Greetings From Tomorrow

Erasmus+ Strategic Partnership for School Education
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Contents

Introduction

During two years, students and teachers from five partner schools have been involved in the Erasmus+ Partnership “Greetings From Tomorrow”: this book represents one of their sharing work.

Environment, nature protection and recycling were chosen as the theme of the project and as the central theme of the book which is structured into the following chapters:

Chapter I – Pollution in my country

Chapter II – Good practices in each country for fighting with pollution

Chapter III – Environmental protection and problems faced by countries regarding decision making in conservation management

Chapter IV – How to use this book in the classroom

There is also an appendix which presents activities for students in a primary school.

The structure above is logical, easy to understand and follow, and the fact that the book has been written in English language gives it a high degree of accessibility and practical applicability.

Besides, we are convinced that the results of our work provides a working model and will be an important and useful teaching material for all teachers eager to make their students aware of the nature protection.

Corinne Duloung
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Chapter 1 - Pollution in my country

1.1 Introduction

Pollution is the alteration of the natural components through the presence of foreign components, called pollutants, as a result of human activity, and which cause, by their nature, through the concentration that they are found in and by the time that they act, harmful effects on health, cause discomfort or prevent the use of environmental components essential to life. (UNO World Conference, Stockholm, 1972).

From the definition it can be seen clearly that the man bears the greatest responsibility for environmental pollution, pollution being the consequence of his especially social-economic activity.

Viewed historically, environmental pollution has emerged at the same time with the man, but it has grown and diversified as the evolution of human society, reaching today one of the important concerns of specialists in various fields of science and technology, of states and governments of the entire population of the earth. This is because the danger represented by pollution has increased and is constantly increasing, requiring urgent action nationally and internationally, in the spirit of ideas to stop pollution.

The first visionaries who sounded the alarm related to environmental degradation were the scientists in the nineteenth century who, faced with galloping urbanization and industrialization tried to stop the destructive actions and to educate people in the field of natural sciences and environmental protection.

Currently energy wealth and resources have been affected to such an extent that the rapid depletion of some of them can be seen, and some essential conditions of human existence, such as water or air, show signs of poisoning. We thus deduce the possibility that mankind's future is called into question if of course vigorous measures to protect the planet are not taken. The man realized that he is part of nature, that the Earth and its resources are limited, that this planet works as a system and that disorders produced in one place can recoil on an entire circuit, including for the man. Humanity and its rapid numerical increase can not, however, give up the high pace of economic development. And the way to harmonize these rhythms with maintaining good environmental quality is its operating in such a way that it can be able to permanently regenerate and preserve.

The first environmental protection endeavors occurred about 200 years ago, as a result of the necessity of saving some endangered species. In time, the reasons which required nature protection became more diverse. Since 1970, there have been clear signs of the decay of our planet: ozone depletion, global warming, acid rain, water, air and soil pollution. People

began to understand the necessity of adopting a responsible behavior towards nature, but man's responsibility to protect the environment is both individual, and also especially collective: the protection of nature involves collaboration and mutual support at the local, county, national and especially international levels.

This chapter enables students, teachers and local communities of the partner schools in the project to familiarize themselves with the environmental problems in the regions and countries participating in the project, to compare the various issues identified and to seek common solutions to preserve healthy living conditions, necessary to future generations.

Prof. Constantin Hriscu
Colegiul Naţional "Garabet Ibrăileanu" Iaşi

1.2 Pollution in my country - Bulgaria

1.2.1 The state of pollution in Bulgaria

More than 90% of Europeans living in cities today are exposed to unsafe levels of the most health damaging pollutants. Pollution occurs in different forms; air, water, soil, radioactive, noise, heat/ thermal and light. Every form of pollution has its sources of occurrence.

Bulgaria remains as one of the leaders in the European Union in terms of air pollution for example, according to the World Health Organization. A few years ago the highest concentration of the two main types of particulates has been measured in Bulgaria, according to WHO.

"Locations of air quality of Bulgaria, broken down by districts for assessment and management of air quality (RUKAV)"

Thankfully, nowadays there is a sharp fall in emissions largely due to the implementation of a uniform methodology for creating an inventory of harmful substances in the air, as set out in the Convention on Long-Range Transboundary Air Pollution and the United Nations Framework Convention on Climate Change.

The country's soils have good ecological status. Water erosion, both as a territorial spread and as an average annual soil loss, has been noticed. Wind erosion has been kept at a constant.

On biodiversity, complex indicators for population trends are used in order to assess the degree of any loss. There has been a decrease in the population status of birds. The protected zones have been assessed as sufficient in regard of the representativeness of the species and the habitats.

The state of forests does not dramatically differ from the average European level. 24.2% of trees in Europe are classified as damaged, while in Bulgaria it is at 21.6%. Insects and fungal pathogens are the most responsible.

The analysis of the data for the daily noise levels measured in cities for a five year period shows that the prevailing ones are in the range 63-67 dB(A), followed by the ones at 68-72 dB(A). The measurements made by the regional health inspectorates show that the regulated admissible noise levels are exceeded in 69% of the control points around the country.

There was a significant increase in the proportion of waste delivered for recovery including recycling and the quantity of hazardous waste generated in the past five years decreased by an average of about 26%. The amount of generated waste in the country decreased mainly due to administrative, economic and financial instruments. The country has achieved national targets for material recycling and recovery of packaging waste.

1.2.2 Sources of pollution in Bulgaria

Like other countries in the 20th century, **Bulgaria** strongly emphasized on heavy industry and intensive agriculture At first it did no pay so much attention on the environmental consequences of such a policy. As a result, in the early 1990s an estimated 60 percent of agricultural land was polluted by fertilizers and pesticides, two-thirds of rivers were polluted, and two-thirds of primary forests had been leveled.

Among the following environmental problems were also air pollution from industrial emissions; severely depleted natural forest cover; forest damage from air pollution and resulting acid rain; and soil contamination by heavy metals resulting from improper industrial waste disposal.

Kozloduy Nuclear Power Plant, the largest power plant in south-eastern Europe

Natural gas storage depot near Chiren

Kremikovtsi metallurgy works

Industry's use of energy and natural resources has had a significantly harmful impact on the environment.

Despite the decrease in Bulgaria's energy intensity, it nevertheless remains high among European Union (EU) Member States.

Energy production remains the biggest source of sulfur dioxide emissions and one of the largest for nitrogen oxide emissions. The domination of road transport in the overall transport structure, together with its ongoing growth, is linked with an increase in fuel consumption and emissions of harmful substances in the ambient air, including greenhouse gas (GHG) emissions, ozone precursors, and particulate matter (PM).

"Mini Maritsa Iztok" AD

"Maritsa Iztok" power plant

Coal power generation in particular adds to the poor air quality in Europe and in Bulgaria - caused mainly by the transport sector, industrial processes, residential heating, and agriculture. Coal power plants release substantial amounts of particulate matter, sulphur dioxide, and nitrogen oxides, with the latter contributing indirectly to the formation of ozone. Of these, the most worrying for health are fine particulate matter (PM2.5) and ozone. Other hazardous substances emitted from the smokestacks of coal power plants are heavy metals, such as mercury, and persistent organic pollutants (POPs), such as dioxins and polycyclic aromatic chemicals (PAHs). Special concern for children's health arise from the large mercury emissions from coal power plants. A large coal power plant emits several thousand tons of hazardous air pollutants every year and has an average lifetime of at least 40 years. For example, thermal power station in Kovachevo is the top European facility having the highest absolute damage costs from emissions of pollutants to air from 2008 to 2012. Building new coal power plants would mean that hazardous emissions and their effects on health would continue for many years. It would also counterbalance short-term reductions in air pollutants achieved in other sectors.

1.3 Pollution in my country - Finland

1.3.1 Introduction

Finland, like any other industrialized country, has had its share of problems with pollution, and sustainable development has not always been one of the top priorities. But how did the sudden era of industrialization affect our mindset on pollution and more importantly, how does nature reflect that mindset?

We can easily find answers to these questions from history books or archives, but it's more refreshing and eye-opening to find examples and reflections of our choices in the events that we see and hear about every day.

Kilpisjärvi, a lake in Lapland

1.3.2 Land of a thousand lakes

Finland is sometimes called the land of a thousand lakes, and that is actually not a lie. Finland has a humongous amount of lakes compared to its surface area - over 9,000 of them! But somewhat surprisingly, the sheer number of lakes has had some negative consequences as well, especially in the past. One consequence was through the nonchalant attitude people used to have towards lakes: as there are so many, what's the harm in not caring so much for a few of them? So, many factories opted for the 'easy way' of getting rid of unwanted material, which basically meant dumping their waste into the nearest lake. Well, as you probably can guess, this method may seem effective and harmless for some time, but in the long run it

effectively destroys the natural ecosystem of the lake and leaves it almost lifeless. That is why many projects are now or have recently been underway to save some of the most heavily polluted lakes.

1.3.3 Recent events

Recently we have seen some significant things related to pollution happening near our school. One of them is a new building project that the city of Helsinki is planning to carry out in the middle of Central Park, and it has received lots of negative feedback. People are heavily against the plan because the projected houses would alter the park so much, and therefore also hurt the wildlife there as well.

Photo of Central Park, Helsinki

Central Park is very much for the people living in the area, and it's a popular outdoor spot for joggers, cyclists and just people passing through, which is why building in it would seem like a horrible alternative. People are also questioning the city's plans, since there are other sites where it would be much more sensible and sustainable to build houses.

1.3.4 Vantaa, countryside and city combined

Vantaa is a city right next to Helsinki, the capital of Finland. Even though Helsinki-Vantaa Airport, Science Park Heureka and Jumbo, one of the biggest shopping malls in the capital area, are located in Vantaa, there are still some old countryside environments quite literally in the middle of the vast city. Because of the large amount of airplanes, railways and highways, there is consequently quite a bit of noise and air pollution in the area. Also, because of the

airport and the noise coming from airplanes taking off and landing, there are some restrictions as to where it is possible to build houses in Vantaa.

A part of River Vantaanjoki during winter in Seutula, a suburb of Vantaa

The river Vantaanjoki runs through the capital area, and it is 101 kilometres long. It was long used as a source for drinking water, but nowadays it's only a backup source. In 1995 there was a huge environmental accident, when about 15,000 litres of dish soap was leaked into the river Vantaanjoki. It required a massive cleaning-up process before the river could be said to be clean again.

1.3.5 Make the Baltic Sea Clean Again

The Baltic Sea is a sea in Northern Europe. It consists of a mixture of salty and fresh water and is home to hundreds of different and unique species of fish and plants. Nine different countries lie on its coast: Poland, Germany, Sweden, Denmark, Russia, Lithuania, Latvia, Estonia and the beautiful and wonderful Finland.

Today the Baltic Sea is horribly polluted. There are a number of reasons for that. For example, a lot of fertilizer ends up in the sea from all the coast countries and from countries that have rivers flowing into the sea, which in turns leads to multiple negative effects such as extensive growth of algae (algae blooms) and oxygen depletion in the sea. Algae and oxygen depletion both kill fish and that way alter the ecosystem. Those harmful algae can also contaminate seafood.

How does this affect Finland? In many ways! The extensive growth of algae is ruining many beaches on the coasts of the country, as the water can't be swum in. Fishing is also getting more difficult since the algae takes over the natural habitat of the fish living there. Moreover, fishermen are starting to get seaweed more often than actual fish. Some fish have become fairly rare, and eating some Baltic Sea fish has to be restricted because of the high level of mercury in them.

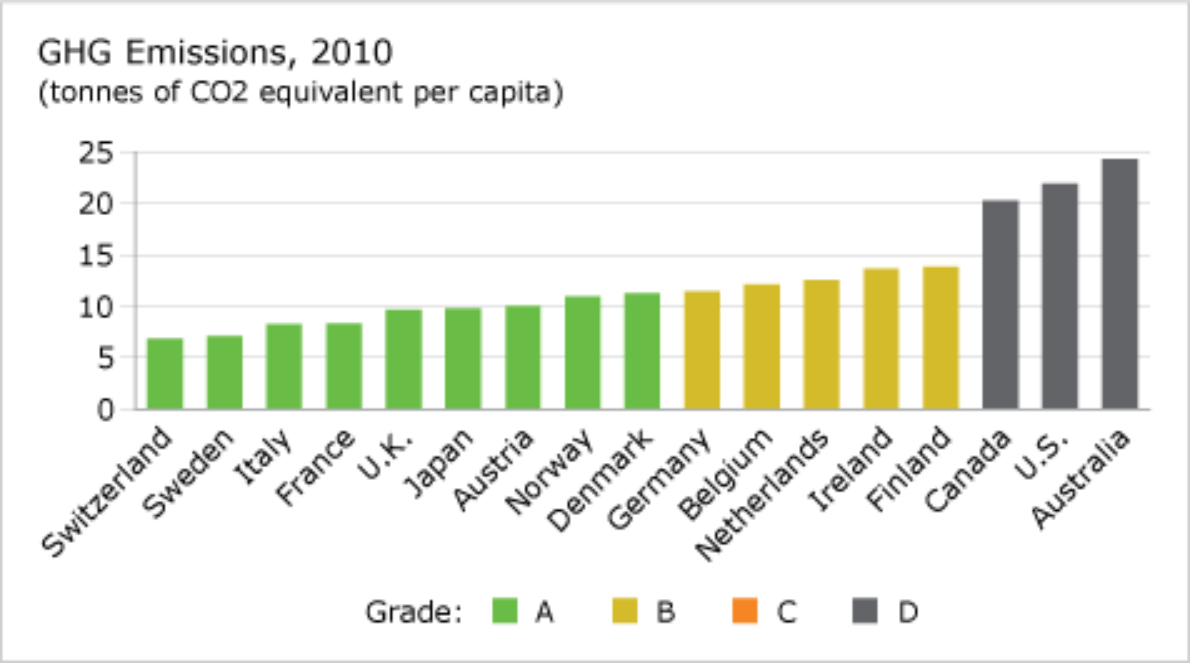
The Baltic Sea is one of the busiest seas in the world, as around 2,000 ships are usually at sea at any time on the Baltic Sea. The Baltic Sea is being ruined by ships dumping their waste into the sea. It is predicted that the number of ships will double in the next 20 years. Combined with the large number of islands, narrow straits, routes that are difficult to navigate and ice cover in the winter, the Baltic Sea is really a high risk area for accidents. Thus, possible oil spills are a serious threat to the Baltic Sea and its ecosystems.

Over the past hundred years, the Baltic Sea has been getting more and more polluted each year. However, the amount of pollution in the Baltic Sea has decreased in the last 30 years.

1.3.6 Did you know?

Finland has about the 30th largest CO2 emissions per capita, but we're working on it, hard! Finland is doing a great deal of work to ensure the CO2 emissions are diminished in different sectors every year. Year 2015 was a very positive year, as unusually warm weather decreased the heating-related emissions. Also the reduced use of fossil fuels helps fundamentally in battling with pollution. Furthermore, Finland is trying to find ways to promote public transport to reduce traffic-related emissions.

Many big Finnish industrial companies are committed to reducing emissions, and also the agricultural sector is trying to invent new ways to diminish emissions. Even ordinary people are more and more aware of the effects of climate change, and want to make a difference to ensure that the generations to come can still live on this Earth. Geothermal heating is becoming more and more popular as a heating source, and regardless of its high price it pays off in a matter of years, as you don't have to use oil or other such means to heat your house anymore.



1.4 Pollution in my country - France

1.4.1 Introduction

Almost 60 million people live in France. Over 47 million French people are exposed to pollution (air pollution, noise pollution, soil pollution, water pollution,...).

The purpose of these paragraphs are to covert these different topics of pollution.

1.4.2 Air pollution

The condition in which air is contaminated by foreign substances, or the substances themselves.

Air pollution consists of gaseous, liquid, or solid substances that, when present in sufficient concentration, for a sufficient time, and under certain conditions, tend to interfere with human comfort, health or welfare, and cause environmental damage.

Air pollution causes acid rain, ozone depletion, photochemical smog, and other such phenomena. Air pollution is the introduction of harmful substances including particulates and biological molecules into Earth's atmosphere. It may cause diseases, allergies or death in humans; it may also cause harm to other living organisms such as animals and food crops, and may damage the natural or built environment. Human activity and natural processes can both generate air pollution.

Air pollution is a significant risk factor for a number of pollution-related diseases and health conditions including respiratory infections, heart disease, COPD, stroke and lung cancer.

The health effects caused by air pollution may include difficulty in breathing, wheezing, coughing, asthma and worsening of existing respiratory and cardiac conditions. These effects can result in increased medication use, increased doctor or emergency room visits, more

hospital admissions and premature death, human health effects of poor air quality are far reaching, but principally affect the body's respiratory system and the cardiovascular system.
There is a positive correlation between pneumonia-related deaths and air pollution from motor vehicle emission.
It's no secret that pollution is a huge problem in the major cities in France, but it appears the problem runs a lot deeper, according to a new study by France's national health agency.
Indeed, air pollution kills 48,000 people each year - or 9 percent of the total number of people who die each year.

1.4.3 **Noise pollution**

For almost 10% of the French, noise pollution (from neighbors, business, transport, etc.) is of great concern. According to the World Health Organization, it is the second highest cause of death amongst environmental risk factors in Europe after atmospheric pollution.

Noise disrupts communication and damages auditory acuity. Its effects can range up to sleeping problems, arterial hypertension, a reduced field of vision, nerve inflammation and depression. In France, almost 40% of residents of cities with a population of over 250,000 are exposed to a daytime noise level of over 60 dB caused by road traffic.

1.4.4 Soil pollution

Land contaminated by industrial activities over the past two centuries has been a major concern for at least 20 years.

As part of land degradation is caused by the presence of xenobiotic (human-made) chemicals or other alteration in the natural soil environment. The main problem in modern intensive farms is the use increased for dependency in chemical manures, by pesticides and by insecticides.

The main families of pollutants found in contaminated sites are :

-heavy metals

-hydrocarbons or mineral oil

-pesticides

-surface active agents

-chemical substances for military use or explosives

1.4.5 Water pollution

Water pollution is the contamination of water from different discharges and waste that may be toxic for the water body and its content, and this stops the natural cycles by ruining it and people can't use it neither can animals, in short water pollution damages not only the water body but the whole biosphere. As of 2006, 15% of the water pollution is caused by the French chemical industry, 0.16 kg per worker, 4.8 % by the textile industry, 7.4% by the wood and paper industry and 46.9% by other industries.

On the 22nd of July in 2014 a report was published about how a French court has sued the French government because of the little care and no regards on the full of decomposing toxic green algae beaches in Brittany."It is possible that some rules haven't been fully implemented", said the Minister of Agriculture Stéphane Le Foll. "The French government is guilty because laws on nitrates exist (...) but they are so difficult to implement that it wasn't always possible to do so."

Environmentalists blame the intensive farming on the near by grounds and the use of pesticides on the soil nearby which in return has harmed the water bodies and the biosphere of the whole space.

In 2009, toxic fumes from green algae caused the death of a horse and the illness of its rider on the beach at Saint-Michel-en-Grève near Lannion in Brittany. And in 2010, a truck driver who was removing algae from the bay at Bionic station in Brittany died, allegedly from toxic gases emanating from decomposing green algae.

Since then, the French government financed the cleanup of polluted beaches but didn't really implement measures to stop the algae growth. On Monday night the Senate passed a bill on agriculture pesticides restriction. A law is needed which should "change production patterns" said Le Foll. "In some areas in Brittany, real efforts have been made, but we need to speed up the process, that's the issue" added Le Foll.

A study released in 2014 showed that over 1.5 million French people who lived in the rural areas were drinking contaminated tap water. Most of those affected live mainly in the French countryside. According to the study most substandard water in France is loaded with pesticides and nitrates from fertilizer and livestock manure. That is the case in 63 percent of instances where homes receive polluted water - which represents around 900, 000 people. However pesticides and nitrates are not the only substances polluting French water.

The study also pointed to the presence of selenium, a natural, but toxic, substance that appears when groundwater supplies are over used.

While eastern and southern France were both home to many areas of poor water quality, the areas are most affected the agricultural regions that ring Paris. Those areas were marked as the worst because 20 percent or more of their populations are drinking contaminated water.

While the amount of contamination has fallen 35 percent since 2012 in towns with more than 5,000 people, it grew by eight percent in villages with fewer than 500 residents.

In an unfortunate coincidence, northern French town Berck, whose name translates as 'yuck' in English, had some of the most polluted tap water in France. A string of ten Brittany towns, including Brandivy, Cruguel and Grand-Champ, wound up on the group's black list due to radioactivity contamination, French paper Le Télégramme reported. But thankfully the vast majority of French people are drinking clean water the study concluded.

UFC-Que Choisir based it’s rating on water quality data that French Ministry of Health publishes every two years on every town and city in France. The treatment schemes and infrastructure are also major causes of polluted drinking water. About 500,000 people, mostly in rural areas, are served by outdated networks or a lack of oversight. Interestingly, natural radioactivity accounted for about four percent of the cases of polluted tap water in rural France.

There are 35000 different public services for water in France that target the eradication of water problems in France.

1.5 Pollution in my country - Italy

1.5.1 Introduction

Italy is a beautiful country. You can be moved to tears by the landscape. Then there's the food, the wine and the art. But there are Italian cities which take your breath away in other ways. In early 2011, officials reported that pollution in Italy was reaching crisis levels. What's particularly troublesome is particle pollution that pervades Italy and accounts for breathing and heart problems, causing a whopping 9% of deaths of Italians over the age of 30.

Northern Italy, including big cities like Milan, has some of the worst pollution in all of Europe. Turin and Brescia are big polluters because of their heavy industry, but even tourist hot spot Florence is a top offender, with the worst air pollution of any Italian city. Naples is especially icky, with toxic waste dumping such a problem that it drove down sales of the city's prized buffalo mozzarella back in 2008 for fear that it was contaminated. Part of the problem is that the local mafia is rumored to profit wildly off illegal dumping.

Italy has been slow to confront its environmental problems. Central government agencies concerned with the environment are the Ministry for Ecology (established in 1983), the Ministry of Culture and Environmental Quality, the National Council for Research, and the Ministry for Coordination of Scientific and Technological Research. Localities also have responsibility for environmental protection, but most of the burden of planning and enforcement falls on regional authorities. The principal antipollution statute is Law No. 319 of 1976 (the Merli Law), which controls the disposal of organic and chemical wastes; enforcement, however, has proved difficult..

Of Italy's mammal species, 10 are endangered, as well as 7 bird species and 202 plant species. Endangered species include the Italian gray partridge, Italian spadefoot toad, and the scarce large blue and false ringlet butterflies. The Sardinian pika and Spengler's freshwater mussel are extinct.

Very important, but little known, it is the architectural pollution, caused by events that affect the ecostistema, for example unauthorized building.

Basilicata (commonly known as Lucania) is a region in the Southern Italy about 10,000 Kmq wide whose capital is Potenza. It includes only two provinces, Potenza and Matera, whose “Sassi” are UNESCO world heritage.

It borders at North and East on Puglia, at West on Campania, at South on Calabria and is washed by the Tyrrhenian Sea at South-West and by the Ionian Sea at South-East.

The territory of Basilicata is mostly mountainous (47%) and hilly (45%) and has just a large plain: the plain of Metaponto. In the North-West there is a huge extinct volcano: the Mount Vulture. The hills are clay type, therefore subject to erosion which result in landslides and typical landscapes such as the "badlands".

Basilicata is marked by a considerable environmental diversity and is divided into 6 different areas:

•"Vulture – Melfese" with characteristics of plateaus mostly sown with wheat, while around the Mount Vulture there is alternation of woods and vineyards;

•"Potentino/Lucan Dolomites" with a prevalence of woods and mountains with an average height of 1.200-1.500 meters;

•"Lagonegrese – Pollino" with mountains high more than 2,000 meters and a strong presence of forests and woodlands;

•"Val d'Agri", a fertile plateau that starts from 600m above sea level and follows the course of the Agri River converging in the plain of Metaponto;

•"Collina materana" that has hills and high hills with a large presence of clay and barren badlands;

•"Metapontino" which is a vast alluvial plain where farming is carried out intensive industrial type and has a type of low and sandy coast.

The differences are related to both aspects of flora and fauna and climate. A characteristic of Basilicata is the presence of the largest "onshore" oil field of the whole European continent (its reserves are estimated at one billion barrels of oil), which provides 90,000 barrels of oil per day, accounting for 74% of the entire oil production Italian and able to cover 10% of the energy needs of Italy. The presence of wells and installations for the initial processing of crude oil is a serious environmental problem for the areas (Val d'Agri) in which they are concentrated.

1.5.2 Air pollution

In 2012, Italy had satisfactory levels of air quality concerning sulphur dioxide and benzene. However it had unsatisfactory concentrations of PM_{10} (the daily limit value was exceeded at 40% of monitoring stations), ozone (the long-term target for human-health protection was exceeded in 93% of monitoring stations) and nitrogen dioxide (the annual limit was exceeded in 17% of monitoring stations). During the last 30 years, the Italian mean temperature anomaly (a measure of how the average temperature in Italy in any given year differs from a historical, multi-year average) was almost always higher than the global over land air

temperature anomaly. In 2013, the mean temperature anomaly was +1.04° C in Italy, compared to the global mean of +0.88° C.

Total greenhouse gas emissions, in CO_2 equivalent and excluding emissions and removals from LULUCF, decreased by 11.4% between 1990 and 2012. Italy's Kyoto target is to reduce annual emissions by 6.5% between the base year (1990) and the period 2008-2012 (which is calculated by taking an average of annual emissions in that four-year period). Comparing the average annual emissions in the 2008-2012 period to the emissions in the base year, Italy's level of emissions decreased by 4.6%.

Italy will meet its Kyoto target for the 2008-2012 period by using the credits arising from Kyoto Protocol mechanism and forestry activities.

1.5.3 **Noise pollution**

In Italy numerous people are subjected to continuous disturbance caused by noisy neighbors or public places (bars, restaurants, pubs…) that do not respect the legal limits. Italians are world famous to be noisy but, as usual, this is based on old prejudice because the Italian legal system actually provides several laws on the quantification of noise pollution, which are restrictive and protect privacy and sleep.

We can distinguish two different legal sets: the first is the Administrative Regulation (Legge Quadro 447 of October 26 1995), which establishes the legal framework addressing noise pollution, setting out the basic principles of its prevention and distributes competence among the central government, the regions, the provinces and the municipalities; the second parallel regulation is the Civil Code one based on the criterion of 'normal tolerability' described inside art.844 of Civil Code.

The administrative code is the main reference if the noise source is related to business activities: if you annoyed by restaurants, pubs, industrial plants, you can make a formal complaint to the municipality you live in. The municipality will ask to the territorial ARPA office (Regional Agency for Environmental Protection) to verify if the noise is beyond law limits with sound pressure level measurements.

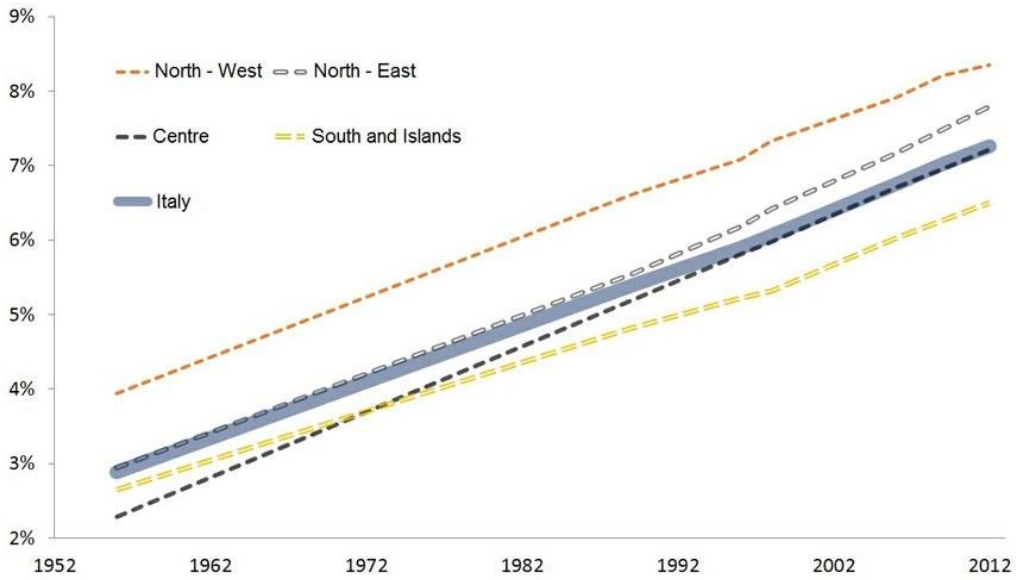
The disturbing activity has to observe both absolute and differential acoustic limits. The absolute limits refer to "Acoustic Zoning Plan" of each municipality. For the entire municipality are established up to 6 different acoustic classes: each one is characterized by certain levels of noise, starting for the quieter "Class I" (Protected Areas) up to the noisier "Class VI" (Exclusively Industrial Areas). Each business activity is required to comply with the absolute limits provided for its acoustic class.The administrative limits are also based on

the concept of differential thresholds: if the noise produced by the business activity is 5 dB higher than daytime residual noise (3 dB higher for night time), the noise law limits are not complied. The residual noise level is the noise level at a given location and time, measured in the absence of the disturbing sound source you are controlling. If the differential threshold is exceeded, the municipality imposes to the business activity administrative sanctions such as fines, obligation to turn off the music after a certain time, obligation to stop the activity until the realization of soundproofing. Unfortunately, in many regions in Italy, the public administration is characterized by slowness and long waiting times: but if you cannot sleep and rest because of noise, do not bother with bureaucracy!

In this case disputes are judged through the civil court. In order to demonstrate that the Civil Code has been breached, it is necessary to show that the noise level is beyond 'normal tolerability': it is usually referred to the overcoming of 3 dB over the background noise (both in daytime as during the night). It is common practice to measure the background noise considering the L95 (i.e. the level exceeded for 95% of the measured time) which is a much stricter system than the required administrative technique.

1.5.4 Soil pollution

At the national level, ISPRA data show that artificial land cover reached 7.3% in 2012.



This means that, on average, more than 7 square metres of soil a second were built over since 1950. The pace has increased in recent years. Between 2009 and 2012, the consumption of soil was approximately 8 metres per second.

Italy has enacted a soil-protection law, which ensures the protection and recovery of soil and subsoil, the maintenance of soil-based water-functions and ground water, and the restoration of soil polluted with hazardous substances.

As Italy recovers from the effects of the economic crisis, it is looking to 'mainstream' environmental concerns into its economic policy. This 'Green Growth' agenda comprises:

- Economic policy and the environment
- Greening the tax system
- Environment-related expenditure and investment
- Expanding environment-related markets and employment
- Promoting environmental technologies and eco-innovation

Greening the tax system is a particularly promising area. Italy hopes to alter its taxation system to receive a smaller share of taxation revenue from income tax, and a larger share of revenue from taxes on polluting activities. Italy is particularly susceptible to hydrogeological instability, due to its geological and geomorphological characteristics, the impact of weather and climate factors, and the widespread, uncontrolled presence of human activities. Land use is an especially important policy area in this regard. ISPRA and the environmental protection agencies at the provincial and regional level monitor soil-sealing activity and land-take across Italy. This monitoring activity helps to shape and assess policies at national, regional, and municipal levels.

Since the '80s a union of interests between the Camorra (an organized crime group active mainly in Naples and the surrounding region of Campania), the industrialists and the Neapolitan and Campania political class has poisoned this part of Italy, which is amongst the most beautiful areas in the country.

Between Naples and Caserta, in the so-called 'Terra dei fuochi' ('land of fire'), illegal dumping has been taking place for over 30 years. An entire area, including the Domitian coast, the Aversano-Atellano countryside, the Acerrano-Nolano and Mount Vesuvius area and the city of Naples, has been affected by the uncontrolled disposal of solid urban waste and special waste, which is often hazardous, with serious consequences for the health of local people, the environment and safety. This environmental disaster is part of a broader scenario that was first outlined in a study by the Italian Institute of Health, which found that the entire area from Giugliano to Villaricca, right up to the Domitian coast, is polluted as a result of the fly tipping and landfill of illegal waste that is subsequently burnt. The majority of this waste arrives from businesses in the North of Italy with the help of the Camorra and has led to the contamination of the groundwater and 2 000 hectares of surrounding agricultural land with toxic sludge, heavy metals and chemicals. According to the Institute of Health, in Campania, at the ex-Resit di Giugliano site, the pollution is irreversible — there are 20 km2 of 'dead' land and 220 hectares of polluted land that can never be restored. In this area, the incidence of illness has tripled in less than 20 years, with a high rate of tumours, birth defects and epigenetic changes. The Italian Ministry for the Environment is about to set up an investigative judicial task force to combat these illegal operations with a view to solving the problem and preventing future toxic waste dumping.

1.5.5 **Water pollution**

In Italy and the Mediterranean, marine coastal zones remain among the most vulnerable and most seriously threatened natural ecosystems. There are many sources of pollution that can render water unfit for swimming, but the most significant source is microbiological pollution. For the 2012 bathing season, Italy counted 629 inland waters and 4 880 marine and transitional waters for a total of 5 509 bathing waters. The results of the monitoring carried out during the 2012 bathing season show 85% of these waters were in compliance with the guideline value established by Directive 76/160/EEC.

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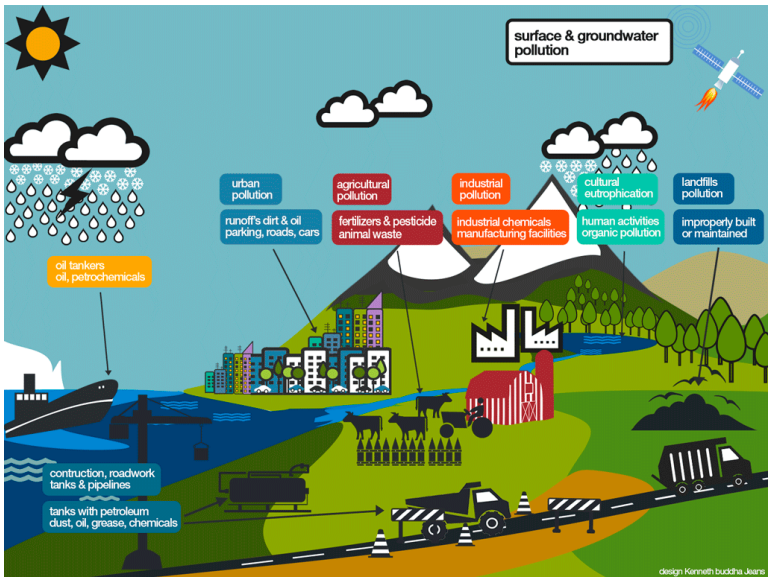


One of the major sources of groundwater contamination and vulnerability depends on past dumping of toxic substances in the soil. Although these practices have long been forbidden and bans on illegal dumping quite successfully enforced, inheritance from the past is overwhelming especially in the areas characterized by early industrial development. Reclamation is in theory a responsibility of the landowner, but enforcing this measure is impossible due to prohibitive costs. Extraordinary actions, probably based on a strong public support, are needed. Land reclamation plans establishing priorities and medium-long term agendas are required, and should become a fundamental part of basin plans as well as management plans.

1.6 Pollution in my country - Romania

1.6.1 Introduction

Lately, Romania's civic consciousness has awoken. In 2000s, the protest against environmental threats was the fantasy of a few idealists, but nowadays, after over 27 years since the establishment of The Ministry of Environment, things took a completely different turn. The thousands of people who shouted in the street "United we save!" prevented a very powerful company from shaving mountains in order to exploit gold by using cyanide, and successfully crowned the activist efforts held in the Apuseni Mountains, proving that something can be done.

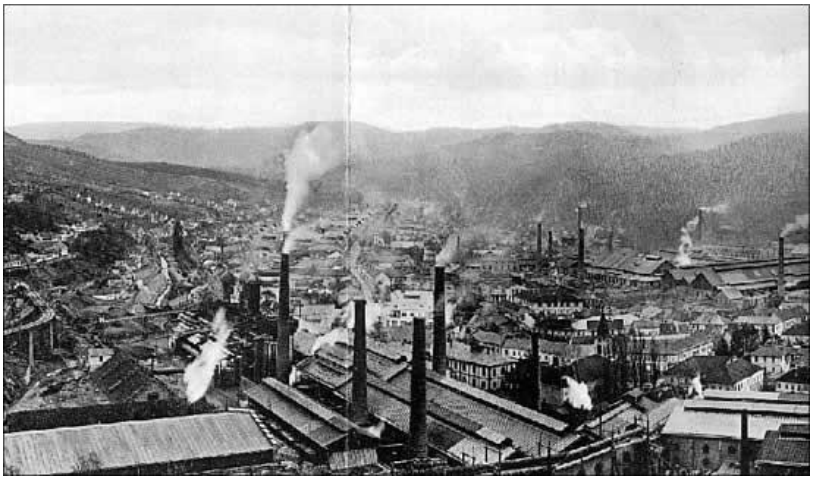
Slowly, the abusive deforestation, the burial of the green spaces under residential areas, the poisoning of the air and the destruction of the rivers made people less indifferent. The inhabitants of the cities understood that the environment must be protected and that this depends mostly on them. Even if, as the effects of the climate change have become increasingly clear globally and the pollution has increasingly become an alarming topic, it is important to understand that its roots are not planted in the very recent history, and only by understanding its route can we create good strategies for a clean future.

With an energy system based on coal and oil, and with a legislation that prohibits widespread use of renewable energies, Romania currently has serious problems related to pollution. Although the authorities boast with the achieved targets of the reduction of carbon emissions and the use of green energy in the final consumption of electricity, little has been done to ensure the entrance in an era of ecological technologies. The emissions decrease is mostly the result of Romania's deindustrialization after 1990, and the green energy is far from being accessible to everyone. Instead, we have inherited tens of thousands of hectares of disused, but polluting industrial sites, and we must adapt to a global effect of climate change to which we also contributed. These changes which occupy priority positions on the international agenda have caused the growth of the average temperature in Romania in the last century with 0.8 degrees Celsius, even with more than one degree in some regions. How did we get here? Through the processes mentioned below, as follows:

1.6.2 Air pollution

Air pollution is the process of physical and chemical modification of the natural composition of the atmosphere. In Romania, the process began with the Industrial Revolution, as a result of the pressure exercised by the demographic explosion in the 19th century.

The effects of this industrialization in Romania have been felt since Britain and Netherland's investments in the exploitation and processing of iron and coal resources in the southwestern part of the country.



Industrialization continued with the exploitation and processing of petroleum resources, with the emerging of the first thermal power plants, with the extension of the railways and with the appeareance of the road transport networks alongside with the development of these economic segments throughout Europe.

In 1771, The Machine Building Factory from Resita was founded in order to produce the necessary equipment for hydropower system, railway steam engines, engines and electric generators, cranes, petroleum equipment and even weaponry.

In 1880, the Romanian Railways were founded, after 11 years from the moment when the first railway was opened on the territory of Romania of those days (this railway connected Bucharest with Giurgiu) and in the mid 19th century, the minning industry had already started in Petrila, where in 1927 was operating the biggest coal processing factory in Europe.

In 1856, in the suburbs of Ploiesti, the "gas factory" was under construction – the first petroleum refinery in the world. The Science of Petroleum attested later that in 1856 Romania of those days became the first country in the world producing crude oil registered in the official statistics, while Bucharest remained in history as the first city with lamp oil illumination.

Although even since the 19th century existed concerns about the climate changes, there was no reason for serious worry about atmospheric pollution, the greenhouse gas emissions and the climate change.

In Romania the greenhouse gas emissions "exploded" at the same time with "the forced industrialization" during the communist era. After 1948, Petru Groza's regime used the Soviet strategy from the '30s, which was, in its turn, inspired from the Industrial Revolution in Europe in the 18th – 19th centuries. The quick modernization, with massive investments in the intensive industry and agriculture came with an important price for the environment. And the price was to become much higher during Ceausescu's regime.

As in the 70's the conflicts from the Middle East led to a rise in the petroleum price and the developing countries began to search for alternatives, Romania was included among the countries that boosted the much more pollutiong coal industry. In 1975, the Romanian Communist Party decided the primary development of the thermal power plants based on coal and bituminous schists, while later the burning of petroleum for energetic purposes was limited. "The energetic policy of the Romanian state during the '70s and '80s had a double polluting consequence", as the chemical industry was also continued and developed, which emitted in the atmosphere pollutants far above the accepted international standards.

Although after 1989 the industry collapsed and the pollutant emissions have dropped sharply - in 2015 the emissions were 56% lower than in 1989 - the legacy of the communist period consists in over 1,300 sites contaminated or possibly contaminated throughout the country and many ruins that remind of the industrial past. This pollution which comes from years ago, a period of time of at least several decades, which persists and has not been removed or remedied is called historical pollution.

Most polluting industries were the mining, metallurgical, chemical and thermal power, industries which, apart from air pollution, also produced large quantities of waste. They left behind large areas covered in waste: the so-called contaminated or potentially contaminated sites are black spots on the environmental map of Romania and potential sources of contamination of the atmosphere and human communities nearby.

1.6.3 Noise pollution

Noise pollution is created by the engines of the cars which used in large cities or along the main streets in the country, it is created by aircraft and by industrial activities close to human concentrations in Romania.

Currently over 60% of the population of large cities in Romania is affected by noise pollution, Bucharest being the city with the highest percentage of the number of residents exposed to noise, 85%, according to the auditing firm in the field of acoustic measurement Enviro Consult.

"Nationally, in the cities with over 250,000 inhabitants there are about 2.9 million people exposed to noise above the limit set out in auditing standards, which means that for more than 60% of the population, the quality of life is greatly affected by the noise pollution." Thus, in the large cities there are areas where noise exceeds 80 decibels, far above the optimal level of 50 decibels.

Thus, among the cities most affected by noise pollution in Romania are Bucharest (85% of the population is affected), Constanta (76%), Cluj-Napoca (64%), Brasov and Ploiesti (61%),

Galati (55%) and Timisoara (49%). By contrast, the quietest city is Iasi, with only 16% of the population being affected by noise.

1.6.4 Soil pollution

Soil pollution consists in changing the quantitative and qualitative composition, change which affects the normal evolution of the biocenosis associated with it.

In Romania, soil pollution is a particular problem and has more causes, namely:

- the excess of chemicals used in agriculture as fertilizers or as chemical treatment;
- accidental or deliberate discharge of chemicals from various industrial activities or as a result of transport accidents;
- discharge of animal manure and human sewage into the soil;
- storage of non-biodegradable waste, especially plastics, over large areas.

Soil pollution by chemicals is a process of contamination and indirectly of degradation, caused by excessive use of pesticides. Pesticides, herbicides and fertilizers are not only harmful to human health, they may have an adverse effect on the soil by destroying the fauna from the soil which ensures the incorporation of organic matter in the soil (bacteria, earthworms, algae, threadlike fungi etc.). These substances are used in agriculture to destroy all crop pests (insects, fungi, weeds, rodents, etc.). Particularly worrying aspects related to the presence of these substances in the soil are emphasized by their movement and accumulation along the trophic chain, not forgetting that the human is on the top of it. Although in the composition of vegetable organisms the average pesticide concentration is lower than 0,1ppm (parts per million), in animal and human body it can increase up to hundreds or thousands of times. Some substances (aldrin and lindane) are non-toxic to humans, but they are very toxic to birds and bees and can even cause their death.

1.6.5 Water pollution

Water is a vital element of the environment, being present in all the processes and phenomena that occur within it.

Romania has significant reserves of freshwater, which are enough to conduct all natural and anthropic processes on its territory. However, some parts of Romania's hydrography are threatened or affected by the following factors:

- Discharge of wastewater, often containing organic or inorganic waste and synthetic detergents which enter the rivers and lakes. Such processes are commonly found in the rivers and lakes that cross or border large cities.
- Acid rains which are the result of the contact between the atmosphere and exhaust gases, products of the metallurgical industry, thermal power plants, refineries and other industrial enterprises and car transport. This phenomenon increases water acidity and affects all forms of aquatic life.
- Solid substances which make water so opaque in the sunlight, preventing the photosynthesis in water basins. Such processes are common in the mountain rivers where the sawdust resulting from wood cutting is often thrown into rivers. A particularly serious problem is the plastic waste which can be found in all hydrographic arteries in Romania.

- Oil spills which prevent oxygenation, prevent light penetration and increase temperature.
- Thermal water pollution which is caused by thermal or nuclear power plants. As a result of the higher temperatures of these waters, in these water basins some biochemical processes are accelerated and the level of the oxygen dissolved in the water decreases.

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Chapter 2 - Good practices in each country for fighting with pollution

2.1 Introduction

It is visible in the first chapter that the issues which worry us in our countries are similar and something we have in common. However, a lot has already been done to tackle those issues, and many good practices have been created to purify the air and fight pollution. “The three Rs” are an excellent rule of thumb for every individual consumer: Reduce, Reuse and Recycle. We could also add “Rethink” as the fourth R; it would signify, for example, checking the practices from time to time and making use of the most recent research data.

As you will find out, reading on, all of our five countries have come up with useful practices to help the environment. Bulgaria, for instance, is a forerunner on the EU level with solar-powered electric car chargers, i.e. photovoltaic stations in Sofia. Finland, on the other hand, manages to recycle 90 percent of its plastic bottles, which in itself is an achievement. In France, the fresh organic food and markets as well as electric cars all contribute to sustainability and to fighting against excess pollution. The Italian microlevel example, the school’s Vegetable Garden with its own solar panel system and wind turbines, is part of very important educational work and a clear sign of an attitude shift, which activates the children and youngsters. Romania also makes a contribution e.g. by making use of natural resources: solar, wind and water power and biomass. We are all striving for a better tomorrow!

Despite the good practices we have, there are also challenges that we face. For example, Finland has the challenge of incorpocating all the nine countries surrounding the Baltic Sea into the task of preserving it. Trying to make all the countries acknowledge the importance of Baltic Sea preservation is an ongoing battle.

In the end, maybe the most significant solutions are created in the micro level, through the choices of individuals. We are already aware that eating meat burdens the environment, and that even soy is not ecological as an import product - its cultivation affects the Brazilian rainforests in a negative way. So, could then using insects as nutrition be one of the solutions of the future? The new EU novel food regulation will come into effect at the turn of the year and will enable this, but the changes in people’s attitudes and real every-day choices are a completely different matter altogether!

Tiina Kokkoniemi, Inkeri Miekkavaara & Päivi Seiskari
Maunulan yhteiskoulu & Helsingin matematiikkalukio, Helsinki

2.2 Good practices in Bulgaria

2.2.1 Introduction

Pollution affects all the elements of an ecosystem. It affects our health and all aspects of our lives. In Bulgaria we are facing many problems regarding the cleanliness of our air, water, soil, etc. This chapter summarizes the steps that are taken to improve the battle with pollution in Bulgaria.

Pollution in Bulgaria	
Air Pollution	66.53 High
Drinking Water Pollution and Inaccessibility	30.56 Low
Dissatisfaction with Garbage Disposal	59.40 Moderate
Dirty and Untidy	55.71 Moderate
Noise and Light Pollution	49.80 Moderate
Water Pollution	42.72 Moderate

2.2.2 The battle with air pollution

Air pollution is an important risk factor for health in Europe and worldwide. A recent review of the global burden of disease showed that it is one of the top ten risk factors for health globally. In Bulgaria it has a the biggest impact on the environment, especially in the capital city Sofia. Old cars and chronic traffic jams are to blame, made worse by the capital's location in a lowland surrounded by mountains.

The solution - plug-in electric vehicles (also known as electric cars or EVs). They can help keep your town and your world clean. In general, EVs produce fewer emissions that contribute to climate change and smog than conventional vehicles.

2.2.2.1 The taxi

Since the beginning of February, the first eco-taxis have can be on the streets of Sofia. Besides the green color, they differ from traditional taxis in that they emit less harmful gases into the air. "Green" taxis are hybrid, which means that their engines are powered in two ways - with electricity and gasoline.

Only two "green" cars are currently on the streets of the capital, but by the end of the year their number will grow to 25.

2.2.2.2 The public transport

Sofia's fleet of buses continues to be upgraded and modernized. Within days, the capital will be home to nearly 200 new ecological buses and 5 semi-pedestrian and fully air-conditioned trams.

Since October 2016 Sofia has130 short buses, 20 of which are electric, 20 hybrid, 60 methane and the other 30 diesel. 60 articulated buses that will run on gas will also be launched.

The new buses and trams were funded by Sofia Municipality.

2.2.2.3 Solar chargers

Sofia has set an EU example in the fight against greenhouse gas emissions by installing its first state-of-the-art solar-powered charger for electric cars in 2012.

Electricity production can be polluting so we thought we would build this photovoltaic station and charge electric cars with green energy from the sun.

The photovoltaic equipment feeds from the light and not the heat and is even more efficient in winter time, when there is no need for cooling it down.

This is a part of the European Green eMotion project, which seeks to help countries reduce their carbon dioxide emissions by promoting research and exchange of electromobility solutions.

2.2.3 **Reducing water pollution**

Generally the data for Bulgaria show that there is low water stress. But there are areas that experience water scarcity in dry summers. Parliament approved a National Strategy and Action Plan for water management and Development in 2012. This strategy outlines the overall vision for the water sector at large, including water resources management, hydropower, flood protection, irrigation and water supply and sanitation which provides for a

more active role of the public authorities in developing and managing the sector. The Water Strategy has four main objectives:

- Guaranteed water supply to the population and business under climate change conditions leading to droughts.
- Protecting and improving the status of surface and ground waters
- Improving the efficiency of integrated management of the water as an economic resource
- Decreasing the risk of damage from floods

Bulgaria has strengthened water management efforts in recent years. Over the past decade there has been considerable improvement in the quality of drinking water. However, overall problems of water quantity and quality remain severe.

2.2.3.1 WWTP of Bulgaria

Kubratovo wastewater treatment plant treats domestic, industrial wastewater and stormwater entering the sewerage network of Sofia. It was commissioned in 1984 and is now one of the largest in the Balkans.

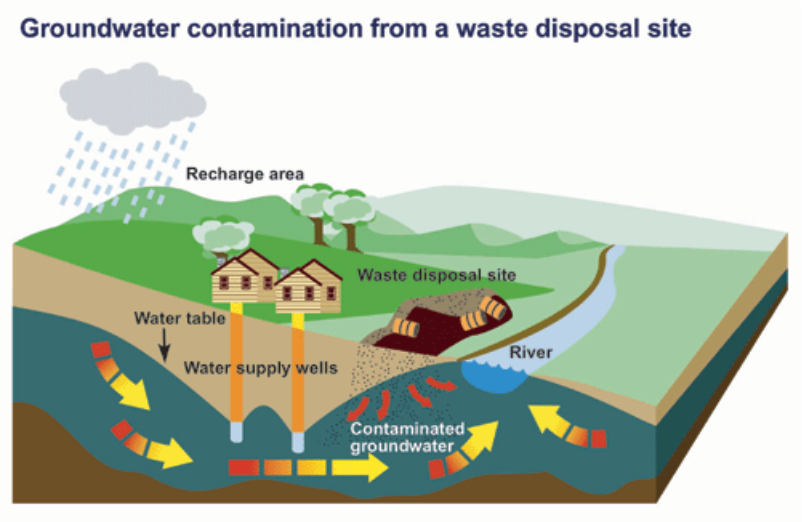
For 30 years, the facility has operated without interruption. Over the years there have been partial reconstructions and improvements funded by EU funds and Sofiyska Voda`s investment programme.

The plant is located in the lowest northern part of Sofia – Kubratovo, on a total area of 60 ha. Its design capacity is 500 000 m3 of wastewater per day.

2.2.3.2 Water management and transposition of EU legislation

The Bulgarian Code of Good Agricultural Practice is a set of rules adopted to prevent the pollution of waters by nitrates from agricultural sources. The objective of the Code is to

reduce the levels of nitrate losses from agriculture and to restore water quality, and also to prevent further such pollution of groundwaters and surface waters. The Code was approved by Decree RD-09-431 of the Minister of Agriculture and Forests from 22 August 2005. It is based on Regulation No 2 from 16 October 2000 (of the Bulgarian Water Law of 1999) for the protection of waters from nitrate pollution from agricultural sources, issues by the Minister of the Environment and Waters, Minister of Public Health and Minister of Agriculture and Forests (Official Gazette, issue 87 from 24.10.2000)



Europe has made enormous progress in treating wastewater in the past 20 years, but there is still room to improve. We need to get better at keeping harmful products out of our wastewater in the first place, develop more advanced treatment methods and keep costs as low as possible. Wastewater will make its way to the sea, where any contaminants that have not been removed during the treatment process will add to the existing pollution in the marine environment. These include pesticides and fertilizers washed off the land as well as products of industrial dumping and litter, particularly plastics.

2.2.4 **Good agricultural practices**

The term “Good agricultural practice” defines a system of rules whose aim is to promote eco agricultural activities to optimal use of scientific achievements and technologies aiming at safe and healthy foods production guaranteeing economic and eco sustainability of farms.

There are different interpretations of “good agricultural practice” meaning. From one side this is a system of rules for good agricultural practices connected to water protection against pollution caused by agricultural sources nitrates and a good plant- protection technique in agriculture.

From the other side it is about successful entrepreneurial farmers` initiatives that shows how agriculture could develop preserving eco, economic and social sustainability of rural areas. Important are rules as well as good practical examples.

Good agricultural practices are connected to production of food and non- food products in agriculture that guarantee eco, social and economic sustainability.

In this sense good agricultural practices are divided into:

- Good agricultural practices connected to soil protection;
- Good agricultural practices connected to water protection;
- Good agricultural practices connected to animals breeding and health;
- Good agricultural practices connected to health and public health.

Three good agricultural practice fields are defined in Bulgaria according to existing environmental legislation connected to agriculture:

- Water pollution;
- Land exploitation and soil fertility;
- Eco sensitive zones.

Following the requirements of Directive 91/676/EEC of the European Union concerning protection of waters against pollution caused by nitrates from agricultural sources (Nitrates Directive) and Ordnance N2 from 13.09.2007 of Republic of Bulgaria for protection of waters against pollution with nitrates from agricultural sources (promulgated in the State Gazette ed.27 from 11.03.2008), the Bulgarian rules for good agricultural practice are approved with Order RD 09-799 from 11.08.2010 by the Minister of agriculture and forests.

The purpose is to reduce waters pollution with nitrates caused by agricultural sources and to prevent any further contamination.

Rules for agricultural practice are obligatory for agricultural producers whose activity is:

- On the territory of sanitary protection zones around sources and facilities for drinking water;
- Around mineral water sources used for therapeutic, prophylactic, drinking and hygiene needs;
- For agricultural producers whose farms are located: on the territory of sensitive/vulnerable zone (regions where waters are polluted with nitrates from agricultural sources through leaching or runoff).

2.2.5 **Recycling**

Permanent environmental deterioration represents a huge international problem. If gone out of control this problem would have a very serious negative effect on the quality of our life and our health as well as it will destroy the natural environment we live in. This, mostly leading to environment deterioration is not the good handling of waste. Annually in Bulgaria accumulated are approximately 12 000 000 tons of household and industrial waste as about 7% of them are plastic waste or 840 000 tons.

In general, Bulgaria still lacks modern facilities for the waste management and recycling. Separate collection of garbage has recently been introduced but is still to prove effective.

2.2.5.1 How to recycle plastics?

The recycling process is carried out as follows:

1. Collecting plastic waste – household and industrial
2. Sorting it by type and color
3. Crushing it into large pieces using shredders
4. Washing and drying
5. Grinding with mills
6. Extrusion/grinded plastic is melted and then extruded as spaghetti which with special granulators are cut and received is the recycled plastic granulate, ready for reuse/. With this the cycle is closed – re-cycle.

The opportunities for recycling plastic waste in Bulgaria need further development and improvement. We set the beginning expecting your support and cooperation.

2.2.5.2 Encouragement

The municipality of Sofia has done some timid efforts to promote home composting; since 2006 7000 composters have been distributed and fortunately there has been follow-up.

A more interesting experience is the initiative of some neighbours in Sofia to organise community composting to treat the food and garden waste locally and which has been praised by the EU.

2.2.5.3 Let's do it

Clean-up Day: uniting together for a better more beautiful Bulgaria

For 5th subsequent year bTV Media Group organizes the ‘’National Clean-up Day’’. bTV Media Group is the biggest private media in Bulgaria part of the family of Central European Media Enterprises (CME).The initiative is the biggest voluntary project that has been organized in the country. The event takes places in one day for the whole country. People unite in order to clean and make Bulgaria happier and healthier.

The efforts of the campaign are focused on improving the quality of the environment..

The main aims of the campaign are:

- increasing the number of cleaned places,
- collecting as much garbage as possible as well as transporting it to landfills,
- motivating people and raising awareness,
- Educating people about the ways to reduce our waste and lead a more sustainable way of life.

We all aim at contributing to our shared goal: making the world a better place and change the attitude of people towards sustainable life in the long-term.

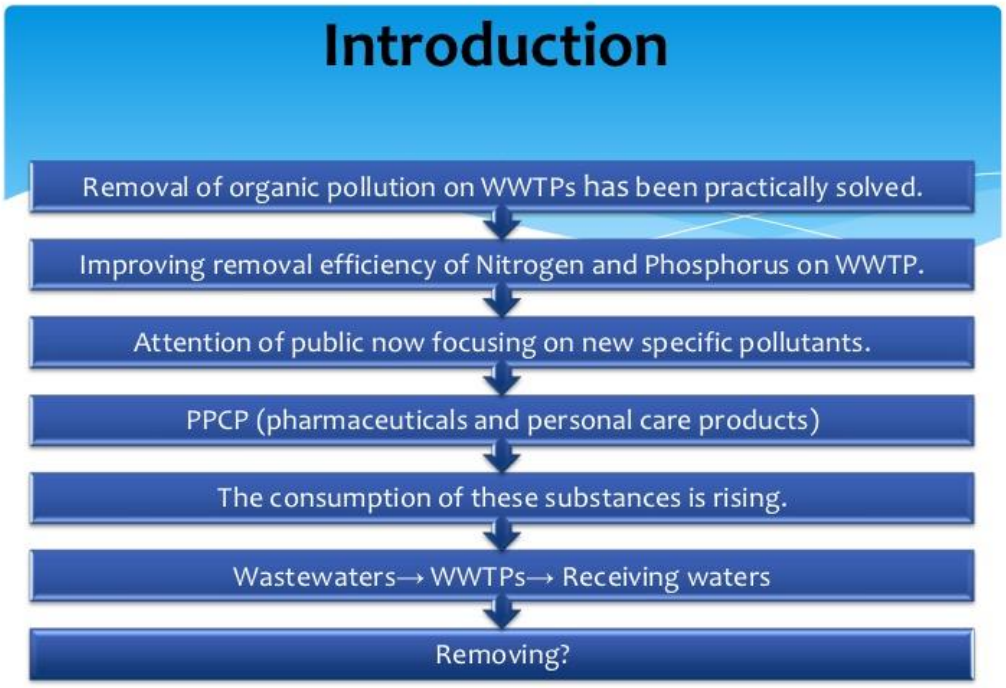
2.2.6 Self-suffiency with green energy

In 2009 a new co-generation system was installed in order to use the biogas and produce renewable energy. The aim was to optimize the operation of the plant and its energy efficiency as well as to reduce carbon emissions.

In 2010 Veolia acquired the majority stake in Sofiyska Voda and put in place new projects for optimization and environmental protection by reusing the waste from its activity. The production of green energy from biogas at the plant continued to increase steadily and in 2014 for the first time since the co-generation system was installed, Sofiyska Voda reached 98% self-sufficiency with green energy.

The capacity of the co-generation installation includes three co-generators, each of them can produce 1063 kW of electricity and 1088 kW of heating power.

The next target for Sofiyska Voda is to achieve 100 % self-sufficiency with green energy for the WWTP.



2.3 Good practices in Finland

2.3.1 Introduction

Finland, like other Scandinavian countries, is a forerunner in what comes to environmental awareness. We have long traditions in recycling and reusing e.g. bottles, cardboard, textiles and metal. All waste material is sorted accordingly into separate biowaste, energy waste and other containers, even in homes. In fact, it is a must for condominiums. During recent years, some Finnish energy companies have built huge waste incinerating facilities where all non-recyclable mixed waste can be burnt to make energy. This has helped enormously in making dump sites smaller and the environment cleaner.

2.3.2 Sorting stations and making use of old dump sites

Finland has sorting stations all over the cities where you can leave cardboard, glass bottles, paper, furniture made from wood, electronics and mixed waste. All the waste will be recycled and used to make something new. There are also special sorting facilities where you can take even bigger things like waste building material or more complex electrical waste. With larger amounts taken to the special facilities, you might have to pay a small fee to cover the costs of the facility.

Malminkartano Hill, also known as Malminkartano Junk Hill, is the highest point of Helsinki and was formed in 1976 - 1996 when leftover building material had to be dumped somewhere. It rises over 90 meters (295 ft) above the sea level. Nowadays there is no way to tell that it’s an old dump site; in fact, it’s a popular site for sporting, and people also go to the top to admire the good bird’s eye view that it offers over the surrounding areas.

There's very little information about Paloheinä peak online, but it is similar to Malminkartano Hill. It is also a great hill for sledging during winter due to the low angle and long straight way down. However, that all might change, as the city of Helsinki has plans for building apartment houses around the area.

2.3.3 National treasures

One important part of Finland's culture of protecting its nature is national parks. As the name suggests, they are parks that are national, but what makes them special is that they are protected by law and they are quite big. They are owned by the government and it is illegal to build anything in the park, or to disturb its nature by your actions.

There are even some protected swamps in Finland, and the protective precautions are basically the same as in the parks. Even though protecting swamplands by law may sound a little odd at first, they have a unique ecosystem and many swamps had been already dried out before this law was reinforced.

2.3.4 Recycling in Finland

Recycling is a common way to get rid of useless clothes or furniture in Finland. It's also a great way to find something new, for example vintage fashion. There are many recycling centers in Helsinki selling used things brought in by other people. All condominiums in Finland have their own recycling bins, which can be used by all the dwellers of the condominiums. The bins are emptied on a regular basis and they are an efficient way of getting Finnish citizens to recycle more.

Recycling is also a great way to help those people who don't have much money, as it's very ecological and cheap! People should think twice before buying brand new products because it is a huge burden to our nature. Why not buy a used, but still functional product and save our planet?

Also the recycling of plastic bottles is very advanced in Finland. According to newspaper Ilta-Sanomat, over 90% of all plastic bottles are recycled. A factor that might contribute to this is the fact that in Finland, people get paid a small amount of money (from 10 to 40 cents in euros) for every bottle and can they recycle. Helsinki is also the second cleanest capital in the whole world, right after Reykjavik.

Finland uses about 10% of its national waste in incineration. Historically Finns have burned their waste in the fireplace for heating and aesthetic purposes. Today, Finland has 8 waste incinerators in Riihimäki, Vantaa, Vaasa, Lahti, Turku, Kotka and Oulu.

The newest waste incinerator in Vantaa, Finland.

http://www.poyry.fi/projektit/vantaan-jatevoimalaitos

2.3.5 The Baltic Sea calculator

Lately there has been much talk about pollution and waste in the Baltic Sea. There have been many problems and controversial stories related to its pollution. But the main problem in this case is politics. When one country throws its trash in the sea, others start doing this too. That has led to both positive and negative effects in our history, but recently things have been looking up. Countries are making deals and arrangements to make the Baltic Sea cleaner!

Syke (Finnish Environment Institute) has a Baltic Sea calculator on its website: http://www.syke.fi/itamerilaskuri. With the calculator, consumers can determine the impacts of their consumption habits on nutrient pollution in the Baltic Sea. There you can also compare how much your results differ from the country's average and from the ideal amount. This has helped some people to make changes to their lifestyle, so they would pollute less!

2.3.6 Food

Reetta Kivelä developed a source of protein called "nyhtökaura" (pulled oats) which is a Finnish innovation. It was developed as an alternative to meat, and it's a real "protein bomb". Nyhtökaura had many titles before it got into shops, but now it is a registered trademark, alongside its Swedish and English equivalents pulled havre and pulled oats.

There aren't any additives on nyhtökaura, and the flavour comes from real ginger, tomato and paprika. When the first 100 nyhtökaura test pieces got into Stockmann in January 2016, it all got sold in 11 minutes. Kivelä might be a true climate saviour with her product. The cultivation of grain and beans has a complelety different carbon footprint compared to the production of meat. For example, the production of a kilogram of meat takes up thousands of litres of water.

In the photo above, Reetta Kivelä with her team.

Reetta Kivelä's spring risotto with pulled oats (for 4)

- Bundle of spring onions
- Small bunch of green asparagus
- 2 tablespoons butter
- Around 7 dl water
- 2 cubes of vegetable stock
- 3 dl risotto rice
- 2 - 3 dl white wine
- 1 lime
- ½ lemon
- 1 packet (250 g) Kaffir lime, sesame & ginger -pulled oats
- 4 table spoons parmesan cheese powder

  http://www.hs.fi/ruoka/art-2000002898930.html

Wash spring onions. Peel asparagus, then chop spring onions and asparagus. Prepare vegetable broth by mixing vegetable stock into water. Heat up butter on pan and sweat spring onions. Add risotto rice and cook for a while. Add white wine and let the rice absorb the wine. Add vegetable broth one scoop at a time. Mix it well and let the broth be absorbed before adding more. Cut lime and lemon and ooze it into risotto. After the rice has been cooked for 15 minutes, add asparagus for five minutes. Add pulled oats. The pulled oats doesn't need to be cooked, just warm it. Add parmesan on top of the risotto.

Soy and tofu

Tofu and soy are also often used as an alternative to meat, and they can be quite delicious if done right. Soy is also fed to livestock, so why not eat the soy instead of meat that has been fed soy? Feeding soy to livestock makes as much sense as feeding cow meat to a tiger and then eating the said tiger. Here are a few recipes found in common cooking books:

Fried Tofu

- 2 pieces of tofu
- Flours
- 0,5 dl of oil
- Half a radish
- 1 piece of ginger
- 10cm of leek
- 2 dl of tentsuyu-sauce

1. Cut both pieces of tofu into 4.
2. Grate the ginger and radish. Cut the leek.
3. Heat the oil to 180C°. Pour a little flour on top of the tofu pieces and put them carefully into the oil.
4. When the tofu pieces have gone brown, take them out of the oil.
5. Put the tofu into dishes, add leek, ginger and radish and 0,5 dl of tentsuyu-sauce.

(Source: “Japanilainen Keittokirja” by Machiko Yamada-Alho)

Soft tofu with chili and scallion

- 250g of soft tofu
- 2 scallions, sliced
- 1 red chili, sliced
- 2 tablespoons of coriander
- 2 tablespoons of soy sauce
- 0,75 dl of oil
- 1 teaspoon of sesame oil

1. Cut the tofu into cubes and put them on a heat resistant plate.
2. Sprinkle the scallion, chili, coriander and soy sauce on top of the tofu. Pour the oils into a small pan and heat them until they steam, pour immediately on top of the tofu.

(Source: "Löytöretki Kiinan keittiöihin" by H.F. Ullman)

2.3.7 Evac

Cleantech Solutions. Anywhere.

Evac is the world's leading provider of integrated waste, wastewater, and water management systems for the marine, offshore, and building industries. They have carried out over 20,000 marine, 1,500 offshore and 2,000 building projects for customers around the world.

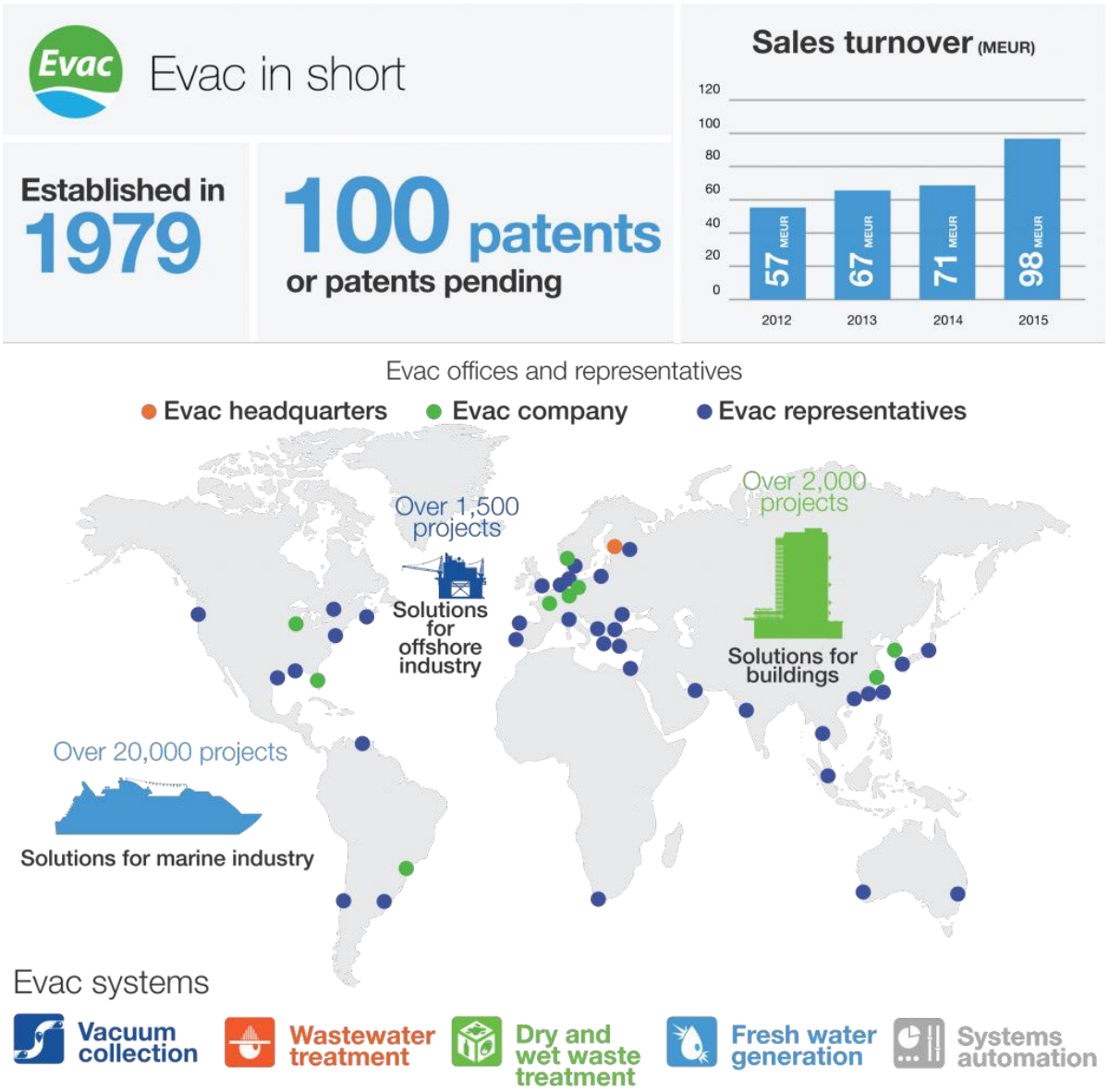
Evac is originally a Finnish company that has upgraded their company to global level. It has employees all around the world, for example China, Finland, Germany, Norway, and USA. The company was established in 1979, and still has its headquarters in Espoo, Finland. Evac also has over 100 patents.

Why do they do what they do? Evac wants to avoid climate change, increase energy efficiency, decrease the lack of fresh water and maintain sustainable development. They also want to be an example to others by reducing waste, saving clean water, making wastewater clean and keeping their environmental footprint small.

Evac mitigates their customers' environmental footprint. They also want to provide their products to customers right on time. Evac makes different types of systems: vacuum

collection, wastewater treatment, dry and wet waste treatment, fresh water generation and systems automation.

They also do waste, wastewater, and water management systems for cruise vessels, yachts, cargo vessels, drilling rigs, high-traffic areas, etc. Evac is also involved in charity work, for example by making these systems for the Atlantic Mercy hospital ship. Atlantic Mercy is the world's biggest hospital ship that moves in the poorest parts of Africa.



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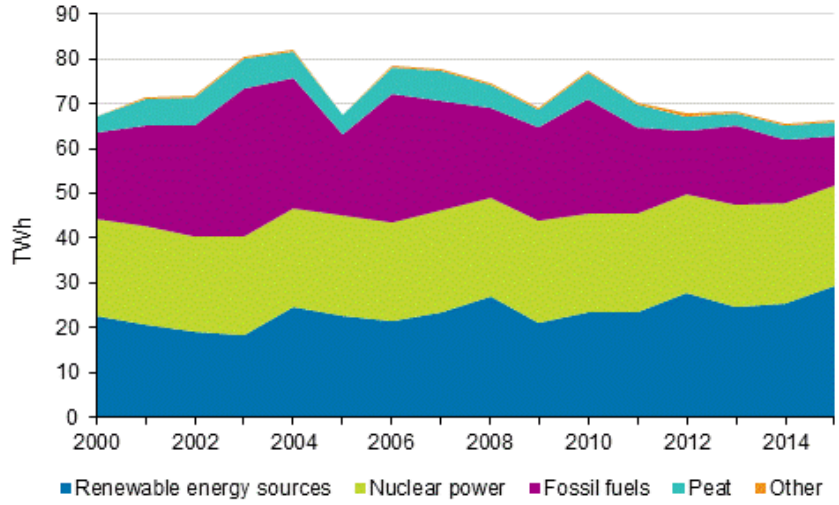
2.3.8 Energy solutions

Finland has actively tried to reduce the consumption of fossil fuels with the rest of Europe for some time now, and we are going in the right direction! The use of fossil fuels as an energy

source has been going down at a steady rate for the last couple of years. And at the same time, our use of renewable energy sources is at record-high peak.

This chart shows electricity generation by energy source in TWh (terawatt hours)



http://www.stat.fi/til/salatuo/2015/salatuo_2015_2016-11-02_tie_001_en.html

All this has been accomplished by people and the government working together. There have been many informative campaigns that tell you about your own energy consumption, and switching to renewable energy sources has been encouraged.

On the other hand, we have very cold winters in Finland, and therefore we need energy to keep our houses warm. This makes up a big part of yearly energy consumption in Finland, and there are still many people that warm their houses by burning wood, which is effective, but not so nature-friendly as one would like. But that's one goal more for us: to switch into warming our houses with renewable energy sources!

2.3.9 Globe hope

We also have many second-hand shops here in Finland. Second-hand shops resell already used products, mostly clothes and accessories. The popularity of these kind of shops is rising incredibly fast, because of the economic downturn. Also, the prices of reused products is lower, which leads us to the rising popularity.

Most people also make DIY (do it yourself) clothes, not just for economic reasons, but because it's fun, too! You can rip your own jeans, colour or remodel your own clothes, or just decorate almost anything you own.

Finland is also making progress in reusing fabrics. Before, whatever was useless, was thrown away. Nowadays people recycle or donate things for charities that can make use of even worn-out fabrics and clothes.

Below you can see a great idea on how to make your old clothes look interesting! If you want more ideas, feel free to google by using words DIY and clothes.

Photo from Google photo

2.4 Good practices in France

2.4.1 Introduction

Pollution affects all the elements of an ecosystem, including air, water and soil. Solutions must be found to combat all types of pollution so that delicate ecosystems can thrive once again. This part explains how we may take action now in France.

2.4.2 Preserving energies on Earth

Currently, we are facing a global warming that is still due to greenhouse gas emissions. Today, French people consume a lot of energy and the cost of energy is increasing dramatically and continuously. It is therefore essential to take action to protect our environment, in order to avoid many climatic changes, namely to act on:

- Domestic energy,
- Automotive fuels using:
- Other environmentally friendly transport devices (bicycles, walking, public transport),
- Carpooling,
- Hybrid vehicle

There are different ways to save energy, namely:

- Changing its behavior by limiting its energy consumption,
- Take advantage of the renewable energies that make it possible to realize the energy savings taking into account the ecology and the environment,
- Improving energy efficiency also saves money,

Emphasize savings in its habitat by:

- Opting for an energy-saving home
- Performing energy-saving work
- Equipping his home differently, such as saving electricity

- Saving water (recovering rainwater or opting for water reducers);

By consuming it differently, that is to say by choosing the ecological purchase (short circuit, know how to decrypt the logos on the packaging).

What are the aids to save energy?

There are various ways to help you improve the energy efficiency of your home. However, these were reformed, but strengthened on heavy renovations. It also depends on household income.

2.4.3 Changing consumption habits

Because of the great crisis that is going in France, French people are changing their consumption habits.

At first, French people are stopping to buy things they consider as useless. Movies for example have now been mostly replaced by streaming, or apartments and houses are now rented instead of being bought. By those kinds of choices, most of the French are saving money for other stuffs.

Those “other stuffs” we were talking about is in France mostly food. Because French people are not spending money on products considered as useless, they now buy things considered as vital like food or medication.

As we told you before, they are now also spending money on services like streaming or renting companies but in comparison of general spending on CD’s or property rights, this spending is way less expensive. And even though it would get more expensive, you could stop spending money for one company and go for a cheaper one whenever you want!

You may wonder, “It’s great but only a few people do that, right?” well you would be right a few years before! The thing is that because of the number of people who were changing their consumption habits kept increasing, that are why most of the services and food companies had to change their own selling habits as their benefit was decreasing. And so today those companies now sell movies downloadable for your computer for example, or in general, things that you could find on the Internet but cheaper. That way, those companies regain the benefit they were losing.

To conclude, French people are already changing their consumption habits, without realizing they are, because it feels like a common thing to do!

2.4.4 French organic food

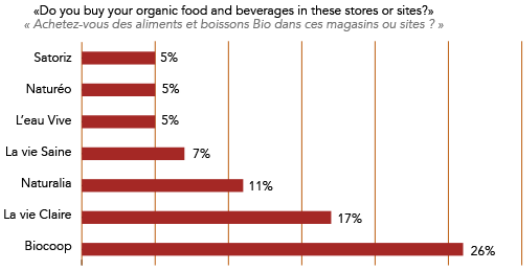
Biodiversity, air and water quality, soil fertility, climate and human health are all areas that are thought to benefit from organic agriculture. The primary benefits come from the lack of negative impacts by using synthetic chemical products in organic agriculture.

Consequently, the organic market in France continues its growth. At European level, the country ranks in second place for the number of consumers behind Germany, with 76% of organic products coming from France.

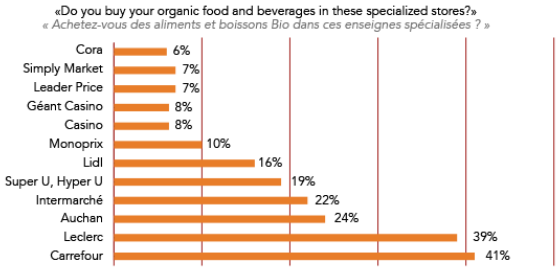
To the end of 2016, with a 10% growth, organic sales are expected to reach **5.5 billion euros,** across all channels.

In specialty stores, sales rose 15% and 7.4% for the supermarkets since early 2015. In general, **the French buy organic products more in supermarkets/hypermarkets (74%) rather than in the specialized networks (37.8%).** Here are the results of Toluna survey, conducted for the magazine LSA on 15 and 16 September 2015 to 2 018 people aged 18 years and older to learn more about the favorite organic points of sale of French consumers.

The 12 Retailers most visited by organic buyers
Les 12 magasins généralistes les plus fréquentés par les acheteurs de bio :



The 7 most popular specialty stores for organic buyers
Les 7 magasins spécialisés les plus fréquentés par les acheteurs de bio :



The French government has accepted a proposal made by Brigitte Allain of Europe Écologie Les Verts (Europe Ecology – The Greens) to impose a minimum amount of organic and seasonal produce into school canteens, public sector catering and social services.

The amendment to the law means that at least 40% of such food must be seasonal and locally-grown, and 20% must be certified as organic. We spoke to Eva Muller of Slow Food France for her take on the matter:

"While it certainly seems like good news on paper, there still is a lot of work ahead for this motion to come into being, but there is a very real interest in it being carried forward, particularly among producers of organic food.

Ideally I think all the canteen and restaurant employees will have to be committed to the initiative, not just the teams working directly in the kitchens. Indeed, for this amendment to make any sense it's going to take a considerable investment, and real dynamism from all actors in the food industry: to organize production, to promote organic producers for whom extra land will be needed. Logistics is also a key element. In my region, producers have gathered to put a local distribution platform in place: we need more projects like this, whether they are initiated by producers or communities.

As far as the kitchens are concerned, it may be necessary to raise awareness among people who work with food, as in many cases they are not convinced of the need for a change in eating habits. It may also be necessary to offer training in order to facilitate the amendment's implementation, as well as visits to organic producers in order to publicize the work they do.

If seasonal, local and organic food is an essential first step, we must look ahead to the next steps: revising the quota of animal protein served each week in canteen and restaurant menus, and favoring a more plant-based protein regime. Emphasizing the importance of combating food waste is also an essential element: there are large amounts of food wasted that could be put to better use. And last but not least, the need to raise awareness among consumers on the considerable benefits these changes will have for our health, our economy, and our environment.

There are more and more canteens and restaurants that have integrated organic local products into their menus but unfortunately they remain a minority. It's our job to share these practices as best we can.

2.4.5 **Reduce, reuse, recycle**

In the past century or two, the human population has increased significantly and so have our needs. New ideas with every new generation, people finding ways to improve their lives. It's a good thing i guess but cons come with pros like bad comes with good. The increase in the population, their ideas and their needs have heightened the need to create more, to provide more to all. We have used more resources in these past 100 years than the whole mankind had ever used. With all these awesome ideas and progress we're making we are also producing a lot of waste. And we're running out of space. This is where the three 'R's come in, Reuse, Reduce and Recycle. Recycling can be used to regenerate materials and manufacture different types of products while saving resources.

France is the second biggest producer of waste in the European Union, with a total of 355 million tonnes. In 2010 64% of this waste was recovered, according to a report by the Department of the Commissioner-General for Sustainable Development (CGDD) published in January 2013.

France recycles 60% of its waste. Between 2008 and 2010, the last year for which official statistics are available, the amount of waste recycled increased from 194.5 to 200.6 million tonnes, in particular thanks to a big increase in sorting and composting, amounting to an additional two million tonnes. More generally, 355 million tonnes of waste was produced in 2010, i.e. 10 million tonnes more than in 2008. 70% is mineral waste, mainly from the construction industry (260 million tonnes). The remainder is waste from households (29 million tonnes), the service sector (25 million tonnes), industry (22 million tonnes), sewerage (15 million tonnes) and agriculture and fishing (1.7 million). 3% is hazardous waste, i.e. represents a risk for health and the environment. In 2012, the recycling rate for glass in France was 86%.France recycled 97% of its steel in 2012 (including clinker, waste from incineration).In 2012, the recycling rate for aluminium was 32%.

Here in France we use different coloured containers for different types of wastes like grey containers for house hold wastes which is collected on every Tuesday and Friday, Green containers for glass which is collected on every Tuesday of an odd week, plastic, cartons, and papers on every Wednesday and Friday. And bulky stuff like furniture or anything big that you don't need any more on the 2nd Monday of every month. But the days and other specific things depend on your city and where you are because every city and department has their own rules and town halls which decide the days and all. Collection dates and times are announced in an "arrêté municipal". The hours when it is permissible to put waste bins outside on the road are also communicated in this announcement. Not respecting the times can result in a fine. Waste bins are often provided for free by the communes. When they are not, the cityhall can require residents to buy bins of specific colours and dimensions.

At a recycling centre on the outskirts of the city, workers hand separate items before technology takes over: steel is removed with a magnet, and plastic and cans are kept together, while paper and card are shipped by barge to a plant in Rouen for pulping.

All the separate recycling processes are done within France. France has pioneered some recycling technologies so that until recently, the UK shipped some of its recyclable waste to be processed in France.

Some items are dangerous to the environment and must be disposed of differently: Paints, toxic products and waste oil from vehicles all need to be taken to the waste collection centre. Tyres may not be disposed of at a waste collection site. They must be taken to a garage which is required by law to take them back free of charge. Batteries should be left at collection points often found in the entrance of supermarkets and electronic shops. All shops selling batteries are obliged by law to take back the old ones for free.

2.4.6 **Rethinking transports**

Red-alert pollution levels have prompted several French cities to make public transport and green schemes, like Paris's Velib bike-share and Autolib electric cars, more important.

For example, the density of the Paris public transport network makes it possible to get around quickly and efficiently throughout the city and beyond the city ring road. This network, which is becoming more and more ecological, is made up of metros and RERs (suburban trains), trams and buses.

For travelers who prefer to get around by car, Paris already has initiatives that enable us to travel by car and go to, or be dropped off directly at, the entrance to the place we want to get to, whilst minimizing our impact on the environment.

In 2011, Paris City Council introduced Autolib', a short-term self-service rental service for 100%-electric cars. A vehicle rented from one station can be dropped off at a different station, enabling passengers to go where they wish in Paris or in one of the other 63 towns and villages equipped with Autolib' stations in the suburbs. It is the first public service of its kind to be to be developed on a city-wide scale and was quickly taken up by Parisians.

By the way, some taxi companies offer fleets of vehicles that operate with hybrid technology or are equipped with combustion engine that emits less CO2. Whether we rent a bicycle for a day or use a **Vélib'** (the short-term rental service put in place by the Mayor of Paris in 2007), this leisurely and green way of getting around is popular with Parisians and tourists! Vélib' is a phenomenal success and the service has been extended to outlying areas of Paris, beyond the city's ring road. It offers the advantages of getting around at ground level, the pleasure of an outdoor activity combined with sightseeing, and a clear conscience for the user as it is a non-polluting mode of transport.

2.5 Good practices in Italy

2.5.1 Introduction

When we destroy or contaminate the environment with various waste, we pollute. Every inhabitants of the Earth must contribute to the State of health of the planet, because all we use the natural resources and all we produce material of discard. The air is one of the most precious resources of our planet. Nowadays we see many cities especially Milano, Roma, Firenze, Napoli etc. enveloped in a cloud of smog that make unbreathable the air. This reality has led Italy, at both public and private level to take innovative measures aimed at countering these phenomena. However air quality depends also on us, with small daily cares, each of us can help to improve it. On April 12, 2016, the Permanent Mission of Italy hosted a high-level conference on the topic of "Fighting Climate Change: Sharing Italy's Innovative Technology." The event gathered representatives from major Italian companies working in the field of innovative and sustainable technologies. During the event, the participants had the opportunity to showcase tips and best practices on how they work to mitigate the harmful effects of climate change, in Italy and around the world.

2.5.2 How to reduce air pollution

- Reducing the number of cars on the road. Public transportation is an alternative
- Move more walking or cycling

- Opt for hybrid or electric vehicles

- Disseminating shared transport(Buses at the request, taxis, car and bike sharing)

- Limit physical activity outdoor in high-traffic areas

- Installation of the stacked up parking lots to permit to build local areas such as more parks and gardens

- Planting tillandsia plants is one step towards solving the dreadful air pollution problem.

- They are environment-friendly alternatives to other houseplants which require a lot of attention and work.
- The environment would be much healthier and cleaner if the some of cars/buses were solar powered

- Many Italian cities put into place traffic restriction, cars with odd-numbered plates and vice-versa
- Improve the thermal insulation of your home
- Regularized the thermostat at a temperature never exceeding 20 degrees for saving Energy
- Buy A+++ class appliances

- Use only Energy saving light bulbs

- Do properly re cycling. If all the people did this, we could save the Earth

2.5.3 What to do against water pollution and wastage of water ?

Each of us could help to the decrease in water pollution by adopting more responsible behaviors, it would be enough to take care of some actions we make daily, for example:

-Choose a shower instead of a bath

-Turn off the tap while brushing teeth

-Many towns in Italy, in Basilicata and in S.Angelo le Fratte, municipalities have construct some “Water House” to reduce the use of plastic bottles

-Use less chemicals to clean opting for those natural

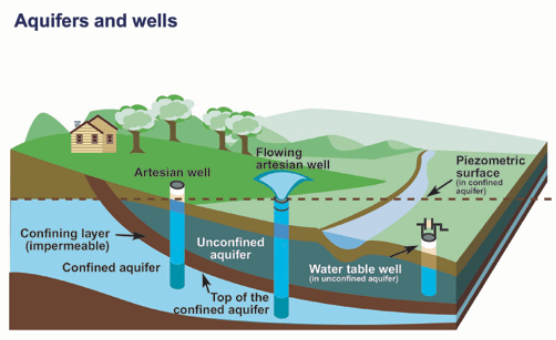
-Avoid the use of plastic; not being biodegradable often ends up in rivers, lakes, seas

Others good solutions are:

-Install of sewage treatment plants wastewater, that is the water returning to the natural environment

-Retrieve the toxic substances used by industries for reuse in production processes

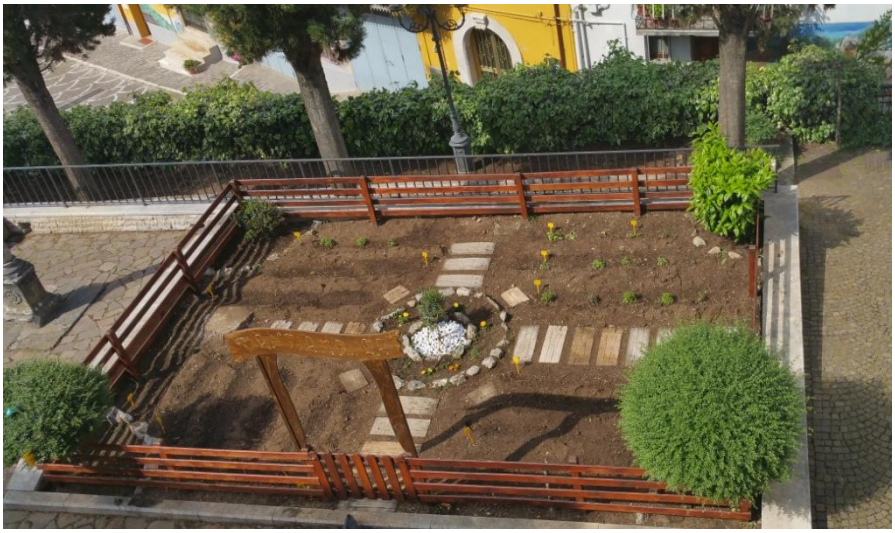
-Limit consumption pesticides and fertilizers in agriculture and building of wells in ground water at levels greater depth



2.5.4 How to limit soil pollution ?

Every day we contribute unknowingly to soil with some eco crimes that should be corrected. But what are good rules to follow?

- Engaging with the separate collection of waste
- Preferable use biodegradable containers. The accumulation of waste, such as plastic, takes many years or decades of decline.
- In our school we are doing a project about “Vegetable Garden” and our students fill in the box compost the organic waste after lunch in the canteen school.



- There are many towns of Basilicata we can find the installation of solar pannel and wind turbines.

2.5.5 **Solutions against noise pollution**

Campaign under way green train monitored throughout Italy the quality of air and environment, including levels of noise pollution. The record end noise in protect areas and even exceeding the limits by the acoustic zoning approved by munipalities also of 15-20 decibel in parks and near factories has particularly worried. In the cities most popolate, where the main sources of noise is traffic, can use hibrid and electric cars, the asphalt sound-absorbing and green barriers with colonners plants such as cipresses, laurels and cover around trees with grass.

2.6 Good practices in Romania

2.6.1 Introduction

Alternative energy is a term used for some energy sources and energy storage technologies. Generally, it indicates energies that are non-traditional and have low environmental impact. The term “alternative energy” is used in contrast with the term fossil fuel according to some sources, and other sources use it in the sense of renewable energy. These new resources need to gradually replace the traditional polluting and exhaustible resources, ensuring the protection of the natural environment and the energy security. The energy sector is of vital importance for the economic and social development and in improving the quality of people’s life. Ensuring sufficient energy supply and widespread access to energy services, especially to the green energy from renewable sources, is a basic requirement for sustainable development.

Aware of the fact that “traditional” energy resources are limited and very polluting, and that humankind is bound to move towards renewable and non-polluting sources of energy, Romania, as well as the entire world, is moving towards a strategy based on the production and gradual use of the types of green energy in order to reduce the use of exhaustible resources and to reduce pollution.

The entire world economy still depends largely on hydrocarbons and coal as main energy resources and the struggle for energy resources dominates the geopolitics of the 21st century, often leading to political instability in some states. Once considered as inexhaustible, the energy and raw materials are generally limited and unevenly distributed across the Earth. There is also a resource scarcity law, which consists in the fact that the volume, structure and quality of the economic resources and goods are changing more slowly than those of human needs. Over the last few years, environmental pollution, the problem of energy resource depletion and energy security dominate the agendas of state leaders. The spectrum of pollution and the depletion of energy resources in the coming years has been a serious alarm signal and it has led to the identification of possibilities in substituting the exhaustible resources and to reducing the environmental imbalances caused by the exploitation, processing and utilization of the resources used up to now.

This alarm signal also prompted Romania to operate with new concepts, such as reducing environmental pollution and energy security. For most specialists, energy security means producing the necessary energy in one's own country, as little import dependency as possible, with a view mainly to sustainable development by identifying and exploiting alternative

energy sources, reducing environmental pollution and retechnologizing and modernizing existing transport routes. In this context, Romania is a member of the European Community countries, a state with an industry mainly based on the consumption of exhausting, polluting resources, but also a state with real possibilities to develop an energy structure based on renewable resources. In order to ensure energy security and for sustainable development, in the last few years, Romania has oriented as much as possible to the development of green energy exploitation technologies, taking into account the following potential of renewable resources within its territory.

- The Danube Delta (solar energy)
- Dobrogea (solar and wind energy)
- Moldova (plain and plateau – micro hydro, wind and biomass energy)
- The Carpathian Mountains (biomass, micro hydro)
- The Transylvanian Plateau (micro hydro)
- The Western Plain (geothermal energy)
- The Subcarpathians (biomass, micro hydro)
- The Southern Plain (biomass, geothermal and solar energy)

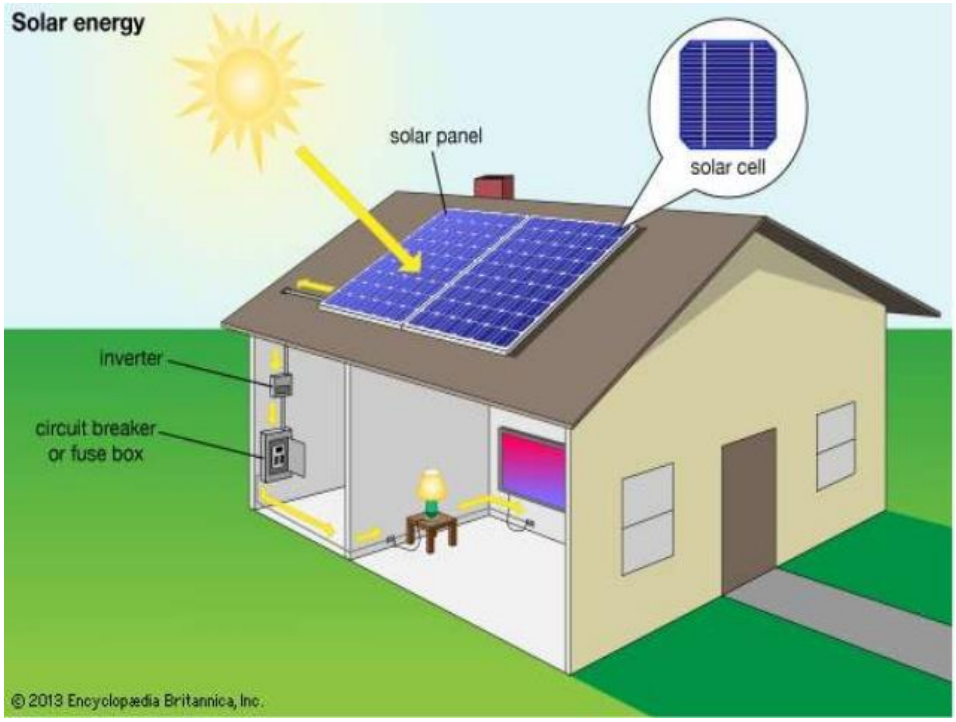
2.6.2 The Exploitation of the Solar Potential in Romania

The production of electricity from solar energy is based on thermal installations and photovoltaic panels. The ways in which solar energy is used are limited only by human imagination. A partial list of solar energy applications includes the heating and cooling of the areas using solar architecture, supplying drinking water by distillation and disinfection, lighting, hot water production, cooking with the help of solar energy and high heat temperatures used for industrial purposes. Solar panels are usually used to capture solar energy.

Generally, solar technologies can be passive or active, depending on the way in which the solar energy is captured, converted and distributed. The active solar techniques include the use of photovoltaic panels and thermal collectors to capture the energy. The passive solar techniques include the orientation of a building towards the sun, the selection of materials with a favorable thermal mass or light dispersion properties, as well as the design of the spaces so that the circulation of air occurs naturally.

Starting from the available information, the map showing the territorial distribution of solar radiation in Romania has been drawn. The map shows the distribution of annual average flows of the incident solar energy on the horizontal surface of Romania.

Five areas are distinguished by the values of average annual flows of incident solar energy. It is found that more than half the country's area benefits from an average annual flow of 1275 kWh/m2.



The special areas of interest for the electroenergetic applications of solar energy in our country are:

- The first area, which includes the areas with the highest potential, covers Dobrogea and a large part of the Romanian Plain.
- The second area, with a good potential, includes the north of the Romanian Plain, The Getic Plateau, the Oltenia and Muntenia Subcarpathians, a large part of the Danube meadow, the south and the centre of the Moldavian Plateau and The Western Plain and Hills and the west of the Transylvania Plateau, where the solar radiation on the horizontal surface ranges between 1300 MJ/m2 and 1400 MJ/m2.

- The third area, with a moderated potential, disposes of less than 1300 MJ/m2 and covers a large part of the Transylvania Plateau, the north of the Moldavian Plateau and the Carpathian Frame.

Especially in the mountain area the variation on the territory of the direct solar radiation is very large, the negative forms of relief favoring the persistence of fog and decreasing even the possible sunshine duration, whereas the positive forms of relief, depending on the orientation towards the sun, and with the air circulation dominant direction, can foster or decrease the direct solar radiation.

The other two areas are situated under the necessary limit of efficient use of solar energy, covering the mountainous areas of Romania.

2.6.3 The Exploitation of the Wind Potential in Romania

The wind power is widely used today, and new wind turbines are being built all around the world, wind power being the fastest growing energy source in recent years. Most turbines produce energy in over 25% of the time, this percentage rising in the winter when the winds are stronger.

It is believed that the world's technical potential for wind power can provide five times more energy than it is consumed now. This level of exploitation would require 12.7% of the Earth's surface (excluding the oceans) to be covered by turbine parks, assuming that the land would be covered with 6 large wind turbines per square kilometer. These figures do not take into account the improvement of turbine efficiency and the technical solutions used.

In the strategy for exploitation of the renewable energy sources in Romania, the declared wind potential is 14,000 MW (installed power), which can provide an amount of energy of about 23,000 GWh/year. These values represent an estimate of the theoretical potential, and should be tinted according to the possibilities of technical and economic exploitation.

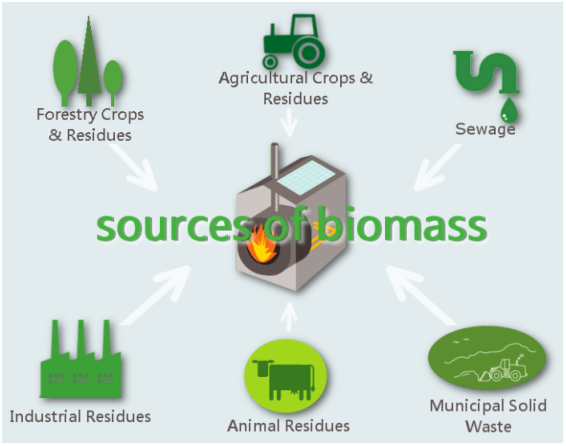
However, what is of interest in the energy development forecasts is the potential for practical use in wind applications, which is much lower than the theoretical potential, depending on the possibilities of land use and the conditions on the energy market. That is why the economically exploitable wind potential can be appreciated only in the medium-term, based on the technological and economic data known today and also considered valid in the medium-term, namely:

- the technic wind potential conditions in Romania (the wind speed), which are close to the average of wind conditions across Europe;
- the energy policy and the energy market in Romania will be integrated into the European policy and European energy market and, in conclusion, the macroeconomic correlation indicators of the medium- and long-term renewable energy potential (2030-2050) should be close to the European average indicators.

According to this evolution, the electricity produced from wind sources provides about 2% of gross electricity consumption in 2014. In relation to the amount of energy provided from renewable sources without high hydro energy, the wind energy would provide 12.3 % of this amount.

2.6.4 The Exploitation of Biomass in Romania

The biomass is the biodegradable fraction of products, waste and residues from agriculture, including plant and animal substances, forestry and related industries, as well as the biodegradable fraction of industrial and urban waste. (Definition in Decision No. 1844/2005 on the promotion of the use of biofuels and other renewable fuels for transport).



Forms of energy exploitation of biomass (biofuels):

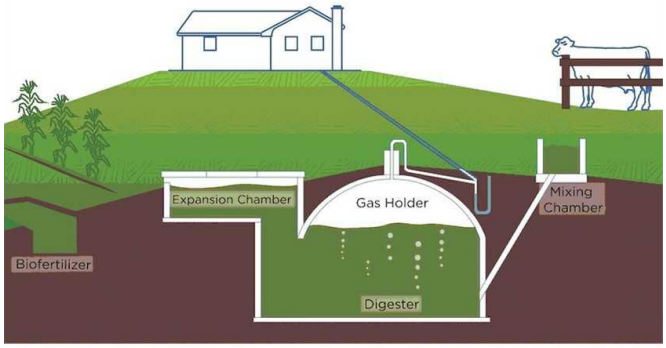
• Direct burning with heat generation

• Pyrolysis burning

• Fermentation, with biogas (CH4) or bioethanol (CH3-CH2-OH) -

• Chemical transformation of vegetable oil type biomass

• Enzymatic degradation of biomass to produce ethanol or biodiesel.



From the point of view of the energy potential of biomass, Romania's territory has been divided into eight regions: The Danube Delta - Biosphere Reserve; Dobrogea; Moldova; The

Carpathian Mountains (Eastern, Southern, Western); The Transylvania Plateau; The Western Plain; The Subcarpathians; The Southern Plain.

2.6.5 The Exploitation of Hydroenergy in Romania

The energy from the rain water and water courses is a source used by people since ancient times, the hydraulic wheel being used to produce mechanical energy.

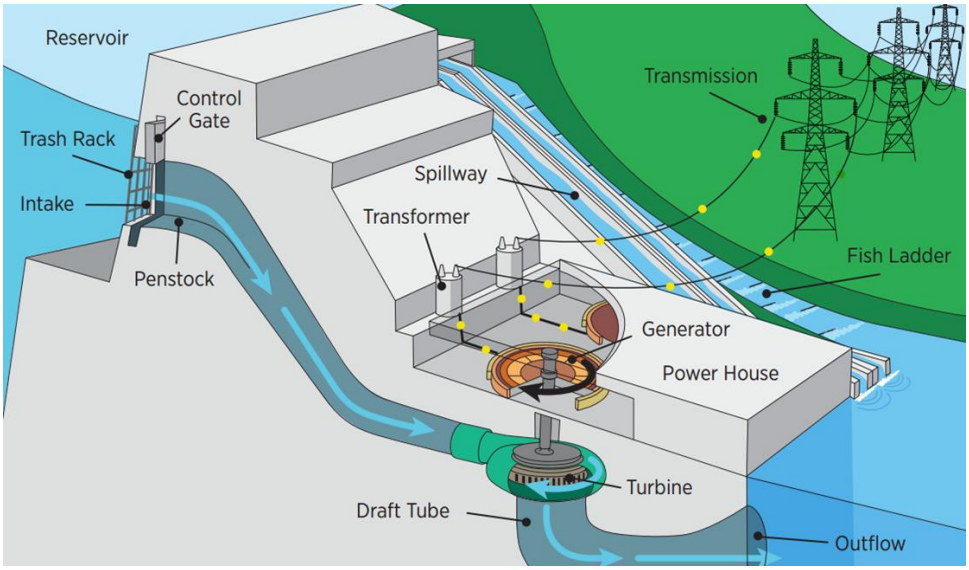
Once the electricity was discovered, the possibility of using the hydraulic energy increased, but it was used even more intense starting with the 1930s in the 20th century. The advantage of this source lies in the fact that it is renewable, non-polluting and cheap. Moreover, the equipment dedicated to using the given energy, even if expensive, allows solving other problems too, such as: the regulation of the river flow, drinking water supply, field irrigation, improving navigation conditions, etc.

The global potential of hydraulic energy is divided in three categories: theoretical potential, technical potential and economic potential.

The theoretical potential includes the total energy of the flows of the water sources in relation with their basic levels, that is the energy of the flowing waters, if we calculate it taking into account the water mass and the height difference between the spring and the mouth of the river.

The technical potential arises from the fact that the energy from the low water drop portions cannot be used. By this it is explained the fact that its value is twice smaller than the value of the theoretical potential.

The economic potential represents the part of the technically adjustable resources which is considered economically profitable in comparison to other energetic sources.



Water resources due to Romania's inland rivers are valued at about 42 billion m3/year, but under unplanned conditions it can only coun on about 19 million m3/year due to fluctuations in river flows. Water resources inside the country are characterized by great variability, both in space and in time. Thus, large and important areas, such as the Romanian Plain, the Moldova Plateau and Dobrogea, are qualified as water scarce. There are also large flow variations in time, both in the course of one year and from one year to another. In the spring months (March-June), more than 50% of the annual stock flows, reaching maximum flows of hundreds of times bigger than the minimum ones. All of these require the need to achieve flow compensation with artificial accumulation.

Regarding the hydroenergetic potential of our country it is estimated that the theoretical potential of precipitation is about 230 TWh/year, the theoretical potential of drainage waters of about 90 TWh/year and the theoretical linear potential of the water courses is 70 TWh/year. The average theoretical potential of the rivers in our country, including the share of Romania's potential from the Danube, amounts to 70 TWh/year, of which the technically feasible potential is 40 TWh/year (2/3 given by the inland rivers and 1/3 by the Danube). As in the case of wind applications, the technically feasible hydroenergetic potential is lower than the theoretical one and in this sense we estimate a value of approximately 1 100 MW and a production of 3,600 GWh / year.

The economic efficiency of hydro power plants depends on:

- the location and the associated investment (including administrative expenses)

- the installed power and the probable energy production (flow regime, drops)
- the distance from the network
- the maintenance needs (automation degree, remote operation without personnel, reliability)
- the financial conditions and the price for the utilization of the produced energy.

2.6.6 The Exploitation of Geothermal Potential in Romania

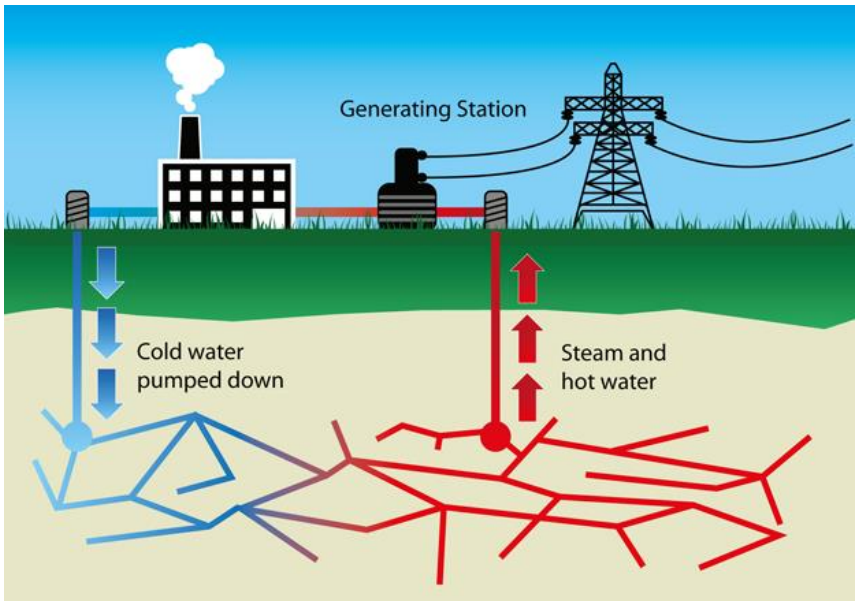
Geothermal energy is part of the renewable energy class (green) and represents the heat which comes from inside the Earth (through rocks and underground fluids); it is obtained by capturing hot water and steam in volcanic and tectonic areas or underground heat. It can be used for heating (dwelling, water), for tourist purposes, but also for energy production.

It is a non-polluting energy, and people have used hot springs for thousands of years for various purposes - for bathing, as a source of cooking water, then in spa resorts and ultimately to produce energy from them. Now, with geothermal energy, homes are heated, plants are grown in greenhouses, crops are dried, water is heated in fish farms, industrial processes are carried out (such as pasteurization of milk).

Theoretically, Romania has a remarkable potential in terms of geothermal energy, being considered the third country in Europe, after Greece and Italy, in this respect.

On the territory of Romania, more than 200 operations of drilling for hydrocarbons encountered at depths ranging between 800 and 3500 m, geothermal resources of low and medium enthalpy (40-120 ° C).

The experimental exploitation of about 100 drilling operations over the past 25 years has allowed the assessment of the energy potential of this type of resource. From a total of 14 geothermal wells dug between 1995-2000 to depths of 1500-3000 m, only two wells were unproductive, with a success rate of 86%. Basically, a single town in the country, Beius, relies entirely on this type of energy for heating homes and has important projects to become a true geothermal ecological center.



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Chapter 3 - Environmental protection and and problems faced by countries regarding decision making in conservation management

3.1 Introduction

Environment is becoming an important national and transnational issue. It has been ages since our land cover has undergone a process of transformation which involves anyone, any inhabitant of the globe who also unconsciously is facing increasingly hard problems which are compromising or better have compromised our environment and environmental security

Are we aware of what is going on? Are we aware of environmental problems? Do we still think that pollution is the only problem we are facing? Do we realize that our lives and the future generations' lives are at stake?

Leading examples of emerging environmental changes are: depletion and pollution of fresh water, depletion of fisheries, degradation and disappearance of biodiversity, loss of agriculture lands, food and health safety, stratospheric ozone depletion, and global warming, climate changes just to name few. But what are they? What do they mean?

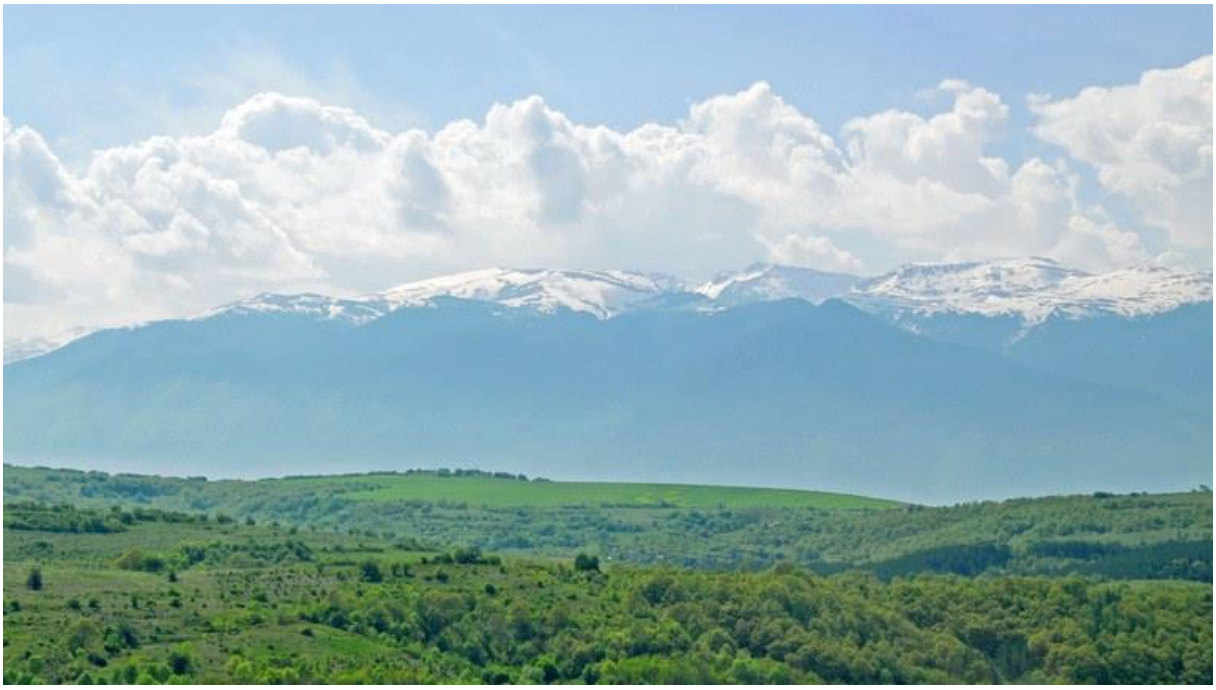
The EU has been at the forefront of international efforts towards a global climate deal. Following limited participation in the Kyoto Protocol and the lack of agreement in Copenhagen in 2009, the EU has been building a broad coalition of developed and developing countries in favour of high ambition that shaped the successful outcome of the Paris conference.

The EU was the first major economy to submit its intended contribution to the new agreement in March 2015. It is already taking steps to implement its target to reduce emissions by at least 40% by 2030.

Prof.ssa Romaniello Rosalba
Prof.ssa Palese Assunta Maria
IC Satriano di Lucania (PZ) ITALY

3.2 Environmental protection in Bulgaria

3.2.1 Environmental protection and countries' problems deciding on how to manage conservation



3.2.2 Main policy responses to key environmental challenges and concerns

In Bulgaria emphasis is increasingly placed on national environmental protection and the prevention and adaptation to climate change. The main legislative initiatives intending to increase the efficiency of the governance of environmental policies and to improve the business environment are:

- draft amendments to the Protected Areas Act, Medical Plants Act and Biodiversity Act, to reduce the regulatory and administrative burden of regulatory regimes in relation to biodiversity conservation.
- proposal for amendments to the Water Act, which mainly aims at accelerating the process of determining the sanitary - protective zones around water intake facilities for drinking water, full harmonization of the framework for Community action in the field of water policy and implementation of new higher environmental standards for water.
- Amendment to the Law on the responsibility to prevent and remedy environmental damage, which are included in the Draft Law amending the Law on Genetically Modified

Organisms in order to ensure effective control over the prevention and remedying of environmental damage.

A new Waste Management Act, which updates the requirements for waste management and establishes national targets for recycling of household and construction waste.

3.2.3 Air quality - problems and measures to improve it

The quality of the air we breathe affects our health and lives.

Economic activities related to road traffic, electricity and heat generation, industry and agriculture are a major source of air pollution. To improve air quality in the future, the use of "green" and more efficient technologies as regards the thermal insulation of buildings as well as the use of alternative fuel sources in households and transport, use of the best available technologies in the industry and others.

Few years ago municipalities with public transport and especially Sofia started to buy more and more busses working with natural gas. Hopefully, at some point, all the busses will be changed soon.

3.2.4 **Water management and water quality**

Conservation of the quality of natural and drinking water is a primary task of society in order to guarantee the health of living for the individual and a high standard of public health.

Compared to other European countries, Bulgaria is characterized by relatively significant fresh water resources, both in absolute terms and per capita.Water resources in Bulgaria are predominantly formed by external inflows and are unevenly distributed throughout the country. Fresh water resources in Bulgaria are about 14 thousand m 3 / yr. average per person who places the country among the top 10 European countries. Nevertheless, certain areas of the country may experience water shortages due to the uneven territorial distribution of resources. Bulgaria is among the European countries with high levels of seized water per person on average due to the significant volumes required for cooling. At the same time, water abstraction in Bulgaria does not cause stress on the aquatic ecosystem.

The amount of waste and cooling water generated by economic activities follows the level of consumption. On average, about 79% of the total water used for the economy (2000-2013) is taken to water bodies or public sewers. Improvement of the level of purification - in 2005, 56% of the wastewater discharged into water bodies was treated with at least secondary methods and 66% in 2013. Public sewerage in the country is predominantly mixed and collects both industrial, domestic and rainwater. The share of the population connected with waste water stations is highest in the Black Sea and Danube basin districts - with predominantly secondary and tertiary purification. Compared to 2012, water bodies in the

"bad" category are 4 times less (8 in 2012 and 3 in 2013). Medium-term trends during the period 2006-2013 show a relative improvement in the state of the coastal seas.

3.2.5 Biodiversity. National Ecological Network

One of the most critical environmental threats on a global scale is the loss of biodiversity. Under the influence of predominantly human activities, species nowadays disappear from 100 to 1000 times faster than normal. In the last decades, almost all ecosystems have been affected by a number of negative factors such as habitat destruction, pollution, over-exploitation and climate change.

To provide food and water and to reduce the risk of disasters, biodiversity is a powerful engine that underpins the current and future sustainability goals.

Bulgaria is a member of the Convention on Biological Diversity (CBD) since 1996 and the MOEW biodiversity policy is related to the implementation of its three objectives - conservation, sustainable use of biodiversity and access and equal distribution of the benefits of genetic resources.

There is an example of a cosmetic company that raised a fund to “adopt” a forest. The company pays the owners of the parcel the amount of money they would earn by cutting the trees and selling them and in return they take the responsibility not to allow ruining the forest and its habitants.

There are at least two active campaigns for planting more trees. The first is called “When we get 100 000 we’ll plant a forest” and is organized as a photo competition between schools all over Bulgaria. Each photo collects votes and receives a hundred trees to plant. The second one is a Sofia municipality campaign for volunteers to plant trees around the city.

3.2.6 Waste and material resources

Waste is seen as an environmental, social and economic problem, and growing consumption and "consumer" behavior continue to produce large quantities of waste. The reality is that large and diverse efforts are needed to prevent them from forming. Waste is also a waste of material resources (through metals and other recyclable materials), and at the same time have potential as energy sources. The waste management challenge is great, but the answer can be found in reuse and recycling! The implementation of these waste treatment activities are environmental friendly, leading to diversion of waste from landfills, thereby reducing polluting emissions, providing opportunities for economic and social benefits: generating economic growth, promoting innovation, creating jobs places, and help ensure the availability of critical resources.

A positive trend towards improved waste management practices is maintained in 2014, achieving national targets for municipal waste recycling, recovery and recycling of packaging waste, and last but not least, the recycling targets for widespread waste (EEA, "SOER-Synthesis2015").

A waste for one is a treasure for another! A lot of people like to use second hand stuff. There are many shops for second hand clothes where people like to search for “treasures” that are cheaper and often one of a kind. You can find groups in the social platforms where people exchange stuff or trade them at lower price or just give them as a gift for people in need. There are some containers on the streets where you can put useful old clothes for someone that will need them.

My food is your food! There were some Help corners around Sofia, where people can put food in public out-of-door fridges for people in need round-the-clock. The food can be bought or from your own fridge. A group of young people initiated this activity when seeing how much food is getting wasted every day.

3.2.7 **Eco tourism**

Waste is seen as an environmental, social and economic problem, and growing consumption and "consumer" behavior continue to produce large quantities of waste. The reality is that

Vazov's eco path

Ecotourism is now defined as "responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" (TIES, 2015). Education is meant to be inclusive of both staff and guests.

It is about *uniting conservation, communities, and sustainable travel*. This means that those who implement, participate in and market ecotourism activities should adopt the following ecotourism principles:

- Minimize physical, social, behavioral, and psychological impacts.
- Build environmental and cultural awareness and respect.
- Provide positive experiences for both visitors and hosts.
- Provide direct financial benefits for conservation.
- Generate financial benefits for both local people and private industry.
- Deliver memorable interpretative experiences to visitors that help raise sensitivity to host countries' political, environmental, and social climates.
- Design, construct and operate low-impact facilities.
- Recognize the rights and spiritual beliefs of the Indigenous People in your community and work in partnership with them to create empowerment.

Bulgaria is familiar with this kind of tourism for about 10 – 15 years. There is a tendency to prefer a "village' or "eco" way of exploring the country. According to Ecotourism magazine,

there are many different opportunities to practice it – mountain transitions and hiking, photo tourism, observation of birds and many more. On the Bulgarian territory of 111 000 m^2 there are 3 national parks, 11 natural parks, 89 wildlife sanctuaries, over 2 200 natural landmarks and 37 000 km marked eco paths. When visiting, you can stay in a family hotel in a small village or to choose between numerous eco or green hotels.

An ecological hotel is one that is fully integrated into the environment without damaging the environment, contributing in some way to progress and improvement of the local community and sustainable growth of the tourism industry. ***We can only hope they really deserved the quality sign!***

Omaya Eco Village

3.2.8 Energy Strategy of Bulgaria by 2020

Bulgaria's energy strategy is the main strategic document at national level. The starting point for the development of the strategy is a European energy policy that targets sustainable energy development and its achievement is linked to long-term quantitative targets by 2020:

- 20% reduction in greenhouse gas emissions compared to 1990;
- 20% share of RES, incl. 10% share of biofuels in transport;
- Improve energy efficiency by 20%.

The results for the fulfillment of the national target under Directive 2006/32 / EC show that the country is currently over-performing the conditional target by 1%.

Year	2005	2006	2007	2008	2009	2010	2011	2012
RE ktoe (normalized)	1048	1118	1067	1183	1205	1429	1515	1680
RE share from total energy, %	9.54	9.74	9.43	10.72	12.44	14.40	16.64	16.34

3.2.9 Country specific issues

National objectives in line with the "Europe 2020" strategy"

"Europe 2020" strategy objectives	Present situation	Objectives of the National reforms program 2020[7]
3% of the GDP of EU goes for investment in scientific and research and development activities	0.6% (2012)	Increase up to 1.5%
20% decrease of GHG emissions compared to 1990 levels	minus 12% (prognosis for emissions in 2020[8] given 2005=100)	Increase with 20% max for sectors outside the ETS[9] (given 2005=100)
	plus 11% (emissions in 2010 given 2005=100)	
20% share of the RES in final energy consumption (incl.10% RES in the end consumption in transport)	16.4% (2012)	Increase the share to 16%
20% increase of the energy efficiency	17.4[10] Mtoe (2010)	Decrease with 3,2 Mtoe=15,8 Mtoe
75% employment of the population aged 20-64	63.5 (2013)	Increase the employment to 76%
Under 10% share of the early school leavers	12.4% (2013)	Decrease the share to 11%
At least 40% share of the aged 30-	29.1% (2013)	Increase the share to 36%

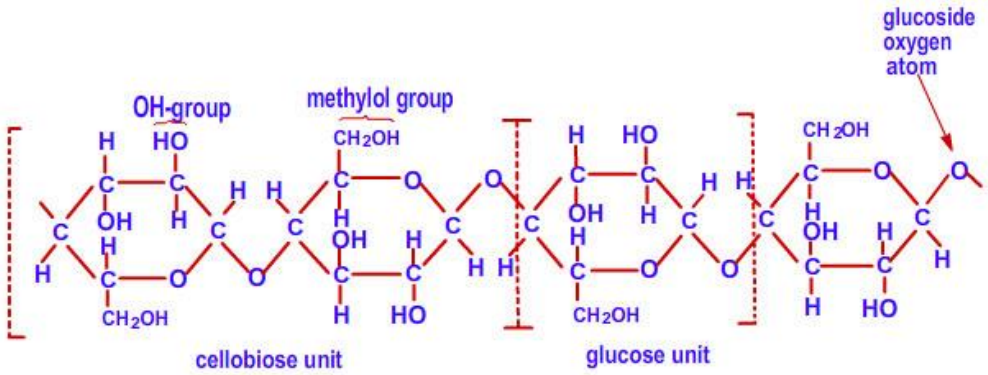
"Europe 2020" strategy objectives	Present situation	Objectives of the National reforms program 2020[7]
34 completed university		
Reducing the number of people living at risk of poverty or exclusion with 20 million	41.6% of the population	Decrease with 260,000

3.3 Environmental protection in Finland

3.3.1 Replacing cotton with synthetic fibers

When thinking in terms of efficiently using space and water, cotton is one of the worst things that you can dream of: It uses enormous amount of water and needs a ton of space to grow. That is the main reason for the growth of synthetic fiber industry. Synthetic fibers can be made tx. by using cellulose as the main starting component of the fiber. This is done by means of splitting the straight chain polymers of cellulose into smaller parts, and then later extruding them into components with the chain length and properties we need.

The structural formula of cellulose

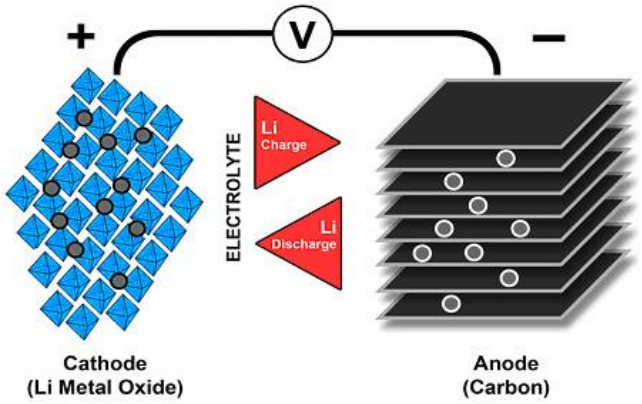


source (http://nptel.ac.in/courses/116102026/6)

3.3.2 Can electric cars save the planet?

The most commonly used batteries in the electric car industry are lithium-ion batteries, and if one compares just the middle of battery's lifespan with gasoline, battery will win every time, but the problem starts to creep in when we talk about producing and recycling lithium-ion batteries: those things are not as environmentally friendly as we would want them to be, this is mainly because lithium is a toxic alkali metal. But even though there may be some problems with recycling lithium-ion batteries, this industry has much more to offer and has better future perspectives than the dying out industries of fossil fuels and internal combustion engines.

Simplified version demonstrating the main principle of li-ion batteries



source (http://batteryuniversity.com/learn/archive/understanding_lithium_ion)
source(http://nptel.ac.in/courses/116102026/6)

3.3.3 **Recycling**

In Finland you can recycle pretty much anything; biowaste, plastics, bottles and cans, paper, cardboard, glass, electronics and metal. You can usually find recycling centers near supermarkets and malls. Every apartment building these days has a sorted dumpster where you can sort your trash. These, however, do not always have the option to sort plastics or electronics so if you want to them you might have to take them to a recycling center.

You can also recycle your clothes and other usable items you do not need in recycle centers

https://www.kierratyskeskus.fi/myymalat_ja_palvelut/itakeskuksen_kauppa

3.3.4 **Recycling clothes**

In Finland, recycling is working good and it is made as easy as possible to all citizens. What comes to clothes, it isn't hard at all to recycle useless pieces. For example chain store H&M receives useless clothes and other textiles. In return service they give you a discount voucher. I think that this is very useful system, and it should be used more. All those big chain stores have enough authority to make clothing recycling even more powerful. If you don't want to take your clothes or other useful textile pieces to stores, you can always go through the easiest way and take them to nearest recycling point. For example in Helsinki, there are recycling points basically everywhere. In the center of Helsinki, recycling points are more unusual than in suburb areas. Most of collected clothes end up to Africa, to reuse. Those clothes, that can no longer be in use become waste.

Beside options above, in Finland and especially in Helsinki we like to exploit flea markets and second hand stores. Every fashion-conscious teenager knows exactly where to shop and find bargains and vintage clothes.

<u>How you can save energy and resources on a daily basis</u>

Everyday in our lives we find ourselves in situations where we can save energy. They usually are really mondaine things to us so we usually don't even pay attention to them. However if you learn to spot these opportunities where you have the ability to make the decision of saving energy, you can reduce your own carbon footprint immensely! And in the end it doesn't take much of your time so why wouldn't you ?

Well now you are probably asking what do I need to do to reduce my carbon footprint ? Most of the times you have the opportunity to save energy and resources happen when you are just

living your normal live and doing normal things. Good example of situation like this is showering. Most of us go to shower every day. While we are cleansing ourselves, we have multiple opportunities to save some water and energy. For example next time you are in the shower ask yourself these questions. Do you leave the water running while you are applying shampoo to your hair ? Does your water need to be steaming hot ? Should you even shower everyday ?

We make these kind of decisions every day. These are situations where we know how to act because they are mondaine, but that's the problem. Because these situations are so normal to us we are on autopilot and we don't think about or actions and that's we miss the opportunity to have an influence to lives. Good thing for us is that we can make a change without needing to do much. All we have to do is make a mental note to ourselves and think more when we face these situations. If we all do this we can have an enormous impact together.

3.3.5 5.5 How to eat in an ecological way

In Finland, our daily food regimen contains more and more vegetables each year. Being a vegetarian is not just a hippie's trend anymore, it's getting pretty casual here. Most of the restaurants also have a vegetarian menu, and there's a lot of vegetarian restaurants. And before we continue, I just want to make clear that a vegetarian and a vegan is not the same thing. Vegetarians don't eat the body parts of any animals, but they might eat dairy products or eggs. Like vegetarians, vegans don't eat any animal flesh but they won't eat any dairy products or eggs either.

Choosing organic food over cheaper, but not finnish food is actually pretty wise. Just because organic food is more expensive, doesn't mean it's just a way to make more money. Organic agriculture actually employs our own citizens and the money doesn't just leave the country. It's also a lot fresher to eat something that comes from your own country! There's also savings in transportation since it doesn't come from across the country it's more friendly for our environment when the distance is not huge.

And besides, vegetarian diet is actually very versatile because it contains lots of protein and vitamins! If I could, I would challenge every single person in living and breathing in this world to try the one week vegan challenge and see the changes in their body and mind themselves.

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And besides, vegetarian diet is actually very versatile because it contains lots of protein and vitamins! If I could, I would challenge every single person in living and breathing in this world to try the one week vegan challenge and see the changes in their body and mind themselves.


3.3.6 **Waste processing in Finland**

In Finland waste processing is controlled by the ministry of environment, there is many regulations about how waste should be processed or recycled. The common regulations affect every kind of waste, except special and nuclear waste that has it's own laws and regulations. The base of every regulation and law is "jätelainsäädäntö" which is a legislation about waste overall. The legislation has 4 points that are the foundation to all other waste policy.

-Preventing the waste and waste management's harms to health and environment.

-Reduce the amount of harmfulness of waste.

-Support the sustainable use of natural resources.

-To ensure effective waste management and to prevent littering.

The finnish legislation follows the European union waste management regulations, but is in some cases stricter.

The latest changes to the laws were made in 2011, the new law replaced the old one made in 1993. When nuclear energy is being made, it produces different types of waste.

3.4 Environmental protection in France

3.4.1 Introduction

In France, different ways exist to protect our environment and this section describes how French people manage it.

3.4.2 Environmental groups and protection

- Velorution

Combine “Vélo”and “Revolution”, and you get Vélorution, a group that promotes cycling to cut down on pollution and congestion in the cities. They lobby for better bike lanes, bike parking, etc, and organize many events in the city throughout the year.

- Greenpeace France

You’ve probably seen the Greenpeace folks out and about in Paris in their green jackets trying to sign up new members. I was walking the dogs when they swooped in on me, and after giving them a good grilling on their current activities in France (which include lobbying against genetically-modified crops, nuclear energy, questionable toxic waste dumping in developing countries, and climate change).

- Réseau action climat France

This group covers the issue of Climate Change, with publications, the latest news, and events happening throughout France.

- Les Amis de la Terre

How can you not like a group called “Friends of the Earth”? Sounds so friendly, doesn’t it? They’re active in issues such as climate change, forest protection, nuclear and fossil fuel alternatives, lobbying against genetically-modified crops, and sustainable lifestyle practices

- Agir pour l'Environnement

This environmental lobby group is currently focusing its efforts on banning the exportation of nuclear energy (because they’ll be building power lines through the Alps and the Pyrenees), against genetically-modified foods, and banning motorized vehicles like ATVs and snow mobiles from nature reserves.

- Protection

As a member of the European Union, France is trying to change resource usage and production habits and to reduce environmental concerns. Many national and territorial action plans are being carried out to reduce emissions of pollution into water. In particular, the country’s Ecophyto action plan and designation of nitrate vulnerable zones are leading to transformations in agricultural practices. In addition, wastewater treatment plants are being improved via infrastructure programs.

French policies have also started supporting growth and development of environmentally-friendly businesses, including support for R&D and clean technology. The proportion of environmental training is also contributing to a fast integration of ecological issues into the economy. Since 2004, the amount of environment-related jobs has jumped by 36 percent.

3.4.3 Eco construction and innovation

Eco-building/Eco-construction or sustainable construction is the creation, restoration, renovation or rehabilitation of a building, enabling it to respect ecology at every stage of construction and, later, its use (heating, consumption energy, rejection of various flows: water, waste).Eco friendly buildings can range from the extreme, where everything is green

with even the toilet water recycled, through those where the fabric of the building is built from natural, sustainable materials such as straw bales and lime plaster, to those that simply incorporate small but effective changes.

However green you want to be, there is something that you can do towards a healthier future for this planet, and probably improve your own standard of living as you do so.

There are many companies now in France that specialise in alternative energy, eco friendly and green technology, We want to build a France fuelled by renewable energies, less dependent on oil and gas.

This is the first eco-district of Ile-de-France which was built on the banks of the Seine, in Issy-les-Moulineaux,. It is located on a former industrial wasteland.

3.4.4 **Eco tourism**

Ecotourism is very trendy all over the world. This sustainable tourism is really a growing activity in France. Eco-friendly tourism has been developed a lot in the country for the last 10 years. What about spending your holidays in the nature this year?

What is Ecotourism?

Ecotourism is a kind of tourism, which is more turned towards nature and ecology. This responsible tourism has been developed in France when people realized that tourism did not only have beneficial effects but, on the contrary, caused an important environmental pollution.

Respect is the key attitude to adopt while doing ecotourism: respect towards human beings, environment and the local culture.

3.4.5 **Repair café**

The repair cafe is an opportunity to repair or to have repaired together objects, by learning, rather than to throw. Or buy back ; small devices household electrical appliances, clothes, computing objects... And quite different easily transportable objects.

This project is to create and to co-create workshops in all the districts of the capital. We have already realized more than 25 Repair Café, in five districts, often with partner associations.

3.4.6 **Local farmers/markets**

In France, most of the country is used to produce all types of cultivable things like fruits, vegetables, wheat, basically everything you can farm. Due to that much products, farmers now sell by their own to customers, or in the food stores like Auchan or Grand Frais.

Of course products we can't cultivate in France are still being sold in those markets, but it is nice to buy and eat products coming from your country, because knowing that, you can deduce that meaning of transportations are less used than importing products from other countries, which is indeed way less polluting our atmosphere !

But, if for any reason you don't to buy those products, another solution exists in France! Nowadays, whenever a building is being built, the city lays out a place dedicated to farming for the habitants, so you can produce your own vegetables and fruits with some kind of community garden!

3.5 Environmental protection in Italy

3.5.1 Introduction

As repeated several times in the previous chapters of this book, the Environment rescue can be achieved essentially at two levels: at macro level, by means of politic choices shared by the Governments of most Countries in the world and encoded by specific legislation at national and international level; at micro level, by the daily behavior of the single aware citizen. In this section, both these aspects will be treated. Particularly, some solutions/indications taken by the Italian Government and/or by the scientific Community will be examined considering their points of weakness and strength and their diffusion possibility on the territory, as well as how simply people can conscientiously use and save Earth resources during their daily routine.

3.5.2 How to manage at macro level

Save freshwater! One of the more impactful human activity on water reserves is agriculture which uses from 50 to 80% of the total water consumption. In addition, climate change will strongly affect worldwide water availability further reducing the already scarce conventional water sources. This is a problem of high concern in Italy, as Mediterranean Country, but in the future it could become a problem also for Countries located in more northern world areas. Alternative irrigation water should be found so dedicating the high-quality water to human consumption. The reuse of municipal wastewater for irrigation could be a realistic way of reducing water shortage, as it has been demonstrated in many countries in the Mediterranean region such as Israel, Cyprus, Jordan and Tunisia (Angelakis et al., 1999). In Italy the use of reclaimed wastewater is regulated by the Decree No. 185 12/06/2003 and following edits (Ministry for Environment). This last provides very stringent and precautionary hygiene parameters making the wastewater use not convenient due to the high costs of depuration processes. This is why in Italy wastewater is not used as water source for irrigation but it is reclaimed following the Legislative Decree No. 152 03/04/2006 which requires microbiological limits less stringent for the direct outpour of wastewater in surface water bodies. On the other hand, low-quality wastewater could be used with minimal health and environmental risk for the irrigation of specific crops chosen taking into account crops types (edible or not) and their human consumption (without or after processing), health hazards for risk groups (young, old, pregnant or immunocompromised consumers and operators such as farmers), water application technologies and the duration of the irrigation season (Palese et

al., 2009). This is the approach adopted by the World Health Organization (WHO) which recommends more liberal microbiological thresholds for unrestricted irrigation of crops to be eaten uncooked, sports fields and public parks, and no hygienic standards concerning restricted irrigation of cereals crops, industrial and fodder crops, pasture and trees (WHO, 1989). To prove this, a long-term study was carried out in an olive orchard located in Basilicata (40°29' N, 16°28' E - Ferrandina, Matera Province) confirming that urban wastewater, reclaimed by a pilot unit according to low-cost simplified schemes (hygiene parameters over the current Italian thresholds) can be used successfully for the safe irrigation of the olives, significantly decreasing depuration process costs (Palese et al., 2009; Palese et al., 2013).

Save the soil by feeding it!!! The excessive use of intensive agricultural techniques (mechanization, fertilization, pest and diseases control, inadequate irrigation, deforestation, burning, etc.) - occurred in the last decades - is leading towards an inexorable degradation of soils all over the world. Soil organic matter (SOM) content is a useful index to evaluate soil vitality. This soil component is fundamental to ensure soil fertility and crop productivity and, as consequence, people feeding. On the other hand, SOM in European Countries is nearby the threshold below which soil is considered irretrievably dead; this makes these Countries non virtuous because they deplete SOM instead to conserve it according to the indications of Kyoto Protocol. Therefore, it is urgent to adopt strategies to recover/maintain adequate SOM level to avoid serious harvesting crop decreases and to allow organic carbon sequestration in European soils as a potential tool for reducing Greenhouse Gases (GHG) emissions. European Union is going towards this direction. The Soil Thematic Strategy (COM 2006 231), preceded by a serious of EU Directives/Decision (Decision No 1600/2002/EC; COM(2002) 179; Directive 2004/35/EC), was specifically aimed at protect soil from different degradation forms, assure its sustainable use and reduce the detrimental effects of climate change. According to this Strategy, SOM decline is one of the major soil degradation processes/threats. In Italy, the current legislation on the so-called "soil defense" (Legislative Decree 152/06) essentially focuses on land protection from geological-hydraulic disasters rather than on the conservation of soil resource. Specific standards on good agricultural and environmental condition of land - designed to maintain soil organic matter level and soil structure - are indicated by the Common Agriculture Policy (CAP) for Italy and the other EU Countries within the cross-compliance system and specifically destined to farmers receiving CAP payments. The provision of organic materials may be a useful strategy to

conserve/increase soil organic matter level and maintain/enhance soil fertility. An adequate source of organic materials is compost which is a stable humus-like product, generally rich in carbon and free of most pathogens and weed seeds. It is useful as soil amendment but also for plant diseases control when applied as compost extracts (the so-called compost tea) (Pane et al., 2016). It derives from the processing of organic residues by means of aerobic and, secondly, anaerobic microorganisms. About 300 big and operative composting plants are present in Italy in 2014 (CIC, 2015). A particular attention is recently given to on-farm composting plants of medium and small size, and domestic size (Photo 1).

1. Photo 1. Example of domestic composting at the IC Satriano di Lucania (Basilicata Region - Italy) built according to the model reported on the right. The composer is feeded by wastes from the school canteen
2. These are object of some National and European research and transfer projects aimed at widely diffuse such on farm composting technologies in Italy (Pergola et al., 2017a; Pergola et al., 2017b) (Photo 2). Particularly, these technologies represent a strategic approach for the sustainability of some agricultural activities also solving critical issues such as the disposal of crop residues and livestock wastes. In addition, if compared to the ordinary agricultural waste disposal methods, on farm composting seems to be the most sustainable solution from both economic and environmental aspects.

3. Photo 2. Composting plant located in Eboli (Piana del Sele - Campania Region - Italy) and built within the activity of project Life+ "CarbOnFarm" - ENV/IT/000719 (Photo by AGES s.r.l.s., Academic Spin-off)
4. *Use alternative energy sources!* Although Italy has many oil and gas wells located in different regions and offshore (Sicily, Basilicata, Emilia Romagna, etc.), these satisfy only 7% of the total consumption forcing Italy to turn to the foreign market (https://www.educambiente.tv/petrolioitalia.html). Such condition combined with the strong environmental impact due to oil and gas extraction and use, and indications at worldwide level to switch to renewable energy sources, lead Italy to experience a new energy approach. Besides photovoltaic and wind energy which are significantly spreading on the Italian territory (Eurostat, 2017), promising energy sources are biogas (Photo 3) and, as its derivate, biomethane. Particularly, biogas a) comes from organic materials (organic fraction of urban

Photo 3. Biogas pilot plant located in San Michele all'Adige (Trentino Alto Adice Region – Italy) (Photo by AGES s.r.l.s., Academic Spin-off)

5. solid waste derived from separate collection, and biomasses of agricultural origin that are renewed over time) subjected to an anaerobic digestion which produces a mixture essentially of methane (CH_4), carbon dioxide (CO_2) and trace of other gases; b) it is a renewable combustible source; c) it has a neutral balance in terms of CO_2 emissions; d) it is a "green" alternative to fuels obtained from traditional fossil fuels, such as oil and coal. Biomethane can be obtained from refining biogas, achieving a combustible gas equivalent to "natural" methane - which in Italy has been commonly used for decades for heating, cooking and transport - and suitable for placing on the natural gas network and usable in the current equipments. According to the Programming Document on Biomethane Platform available on CIC website (CIC, 2016), since the end of 2015, about 1,555 operative biogas plants are present in Italy; about 77% of them are feeded by agricultural matrices. Italy is the second largest producer of European Biogas after Germany, and the fourth world producer after China, Germany and USA. Investments in the sector amounted to 3.5-4.0 billion euros and created about 12,000 new stable jobs. Seven biomethane production plants are in Italy in August 2016. The first plant is located at the Malagrotta dump in Rome and is working since the mid-1990s. Biomethane is not fed into the net and it is used as a biofuel in a series of waste collection vehicles. The others 6 are demonstrative plants made by Italian companies that intend to propose solutions for the upgrading of biogas. No one is connected to the gas network. There are 2 biomethane refueling points for natural gas powered vehicles. The opportunity to use biomethane as a substitute or additive gas in transport and distribution networks derives from the implementation of European Directives 55/2003/EC and 28/2009/EC, which give particular importance to the exploitation of gases produced from renewable energies, as the biomethane, to achieve Kyoto objectives and counteract climate change. Biomethane can play a key role in Italy's strategy against climate change, driving the Country, in this energy transition phase, towards a low-carbon economy based on a sustainable and circular resource use.

3.5.3 How to manage at micro level: “Man-made” solutions!

Everyone can contribute to save the Environment. Such awareness must growth in anyone - since the first years of life - and must guide us at any time of our day. It will be enough to change our daily habits and a small, but substantial, step will be done towards a sustainable use of Earth resources. This behavior can have a positive and

concrete relapse on us and our life, while guaranteeing a healthy living Environment for the future generations - our children, the children of our children, the children of our grandchildren ... infinitely! - as indicated by the universally recognized definition of Sustainability concept! Here you find the Decalogue of conscious citizen: some golden rules to contribute to the Main Objective "the Environment rescue" (adapted from www.wikihow.en).

6. turn off any power-operated instrument when you do not use it	**7.** save water (make shorter showers or fill the bathtub less; close the tap while you brush your teeth; wash the washing machine only at full load; try to water the garden the minimum you need; etc.)	**8.** eat less meat and dairy products which require high consumption of resources for their production showing a negative cost-benefit ratio
9. disconnect the electrical appliances whenever you can (they can consume "invisible" energy), use the air conditioner and the dryers moderately	**10.** recycle everything you can, avoid excessive packaging, avoid using disposable products	**11.** be a responsible and aware consumer, do not waste food, buy local food at zero miles
12. set the thermostat to 20°C during the winter (less in the night) and cover yourself more	**13.** schedule the various commissions and organize the trip accordingly	**14.** evaluate the possibility of teleworking or working from home if your job allows
15. go on foot or bike for local shifts	**16.** get public transportation, organize a car pooling service to go to work or at school, get a hybrid car and have good maintenance on your car	
17. ……and so on….For further information visit the website *www.wikihow.en*		

3.6 Environmental protection in Romania

3.6.1 Education the first

Nowadays, people use (often abusing, knowingly or not) Earth's natural resources. In every corner of the land, people cut forests, extract minerals and energy resources, eroding the soil surface, polluting both water and air, creating dangerous waste and producing a tearing of the natural areas in a rhythm never heard of before in the history of life on Earth. Due to the increasing progress and overcrowding necessities, it is getting tougher and tougher for people to please their wishes and needs. And it also becomes impossible to get rid of the consequences of the serious environmental degradation: extinction of species, desert expansion, pesticide contamination, increase in health problems, famine, poverty and even loss of human lives. A lot of experts are worried that if this rhythm of destruction keeps on going, we will be the witnesses of gradual annihilation of the systems which support life on Earth.

Environmental education is a process whose purpose is to improve quality of life by ensuring people with necessary 'tools' to solve and to baulk environmental issues. This kind of education can help people gain knowledge, skills, motivation, values and become aware that they need to efficiently manage environmental resources and to assume responsibility for maintaining environmental quality.

Environmental problems are urgent and they need to be approached by the whole community, and education must be part of the solution. Divergent views on the condition of the environment, the consequences of its degradation and the role of education are important debate and discussion topics. Also, ecological education should not impose a certain way of thinking on people, but help them learn how to think – including solving problems, making decisions, weighing their options and analyzing values by initiating and completing personal actions.

On the other hand, environmental education increases awareness of these current issues and also the ability of understanding personal values through 'discovering' a certain attitude and consideration, helping students evaluate and clarify their feelings regarding the environment and how they relate to its problems. It also helps each person understand the fact that people have different values, and that the conflicts that have a negative effect on those values must be approached in such manner to avoid and/ or prevent environmental issues. This education is also practical, as it teaches us things such as planting a tree or reducing personal consumption or how to live our lives without negatively influencing the environment on a massive scale.

3.6.2 **Danube Delta Biosphere Reserve (DDBR), an example for environmental sustainability**

At the end of a course of over 2,860 km, collecting the water from a vast hydrological basin that exceeds 8% of the area of Europe, the Danube (the second largest river of the Continent) has during the last 16,000 years built at its mouth with the Black Sea one of the most beautiful deltas in Europe, perhaps in the whole world.

The Danube Delta is famous as one of the greatest wetlands on Earth. The wonderful natural habitats formed here offer good living conditions for an impressive number of plants and animals. Among these, reeds form one of the largest single expanses in the world, and Letea and Caraorman forests represent the northern limit for two rare species of oak that are more frequently met in the south of the Italian and Balkan Peninsulas. Together with the great number of aquatic and terrestrial plants, there are also many important colonies of pelicans and cormorants, which are characteristic of the Danube Delta, as well as a variety of other water birds which reside in or visit the Delta for breeding or wintering. The large number of fish is also notable, with species of both high economic and ecological value.

Without doubt, the impressive range of habitats and species which occupy a relatively small area makes the Danube Delta a vital centre for biodiversity in Europe, and a natural genetic bank with incalculable value for natural world heritage.

Many of the plant and animal species found in the Delta are also important natural resources for economic use as food, building materials and medicines, they have attracted people to the area since ancient times. The human dwellings were chiefly based on the use of these natural resources, thus developing traditional economic activities and characteristic cultural and social habits. Later, there was a tendency to overexploit some of these natural resources.

This tendency, which is still seen at present time, puts increasing pressure on the resources, especially fish and grasslands, and this was complemented by the development of economic activities which were not in harmony with the environment; for example, sand mining at Caraorman forest upset the ecological balance, causing the loss of some areas of natural fish spawning grounds through the sedimentation and eutrophication (or nutrient enrichment) of water channels and lakes.

Because of the cumulative negative effects of human activity in the Delta, together with those occurring around the Delta itself, there was an increasing danger that the natural ecological balance would become irreparably harmed if appropriate measures were not taken to reduce these impacts, to restore already damaged areas, to protect the existing unaffected areas, and

to harness local and regional support for these measures.

The elements briefly described above provided arguments for the designation of the Danube Delta Biosphere Reserve (DDBR) by the Romanian Government in 1990, a decision then confirmed by the Romanian Parliament through law 82 of 1993. The universal value of the reserve was recognised by the Man and Biosphere Programme of Unesco in 1990 through its inclusion in the international network of biosphere reserves. In fact, DDBR possesses all the main features of a biosphere reserve, namely:

a) it conserves examples of ecosystems characteristic of one of the world's natural areas and contains strictly protected core areas, traditional use areas, e.g. for fishing and reed harvesting, and buffer zones to reduce external impacts;

b) it is a land and coastal/marine area in which people are an integral component, and which is managed for objectives ranging from complete protection to intensive yet sustainable production;

c) it is a regional centre for monitoring, research, education and training on natural and managed ecosystems;

d) it is a place where government decision-makers, scientists, managers and local people cooperate in developing a model programme for managing land and water to meet human needs while conserving natural processes and biological resources;

e) it serves as a symbol of voluntary cooperation to conserve and use resources for the well-being of people everywhere.

From September 1990, the DDBR was listed as a wetland of international importance especially as waterfowl habitat under the Ramsar Convention, and is among the largest of the about 600 wetlands which were acknowledged. The universal natural heritage value of the reserve was recognised in December 1990 by the inclusion of the strictly protected areas in the World Heritage List under the World Heritage Convention.

The Integrated Monitoring Program of the Danube Delta Biosphere Reserve has three well-defined purposes:

• to provide information for the scientific community, administration and politics, as a result of the research activity in physics, biology and social sciences;

• to provide support for systematic exchanges of scientific information;

• to provide support for the integrated monitoring of the biosphere reserves, especially concerning the global changes, biological diversity, ecosystems management, human impact and sustainable development.

From the Danube Delta Biosphere Reserve, several institutions with scientific and monitoring activities extract data and information, cooperation being necessary due to the complexity of this work.

Danube Delta Biosphere Reserve Authority benefits from this database and uses the information as support in the decision making process concerning the natural heritage of the area. The monitoring activity complies with the Integrated Monitoring System for the Environment in Romania and the objectives of the Management Plan for the Danube Delta Biosphere Reserve.

The monitoring system in the DDBR identifies and measures the state variables of the structure and functions of the Danube Delta ecosystems and the command factors that affect their ecological integrity, in order to prevent their effects through corresponding management measures.

The objectives of the integrated monitoring system are:

• to supervise the evolution of natural capital;

• to conserve the Danube Delta biological diversity and genetic resources;

• to assist the decisions of the socio-economical management in order to guarantee:

- prevention of the deterioration of the natural capital of the Danube Delta Biosphere Reserve;
- that the natural capital productive capacity is not exceeded;
- that the support capacity of the natural capital is not exceeded;
- the substantiation and achievement of the natural capital recovery of deteriorated components.

The conceptual model of the integrated monitoring system involves two main components: data obtaining system and data management system.

The selection of the domains and parameters of the integrated monitoring system is based on causal concepts, aiming at identifying the impact factors that could determine the lack of balance of the Danube Delta systems.

The selection of the domains and parameters of the integrated monitoring system is based on causal concepts, aiming at identifying the impact factors that could determine the lack of balance of the Danube Delta systems.

The selected domains included in the integrated monitoring system are:

1. climate and air quality;
2. hydrology;
3. hydrobiology;
4. water quality;

5. soil quality;

6. biodiversity;

7. natural resources;

8. economic activities;

9. human population.

The “physics-chemistry” domain criteria include parameters describing ecosystems structure and reflect its possible evolution. “Biology” criteria indicate the levels of environmental productivity and the “social-economic” criteria indicate the level of human pressure.

For each of these domains, key-parameters have been identified and are monitored in order to allow gathering information with maximum efficiency, using it in order to protect and to keep this space as clean and as natural as possible.

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Chapter 4 - How to use this book in the classroom

4.1 Introduction

After two years of an intensive work, we can present you how our book could be used in the classroom. Each of you will find different strategies and ideas according to our own curriculum and experiences.

These different activities will encourage students and teachers to live a greener lifestyle at home and at school.

By teaching students and teachers to be environmentally aware, we are building lifelong habits that could potentially make a difference in the future of the Earth.

Corinne Duloung
Lycée Jean-Pierre Timbaud - Brétigny

4.2 Bulgaria

4.2.1 Introduction

Starting a project about environment and how to preserve it and participating in one was a challenge for us as we had not a very clear idea what we were going to find out about "Pollution in my country" (chapter 1) or the way we try to deal with it – "Good practices in my country" (chapter 2). Working on this project, communicating and having exchanges in other countries gave us the opportunity to learn more about "Environmental protection and countries' problems deciding on how to manage conservation" (chapter 3).

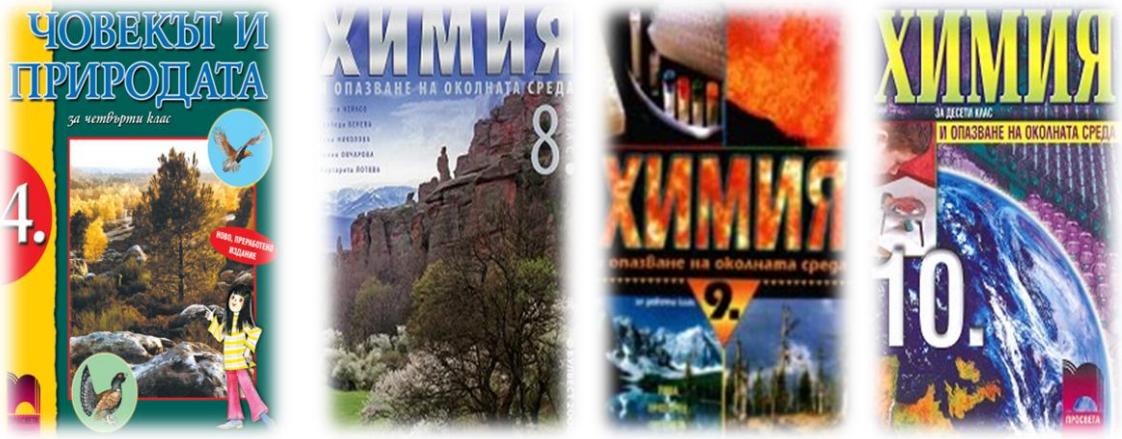
It's time for chapter 4 – "How to use this book in classroom/lessons" and we both, students and teachers, feel more confident about talking on this subject. We gained a lot of experience during the meetings in France, Romania, Italy and Finland and we think it's important to share it with our classmates and colleagues.

4.2.2 Can we use the book according to the curriculum ?

According to Bulgarian curriculum we have a subject concerning the environment sustainability in each level of our school education:

- 1-2 grades (age 7-8): "The world around us"
- 3-6 grades (age 9-12): "Man and nature"
- 7-12 grades (age 13 -18): "Chemistry and protection of the environment"

There is a different number of hours of lessons for each grade but students - they all study about environment, ecology, recycling and sustainability at some point.



4.2.3 How to use the book in class: different aspects and ideas for good practices.

The book we are writing together with all the partner countries is going to be a useful tool for students and teachers as it is a kind of an encyclopedia, a student's book and a diary combined in one. It is the result of a research in its first, second and third chapters but it's also a kind of a diary in the last chapter that includes all the good memories and experience of the participants that with turn the book into workbook and help the teaching-learning process at school. The book is an example of how students can produce a useful material on any subject by researching and communicating with each other or with specialists.

4.2.3.1 Primary students and teachers

It's important to talk about environmental issues from early age so that there will be more visible results later. We were thinking about how to share our experience with younger students but in a way that is easy for them to understand the main idea of our project and to be able to take a part. The style of the chapters in the book will be hard for them to assimilate besides it's in other language. So, we thought that we can provide in addition to the book a booklet or some printable materials that will include some main points of our researches in the form of games, exercises, pictures for coloring, etc. During the exchanges we participated in a lot of workshops, games and experiments that would be useful for the students in the primary level.

4.2.3.2 Students and teachers in upper grades

The book will be a perfect additional tool in class having in mind that workbooks are never up to date as they are not edited every year but environmental changes happen even faster. This book can show the good experience and the way things happen in other countries. It Is even more valuable because some of the things described in the book are seen by the students so it's not just "on paper" anymore. There are a lot of examples for a better life with less

consumption of energy and resources at all and it's necessary that more students who are future architects, or businessmen, or teachers, etc. to think in this direction and continue the idea.

The book can give ideas about project – based learning. It can help teachers and students at school to start a project connected to recycling or decreasing the use of energy and water. It can help young people to rethink about the reuse of paper, clothes, etc. and to consume food because of it taste and not because of it outlook.

Teachers can take some ideas from the book and the gained experience during the meetings and organize classes outside the classroom. That way a lot of activities and visits can happen with the help of specialists and people who work on such places.

Students learn better when they are the active part, by doing not only reading or listening.

4.3 Finland

4.3.1 Introduction: looking back on the process of compiling this book

Compiling this book has been an interesting but challenging process. Many of us, teachers and students alike, have taken environmental issues for granted, as they are already so mundane to us. We all recycle and sort our waste, and Finland as a country has already made decisions on many sustainable-development strategies that fulfill or even exceed the regulations and directives given by the European Union. But although a lot has already been done, there are still problems that need to be tackled more precisely. Thus, it has been a joy to learn from the other countries' good practices and solutions, as they offer as a fresh point of view on things.

4.3.1.1 The first chapter

Starting in the beginning of 2017 with the topic **"Pollution in my country",** we really had to think about what kind of pollution is typical to Finland. We studied the historical aspects of pollution in Finland as well as its consequences to present-day life, which made us more aware of how we've come to our current situation. We were relieved to learn that our country has already put and is still putting a lot of effort into diminishing pollution, its sources and its effects on Finland. Still, in the end, everyone is responsible for making an effort for the wellbeing of our environment.

4.3.1.2 The second chapter

The second chapter in the spring of 2017, **"Good practices in my country"**, gave us some hope for the future, as it looked as if we have good schemes for recycling and people are already very environmentally friendly. Finnish innovations such as pulled oats are setting the norm for others, too, in trying to figure out how to reduce our carbon footprint through cutting down on meat consumption. This topic has touched all of us involved, from the individual student to decision-making in the city and state level. Finland understands that the decisions made now affect our future in long term.

One good practice in our school comes through our recycling and sustainable development schemes, for which we have been awarded a "green flag". It means that we recycle and sort our waste, save energy and pay a lot of attention to the use of printing paper. Every new student is guided in how to recycle during the first days in the beginning of the school year. Moreover, we try to cut down on wasting food by educating our students; they

are taught to take enough but not too much of food. Better to take too little than too much, as it is always possible to take seconds!

4.3.1.3 The third chapter

The third chapter, **"Environmental protection and countries' problems deciding on how to manage conservation"**, written in the last months of 2017, was a continuation of the work we had done for the previous two chapters. It was pleasing to find out that Finland is actually stricter than the European Union in what comes to waste management legislation. Finns are also very interested in the aspects of vegetarianism and veganism as well as locally produced food. A fairly recent addition is the introduction of "food circles" or co-ops on a larger scale. Finland is not, in fact, in terrible turmoil about conservation; it is seen as a must, and very few politicians question the need for it.

The Erasmus+ tree in Finland during the last Erasmus+ exchange

4.3.2 How to use this book in teaching

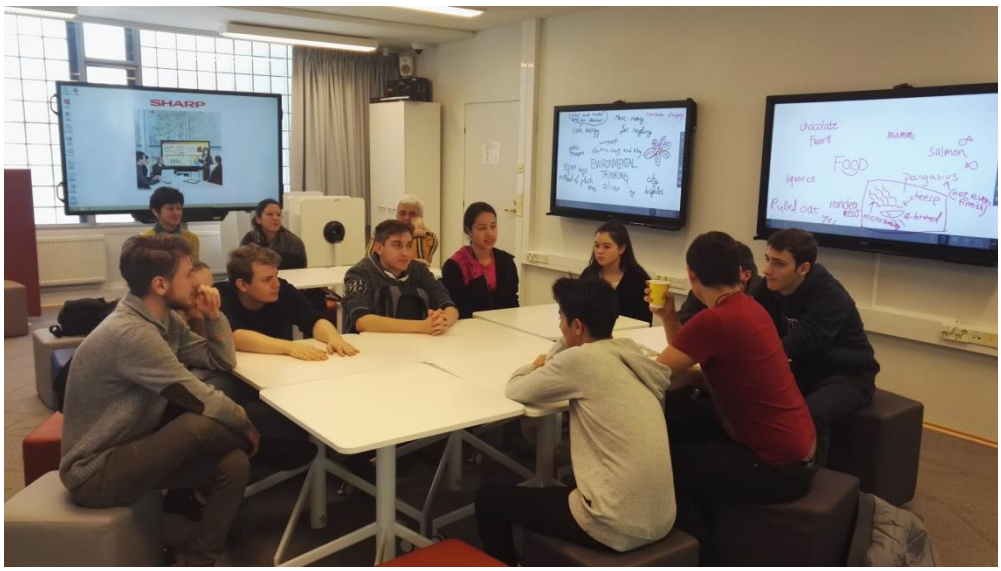
At first, the idea of using this book in teaching or learning at school felt a bit strange, as we didn't feel that it was straightforwardly meant for teaching purposes in the first place. However, the more we thought about the different perspectives that the book offers, the more convinced we became that we could actually work with the book in various different ways. Below, we will give a few examples of how we think this could work. We are eager to learn what the other partners include to get even more insight into this!

4.3.2.1 Phenomenon-based learning and thematic studies

The Finnish National Curriculum for grades 1-9 (2016) features a relatively new method of teaching and learning called phenomenon-based learning, also called multidisciplinary learning in some sources. It means that all students in grades 1-9 must experience at least two phenomena within one school year, using group work methods, and those phenomena should be examined through the eyes of different school subjects - so that it actually becomes multidisciplinary. The student is in the core of the phenomena; they are given the freedom of choice to pursue whatever topic motivates them to research it more and produce some sort of end result from it, although they usually have to stay within a given broader theme, e.g. “environment” or “culture”.

The upper secondary school also has its own equivalent for phenomenon-based learning in its National Curriculum (2016), called thematic studies. The idea behind thematic studies is the same as in phenomenon-based learning, and that is to give the students the opportunity to study and learn about a certain topic through many different subjects. However, thematic studies are focused on a certain given topic, so it gives less freedom to the student.

This book could be used both in lower and upper secondary in these multidisciplinary learning activities when they are about sustainable development, the environment etc. The book’s main purpose would be to open new horizons and give the students food for thought, as they search for material and insight.



Problem-solving group work in Finland during the last Erasmus+ exchange

4.3.2.2 Pedagogical help

This book could work as pedagogical tool for teaching about environmental issues such as pollution and recycling. The different countries' contributions are valuable resources for all of us, since we normally only think of different things from our point of view. The realisation that different countries have their own typical challenges helps to understand the methods, problems and solutions of our own country on a wider scale.

4.3.2.3 Using experts and professionals in teaching

This book offers a wide range of solutions and methods for saving the environment. One idea that rises with it is making use of experts and professionals of this field that are not regular school staff but rather scientists, innovators or CEOs in companies and other facilities. For example, we could invite an innovator to talk about their achievements in this field of research. Thus, instead of having a teacher talk about an issue "second-hand", the information would come straight from the source and so make learning possible for the whole community - teachers included.

4.3.2.4 Taking teaching out of the classroom

A good way of giving the students new insights into any topic is to take them out of the classroom to learn about things in authentic places where they can observe and study whatever necessary more closely. Study trips are very helpful, especially combined with workshops. This book can give ideas about what kinds of places could be worth visiting - for example, a waste incinerator or energy exhibition are sure ways to get the students' attention.

4.3.2.5 Learning by doing

Making this book is a perfect example of how a process teaches new things. Both students and teachers got to learn new things through the process of writing the different chapters. Learning by doing is one of the best ways to immerse oneself into a certain theme and learn about it at the same time.

Learning about using waste food in Finland during the last Erasmus+ exchange

4.4 France

4.4.1 Introduction

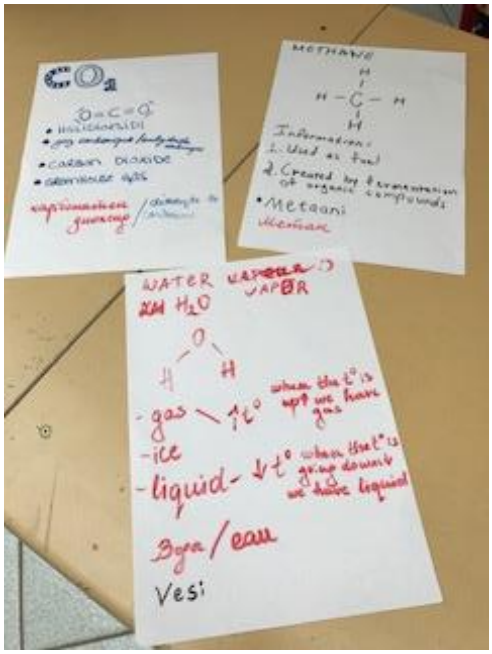
In France, different solutions exist to explain environmental protection through the curriculum. This section describes how we can use it according to an high school's curriculum.

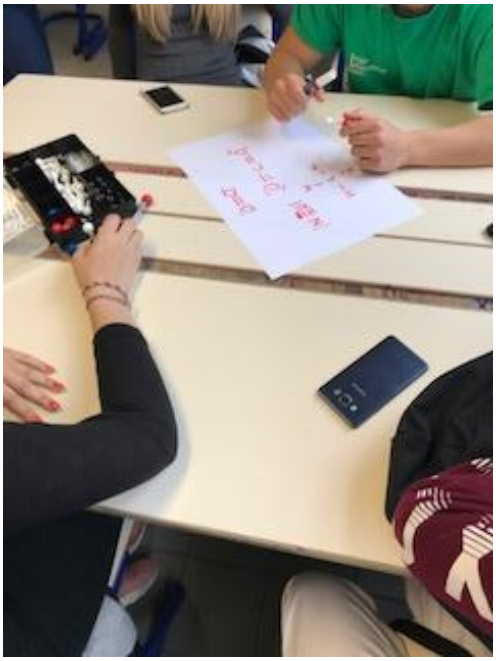
4.4.2 How to use the book according to the curriculum ? Different aspects and ideas.

4.4.2.1 Workshops: Building greenhouse gases

The goal of the activity is to make these greenhouse gases : argon, carbon dioxide, methane, nitrogen, oxygen and water vapor.

To achieve this goal, students make these molecules using modeling clay, cocktail sticks, and cable ties.





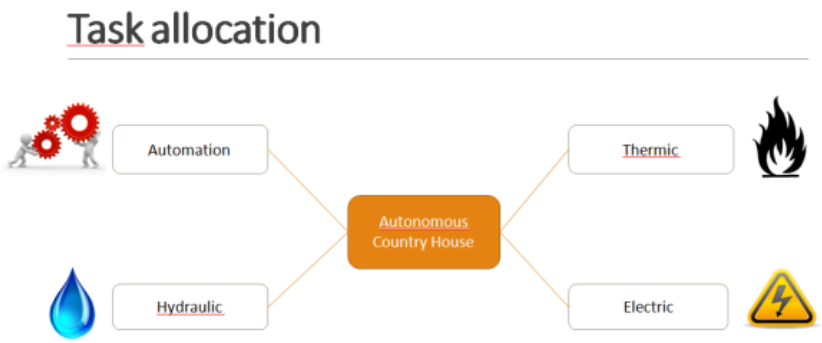
4.4.2.2 Final exam for French students

Students involved in the project have their final exam this year (2018). Thanks to that book we have worked in order to pass their exam. Some ecological problem have been solved with their ideas. For example, two subjects were made.

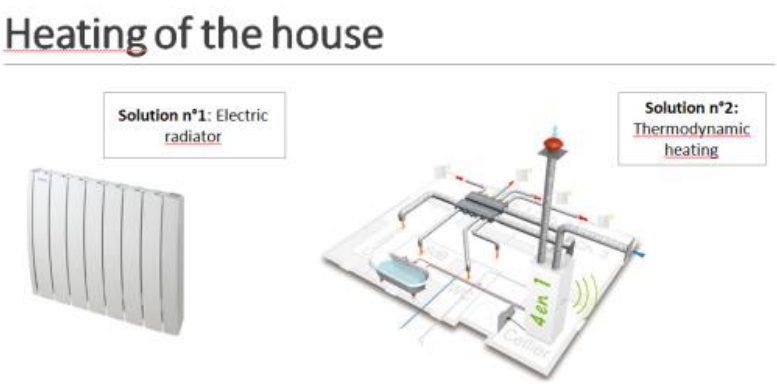
- **Project review N°1 - Country house**

The main idea of the project is to rehabilited a single house located in the countryside. Solutions found must be ecofriendly.

Students shared the work through different tasks:



They found different solutions afterwards.

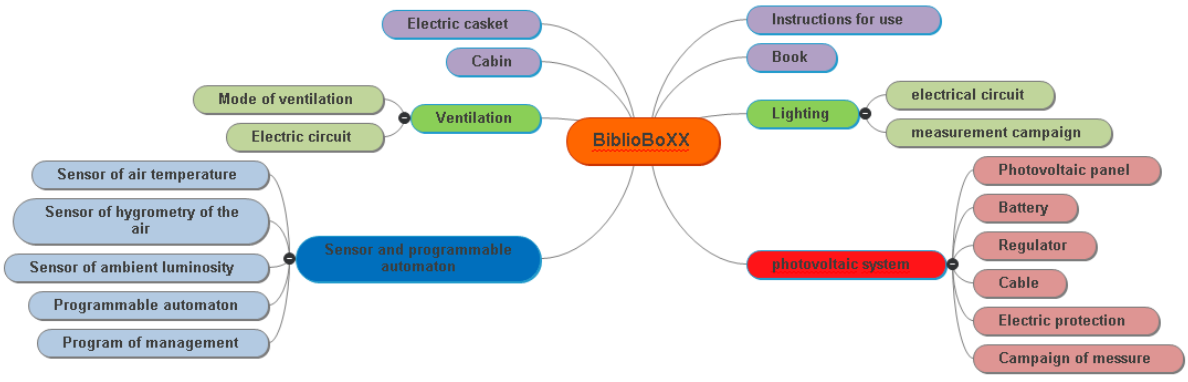


Finally, they chose a solution, that you can see below :

- **Project review N°2 - Biblioboxx**

This project consists in improving the living environment of athletes and people working on the site of INSEP Vincennes. Thus, a Biblioboxx (former telephone booth reconverted in street library) will be established.

Presentation of the cabin



Mind map of the sudents' work

4.4.2.3 Activities made during the school year

- **Work done**

1/ REVISE ON THE DIFFERENT GREEN RENEWABLE ENERGIES

WIND TURBINES/ DAMS/ SOLAR PANELS/ GEOTHERMAL ENERGY

2/ FORVO.COM / WORDREFERENCE.COM

GO TO ONE OF THE TWO WEBSITES ABOVE, LISTEN TO THE 10 WORDS BELOW AND MAKE A RECORDING IN WHICH YOU PRONOUNCE THEM ALL

renewable/ green/ geothermal/ solar/ wind turbines/ consumption/ energy/ power/ pipe/ blades

ACTIVITY 1 : WATCH THE VIDEO BELOW AND TAKE NOTES IN YOUR GRID

STUDENT A : SOLAR ENERGY

→ SOLAR PANELS

https://www.youtube.com/watch?v=x4CTceusK9I

STUDENT B : WIND ENERGY

→ WIND TURBINES

https://www.youtube.com/watch?v=SQpbTTGe_gk

STUDENT C : HYDROPOWER

https://www.youtube.com/watch?v=tpigNNTQix8

STUDENT D : GEOTHERMAL ENERGY

https://www.youtube.com/watch?v=mCRDf7QxjDk

ACTIVITY 2 : ASK YOUR CLASSMATES ABOUT THEIR VIDEOS AND TAKE NOTES BELOW :

- **Correction**

	SOLAR	WIND	HYDROPOWER	GEOTHERMAL
ORIGIN	The sun→ limitless supply 1 hour of sun = amount of energy used by the whole world in 1 year	Wind-powerful source Blades of a farm's windmill to pump water	For thousands of years Power resource :new/affordable/clean	Hotspring Heat comes from deep beneath the surface of the Earth
FUNCTIONING	Photovoltaic cell technology optimized over years of research Even on cloudy days-Panels absorb energy	Modern are slicker with more technology Wind pushed on one blade, creates pressure and makes the blade turn which creates electricity Spinning parts	Harness energy from flowing water Water flows from a higher elevation to a lewer + power converts into electricity (+ than 100 years) DAMS -impoundment Reservoir/generator Diversion : river/canal and pipe : natural flow	Heat from the Earth crust warms that is in underground reservoirs Steam when hot enough

			of the river- Pump storage hydropower : huge battery/ power released during day and stocked at night	
PRODUCTION METHODS	The greater the intensity of the sun, the greater the current of electricity DC electricity- Solar power will be fed back to utility company BEP : easy installation process AFFORDABLE/ACCESSIBLE	Convert wind energy into electricity produced by a generator	7 % US (larger source of renewable power) Water evaporates and recycles back to earch in precipitations Upgrade/optimize energy productions	In the past, near the surface Leverage even more this resource Different ways : Dry Steam/ Flash Steam Geothermal/Binary cycle geothermal/
ENVIRONMENTAL BENEFITS	Reliable source of energy Prices never fluctuate	Renewable resource No emissions Expensive to stock energy Location – But rapidly growing industry Cheaper and easier to use	Dams to prevent floods 80, 000 dams- big opportunity to generate more and clear renewable power New techs : less impact on fish → swim around dams	Generate clean/renewable electricity Small footprint Minimum environmental impact → help recycled water sulphur recovery Supply of 10% of today's energy

4.4.3 Conclusions

Writing a book with students or travelling aboard is always a great experience. More students have a lot of memories. Here you have some of their opinions:

"Good experience to see what happens elsewhere and be able to compare. And progress in English."

"Very good for our children (and parents too) to see the difference between people from other countries (ideas, religions, ...)"

4.5 Italy

4.5.1 Introduction

The book this chapter belongs to is one of the final output of "Greetings From Tomorrow" Erasmus+ project. Not only does it aim at spreading information about the wide environmental issue to European students, but this book also provides a useful guide for teachers willing to deal with this topic in class, to arouse their students' interest in environment *sensu lato* and to make them aware of its vital importance for life on the Earth. Chapter 4 is concerned with some attractive and non formal teaching/learning strategies aimed at achieving the above mentioned aims.

4.5.2 Some alternative teaching strategies

Teaching methodologies have changed as a response to the emergent society needs. New generations are constantly faced with rapidly evolving technology; therefore, they need stimulating teaching approaches to sustain their motivation and to have them involved in the learning dynamics. The traditional lesson, similar to a lecture, which was so popular in Italy in the past years, has to be resorted to only together with other teaching strategies aimed at involving and stimulating students.

Environment as a transversal topic

Environment is a transversal topic; so it is particularly suited to be dealt with under different perspectives by teachers of science and technology, history, geography, civics, etc. A detailed syllabus can be agreed upon by all teachers at the beginning of the school year so that each discipline deals with an environmental topic in a sequential or simultaneous and organic way. In this sense, the book "Greetings From Tomorrow" Erasmus+ project can provide teachers with an operative guide. Here is an example:

- *Geography*: human activities and oil pollution in the countries involved in the project
- *Sciences*: oil as a non renewable resource; how oil is obtained
- *Technology*: technologies employed to extract oil from the ground
- *History*: the role of oil in the international scenarios and political dynamics
- *Civics*: a responsible use of oil by citizens

CLIL (Content and Language Integrated Learning) aims at teaching specific subjects through a foreign language. In a CLIL class there are two main objectives: one related to the curricular or thematic content, the other connected to the language. It is for this reason that CLIL is sometimes defined as dual purpose education. This teaching technique is strongly recommended by the Italian Ministry of Education, University and Research. At IC Satriano di Lucania, a CLIL course started last school year and involved a large part of pupils of different ages. Particularly, the course aims at stimulating students' interest, curiosity and sensitivity towards environmental issues while improving their language and communication skills through the creation of an authentic learning context.

Demonstrative days

In recent years the European Union have been promoting the dissemination of scientific results in the environmental field to raise awareness not only among the experts but above all in the public opinion. Particularly, sensitizing young students is very important when it comes to the future of our planet and our societies. In this respect, connections with such national and European dissemination projects (i.e. Life+ Project) should be recommended. Demonstrative days are organized by scientific teams from Universities, others research Institutions and Environmental services at different levels to get in touch with teachers and young students within local territories and realities.

Below the experience performed last year (16/05/2017) by the students of the “IC Satriano di Lucania” within the dissemination actions of "CarbOnFarm” life+ European project (coordinator: Prof. Riccardo Spaccini – University of Naples, Italy). The event – entitled “Demonstrative day on composting” – saw the participation of experts (from University of Basilicata; Agency for Development and Innovation in Agriculture of Basilicata Region – ALSIA; University Spin-Off AGES srls; vermicompost producers) who presented their activity with

- a brief informative lesson in the school multimedia room during which the LIFE12 ENV/ IT/000719 project was illustrated; the video entitled "Dal campo al campo – *From the field to the field*" - available on Youtube (https://www.youtube.com/watch) - was seen; vermicompost producers showed their compost rich in earthworms (photos 1 and 2);
- a practical part of on-site composting in the school garden during which the students made a "cylinder" composting module (photo 3).

The aim of the activity was to transfer a proven composting technology - simplified and low cost - focused on the use of various organic matrices and available in domestic/business/school environment (food preparation waste, i.e. canteen, mowing residues from green areas, pruning residues of trees and hedges, scraps of wood, straw, etc.) to obtain compost, a stabilized product to be reused to fertilize and amend soils with benefits for the environment and a significant economic saving (on the tax of urban waste, for the purchase of fertilizers or soil amendments).

The demonstrative day was preceded by the following preparatory activities

- Explanatory class lessons on the composting process and preparatory to the Day;
- Distribution of the informative brochure to the students of the first classes (I A and I B) (photo 4);
- Classification of explanatory posters about the composting process with texts in Italian and English to be exhibited in the corridor of the school during the day (photo 5);
- Creation of a model of the composting cylinder (photo 6);
- Collection of grassy mowing material from the school garden;
- Collection of pruning material from the school garden olive trees;
- Purchase of the material for the construction of the composting cylinder (narrow meshed metal mesh, shading net or dark non-woven fabric, pruning shears, gloves).

The students participated actively and enthusiastically both in the preparatory activities in the classroom and during the demonstrative day, showing how successful a laboratory teaching approach is characterized as it is by a constant connection between theory and practice and with the students' daily experience. The preparation and enthusiasm of the students were noted and appreciated by the expert speakers involved in the event.

The collaboration with the school administrative staff involved in organizing the event (material purchase, logistics) was positive.

The contents of the demonstrative day were also an opportunity to disseminate the composting practice to the students' families, who had already collaborated during the preparatory phase with the material collection used for the preparation of the explanatory posters and the compost model.

The demonstrative day program was publicized through the dissemination channels of the school (https://icsatrianodilucania.scuolainfo.it/public/documenti/12-5-2017-17-58-15Programma%20giornata%20compostaggio%20Satriano.pdf), the European Life Project "CarbOnFarm", ALSIA and University Spin-Off AGES srls.

Photo 1. Informative lesson in the Multimedia room

Photo 2. Earthworms in the vermicompost

Photo 3. The "cylinder" composting module

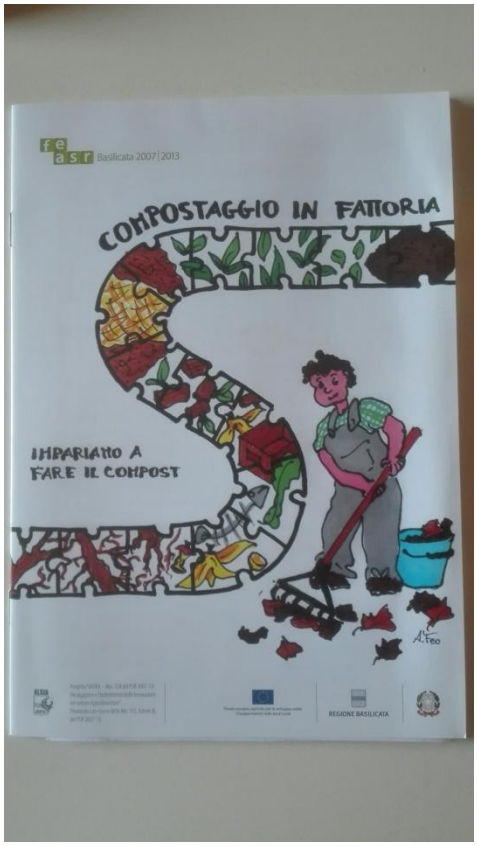


Photo 4. Informative brochure on composting

Photo 5. A model of the composting cylinder

Photo 6. Explanatory posters of the composting process

4.5.3 Attractive tools for a significant teaching/learning process (free available on Internet): some examples

4.5.3.1 Kahoot!

Kahoot! is a very engaging and easy-to-use tool for creating quizzes, discussions and online surveys to be used at the end of a lesson to check comprehension or on any other occasion within the teaching activity….. Erasmus+ project's students used it during the workshop held in Satriano di Lucania in February 2018 (Photo 7)!!! This tool is in English, but the interface is simple and intuitive. Kahoot!, can be used with students of different ages. Kahoot! needs a surface where to project the questions – an interactive board or a simple video projector - and devices of any kind that can be connected to the Internet - smartphones, computers, tablets - used as responders through which the students send the answers to the site. After registering on https://getkahoot.com/, the teacher can create a questionnaire on the Kahoot Platform. It is possible to choose the number of answers (multiple choice) of the quiz and complete the question with images or short videos by uploading them with a simple drag and drop. The teacher can also vary the allotted times for each answer according to the difficulty of the questions. The time is punctuated by music that changes according to the seconds available (from 5 to 120). A rhythmic "soundtrack" helps challenge the competitors because what takes place is a real competition students are likely to be involved in. You move on to the next question when the last player has answered, but not before you have seen the correct answer,

a histogram with the number of answers received for each option and a partial ranking with the scores assigned to each player. The final results can be downloaded in Excel. For more details you can visit the official site https://kahoot.com/welcomeback/

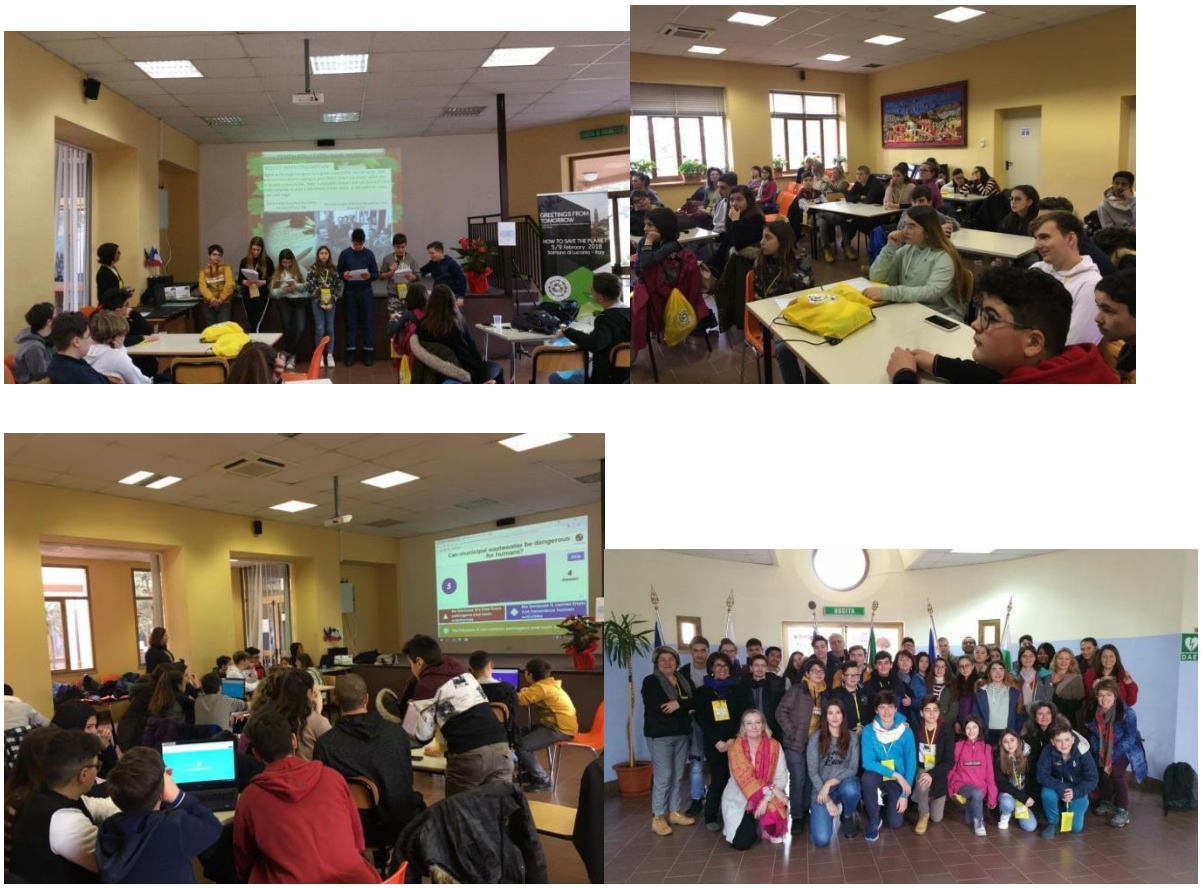


Photo 7. Workshop held in Satriano di Lucania in February 2018. Erasmus+ project's students working with the Kahoot! platform

4.5.3.2 Crosswords

Crossword puzzle can be: a) a useful follow up activity; b) a stimulating way for the students to consolidate their learning processes. Crossword puzzle maker (https://www.armoredpenguin.com/crossword/) is a very simple online application to create crossword puzzles by inserting the solutions on the Word column and the definitions on the Clue column. It is possible to choose how many words to insert and, at the end, after clicking on Make Puzzle, your crossword puzzle will be immediately composed. Then, a whole series of options can be chosen from. It is possible to view the completed crossword puzzle, to save it in PDF format for printing and proposing it to your students or to run the solution directly online.

4.5.3.3 Sitography

- **“Demonstrative day on composting” program** - https://icsatrianodilucania.scuolainfo.it/public/documenti/12-5-2017-17-58-15Programma%20giornata%20compostaggio%20Satriano.pdf (accessed 26 March 2018)
- **Kahoot! -** https://kahoot.com/welcomeback/ (accessed 15 January 2018)
- **Crossword puzzle maker -** https://www.armoredpenguin.com/crossword/ (accessed 1 March 2018)

4.6 Romania

4.6.1 Introduction

This course stimulates students' interest in geography, the natural environment, the importance and the issues related to the environment, it stimulates and develops the skills to use information from media sources, supports the initiation in the elaboration of projects, magazines and brochures on environmental protection issues, education for a healthy life, sustainable education, education for quality.

For this purpose, we suggest for the school year 2018-2019, at the level of the 11th grade, the optional course "***Environmental Protection***", with very attractive, extremely interesting and current themes. The course learning activities are designed to allow the student's direct activity, in order to be able to observe, locate, identify, explain, associate, select and compare environmental elements, phenomena and processes. The learning activities will be organized both in the classroom, in the field (data and images collection, investigations) and in the library for documentation activities.

The course aims to emphasize the importance of the quality of the environment for the contemporary society, aims to identify its problems and aims to find viable, real solutions to ensure its sustainability.

4.6.2 General competences

1. Proper use of specific terminology to explain the geographic environment using different languages;
2. Reporting significant elements of society, science and technology to the environment as a whole and its component systems;
3. Integrating aspects of nature and society into an objective structure (the environment) and a synthesis school subject (geography);
4. Relating the elements and phenomena from reality (nature and society) with their cartographic, graphic satellite images or model representations;
5. Acquiring general competences, skills, learning methods and techniques (including ICT) to facilitate permanent assumed training;
6. Acquiring social, interpersonal, intercultural, civic and entrepreneurial skills based on the study of geography.

4.6.3 **Values and attitudes**

Positive attitude towards education, knowledge, society, culture, civilization;

Curiosity to explore the geographic environment;

Respect for natural and human diversity;

Preservation and protection of the living environment;

Active involvement in the activities of knowledge and promotion of natural heritage and universal cultural values;

Continuous information with a view to adapt to the requirements of the European and global community;

Specific competences	**Contents**
1.The use of scientific terminology for the presentation of relevant information; 2. Reading and interpreting graphical and cartographic information; 3.Operating with symbols, signs, conventions; 4. Creating structured text using cartographic or graphical information; 5.Identifying sources of information and information useful in multimedia systems; 6. Spatial relation of the natural and anthropic elements of a given territory; 7. Sensing successions of natural and anthropic processes.	**1. General notions: definitions, terminology** **2. Pollution in my country:** - Pollution in Bulgaria; - Pollution in Finland; - Pollution in France; - Pollution in Italy; - Pollution in Romania;
1.Use of scientific terminology to present relevant information; 2.Reading and interpreting graphic and cartographic information; 3. Operating with symbols, signs, conventions; 4. Building a structured text using cartographic or graphical information; 5. Building simple cartographic sketches; 6. Identifying sources of information and information useful in multimedia systems;	**3. Good practices in each country for fighting with pollution:** **3.1 Good practices în Bulgaria** The battle with air pollution; Reducing water pollution; Good agricultural practices; Recycling; Self-suffiency with green energy. **3.2 Good practices in Finland** Sorting stations and making use of old dump sites; National treasures; Recycling in Finland; The Baltic Sea calculator; Food;

7. Understanding the elementary processes in nature and environment; 8. Spatial relation of the natural and anthropic elements of a given territory; 9. Sensing successions of natural and anthropic processes; 10. Explaining natural and anthropical processes in the geographical environment; 11. Transferring written information into graphic designs.	Energy solutions; Globe hope. **3.3 Good practices în France** Preserving energies on Earth; Changing consumption habits; French organic food; Reduce, reuse, recycle; Rethinking transports. **3.4 Good practices în Italy** How to reduce air pollution; What to do against water pollution and wastage of water ? How to limit soil pollution ? Solutions against noise pollution. **3.5 Good practices în Romania** The Exploitation of the Solar Potential in Romania; The Exploitation of the Wind Potential in Romania; The Exploitation of Biomass in Romania; The Exploitation of Hydroenergy in Romania; The Exploitation of Geothermal Potential in Romania.
1. Use of scientific terminology to present relevant information; 2. Reading and interpreting graphic and cartographic information; 3. Operating with symbols, signs, conventions; 4. Building a structured text using cartographic or graphical information; 5. Building simple cartographic sketches; 6. Identifying sources of information and information useful in multimedia systems; 7. Understanding the elementary processes in nature and environment; 8. Spatial relation of the natural and anthropic elements of a given territory; 9. Sensing successions of natural and anthropic processes; 10. Explaining natural and anthropical processes in the geographical environment; 11. Transferring written information into graphic	**4. Environmental protection and problems faced by countries regarding decision making in conservation management** **4.1 Environmental protection in Bulgaria** Main policy responses to key environmental challenges and concerns; Air quality - problems and measures to improve it Water management and water quality Biodiversity, National Ecological Network; Waste and material resources; Eco tourism; Energy Strategy of Bulgaria by 2020; Country specific issues. **4.2 Environmental protection in Finland** Replacing cotton with synthetic fibers; Can electric cars save the planet? Recycling; Recycling clothes; How to eat in an ecological way; Waste processing in Finland. **4.3 Environmental protection in France** Environmental groups and protection; Eco construction and innovation; Eco tourism; Repair café; Local farmers/markets; **4.4 Environmental protection in Italy**

designs.	How to manage at macro level; How to manage at micro level: "Man-made" solutions! **4.5 Environmental protection in Romania** Education the first; Danube Delta Biosphere Reserve (DDBR), an example for environmental sustainability.

4.6.4 Methodological suggestions

The content of this syllabus for a school optional course summarizes the knowledge and skills of Physical Geography and Human Geography that it combines with information and skills specific to the study of History, Biology, Foreign Languages and Arts.

The course syllabus presents the following elements of novelty:

► it assumes a very specific set of specific competencies;

► it is focused on the understanding of the natural and human part of the environment;

► it makes interdisciplinary connections between art, technology, natural sciences, social sciences and foreign languages;

► it focuses on developing specific skills required for the entire life.

Learning Activities

This syllabus introduces a number of new features in the educational process which aim at achieving specific competencies by suggesting learning activities centered on teamwork or individual work, namely:

Define basic terms;

Making a text with thematic content;

Acquiring the main concepts related to environmental protection through conversation;

Localization exercises on cartographic support;

Explaining the location of environmental components;

Exercises for characterization of environmental components based on images;

Graphical representation of statistical data and their interpretation;

Completing and making of crossword puzzles;

Problem solving;

Identification and processing useful information from the media;

Describing exercises based on an image;

Transfer of textual information in graphical representations.

Evaluation

The evaluation can be done by using all types of items in different sentences and structures, continuous evaluation, and also using alternative forms (portfolio, essay, interdisciplinary mini-projects, etc.)

The training supports include the first three chapters of this book, maps, atlases, cartographic media, didactic software, English and Romanian educational websites. Their selection takes into account the general competences in the common trunk and the optional school curriculum.

4.6.5 Bibliography

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https://www.eea.europa.eu/soer-2015/countries/italy

https://it.glosbe.com/en/it/Camorra

Appendix

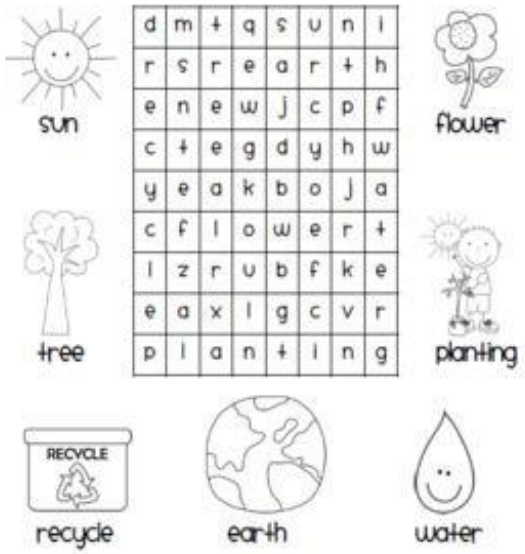
GREETINGS FROM TOMORROW

"POLLUTION"

What is a pollution?

Pollution is anything that makes the earth dirty and unhealthy. Land, air, and water are all affected by pollution.

1. **Find the words**



FACTS ABOUT POLLUTION FOR KIDS

Plastic was invented in the mid-20th century. Plastic is useful in many ways, but it doesn't break down or biodegrade. Anything made with plastic piles up in landfills or pollutes the ocean, where it kills wildlife.

3. Use your imagination!

Try to make a pencil case from an old plastic bottle.

Use: scissors, plastic bottle, zipper, glue.

2. **Do the Math!**

We use 324 litters of water to produce 1 kg of paper. How many litters will we use to produce 5 kg of paper? What about 8 kg? What about 10 kg?

……

……

……

……

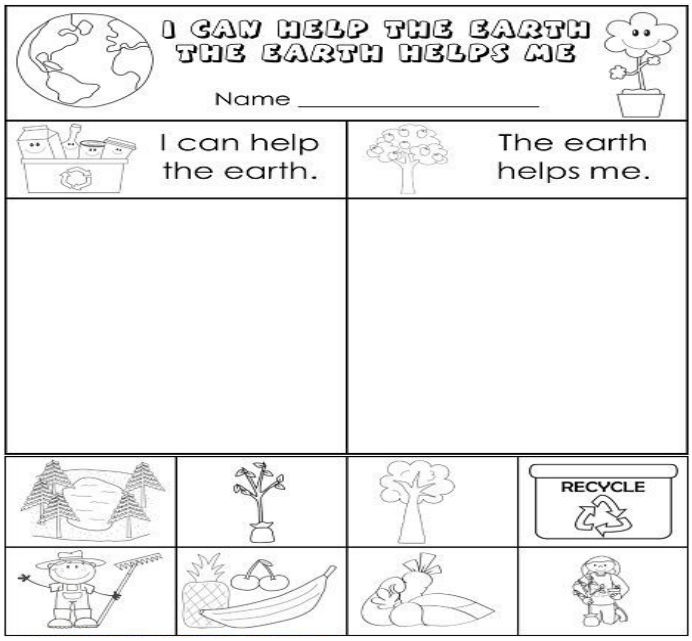
_____

www.easyscienceforkids.com / www.pinterest.com / www.overgas.bg

GREETINGS FROM TOMORROW

"HOW TO SAVE THE PLANET?"

1. How can you help?



Did you know…?

In Guatemala, poor people make eco bricks for wall-building. They make the 'bricks' from plastic bottles stuffed with plastic trash. In Joygopalpur city, India, a Danish student has invented a way to make plastic bricks from soft plastic waste (like plastic bags) collected by Heavy rains destroy houses built of mud bricks, but plastic bricks are weatherproof!

2. Do the Math!

When we recycle 1 glass bottle we can provide electricity for 1,5 hours for our TV. How many workings hours we can provide recycling 7 such bottles? What about 9?

……

……

……

3. **Let's do it!**

You and your class plant some flowers and trees in the school garden or yard. Don't forget to water them!

www.tiki.oneworld.org / www.pinterest.com / www.overgas.bg

GREETINGS FROM TOMORROW

"REDUCE, REUSE, RECYCLE"

1. Talk about it

2. BE CREATIVE!

Work in groups and make a logo or a poster on the topic!

3. **Do the Math!**

The recycling of 10 000 tons of plastic gives 36 people a job. How many people will have a job if we recycle 4 times more tons of plastic? What about 12 times?

……
……
……

_____

www.brighton-hove.gov.uk / www.pinterest.com / www.overgas.bg

GREETINGS FROM TOMORROW

"GLOBAL WARMING"

1. **What is global warming?**
   Global warming is the term used to describe the rising of the average temperature on Earth. It has to do with the overall climate of the Earth rather than the weather on any given day.

   1. **Find the words.**

Word Search - Global Warming

Find all the words related to global warming in the grid below.

F	L	O	O	D	I	N	G	Q	O	P	X	Z	T	G
P	Y	U	B	Q	E	T	A	T	I	B	A	H	S	S
Z	A	C	L	A	S	R	Y	I	D	C	M	E	I	V
S	E	R	U	T	A	R	E	P	M	E	T	G	T	W
C	X	B	W	E	L	D	T	G	L	Z	R	N	N	A
A	I	H	S	A	L	L	Z	T	N	H	U	A	E	R
R	C	T	B	A	F	P	I	G	C	A	X	H	I	M
E	C	O	C	P	V	N	H	R	Y	C	D	C	C	I
S	L	L	F	R	G	E	A	K	A	G	Z	N	S	N
G	J	N	I	L	A	E	H	Y	O	L	I	W	E	G
V	T	F	G	M	S	D	Z	N	K	K	Y	N	D	O
W	B	X	C	E	A	V	J	Q	K	S	K	N	X	C
C	F	Q	R	M	J	T	G	F	I	Y	R	P	U	T
R	N	M	F	W	V	I	E	C	L	K	T	J	K	K
F	U	T	U	R	E	K	E	R	Q	N	X	C	E	A

ARCTIC	ENDANGERED	HABITAT	SAVE
CARE	FLOODING	ICE	SCIENTIST
CHANGE	FUTURE	MELTING	TEMPERATURES
CLIMATE	GLOBAL	RESEARCH	WARMING

www.natgeokids.com / www.busyteacher.org /

2. Read the facts and translate

What causes climate change?

Many industrialized countries burn large amounts of fossil fuels such as oil and gas. The gasses in the atmosphere act like an "invisible blanket", trapping heat from the sun and warming the Earth. This is known as" Greenhouse effect".

Forests absorb huge amounts of carbon dioxide – a greenhouse gas – from the air, and release oxygen back into it. Sadly, many rainforests are being cut down to make wood, palm oil and to clear the way for farmland, roads, oil mines.

What effects does it cause?

Polar animals – whose icy natural habitat is melting in the warmer temperatures – are particularly at risk. Polar bears need sea ice to be able to hunt, raise their young and as places to rest after long periods of swimming.

Search for more information and make a poster. Work in pairs!

GREETINGS FROM TOMORROW

"HOW TO SAVE ENERGY AND REDUCE POLLUTION?"

What is energy?

Energy is Ability to do work. The energy can take a wide variety of forms - heat (thermal), light (radiant), mechanical, electrical, chemical, and nuclear energy

1. Cut the cards, color them and glue them on the correct place.

Helpful	Hurtful

2. Work in small groups. Explain why you put them there.
3. Make Christmas decorations from old bulbs.

http://www.kids.esdb.bg/basic.html

http://bonlacfoods.com/worksheet/recycling-for-kids-worksheets-4.html

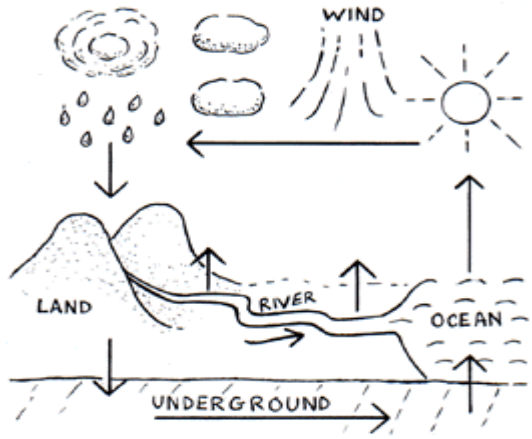
GREETINGS FROM TOMORROW

"HOW TO SAVE THE WATER?"

What is water?

Water is a basic molecule made up of two hydrogen atoms and one oxygen atom (H2O). When these three atoms come together, they form a strong bond that is difficult to break. The strength of this bond keeps a water molecule together for millions and even billons of years.
Water is one of the most common substances on the Earth. Covering over 70% of the surface of the Earth, it is easy to find. Even in a desert it is not hard to find water, if you know where to look.

1. **Explain the water cycle. Color.**



2. How does water circulate at home?

3.Make a discussion in groups.

https://www.pinterest.com/pin/447615650434935155/
https://kidsgeo.com/geography-for-kids/what-is-water/

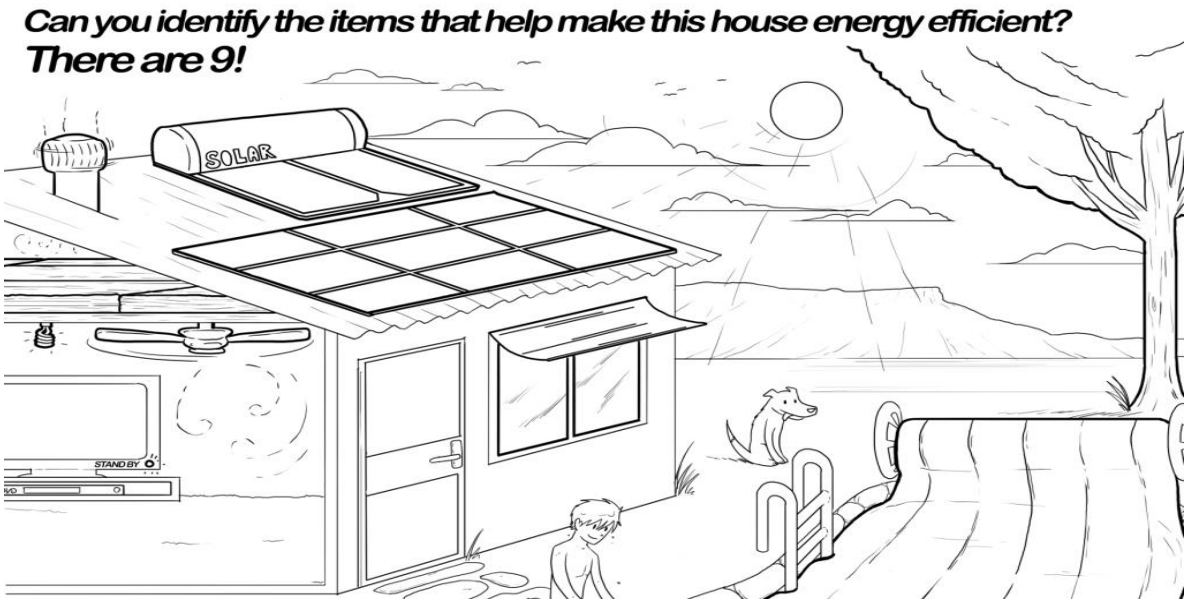
GREETINGS FROM TOMORROW

"HOW TO BE ENERGY EFFICIENT?"

What is to be energy efficient?

Using energy wisely also means being energy efficient.

1. **Colour the items**



2. Make a poster about energy efficiency. Work in pairs and make an exhibition.
3. Here are a few things you can do to start saving more energy. Think of more…
   - 3.1. The lights and television use electrical energy, so when you leave the room, shut them off.
   - 3.2. Don't stand with the refrigerator door open. Decide what you want before you open the door.
   - 3.3. ……
   - 3.4. ……

https://c03.apogee.net/contentplayer/?coursetype=kids&utilityid=pseg&id=16160
http://bonlacfoods.com/worksheet/solar-energy-worksheets-for-kids-6.html

GREETINGS FROM TOMORROW

"AIR POLLUTION"

1. **What does it say? Find out and translate in your mother language.**

Cryptogram

Can you figure out what the message says?

Not too hard.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
							19				25		7		16			26	4						

_ _ _ P _ L L _ T _ _ N
1 20 13 16 5 25 25 18 4 20 5 7

_ _ S _ _ _ S _ _ _ _ _
20 26 24 1 18 26 17 3 21 15

S _ _ _ _ _ N _ _
26 23 5 9 17 1 7 3

_ _ S _ S T H _ T _ N T _ _ _
12 1 26 17 26 4 19 1 4 17 7 4 17 13

T H _ _ T _ _ S P H _ _ _ _ .
4 19 17 1 4 23 5 26 16 19 17 13 17

T H _ _ T _ _ S P H _ _ _ _
4 19 17 1 4 23 5 26 16 19 17 13 17

_ S _ _ _ _ _ _ P _ _
20 26 23 1 3 17 18 16 5 22

_ _ _ S _ S T H _ T
12 1 26 17 26 4 19 1 4

S _ _ _ _ _ N _ _ T H _ _ _ T H .
26 18 13 13 5 18 7 3 4 19 17 17 1 13 4 19

_____

http://www.schoolexpress.com/fws/cat.php?id=2763

https://www.ducksters.com/science/environment/air_pollution.php

What is air pollution?

Air pollution is when unwanted chemicals, gasses, and particles enter the air and the atmosphere causing harm to animals and damaging the natural cycles of the Earth.

Natural Causes of Air Pollution

Some sources of air pollution come from nature. These include eruptions of volcanoes, dust storms, and forest fires.

2. Search

Human Causes of Air Pollution (Group 1)

Effects on the Environment (Group 2)

Effects on Health (Group 3)

GREETINGS FROM TOMORROW

"HYDROPOWER ENERGY"

1. What is hydropower?

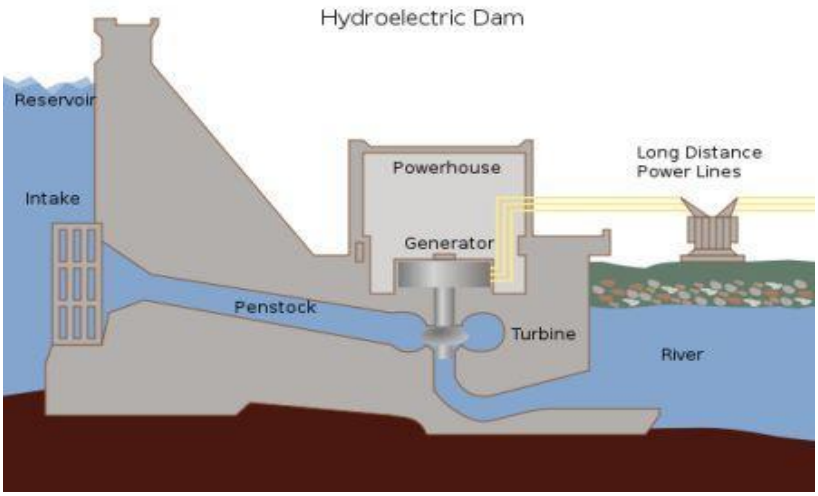
Hydropower is power that is generated from moving water such as rivers.

Renewable Energy

Hydropower is a renewable energy source. This means that using a dam or a river to generate electricity doesn't use up any limited resources like coal or gasoline.

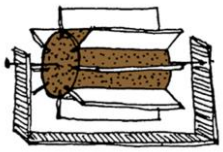
How do we get power from water?

Falling or flowing water from a big river has a lot of energy. We can harness this by forcing the water through a pipe called a penstock. As the water flows through the pipe it turns the blades of a turbine which spins an electric generator. As long as the water is flowing, the generator will be able to provide electricity.



2. Make a research about hydroplants in your country. Work in groups.

3. Make some experiments. Let your teacher help you.



https://www.ducksters.com/science/environment/hydropower.php
http://www.reachoutmichigan.org/funexperiments/agesubject/lessons/energy/waterenergy.html

GREETINGS FROM TOMORROW

"DAMAGED PLANET"

1. **Make words using the letters from the words in the sentence. Write them down.**

Fires destroy many of our forests.

Can you make lots of words using only the letters in the sentence above? Write the words on the lines below. If you need to, turn over the page, and write on the back:.

2. Make a list of the things that damage the planet:

- ……
- ……
- ……
- ……

3. Work in groups. Make a poster of the planet you want to live on.
Make an exhibition in your school.

http://www.schoolexpress.com/fws/cat.php?id=2752

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