



Rules of the game

AIM OF THE GAME

Win as many cards as possible by answering questions about the energy transition.

CONTENTS

56 cards divided into 2 criteria:

1. The category (Sources, Uses, Solutions, Impacts & Choices)
2. Level of difficulty (Beginner or Advanced)

HOW LONG THE GAME TAKES TO PLAY

The game takes an average of 30 minutes but can continue until all the cards have been used.

SET UP

Form 2 to 4 teams. Place the cards with the "answers" face down in 8 stacks (category × level).

Rules of the game

TURN SEQUENCE (going clockwise)

1. Choose a category and a level.
2. The next opposing team reads the question.
3. You have 30 seconds to answer and give your reason.
4. If the answer is correct, you win the card.
5. If the answer is incorrect, the card is set aside and can't be played again.

For games with more than 2 teams: A team can shout "Challenge!" before the correct answer is read out if they think the first team's answer is incorrect.

- If the challenge is correct, the challenging team wins the card.
- If the challenge is incorrect, the original team keeps the card.

END OF GAME

When all the cards have been used up, count how many you won.

Beginner cards score 1 point, Advanced cards score 2 points.

Bonus: +4 points if a team has at least 1 card in each category.

The team with the highest score wins the game.

Glossary

This game invites you to explore the major challenges of the energy transition across four categories:

Sources

Uses

Solutions

Impacts & choices

And two levels: Beginner Advanced

Energy transition refers to the gradual phasing out of fossil fuel based energy sources in favor of low-carbon energy such as renewables and nuclear, in order to reduce greenhouse gas emissions and combat climate change. It also involves changing practices in modern society towards a model that consumes less and uses resources more efficiently.

DIFFERENT LEVELS:

Beginner level: for those starting to discover the challenges of energy and the energy transition. **Advanced level:** for those who want to go a little further and challenge themselves. Everyone can choose the level that suits them... and may the best team win!

Glossary

DIFFERENT CATEGORIES:

SOURCES – Where does the energy come from?

Discover the different sources of energy used across the world: fossil, renewable and nuclear. The energy transition aims to gradually replace fossil fuels with low-carbon energy sources.

USES – How do we use energy?

Energy is used for heating and travel, and to produce goods and run devices. Understanding these uses helps us to identify where and how we can reduce energy consumption.

SOLUTIONS – How can we reduce emissions and energy consumption?

Insulating buildings, renewable energies, sustainable mobility and energy efficiency: these solutions help us to consume less energy and reduce CO₂ emissions.

IMPACTS & CHOICES – Why is the energy transition necessary?

Our energy choices have impacts on the climate, environment, economy and society. This category explores the consequences of our choices and the decisions we need to take to build a more sustainable energy system.



Sources

Beginner

Question

Which of these energy sources are renewable?

- A. Wind, sun, water
- B. Petroleum, gas, coal
- C. Uranium, coal, fuel oil

Energy
Transition



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Sources

Beginner

Answer

A. Wind, sun, water

Renewable energy comes from sources that are replenished naturally.

There are 5 main categories:

- Solar: using sunlight and heat from the sun
- Wind: using the force of the wind
- Hydroelectric: using the movement of water (rivers, dams, tides)
- Biomass: using natural materials (wood, organic waste)
- Geothermal: using heat from the subsoil (the Earth's crust)

For example: Solar panels on the roof of a school generate electricity to power classrooms. A turbine installed in a field is turned by the wind and supplies electricity to neighbouring homes. A dam on a river uses the movement of water to produce electricity for a city. A wood-fired boiler uses wood chips to heat homes or a hospital. A geothermal heating system recovers heat from the ground to heat a building in winter.



Sources

Beginner

Question

Which of the following is a fossil fuel?

- A. Wind
- B. Natural gas
- C. Solar

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Transition



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Sources

Beginner

Answer

B. Natural gas

Fossil fuels are formed from the remains of plants and living organisms that accumulated in the ground millions of years ago. Over time, pressure and heat have transformed them into coal, petroleum, and natural gas.

Examples: Today, these energy sources are used to generate energy. Coal can be burned in certain power stations, oil is turned into petrol or diesel for cars, and natural gas is often used to heat homes or generate electricity. When these fossil fuels are burned, they release CO_2 , a gas that contributes to global warming.



Sources

Beginner

Question

Choose which one does not belong:

- A. Coal
- B. Petroleum
- C. Wind
- D. Gas

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Sources

Beginner

Answer

C. Wind

Wind is a renewable energy because it is renewed naturally.

Coal, petroleum and gas are fossil fuels because they are resources from a finite source, formed over millions of years, and they can be exhausted as they are extracted and burned.

For example: A wind turbine produces electricity as long as the wind blows, without "using up" a reserve.

On the other hand, burning gas or coal uses up a resource that cannot be regenerated in our lifetimes.



Sources

Beginner

Question

A hydroelectric power plant mostly uses...

- A. Heat from the ground
- B. The movement of water
- C. Wind

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Transition



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Sources

Beginner

Answer

B. The movement of water

A hydroelectric power plant produces electricity by harnessing the movement of water. A large wheel, called a turbine, is turned by water flowing down from a dam or along a river. This turbine drives a generator that produces electricity. So water energy is renewable. As long as water continues to flow through the natural cycle (rain, rivers), electricity can be produced without burning fuel.

For example: Imagine an old-fashioned watermill: the wheel is turned by water. The same applies to a hydroelectric power plant... but instead of milling grain, the wheel produces electricity to power houses, schools or hospitals.



Sources

Beginner

Question

True or false?
Renewable energy is
inexhaustible on a human time scale.

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Sources

Beginner

Answer

True

Renewable energy is regenerated naturally and quickly through natural cycles. This means that at the human time scale, we are not likely to run out if we use it judiciously. However, this does not mean that it is unlimited. It depends on natural conditions such as sun, wind and rain.

For example: The sun comes up every day, so we can use its light to produce electricity without "exhausting" the sun. On the other hand, if there is no rain for a long time, a hydroelectric power plant might produce less electricity because the water level in the dams is lower.



Sources

Beginner

Question

Uranium is mainly used to produce...

- A. Electricity
- B. Gas
- C. Coal

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Sources

Beginner

Answer

A. Electricity

Uranium is a metal that is used as fuel in nuclear power plants to produce electricity. In a nuclear power plant, uranium atoms are split using a reaction called nuclear fission, which releases a lot of heat. This is used to heat water and produce steam, which turns a turbine connected to an electricity generator. Unlike coal-fired or gas-fired power plants, nuclear electricity is produced without burning fossil fuel during the production phase, which reduces direct CO₂ emissions.

For example: In countries that use nuclear energy, uranium produces electricity to power hospitals, schools, electric transport and even homes. This electricity is produced without burning coal or gas during the production phase.



Sources

Beginner

Question

Link the source to what makes it work:

A. Solar

B. Wind

C. Biomass

1. Uses the force of the wind

2. Uses the sun's radiation

3. Uses organic matter

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Sources

Beginner

Answer

A. Solar → 2. Uses the sun's radiation

B. Wind → 1. Uses the force of the wind

C. Biomass → 3. Uses organic matter

Each source is linked to what makes it work: solar captures sunlight, wind energy uses the force of the wind, and biomass uses organic matter (wood, vegetable waste, etc.) to produce energy.

For example: Sunlight shining on a rooftop solar panel to generate electricity. Wind turning a wind turbine to produce electricity. Wood chips burning in a wood boiler to heat a house.



Sources

Advanced

Question

What is nuclear energy?

- A. Energy produced by burning uranium like coal
- B. Energy produced using heat derived from the fission of uranium
- C. Renewable energy produced by the heat of the sun
- D. Energy produced by burning natural gas

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Sources

Advanced

Answer

B. Energy produced using heat derived from the fission of uranium

Nuclear energy is produced through a phenomenon called nuclear fission. In a nuclear power plant, uranium atoms are “split” in two. This reaction releases a large amount of heat. This is used to heat water to produce steam. The steam is used to turn a turbine, which produces electricity. Nuclear energy is considered to be low-carbon because it emits very little CO₂ during the production phase. On the other hand, it is not renewable because uranium is a limited resource.

For example: In countries that use nuclear energy, some power plants produce enough electricity to supply several million people. A single nuclear power plant can produce as much electricity as a very large wind farm, but continuously, day and night.



Sources

Advanced

Question

What is the main challenge for wind and solar energy, where the production is weather-dependent?

- A. Too much CO₂
- B. Intermittency
- C. Lack of network power





Sources

Advanced

Answer

B. Intermittency

Wind and solar energies are dependent on natural conditions to produce electricity. The amount they produce varies depending on the weather (wind, sunshine), the time of day and the season. So the main challenge is sporadic supply: the electric system must be adapted to guarantee electricity even when there is no wind or at night. This involves storage, adapted networks, or other complementary sources.

For example: At night, solar panels do not produce electricity. To continue to supply hospitals or transport systems, we either use stored electricity or other power plants that produce continuously.



Sources

Advanced

Question

**True or false?
Energy can be low-carbon
without being renewable.**

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Sources

Advanced

Answer

True

An energy source is said to be low-carbon if it emits little CO₂ to produce electricity. This does not necessarily mean that it is renewable. For example, nuclear power emits very little CO₂ during production, but it uses uranium which is a limited resource.

So energy can be low-carbon without being renewable.

For example: A nuclear power plant produces a lot of electricity with few direct CO₂ emissions. On the other hand, a coal-fired power plant emits a lot of CO₂. Both use non-renewable resources, but their carbon impact is very different.



Sources

Advanced

Question

Which resource is a “stock” rather than a “flow”?

- A. Wind
- B. Sun
- C. Petroleum





Sources

Advanced

Answer

C. Petroleum

This is a stock resource, i.e., a limited underground reservoir that takes millions of years to form. Wind and sun are flow resources since they are continually renewed by nature.

For example: You can harness the wind and capture the sun every day, but an oil field can be exhausted when all the oil has been extracted.



Sources

Advanced

Question

**True or false?
Locally produced energy
is always low-carbon.**

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Sources

Advanced

Answer

False

“Locally produced” tells us where the energy is produced, but not its source. The energy can be local and yet highly emitting if it comes from coal or petroleum, or can emit very little CO₂ if it comes from solar or wind.

For example: A coal-fired power plant built near a city produces “locally” ... but it emits a lot of CO₂. In contrast, a local wind farm also produces “locally”, but emits very little CO₂ during energy generation.



Sources

Advanced

Question

**Which energy source is not dispatchable
(i.e. cannot produce on demand)?**

- A. Nuclear
- B. Wind
- C. Gas

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Sources

Advanced

Answer

B. Wind

A wind turbine is reliant on the wind: we can't "control" its production. We can sometimes limit (brake) a wind turbine, but we can't make it produce more if there is no wind.

On the other hand:

- production at a gas-fired power plant can be increased or decreased quite quickly,
- nuclear power production can also be adjusted, but with more technical constraints.

For example: If household energy consumption increases at 7pm but there is no wind, a gas-fired power plant can increase in power, but wind turbines can't.



Sources

Advanced

Question

What is hydrogen?

- A. An energy source like the sun
- B. A "carrier": it is made from another type of energy so it can be stored or used
- C. A type of coal





Sources

Advanced

Answer

B. A “carrier”: it is made from another type of energy so it can be stored or used

Hydrogen, for example, is not found directly in nature in a form that is ready to use. We need to produce it from another type of energy (electricity or gas). Once produced, hydrogen can be used to store energy (like a battery) and to transport it (in a tank, a pipeline, etc.). That's why it's called an energy vector: it carries energy that comes from elsewhere.

For example: We can use electricity produced by solar panels during the day to make hydrogen. This hydrogen can then be used later (or elsewhere) to run a fuel cell bus or power an industrial site, for example.



Uses

Beginner

Question

**True or false?
Leaving a light on in
an empty room for several hours
per day has almost no impact
on electricity consumption.**

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Uses

Beginner

Answer

False

A lamp consumes electricity when it is on, even if no one is in the room. For just a few minutes at a time, the impact may seem small, but if we do this every day and in several rooms, we end up consuming a surprising amount of electricity. Small daily actions, such as turning the light off when leaving a room, help to reduce energy consumption without changing your comfort levels.

For example: An LED bulb consumes around 10 W. If it stays on unnecessarily for 3 hours a day, this amounts to about 11 kWh per year. So you can save several days of lighting simply by turning off the light. And if there are several lamps on unnecessarily in a home, the consumption can be much higher.



Uses

Beginner

Question

True or false?
Devices on standby still use
a small amount of electricity.

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Uses

Beginner

Answer

True

Even when not in use, some devices continue to consume a small amount of electricity on standby. This is the case for example for televisions, game consoles, computers and internet routers. Devices on standby don't consume very much, but multiplied by several devices and over a whole year, this can add up to a significant amount of electricity. One way to reduce energy waste and contribute to the energy transition is to reduce this unnecessary consumption.

For example: A television on standby generally consumes between 1 and 3 watts. Over a year, this adds up to about 10 to 25 kWh of electricity. This is the equivalent of using your television normally for approximately 10 to 20 days. You can easily avoid this unnecessary consumption by turning all devices off completely or using a power strip with a switch.



Uses

Beginner

Question

In general, at what time of day do we consume the most electricity?

- A. In the morning
- B. In the middle of the day
- C. In the evening

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Uses

Beginner

Answer

C. In the evening

There are certain times of the day when many of us use electricity at the same time in our homes and buildings.

For example, we might turn on the lights, start cooking, use our electronic devices and operate household appliances.

When many homes use energy at the same time, the demand for electricity increases sharply. This creates a consumption peak for the electricity network, which the system must be able to cover.

For example: In many countries, electricity consumption increases at the end of the day when people get home and turn on several devices at the same time. When these uses are combined on the scale of a city or a country, this creates a high electricity demand at a certain time of day.



Uses

Beginner

Question

Rank these uses from the most energy-consuming to the least:

- A. Heating
- B. Telephone
- C. Fridge

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Uses

Beginner

A. Heating → C. Fridge → B. Telephone

Answer

Heating is generally the most energy-intensive use since it needs to provide a lot of heat for extended periods of time. Fridges consume less energy but work continuously all year round. Telephones consume the least amount of energy because their batteries are small and only a small amount of electricity is needed to charge them.

For example: Heating a home can use several thousand kWh per year. A fridge uses a few hundred kWh per year. Charging a smartphone for one year takes only a few kWh.



Uses

Beginner

Question

True or false?
A 5-minute shower
generally requires
less energy than a bath.

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Uses

Beginner

Answer

True

A bath generally requires a lot more hot water than a short shower, so more energy is needed to heat the water.

For example: A 5-minute shower uses around 40 to 60 litres of water.

A bath uses about 120 to 200 litres.

So a bath uses 2 to 4 times more energy than a short shower.



Uses

Beginner

Question

What can you do to reduce the energy consumption of your heating?

- A. Leave your windows open in winter
- B. Lower the thermostat by 1°C
- C. Heat more at night

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Transition



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Uses

Beginner

Answer

B. Lower the thermostat by 1°C

Your heating system uses energy more if you set it to a higher temperature. Turning it down by 1°C immediately reduces the amount of heat to be produced: the heating runs less and so uses less energy.

For example: Going from 20°C to 19°C saves around 7% on heating (depending on the home and the weather).



Uses

Beginner

Question

True or false?
If we switch to greener electricity from renewable energy, we'll have to change our electrical sockets.

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Uses

Beginner

Answer

False

The sockets are the same. The main change is in how we produce electricity (more renewables) and sometimes in the equipment used (e.g. heat pump, electric car).

For example: An electric car can be charged at night at home with a plug or a terminal, without having to change the electrical sockets.



Uses

Advanced

Question

**True or false?
Switching to electricity automatically
reduces emissions,
regardless of the electricity mix.**

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Transition



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Uses

Advanced

Answer

False

Switching to electricity (car, heating, etc.) only reduces emissions if the electricity used is low-emission. If the electricity mix relies heavily on coal or gas, the electricity is still highly carbon-based and very little is gained.

For example: The emissions for an electric car are much lower when it is mainly charged using nuclear/renewable electricity than in a country where the electricity is mostly coal-generated.



Uses

Advanced

Question

Which sector consumes a lot of energy and is particularly difficult to decarbonize (i.e. to significantly reduce its CO₂ emissions)?

- A. The residential sector (housing)
- B. Heavy industry (steel, cement, chemicals)
- C. Digital services





Uses

Advanced

Answer

B. Heavy industry (steel, cement, chemicals)

Heavy industry consumes a lot of energy and often uses fossil fuels to produce very high temperatures or chemical reactions. This makes it more difficult to reduce emissions than in homes or services.

For example: Traditionally, coal is used to make steel, which emits a lot of CO₂. A possible solution is to use low-carbon hydrogen, i.e. hydrogen produced with few emissions. It can replace coal in some processes and reduce emissions. But this requires new factories and lots of electricity, making the transition more difficult.



Uses

Advanced

Question

Rank these means of transport from the least energy-consuming to the most energy-consuming for one person travelling 100 km.

- A. Electric car
- B. Train
- C. Plane

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Transition



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Uses

Advanced

Answer

B. Train → A. Electric car → C. Plane

Not all modes of transport consume the same amount of energy to transport a person over the same distance. Trains are very efficient because they carry a lot of passengers with a single source of energy. Electric cars are more efficient than combustion cars, but often carry fewer people. Planes consume a lot of energy to fly, which increases the energy used per passenger.

For one person travelling 100 km:

- Train: about 3 to 5 kWh
- Car (1 person onboard): about 12 to 20 kWh
- Plane: about 25 to 30 kWh

A car used by a single person can consume up to 10 times more energy per passenger than a train. If several people share the car, the consumption per passenger decreases sharply, which is why carpooling is an important part of the energy transition.



Uses

Advanced

Question

Electricity consumption “flexibility” is...

- A. Consuming more whenever you want, without limits
- B. Moving some uses to another time
(when the network is less busy)
- C. Shutting down the internet

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Uses

Advanced

Answer

B. Moving some uses to another time (when the network is less busy)

Flexibility involves delaying non-urgent consumption to avoid peaks in consumption and make better use of the available electricity.

For example: Programming your water heater or charging your electric car at night means you can avoid times when demand is very high (for example around 7pm in winter).



Uses

Advanced

Question

The carbon footprint (CO₂ emissions) of 1 kWh of electricity depends mainly on...

- A. The “electricity mix” at the time (which power plants are producing)
- B. The colour of the cables
- C. The weather only

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Uses

Advanced

Answer

A. The “electricity mix” at the time

The carbon footprint of a kWh varies depending on the electricity mix at the time of consumption.

If the grid relies on gas or coal, each kWh emits more CO_2 ; if it comes mainly from hydro, nuclear, solar, or wind power, it emits less.

Example: At 7 pm in winter, when many households are cooking and heating their homes, the grid often uses more gas and coal, so a kWh consumed at that time emits more CO_2 ; by contrast, at 1 pm on a very sunny day, solar generation is high and the share of fossil fuels decreases, so a kWh consumed at that time emits less CO_2 .



Uses

Advanced

Question

True or false?
"Consumption peaks"
influence the size of networks
and power plants.

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Transition



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Uses

Advanced

Answer

True

The electrical system must be able to meet the maximum level of demand, even if this peak only lasts a few hours.

This means that the networks and power plants must be big enough to be able to supply power during these extremes.

For example: During a cold spell in winter, many homes use electric heating at the same time. Consumption increases sharply and the country may be forced to import electricity or start up additional power plants.



Uses

Advanced

Question

What percentage of global final energy consumption is electric today?

- A. About 10%
- B. About 20%
- C. About 50%

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Transition



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Uses

Advanced

Answer

B. About 20%

Today, only about one fifth of the energy we use globally comes from electricity. The vast majority of the energy consumed is still used to power uses that directly use fossil fuels such as petroleum, gas or coal. This is particularly the case for transport (cars, planes, trucks), heating for buildings and many industrial processes. This is why one of the major levers of the energy transition is to increase the use of electricity.

For example: Let's imagine that all the energy consumed in the world is represented by ten lightbulbs. Only two lightbulbs would be electric. The other eight would still be using fossil fuels (petroleum, gas, coal).



Solutions

Beginner

Question

Which solution produces electricity without burning fuel (and so emits little CO₂ during electricity generation)?

- A. Solar panels
- B. Diesel engine
- C. Oil-fired boiler

Energy
Transition



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Solutions

Beginner

Answer

A. Solar panels

Photovoltaic solar panels transform sunlight into electricity. Since no combustion is involved, there are no direct CO₂ emissions during production, unlike diesel engines or oil-fired boilers, which burn fuel and emit CO₂.

For example: Rooftop solar panels mainly produce during the day, with a peak around noon (and often more in summer when the sun is at its strongest).



Solutions

Beginner

Question

True or false?
**Electricity produced by the sun
or the wind can be stored
to be used later.**

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Transition



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Solutions

Beginner

Answer

True

Electricity generated at certain times – for example when there is a lot of sun or wind – can be stored for later use. This means we can use this energy when production is lower, for example at night or when there is no wind. So storing electricity helps to balance production and consumption.

For example: Electricity can be stored in batteries or in the form of water in hydroelectric dams that can produce electricity later. The energy produced during the day can then be used in the evening when consumption is higher.



Solutions

Beginner

Question

**True or false:
Protecting a building from the sun
in summer can reduce the consumption
of electricity for air conditioning.**

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Transition



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Solutions

Beginner

Answer

True

Homes stay cooler when heat is prevented from entering (sunlight on the windows, overheating roof). So there is less need for air conditioning, which reduces electricity consumption and provides greater comfort during hot weather. Reducing the energy needs of buildings is one of the solutions of the energy transition, because this makes it possible to consume less electricity while staying comfortable.

For example: During a heatwave, you can:

- close shutters/blinds during the day on the sunny side of the house,
- create shade using a sun shade or an awning,
- use vegetation (trees, green pergolas) to lower the indoor temperature and reduce the use of air conditioning.



Solutions

Beginner

Question

Why are LED bulbs more efficient than non-LED bulbs (halogen or incandescent)?

- A. They provide the same amount of light but consume less electricity
- B. They provide less light, so you can see less
- C. They work with coal

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Transition



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Solutions

Beginner

Answer

A. They provide the same amount of light but consume less electricity

Being “efficient” means providing the same service (lighting) with less energy. An LED is a modern type of bulb that produces light using a small electronic component called a “light-emitting diode.” It is said to be more efficient because it provides the same amount of light with much less electricity than an old-fashioned bulb. In other words, you light a room just as much, but with less energy.

For example: To light a room:

- An old-fashioned bulb consumes about 60 watts.
- An LED bulb produces the same light with about 10 watts.

So it consumes 5 to 6 times less electricity for the same lighting.



Solutions

Beginner

Question

Choose which one does not belong:

- A. Photovoltaic solar panels
- B. Solar water heater
- C. Oil-fired boiler

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Solutions

Beginner

Answer

C. Oil-fired boiler

Solar panels (photovoltaic or thermal) and solar water heaters use a renewable energy source – the sun. Fuel oil is a fossil fuel derived from petroleum which emits a large amount of CO₂ when burned.

For example: A roof can produce electricity with photovoltaic panels or heat water with a solar water heater, but an oil-fired boiler burns fossil fuel.



Solutions

Beginner

Question

Link the solution to its main impact:

A. Insulation

B. LED bulbs

C. Bicycle

1. Less heating

2. Less electricity for lighting

3. Less fuel

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Transition



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Solutions

Beginner

Answer

- A. Insulation → 1. Less heating**
- B. LED bulbs → 2. Less electricity for lighting**
- C. Bicycle → 3. Less fuel**

Each of these solutions makes it possible to reduce energy consumption for a different use. Insulation helps keep heat in a home. So there is less need for heating. LED bulbs provide the same lighting as conventional bulbs but consume less electricity. Cycling means you can travel without using fuel such as petrol or diesel. So these solutions reduce energy consumption and the associated emissions.

For example: A well-insulated house keeps more heat inside in winter, so we use less heating. An LED bulb provides the same lighting with much less electricity than an old-fashioned bulb. Cycling to college or work means you don't use a car and consume fuel.



Solutions

Beginner

Question

True or false?
Using recycled aluminium to make an object requires much less energy than using ore extracted from a mine.

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Solutions

Beginner

Answer

True

It takes much less energy to recycle aluminium than to make it from ore extracted from a mine. Aluminium can be recycled simply by melting it and using it again. On the other hand, producing new aluminium requires several long, energy-consuming steps.

For example: Making a can with recycled aluminium requires much less energy than making a can from ore. That's why it's important to sort and recycle cans and aluminium foil.



Solutions

Advanced

Question

When renovating a home to save energy, what is the most logical order to do things?

- A. Heating → Insulation → Ventilation
- B. Insulation → Ventilation → Heating
- C. Heating → Ventilation → Insulation





Solutions

Advanced

Answer

B. Insulation → Ventilation → Heating

For energy renovations, we start by reducing energy needs.

- Insulation: to reduce heat loss (walls, roof, windows).
- Ventilation: to ensure healthy air is circulating in a well-insulated home.
- Heating: once the needs are reduced, a smaller and more efficient heating system can be installed.

This strategy makes it possible to consume less energy and reduce costs.

For example: In a poorly insulated house, a great deal of heat is lost through the roof and walls. If you first install a new heating system, it will have to be very powerful to make up for these losses. If you first insulate the house, more heat will stay inside, so you can then install a smaller and less energy-consuming heating system.



Solutions

Advanced

Question

**True or false?
Some electric cars can
supply electricity to appliances
or to a home through their battery.**

Energy
Transition



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Solutions

Advanced

Answer

True

Some electric cars have functions called V2L (Vehicle-to-Load) and V2H (Vehicle-to-Home).

- V2L means that the car can directly power an electrical appliance (tool, coffee maker, fridge...) via an integrated socket.
- V2H means that the car can provide some of the power for a house through a specific installation.

So the battery is not only used to drive the car, it can also become a temporary source of electricity for other uses.

For example: With V2L, you can connect a drill to the car on a construction site. With V2H, in the event of a power outage, you can use your car to power the fridge or lights in the home for several hours.



Solutions

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Question

The main role of an energy mix is...

- A. To only produce renewable energy
- B. To balance costs, safety and CO₂ emissions
- C. To get rid of the networks





Solutions

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Answer

B. To balance costs, safety and CO₂ emissions

A country can use solar energy when the weather is good, supplemented with hydropower or gas when demand increases, and trade electricity with neighbouring countries through interconnections (high-voltage power lines connecting the two networks).

For example: A country can use renewable energies when these are producing (sun/wind), supplemented with controllable sources (water, gas, nuclear), and rely on interconnections to avoid power outages.



Solutions

Advanced

Question

What is the main advantage of heat pumps?

- A. They create energy
- B. They can provide more heat than the electricity they consume
- C. They always consume more than a boiler





Solutions

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Answer

B. They can provide more heat than the electricity they consume

Heat pumps do not produce heat directly as boilers do. They recover heat from the air, ground or water and then use it to heat the house. Since they transfer heat instead of creating it, they can provide more heat than the electricity they consume. This explains why they perform so well: we can say they have a COP (coefficient of performance) greater than 1.

For example: Depending on the outside temperature and the model, a heat pump can use 1 kWh of electricity to recover and transfer heat from outside. Result: 1 kWh of electricity consumed $\approx$ 3 kWh of heat in the house. This is why it is very effective for heating.



Solutions

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Question

Which of the following examples illustrates electricity “load shifting”?

- A. A factory that reduces its consumption for one hour when the network is under pressure
- B. A factory that doubles its consumption during the peak
- C. A school that leaves everything on at night





Solutions

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Answer

A. A factory that reduces its consumption for one hour when the network is under pressure

Load shifting means reducing or delaying consumption for a short time (a few minutes to a few hours) when demand is very high. This prevents network overload and reduces the use of back-up production methods, which are often more expensive and emit more emissions.

For example: During a peak at 7pm, a factory delays a very energy-intensive cycle by one hour (furnaces, compressors, pumps). Or a building lowers the air conditioning slightly for 30 minutes: the impact on comfort is low, but the gains for the network can be significant.



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Question

True or false?
A “smart” electrical grid can help prevent outages and integrate more renewables.

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Answer

True

A smart grid is an electrical grid equipped with sensors and digital tools to:

- measure what is happening in real time (production, consumption, congestion),
- better predict peaks in demand and renewable production (wind/solar),
- manage the network more closely (distribute flows, activate flexibility, reduce overloads).

Since wind and solar vary depending on the weather, this close management helps to balance the network and reduce the risk of outages.

For example: When the network is nearing a peak in consumption, the smart grid can automatically postpone (with agreement/configuration) the charging of thousands of electric cars from 7pm to 10pm, or spread the load over the night. The result: fewer overloads, lower risk of power outages, and a better capacity to use the electricity produced by renewables.



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Question

What does the energy transition entail in practical terms?

- A. Simply producing more energy
- B. Acting on three levers: waste less, consume better, and replace some fossil fuels with low-carbon energies
- C. Replacing all energies with renewables

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Answer

B. Acting on three levers: waste less, consume better, and replace some fossil fuels with low-carbon energies

The energy transition is not just about “producing differently.” It relies on three complementary actions: **Sufficiency**: avoid waste and reduce unnecessary uses. **Efficiency**: provide the same service with less energy by using better equipment. **Change sources**: gradually replace fossil fuels with low-carbon energies. The aim is not to go without, but to maintain the same service with less energy and fewer emissions.

For example: In a home:

- **Sufficiency**: turn the heat down a bit or stop heating an empty room
- **Efficiency**: improve wall insulation or install LED bulbs.
- **Change source**: install solar panels to produce some of your electricity.



Impacts & choices

Beginner

Question

Why is it urgent to act for the energy transition now?

- A. Because the effects of climate change and energy volatility-related tensions are already visible
- B. Because electricity is going to disappear
- C. Because fossil fuels are not polluting

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Impacts & choices

Beginner

Answer

A. Because the effects of climate change and energy volatility – related tensions are already visible

The effects of climate change are already visible: high temperatures, droughts, floods. Energy prices are also rising and often depend on wider geopolitical variables. If we wait too long, we will have to act more quickly and that will cost more. Taking action now helps to prevent bigger problems later.

For example: Progressively renovating homes reduces energy bills and avoids the need for “emergency” work in the future.



Impacts & choices

Beginner

Question

Why do we say that “The greenest energy is the energy you don’t use”?

- A. Because by consuming less, we avoid generating and transporting energy, which reduces emissions and impacts
- B. Because all energy is green if we use it less
- C. Because reducing consumption automatically reduces bills

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Impacts & choices

Beginner

Answer

A. Because by consuming less, we avoid producing and transporting energy, which reduces emissions and impacts

When we consume energy, it has to be produced and transported, and installations may need to be built as the demand increases. All of this emits CO₂, uses resources, and creates pollution. We can avoid these impacts from the outset by consuming less energy. So, the least polluting energy of all is energy that hasn't been produced in the first place.

For example: Insulating a home or turning off unnecessary devices avoids having to produce additional electricity during peaks in consumption (often with more polluting power plants).



Impacts & choices

Beginner

Question

What are the effects of reducing fossil fuel-related air pollution?

- A. It improves the health of populations
- B. It increases respiratory diseases
- C. It wouldn't change anything for health

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Impacts & choices

Beginner

Answer

A. It improves the health of populations

Burning fossil fuels such as coal, petroleum and gas emits pollutants into the air. These pollutants can cause respiratory and cardiovascular diseases.

So when we reduce this pollution through the energy transition, we also improve air quality and the health of populations.

For example: If we replace coal-fired power plants or reduce the use of highly polluting cars, we can improve air quality in cities and reduce certain health problems linked to pollution.



Impacts & choices

Beginner

Question

Rank these actions from the best to the worst in terms of reducing the environmental impact of a device (energy and resources):

- A. Repairing a device
- B. Throwing it away and buying a new one
- C. Buying a second-hand device

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Impacts & choices

Beginner

Answer

A. Repair → C. Buy second-hand → B. Throw away and buy new

The environmental impact of a device often lies in its manufacture: extracting raw materials, manufacturing the parts in the factory and transporting the product. All of these steps consume energy and natural resources and can emit CO₂. So, to reduce the “energy + resources” impact, the best thing to do is to keep the device for as long as possible.

For example: For a smartphone:

- Repair (change the battery, replace the screen): you extend the life of the device and avoid producing a new phone.
- Buy reconditioned or second-hand goods: choosing a refurbished telephone means that fewer new materials are extracted and fewer new devices are manufactured.
- Buy new: new resources are extracted and a new phone is manufactured and transported: this option has the highest environmental impact.



Impacts & choices

Beginner

Question

Why can some projects for the energy transition be difficult to implement locally?

- A. Because some people are worried about changes to their environment (landscape, noise, construction)
- B. Because renewable energy never works
- C. Because the weather never changes

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Impacts & choices

Beginner

Answer

A. Because some people are worried about changes to their environment (landscape, noise, construction)

Even if a solution is useful, it can cause concern:

- the impact on the landscape or the living environment,
- the perceived noise or nuisance,
- the duration (often long) of the work,

This is sometimes called a local acceptance issue.

So, to make the energy transition a success, it is important to explain the projects, dialogue with local residents and share the benefits.

For example: A wind farm project can be contested locally because some residents fear that it will damage the landscape or increase noise pollution, even if the project produces low-carbon electricity.



Impacts & choices

Beginner

Question

Is “green” energy production the same all over the world?

- A. Yes, it is exactly the same in all countries
- B. No, but most countries can produce green energy, with different resources
- C. No, it only exists in certain countries

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Impacts & choices

Beginner

Answer

B. No, but most countries can produce green energy, with different resources

Green energy production exists in many countries, but the sources available are not the same everywhere. It all depends on geography, infrastructure and investments.

For example: Sunny regions can produce a lot of solar energy. Windy areas can develop wind energy. Countries with large rivers can produce hydroelectricity.



Impacts & choices

Beginner

Question

Why are some solutions that change how we produce or use energy expensive at the start?

- A. Because they use more and more energy
- B. Because they often require an initial investment to consume less energy later
- C. Because they produce less electricity

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Impacts & choices

Beginner

Answer

B. Because they often require an initial investment to consume less energy later

Some solutions require an initial investment, but help us consume less energy and reduce pollution in the long term. Globally, more than \$2 trillion are invested each year to transform the energy system, equivalent to the economy of a large country.

For example: Installing solar panels on a building initially costs money, but they then produce electricity for many years.



Impacts & choices

Advanced

Question

What are two potential positive effects of the energy transition, beyond climate?

(Select 2)

-
- A. Better air quality and health
 - B. Job creation (renovation, renewable energies, networks)
 - C. More air pollution
 - D. Less electricity production

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Impacts & choices

Advanced

Answer

A. Better air quality and health

B. Job creation (renovation, renewable energies, networks)

The energy transition is not only about acting for the climate. It can also bring immediate and concrete benefits:

- Better air quality: reducing the use of coal, fuel oil or diesel means that less smoke and fewer particles are emitted. The result: we can breathe easier and our health improves, especially in the city.
- Local job creation: insulating buildings, installing solar panels or heat pumps, modernising networks... all of these projects require labour. So jobs can be created locally in the building and energy sectors.

And sometimes, as a bonus, we can also reduce dependence on energy imports. The energy transition is not about reducing electricity production, but about producing it differently and using it better.



Impacts & choices

Advanced

Question

What does “rebound effect” mean in energy?

- A. When renewable energy replaces fossil energy
- B. When an improvement (greater efficiency) encourages more use, which reduces some of the energy savings
- C. When electricity costs less at night





Impacts & choices

Advanced

Answer

B. When an improvement (greater efficiency) encourages more use, which reduces some of the energy savings

The rebound effect occurs when equipment becomes more efficient (it consumes less energy), but this encourages people to use it more. Some of the energy savings are then cancelled out by the increase in use. In other words: efficiency saves energy, but if we then consume more because it is cheaper or more practical, the gain decreases.

For example: A fuel-efficient car can encourage the owner to make more trips, or a better insulated house can be heated to a higher temperature. In these cases, efficiency improves the situation, but some of the energy savings are lost due to increased use.



Impacts & choices

Advanced

Question

Why can energy sufficiency be controversial?

- A. Because it means people might have to change their habits or levels of comfort
- B. Because it simply prohibits all energy consumption
- C. Because it has no effect on emissions





Impacts & choices

Advanced

Answer

A. Because it means people might have to change their habits or levels of comfort.

Energy sufficiency involves reducing certain uses or adapting them (heating, travel, equipment). It can be perceived as a constraint because it means people might have to change their habits and levels of comfort. To be accepted, the approach must be fair, with clear guidance.

For example: Lowering the heating by 1°C reduces consumption, but can be poorly perceived if the home is poorly insulated or if the measure is experienced as an imposition.



Impacts & choices

Advanced

Question

How can geopolitics hinder or complicate the transition?

- A. Because some strategic resources and materials are concentrated in a few countries
- B. Because all countries produce the same energy resources
- C. Because the transition eliminates international trade

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Impacts & choices

Advanced

Answer

A. Because some strategic resources and materials are concentrated in a few countries

The energy transition reduces dependence on petroleum and gas, but it increases the need for strategic materials (lithium, cobalt, rare earths), which are needed for batteries and renewable energies.

However, these resources are concentrated in a few countries: in the event of political tensions or trade restrictions, production may slow down.

For example: If a major lithium-producing country limits exports, the process of manufacturing batteries for electric cars may become slower or more expensive.



Impacts & choices

Advanced

Question

What is greenwashing and why is it a problem in the energy transition?

- A. It is a method for producing 100% renewable energy
- B. It is a strategy that exaggerates or falsely presents an action as green
- C. It is a legal requirement for energy companies

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Impacts & choices

Advanced

Answer

B. It is a strategy that exaggerates or falsely presents an action as green

Greenwashing is the process of giving a product, service or company a misleading green image, without any real significant change. In the energy transition, this can slow down real actions by making it appear that sufficient efforts are already being made.

For example: A company can put forward a "green electricity" offer without clear proof that it is "green" in any way, while continuing to mainly invest in fossil fuels.



Impacts & choices

Advanced

Question

What should be taken into account when comparing the cost of an energy solution (e.g. heat pump)?

- A. The purchase price only
- B. The cost over time: purchase + energy + maintenance
- C. The number of sales of the product





Impacts & choices

Advanced

Answer

B. The cost over time: purchase + energy + maintenance

The purchase price is not the only cost – it's just what you pay at the start. For accurate comparisons, we need to look at the total cost over time, since a solution may cost more to install, but it could then consume less energy (and so reduce bills), require less maintenance and have a longer lifespan.

For example: Heat pump vs electric radiators: A heat pump is more expensive to install but it uses less electricity to produce the same heat. As a result, monthly bills are lower, and some of the extra purchase costs can be “made up” over time.



Impacts & choices

Advanced

Question

What is “energy poverty”?

- A. A situation where a household chooses not to turn on the heat in winter to save energy
- B. A situation where a household is finding it hard to pay for the energy they need or is living in a home that is difficult to heat properly
- C. A situation where a home uses only fossil fuels





Impacts & choices

Advanced

Answer

B. A situation where a household is finding it hard to pay for the energy they need or is living in a home that is difficult to heat properly

Energy poverty refers to a situation in which a household cannot afford the energy it needs to live in decent conditions, particularly for heating. This may be related to:

- energy bills that are too high in relation to income,
- a poorly insulated home or one that is difficult to heat.

Some people turn down or switch off their heating, not because of environmental concern, but because they cannot afford to pay their bills.

Example: A family living in a poorly insulated home may turn the heating down significantly or leave certain rooms unheated to avoid a high energy bill. Energy-efficient renovations, such as better insulation or more efficient heating systems, can improve comfort and reduce bills.