

Erasmus+

*The Causes and
Effects of Pollution
in Romania*

***LET'S BE GREEN
TOGETHER!***

2017-1RO01KA219- 037393



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POLLUTION

Pollution is the contamination of the environment with materials that interfere with human health, the quality of life or the natural function of ecosystems.

Pollution has immediate negative consequences on both local and global environmental elements .The sources that lead to these effects are diverse, some of them being natural, others (most of them) being imposed by human activities.

The state of the quality of environmental elements in Romania is monitored by the Ministry of Environment. It is, however, a matter of general interest, above all a health problem, which must preoccupy all local organs and every citizen.



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THE AIR POLLUTION

Air is the component of the environment in which harmful elements propagate rapidly on extended spaces. Achieving higher efficiency in economic activities has made the human being to interfere directly or indirectly in the evolution of many climate elements, provoking a lot of local and regional mutations that, by cumulation, begin to influence the state of the climate on large territories, including the global level.

The large number of local climate changes are linked to the creation of specific microclimates (greenhouse, urban, rural, industrial platforms, etc.), mainly focused on changes in temperature, humidity, calm state, In this group of local changes we can see the expansion of housing districts to the detriment of forest spaces, the creation of parks or recreation areas, the growth of paved or concrete surfaces accompanied by direct consequences in the reception of solar radiation and excessive heating of air in cities.

Regional climate change refers to larger spaces, which include the effects of local ones. Severe implications occur in the industrial complexes that have become important sources of air pollution by the emission of gases and harmful particles not only for humans but also for other creatures.

In recent decades, air pollution sources have gained a distinct significance through the increasing diversity and volume of substances (toxic gases, smoke, particles, means of road, rail, air transport, etc.).



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AIR POLLUTION EFFECTS

All the mentioned actions lead to consequences that are part of a general process of climate warming, local and regional disturbances in the circulation of air masses, changes in the production regime and the evolution of meteorological phenomena, all with an impact on the quality of the environment and life. On the territory of Romania in the last years, the process of aridization of the climate has been emphasized, especially in the South and East; some specialists even speak of desertification, the production of wind turbines like tornadoes (2005, 2006 - photo 2), drought frequency, torrential rains, hot summers and mild winters, etc.



Desertification in the Plain of Oltenia



Effects of Tornado from Făcăieni, Ialomița, 2002

Absorption or inhalation of gases or dusts leads to serious illness, rachitis or even death of the creatures. High concentrations of sulfur, nitrogen and chlorine oxides in the air rich in water vapors causes the production of acid solutions which, in contact with vegetation, causes its degradation.

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WATER POLLUTION

It was done through actions that altered its original qualities, rendering it inappropriate. Frequent pollution is recorded through direct or indirect discharges of harmful substances (in agriculture: fertilizers, insecticides, in industry: wastewater in production processes, dejections from animal farms, household garbage, etc.). All this happens due to the diminishing of primary resources. Programs to reduce the pollution and water recycling are required, especially by creating wastewater treatment plants.

EFFECTS OF WATER POLLUTION

Groundwater has in some cases a chemical concentration of ammonium, phosphates, pesticides, nitrates or organic substances. Pathogens also appear more and more often. The impurity stage is easy to medium and refers to small areas, but in many places with a tendency of generalization on large surfaces.

Particularly along the valleys there are concentrations of pollutants such as in many areas in the meadows of Jiu, Olt, Arges, Ialomita, Prahova, Buzau, Siret, Mureş or Someş. The same phenomenon occurs in the industrial platforms, especially those with an energetic, metallurgical, food or agrozootechnical profile.

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In general, there is an increase in the phreatic areas with a potential for risk for the health of the people and animals. In rural areas, fountains often contain nitrates, and in the oil fields it becomes the main pollutant.



Waste water spill



Wastes on the Siret River

Waste storage is often uncontrolled. In many cases we can see garbage on the banks of rivers, lakes or where groundwater is close to the surface. Sometimes it occupies large areas. In many villages waste disposal is done by chance, on the banks of the water or directly in the river. At other times, tons of infested corn, degraded vegetables etc. are thrown away.

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SOIL POLLUTION

Soil pollution means any action that causes the disruption of normal soil functioning (especially for higher terrestrial plants) in the case of different natural or human (anthropic) ecosystems.

Soil pollution occurs in various forms and on diverse areas. Chemical pollution has expanded a lot, especially with heavy metals, fluorine, sulfur, etc. and is caused by evaciations from chemical fertilizer plants, from those producing and processing non-ferrous ores, sodium, cement, or coal-fired power plants. Oil fields spread oil and salt water. Insecticide residues can be found in the fields and animal farms evacuate dejections around them. Waste also affects important areas, especially in settlements.

Degraded soils - Romanati Plain



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SOIL POLLUTION EFFECTS

The growth of the world's population requires the cultivation of increasingly large areas of soil, which in turn leads to an ever-increasing degradation of the land and a decline in agricultural production.

The humus layer disappears if it is eroded by water or wind, which happens if it is not well fixed into the soil through the plant roots or if the water slips too vigorously on the surface of the soil. The roots of crop plants are deeper than those of wild plants and do not protect the humus layer. Water leakage, on the other hand, is favored by the disappearance of forests.

Erosion and landslides are natural phenomena of soil pollution. Preventing and combating such conditions requires the undertaking of specific land improvement works in order to avoid the desertification phenomenon in the end.

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Vegetal and Animal World - Causes and Effects of Degradation

The deforestation had different roles and consequences. You can first distinguish those that were directed to extend the land to create meadows, agricultural lots or settlements. These are the ones that have been made since ancient times. A special place had those in the mountains, near the subalpine floor. In the plains regions, ecosystems have been completely destroyed, a lot of plots for agricultural crops appearing in their place. In suburbs, forest areas have sometimes been removed to build residential districts, and sometimes for creating parks and other utilities.

Secondly, the deforestation was done for the exploitation of the wood. In this situation the forests have been restored in two ways: naturally, without directed interventions, and usually by plantations of young species belonging to species of higher value and faster rhythm of growth.

The forest ecosystem has also suffered from other factors: strong winds, fires, violent human action, uncontrolled grazing in the forests, weekend parties near cities, etc.



Sliding in the Curb Subcarpaths

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Sliding in the Curb Subcarpaths

Effects of natural ecosystems degradation

The use of chemical fertilizers in agricultural crops, but especially chemicals against pests, both in agriculture and forestry, or those resulting from the discharge of certain enterprises, leads to soil pollution and endanger the life of plants and animals, situations noted by drying trees, bushes or fish deaths from the rivers in these places (Tisa, Vișeu, Someș, Arieș, Dâmbovnic etc.).

Pollution of water, air, and soil around large chemical factories has meant significant losses in both local ecosystems and in more extensive areas.

Also, the reduction of wooded land on the slopes has led to the appearance of large-scale geomorphological processes (collapses, landslides, ...) with unfavorable influences on human settlements, agricultural land or communications. In this way, the hunting fauna was directly affected, many species being endangered.

The Causes and Effects of Pollution in Spain

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Air pollution

Light pollution

Noise pollution

Soil pollution

We have focused on these four types of pollution. We will describe their causes, effects and possible solutions.

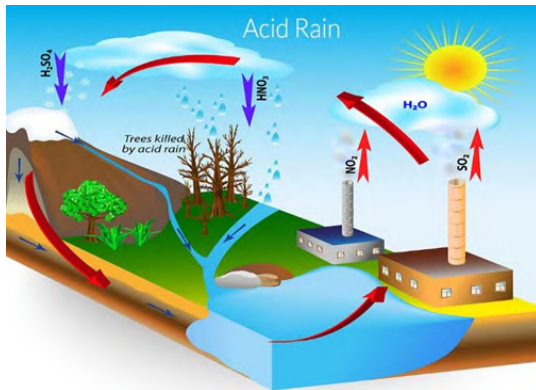
1. AIR POLLUTION



Some sources of air pollution come from nature. These include eruptions of volcanoes, dust storms and forest fires. But human activity is a major cause of air pollution, especially in large cities. Human air pollution is caused by things such as factories, power plants, cars, airplanes, chemicals, fumes from spray cans, and methane gas from landfills, but the ways that humans caused the most air pollution is by burning fossil fuels.

Air pollution and the release of gasses into the atmosphere can have many negative effects on the environment like global warming, damage of the ozone layer and acid rain.

It can also make people sick. It can make it difficult to breathe and it causes diseases such as lung cancer, respiratory infections, and heart disease. According to the World Health Organization, 2.4 million people die each year from air pollution. Air pollution can be specially dangerous to chil-



Spain is not a country with a lot of air pollution, only in big cities like Madrid, Sevilla, Barcelona and Valencia there is more air pollution. But our city, Málaga, is one of the Spanish cities with less air



To reduce this serious problem the solutions are to use less energy, like electricity or petrol, turning off the lights when leaving your room, not leaving the TV or computer on when you are not using them and use public transport to help to reduce air pollution. Although they seem insignificant things, everything helps to reduce air pollution.

2. LIGHT POLLUTION

It is the shine sent to the sky instead of to the floor, where we really need it. It happens because of the bad quality and bad design of the



The first one is the worst because all the light is sent to the sky. The second one is the traditional but definitely not the best because there is some light reflected to the sky too. The third one is the best one because all the light is sent to the floor.

There are types of light pollution too, those are the more important:

GLARE: Visual impairment that occurs when the light source is brighter than the light your eyes are accustomed to.

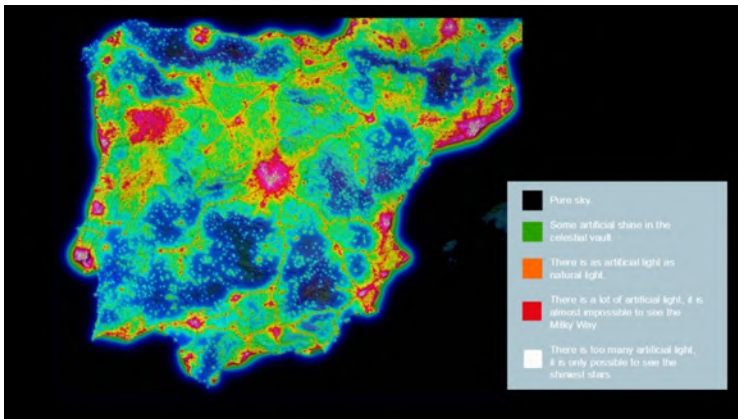
SKY GLOW: Brightening of parts or the whole night sky. The dome shaped glow can be seen from miles away

LIGHT TRESPASS: Light that is cast where it's not wanted or needed.

This light pollution causes a lot of problems:

- It damages the nocturnal ecosystem.
- Money and energy waste. Every year, Spain pays around 955 millions euros because of it.
- Due to the light sent to the sky we can't see the starry sky.

This map shows the level of light pollution in Spain.



Possible solutions? At first, we should think it twice the next time we design a new type of streetlight, then, we should decrease the intensity of the light bulbs and the hours they are on to decrease this waste of money and energy also we can pull our weight and join the Earth Hour. It is more than turn off the lights project, it is a big movement to face the climate change. It is organized by a global campaign which started in 2007 in Sidney inspired by WWF to be a symbolic sign versus the climate change. Today, in 188 countries, millions of citizens turn off the lights from their homes and their streets to demand the governments of every country

3. NOISE POLLUTION

Sound is essential to our daily lives, but noise is not. Noise is generally used as an unwanted sound, or sound which produces unpleasant effects and discomfort on the ears.



Sound becomes unwanted when it either interferes with normal activities such as sleeping, conversation, or disrupts or diminishes one's quality of life. Not all noise can be called noise pollution.

Generally, noise is produced by household gadgets, big trucks, vehicles and motorbikes on the road, jet planes and helicopters hovering over cities, loud speakers etc.

Noise (or sound) is measured in the units of decibels and is denoted by the dB. Noise which is more than 115 dB is intolerant. The industrial limit of sound in the industries must be 75 dB according to the World Health Organization.

Generally, problems caused by noise pollution include stress related illnesses, speech interference, hearing loss, sleep disruption, and lost productivity. Most importantly, there are three major effects we can

- **Hearing:** The immediate and acute effect of noise pollution to a person, over a period of time, is impairment of hearing.
- **Marine Animals:** Marine scientists are concerned about excessive noise used by oil drills, submarines and other vessels on and inside the ocean. Many marine animals, especially whales, use hearing to find food, communicate, defend and survive in the ocean. Excessive noises are causing a lot of injuries and deaths to whales.
- **Effects on general health:** Health effects of noise include anxiety and stress reaction and in extreme cases fright. The physiological manifestations are headaches, irritability and nervousness, feeling of fatigue and decreases work efficiency.

Spain is recognised as one of the “noisiest countries in Europe”. Spain, according to the World Health Organization (WHO) data, is the second noisiest country in the world after Japan. So, 70% of the Spanish population suffers "unacceptable" noise levels.

Below are a few things people and governments can do to make our communities and living places quieter:

- Construction of soundproof rooms for noisy machines in industrial and manufacturing installations must be encouraged. This is also important for residential building—noisy machines should be installed far from sleeping and living rooms, like in a basement or garage.
- Use of horns with jarring sounds, motorbikes with damaged exhaust pipes, noisy trucks to be banned.
- Noise producing industries, airports, bus and transport terminals and railway stations to be sighted far from where living places.
- Community law enforcers should check the misuse of loudspeakers, worshipers, outdoor parties and discos, as well as pub-

- Community laws must silence zones near schools / colleges, hospitals etc.
- Vegetation (trees) along roads and in residential areas is a good way to reduce noise pollution as they absorb sound.

4. SOIL POLLUTION

Land or soil pollution is the deterioration (destruction) of the earth's land surfaces, often directly or indirectly as a result of man's activities and their misuse of land resources.

It occurs when waste is not disposed of properly, or can occur when humans throw chemicals onto the soil in the form of pesticides, insecticides and fertilizers during agricultural practices. Exploitation of minerals (mining activities) has also contributed to the destruction of the earth's surface.

There are different types of land pollution: solid waste, pesticides and fer-



There can be catastrophic consequences of land pollution in relation to humans, animals, water and soils. The effects are even worse if the garbage is not separated into organic, reusable and recyclable waste.

Contaminated lands and environments can:

- Cause problems in the human respiratory system.
- Cause problems on the skin.
- Cause various kinds of cancers.

The toxic materials that pollute the soil can get into the human body directly by:

- Coming into contact with the skin.
- Being washed into water sources like reservoirs and rivers.
- Eating fruits and vegetables that have been grown in polluted soil.
- Breathing in polluted dust or particles.

The greatest prevention to land pollution is in the three 'R's':

Reduce Waste, Reuse things and **Recycle** things. This is true even for governments. They can also use the three 'R' rule to minimize the amount of waste that ends up in landfills. After the three 'R's, remember to turn the rest of the garbage into compost.





The Causes and Effects of Pollution in Romania

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2017-2019



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WHAT IS POLLUTION?

Pollution is the introduction of contaminants into the natural environment that cause adverse change.

Pollution occurs in Romania different forms: air, water, soil, radioactive, noise, heat/ thermal and light.

Every form of pollution has two sources of occurrence the point and the non-point sources.



Every form of pollution has two sources of occurrence the point and the non-point sources. The point sources are easy to identify, monitor and control, whereas the non-point sources are hard to control. Let us write about the different types of pollution, their causes and effects on mankind and the environment as a whole.

AIR POLLUTION

Air Pollution is the most prominent and dangerous form of pollution. It occurs due to many reasons.





Excessive burning of fuel which is a necessity of our daily lives for cooking, driving and other industrial activities, releases a huge amount of chemical substances in the air every day. In this way the air becomes polluted. Smoke from chimneys, factories, vehicles or burning of wood basically occurs due to coal burning. It releases sulphur dioxide into the air making it toxic. The effects of air pollution are evident, too. Release of sulphur dioxide and hazardous gases into the air causes global warming and acid rain which have increased temperatures, erratic rains and droughts, making it tough for the animals to survive. We breathe in every polluted particle from the air. The result is the increase in asthma and cancer in the lungs.

WATER POLLUTION

Water pollution has taken toll of all the surviving species of the earth. Almost 60% of the species live in water bodies.

Water pollution occurs due to several important factors: disposing of sewage waste which contains dangerous chemicals, waste water poured down the drains or toilets by ordinary people or factories and chemical waste which are highly toxic.

It is possible to catch serious illnesses such as hepatitis, typhoid, and cholera from river and sea water. So, the humans are affected by water pollution and all the animals and plants that live in water, as well.



SOIL POLLUTION

Any undesirable change in the physical, chemical or biological properties of the soil, which is harmful to environment, living organisms and plants, is called 'soil pollution'. It adversely affects human nutrition and crop production and productivity, and the quality and utility of soil.





Cadmium, chromium, copper, pesticide, chemical fertilizer, weed, toxic gases etc. are major soil pollutants. For example, if pesticides are used while farming, then it affects the plants and the soil apart from killing the insects. The alert for sensitive soil (50 mg/kg) has been exceeded in both the urban and rural areas in Romania.

NOISE POLLUTION

Noise pollution takes place when there is either excessive amount of noise or an unpleasant sound that causes temporary disruption in the natural balance. The main causes of the noise pollution in Romania are industrialization, poor urban planning, social events, transportation, construction activities and even household chores.



The effects of noise pollution are hearing problems, different health issues such as cardiovascular issues, sleeping disorders and trouble communicating. It also has a bad impact on the wildlife.

THERMAL/HEAT POLLUTION

Thermal pollution is a real problem in our modern society. It is defined as sudden increase or decrease in temperature of a natural body of water which may be ocean, lake, river or pond by human influence.



This normally occurs when a plant or facility takes in water from a natural resource and puts it back with an altered temperature. The causes of this new type of pollution are: water as cooling agent in power, runoff from paved surfaces, manufacturing and industrial plants, soil erosion, deforestation and natural causes.

The effects of this kind of pollution are the following: decrease in dissolved oxygen level, increase in toxins and metabolic rate, loss of biodiversity, ecological impact and migration.



*The Causes and Effects
of Pollution in Italy*



WATER POLLUTION



Discharges: urban and industrial discharges (heavy metal and plastic)



Discharges of agricultural activities and animal breeding (pesticides, herbicides, excrements, fertilizers, ect.)



ELECTROMAGNETIC POLLUTION

Non-ionizing radiations
are emitted by:



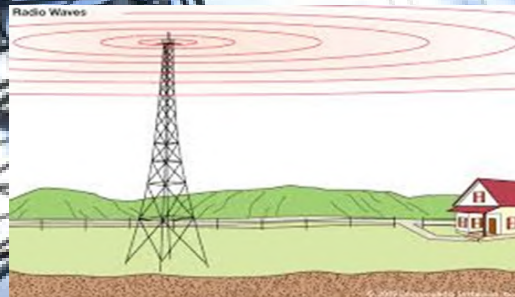
Mobiles



Wireless systems



microwaves



Radio waves



**SOIL POLLUTION DUE
TO PLASTIC WASTE**

After a picnic...

THE PO VALLEY

ITALY

The Po Valley includes parts of the following regions: Piedmont, Lombardy, Emilia-Romagna and Veneto.

The Po Valley derives its name from “Padus” which means Po in Latin. The Po Valley is the largest plain in Italy and it's also one of the largest plains in South Europe.



Adriatic sea is polluted too.

Plastic bags, shoppers, cigarette butts, plugs, glass, cotton fioc, bottles and pesticides polluted water and sea side.

One of the most polluted area is the Gulf of Venice



The Po Valley is one of the most important industrial and agricultural areas in Europe, In the Po Valley there are many important cities (Turin, Milan, Parma...).

Industrial and agricultural activities produce pollution. The great number of inhabitants in the valley produces air pollution because of cars, home heating and burning wood (combustion)



**The Po river runs from the Western Alps to the Adriatic sea.
It is used for irrigation and industrial activities.**



**The pollution of the river Po has been caused by
chemical fertilizers, pesticides and irrigation to produce
crops for animals and humans.**



HOW TO PREVENT POLLUTION?

Italy decided to...



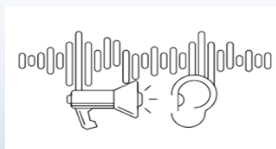
HOW DOES ITALY PREVENT POLLUTION?



**SUSTAINABLE
BUILDINGS**



NOISE POLLUTION
L. 447/1995



LIGHT POLLUTION

**m'illumino
di meno**



WATER POLLUTION

DIRECTIVE 2000/60/CE

- ⇒ TO PROTECT
- ⇒ CHECK QUALITY
- ⇒ AWARENESS



AIR POLLUTION

<http://www.minambiente.it/pagina/decreti-inquinamento>

- ⇒ SUSTAINABLE MOBILITY
- ⇒ QUALITY CONTROL - ECOLOGICAL SUNDAYS
- ⇒ REFOREST



**WASTE
RECYCLE**



<http://scuolamediazanifidenza.gov.it/erasmus/790-materiali-4.html>

The Causes and Effects of Pollution in Poland

According to the survey concerning environmental issues carried out among students from our school, Poland is quite a polluted country. There are many causes for its contamination but one thing is certain: humans are to be blamed for all of them. Developing countries are facing such a problem because nowadays development usually equals pollution. It comes from our convenient lifestyle and short-sightedness. For people it is sometimes more important to have than to be. Also quick development of different kinds of industry has huge influence on the pollution.

We analysed the main factors responsible for raising the level of contamination.

The main causes of pollution:

Industry;

factories;

not recycling trash;

huge emission of carbon dioxide (CO₂);

neglecting the environment;

mining;

new technology;
using cars – exhaust fumes;
littering on the streets;
not picking yours dog's mess;
throwing trash into the sea;
burning plastic;
cutting down trees;
lack of appropriate filters in industrial chimneys;
leak of oil;





So many factors have huge influence on the environment and, as a result, on people, animals and plants. When these factors appear together,

their effects are much more intensified and the consequences are much more serious for the nature. The contamination can be transferred with the wind, water from one area to another that is why we need to act together. We are all responsible for it as the Earth is our home. We all need to take actions. Consequently, promoting eco-friendly activities is crucial for the case. One engaged person, no matter if it is a teacher, student, or parent, is able to get more people involved.

Some of these factors may be considered really serious and unless some action is taken to change the situation, a lot of species will be extinct and the consequences will be tragic. In the near future, the Earth might not be a good place for people to live.

Most of the causes mentioned above can be eliminated but it would take a lot of time and money, as well as changing our own attitude towards this problem.



The effects of pollution:

death of animals and plants;

illnesses;

allergies, rashes;

smog, photochemical smog;

lack of drinking water;

spending plenty of money on improving the condition of the environment ;

toxic water;

greenhouse effect / global warming;

death of sealife;

acid rain;

ozone depletion;

poor quality of air we breathe;

to many dumps;

radiation;

deceases;

It is obvious that these effects are caused by human activities. They are really serious and life-threatening.



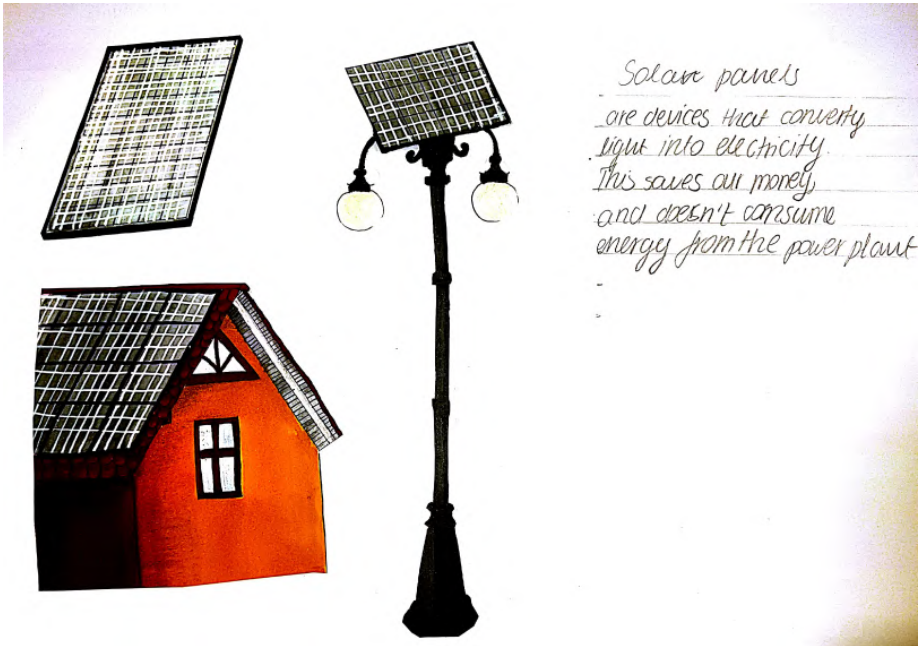
Luckily, some of these effects caused by the pollution can be stopped and even reversible. Nevertheless, some are irreversible, such as

extinction of certain species. What can be done to limit or stop the destruction caused by the humans?



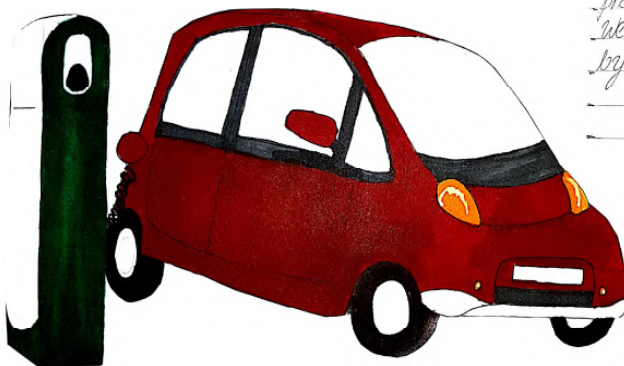
First of all, we must increase awareness of the problem. People often do not give much thought to environmental issues because they are not aware of them. Another reason is that they believe they cannot do anything to change the situation. Sometimes they think somebody else will deal with the problem for them. That is why the government should introduce special classes at school that would educate young people how to take care of the environment. Students should

be involved in many interesting projects helping to take actions protecting the nature. They ought to take active parts in such activities. When they see they can make a difference, they will be more willing to change their attitude.



Second of all, the government should introduce new laws forbidding any actions highly contaminating the environment. The scientist should think of other methods of using technologies that would not be so harmful for the nature.

Third of all, companies and institutions promoting eco-friendly lifestyle ought to be praised for their action, for example by having lower taxes or extra benefits. Also citizens using renewable sources of energy, segregating rubbish, trying to cut down on emission of carbon dioxide should be appreciated by the government. If people can see that their actions bring effects, they will continue them and encourage their relatives and friends to join them. Also companies and institutions will prefer to spend less money on fixing the situation and will choose to protect the environment before the situation gets really dramatic.



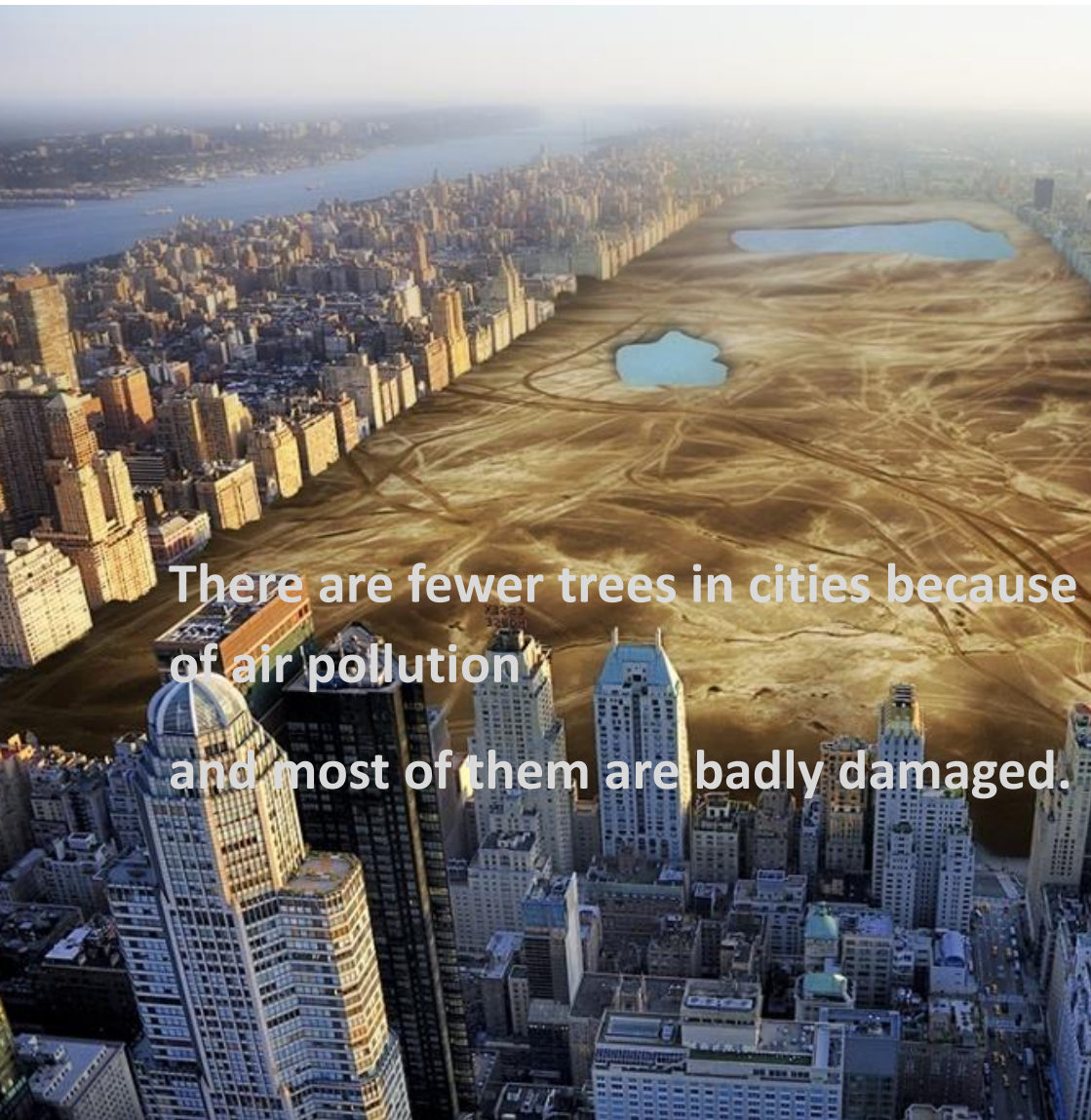
electric car
is a plug-in electric
automobile that is
propelled by electric motor.
we protect the environment
by not using petrol

We should think global and act local. If young generations get involved in actions protecting the environment, it will be a long term activity that will bring best effects. It is crucial to take action now when it is still not too late. We need to bear in mind that the longer we wait, the worse it is for our planet.

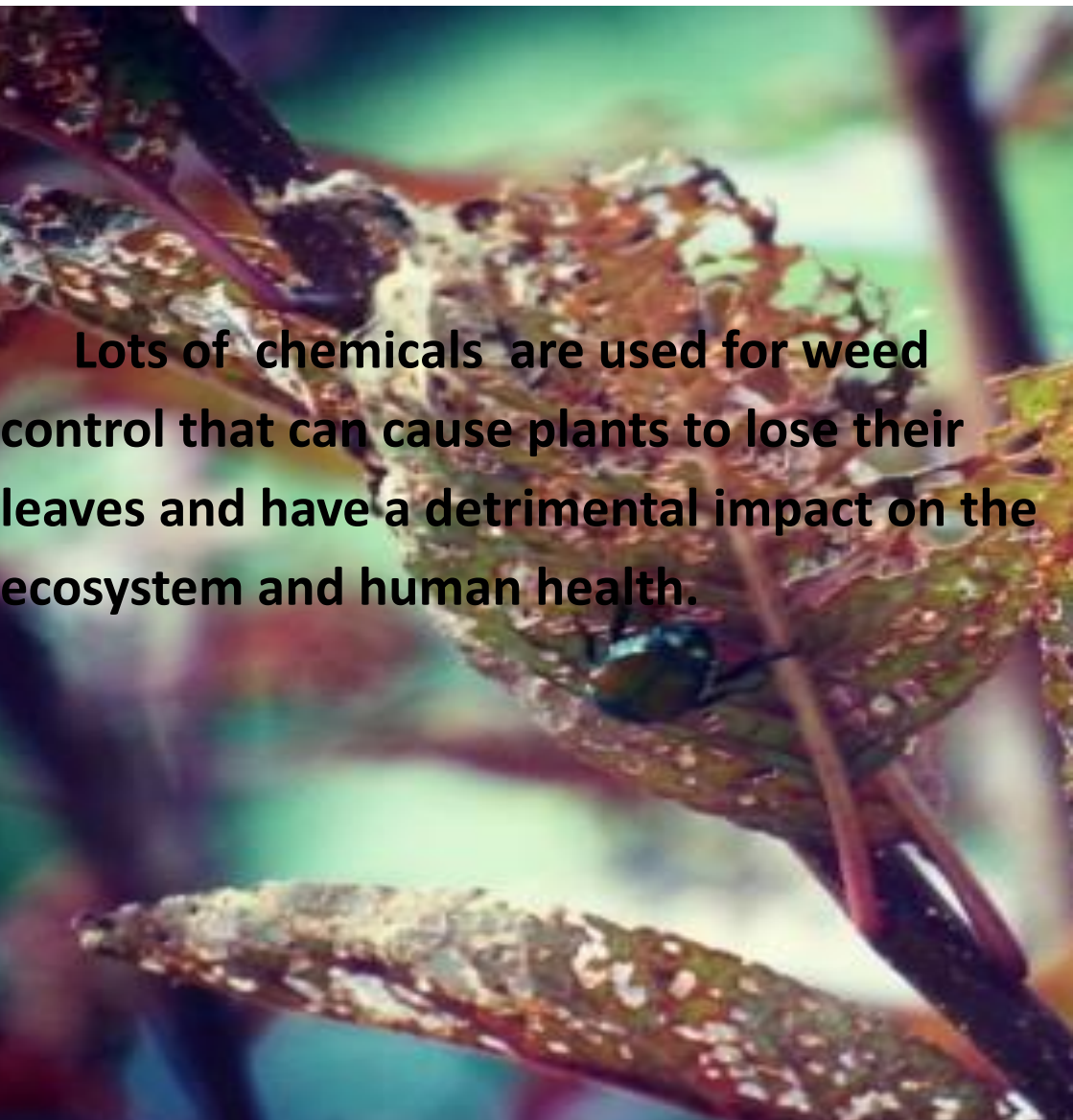
The Causes and Effects of Pollution In Lithuania

Deforestation. Forests are being destroyed because of man's commercial activities. Moreover, many forests have been destroyed by fire or by slash and burn agriculture where trees are cut down and burned to clear land, which practice can have disastrous consequences.





There are fewer trees in cities because of air pollution and most of them are badly damaged.

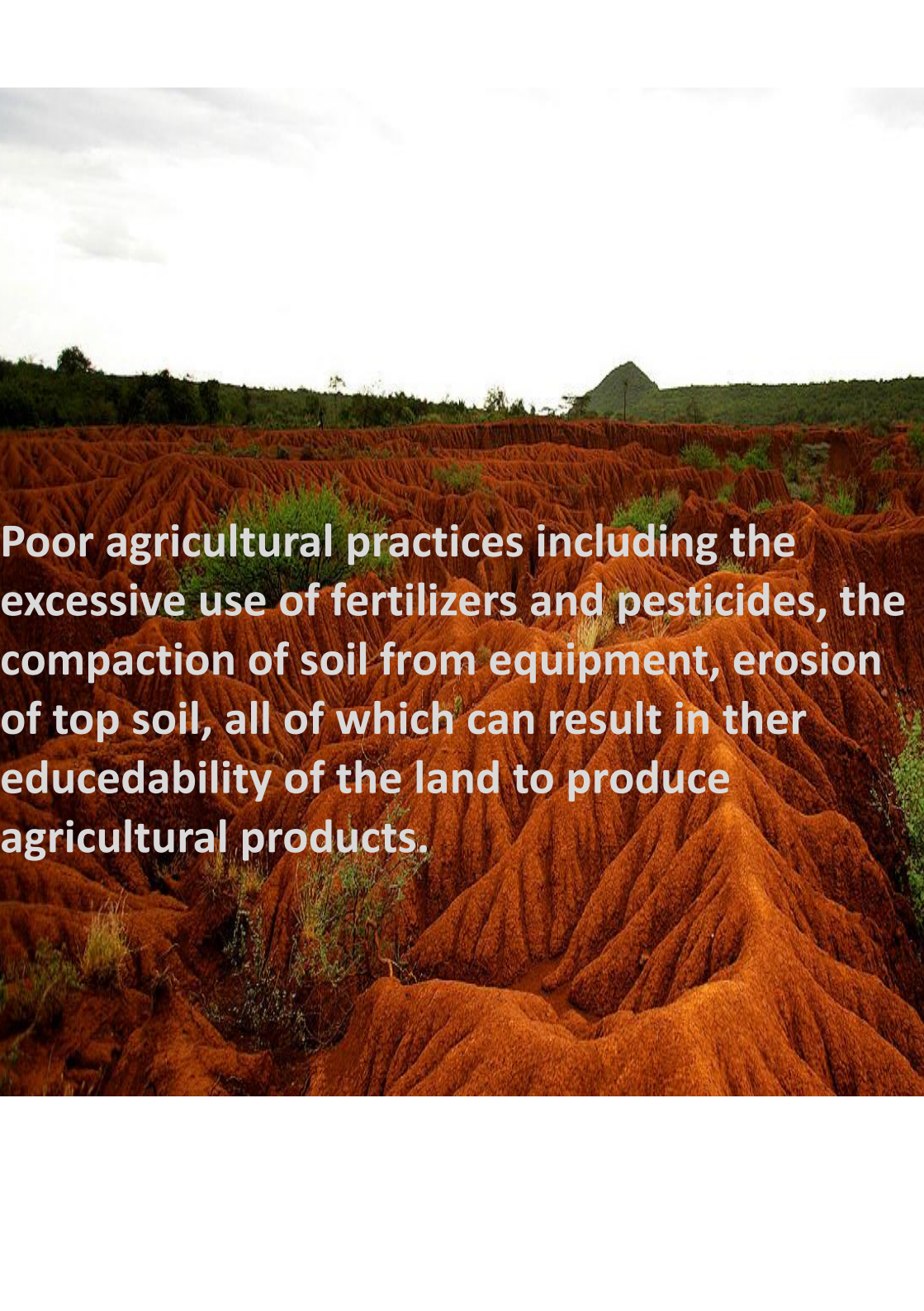


Lots of chemicals are used for weed control that can cause plants to lose their leaves and have a detrimental impact on the ecosystem and human health.


Industrial plants dispose their toxic waste which in to the water and air in Kėdainiai, Jonava, Mažeikiai, Naujoji Akmenė.



Overgrazing. Animals graze plants in range land that causes a permanent loss of plant cover that cannot regrow fast enough.

The image depicts a landscape of severe soil erosion. The foreground and middle ground are dominated by deep, winding channels and ridges of reddish-brown soil, characteristic of laterite. Sparse green vegetation is scattered throughout the eroded terrain. In the background, a line of green trees and a small, conical hill are visible under a cloudy, overcast sky. The overall scene illustrates the consequences of poor agricultural practices.

Poor agricultural practices including the excessive use of fertilizers and pesticides, the compaction of soil from equipment, erosion of top soil, all of which can result in the reduced ability of the land to produce agricultural products.



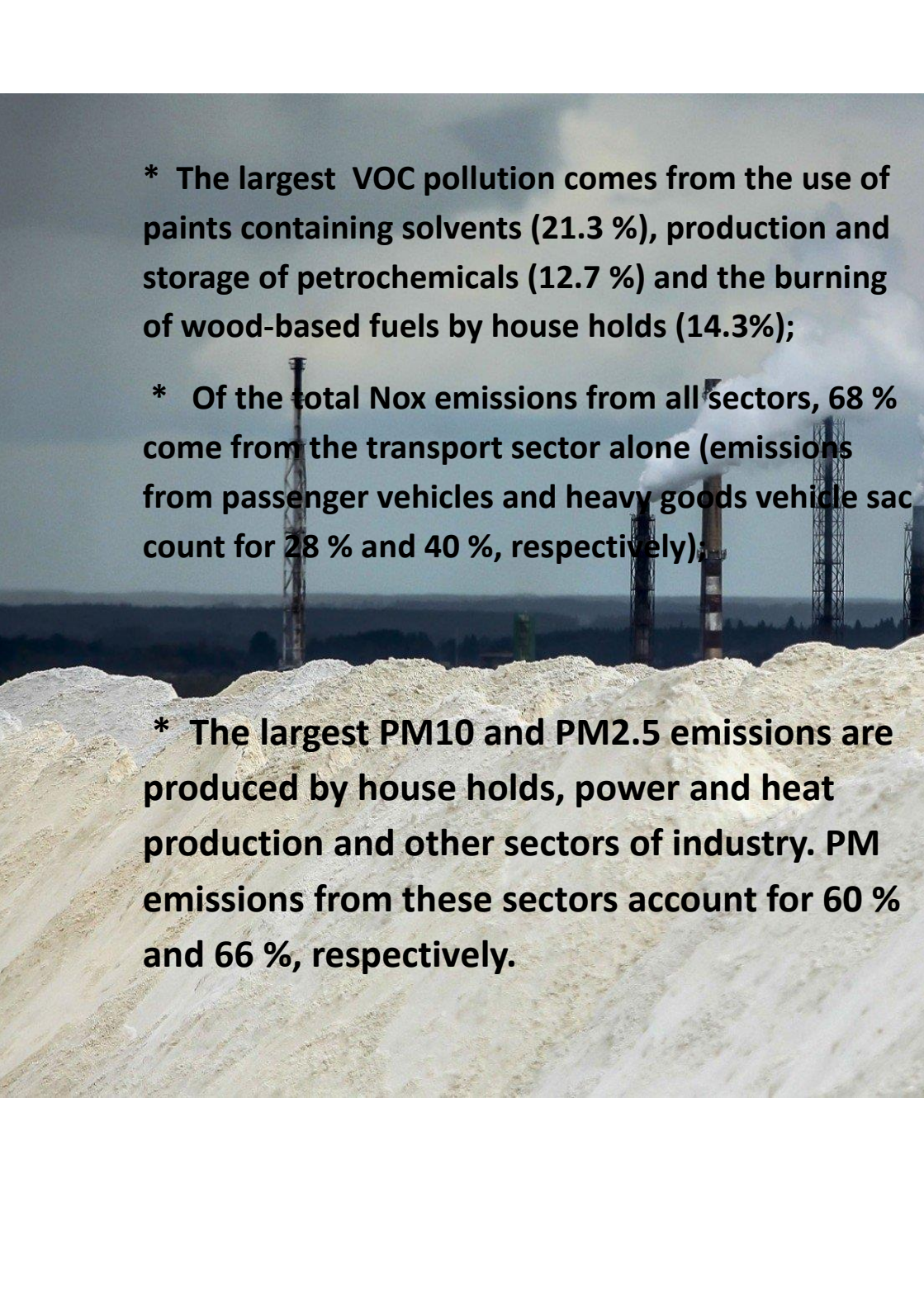
Meteorological conditions affect air pollution with anthropogenic pollutants. Pollution depends whether these pollutants are spread out in wider areas or locally. Anticyclones are very down-side towards it. In winter, In the freezing cold , thermal energy production is increasing and emission of pollutants is also increasing.

The background of the slide is a photograph of several industrial smokestacks. Two prominent stacks in the foreground are emitting thick, dark plumes of smoke that rise into the sky. The sky is a mix of blue and orange, suggesting a sunset or sunrise. The smokestacks are dark silhouettes against the lighter sky.

The largest sources of pollutants for which national emission ceilings have been established (SO₂, NO_x, VOC and NH₃) are the energy, transport and industry sectors:

*** In 2007, emissions from oil refineries, power and heat production and other energy and house hold sectors accounted for almost 60 % of total SO₂ emissions;**

*** The sector producing the largest NH₃ emissions is agriculture. Over 70% of all ammonia is released from live stock manure, with another 12 % of emissions from soil;**



*** The largest VOC pollution comes from the use of paints containing solvents (21.3 %), production and storage of petrochemicals (12.7 %) and the burning of wood-based fuels by house holds (14.3%);**

*** Of the total Nox emissions from all sectors, 68 % come from the transport sector alone (emissions from passenger vehicles and heavy goods vehicle sac count for 28 % and 40 %, respectively);**

*** The largest PM10 and PM2.5 emissions are produced by house holds, power and heat production and other sectors of industry. PM emissions from these sectors account for 60 % and 66 %, respectively.**

*** Urban air pollution by particulate matter has been gradually decreasing since 2004. For the first time in 2008, the number of daily limit value exceedances of particulate matter was below the maximum allowable number (daily limit value not to be exceeded more than 35 days per year) (Fig. 2). In previous years, a fairly large number of exceedances had been recorded as a result of the sand and salt mixtures preadon streets during the winter season to improve traffic safety.**

