NUCLEAR ENERGY

1. What do you associate nuclear energy with?
2. How is energy produced in your country?
3. Why does nuclear energy provoke so much controversy?

Read the following text and answer the questions below it.

An adequate source of energy is one of the major requirements for **sustaining** human progress. Currently, the largest sources of energy are **combustion** of coal, oil and natural gas. According to estimates, these **fossil fuels** will last a few centuries or so, but they will eventually run out or become extremely harmful to the environment. As the population of our planet is increasing rapidly, the demand for electricity is growing. Definite resolutions will have to be made in the future about energy **conservation** and the protection of the natural environment. Humans will also be forced to think about greater efficiency in energy production. It is predicted that energy generated in nuclear power plants will constitute the best alternative on account of its being safe, clean and efficient.

Presently, nuclear power plants provide more than 15 percent of electricity in the world. There are countries like France which depend on nuclear power more than on other sources. In France, 75 percent of electricity is produced from nuclear power. Around the world, there are more than 400 nuclear power stations and their number will increase in the future as more and more countries discover the benefits of nuclear power.

Many people consider nuclear power and environmental protection to be **mutually exclusive** issues. They cannot be more wrong. This widespread unenthusiastic attitude toward nuclear energy was **sparked off** by several accidents that took place in nuclear power plants around the world. The best remembered one occurred in Chernobyl in April 1986. The public opinion was informed then about the deaths of 31 workers and an extensive release of radiation. A thorough investigation **revealed** though that the causes of the incident were operational problems, broken safety regulations and **outdated** technologies. Reactors like the one that went wrong in Chernobyl are not used elsewhere in the world. The nuclear power industry has advanced a lot since that time and has established itself as one of the safest, most economical and environment-friendly methods of generating electricity. Although calls for the **abandonment** of nuclear power can be heard from its many opponents, specialists, researchers and **advocates** of nuclear energy claim its advantages **outweigh** its disadvantages by far. The core of the problem might be inadequate information about nuclear energy. Here are some pros and cons that need to be weighed up.

One of the major advantages is that nuclear power plants do not produce carbon dioxide which is the effect of coal combustion and is known to be the main **contributor** to the greenhouse effect and climate change. In fact, nuclear energy releases no emissions of any kind, so it does not pollute the air. Greater reliance on nuclear energy might help reduce greenhouse gas emissions by a great amount. Nuclear power stations are considered to be a safer technology for electricity production than any other. Accidents or **fatalities** inside nuclear power plants are very rare due to the advanced technologies and very strict safety **measures**. Nuclear energy **entails** no risk of oil **spills**, which is another feature that makes it environment-friendly. Nuclear power plants are one of the most economical methods of electricity production. The cost of nuclear fuel amounts to about $1/5^{th}$ of the cost of fossil fuel production. Efficiency is yet another relevant factor. Most of the world's nuclear power is generated from the **fission** of uranium. The fission of an atom of uranium generates 10 million times the energy produced by the **combustion** of an atom of carbon from coal. The uranium that is used in nuclear power plants comes from the **extraction** of uranium **ores**. There are plenty of uranium resources to last for the next hundreds of years but even if their extraction were stopped, the use of so called *breeder* reactors (they create more nuclear fuel than they use) would enable power plants to continue generating electricity for the next thousand years.

Many people may be concerned about the issue of nuclear radiation. In fact, people are constantly exposed to different forms of radiation be it from water, soil, space, microwave ovens, radios, radars, mobile phones or X-rays used in medicine. Low-level doses of radiation are harmless to humans. Only high-level doses cause cancer, **leukaemia** or dangerous genetic changes. Radiation exposure from commercial nuclear power plants is very low. Even individuals living in the neighbourhood of nuclear power stations are unaffected by the level of radiation that is emitted. It is estimated that nuclear power plants release less radioactivity than coal-fired plants do. The nuclear radiation exposure **accounts for** less than 1 percent of all human exposure to background radiation.

Certain problems and **drawbacks** exist though. Opponents point to the fact that mining and **purifying** of uranium is not an environment-friendly process. Radioactive nuclear waste disposal has not been fully solved yet, either. Spent fuel **rods** can be reprocessed but it is much cheaper to use fresh extracted uranium. At present, nuclear waste is stored underground or under water but its **decay** time is about 1000 years, which makes the waste a hazardous **legacy** for future generations. Safety measures are strict inside nuclear plants but accidents may always occur and put the local populations under considerable threat of radioactive release.

The future of nuclear energy is still being **disputed**. Before it is put into wider use the general public must express its full consent and must be thoroughly convinced about the benefits to be **reaped**.

1. Are you convinced about the advantages of nuclear energy? Why?
2. Would you object if a nuclear power plant were to be built in your neighbourhood?
3. Do people need nuclear energy to survive?
4. What are the alternative natural sources of energy? What are some limitations to their use?
5. Why is the question of nuclear waste storage so important? How can it be solved?

VOCABULARY PRACTICE

Match the words with their definitions

1	combustion	a	the central or most important part of something
2	consent	b	a difficulty, obstacle or disadvantage
3	conservation	c	rock that contains metal
4	core	d	agreement or permission to do something
5	decay	e	something that the future generations inherit
6	drawback	f	the process of burning something
7	legacy	g	steps or an action taken to solve a problem
8	measure	h	rubbish that remains after having used something
9	ore	i	protection of the natural environment
10	waste	j	a gradual destruction of something

Insert the verbs in the correct phrases

account for advance amount to entail
generate outweigh sustain weigh up

1. A large amount of the electric energy that we use is ..... by the solar batteries.
2. Before you put your signature on the contract you'd better ..... the possible consequences of your decision.
3. Our knowledge of space and space travels has ..... incredibly, but we may never be able to make a settlement on another planet.
4. A failure to pay the installments on time ..... having to pay penal interest.
5. We've decided to move our house from the city centre to the suburbs because, as we believe, the advantages ..... the disadvantages of it by far.
6. Inexperience and carelessness ..... more road accidents than drink-driving.
7. The atmosphere of Mars does not contain enough oxygen to ..... human life.
8. It's been reported that the number of the victims of the plane crash now ..... ninety, but it may still be higher as over fifty passengers are missing.