



# CLIL LESSON cenario

02

**electrical engineering**  
wind power



Erasmus+

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## 1 Topic of Today

- Write the topic of today on the blackboard
- short discussion

Wind Power: What is Wind Power?

## 2 Key Words

- Write up any key word from the text and give the translation in the mother tongue or explain the words in English. Ask students to listen and repeat in English.

**power source - power plant - rotors - offshore - onshore -**

**wind farms - renewable resource - kinetic energy - air pollutants -**

**greenhouse gases - sustainable - visual pollution**

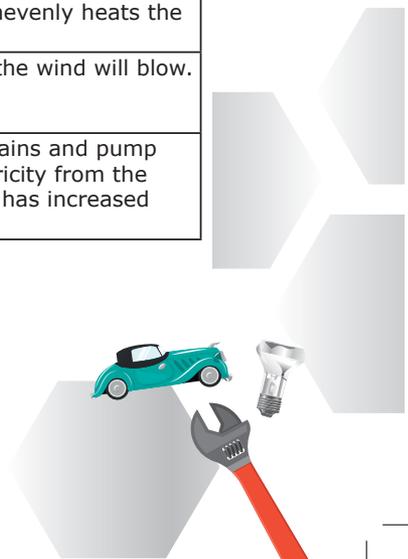
## 3 Text circles

- Asking and answering questions; ordering words
- Getting new information; working in groups; reading

1) Write a text you would like to use in your class.

2) Divide the text into sections, making sure that each section break is in the middle of the sentence. There should be enough parts for each student in a group to have one. Write the prepared text in the parts, writing the number 1 next to the beginning. Do not write any other numbers.

<b>1</b> Wind is the movement of air from an area of high pressure to an area of low pressure. In fact, wind exists because the sun unevenly heats the surface of the earth. As hot air rises, cooler
air moves in to fill the void. As long as the sun shines, the wind will blow. Wind has long served as a power source to humans. Ancient mariners used sails to capture
the wind. Farmers once used windmills to grind their grains and pump water. Today, more and more wind turbines wring electricity from the breeze. Over the past decade, the use of wind turbines has increased more than 25 percent



per year.

**- How does a Wind Power Plant work?**

A wind power plant utilizes the speed of wind to drive large rotors, which are connected to a generator, which then, generates electricity. The central factor with wind power plants is the speed

of wind: the more even and less rough the ground is, the higher the speed of wind. The speed of wind increases also with altitude, the higher you go, the more steadily the wind blows.

Therefore the most efficient plants are

those situated at sea (offshore) and in the windy regions on land (onshore), for instance, in the Pannonia plains southeast of Vienna. Austria has very good wind conditions

in some parts of the country. This means that electricity can be efficiently produced. Around 25 percent of Austrian households are currently being supplied with electricity from wind farms.

**- Advantage of wind power**

Wind is an unlimited,

free, renewable resource. Wind is a natural occurrence and harvesting the kinetic energy of wind doesn't affect currents or wind cycles in any way. Unlike

other types of power plants, it emits no air pollutants or greenhouse gases (carbon dioxide).

**- Disadvantage of wind power**

Wind is not a constant energy source. Although wind energy is sustainable and will never run out, the wind

isn't always blowing. For a wind turbine to be efficient, the location where it is built needs to have an adequate supply of wind energy.

Wind turbines generate noise and visual pollution. A single wind

turbine can be heard from hundreds of meters away.

Alternative uses for the land might be more highly valued than electricity generation. Flying into spinning turbine blades

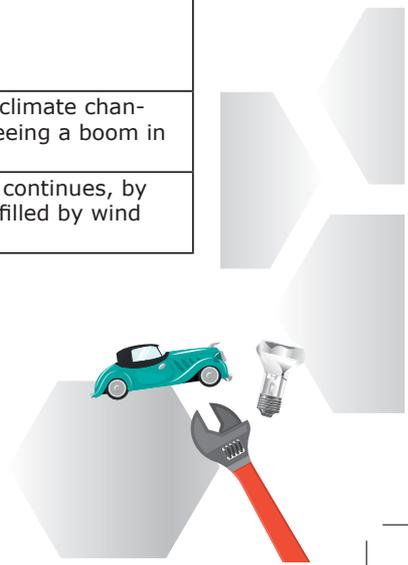
has killed animals like birds and bats. However, it is believed that wind turbines pose less of a threat to wildlife than other man made structures such as cell phone masts or radio towers.

**- The future of wind power**

The wind energy

industry is booming. Thanks to global efforts to combat climate change, such as the Paris Agreement, renewable energy is seeing a boom in growth, with wind energy leading the

way. Industry experts predict that if this pace of growth continues, by 2050 one third of the world's electricity needs will be fulfilled by wind power.



3) Cut into slips.

In this example you have fourteen slips for one circle of fourteen students.

4) Give out the slips. Ask students to read their slips to each other. They must keep their own slips of paper. Ask them to work out the correct order of the text and to stand in that order.

5) Ask the student who have the first part of the text to read out their slip. Then get the rest of the group to read their slips in their chosen order to check that they are correct.

6) Take in the slips. The students sit down.

## 4 Conclusions

- Give out copies of the text.
- Each student writes a question about the text.
- Taking their question with them the students move round the class asking and answering the questions.

### Prepared Text:

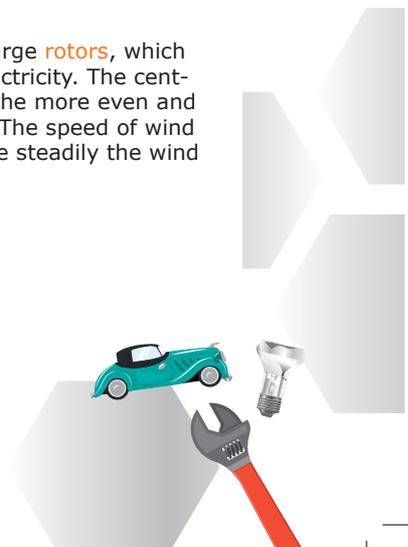
#### Wind Power

Wind is the movement of air from an area of high pressure to an area of low pressure. In fact, wind exists because the sun unevenly heats the surface of the earth. As hot air rises, cooler air moves in to fill the void. As long as the sun shines, the wind will blow. Wind has long served as a **power source** to humans. (1)

Ancient mariners used sails to capture the wind. Farmers once used wind-mills to grind their grains and pump water. Today, more and more wind turbines wring electricity from the breeze. Over the past decade, the use of wind turbines has increased more than 25 percent per year. (2)

#### How does a Wind Power Plant work?

A wind **power plant** utilizes the speed of wind to drive large **rotors**, which are connected to a generator, which then, generates electricity. The central factor with wind power plants is the speed of wind: the more even and less rough the ground is, the higher the speed of wind. The speed of wind increases also with altitude, the higher you go, the more steadily the wind blows.



Therefore the most efficient plants are those situated at sea (**offshore**) and in the windy regions on land (**onshore**), for instance, in the Pannonia plains southeast of Vienna. (3)

Austria has very good wind conditions in some parts of the country. This means that electricity can be efficiently produced. Around 25 percent of Austrian households are currently being supplied with electricity from **wind farms**. (4)

### Advantage of wind power

Wind is an unlimited, free, **renewable resource**. Wind is a natural occurrence and harvesting the **kinetic energy** of wind doesn't affect currents or wind cycles in any way. Unlike other types of power plants, it emits no **air pollutants** or **greenhouse gases** (carbon dioxide). (5)

### Disadvantage of wind power

Wind is not a constant energy source. Although wind energy is **sustainable** and will never run out, the wind isn't always blowing. For a wind turbine to be efficient, the location where it is built needs to have an adequate supply of wind energy.

Wind turbines generate noise and **visual pollution**. A single wind turbine can be heard from hundreds of meters away.

Alternative uses for the land might be more highly valued than electricity generation.

Flying into spinning turbine blades has killed animals like birds and bats. However, it is believed that wind turbines pose less of a threat to wildlife than other man made structures such as cell phone masts or radio towers. (6)

### The future of wind power

The wind energy industry is booming. Thanks to global efforts to combat climate change, such as the Paris Agreement, renewable energy is seeing a boom in growth, with wind energy leading the way. Industry experts predict that if this pace of growth continues, by 2050 one third of the world's electricity needs will be fulfilled by wind power. (7)

#### Sources:

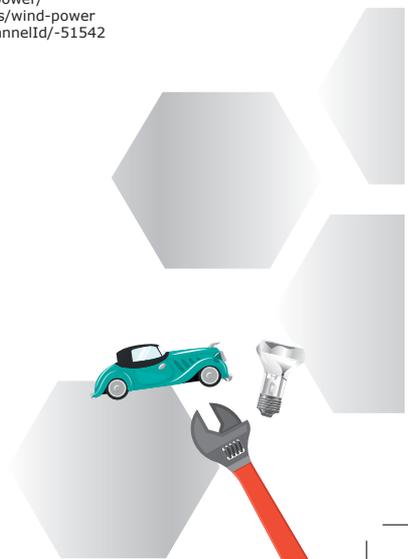
(1)(2)(7) <https://www.nationalgeographic.com/environment/global-warming/wind-power/>

(3) <https://www.verbund.com/en-at/about-verbund/power-plants/power-plant-types/wind-power>

(4) <https://www.wienenergie.at/eportal3/ep/channelView.do/pageTypeId/67860/channelId/-51542>

(5) <http://large.stanford.edu/courses/2014/ph240/lloyd2/>

(6) <http://www.powerworldanalysis.com/advantages-disadvantages-wind-energy/>



**Subject: Electrical Engineering**  
**Title of the Lesson Plan: Wind Power**

**Course / Level: 11<sup>th</sup> grade (3<sup>rd</sup> Class HTL)**  
**L2 level for students/teacher: B2**

<b>1. Learning outcomes</b>	Knowledge: to know how Wind Power works Skills: to be able to talk about the advantage and disadvantage of Wind Power
<b>2. Subject Content</b>	Wind Power
<b>3. Language Content / Communication</b>	
<b>Vocabulary /Structures</b>	Technical subject-specific language General English BICS
<b>Discourse type</b>	description, argumentative
<b>Language skills</b>	B2
<b>4. Contextual (cultural) element</b>	Added value of studying how Wind Power works through the medium of English – Content and Language skills get improved
<b>5. Cognitive (thinking) processes</b>	remembering, identifying, defining things
<b>6. Activities</b>	1) "Key Word" speaking, remembering 2) "Text circles" asking and answering questions, ordering words, getting new information, working in groups, reading
<b>7. Methodology</b>	
<b>Organization and class distribution / timing</b>	1) Whole class / 15min 2) Group work / 20 min 3) Pair work / 40 min 4) Whole class / 25
<b>Resources / Materials</b>	Set of vocabulary, Slips of prepared text, Text
<b>8. Evaluation Criteria</b>	Learners should be able to know facts about Wind Power in L2 language
<b>9. Evaluation Instruments</b>	Be able to make questions about the given text; Answering text related questions

