



RESCUE **Climate Challenge**

The RESCUE Climate Challenge is a game for adults and children from 10 years old to learn and understand the causes and consequences of climate change, and encourage a discussion on potential solutions for mitigation.

First, print (double-sided) and cut the cards found in the next pages. The game is played in small groups over several rounds. The objective is to sort the cards on a table from left to right, showing the progression from causes to consequences of climate change. You will find a detailed explanation of each concept at the back of the cards.

A proposed solution is provided in the next page, however this can be adapted according to discussions.

Step 1: Separate the “Set 1” cards into two categories, placing human activities on the left and the effects of climate change on the right (leaving some space in the middle).

Step 2: “Set 2” explores the effect of CO₂ emissions and how they lead to climate change. These go between the “Set 1” cards.

Step 3: Within each group, organise the cards in the best order possible from causes (left) to effects (right), separating into further columns and moving further to the right, as needed.

Step 4: Place the “Set 3” cards, which show the consequences of climate change for humans and the environment.

Step 5: Place the “Set 4” cards (rotated 90°) next to the effects they help counteract or resolve.

Step 6: Review, reflect, and suggest more solutions to combat climate change.



The European project RESCUE investigates carbon dioxide removal methods and carbon neutrality scenarios. RESCUE has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101056939.

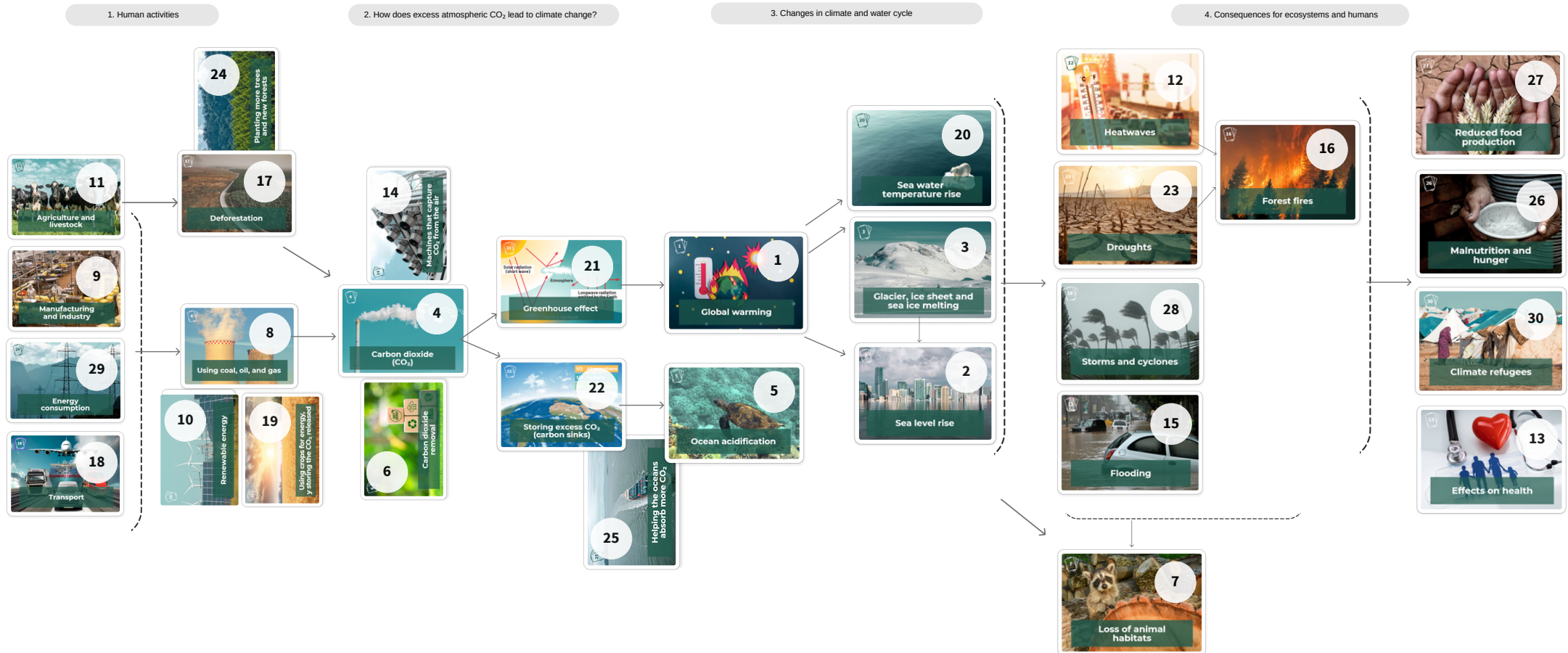


The game was prepared by the Barcelona Supercomputing Center, 2025. This version was adapted and inspired by the game Climate Fresk, developed by Cédric Ringenbach.

Solution

Find here a proposed solution of the RESCUE Climate Challenge. However, some cards or interactions can be moved or adapted according to the discussions between participants.

The numbers on the cards do not indicate their order, but aim to facilitate finding their position in the solution diagram.



18



Transport

9



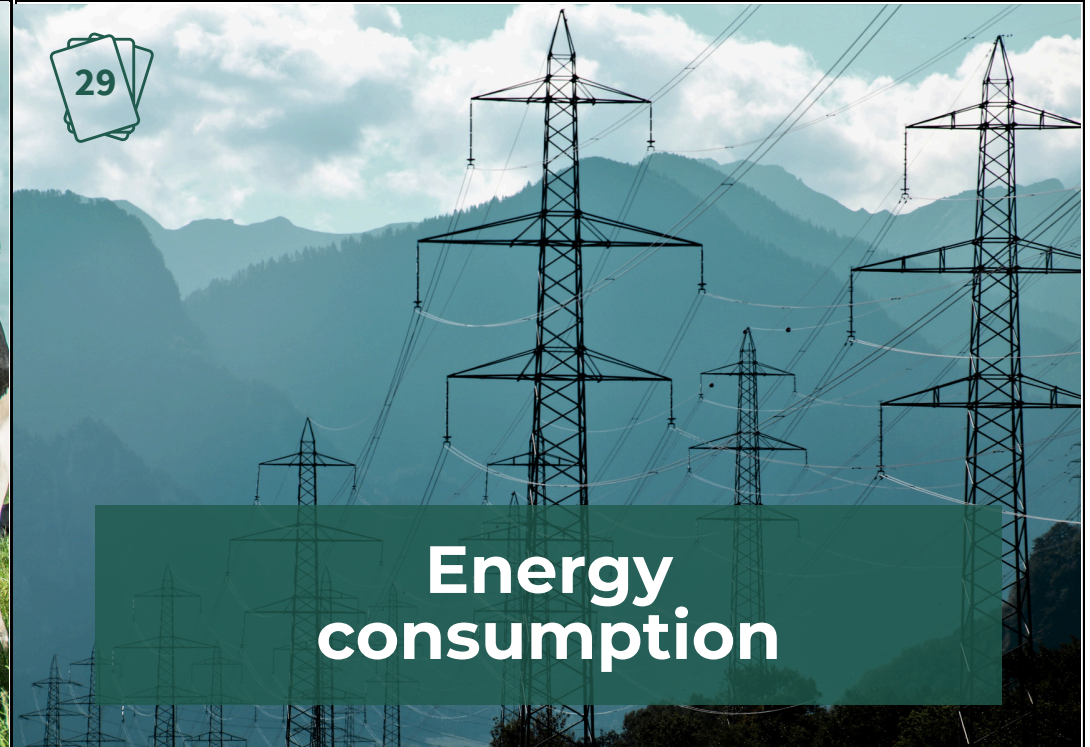
Manufacturing and industry

11



Agriculture and livestock

29



Energy consumption

To grow food and raise livestock (like cows and sheep), large areas of land and machinery are needed.

These activities generate greenhouse gases, such as carbon dioxide (CO₂) and methane, which contribute to climate change.



Set 1

We use electricity for everyday activities, such as lighting, heating or air conditioning. Often, this energy comes from fossil fuels, such as oil and natural gas. When burning these fuels, carbon dioxide (CO₂) is released.



Set 1

When we travel by car, plane, and other transportation methods that use fossil fuels, carbon dioxide (CO₂) is released.

An increased concentration of this gas in the atmosphere traps more of the heat emitted by the Earth's surface, contributing to the warming of the planet.



Set 1

To manufacture clothes, toys, mobile phones, and other products, energy is used, often coming from fossil fuels. This generates carbon dioxide (CO₂), which contributes to global warming.



Set 1

17

Deforestation

8

Using coal, oil, and gas

20

**Sea water
temperature rise**

2

Sea level rise

As the CO₂ concentration in the atmosphere increases, the Earth's temperature rises. The oceans absorb 91% of this heat, causing the water temperature to rise. This puts marine life at risk, and can lead to more storms and hurricanes.



Set 1

Sea level is rising due to the melting of glaciers, and the ice sheets in Antarctica and Greenland. Additionally, as the water gets warmer, it expands and takes up more space.

Since 1900, sea level has already risen by 20 cm, affecting coastlines, cities, and agricultural areas.



Set 1

Many forests are cut down for construction or farming, leaving fewer trees to absorb CO₂, thus increasing its concentration in the atmosphere.

About 80% of **deforestation** is due to agriculture and livestock farming.



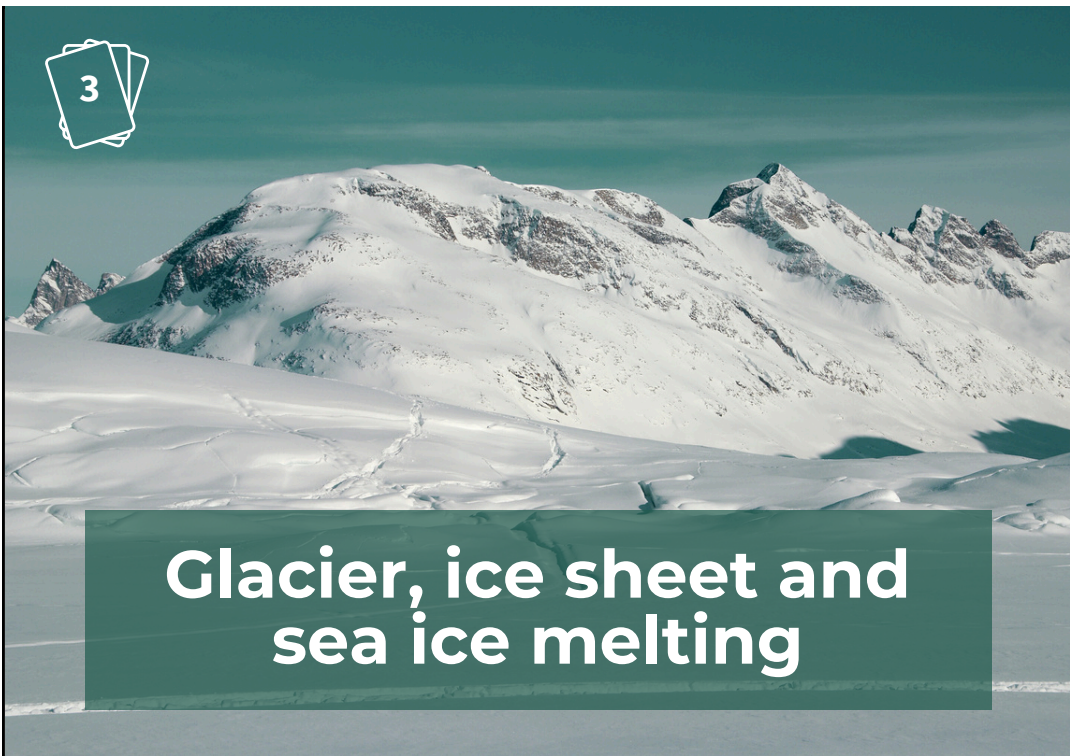
Set 1

Coal, oil, and natural gas are **fossil fuels**. When burned for transportation, manufacturing, energy production, and other activities, carbon dioxide (CO₂) is released into the atmosphere.



Set 1

3



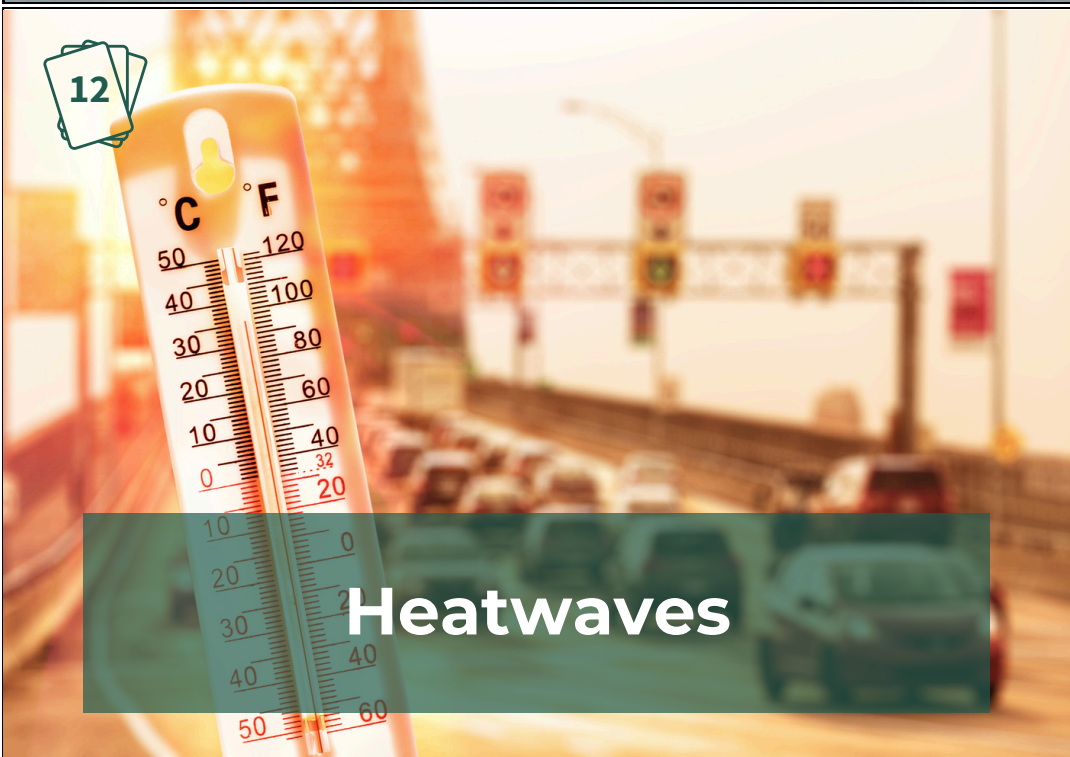
Glacier, ice sheet and sea ice melting

16



Forest fires

12



Heatwaves

15



Flooding

Higher temperatures can cause more heatwaves, which are prolonged periods of extreme heat, lasting days or weeks. Heatwaves can be dangerous for people, animals, and plants



Set 1

Heavy rainfall or overflowing rivers can flood cities and farmland. These extreme weather events are becoming more frequent with climate change.



Set 1

Glaciers and ice sheets provide drinking water and help regulate the planet's temperature, but most of them are currently melting. If the ice in Greenland and Antarctica melts, the sea level would rise significantly, flooding many areas.

Sea ice is also melting, and while it doesn't cause the sea level to rise, it disrupts ecosystems and decreases the Earth's ability to reflect sunlight.



Set 1

With rising temperatures and longer periods of droughts, forests dry out. This can cause more forest fires, releasing more CO₂ into the air.



Set 1

23

Droughts

28

Storms and cyclones

4

Carbon dioxide (CO₂)

21

Solar radiation (short wave)

Atmosphere

Longwave radiation emitted by the Earth

Greenhouse effect

Earth's surface

Carbon dioxide (CO₂) is one of the greenhouse gases naturally present in the atmosphere. It helps trap the sun's heat, maintaining habitable conditions on Earth.

As human activities release more CO₂ into the atmosphere, the Earth's temperature rises to undesirable levels for humans and ecosystems.



Set 2

The atmosphere is the layer of gases that surrounds the Earth, letting sunlight through but trapping some of the heat, similar to a greenhouse. This is a natural and necessary phenomenon to keep the Earth's temperature stable.

When there are more greenhouse gases (like CO₂) in the atmosphere, the Earth heats up.



Set 2

Climate change disrupts the water cycle. This can cause more rainfall in some areas (leading to floods) and less in others (leading to droughts).

As a result, longer drought periods are expected in the future, which will affect people, animals, and crops.



Set 1

Cyclones and storms are fueled by warm ocean waters. As the oceans' temperature increases due to climate change, these are becoming more intense and dangerous.



Set 1

1



Global warming

22

1/2 Atmosphere

1/4 Oceans

1/4 Vegetation



Storing excess CO₂ (carbon sinks)

13



Effects on health

7



Loss of animal habitats

Climate change can potentially affect our health through heatwaves or other extreme events, scarcity of food and clean drinking water, and the spread of infectious diseases.



Set 3

Many animals are losing their homes because climate change alters their habitats.

For instance, the Arctic sea ice is melting, which is essential for polar bears' survival. Forests, coral reefs, and other important habitats are also disappearing.



Set 3

As the levels of heat-trapping greenhouse gases build up in the atmosphere, the planet's temperature is rising, referred to as **global warming**.

Since 1990, the global temperature has risen by about 1°C. Although it may seem small, an increase of even 1 or 2 degree can result in major changes and risk for humans and nature.



Set 2

Where does the CO₂ released from human activities go?

About half of it stays in the atmosphere, while the rest is absorbed by the oceans and land, which act as "**carbon sinks**" by storing the excess CO₂.



Set 2

30



Climate refugees

27



Reduced food production

26



Malnutrition and hunger

5



Ocean acidification

Food shortages due to low crop yields can lead to hunger and malnutrition, especially among children and low-resource communities. Hunger is one of the major issues that could worsen with climate change.



Set 3

The ocean absorbs part of the CO₂ we emit into the atmosphere. This changes the water's chemistry, making it more acidic.

Acidic water makes it harder for some marine animals, like shellfish and corals, to build their shells or skeletons.



Set 3

People who are forced to leave their homes due to extreme weather conditions are known as **climate refugees**. They are displaced due to droughts, severe storms, or rising sea levels.



Set 3

Climate change affects food production due to droughts, heavy rainfall, or extreme heat. This threatens food security in certain parts of the world.



Set 3

24

**Planting more trees
and new forests**

14

**Machines that capture
CO₂ from the air**

19

**Using crops for energy,
y storing the CO₂ released**

25

**Helping the oceans
absorb more CO₂**

Plants absorb CO₂ as they grow. This is the basis of **Bioenergy with Carbon Capture and Storage (BECCS)**, a carbon dioxide removal method. For this, plants are grown to produce biofuels, which are then burned for energy production. The CO₂ released is captured and stored underground.



Set 4

The ocean absorbs a large share of the CO₂ we emit into the air. The **Ocean Alkalinity Enhancement (OAE)** method involves adding minerals to seawater to reduce its acidity and thus increase its ability to absorb CO₂. It is a new method under development, with attention paid to ensure that marine life is not affected.



Set 4

Part of the carbon on Earth is stored in forests, taken up as trees absorb CO₂ from the atmosphere. **Reforestation** (planting more trees in damaged forests) **and afforestation** (creating new forests) is one of the carbon removal strategies used to reduce atmospheric CO₂.



Set 4

A new technology known as **Direct Air Carbon Capture and Storage (DACCS)** involves the use of machines to capture CO₂ directly from the air and then storing this underground. At the moment, this technology is very expensive and only applied on a small scale.



Set 4

6

Carbon dioxide removal



How to play

PART 1

The goal of the game is to arrange the cards from left to right, showing the progression from causes to consequences of climate change. In the back of each card, you will find a detailed explanation of the concept.

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10

Renewable energy



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Funded by
the European Union



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Energy can be generated from natural sources, like the sun, wind or water. Renewable energy generation does not produce CO₂, so using this instead of fossil fuels (like coal or oil) helps protect the planet.



Set 4

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Carbon dioxide removal (CDR) refers to methods for removing CO₂ from the air and storing it (e.g. underground or in the ocean). This includes planting trees, using machines to capture CO₂, or helping the oceans absorb it more.

CDR does not replace the urgent need to reduce emissions, but it can be an additional tool for mitigating climate change.



Set 4

How to play

PART 2

Step 3: Within each group, organise the cards in the best order possible from causes (left) to effects (right), separating into further columns and moving further to the right, as needed.

Step 4: Place the “Set 3” cards, which show the consequences of climate change for humans and the environment.

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