



2023-1-TRO1-KA220-SCH-000160173
GREEN AGRIPRENEURS OF FUTURE

UNDERSTANDING CLIMATE CHANGE: PRACTICAL WAYS TO TEACH IT

Teacher Training

Instructor: Bilgesu Tatal, CERA Europe

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19 December 2024



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What does climate change mean to you?



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What does climate change mean to you?

34 responses



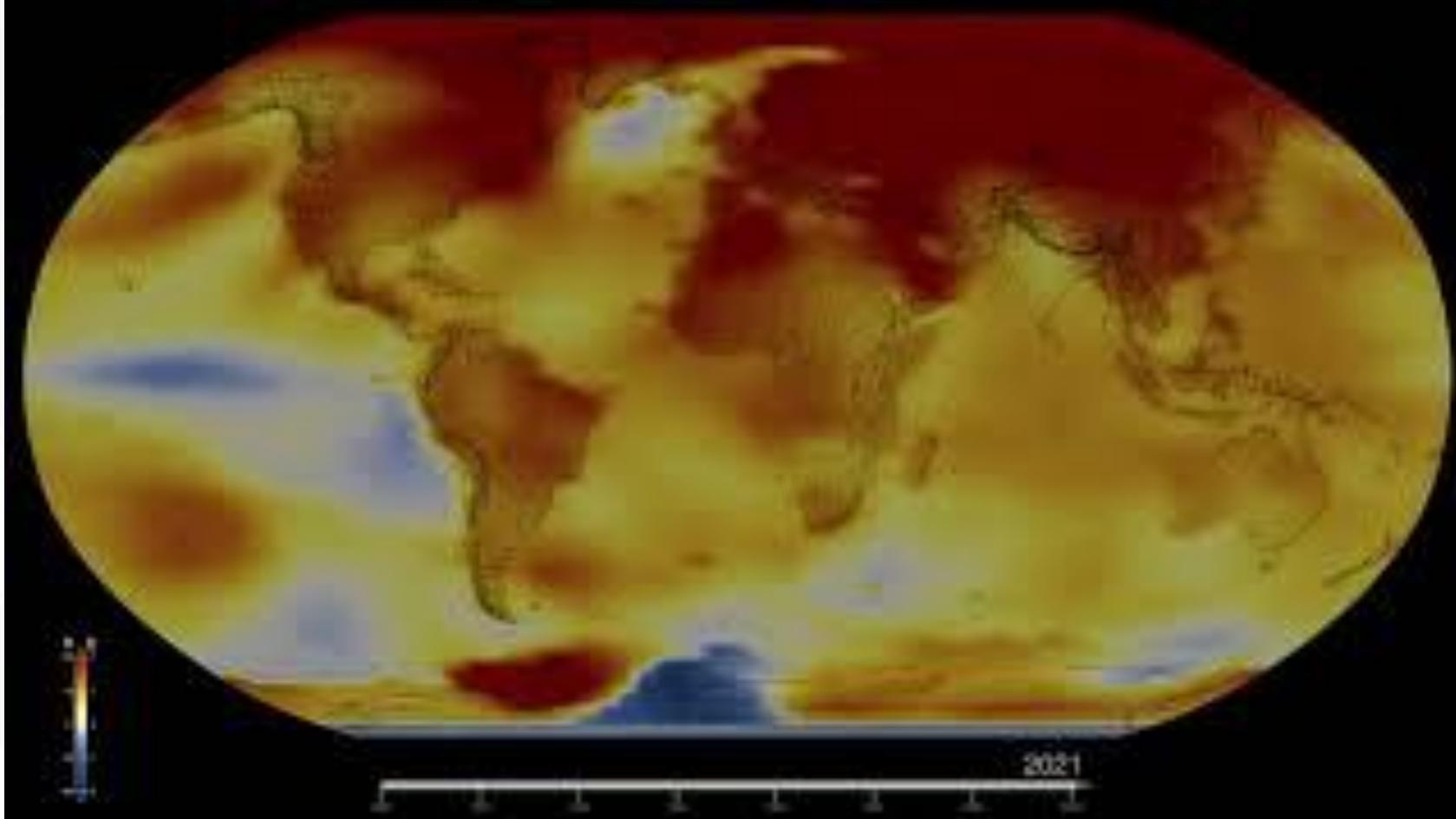


What is Climate Change?

Climate change refers to long-term changes in global temperatures and weather patterns. While these changes occur naturally, human activities have accelerated the process, leading to significant warming in recent decades.



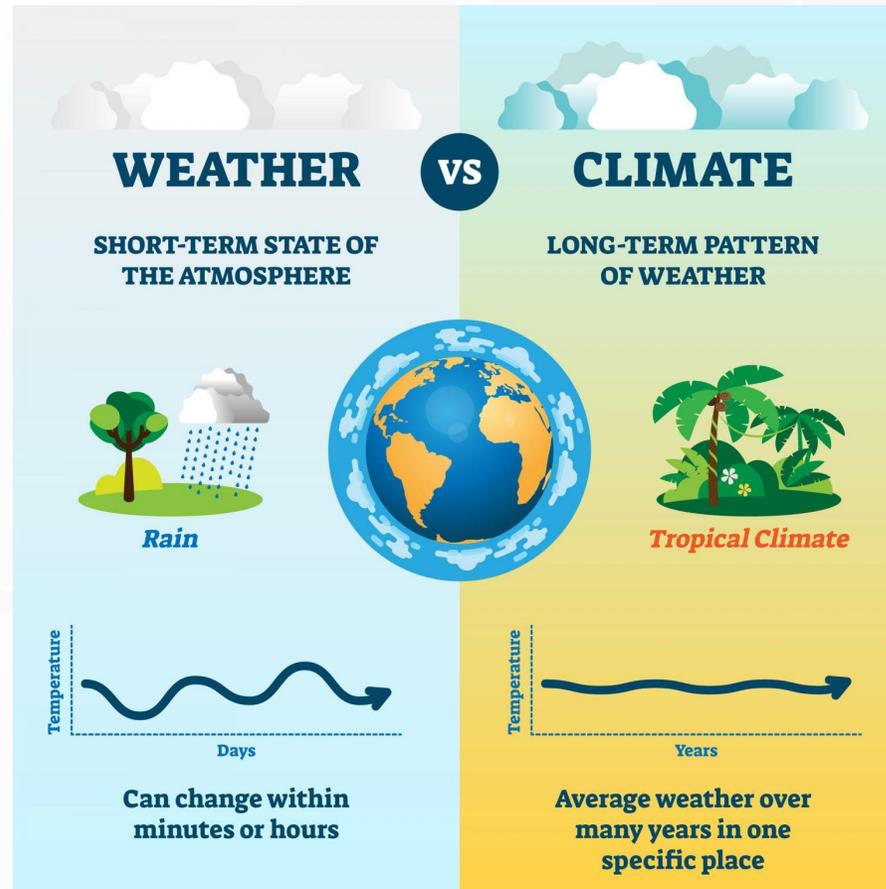
Global Temperature Anomalies from 1880 to 2023



<https://www.youtube.com/watch?v=b42jdyhA6YI>



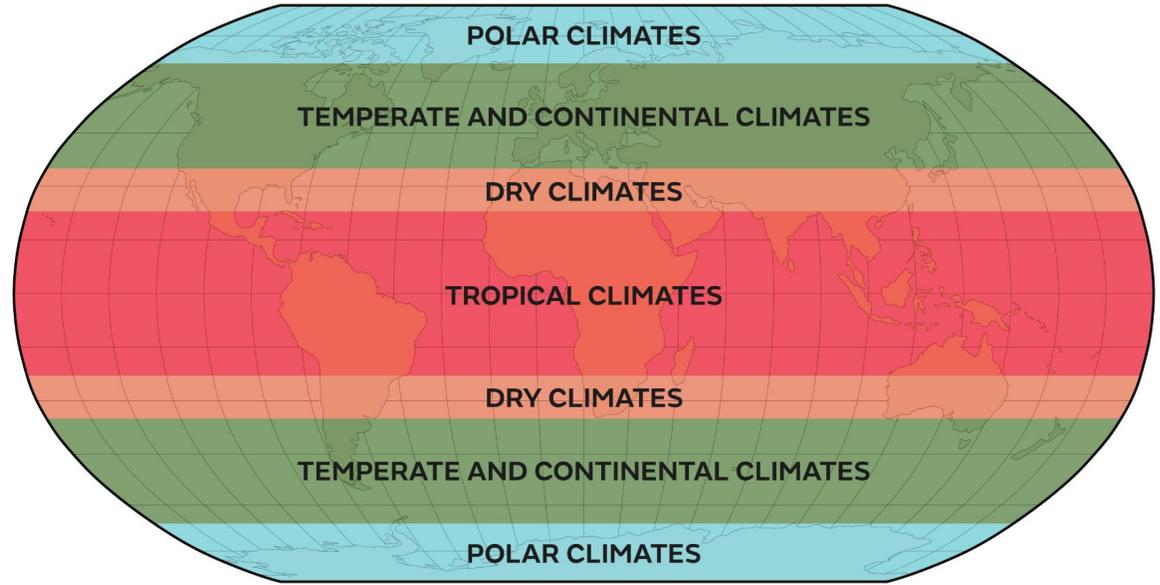
Weather vs. Climate





Climate Types

Met Office



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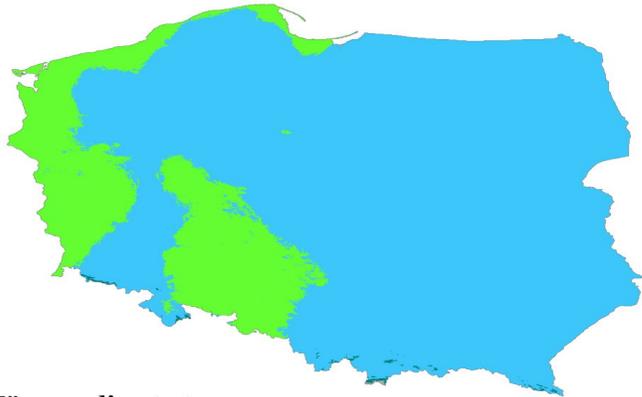
	1ST	2ND	3RD
A (Tropical)		f (Rainforest) m (Monsoon) w (Savanna, wet) s (Savanna, dry)	
B (Dry)		w (Desert) s (Steppe)	h (Hot) k (Cold)
C (Temperate)		w (Dry winter) f (No dry season) s (Dry summer)	a (Hot summer) b (Warm summer) c (Cold summer)
D (Continental)		w (Dry winter) f (No dry season) s (Dry summer)	a (Hot summer) b (Warm summer) c (Cold summer) d (Very cold winter)
E (Polar)			t (Tundura) f (Ice cap)



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Changing Climates

Köppen climate types of Poland



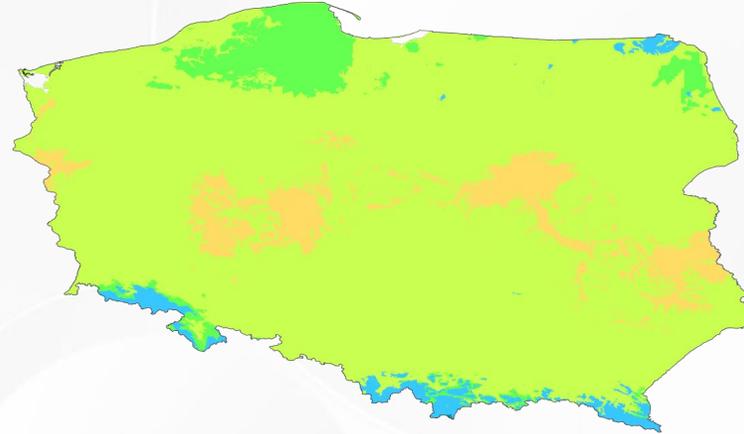
Köppen climate type

- ET (Tundra)
- Dfc (Subarctic)
- Dfb (Warm-summer humid continental)
- Cfb (Oceanic)

*Isotherm used to separate temperate (C) and continental (D) climates is -3°C
Data source: Climate types calculated from data from WorldClim.org

Poland

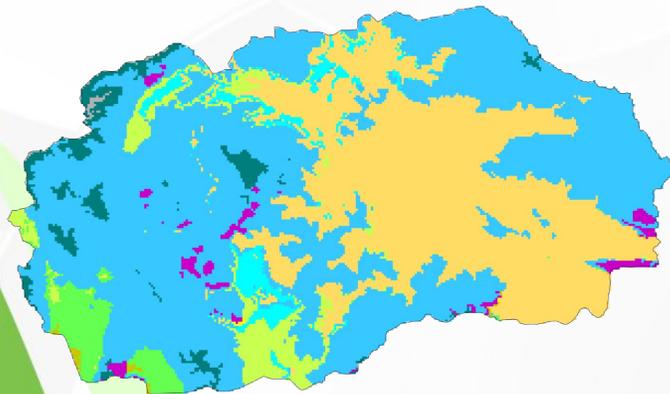
Köppen-Geiger climate classification map for Poland (2071-2100)



- Arid, steppe, cold (BSk)
- Temperate, no dry season, hot summer (Cfa)
- Temperate, no dry season, warm summer (Cfb)
- Cold, no dry season, hot summer (Dfa)
- Cold, no dry season, warm summer (Dfb)
- Cold, no dry season, cold summer (Dfc)

Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

Köppen-Geiger climate classification map for Macedonia (1980-2016)

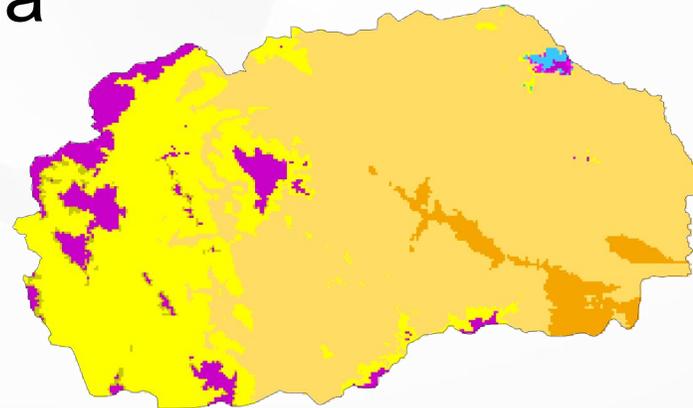


- Arid, steppe, cold (BSk)
- Temperate, dry summer, hot summer (Csa)
- Temperate, dry summer, warm summer (Csb)
- Temperate, no dry season, hot summer (Cfa)
- Temperate, no dry season, warm summer (Cfb)
- Cold, dry summer, warm summer (Dsb)
- Cold, dry summer, cold summer (Dsc)
- Cold, no dry season, hot summer (Dfa)
- Cold, no dry season, warm summer (Dfb)
- Cold, no dry season, cold summer (Dfc)
- Polar, tundra (ET)

Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

Macedonia

Köppen-Geiger climate classification map for Macedonia (2071-2100)



- Arid, steppe, hot (BSH)
- Arid, steppe, cold (BSk)
- Temperate, dry summer, hot summer (Csa)
- Temperate, dry summer, warm summer (Csb)
- Temperate, no dry season, hot summer (Cfa)
- Temperate, no dry season, warm summer (Cfb)
- Cold, dry summer, hot summer (Dsa)
- Cold, dry summer, warm summer (Dsb)
- Cold, no dry season, warm summer (Dfb)

Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

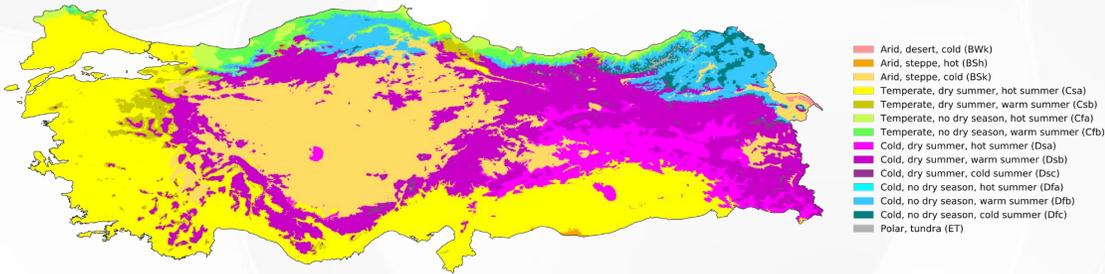


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Changing Climate

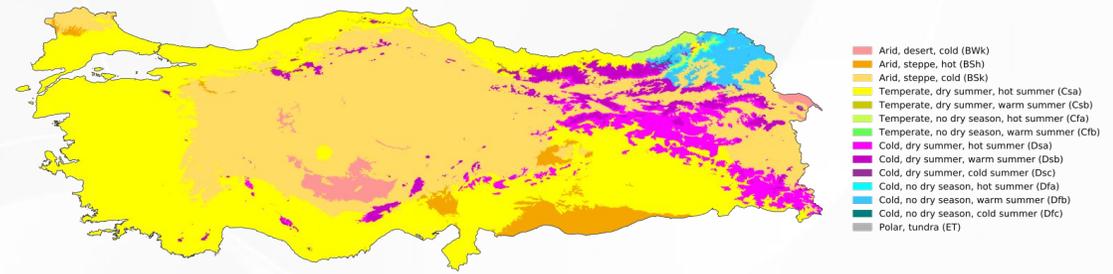
Köppen-Geiger climate classification map for Turkey (1980-2016)

Turkiye



Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

Köppen-Geiger climate classification map for Turkey (2071-2100)



Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

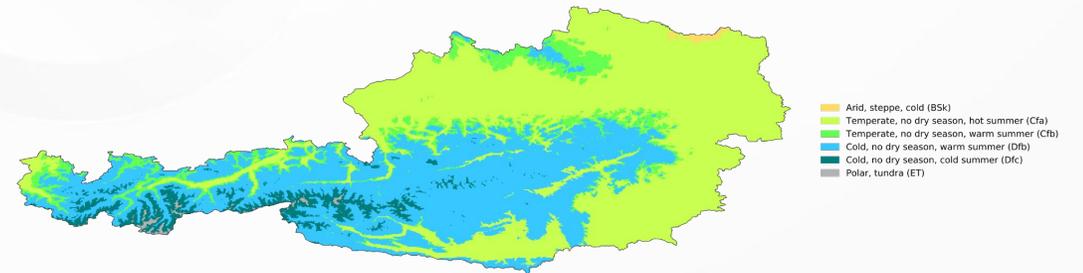
Köppen-Geiger climate classification map for Austria (1980-2016)

Austria



Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)

Köppen-Geiger climate classification map for Austria (2071-2100)



Source: Beck et al.: Present and future Köppen-Geiger climate classification maps at 1-km resolution, Scientific Data 5:180214, doi:10.1038/sdata.2018.214 (2018)



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Why is important to observe climate patterns?

Belgian farmers harvesting up to 50% less wheat due to record wet weather

Sunday 11 August 2024

By Ellen O'Regan



A harvester in West Flanders, Belgium. 19 July 2022. Credit: Orlando Whitehead

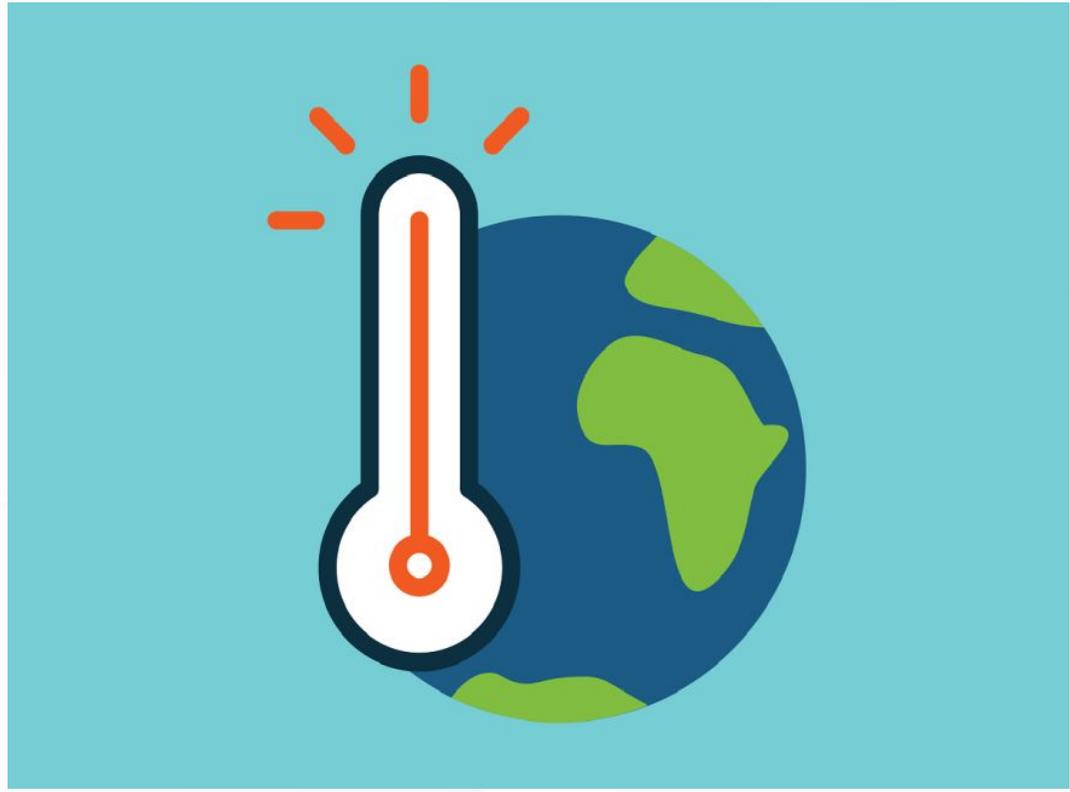
Climate crisis strikes country's major olive producers

MANİSA

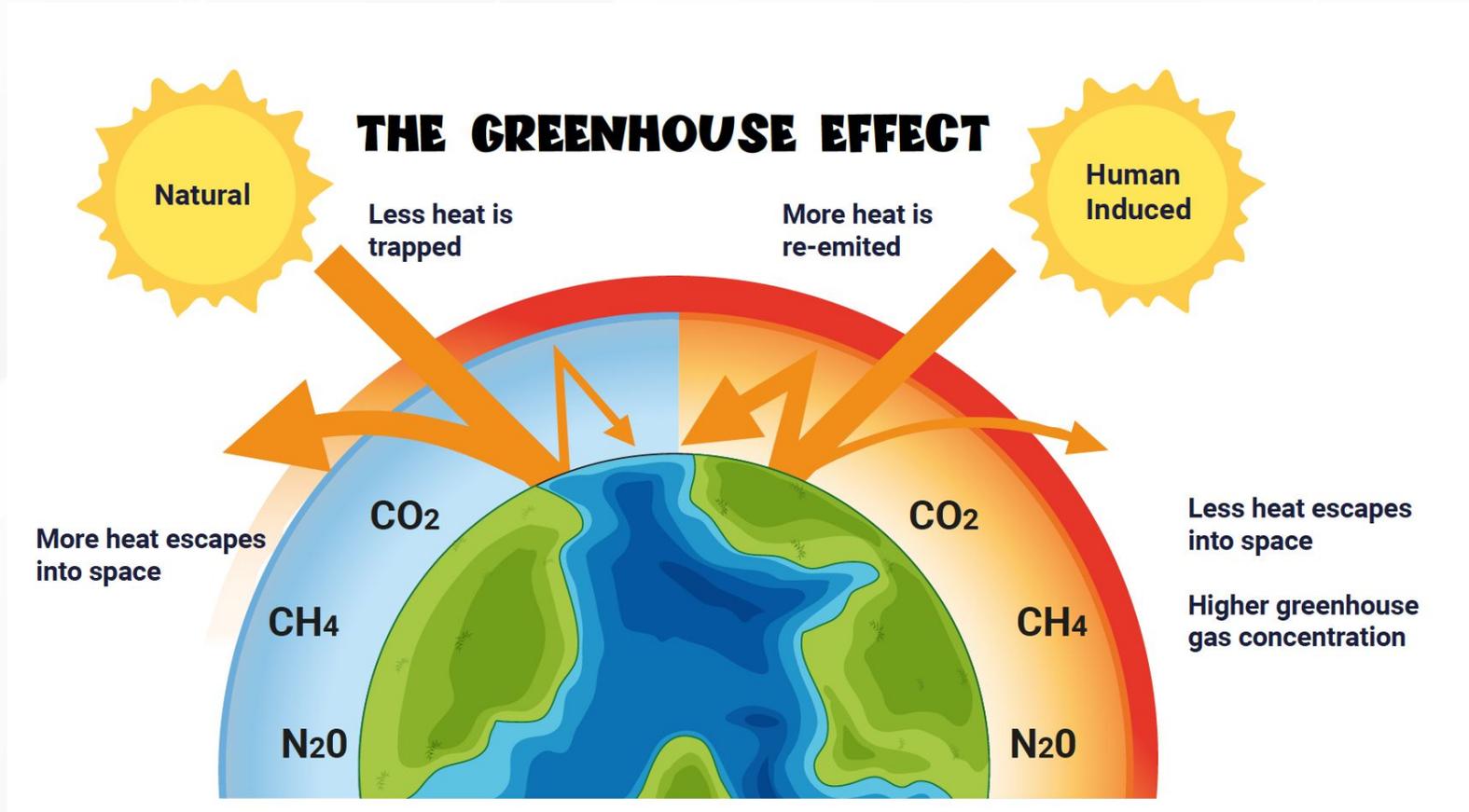
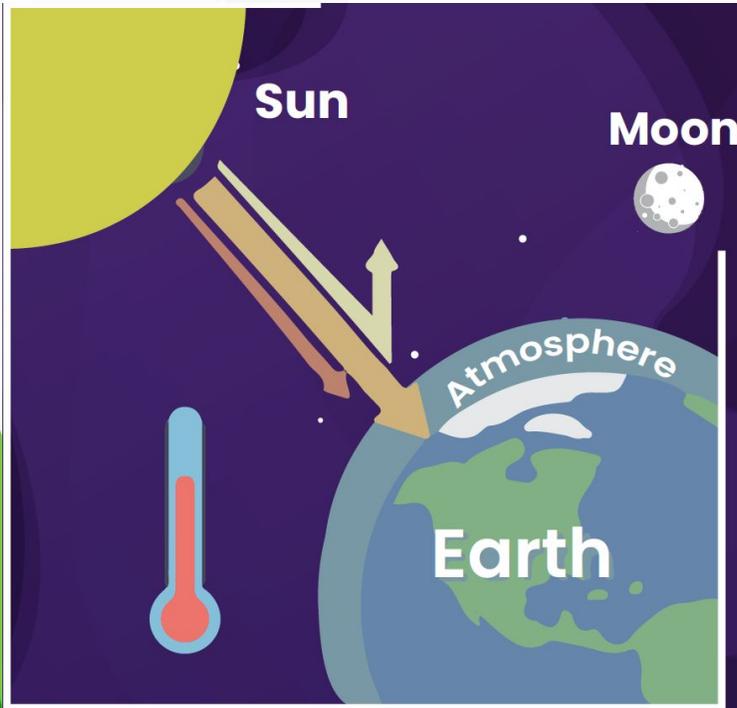




Does climate change mean global warming?



The Science Behind Climate Change



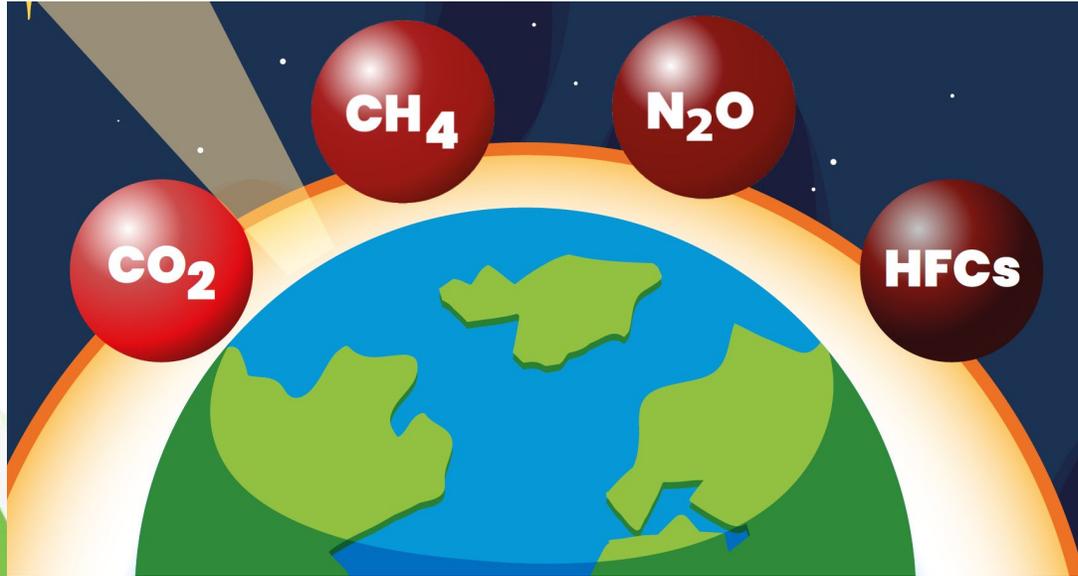
How Does the Greenhouse Effect Work?



<https://www.youtube.com/watch?v=SN5-DnOHQmE>



Main Causes of Climate Change





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What is the largest source of global greenhouse gas emissions?



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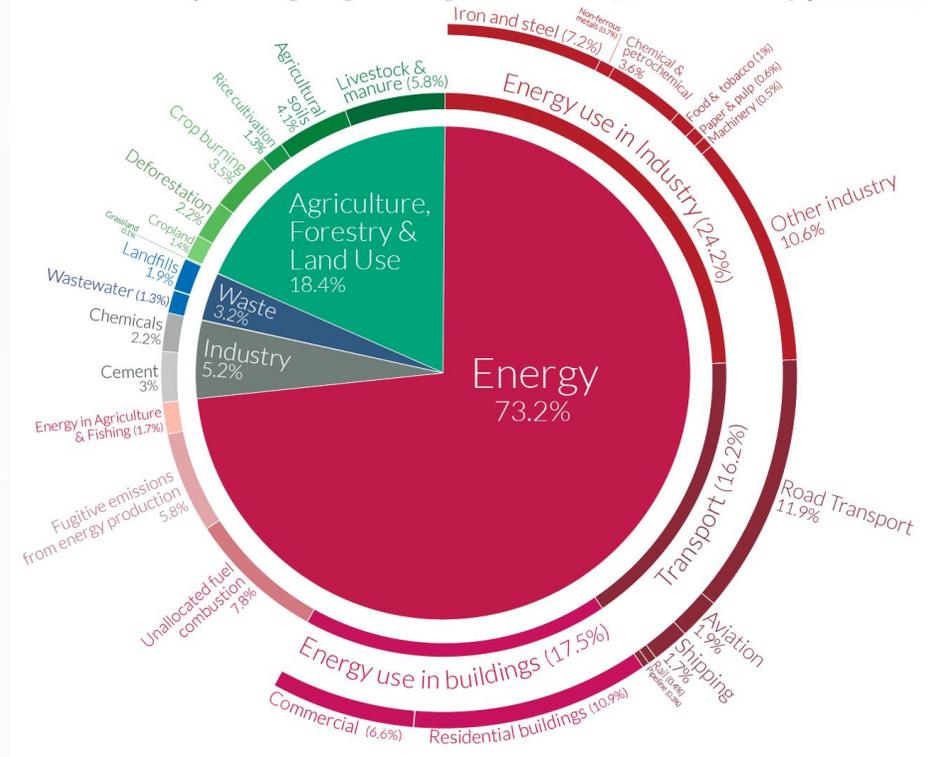
What is the largest source of global greenhouse gas emissions?





Global Greenhouse Gas Emissions by Sector

Global greenhouse gas emissions by sector
This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO₂eq. **Our World in Data**

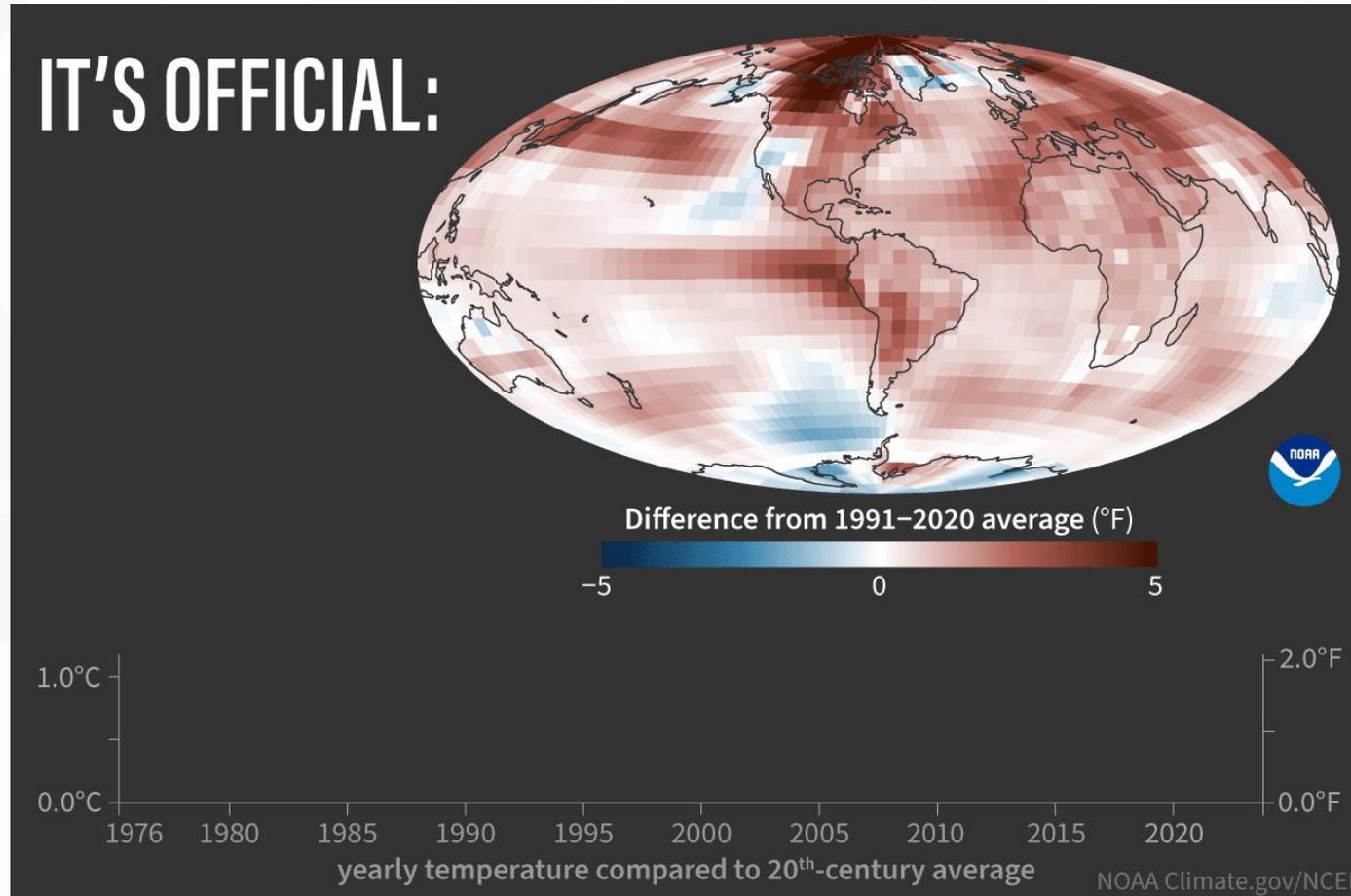


OurWorldinData.org – Research and data to make progress against the world's largest problems.
Source: Climate Watch, the World Resources Institute (2020). Licensed under CC-BY by the author Hannah Ritchie (2020).





Impacts of Climate Change



The 10 warmest years in the historical record have all occurred in the past decade (2014-2023).





Impacts of Climate Change



United Nations
Climate Change

▶▶

CORAL REEFS
EVERY FRACTION OF
A DEGREE MATTERS

SOURCE | IPCC

▶▶

+ 1.5° C
70 to 90% of coral reefs will vanish

SOURCE | IPCC

▶▶

+ 2° C
99% of coral reefs will vanish

SOURCE | IPCC





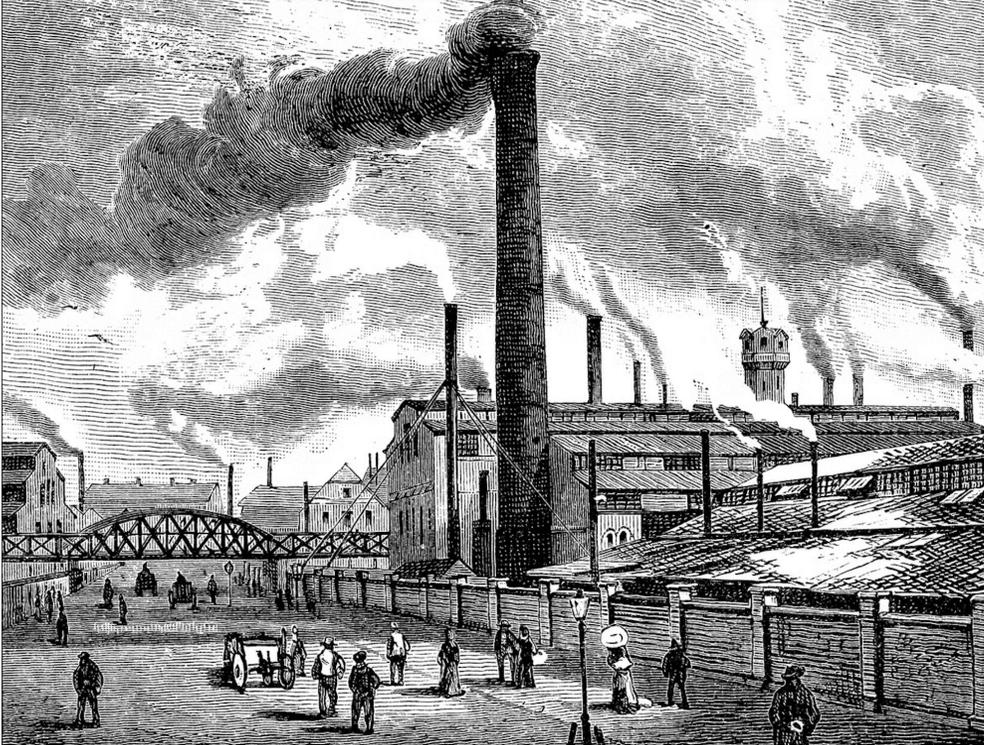
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Short break

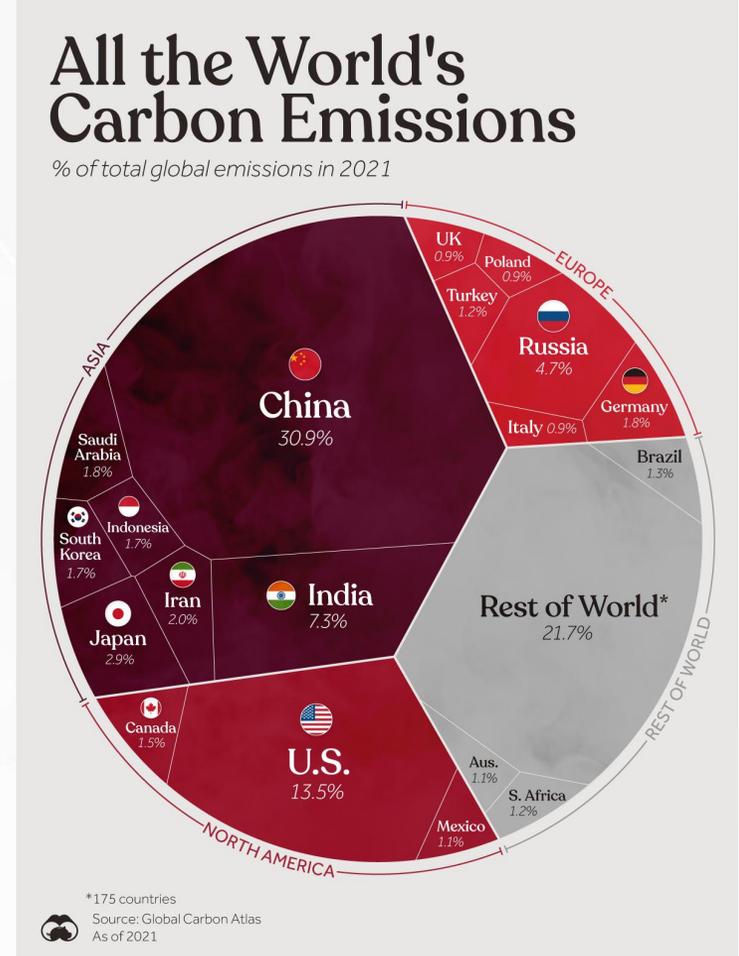


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All the World's Carbon Emissions



Today, China is the leader in total annual emissions, but the US and European countries are in the first place in historical emissions.





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Climate Crisis and Climate Justice

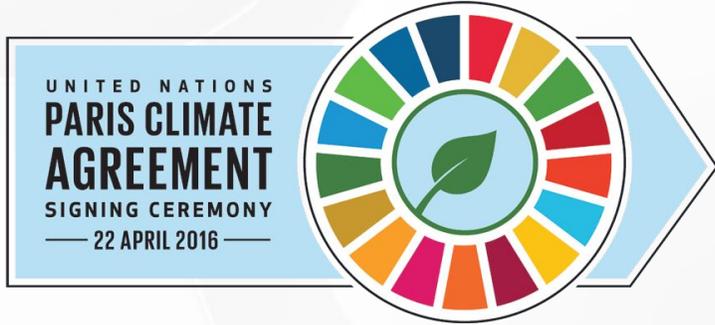


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Solutions - Global Efforts

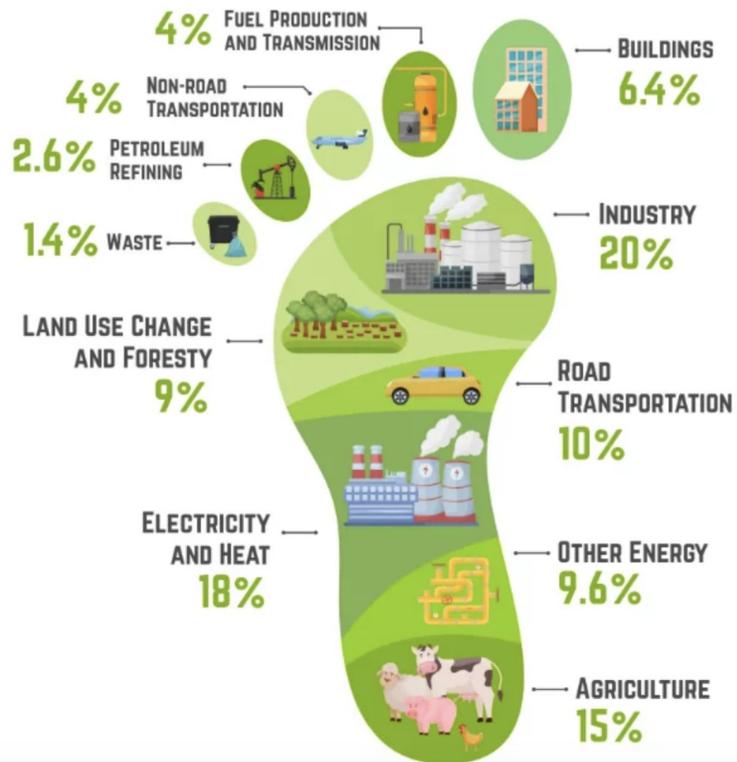


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Solutions - Individual Efforts

CARBON FOOTPRINT



Ecological Footprint Calculator:

<https://www.footprintcalculator.org/home/en>

- Food
- Travel
- Home
- Stuff

WWF Footprint Calculator:

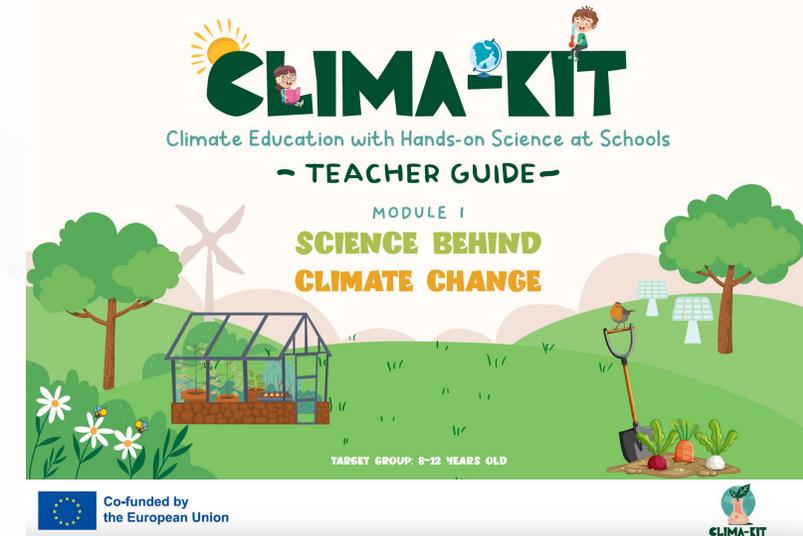
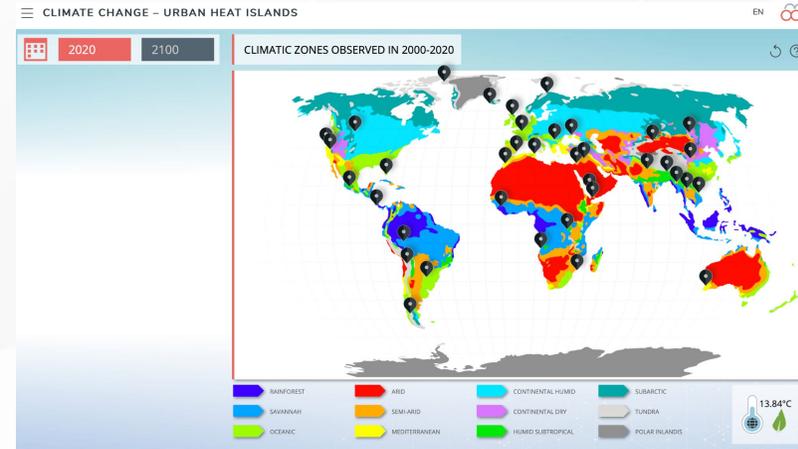
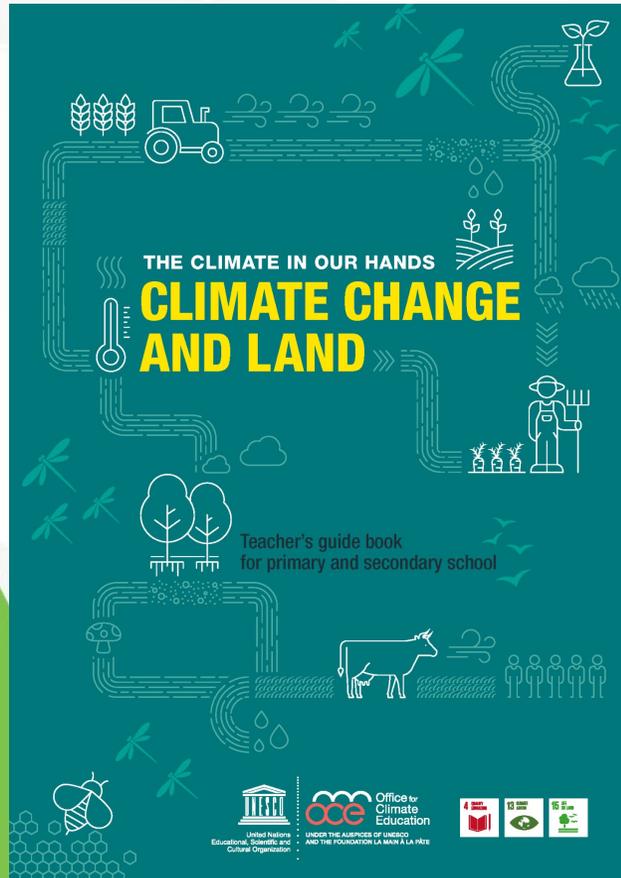
<https://footprint.wwf.org.uk/>



Classroom Activities for Teaching Climate Change



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Office for Climate Education:
<https://www.oce.global/en/ressources>

CLIMA-KIT:
<https://platform.climakit.org/>



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Useful Resources

- Global Temperature Anomalies from 1880 to 2023: <https://www.youtube.com/watch?v=b42jdyhA6Y>
- Climate Zones: <https://www.metoffice.gov.uk/weather/climate/climate-explained/climate-zones>
- What is the Greenhouse Effect: <https://www.youtube.com/watch?v=SN5-DnOHQmE>
- GHG Emissions by Sector: <https://ourworldindata.org/ghg-emissions-by-sector>
- Climate Change: Global Temperature: <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>
- All the World's Carbon Emissions: <https://www.visualcapitalist.com/carbon-emissions-by-country-2022/>
- Biodiversity - our strongest natural defense against climate change: <https://www.un.org/en/climatechange/science/climate-issues/biodiversity>
- IPCC Sixth Assessment Report: <https://www.ipcc.ch/>
- Office for Climate Education Resources: <https://www.oce.global/en/ressources>
- CLIMA-KIT Digital Platform: <https://platform.climakit.org/>





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What is one important takeaway you've gained from today's session?



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What is one important takeaway you've gained from today's session?

21 responses

Sıcaklıkların artışı

Biyçeşitlilikte azalma

Ekstrem doğa olaylarında artış

Küresel ısınma

Dengesizlik

Disaster

İklimlerde anormali

Sınıf içi uygulamalar için kaynak

Agriculture is important actor in climate change

Küresel ısınma ve iklim değişikliği farkını çok net ifade ettiniz

İklim adaleti kavramını öğrendim

Küresel ve İklim arasındaki fark

Coral reef loss

Küresel ısınma sebepleri

Mitigation scenarios and different results

Küresel iklim sorunun esas nedenleri, karbon ayak izi kavramı .

Weather change and climate change difference

insanlar hırslarını durdurmalı

İklim değişikliği ile mücadele

İklim değişikliğinin esas nedenleri

Küresel Isınma, iklim değişikliğinin nedenleri



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Thank You!

**THE CLIMATE IS
CHANGING**



WHY AREN'T WE?