

KNOWLEDGE KIT OF THE

Eco-friendly youth

YOUR
WAY
TO
SUSTAINABLE
FUTURE



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Erasmus+ Programme
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About the project

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This booklet was created as a result of "Sustain your way" project which was part of the Erasmus+ Programme of the European Commission

The main activity of the project was youth exchange - a 7 day (+2 travel days) outdoor activity that took place in Georgia from 23rd to 31st of July 2017. The project was aimed for 35 people with different social, cultural and economical background (6 participants + 1 leader) from Estonia, Georgia, Ukraine, Croatia, Poland and Moldova aged 18 to 30.

The project gathered young people interested in environmental issues in order to raise their awareness about environmental situation and challenges on a global as well as local scale and equip them with specific knowledge, skills and attitudes that would enable them to become active in this field and multiply the outcomes of the project back home in their communities.

The Youth Exchange set the following objectives:

- to develop the participants' understanding of environmental sustainability and its importance;
- to reflect on the environmental situation in different parts of Europe (trash issues, climate change problems, air, water, noise pollution etc.);
 - to introduce the principles of Zero waste lifestyle;
- to create a basic "knowledge kit of the Eco-friendly person" sharing good practices for supporting each-others awareness of "Green techniques";
- to introduce some possible solutions of trash problems, such as creative recycling, composting and etc.
- to involve youngsters in designing concrete steps, action-plan in order to make a positive impact on the environmental state in their local communities;

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- to promote outdoor education as an efficient and inclusive tool while working on environmental issues;
- to promote healthy lifestyle through involving the participants in outdoor educational activities;
 - to develop new tools and ideas for following up and developing existing/future projects;
- to improve participants' self esteem, develop their ability to cooperate, lead the constructive communication with their peers, decision making and responsibility taking.
 - to improve their knowledge and understanding of different cultures, traditions and widen their horizons in terms of international cooperation.

As the main methods of education we've chosen the non-formal, outdoor and experiential learning methods. During the YE the flash mob took place to raise peoples' awareness of the environmental issues and promote cleanliness on the streets. The flash mob was documented on the video and was one of the main tangible outcomes of the YE together with the brochure and articles written by the participants, ensuring the successful dissemination of the projects' results. Some of the young people and youth leaders were able to organise a workshops in their organisations and share the results and knowledge they've gained during the activity.

The project also helped to introduce young people to the Georgian local culture as we had several locations during the activity: Kobulety-Mtirala National Park-Anaklia-Tbilisi. Young people mentioned that we had 3 projects in one, as the activities during the YE were very varied: youngsters took a hike in the Mtirala National Park, embracing the positive influence of reconnecting with nature, took part in the one of the big local cultural events, where they organised a flash mob to promote cleanliness on the streets and raise the awareness of the environmental issues among the public, and finally, to see the Georgian capital - Tbilisi. During the activity participants formed good connections with their peers and continue their communication. Also, some of the youngsters showed interest in organising their own projects under the E+ initiative as well as smaller projects on a local scale.

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Most importantly, the youth exchange pushed the participants to be more thoughtful and responsible in their own decisions and actions related to the environment, implement the experience in their everyday lives and by that to set a good example in their social circles and communities.

Apart from the participants, the YE had a positive impact on different categories of beneficiaries:

Organisations:

- through the conducted workshops benefit from the knowledge, inspiration and the best practices the participants and leaders shared;
 - acquired more qualified and motivated activists;
 - broadened their contacts and networks;
 - strengthened their partnerships and cooperation;
- widened and improved their grant history and history of successful projects, that increases their credibility and opens new opportunities for creation of new projects and making partnerships with other NGOs', civil organisations and businesses;
- acquired more experienced staff in training delivery and project management in the face of the country leaders and coordinators organisations.

Communities as a target group:

- benefit from new initiatives that participants may take up after the project;
- benefit from the follow up activities organised by the participants

Most importantly, the youth exchange will push the participants to be more thoughtful and responsible in their own decisions and actions related to the environment, implement the experience in their everyday lives and by that to set a good example in their social circles and communities.



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PARTICIPATING ORGANISATIONS

ESTONIA

Let's Do It! World (known in Estonia under the name of Teeme Ära!) is a civic led mass movement which began in Estonia during 2008 when 50,000 people gathered to clean up the entire country in just five hours. We are now an international movement with 113 countries working together, engaging over 16 million participants. Our aim is to clean up the whole World from illegally dumped solid waste and to keep our planet clean. To reach the essential transformation in our global society, we have set the ambitious goal to involve 380 million people by 2018. This is around 5% of the World's population and is the estimated amount to create a lasting change.

Let's do it Foundation is a legal name of the organisation representing an Estonian based head-quarters of Let's do it! World civic movement.

The organisation largely promotes Eco-friendly zero waste lifestyle and thinking around the world by cooperating with experts in that field (Zero Waste Europe organisation), organising various events, such as annual global and regional conferences, country clean-ups, training courses and other.

The movement largely contributes to creating a non-violent, non-discriminative global community around the world and thus, to peace building and solving serious problems humanity faces today using the principals of unity, understanding, tolerance and successful communication.



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UKRAINE

GO Unit is a non-governmental organization found in 2015 year by a group of active and creative volunteers who wanted to change the world for better.

The aim of the organization is development of international and regional cooperation and international ties and cooperation in scientific, educational, cultural, recreational areas. We care about protection of rights and freedoms; social, economic, cultural satisfaction through support of the local initiatives in various spheres of life. We implement the best national and international experience, as well as various forms of local democracy.

The objectives of the Organization are:

- Local democracy development support, spread of ideas through governments and civil society;
- Implementation of the principles of social justice and social partnership in a society;
 - Organization and participation in activities intended to improve cultural, educational, environmental, recreational areas of society;
- Conduct of programs aimed at supporting community initiatives in education, arts, sports, environment, human rights and development of civil society;
- Creating conditions for active participation of youth associations in the state-building process and the development of local democracy;
 - Inclusion of young people with fewer opportunities into society.

Vision:

NGO Unit aims to inspire young people to build together democratic society, to become a more social, more active, more environmentally-concerned people. We believe youth have enough power to change their own realities. We aim to empower youth through non formal educational activities.

Mission: NGO Unit aims to:

- To activate young people to take initiative in social life;
- To build strong Partnership in local and international level to open borders of possibilities for young people in education, economical, environmental and sport development.
- To promote non-formal education in formal institution and in general.

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POLAND

Started as a small enthusiastic group in 2015 that was bringing the values of organization to polish youngsters. Logos Polska focusing on intercultural exchange, the power of benefits of cultural diversity and hygiene of information our members coordinated participants to several multinational projects in Georgia, Armenia, Estonia, Germany and other countries. Logos enthusiastic group became bigger and was strong enough to make a next step and now starting from July 2016 are working as a Logos International with a headquarter in Poland, Poznan.

The main goal of the organization is to develop Polish young people providing them with various opportunities. Three main areas of work of the organization are: international exchanges, education and tolerance. Young team of Logos Polska is active who want to bring some positive change to local and international society.

Our vision:

through our activities, we provide youngsters with opportunities to learn and develop. We want to develop society we live in and build it according to our values.



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GEORGIA

Youth for Peace and Equality is a NGO with the mission to promote Peaceful and Equal society, to empower youth and raise their awareness about Peace, Human Rights and Gender Equality. In order to meet this task the association is implementing the educational and Youth development programs though using different tools such as modern art and etc. YPE was established in the end of 2012 and it is working mainly in education field with different target groups, youth, students, teachers, internally displaced people.

- Human Rights Education;
- Peace-building and Conflict resolution;
- Gender Issues;
- Youth empowerment and youth participation;
- Art and Culture

YPE is activity involved in youth field and is one of the most youth NGO which is promoting volunteering, non-formal education, youth participation and active citizenship, as well as cross experiential learning. Since its existence organisation has implemented many innovative international, national and local projects what can be seen on our facebook, All above mentioned goes inline with proposed activities, as its priority of Erasmus+. YPE has very good experience in conducting outdoor projects since 2009. Organisation has own outdoors tools, such as tents, kitchen equipment, sleeping pads etc.



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MOLDOVA

MEGA (the complete name: Moldovan Environmental Governance Academy) is the social entrepreneurial organization focused on delivering services of gamification, game development, gamified trainings, and e-learning with environmental and social value.

MEGA represents an innovative solution for addressing the modern world's most pressing social and environmental issues, including inefficient natural resource management, environmental pollution with greenhouse gas emissions and waste toxins, loss of biodiversity, climate change, etc. We tackle these issues through community participation and collaborative environmental governance.

The purpose of MEGA is to create an environmentally sustainable world not on the basis of fear of possible environmental apocalypse, but on the basis of such positive and motivating feelings as fun, enjoyment, and optimism about the future.

To achieve this we combine psychology + technology + ecology in a unique and innovative way and use their combined advantages. More specifically, we apply the concepts of gamification, open-source eco-innovations, and citizen science and grant communities the “power” to create the clean, green, and environmentally prosperous world they dream of with their own hands and minds.

The core of our organization is MEGA Game - the Game with Impact, which is the education-and-collaboration system for environmental and social education and eco-innovation development that improve resilient social well-being of communities worldwide and health of natural environment they live in. It allows them to change behavior to more eco-friendly and environmentally conscious.

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MOLDOVA

Specific Social Context

MEGA Game is delivered to beneficiaries (community members, individual environmentalists, civil society initiative groups, environmental non-governmental organizations (NGOs), and CSR-oriented companies). In form of a map-based gamified web platform and smartphone application we offer them to engage in collaborative e-learning and environmental action through on-line trainings, missions, quests, and challenges shared within the platform & app.





Why worry?

CAPTER II

Nowadays the number of talks about the environment seem to go up every minute. But why do we need to care about our environment at all?

Well... the answer seems to be obvious: if you keep your flat tidy it improves your quality of life. The same thing is with the environment overall: keep your surrounding clean, do small little things every now and then (or even challenge yourself with big ones) and your life quality will raise. But let's take a closer look. Here we'd like to bring up a few reasons why we think it's important to care not only about the cleanliness of your flat/house/backyard/surroundings but for the environment overall.

CLEAN ENVIRONMENT - BETTER HEALTH

The ecosystem and its balance is highly essential for our health and well being. And here's how: our forests remove carbon dioxide and other pollutants from the air we breathe and also cool our air temperatures, reducing the formation of ground-level ozone, a pollutant that can cause heart and lung problems to worsen. Excessive logging leads to the lack of trees that purify our air, damage local biodiversity that may lead to the extinction of the whole species. The worse the quality of air, the higher the risk of respiratory diseases, the lower the quality and longevity of our lives. Low quality of life and poor health lead to mental disorders, such as anxiety, depression, increase in suicide rates, which also has an impact on the economic system overall through low level of performance of the workers and/or inability to work at all due to the health conditions. Of course this is an exaggerated example, but it may as well come true unless we'll do something to prevent it from happening.

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“When the earth is sick and polluted, human health is impossible... To heal ourselves we must heal our planet, and to heal our planet we must heal ourselves.” – Bobby McLeod (Aboriginal Activist & Poet)



SAVE THE GREEN ZONES FOR YOUR CHILDREN

If you don't want to do it for yourself, do it for your children, or future children, or grand children even. You know what they say, people tend to have more satisfaction from the things they've done if they've done it for someone they care for

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- The concept of 'needs', in particular, the essential needs of the world's poor, to which overriding priority should be given; and
- The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs. "

— World Commission on Environment and Development, Our Common Future (1987)

LIKE TO WATCH ANIMAL PLANET?

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We've mentioned briefly about the biodiversity, which refers to the variety of plants, animals, and other living things in our world. It can be negatively influenced by habitat loss and degradation due to human activity, climate change, and pollution, among other things. But why is it important to preserve different species on the planet? Apparently, biodiversity can impact many processes in ecosystem such as:

- natural cycling of elements, like nitrogen or carbon, and soil fertility
- water purification and rainwater harvesting
- pest and disease cycles
- drought resistance of an area or forest and other things



TAKE A HIKE

Another reason to care for the environment is simply because it's beauty. It's wild life, it's pristine desolate areas, it's magical forests and mesmerising sunsets, it's deep oceans and fast moving everchanging rivers, it's clear blue sky, it's unforgettable delicate noises, it's soft green grass, it's giant lonely mountains along with it's crystal clear lakes. We all cherish the time we spend in nature that helps us to recover from city dwell, relax and unwind. And what about all this exciting active stuff that you can do outside? If no such places would be left, where would we go for hikes, picnics, rafting, canyoning, mountain climbing, snowboarding, skiing, paragliding and many more? Haven't tried it yet? Then what are you waiting for? :)

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IT'S OUR HOME

Well... this planet is the only home that we have. While NASA is recruiting for its very first expedition to Mars, the rest of us are still staying here. So if we will not take care about our home, then who will?

“Out of all those millions and millions of planets floating around there in space, this is our planet, this is our little one, so we just got to be aware of it and take care of it.” – Paul McCartney



Air pollution

CAPTER III

The beginning of the second half of the XX century was marked by the intensive process of motorization of society.

The development of motor transport has identified two distinct and contradictory trends. On the one hand, the level of motorization achieved, reflecting the technical and economic potential of the development of society, contributed to meeting the social needs of the population, and on the other hand, led to an increase in the scale of negative impact on society and the environment, leading to a violation of the ecological balance at the level of biosphere processes. The apparent positivity of the first trend has caused a pronounced undesirable effect. By the end of the century arose, everywhere manifested itself and firmly settled a new threat to the vital interests of the individual, society, the state - a real environmental hazard for life, associated with the giant scale of the level of motorization.

The relevance of this topic is due to the increasing number of motor transport and the solution of the problem of its impact on the quality of urban environment and public health.

Pollution is the contamination of the environment, including air, water, and land, with undesirable amounts of material or energy. Such contamination originates from human activities that create waste products.

Many of the world's largest and industrialised countries are located in Europe: Paris, London, Berlin, Amsterdam. Due to their high level of development these cities have a large number of factories, power plants, cars and other vehicles that contribute to traffic and through that the release of carbon dioxide into the atmosphere, polluting the air.

United Kingdom is considered to be the worst air pollutant in Europe.

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The word "smog" was firstly introduced in 1905 to describe the air in London, which is a combination of the words "smoke" and "fog". Thick London smog happens when water in the air mixes with smoke particles from coal fire.



In the past the major source of the air pollution was smoke from burning coal, thus the factories that processed coal. However, today exhaust fumes from public and private transport is a bigger issue.

The effects of the air pollution are numerous, here we will mention only some of them:

- asthma and pneumonia are linked to vehicle emissions;
- high air pollution keeps people indoor, lowering their quality of life, health and well-being due to the lack of connection with the nature;
 - air pollution has harmful effects on wildlife;
- blackens the buildings and damaging historical heritage.

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An industrial and intensively farmed country, Ukraine contains some of the most polluted landscapes in Eastern Europe. Pollution became evident in Ukraine with industrial development in the 19th century.



SOURCES OF THE AIR POLLUTION IN UKRAINE

The sources of the atmospheric air pollution in Ukraine are energetics, metallurgy, coal mining, mechanical engineering industry, chemical industry, agricultural production, municipal engineering facilities and transport.

The main source of air pollution in Ukraine are emissions from stationary sources. Up to 62% of industrial emissions come from sources of processing industry, up to 37% - mining and industrial quarries, up to 1% - as a result of the production of building materials.

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The main air pollutants in Ukraine include thermal energy companies - thermal power plants and heat and power plants that burn "dirty" fossil fuels. In this case, various pollutants (compounds) and greenhouse gases are formed. The most significant of these are suspended solids (ash), SO₂, nitrogen compounds and greenhouse gases. Enterprises in the coal industry are throwing mainly dust, greenhouse gases and acid gases.

The volume of pollutant emissions from stationary sources in Ukraine is almost 5 million tons. Only the enterprises of the mining and smelting complex emit about 3 million tons of compounds, 80% of which are gaseous substances (SO₂, CO, (NO_x, ammonia, phenol, hydrogen sulfide, cyanide hydrogen and benzene).

The enterprises of the chemical industry, which release into the atmosphere ammonia, nitrogen oxides, sulfur and carbon, suspended solids of sodium, alkali, mineral fertilizers, limestone, soot, carry a special danger to the population and the environment.

The main pollutant emissions from steel, iron and steel, forging and press, welding and dyeing industries of the machine-building enterprises are sulfur and nitrogen oxides, phosphoric acid, dust, iron oxides, manganese, copper, chromium, zinc and aluminum, hydrocarbons, white spirit, xylene, toluene and other solvents.

One of the largest sources of air pollution is transport. Vehicles with usage of various types of petroleum products as a fuel throw into the air 95% of lead, 47% of carbonous oxide and 31% of hydrocarbons.

Over one-third of the emissions into the atmosphere originate, from automobile transport. That source, which attains overwhelming proportions in cities with little industry, such as Uzhhorod, Yalta, Poltava and Khmelnytskyi, is aggravated by the use of leaded gasoline and inefficient engines as well as a lack of catalytic converters.

Among the industries the most polluting to atmosphere are energetics (32%), metallurgy (27%), coal mining (23%). The volume of emissions of enterprises in these industries account for more than 80% of all emissions in the country. Air pollution is especially severe in many of the heavily industrialized cities

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and towns of southeastern Ukraine, notably in Luhansk, Donetsk and Zaporizhia. Coal-using industries, such as metallurgical coke-chemical plants, steel mills, and thermal power plants are major sources of high levels of uncontrolled emissions of sulphur dioxide, dust, unburned hydrocarbons, and other harmful substances.

In the majority of industrial cities, the air pollution degree exceeds threshold limit values for nitrogen dioxide, carbonous oxide, sulfur dioxide. The most negative impact is experienced in the cities of Dnipro, Kamianske, Kryvyi Rih, Mariupol, Donetsk, Luhansk, Makiivka, Zaporizhia.



POLLUTION BY CARS

Exhaust gas - the gas exiting the exhaust pipes of a motor vehicle

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Today in the world about 600 million cars. On average, each of them emit 3.5-4 kg of carbon monoxide per day, a significant amount of nitrogen oxides, sulfur, and soot. When using the ethylene (with the addition of lead) gasoline, this highly toxic element falls into the exhaust. "Contribution" of road transport to atmospheric pollution today in most cities of Ukraine is at least 30%. Cars use atmospheric oxygen, they annually extend a network of hard-coated roads that surround the planet with a dense grid. The content of such roads requires very high energy costs.



Even a car for burning 1 kg of gasoline requires 2.5 kg of oxygen. On average, a motorist passes 10 thousand kilometers a year and burns 10 tons of gasoline, spending 35 tons of oxygen and emitting 160 tons of exhaust gases into the atmosphere, which detected about 200 different substances, including 800 kg of carbon monoxide, 40 kg of nitrogen oxides, 200 kg of hydrocarbons. If gasoline is ethylated, then another 3.5 kg of poisonous lead. In addition, each car, washing the tires, supplies to the atmosphere 5-8 kg of

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rubber dust annually. The amount of harmful substances entering the atmosphere in the composition of the exhaust gases, depends on the general technical condition of cars and especially from the engine - the source of the greatest pollution. So, in case of violation of the regulation of the carburetor emissions are increased by 4 - 5 times.

The use of ethylene gas, which has a lead compound in its composition, causes air pollution with toxic toxic compounds of lead. About 70% of lead, added to gasoline with ethyl liquor, enters the atmosphere with exhaust gases, of which 30% is deposited on the earth immediately, and 40% remains in the atmosphere. One medium-tonnage truck allocates 2.5 - 3 kg of lead per year. The exhaust gases of the car are heavier than air, so they all accumulate in the ground. A child sitting in a carriage on the pavement of a street with a large traffic area, inhales a much more toxic air than adults walking with him.

The morning of many towns people begins with the sound of the included engines and the smell of exhaust gases. Emissions of pollutants in the warming up of the car, especially in the winter, is much higher than when it moves in the yard. In general, the exhaust gases in dangerous concentrations extend to the third or fourth floor. If the smell of gas is felt in the apartment, you can be sure that its content exceeds the norm.

The modern car makes a cocktail of more than 200 pollutants. Among them:

- hydrocarbons;
- Carbon monoxide;
- Oksis;
- Ground ozone;
- Sulfur;
- Aldehydes;
- Soot;
- Small metals: nickel, mercury, chromium, cadmium, zinc, iron, arsenic, manganese and beryllium;
- Tetraetilsvinnets.

Air pollution affects human health and the environment in various ways - from direct and immediate threat (very polluted air, etc.) to the slow and gradual destruction of various systems of life support of the organism.

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In many cases, air pollution contributes to the structural components of the ecosystem in such a way that regulatory processes are not able to return them to the initial state and as a result, the mechanism of homeostasis does not work.

INCINERATION OF WASTE

The problem of garbage disposal is one of the main factors of air pollution in Ukraine. The absence of an opportunity for processing waste leads to the fact that it is burned. It can be both domestic and industrial waste, fallen leaves and last year's grass.

Green plantations, as a biological filter, absorb toxic substances. During combustion, these chemicals are released. When one ton of plant residues are burned, about 9 kg of smoke microparticles are released into the air. They include dust, nitric oxide, carbon monoxide, compounds of lead, mercury and other heavy metals and a number of carcinogenic compounds.

In a fire smoldering without access to oxygen, benzoprene is released, which can cause cancer in humans. In addition, dioxins are released into the air by smoke, one of the most toxic substances for humans.

Residents of the private sector often pesticide plants with pesticides, which are also released into the air when burning foliage or grass. Most pesticides contain potato tops that "save" from the Colorado beetle, by spraying poison.

In Ukraine, it is very popular to burn garbage dumps. Their burning significantly increases the pollution of the atmosphere. When a plastic bag burns, up to 70 different chemical compounds are released into the air, most of which are toxic to humans. Thick black smoke from smoldering plastic debris contains carcinogenic polycyclic hydrocarbons. When burning rubber in addition to the above, carcinogenic carbon black and sulfur oxide. Also, firewood, chipboard, plywood often fall into the fire. These materials contain formaldehyde resins, which contain formaldehydes and can be painted with an oil paint containing lead.

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In addition to the immediate threat to human health, the burning of leaves, debris and dry grass leads to such dangerous factors:

- over the past decade, the number of allergic people affected by the release of toxic substances contained in smoke from fires has increased several fold.
- the majority of steppe fires begin with the burning of stubble in the fields.
- in natural areas of lawns, fire destroys the seeds and roots of herbaceous plants, damages the lower part of trees and shrubs and the upper parts of the roots.
- destruction of natural deciduous litter leads to an increase in 2-4 times the freezing of the soil.
- under normal conditions, when the leaves rot, the substances necessary for plant development return to the ground. When the leaves burn, ash forms. Despite the generally accepted opinion, ash is a very poor fertilizer, because the burning of leaves annually leads to more impoverishment of the soil.

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- A soil impoverishment in turn leads to the depletion of vegetation.
- a smoke from fires in foggy days can form smog and for a long time hang in the air.



© ChinaFotoPress via Getty Images

Because of the smog a sunset can not be seen in Beijing, China

Acid rain

CAPTER IV

Acid rain is a rain or any other form of precipitation that is unusually acidic, meaning that it has elevated levels of hydrogen ions (low pH)

Acid rain is a result of air pollution. When any type of fuel is burnt lots of different chemicals are produced and released into the air and mix with water in the clouds. The rain from these clouds then fall as a very weak acid. Eventhough it is not acidic enough to burn your skin it is extremely harmful for the environment.

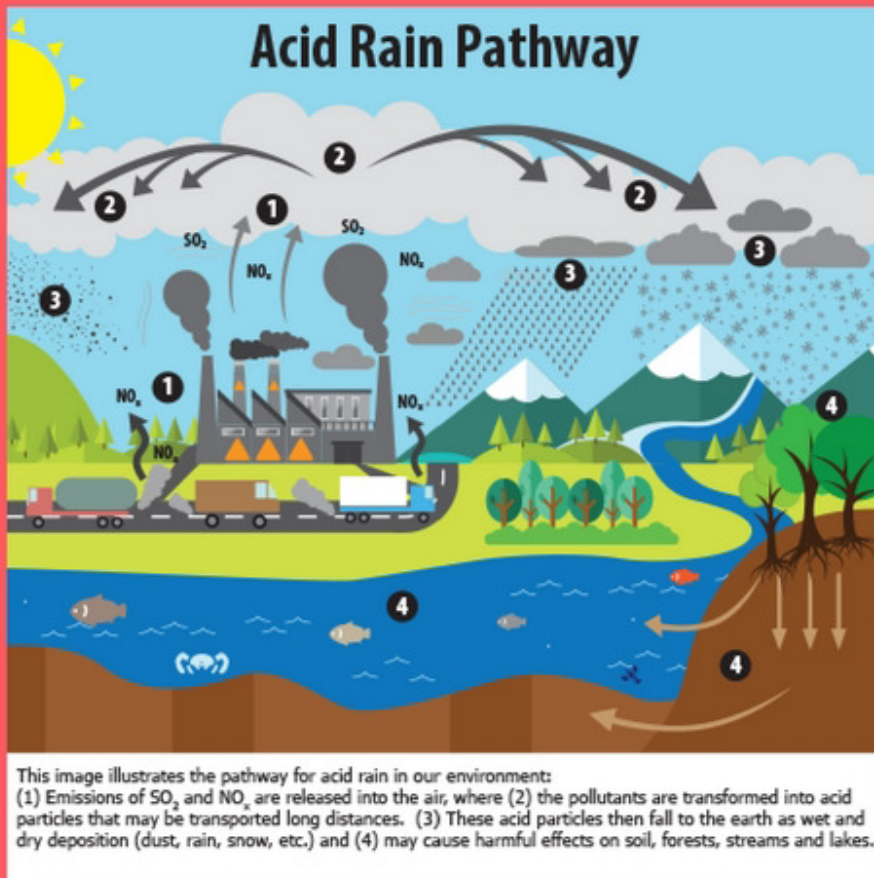
Though acidic rain was discovered in 1853, it was not until the late 1960s that scientists began widely observing and studying the phenomenon. The problem of acid rain has not only increased with population and industrial growth, but has become more widespread.



Since 1998, Harvard University wraps some of the bronze and marble statues on its campus, such as this "Chinese stele", with waterproof covers every winter, in order to protect them from corrosion caused by acid rain and acid snow

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The country with the worst acid rain in Europe is Germany, who is in this case it's worst enemy: the main sources of acid rain in Germany is smoke from factories (burning fuels like natural gas, coal and oil). Germany is a top manufacturing country in the car industry, production of steel and chemical produce, which means that German economy is highly dependent on these industries. According to the global statistics Germans own more cars than people of most other countries do. Acid rain can have severe effects on vegetation, soil, crops, surface water and aquatic animals.

Acid rain does not directly affect human health. The acid in the rainwater is too dilute to have direct adverse effects. However, the particulates responsible for acid rain (sulfur dioxide and nitrogen oxides) do have an adverse effect. Increased amounts of fine particulate matter in the air do contribute to heart and lung problems including asthma and bronchitis.

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How acid rain affects stonework.
The picture on the left was taken in 1908.
The picture on the right was taken in 1968

Nuclear disaster

CAPTER V

In 1986 USSR generated 10% of the world's nuclear power. Chernobyl plant exploded on April 26, 1986 causing a nuclear disaster for Europe.

200 000 people were evacuated to decrease exposure to radiation. How did the country react? The morning after the explosion, there was no hint of a disaster.

After 36 hour of being exposed to radiation, people were told to pack their belongings and evacuate their homes. The radius of the evacuation region was 30 km or 18 miles. At the nuclear power plant itself several attempts were made to clear away and seal the chunks of graphite and other radioactive solids. The number of volunteers was sent to do that. The volunteers were only allowed to be at the plant for no more than 90 seconds. The radiation levels were 15 000 times greater than a normal person's exposure in a year.

It has been approximated that about four hundred times more radioactive material was released from Chernobyl than by the atomic bombing of Hiroshima. By contrast the Chernobyl accident released about one hundredth to one thousandth of the total amount of radioactivity released during the era of nuclear weapons testing at the height of the Cold War, 1950 – 1960s, with the 1/100th to 1/1000th variance due to trying to make comparisons with different spectrums of isotopes released. Approximately 100,000 km² of land was significantly contaminated with fallout, with the worst hit regions being in Belarus, Ukraine and Russia. The initial evidence that a major release of radioactive material was affecting other countries came not from Soviet sources, but from Sweden. On the morning of 28 April workers at the Forsmark Nuclear Power Plant (approximately 1,100 km (680 mi) from the Chernobyl site) were found to have radioactive particles on their clothes. The disaster had major effects on the soil, ground water,

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wildlife and vegetation and human health in the contaminated regions. The Pripyat city is still considered to be not suitable for life.



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Overconsumption

CAPTER VI

Can we OVER Overconsumption?

All over the world people are consuming every day, in some cases nearly all the time. In today's economy the global resource network has given us the ability to shuffle goods from where they are produced to where they are desired at mind-boggling speeds. One of the main causes of the rise in consumerism is that items that were once considered luxuries (televisions, cell phones, computers, Ipods) are now seen as necessary.



Since the 1800s and the Industrial Revolution the world has been consuming at a higher rate than ever. The Revolution allowed products to be available in enormous quantities for the first time in history. Because of their unheard of low cost, products were basically made available to all.

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This unlimited access led to the era of Mass Consumption. It soon grew to be expected that people have the latest model of the newest appliance. 'Why have the old model? The new one was more efficient'. This philosophy soon morphed into people buying newer models based on appearance rather than function, and consumption continued to grow. Since the 1950s, people everywhere on the globe have consumed more goods than the combined total of people throughout history. There are five basic stages of the consumer cycle: extraction, production, distribution, consumption, and disposal. This is the basis of the material economy. What powers this cycle? Planned obsolescence and perceived obsolescence are the main types of production that contribute to the excessive consumerism today. Planned obsolescence: Companies design products so that people will need or want to throw them out soon after they buy them. Perceived obsolescence: Companies use advertisements and new models to convince the consumer that they need the new model. For example, a car company comes out with a new model that has one, small, nearly insignificant new feature, and suddenly the model from the year before is completely un-desireable. The same goes for ipods, digital cameras, and nearly any other popular product.

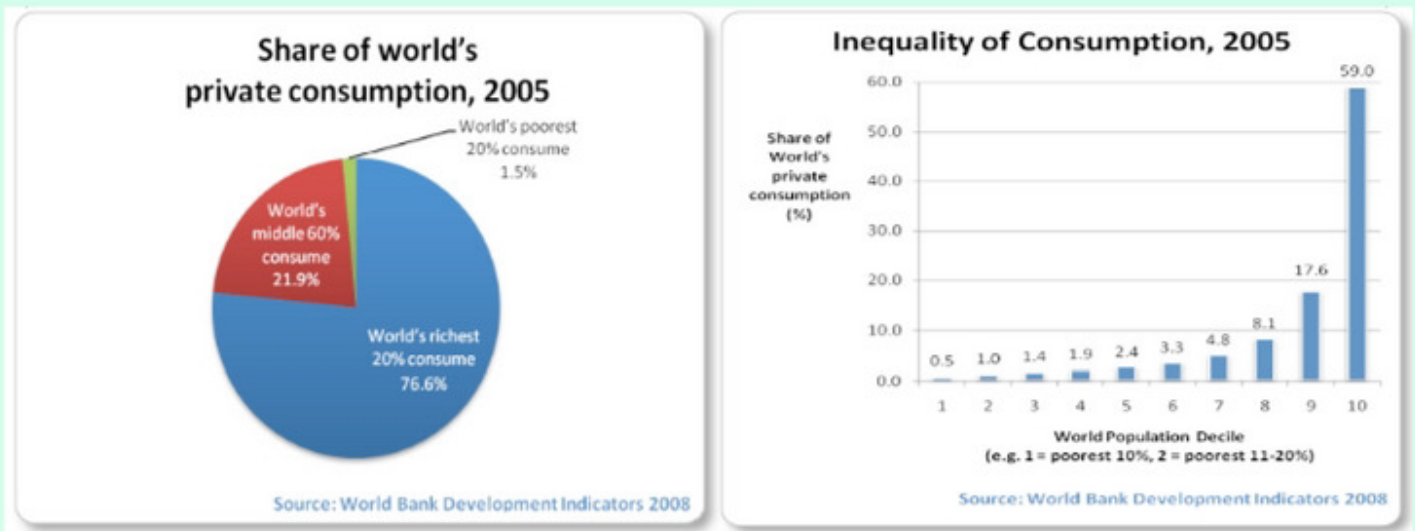
Consumption of products and services impacts the environment in many different ways. For example, the things we buy contribute, directly or indirectly through the product lifecycle, to climate change, pollution, biodiversity loss and resource depletion in Europe and other regions. We consume a variety of resources and products today having moved beyond basic needs to include luxury items and technological innovations to try to improve efficiency. Such consumption beyond minimal and basic needs is not necessarily a bad thing in and of itself, as throughout history we have always sought to find ways to make our lives a bit easier to live. However, increasingly, there are important issues around consumerism that need to be understood. For example: How are the products and resources we consume actually produced? What are the impacts of that process of production on the environment, society, on individuals? Which factors influence our choices of consumption? and lot more questions...

OVERCONSUMPTION

CHAPTER VI

Perhaps what is more frightening than the rate at which consumption is destroying the environment is that the mantra of consumer economy - "more is better" - is spreading throughout the globe. We simply buy too much of what we don't need and often even what we don't really want.

And the bigger issue that major overconsumption part comes on developed countries from western Europe and North America. Global inequality in consumption, while reducing, is still high. Using latest figures available, in 2005, the wealthiest 20% of the world accounted for 76.6% of total private consumption. The poorest fifth just 1.5%:



Humans have base needs: food, shelter, safety, health etc. These are the things that, when taken away from us, pose a risk to our survival, but what about all this other "stuff"? Bottled soft drinks, designer shoes, brand new smartphones, takeaway coffee... Do we really need all of this? Where do we draw the line between consumption and overconsumption??? With SALE signs in every shop window, people handing out flyers for end-of-season sales and loud music pumping from department stores, that you'd think that humans were somehow hardwired to consume. One quarter of humanity—1.7 billion people worldwide—now belong to the "global consumer class", having adopting the diets, transportation systems and lifestyles that were once

OVERCONSUMPTION

CHAPTER VI

mostly limited to the rich nations of Europe, North America, and Japan. Today, China, India, and other developing countries are home to growing numbers of these consumers. Our consumption of goods obviously is a function of our culture. Only by producing and selling things and services does capitalism in its present form work, and the more that is produced and the more that is purchased the more we have progress and prosperity. However, the production, processing, and consumption, of commodities requires the extraction and use of natural resources (wood, ore, fossil fuels, and water); it requires the creation of factories and factory complexes whose operation creates toxic byproducts, while the use of commodities themselves (e.g. automobiles) creates pollutants and waste. Yet of the three factors environmentalists often point to as responsible for environmental pollution — population, technology, and consumption — consumption seems to get the least attention. One reason, no doubt, is that it may be the most difficult to change; our consumption patterns are so much a part of our lives that to change them would require a massive cultural overhaul, not to mention severe economic dislocation. As consumers, we can play our part by considering the lifespan and impact of the products we buy, and how we use energy and water at home, and by talking to friends and family about our buying decisions. But one should always ask himself-how much do you consume? If you want a change, you should start first from yourself. The first step towards living a more planet-conscious life is working out what you already consume. What are your daily habits? Do you buy a takeaway coffee every morning in a disposable cup? Do you accumulate single-use plastic bags when you go to the supermarket? How much is your quarterly electricity bill? Next, think about how much of that stuff is essential for your survival, how much is important to your happiness and comfort, and how much is just excess or luxuries—all in all separate things that you NEED and WANT. And the most important - learn to be happy with less.

One wise man said once “The world has enough for everyone's need, but not enough for everyone's greed.” This is a philosophy which should be shared through generation. If we not finish with OVERCONSUMPTION, at one point it can finish with whole humanity.

Other environmental challenges

CAPTER VII

Intensive agriculture, industrialisation and deforestation are one of the major problems our environment face today.

For example, the effects of the intensive agriculture and industrialisation were observed in Bulgaria in 1990s. According to the research made, out of the total agricultural land, 60% got polluted by chemical fertilizers and pesticides. Two thirds of the rivers in the country were polluted. The exploitation of the natural resources in Bulgaria serves well to highlight this type of pollution.



DEFORESTATION

According to ONU, since 2000 the surface of primary forests on the planet has reduced in 40% approximately, taking into account that an area is similar to the size of Germany and Denmark together.

OTHER ENVIRONMENTAL CHALLENGES

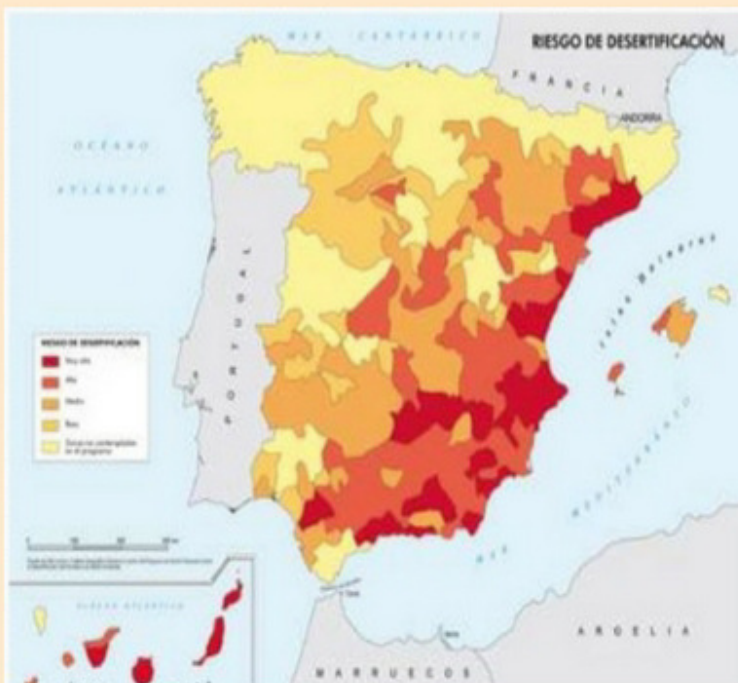
CHAPTER VII

To fight the climate change, we need to stop deforestation before 2020. The loss of forestry, or deforestation is one of the most serious problem the planet is facing now. Some of the effects of the deforestation are:

- destruction of the ground due to erosion;
- loss of habitat of wild life;
- loss of biodiversity;

variation of water cycle and destruction of the ecosystem.

One of the worst cases of deforestation in Europe is Spain.

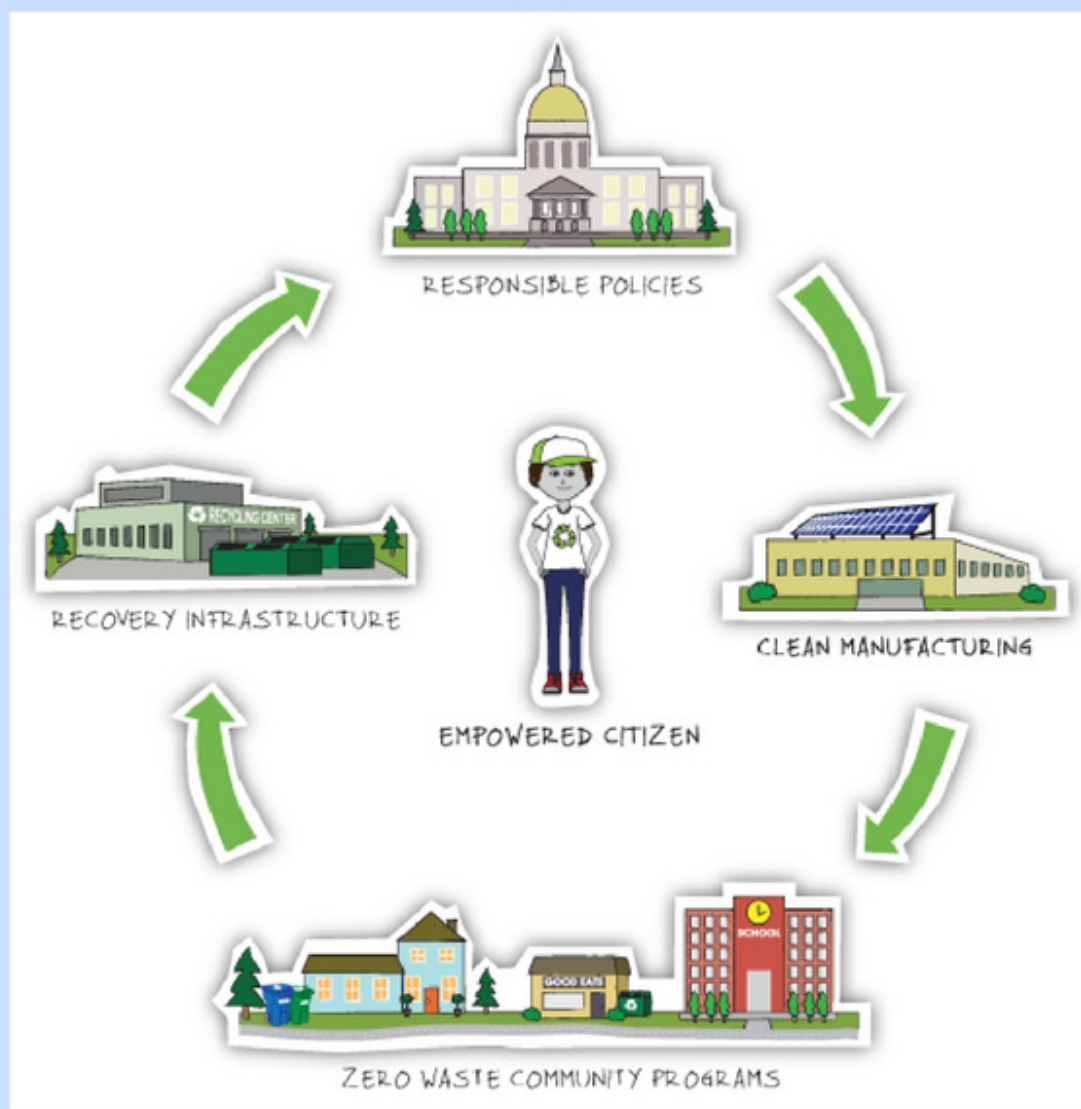


What can we do to stop the deforestation? First of all, we can start recycling. Spain uses a lot of paper. However, about 42% of the consumed paper, which is a relatively high proportion, is recycled providing a major component in the fiber needed for paper manufacture. Other things that we can do is to switch to renewable energy. Then we can be more cautious in the forest and prevent fires. Finally, we can reforest the damaged areas. So next time when you'll do printing make sure tha you print on both sides, or reconsider printing at all if you know that you will use copies only once.

ZERO WASTE

CHAPTER VIII

A Zero Waste System has:



WHAT WE WASTE IN ESTONIA?

Water

- Estonia is a country with a medium level of water stress, abstracting around 14% of the total available renewable freshwater in 2014.

ZERO WASTE

CHAPTER VIII

Gross water abstraction has increased by 20% since 2000, mainly for electricity production; it is among the highest per capita in the OECD.

- Water pollution has decreased significantly: 70% of surface waters and 90% of groundwater have good status according to EU norms. Non-point source pollution from agriculture is the biggest pressure in all river basins.

Water discharges from oil shale mines also affect water quality.

In Estonia 1755 rivers, streams, ditches and other such a flowing water bodies with their basins have been counted.

Estonia has no water shortage problems as the annual precipitation exceeds evaporation by 30%. The total volume of freshwater available per capita (8600 m³) is on the medium level in Europe. During the last decade the water consumption has decreased (37% in 1991-1994), but has stabilized currently.



BUT Most of the rivers and lakes are in a good state.

What pollutes Estonian water?

- Agriculture
- Manufacturing
- And people

ZERO WASTE

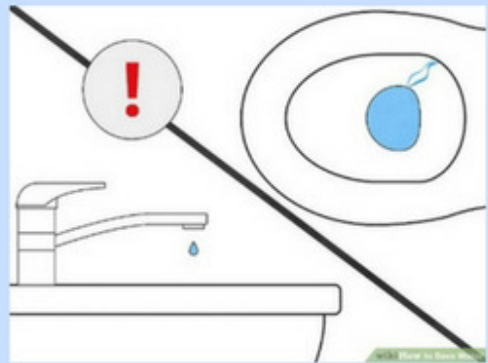
CHAPTER VIII

What every estonian can do?

Turn the faucet/tap off while you are brushing your teeth, shaving, washing your hands, doing dishes, and so on. Turn the tap off when you shower, too. Get wet, then turn off the water while you soap up.



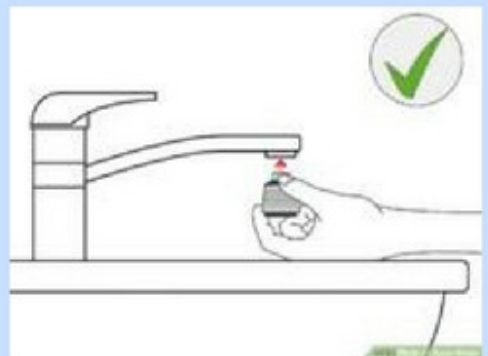
Convert your toilet to low flush. Place a plastic bottle of water in the tank to displace some of the water used for each flush. Weigh the bottle down with pebbles or sand, if necessary. Or, try ordering a 'save-a-flush' or 'hippo' from your local water board.



Check your plumbing for leaks, especially leaking toilets and faucets. Fix anything you find leaking. A silent toilet leak could waste from 30 to 500 liters every day!



Install low-flow shower heads and faucets or faucet aerators



ZERO WASTE

CHAPTER VIII

What every estonian can do?

Make sure to use your toilet appropriately. Don't flush every time. Remember: "If it's yellow let it mellow, if it's brown flush it down." Also, don't use your toilet as a trash can. Each time you flush you use up to 9 liters of clean water, which is a lot of unnecessary waste!



Urinating in the shower is doing the planet a very big favor. According to the research done by the Agency for Environmental Protection which is based in the United States, doing this can actually save up to 27% water flow! This is because you wouldn't actually need to flush the toilet.



Cut down on what you buy. That t-shirt? 713 gallons of water. 500 sheets of paper? 1,320 gallons. Reduce, reuse, recycle is usually the best policy when it comes to the environment, and trying to save water is no exception. This means reusable products, such as dishes instead of paper plates, or reusable as opposed to plastic bags, are better.



ZERO WASTE

CHAPTER VIII

What government do?

Water use (abstraction and discharge) in Estonia is regulated by the water consumption permits issued by local environmental protection departments for 5 years as a maximum.

Water related legislation covers about 20 legal act and regulations that are directly regulating the water protection and use. The most important of them is the Water act, which was first published in 1994.

- The government is actively involved in environmental education and awareness raising.
 - Address diffuse water pollution from agriculture.
- General government spending on environmental protection rose from 0.7% to 0.9% of gross domestic product (GDP) between 2000 and 2012, just above the EU-28 average. Major public funds support upgrading the municipal water supply and wastewater treatment.

LABLES

Many products have lables on them. But what do this label actually mean?

- “best before” – informs you about food safety, food is still safe to consume after the indicated date in condition that storage instructions are respected and packaging is not damaged, but it might begin to lose its flavor and texture, after opened, then person should follow other instructions like “eat within three days of opening”, on wide range od refrigerated, frozen, dried, tinned and other foods ((eesti keeles : “parim enne ... “))
- “use by” – informs you about food quality, used on highly perishable food (fresh meat, fish, etc), person should follow storage instructions like “keep at 2-4C” etc,

ZERO WASTE

CHAPTER VIII

person can extend the life of food beyond the “use by” date, if it is frozen properly, but again should follow the instructions on package like “cook from frozen”, “freeze up to the use by date”, etc, the food should be eaten before the “use by” date has expired ((eesti keeles “kõlblik kuni”))

For more information:

https://ec.europa.eu/food/safety/food_waste/eu_actions/date_marking_en



UTZ Certified – label for sustainable farming of coffee and cocoa, largest sustainability program for coffee and cocoa, the program covers good agricultural practices, farm management and the environment, program was launched in 2002 as Utz Kapeh meaning “Good Coffee”, is now a global standard, their products are coffee, cocoa, tea (and rooibos) and also currently running a pilot program for hazelnuts (for example: 9% of coffee produced in the world was UTZ certified, in Estonia Kalev is UTZ certified also)

For more information: <https://utz.org/>



FSC – label that assures that this product is made from wood from responsible sources, that the product has been manufactured at the expense of the forest, or the animals, plants, and people, who rely on it; there are three types: FSC 100% – means that the wood within the product comes completely from FSC-certified forests; FSC Recycled – means that all the wood or paper in the product comes completely from reclaimed material; FSC Mix – means the wood within the product is from FSC-certified material, recycled material or controlled wood

For more information: <https://ic.fsc.org/>

ZERO WASTE

CHAPTER VIII



Rainforest Alliance Certified – label that indicates that a farm, forest, or tourism enterprise has been audited to meet standard that require environmental, social and economic sustainability, agriculture: farm must meet the criteria set by Sustainable Agriculture Network that sets guidelines, which require continual improvement on the journey to sustainable agriculture as in biodiversity, improved livelihoods and human wellbeing, natural resource conservation, effective planning and farm management systems; tourism: properties of tourism businesses, including lodging services and inbound tour operators, who demonstrate they are minimizing their environmental footprint and supporting workers, local cultures, that means they protect nearby ecosystems, use natural resources wisely, lessen climate change, benefit to the social and cultural development of surrounding communities; forestry: protect endangered species and forest areas of high conservation value, set aside a portion of land as forest reserve, provide workers with decent wages and protect their ability to organize, follow FSC guidelines that determine how, when and where to timber and non-timber forest products are harvested, respect the rights of local communities and indigenous people, connected to next label.

For more information: <http://www.rainforest-alliance.org>



FairTrade / Fair Trade Certified – social movement whose stated goal is to help producers in developing countries achieve better trading conditions and to promote sustainable farming, focus on commodities which are typically exported from developing countries to developed countries,

but also consumed in domestic markets most notably handicrafts, coffee, cocoa, wine, sugar, cocoa, wine, fresh fruit, chocolate,

ZERO WASTE

CHAPTER VIII

flowers and gold, label identifies goods, which meet agreed standard, the mark can be given to the product by FLO-CERT inspected and certified producer organizations, it means that the crops must be grown and harvested in accordance with the international Fair trade standards set by FLO International

For more information: <https://www.fairtrade.net/>



World Wildlife Fund for Nature – means that the product is produced by supplier that is certified sustainable by WWF, an organization that works in the field of the wilderness preservation and the reduction of humanity's footprint on the environment
For more information: <http://wwf.org/>



ECOCERT – indicates that the product is certified organic by the ECOCERT organization, that certifies food, food products, cosmetic, detergents, perfumes and textiles



Eurasian Conformity mark – product marking to indicate that the products conforms to all technical regulations of the Eurasian Customs Union assessment producers, this means that it meets all requirements and technical regulations applicable to the product

ZERO WASTE

CHAPTER VIII



EU label for food that has been organically produced



EU Ecolabel or EU Flower – EU label for products that are produced while using the criteria supporting the sustainable production and consumption in the region



European Quality Control System for Juice and Nectars from Fruits and Vegetables – label indicates that materials of the product have been manufactured according to EQCS guidelines, that want to assured free and fair competition



V-Label – means that the product is vegan or vegetarian

ZERO WASTE

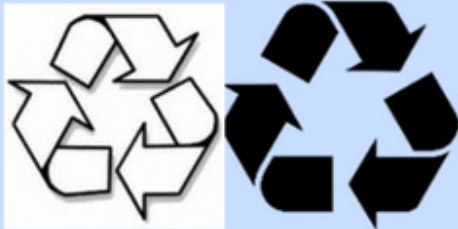
CHAPTER VIII



Those labels show that in the process of making those products animals were not harmed

RECYCLING LABELS

(more information: <https://www.recyclenow.com/recycling-knowledge/packaging-symbols-explained>)



Mobius Loop (white with an outline or solid black) – indicates that an object is capable of being recycled, not that the object has been recycled or will be accepted in all recycling collection systems

















Mobius loop (inside a circle – either white on black or black on white) – indicates that the product is made of recycled materials, sometimes this symbol is used with a percentage figure in the middle to explain that the packaging contains x% of recycled materials

ZERO WASTE

CHAPTER VIII

Plastic resin codes – this identifies the type of plastic resin used to make the item providing a “Resin Identification Code”. It is represented with a chasing arrows symbol surrounding a number between 1-77 that defines the resin used

 1 PETE	 2 HDPE	 3 PVC	 4 LDPE	 5 PP	 6 PS	 7 OTHER
polyethylene terephthalate	high-density polyethylene	polyvinyl chloride	low-density polyethylene	polypropylene	polystyrene	other plastics, including acrylic, polycarbonate, polyactic fibers, nylon, fiberglass
soft drink bottles, mineral water, fruit juice containers and cooking oil	milk jugs, cleaning agents, laundry detergents, bleaching agents, shampoo bottles, washing and shower soaps	trays for sweets, fruit, plastic packing (bubble foil) and food foils to wrap the foodstuff	crushed bottles, shopping bags, highly-resistant sacks and most of the wrappings	furniture, consumers, luggage, toys as well as bumpers, lining and external borders of the cars	toys, hard packing, refrigerator trays, cosmetic bags, costume jewellery, audio cassettes, CD cases, vending cups	an example of one type is a polycarbonate used for CD production and baby feeding bottles
						



The Green Dot – does not necessarily mean that the packaging is recyclable, will be recycled or has been recycled. It is a symbol used on packaging in some European countries and signifies that the producer has made a financial contribution towards the recovery and recycling of packaging in Europe

ZERO WASTE

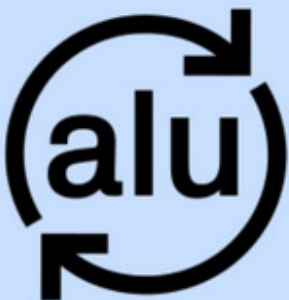
CHAPTER VIII



Tidyman – symbol from Keep Britain Tidy organization, that asks you not to litter. It doesn't relate to recycling, but it is a reminder to be a good citizen, disposing of the item in the most appropriate manner, do not litter



Glass recycling – symbol indicates that a glass product can be recycled if placed into a glass recycling bottle bank, once it has been washed



Recyclable aluminum – indicates that the item is made from recyclable aluminum



Waste electricals / non household waste – symbol explains that you should not place the electrical item in this general waste, they can be recycled through a number of channels, it should be disposed of separately from household waste

ZERO WASTE

CHAPTER VIII

LABELS USED IN ESTONIA



Clean up (Tee puhtaks) – Estonian version of tidyman, promoting the cleanliness of highways



Estonian national ecolabel – indicates that the product is organic, for example processed food contains at least 95% of agricultural ingredients from organic farming



Pure and interesting Estonia (Ehtne ja Huvitav Eesti) – label for touristic products and services that comply with the principles of eco-tourism



Green label of Hiiumaa (Hiiumaa Roheline mark) – for products that are related with Hiiumaa, made from natural materials and have good quality



Green Energy (Roheline energia) – for alternative energy

ZERO WASTE

CHAPTER VIII

LABELS USED IN ESTONIA



Recognized Estonian taste (Tunnustatud Eesti maitse) – given to products with high quality and that are produced only in Estonia, also all the primary goods are from Estonia



Recognized taste (Tunnustatud maitse) – given to products, that have high quality and are produced in EU



Estonian best food product (Eesti parim toiduaine) – label is given to a new product, that has won the year competition of the best foods



Grown in Estonia (Eestis Kasvatatud) – national brand and quality mark, that is given to products that are grown in Estonia, are unprocessed horticultural products (vegetables, potatoes, fruits, berries, mushrooms)

ZERO WASTE

CHAPTER VIII

LABELS USED IN ESTONIA

Eesti toodete ja teenuste ökomärgid



Ehtne ja Huvitav Eesti

ökoturismi põhimõtetele vastavad turismitooted



Hiiumaa Roheline Märk

loodussõbralik teenindus



Puhas Keskkond

väiksem keskkonnakahju oma olelutsükli jooksul (va toiduained ja ravimid)



Roheline Energia

alternatiivenergia kaubamärk (Eesti Energia)



Mahemärk

mahepõllumajandusliku toidu eristamiseks



Tee Puhtaks

eelkõige maanteede puhtust propageeriv

ZERO WASTE

CHAPTER VIII

ZERO WASTE ALTERNATIVES

Participants of our project made photos of the sustainable changes they've made in their everyday life

Donate your old clothes to charity instead of just throwing them away



Start recycling at home. Check your municipality's recycling rules first. In many countries it's possible to recycle food, packaging, metal, glass, hazardous waste etc.

ZERO WASTE

CHAPTER VIII

ZERO WASTE ALTERNATIVES



Example of recycling bins next to the local school in Ukrainian town: paper, metal, plastic and glass are collected separately.



This picture was made in the local grocery shop in Tbilisi - a good example of how you can reduce the use of the plastic packaging - just bring your own reusable bag/jar

ZERO WASTE

CHAPTER VIII

ZERO WASTE ALTERNATIVES

Plastic bags are a big problem for our environment. The period of their decay may last up to 500 years. But, good news is that in most of the cases they can be recycled. Just check you local recycling rules.



Buy a reusable cup and carry it with you avoiding plastic water bottles

ZERO WASTE

CHAPTER VIII

ZERO WASTE ALTERNATIVES



Try switching regular household products with the eco-friendly ones, they are less harmful for the environment and your health. Or try making your own from the natural ingredients. For example you can try washing dishes with the mixture of baking soda and powder mustard.



Switch to wooden hair brush.
The one in the picture is a 100% recyclable made of wood and boar hair

ZERO WASTE

CHAPTER VIII

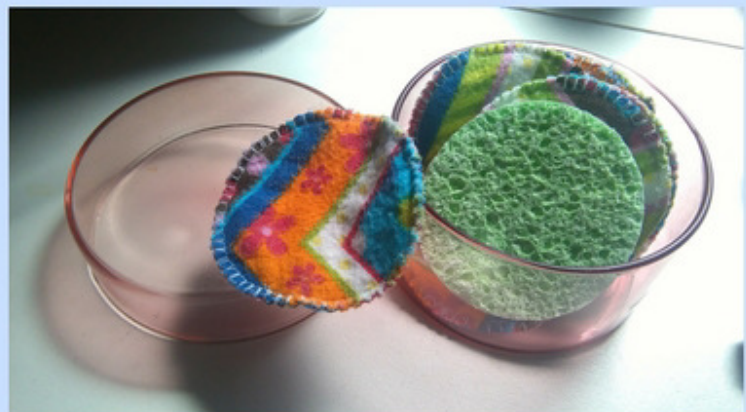
ZERO WASTE ALTERNATIVES

Switch to reusable
steel razor



Buy bathroom produce with eco labels. Not only they are better for your skin, as they are free of toxic ingredients, they are also good for environment, as those toxins don't end up in ground and surface waters and soil

Use reusable facial
rounds and sponge
instead of 1 time use
only cotton rounds

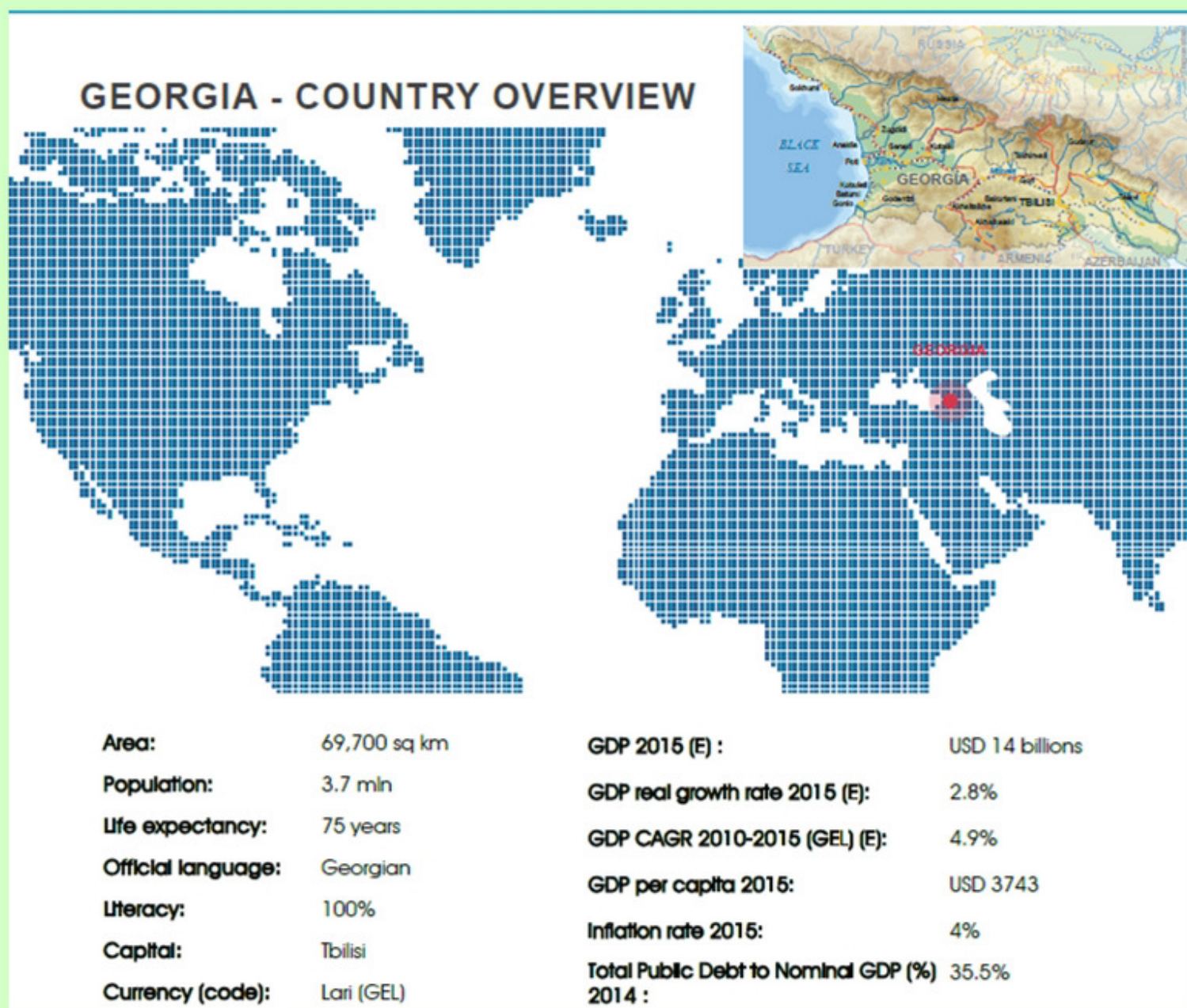


For more zero waste alternatives
check <http://www.trashisfortossers.com/2013/08/zero-waste-alternatives-ultimate-list.html>

Alternative energy

CAPTER IX

Here we would like to bring some statistical data illustrating Georgian energy sector and it's potential.



ALTERNATIVE ENERGY

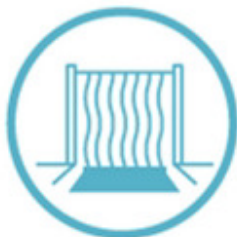
CHAPTER IX

OVERVIEW OF GEORGIA'S ENERGY SECTOR



STRONG DEMAND GROWTH PROSPECTS

- Domestic Demand growth, which is expected to grow in line with GDP, requires an extension of Power generation by around 65% until 2025
- Georgia is surrounded by countries with a projected structural power deficit (e.g. Turkey, Southern Districts of Russia) or expensive power generation, opening up attractive export opportunities



HUGE UNTAPPED POTENTIAL

- 75% of economically viable hydropower potential not yet exploited (Approximately 25TWh)
- Over 60 potential HPP projects (<100MW) on the Pre-feasibility Study Level with Financial and Technical projection are available for investors
- In addition to hydro, there is considerable generation potential from wind, solar and other renewable sources



LIBERALIZED AND DEREGULATED MARKET

- Renewable projects are based on Build-Own-Operate (BOO) principle
- No tariff set for the newly built Renewable energy Plants- investor is free to choose the market and negotiate the price
- New and simplified rules for development of renewable energy projects

SOME LARGE PROJECTS ARE ALREADY UNDERWAY AND EVEN MORE ARE COMING

- 17 HPP Projects Under construction - installed capacity of 820 MW (7 HPPs started in 2015)
- Construction of 14 HPP Projects will commence in 2016 - installed capacity of up to 1,900 MW
- 26 HPP Projects are under feasibility studies with construction liabilities - installed capacity of up to 1010 MW

ALTERNATIVE ENERGY

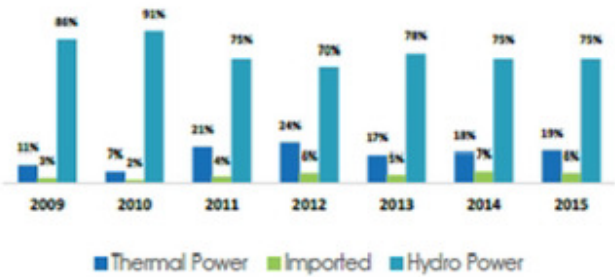
CHAPTER IX

GENERAL STATISTICS

CONSUMPTION VS GENERATION, TWH



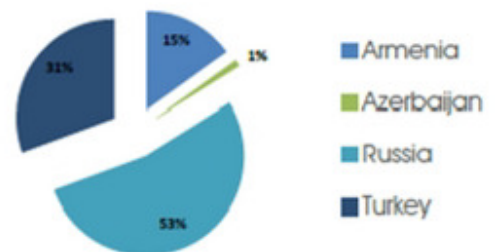
COMPONENTS OF TOTAL CONSUMPTION



IMPORT VS EXPORT, TWH



EXPORT BREAKDOWN 2011-2015



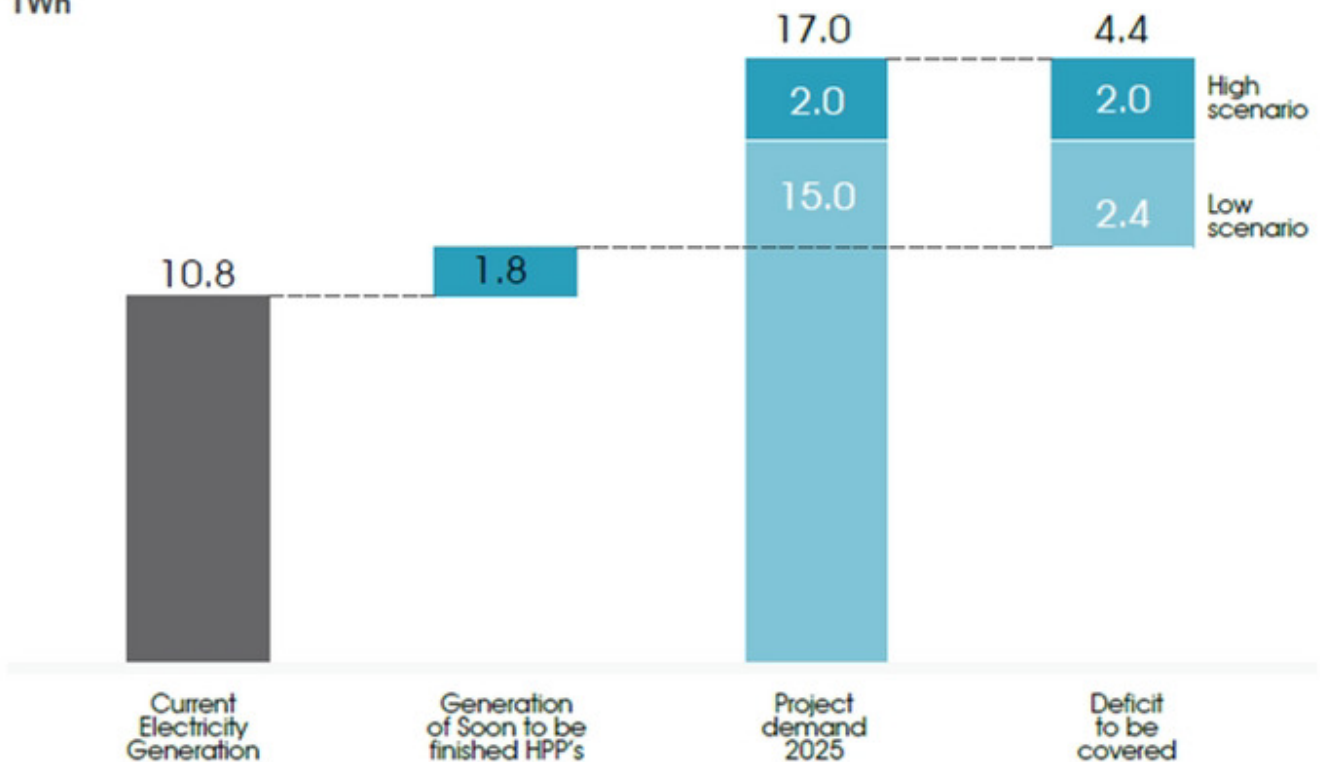
ALTERNATIVE ENERGY

CHAPTER IX

DOMESTIC DEMAND GROWTH REQUIRES AN EXTENSION OF POWER GENERATION

DOMESTIC DEMAND AND SUPPLY PROJECTIONS

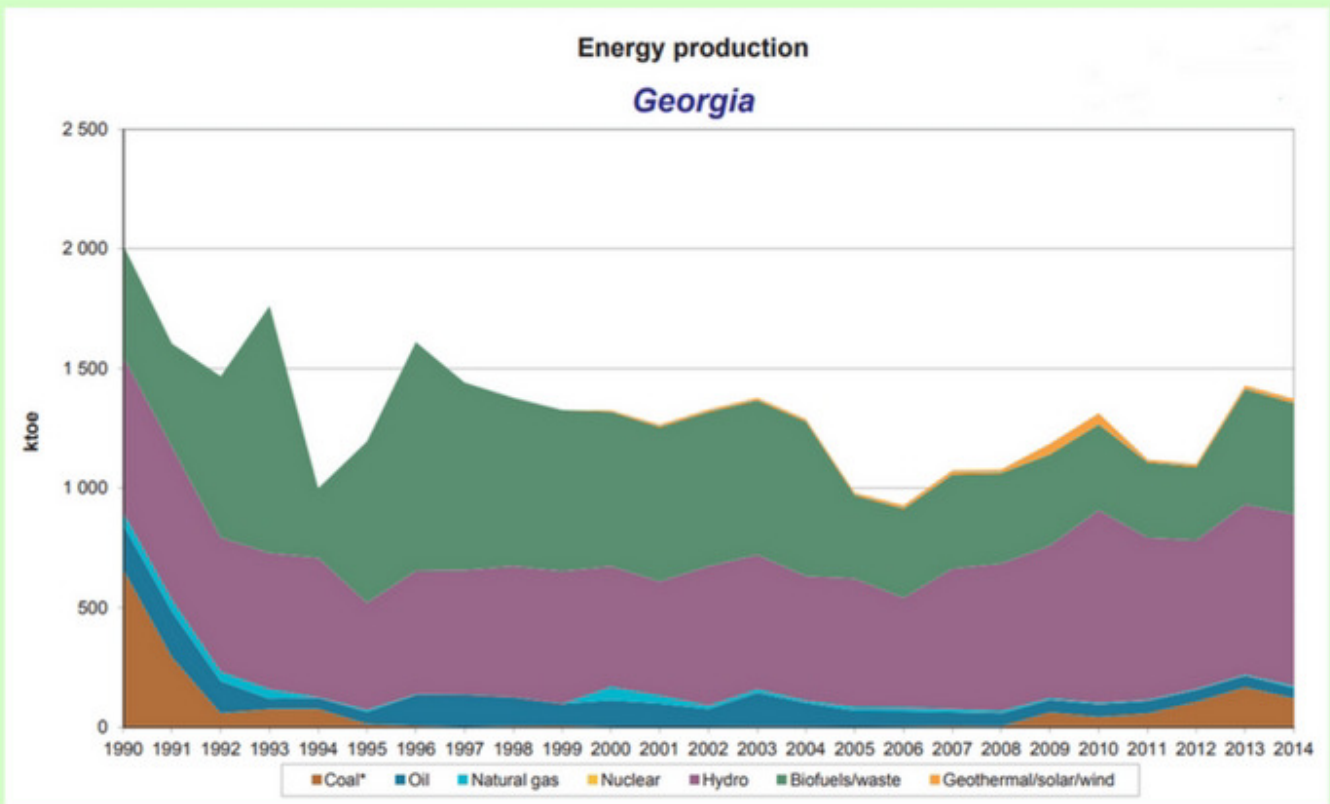
TWh



- Georgia's demand for electricity is increasing in line with expected GDP growth, requiring more HPP generation capacity
- Even after completing HPPs that are under development, demand will be higher than supply

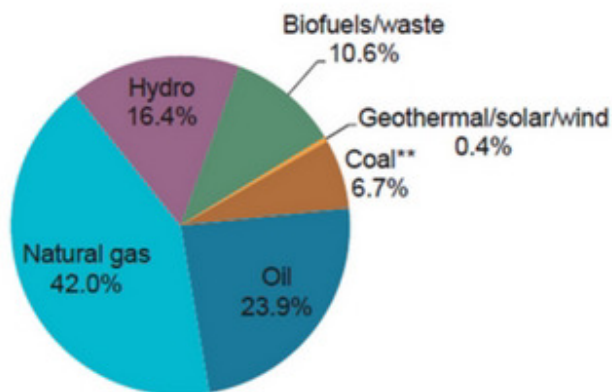
ALTERNATIVE ENERGY

CHAPTER IX



Share of total primary energy supply* in 2014

Georgia

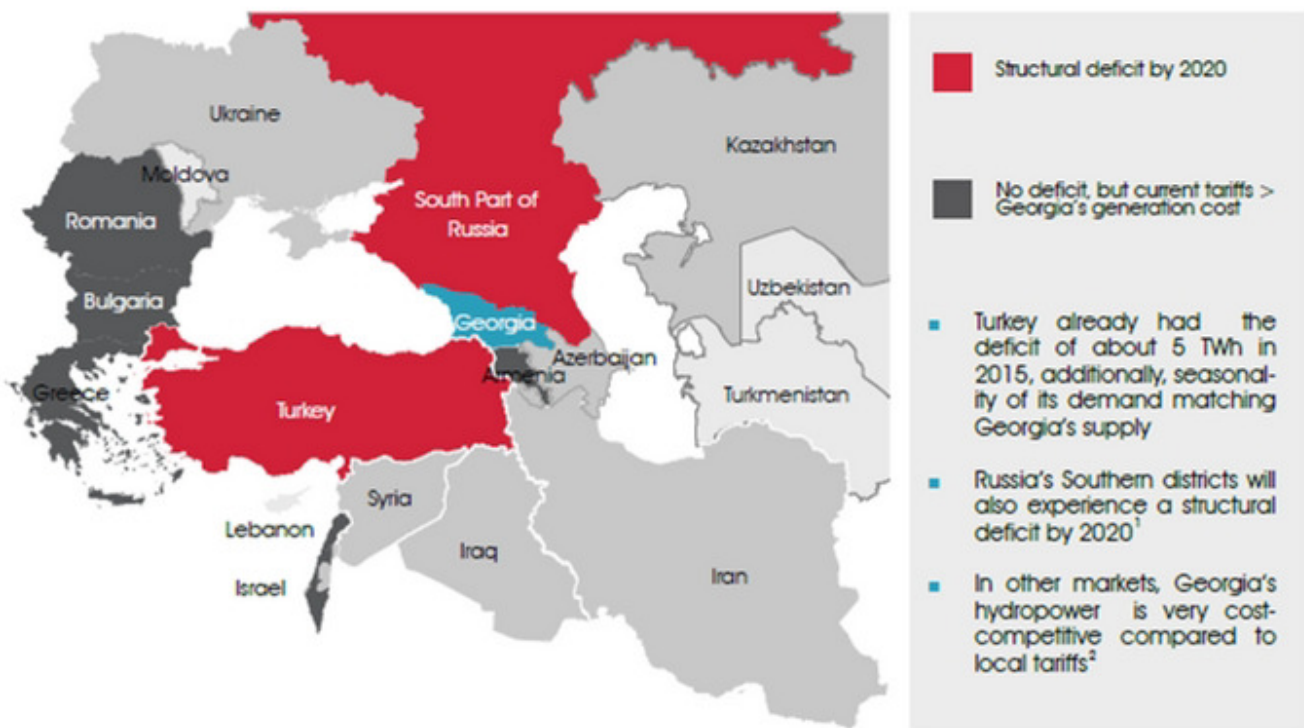


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ALTERNATIVE ENERGY

CHAPTER IX

GEORGIA IS SURROUNDED BY COUNTRIES WITH A STRUCTURAL POWER DEFICIT OR EXPENSIVE POWER GENERATION



¹ Assuming current consumption and supply pattern

² This does not even include countries with heavily subsidized electricity generation (e.g. Azerbaijan, Kazakhstan)

ALTERNATIVE ENERGY

CHAPTER IX

GRID MAP OF GEORGIA 2016



GRID MAP OF GEORGIA 2022



ALTERNATIVE ENERGY

CHAPTER IX

HYDRO POWER



- Georgia is one of the top countries in terms of water resources per capita
- Today 78% of total electricity is generated from Hydro Power Plants
- Georgia could produce additional 25 TWh annually with hydro resources alone
- There are over 60 potential HPP projects on the Pre-feasibility Study Level with Financial and Technical projection ready for investors

WIND POWER



- Wind potential of Georgia is estimated at 4 TWh
- Wind power is very important because of higher generation during winter, when hydro generation is lower.
- It's estimated that share of wind power in total generation will reach 10% by year
- In 2016, Pilot 20 MW wind farm project, "Kartli 1" was initiated by Georgian Energy Development Fund, with potential to be expanded up to 150 MW
- There are numerous other locations with strong winds and high generation potential

ALTERNATIVE ENERGY

CHAPTER IX



SOLAR POWER

In most regions of the country there are 250-280 sunny days in a year, which is approximately 6000-6780 hours per year. The annual radiation of the Sun varies depending on regions from 1250-1800 kWh/m², while the average sun radiation equals 4.2 kWh/m².



GEO THERMAL POWER

Georgian geothermal water reserves reach 250 mln m³ per year. At present there are more than 250 natural and artificial water channels where the average temperature of geothermal waters ranges from 30 to 110 C⁰, while the total debit is 160 000 m³ per day and night. These water channels are grouped into 44 deposits. Within the territory of 3500 km there are bore-hole wells with the water temperature of 85 C⁰ and more. Up to 80% of the geothermal deposits are in Western Georgia. In the Zugdidi-Tsaishi geothermal area, there are now 9 productive, 7 reinjection and 3 observation bore-hole wells which are considered to be exploitable.



BIOMASS POWER

Thanks to an advantageous geographical location and a climate favorable to forest and agricultural development, Georgia is endowed with major potential for biomass power plants, especially for producing heat and hot water. Biomass could be one of the most important sources of power supply in rural areas, given that forests cover 40% of the country's total territory.

ALTERNATIVE ENERGY

CHAPTER IX

ONGOING PROJECTS - INVESTORS FROM ALL OVER THE WORLD ARE INTERESTED IN GEORGIA'S ENERGY SECTOR



Environmental initiatives

CAPTER X

Here we would like to bring some examples of environmental initiatives that were a result of brainstorming made by the participants of the project and the actual initiatives that took place during the activity.

Switching to a completely new way of living could be quite challenging and also confusing. The best way on the way to more eco-friendly and sustainable lifestyle is to start from small steps that don't seem so hard.

- buy a reusable cup
- start using reusable fabric bag every time you go shopping
 - try buying fairtrade and/or second hand clothing
 - start recycling at home/work
 - start cycling
- if you're a car owner, try using public transport more or share a car with your colleagues/friends
- buy local produce/food (imported products are transported to your country, which means that a lot of carbon dioxide was released to the atmosphere because of the emissions from transport
 - educate yourself, ask questions, research
 - start discussions with your family, friends, colleagues
 - join local eco club/movement and become a volunteer
- plant a tree (but check with your city/town officials first: if you will decide to plant a tree exotic for your region it may lead to serious consequences for the local ecosystem
 - create your own workshop educating people how to switch to more eco-friendly lifestyle
 - involve your social circles (family, friends) in your activities

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- prepare some presentations and present them at local schools to share your knowledge with children
- create some cool stickers (make sure they will be recyclable) and share them among youth, teenagers
- take part in the local clean up actions (Let's do it! World/Teeme ära!/Let's do it! Ukraine, Hai, Moldova! or any others)
- Refuse free plastic bags at the shop and explain why (in many cases the cashiers are not aware of the effects plastic bags have on the environment. You can start from explaining that it takes up to 500 years for plastic bag to decay, it's toxic and when we're throwing it toxins contaminate the soil, water, ground water.
- think about some ideas for viral videos/challenges that you could start in the social media (remember the ice bucket challenge?)
- influence people by setting an example - so far it is the best known way to influence someone!
 - organise local hiking eco trips
 - use blabla care to move from one place to another
- pick one piece of trash every day. See a can laying on the street - pick it up and throw to the bin!
 - organise a clean-up action
- make a network of people who shares your views and will support you - you're stronger together.

During the activity participants organised a flash mob and a creative recycling workshop on one of the big local cultural events in Georgia. The flash mob was planned as an attention catching event that would bring people to the workshop, where they would be warned about the harmful effects of plastic and shown how to minimise plastic waste and give it a second life. You can see the flash mob video by following the link: <https://youtu.be/y-Md8h5eQfg>

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PHOTOS FROM THE WORKSHOP



Participants' stories and thoughts

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In this chapter we would like to share our participants' stories, impression, thoughts and feelings they kindly shared after the project.

IT IS IMPORTANT TO TALK AND DISCUSS...

the issues of environmental situation of our planet. But it is pointless to just talk about those issues, then go back home and continue the life like it was before. People tend to forget easily: they understand the problem, but when it is not in front of them (and at home-work-etc those issues are not the priority), it is simpler to just throw all the garbage in one bin, buy cheaper clothing-foods, that aren't fair trade and so on. That is why example is important. Here comes Kolb's learning theory in handy: experience – reflection – conceptualise – test. Sounds logical.

That is what we also did in our project: first couple of days we got to know each other and discussed the situations in our countries, also the overall problems of the environment. After that we went to nature in order to get one with it, to hike and to "survive". During this period, we were given all the power and we had to decide as a group, what we learned was not the easiest thing. And weren't we just 35 people with different backgrounds, strangers to each other? It seems weird to think that, because during those days in the forest we grew together, started working more as a team and at the same time were all stunned by the beautiful nature around us. It is important to hold on tight to it and do everything in order for it and for us to stay in balance. We are part of nature and nature is part of us. And although everything didn't work out like

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we planned, we learned our lesson in practice, which is the most important part as this will not fade as easily as the thoughts gathered while only sitting in a circle in a hotel. After those three days living in tents, cooking and cleaning together, compromising and having fun (because that is also really important) we went to GEMfest in order to not only enjoy the festival atmosphere and music, but to give something back and teach others, what we had learnt. We did a flash mob in order to draw attention to our workshops about trash. Although the flash mob got more attention than the workshops, it was a small step to make a change. Next time better and bigger.

Then it was time to go to Tbilisi to reflect and make conclusions. Endings are always sad and bittersweet, but they are the beginnings of something new (sorry for all the clichés). That is why they should be taken as something positive. We were asked in groups to write down ways to bring the knowledge we learnt with us to our homes to really sustain our ways.

The Estonian team started to think about big changes and events to organise, but we were told to start from little things. To start from ourselves. Because those little things really count and make bigger difference. Writing, talking and thinking are only one part. Now back home, back in our “reality” comes the real test: will we change our behaviour in order to improve the situation?



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As a sceptic I doubted it at first. But then I thought back to our project: I remembered the sessions about environmental issues, gathering wood in the forest and swimming in the waterfall and making noise with plastic bottles during the flash mob and putting up tents and talks with different people from different countries, one moment joking around, another talking about important issues, trying foods from other countries, riding through Georgia in the night train and so on and on. And think that those memories help me go back to the feelings I had then and change my way. Because I do care, even though I am lazy Liisi.

PS Thank you!

PPS I bought my organic cup. So first step is done. Next step, here I come.

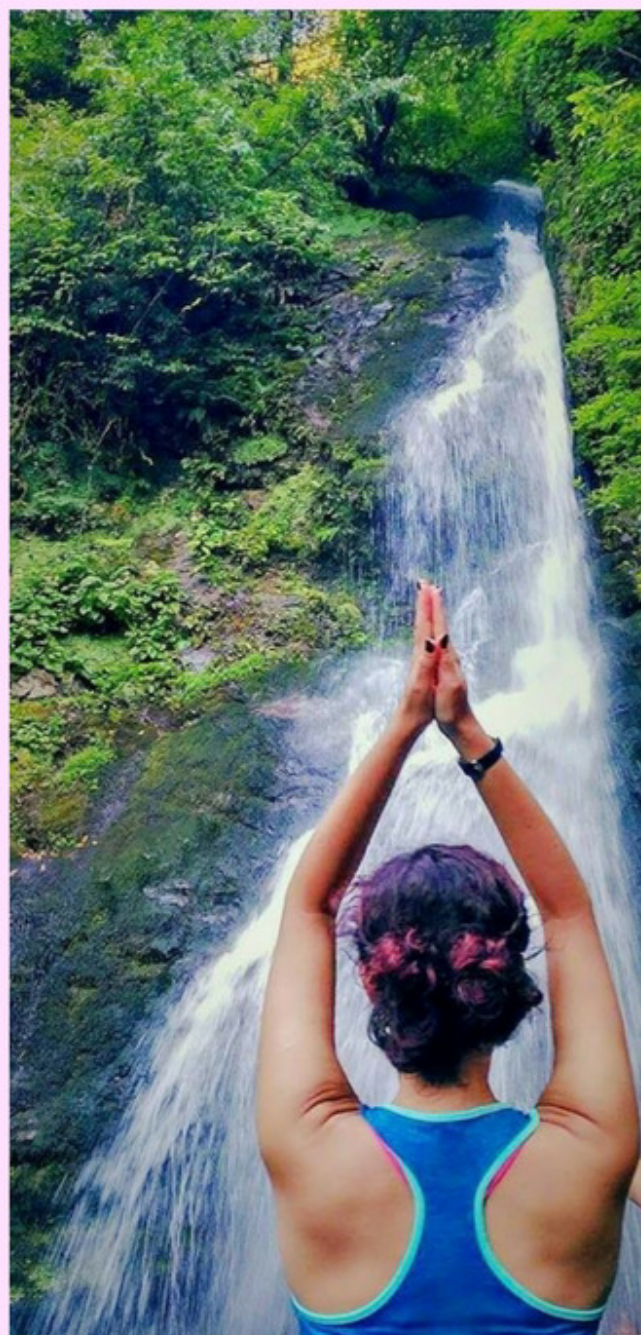


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ALL I NEW BEFORE ...

arriving to Kobuleti is that I am really interested in this training topic. I didn't even know where Georgia is and what are the customs and traditions there. Some of the discussed things I knew, some of them no but most of all I was glad to see that there are youngsters interested in getting new information even if they come from different fields like IT, consulting, math, engineering and so on. The plan of the project was so well developed that in a short time we managed not only to get to know each other but also to make good friends (in the full meaning if this word) , to have fights, to fall inlove, to experience new sensations and get to know local culture. "Sustain Your Way" sustains people arround me after I came back . All those good vibes I got from our amazing Organizing-Ladies are reaching those who care about ecological issues nowadays. I am thankful for the emmotions shared with every person prom this training and a huge gratitude to organizing team!



A WEEK LIKE A LIFE

Do you know that feeling when after being involved in such unusual activities you can't get back to your usual habits. So, it happened to me after the project Sustain your way in Georgia.

Presenting in a few words my experience in this project, I can characterize it as the first... my first Erasmus+programme, my first traveling to Georgia, my first experience in a multicultural community, first time I met so many foreign cultures in such a short time, my first lezginka dance, my first ajarian khachapuri, my first trekking trip in mountain, my first bath in a mountain river, my first time I get underneath a waterfall, my first balance board experience, my first flash mob experience, my first bungee jump, my first birthday I met under the stars in mountains and on the rhythms of waves on the seashore, my first smashed cake in the face 😊

My experience was like the country in which it took place... different, but at the same time so familiar, exciting, but at the same time relaxing, combining mountain and sea, European and Oriental, technologies and nature, tradition and progress, communication and dive oneself. It's really different to meet new people, acquire new knowledge, try new things, discover yourself in an unknown environment.

This project encouraged me in the effort to encourage and promote the principles of a sustainable way of life in the community in which I live.

Moreover, the hiking experience I had in the Georgian mountains encouraged me to adopt a much more active and healthy lifestyle, with closer connection with nature. Since my return from the project, no weekend has passed without activities outside of the city.

This experience gets special colors, special emotional implications and the lessons I learned will remain deeply implanted in my memory for all my life.

The main thing I learned is to believe that **EVERYTHING IS POSSIBLE**.

The best thing I learned is to seek answers in myself, to listen to me and **TO HEAR MYSELF**.

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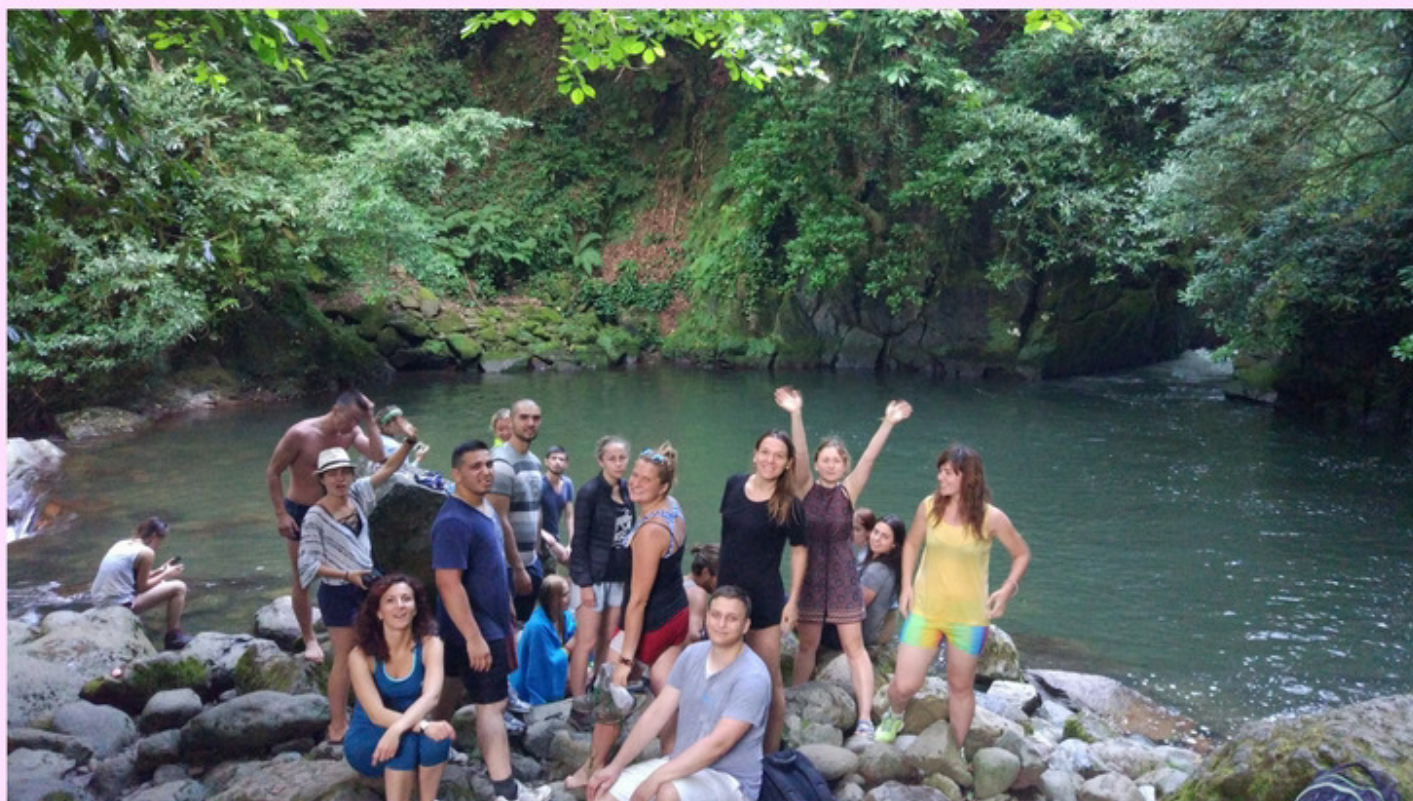
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The most valuable thing I learned is not to be afraid to **TRY.**

The special thing I learned is to **DREAM.**

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The most important thing I learned is what you can make **MAJOR CHANGES** making **SMALL IMPROVEMENTS** in your daily routine.

The most useful thing I learned is that the **JOINED ACTIVITIES** are the best way to bring people together and form a team.

The most important thing I understand is that you have to **BE HAPPY** with who you are and what you have at this moment.

The most valuable thing I understand is what the present moment is the best moment for starting to **CHANGE YOUR LIFE**.

The main thing I achieved is the **SELF-CONFIDENCE**.

The best thing I achieved is the **EXPERIENCE**.

The most valuable thing I achieved is the **DESIRE TO TRY** and to learn more.

The special thing I achieved is the **FRIENDSHIP** and support of people who are on the same wave with me.

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The most important thing I get from the project is the ENERGY and the TASTE OF LIFE.

Now, after the project, my dream, my scope, is to continue to overcome my limits, to gain new experiences, to visit new places, to meet new peoples, to come to know the unknown and to explore myself.

It's really exciting to experience in a few days more than someone do for a lifetime.

It's really amazing to discover yourself and to find out in a few days more about you're and you can be, than you was thinking your whole life.

It's really wonderful how a few days can turn into a small life and can change your entire life.

Love and protect the nature, love and fully live your life, love and enjoy the lifeway you have chosen or that chose you, love and develop yourself on your lifeway, love and sustain the people you meet on your lifeway to love their self and to find their lifeway. It is the way for a sustainable life- it is the way for a happy life.

THESE ARE A FEW WORDS...

These are few words i had no time to write on the back of each of you... I participated in many projects and it was always different... the place, the topic... but what really makes every project special - are people.

Every time i go to the project at some point i think: 'Would not it be a waste of time or not the main thing to do at this moment?' And after every project i realize that it seems like it is impossible.

I am very happy that i met you all! Somebody i knew before but a new role in the project opened new positive sides for me and its great!

Every person is a book full of interesting stories, fairytales, mysteries and ideas. Everyone of us is a greatest treasure on Earth. I am happy to have new great friends from all over the world! I had a lot of deep conversations and some of them lasted for many many hours non-stop :)

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I was really into sharing my ideas and views. I am not the best example of right way to live and behave for sure. It was great that you accepted me talking all the time and i received a lot of motivation from you. I could not

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think that my thoughts would have that big effect on some of you and you would be so interested in these ideas. I would like to thank for all these nice, positive feedback and comments i received. It is not that easy to talk about things going on in the soul and usually people are used to hurt when you open, so one week is not enough to share all the ideas, thoughts, points of view, but I hope this is not the end.

Actually during this week i felt like it was a project into project. One was about ecological ideas and another was about people. How do we behave in different situations, what do we do and how we do that. I had an opinion before the project that people unhappiness is connected to many problems in our lives and ecological ones were one of them. But I saw even more connections. This made me think about doing my own YE that would be focused on the relationship between people, psychology, connections between all the things that we are doing daily and how decisions we make changes our life.

I would be happy to meet you in any place in the world, would be happy to meet you in Estonia as well, make interesting ideas come true and maybe to see you on relationship YE as well. Tell me if you are interested it that :) I wish you all to be happy! To have a close people that would always help and support, to have a work that gives energy and motivation every new day, to have a bright star, the goal that would be keeping you moving and open new galaxies =)



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MY WAY

It will not ever be as it was before. With every event, human or sunrise, we become different. For someone, these changes are good, for another they are complicating life. Being 100 %“eco” is unique ability. As for me, it is necessary: not to eat creatures from the animal kingdom, not to make garbage and grow many plants in order to photosynthesize carbon dioxide, to use eco-vehicles, and to use natural energy resources. The list can be continued and propagated, but does anyone live in such way? All of this is not so difficult, many people have checked the above ways to be eco. It's worth starting with you.

This project gave me the opportunity to see me again. How I live, to discover new people with their own stories, and once again showed that I love to experiment and test myself. All these days, the world of ideas, experience and discoveries dominated in me. People are the greatest source of inspiration. During the project and beyond, when I was in Georgia, I discovered new people and their attitude to life. This experience is valuable. I am pleased that we talked about the environmental problems that exist in our countries, how badly each of us affects the environment, been in nature, to generate ideas and, as a result, we can talk about this world! In this project, I understood the hidden essence, why are these projects made? In a very short time, people who have never before seen forget about their pride, pomp, hostility, rudeness, insincerity, and communicate with each other guided only by the best intentions. In this way, clinging to each other, which is absent in everyday life, and people become close to each other already before the evening of the first day. As a result, a whole group of people with a common interest comes to act. When the time comes to forgive, but it really means to forgive, because there is a greater chance of never being seen, people are dismayed with mild feelings, because the previous days were so active and easy that people As if leaving the particle itself. And

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what's next? Participants return home not like they were before, they look at the world differently. Some people begin to draw up an action plan for the future, someone is happy with something like a mini-format, while others share their experiences and experiences with everyone, thus infecting people with a desire to visit a similar event and become more active. Even if one storyteller is able to impress your experience and bring him to change, this is a great progress. Thus, a network of active people who aspire to change for themselves and the world grows up. This is a peculiar sect, but what is the secret of the sect. Development and expansion of my horizons are very important to me. Erasmus + and life in eco style give me what you need.



Photo gallery



Photo gallery



Photo gallery



Photo gallery



Photo gallery



Photo gallery



Photo gallery

