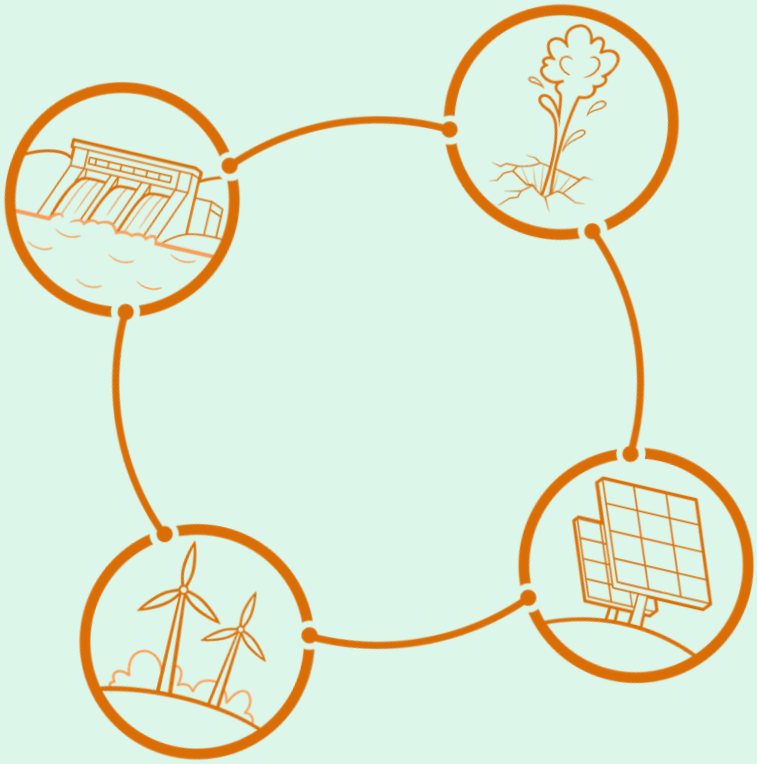


Curriculum for
Energy Literacy

Facilitator Material

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Module 1 - Method 1: Silent Discussion



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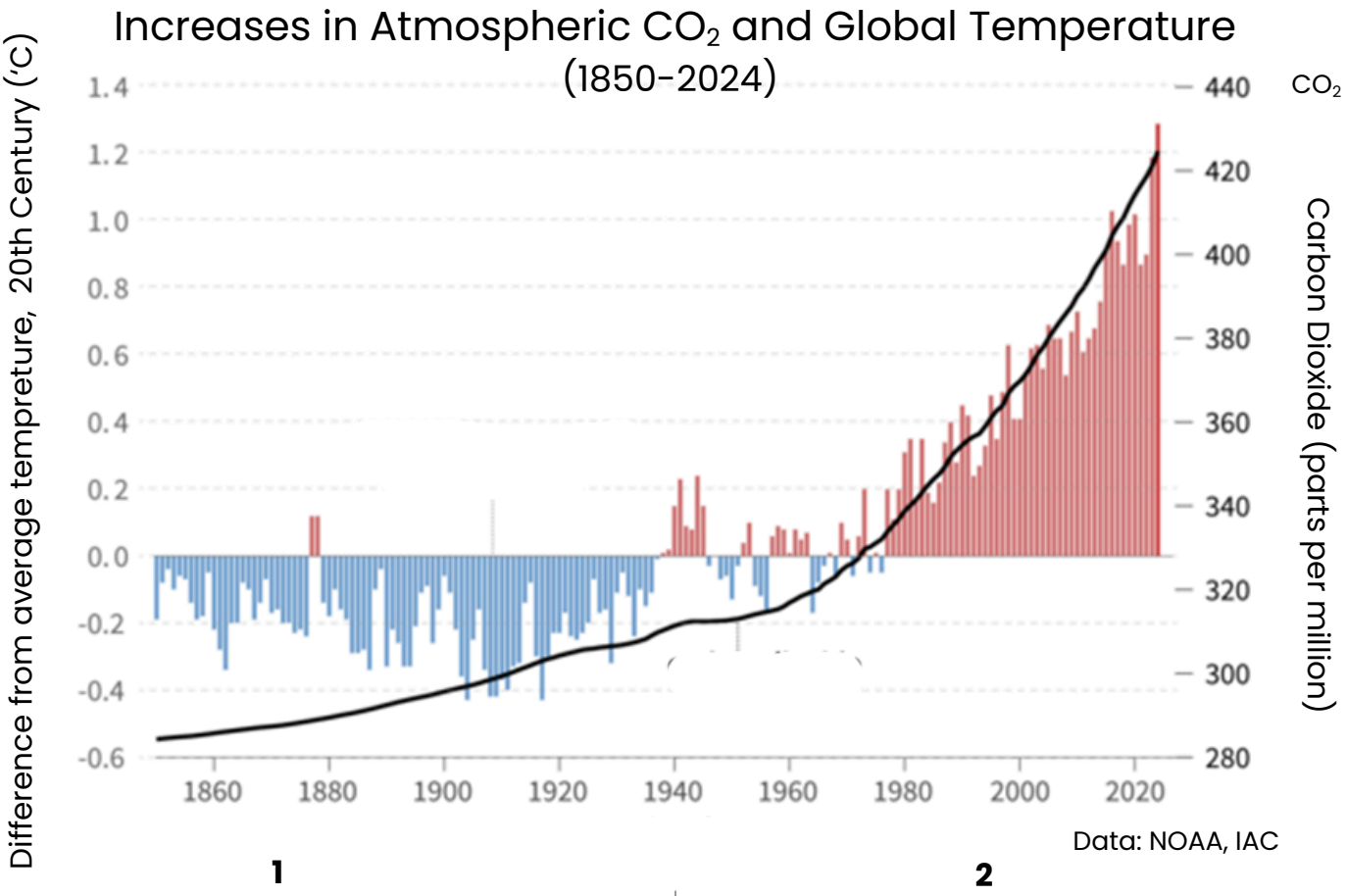
Module 1 - Method 1: Silent Discussion



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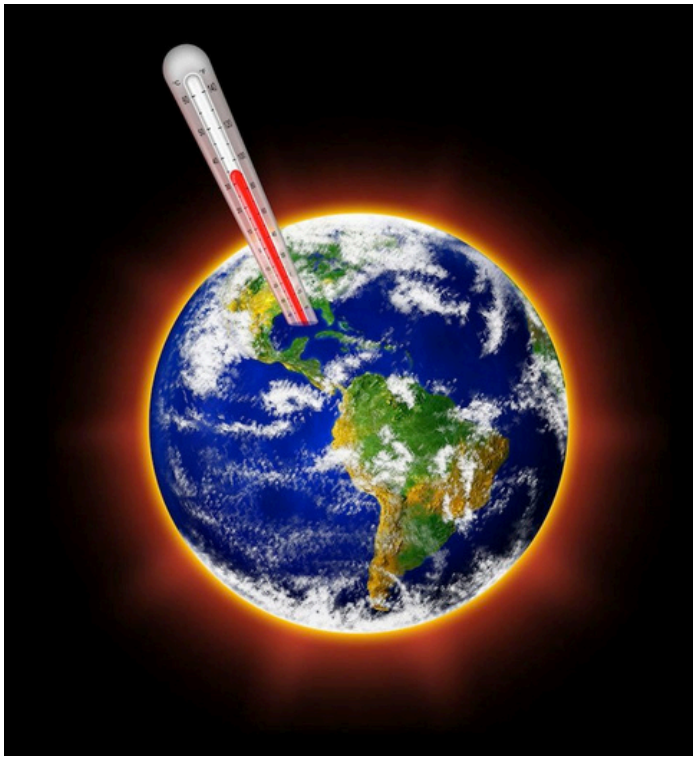
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Module 1 - Method 1: Silent Discussion



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Module 1 - Method 1: Silent Discussion



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Module 1 - Method 1: Silent Discussion



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Module 1 - Method 1: Silent Discussion



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Module 1 - Method 1: Silent Discussion



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Module 1 - Method 1 : Silent Discussion



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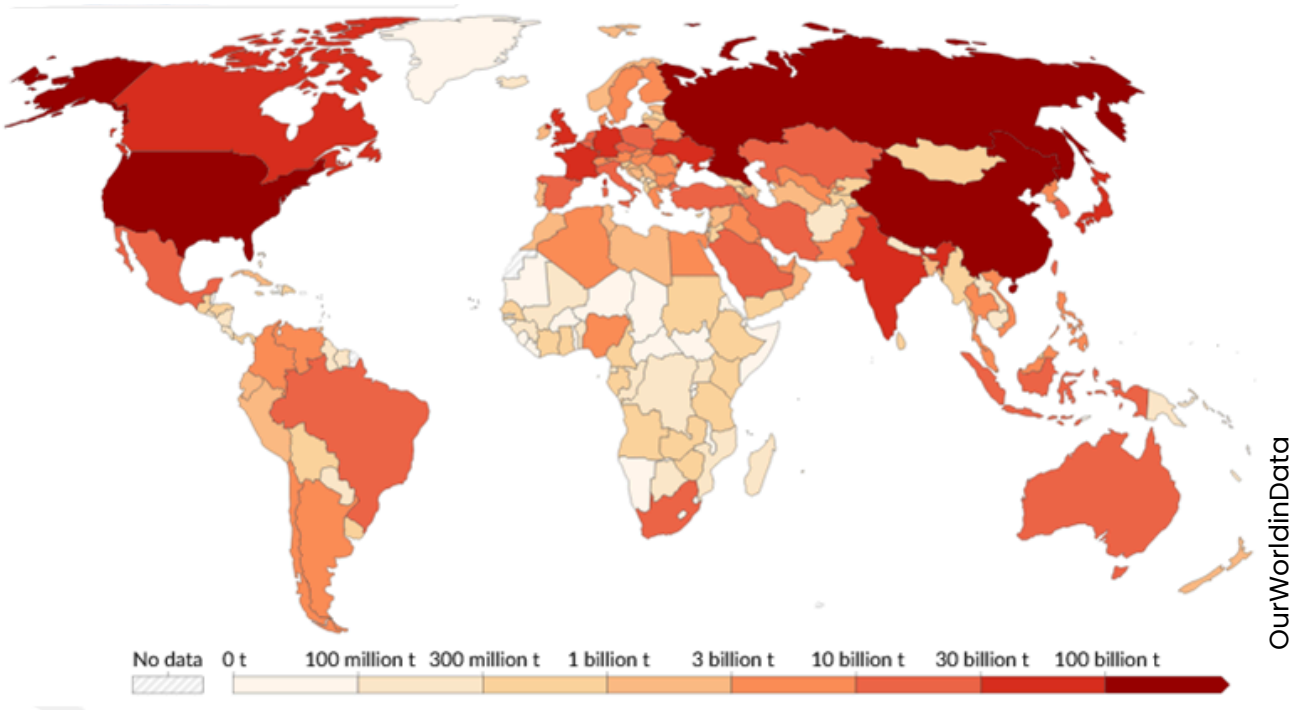
Module 1 - Method 1 : Silent Discussion



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1	2

CUMULATIVE CO_2 EMISSION PER CAPITA, 2024



1 **2**

WORKSHEET HEADLINES: PRINT OUT AND CUT INTO STRIPES

1 "ZOMBIE VIRUSES" IN SIBERIA COULD WAKE UP BECAUSE OF GLOBAL WARMING.

2 OVER 100 DOLPHINS DIED IN THE AMAZON IN SEPTEMBER 2023. HEAT AND DROUGHT ARE BLAMED.

3 PEOPLE IN EUROPE MIGHT NEED MORE AIR CONDITIONING IN WINTER BECAUSE OF CLIMATE CHANGE.

4 MANGOES ARE LOSING THEIR COLOUR AND TASTE. FARMERS ARE LOSING MONEY.

5 EXTREME WEATHER COSTS GERMANY A LOT OF MONEY. HEAVY RAIN IS HAPPENING MORE OFTEN.

6 STORKS ARE THROWING THEIR BABIES OUT OF THE NEST BECAUSE THEY HAVE NOTHING TO EAT.

7 COFFEE IS MORE EXPENSIVE, TASTES WORSE, AND IS HARDER TO FIND.

8 IN 30 YEARS, PARIS COULD HAVE VERY HOT DAYS, TICKS, AND WILD BOARS IN THE CITY.

9 THE MEDITERRANEAN DIET IS CHANGING: OAK AND OLIVE TREES ARE DYING, OLIVE OIL AND WINE ARE BECOMING RARER AND MORE EXPENSIVE.

10 MAYBE SWEDEN COULD GROW ORANGES BECAUSE OF GLOBAL WARMING?

HEADLINES -PART 2
PRINT OUT AND CUT INTO STRIPES

11 PRICES FOR TAMPONS, DIAPERS, AND COTTON BALLS ARE GOING UP BECAUSE OF CLIMATE CHANGE

12 CHRISTMAS TREES MAY BE HARD TO GROW BECAUSE OF CLIMATE CHANGE.

13 HALF OF ITALY'S SANDY BEACHES COULD DISAPPEAR THIS CENTURY.

14 CLIMATE CHANGE CAN MAKE BEER TASTE WORSE

15 ALLERGIES LAST LONGER BECAUSE OF GLOBAL WARMING.

16 JELLYFISH ARE INCREASING AND SHRIMP ARE DISAPPEARING BECAUSE THE OCEAN IS WARMER.

17 TOMATOES COULD START GROWING SO FAST THEY EXPLODE IN SUPERMARKETS.

18 LONDON'S PIGEONS MAY LEARN TO SWIM BECAUSE RIVERS KEEP FLOODING.

19 SUMMER MUSIC FESTIVALS MAY BE CANCELLED MORE OFTEN BECAUSE OF HEATWAVES AND STORMS.

20 FOOTBALL MATCHES MAY ONLY TAKE PLACE AT NIGHT TO AVOID DANGEROUS DAYTIME HEAT.

EVALUATION & EXPLANATION
PART 1

1. Melting permafrost can release ancient microbes, and scientists have revived viruses tens of thousands of years old in labs. The risk to humans is still debated and not yet proven. ✅
2. This event was widely reported, as record-high water temperatures and drought left dolphins without enough oxygen. It shows how climate extremes directly impact animals. ✅
3. Winters are becoming milder, which reduces heating demand but does not create a need for AC in cold months. This headline is misleading. ❌
4. In tropical regions, heat stress and irregular rains affect the taste and quality of mangoes. Farmers in India and elsewhere have reported reduced harvests. ⚖️
5. The 2021 Ahrtal flood alone caused over €30 billion in damages. Studies confirm climate change increases the frequency of heavy rainfall events in Central Europe. ✅
6. Drought makes it harder for storks to find food, which leads to higher chick mortality. But the dramatic image of parents throwing babies out is not scientifically proven behaviour. ⚖️
7. Arabica coffee plants are sensitive to temperature changes, pests, and drought. Yields and quality are already declining in some key growing countries. ✅
8. Heatwaves and tick expansion in France are projected. Wild boars appear in cities, but if this becomes the “new normal” is speculation. ⚖️
9. Prolonged droughts and heatwaves have reduced olive oil production, driving prices up. Wine production is also shifting northward as traditional grape regions struggle. ✅
10. Even with warming, Sweden’s climate remains unsuitable for oranges, which need long hot seasons. Outdoor production is unrealistic. ❌

EVALUATION & EXPLANATION
PART 2

11. Cotton is vulnerable to drought and heat, which can raise prices. But other factors like supply chains and energy costs also play a role. ⚖️

12. Rising temperatures and drought stress spruce and fir trees. Farmers may need to switch species or irrigate more. ⚖️

13. Sea level rise and erosion put Mediterranean beaches at high risk. Studies suggest up to 50% could vanish without adaptation. ✅

14. Droughts and heat waves lower the quality of hops and barley. Brewers warn this can affect taste and aroma. ⚖️

15.Pollen seasons for plants like ragweed and birch are lengthening. This means more weeks each year of sneezing and asthma symptoms. ✅

16. Warmer waters and overfishing favour jellyfish. Shrimp populations, however, depend on multiple factors. ⚖️

17. Tomatoes are affected by climate stress, but they will not explode from rapid growth. This is a humorous exaggeration. 🤪

18. London faces more flood risks, but pigeons won't adapt by swimming. This is satire, not science. 🤪

19. Several European festivals have already been cancelled or disrupted by extreme weather. Organisers are increasingly worried about safety and costs. ⚖️

20. Sports leagues are already shifting schedules due to hot weather. Whether this becomes a strict rule is still speculation. ⚖️

Chicken Sandwich Worksheet (one per group)

The world produces nearly 300 million tonnes of **plastic** every year, half of which is for single use. More than 8 million tonnes of plastic are dumped into our oceans every year. If this continues, there will be more plastic than fish in the ocean by 2050.
There are already more than 5 trillion pieces of plastic in the world's oceans, most of them **microplastics.**
These tiny broken-down pieces of plastic look like food to fish: they can end up killing the fish, or a bird which eats the fish. Some have been found in fish eaten by humans.

Between a third and a half of all food produced around the world is lost or **wasted**. This is about 2 billion tonnes of food. In the EU, food waste is expected to rise to about 126 million tonnes a year by 2020.

The average Western **diet** has high levels of meat, fat and sugar, which carries risks for individual health, and for the health system. Obesity, type 2 diabetes, hypertension, osteoarthritis, and cancer are widespread **diet-related diseases**.
Recent decades have seen a trend towards less sustainable and less healthy diets. For the first time in history, the world has as many overweight people as undernourished people.

More than 85% of the world's **fisheries** are either beyond, or up to safe biological limits. The populations of several fish populations (such as Atlantic bluefin tuna) have shrunk to the point where their survival
as a species is threatened.

Greenhouse gas emissions relating to the food we eat are partly a result of transport, but mostly a result of the way the **food is produced** – e.g. by industrial methods or by hand, in heated greenhouses or in open fields, on existing land, or land cleared from forest.
Many countries in the developing world have deals with rich donor countries that force small farmers to shift to **industrial farming methods.** These arrangements tell the farmers what to plant: mostly crops for far-off markets instead of local crops to feed people at home.

Chicken Sandwich Worksheet (one per group)

Agriculture is one of the biggest threats to a healthy environment. It uses most of our available freshwater, and about 20 000-50 000 square kilometres of potentially productive land is lost annually through unsustainable farming methods resulting in soil erosion and degradation.

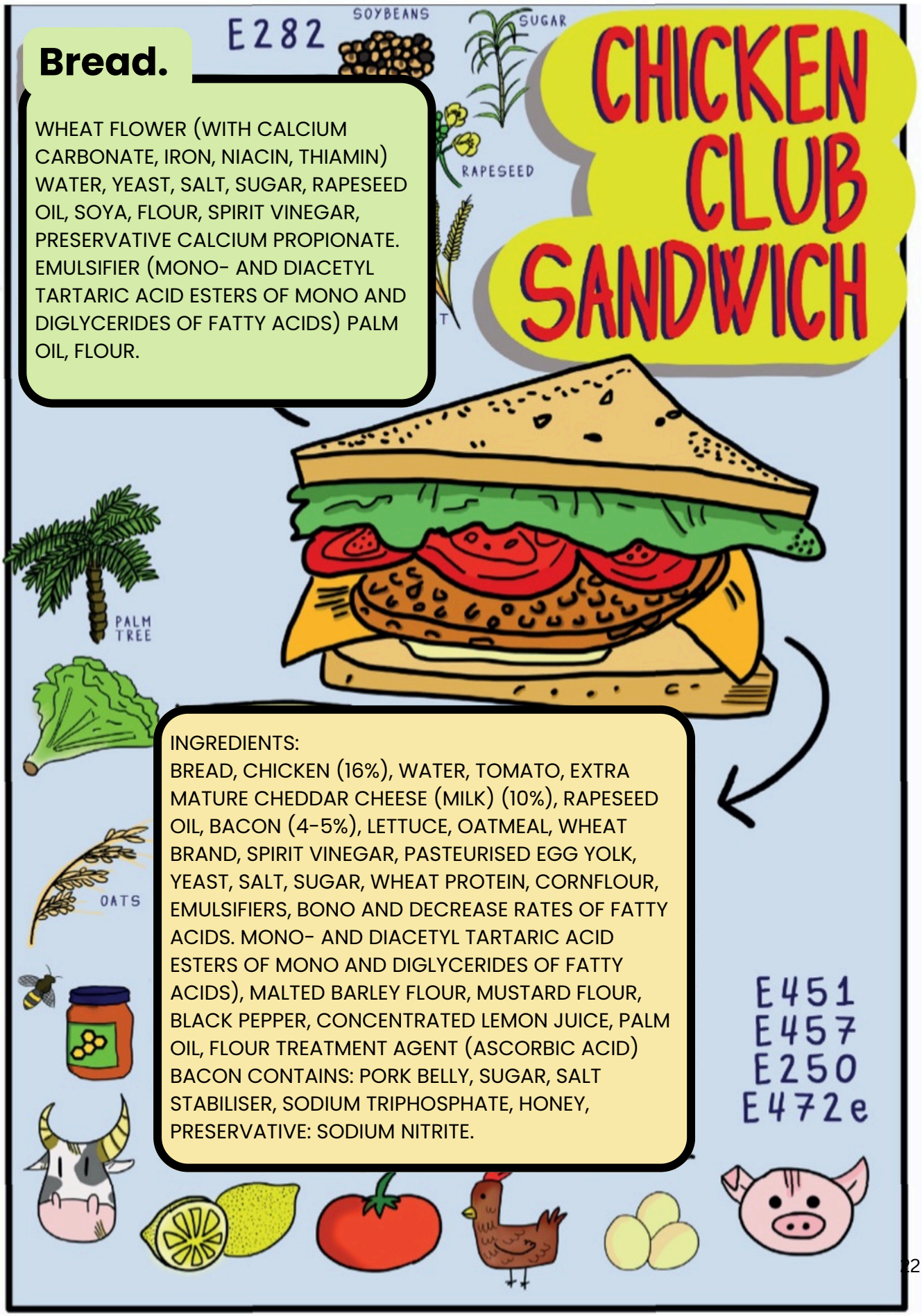
A typical meat eater's diet requires up to 2.5 times the amount of land compared to a **vegetarian diet** and five times that of a **vegan diet**.
A farmer can feed up to 30 people throughout the year with vegetables, fruits, cereals and vegetable fats on 1 hectare of land. If the same area is used for the production of eggs, milk and/or meat the number of people fed is about 5-10.
The **meat industry** accounts for 14% of greenhouse gas emissions worldwide, which is roughly equivalent to all emissions from transport.

The **cattle industry** is responsible for up to 80% of Amazon **deforestation.** The Amazon is home to at least 10% of the world's known biodiversity and plays an essential role in regulation of the planet's climate.

Livestock is the most significant contributor to nitrogen and phosphorus **pollution of streams, rivers and coastal waters** worldwide.

Four multinational corporations control between 75-90% of the **global grain trade.** Corporations are exerting increasing pressure on farmers, making them grow crops which can be easily traded, like corn and soy, instead of native crops.
Six enormous agribusiness companies control nearly 70% of the world's seed market. The same companies control all the **genetically modified (GM) crops**, whose effects on the environment – and on humans – are largely untested. Again, these 6 companies are the largest global manufacturers of pesticides.

Many of the foods we eat every day are sprayed with **pesticides** before they land on our tables. There are a growing number of studies that have linked certain pesticides with increased cancer risk and with diseases such as Parkinson's and Alzheimer's.


Bread.
WHEAT FLOWER (WITH CALCIUM CARBONATE, IRON, NIACIN, THIAMIN) WATER, YEAST, SALT, SUGAR, RAPESEED OIL, SOYA, FLOUR, SPIRIT VINEGAR, PRESERVATIVE CALCIUM PROPIONATE. EMULSIFIER (MONO- AND DIACETYL TARTARIC ACID ESTERS OF MONO AND DIGLYCERIDES OF FATTY ACIDS) PALM OIL, FLOUR.
E282
SOYBEANS
SUGAR
RAPESEED
CHICKEN CLUB SANDWICH
PALM TREE
OATS
INGREDIENTS:
BREAD, CHICKEN (16%), WATER, TOMATO, EXTRA MATURE CHEDDAR CHEESE (MILK) (10%), RAPESEED OIL, BACON (4-5%), LETTUCE, OATMEAL, WHEAT BRAND, SPIRIT VINEGAR, PASTEURISED EGG YOLK, YEAST, SALT, SUGAR, WHEAT PROTEIN, CORNFLOUR, EMULSIFIERS, BONO AND DECREASE RATES OF FATTY ACIDS. MONO- AND DIACETYL TARTARIC ACID ESTERS OF MONO AND DIGLYCERIDES OF FATTY ACIDS), MALTED BARLEY FLOUR, MUSTARD FLOUR, BLACK PEPPER, CONCENTRATED LEMON JUICE, PALM OIL, FLOUR TREATMENT AGENT (ASCORBIC ACID) BACON CONTAINS: PORK BELLY, SUGAR, SALT STABILISER, SODIUM TRIPHOSPHATE, HONEY, PRESERVATIVE: SODIUM NITRITE.
E451
E457
E250
E472e

List of Energy Saving Methods and Strategies

Familiarise yourself with the list before the training

Energy-saving at home

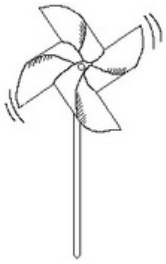
- Turn off lights when you leave a room.
- Use LED lamps. They need much less electricity.
- Do not heat your home more than needed. Put on a warm jumper first.
- Close windows and doors to keep heat inside.
- Use less hot water. Take shorter showers.
- Turn off appliances fully. Do not leave them on standby.
- Wash clothes at lower temperatures, for example 30°C.
- Air-dry clothes instead of using a dryer.
- Cook with a lid on the pot, it saves heat.
- Use pressure cooker, and haybox for longer cooking.
- Unplug chargers when you do not need them.
- Buy energy-efficient appliances with a good energy label.
- Replace old appliances. New fridges, washing machines use less energy.
- Do not set your fridge to very low temperature. Keep the fridge closed.
- Heat only the rooms you use.
- In cold winter: use thick curtains and carpets to keep warmth inside.
- In hot summer: Use shades at the windows and ventilate at night.
- Live in a smaller home if possible. Smaller homes need less energy.
- Repair things instead of buying new ones.
- Share tools or appliances with neighbors or friends.
- Buy fewer new products, because producing things uses a lot of energy.
- Travel less by car and plane to reduce overall energy use.

Energy-saving for a whole country

- Set strong laws that require products to use less energy (efficiency rules), and new and renovated buildings has low-energy consumption.
- Use clear energy labels to help people choose good products.
- Use smart street/staircase lighting that switches off when no one is there.
- Improve public transport so people can use buses and trains more.
- Support and promote car-sharing, bike lanes, and car-free zones.
- Give money support for saving energy, e.g. new windows, efficient fridges.
- Encourage factories to use more efficient machines.
- Protect nature areas, forests and water. Healthy nature uses less energy to manage. (e.g. parks with grass need to be cut regularly)
- Support citizens and municipalities to establish energy communities installing solar, wind, heatpumps, and energy savings in buildings.
- Support heat pumps instead of gas or oil heating.
- Support new research on renewable, and low-energy technologies.
- Renovate old buildings to reduce heating costs and energy use.
- Encourage smaller living spaces and city planning that reduces long travel.
- Support repair and sharing services to reduce waste, and consumption.
- Make sure everyone has enough energy for basic needs like heating, cooking and light.

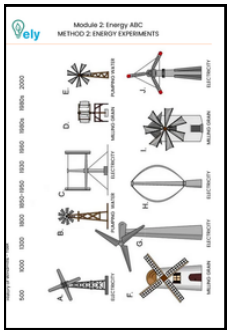
Station 1: Wind Energy

A1. Paper Windmill (Beginner)



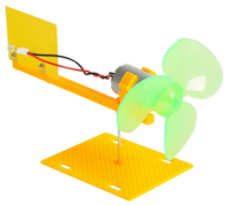
Make a small paper windmill, and walk with it to see how it works. Before folding the wings participants can write /draw something on it (their name, or an icon (eg., happy face, sun, green leaves, hearts, flowers). When the windmill turns around it will be seen as moving.
Materials: sheet of paper, scissor, pin, pushpin (or needle and 2 beats), colored pens. Instruction sheet How to make it.

A2. History of Windmills



Use images to explore wind energy history, how windmills have evolved into modern wind turbines. Discuss and organise the images on the timeline. When ready, show the page with images on the correct timeline.
Materials: Task Sheet: timeline, and the random images.
Solution Sheet: images arranged according to time.
Note: The type of use of the windpower (electricity, grinding grain, pumping water) are on the task sheet, which is guiding to solve the task.
You can read more details on the history on the Fact Sheet on Wind Energy.

B. Propeller and Light Bulb (Advanced)



Use a device: small windmill propeller with a motor and led bulb. The participants blow to the propeller and it lights up the LED. You can also use a hairdryer or wind if it is windy outside.
This demonstrates that wind power can make not only move the blades, but also electricity.
Materials: Device of windmill propeller with LED can be bought from different shops for 10-12 Euro. They need to be assembled it before the event, which is very easy. You can also use parts and assemblé them. (See Station 3)

Knowledge transfer: Discussion based on Fact Sheet, Maps (optional)

Read the Fact Sheet on Wind Energy, and discuss it. Making questions about the content. Compare the world maps of wind power potential and production.
Materials: Print the Fact Sheet on Wind Energy, including the Annex with the world maps of wind power potential and production.

Station 1: Wind Power (continued)

C Bike Wheel Windmill (Advanced, low cost)



There are many ways to build a windmill. At this experiment the bicycle wheel is transferred to a propeller, which enables the dynamo to rotate and power a light a bulb.

The experiment can be also used showing the power of mechanical energy, when you turn the wheel by hand powering the dynamo. (when there is no wind).

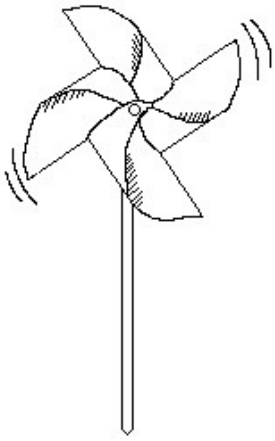
Similarly, when you bicycle,, pedaling the bicycle powers the dynamo, which powers the light. So you do not need battery for your lightbulb on the bicycle.

Buy or get a used bike wheel, wood plank and dynamo with LED light.
Set up the a station ready to assemble according to the instruction sheet.

Material:

- Instruction Sheet how to build it.
- Bicycle front wheel preferably with tyre
- Plank / Wood stand 10 x 2 cm to mount the tyre to
- Tape and cardboard
- Dynamo with LED light

Make a Windmill from Paper - Instruction Sheet

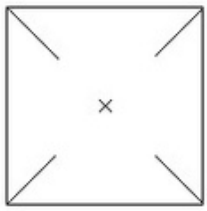


About wind turbines: The wind can't be seen, but you can feel it. When the wind moves, it has energy. The wind pushes the blades of a windmill, making them spin. Inside a real windmill, the blades are connected to a long pole (shaft). When the blades spin, the shaft spins too.
New and old mills: Wind turbines have been around for many centuries In old-style windmills, the spinning shaft turned gears that crushed grain or pumped water. In modern wind turbines, the spinning shaft is connected to a generator that makes electricity.

How to do

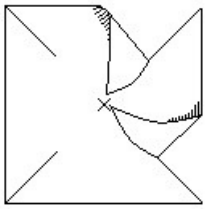
Cut & color

Cut a square piece of paper out of A4 paper. (21x21 cm or 15x15 cm)
Use colored paper or decorate both sides of the paper.
Fold the paper diagonally on opposite directions. After unfolding, you will have a creased "X" on the paper.



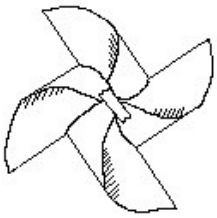
Cut

Cut halfway to the middle of the paper.



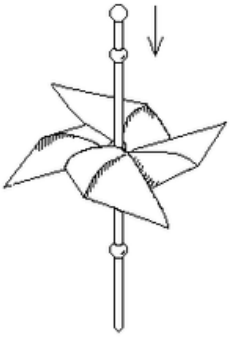
Bend & Tape

Bend each corner into the middle. Make sure to bend and not to fold. Attach them with a piece of tape. (You can also glue the corners to the middle.)



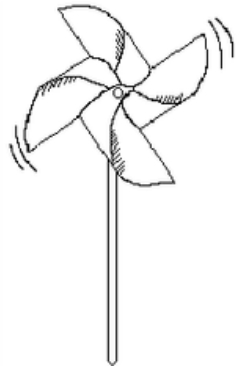
Build

Put the first pearl on the needle. Push the needle trough all 4 corners. Put the other pearl on. (Can be done without the pearl but with a push pin too.)



Put on stick

Attach your mill to a stick or a straw.
Don't push the needle too near to the stick, because then the windmill can't rotate.

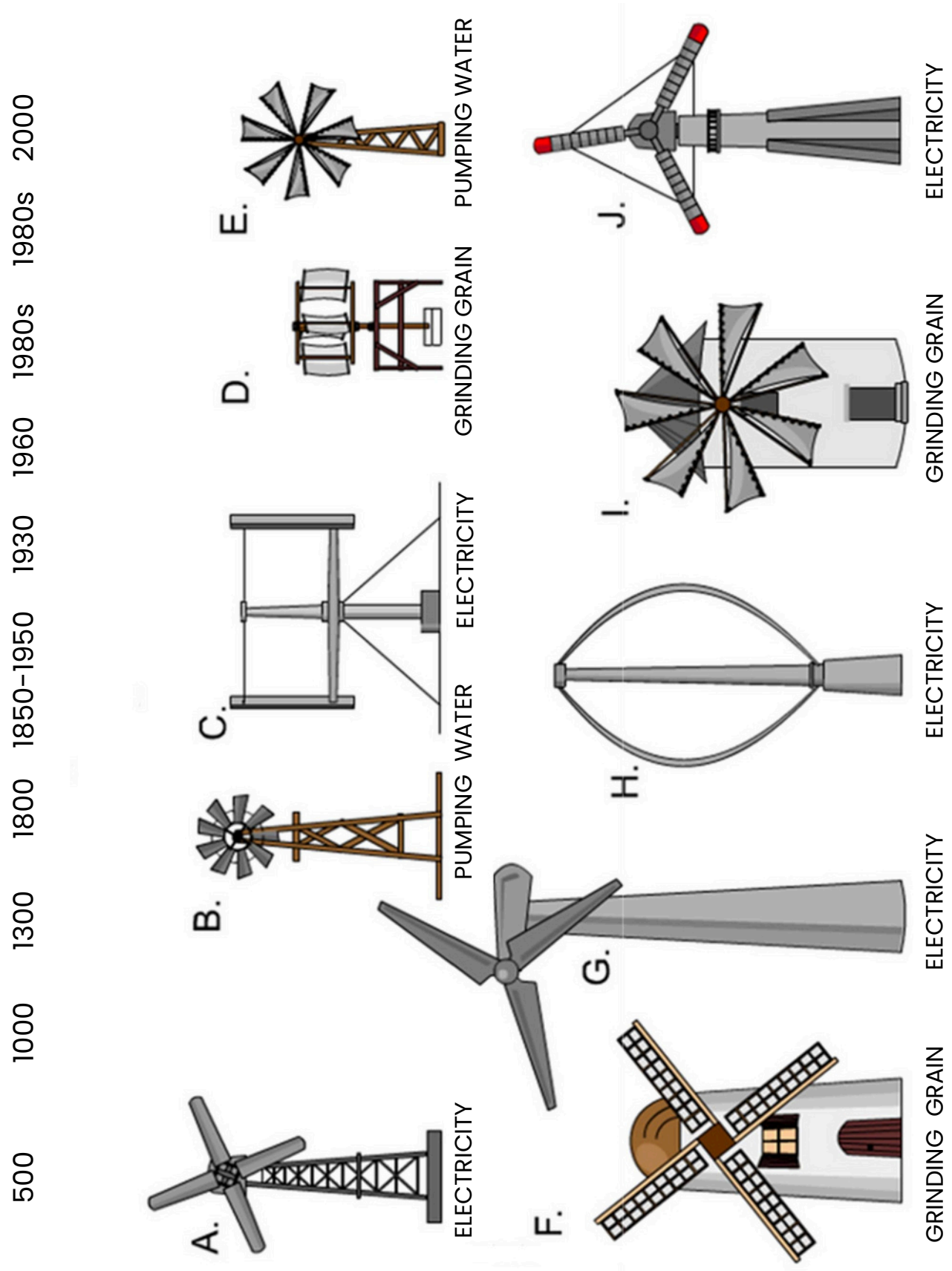


The wind mill is ready. Try it out. Walk with it. It is fun. Building windmills from paper is a popular activity by schouts. Ready made models are used at festivals for fun or as a marketing tool. Models from plastic are also used to chase birds away from plants in gardens.

Materials

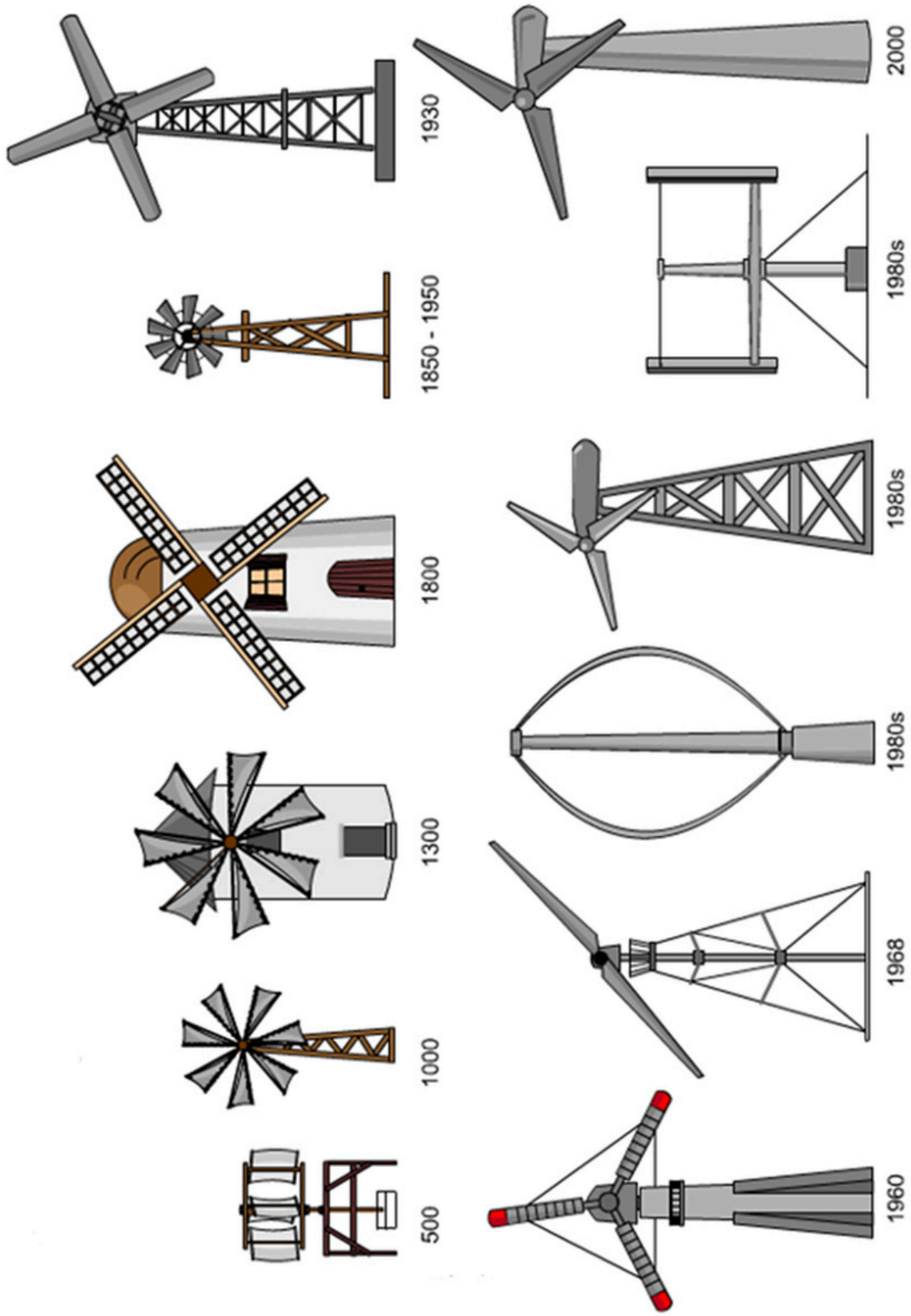
- Seet of paper (eventuel coloured paper or coloring pens to decorate)
- Stick or straw.
- Needle with 2 pearls or a push pin
- Scissors
- Tape or glue

History of Windmills - Task



Source: WATT

History of Windmills - Solution

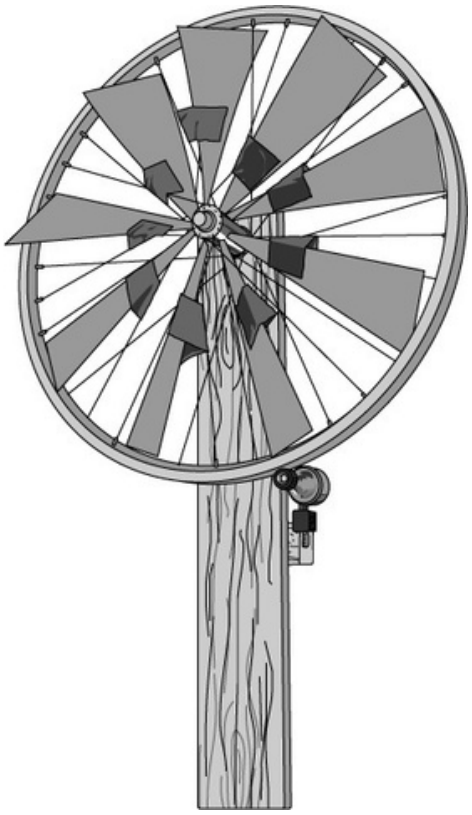


Source: WATT

Station 1: Wind Energy - Low Cost Alternative

Build a Bicycle Wheel Windmill

At the bicycle wheel windmill, the blades are from cardboard set on the spokes of the wheel. When the wind is blowing the propellers rotate the wheel, which are rotating the dynamo to power a light a bulb.
The experiment can be also used showing the power of mechanical energy, when you turn the wheel by hand powering the dynamo.
This experiment is using the bicycle wheel to power the dynamo, which powers the light. Here the power is not the pedaling, but the wind, which turns the wheel.



Materials

1. Bicycle front wheel prefererably with tyre
2. Plank 10 x 2 cm
3. Tape and cardboard
4. Dynamo and LED light bulb/ bicycle lamp

How to do:

1. Fasten the cardboard between the spokes to ensure that they are angled in relation to the rotations of the wheel. The cardboard must therefore be cut out in triangular form.
2. Fit as many pieces of cardboard as possible.
3. Mount the wheel onto the plank with the dynamo so that it is in contact with the tyre or the wheel if there is no tyre. Contact the dynamo to the LED.

How much current can the wheel produce?
Reduce the number of cardboard blades by a half. How much current does it produce now?

Station 2: Solar Energy

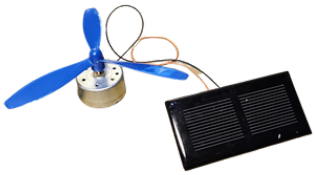
A. Use a solar cell to power a propeller

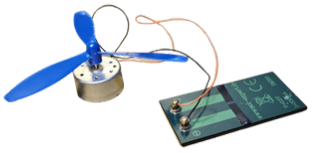




Use the sunshine in the room. If there is no sunshine then you need a lamp, which has at least 40 Watt (check). Observe how light intensity affects energy production.
Preparation: Set up the station that it is ready to use.
Material: *A* solar cell connected to a motor and a propeller, lamp in case there is no sunshine. The lamp needs to be at least 40-60 Watt depending on the size of the solar cell. LED cannot be used. You can use different sizes, and see the effect. The stronger the lamp is the propeller turns quicker around. Solar cell devices can be bought at several shops in different qualities. They cost 8-20 EUR. You can check out Conrad.com, which has shops in most European countries. Some of the devices are very nice and can be used as small sculptures in the office after the training.

B. Assemble a solar cell and connect it to a motor and propeller





Assembling is very simple, more fun, and increase the understanding of technology, and participation.
Material: Assemble set with solar cell, propeller, motor with cables. Screwdriver.
Preparation: Set up the station with the assemble set. Try it out yourself before the session. The best set is, where you can assemble the cables to the solar panel with a screw and do not need welding. You can rotate a propeller or any other DIY sculpture. There are also school sets with 20 pieces (Sol Expert 77774) for 90 EUR at Conrad.com (choose your country shop).

Add other PV devices on the table (optional):



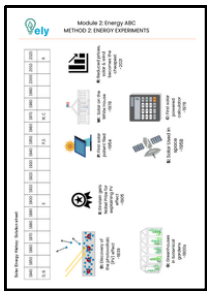


Solar cell powered radio, mobile phone or powerbanks.
Discuss the role of these devices, off-grid electricity supply, when to use it, how cheap they are. What does it mean when milliards of people charge their mobile, and computer. This would lead to the other station on energy consumption.
Ask to explore the functions of the emergency radio. The radio can be charged by the solar cell, hand-driven crank, battery, and a USB. The radio also can charge a mobile through USB.

Note: You can find PV powered devices in many shops.
A solar emergency radio costs 20-40 EUR.

Station 2: Solar Energy (continued)
Supplementary to station A and B

A2 ./ B2. History of Solar Energy
Use images to explore solar energy history. Discuss and organise the images on the timeline. When ready, show the page with images on the correct timeline.
Materials: Task Sheet: timeline with random images.
Solution sheet with the organised images.
You can read more details on the history on the Fact Sheet on Solar Energy.

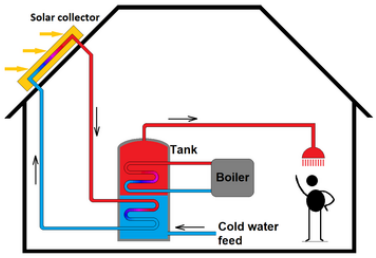


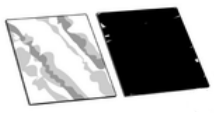
Knowledge transfer with modification options Using the Fact Sheet:
Discuss solar energy based on the Fact Sheet: Solar Energy. Make questions about the content. Compare the maps of potential and production, Compare the graphs of solar cell price and volume by timeline.
Material: Print Fact Sheet, including Annexes (Maps, graphs)

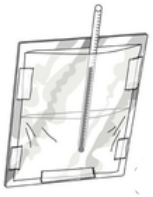
Station 2: Solar Energy-Low cost alternative

C. Experiment: Heat from the Sun

A solar water heater traps the heat of the sun to heat water or air. The hot water can be used for showers, washing, or heating homes. Usually, the hot water is stored in water tanks for use at night or on cloudy days. A solar water heater converts around 40% of sunlight into heat.







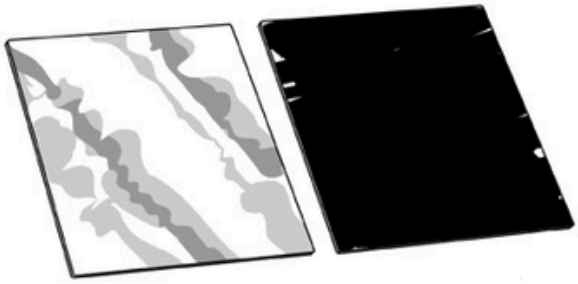
In this experiment you can investigate how a solar water heater functions.

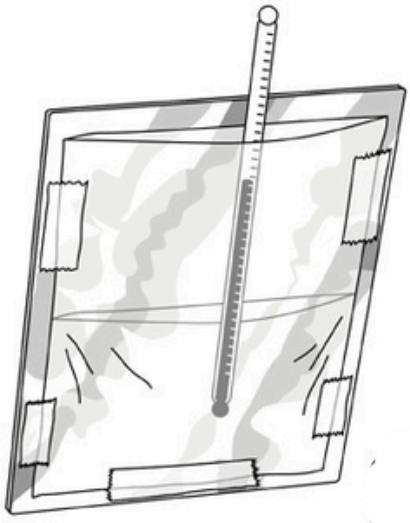
Use Instruction sheet how to make the experiment.
More information: Fact Sheet on Solar Energy.

Station 2: Solar Energy

Heat from the Sun - Instruction Sheet

Background:
A solar water heater traps the heat of the Sun. In this experiment you can investigate how a solar water heater functions.





Materials needed:

- 2 sheets of aluminium approx. 20 cm x 20 cm
- Black matt paint and brush
- Plastic folder or plastic bag
- Strong tape
- Measuring jug and water
- 2 thermometers
- Timing device

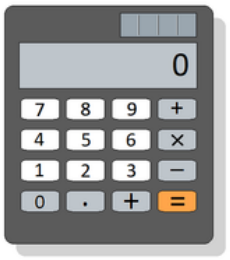
How to do:

- Paint one of the sheets of aluminium completely black. Put a plastic bag or adapt a plastic folder on one side of each sheet of aluminium with the help of the strong tape.
- Fill both bags with 100 ml water and put 2 thermometers into the water.
- Place the aluminium sheets with the bags, water and thermometers at an angle towards the sun.
- Measure the temperature every 30 seconds for 10 minutes and note the results in a table. Plot the results on a graph and evaluate the results.
- Try to explain your conclusions and what the results have shown you.

1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020



S: Solar Used in space



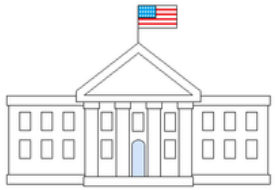
C: First solar powered calculator



R: Reduced prices. solar & wind becomes the cheapest.



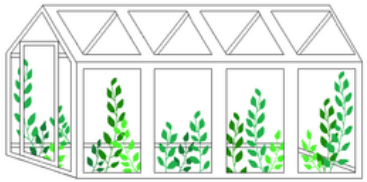
P: First solar patent filed



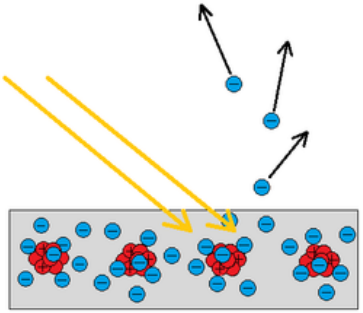
W: Solar on the White House



E: Einstein gets Nobel Prize for explaining PV effect



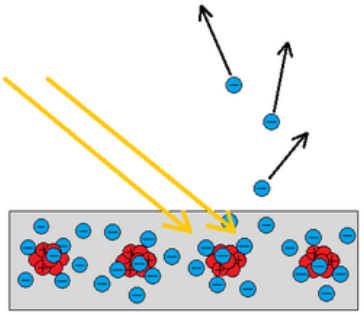
G: Greenhouses in botenical gardens



D: Discovery of the photovoltaic (PV) effect

Solar Energy History: Solution Sheet

1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000	2010	2020
D, G						E					P,S		W, C					R



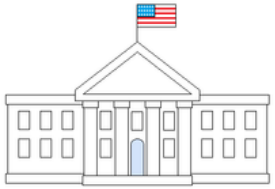
D: Discovery of the photovoltaic (PV) effect
-1839



E: Einstein gets Nobel Prize for explaining PV effect
-1905



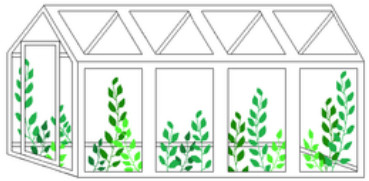
P: First solar patent filed
-1954



W: Solar on the White House
-1978



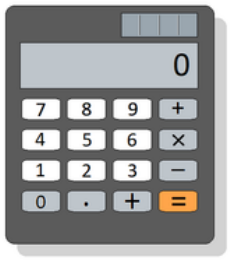
R: Reduced prices. solar & wind becomes the cheapest
-2021



G: Greenhouses in botenical gardens
-1800s



S: Solar Used in space
-1958



C: First solar powered calculator
-1978

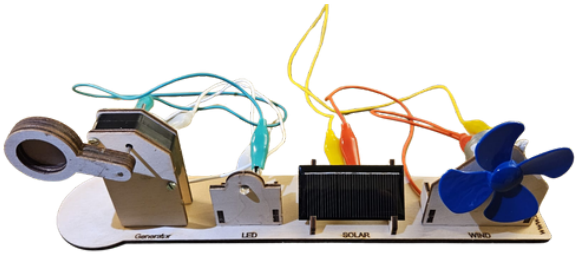
Station 3: Renewable Power Station

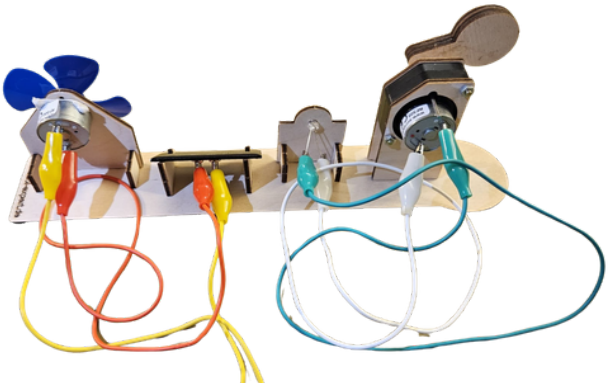
A. 3-type of energy generator and LED

Use a device: 3 types of energy generator and LED light, and connect them in different ways showing generating energy in 3 ways, and transferring electrical energy to mechanical and vice versa. The 3 types of energy are: solar, wind and hand-driven (mechanical/hydro energy). The experiment is easy and fun.

Connect the cables with crocodile clips together:

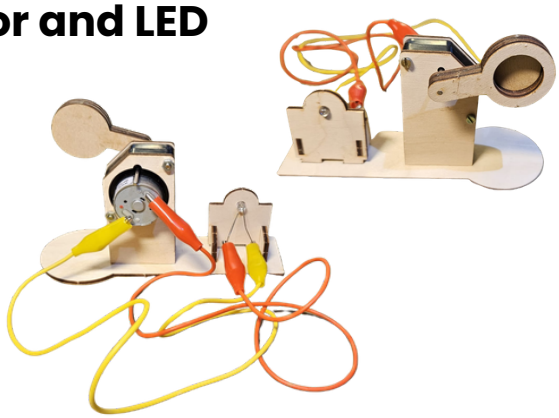
- Hand-driven crank to LED (mechanical energy to electricity)
- Hand driven crank to propeller (mechanical to mechanical energy)
- Solar cell to LED (light to electricity)
- Solar cell to propeller (light to mechanical energy)
- Solar cell to hand-driven crank (light to mechanical energy)
- Propeller to LED and blow air to the propeller (wind energy to electricity)





B. Hand-driven Energy Generator and LED

Use a device: Hand-driven crank, with a motor, which generator electricity to light an LED. This demonstrate a hydro power when mechanical energy is transferred to electricity.
This supplement the devices used at the wind energy and the solar stations.



How to buy and install: The above devices are assemble sets. The instructor need to assemble them before the training. It can take an hour when you first assemble them. Glue and instruction are in the package. The size is handy small. (Version A. is 25 cm long). They are available at Conrad Electronics, with shops in many European countries. Choose your country shop at conrad.com. Version A: Sol Expert 78898 (19 EUR). Version B: Sol Expert 16533 (10 EUR).
Alternatives: Connect single-energy devices or parts together. Ready assembled single-energy devices often need modifications as the cable connections are fixed.

Station 3: Renewable Power Station (continued)

C. Bike Wheel to Produce Electricity

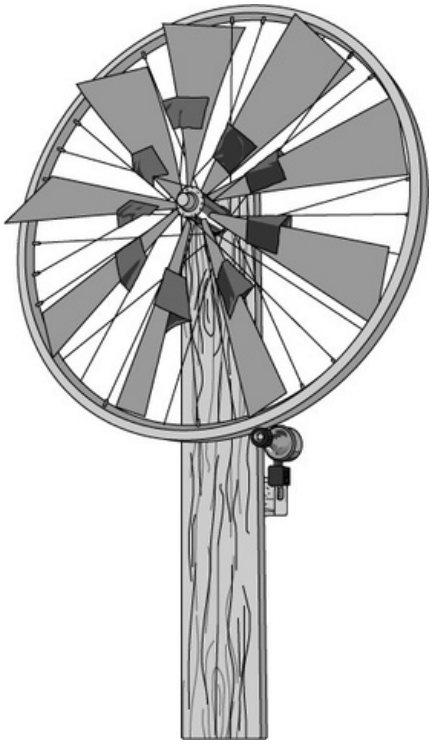
Use a bike or just a wheel with dynamo to light up a bicycle lamp (LED).
Turning of the wheel by hand or by pedaling the bike produce electricity in the dynamo, which lights up the lamp.
This experiment needs preparations of getting the bike or the wheel, and dynamo. If these are not available you can discuss it. Many people have bike with dynamo so it is a hands on knowledge.

Note: Check out the experiment of making the bike wheel to wind mill at the wind mill station.

See Station 1 C. for the bike wheel instructions

Add:

- **a lamp**
- **power it with the dynamo to show the use of wind energy for electricity.**



Station 4: Energy Saving - Energy Metering



A. Use Watt Meter and Electric Equipments

B**ackground :** Electrical alliances require electricity to operate.
Watts is a measure of the energy usage. Measuring the Watt and the time of usage gives the total electrical energy consumed.

Energy consumed = energy (Watt) X time
Wh = Watt X hours kWh = Watt/1000 X hours
In Europe the electricity has 220 Volt in the plugs of the wall.
Volt (pressure or push) x Ampere (flow) = Watt. (W)
compare to the water flow in a tube, the electrons are flowing in the wire
220 V x 10 A = 2.200 W = 2.2 kW (1 kW = 1000 W)

An electric meter measures the Watt of the actual appliances. The electric consumption can also be determined through the appliance rating written on the appliance. E.g., a light bulbs is 60 W or a hoover is 800 W. The higher Watt means that more power is consumed.

Experiment: Participants test the energy consumed by the appliances and can estimate the energy consumed by a household depending on how long they are used.

Material: An electric meter, 6-8 electrical appliances (hair dryer, microwave, hot pot, radio, TV, computer, cell phone, toaster, lamp, hoover etc.)

How to do:

- Plug the Watt meter into the wall and the appliance into the meter.
- Find the setting that reports “power,” - Watt (W).
- Measure the Watt usage for each appliance.
- Fill out the *Datasheet* using one row for each appliances.
  Note down the Name of appliance, How many Watt it uses.
- Set appliances for low and high setting (if available), add rows for these.
- Estimate the time you use this appliance at home. monthly. (hours)
- Calculate the energy consumed for each appliance monthly.
  (W x hours/1000 = kWh). or annualy (x 12 months) (optional)

Station 4: Energy Saving - Energy Metering

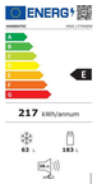
A. Use Watt Meter and Electric Equipments



Electricity Meter Data Worksheet

Appliance name	Setting	Watt appliance	Watt (measured)	Hours used monthly (h)	consumed monthly (kWh)*	cosumed annual (kWh)

Station 4: Energy Saving - Energy Metering
B. Exploring Energy Efficiency and Labels



Exercise:
Participants analyse real EU energy labels and use the pictograms and symbols to figure out which appliance each label belongs to. They then discuss how energy labels help evaluate efficiency and support better purchasing decisions.

Find the method description in the Curriculum.

Material:
- Explanation sheet with the newest EU energy labels for fridges, washing machines
  Source: European Commission 2024 - available in 30 languages
  https://energy-efficient-products.ec.europa.eu/ecodesign-and-energy-label/understanding-energy-label_en
- Worksheet for participants with 4 different EU energy labels
- Background

Background:
Electrical appliances use energy when they are switched on. How much energy an appliance uses depends on how it is designed and how efficient it is.

Energy efficiency means getting the same service (cooling food, washing clothes, displaying images, using a phone) while using less energy. More efficient appliances usually cost less to run and are better for the climate.

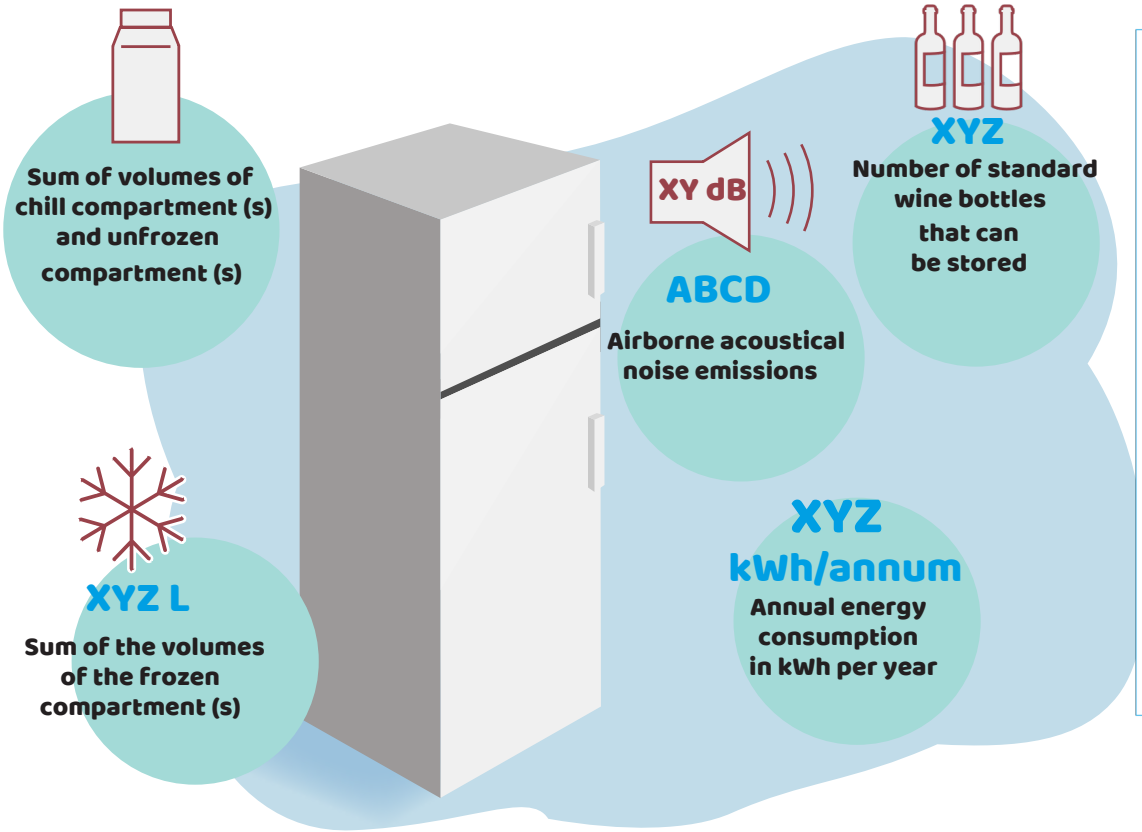
To help consumers understand the energy efficiency of household devices, the European Union uses energy labels. These labels show important information about an appliance's energy efficiency and other key features.
The new EU energy labels use a scale from A (most efficient) to G (least efficient).

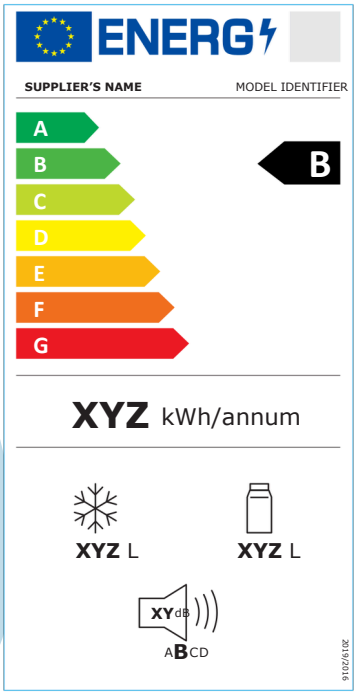
They also include pictograms that show information such as annual energy consumption, water use, noise level, screen size, or battery performance, depending on the product type. This information helps people compare products and make informed decisions before buying.

Energy Labels – Explanation Sheet

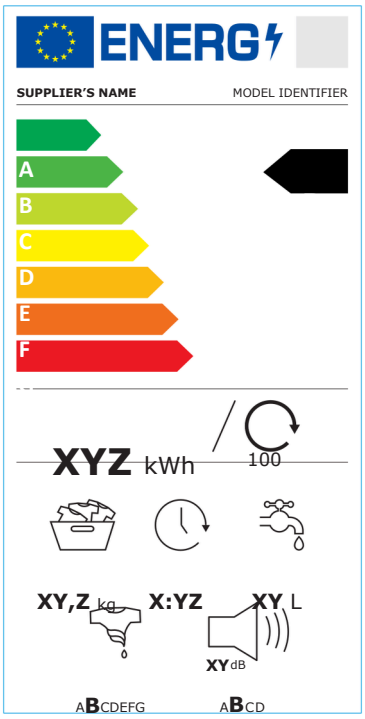
BELT
BOOST ENERGY LABEL TAKE UP

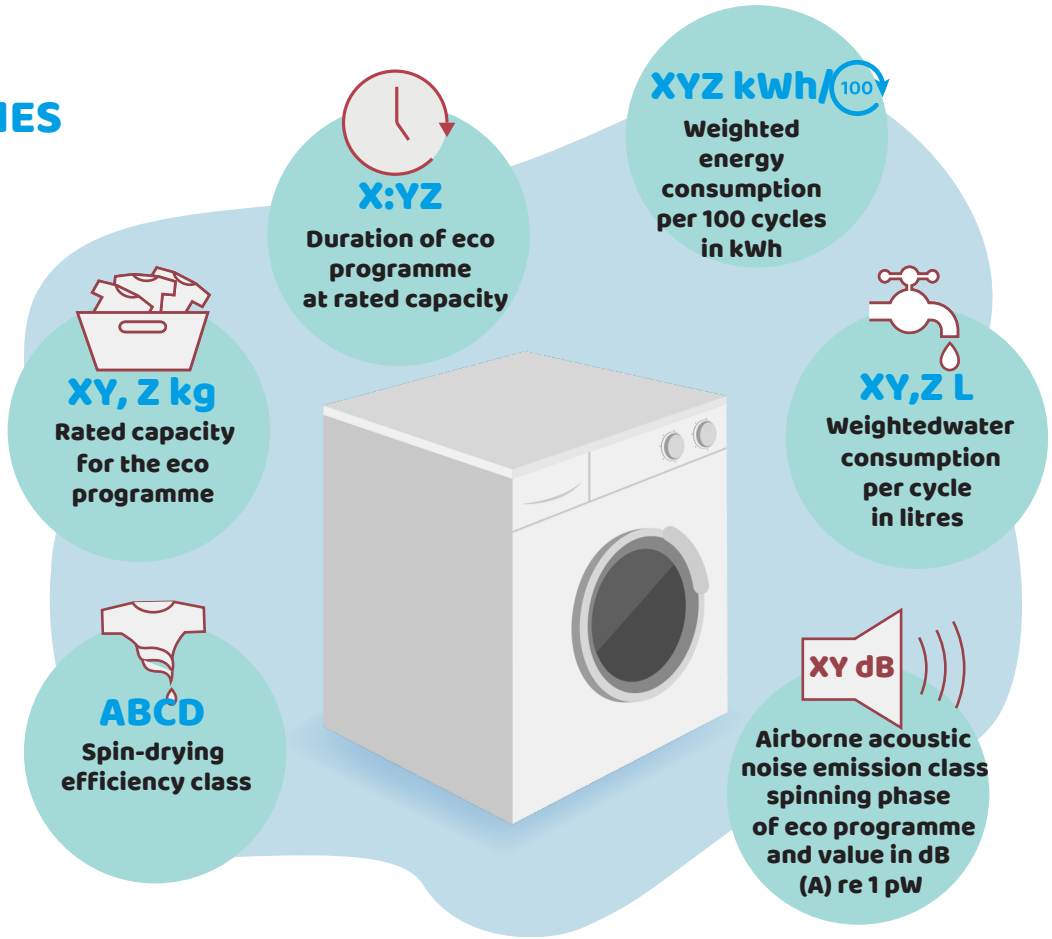
REFRIGERATOR APPLIANCES





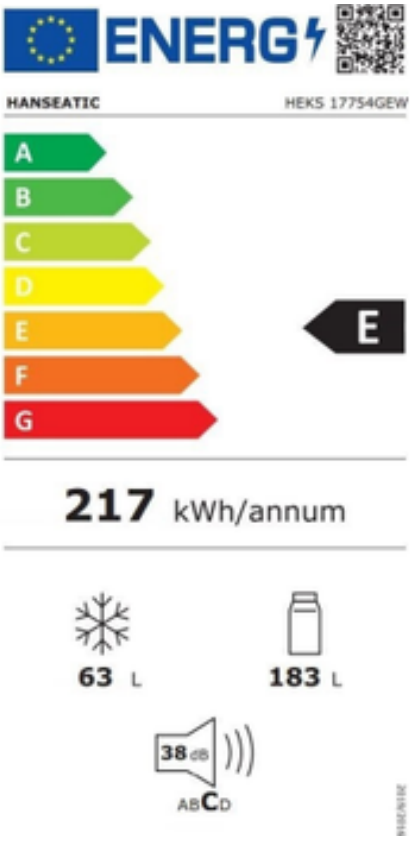
WASHING MACHINES

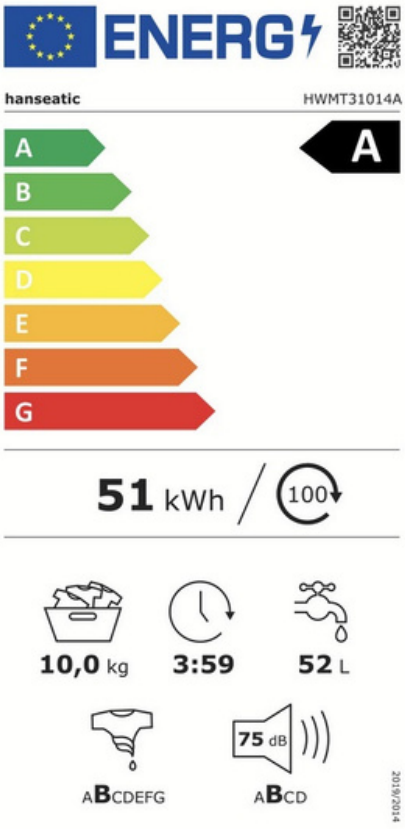


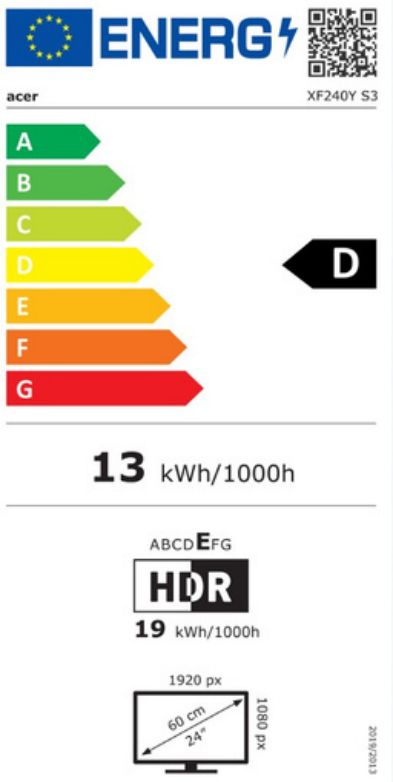


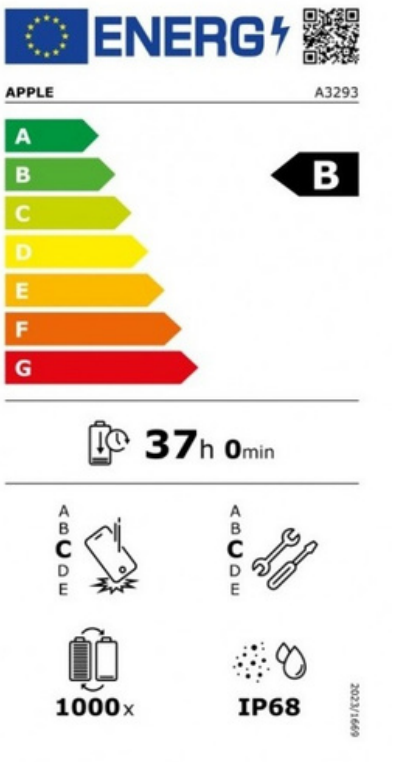
The project BELT has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 847043. The sole responsibility for this content lies with the authors. It does not necessarily reflect the opinion of the European Union. Neither the EASME nor the European Commission are responsible for any use that may be made of the information contained therein.

Energy Labels - Worksheet









Station 4: Energy Saving - Energy Metering

C. Low Cost Alternative: Energy Consumption Tables

Look at the table with an example of a household consumption from different appliances, and typical time usage.

The table calculates the annual consumption. You can estimate your own consumption. Discuss where you can spare energy, and money.

The table is available as an excel sheet to help a more detailed calculation for participants interested to calculate this. There can be done a specific training session on this (advanced level).



Station 4: Energy Saving – Energy Metering

Appliances	kWh average	Watt	hours/month	hours / 1 yr	kWh, year
Laptop (45-90 W)	45 – 90	65	150	1800	117
Mobile charging (5-20 W)	15	20	60	720	14.4
Mobile charger (0,5 W) 24 h					
Electric kettle (1500-3000W)	50 – 100	1500	4	48	72
Toaster 2 slice (900 W)					
Coffee machine (750-1500 W)	40 – 80	1200	6	72	86.4
Lamp halogen, 1 stk	30 – 80				
Lamp LED (5-12 W) 1 stk	5 – 15	40	150	1800	72
Hairdryer (2200 W)	15-40	2200	0.4	4.8	10.56
Tooth brush charger (1-2.5 W)	2 – 5				
Hairstrainer (60-100 W)	20 – 40				
Computer Monitor (25-30 W)	20 - 50	30	120	1440	43.2
Vacuum cleaner (900-1400 W)	20 - 50	1000	2	24	24
DVD/Blue Ray player (20 W)					
Radio (15 W)					
Iron (1500-3000 W)		1500	1	12	18
Washing machine 40-90C (600-2000W)	150 – 250	1000	8	96	96
Tumble dryer (1000-4000 W)	200 – 500	2000	4	48	96
Dishwasher A-C (600-2000 W)	200 – 380				300
Fridge A 100-300l (70-400 W)	100 – 400				
Fridge old, 400 l (150-400W)	300-500				
Freezer	200 – 400				
Television LED (17-40 W)	100 – 300				
Gaming console (200 W)	100 – 200				
PC desktop (>300 W)	300 – 600	300	90	1080	324
Lighting (general household)	300 – 500				
Microwave (800-1200 W)	30 – 60				
Cooker Hood (20-30 W)	20 – 40	20			
Induction / Electric Oven (2500-3000 W)	150 – 250	3000	8	96	288
Air Frier (1500-2000 W)					
WI-FI Router (15 W)	40-80	15	240	2880	43.2
Satelit TV Box/Streaming (30 W)		30	120	1440	43.2
Standby TV, toys 0,5-1 W (<2013)	20-60	2	720	8640	17.28
Standby internet: 2-8W (<2017)	60 -200	16	720	8640	138.2
Towel dryer	300-600				
Aquarium with heat and light	500 – 1,000				
Electric heater	3000-10,000				
Heater/cooler fan	600 – 1,000				
				Sum	1803

Station 5: Cooking

A. Look at Types of Cooking

See pictures of different type of solar and efficient type of cooking devices e.g., hay box, solar oven, efficient 2-pot cooker for fuel wood, electric-pressure cooker (efficient, insulated type).

Discuss: Cooking in both north and south, women cooking and collect firewood and water, indoor smoke, firewood crises, and desertification.

Look at the instruction sheets how to build a solar oven or a hay box. They are insipring to Do It Yourself (DIY). after the training or at the next training.

Optional: Look at the video on solar cooking in Africa including refugee camps. (10 minutes). It is in English speaking, with automated subtitle options in many languages.

Materials: Sheet with pictures, solar box cooker case, instruction sheet how to build a hay box, and a solar oven, link to a video.
Fact Sheet on Solar Energy and Biomass Energy

Link to video "Solar Cooking in Africa" (10 minutes) from this page:
https://solarcooking.fandom.com/wiki/Introduction_to_solar_cooking

B1: Build a Solar Oven

Material: Instruction sheet

B2: Build a Hay box / Fireless Cooker

Material: Instruction sheet

C: Cook something with a solar oven or with a hay box

Cooking during the training session can be fun. It is a hands on experience that it is actualy working. It can be a solar oven or a hay box made by a training earlier or ready bought. The solar oven needs a sunny day, but a hay box can be used in any wheather.

Sources and additional information:

The pictures are from INFORSE local solution database for East Africa. You can find several cases in the database or in the publication. Link to the database: https://localsolutions.inforse.org/ . Download the Publication as pdf file: https://inforse.org/africa/pdfs/Catalogue_LocalSustainableSolutions_EastAfrica_March2023_F.pdf

The how to build experiments are from INFORSE's school material collection: https://inforse.org/europe/schools/experiments.htm

Station 5 A - Cooking

Pictures of different types of cooking devices







Efficient 2-pot cooking stoves and institutional ovens for fuel wood.

Advantages: Less firewood needed as there is one fire and it cooks in 2 pots. Smoke is reduced in the kitchen as there is a chimney. It is available locally, built from local matrials.

Foldabale solar cooker, Solar box oven

Advantages: no fuel needed, no smoke.

Why is it good? Less fuel wood used thus less deforestation. Smoke causes eye infection and lung diseases. Reduces time for women cooking and collecting fuelwood.



Hay box /fireless cooker
Electric-pressure cooker (insulated)







Photos: JEEP, TATEDO, SCI, INFORSE

Case: Solar Box Cooker in Uganda





Photo: JEEP

Advantages: Solar box cookers are an easy way to use less firewood/fuel/electricity and save money. Beyond cooking, it can be also used for drying and preserving farm produce like fruit, and spices. There is no smoke and it reduces the time for cooking and collecting firewood.

Climate effect:

Solar box cookers produce no smoke and no pollution, hence reducing greenhouse gas emissions by 100%. Solar cookers decrease the demand for firewood, saving up to 1 ton of wood per year for each solar cooker.

Savings per day:

The solar box cooker saves the use of fuels for cooking, because it requires no fuels for heat generation.

Cost in money and in own time to construct:

The ready solar box cooker costs 40-100 EUR.
It can be made cheaper using local and reused materials. It takes 1-5 hours to make one depending on the model, and the preparation made.

Lifetime: Around 10-20 years.

Resources needed in use:

Good sunny weather, knowledge of solar cooking. Recipe books are available.

Skills needed to make, install, maintain, use:

Production requires some technical skills depending of the model. There are no specific skills required to maintain or to install the solar box; all you need is to keep it clean. Using a black pot increases the efficiency.

Limitations:

Requires sunny weather. Cannot fry foods. In cultures where frying is common, uptake of solar cookers is less.

If you can make it, a short description, typical problems, materials needed:

You need a box, reflecting mirror/aluminium folia, and a transparent cover.
See the instruction sheet.

Where and how can you get it or make it?

The solar box is sold at NGOs like JEEP's offices in Uganda, through online shopping platforms. Manuals how to make it are available.

Why is it successful ? Promotion methods

JEEP promotes renewable energy for cooking as solar cookers and hay boxes. JEEP carries out trainings, and also encouraging youth to be creative and to start producing these boxes to earn some income, to make it cheaper, and to make it available to all kinds of people.
Financial support has reduced the costs.

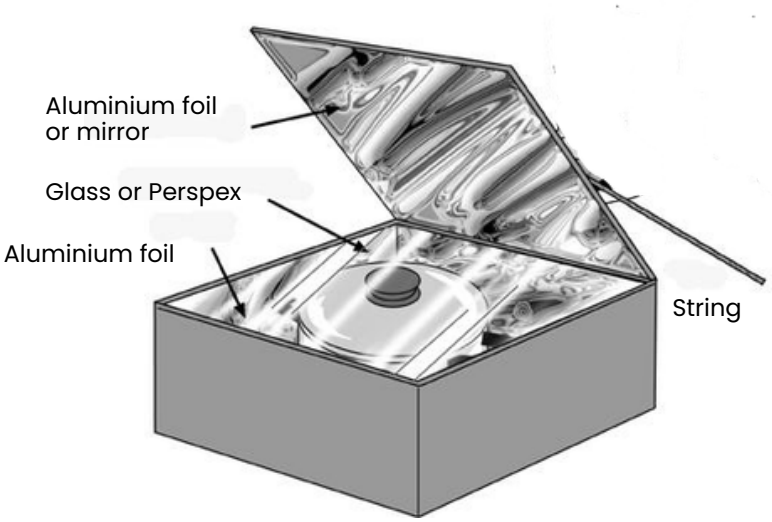
Sources & More information:

Joint Energy Environment Projects (JEEP) in Uganda. W: www.jeepfolkecenter.org
East Africa Catalogue of Local Solutions:
W: www.localsolutions.inforse.org

Station 5 Cooking - B1 Worksheet

Build a Solar Oven

Background: In developing countries, where cooking fuel resources are very limited, wood is often the only fuel. Trees are cut and not replanted, which results in soil erosion and often desertification. Cooking with a solar oven, which is not using fuel, decreases the use of wood, and no cost to use.
In Europe, it is used by people concerned on environment, and scouts, especially in dry periods, when you are not allowed to make fireplace.
The solar oven can be made from simple material.



Materials needed:

1. a cardboard box
2. aluminium foil or a mirror
3. clear glass or transparent plastic sheet or transparent baking foil.
4. tape, glue
5. string, nail
6. thermometer

How to do:

1. Cover the inside of the box with aluminium foil. Put the mirror or foil on the inside of the lid. Fasten the string with nail or tape so the lid can be inclined at different positions.
2. Put the clear glass or transparent sheet over the open cardboard box and put the oven in the sun light.
3. Tilt the lid to enable as much sunlight as possible to reflect into the oven.
4. Place a thermometer in the oven and observe the rise in temperature.
5. How high can the temperature rise?
6. Try to make a cup of tea, a cooked egg or something else edible in the oven.

Modification options:

- Put an insulating flamingo foam box (reused from packaging) inside and cover that with aluminium foil. Aluminium foil reflects the sun to the pot. Instead of aluminium foil, paint the walls black to keep the heat in the box.
- Use a black pot.
- If you do not have a transparent cover, it works as a solar cooker. You can increase the efficiency by putting the pot in a transparent plastic bag.

Station 5: Cooking - B2 Worksheet

Build a Hay box / Fireless Cooker

Back ground: Using hay box, also called fireless cooker, saves fuels.
Hayboxes are used in areas where cooking fuels are scare and expensive. It is a simple device. Non-profit organisations organise workshops to make it or sell ready made colorful models in Africa, Asia, and Europe.



Materials needed:

1. Cardboard box or wood box or straw baskets
2. Insulation material (wool, cloth, cork, halm etc.,)
3. Cooking pot

Alternatives for a box or basket:

- A bag from cloth with insulating material inside tailored for the purpose.
- Fold a blanket around the pot.

How to make it:
Take a cardboard box, wooden box or basket. Put insulation in it.
Cook the food for 5-10 minutes boiling. Put the pot into the haybox for 2.5 hours. Make sure to cover it with the insulation. Close the lid or wrap a blanket around it to trap the warmth inside.

How does it work:
The food in the pot is close to 100°C after the food was boiling. When the hot pot is placed in an insulated box, the food finishes cooking. The food is kept hot enough to simmer to completion, because the stored heat stays in the food.

Hayboxes used In Denmark:
Haybox has been used for centuries in Denmark at farms, where hay was available. It was also used during the World War II, when the gas prices were high and people wanted to spare the gas. Today, it is still used in simplified way at Christmas to make the traditional rice porridge. Blankets are folded around the pot to cook rice porridge ready after boiling it up. It is popular as you do not need stirring it continuously, and can avoid burning the rice down.



Transport



Transport



Transport



Transport



Transport



Transport

1€ public transport ticket

→ **Reduce carbon footprint of your team by 1.25 tons / 5 lines**

More people use public transport. This means less traffic and emissions.

Expansion of bicycle infrastructure

→ **Reduce carbon footprint of your team by 1 ton / 4 lines**

More bikes means emission-free mobility and less car traffic.

Citytoll -Fee on entering cities by car

→ **Reduce carbon footprint of your team by 0.75 tons / 3 lines**

Less car traffic in cities and more public transport.

Motorway construction programme

→ **Increase carbon footprint of your team by 0.5 tons / 2 lines**

Results in more car traffic and truck deliveries.

Increase in tax bonus for car commuters

→ **Increase carbon footprint of your team by 1 ton / 4 lines**

Promotes daily car rides to work.This means more traffic and emissions.

Government support for the car industry

→ **Increase carbon footprint of your team by 1.25 tons / 5 lines**

Supporting car manufacturers slows down the transition to public transport.



Waste & Recycling



Waste & Recycling



Waste & Recycling



Waste & Recycling



Waste & Recycling



Waste & Recycling

Ban on single-use plastics

→ **Reduce carbon footprint of your team by 1 ton / 4 lines**

Plastic products have to be recyclable. A lot less waste and pollution is the result.

Mandatory reusable packaging

→ **Reduce carbon footprint of your team by 0.75 tons / 3 lines**

Re-use systems like with bottles reduce plastic waste in the long term.

No recycling duties for private households

→ **Increase carbon footprint of your team by 0.5 tons / 2 lines**

More waste and environmental pollution is the result.

Lifting the ban on single-use plastics

→ **Increase carbon footprint of your team by 1 ton / 4 lines**

More waste and environmental pollution is the result.

Subsidies for plastic packaging

→ **Increase carbon footprint of your team by 0.75 tons / 3 lines**

Makes sustainable alternatives less attractive.

Subsidies for zero-waste shops

→ **Reduce carbon footprint of your team by 0.5 tons / 2 lines**

More plastic-free shopping alternatives.



Food & Drink



Food & Drink



Food & Drink



Food & Drink



Food & Drink



Food & Drink

Tax on high-emission meat

→ Reduce carbon footprint of your team by 1 ton / 4 lines

Makes beef more expensive. Eating less beef means less emissions.

Subsidy for plant-based foods

→ Reduce carbon footprint of your team by 0.75 tons / 3 lines

Makes sustainable food cheaper. Eating more sustainable means less emissions.

Removal of labelling requirements

→ Increase carbon footprint of your team by 0.75 tons / 3 lines

If no label of ingredients is needed, cheaper high emission ingredients will be used.

Subsidies for meat/dairy farming

-> Increase carbon footprint of your team by 1 ton / 4 lines

Makes meat/dairy cheaper. Eating more meat/dairy means more emissions.

Advertising ban on high emission foods

→ Reduce carbon footprint of your team by 0.5 tons / 2 lines

Changes our diet to low emission options.

Increase tax on vegan products

→ Increase carbon footprint of your team by 0.5 tons / 2 lines

Makes vegan products more expensive.



Holidays



Holidays



Holidays



Holidays



Holidays



Holidays

CO_2 tax on all flight tickets

→ Reduce carbon footprint of your team by 1.25 tons / 5 lines

More people travel with sustainable alternatives. Lower emissions are the result.

Subsidies on long distance train rides

→ Reduce carbon footprint of your team by 0.75 tons / 3 lines

Cheaper long distance trains replace flights and are more climate-friendly

Tax on cruise ships

→ Reduce carbon footprint of your team by 1 ton / 4 lines

Emission-intensive cruises become more expensive and less popular.

Lift of flight tax

→ Increase carbon footprint o your team by 1.25 tons / 5 lines

More people travel by plane. Higher emissions are the result..

Toll free roads: Paid highways become free

→ Increase carbon footprint of your team by 0.75 ton / 3 lines

Holidays by car are cheaper and rail travel reduced. As a result emissions rise.

Subsidies for new cruise terminals

→ Increase carbon footprint of your team by 1 ton / 4 lines

Emission-intensive cruises become cheaper and more popular.



Pets & Things at Home



Pets & Things at Home



Pets & Things at Home



Pets & Things at Home



Pets & Things at Home



Pets & Things at Home

Right to repair

→ **Reduce carbon footprint of your team by 0.75 tons / 3 lines**

Electronic waste becomes less.

Subsidies for durable appliances

→ **Reduce carbon footprint of your team by 1 ton / 4 lines**

Energy & resource use goes down.

CO_2 tax on animal food

→ **Reduce carbon footprint of your team by 0.5 tons / 2 lines**

Companies save money by emitting less in animal food production.

Tax reduction on electronics.

→ **Increase carbon footprint of your team by 0.75 tons / 3 lines**

When new gadgets become cheaper, there is less repairs, more waste and resources.

Relaxation of energy efficiency standards

→ **Increase carbon footprint of your team by 1 ton / 4 lines A**

Electricity consumption appliances goes up.

Subsidies for cheap animal food

→ **Increase carbon footprint of your team by 0.5 tons / 2 lines**

More emissions in food production.



Housing, Power & Heating



Housing, Power & Heating



Housing, Power & Heating



Housing, Power & Heating



Housing, Power & Heating



Housing, Power & Heating

Subsidies for heat pumps

→ **Reduce carbon footprint of your team by 1 ton / 4 lines**

Heat pumps are renewable energy and reduce emissions.

Subsidised building insulation

→ **Reduce carbon footprint o your team by 1.25 tons / 5 lines**

Insulation keeps temperature in buildings steady and less heating is needed

Tax on oversized apartments and houses

→ **Reduce carbon footprint of your team by 0.75 tons / 3 lines**

Smaller living space means less heating & power needed.

Subsidies for gas/oil heating

→ **Increase carbon footprint o your team by 1.25 tons / 5 lines**

Fossil energies like oil create high emissions. Transformation to renewable is delayed.

Support for building single-family homes

→ **Increase carbon footprint of your team by 1 ton / 4 lines**

Large living space means more heating & power needed.

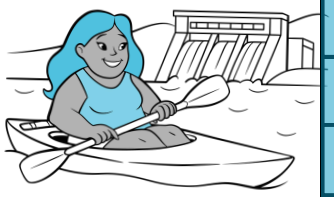
Lower energy standards for new houses

→ **Increase carbon footprint of your team by 0.75 tons / 3 lines**

New houses need more energy. Change to carbon neutral housing is delayed.

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6

5

5 tons: Shared emissions – independent of your decisions this CO_2 is emitted from government facilities including military as well as public services such as public transport and health care. This value may differ by country.

4.7 tons: EU goal per person by 2030 excluding imports and aviation by 2030.

Gameplay

- **Form teams: You can play 1 on 1 or form two teams, that play against each other.**
- **Round structure: One team plays at a time:**
- **Select a category**
- **Discuss and reach consensus on each lifestyle tile from the category,**
- **before you place it**
- **Draw a political intervention card**
- **Move your tiles up or down accordingly.**
- **Final round:**
- **Each team draws a political intervention card from the area that they spent the most CO_2 on.**
- **Winner: The team with the lower total score wins.**
- **End discussion:**
- **What makes the biggest difference for your footprint in the game and in real life: Personal decisions, politics or luck ?**

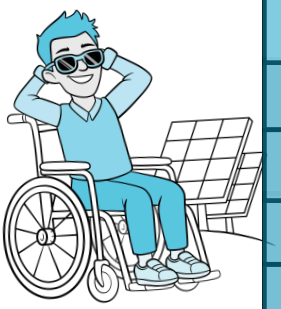
Note: The values are rounded. The CO_2 values are CO_2equvalent

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0-TONS CARDS

9.1 tons: EU average CO_2 emissions per person including consumption (2023)



13

12

11

10

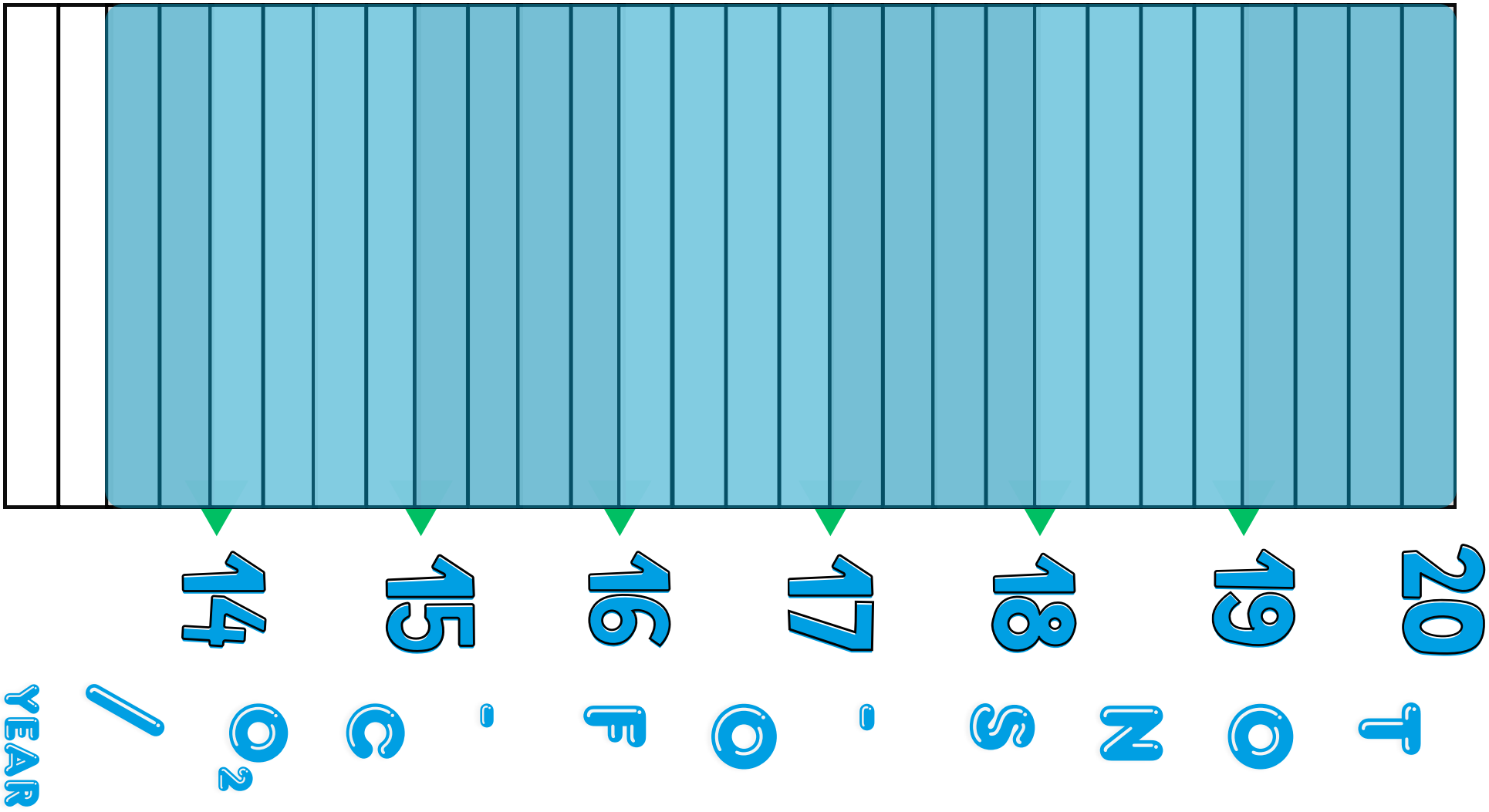
9

8

7

0-TONS CARDS

ely CLIMATE GAME



Car travel in Europe
+ 0.5

Travel by plane in Europe
+1

Car travel in Europe
+ 0.5



One vacation by plane to other continents
+ 3

Travel by train + 0.25

Travel by train + 0.25

Travel by train + 0.25

One vacation by plane in Europe
+1

Staycation / holiday at home + 0

Own vacation home
+ 0.75



Large flat or house
>50 m² per person +1.50

Small flat or house
< 30 m² per person +0.75

Medium-sized flat or house
up to 50 m² per person
+1



One vacation by plane to other continents
+ 3

Buy in standard packaging
+ 0.5

No packaging + 0

Little packaging +0.25

New furniture + 0.25

Recycled clothing + 0

Never repair but buy new
+1

Do not recycle waste + 0.5

New clothing >= every year
+ 0.75

Heated with district heating
+ 0.75

Heated with heat pump
+ 0.50

Own solar panel +0

Natural gas heating
+ 1.75

Use electric dryer or washer dryer to dry clothing
+1.75

Holiday at home + 0

Tablet + 0.25

One Computer / Laptop + 0.25

One Mobile Phone + 0.250

One Dog
+ 1

One Dog
+ 1

One Cat + 0.25

One Cat + 0.25

Tablet + 0.25

Screen or TV +0.25

One Mobile Phone + 0.25

One Computer / Laptop + 0.25

Public transport everyday + 0

Bicycle or scooter everyday + 0

Vegatarian + 0

Vegan + 0

Eat Cheese / Joghurrt + 0.25

Cooking everyday + 0

Plant-based drinks + 0

Take away once a week + 0.25

Eat beef, no meat-free days
+ 2

Take away 5 to 7 times a week
+ 1.75

Take away two to four
times a week + 1

Drive electric car everyday
+ 0.75



Drive car (petrol/diesel)
everyday
+ 2

Pork/chicken daily, no beef
+ 0.5

Pork/Chicken, 2 free days + 0.25

Eat beef, 2 meat-free days
+ 0.5

Milk every day + 0.5

Renewable Power provider + 0.25

Fossil power provider
+ 0.75

Phone + 0.25

Computer / Laptop + 0.25

Module 2: Energy ABC
METHOD 4: LEGO FUTURE SCENARIOS
Facilitator Guide

Perform the method as described in the handbook.
Read the Fact Sheet on Energy Communities to prepare yourself on the topic.

Make sure not to give much input before the creative Lego activity. Give the first slide ofthe presntation with the definition of an Energy community as a frame. Then let the participants make up their own minds and create their community freely.

Lego building frees up fantasy, and participants get inspired to build and get a story. It is useful to have mainly basic bricks in different sizes and colors.

Show the remaining slides of the short presentation after the participants presented their creative energy communities. It gives the participants an insight into real life energy communities, how they can be achieved and what purpose they fulfill.

Energy Communities

- Energy communities are groups of local people who produce and use energy together.
- They usually use renewable energy, such as solar or wind power.
- The energy is produced and used locally in the same area.
- This helps reduce dependence on large energy companies.
- People in the community decide together how the energy is produced and used.





8 Reasons to Start or Join a Community Energy Project



- Help fight the climate crisis.
- Keep money in your local community.
- Reduce energy poverty in your area.
- Strengthen your community neighborhood, meet new people.
- Produce your own clean renewable energy.
- Educate others about energy, climate, and democracy.
- Inspire other communities to act.
- Create the kind of sustainable world you want to live in.

Six Steps to Start

Step	**Action**
1. Gather people	Invite neighbours, schools, or the municipality.
2. Define goals	Aim at lower costs, CO_2 reduction, new local jobs.
3. Map resources	Check weather conditions and available places (e.g. roofs and open space) for solar or wind projects.
4. Choose a model	Decide on an organisation form: cooperative or association.
5. Plan the system	Select technologies (like solar, wind,) and where to install them.
6. Find funding	Raise money from members, grants, or crowdfunding.



Real Life Example : Dorset Community Energy

- a local energy project in the United Kingdom, producing cheaper solar electricity
- The project was started by local citizens as a community organisation.
- Solar panels were installed on the roofs of schools and public buildings in the area.
- Local people invested small amounts of money and received a small yearly return.

What Worked Well



- Many schools and public buildings use solar power.
- Many local people joined and supported the project.
- Electricity prices stayed stable over time.
- Over time, the project created high financial savings for schools and public services.
- The community became stronger and more connected.

Facilitator Guide

Explain to participants that during the session you will consider, which countries emit the most carbon dioxide (CO_2) where Poland ranks among these countries, and discuss who is most responsible for reducing CO_2 emissions in Poland. To begin with, ask the participants what determines the amount of CO_2 emitted annually by a country? What factors cause some countries to emit a lot of CO_2 and others relatively little? Discuss this topic for a while, adding to your participants' comments if necessary.

Annual carbon dioxide emissions depend on many factors, some of which are:

- the population of a given country
- the level of development of the country
- the wealth of its inhabitants
- the level of consumption of the inhabitants
- the nature of the country's economy (whether it is focused on industry, agriculture, or tourism)
- the degree of industrial development and the nature of industry
- the country's energy system (based on the burning of fossil fuels or renewable energy sources)

Poland

China

India

Japan

Germany

Indonesia

Brazil

France

United States

Nigeria

New Zealand

Denmark

Tanzania

Congo

Malta

Russia

Solution - Hang next to the attempts of the participants

China - 10,065 Mton CO_2 (in 2018)

United States - 5,416 Mton CO_2 (in 2018)

India - 2,654 Mton CO_2 (in 2018)

Russia - 1,711 Mton CO_2 (in 2018)

Japan - 1,162 Mton CO_2 (in 2018)

Germany - 760 Mton CO_2 (in 2018)

Indonesia - 615 Mton CO_2 (in 2018)

Brazil - 457 Mton CO_2 (in 2018)

Poland - 344 Mton CO_2 (in 2018)

France - 338 Mton CO_2 (in 2018)

Nigeria - 127 Mton CO_2 (in 2018)

New Zealand - 35 Mton CO_2 (in 2018)

Denmark - 34.6 Mton CO_2 (in 2018)

Tanzania - 13 Mton CO_2 (in 2018)

Congo - 3.2 Mton CO_2 (in 2018)

Malta - 1.55 Mton CO_2 (in 2018)

Material

- Facilitator guide
- Category Cards
- Risk Cards

Preparation

- Download and familiarise yourself with the facilitator guide
- Prepare a workspace (physical or digital) for sticky-note brainstorming and system mapping.
- Prepare and print or load: Category Cards, Risk Cards

Suggested CATEGORY CARDS

(From the brainstorming clusters listed in the method description, p. 24–25)

These cards help participants place activities on the map and see how sectors connect.

The following categories are available below as printable cards.

There is three empty slots for additional slots, that come up during facilitation.

Energy Use Sectors / Categories

Transport

Food Production

Heating & Cooling

Electricity Production

Industry & Factories

Construction & Housing

Internet & Digital Services

Health & Hospitals

Waste & Recycling

Water Supply

Agriculture & Land Use

Mining & Resource Extraction

Retail & Consumer Goods

Communication & Media

Government & Public Services

Electricity Production	Industry & Factories	Internet & Digital Services
Food Production	Government & Public Services	Communication & Media
Transport	Heating & Cooling	Construction & Housing

	Agriculture & Land Use	**Health & Hospitals**
	Retail & Consumer Goods	**Waste & Recycling**
	Mining & Resources	**Water Supply**

Suggested RISK CARDS

(For use during "Mapping Injustice" when participants place their Climate Walk stories on the system map, p. 26)
These risks reflect social impacts, climate justice issues, and systemic vulnerabilities.

The following risk cards are available below as printable cards.

Climate & Environmental Risks:

Extreme Heat
Drought
Flooding & Sea-Level Rise
Storms & Cyclones
Water Scarcity
Crop Failure
Biodiversity Loss
Air Pollution
Land Degradation

Social & Economic Risks:

Loss of Homes
Loss of Jobs
Water & Food Insecurity
Health Problems
Migration & Displacement
Rising Energy Prices
Unequal Access to Health Care
Unequal Access to Electricity
Poverty Increase
Loss of Access to Education

Storms & Cyclones	Drought	Biodiversity Loss
Extreme Heat	Crop Failure	Air Pollution
Water Scarcity	Flooding & Sea-Level Rise	Land Degradation

Loss of Homess	Rising Energy Prices	Loss of Access to Education
Loss of Jobs	Migration & Displacement	Unequal Access to Electricity
Water or Food Insecurity	Unequal Access to Health Care	Poverty Increase

South Sulawesi, Indonesia – Polluted Rivers from Battery Mining



You live in Luwu Timur, South Sulawesi.
Near to your village Nickel and Lithium mines pollute the river you once used for drinking and fishing. These minerals are sent to build batteries for electric cars and tech products around the world.

https://www.ecohubmap.com/hot-spot/pollution-in-the-citarum-river/52ilml7j38d5g

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What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Funafuti, Tuvalu – Sinking Island, No Energy Access



You live on Funafuti, the main island of Tuvalu in the Pacific. Sea levels are rising, flooding your land. Your island uses diesel generators for electricity, but fuel is expensive. While others shift to electric cars, your community struggles to power a fan.

https://english.aaj.tv/news/30347867/tuvalu-a-sinking-nation-that-is-replicating-itself-in-metaverse

What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Manicoré, Brazil – Forest Cut for Soy Export



You are from Manicoré, in the Brazilian Amazon. Forest near your home is cleared to grow soybeans, mostly exported to feed livestock in Europe and China. Deforestation increases heat, floods, and smoke, while you lose access to hunting and clean water.

https://edition.cnn.com/2020/07/16/americas/brazil-deforestation-soy-beef-eu-intl-hnk/index.html

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What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Tabasco, Mexico – Fracking and Rural Pollution



In the state of Tabasco, fracking and oil drilling have polluted land and water in rural villages. Flares burn night and day, while local communities see little benefit and suffer health issues. The oil is exported or used in transport fuel.

https://350.org/es/mexico-aproba-explotacion-por-fracking/

What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Agbogbloshie, Accra, Ghana – Dumping Ground for E-Waste



You live in Accra near Agbogbloshie, one of the world's biggest e- waste sites. Old computers, TVs, and phones arrive from Europe and North America. People burn electronics to extract copper. The air is toxic, and there is no recycling system.

https://ghana.for91days.com/agbogbloshie/

What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

eMalahleni, South Africa – Living Next to Coal



You live in eMalahleni, Mpumalanga, South Africa. The area has dozens of coal mines and power plants that send electricity across the country. Your community breathes coal dust daily, but has frequent blackouts and little healthcare.

https://cer.org.za/news/air-pollution-from-coal-power-stations-causes-disease-and-kills-thousands-of-south-africans-every-year-says-uk-expert

What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Grünheide, Germany – Migrant Labour in the Electric Vehicle Industry



You live in Grünheide, Brandenburg, near the Tesla Gigafactory. Many workers are migrants, some from climate-affected regions. They work long hours building electric cars, often in precarious conditions. The factory brings tax income but nearby villages face water shortages and traffic from factory operations.

https://www.zdfheute.de/politik/deutschland/tesla-protest-camp-gruenheide-aktivisten-100.html

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What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Central Greece – Wildfires and Energy Poverty



You live in a village in Central Greece. Every summer, wildfires get worse due to heatwaves, drought, and land mismanagement. Fires destroy homes, farmland, and forests. Rebuilding takes time and resources. Power outages follow, and poor families can't afford cooling or relocation.

https://www.aljazeera.com/gallery/2024/9/30/raging-wildfires-in-central-greece-leave-two-people-dead?traffic_source=rss

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What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

California Central Valley, USA – Monoculture Farming and Desertification



You live in the Central Valley, California, where large-scale monoculture—growing only almonds, grapes, or lettuce— uses huge amounts of water and pesticides. The soil is eroding, and long droughts linked to climate change are turning the land into desert. Farmworkers, often migrants, work under harsh conditions to supply supermarkets far away.

https://www.farmers.gov/blog/five-facts-about-united-states-drought-monitor

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What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Basra, Iraq – Oil Rich, Water Poor



You live in Basra, southern Iraq, near one of the world's richest oil fields. International companies extract oil here, fueling cars and planes around the world. But your town lacks clean water. Oil pollution and climate change have made the rivers salty and toxic. Many young people want to leave, but there are few jobs beyond oil.

https://www.hrw.org/news/2019/07/22/iraq-water-crisis-basra

What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Gafsa, Tunisia – Phosphate Mining and Unemployment



You live in Gafsa, Tunisia, where phosphate is mined for use in fertilizers and industrial processes worldwide. Mining pollutes the air and soil, and most of the profits go to national elites or foreign buyers. Despite living next to the mine, local youth face high unemployment and poor services.

https://geographical.co.uk/science-%20environment/gafsas-silent-suffering-the-hidden-cost-of-phosphate-mining-in-tunisia

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What kinds of impacts can you see on the environment and climate?

What kinds of impacts can you see on society and the economy?

Faciiliator Guide

Conduct the exercise as described in the handbook.

Additional materials on climate change tensions and conflicts can be found here:
https://www.youtube.com/watch?v=4IMnDpLBdLU
https://www.youtube.com/watch?v=T4sMkZKm91
https://www.youtube.com/watch?v=FQTCfJe0S4w
https://www.youtube.com/watch?v=bLbMguoHphY

A Peters Projection Map is available here:
https://commons.wikimedia.org/wiki/File:Peters_projection,_warm_grey.png

Below please find the conflict cards to print out for the exercise. Make sure to exclude conflicts that could be connected to trauma for the participants.

Conflict Cards

Resource- and Climate-Related Conflicts Around the World

Africa: Sudan (Darfur Conflict)

Place: Africa, Sudan

Time: Since early 2000s

Description: Desertification and water scarcity have reduced access to fertile land and pasture, intensifying tensions between nomadic pastoralist communities and settled farming populations.
As traditional migration routes narrowed and resources dwindled, local disputes escalated into armed conflict, with widespread displacement.

Involved groups: Nomadic pastoralists (many of Arab background), settled farmers (many of non-Arab background), armed militias, state forces

Outlook: Climate pressures persist; peace agreements fragile; resource-based tensions remain unresolved.

South America: Amazon Basin (Brazil, Peru)

Place: South America, Brazil, Peru

Time: Since early 2000s (intensified)

Description: Deforestation, illegal resource extraction, and land use change have led to disputes over territory and environmental protection. Indigenous communities have organised to defend their land rights and ecosystems, often facing encroachment from external actors.

Involved groups: Indigenous groups, extractive operators (e.g. miners, loggers), landowners, government bodies

Outlook: Rising pressure for conservation; conflict risks remain amid weak enforcement and climate threats.

North America: Northern Triangle Migration

Place: North America, Central American region (Honduras, Guatemala, El Salvador)

Time: Intensified since mid 2010s.

Description: Recurring droughts and crop failures have undermined rural livelihoods, driving migration northward and straining regional relations. People seeking better living conditions often face restrictive immigration policies and border enforcement.

Involved groups: Migrant communities, farming households, national governments, border authorities

Outlook: Migration expected to rise with climate stress; increased international cooperation on adaptation is under discussion.

Oceania: Papua New Guinea (Bougainville Conflict)

Place: Oceania, Papua New Guinea

Time: 1988–1998, aftermath ongoing

Description: Disputes over environmental degradation and perceived inequality in mining benefits at the Panguna copper mine led to armed conflict. Local communities mobilised against mining operations and state forces, demanding land rights and autonomy.

Involved groups: Local landowners, Bougainvillean armed groups, Papua New Guinea state authorities

Outlook: Bougainville's vote for independence (2019) has opened a path for peaceful transition; environmental and land issues remain central.

Europe: Russia–Ukraine Conflict

Europe: Russia–Ukraine Conflict

Place: Europe, Ukraine

Time: Since 2014; full-scale invasion since 2022

Description: The conflict centres on control over land, energy infrastructure, resources, and transport routes. Russian attacks and occupation have caused mass displacement and major disruption of food and energy supplies. The militarisation of nuclear power plants creates serious regional risks.

Involved groups: Russian armed forces, Ukrainian state and defense forces, municipalities, displaced civilians, international actors.
Outlook: Ongoing conflict with lasting impacts on energy and food security.

Arctic: Greenland

Arctic Ice Sheet – Resource Access and Sovereignty

Place: Arctic, Greenland (Kalaallit Nunaat)

Time: Since 2010s

Description: Ice-sheet melt has expanded access to minerals, shipping routes, and fisheries, increasing geopolitical and economic pressure. Tensions have grown between foreign investment interests and local control, alongside environmental and cultural concerns.

Involved groups: Greenlandic communities, Government of Greenland, Denmark, international companies, environmental organisations.
Outlook: Strategic competition is increasing; sustainable development and Indigenous rights remain contested.

Asia: China (Tibetan Plateau – Pasture Access and Water Security)

Place: Asia, China (Tibet, Qinghai, Xinjiang) Time: Since 2000s (increased tension)

Description: Glacier retreat and changing precipitation patterns have altered water availability and degraded high-altitude pastures. Tensions have emerged between herding communities, conservation efforts, and infrastructure expansion. Local populations have expressed concern over resettlement policies and limits on traditional mobility.

Involved groups: Tibetan and Mongol herders, Chinese local authorities, conservation agencies, infrastructure developers

Outlook: Climate impacts likely to intensify; balancing ecological protection and traditional livelihoods remains contentious.

North America: Arctic Resource Tensions (Alaska, Northern Canada)

Place: North America, US (Alaska), Canada (Yukon, Nunavut)

Time: Since 2010s (rising tensions)

Description: Melting sea ice has opened new routes for shipping and resource extraction, leading to concerns among Indigenous communities about threats to subsistence practices and territorial rights. States have increased military and commercial presence in contested zones.

Outlook: Rising pressure for conservation; conflict risks remain amid weak enforcement and climate threats.

Module 4: Active Citizenship
METHOD 1: ORGANISATION BINGO
Facilitator Guide

Conduct the exercise as described in the handbook.
Choose a video in the training language on the topic that mentions some of the organisations. Adapt the Bingo cards as needed to your video by removing or adding organisations and abbreviations. Alternatively, the facilitator can read a text about the topic or record it for the training.

Video Links in English Language
Each video is around 15 minutes and describes the COP history and or state of the climate negotiations.

History of the COP:
https://www.youtube.com/watch?v=aPV2nVcflo4

COP explained:
https://www.youtube.com/watch?v=AF6UONfp1Kw

Glossary of Organisations

International Networks of Environmental Non Governmental Organisations (NGOs)

- 350org
- CAN - Climate Action Network
- CJN - Climate Justice Now
- CJA - Climate Justice Alliance
- Community Power Coalition
- ECOs - Environmental Coalition on Standards
- EEB - European Environmental Bureau
- FoE - Friends of the Earth
- FfF - Fridays for Future
- Greenpeace
- GEN - Global Ecovillage Network
- INFORSE - International Network for Sustainable Energy
- REScoop - European Federation of Energy Communities
- YEE - Youth and Environment Europe
- WWF - World Wide Fund

European Governmental Organisation

EC - European Commission
EP - European Parliament

United Nations Organisations and terms:

UN - United Nations
UNFCCC - United Nations Framework Convention for Climate Change
IPCC - International Panel for Climate Change
UNEP - United Nations Environmental Program
UNDP - United Nations Development Program
COP - Conference Of the Parties - countries of the United Nations.

See more at the Fact Sheet on Climate Change.

Friends of the Earth	CLIMATE JUSTICE NOW! CJN	UNFCCC
INFORSE International Network for Sustainable Energy	350	COP
YEE YOUTH AND ENVIRONMENT EUROPE	GREENPEACE	FRIDAYS FOR FUTURE

REScoop.EU	SEED	Friends of the Earth
CAN CLIMATE ACTION NETWORK	CLIMATE JUSTICE NOW! CJN	OTWARTY PLAN
YEE YOUTH AND ENVIRONMENT EUROPE	ipcc INTERGOVERNMENTAL PANEL ON climate change	WWF

ipcc INTERGOVERNMENTAL PANEL ON climate change	CLIMATE JUSTICE NOW! CJN	UNFCCC
WWF	350	COP
UNEP	GREENPEACE	FRIDAYS FOR FUTURE

RESCOOP.EU	OXFAM	Friends of the Earth
CAN CLIMATE ACTION NETWORK	FRIDAYS FOR FUTURE	OTWARTY PLAN
YEE! YOUTH AND ENVIRONMENT EUROPE	unicef	UNEP

Conduct the exercise as described in the handbook.
Make sure the instructions are understood and there is no open questions before the group start. To aid understanding give out the instruction sheet for parallel reading, while you explain the game. This way the participants can also take the instructions into group and recheck them in case something is unclear.

Laptop required for each group:
Every group needs a laptop or tablet with the excel sheet open to enter their X to the decided measures. Here the link to the excel sheet:

Special Needs: For groups with low reading or language level, audio output of the texts via common office programs can be considered.

Easy modes: If the participants has no knowledge on using excel, you can add a person who assist using the excel. Other alternative is that you run the role play without the excel.

Advanced and extended method:
A longer version of the role play is available in English language on the ELY webpage. It is a longer text with more detailed country cards and explanations of the measures, so we recommend starting with the shorter version in this material package. Use the longer version only for more information on the country background and effects of the chosen measures.

Game Background: The EU is on track to meet its climate and energy targets for 2030. This role play explores how EU countries can further reduce CO_2 emissions through national policies beyond those already made.

EU Climate and Energy Targets:
In 2020, EU countries agreed to reduce greenhouse gas emissions by 55% by 2030 compared to 1990, increase renewable energy to 42% of total energy use, and improve energy efficiency so that energy use falls by 11.7% compared to 2020. Together, these goals are known as the Climate and Energy Targets 2030.
In 2025, the European Commission stated that the EU could reach these targets, but progress in renewable energy and energy efficiency has slowed. This is not only a climate issue but also a risk to energy security because EU imports most of its oil, gas, and coal.
National targets: The targets are shared among the EU countries. Some countries, such as Denmark and Germany, have higher targets, while others, such as Poland, have lower ones. Not all countries are equally close to meeting their 2030 goals.

Source and more info: https://inforse.org/europe/EU_climate_role_play.htm

Module 4: Active Citizenship
METHOD 2: EU CLIMATE NEGOTIATIONS
Instruction sheet

You receive: Country Card; List of measures; Excel sheet with targets for calculations.

Your aim: Reduce a country's CO_2 by deciding on measures with the government with ministers.

Steps:

Read the Country Card to understand your country.

Choose Ministers (3-5 depending on group size):
• Prime Minister (spoke person for the country)
• Minister of Energy • Minister of Industry, Business and Finance
• Minister of Climate & Environment • Minister of Transport

All ministers look at the list of policy measures of their areas and decides, which to propose to the government's meeting with the other ministers.

Government's meeting:

- The ministers (you) get together and argue based on your priorities. The government makes a on decision which measures to choose.
- Fill in the decided measures in the table with the country measures and the excel sheet. Set an "X" in the excel sheet on the measures chosen, which automatically calculate the effect of the measures in billions of €, oil saved, gas saved and effect on CO_2e emissions. Make sure that there is no red warnings in the excel sheets. If there are, delete the "X" until the warning disappear. Use the columns for combinations of measures, if you want more than one measure in a sector.
- After filling in all measures that you choose, look together, what the effects are for climate (CO_2e), economy etc..
- Check the target CO_2e level in the table and see if you are close this target.
- Decide if you want to stick with your measures or change your decision.
- Prepare a presentation in 2-3 minutes with info
  - on your country (from the country card)
  - about what you discussed in the group and
  - on your final decision and CO_2 reduction.

All country groups meet the President of the EU Commission (trainer), and present their decisions. The Prime Minister is the spoke person, but other ministers can present a particular decision.

Module 4: Active Citizenship
METHOD 2: EU CLIMATE NEGOTIATIONS
List of Measures



BUILDINGS & HEATING – MEASURES (H)

Measure	What is done (who pays)	CO_2e	Costs	Time
H1: Lower indoor temperature	**National Campaign for 18/19 °C instead of 21/22 °C** in homes **during winter.** State pays the campaign. ➔ 50% of the citizens follow and reduce the temperature.	↓ 1-2%	Saves money	Fast
H2: Energy checks & new boilers	Homes get **free energy checks** and **cheap state loans** for **insulation, better windows, heat pumps, district heating**.. ➔ 40% of home owners insulate, 25% replace old boilers	↓ 1–4%	Medium	Fast
H3a: Stop oil heating	**Mandatory change of oil boilers** to heat pumps, district heating or biomass. State loans to support. ➔ 80% oil boilers changed with loans from state.	↓ 0,1-3%	Medium	Fast
H3b: Stop oil & gas heating	**Mandatory change of oil + gas boilers** to heat plus district heat or biomass. State loans to support. ➔ 80% oil + gas boilers changed with loans from state.	↓ 3-6%	Medium	Fast
H4: Limit fossil fuel in houses, tax overuse	The state **limits fossil fuel use per house** to 75% of last year use. **Fossil overuse is taxed** with 3 €/liter oil, m3 gas, and kg coal. ➔ 80% save 25% to not pay extra tax, they insulate, lower temp. etc.	↓ 1-2%	Low - Medium	Fast

Module 4: Active Citizenship
METHOD 2: EU CLIMATE NEGOTIATIONS
List of Measures



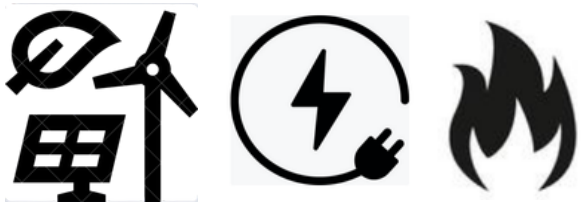
TRANSPORT – MEASURES (T)

Measure	What is done (who pays)	CO_2e	Costs	Time
T1: Car-free Sundays	**Private cars** are **not allowed on Sundays.** ➔ People drive 10% less per year in cars.	↓ 1–3%	Low	Fast
T2: Road pricing + extra trains + buses	**Road pricing** with higher costs to drive on motorways and in major cities. **Extra buses and trains.** ➔ 18% less private driving, 10% less commercial driving.	↓ 3–8%	Low - medium	Fast
T3: High fuel tax + extra tains + buses	**Increased petrol and diesel taxes**, 2€ extra per liter. **Extra buses and trains.** ➔ 28% less private driving, 15% less commercial driving.	↓ 4–12%	Low-Medium	Fast
T4: Limit fossil fuel in transport, tax overuse	**The state limits fossil fuel for private cars** to 75% of last year use. Overuse is taxed with 3 €/liter oil and m3 gas. ➔ 80% save 25% to not pay extra, drive less.	↓ 1-8%	Low-medium	Fast
T5: Airplane tax, less holiday flights	**Tax on aviation fuel** (2€/liter) and also limit to allow **one holiday flight trip per year** per person. ➔ Flying is reduced 25%,	↓ 1-8%	Low	Fast



INDUSTRY & ECONOMY – MEASURES (E)

Measure	What is done (who pays)	CO_2e	Cost	Costs
E1: Energy saving checks + loan guarantees	. **Free energy checks** for industry and agriculture. **State-guaranteed loans** for **energy savings.** ➔ 40% of companies save energy and 25% switch to heat pumps or district heating	↓ 5-7%	Medium	Medium
E2: Energy/CO_2 tax on fossil fuel	**Energy/CO_2 taxes** of 0,5€/liter oil and m3 gas and kg coal for industry and agriculture. ➔ Industry and agriculture save 5%, but much more if combined with E1 or E3	↓ 1%	Low	Low
E3: Grants to change to renewable energy	**30% subsidy + loan guarantee** to change **to renewable energy** to companies. ➔ Industry and agriculture save 5%, but much more if combined with E2	↓ 1%	Medium	Medium



ELECTRICITY & HEAT SUPPLY – MEASURES (F)

Measure	What is done (who pays)	CO_2e	Costs	Time
F1. Wind & solar electricity	State requires power companies to **allow wind and solar power to increase to 90% of electricity**, except biomass based and hydro electricity.	↓ 4-28%	Medium	Long
F2. Stop coal	State requires **coal power plants to close,.** They will change to gas fuel for power production. The state supports regions with coal.	↓ 3-111%	Medium -high	Medium
F3. Gas and coal to biomass	State requires gas and coal power plants to change to biomass fuel.	↓ 12-41%	Medium – High	Medium

Explanation to the tables: The CO_2e reduction percentage is relative to the total CO_2e emission from the energy use of the country. The CO_2e reduction is given as a range showing the differences among the countries. For example: Poland use more coal, and therefore reduction of coal use gives more reduction in total emissions. Limiting flights has bigger effect in Denmark, where people fly more. The excel sheet calculates the reductions differently in each country.
The CO_2e (equivalent) is CO_2 plus other greenhouse emissions.

Country Card - Poland

‹‹‹ Coal-dependent country with strong energy security concerns. ›››

Energy and climate situation

- Most electricity in Poland comes from coal.
- Renewable energy is growing, but slowly.
- Energy security with energy imports and social impacts are major issues.
- No nuclear power. Planned in the future.

Main priorities

- Poland wants a gradual energy transition.
- Protecting jobs and keeping energy affordable are key goals.
- Strong social support is needed for change.

Position in EU negotiations

- Poland supports EU climate action in principle.
- It prefers slower change and national flexibility.
- It asks for support to manage economic and social impacts.

Country Card – Germany

‹‹‹ Large industrial country in energy transition. ››››

Energy and climate situation

- Germany uses a lot of energy, especially in industry and transport.
- Coal and gas are still important, but renewable energy is growing fast.
- Nuclear power ended in 2023.
- Energy prices and security are key concerns.

Main priorities

- Germany wants to reduce emissions while protecting jobs and industry.
- A stable and affordable energy supply is very important.
- The country needs solutions that work for a large economy.

- **Position in EU negotiations**
- Germany supports EU climate goals.
- It asks for flexible rules for industry.
- It looks for compromises between climate action and economic stability.

Country Card – Denmark

‹‹‹‹ Climate leader with strong renewable energy. ››››››

Energy and climate situation

- Denmark produces a large share of its energy from wind and solar power.
- Coal is almost phased out, but Denmark imports and uses too much biomass.
- No nuclear power. It is banned by law since 1985.
- Energy supply is stable, but transport still depends on oil. The increase of electric cars and trains is growing slowly.
- Renewable energy is planed to take over all energy, but there are protests against wind and solar power projects on land.

Main priorities

- Denmark wants strong climate action.
- Increase renewable energy and energy efficiency are priorities.
- Public support for climate policy is very important.

Position in EU negotiations

- Denmark supports ambitious EU climate targets.
- It prefers renewable energy solutions.
- The green transition increase jobs, industry, and economy.

Material

- Facilitator guide
- Cards or post-its with different participation forms

Preparation

- Familiarise yourself with the facilitator guide.
- Print Cards or make post-its with different participation forms and place them upside down
- Draw a chart with vertical axes “easy–hard to get involved” and horizontal axes “effective–ineffective

List of Participation forms:

Sign an online petition about a climate issue.
Join a local park clean-up organised by your community.
Share a video on social media explaining climate change effects.
Vote in your local or national elections.
Write an email to your city councillor about improving bike lanes.
Attend a town hall meeting about a new environmental plan.
Donate €5–€10 to an environmental NGO.
Become a member of a local climate or youth organisation.
Join a climate strike or public protest in your city.
Help run a community garden in your neighbourhood.
Write a short letter to a local newspaper about air pollution.
Volunteer two hours a month for an environmental NGO.
Take part in a citizens’ consultation on new city climate policies.
Organise a small workshop at school or a youth centre about recycling.
Run for a position in the school council or neighbourhood board.
Start a petition asking for more trees or green spaces in your area.
Join a participatory budgeting meeting and vote for green projects.
Talk to a local shop about reducing plastic packaging.
Post one photo of a local climate problem with explanation on Instagram.
Start a small climate action group with three friends.
Run for national parliament.
Run for local parliament or city council.
Organise a public demonstration about a climate issue.

Talk to a local shop about reducing plastic packaging.	Take part in a citizens' consultation on new city climate policies.	Help run a community garden in your neighbourhood.
Join a climate strike or public protest in your city.	Organise a workshop at school or a youth centre about recycling.	Write a short letter to a local newspaper about air pollution.
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Write an email to your city councillor about improving bike lanes.	**Become a member of a local climate or youth organisation.**	
Attend a town hall meeting about a new environmental plan.	**Join a participatory budgeting meeting and vote for green projects.**	
Donate €5–€10 to an environmental NGO.		

Appendix

Glossary of Energy and Climate Terms in Easy Language

Active Citizenship: Being actively involved in society to improve communities, protect democracy, and support social and environmental change.

Adaptation: Adjusting how people live, work, or build things to reduce harm from climate change, for example flood protection or heat plans.

Biogas: Gas made from biomass (e.g., food, animal waste) by bacteria in tanks at biogas plants. Biogas consist of mainly of methane that can replace natural (fossil) gas that also consist of methane.

Biomass: Wood, straw and other biological materials. They can be used for energy by burning or in biogas plants, where bacteria make gas from the biomass. Biomass burning produces CO_2, but if the plants grow again, they will absorb the CO_2 again. If too much biomass is burned in a short time, the growth of the plants cannot absorb all the CO_2 from the burning.

Carbon Dioxide (CO_2): A greenhouse gas released when burning coal, oil, or gas, producing electricity, driving cars, or cutting down forests.

Carbon Dioxide equivalent (CO_2e): CO_2 plus greenhouse gaes.

Carbon Footprint: The total amount of CO_2 caused by a person, product, or lifestyle, including indirect effects.

Carbon Intensity: How much CO_2 is produced by an activity, product, or energy source.

Climate Change: Long-term changes in the Earth's weather, including higher temperatures (global warming), stronger storms, floods, and droughts, mainly caused by greenhouse gases from burning fossil fuels and other human activities.

Climate Conflict: Conflicts that are made worse by climate change, for example over water, land, or natural resources.

Climate Injustice: An unfair situation where some people or countries suffer more from climate change even though they caused less of it.

Climate Justice: Acting fairly in response to climate change by sharing responsibility, protecting vulnerable people, and supporting those most affected.

Climate Risk: The danger of harm from climate change, such as heatwaves, floods, food shortages, or water scarcity.

Consumption: Buying and using goods and services, which often leads to higher energy use and emissions.

Appendix

Glossary of Energy and Climate Terms in Easy Language

Democratic Participation: Having a say in decisions that affect society, for example through voting, public debate, or civic action.

Emissions: Gases released into the air, especially greenhouse gases that contribute to global warming.

Energy Community: A group of people who produce, share, or manage renewable energy together.

Energy Consumption: The total amount of energy used by a person, household, organisation, or country.

Energy Efficiency: Using less energy to achieve the same result, for example with efficient appliances or good insulation.

Energy Efficiency Label: A label that shows how much energy a device uses and helps people choose more efficient products.

Energy Mix: The combination of different energy sources used in a country or region.

Energy Production: Making energy, for example in power plants, with solar panels, or with wind turbines.

Energy Saving: Reducing energy use through behaviour changes or technology, such as switching off lights or insulating buildings.

Energy System: All parts connected to energy, including production, transport, distribution, and use.

Energy Transition: Changing the energy system from fossil fuels to renewable and sustainable sources.

Energy Use: How energy is used in daily life, for example for heating, cooking, transport, or digital devices.

Environmental Impact: The effect of actions on nature, ecosystems, animals, and people.

Food Security: Having reliable access to enough safe, healthy, and affordable food.

Fossil Fuels: Coal, oil, and natural (fossil) gas that are extracted from the ground and that is burned for heating, electricity, transport etc. When it is burned, it produces pollution and CO_2 that causes climate change.

Global Warming: The increase in the Earth's average temperature. See: Climate Change, and Greenhouse gases.

Appendix

Glossary of Energy and Climate Terms in Easy Language

Greenhouse Gases: Gases in the air that trap heat, acting like a blanket around the Earth. The most importants are carbon dioxid (CO_2) and methane (CH_4).

Hydropower: Electricity produced from running or falling water. Some hydropower plants have large dams that store water for a long time and produce electricity when it is needed.

Lifestyle Choices: Everyday decisions such as travel, food, or housing that influence energy use and emissions.

Low-Carbon: Causing little CO_2 and having a smaller impact on the climate.
Mitigation: Reducing the causes of climate change, for example by cutting emissions or using renewable energy.

Participation: Taking part in decisions and actions, for example in local projects, activism, or political processes.

Policy: Rules, laws, or plans made by governments to guide actions, such as climate or energy regulations.

Renewable Energy: Energy from natural sources that do not run out, such as sun, wind, and water.

Resource Depletion: Using natural resources faster than they can be replaced by nature.

Resources: Natural materials and systems people depend on, such as water, land, energy, and raw materials.

Solar Energy: Energy produced from sunlight, mostly with solar panels producing electricity (called photovoltaic panels) or producing heat and hot water (called solar collector panel). The solar energy is also captured in greenhouses, solar cookers etc.

Sustainability: Living and developing in a way that protects nature, people, and resources for the future.

System Mapping: A method to show how different systems, such as energy, transport, food, and politics, are connected.

Water Insecurity: Lack of reliable access to clean and safe water.

Wind Energy: The wind's moving air is captured to producing electricity, grinding grain, pumping water, and sailing ships.