



COOL CUISINE

Taking the Bite Out of Global Warming



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with **Eugene Cordero, Ph.D.**

creators of GlobalWarmingDiet.org

Published Oct, 2008
Gibbs Smith
www.coolcuisine.org



PART ONE

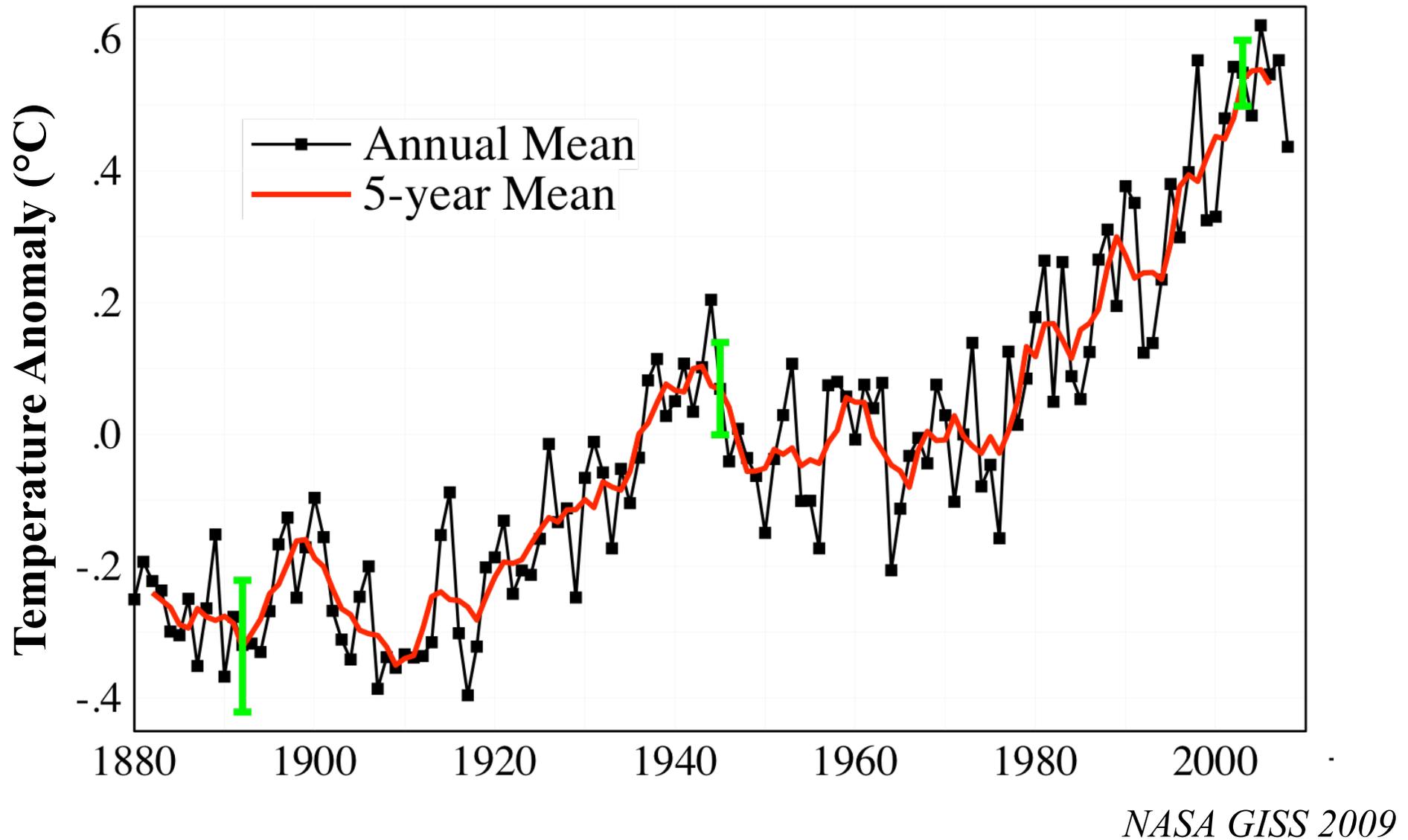
BACKGROUND



Climate Science

Observations - The Earth is Warming

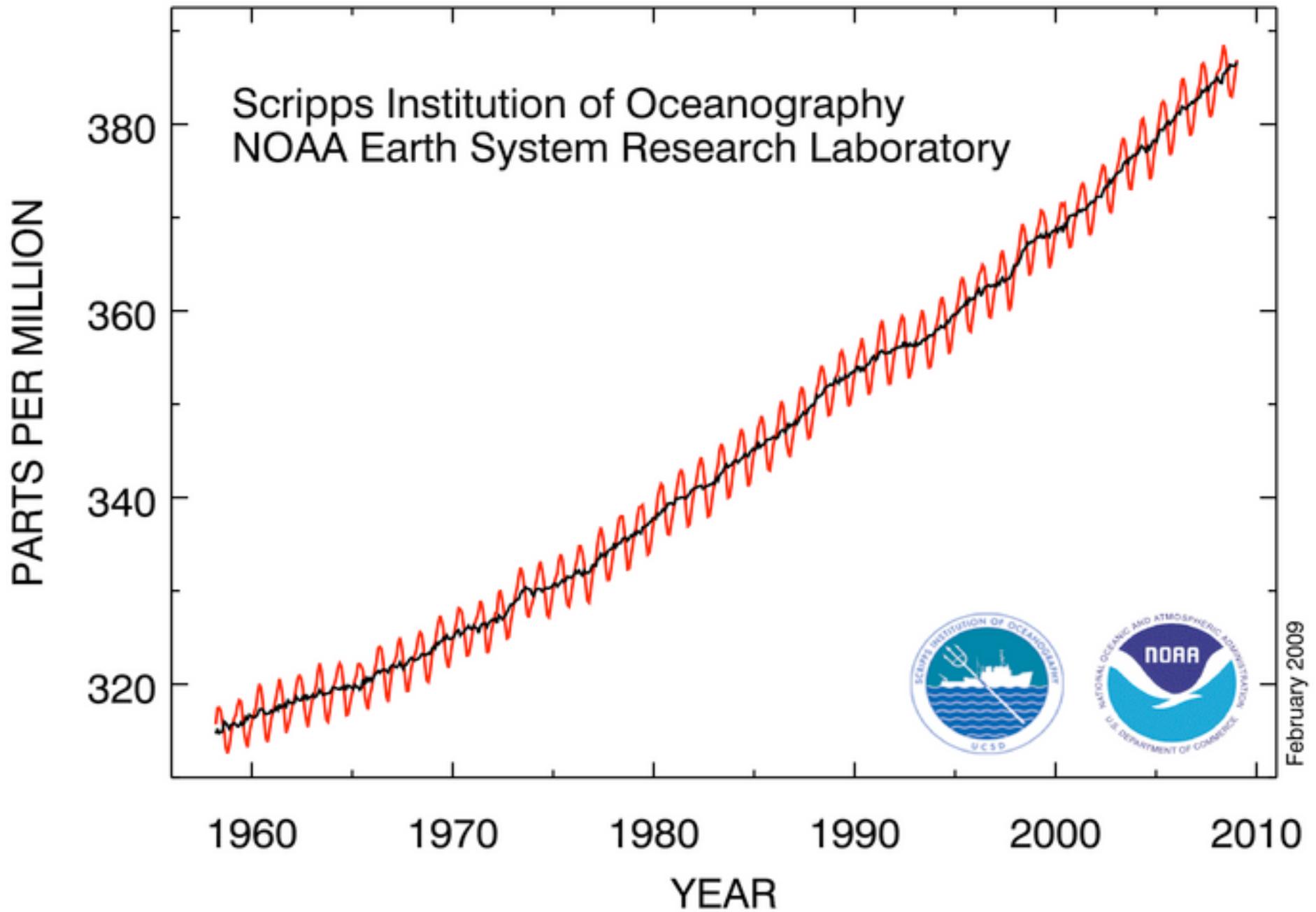
Global Land-Ocean Temperature Anomaly



Climate Science

Attribution - Human Connection

Atmospheric CO₂ at Mauna Loa Observatory



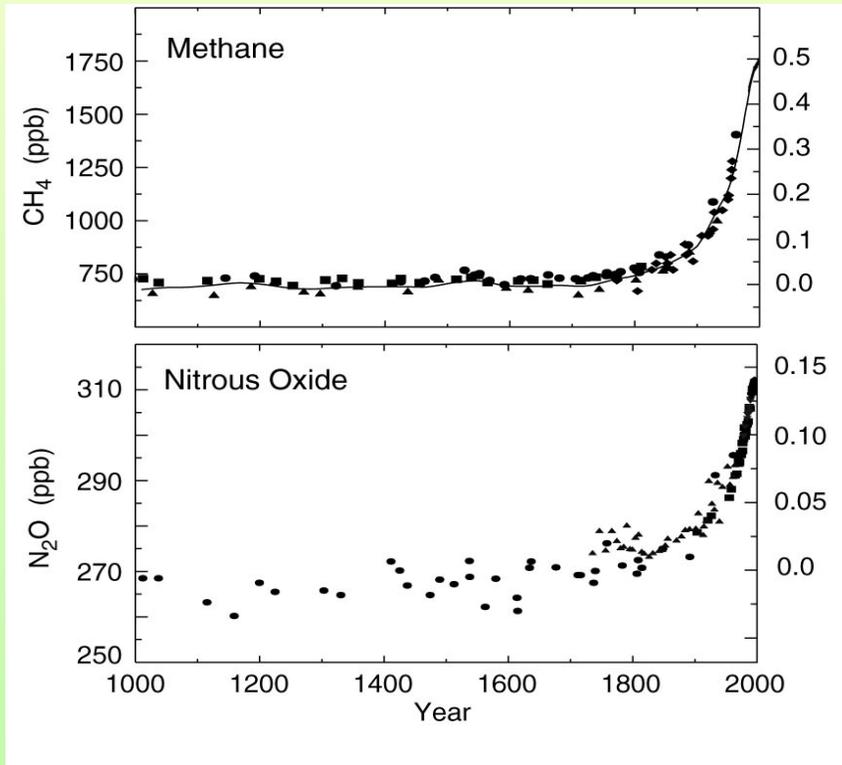
Land use change

Los Angeles Basin

Bolivian rain forest

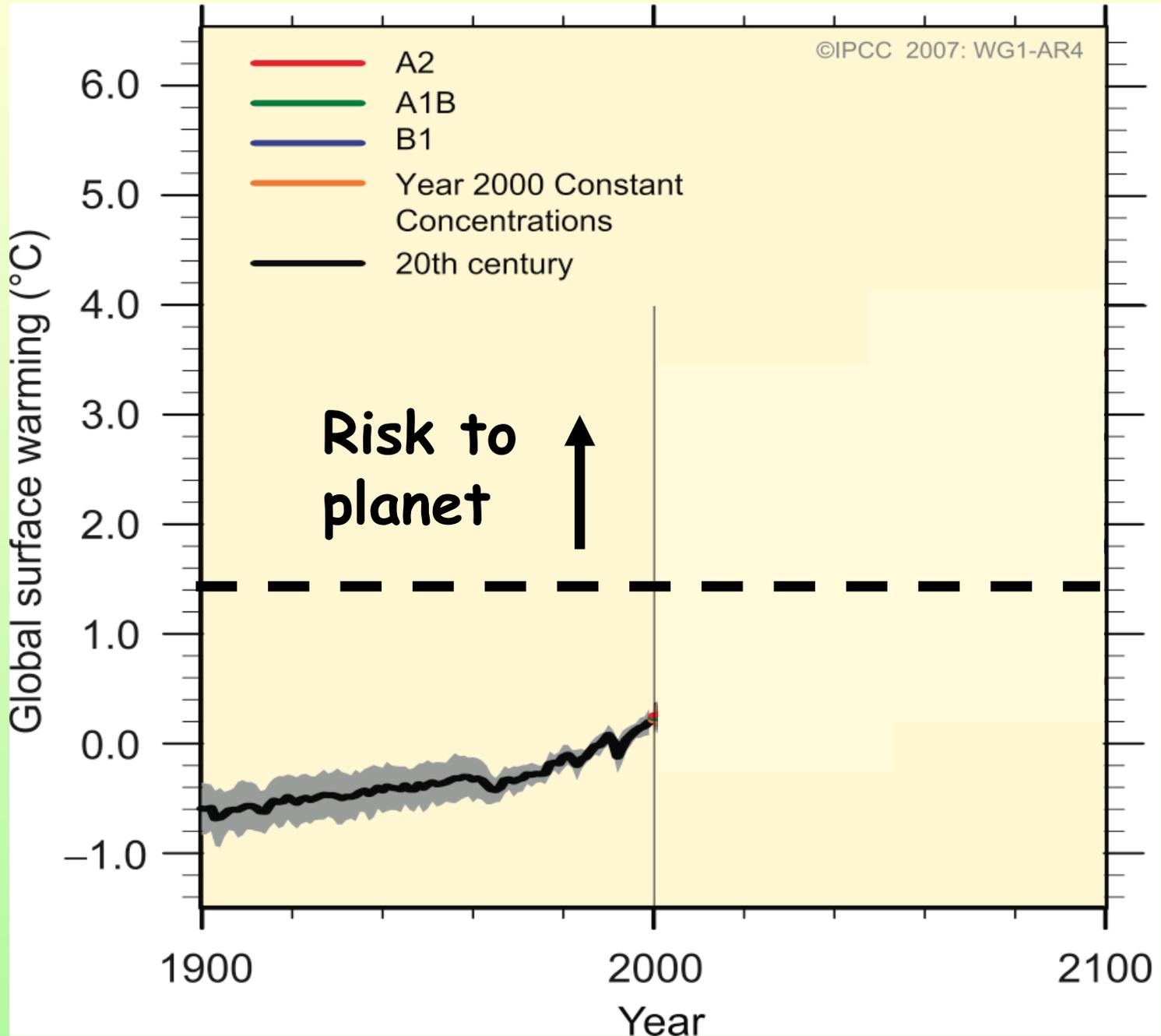


Methane (CH₄)



Nitrous Oxide (N₂O)

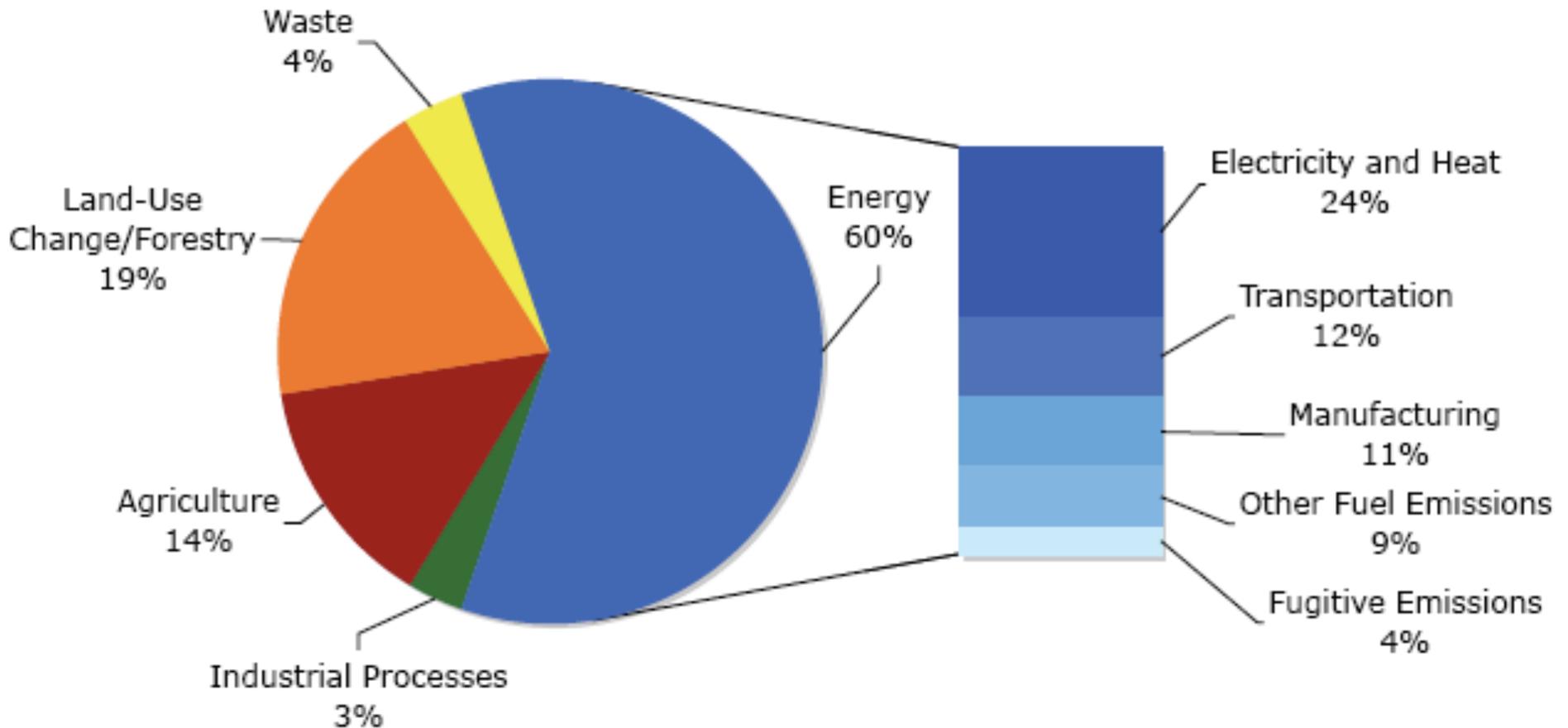
What are the predictions
for the future?



4 - 8°F warmer

Global Emissions of Greenhouse Gases

Greenhouse Gas Emissions



Agriculture ~ 20-25% of all emissions

Solutions require reductions in energy use...

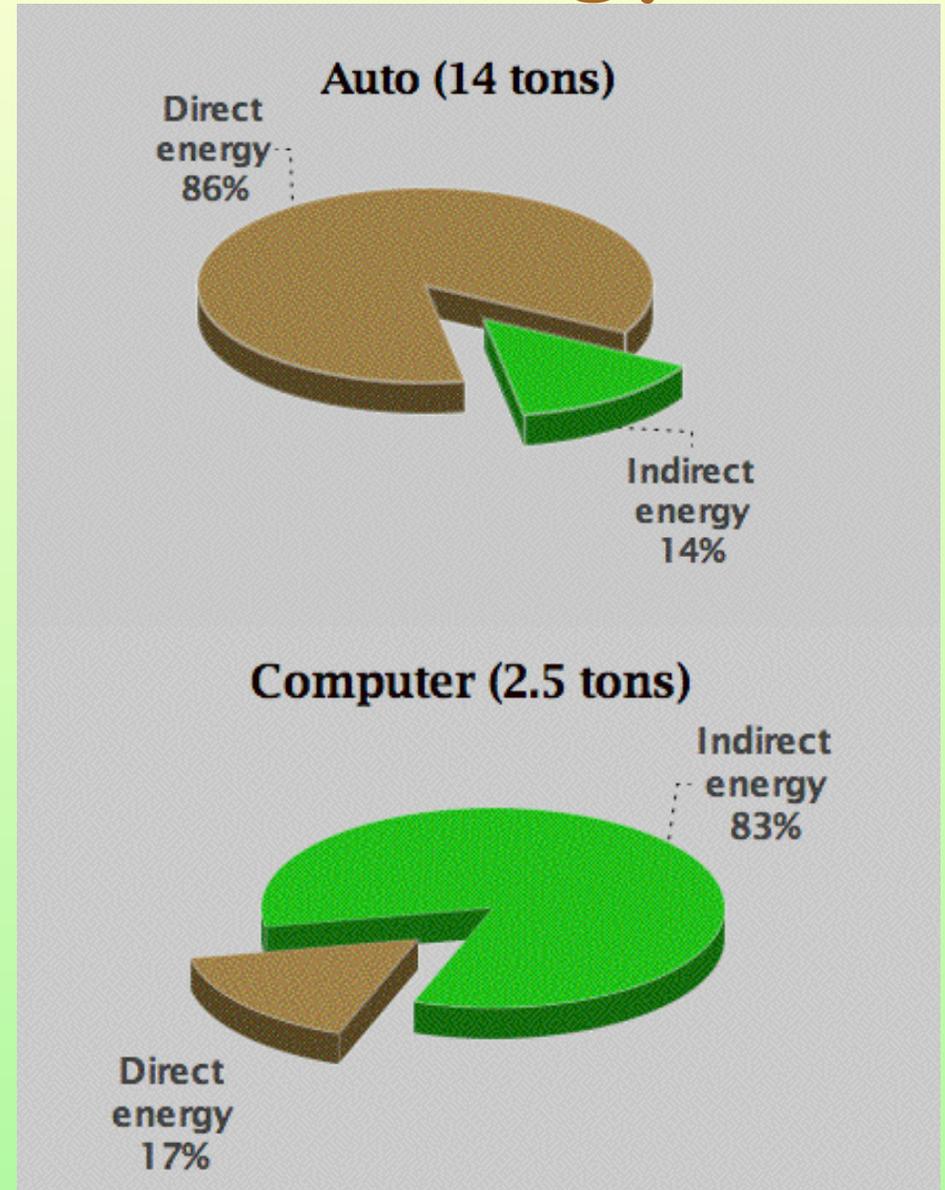


Energy is used to make many things...



Embodied Energy

Direct and Indirect Energy



Apple



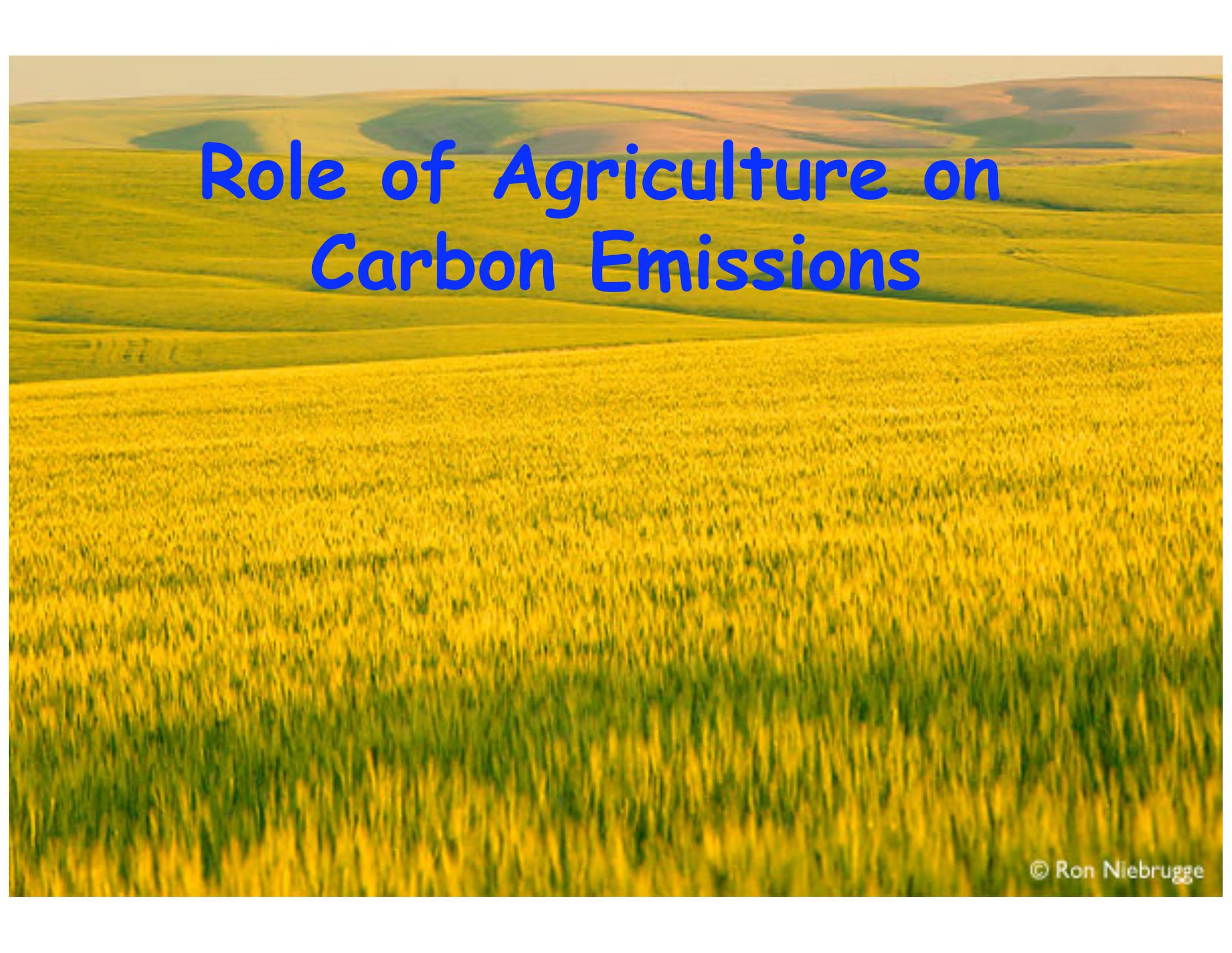
1 Energy Unit

**Apple
Ipod**



100-250 Energy Units

Photo credit: Terry Nathan

An aerial photograph of rolling hills. The foreground is dominated by a vast field of bright yellow flowers, likely rapeseed. The middle ground shows rolling green hills, and the background features more distant hills with patches of brown and green, suggesting different agricultural uses or natural vegetation. The sky is a pale, hazy blue.

Role of Agriculture on Carbon Emissions



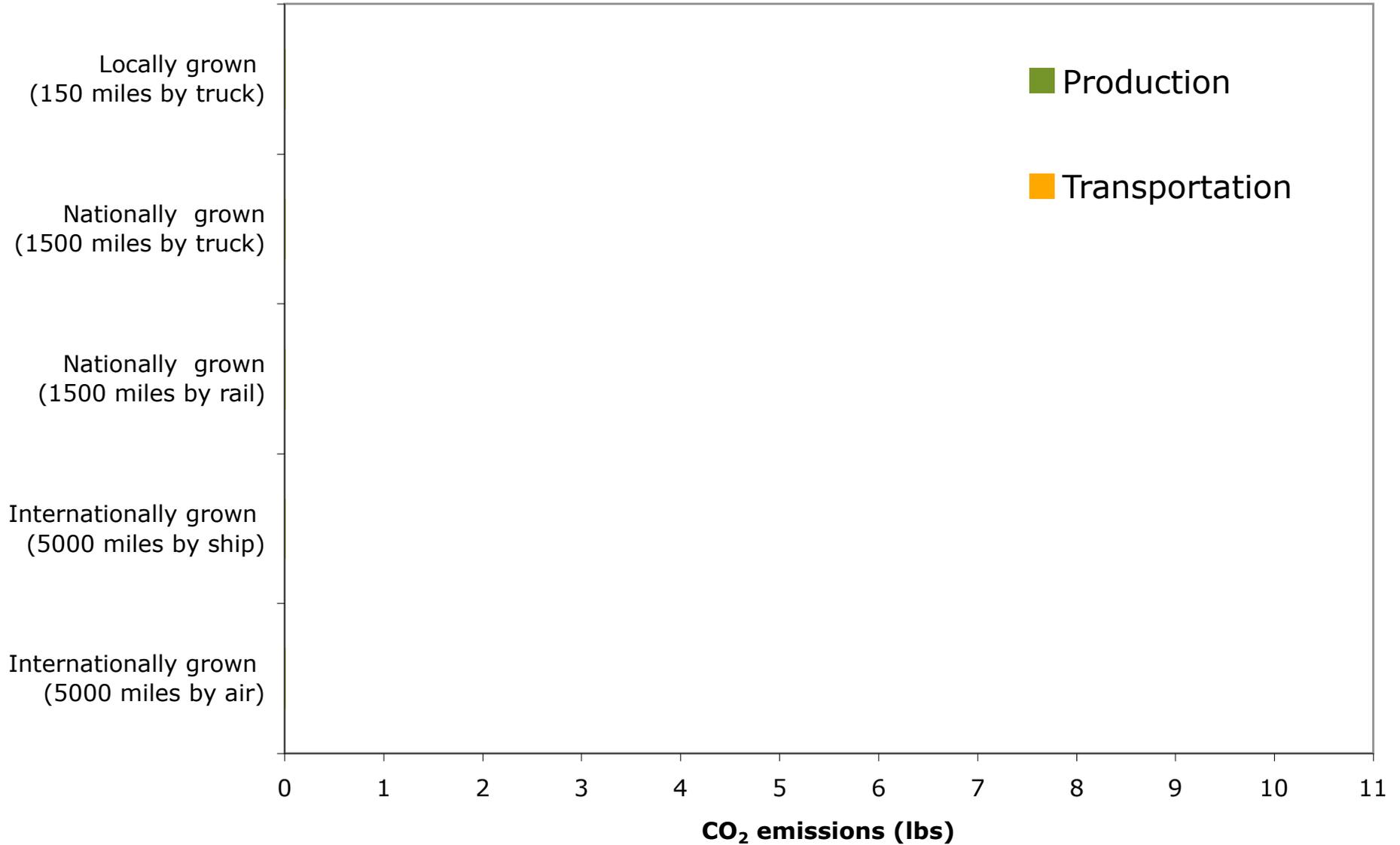
"Food Miles"

The number of miles (kilometers) that food is transported from origin (farm) to your mouth.

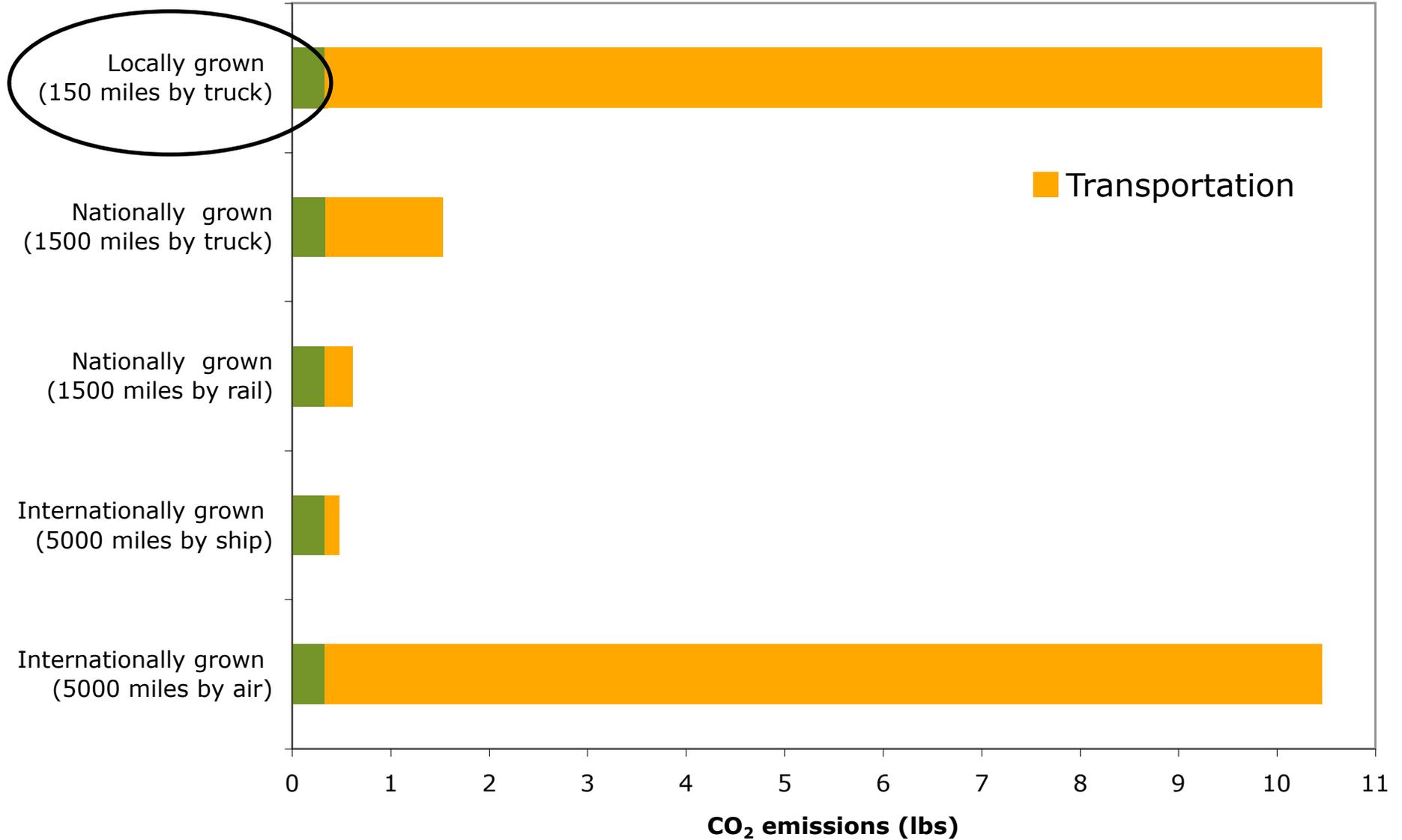
1 lb of
Cherries



Emissions associated with transport



Emissions associated with transport






MARKS & SPENCER
ready prepared
young garden peas & sweetcorn
fresh and furo free

Produced in **KENYA 4848V**
240g e BEST BEFORE USE BY **02 JUL**
KEEP REFRIGERATED


buy 1, get 1 1/2 price
on selected fresh produce

MARKS & SPENCER

fine beans
for a variety of cooking uses

Produced in **KENYA 4848D**
400g e BEST BEFORE USE BY **03 JUL**
M 0046 909 5

Global Carbon Emissions Associated with Agriculture

- Energy required for:
 - Soil management and fertilization
 - Farm machinery/irrigation
 - Food production
 - Transportation
 - Animal emissions (CH₄)

- Livestock activities generate:
 - 4.6-7.1 billion tons CO₂ per year
 - (14-18% of global emissions)

Livestock's Long Shadow,

U.N. Food and Agriculture Organization, 2004

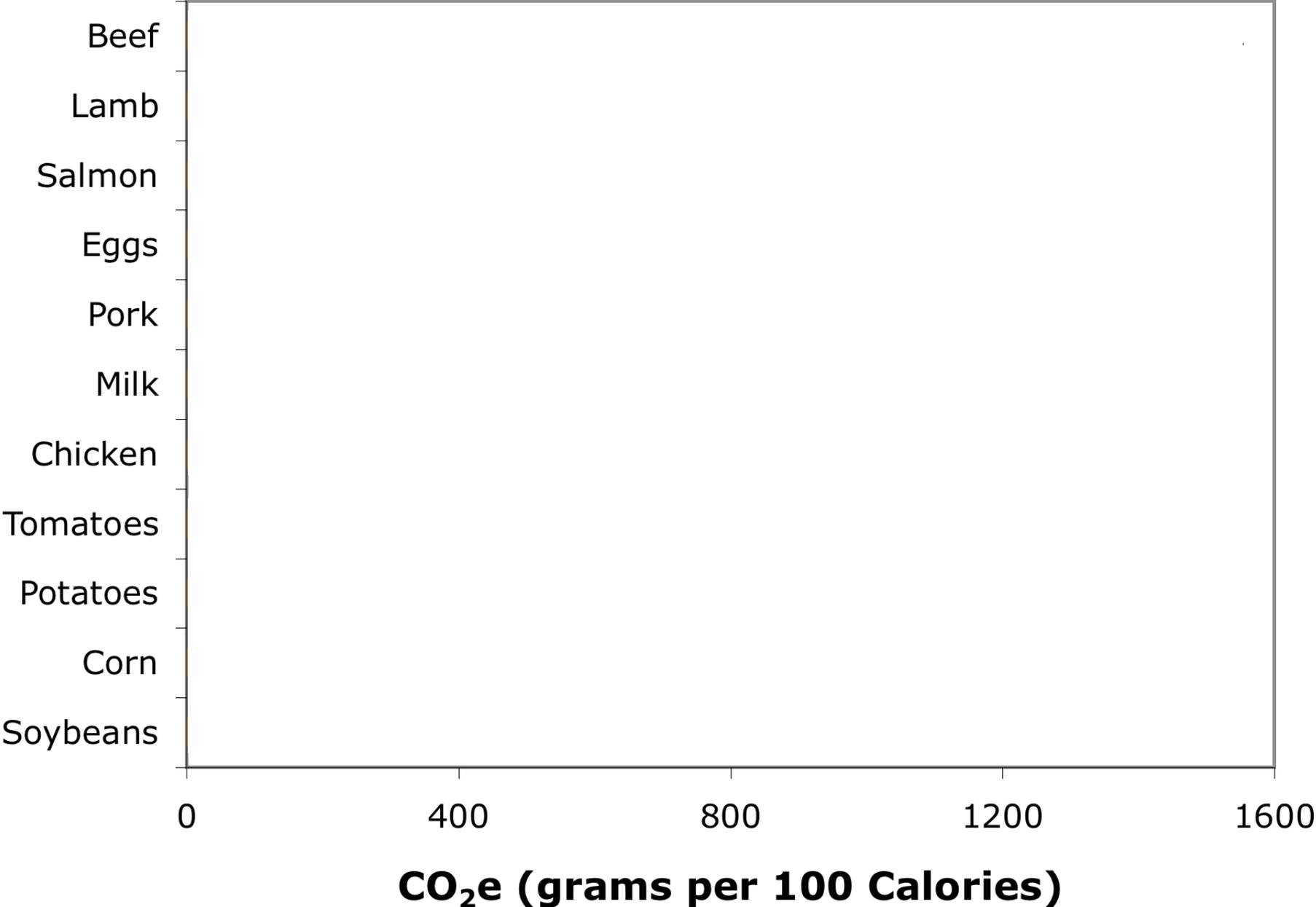
CO₂ intensity of foods

$$\textit{Food Energy Efficiency} \equiv \frac{\textit{Input Fossil Energy}}{\textit{Calories}}$$

+

Animal related methane emissions

CO₂ Intensity of Various Foods



Carbon Showdown



VS



Emissions from Transportation

- **Annual transportation (USA)**
 - 9,000 average passenger car miles

**Toyota
Prius
(50 mpg)**

1.8 tons/yr

**Toyota
Camry
(28 mpg)**

3.5 tons/yr

**Chevy
Suburban
(13 mpg)**

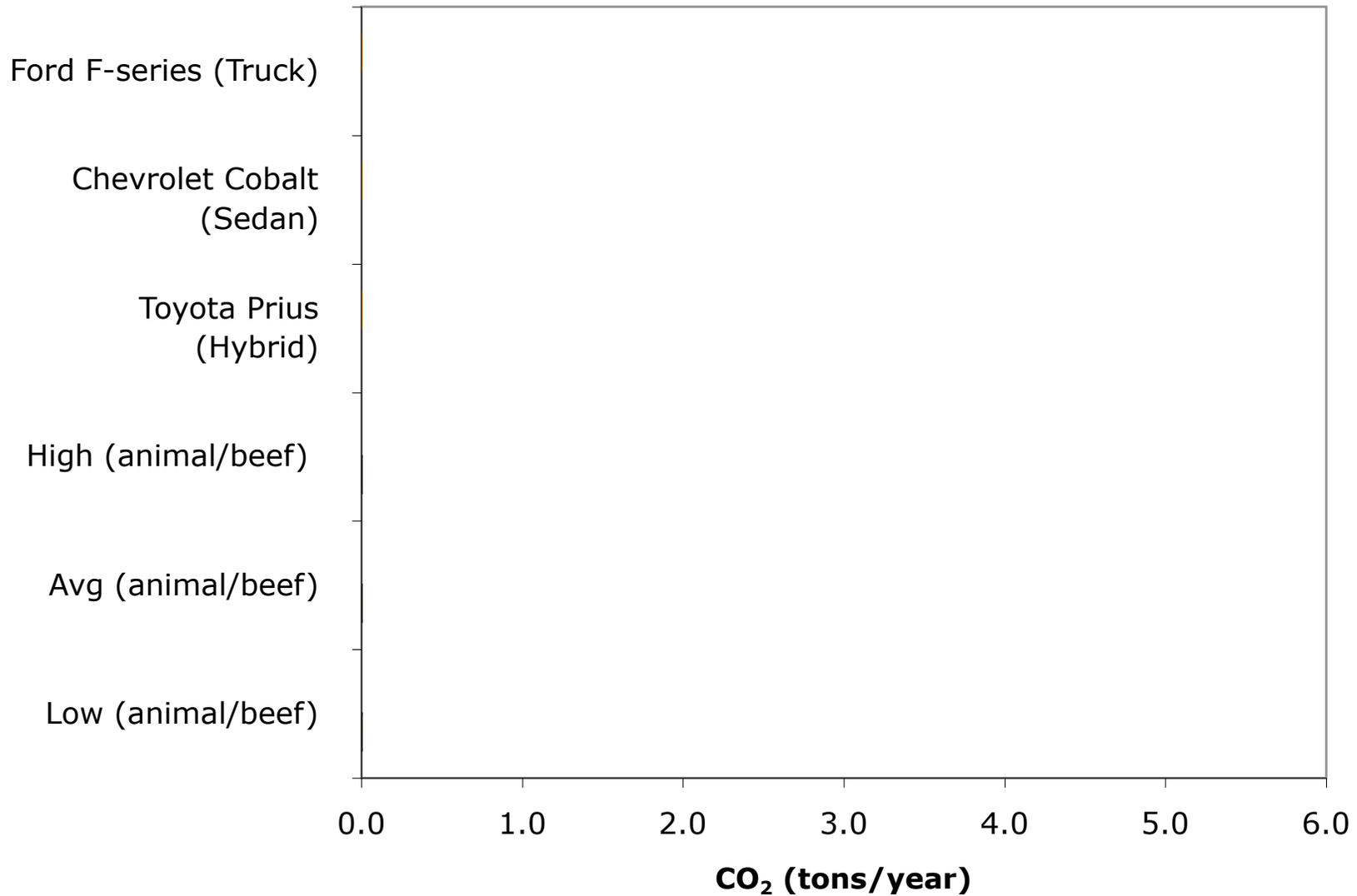
5.2 tons/yr

Food: Three Diets

- **High:**
 - 38% animal products
 - All red meat
- **Normal:**
 - 28% animal products
 - Mix of red meat, poultry and fish
- **Low:**
 - 18% animal products
 - Chicken instead of red meat



Auto - Diet Comparison





Stir-Fry: 3 ways
Veggie
Beef
Chicken

BASIC STIR-FRY: 3 WAYS

RECIPES

Base ingredients		g CO ₂ eq	Assumptions
Soy sauce (estimated)	2 tablespoons (28.47 g)	84	\$2.00 per pound, sauce = 673 g CO ₂ eq/\$
White wine	1 tablespoon (14.7 ml)	50	\$6.73 per liter, wine = 523 g CO ₂ eq/\$
Lemon juice	1 tablespoon (14.23 g)	104	\$1.16 per pound, fruit = 711 g CO ₂ eq/\$, 4 times the weight in lemons to get the juice
Vegetable oil	2 tablespoons (28.47 g)	47	\$1.10 per pound, sauce = 673 g CO ₂ eq/\$
Peppers	1/3 pound (151.3 g)	688	\$1.93 per pound, vegetables = 1070 g CO ₂ eq/\$
Broccoli	1/3 pound (151.3 g)	467	\$1.31 per pound, vegetables = 1070 g CO ₂ eq/\$
Carrots	1/3 pound (151.3 g)	209	\$0.58 per pound, vegetables = 1070 g CO ₂ eq/\$
	Total	1649	

RECIPE 1: VEGETABLE STIR-FRY

6 lbs

Peppers	1/3 pound (151.3 g)		\$1.93 per pound, vegetables = 1070 g CO ₂ eq/\$
Broccoli	1/3 pound (151.3 g)	467	\$1.31 per pound, vegetables = 1070 g CO ₂ eq/\$
Carrots	1/3 pound (151.3 g)	209	\$0.58 per pound, vegetables = 1070 g CO ₂ eq/\$
	Total for Recipe 1	3013	g CO ₂ eq

RECIPE 2: BEEF STIR-FRY

31 lbs

Beef (sirloin)	1 pound (454 g)		\$6.34 per pound, beef = 2214 g CO ₂ eq/\$
	Total for Recipe 2	15692	g CO ₂ eq

RECIPE 3: CHICKEN STIR-FRY

11 lbs

Chicken	1 pound (454 g)		\$3.30 per pound, chicken = 1173 g CO ₂ eq/\$
	Total for Recipe 3	5520	g CO ₂ eq

NOTES AND ADDITIONAL ASSUMPTIONS

Emissions data is in grams of carbon dioxide equivalent per 2004 purchaser dollars. The price data came from the Consumer Price Index when available, otherwise EcoSynergy used the best available price information to make the above calculation. The price assumption is listed for each ingredient. The emissions per dollar come from the EcoSynergy data base.



6

Holy Cow!

Louis Sukovaty is a hard guy to keep up with. He walks at a quick clip, leading me around Crown S Ranch, LLC, in Winthrop, Washington. Winthrop is in the north-central part of the state in the Methow Valley, a forty-square-mile area with a growing interest in local food production and agriculture.

"The ruminants are incredible—the cows, sheep, goats, and deer who eat grass for food, something humans can't do. With more than one stomach, ruminants have an overly efficient digestive process, exactly what is needed to convert grass to energy." Sukovaty is a third-generation farmer whose farming practices are based on his extensive research in animal husbandry (the way it was done prior to the invention of fossil-fuel fertilizers and chemicals), his engineering background (he is a licensed professional engineer in both electrical and mechanical engineering), and his passion for working with nature.

A number-crunching, wild-eyed rancher, Sukovaty describes himself as an "artisan finisher," taking cattle from 500 to 1,200 pounds. "Weight doesn't matter as much as the 'finish of the animal'—how fat the animal is and whether the marbling will provide a product the consumer wants." Sukovaty says his work on the farm is similar to cooking.

A big misunderstanding about grass-fed beef is that people think it will taste gamey, but that depends on what you feed them. You can make the flavor



PART TWO

SOLUTIONS



Climate Solutions



Transport



Housing



Food

Consumption

Promoting energy efficiency



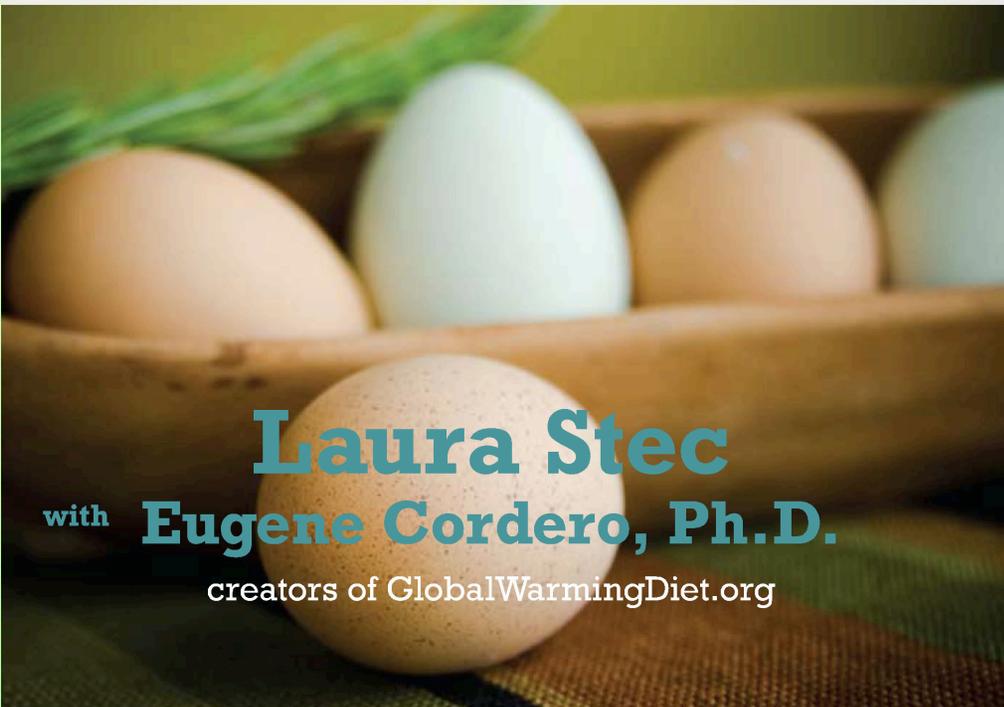
Efficient Transportation





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- Seasonal
- Local
- Organic
- Whole



Nutrition Facts

Carbon Footprint

Per Serving: 118g CO₂e
Total Carbon: 1648g CO₂e

Primary location of origin:
Orrville, Ohio

Method of transportation:
Train/Truck

4c



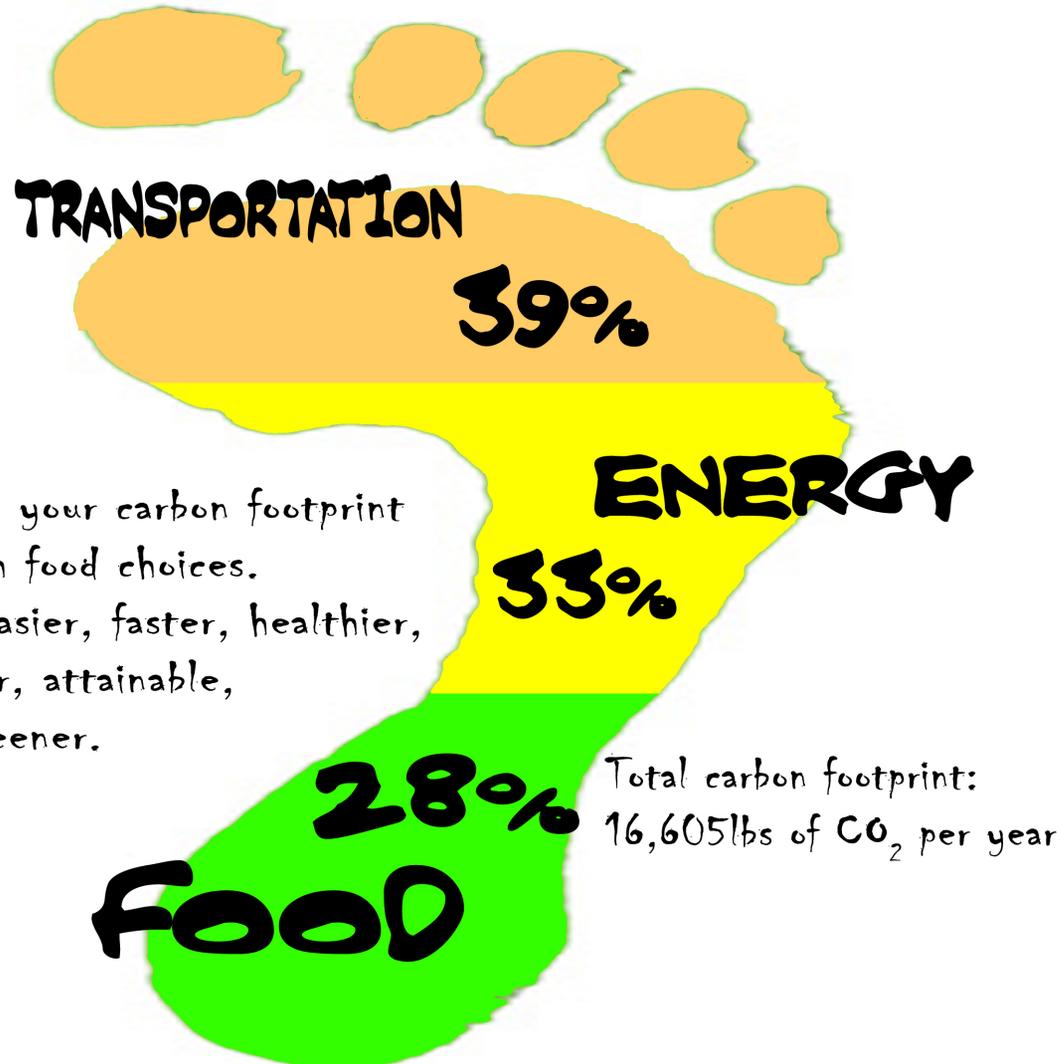
Note: Carbon rating ranges from 1 to 10, with lower numbers being more climate friendly.

Carbon dioxide equivalent (CO₂e) accounts for carbon dioxide and other greenhouse gases.

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Carbon dioxide equivalent (CO₂e) accounts for carbon dioxide and other greenhouse gases.

THE CARBON FOOTPRINT OF AN SJSU STUDENT



Reduce your carbon footprint through food choices. It is easier, faster, healthier, cheaper, attainable, and greener.

Lower carbon food choices: vegetables, grains, beans, and chicken
Higher carbon food choices: beef, lamb, and salmon



World **Greened**

through you through foods

WHAT DOES YOUR FOOTPRINT LOOK LIKE?



Food choices can have a larger impact on global warming than the type of car you drive.



The average cheeseburger is responsible for producing over 10 pounds of heat trapping gasses (CO₂), which is equivalent to driving a car 13 miles.



Carbon friendly food choices:

Chicken instead of beef

Seasonal fruits and vegetables

Fresh foods instead of processed foods

**Find out more @ the art quad on
Tuesday, November 18th**

Check out our Facebook group: [thru you thru food](#)

Email: thruyouthrufood@yahoo.com





Food

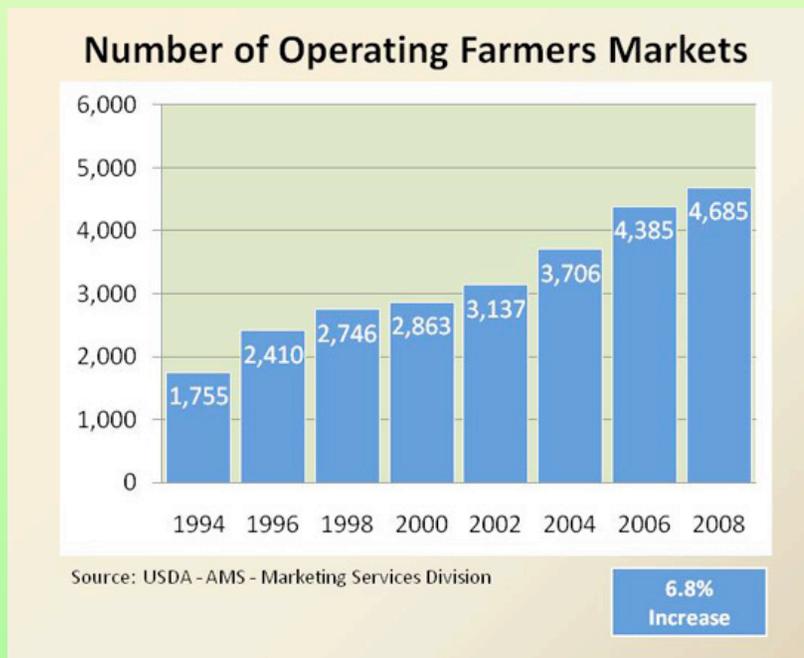
Public health

Local and national economy

Environment

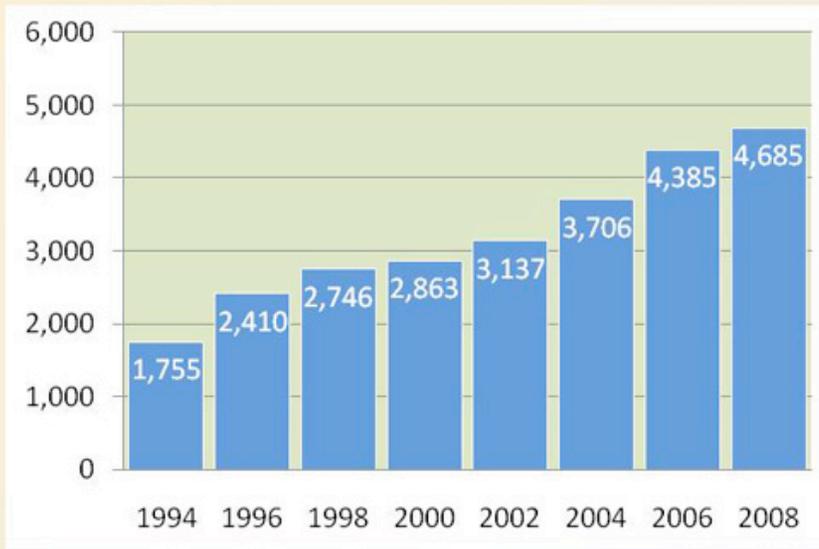
Community Supported Agriculture

- In 1990, about 50 farms
- In 2008 more than 2000 farms



Food Movement

Number of Operating Farmers Markets



Source: USDA - AMS - Marketing Services Division

6.8%
Increase

Community Supported Agriculture

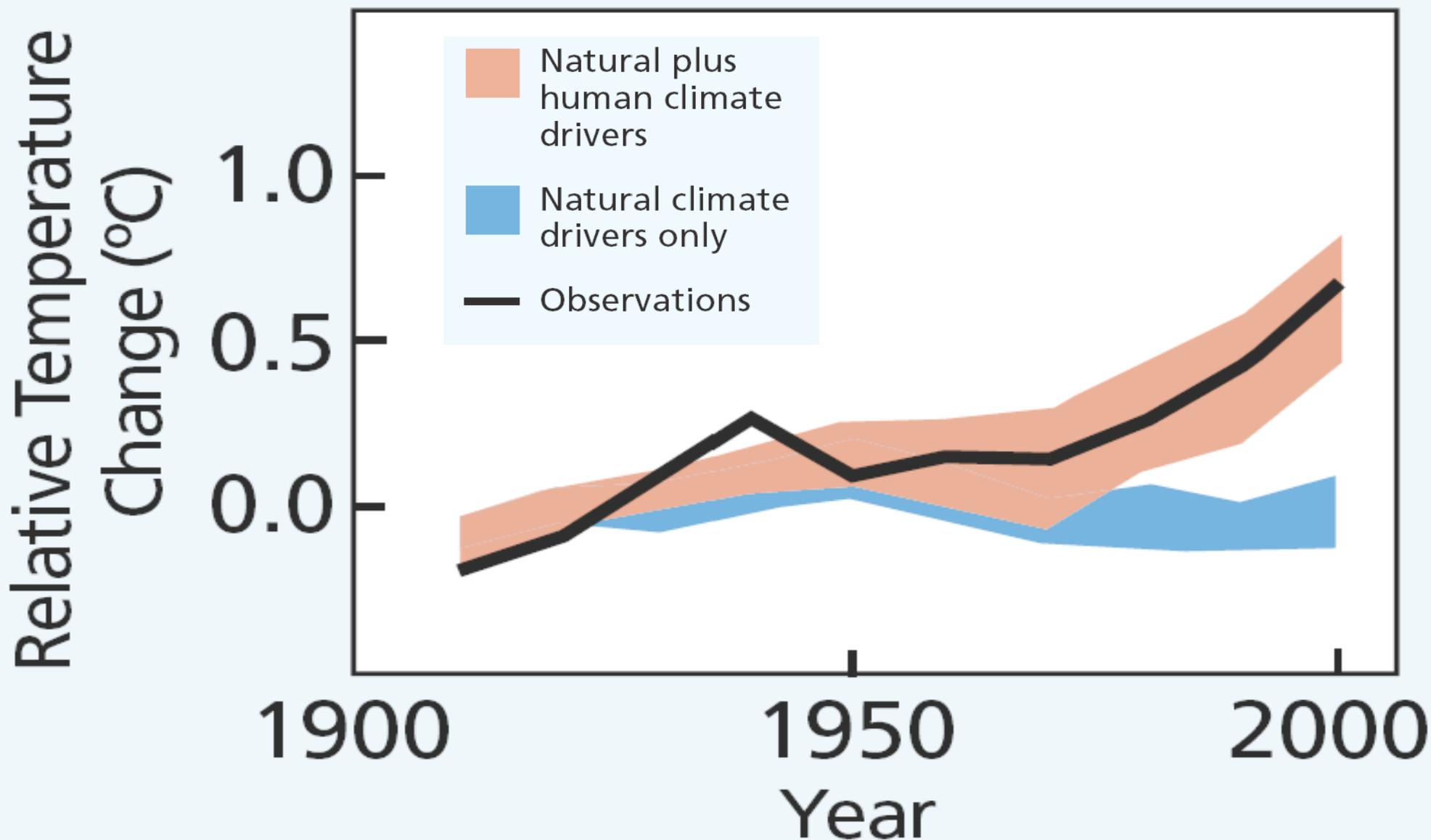
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Lines of evidence connecting human activity and 20th century climate change?

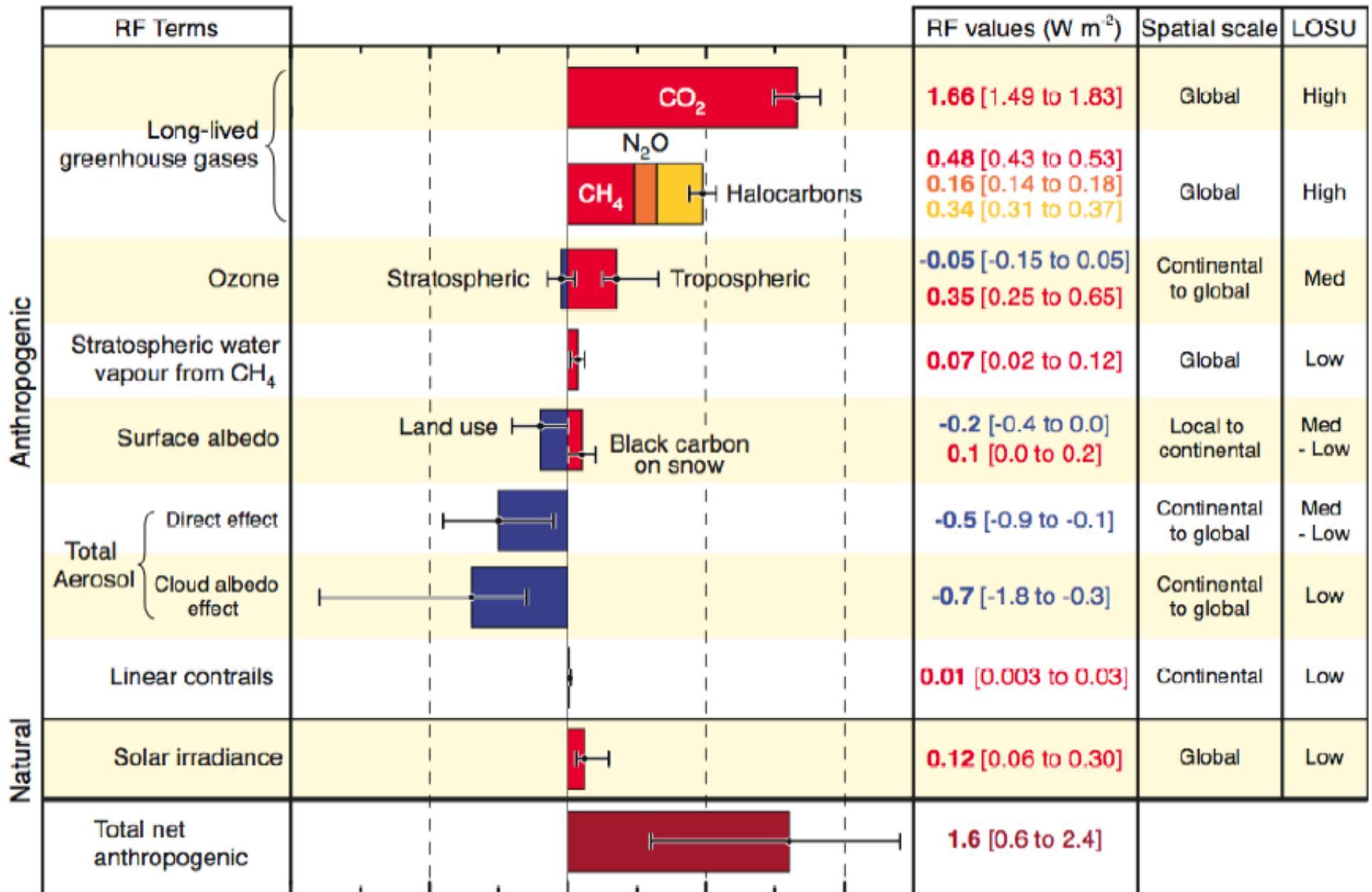
- Radiative forcing
- Patterns of changing climate
- Global climate models

Global Average Surface Temperature



Source: IPCC *Climate Change 2007: The Physical Science Basis*—Summary for Policymakers.

Radiative Forcing Components



©IPCC 2007: WG1-AR4

Warming

AOGCM/CCM Global Temperature Trends (1958-99)

