

THE ENERGY [R]EVOLUTION

TEACHER'S GUIDE | HIGH SCHOOL

GREENPEACE

INTRODUCTION

This is the teacher's guide to 'The energy[r]evolution'. This educational material has been specifically developed for Greenpeace Netherlands to be used for secondary education in the Netherlands. Any class can play it. The pupils determine the level. The package consists of a simulation game that can be played with the whole class and an activating assignment. During the simulation game, the pupils are assigned a role within the theme energy transition and climate change. Teams of pupils will all try to reach the goals they have set for their team. But that will not be easy because each group has their own, often conflicting interests. At the end of the game the pupils will get together again and think of an activity to reduce CO2 emissions themselves and will execute this plan together.

The educational targets of this educational package are:

The pupils will be able to explain what fossil fuels are and get to know a number of sustainable energy sources,
The pupils get to know what the energy problems are,
The pupils will become more aware of climate change and will be able to explain what the possible consequences are,
The pupils will gain a better insight into energy transition,
The pupils will be more aware of their own contribution to the energy problem and that of others,
The pupils will gain some experience in planning and executing positive action,
The pupils get an opportunity to practise their spoken in English in a relatively natural way.

Should you have any questions, please send us an e-mail:
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We wish you lots of fun and success with this material!

CONTENTS

Preparation	2
Getting started	3
Summary of game rounds	4
Final assignment – end of game and the campaign	5
Annex 1 Targets for teams	7
Colophon	8

PREPARATION

TIME SCHEDULE

Activity	Time	Needed?
Introduction subject and simulation game	10 minutes	Videos (see preparation p. 2) bit.ly/broeikaseffect bit.ly/energievoorraad https://act.gp/energierevolutie
The simulation game (15 minutes per round)	45 minutes	Summary game rounds (p. 4) action cards 1x printed one sided
Evaluation game and introduction own action	10 minutes	See final task (p. 6) pupils' task book printed (1 per pupil)
Campaign: prepare questions and set up action	30 minutes and homework	See final task (p. 6) pupils' task book printed

GENERAL SET-UP

The class has to be split up into four groups of three to six pupils. Each group represents another party. The four parties are: the government, family Johnson, the energy corporation Energy™ and an international environmental organisation Earth & Environment. Each team can win or lose in its own way. See annex 1 for the goals per team.

There are three rounds. Each round represents five years and consists of:

- 10 minutes to discuss the decision about the choice of action and handing their choice to the teacher;
- 5 minutes to discuss the chosen actions with the whole class and to adjust the CO₂-meter.

The game ends after three rounds with a round-up talk. After this, the class gets the time to think of and discuss an activity or campaign to reduce CO₂ which they also have to execute.

For a short explanation of the game you can watch this video: <https://act.gp/energierevolutie>.

TIP When you play the game with a large group, you can begin by splitting the class in two. Each part can play the game as described with 'two worlds' with four teams each.

Note This will ask more of you as a coach. Consider getting assistance.

TIP A small prize for the winning team will help to motivate all.

PREPARATION

- Read this manual and the rules of the game well.
- You could print the short version to keep at hand for yourself.
- Print the action cards once and print them single-sided. Each group will get their own specific action card each round. Keep the sheets separated (do not staple them together) so that they and the action cards can be handed out separately. The pages with actions will be handed out per round and not all in one go.
- Rearrange the classroom in such a way that there is room for the four groups to sit together. Have a pair of scissors ready for each group.
- When necessary, watch a short video about CO₂ and greenhouse emissions to refresh their minds.
- Draw a CO₂-meter on the board or use an excel file with the CO₂-meter. During the game you can keep track of the number of CO₂ points in excel and the meter will automatically adjust.

GETTING STARTED

INTRODUCTION

Explain to the class that they are going to do a roleplaying game about sources of energy and climate change. When necessary, watch a short video about CO₂ and greenhouse emissions to refresh their minds.

Introduce the game. Explain that it isn't just any game but a simulation. Show them the instruction video about the simulation game: <https://act.gp/energierevolutie>.

Split the class into four groups and hand out the workbooks.

Each group represents a party: The government, Family Johnsen, Energy company Energy™ and Environmental organisation Earth & Environment

Read out loud that an important event has taken place: "the climate conference has just finished. It was decided that CO₂ emissions have to be reduced by 25 units in 15 years."

Show the CO₂-meter. The present emissions are units. Target resulting from the climate conference is 75 units.

Explain the workings of the game to the pupils. Tell them the following:

- 1. You should read the information in the workbook about your team and your team's goals together. Each team has different goals.*
- 2. When round one starts, I will give each team a page which three actions to choose from and a blank playing card.*
- 3. Discuss the possible actions with your team and choose the one you want to execute. Keep your team's goal in mind while doing so! You can confer with other teams (lobbying), but you don't have to.*
- 4. Write down on the blank playing card which action you have chosen to execute and what consequences that will have for the CO₂ meter and the budget. This card will stay with the team.*
- 5. Hand in the action card to me. We will discuss which actions have been chosen and why.*
- 6. Round 2 and 3 will proceed in the same way, but with other actions. Play cleverly and try to achieve you team's goal! That will be tricky, because you don't know beforehand which actions you can choose from in rounds 2 and 3.*

Use the summary below as a guide through the rounds. Be aware that the actions chosen in a previous round may have consequences for a following round and/or for other teams. Discuss this after the action cards have been handed in. Do not forget to adjust the budget or CO₂ meter if necessary.

ROUND 1.

Hand out the team descriptions and action cards for round 1.

Read out loud: "The climate conference has just taken place. During this conference it has been agreed upon that in 15 years, the CO₂ emissions have to be reduced by 25 CO₂-units."

Show the CO₂ meter

Start game:

5 min teams confer.

5 min choose action. Teams hand in action cards. Teams keep filled-in card.

5 min class discussion. Discuss actions.

CO ₂	Event (5 years later)
100 - 106,5	CO ₂ emissions have risen. Heavy downpours increase by 10%.
85 - 100	There are slightly less CO ₂ emissions. The environment is doing better. Nature is recovering because of fewer droughts. A rare frog has been spotted for the first time in 5 years.
70 - 85	CO ₂ emissions have gone down considerably. Affordable electric cars get a radius of 500 km and become very appealing to buy.

ROUND 2.

Hand out the action cards for round 2.

Resume game.

5 min: teams confer.

5 min: choose action.

5 min: class discussion and discuss chosen actions.

ATTENTION!

Did the energy company apply for subsidies this round? Than this will cost the government € 3,000,000.

Did the family Johnson switch to Energy™? That will give Energy™ an extra € 1,000,000.

Adjust CO₂ units (in Excel).

CO ₂	Event (10 years later)
100 - 106,5	CO ₂ emissions have risen a lot. Because of rising temperatures the circumstances for organisms that cause diseases like the malaria mosquito, become more favourable. Malaria is now occurring in Northern Europe.
85 - 100	CO ₂ emissions have risen. Sea levels are rising and many lower areas of Europe have flooded. ATTENTION! If the government has NOT raised the dykes in round 2? They should have! That is why there is a lot of damage which will now cost them € 5 million.
70 - 85	There are slightly less CO ₂ emissions. Technical developments made solar panels 20% more efficient. The demand for solar panels has risen which lowered production costs.
47 - 75	Well done! CO ₂ emissions have dropped considerably. Demand for clean energy is rising. More and more big energy consumers use clean energy.

ROUND 3.

Hand out the action cards for round 3.

Resume game.

5 min: teams confer.

5 min: choose action.

5 min: class discussion and discuss chosen actions.

ATTENTION!

Did the government close coal fired power stations? If yes, any action of Energy™ in this round has no effect and the end result of the previous round is the final score.

Did the family Johnson vote for another government? If yes, the result of the government will be halved even if their choices were positive. Half of the CO₂ units and half of the budget in round 3 will be used.

Did the environmental organisation E&E shut down operations at all petrol stations in Europe? That will cost Energy™ an extra € 2,000,000.

Adjust CO₂ units (in Excel).

CO ₂	Event (15 years later)
100 - 106,5	CO ₂ emissions have risen enormously. Temperatures on Earth have increased too much. Because of heavy rainfall and flooding, the low lying-areas of Europe have flooded. Nobody wins.
85 - 100	CO ₂ emissions have risen and that has serious consequences. Sea levels are rising further and many low-lying areas of Europe have flooded.
70 - 85	The goal of the climate conference to lower CO ₂ emissions by 25 CO ₂ units, has not been achieved. What a shame! What could have been done differently?
47 - 75	The goal of the climate conference to lower CO ₂ emissions by 25 CO ₂ units has been achieved. The environment is doing better. Nature is recovering.
0 - 50	Well done! CO ₂ emissions have dropped a great deal. A disaster has been avoided. This has a positive effect on nature everywhere. The acidity of the ocean is stable. Rare corals can grow again. The harvest of corn and wheat is up by 20%.

SUMMARY OF
GAME ROUNDS

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FINAL ASSIGNMENT

END OF GAME - GROUP DISCUSSION

Start a group discussion with the whole class. Ask teams to have a look at the actions in round 3 and to see how they impacted the CO2 meter and budgets. What do the teams think about that?

Questions for final discussion:

- At what level is the CO2 meter?
- How are the budgets doing?
- Which team(s) has reached its goal? Which team(s) did not?
- What choices should have been made to make sure each team reached its goal?
- What could have made them make those correct choices?
- What are the solutions for the energy problem? (More clean energy, less energy use).

THE CAMPAIGN

To close the game, the pupils get back together and think of a campaign to reduce CO2 emissions themselves.

First, the pupils think about the role they have in real life: the consumer (Johnson family). They think about the changes they can make at home or at school. When there's time available, the pupils can execute their campaign idea.

- Examples for what they can do themselves: smartphone usage, computer use, holidays (air travel)
- Examples at home: central heating, shower, electrical appliances.
- Examples at school: central heating, lighting, computers.
- Examples for energy saving: turn down the heating by one or two degrees, energy and water saving showerhead, don't put computer on stand-by."

ANNEX 1. AIM OF THE GAME

GOVERNMENT

Your team represents the government. You are taking measures to avoid climate change. That is why your country and others in Europe have agreed to reduce CO₂ emissions by 30 CO₂ units over the next 15 years.

Your team wins if this goal is reached and your budget of € 20,000,000 is not used up. You will lose if you don't reach the CO₂ target OR if you run out of money.

Budget: € 20,000,000

Goal: 30 CO₂ units less AND have more than € 0.0 left.

FAMILY JOHNSON

Your team is the family Johnson. You are an ordinary household in Europe. Just like everybody else and every other household or company, you use energy. The family Johnson is positive towards sustainability the environment and the green economy BUT it should all be affordable.

Your team wins if you are, at the end of the game, using sustainable energy AND if you have € 5.000 left over. You lose if you are not using sustainable energy OF if you don't have enough money left.

Budget: € 15,000

Goal: using sustainable energy AND have a minimum of € 5,000 left.

ENERGY COMPANY ENERGY™

Your team is energy company Energy™. Energy company Energy™ has recently made an investment of € 5,000,000. The company wants to earn its investment back in 15 years' time.

Your team wins if you can get this investment back in 15 years. You lose if you don't.

Budget: € 10,000,000

Goal: having € 15,000,000 or more at the end of the game.

INTERNATIONAL ENVIRONMENTAL ORGANISATION EARTH & ENVIRONMENT

Your team is the international environmental organisation Earth & Environment. This organisation wants to reduce CO₂ emissions with 40 CO₂ units in 15 years' time so that the earth does not warm up too much and thereby avoid catastrophic climate change.

Your team wins if CO₂ emissions have gone down by 40 CO₂ units at the end of the game AND your budget of € 250,000 is not completely used up. You lose if the CO₂ reduction is smaller than 40 units OR if you have no money left.

Budget: € 250,000,000

Goal: 40 CO₂ units less AND have more than € 0.0 left.

COLOPHON

This educational material 'The Energy[r]evolution' was developed by 'De Praktijk' for Greenpeace Netherlands.

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GREENPEACE

Greenpeace is an international environmental organisation that is devoted to clean energy, healthy forests, living oceans, clean production processes and sustainable agriculture. With appealing and successful campaigns we expose environmental problems and drive authorities and businesses towards solutions. We are innovative, creative, brave, tenacious and honest. We are supported by about three million financial supporters and thousands of volunteers worldwide. Greenpeace is fully independent and does not accept money from authorities or businesses.

Young people are incredibly important to Greenpeace. They inspire us to take good care of the Earth and are, of course, indispensable for a green future. Our most important message is: what they do influences the world around them. That is why we also talk about the bigger environmental problems and are inspiring them to take action for a healthy planet themselves.

You can find more educational material at www.greenpeace.nl/docenten.