МИНИСТЕРСТВО ОБРАЗОВАНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ

УЧРЕЖДЕНИЕ ОБРАЗОВАНИЯ
«БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ УНИВЕРСИТЕТ ТРАНСПОРТА»

Кафедра иностранных языков

А. А. ТИТОВА, Т. В. ШЛЫК

ТРАНСПОРТ И ОКРУЖАЮЩАЯ СРЕДА

Учебно-методическое пособие по английскому языку
для студентов дневного обучения всех специальностей

Под редакцией *Н. А. Гришанковой*

Одобрено методической комиссией
гуманитарно-экономического факультета

Гомель 2011

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УДК 811.111(075.8)
ББК 81.2 Англ.
Т45

Р е ц е н з е н т ы: ст. преподаватель кафедры иностранных языков *М. И. Дроздова* (УО «БелГУТ»); преподаватель кафедры «Гуманитарные науки» *Е. В. Орлова* (УО «Гомельский инженерный институт МЧС»).

Титова, А. А.

Т45 Транспорт и окружающая среда : учеб.-метод. пособие по английскому языку для студентов дневного обучения всех специальностей / А. А. Титова, Т. В. Шлык ; под ред. *Н. А. Гришанковой* ; М-во образования Респ. Беларусь, Белорус. гос. ун-т трансп. – Гомель : БелГУТ, 2011. – 43 с.
ISBN 978-985-468-808-4

Пособие состоит из четырех уроков, каждый из которых содержит словарь, тексты и задания.

Цель пособия – развить навыки, необходимые для чтения и понимания текстов, сформировать умения монологической и диалогической речи.

Предназначено для студентов I курса всех специальностей.

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ISBN 978-985-468-808-4

U N I T 1

TRANSPORT AND THE ENVIRONMENT

ESSENTIAL VOCABULARY

to appreciate	оценивать, принимать во внимание
as a result	в результате
acidic	кислотный
to affect	воздействовать, влиять
despite	несмотря на
conservation	сохранение
the environment	окружающая среда
ecosystem	экосистема
engine	двигатель
fuel	топливо
freight	фрахт, груз
destructive	разрушительный
to alter	изменять, менять
alternative	альтернативный
urban areas	городские территории
vehicle	транспортное средство
to preserve	сохранять, охранять
vegetation	растительность
to require	требовать, нуждаться
facilities	средства обслуживания, удобства
significant	значительный, важный
deforestation	вырубка лесов
marine	морской
impact	воздействие, влияние
consequence	последствие
accumulate	накапливать, скапливаться
source	источник
steadily	непрерывно, постоянно

1 Divide the words and expressions given below into two lists: "protectors of the environment" and "threats to the environment":

greenhouse effect, car, power station, national park, smog, Greenpeace, acid rain, urban development, recycling, species extinction, global warming, lead-free petrol, exhaust fumes, ozone layer, cutting down trees, toxic waste, rubbish, dustbins.

2 Match word combinations with their translations:

to pollute the atmosphere	токсичные отходы
rubbish bin	парниковый эффект
environmental problems	загрязнять атмосферу
impact	электростанция
acid rain	влияние, воздействие
the greenhouse effect	накапливать
ultraviolet light	солнечная энергия
solar power	экологические проблемы
the ozone layer	кислотный дождь
power station	ультрафиолетовые лучи
toxic waste	озоновый слой
accumulate	мусорный бак

3 Put in an appropriate word or word combination.

a) Local people are protesting because the planned new road will ..... the environment.

b) The biggest …….. today is the car.

c) …….. may cause the ice at the North Pole and South Pole to melt and sea level to rise, leading to serious …….. in many parts of the world.

d) …….. is the layer of gases that protect us from …… the sun.

e) In the last few years the news has been full of stories of hurricanes, floods, droughts and other …….. caused by the weather.

f) Smoke, dirt and noise are all types of ……. .

g) At Chernobyl, there was an accident at a nuclear …… .

4 Translate into English.

a) Захоронение токсичных отходов в земле приводит к загрязнению почвы.

b) Кислотные дожди наносят ущерб не только здоровью людей и природе, но также и старинным зданиям.

c) За последнее время количество дыр в озоновом слое резко возросло.

d) Парниковый эффект вызван скоплением в атмосфере газов, препятствующих выходу в космос тепла с поверхности земли.

e) Во многих больших городах воду из местных водоемов пить нельзя, так как она загрязнена промышленными отходами.

f) В результате глобального потепления сухие тропические регионы могут стать еще суше, а влажные – еще влажнее.

5 Correct the following statements.

a) Acid rain is friendly to nature.

b) The higher the average temperature on the Earth, the better.

c) People who are trying to protect nature are called naturalists.

d) It is more environmentally friendly to use a car than public transport.

6 Give definitions to the words:

pollutant, impact, alternative forms of transport.

7 Read the text and be ready to speak about transport activities and the environment.

T e x t 1A

The Issue of Transport and the Environment

The issue of transportation and the environment is paradoxical in nature. From one side, transportation activities support increasing mobility demands for passengers and freight, and this ranging from urban areas to international trade. On the other side, transport activities have resulted in growing levels of motorization and congestion. As a result, the transportation sector is becoming increasingly linked to environmental problems. With a technology relying heavily on the combustion of hydrocarbons, notably with the internal combustion engine, the impacts of transportation over environmental systems have increased with motorization. This has reached a point where transportation activities are a dominant factor behind the emission of most pollutants and thus their impacts on the environment. These impacts, like all environmental impacts, can fall within three categories:

1 Direct impacts. The immediate consequence of transport activities on the environment where the cause and effect relationship is generally clear and well understood.

2 Indirect impacts. The secondary (or tertiary) effects of transport activities on environmental systems. They are often of higher consequence than direct impacts, but the involved relationships are often misunderstood and difficult to establish.

3 Cumulative impacts. The additive, multiplicative or synergetic consequences of transport activities. They take into account of the varied effects of direct and indirect impacts on an ecosystem, which are often unpredicted.

The complexities of the problems have led to much controversy in environmental policy and in the role of transportation. The transportation sector is often subsidized by the public sector, especially through the construction and maintenance of road infrastructure which tend to be free of access. Total costs incurred by transportation activities, notably environmental damage, are generally not assumed by the users. The lack of consideration of the real costs of transportation could explain several environmental problems. For instance, external costs account on average for more than 30% of the estimated automobile costs. If environmental costs are not included in this appraisal, the usage of the car is consequently subsidized by the society and costs accumulate as environmental pollution. This requires due consideration as the number of vehicles, especially automobiles, is steadily increasing.

1 Complete the sentences.

1 The impacts of transportation over environmental systems ……..

a) have increased with motorization

b) have increased with the invention of electric cars

d) have increased dramatically

2 Cumulative impacts of transportation are……..

a) the immediate consequence of transport activities on the environment

b) the secondary (or tertiary) effects of transport activities on the environment

c) often unpredicted

3 People do not realize …….

a) the importance to take care of the environment

b) the real costs of the transportation

c) ecological situation in the world

2 Answer the questions:

1 Why is the issue of transportation and the environment paradoxical in nature?

2 What are the impacts of transportation on environmental systems?

3 Does the government pay any attention to environmental issues?

4 Do people realize the real costs of transportation activities?

5 What can be done to minimize transportation impacts on the environment?

3 Speak about:

a) Transportation activities and the environment.

b) Transportation impacts on the environment.

Transportation activities support increasing mobility demands for passengers and freight, notably in urban areas. But transport activities have resulted in growing levels of motorization and congestion. Read the text and find more information about this problem.

T e x t 1B

The Environmental Impacts of Transportation

These days we often hear that the transportation sector is becoming increasingly linked to environmental problems. The most important impacts of transport on the environment relate to climate change, air quality, noise water quality, soil quality, biodiversity and land take:

Climatic change. The activities of the transport industry produce several million tons of pollutants each year into the atmosphere. These include the emission of lead, carbon monoxide (CO), carbon dioxide (CO_2), methane (CH_4), nitrogen oxides, nitrous oxide (N_2O), chlorofluorocarbons (CFCs), heavy metals (zinc, chrome, copper and cadmium) and particulate matters (ash, dust). The road transport sector is responsible for 74 % of global CO_2 emissions, while aviation, shipping and railways account for 12 %, 10 % and 4 % respectively. There is an ongoing debate to what extent these emissions (labeled as "greenhouse gases") may prevent the wavelengths of electromagnetic radiation from leaving the earth surface and may thus contribute to global warming. This could lead to an increase in the average temperature at the earth surface, reducing snow cover of Polar Regions, which in turn could contribute to sea level rise and an increase in ocean heat content.

Air quality. Highway vehicles, marine engines, locomotives and aircraft are the sources of pollution in the form of gas and particulate matters emissions that affects air quality causing damage to human health. Toxic air pollutants are associated with cancer, cardiovascular, respiratory and neurological diseases. Carbon monoxide affects bloodstream, reduces the availability of oxygen and can be extremely harmful to public health. An emission of nitrogen dioxide from transportation sources reduces lung function, affects the respiratory immune defense system and increases the risk of respiratory problems. Particulate emissions in the form of dust emanating from vehicle exhaust as well as from non-exhaust sources such as vehicle and road abrasion have an impact on air quality.

Noise. Noise represents the general effect of irregular and chaotic sounds. It is traumatizing for the hearing organ and that may affect the quality of life by its unpleasant and disturbing character. Long term exposure to noise levels seriously hampers hearing and affects human physical and psychological well-being. Transport noise emanating from the movement of transport vehicles and the operations of ports, airports and rail yards affects human health, through an increase in the risk of cardiovascular diseases

Water quality. Transport activities have an impact on hydrological conditions. Fuel, chemical and other hazardous particulates discarded from aircraft, cars, trucks and trains or from port and airport terminal operations, such as de-icing, can contaminate rivers, lakes, wetlands and oceans. Globally, world sea-borne trade grew from 2.6 billion tons in 1970 to over 7 billion tons of loaded goods in 2006. The main effects of marine transport operations on water quality predominantly arise from dredging, waste, ballast waters and oil spills.

Soil quality. The environmental impact of transportation on soil consists of soil erosion and soil contamination. Coastal transport facilities have significant impacts on soil erosion. Shipping activities are modifying the scale and scope of wave actions leading to serious damage in confined channels such as river banks. The removal of earth's surface for highway construction or lessening surface grades for port and airport developments have led to important lost of fertile and productive soils. Soil contamination can occur through the use of toxic materials by the transport industry. Fuel and oil spills from motor vehicles are washed on road sides and enter the soil. Chemicals used for the preservation of railroad ties may enter into the soil. Hazardous materials and heavy metals have been found in areas contiguous to railroads, ports and airports.

Biodiversity. Transportation also influences natural vegetation. The need for construction materials and the development of land-based transportation has led to deforestation. Many transport routes have required draining land, thus reducing wetland areas and driving-out water plant species. The need to maintain road and rail right-of-way or to stabilize slope along transport facilities has resulted in restricting growth of certain plants or has produced changes in plants with the introduction of new species different from those which originally grew in the areas. Many animal species are becoming extinct as a result of changes in their natural habitats and reduction of ranges.

1 Say if the following statements are true or false. Correct the false statements.

1 Transport activities do not contribute to climatic change.

2 Global warming is caused by the greenhouse effect.

3 Road transport is the main source of air pollution.

4 Noise pollution is not so dangerous as air pollution.

5 The main effects of marine transport operations on water quality predominantly arise from oil spills.

6 Transportation does not influence natural vegetation much.

2 Fill in the correct word derived from the word in brackets.

These days it is …….(possible) to open a newspaper without reading about the damage we are doing to the environment. The earth is being ……..(threat) and the future looks ……..(horror). What can each of us do?

We cannot clean up our ……...(pollute) rivers and seas overnight. Nor can we stop the ……(appear) of plants and animals. But we can stop adding to the problem while ……(science) search for answers and laws are passed in nature's …….(defend). It may not be so easy to change your lifestyle and habits ……..(complete) but some steps are easy to take: cut down the amount of ……..(drive) you do or use as little plastic as possible. It is also easy to save energy, which also reduces ……...(house) bills.

We must all make a personal …….(decide) to work for the future of our planet if we want to ……..(sure) a better world for our grandchildren.

3 Multiple choice.

The Baltic is a small sea, **A** …… it becomes **B** …… very easily. Its water changes slowly through the shallow straits. 150 rivers run **C** …….. the Baltic. There are hundreds of factories **D** ……. these rivers and millions of people live among them. Seven industrial countries **E** …… the Baltic. **F**…… a lot of big cities lie on its **G** …….. . All of this combined with active navigation of the sea naturally **H** …….. the state of the sea water and the shoreline flora and fauna.

Once we **I** …….. a sea it's very difficult to **J** …… it. Fortunately all the countries in the Baltic area have realized the problem. They co-operate actively **K** ……. solving ecological problems of the Baltic basin. **L** …… international law and the national laws of the coastal states **M** …… the regime of environmental protection of the Baltic Sea. The **N** ……. of the agreements among these states is to **O** …… oil pollution of the sea, to organize rational fishing and the preservation of sea life.

A 1. as	2. because	3. so that	4. so
B 1. muddy	2. dusty	3. dirty	4. greasy
C 1. into	2. out of	3. through	4. across
D 1. at	2. on	3. in	4. above
E 1. gather around	2. encircle	3. surround	4. round up

F 1. quite	2. rather	3. pretty	4. very
G 1. beach	2. coast	3. shore	4. banks
H 1. reflects	2. effects	3. forces	4. affects
I 1. had polluted	2. pollute	3. have polluted	4. polluted
J 1. brush	2. clean	3. polish	4. scour
K 1. in	2. over	3. within	4. for
L 1. either	2. neither	3. and	4. both
M 1. deprive	2. define	3. decline	4. defile
N 1. target	2. point	3. objective	4. aim
O 1. prevent	2. protect	3. preserve	4. pretend

Read the text and be ready to discuss cars as the main cause of air pollution.

T e x t 1C

Cars, Air Pollution and Health

Driving a car is the most polluting act an average citizen commits. Air pollution is not a good idea for a variety of reasons, large and small. The right ideas for remediation of environmental degradations involve unselfish and compassionate behavior, a scarce commodity. The right ideas involve long-term planning, conservation and a deep commitment to preserving the natural world. Without a healthy natural environment, there will be few or no healthy humans.

The decision to drive cars long distances to work was common among people in North America and Europe in the past 60 years. Cities grew larger. The development of suburbs often placed homes far from work places; massive road construction encouraged extravagant car use. In retrospect, it is clear that commuters made a mistake and they should stop commuting. Their mistake had health and economic consequences for them personally and for every other inhabitant of planet earth.Emissions from passenger vehicles increased in Canada and the US despite attempts to make engines more fuel efficient and despite the addition of antipollution devices. The two main reasons were: vehicle use increased; in the US and Canada, cars were getting bigger; pick-up trucks, vans and sports vehicles often replaced smaller, lighter passenger cars.

Despite scientific evidence of climate change, governments in most affluent countries have avoided their responsibility to reduce emissions of greenhouse gases. The USA is the biggest emitter of greenhouse gases worldwide.

Exhaust from all combustion engines combine to produce local adverse effects on the health of car users and all innocent bystanders. Cities have be-

come islands of toxic chemicals from the unrestrained use of vehicles burning fossil fuels. Cars are noisy, ugly, often dangerous and dominate the experience of modern living. We are now used to the carnage on roads and highways-attempts to reduce death and disability from our motorized containers have not substantially altered the negative impact on society. The adverse health effects of car exhaust are pervasive and difficult to measure.

Both local and global pollution would be reduced if each car-driving person pledged to use their car 30 % less starting immediately. Cities can reduce vehicular traffic by 30 % over the next 3 to 5 years. This is a responsible, individual contribution to a global problem. The rising cost of crude oil in 2008 quickly altered driving habits and big auto companies closed plants that produced SUVs and pick up trucks. If you are interested in longer term human survival, then the high cost of oil is a real benefit. With or without high fuel prices, each person can drive less and resist the temptation to buy larger, heavier cars, vans, trucks and sports vehicles.

1 Translate from Russian into English:

включать	изменение климата
большое расстояние	парниковые газы
окраина	двигатель внутреннего сгорания
последствия	токсичные отходы
житель Земли	сжигать топливо
транспортное средство	выхлопные газы
устройства	сокращать, уменьшать

2 Match English words and word combinations with their Russian equivalents:

reason	вклад
long distances	немедленно
road construction	изменять, менять
to increase	противостоять искушению
efficient	химические отходы
trucks	несмотря на
despite	причина
vehicle	сочетать, соединять
to replace	строительство дорог
fuel	большие расстояния
engine	увеличивать(-ся)
to combine	двигатель
to alter	эффективный

chemicals	заменять, вытеснять
to measure	транспортное средство
immediately	грузовики
contribution	топливо
to resist the temptation	измерять

3 Fill in the correct word derived from the words at the end of the sentence.

a) What can we do to reduce …….. of the atmosphere? ***pollute***
b) The change in the climate has produced ……. floods. ***terror***
c) Many of gases produced by factories are ……. to our health. ***harm***
d) Exhaust fumes have …… effects on the environment. ***damage***
e) Protecting the environment is essential to our …… . ***survive***
f) The rising cost of crude oil in 2008 quickly altered ……. habits. ***drive***
g) The greenhouse effect is the main cause of global ….. ***warm***

4 Answer the questions on the text:

1) Why is the car the biggest polluter?
2) What encouraged extravagant car use?
3) What attempts were made to reduce air pollution?
4) Do people realize all the consequences of extensive car use?
5) How can we characterize ecological situation in big cities?
6) What are the possible solutions to air pollution problem?

1 Translate the text from Russian into English.

T e x t 1D

Приведение транспортной инфраструктуры в соответствие с окружающей средой

Инженеры, занимающиеся разработкой транспортной системы, должны учитывать не только нужды клиентов, но и уделять больше чем когда-либо внимание охране окружающей среды. Сегодня неизбежны расходы на оценку и регулирование воздействия транспорта на окружающую среду, а также на борьбу за снижение уровня шумов и других загрязнений, источником которых является транспорт. Чтобы снизить отрицательное воздействие на окружающую среду, необходимо создать принципиально новые конструкции основных средств передвижения – автомобилей, поездов, самолетов и морских судов.

SPEAKING ACTIVITIES

Work in pairs or groups.

a) A: You want to build a new motorway in your city to solve traffic problem.
   B: You object to it.

b) A: You want to provide some opportunities for cyclists to ride around the city.
   B: You are a driver and you object to it.

c) A: You want to construct a new park next to B's house.
   B: Persuade him not to do that.

DISCUSSION

Points for discussion.

a) Observe environmental problems caused by transport activities.

b) Think of some consequences of the environmental problems. Use the 1-st and 2-nd Conditionals and don't forget about modal verbs.

E x a m p l e: If the average temperature increases it might lead to flooding.
If there were no ozone layer we would die of skin cancer.

c) We often hear the words "harmful effects of civilization on nature". What do they mean? Illustrate the results of harmful and helpful influences of human contacts with nature.

U N I T 2

AIR POLLUTION

ESSENTIAL VOCABULARY

acid rain	кислотный дождь
to absorb	поглощать, впитывать
by-product	побочный продукт
to cause	вызывать, причинять
carbon dioxide	углекислота
oxygen	кислород
hydrogen	водород
combustion	сгорание
colourless	бесцветный
to deplete	истощать, исчерпывать
efficient	эффективный, результативный
greenhouse effect	парниковый эффект

fuel	топливо
to consume	потреблять, расходовать
fallout	выпадение радиоактивных осадков
poisonous gases	ядовитые газы
heat	тепло
emission	выделение, распространение
exhaust fumes	выхлопные газы
to lead	приводить к (последствиям)
mixture	смесь, смешивание
to pour	лить(ся), вливать(ся)
unpredictable	непредсказуемый
due to	благодаря, из-за
to be responsible for	нести ответственность за
negative impact	отрицательное влияние/ воздействие
to transform	превращать, изменять
ozone layer	озоновый слой
to result in	иметь результатом, заканчиваться

1 Match the words from A with those from B to make word combinations.

A	B
poisonous	pollutant
air	dramatically
to cause	gas
to increase	illness
carbon	consequences
weather	dioxide
to burn	radiation
biological	its worst point
unpleasant	fossil fuels
ultraviolet	conditions
to reach	balance

2 Give English equivalents:

загрязнение воздуха, повышение температуры, выхлопные газы, истощение озонового слоя, побочные продукты, непредсказуемые последствия, вызывать заболевания, поглощать тепло, вредное влияние.

3 Give definitions to the words:
pollution, fallout, the greenhouse effect, smog, global warming, acid rain.

4 Read the following text. Use the information given in it while speaking about air pollution.

T e x t 1A

Air Pollution

Air pollution turns clear, odourless air into hazy, smelly air that harms health, kills plants, and damages property. People cause air pollution both indoors and outdoors. Outdoor air pollution results from pouring hundreds of millions of tons of gases and particulates (tiny particles of liquid or solid matter) into the atmosphere each year. One of the most common forms of outdoor air pollution is smog. Indoor air pollution results from many of the same substances found outdoors. But indoor pollutants can present a more serious problem because they tend to build up in a small area from which they cannot easily escape. Cigarette smoke is a familiar indoor air pollutant.

Most air pollution results from combustion processes. The burning of gasoline to power motor vehicles and the burning of coal to heat buildings and help manufacture products are examples of such processes. Each time a fuel is burned in a combustion process, some type of pollutant is released into the air. The pollutants range from small amounts of colourless poisonous gas to clouds of thick black smoke. Weather conditions can help reduce the amount of pollutants in outdoor air. Wind scatters pollutants, and rain and snow wash them into the ground. But in many areas, pollutants are put into the air faster than weather conditions can dispose of them. In crowded cities, for instance, thousands of automobiles, factories, and furnaces may add tons of pollutants to a small area of the atmosphere each day.

At times, weather conditions cause pollutants to build up over an area instead of clearing them away. One such condition – called thermal inversion – occurs when a layer of warm air settles over a layer of cooler air that lies near the ground. The warm air holds down the cool air and prevents pollutants from rising and scattering.

Air pollution can have a serious effect on human health. Both gases and particulates burn people's eyes and irritate their lungs. Particulates can settle in the lungs and worsen such respiratory diseases as asthma, bronchitis and pneumonia. Studies have shown that particulates cause such diseases as cancer and emphysema.

Air pollution also harms plants. Poisonous gases in the air can restrict the growth of nearly all kinds of plants.

Most materials get dirty and wear out more quickly in polluted air than in clean air. Polluted air even harms such hard and strong materials as concrete and steel. In some cities, statues and other art objects that stood outdoors for centuries have been moved indoors because air pollution threatened to destroy them.

Air pollutants may also affect climate. Both gases and particulates can cause changes in the average temperature of an area. Particulates scatter the sun's rays and reduce the amount of sunlight that reaches the ground. Such interference with sunlight may cause average temperatures in an area to drop. Some gases, including carbon dioxide, allow sunlight to reach the ground, but prevent the sunlight's heat from rising out of the atmosphere and flowing back into space. The warming of the earth's surface that results is called the greenhouse effect. The burning of fuel and other polluting activities are increasing the amount of heat-trapping gases in the atmosphere. This development may intensify the greenhouse effect, causing average temperatures to rise.

1 Answer the questions:

1 Why is air pollution so dangerous to the environment?

2 Why do indoor pollutants present a more serious problem than outdoor ones?

3 What happens when a fuel is burned?

4 What is thermal inversion?

5 How does air pollution affect human health?

6 What causes the greenhouse effect?

2 Read the text again. Find a paragraph which:

a) shows how air pollution affects human health

b) compares various air pollutants

c) describes climatic changes

d) gives information about combustion processes.

Gases are not only a component of the industrial process. They are also its result. Unfortunately they often produce a damaging effect on the environment. Read the text attentively to learn more about air pollution.

Text 1B

Air Pollution as the Major Problem of the Day

Since the 19th century we are getting increasingly worried about industry polluting breathing air in densely populated cities where the great majority of people live.

Not all air pollutants are man-made. For billions of years the air has been polluted by volcanoes throwing out tons of ash and smoke, dust stirred by the wind, gases given off by growing plants or by rotting animal and vegetable matter, salt particles from the oceans, etc. However, having discovered fire man added much to natural pollutants by burning fossil fuels. Sherlock Holmes' for example, observed London "pea-soupers", blanketing the city for days. That's because Londoners used soft coal for heating their houses.

Let us review what we know about combustion. All fossil fuels naturally contain hydrogen, carbon and sulphur, present in plants and animals. Uniting with oxygen during combustion these gases result in forming water and releasing carbon monoxide, carbon dioxide and sulphur dioxide. Besides, oxides of nitrogen are produced in the air whenever there are high temperatures, be it a car spark or a lightning stroke. These natural processes have far-reaching consequences.

The oxides reacting with water in the air produce carbonic, nitric, nitrous, sulphurous and sulphuric acids. Acid rains have damaging effects on materials and the environment. An excess of nitrogen in the air, greater than the ecosystems are able to absorb results in destructing the biological balance of the soils and water (eutrophication). In the layers of the air close to the ground photochemical (photo-oxidizing) pollution causes the formation of 'bad ozone', called so because of its destructing effect on human health and vegetation. And vice versa, the 'good ozone' protecting us from solar ultraviolet (UV) radiation in the stratosphere is being depleted by NO (mainly from traffic) and by chlorofluorocarbons. The ozone layer depletion has damaging effects on human health and environment. The greenhouse effect consists in atmospheric gases (CO_2, CH_4, O_3, N_2O, CFCs) absorbing infrared (IR) radiation, reflected from the surface of the earth. When not reflected back into space the energy is absorbed and transformed into heat. Without the natural greenhouse effect the average temperature on the earth would be –18 °C. However, since the industrial revolution; the concentration of greenhouse gases proves increasing. Thus, today we are facing the prospect of global warming with all its unpleasant consequences.

1 Say if the following statements are true or false. Correct the false statements.

1 Everybody is concerned with air pollution today.
2 Large cities seem to be the most highly polluted places.
3 All air pollution is due to man's activities.
4 Smog means *smoke + fog*.
5 The process of oxidizing is known as combustion.

6 Combustion causes problems because of the oxygen released into the atmosphere.

2 Fill in the table. Find information in the text

Major Types of Air Pollution		
Type	**Sources**	**Signs/Effects**

3 Complete these sentences with suitable words from the box

1) rubbers	7) acetylene
2) helium	8) man-made
3) non-flammable	9) oxygen
4) foam	10) toxic
5) dioxide	11) noble
6) air	12) odourless

Gases used in industry for making all kinds of products are known as industrial gases. They can be classified as natural and … The examples of natural gases are nitrogen and hydrogen. The first largest industrial gas is nitrogen. It is colourless, tasteless,... and non-toxic. Breathing and combustion are impossible without oxygen. Hydrogen is the most abundant gas in the universe. Carbon … is used in producing lemonades and conserving food. Balloons are normally filled with ... . The gases depleting the ozone layer are known as fluorocarbons. They are necessary in air conditioning, refrigeration and making packaging ... . Argon is a ... gas applied in welding. Chemicals such as solvents,..., plastics, and pesticides are available due to chlorine, which is a very ... gas. Water based paints and vinyl records are made with the help of ... that is also known for producing an extremely hot flame. Even the ... is used as an industrial gas because it will not react chemically with any elements.

1 Read the text and be ready to discuss ecological situation in big cities.

T e x t 1C

Ecological Problems of a Big City. London

It was in Britain that the word "smog" was first used (to describe mixture of smoke and fog). As the world's first industrialized country, its cities were the first to suffer this atmospheric condition. In the XIX-th century London's "pea-soupers" (thick smog) became famous through descriptions of them in the works of Charles Dickens and in the Sherlock Holmes's stories. The situation in London reached its worst point in 1952. At the end of that year particularly bad smog, which lasted for several days, was estimated to have caused between 4000 and 8000 deaths.

Water pollution was also a problem. In the XlX-th century it was once suggested that the Houses of Parliament should be wrapped in enormous wet sheets to protect those inside from the awful smell of the River Thames. In the middle years of this century, the first thing that happened to people who fell into the Thames was that they were rushed to hospital to have their stomachs pumped out!

Then, during the 1960s and 1970s, laws were passed which forbade the heating of homes with open coal fires in city areas and which stopped much of the pollution from factories. At one time, a scene of fog in Hollywood films was all that was necessary to symbolize London. This image is now out of date, and by the end of the 1970s it was said to be possible to catch fish in the Thames outside Parliament.

However, as in the rest of western Europe, the great increase in the use of the motor car in the last quarter of the XX-th century has caused an increase in a new kind of air pollution. This problem has become so serious that the television weather forecast now regularly issues warnings of "poor air quality". On some occasions it is bad enough to prompt official advice that certain people (such as asthma sufferers) should not even leave their houses, and that nobody should take any exercise, such as jogging, out of doors.

1 Find English equivalents for Russian words.

Страдать	***Ужасный***	***Запрещать***
a) surprise	a) awkward	a) forbid
b) suffer	b) available	b) forgive
c) suggest	c) awful	c) forget
d) surround	d) average	d) foretell

Предостережение	*Качество*	*Условие*
a) warming	a) quality	a) conviction
b) warring	b) quantity	b) conclusion
c) warrant	c) quarrel	c) connotation
d) warning	d) quarter	d) condition

2 Complete the collocates below by adding an appropriate noun. Some can combine with more than one noun.

warming	fuels	changes	resources
effect	waste	disasters	gases
energy	rain	pollution	
fumes	layer	transport	

acid.....	exhaust.....
global	ozone .....
nuclear.....	public.....
natural.....	air.....
sea.....	solar ..... ……
finite.....	greenhouse.....
clean.....	recycled.....
noisy.....	renewable .....

3 Open the brackets and use the verb in the required tense-form; fill in the blanks using a word from the following list:

1) weather
2) exhaust
3) greenhouse effect
4) recycling
5) fuel
6) resources
7) environmental
8) atmosphere
9) energy

In recent years, the number of a)..... problems (to increase) dangerously. One of the most serious problems is changes to the b) .....which (to lead) to the «c) .....» this (to make) most climates warmer. It already (to affect) several areas of the world with unusual d) .....causing droughts or heavy storms. Cutting down on e) .....fumes from vehicles (to help) solve the problem. Natural f) .....such as oil and coal are not endless, so using the other forms of g) .....such as wind, sun, wave and even sea waves (to help) preserve our planet. Very soon we (to be able) to

drive cars in cities that run on electricity -- a much cleaner h) .....than petrol. And we can also help preserve finite resources by i) .....things made of glass, aluminium, plastic and paper.

4 Translate into English.

a) Впервые слово «смог» появилось в Великобритании.

b) Одно время лондонский туман в голливудских фильмах был неотъемлемым символом Лондона.

c) Рост использования автомобилей привел к росту загрязнения атмосферы.

d) В середине шестидесятых был принят закон, который контролировал загрязнение атмосферы фабриками.

e) В некоторых случаях, когда загрязнение воздуха превышает норму, больным астмой рекомендуют не выходить из дома.

f) Людей, упавших в Темзу, сразу отправляли в больницу, где им делали промывание желудка.

g) Говорят, что в середине семидесятых в Темзе уже можно было ловить рыбу.

5 What environmental problems do these passages refer to?

a) Some experts predict that by 2090 the average temperature can be higher than today.

b) For some years scientists checked and rechecked their findings. By October 1984 the "hole" over Halley Bay showed a 30 per cent reduction in ozone.

c) The alarm was sounded in 1970 by the Scandinavian countries where acid rain has destroyed all life in many of their lakes.

d) Gone for ever, for example, are seventeen species of bears, five of wolves and foxes, four of cats, five of horses and zebras and three of deer.

e) Around the world between 11 and 15 million hectares of tropical forest are lost every year, an area larger than Austria.

f) 25 % of the world's electricity comes from dams and rivers.

Translate the text from Russian into English.

T e x t 1D

Озон под угрозой

На планете есть места, где слой озона уже уменьшился на три процента. А ведь его сокращение на один процент вызывает ежегодный прирост заболеваний кожи на шесть процентов.

34 государства уже подписали соглашение о прекращении использования соединений хлора, фтора и углерода в кондиционерах и о сокращении имеющихся их запасов на 50 процентов. Однако, как утверждают многие специалисты, уже сейчас необходимо 85-процентное сокращение для того, чтобы предотвратить дальнейший рост вредного вещества в атмосфере.

ACTIVITY

"Friends of the Earth" have organized a summer camp for everybody interested in the environmental protection. The hot issue of the day is air pollution.

Student A: The air in your city is getting more and more polluted. You want to write an article on air pollution problems. Interview a member of the "Friends of the Earth" organization for more information about air pollution and its effect on the environment.

Student B: You possess up-to-date and interesting information on environmental problems and their solutions. Share your knowledge at the interview.

DISCUSSION

1 The consequences of air pollution may be fatal that is why we must take measures before it is too late. Can anything be done? What exactly? Read this information and do the task below.

Most of the classic atmospheric pollutants, often found in the form of smog, are sadly known for affecting human health, ecosystems and buildings. Clean air laws are aimed at reducing air pollution.

Since the 1950s when the Clean Air Acts were introduced in Britain, we have been sure of the atmosphere improving slowly. Local authorities insist on companies receiving integrated pollution licenses reducing the amount of gases they release. These licenses are strictly controlled to avoid limits being exceeded. Special detectors are placed around the factories with the purpose of monitoring the amount of oxides sent to the atmosphere.

2 In groups analyze the condition of air in your city/country. Is it satisfactory? Work out several Clean Air Laws for improving the situation. Report on the problem and offer your suggesting.

U N I T 3

WATER POLLUTANTS EMITTED BY TRANSPORT SYSTEMS

NOISE POLLUTION EMITTED BY TRANSPORT SYSTEMS

TOPICAL VOCABULARY

1 Read and memorize the following words and word-combinations:

Alga, (pl. algae)	водоросль
to proceed	действовать
discharge	выброс
bulk	бестарный (насыпью, наливом)
to spill	проливать, разливать
washout	промывка, промывание
residue	остаток, отходы
residual	остаток
petroleum	нефть
runoff	слив, сток, спуск (жидкости)
dissolve	растворять (-ся)
convergence	сходимость, конвергенция
de-icing	борьба с обледенением
lubricant	смазочный материал
leakage	утечка
brake	тормоз
transmission	трансмиссия
abrasion	абразивный износ
catchment	дренаж, водосбор
larva, (pl. larvae)	личинка
turbidity	мутность
eutrophication	эвтрофикация (зарастание водоема водорослями)
dredging	дноуглубительные работы
friction	трение
ambient	внешний, окружающий
to impair	ослаблять, уменьшать
to alleviate	ослаблять, смягчать
transshipment	перегрузка
rail yard	ж/д станция
exposure	воздействие
jet propulsion	ракетный двигатель
wetland	заболоченная территория

2 Read and translate the following chemical element and compounds:

Nitrous oxide, lead, calcium, magnesium, oxygen, nitric acid, sulfuric acid, nitrogen, chlorine, NaCl, Zn, Cd, Cu, Ni, Cr, Fe.

3 Translate the following word combinations into Russian.

Destructive fallouts, water pollution sources, to alter the pH of water, aquatic food chain, oil spills, disruption of shore ecosystems, to be vulnerable to marine vessels discharges, artificial source of salt release, hydrographic system, hydrological environment, turbidity of water.

4 Match the words from the part A with those from the part B.

A. Acid, acidity, acidify, acidified, acids

B. Level, soil, sulfuric, rain, water resources.

5 Form adjectives from the words given in brackets:

(Destruct) fallouts, (ecology) balance, (continue) accumulation, (poison) substances, (coast) area, (harm) products, (environment) effects, (territory) handholds, (hydrology) environment, (continent) hydric system, (disrupt) infrastructure, (nature) habitat.

6 Form nouns from the words given in brackets:

(Pollute) fallouts, (acidify) of lakes, long term (accumulate), (destruct) of aquatic plant life, to provide (adhere), sea water (evaporate), (tend) to accumulate, (reproduce) cycle, (purify) capacity, (concentrate) of salt, (abrade) of tires, (converge) of a surface, (modify) of the aquatic environment, (maintain) of transportation infrastructure, (drain) system, (turbid) of water.

7 Read the following article and make a chart:

what ideas are rendered;
what ideas we agree with;
what we cannot agree with.

T e x t 1

Water Pollutants Emitted by Transport Systems

1 Modal Impacts

Transportation contributes significantly to the pollution of the hydrosphere in various ways ranging from air pollution fallouts to the construction and maintenance of infrastructure such as roads, railways and ports. The first types of impacts are related to the transport modes.

Air Pollution Fallouts

- Fallouts occur when a pollutant goes from an airborne state (gas, solid or liquid) towards a solute or colloidal state. Water is a very good solvent for several pollutants, notably acid depositions. Fallouts are accelerated and concentrated in an area by rainy conditions.
- As an important source of air pollution, transportation accounts on a similar scale for fallouts. In some areas transportation may account for up to **25 % of nitrogen fallouts in water**. It is estimated that acid rains may account for more than 75 % of the growth of acidity of lakes.
- Since fallouts are a continuous accumulation and occur over a longer period than most water pollution sources, they have a higher impact on still-water (lentic) environments than running-water (lotic). The most notable and destructive fallouts are sulfuric and nitric acids that may alter the pH of water if they are present in sufficient concentrations. Several northeastern United States and eastern Canadian lakes have seen their entire fish population destroyed as a result of increased acidity levels. It also includes damage to forests like reduced photosynthesis (sparse foliage) and acidified soils (limited nutrients). Nitrous oxides may affect the ecological balance of marine life by favoring algae blooms.
- Other fallouts such as HC/VOC and lead are poisonous and may disrupt marine life if they accumulate in the aquatic food chain. Particulate fallouts, when in sufficient quantities, may increase the turbidity of water and thus reduce the photosynthesis capacity of aquatic plants. A long term accumulation of air pollution fallouts of various nature will contaminate and disrupt whole aquatic ecosystems.

Marine Vessels Discharges and Spills

- After unloading their bulk loads like oil, coal, nitrates and mineral products, marine vessels require cleaning. Since this practice is restricted in several port and coastal areas, operators wait until they are in international waters to proceed. Oil products residuals carried by tankers are the major source for discharges.
- It is estimated that **for every million tons of oil carried, one ton is spilled through washouts**. Once a spill has occurred, it is extremely difficult to contain it. From 1989 to 1992, 105 accidental oil spills by tankers were accounted worldwide, totaling 991,000 tons of oil being spilled. Annually, an average of 1.1 million tons of oil comes from discharges and 400,000 tons are spilled. They depend on the nature of the residue discharged.
- **Petroleum products** are the most harmful and include environmental effects like the destruction/disruption of aquatic plant/animal life and of shore ecosystems. Since most marine life is in neritic (continental shelf) and epipe-

lagic (less than 100 meters) zones, it is particularly vulnerable to marine vessels discharges.

2 Infrastructure Impacts

The second type of impact involves transport infrastructures.

De-Icing of Infrastructure and Runoffs

- Salt (NaCl) has the characteristic of lowering the melting point of water and thus presents an useful compound for keeping safe road conditions in subzero climates. Other elements like sand and gravel are also added to provide adherence.
- Runoffs occur when substances accumulated by a surface (notably a road) are dissolved / carried by water and evacuated elsewhere. It is often the convergence of a surface to a point. De-icing of transportation infrastructure (roads, parking lots, airfields etc.) is almost the only artificial source of salt release in the environment. Salt mostly comes from mining (halite) or in fewer proportions from sea water evaporation. Other compounds like calcium and magnesium can be used, but they work more slowly and cost ten times as much.
- Lubricants (from car leakages – engine, brakes, and transmission), heavy metals (Zn, Cd, Cu, Ni, Cr and Fe from abrasion of tires and brake linings) and dry fallouts (HC/VOC, particulates) account for harmful sources of runoffs.
- Since road infrastructure (parking lots, roads, drainage systems) occupy a significant land surface in developed countries, it is the major source of runoffs. For instance, while highways occupy 5–8 % of the urban catchment area, it contributes for as much as 50 % of the total suspended solids, 16 % of the total HC and 75 % of the total metal inputs to a receiving stream.
- High concentrations of salt, notably chlorine ions, in fresh water environments disrupt life cycles and may be fatal to some organisms like larvae. Runoffs from infrastructure will alter the turbidity and the oxygen level of water (warm water holds less oxygen), and contaminate the food chain. It may increase the eutrophication process of several lakes, particularly in recreational areas where dirt roads are dense. De-icing salt has the tendency to accumulate in snow and soils beside roadways. During early springtime, nearly all the salt accumulated will be released in the hydrographic system where it will contaminate ground water and interfere with the growth of plants and the reproduction cycle of aquatic life, particularly vulnerable at this time of year.
- Infrastructure runoffs collected by the sewage system of urban areas often converge at evacuation points and contaminate whole hydrographic systems at high concentrations. It is worth noting that most cities have 30 to 70 %

of their surface occupied by roads and parking space. Thus they represent important sources of runoffs.

Construction and Maintenance of Infrastructure

- Several transportation infrastructures have important territorial handholds. When a transportation infrastructure is built over a hydrological environment like a river, wetland or a coastal area, disruption occurs.
- The maintenance of transportation infrastructure, particularly harbor and waterways (dredging), have also a significant impact. Each mode needs a specific set of infrastructure that interferes with hydric systems.
- **Road infrastructure accounts for most of the territorial handhold of transportation** with structures like bridges and parking facilities. Railways have also an important handhold over continental hydric systems. Maritime transportation, by its intrinsic link with hydric systems has several disruptive infrastructures like piers, canals, harbors and terminals. Airports have similar effects when constructed over wetland. Dredging accounts alone for 80 % of the waste released in aquatic environments.
- The most widespread effect of transportation infrastructure on hydric systems is the removal of natural habitats along shorelines. The aquatic / land interface to which several animal and vegetal species depend is considerably reduced. Further, a modification of the aquatic environment occurs, particularly during dredging in port harbors and along waterways. This notably influences the turbidity of water and destroys habitats. Roads and rails, when running through wetland, reduce the water regeneration / purification capacity by splitting available areas and disrupting water flows. Large ports occupy extensive areas along the shorelines of waterways and coasts. The construction and maintenance of those infrastructures have thus extensive impacts over aquatic environments. The construction of canals changes whole hydrographic systems by altering water flows (quantity and speed) at regional and often at continental levels.

(Author: Dr. Jean-Paul Rodrigue)

1 Answer the following questions:

1 What are the main sources of water pollution?

2 What are the consequences of nitrogen fallouts in water?

3 How do air pollution fallouts influence aquatic ecosystem?

4 Why are petroleum products harmful for aquatic environment?

5 How does de-icing of transportation infrastructure affect the environment?

6 What are the main sources of runoffs?

7 How do different kinds of transportation and their set of infrastructure interfere with hydric systems and influence them?

2 What do you think the main idea, message of the article is?

3 Into how many paragraphs is the article divided?

4 Find key sentences (main points).

5 What is the topic of each paragraph?

In a brainstorming activity try to anticipate some of the main points and offer your own ideas on the subject before reading the text.

Read the article and present the information in the form of a diagram, table, etc.

T e x t 2

Noise Pollution Emitted by Transportation Systems

Road Transportation Noise

- Road accounts for approximately 70 % of total noise emissions by transportation. It must be noted that different road transportation modes have different scales of noise emissions.
- Main sources of noise come from the **engine** and the **friction of the wheels** over the road surface. Further, travel speed and the intensity of traffic are directly linked with its intensity of noise. For instance, one truck moving at 90 km/hr makes as much noise as 28 cars moving at the same speed.
- **Ambient noise** is a frequent result of road transportation in urban areas. The addition of all the noise generated by cars, trucks and buses creates a permanent ambient noise (ranging from 45 to 65 db) that impairs the quality of life in urban areas and thus the property values of residences. Nearby road arterials, **ambient noise** is replaced by direct noise and vibrations. The acoustics created by the surrounding environment (hills, buildings, trees, open space, etc.) alleviate or worsen local conditions.
- **Noise level grows arithmetically with speed**. For instance a car traveling at 20 km/hr emits 55 db of rolling noise, at 40 km/hr 65 db, at 80 km/hr 75 db and at 100 km/hr 80 db. Available evidence underlines that around 45 % of the population in developed countries live in high levels of noise intensity

(over 55 db) generated by road transportation. Along major highway arterials in inter-urban areas, noise emissions are likely to alter the living environment of wildlife species.

Rail Transportation Noise

- Rail accounts for 10 % of total noise emissions by transportation. Noise comes from the engine (mostly diesel), the friction of wheels over the rails, and whistle blowing. Furthermore, when trains are moving at high speed, **aeroacoustic noise** becomes more important than other sources. Depending of the train aerodynamics, noise emissions are from 50 to 80 times the logarithm of train speed and become significant at speeds higher than 200 km/hr.
- When rail / truck transshipment is involved, the convergence of trucks towards railyards provides an additional source of noise related to rail transportation activities.
- Around 3 % of the population may be exposed to high noise levels from rail transportation in OECD countries. The level of exposure is obviously related to the importance and location of rail transportation infrastructure. The most important noise impacts of rail operations are in urban areas where the majority transshipment functions are performed. Furthermore, rail terminals are often located in the central and high density areas of cities.

Air Transportation Noise

- **Air transportation accounts for 20 % of total noise emissions by transportation**. As air transportation took a growing importance in inter-city transportation and that jet engines were predominantly used, noise emissions have increased significantly to the point of becoming a major concern near airports.
- Noise comes from the **jet engine**, the **aerodynamic friction** and **ground craft operations**. Even if the turbofan is the least noisy jet propulsion technology available, aircrafts are an acute source of noise in several urban areas. Noise from aircraft operation is known to have **direct impact on property values around airports**. This effect is distributed along major approach and takeoff lanes.
- The establishment of heavily used flight paths between major cities creates noise corridors where ambient noise is almost prevalent. This is particularly noted when those corridors are over densely populated areas.

(Author: Dr. Jean-Paul Rodrigue)

1 Answer the following questions:

1 What is the main source of noise pollution?

2 What does the intensity of road transportation noise depend on?

3 Where does rail transportation noise come from?

4 What do rail transportation noise emissions depend on?
5 Where does air transportation noise come from?

2 What sentences, paragraphs, words or phrases state the message of the article?

3 What are the details relevant to the topic of the article?

4 Do you agree with the conclusions the author has made? Justify your point.

5 Make up a summary of the text using the cliché:

The facts: 1 All the important facts are given. 2 Enough important facts are given to get a good picture of what has happened/is going on. 3 Not enough important facts are given.

The details: 1 Most details given add valuable information. 2 Most details given are interesting, but not really necessary. 3 Most details given are not necessary.

The author's intention: 1 S/he tries to give a full account of events without showing personal feelings. 2 S/he tries to tell the truth but is not afraid of showing personal feelings. S/he is especially interested in telling the readers what s/he themselves felt when watching all these events/

I/we think: 1 The article is very well written. 2 The article is reasonably well written. 3 It is a boring/useless article.

Read the following paragraph. Fill in each blank with a suitable word given below:

Environment, automobiles, noises, pollution, powerful, combustion, advances, polluting, nitrogen oxide, materials, power, problems.

Technological causes.

Many environmental pollution _____are a result of the rapid advances in technology that have been made since about the end of World War II (1945). Technological _____in agriculture, industry, and transportation have greatly improved our way of life. But most of the advances were made without consideration of the effects they would have on the_____.

The automobile engine is an example of a very useful technological development that harms the environment. Through the years, _____have been made more and more powerful. Many cars being built today have two to three times as much _____as most cars built during the 1940's. Because of this, the

new cars produce much more _____exhaust than the older ones did. In order to make engines more_____, automobile manufactures had to increase compression rations. That is, they increased the pressure and-as a result-the temperature at which _____takes place in the engines' cylinders. The higher temperatures during combustion cause chemical reactions that put large amounts of _____gases into the engines' exhausts. In addition, high compression engines require special gasolines that burn evenly to prevent "knocking"____. Mechanisms called catalytic converters now remove some of the polluting _____produced by automobile engines. Also, the gradual elimination of the antiknock compound tetraethyl lead from gasoline has helped make automobiles less polluting. However, there is still much to do to eliminate _____from automobiles. An increase in their number may cancel gains from using catalytic converters and unleaded gasoline.

DISCUSSION

Choose one of the following for discussion:

1) Some people believe that the Earth is being harmed (damaged) by human activity. Others feel that human activity makes the Earth a better place to live. What is your opinion? Use specific reasons and examples to support your answer.

2) Choose one of the following transportation vehicles and explain why you think it has influenced the environment most of all:

- automobiles
- bicycles
- airplanes

Use specific reasons and examples to support your answer.

3) The 21st century has begun. What changes do you think the new century will bring? How do they affect the environment?

PROJECTS

Study the following project. You should use local mass media, the web, and interview ecological organizations. Present the result of your independent research in class.

Cleaner water

The pressures on water supplies are increasing and climate change may reduce rainfall further.

So we are:

– Requiring water companies to reduce leakage by a quarter over three years.

– Improving the quality of drinking water, rivers and bathing waters while reducing charge for customers.

– Ending the dumping of oil platforms and tackling releases to the sea of hazardous and radioactive substances.

U N I T 4

TRANSPORT AND ENVIRONMENTAL MANAGEMENT

TOPICAL VOCABULARY

1 Read and memorize the following words and word-combinations:

To exert	влиять, оказывать давление
to assess	оценивать, определять
to undertake	предпринимать
to conceive	понимать
to evaluate	оценивать
to emanate	происходить, быть результатом
obligation	обязательство
sustainability	устойчивость
fossil fuel	ископаемое топливо
conventional fuel	обычное, традиционное топливо
non-crude	сырой, неочищенный
to shrink	сокращать
energy-intensive	энергоемкий
to propel	приводить в движение
depletion	истощение
liquefaction	сжижение
refined oil	очищенная нефть
renewable	возобновляемый

2 Using the text give derivatives from the following words and translate them into Russian:

Verify, fragil, sustain, responsible, indicate, specify, inform, perform, measure, relate, hold, environment, manage, organize, apply, operate, continue, commerce.

Text 1

Transportation Environmental Management

Environmental Management Systems

All transport infrastructures vary in terms of property, investment provisions, types of activities and volume of traffic. As a result, it is not possible to provide a unique model of environmental management as problems are mode specific and there is no agreed upon common international standards. Nevertheless, there are several environmental management systems (EMS) that provide procedures and specifications in a structured and verifiable manner to meet environmental objectives.

An environmental management system is a set of procedures and techniques enabling an organization to reduce environmental impacts and increase its operating efficiency.

Obviously, transport firms can only manage environmental issues on which they can exert a controlling influence. The best environmental practices include the following procedures:

- Match transport facilities, operations or projects with environmental components.
- Link environmental components with regulatory requirements.
- Assess risks, impacts and responsibilities.
- Identify environmental issues to be addressed.
- Consider commercial strategies and operations of private and public sector organization.
- Introduce better practices.
- Undertake continuous monitoring and auditing.

These issues must be clearly understood and addressed before designing a particular framework of environmental management for a transport organization. There exist numerous environmental management systems. Obviously, the choice of a system is specific to each transport enterprise in relation to the problem, risks, impacts and responsibilities identified and the geographical environment in which the enterprise must operate. The most often mentioned environmental management systems are EMAS and ISO 14 001:

- **Eco-Management and Audit Scheme**. In 1993, the European Union created the norm EMAS, conceived to provide European firms with a framework and operational tools that would permit to better protect the environment. EMAS has developed a handbook entitled «Identification of environmental

aspects and evaluation of their importance». This approach rests on the necessity to identify environmental impacts and the various types of environment that are affected by the operations and activities of any types of organizations including transport enterprises. The impacts are evaluated according to a step by step procedure that examines each activity of an enterprise and their impacts on the environment. Each impact is then assessed in relation to criteria developed by the organization. These criteria must evaluate the potential damage to the environment, the fragility of the environment, the size and frequency of the activity, the importance of that activity for the organization, the employees and the local community, and the legal obligations emanating from environmental legislation.

- **ISO 14001**. The International Standard Organization has developed a set of norms that represent the main industrial reference in terms of environmental management systems and sustainability. ISO 14001 offers three categories of indicators to measure the environmental performance that could be applicable to the transport industry. The indicators of environmental conditions (IEC) present the information on the environmental conditions permitting a better understanding of the impacts or the potential impacts of transport operations. The indicators of management performance (IMP) present information on the management efforts that are being made to influence the environmental performance of transport operations. The indicators of operational performance (IOP) present information on the environmental performance of transport operations. Generally, these indicators permit to identify the most significant environmental impacts that are associated with transport operations, to evaluate, review and increase the environmental performance of transport corporations, to identify new practices and opportunities for a better management of transport operations, and to have constant, credible and measurable information and data on the relationship between the environmental performance of the firm and its environmental objectives, targets and policies.

EMAS has been developed to stimulate and synchronize European environmental policies. EMAS mainly addresses manufacturing and transportation issues and is site specific. EMAS has a focus on internal corporate activities (as ISO) but also on external stakeholders. As a result EMAS holders are required to publish environmental statements for the public, while ISO 14 001 has no such provision. In contrast, ISO is global in scope and is company specific. The corporate benefits do not differ between the two systems and studies suggest that the two standards have no practical effects on environmental performance. The most important issue is that both EMS have strength and areas to improve, but it is the corporate environmental outlook that is the real engine to a high level of environmental performance and therefore a strong EMS.

(Author: Dr. Claude Comtois)

Reply to the following sentences with a suitable question:

1 An environmental management system is a set of procedures and techniques enabling an organization to reduce environmental impacts and increase its operating efficiency.

2 The choice of a system is specific to each transport enterprise in relation to the problem, risks, impacts and responsibilities identified and the geographical environment in which the enterprise must operate.

3 These criteria must evaluate the potential damage to the environment, the fragility of the environment, the size and frequency of the activity, the importance of that activity for the organization, the employees and the local community, and the legal obligations emanating from environmental legislation.

4 The indicators of environmental conditions (IEC) present the information on the environmental conditions permitting a better understanding of the impacts or the potential impacts of transport operations.

5 These indicators permit to identify the most significant environmental impacts that are associated with transport operations, to evaluate, review and increase the environmental performance of transport corporations, to identify new practices and opportunities for a better management of transport operations, and to have constant, credible and measurable information and data on the relationship between the environmental performance of the firm and its environmental objectives, targets and policies.

1 Into how many paragraphs is the article divided?

2 What is the topic of each paragraph?

3 Find key sentences (main points).

4 Think of your appropriate paragraph titles.

5 Read the text and say if it has a clear structure (conceptually and formally); what means the author uses to deliver his message.

T e x t 2

Solution: Reduce Air Pollution, change motor vehicle use.

The use of cars must be re-defined. Car use has to be considered a privilege, not a right. The cost of environmental damage and reclamation has to be

added to the cost of owning and operating a car. Vehicle use should no longer be subsidized.

Reduce number of vehicles – an areas need to set vehicular quotas and issue permits to limit the number of vehicles to control regional traffic congestion and air pollution.

Smaller cars are desirable, but make their occupants especially vulnerable when they collide with much larger vehicles. A sane city would separate small, efficient passenger vehicles from buses and trucks.

Improve efficiency of vehicles – reverse the trend to larger vehicles; engineering solutions to emissions of combustion engines. Hybrid cars are a step in the right direction but in small numbers will not have a significant impact on air pollution.

Reduced vehicle use and traffic reform can be a bigger and more immediate remedy for urban air pollution. Improved efficiency of traffic is important. Examples are: dedicated bus lanes and priority for car-pools and vehicles with 3 or more passengers. Traffic can be scheduled to optimize road usage; e.g. commercial traffic at night; large companies can stagger working hours and decentralize administrative operations. Commuting long distances in cars to work needs to be phased out. Single passenger commuting to work should be strongly discouraged.

Recreational driving can be reduced immediately. Car owners need to pay for miles driven and fuel burned on an escalating scale. Each person can have a "free driving" allotment per year and pay increasing insurance and/or taxes on fuel consumption beyond this limit. The most accessible measure of air pollution contribution is the amount of fossil fuel burned.

Governments can encourage the reduction of vehicular use by:

- Promoting Voluntary abstention.
- Increase Public Transit – diversify options and limit access to existing roads.
- Separate commercial and private traffic to increase efficient use of roads.
- Stop building car-oriented roads and highways.
- Replace 30 % of the existing roads designed for cars with a variety of transportation options.
- In cities, build more walking paths, bicycle routes and roads for small electric vehicles.
- Reduce commuting - link residence and business activities by rezoning and rebuilding cities.
- Reward car-pools and car-sharing plans.
- Redefine road use by defining access privileges – no longer a right.

- Road Tolls and increased gasoline and vehicle registration taxes.
- Base car license fees on fuel consumption in the previous year. Use exponential fee rate increase for high fuel consumption individuals.
- Provide generous development grants and tax incentives for all non-polluting transportation alternatives.

Governments can use a combination of

- Voluntary and Reward Schemes.
- Compulsory and Penalty Schemes.
- Incentives for New Technology and Changes in Industrial Fuel Consumption.

Long term solutions require that vehicles use less polluting energy sources such as biofuels, propane, natural gas and hydrogen. I am sorry to say that the marketing of "green solutions" to global warming is becoming yet another scam. One problem is that producing alternate fuels and hybrid cars often requires CO_2 emissions that offset or cancel the benefits of improve vehicular design. When ethanol is made from corn, more than 75 % of its energy value is spent on its production. Burning ethanol still produces carbon dioxide.

Electric Cars

Electric cars are on the road, under development and promise to become vehicles of choice for urban transportation. The new cars represent advances in technology that link computers, electric motors and batteries into systems that drive well, self-regulate, and require little maintenance. The main components are modules that are removed to be refurbished in specialized factories and recycled. The main limitation is battery technology. Batteries are heavy, wear out quickly with repeated recharging and require expensive, rather scarce materials such as lithium.

Even if all the technical problems of building reliable cars were solved, there remains a daunting list of infrastructure problems yet to be solved. While eclectic cars produce little air pollution, generating electricity continues to be a major source of air pollution. If an electric car is recharged with electricity produced by a fossil fuel burning generator, there may be no net benefit to the atmosphere.

A real solution for car technology would reduce air pollution beginning at source materials and would continue through the use cycle of the vehicle. While is it feasible to use fossil fuels in generation plants with all the latest techniques of emission control and CO_2 recycling, these plants are uncommon in 2009. Before more people plug in electric vehicles, a new infrastructure of non-polluting, affordable electricity production will have to be built.

In the immediate future reduced car use is the best solution. A gas-inefficient clunker driven twice a week for 20 km is a better choice than a new

expensive hybrid car driven everyday for 100 Km. No solutions is better than reduced vehicle use.

1 Give the definitions of the words in italics.

2 Analyze the given information and group it in two parts: 'facts' and 'opinion'.

3 Make up a summary of the text.

1 Translate the following word combinations into Russian.

Complicated storage system, non-crude oil resources, result of shrinking oil reserves, to reduce emissions of harmful pollutants, fermentation of food crops, to absorb solar energy, transform it through photosynthesis, low productivity of the biomass, to reduce oil consumption, energy-intensive process, energy efficiency of the production process, electrolysis of water, compressing or converting hydrogen into liquid form, generate near-zero pollutants, hydrogen-powered vehicle, high pressure storage tank, liquid hydrogen fuel, alternative to petroleum fuels, to convert energy into electricity, driving ranges and speed, energy capacity of batteries, propulsion system, to combine the efficiency of electricity with long driving range, to charge the battery via a generator, to recharge the battery, inevitable oil depletion, fuel-recovery technologies, demand for gasoline, coal liquefaction technology, transformation of coal into refined oil, cost-effectiveness of the technique, competitive advantages, to rely on solar, wind or hydro-power, renewable energy sources, not to be competitive with petroleum fuels.

2 Analyze the title, and visual means (typography – bold type, capital letters, italics; illustrations, subheadings), paragraphing, dates, numbers, names, etc., used to identify or speculate on content and message of the article.

3 Read the following article and write down the questions that occur to you while reading.

4 Read the following article and make a chart:

what ideas are rendered;
what ideas we agree with;
what we cannot agree with.

Text 3

Transportation and Alternative Fuels

All other things being equal, the energy source with the lowest cost will always be sought. The dominance of petroleum fuels is a result of the relative simplicity with which they can be stored and efficiently used in the internal combustion engine vehicle. The transportation sector is heavily dependent on the use of petroleum fuels for obvious reasons. Other fossil fuels (natural gas, propane, and methanol) can be used as transportation fuels but require a **more complicated storage system**. The main issue concerning the large-scale uses of these alternative vehicle fuels is the large capital investments require in distribution facilities as compared with conventional fuels. Another issue is that in terms of energy density, these alternative fuels have lower efficiency than gasoline and thus require greater volume of on-board storage to cover the equivalent distance as a gasoline propelled vehicle.

Alternative fuels in the form of non-crude oil resources are drawing considerable attention as a result of shrinking oil reserves, increasing petroleum costs and the need to reduce emissions of harmful pollutants:

- **Biogas** such as ethanol, methanol and biodiesel can be produced from the fermentation of food crops (sugar cane, corn, cereals, etc) or wood-waste. Their production however requires large harvesting areas that may compete with other types of land use. Besides, it is estimated that one hectare of wheat produces less than 1,000 liters of transportation fuel per year which represents the amount of fuel consumed by one passenger car traveling 10,000 kilometers per year. This limit is related to the capacity of plants to absorb solar energy and transform it through photosynthesis. This low productivity of the biomass does not meet energy needs of the transportation sector. In 2007, the US government proposed to reduce oil consumption by 20 % by using ethanol. As the US is currently producing 26 billion liters of ethanol each year, this objective would require the production of nearly 115 billion liters of ethanol by 2017 which amounts to the total annual US maize production. Besides, the production of ethanol is an energy-intensive process. The production of 1 thermal unit of ethanol requires the combustion of 0,76 unit of coal, petroleum or natural gas. Biodiesel can be obtained from a variety of crops. The choice of biomass fuel will largely depend on the sustainability and energy efficiency of the production process.
- **Hydrogen** is often mentioned as the energy source of the future. The steps in using hydrogen as a transportation fuel consist in: 1) producing hydrogen by electrolysis of water; 2) compressing or converting hydrogen into liquid form; 3) storing it on-board a vehicle; and 4) using fuel cell to generate

electricity on demand from the hydrogen to propel a motor vehicle. Hydrogen fuel cells are two times more efficient than gasoline and generate near-zero pollutants. But hydrogen suffers from several problems. A lot of energy is wasted in the production, transfer and storage of hydrogen. Hydrogen manufacturing requires electricity production. Hydrogen-powered vehicle requires 2-4 times more energy for operation than an electric car which does not make it cost-effective. Besides, hydrogen has a very low energy density and requires very low temperature and very high pressure storage tank adding weight and volume to a vehicle. This suggests that liquid hydrogen fuel would be a better alternative for ship and aircraft propulsion.

- **Electricity** is being considered as an alternative to petroleum fuels as an energy source. A pure battery electric vehicle is considered a more efficient alternative to hydrogen fuel propelled vehicle as there is no need to convert energy into electricity since the electricity stored in the battery can power the electric motor. Besides an electric car is easier and cheaper to produce than a comparable fuel-cell vehicle. The main barriers to the development electric cars are the lack of storage systems capable of providing driving ranges and speed comparable to those of conventional vehicles. The low energy capacity of batteries makes the electric car less competitive than internal combustion engines using gasoline. An electric car has a maximum range of 100 kilometers and speed of less than 100 kph requiring 4-8 hours to recharge.
- **Hybrid vehicles** consisting of propulsion system using an internal combustion engine with an electric motor and batteries provide interesting opportunities combining the efficiency of electricity with long driving range. A hybrid vehicle still uses liquid fuel as the main source of energy but the engine provides the power to drive the vehicle or is used to charge the battery via a generator. Alternatively the propulsion can be provided by the electricity generated by the battery. When the battery is discharged, the engine starts automatically without intervention from the driver. The generator can also be fed by using the braking energy to recharge the battery. Such a propulsion design greatly contributes to overall fuel efficiency. Given the inevitable oil depletion, the successful development and commercialization of hybrid vehicles appears the most sustainable option to conventional gasoline engine powered vehicles.
- The penetration of non fossil fuels in the transportation sector has **serious limitations**. As a result, the price of oil will certainly continue to increase as more expensive fuel-recovery technologies will have to be utilized with soaring demand for gasoline. But high oil prices are inflationary leading to recession in economic activity and the search for alternative source of energy. Already, the peaking of conventional oil production is leading to the implementation of coal derived oil projects. Coal liquefaction technology allows the

transformation of coal into refined oil after a series of processes in an environment of high temperature and high pressure. While the cost-effectiveness of this technique as yet to be demonstrated, coal liquefaction is an important measure in the implementation of transportation fuel strategies in coal-rich countries, such as China and South Africa.

- The costs of alternative energy sources to fossil fuels are higher in the transportation sector than in other types of economic activities. This suggests higher competitive advantages for the industrial, household, commercial, electricity and heat sectors to shift away from oil and to rely on solar, wind or hydro-power. Transportation fuels based on renewable energy sources might not be competitive with petroleum fuels unless future price increase is affected by different fuel taxes based on environmental impacts.

1 Answer the following questions:

1 Why is petroleum fuel dominant in transportation sector?

2 What fossil fuels are used as transportation fuels?

3 What are the advantages and disadvantages of alternative fuels?

4 What are the main alternative fuels?

5 Why biogases can't completely replace fossil fuels?

6 What are biofuels produced from?

7 What are the steps in using hydrogen as a transportation fuel?

8 What is a drawback of production and storage of hydrogen?

9 What are the advantages of electricity over the others alternative fuels?

10 What are the competitive advantages of hybrid vehicles over electric cars?

2 Choose from part II the appropriate continuation of the sentences.

I. 1 While ethanol has been championed as an alternative …

2 Burning ethanol still produces …

3 Ethanol yields 25 % more energy than the energy invested in its production, …

4 Compared with ethanol, …

5 Relative to the fossil fuels …

6 Biodiesel also releases …

7 These advantages of biodiesel …

8 Biofuels cannot replace petroleum …

9 When ethanol is made from corn, …

II. 1 … biodiesel releases just 1.0 %, 8.3 %, and 13 % of the agricultural nitrogen, phosphorus, and pesticide pollutants, respectively, per net energy gain.

2 … without impacting food supplies.

3 … carbon dioxide.

4 … to petroleum fuels, it mainly helps to reduce dependency on oil producing countries.

5 … whereas biodiesel yields 93 % more.

6 … more than 75 % of its energy value must be spent on its production.

7 … they displace greenhouse gas emissions are reduced 12 % by the production and combustion of ethanol and 41 % by biodiesel.

8 … less air pollutants per net energy gain than ethanol.

9 … over ethanol come from lower agricultural inputs and more efficient conversion of feed stocks to fuel.

DISCUSSION

Choose one of the following for discussion:

1) Some people think that human needs for farmland, housing, and industry are more important than saving land for endangered animals. Do you agree or disagree with this point of view? Why or why not? Use specific reasons and examples to support your answer.

2) Many parts of the world are losing important natural resources, such as forests, animals, or clean water. Choose one resource that is disappearing and explain why it needs to be saved. Use specific reasons and examples to support your opinion.

3) A company is going to give some money either to support the arts or to protect the environment. Which do you think the company should choose? Use specific reasons and examples to support your answer.

PROJECTS

Study the following project. You should use local mass media, the web, and interview ecological organizations. Present the result of your independent research in class.

Cleaner air.

Up to 24,000 people a year die before their time because of air pollution. A similar number are admitted to hospital. Cutting pollution will also save more children from asthma attacks and protect everyone from the long-term effects of polluted air.

So we are:

– To get rid of lead in petrol.

– To propose tighter targets for reducing five of the main air pollutants.

– To use the tax and duty systems to encourage cleaner vehicles and fuels.

ОГЛАВЛЕНИЕ

Учебное издание

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ТРАНСПОРТ И ОКРУЖАЮЩАЯ СРЕДА

Учебно-методическое пособие
по английскому языку
для студентов дневного обучения всех специальностей

Технический редактор В. Н. К у ч е р о в а
Корректор Т. А. П у г а ч

Подписано в печать 12.03.2011 г. Формат 60x84 1/16.
Бумага офсетная. Гарнитура Таймс. Печать на ризографе.
Усл. печ. л. 2,56. Уч.-изд. л. 2,74. Тираж 1200 экз.
Зак. № . Изд. № 116.

Издатель и полиграфическое исполнение
Белорусский государственный университет транспорта:
ЛИ № 02330/0552508 от 09.07.2009 г.
ЛП № 02330/0494150 от 03.04.2009 г.
246653, г. Гомель, ул. Кирова, 34.