

LESSON 1.

Worksheet 1.

Table 1.: what I already know / what I have learned

Part 1.: it is done at the beginning before watching the video and reading the text

Part 2. students solve after watching the video and reading the text

terms	What I already know	What I have learned
"clean energy"		
Renewable energy sources		
Affordable energy		
Sustainable energy		

Table 1.

Text:

Goal 7 of sustainable development is about clean energy, which is energy that enables sustainable development because it does not harm the environment and human health. Part of the goal is to enable the availability of energy for people, the use of modern technology in energy production and reliability in energy production. Access to "clean, modern and sustainable" energy is key to improving the health and living standards of people around the world. The construction of solar power plants, wind power plants, geothermal power plants and hydroelectric power plants will enable the achievement of goal 7 by 2030. The use of renewable energy sources (Sun, water, wind, geothermal sources) requires the further development of modern technologies to ensure a still clean and healthy environment.

What does it mean to have access to affordable energy?

The heterogeneity of energy use worldwide is largely due to the state's diverse natural resources and purchasing power. For example, a country with large coal deposits is likely to make extensive use of this resource to industrialize its economy. People living in this country are likely to use it as their primary means of producing energy.

Today, approximately 2.7 billion people (about 40 percent of the world's population) rely on traditional biomass fuels for cooking. Such low quality fuels can be a major source of indoor air pollution. Even with the expansion of energy availability and economic development, the annual number of deaths from indoor air pollution will still be over 1.5 million people. If a country's level of development is low and energy production costs are high, then people will lack access to energy. In many parts of the developing world, energy sources are often scarce

and their supply insecure. Today, 20% of the world's population still does not have access to electricity.

Electricity, automated transport and information technology are essential for economic development. They are also fundamental features of modern society, so energy sources and systems that reliably and affordably meet these needs can be considered "modern". The constant flow of energy enables the satisfaction of basic human needs, the maintenance and improvement of society as a whole and the improvement of living standards.

Today, coal still provides about 40 percent of the world's electricity. Coal is not sustainable globally because of its contribution to anthropogenic climate change, nor at the local level because it poses a threat to public health and environmental conditions (harmful combustion products).

It is important to transfer clean energy technology to developing countries, but it is also important for each of us to act locally. This means using energy sources that will not be harmful to the environment and saving energy.

Table 2.

Renewable energy sources	Production technology	Energy conversion
	Wind farm	
Sun		
	Geothermal power plant	
Water		
	Biomass power plant	Chemical energy → electricity

Answer the questions.

1. Explain the importance of clean energy for human health.
2. Explain the connection between economic development and the availability of electricity
3. Why is coal considered a "bad" source of energy?

LESSON 2.

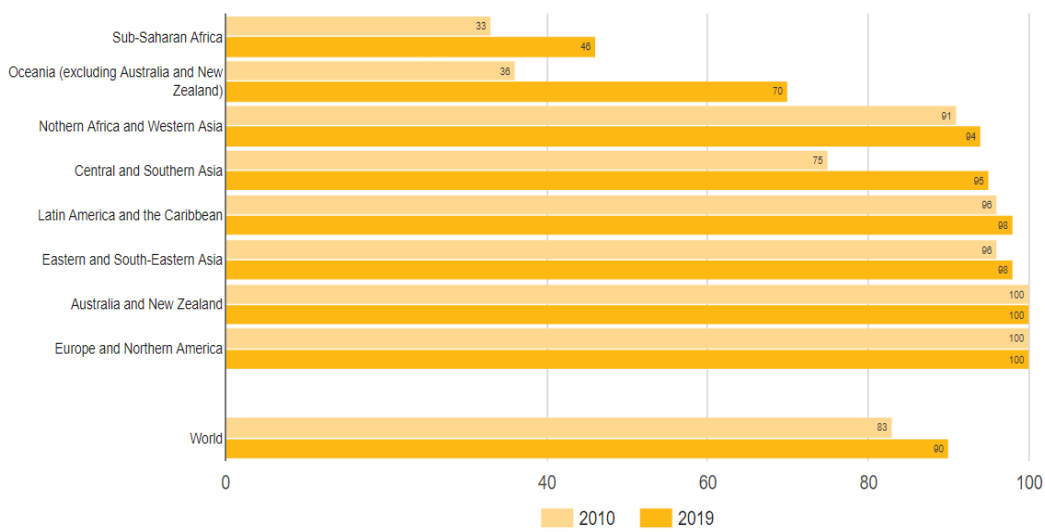
Worksheet 2.

1. Study the given diagram and answer the questions

The diagram shows the access to electricity by world regions in 2010 and in 2019 in percentages. Globally, there has been a visible increase since 2010 when 83% of the world's

population had access to electricity to 90% in 2019. But still in 2019, 759 million people worldwide were without electricity.

Answer the questions:



1. In which regions of the world is electricity 100% affordable?
2. In which world regions have the greatest

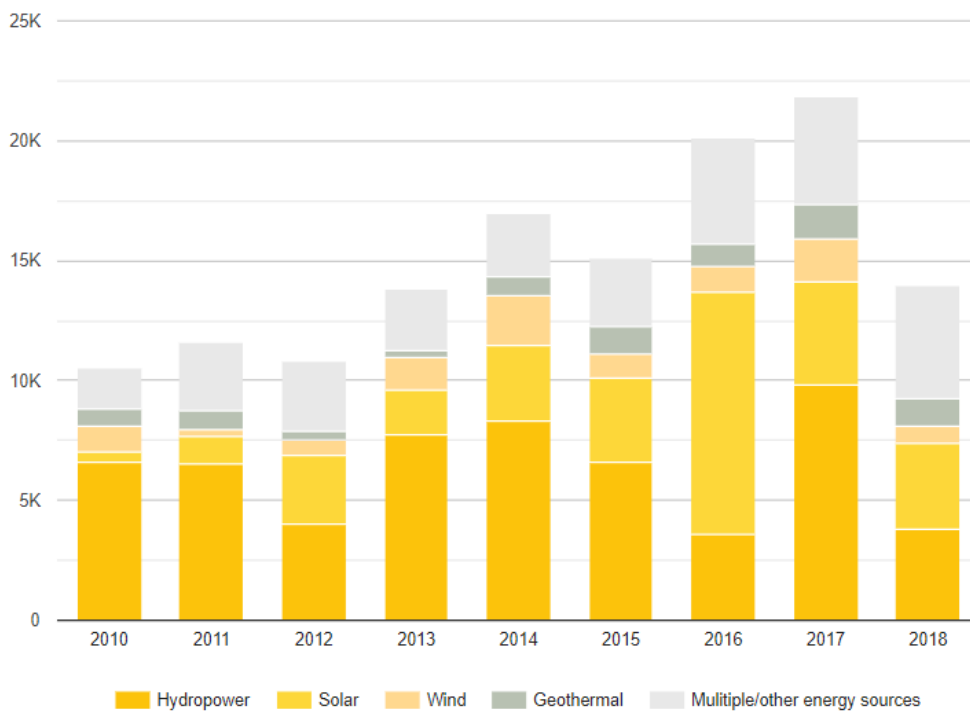
changes in access to electricity occurred in a given period?

3. Which world region has the lowest electricity accessibility in 2019?

4. Connect the accessibility of electricity with the economic development of the area.

2. Study the given diagram and answer the questions

The chart shows billions of dollars in financial investment to developing countries to support clean and renewable energy. In 2018, a total of \$ 14 billion was invested in these purposes.



Answer the questions:

1. Does the type

of financial investment in "clean" energy depend on the geographical characteristics of a developing country? Explain.

2. What is the possible reason for the constant smallest financial investments in geothermal and wind energy? Explain.

3. Can we determine the trend of further investments in clean energy from the chart? Explain.

3.a) Analyze energy data for your country and solve tasks with the help of an interactive map.

<https://trackingsdg7.esmap.org/>

Read the following data on the interactive map by selecting the data specified in the table in the menu:

Table 3.

My country	Affordable electricity	Approach to healthy cooking	Energy from renewable sources
2000.			
2018.			
Changes over a period of 18 years			

3b) Compare the same data from your country with data from Norway or Sweden, using the same interactive map.

Table 4.

Sweden or Norway	Affordable electricity	Approach to healthy cooking	Energy from renewable sources
2000.			
2018.			
Changes over a period of 18 years			

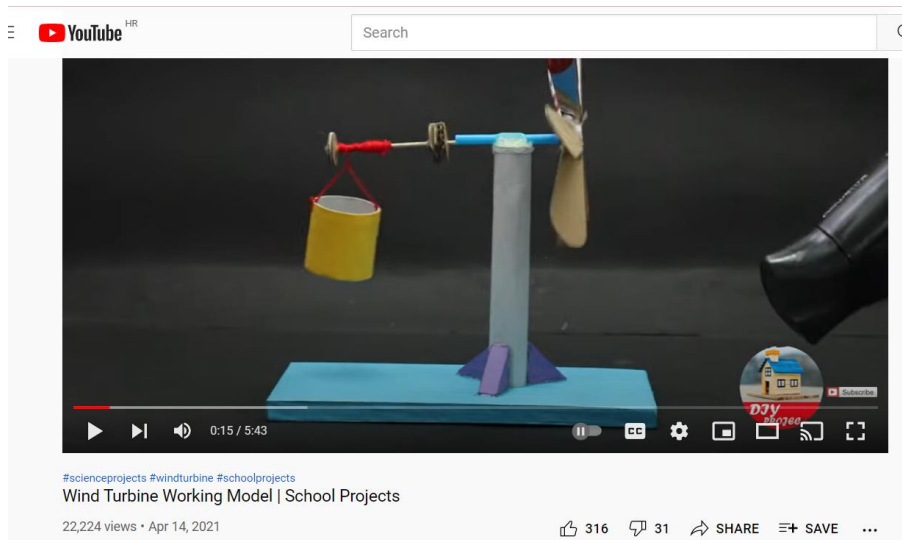
Answer the question:

Explain how we can conclude from the data from the interactive map about the economic development of a particular country?

POSSIBLE PROJECT TASKS

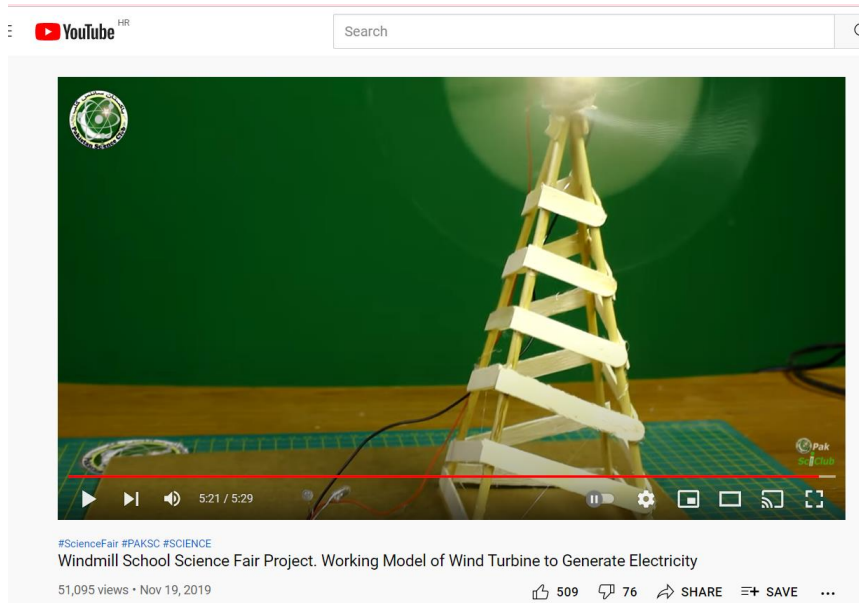
1. Make a model of a windmill (conversion of wind energy into energy that allows the body to move).

<https://www.youtube.com/watch?v=qeVTCe8HLio>



1. Make a model of a windmill with an electric motor (conversion of wind energy into electricity).

<https://www.youtube.com/watch?v=cFvuWMyzviQ>



1. Jobs of the future



People of different professions are involved in decisions about the construction and construction of wind farms in an area. In addition to deciding on construction, certain occupations follow other activities. Read the tasks and imagine yourself in one of the future jobs. Write a composition of about one working day in such a workplace in the future.

a) Teacher

Teaching children what is a wind farm and a benefit to the settlement?

b) Ecologist/biologist

How do wind farms affect the environment and which crops will grow on the surface below them?

c) Specialist communication

Explain to the people in the settlement that they will benefit from wind farms.

d) Financial specialist

How much money is needed to build wind farms and how much is the profit on the obtained energy?

e) Electrical engineering

Construction and maintenance of wind farms.

f) Electronics and computing engineering

Application of modern technology in wind farm operation control.

a) Geologist/ geographer

Research of soil base and wind quantity, determination of geographical position where wind power plants will be built.

b) Medical doctor

Care for the health of all workers during construction and after the commissioning of all wind farms.

c) Economist in the municipality

Development of a time plan for the construction of wind farms, convening construction experts on agreements.

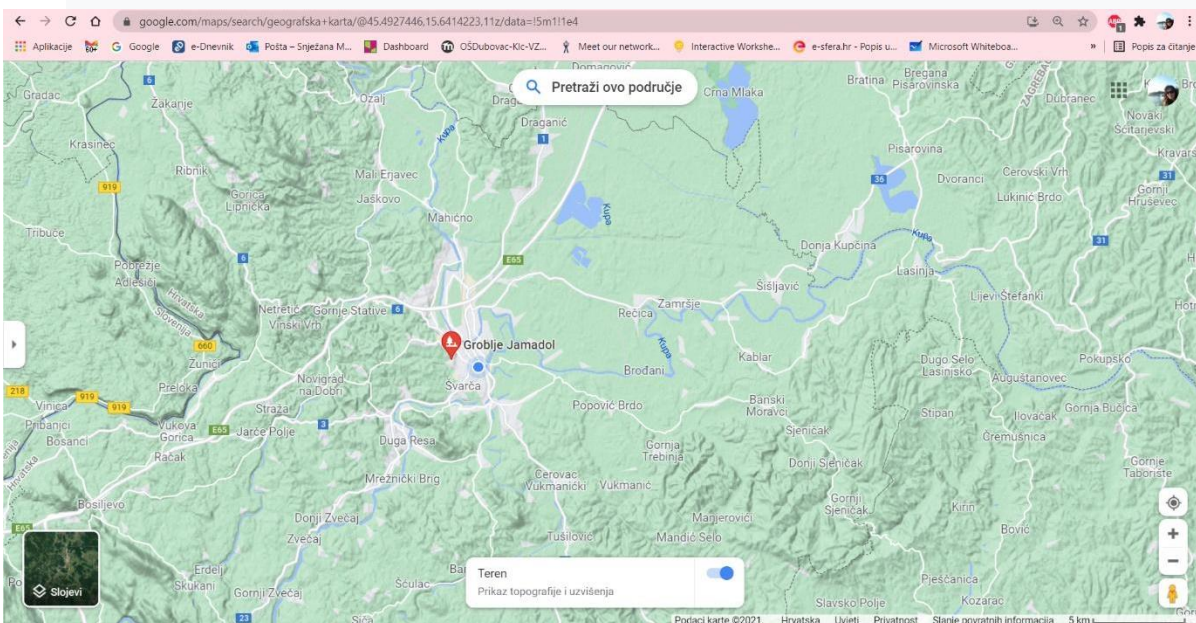
1. Investigate the geographical features of your place of residence and atmospheric factors. Based on the collected data, decide which renewable sources in your area (town, region) people can use.

Geographical location:

a) Using a geographical map, describe the geographical position of your place (elevation, slope, vegetation, climate, running water, geothermal springs).

Comment on the possibility of building hydroelectric power plants, geothermal power plants.

(example Karlovac, Croatia)



b) In the data of the

Meteorological Institute for your country, find data for the number of sunny days a year and comment on the profitability of investing in solar panels.

(example Karlovac, Croatia)

Državni hidrometeorološki zavod

Digitarna pristupačnost | O nama | Objave | Kontakti | PD | EN |

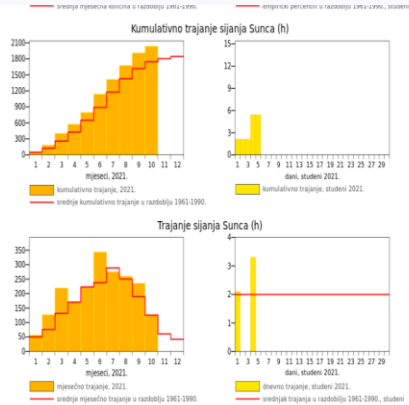
Naslovica Podaci Prognoze **Klima** Infrastruktura Istraživanje i suradnja Proizvod i usluge

Upozorenja OTVORI

Naslovica » Klima » Praćenje klime

Oborina i trajanje sjajanja Sunca

Odaberite: **Karlovac** studeni 2021 Praćenje klime



c) In the data of the meteorological institute for your country, find (or search for) data for the number of windy days and wind strength in the year and comment on the profitability of investments in wind farms. (example Karlovac, Croatia)

DHMZ Naslovica Podaci Prognoze **Klima** Infrastruktura Istraživanje i suradnja Proizvod i usluge

Atlas vjetrova

Klima Hrvatske

Opće značajke klime Hrvatske

Klimatske norme

Klimatski ekstremi

Karte 1931. - 1960.

Karte 1961. - 1990.

Karte 1971. - 2000.

Atlas vjetrova

- metodologija izradbe karata
- Digitalne klimatske karte

Atlas vjetrova je esehora za procjenu energetskeg potencijala vjetrova u Hrvatskoj. Prikazane su karte srednje godišnje brzine vjetrova (h/m) i srednje godišnje gustote snage vjetrova (W/m²) na visinama 10 m i 80 m iznad tla.

Prikazane brzine i gustote snage vjetrova rezultat su numeričkog modela atmosfere i predstavljaju prosječnu vrijednost u kvadratu mreže 2 km x 2 km. Lokalna brzina i gustota snage vjetrova na pojedinoj lokaciji može biti manja ili veća od prikazane prosječne vrijednosti kvadrata mreže. Učinko se prikazani podaci koriste u procesu donošenja odluka. Državni hidrometeorološki zavod nije odgovoran za moguće ekonomski ili druge posljedice koje proizlaze iz upotrebe datih podataka.

Dodatnije podloge za procjenu energetskeg potencijala vjetrova za pojednu lokaciju, kao i sve ostale dodatne informacije mogu se dobiti na: atlas@dmhz.hr.

Downloaded October 30th 2021.

- <https://unstats.un.org/sdgs/report/2021/goal-07/>
- <https://www.youtube.com/watch?v=yMB1jIGtHYE>
- <https://sdgs.un.org/topics/energy>
- https://trackingsdg7.esmap.org/data/files/download-documents/2021_tracking_sdg7_report.pdf
- <https://trackingsdg7.esmap.org/>

Downloaded November 11th 2021.

- <https://www.youtube.com/watch?v=T4xKThjcKaE&t=21s>

Downloaded November 5th 2021.

7. <https://www.youtube.com/watch?v=cFvuwMyzviQ>

8. <https://www.youtube.com/watch?v=qeVTCe8HLio>

Downloaded November 6th2021.

9. https://meteo.hr/klima.php?section=klima_hrvatska¶m=k1_8

10. https://meteo.hr/klima.php?section=klima_pracenje¶m=klel

11. <https://www.google.com/maps/search/geografska+karta/@45.4537404,15.5301795,11z/data=!5m1!1e4>