

Text C Nuclear energy

Nuclear energy constitutes six percent of global energy production and 20 percent in the countries that have nuclear power. Despite growth in Asia, the prospects for this sector spell stagnation until 2010 and a minor recession after that. This recession is mainly caused by perceived problems of security as stressed by the accidents at Three Mile Island and Chernobyl which undermined many people's confidence in this energy source.

Ordinary nuclear power exploits the energy of fission by cleaving the molecules of uranium-235 and reaping the heat energy. The energy of one gram of uranium-235 is equivalent to almost three tons of coal. Nuclear power is also a very clean energy source which, during normal operation, almost does not pollute. It produces no carbon dioxide and radioactive emissions are actually lower than the radioactivity caused by coal-fueled power plants.

At the same time nuclear power also produces waste materials that remain radioactive for many years to come (some beyond 100,000 years). This has given rise to great political debates on waste deposit placement and the reasonable of leaving future generations such an inheritance. Additionally, waste from civilian nuclear reactors can be used to produce plutonium for nuclear weapons. Consequently, the use of nuclear power in many countries also poses a potential security problem.

For the moment there is enough uranium-235 for about 100 years. However, a special type of reactor – the so-called fast-breeder reactor – can use the much more common uranium-238 which constitutes over 99 percent of all uranium. The idea is that while uranium-238 cannot be used directly in energy production it can be placed in the same reactor core with uranium-235. The uranium-235 produces energy as in ordinary reactors, while the radiation transforms uranium-238 to plutonium-239 which can then be used as new fuel for the reactor. It sounds a bit like magic, but fast-breeder reactors can actually produce more fuel than they consume. Thus it is estimated that with these reactors there will be sufficient uranium for up to 14,000 years. Unfortunately these reactors are more technologically vulnerable and they produce large amounts of plutonium that can be used for nuclear weapons production, thus adding to the security concerns.

Nuclear power, however, has barely been efficient in the production of energy and this is probably the major reason why its use has not been more widespread. It is difficult to find unequivocal estimates of the total costs since there are so many different variables that can affect the calculations, but typically the price hovers around 11-13 cents for one kilowatt-hour (kWh) in 1999 prices. This should be compared with an average energy price for fossil fuels of 6.23 cents.

In the longer run, the primary focus is no longer on fission energy but rather on fusion energy. This technology aims at fusing two hydrogen atoms into a single atom of helium. A single gram of fuel can develop the same energy as 45 barrels of oil. Fuel comes basically from ordinary sea water and thus supply is virtually infinite. Moreover, there will be very little radioactive waste or emissions. However, fusion demands astronomical temperatures and despite investments above \$20 billion we have still only managed to achieve 10 percent of the laser power necessary for producing energy. Consequently it is supposed that fusion energy will be commercially available only after 2030 or perhaps only well into the twenty-second century.

EXERCISE 1

Выпишите незнакомые слова и составьте словарь, аналогичный предлагаемому в предыдущих уроках.

EXERCISE 2

Переведите текст и составьте по одному вопросу к каждому абзацу.

EXERCISE 3

Дайте названия абзацам.

EXERCISE 4

Выделите главную идею каждого абзаца и прочтите предложение, которое является главным для каждого абзаца.

EXERCISE 5

Перескажите текст.