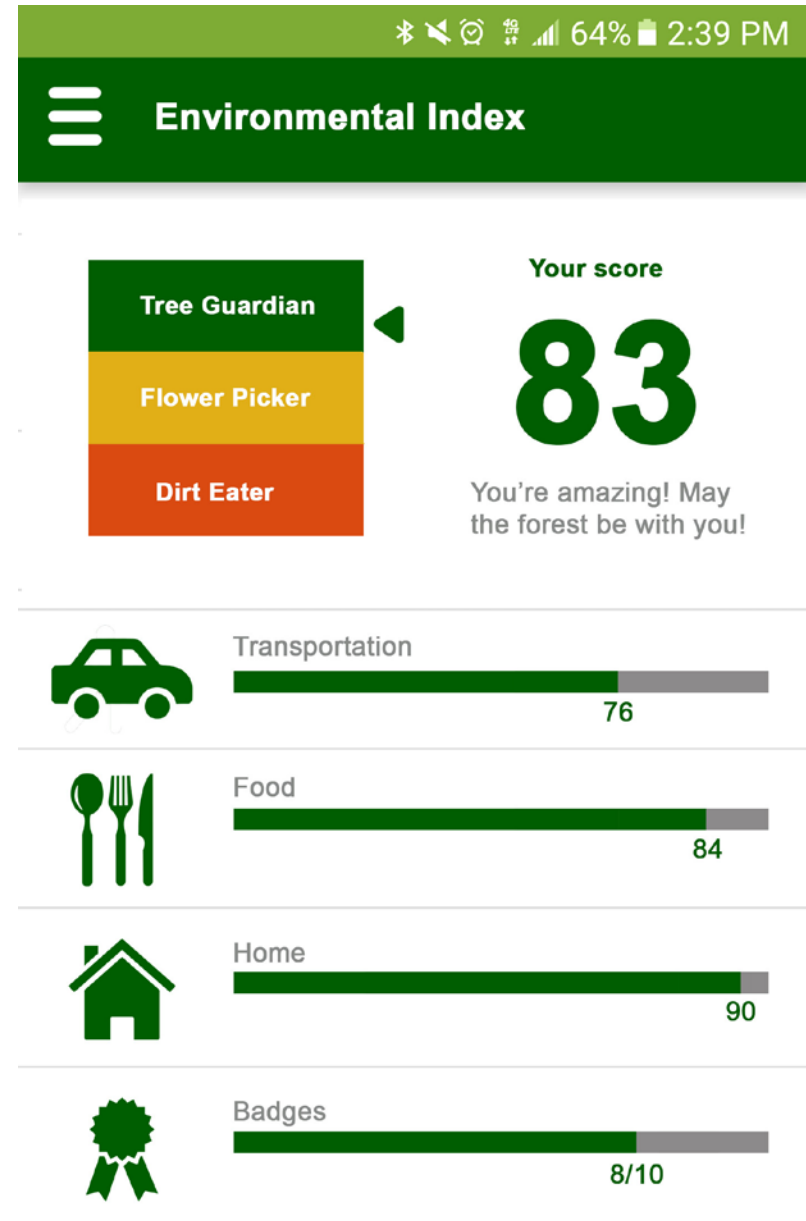
Solutions





**Middle school curriculum that satisfies the new standards and produces verifiable reductions in carbon emissions.**

# Fitbit for Environmental Education



# Summary

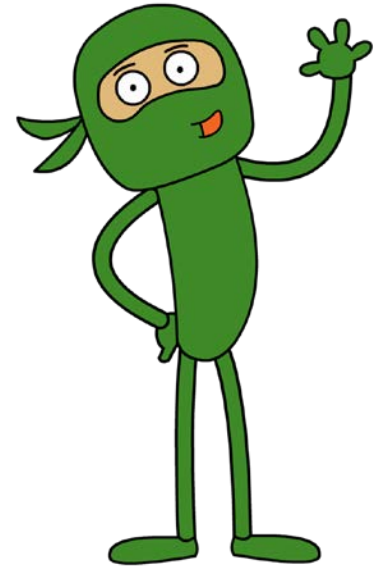
- Education can be an effective climate change mitigation tool, provided the education is well designed.
- At scale, education can be as effective as electric cars in reducing carbon emissions.
- Green Ninja is currently offering such education in middle schools.

# Thank You!

**Eugene Cordero**

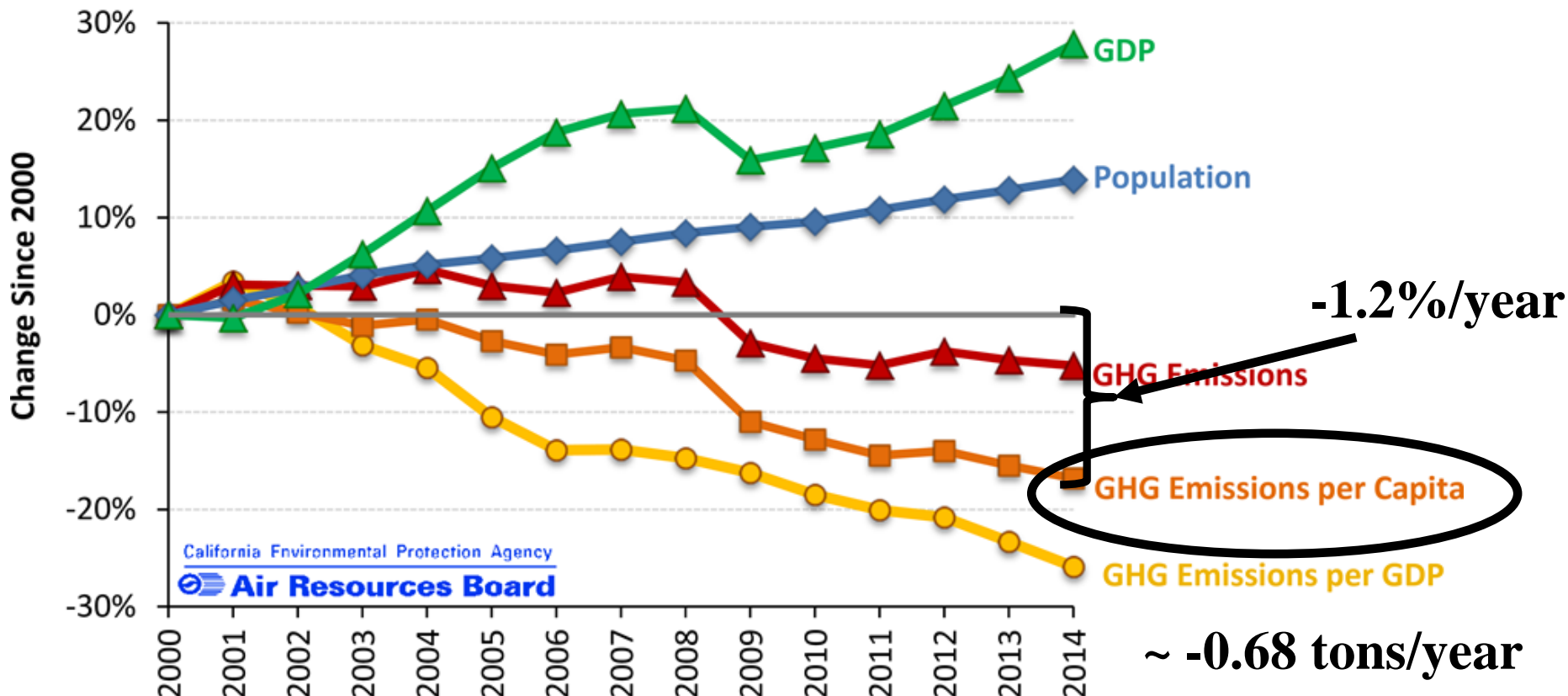
**Meteorology and Climate Science**

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*Eugene Cordero acknowledges that he is the majority owner of Green Ninja Inc.*

# Change in California GDP, Population and GHG Emissions since 2000



California Environmental Protection Agency  
**Air Resources Board**

**Metric**

**Associated 2014 Value**

**GDP**

**2.1 trillion (2009 \$)**

**Population**

**38.7 million**

**GHG Emissions**

**441.8 MMTCO<sub>2</sub>e**

**GHG Emissions per Capita**

**11.4 metric tons CO<sub>2</sub>e per person**

**GHG Emissions per GDP**

**209 metric tons CO<sub>2</sub>e per million dollars**

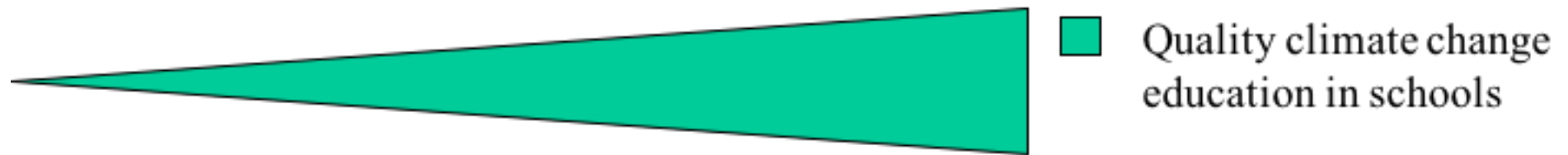
**-1.2%/year**

**GHG Emissions**  
**GHG Emissions per Capita**

**~ -0.68 tons/year**

# Can 'exceptional' education produce a U.S. Stabilization wedge?

- If 5.6 million U.S. students receive quality climate education (extrapolating from our results)



*1 US stabilization wedge (0.25 gigatons of C)*

**1 US stabilization wedge - double fuel economy of US fleet (54 mpg)**

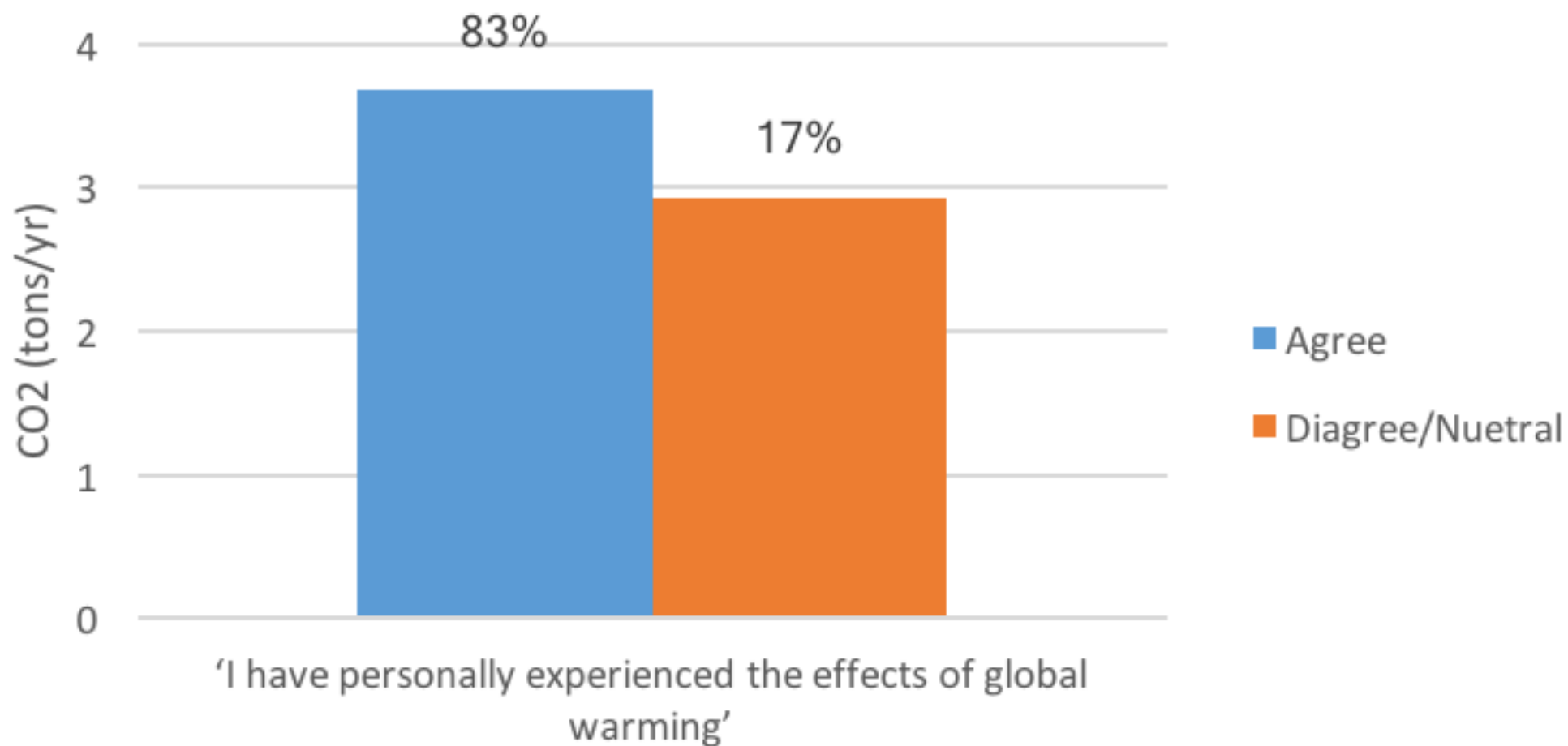
**1 US stabilization wedge - 6x increase in renewable energy (30% total)**

# Control Group

Consider average Californian  
over 5 year time frame



## Reductions in Carbon Emissions



# Category B Questions

As a result of my participation in this course, I have

- Made the following changes to my transportation methods (e.g., purchase hybrid or electric vehicle, carpool, ride a bike, etc.)
- Made the following actions to reduce energy consumption at home (e.g., purchased energy efficient appliances, installed solar panels, purchased renewable energy, etc.)
- Made food choices to reduce carbon emissions (e.g., reduced red meat consumption)

# Carbon Reductions

- The average reduction/alumni is: 3.9 tons of CO<sub>2</sub>/yr
  - Waste reduction: 27%
  - Home energy conservation: 24%
  - Food choices: 22% tons
  - Transportation choices: 27%