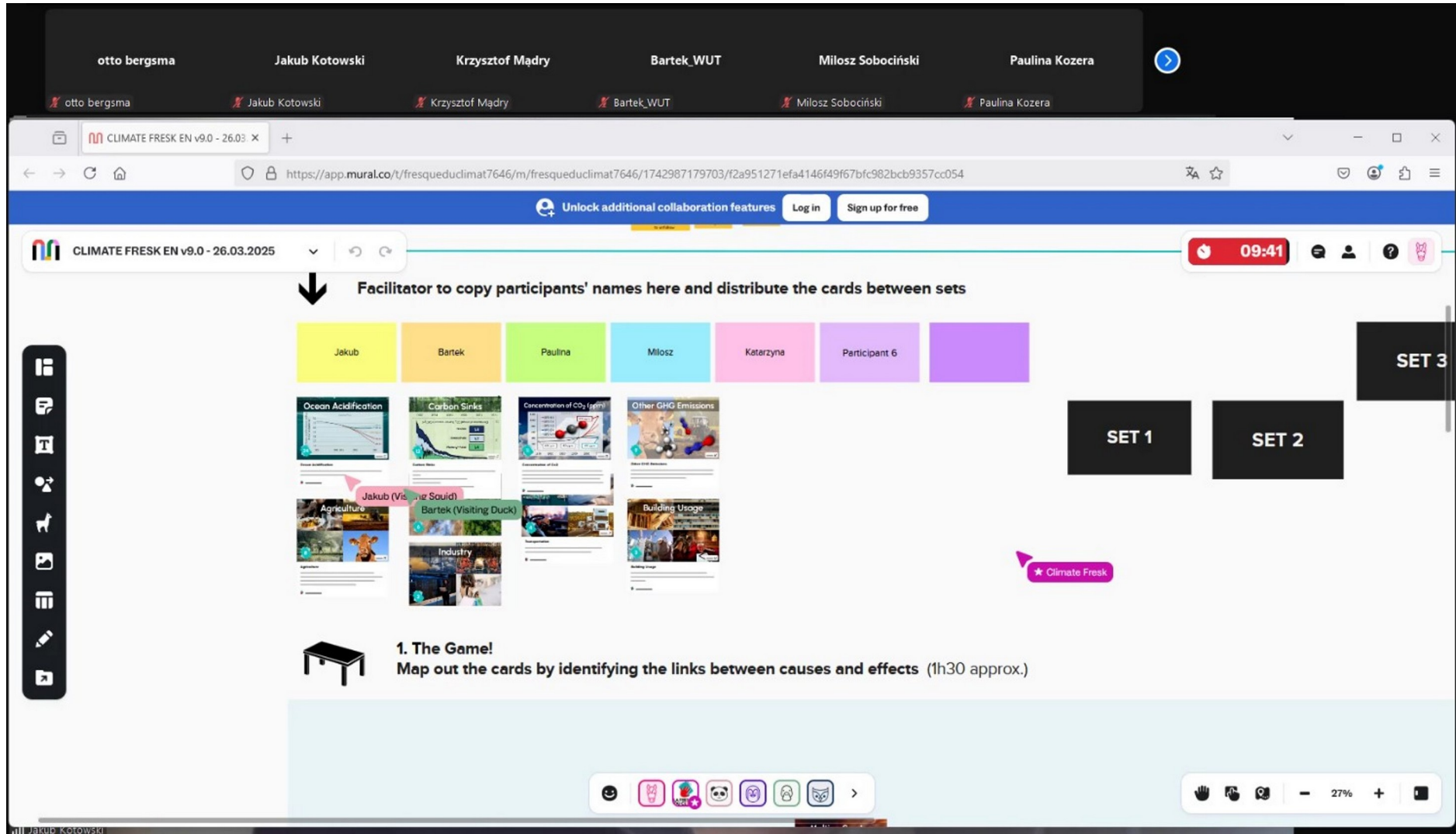


# Impression of the online course by screen shots -01



## Impression of the online course by screen shots-02

The screenshot displays a Mural online collaboration session titled "CLIMATE FRESK EN v9.0 - 26.03.2025". The interface features a top navigation bar with user names: otto bergsma, Jakub Kotowski, Krzysztof Mądry, Bartek\_WUT, Milosz Sobociński, and Paulina Kozera. Below the navigation bar, there is a blue banner with the text "Unlock additional collaboration features" and buttons for "Log in" and "Sign up for free". The main workspace contains a central arrangement of cards and diagrams related to climate change. The cards include:

- Human activities
- Transportation
- Burning Fossil Fuels
- CO<sub>2</sub> Emissions
- Concentration of CO<sub>2</sub> Levels
- Additional Greenhouse Effect
- Radiative Forcing
- Energy Budget
- Rising Water Temperatures
- Melting Sea Ice
- Rising Temperatures
- Melting Ice Sheets
- Sea Level Rise
- Melting Glaciers
- Agriculture
- Deforestation
- Disruption of the Water Cycle
- Ocean Acidification
- Carbon Sinks
- Aerosol Emissions
- Industry
- Building Usage

The interface also includes a left sidebar with navigation icons, a top right corner with user avatars and a search icon, and a bottom toolbar with navigation and zoom controls (hand, mouse, camera, zoom in/out, 27% zoom level).

# Impression of the online course by screen shots-03

The screenshot displays a Mural board titled "CLIMATE FRESK EN v9.0 - 26.03.2025". At the top, a list of participants is visible: otto bergsma, Jakub Kotowski, Krzysztof Mądry, Bartek\_WUT, Milosz Sobociński, and Paulina Kozera. The board features a central flowchart illustrating the climate change process. On the left, "Human activities" are categorized into Agriculture, Deforestation, Transportation, Burning Fossil Fuels, Industry, and Building Usage. These lead to "CO2 Emissions" and "Carbon Sinks". "CO2 Emissions" further branches into "Concentration of CO2 (ppm)", "Additional Greenhouse Effect", "Radiative Forcing", and "Energy Budget". "Carbon Sinks" leads to "Aerosol Emissions". "Radiative Forcing" leads to "Ocean Acidification". "Energy Budget" leads to "Rising Temperatures", which in turn leads to "Disruption of the Water Cycle". "Disruption of the Water Cycle" leads to "River Flooding", "Droughts", and "Cyclones". "Rising Temperatures" also leads to "Rising Water Temperature", which leads to "Melting Ice Sheets" and "Melting Glaciers". "Melting Ice Sheets" and "Melting Glaciers" lead to "Sea Level Rise", which leads to "Coastal Flooding". "Coastal Flooding" is annotated with "Milosz Sobociński (Visiting Owl)" and "Bartek (Visiting Duck)". "River Flooding" is annotated with "Paulina (Visiting Panda)". A notification at the top center says "Climate Fresk asked to be followed" with a "Follow" button. The interface includes a toolbar on the left with various tools, a top navigation bar with "Log in" and "Sign up for free" buttons, and a bottom toolbar with a zoom level of 27%.

# Impression of the online course by screen shots-04

The screenshot displays a web browser window with a course titled "CLIMATE FRESK EN v9.0 - 26.03.2025". The browser address bar shows the URL: <https://app.mural.co/t/fresqueduclimat7646/m/fresqueduclimat7646/1742987179703/f2a951271efa4146f49f67bfc982bcb9357cc054>. The course interface includes a navigation bar with user names (otto bergsma, Jakub Kotowski, Krzysztof Mądry, Bartek\_WUT, Milosz Sobociński, Paulina Kozera) and a "SET 1" indicator. The main content area features a large flowchart titled "Climate in Crisis: Unraveling the Causes and Impacts".

The flowchart illustrates the following causal chain:

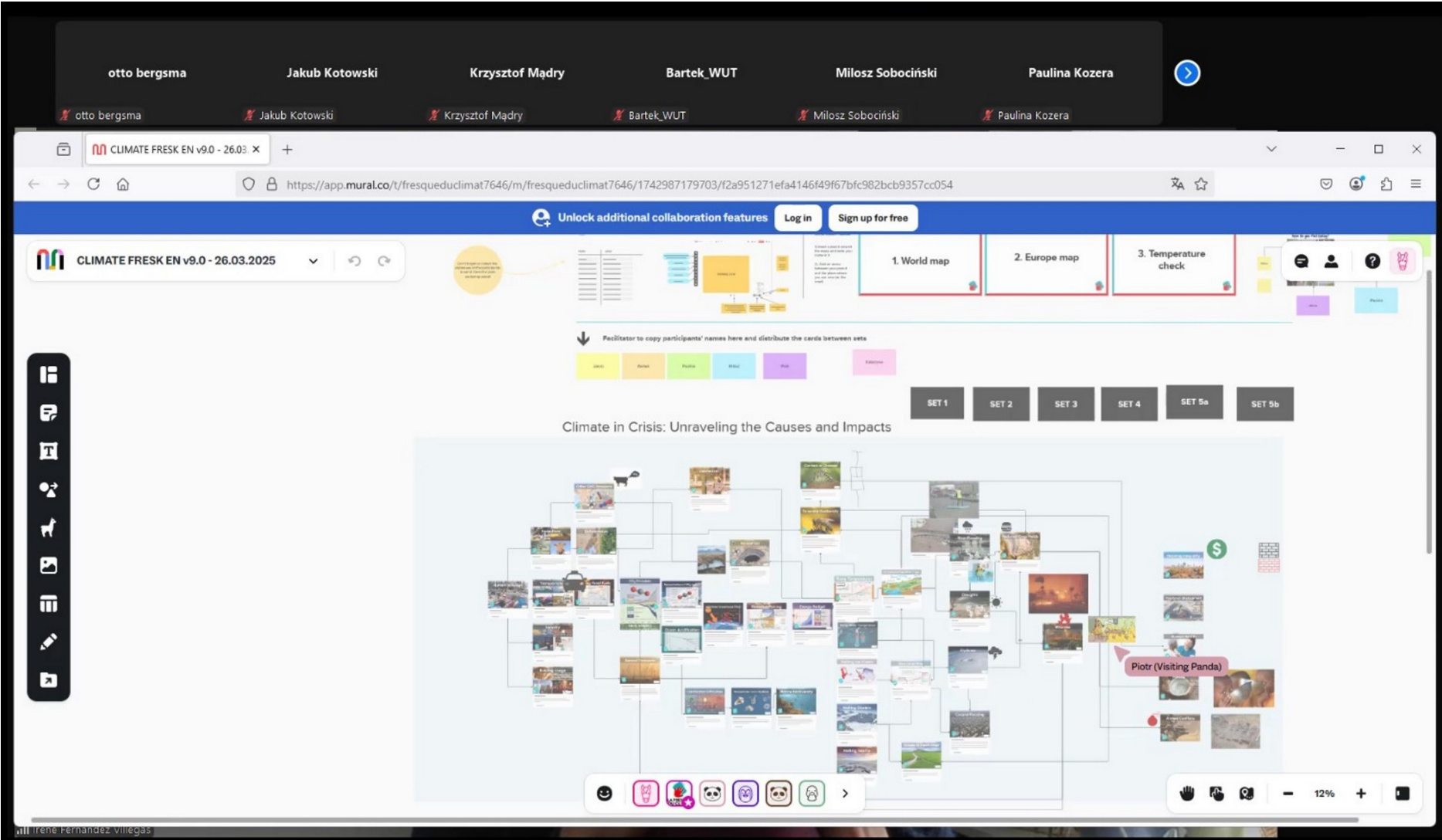
- Human activities** (including Agriculture, Deforestation, Industry, and Transport) lead to **Other GHG Emissions** and **Increasing Fossil Fuels**.
- Increasing Fossil Fuels** leads to **CO<sub>2</sub> Emissions** and **Carbon Sinks**.
- CO<sub>2</sub> Emissions** and **Carbon Sinks** result in **Concentration of CO<sub>2</sub> (ppm)**.
- Concentration of CO<sub>2</sub> (ppm)** leads to **Additional Greenhouse Effect**, **Radioactive Forcing**, and **Energy Budget**.
- Additional Greenhouse Effect**, **Radioactive Forcing**, and **Energy Budget** result in **Rising Temperatures** and **Rising Water Temperature**.
- Rising Temperatures** leads to **Heatwaves**, **Permafrost**, **Carriers of Disease**, and **Terrestrial Biodiversity**.
- Rising Water Temperature** leads to **Disruption of the Water Cycle**.
- Disruption of the Water Cycle** results in **River Flooding** and **Droughts**.
- River Flooding** and **Droughts** lead to **Reduced Crop Yields**.

The interface also includes a sidebar with navigation icons, a zoom control set to 27%, and a bottom status bar with the name "Krzysztof Mądry".

# Impression of the online course by screen shots-05

The screenshot displays a Mural collaborative workspace titled "CLIMATE FRESK EN v9.0 - 26.03.2025". The interface includes a top navigation bar with user names: otto bergsma, Jakub Kotowski, Krzysztof Mądry, Bartek\_WUT, Milosz Sobociński, and Paulina Kozera. A browser address bar shows the URL: <https://app.mural.co/t/fresqueducimat7646/m/fresqueducimat7646/1742987179703/f2a951271efa4146649f67bfc982bcb9357cc054>. The main workspace contains a complex mind map illustrating the climate system. The central node is "CO<sub>2</sub> Emissions", which branches into "Human activities" (including Agriculture, Deforestation, Transportation, Burning Fossil Fuels, Industry, and Building Usage) and "Aerosol Emissions". "CO<sub>2</sub> Emissions" leads to "Concentration of CO<sub>2</sub> (ppm)", "Ocean Acidification", "Marginal Greenhouse Effect", "Radiative Forcing", and "Energy Budget". "Radiative Forcing" leads to "Rising Temperatures", which in turn leads to "Disruption of the Water Cycle", "Rising Water Temperature", "Melting Ice Sheets", and "Sea Level Rise". "Rising Temperatures" also leads to "Permafrost" and "Terrestrial Biodiversity". "Disruption of the Water Cycle" leads to "River Flooding", "Droughts", and "Cyclones". "Sea Level Rise" leads to "Wildfires". "Terrestrial Biodiversity" leads to "Carriers of Disease". "River Flooding" leads to "Reduced Crop Yields". The workspace also features a sidebar with various tool icons, a top bar with "Unlock additional collaboration features", "Log in", and "Sign up for free", and a bottom bar with a zoom level of 27%.

Impression of the online course by screen shots-06



# Impression of the online course by screen shots-07

The screenshot shows a Mural collaboration board titled "CLIMATE FRESK EN v9.0 - 26.03.2025". The board is a complex flowchart illustrating the relationship between human activities, climate change, and societal impacts. Key elements include:

- Human Activities:** Includes cards for Agriculture, Deforestation, Industry, Building Usage, Transportation, and Fossil Fuels.
- Greenhouse Gas Emissions:** Includes cards for CO2 Emissions, Concentration of CO2 in the Air, Other GHG Emissions, and Aerosol Emissions.
- Climate Change Impacts:** Includes cards for Global Warming, Sea Level Rise, Melting Ice Sheets, Melting Glaciers, Melting Sea Ice, Rising Temperatures, Droughts, River Flooding, Reduced Crop Yields, and Wildfires.
- Societal Impacts:** Includes cards for Growing Inequality, Population Displacement, Screen Health, Famine, and Armed Conflicts.
- Other Key Concepts:** Includes cards for Biodiversity, Ocean Acidification, and Energy Budget.

The interface features a top navigation bar with user names: otto bergsma, Jakub Kotowski, Krzysztof Mądry, Bartek\_WUT, Milosz Sobociński, and Paulina Kozera. A toolbar on the left contains various editing tools. The bottom toolbar shows navigation and zoom controls, with a zoom level of 20%.

# Impression of the online course by screen shots-08

**Who has contributed most to global CO<sub>2</sub> emissions?**  
Our World in Data  
 Cumulative carbon dioxide (CO<sub>2</sub>) emissions over the period from 1751 to 2017. Figures are based on production-based emissions which measure CO<sub>2</sub> produced domestically from fossil fuel combustion and cement, and do not correct for emissions embedded in trade (i.e. consumption-based). Emissions from international travel are not included.

Region/Country	CO <sub>2</sub> Emissions (billion tonnes)	Global Cumulative Emissions (%)
North America	457	29%
Asia	457	29%
Europe	514	33%
China	200	12.7%
USA	329	25%
India	48	3%
Russia	101	6%
South America	40	3%
Africa	43	3%
Oceania	20	1.2%
Japan	62	4%
Canada	32	2%
Mexico	18	1.4%
Ukraine	13	1%
Iran	17	1%
South Korea	18	1%
Indonesia	17	1%
Uzbekistan	12	0.8%
Ukraine	13	1%
Ukraine	13	1%
Ukraine	13	1%
Ukraine	13	1%
Ukraine	13	1%

**Global CO<sub>2</sub> emissions by sector (2016)**  
This is shown for the year 2016 - global

Sector	Percentage
Agriculture	2.1%
Industry	5.2%
Buildings	2.2%
Transport	1.2%
International aviation & shipping	0.5%
Land use change and forestry	1.2%
Other	1.2%
Energy	1.2%
Waste	3.2%
Energy in Agriculture & Fishing	1.7%
Unallocated fuel combustion	7.6%
Energy	1.2%
Commerce	1.2%
Energy	1.2%

**Collaborative Annotations:**

- Jakub (Visiting Ram) points to the USA region in the treemap.
- Piotr (Visiting Panda) points to the South America region in the treemap.

**Browser & Mural Interface:**

- Browser: https://app.mural.co/t/fresquedudimat7646/m/fresquedudimat7646/1742987179703/f2a951271efa414649f67bfc982bcb9357cc054
- Mural Title: CLIMATE FRESK EN v9.0 - 26.03.2025
- Users: otto bergsma, Jakub Kotowski, Krzysztof Mądry, Bartek\_WUT, Milosz Sobociński, Paulina Kozera
- Tools: Unlock additional collaboration features, Log in, Sign up for free



# Impression of the online course by screen shots-09

The screenshot displays a Mural collaborative workspace titled "CLIMATE FRESK EN v9.0 - 26.03.2025". At the top, a list of participants includes otto bergsma, Jakub Kotowski, Krzysztof Mądry, Bartek\_WUT, Milosz Sobociński, and Paulina Kozera. The workspace features a central diagram with a vertical axis labeled "High impact" and a horizontal axis labeled "Easy to do" on the left and "Difficult to do" on the right. The diagram contains several action items in colored boxes: "education", "change car to public transport", "plant trees", "stop buying unnecessary things", "Buda passive houses", "recycling", "Use renewables", "cycling or walking instead of driving (if possible)", "Stop eating meat", "if possible use other means of transport than planes", and "stop traveling". A speech bubble from "Bartek (Visiting Duck)" points to the "Stop eating meat" box. On the left side, there is a sidebar with a title "d: greenhouse gas emissions across the supply chain" and a bar chart showing emissions for various categories like Travel, Home, Food, etc. The top of the workspace includes a navigation bar with "Unlock additional collaboration features", "Log in", and "Sign up for free" buttons, along with icons for chat, help, and other tools.