

COMBATING CLIMATE CHANGE

Junior Model UN

March 5-6, 2020

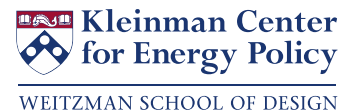
Temple University

Cornelia Colijn

Executive Director

Kleinman Center for Energy Policy

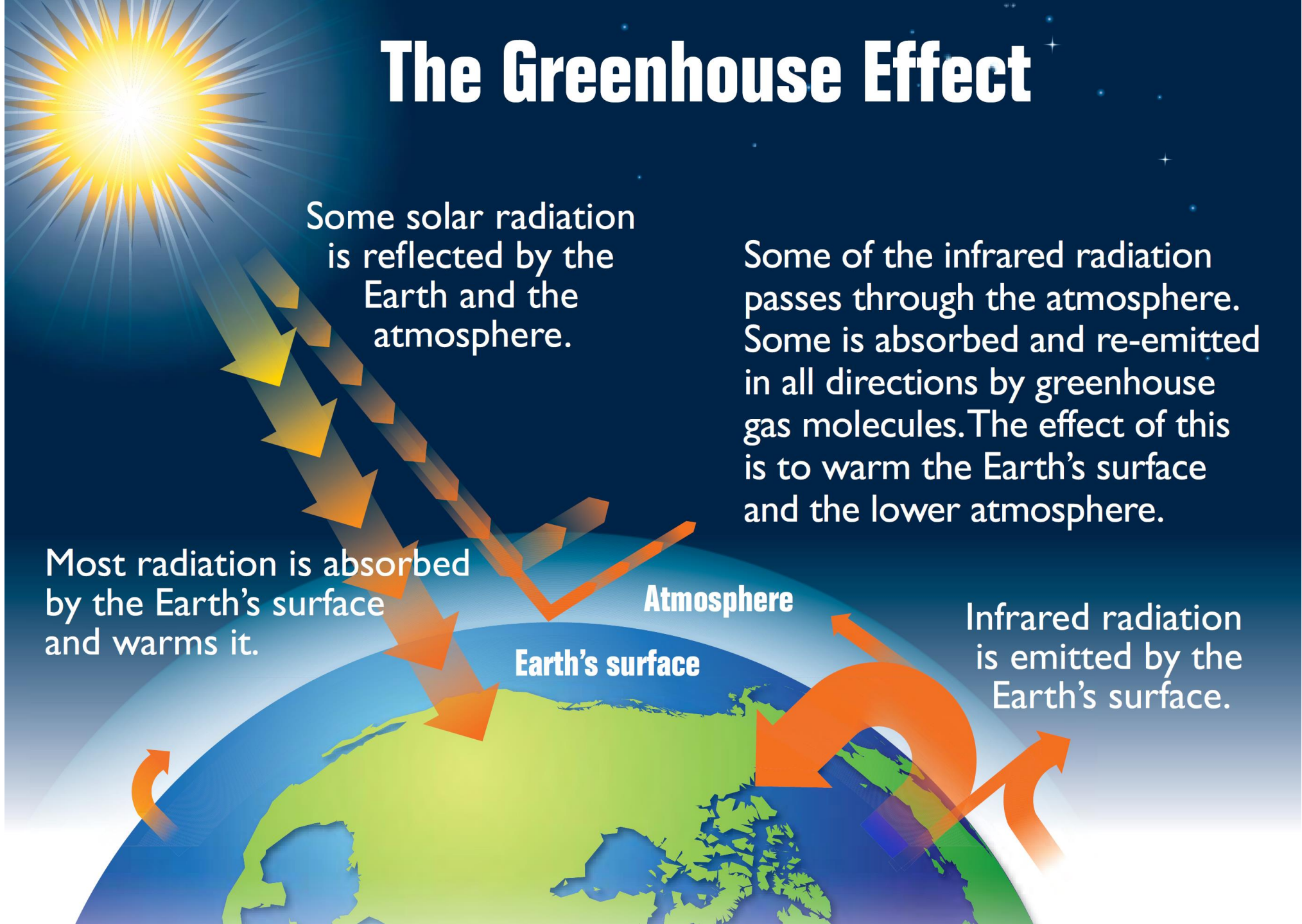
University of Pennsylvania



How do you get to school?

A. Walk	A. 0
B. Bike	B. 0
C. Car	C. 1115
D. Bus (or other public transportation)	D. 131
E. Carpool	E. 459

The Greenhouse Effect



Some solar radiation is reflected by the Earth and the atmosphere.

Some of the infrared radiation passes through the atmosphere. Some is absorbed and re-emitted in all directions by greenhouse gas molecules. The effect of this is to warm the Earth's surface and the lower atmosphere.

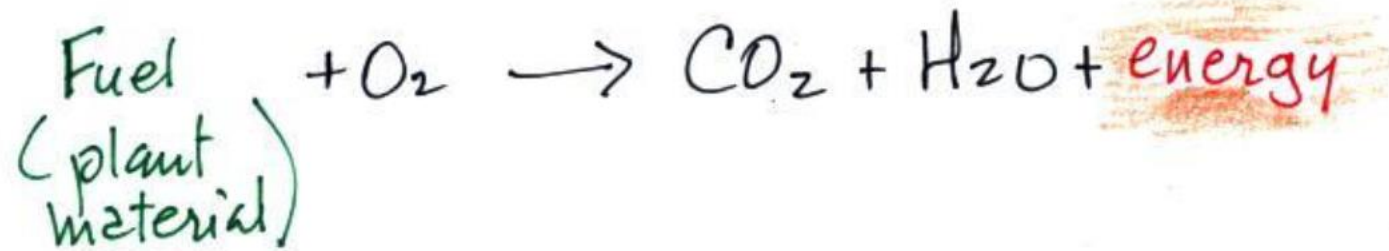
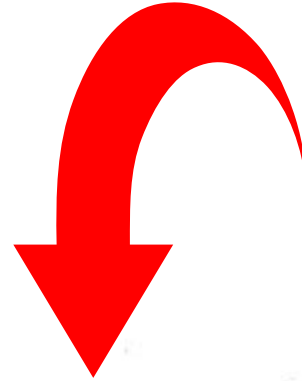
Most radiation is absorbed by the Earth's surface and warms it.

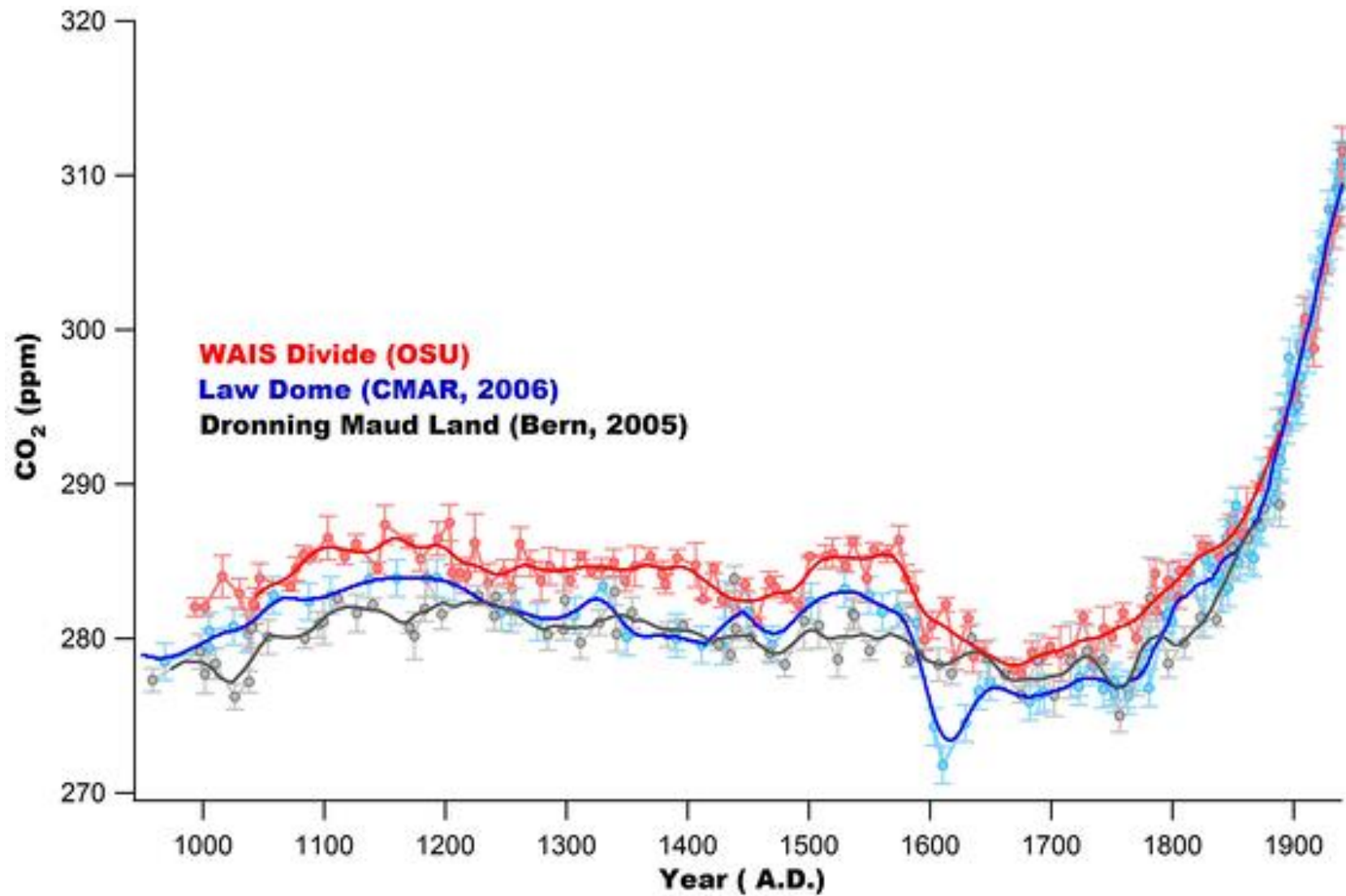
Atmosphere

Earth's surface

Infrared radiation is emitted by the Earth's surface.

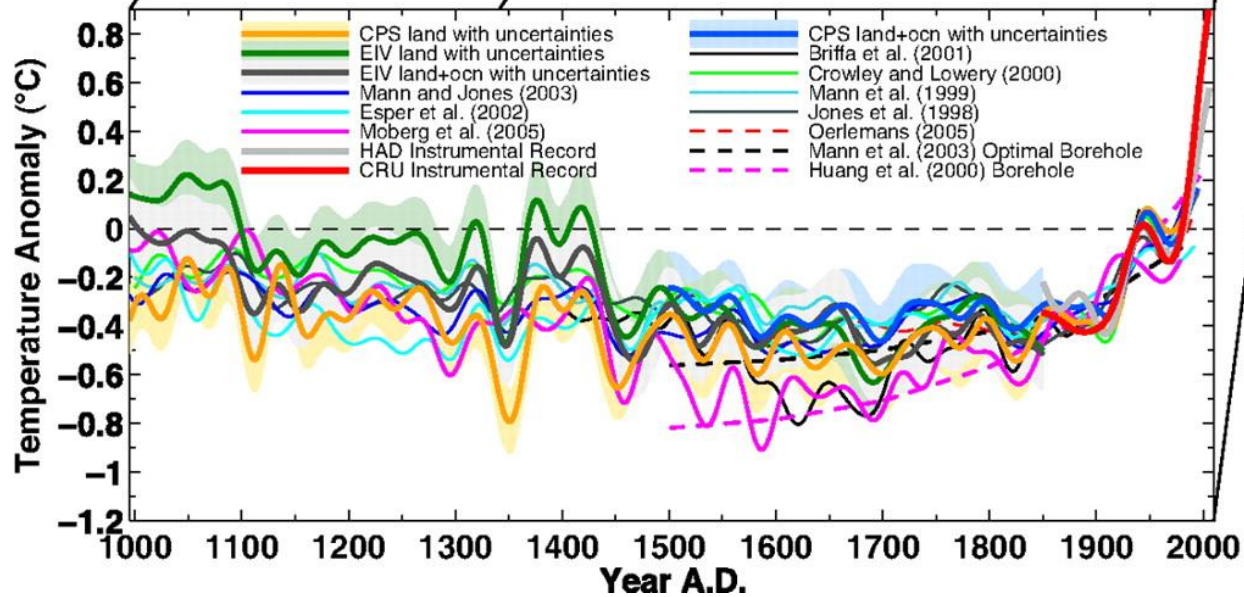
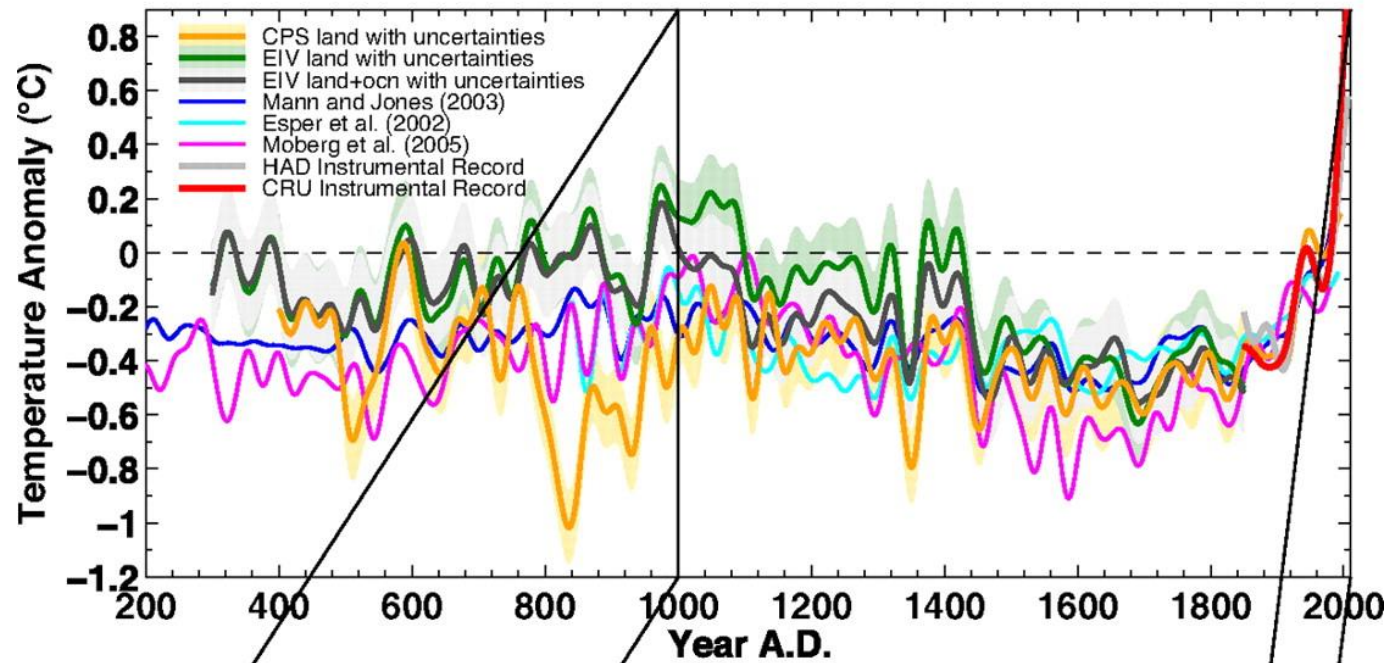
Combustion



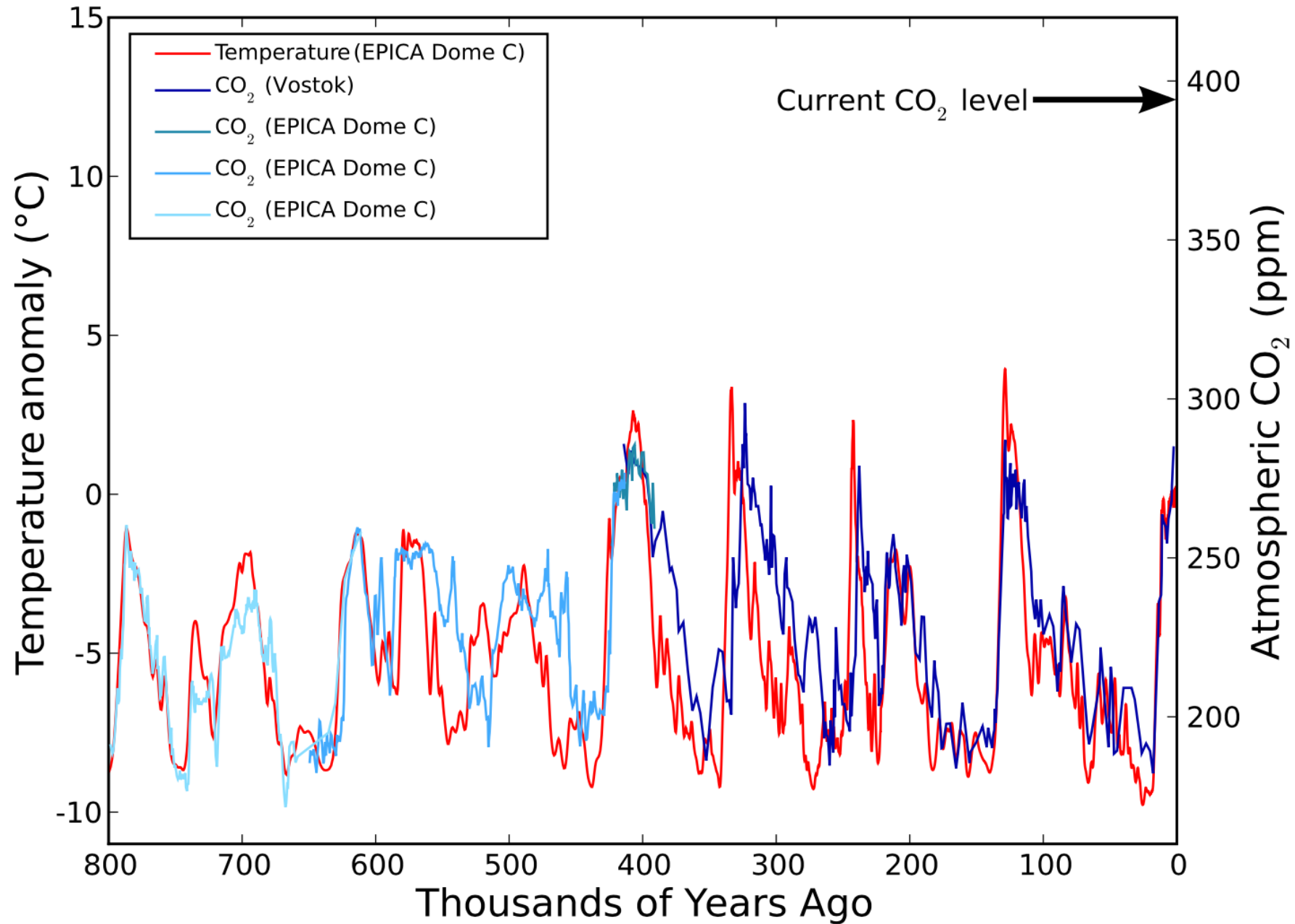


Atmospheric CO₂ over the last 1000 years: A high-resolution record from the West Antarctic Ice Sheet (WAIS) Divide ice core

Northern Hemisphere



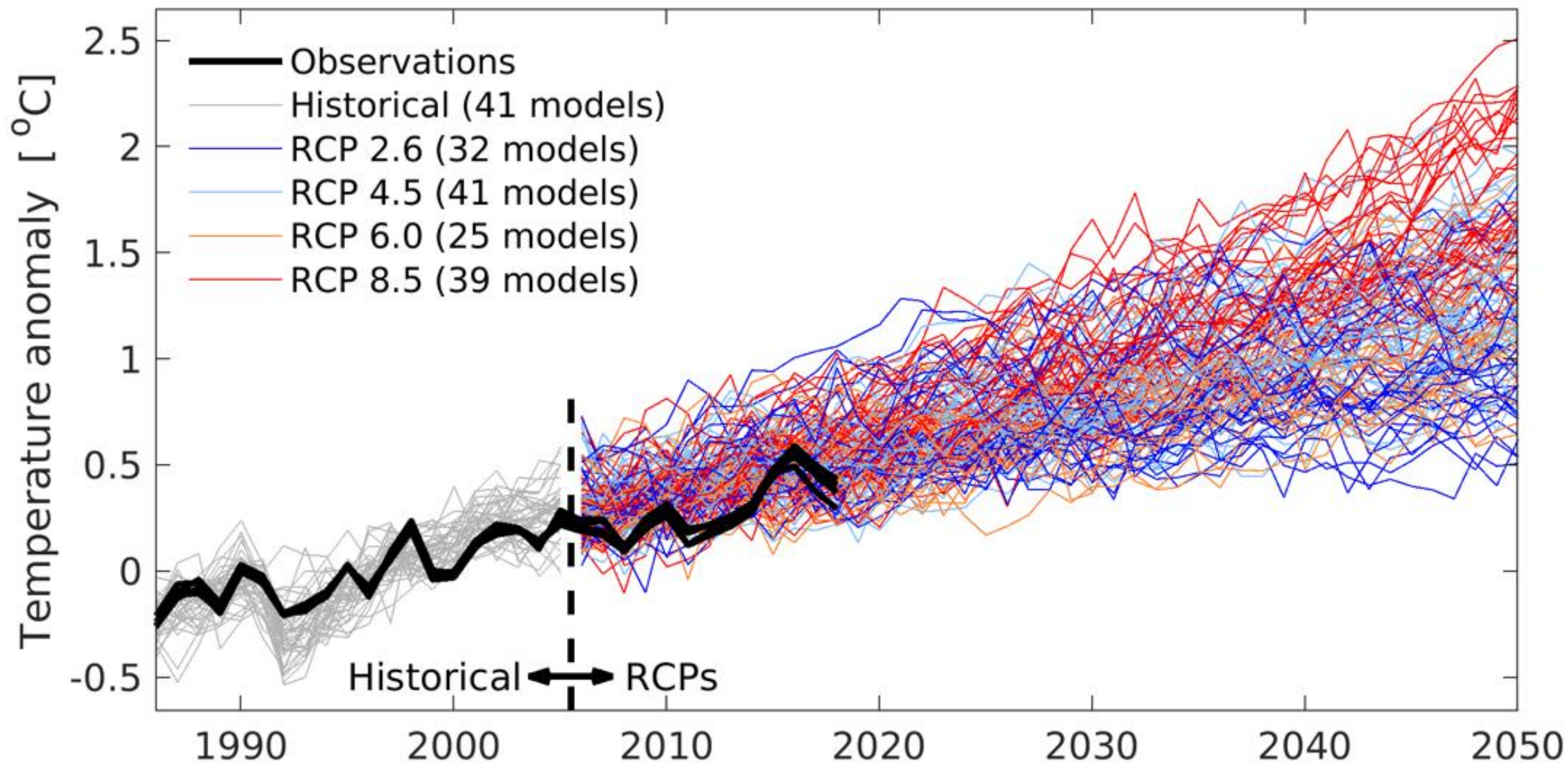
Temperature and CO₂ Records







GMST near-term projections relative to 1986-2005

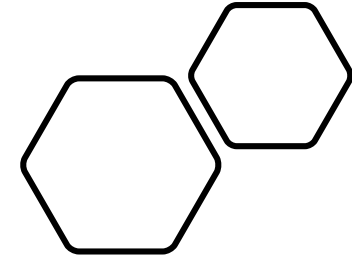


Do you eat mostly...

A. Vegetables/fruits	A. 153
B. Meat	B. 644
C. Bread	C. 364



Drought



“Drought is a slow-moving natural disaster that can wither crops, threaten endangered species and other natural resources, and disrupt public water supplies. Drought can also increase the likelihood of wildfires, pest infestations, even epidemics.”

NOAA



Sea Level Rise

“Without cuts in carbon emissions, the ocean is expected to rise between 61cm and 110cm, about 10cm more than the earlier estimate. A 10cm rise means an additional 10 million people exposed to flooding, research shows.” [The Guardian](#)

Extreme Weather

Carbon Brief's analysis suggests 68% of all **extreme weather** events studied to date were made more likely or more **severe** by human-caused **climate change**. Heatwaves account for 43% such events, droughts make up 17% and heavy rainfall or floods account for 16%

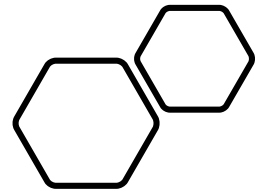




Flooding

“From 1958 to 2016 heavy rainfall events have increased in the northeastern states by 55 percent, midwestern states by 42 percent, and southeastern states by 27 percent.”

Ellen Gray & Jessica Merzdorf, NASA





"Biodiversity," the panel declared, "is declining faster than at any time in human history. A million species are on the brink."
UN IPCC Biodiversity Panel

Biodiversity Loss

How do you dry clothes?

A. Hang to dry

B. Dryer

C. Both

A. 0

B. 750

C. 375



Famine

“The number of extreme climate-related disasters, including extreme heat, droughts, floods and storms, has doubled since the early 1990s, with an average of 213 of these events occurring every year during the period of 1990–2016. These disasters harm agricultural productivity of major crops such as wheat, rice and maize causing food price hikes and income losses that reduce people’s access to food.” United Nations Food and Agriculture Organization



Climate Migration

“...for example we know that last year **24 million people** were displaced by weather related disasters like floods and hurricanes.”

Climate Migration Coalition

War/Disputes

“In a scenario of 2 degrees Celsius of warming beyond preindustrial levels – the stated goal of the Paris Climate Agreement – the influence of climate on conflicts would more than double, rising to a 13% chance.”

Stanford University, Woods Institute



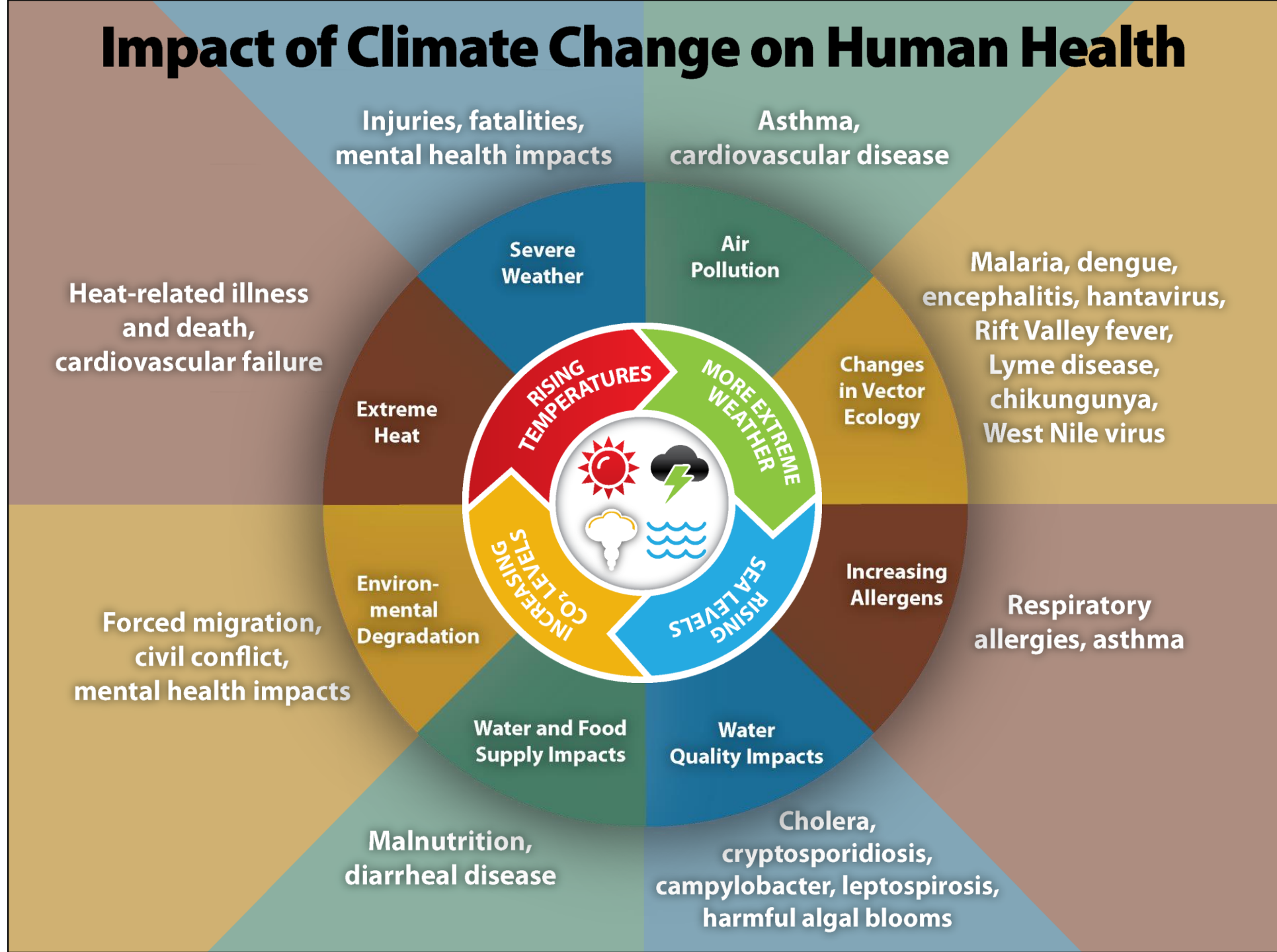


Public Health Crisis

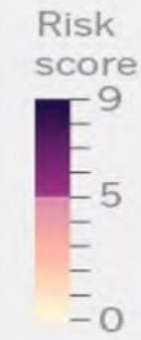
“Climate change will also affect infectious disease occurrence.” A number of diseases well known to be climate-sensitive, such as **malaria, dengue fever, West Nile virus, cholera and Lyme disease**, are expected to worsen as climate change results in higher temperatures and more extreme weather events.”

Columbia University, Earth Institute

Impact of Climate Change on Human Health



Cumulative risks of **3°C** warming



Population affected by various risks (millions of people)

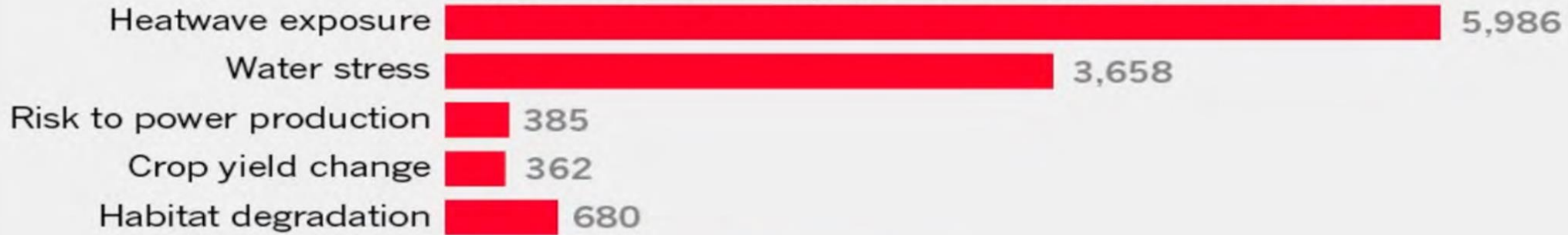


Source: IPCC/E. Byers et al. Environ. Res. Lett. 13, 055012 (2018).

Cumulative risks of **2°C** warming



Population affected by various risks (millions of people)



Source: IPCC/E. Byers et al. Environ. Res. Lett. 13, 055012 (2018).

Cumulative risks of **1.5 °C** warming

Risk
score



9
5
0

Population affected by various risks (millions of people)

Heatwave exposure  3,960

Water stress  3,340

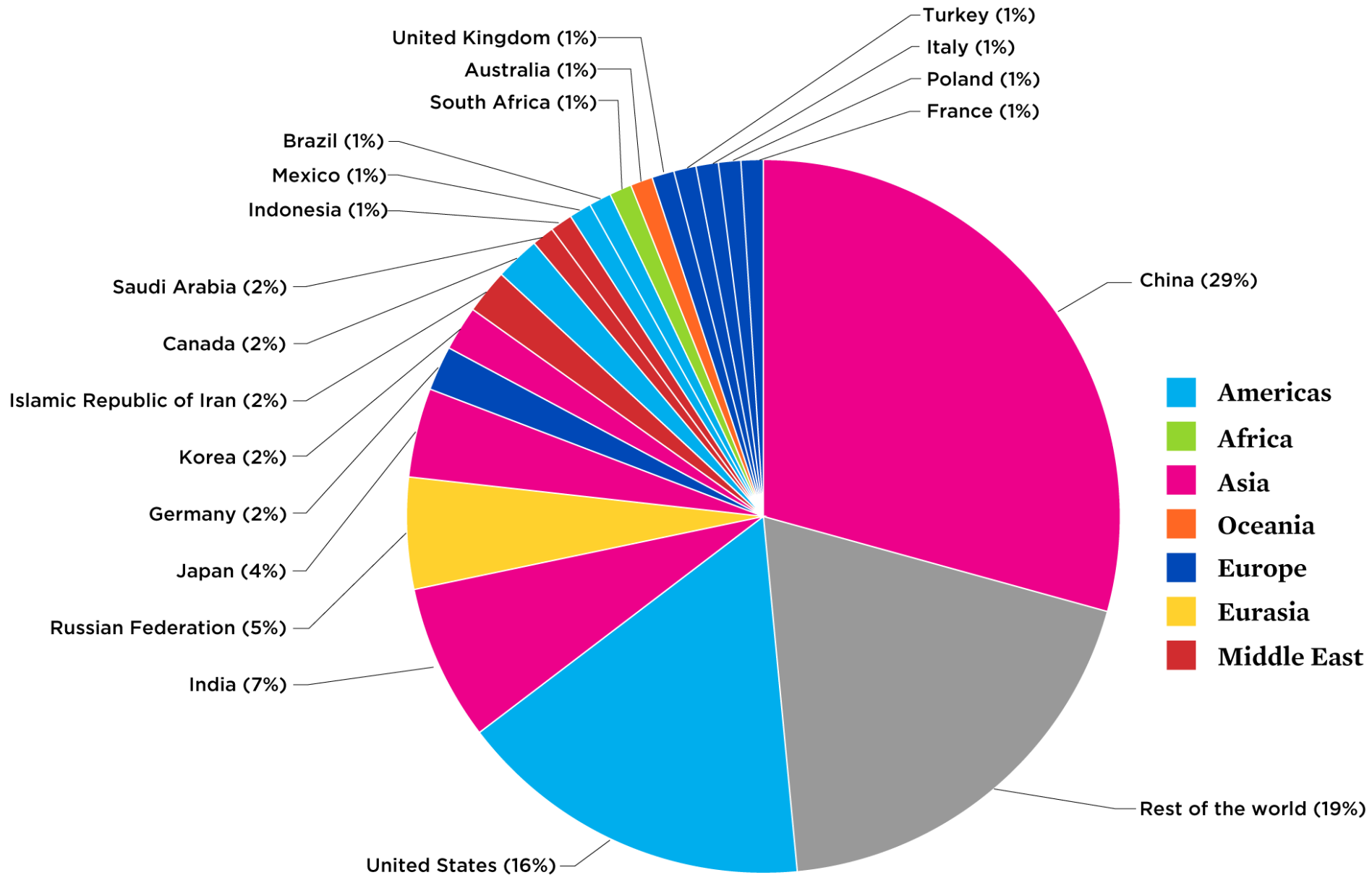
Risk to power production  334

Crop yield change  35

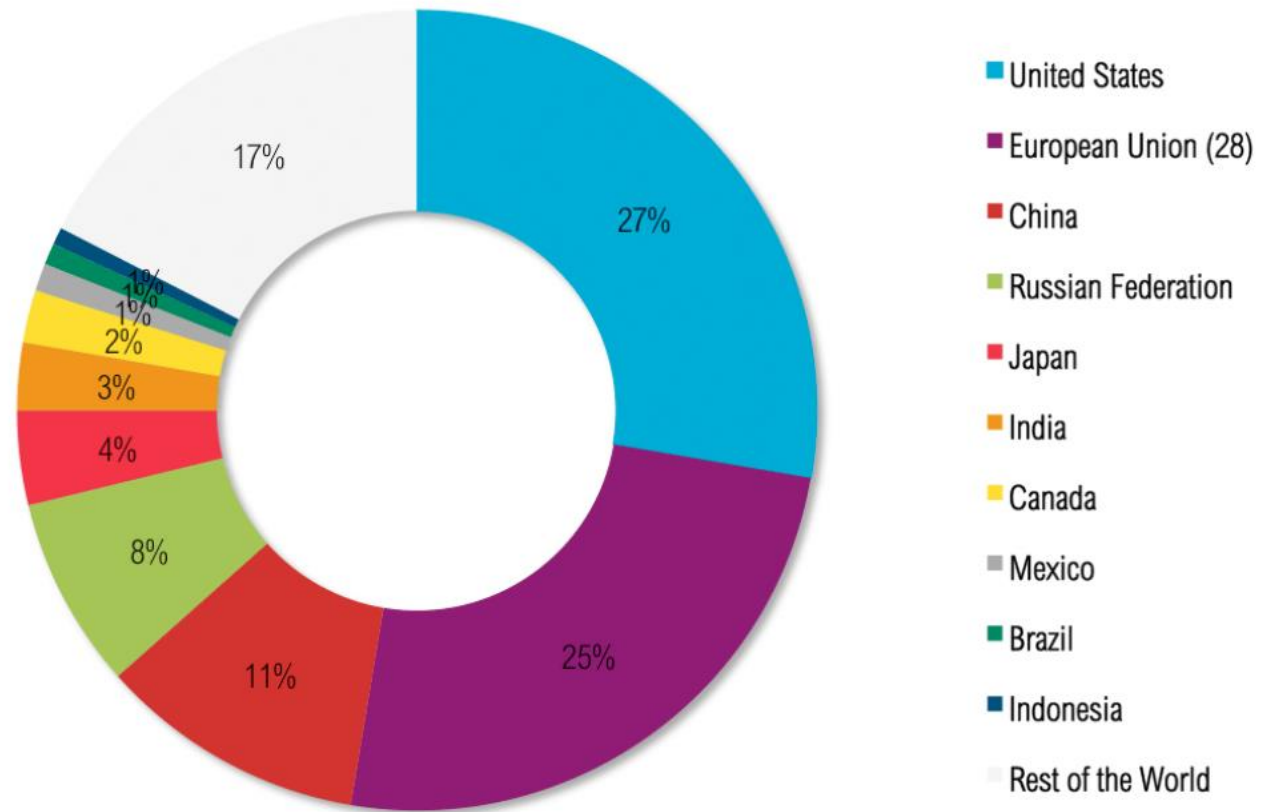
Habitat degradation  91

Do you turn off the water when brushing your teeth?

- Yes • 34
- No • 274



Cumulative CO₂ Emissions 1850–2011 (% of World Total)



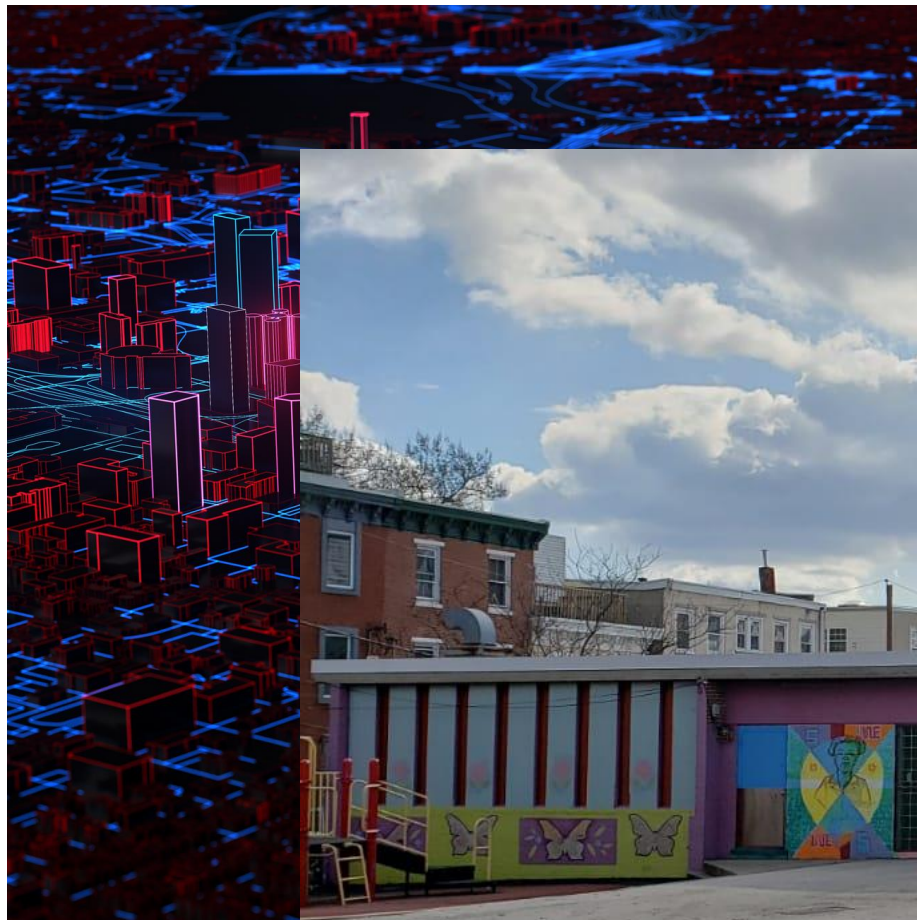
<http://bit.ly/11SMpjA>

Potential Solutions
Adaptation & Mitigation
Technology & Policy

Adaptation: Technology



Adaptation: Policy



Do you unplug appliances/chargers when not in use?

A. Yes

A. 9

B. No

B. 18

Mitigation: Technology

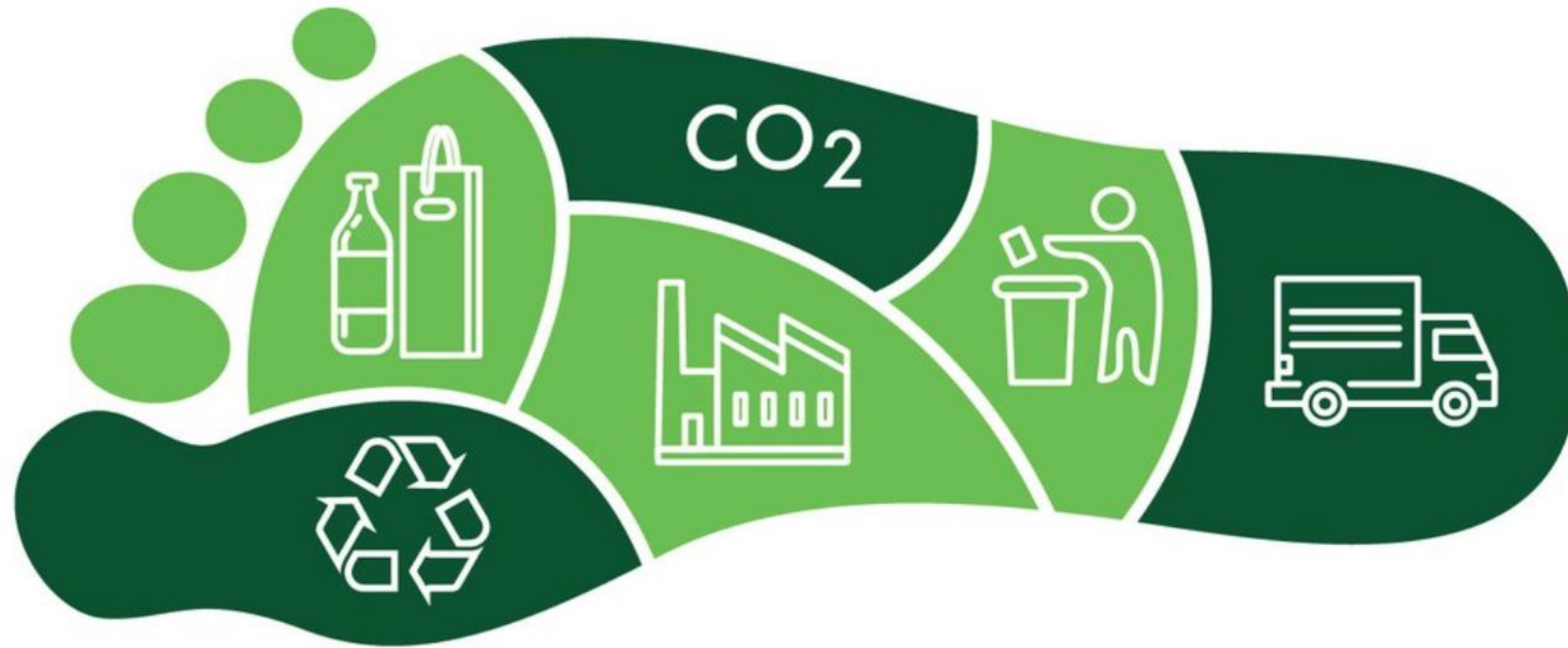


Julia Dunlop/Climeworks

Mitigation: Policy



Calculate Your Total!



How can you reduce your carbon footprint?



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