Unit 6 SAFE ENERGY

Text A Energy problems

EXECISE 1: Is it cheaper to use solar energy or wind energy?

Renewable energy sources, unlike fossil fuel, can be used without ever being used up. These are typically sources such as sun, wind, water and Earth's internal heat.

It is important to focus on the fact that the difference in cost between traditional fossil fuels and some of the cheapest: renewable energy sources is so relatively slight. Moreover, these economic costs do not include the negative social cost of fossil fuel use on the environment. Energy from a coalfired power plant may still be 20-50 percent cheaper than the energy produced by a windmill, but if the effects on environment and humans from coal pollution and waste products exceed the price difference then society ought to choose wind energy.

Recently, one European and two American large-scale projects have attempted to examine all costs associated with electricity production, all the way from the mortal risks of mining coal, the traffic hazards of transportation and occupational hazards of production including consequences of acid rain, particles, sulfur dioxide, nitrogen oxides and ozone on lakes, crops, buildings, children and old people and up to the consequences of tax codes and occupation plus a long, long list of similar considerations and costs. Altogether these studies find that the extra social cost of new coalfired power plants is around 0.16-0.59 cents per kWh. None of the three studies, however, quantifies the costs of carbon dioxide which probably means an additional 0.64 cents per kWh. Consequently renewable energy actually has to drop somewhat in price before it will be competitive, even including social costs. Nevertheless, it is estimated that the price of renewable energy will fall faster than the price for conventional energy. It should however also be added that there is still quite a bit of uncertainty about the predictions of such prices, because early predictions in hindsight have seemed rather optimistic. In 1991 the Union of Concerned Scientists predicted that solar power today would drop below 10 cents per kWh, but unfortunately it has still only dropped to about 50 cents per kWh.

Thus, it is unclear whether it is necessary to support renewable energy with subsidies and tax exemptions. In Denmark this subsidy is as much as 5 cents per kWh for wind energy, and in the US, subsidy for wind power is estimated at about 1.5 cents per kWh. It would still be much more effective to tax energy such that its actual price would adequately reflect the social costs in production and emissions.

VOCABULARY:

Cost	Стоимость	Conventional	Традиционный
Ought	Должен (модальный глагол)	Should	Следует (модальный глагол)
Renewable	Возобновляемый	Hindsight	Взгляд в прошлое, оценка прошлых событий
Waste	Отходы	Subsidy	Субсидии
Fossil fuel	Ископаемое топливо	Exemption	Освобождение от налогов
Mortal	Смертельный	To tax	Облагать налогом
Mining	Добыча	Emission	Выпуск
Hazard	Несчастный случай	Similar	Подобный
Tax code	Налоговый кодекс	To quantify	Подсчитывать
Competitive	Конкурентный	Adequately	Адекватно

EXECISE 2

Найдите правильные переводы выражений на английском языке, приведенных в правой колонке:

1. To focus on the fact	1. Отходы
2. Negative social cost	2. Смертельный риск
3. Fossil fuel use	3. Несчастные случаи на производстве
4. Waste product	4. Весь путь начиная от
5. The mortal risks	5. Обратить внимание на тот факт
6. Occupational hazards of production	6. Стоимость негативного социального воздействия
7. All the way from	7. Использование ископаемого топлива
8. Tax codes	8. Налоговый кодекс
9. Similar considerations	9. Подобные соображения
10. To drop somewhat in price	10. Тем не менее по оценкам
11. It should however also be added	11. До
12. There is still quite a bit of uncertainty	12. Расходы на производство и выпуск продукции
13. Nevertheless, it is estimated	13. Было бы намного эффективнее

14. It is unclear whether it is necessary	14. Есть еще небольшая доля сомнения
15. It would still be much more effective	15. Снизить стоимость чего-либо
16. Costs in production and emissions	16. Неясно необходимо ли
17. Up to	17. Следовало бы однако также добавить

EXECISE 3

Согласны ли вы с кратким выводом по содержанию предыдущего текста: The most important point in this text on energy is to stress not only that there are ample reserves of fossil fuels but also that potentially unlimited renewable energy resources definitely are within economic reach.

EXECISE 4

Ответьте на вопросы: 1. Which kind of energy is cheaper? 2. Why can't we agree that coalfired energy is cheaper? 3. How many projects have been realized to examine all costs associated with electricity production? 4. How much do these studies evaluate the extra social cost of a new coalfired plant? 5. What is it necessary to do in order to make renewable energy competitive? 6. Does the renewable energy fall in price fast? 7. How is it possible to support the development of renewable energy?

Text B Solar energy

The largest part of the energy on Earth comes from the sun. Only a small part comes from radioactive processes within the Earth itself. The sun gives off so much energy that it is equivalent to a 180-watt bulb perpetually lighting up every single square meter on Earth. Of course energy is not distributed equally - the tropics receive more than 250 watts whereas the polar regions get only about 100 watts.

The solar energy influx is equivalent to about 7,000 times our present global energy consumption. The yearly solar energy by far exceeds any other energy

resource. Or put in a different way: even with our relatively ineffective solar cells, a square area in the tropics 469 km (291 miles) on each side - 0.15 percent of Earth's land mass - could supply all our current energy requirements. In principle this area could be placed in the Sahara Desert (of which it would take up 2.6 percent) or at sea. In reality, of course, one would not build a single, central power plant, but the example underscores partly how little space really is necessary to cover our energy needs, partly that the area can be placed somewhere of little or no biological or commercial value.

The remote Indonesian village of Sukatani was changed literally overnight when solar cells were installed in 1989. The equatorial nights, which last 12 hours all year round, previously left little to do. But today, children can do their homework after supper, the village sports a new motorized well pump providing a steady supply of water for better sanitation, and now some of the local waning (shops) are open after sunset and television sets provide entertainment and a window on the wider world.

Solar energy can also be exploited directly through heating and indirectly by growing plants, later to be burnt (biomass). In Denmark it is estimated that direct solar energy can provide about 10-12 percent of our energy. In the US also, biomass is predicted to have substantial growth. The US Energy Information Agency estimates that solar energy could cover the entire American energy requirements more than 3.5 times over. But for this to become reality a lot of ingenuity is required.

Japan has started integrating solar cells in building materials, letting them become part of roofs and walls. Others have produced watertight thin-film ceramic solar cells to replace typical roofing materials. In Wales an experimental center open to visitors has chosen solar cells not only to supply the building with electricity, but also because it can save costs for traditional roofing.

VOCABULARY:

Radioactive	Радиоактивный	pump	Насос
Bulb	Лампочка	Steady	Постепенно
Perpetually	Бесконечно	Supply	Снабжение
Influx	Приток	Sanitation	Санитария
Cell	Элемент	To exploit	Эксплуатировать
To exceed	Превышать	Biomass	Биомасса
By far	Безусловно	Ingenuity	Изобретательность
To illustrate	Иллюстрировать	Watertight	Водонепроницаемый
Requirement	Потребности	Thin-film	Тонкопленочная
To underscore	Подчеркивать	Ceramic	Керамика
Indonesian	Индонезийский	Literally	Буквально
To sport	Использовать		

EXECISE 1

Ответьте на вопросы: 1. Where does the largest part of the energy come from? 2.How much energy does the sun give off? 3. How is the sun energy distributed on the Earth? 4. Does the solar energy influx cover our present global energy consumption? 5. How much area in the tropics is required to cover all our current energy consumption? 6. How did the Indonesian village change when solar cells were installed in 1982? 7. How solar energy can be exploited? 8. How are solar cells used in Japan? 9. What is done in Wales for using solar cells?

EXECISE 2

Соедините переводы с соответствующими словосочетаниями на английском языке:

1. To leave little to do	1. Распространять равномерно
2. The example underscores partly	2. Поток солнечной энергии
3. Watertight thin-film ceramic cells	3. Пример частично подчеркивает
4. For this to become reality	4. Не представляющий коммерческого интереса

5. To change literally overnight	5. Масштаб взаимоотношений
6. To illustrate clearly	6. Ясно показывать
7. The solar energy influx	7. Тотально измениться за одну ночь
8. To be of no commercial value	8. Оставлять мало времени для жизнедеятельности
9. To let to become the part	9. Позволить стать частью
10. To distribute equally	10. Чтобы это стало реальностью
11. Or put in different way	11. Водонепроницаемые тонкопленочные керамические фотоэлементы
12. A steady water supply for better sanitation	12. Постоянное водоснабжение для создания лучших санитарных условий
13. The scale of these relationships	13. Или пойти другим путем

Text C Wind energy

Wind energy has been exploited through millennia. Long before the Current Era, ancient Civilizations in China, India and Persia used wind to pump up water and to mill grain. Already in early medieval times windmills were a known technology throughout Europe, and the windmill remained the primary energy source till the arrival of the steam engine. In countries such as Denmark that did not have their own coal supply, the windmill continued to have a central position. In 19l6 alone Denmark built more than 1,300 new windmills.

Being the world leader in wind power, windmills in Denmark still produced only about 9 percent of all Danish electricity in 1998. In the US, windmills produced just 0.1 percent of the total electricity production in 1998.

But problems will arise if a significant part of a nation's electricity requirements are to be met by wind power. Close to inhabited areas windmill noise can be a nuisance. Moreover, to be effective, windmills need to be placed in open environments, and here they easily mar the scenery. The only long-term solution is placing windmills far out to sea. Not only will there be few if any esthetic problems but windmills are typically 50 percent more effective here.

Critics of windmills often point out that they are still not profitable, that they require much energy to produce, and that they kill birds. As we saw above, windmills are still not fully competitive, although they are probably no more than 30-50 percent more expensive, and even less when including the social and

environmental costs of continued use of fossil fuels. In the longer run, they will undoubtedly be competitive or even cheaper.

It is also objected that windmills themselves demand quite a bit of energy to be produced: the steel has to be mined, smelted and rolled, and the windmill itself has to be transported and in the end disposed of. However, going over the extended energy account, it turns out that a modern windmill can produce the energy used for its own production within just three months.

It is true that windmills kill birds, although the problem will be much smaller at sea. In Denmark it is estimated that about 30,000 birds die in collisions with windmills each year. In the US the number is about 70,000.

VOCABULARY:

To mill	Молоть	Undoubtedly	Несомненно
Grain	Зерно	Steel	Сталь
Steam engine	Паровой двигатель	To mine	Добывать
Inhabited	Населенный	To smelt	Расплавлять
Noise	Шум	To roll	Прокатывать
Nuisance	Помеха	To go over	Внимательно изучать
To mar	Портить	Account	Счет
Scenery	Пейзаж	Collision	Столкновения
Esthetic	Эстетический	Extended	Расширенный

EXECISE 1

Соедините переводы с соответствующими выражениями на английском языке:

1. Задолго до нашей эры	1. A technology known throughout Europe
2. В начале средневековья	2. In the end of disposal
3. Известная во всей Европе технология	3. It is also objected

4. Продолжает занимать центральное положение	4. Not to be still fully competitive
5. Будучи мировым лидером в чем-то	5. Long before the current era
6. Значительная часть национальных потребностей в электричестве	6. In early medieval times
7. Долгосрочное решение	7. To continue to have a central position
8. В долгосрочной перспективе	8. Being the world leader
9. Еще не быть до конца конкуренто- способным	9. In the long run
10. Также выдвигаются возражения	10. The only long-term solution
11. Конечный пункт назначения	11. A significant part of a nation's electricity requirements
12. Иметь собственные запасы угля	12. Quite a bit of energy to be produced
13. Удовлетворить требования	13. To have own coal supply
14. Не только из-за каких-то эстетических соображений	14. Not only will there be few if any esthetic problems
15. Дальнейшее использование угля	15. Continued use of coal
16. Производиться достаточно мало энергии	16. The requirements are to be met by
17. Взглянув на расширенный расчет стоимости энергии	17. Going over the extended energy account

EXECISE 2

Ответьте на вопросы: 1. How long has the wind energy been exploited? 2.How was the wind used by ancient civilizations? 3. When did first windmills appear? 4. Where did the windmill continue to have a central position? 5. How much energy do windmills produce in Denmark? 6. How many windmills were built in Denmark in1916? 7. What problems do the modern windmills have today? 8. What do critics of windmills often point out?