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Natural Gas: From the Ground to Your Home

Given the recent decline in the demand for oil and the move away from coal toward cleaner-burning energy sources, natural gas is expected to dominate fossil fuel production in the coming years. With global energy demands at an all-time high, natural gas may be the solution as it is highly efficient and abundantly available in certain areas of the world. But delivering this versatile energy source to consumers is a complex and multifaceted process.

First, gas must be brought to Earth's surface and extracted by drilling into gas deposits, which can be found both on land and beneath the ocean floor. While extracting gas onshore involves drilling downward into gas deposits, accessing an offshore reserve necessitates first constructing floating platforms for the engineers to work from. Then, depending on how deep beneath the ocean's surface the gas deposit is located, the appropriate extraction technique is employed. If the natural gas supply is in shallow water, a technique called cable drilling, or percussion drilling, is used. This entails repeatedly dropping a cable with a heavy metal bit attached to it against the ocean floor until the reservoir is penetrated and the gas is released. The usual method of reaching a reservoir located at a greater depth, however, is to use a large rotary drill capable of spinning a metal drill bit thousands of feet into the soil if necessary. Once the reservoir has been breached, powerful pumps draw the gas toward the surface.

The next stage is to pump the raw gas from the extraction site to a nearby processing plant, where operators reduce it to its principal component - methane. Natural gas is not a single gas but made up of various hydrocarbons, including crude oil, methane, propane, ethane, and butane. Water vapour, helium, nitrogen, and carbon dioxide are also sometimes present. The process of isolating methane and disposing of the other parts involves multiple steps, which can make the overall cost of natural gas production quite high. However, some byproducts, like propane, crude oil, and butane, all have value of their own and can be sold to offset the expenses of those various steps.

After processing, the gas must be transported to its intended customer market through a vast underground pipeline system that can pump the resource from one place to another. In most cases, the gas is moved great distances, crossing state, provincial, and even international borders, to its eventual point of use. Metering stations are built along the length of the pipeline to allow the gas to be measured and monitored, while valves can be found every ten kilometres or so. These valves can be opened or closed to control the flow of gas through the pipeline so that, in the event that maintenance needs arise, the gas can be stopped to provide safe access to crews entering the interior of the pipe. The final step of the procedure is to deflect the gas into distribution lines, which convey it to local sources where it is used for, among other things, heating and electricity and as a power source for automobiles.

Complete the flow-chart below.

Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

The Process of Extracting and Refining Natural Gas

- If gas reserves are beneath the water's surface, 19 are built.
- Outcome: Engineers have a place to work from.



- Engineers either drop a heavy metal bit against a reserve or make a hole in the 20 in cases where reservoirs are deep.
- Outcome: Natural gas is released and can be brought to the 21 using pumps.



- The gas is transported to a processing plant.
- Outcome: Methane is separated from the 22 and other elements that might be present.



- Byproducts of natural gas are sold.
- Outcome: The money can help pay for the various 23 involved in isolating methane.

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Note/Table/Flow-chart/Diagram Completion

HACKERS IELTS READING

all-time high phr. đạt mức cao nhất lịch sử/từ trước tới nay abundantly adv. dồi dào versatile adj. đa năng multifaceted adj. nhiều mặt/khía cạnh, nhiều bước/phản onshore adv. trên bờ, gần bờ offshore adj. xa bờ, ngoài khơi reserve n. trữ lượng drilling n. sự khoan lỗ bit n. mũi khoan reservoir n. bể chứa, giếng ngầm breach v. khoan thông reduce v. biến đổi, nên hydrocarbon n. hydro cacbon crude oil phr. dầu thô nitrogen n. ni tơ offset khoan thủng reduce v. biến đổi, nên hydrocarbon n. hydro cacbon crude oil phr. dầu thô nitrogen n. ni tơ offset v. bù đắp metering n. đo, định lượng deflect v. làm chệch hướng, rẽ (về hướng)

Do Placebos Have a Place in Medicine?

A placebo is an imitation medicine that doctors sometimes administer to patients. Although they contain no pharmacological substances, patients who are given placebos are often convinced that these sugar pills possess the power to alleviate their symptoms or even cure them of their illnesses. What is most remarkable is that sometimes, they do. This baffling psychological and medical phenomenon is known as the placebo effect.

Some medical practitioners believe that the apparent efficacy of placebos lies in the simple act of writing a prescription. Essentially, it is thought that patients assume their ailments can be overcome if it is possible to prescribe medications for them. This view is substantiated by studies indicating that a large percentage of those seeking medical treatment suffer from disorders that the body is capable of healing itself. However, patients strongly think otherwise, and this attitude makes them attribute getting better, when they eventually do, solely to the medication they were prescribed. This, coupled with the trust they have in their doctor's ability to treat them, is what some say accounts for the positive performance of placebos.

Nevertheless, most experts strongly oppose medicating patients with placebos, suggesting the practice violates the doctor-patient relationship. Medical ethics standards maintain that trust is paramount and that doctors should be honest. However, some physicians are tempted to provide misinformation or gloss over the truth because they believe doing so is in the patient's best interests. For instance, a doctor may choose to present patients with a more optimistic picture of possible outcomes in order to convince them to undergo treatments they might otherwise reject. It is the hope that comes from believing it is still possible to be cured that can make all the difference in the end.

Further studies report of some patients learning they have been given placebos instead of actual drugs. In many cases, this causes patients to lose faith in their doctors, resulting in exacerbated symptoms and their health taking a turn for the worse. Due to the possibility of malpractice suits, the use of placebos in clinical practice has become increasingly uncommon. These days, placebos are almost exclusively administered in research situations where the subjects are informed that they may or may not receive a placebo and told about all potential risks in advance. In addition, policies are implemented to ensure that informed consent is observed, thus aligning standards for medical research and practice with the need for further investigation into the so-called placebo effect.

Complete the notes below.

Choose **ONE WORD ONLY** from the passage for each answer.

The Placebo Effect

How placebos work

- Some professionals think that a placebo's effectiveness could be due to a doctor making a 24
- Research shows that many patients asking for medicine will heal without it.
- A patient's 25 makes them think any improvement they feel is due to medicine.

The opinion of doctors

- Most 26 are against giving patients placebos.
- The honesty of doctors is considered ethically important.
- Doctors sometimes think it's in the patient's best 27 not to tell the truth.
- The health of patients who find out they've been given placebos can become 28

Current usage

- Today, placebos are mostly used for 29

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Note/Table/Flow-chart/Diagram Completion

HACKERS IELTS READING

placebo n. thuốc trấn an (thuốc không có tác dụng thật được bác sĩ kê để trấn an tâm lý bệnh nhân) administer v. phân phát, cung ứng pharmacological adj. (thuộc) được lý alleviate v. làm nhẹ bớt baffling adj. phức tạp, không thể hiểu được placebo effect phr. hiệu ứng giả được, hiệu ứng trấn an efficacy n. tính hiệu quả ailment n. sự đau ốm, bệnh tinh substantiate v. chứng minh medicate v. kê thuốc paramount adj. tối quan trọng gloss over phr. che dày, bung bít exacerbate v. làm trầm trọng malpractice suit phr. kiện việc kê thuốc sai informed consent phr. sự đồng ý sau khi có đủ thông tin

Over the course of the last century, farming was transformed from a small-scale, subsistence-based activity to an industrialised global enterprise. However, the industry is currently under extreme strain from a lack of arable land. Furthermore, studies have shown that people will increasingly abandon farming in favour of more reliable work in cities. This will put added pressure on an already stretched global food supply. Societies must create innovative new ways of ensuring that their residents' fundamental need for sustenance continues to be met.

One trend that city planners around the world are embracing to address concerns about the growing lack of agricultural land is urban farming, which utilises infrastructure found in cities, such as buildings, vacant lots, and backyards to grow crops. One benefit of this practice is that fewer resources are used to transport food as growers and buyers are provided with fast access to agricultural yields. Also, because many urban farming projects use hydroponics, a method of growing plants in nutrient-enriched water, soil - which is increasingly facing mineral degradation due to harmful farming practices - is conserved. Finally, urban agriculture solves the problem of sometimes losing crops to extreme weather as city structures make it easier to cultivate plants in a strictly controlled environment.

An exemplary model of urban agriculture is a farm located beneath Pasona headquarters in Tokyo, Japan, where more than 200 plant species grow in a 43,000-square-foot space. The plants are grown using both hydroponic and soil-based farming methods, and an intelligent climate control system monitors humidity, temperature, and breeze. Because the farm at Pasona is located underground and has no direct sunlight, which plants need to survive, artificial lighting sustains the crops planted there. On the other side of the globe, in New York City, people are turning to rooftop greenhouse farming. One such operation, called BrightFarms, boasts automated sensors to activate lights, fans, shade curtains, and heat blankets. It also has tanks to catch and store rainwater. Selling nearly 500 pounds of produce each day to local supermarkets and restaurants, BrightFarms is able to avoid the expense of investing in delivery vehicles while keeping its carbon footprint to a minimum.

It is important to note that despite the success urban agriculture has so far experienced in places like Tokyo and New York, there remain significant obstacles to overcome. One challenge lies in supplying farms with adequate amounts of uncontaminated soil as soil in and around urban areas often contains high amounts of lead, which is poisonous to humans. Not using soil at all and relying instead on hydroponic systems is not yet an option everywhere since reliable and safe freshwater sources are scarce in many parts of the world, especially with global climate change negatively affecting precipitation rates. However, new developments, such as the ability to remove salt from ocean water for safe use in hydroponic systems and the creation of methods to treat contaminated soil, may help to resolve these issues one day soon.

Complete the table below.

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Choose **NO MORE THAN TWO WORDS** from the passage for each answer.

LET'S MAKE IT HAPPEN

Problem	Solution
More people will give up farming and move to cities.	Societies need to start developing new ways of feeding their people.
There is a lack of land on which to grow agricultural crops.	Grow plants using urban 30
Crops are sometimes lost because of the 31	Take care of plants in a 32 environment.
The farm beneath Pasona headquarters gets no 33	Use artificial lighting to keep the plants alive.
Buying and using delivery vehicles is an additional cost.	Sell products to 34 clients.
There has been a negative effect on 35 due to climate change.	Remove the salt from seawater so it is safe to use on crops.

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Đáp án-Dịch nghĩa-Chú giải trang 385

Subsistence n. sự tồn tại, sự sống strain n. gánh nặng, sự căng thẳng stretch v. duỗi, kéo dãn ra sustenance n. phương tiện sinh sống hydroponics n. thủy canh degradation n. sự giảm sút, thoái hóa cultivate v. trồng trot, nuôi dưỡng exemplary adj. gương mẫu, mẫu mực turn to phr. chuyển sang, đổi sang rooftop n. nóc nhà produce n. sản lượng carbon footprint phr. dấu chân cacbon (lượng cacbon con người thải vào khí quyển) uncontaminated adj. không bị ô nhiễm precipitation n. mưa, lượng mưa