SHALE GAS

WHAT IS SHALE GAS AND WHY IS IT IMPORTANT?

Shale gas is natural gas found in very fine-grained sedimentary rock. Sedimentary rocks are rocks formed by the accumulation of sediments at the Earth's surface and within bodies of water. Common sedimentary rocks include sandstone, limestone, and shale.
The gas is tightly locked in very small spaces within the reservoir rock requiring advanced technologies to drill and stimulate (fracture) the gas-bearing zones. Over the past decade, the combination of horizontal drilling and hydraulic fracturing has allowed access to large volumes of shale gas that were previously uneconomical to produce. The creation of fractures within the reservoir is critical in allowing the natural gas to flow to the well. Once stimulated, the shale gas reservoirs are produced in the same way as conventional gas wells. The application of these technologies has led to a rapid rise in shale gas production, especially in the United States.

1 Match these words with their synonyms.

a.	Shale	☐	**1.** Schistous clay
b.	Sandstone	☐	**2.** Source
c.	Limestone	☐	**3.** To excavate
d.	Tightly	☐	**4.** Pit
e.	Locked	☐	**5.** Firmly
f.	Reservoir	☐	**6.** Calcareous rock
g.	To drill	☐	**7.** Increase
h.	Allowed	☐	**8.** Arenaceous rock
i.	Well	☐	**9.** Fixed
j.	Rise	☐	**10.** Permitted

2 Before watching the video, match the following phrases.

a.	Most energy consumption is supplied…	☐	**1.** from deep layers inside the earth.
b.	Fracking is the recovery of natural gas…	☐	**2.** by coal or natural gas.
c.	The fracking technique has been known…	☐	**3.** are rising steadily.
d.	Conventional natural gas sources…	☐	**4.** are unforeseeable.
e.	Prices for natural gas and other fuels…	☐	**5.** extremely toxic and carcinogenic.
f.	The primary risk of fracking consists in…	☐	**6.** have been exhausted in America and Europe.
g.	The chemicals used in fracking may be…	☐	**7.** than carbon dioxide.
h.	The long-term consequences of fracking…	☐	**8.** since the 1940s.
i.	Methane is a greenhouse gas 25 times more potent…	☐	**9.** a very large consumption of energy.
j.	The fracking process requires…	☐	**10.** the contamination of drinking water sources.

ACTIVITIES

3 Before watching the video, match the following words with their Italian translation.

a. Unceasingly	☐	**1.** Costantemente
b. Fracking	☐	**2.** Imprevedibile
c. Recovery	☐	**3.** Perforato
d. Exhausted	☐	**4.** Estrazione
e. Steadily	☐	**5.** Sigillato
f. Shaft	☐	**6.** Pozzo di gas
g. Drilled	☐	**7.** Incessantemente
h. On average	☐	**8.** Esaurito
i. Sealed	☐	**9.** Fratturazione idraulica
j. Treatment plant	☐	**10.** Pozzo di areazione
k. Due to	☐	**11.** Valutato
l. Hazardous	☐	**12.** Impianto di depurazione
m. Gas well	☐	**13.** A causa di
n. Assessed	☐	**14.** Pericoloso
o. Unforeseeable	☐	**15.** Mediamente

4 Watch the first part of the video and say if these sentences are true or false. Correct the false ones.

Fracking explained: opportunity or danger

	T	F
a. Most energy consumption is provided by solar panels and wind generators.	☐	☐
b. Hydraulic fracturing is widely considered one of the best methods for extracting natural gas.	☐	☐
c. Fracking mainly extracts gas from the superficial soil layers.	☐	☐
d. Fracking method uses water, sand and chemicals to extract natural gas from the subsoil.	☐	☐
e. This technique is mainly used in the USA.	☐	☐
f. Prices for natural gas and other fuels are rising because conventional gas sources have been used up.	☐	☐
g. Only a small percentage of wells are drilled using this method.	☐	☐
h. The fracking fluid pumped into the ground produces many cracks in the rock.	☐	☐
i. The sand has the function to close the cracks in the soil.	☐	☐
j. After extracting the gas, the fluid is left in the soil.	☐	☐

5 Now watch the second part of the video and fill in the gaps of the following text.

However, fracking is also associated with several considerable (1) ..... . The primary risk consists in the contamination of drinking water sources. Fracking not only (2) .... large quantities of fresh water, but in addition the water is subsequently contaminated and is highly (3) ..... . The contamination is so severe that the water cannot even be cleaned in a (4) ..... .

Even though the danger is known and theoretically could be managed, in the USA already sources have been contaminated (5) ..... negligence.

No one yet knows how the enclosed water will behave in the future, since there have not yet been any (6) ..... studies on the subject. The chemicals used in fracking vary from the (7) ..... to the extremely toxic and carcinogenic, such as benzol or formic acid.

The companies using fracking say nothing about the precise composition of the chemical mixture. But it is known that there are about 700 different (8) ..... agents which can be used in the process.

Another risk is the release of (9) ..... gases. The natural gas recovered by fracking consists largely of (10) ....., a greenhouse gas which is 25 times more potent than carbon dioxide.

Natural gas is less harmful than coal when burned. But nonetheless, the (11) ..... effects of fracking on the climate balance are overall greater.

Firstly, the fracking process requires a very large (12) ..... of energy. Secondly, the drill holes are quickly exhausted and it is necessary to (13) ..... fracking holes much more frequently than for classical natural gas wells. In addition, about 3% of the recovered gas is lost in the extraction and escapes into the atmosphere.

So how is fracking and its expected (14) ..... to be assessed when the advantages are balanced against the disadvantages? When properly employed, this technique offers one way in the short to medium term to meet our demand for lower-cost energy. But the long-term consequences of fracking are unforeseeable and the risk to our (15) ..... water thus should not be underestimated.

ACTIVITIES

6 Answer the questions without looking at the text.

a. What is hydraulic fracturing or fracking?
b. Why was this method used extensively in the last decade?
c. How does fracking technique work?
d. What is the fracking fluid made of?
e. What are the main risks of fracking?
f. What are the advantages and disadvantages of this technique?