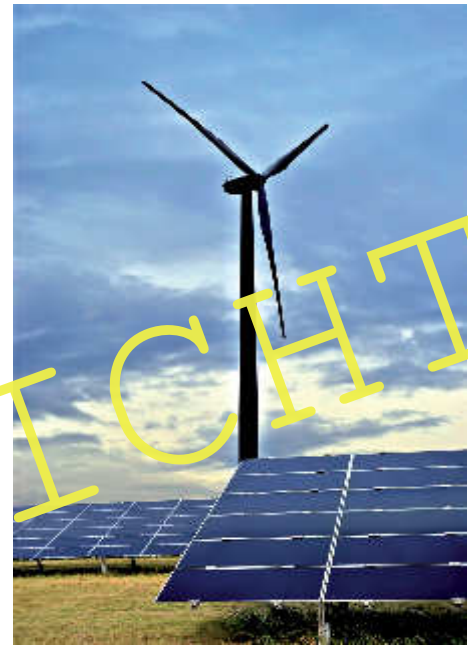


Coal, nuclear energy or wind? – Discussing different sources of energy

Von Jens-Uwe Dürr, Donzdorf

Das Thema „Energieversorgung“ hat in der heutigen Zeit mehr an Aktualität denn je gewonnen. Unsere Entscheidungen, welche Arten von Energie wir fördern, und das Maß, in dem wir diese nutzen, werden unser Leben, unsere Zukunft und vor allem die der nächsten Generationen beeinflussen.

In dieser Unterrichtseinheit befassen sich die Schüler mit erneuerbaren sowie nicht erneuerbaren Energien und erarbeiten deren Vor- und Nachteile. Sie analysieren Diagramme zur Energienutzung in verschiedenen Ländern und führen abschließend eine Diskussion zum Thema „erneuerbare Energien“.



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Erneuerbare Energien sind weltweit auf dem Vormarsch.

Das Wichtigste auf einen Blick

Kompetenzen

- die wichtigsten Energieformen sowie deren Vor- und Nachteile kennen
- thematischen Wortschatz kennen und anwenden
- Diagramme beschreiben und analysieren
- mithilfe von *if-clauses* über wahrscheinliche und unwahrscheinliche Situationen und deren Folgen sprechen
- einen Standpunkt in einer Diskussion vertreten

Dauer

5 Schulstunden (+ Test)

Niveau

Niveau B1/B2

Ihr Plus

eine Farbfolie zum Thema und Rollenkarten für eine Diskussion

Verlaufsübersicht

1. Stunde: Renewable and non-renewable sources of energy	
Material	Verlauf
M 1	Coal, nuclear power or wind? – Getting to know different sources of energy / Energiequellen den passenden Bildern zuordnen
M 2	Renewable or non-renewable? – Categorising energy / thematischen Wortschatz zum Thema „Energiequellen“ erarbeiten
<i>Stundenziel:</i>	Die Schüler kennen den Unterschied zwischen erneuerbaren und nicht erneuerbaren Energiequellen.

2./3. Stunde: Advantages and disadvantages of different source of energy	
Material	Verlauf
M 3	The energy issue – analysing a picture / anhand eines Bildes über die Vor- und Nachteile von erneuerbaren Energien nachdenken
M 4, M 5	(Non-) renewable sources of energy – an info text / Vor- und Nachteile der verschiedenen Energiequellen anhand von Sachtexten arbeitsteilig erarbeiten
M 6	Different sources of energy – advantages and disadvantages / ein Übersichtsblatt in Partnerarbeit ausfüllen
M 7	Energy use in different countries – analysing charts / die Nutzung von Primärenergie in Deutschland, den USA und Neuseeland anhand von Diagrammen vergleichen
M 8	Phrases for analysing charts – language support / Redemittel zum Beschreiben und Analysieren von Diagrammen
<i>Stundenziel:</i>	Die Schüler kennen die Vor- und Nachteile der verschiedenen erneuerbaren sowie nicht erneuerbaren Energien.

4. Stunde: Describing realistic and imaginary situations and its consequences	
Material	Verlauf
M 9	If we closed all nuclear power plants, ... – practise using conditional sentences / die Zeitenfolge in den <i>if-clauses</i> Typ 1 und 2 wiederholen und in Übungen anwenden
<i>Stundenziel:</i>	Die Lernenden beschreiben mithilfe von <i>conditional sentences</i> wahrscheinliche und unwahrscheinliche Situationen und deren Folgen.

5. Stunde: It's your turn! – Discussing renewable sources of energy	
Material	Verlauf
M 10	Giving your opinion – language support / Redemittel zum Diskutieren
M 11	A discussion about renewable sources of energy / mithilfe von Rollenkarten eine Diskussion zum Thema „erneuerbare Energien“ vorbereiten und durchführen
<i>Stundenziel:</i>	Die Schüler wenden die erarbeiteten Argumente sowie thematischen Wortschatz im Kontext an.



Auf der **CD RAAbits Englisch Berufliche Schulen (CD 18)** befinden sich alle Materialien im veränderbaren Word-Format sowie Zusatzmaterialien.

Materialübersicht

1. Stunde Renewable and non-renewable sources of energy

- M 1 (Tr) Coal, nuclear power or wind? – Getting to know different sources of energy
 M 2 (Ws) Renewable or non-renewable? – Categorising energy

2./3. Stunde Advantages and disadvantages of different sources of energy

- M 3 (Ws) The energy issue – analysing a picture
 M 4 (Tx) Non-renewable sources of energy – an info text
 M 5 (Tx) Renewable sources of energy – an info text
 M 6 (Ws) Different sources of energy – advantages and disadvantages
 M 7 (Ws) Energy use in different countries – analysing charts
 M 8 (Voc) Phrases for analysing charts – language support

4. Stunde Describing realistic and imaginary situations and its consequences

- M 9 (Gr) If we closed all nuclear power plants, ... – practise using conditional sentences

5. Stunde It's your turn! – Discussing renewable sources of energy

- M 10 (Voc) Giving your opinion – language support
 M 11 (Rp) A discussion about renewable sources of energy

Vocabulary Talking about different sources of energy (M 11/12)

Test What do you know about energy? (M 13)

Bedeutung der Abkürzungen

Gr: Grammar sheet; Rp: Role play; Tr: Transparency; Tx: Text; Voc: Vocabulary sheet; Ws: Worksheet

Minimalplan

Sie haben nur zwei Stunden zur Verfügung? So können Sie die wichtigsten Inhalte erarbeiten:

- | | | |
|------------|---|--------------------|
| 1. Stunde: | Renewable and non-renewable sources of energy | M 1 und M 2 |
| 2. Stunde: | Advantages and disadvantages | M 3–M 6 |

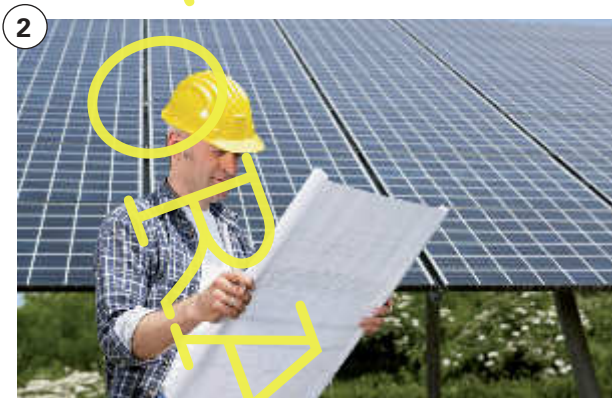
Zusatzmaterialien auf CD

M8_Zusatz_jumbled_phrases (alternatives Arbeitsblatt, auf dem die Redemittel zum Beschreiben von Diagrammen mithilfe einer Zuordnungsübung erarbeitet werden)

M10_Zusatz_missing_vowels (alternatives Arbeitsblatt, auf dem die Redemittel zum Diskutieren durch Einsetzen fehlender Vokale erarbeitet werden)



Coal, nuclear power or wind? – Getting to know different sources of energy



nuclear energy

water

coal

biomass

wind

solar energy

Tasks

1. Look at the pictures above and say what they all have in common.
2. Which source of energy do the different production sites use? Match the photos and the words in the box.
3. Which other sources of energy do you know?

© Fotos: 1, 2, 4, 5 und 6: Thinkstock; 3: Colourbox

Renewable or non-renewable? – Categorising energy

M 2

Find out about the difference between renewable¹ and non-renewable sources of energy.

Tasks

1. Match the sources of energy in the box to the definitions on the right.

- | | |
|-----------------|--|
| a) _____ | It's a dark, solid ² mineral that is burnt to produce electricity for example. |
| b) _____ | It's a natural liquid ³ that can be found underground ⁴ . |
| c) _____ | It's organic material for example bio waste, wood residues ⁵ or slurry ⁶ . |
| d) _____ | It's an invisible ⁷ substance that can be found underground. |
| e) <u>water</u> | It's a source of energy when it falls or flows. |
| f) _____ | It's a source of energy that can be found in atomic material like uranium. |
| g) _____ | This energy is stored ⁸ as heat ⁹ in the ground. |
| h) _____ | This energy comes from moving air. |
| i) _____ | This energy is in light and heat of the sun. |

coal, oil, biomass, natural gas¹⁰, water, nuclear energy, geothermal energy¹¹, wind energy, solar energy

2. a) Read the info box.



Renewable sources of energy are continuously renewed or can easily be replaced.

In contrast, **non-renewable** sources of energy don't renew¹² themselves and will be exhausted¹³ at some point in time. Fossil fuels¹⁴ are a special type of non-renewable sources of energy. These are substances formed by natural processes that can usually be found underground.

b) Now decide which sources of energy in the box in task 1 are renewable and which are non-renewable. Then complete the chart. Be prepared to give reasons for your choice.



3. What might be the problems of using fossil fuels? Make notes. Then share results with your partner. Be prepared to report back to the class.

Vocabulary

1 (non-)renewable: (nicht) erneuerbar – 2 solid: fest, massiv – 3 liquid: die Flüssigkeit – 4 underground: hier: unter der Erde – 5 residue: der Abfall, der Überrest – 6 slurry: die Gülle – 7 invisible: unsichtbar – 8 to be stored: gespeichert sein – 9 heat: die Wärme – 10 natural gas: das Erdgas – 11 geothermal energy: die Energie aus Erdwärme – 12 to renew oneself: sich erneuern – 13 to be exhausted: ausgeschöpft sein, zu Ende gehen – 14 fossil fuel: der fossile Brennstoff

Renewable sources of energy – an info text

Text B

M 5

Find out about the advantages and disadvantages of renewable sources.

Renewable sources of energy

Renewable sources of energy are generated¹ from natural processes or organic materials that are continuously renewed. As fossil fuels like coal, oil and natural gas will be exhausted one day, scientists keep on searching for alternative technologies to generate electricity or fuel for vehicles. Renewable energies are growing fast around the world. They are almost emission-free² and do not pollute³ the environment. But these alternate technologies often depend⁴ on the weather or require⁵ special geographical conditions.



Wind farms use renewable energies.

The power in flowing or falling **water** can be used to generate electricity. Hydroelectric power plants⁶ are very efficient but they are very expensive to build. They also affect⁷ the natural flow of rivers or lakes which can have negative effects on fish or other animals living in the water or nearby. But the influence on the environment is local, not global.

Wind energy is captured⁸ with the help of large turbines and is most often converted⁹ into electricity. But the costs to build wind farms are very high and they often depend on government subsidies¹⁰. The large turbines take a lot of space and often do not look nice in the landscape. As it depends a lot on the weather, wind energy is not very reliable¹¹.

Solar energy is captured with the help of solar cells and is then converted into electricity or heat. These cells are very quiet and need minimal maintenance¹². But the technology has a relatively low efficiency compared with other techniques. As it depends a lot on the weather, it is not very reliable.

Geothermal energy is almost emission-free and it is very reliable. But the geothermal power plants¹³ can only be built in remote areas, and therefore electricity generated needs long distances for its transmission. Unfortunately, the construction costs are very high.

Biomass is organic material, as for example bio waste, wood residues or slurry. It can be converted into electricity or fuel by being burnt or through other chemical processes like fermentation¹³. The costs are relatively low but it releases CO₂ when burnt.

Tasks

1. Read the text above. While reading underline advantages of the different sources of energy in green and disadvantages in red.
2. Work with a partner who has read text A and fill in the overview sheet together.

Extra task: Check the Internet for further advantages and disadvantages of the different sources of energy.

Vocabulary

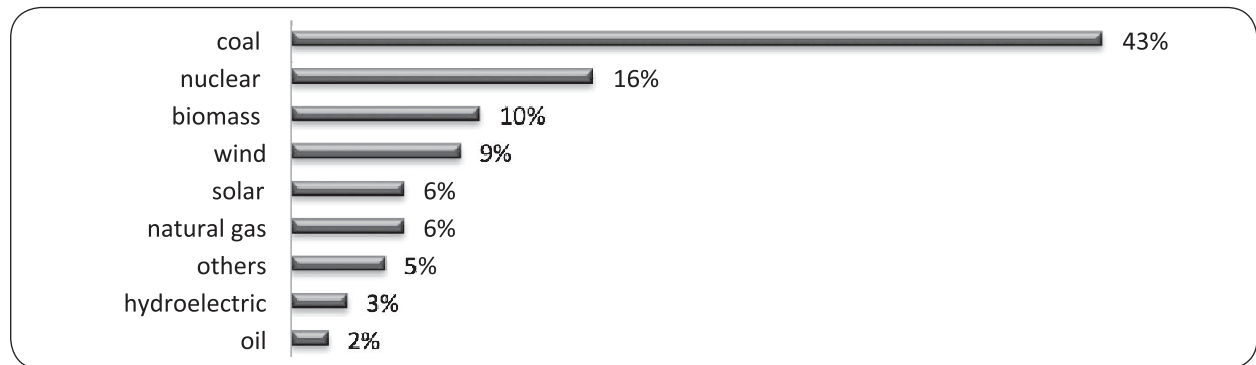
1 **to generate sth.:** etw erzeugen – 2 **emission:** der Ausstoß, die Abgase – 3 **to pollute sth.:** etw. verschmutzen – 4 **to depend on sth.:** von etw. abhängen – 5 **to require sth.:** etw. voraussetzen – 6 **hydroelectric power plant:** das Wasserkraftwerk – 7 **to affect sth.:** etw. betreffen, etw. beeinträchtigen – 8 **to capture sth.:** etw. einfangen – 9 **to convert sth. into sth.:** etw. in etw. umwandeln – 10 **government subsidies:** die staatliche Unterstützung – 11 **reliable:** zuverlässig – 12 **maintenance:** die Instandhaltung – 13 **fermentation:** die Gärung

Energy use in different countries – analysing charts

M 7

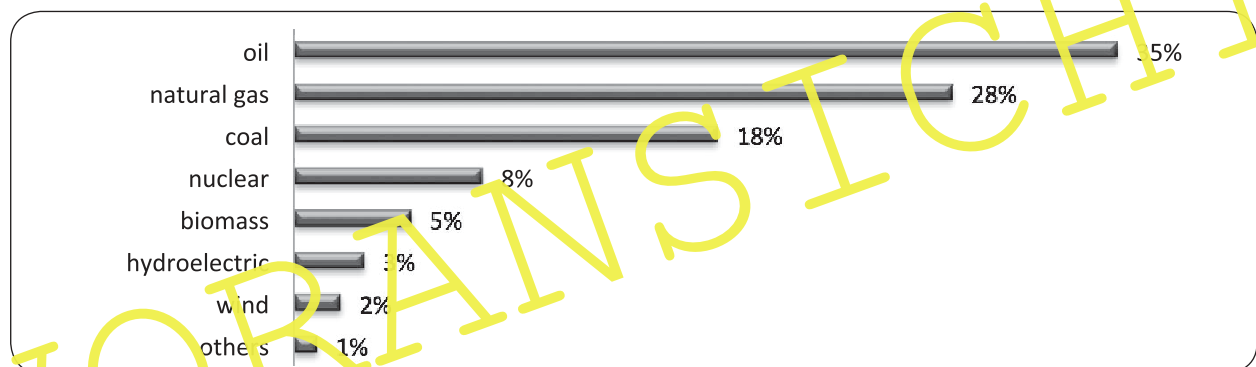
Find out about the percentages of the so-called primary sources of energy used in different countries in 2014. These primary sources are converted into other forms of energy such as electricity or fuel.

Germany



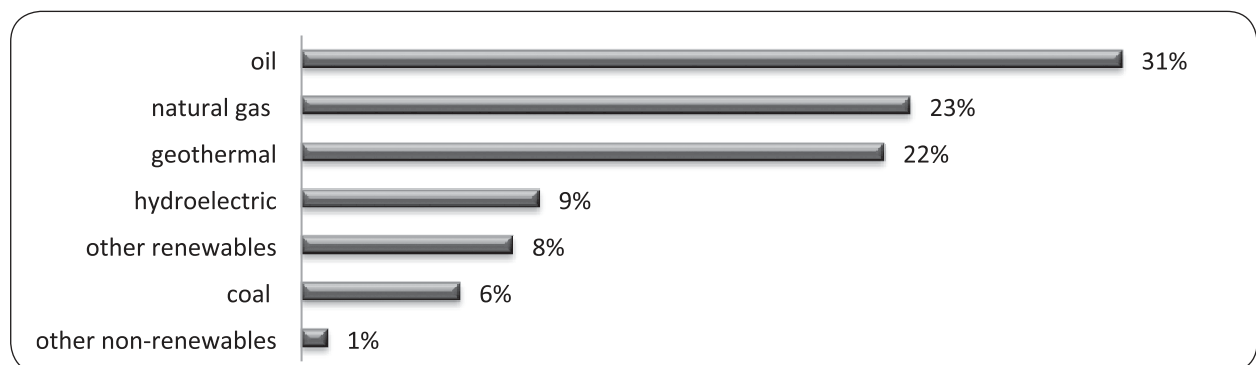
source: Fraunhofer Institut für Solare Energiesysteme (ISE) 2015

USA



source: US Energy Information Administration (EIA) 2015

New Zealand



source: Ministry of Business, Innovation and Employment (MBIE) 2015

Tasks

1. Look at the charts and say what is different in the three countries. Take notes.
2. What reasons can you imagine for the differences? Take notes.

hydroelectric (energy): die Elektrizität aus Wasserkraft

M 11 A discussion about renewable sources of energy

Prepare a discussion about renewable energies and act it out in class.

Tasks

1. You will discuss the following statement: "Renewable sources of energy: The solution to the energy crisis!" Get together in groups of three and decide who takes which role (A, B or C).
2. Prepare your roles. Think of arguments for "your" positions and take notes.
3. Get together in your group and discuss the statement. Use if-clauses where possible.

Person A: Your name is Allyson Black. You are an environmentalist¹ from New Zealand who wants to protect nature and save the planet. You defend² the following statement: "We must give more money to make their use possible as they can save the energy problem".



Person B: Your name is Katja Arndt. You are from Germany and you defend the position that nuclear power is the best source of energy. Of course you know that it has disadvantages as well. You do not support³ renewable sources of energy as the costs are often very high.



Person C: You are Jason Wallace from the US. You defend the position that we should use more coal to generate energy. Nuclear power is too dangerous as nuclear accidents in the past have shown. You support the use of renewable energies but you are sure they cannot guarantee a constant energy supply⁴.



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Vocabulary

- 1 **environmentalist:** der/die Umweltschützer/-in – 2 **to defend sth.:** etw. verteidigen – 3 **to support sth.:** etw. unterstützen – 4 **supply:** die Versorgung