5R GREEN TECHNOLYMPICS

Interreg South Baltic

EUROPEAN UNION

European Regional Development Fund

SOUTH BALTIC BRIDGE

Refuse Reuse Recycle Replace Reduce

Interreg
South Baltic

EUROPEAN UNION

European
Regional
Development
Fund

SOUTH BALTIC BRIDGE

CONTENT

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Rector of Klaipeda University

Dear participants of the International Green Technolympics!

We live in a time when the environment around us and the preservation and conservation of its limited resources are essential. Not only we observe that, but we also create the environment in which we want to live harmoniously. Therefore, I welcome Your initiative and aspire to participate in the International Green Technolympics, which will be held in Klaipėda on January 8 - 9, 2020!

The theme is chosen for the International Green Technolympics – „5R" - Reuse, Reduce, Recycle, Replace and Refuse - are meaningful words that must accompany us every day. Klaipeda University is a higher education institution, which aims to educate not only good specialists in their fields but also honest and responsible citizens. I believe that by educating the younger generation, we can change the public perception of the good and contribute to a change in the environment in which we live.

Today, one of the most important environmental problems - the steady increase in consumption and its consequences - is evident: increasing waste, pollution during production, the constant need for resources and their increasing use. People are caught in a constant circle of consumption where we use everything - even what we really don't need. And only together can we change this situation!

We need to understand that Green Growth is not just about sounding fashion words. It is the process upon which the quality of life of all of us depends. By actively engaging in the implementation of Green Growth, we not only create a friendly environment for ourselves but also develop our professional competencies and expand our knowledge base. And only with sufficient theoretical knowledge of green growth and green technologies will we be able to put them into practice and contribute to the environment that we all dream of.

By strengthening our green competencies, we not only create an environment in which to live, but also create closer collaboration between students, students and businesses in regions of interest to the South Baltic Program.

Congratulations to all motyvated and ambitious participants of the International Technolympics, which we welcome not only from Lithuania, but also from Poland, Germany, Sweden and Denmark! Thank You for answering to this meaningful green Technolympics "5R" call!

Once again, I want to congratulate You on Your determination and initiative, and wish You every success in creating a friendly environment in which everyone lives! Stay civic, remain ambitious, and pursue Your goal consistently - this is the only way we can change the prevailing habits of society for the better.

This is how we all win and good luck to You!

There is no Planet B.
Join the green side

SB BRIDGE - BUILDING BRIDGES FOR GREEN TECH FUTURE

Main objective - to increase the capacity of youth as skilled potential labor force working in green and blue economy sectors of the South Baltic area through joint cross-border initiatives.

Main result - skilled and motivated students and scholars for potential workplaces in green and blue economy SMEs in these South Baltic countries: Lithuania, Germany, Poland, Sweden and Denmark.

Main outputs:

- More than 300 students participants in joint training and joint employment initiatives: green camps, green techolympics, study visits, knowledge e-platform.
- More than 25 SMEs involved in the implementation of cross-border joint training and employment.
- More than 20 institutions, involved into the implementation of joint training and joint employment services.
- Delivered 1 cross-border employment scheme in the green and blue economy of the South Baltic area.

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Interreg South Baltic
EUROPEAN UNION
European Regional Development Fund

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- Gdansk Entrepreneurial Foundation, Poland
- KlaipedaID, Lithuania
- County Administrative Board of Skane, Sweden
- ATI erc gGmbH education, research and furtherance of cooperation, Germany

SUSTAINABILITY

What is sustainability?

Sustainability is based on a simple principle: Everything that we need for our survival and well-being depends on our natural environment.

The planet's ecosystems are deteriorating so badly and the climate is changing too quickly, because we are consuming far too much. As a population we are already living far beyond the earth's capacity to support us- this is not sustainable.

Sustainability is basically meeting the needs of the current generation without compromising the ability of future generations to meet its needs.

To sustain is to create and maintain the conditions, under which humans and nature can exist in productive harmony to support present and future generations.

The 6 R'S of sustainability

If you find it hard to memorise all of the above, then just think of the '6 R's of Sustainability'.

The 6 Rs are an important checklist. They are used by designers to reduce the environmental impact of products. They can also be used to evaluate the environmental impact of other products. The 6Rs stand for:

RETHINK – is there a better way to solve this problem, that is less damaging to the environment? This R we keep very important and so further in this material it will be involved in other 5Rs.

REDUCE - is it possible to reduce the amount of materials used? This will help to protect valuable resources.

REFUSE – this means not accepting things, that are not the best option for the environment. For example, is the packaging really needed?

RECYCLE – could recycled materials be used, or is the product made from materials that are easy to recycle?

REUSE – could the product have another use? Could its parts be used in other products? Is this information clearly communicated on the product? This will extend its life.

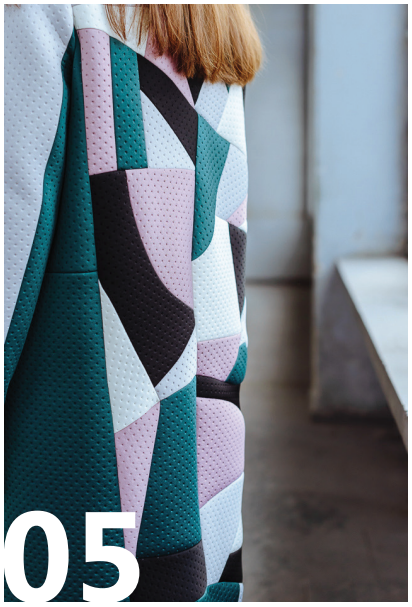
REPAIR – is the product easy to repair? This will extend its life.

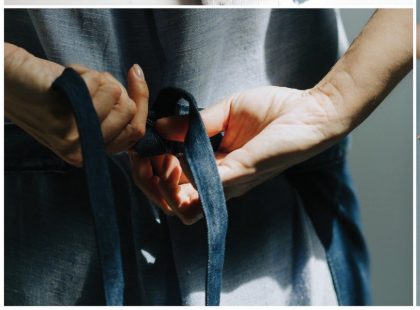
SOME EXAMPLES FOR THE 5 R'S OF SUSTAINABILITY

01. COMMUNE DIY
02. STANKEVICIUS ZILVINAS
03. IGNORANCE IS BLISS BY AGNE KUCERENKAITE
0.4 INDI

ekoda
ekologinio dizaino asociacija

SOME EXAMPLES FOR THE 5 R'S OF SUSTAINABILITY





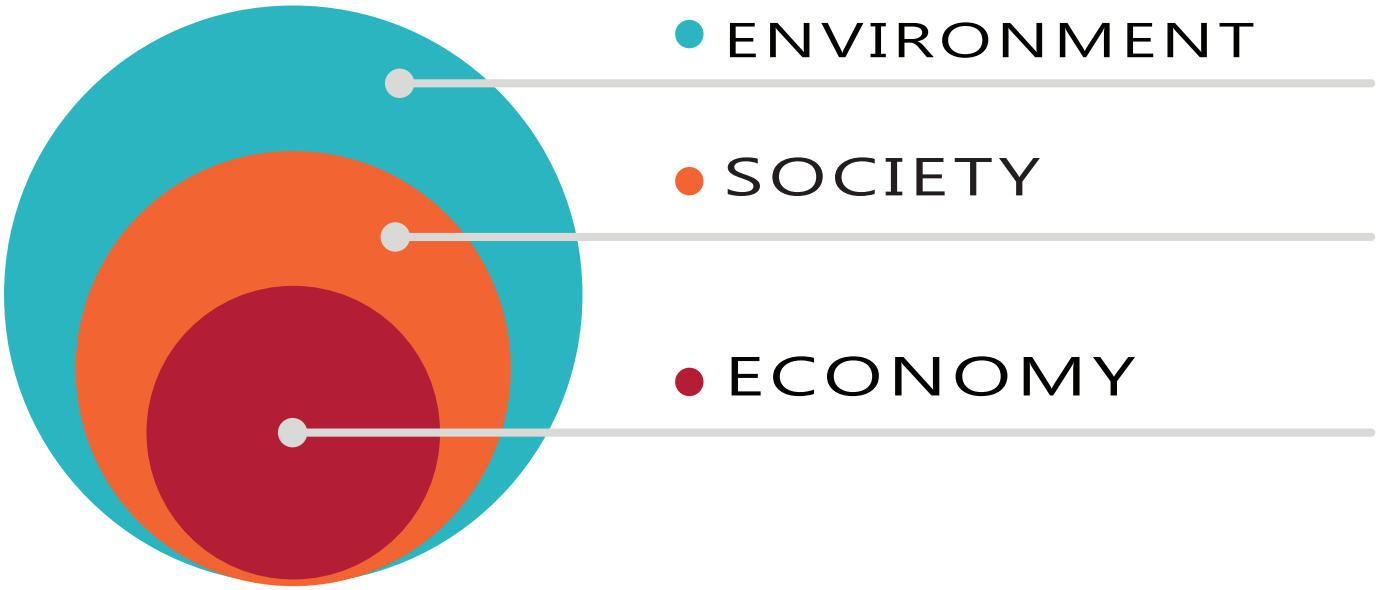
05. ZEFYRAS
06. SIMONA UVAROVAITE
07. RASA DESIGN
08. ZALIA ZINUTE

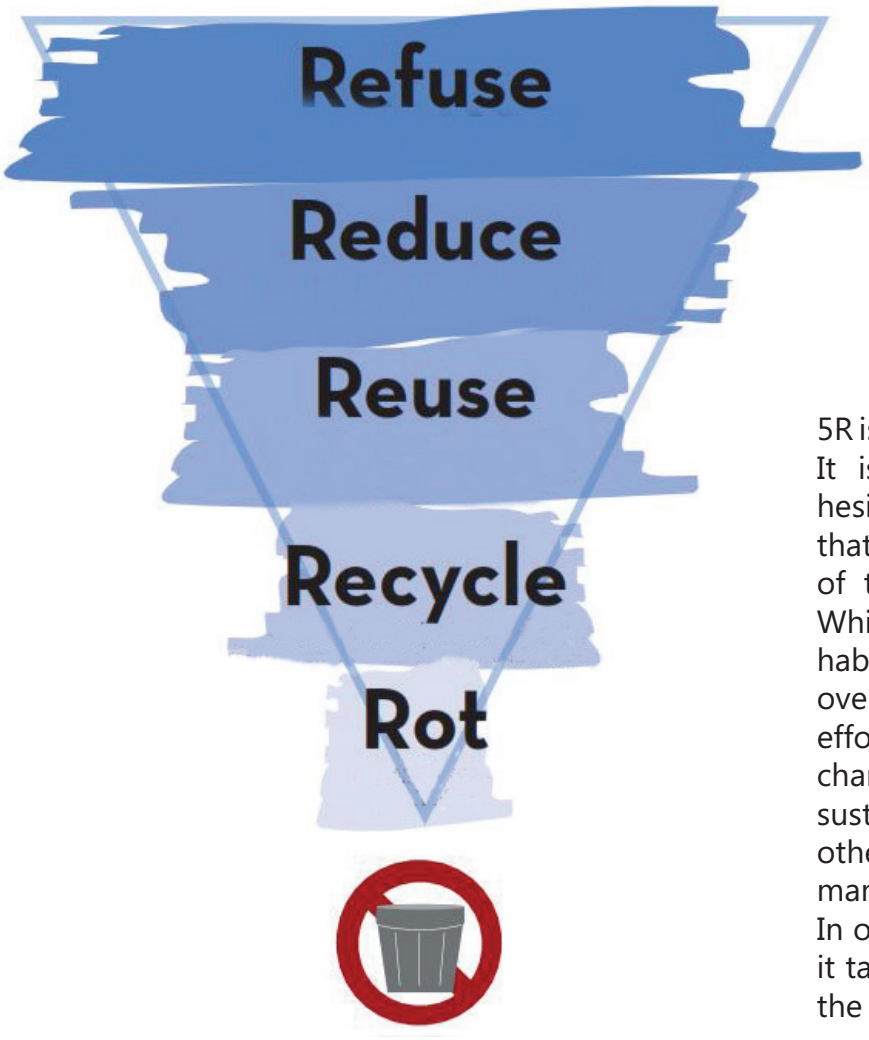
ekoda
ekologinio dizaino asociacija

5 R'S of sustainability

RETHINK / REINVENT:

consider and question consumption habits. It is ultimately up to us to really start thinking about what we buy, why we buy it and how we dispose of it. To make a difference, people must make a conscious effort to do so. That begins by questioning our actions. We must ask ourselves, do we really need these things? Is there another use for this? Can this be recycled? (Green Triangle Blog, 2012). These are just some of the basic questions that we should consider every day. By investing more time in understanding personal consumption habits, people will become increasingly self-aware of their effect on the environment. This self-awareness may influence their behavior, values and consumption habits.





5R is are dependent on the rethinking. It is that moment of pause, that hesitation to throw out something that still has value; it's the recognition of that value, that creates change. While it may take practice, as most habits don't develop overnight, over time an individual's conscious efforts may become part of person's character. Living a life, that supports sustainable practices, may influence others to do the same, as there are many long-term benefits in doing so. In order to reap the benefits though, it takes the willingness to change for the better.

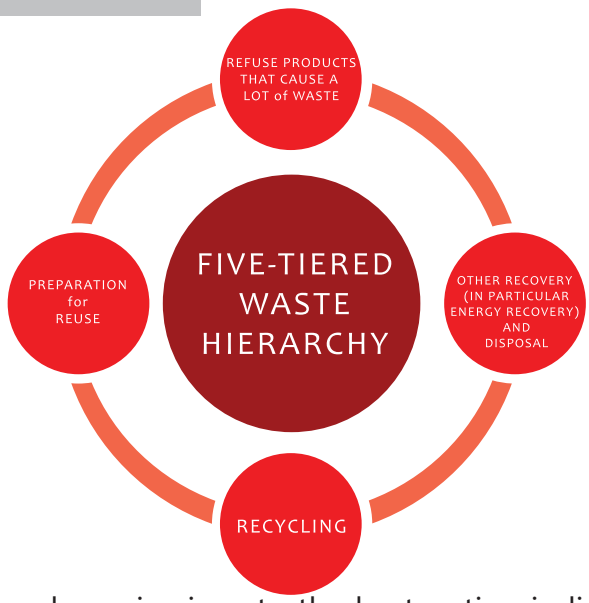
REFUSE: MAKE THE CHOICE TO NOT GENERATE WASTE

The most direct method of reducing the amount of trash is by refusing to consume. This does not mean to stop generating trash altogether, but rather to stop consuming particular products. A person may decide not to buy certain items, that generate more waste than benefits. For example, a person may feel the need to buy apples every time he goes to the store. However he may not eat them and often they go to waste. Knowing this, one may decide to quit purchasing apples, which will result reduces the amount of waste they produce.

Around the globe, piles of waste are swelling to become gigantic mountain ranges. If concerted action is not taken, humanity will be producing 11 million tonnes of waste per day in 2100. the growing mountains of waste exact a heavy toll not only in economic terms, but also on the environment. In most emerging nations, the infrastructure for waste disposal is inadequate or simply non-existent. Unregulated storage, illegal dumping and open-air incineration create significant environmental pollution and pose serious health risks. Contamination of the soil, groundwater and surface water damages ecosystems. The inappropriate treatment and dumping of waste also has have severe repercussions for the climate.

To keep the waste heaps from reaching to the skies, waste management and recycling must be ramped up around the globe. Two aspects are key: waste avoidance and the recovery of reusable materials. By fostering the reuse of waste, the lead market for waste management and recycling has the potential to reduce inputs of primary raw materials and the burden on the environment associated with their extraction. The tremendous importance of waste avoidance and recycling is mirrored in the ideal of the full-cycle concept. This model of closed material cycles follows the principles seen in natural ecosystems that produce no waste, instead converting all materials into reusable resources.

The guiding principles established for waste management and recycling map out a five-tiered waste hierarchy with the following priority order:



Precedence is given to the best option in light of environmental considerations, although ecological, technical, economic and social consequences must also be analysed.

The above waste hierarchy creates a framework within which to identify distinct market segments in the lead market for waste management and recycling. The services and infrastructures subsumed under the market segments for waste collection, transportation and separation lay the foundation for waste management and recycling. The market segment for material recovery comprises the technology lines for mechanical recycling and feedstock recycling. Mechanical recycling refers to recycling processes in which the materials and their chemical structure are not altered. One example is the remelting of plastic waste to produce granulate. Feedstock recycling treats substances in a way that changes their chemical structure – deriving oils, waxes and gases from plastic waste, for example.

One widespread form of energy recovery is thermal waste treatment, which involves incinerating waste and using the energy released by this process to supply heat and generate power. The use of organic waste in biogas plants is another variation on the same theme. Waste that is not suitable for material or energy recovery must be disposed of in an environmentally friendly manner. The landfill technologies market segment brings together those technology lines that serve this purpose.

GERMANY

REFUSE IN GERMANY

We live in abundance: While about six generations ago personal property consisted of just over one hundred things, today's average German owns a total of around 10,000 objects in his home, attic, cellar and garage. Many things we own get dusty unused and yet we can't stop buying new things. Our society lives from consumption, or rather from the desire for more. But all this consumerism causes environmental problems. Everything we buy has to be produced, transported and packaged. Thoughts about the required consumption of resources, CO2-emissions and tragic exploitation of workers during the production process do the rest when one critically examines one's own consumer behaviour. The same does apply to everything we want to get rid of later. It is just there, has to be disposed of, causes waste and burdens the environment. "Enough with it", say more and more contemporaries and tries to focus on minimalism. But is less really more?

But our "refuse" and "minimalism" can also destroy jobs as well as economic growth. "I am a follower of combining ethics and business," says Prof. Dr. Dominik Enste. He heads the Competence Field "Behavioral Economics and Business Ethics" at the Institut der Deutschen Wirtschaft in Cologne. Of course, one could call for a renunciation of consumption, as on events like today's "Kauf-Nix Day" (buy-nothing day) and live it. But if everyone would live in such a minimalist way, then in some countries it could be difficult with jobs and prosperity. Beyond this, not everyone wants and can do "refuse" in all areas of life; it is not about denying yourself all the pleasures. In addition, the way of refusing depends on the personal life situation as well. It is certainly different with children to change your lifestyle and reduce the amount of waste you produce than in a single household.

So far, responsibility for a lifestyle that consumes fewer resources is still too often seen as a purely personal decision. Politicians are also called upon to set the framework for sustainable lifestyles so that our vision of the future can become reality: An intact environment, the preservation of biological diversity, low resource consumption and a high quality of life for people.

WASTE MANAGEMENT POLICY IN GERMANY

The German Closed Cycle Management Act (Kreislaufwirtschaftsgesetz, KrWG) is aimed to turn the waste management into a resource management. The realisation that waste can be a useful source of raw materials and energy is not new. Metals, glass and textiles have been collected before and put to new use. The waste management policy, which has been adapted in Germany over the past 20 years, is based on closed cycles and assigns disposal responsibilities to manufacturers and distributors of products. This has made people even more aware of the necessity to separate waste, led to the introduction of new disposal technologies and increased recycling capacities. Today, 14 percent of the raw materials used by the German industry are recovered waste.

The Closed cycle management is not only a contribution to the environmental protection, it also pays off economically. The waste management industry has become an extensive and powerful economic sector in Germany. Almost 200,000 people are employed in approximately 3,000 companies which generate an annual turnover of approximately 40 billion euro.

Article 4 of the revised EU Waste Framework Directive (Directive 2008/98/EC) sets out five steps for dealing with waste, ranked according to the environmental impact – the waste hierarchy.

The waste hierarchy gives top priority to preventing the creation of waste in the first place. When waste is created, it gives priority to preparing it for re-use, recycling, another recovery (such as energy recovery) and disposal (landfill after pre-treatment) in descending order of environmental preference. This waste hierarchy has been transposed into German law.

A new obligation is included to draw up a national waste prevention programme (Article 33 KrWG). The programme formulates waste prevention targets, presents and evaluates existing waste prevention measures, and develops new measures on this basis. The aim is to strengthen waste prevention policies and make them more transparent to the general public. The Federal Ministry of the Environment formulated a waste prevention programme for the first time in 2013.

The German waste management system is totally financed by fees. No subsidies! There is a "polluter-pays" principle, means the producer has to pay for waste treatment or disposal. Various groups of main stakeholders are working in waste management - municipal and private waste management companies (waste collection, recovery and disposal). Municipal waste management companies are responsible for biowaste and domestic waste; private waste management companies ae responsible for the waste recycling (domestic waste; trade waste, commercial waste).

WASTE PREVENTION – the best waste is the one that is not produced.

The amount of waste currently produced is still too high. In particular in the field of municipal waste, further efforts towards a resource efficient consumption are needed to prevent waste from arising.

In the interests of conserving resources, waste prevention aims to reduce both the volume of waste and its pollutant content. To this end, in 2013, the German government and the Federal States (Bundesländer) launched a programme of public-sector measures designed to reduce waste volumes. The Waste Prevention Programme will be revised and updated in 2019.

There are also many other ways for producers and consumers to reduce their waste: by focusing on durable, lean, repairable products; by avoiding unnecessary and short-lived items; by purchasing services rather than goods; and last but not least by using rather than owning, for example. The message is that by acting considerately, each and every one of us can do our bit to protect the environment.

Raising awareness and sensitising the general public to effective waste prevention is therefore crucial. Each year in November, Germany stages its own series of events to mark the European Week for Waste Reduction, promoting the implementation of awareness-raising actions about sustainable resource and highlighting what can be achieved through individual activities, ideas and commitment. This years' edition will take place from 16 to 24 November 2019.

Waste management in Germany is characterised by a good development in the last 30 years, but some problems are still to solve and new challenges are coming up. The prices for waste treatment vary greatly. Overcapacities of waste-treatment plants lead to falling prices. It airses always problems in financing the collection and recycling of waste from the yellow bin. These wastes are not funded by a waste fee. Still too many wastes are incinerated (thermal recycling) although material recycling would be ecologically beneficial.

However, the German approach to plastic bags is a good example for waste reduction. Although Germany's consumption of plastic bags was already below the European average, at around 72 bags per person, per year, the voluntary introduction by retailers of a plastic bag charge has reduced this further to around 38 bags, proving that conscious behavior by individuals can have a big impact.

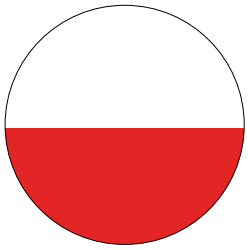
INTERESTING

GERMANY

If all Germans were to do without "coffee to go", 43,000 fewer trees would have to be felled each year. The annual production of 2.8 billion cups in Germany also consumes so much water that all residents of Bavaria could have a shower for about 10 minutes.

Coffee capsules are trendy, easy to use and promoted by stars like George Clooney. But they are designed as an expensive disposable product. Almost three billion coffee capsules were consumed in Germany in 2014. That's around 5,000 tons of aluminum and plastic waste that we could save.

At many major events, most of the rubbish is produced by disposable crockery. Festivals like the "Tollwood Festival" in Munich, where only reusable tableware is used, show that there is the another way.

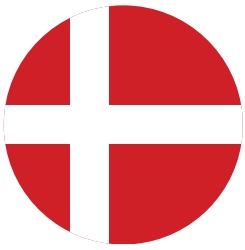


POLAND

A growing trend to resign from unnecessary plastic bags, nets and other types of packaging when shopping. More and more shops allow you to pack your products in your own packaging.

More and more popular trend of not using or refusing promotional gadgets and gifts during conferences/events.

Returning to the event organizers lanyards and unused materials.



DENMARK

In a 2018 report compiled by the Danish Technological Institute, 33 percent of the companies who were asked answered that they are already using recycled raw materials and materials, and at the same time have a strategic focus on increasing their share in the coming years. 27 percent of companies have ambitions to become part of the circular economy, while 40 percent of companies do not recycle materials - nor do they have ambitions to do so.

The Danes are quite good at delivering empty cans and bottles. In fact, 9 out of 10 packages sold return, and aluminum, plastic and glass are re-melted and used to make new cans and bottles.

Every year, tons of used furniture is wasted - including good leather furniture. The waste happens when furniture is just thrown out and burned in the large ovens. But at AVV, during the project Well done (Godt Gjort) in Denamrk discarded sofas are striped for the good leather, it is treated and washed, quality assured - and can be supplied in meter dimensions for new products: bags, cushions, aprons, pillows and much more. The idea is simple, new and groundbreaking.

Danish Shark Solutions transforms discarded car windows into industrial raw material. Shark Solutions began at Holbaek in 2005, when the company was founded based on an idea to avoid sending laminated glass to the landfill.

INTERESTING

SWEDEN

Pressbyrån and 7-Eleven chains have started a campaign giving a discount on takeaway coffee to customers that bring their coffee mug.

A lot of municipalities and public authorities has changed their procurement requirements in order to remove unnecessary plastic products and replace them with products from non-fossil and renewable sources as much as possible. (Source: "EN PLASTFRI MILJÖ - Plastprogram för Skåne", Länsstyrelsen Skåne)

In Europe, where the organic food market is growing by 5-7 per cent a year, Sweden ranks at the top of the green shoppers list. A study by the European Commission found that 40 per cent of Swedes had purchased an eco-labelled item in the past month, which is more often than the European average.

LITHUANIA

There is 453 kg of waste per capita in Lithuania. Since 2019 Lithuania is trying to reduce the plastic waste by charging for the plastic bags in supermarkets as well as promoting the usage of paper bags. Companies like Maxima, the retail giant is even offering the option of getting your groceries delivered at home in a paper bag. Another way that Lithuanians are refusing the plastic bags at shops is by using the textile bags that are priced almost the same.

In Lithuania during the summer there are several festivals organized and many tourists come and spend time by the sea. In order to discourage the use of single use cutlery the stores in Lithuania have stopped selling non disposable cutlery sets and instead they are offering alternatives of disposable sugar cane plastic. Also, many online stores are offering metal straws as a solution to the single use straw that is still being used.

Lithuanian tap water is among the cleanest in Europe, because 100% of it is taken from abundant underground sources sheltered from human interference. This is an encouraging fact to bring your own reusable bottle and to refill it anywhere even in the public water fountains. If it happens to buy a plastic bottle, refuse to throw it away and do like 92% of Lithuanians that deposit their plastic bottles in the disposing machines near any of the shopping centers.

REDUCE: MAKE DECISIONS THAT DECREASE THE AMOUNT OF WASTE PRODUCED

To cut trash, simply consume less. It is the idea that less is more. We can reduce the amount of Reducing and Reusing Basics.

The most effective way to reduce waste is to not create it in the first place. Making a new product requires a lot of materials and energy - raw materials must be extracted from the earth, and the product must be fabricated then transported to wherever it will be sold. As a result, reduction and reuse are the most effective ways you can save natural resources, protect the environment and save money.

BENEFITS OF REDUCING AND REUSING

- Prevents pollution caused by reducing the need to harvest new raw materials
- Saves energy
- Reduces greenhouse gas emissions that contribute to global climate change
- Helps sustain the environment for future generations
- Saves money
- Reduces the amount of waste that will need to be recycled or sent to landfills and incinerators
- Allows products to be used to their fullest extent

Ideas on How to Reduce and Reuse

- Buy used. You can find everything from clothes to building materials at specialized reuse centers and consignment shops. Often, used items are less expensive and just as good as new.
- Look for products that use less packaging. When manufacturers make their products with less packaging, they use less raw material. This reduces waste and costs. These extra savings can be passed along to the consumer. Buying in bulk, for example, can reduce packaging and save money.
- Buy reusable over disposable items. Look for items that can be reused; the little things can add up. For example, you can bring your own silverware and cup to work, rather than using disposable items.
- Maintain and repair products, like clothing, tires and appliances, so that they won't have to be thrown out and replaced as frequently.
- Borrow, rent or share items that are used infrequently, like party decorations, tools or furniture.
- One person's trash is another person's treasure. Instead of discarding unwanted appliances, tools or clothes, try selling or donating them. Not only will you be reducing waste, you'll be helping others. Local churches, community centers, thrift stores, schools and nonprofit organizations may accept a variety of donated items, including used books, working electronics and unneeded furniture.

Benefits of Donation

- Prevents usable goods from going into landfills
- Helps your community and those in need
- Tax benefits may be available

Repair saves money. It saves the environment. And it connects us to our things.

Repair jobs can't be outsourced—who would ship a washing machine from Chicago to Shanghai for repairs?

These jobs are skilled, well paid, and continually in demand. Our stuff is here! That stuff will eventually break, and we will always need people to fix it.

Reuse of waste means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

The differentiation between the terms reuse, recycling and recovery is important for the understanding and application of the targets stated in EU waste legislation.

Definitions for recycling and reuse in waste specific Directives partially deviate from the corresponding definitions of the Waste.

FRAMEWORK DIRECTIVE:

The term recycling specified in waste specific Directives does in particular not include backfilling operations.

Reuse as defined in the Packaging Directive 94/62/EC and the WEEE Directive 19/2012 of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) comprises specifications the Waste Framework Directive does not include.

Recycling of waste is defined as any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes.

It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

LITHUANIA

Lithuanian manufacturers proposed innovative fabrics – enriched with coffee grounds, seaweed, or mint. Innovation in the textile industry is essential to create competitive and exclusive products for foreign markets. Our country's companies are focused on future textile trends: eco-friendly, smart materials and functionality. The most promising sustainable fashion innovation of 2019 award won Trash and Culture (by Dmitry Makoveev), who introduced the concept of slow fashion.

The long-term environmental goals are identified in the field of smart society, approved by the Lithuanian Progress Strategy Lithuania 2030 (hereinafter referred to as the Strategy) which was assigned in 2012, include the aspirations of raising public ecological awareness, sustainable consumption and promotion of responsible attitude to economic development; In the area of 'smart economy', environmental objectives include fostering an environmentally friendly business culture, fostering the development of a green economy, increasing incentives for business to invest in green technologies, goods and services, advanced technologies and products that save resources and reduce environmental and climate change; it is assumed to take care on stability and biodiversity conservation in industrial, energy, and transport sectors, as well as the effects on whole ecosystem.

In the area of 'smart management', there are no specific objectives for the environment, but common objectives for a strategically capable government that responds to the needs of society.

In the National Implementation Plan 2014-2020, The National Program for Progress (NDP) formulates a priority "Public Education, Science and Culture" with the overall objective "to encourage every citizen to realize his or her potential through learning, development, research, purposeful responsibility for himself, the state and the environment" environmental objectives - to promote health and the environment; Priority "Environment for growth" has the general objective of "creating an environment conducive to growth and competitiveness" and two more specific environmental objectives: to create favorable conditions for entrepreneurship and sustainable business development and to promote sustainable use of resources and ensure ecosystem stability.

2017 The Plan of Implementation of the 17th Government Program approved the more detailed environmental objectives: to ensure the quality of environment suitable for all life forms, to improve the status of water bodies, to improve efficiency of drinking water supply and wastewater management, to reduce air pollution and climate change; ecosystem services; and raising public awareness of the environment.

In addition to the country-wide strategic documents, environmental objectives are also addressed in sectoral medium-term strategies, the most important of which are the National Environmental Strategy and the National Strategy for Climate Change Management.

The National Environmental Strategy is designed to set priority environmental policies, long-term goals for 2030 and the vision of Lithuania's environment by 2050. The Strategy states that the primary objective of environmental policy is to achieve a healthy, clean, and safe environment in Lithuania that is in harmony with the needs of society, the environment, and the economy. The strategy covers four priority areas of environmental policy: the sustainable use of natural resources and waste, improving the quality of the environment, preserving the stability of ecosystems, and mitigating and adapting to climate change. The latter policy area is set out in a separate document - the National Strategy for Climate Change Management.

THE NATIONAL ENVIRONMENTAL STRATEGY HAS THE FOLLOWING MAIN OBJECTIVES:

- Ensure the long-term rational and sustainable use of, and protection of, national natural resources of importance to the functioning of the State and, where appropriate, the expansion, creating conditions for sustainable economic development;
- To reduce the amount of waste generated, ensure the safe management of waste for human health and the environment and the rational use of material and energy resources of waste;
- Ensure that groundwater, surface water bodies, the Curonian Lagoon and the Baltic Sea are in good condition, that surface water bodies are suitable for recreational purposes and that all residents of the country receive drinking water that meets safety and quality requirements;
- Protect and conserve soil;
- To ensure that the emission of pollutants into the ambient air in Lithuania does not exceed the amount specified in international and EU legal acts, the concentration of air pollutants in the ambient air does not exceed the levels of ambient air pollution that are not harmful to human health and the environment;
- To achieve a good environmental radiological status in Lithuania;
- To protect the public from the harmful effects of environmental noise;
- Reduce the use of hazardous chemicals and mixtures and their adverse effects on human health and the environment;
- To achieve good quality of the urban environment while ensuring the harmonious development of the territory of the country and favorable conditions for the social and economic development of the urbanized territories;
- To preserve landscapes and their geoecological potential at different territorial levels;
- Halt the loss of biodiversity and the degradation of ecosystems and the services they provide, wherever possible;
- Ensure the safe conduct of activities that generate, process, use, transfer and release living modified organisms that may adversely affect the conservation and sustainable use of biological diversity.

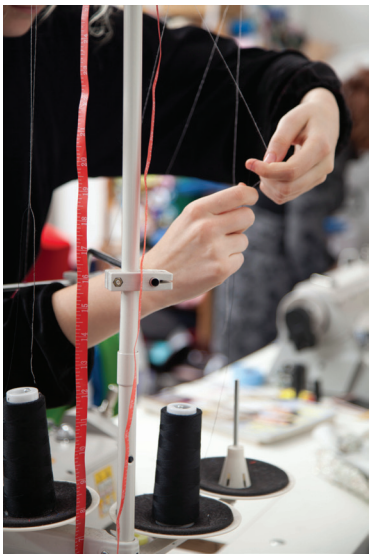
Already in Lithuania we have excellent examples, which are known not only in our country but also abroad, which use only secondary raw materials in their production, creation and activity, and the works produced from them do not go down to new ones. This is Zilvinas Stankevicius, an artist who makes eye-catching paper kaleidoscopes, all of which are made of recycled materials, and the INDI design studio is known not only in Lithuania, but also to reclaim recycled paper lamps for foreigners. Another good example of this culture is Simon Sonkin and his workshop "Commune DIY", where second-hand, broken skateboard wood brings to life a variety of pleasant little things - phone cases, business gifts, car accessories or Christmas tree toys.

Domino Colors - unique furniture and interiors are made using recycled wood from old, reconstructed buildings. LeaF - the makers of eco-friendly handbags - their products are reborn from worn over coats, worn-out skirts or forgotten accessories in cabinets, and become pieces in stylish bags, handbags, backpacks or cosmetics.

Currently, 65 companies are engaged in recycling in Lithuania. They recycle glass, paper and cardboard, plastic, PET, metal, wood and composite packaging. Part of recycled materials, e.g. glass, plastic, or paper, is used to make new products: glass bottles, bags, tubes, paper packaging, furniture fibers, etc. The rest is exported to other countries.












INTERESTING

LITHUANIA

75% of Lithuanians care about using eco-friendly products. That is why local brands such as Margarita, Mano and many others are promoting products made from only natural products that do not cause as much damage to the environment.

The Lithuanian government plans to allocate 4.5 million euros in financial support to residents who have installed small solar power plants. This is a great incentive to encourage people to use clean energy and reduce the consumption fossil fuels and impact the environment.

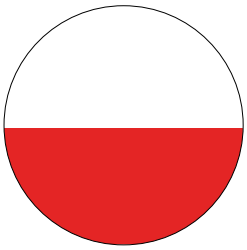
Non-biodegradable chemical products used generously in everyday life, have a tremendous impact in the environment. Buying EU-Ecolabel products that do not contain harming ingredients nor non recycable packaging is a way that lithuanians can reduce chemichal pollution in water and air.

SWEDEN

Sweden has made a lot of effort in digitalization of public authorities and municipalities. This made possible to significantly reduce the usage of paper in their business activities. For example, "Digital postbox" is a free service which enables citizens to receive all important documents and letters from the government and some business (ex. banks) digitally.

More and more grocery stores are starting to cell package-free goods. For example, Matkooperativet in Helsingborg is selling a dozen of products, such as vegetables and fruits, spices, oil, vinegar, detergents, etc. package free.

Järnhandel is a store in Malmö that rents out tools for free, so people don't have to buy tools that they will use just a few times.



POLAND

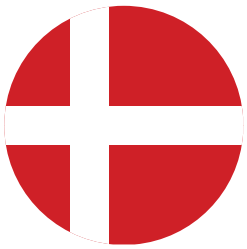
The sharing economy market is growing rapidly in Poland. There are more and more companies using this idea in many different ways like:

- couchsurfing,
- co-working,
- car rental companies,
- exchanging objects,
- renting parking spaces,
- care of animals in the absence of owners,
- doing small jobs,
- pick-up service,
- bicycle rentals,
- currency exchange,
- ordering dinners together.

Myzbieramy.pl is the portal connecting farmers and fruit growers with those who want to pick fruits and vegetables for yourself. Farmers and fruit growers have to do is designate a section of the field, an orchard, where guests will collect fruit and vegetables, and set the weight at the exit and charge fees there. Prices for vegetables, fruits can be offered higher than those at collection points, and lower than store prices - both sides gain.

Two Polish students created an App Nextplease for free book exchange. They call it a book secondhand. You can place your offers in it, and browse through the suggestions of other users.

INTERESTING



DENMARK

Denmark was the first country to impose a tax on the plastic bags in 1993 in order to reduce the number of plastic bags. Today, the Danes use fewer plastic bags than the EU target for 2019, namely 79 per capita per year.

43.4 percent of Denmark's electricity consumption was supplied by wind turbines, which is not only a new Danish record, but also a world record. It is the ninth time in ten years that Danish wind turbines set a record. A wind turbine of 20 turbines will produce approximately 5,200,000 MWh for 20 years, and at the same time save the environment for 4,500,000 tons of CO2. This corresponds to the amount of CO2 absorbed by a forest of 160 km2 over a similar period.

Every year around the world large quantities of electronics and other products are thrown out every year because the products are broken. In many cases, it is even a deliberate strategy on the part of the manufacturer for the product to break shortly after the expiration of the warranty, so that the customer must buy a new product. This so-called planned obsolescence is due to much unnecessary resource consumption.

The new Danish company Make it Good Again is an online marketplace where people offer and demand help to repair everything from washing machines to mobile phones. This is done by describing what is wrong with the product, and registered repairers can then offer what they need to repair the damage.

The customer chooses which offer is the best. For example, based on price, distance to the repairman, etc. If the repair is unsuccessful, the customer do not have to pay, but if it works, the customer pays the repairer through the Make it Good Again platform, which then takes 15 percent of the amount in the mediation fee.

In the first half of 2019, electric cars and charging hybrid cars accounted for 3.2 percent of total car sales and are thus slightly higher than electric car sales in the latter half of 2015, with electric cars and charging hybrid cars accounting for 3.1 percent of car sales.

In 2009, Holbæk Municipality entered into a climate municipality agreement with the Danish Nature Conservation Association. Holbæk Municipality thus committed to reducing its CO2 emissions by 3% per year. The last agreement expired at the end of 2018. In the nine years that have passed, the municipality has reduced its CO2 emissions by just over 13% compared to the agreed (9,988 tonnes in 2018 instead of 11,437 tonnes, which was the target of the agreement) .

GERMANY

Every year, about 18.4 million tons of food waste are collected in Germany. The harvest of an area about the size of Sicily is thrown away unused.

Every German consumes around 787 bottles of shampoo in his life. If you stacked them on top of each other, you would have a tower about the height of the pyramid of Cheops. This corresponds to an estimated plastic waste of 20 to 25 kilograms per capita, which could easily be avoided.

Internet trading in Germany is booming. The result: more and more packaging waste. In 2013, the volume of total packaging waste rose to 17.1 million tons. Internet trading accounts for a large proportion of this.

On average, 617 kg of waste per capita are thrown away in Germany every year. For comparison, this corresponds to the weight of a horse or the heart of a blue whale.

RE-USE/REPAIR: EXPAND THE SHELF-LIVES OF PRODUCTS

By reusing what you already have or by reinventing new uses for the item, you can extend the item's product life. Before rushing out to the store to buy an item make the decision to buy as a last recourse. For example, we can use pickle jars for storage rather than buying a brand new container. It's the idea of being creative with the things you have, to extend the life of a product.

If I no longer have a use for the item I can give away the item instead of throwing it away. I can donate unwanted equipment, furniture, supplies, clothes to a nonprofit organization, schools, a shelter or charity. Also, I may able to reclaim some of the value of my items through consignment stores or pawn shops. If there is no other use for the product, then recycle.

Reuse means recovering and reusing products or their components. It includes both preparing for reuse and reuse.

Preparing for reuse refers to checking, cleaning or repairing recovery operations, by which products or their components that would have become waste are prepared in a way so that they will be reused without any other pre-processing.

Reuse means any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

Reusing items decreases the use of material and energy resources and reduces pollution and natural capital degradation. Recycling does so too, but to a lesser degree.

Reusing products is thus the second best option in waste management, after reducing!

WHY IS REUSE IMPORTANT?

Reuse confronts the same problems than reduce: There is too much waste being produced in the European Union! By extending the lifespan of products, preparing for reuse and reuse are influential measures to reduce the amount of waste produced. Reuse has a strong value for sustainable development because it not only promotes environmental protection through waste prevention but also contributes to social aims and has economic benefits.

ENVIRONMENTAL BENEFITS OF REUSE:

- Reduction of the amount of waste, including hazardous waste
- Pollution prevention
- Reduction of greenhouse gas emissions, which contribute to global climate change
- Decreased strain on natural resources (raw materials, fuel, forests, water)
- Preservation of the "embodied energy" that was originally used to manufacture an item
- Social benefits of reuse:
- Fight against poverty by providing affordable products to low income households
- Social inclusion by bringing disadvantaged people back in the labour market and society
- Job creation in collection, sorting, testing, refurbishment and reselling of items reused
- Training opportunities in fields such as driving commercial vehicles, carpentry, electrical engineering, marketing, or even handicraft and art.

ECONOMIC BENEFITS OF REUSE

Monetary savings (customer: in purchases and disposal, state: less social costs through job creation and training)

Savings in energy, materials and chemicals embodied in the appliance

Buying re-used items like sofas and TVs rather than buying new items is saving UK households around £1 billion a year and helping to create jobs - but this is just a fraction of the potential shown by ground breaking new research from WRAP (Waste & Resources Action Programme) which will be launched tomorrow. One million sofas which the current owner has finished with are re-used in the UK every year, saving households over £320 million – but this is just 17% of the total number of sofas discarded each year. The environmental benefits of re-using one tonne of sofas are the same as recycling one tonne of plastics.

Social, environmentaland economicbenefits of reuse and recyclingThe FRN "Win Win" report (2007) states that reuse can play an important role in meetingobjectives around social and financial inclusion, sustainable communities, reducing carbon emissions and the use of natural resources. It has direct linkages to a number of current government policies and initiatives as discussed below. SocialbenefitsSocial benefits are the primary driver for many third sector organisations. The principal benefits are employment for disadvantaged workers and provision of low cost, or free, household goods to low income families. The FRN estimates that reuse charities have helped 750,000 low-income households, and they suggest that demand from such households is greater than the present capacity of third sector reuse organisations. The sector contributes to a number ofobjectives3including: the creation of socially inclusive wealth; the regeneration of local neighbourhoods; the development of new ways to deliver public services; employment and training; and provision of basic items (bed, fridge, cooker) for the socially excluded.

Training opportunitiesFurniture reuse organisations provide a number of training opportunities, which can include retail, warehousing, furniture restoration, upholstery, electrical skills, office and IT skills. Training is usually offered to individuals that have been long term unemployed, on probation or disabled, thereby enabling them to gain valuable work and social skills. Providing these opportunities can often attract support funding, although additional income will be needed to cover all overheads. Once training placements have been completed, approximately one third go onto paid employment. According to the FRN, the sector provides training for over 8,000 trainees.Volunteering opportunitiesReuse organisations often rely on time and commitment from volunteers, which may be recruited through referral and welfare agencies (e.g. social care organisations). As well as providing volunteer opportunities for disadvantaged individuals, volunteers can come from other walks of life, for example, retired workers. Volunteers often benefit from improved self-esteem as well as a sense of contributing to a worthwhile cause. According to the FRN, the sector supports over 10,000 volunteers.

Community involvement Social enterprises often have strong ties to local communities, which may result in greater involvement of those communities. Linked to the provision of training and volunteer opportunities, reuse projects can play an important role in community cohesion, by giving residents the opportunity to become involved as volunteers or employees in a worthwhile community service.

Provision of goods to low income families. This guidance has mentioned that one of the main benefits of involving reuse organisations in bulky waste service provision is that items can be sold or given to low-income families and individuals. While the cost of many items has reduced considerably, bulky items can still be very costly. Low income families often rely on „sub-prime" credit shops with high APRs and a mark-up on retail prices to purchase consumer goods, such as washing machines, televisions, and large household furnishings. This means that the cost of the item canmore than double for those on a low income. By comparison, many better off families have a range of means of paying for these items –including upfront, with a credit card, or hire purchase5.

Impact on residents by delivering a service that maximises reuse and recycling of bulky waste, local authorities can also provide a better service to residents but this will need to be carefully communicated.

Economic benefits. There are economic benefits to local authorities, communities and individuals as a result of increased reuse and recycling. For a local authority these benefits are: reduced costs of, and LATS liabilities for, disposal; potential sales income to contribute to collection costs; reduced costs for services delivered by social service and housing departments by providing practical social benefits in the community; and greater efficiencies from cross department working, such as funding reuse activities through more than one department, splitting the cost between waste and other departments.

These can be achieved by: promoting reuse activities not carried out by the council, such as the use of online exchange websites or charity shops; contracting a more efficient collection service with an organisation that can, potentially, add value and provide a better service at a lower cost; and maximising reuse and recycling to generate income from the sale of goods or materials.There are also economic benefits through strengthening the local economy, which can help to alleviate poverty, promote financial inclusion, and sustain tenancies of those currently housed.

Social-economic benefits of reuse. Reuse is labour intensive as it involves collection, sorting, testing, refurbishment and reselling which is important considering the EU is experiencing an average unemployment rate of nearly 11%. Social enterprises working in the field of reuse provide opportunities for those distanced from the labour market to gain key skills such as driving commercial vehicles, carpentry, electrical engineering or marketing. Some even embark on intricate trash design or eco-fashion activities 8. Regarding economic benefits, itcosts France 20,000 EUR to support an unemployed person. By funding integration contracts in the field of textile collection, reuse and recycling, the state only pays half this and ends up saving 2 Euros for every Euro spent. At the same time it improves the skill set of its workers and boosts green jobs. In the UK, WRAP estimated that reuse of a selection of waste streams brings benefits of £720 Million of savings to the economy. Concerning job potential, UNIDO and Microsoft found that computer reusecreates 296 jobs for every 10,000 tons of material disposed of each year. In addition, Irish enterprise Rehab Recycle, calculated that between 2010, business to business IT reuse generated 10 times more jobs than the equivalent tonne of recycled materials. The Illinois Department of Commerce and Economic Opportunity estimate also that for every 1,000 tonnes of electronics, 15 jobs can be made in recycling whilst up to 200 jobs exist if refurbished and repaired.

Reuse Alliance represents over one hundred reuse organizations that employ 250,000 people. Our community diverts 9.1 million pounds of waste from landfills every day.

NATIONAL REUSE DAY

October 20th has been recognized by many cities as National Reuse Day – a day to celebrate reuse as a central tenet of sustainability.

Interreg South Baltic
EUROPEAN UNION
European Regional Development Fund

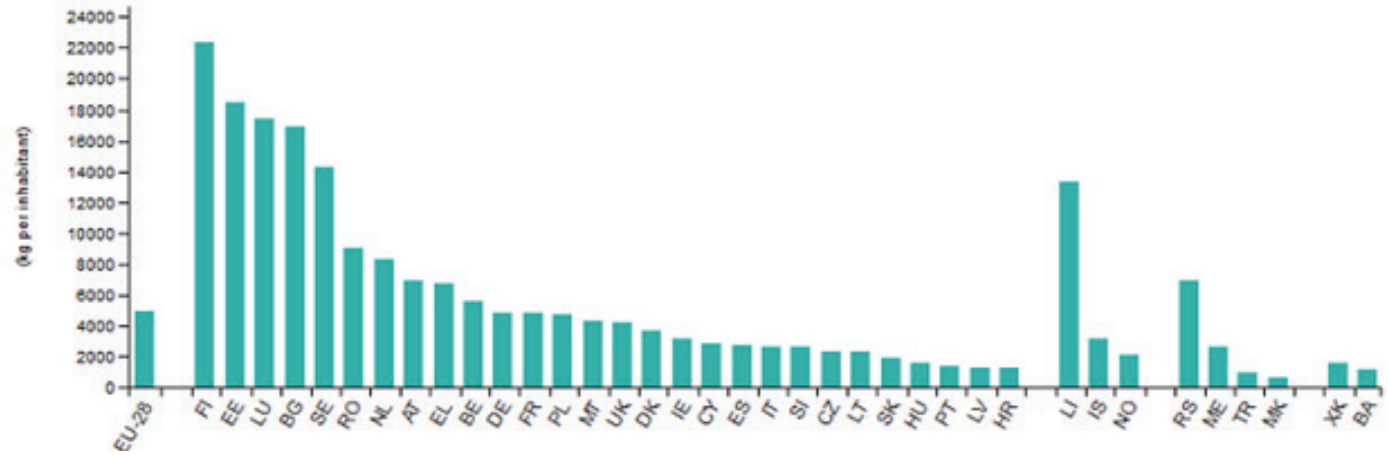
Waste treatment, 2016
(% of total)

	Recovery			Disposal	
	Recycling	Backfilling	Energy recovery	Landfill and other	Incineration without energy recovery
EU-28	37.8	9.9	5.6	45.7	1.0
Belgium	76.9	0.0	12.6	6.4	4.1
Bulgaria	5.2	0.0	0.4	94.4	0.0
Czechia	49.5	29.0	4.5	16.6	0.4
Denmark	51.4	0.0	19.5	29.1	0.0
Germany	42.7	26.6	11.3	18.1	1.2
Estonia	21.6	11.2	2.5	64.7	0.0
Ireland	10.6	46.0	4.8	38.4	0.3
Greece	4.8	0.0	0.3	94.8	0.0
Spain	37.1	5.7	3.6	53.6	0.0
France	55.0	10.3	5.4	27.6	1.6
Croatia	47.2	4.0	1.0	47.8	0.0
Italy	78.9	0.1	4.0	14.2	2.7
Cyprus	10.4	28.0	3.8	57.8	0.0
Latvia	71.7	1.1	6.8	20.3	0.0
Lithuania	33.4	4.1	5.8	56.6	0.0
Luxembourg	34.8	24.2	2.1	39.0	0.0
Hungary	54.1	3.7	7.4	34.2	0.6
Malta	19.1	63.4	0.0	17.2	0.4
Netherlands	45.6	0.0	7.6	46.0	0.9
Austria	37.0	11.0	:	45.9	:
Poland	46.2	22.2	3.3	28.0	0.4
Portugal	43.5	9.5	12.1	34.7	0.2
Romania	4.0	0.4	1.4	94.1	0.1
Slovenia	60.2	27.2	4.8	6.9	0.8
Slovakia	40.0	4.7	7.0	47.8	0.5
Finland	7.4	0.0	4.5	88.0	0.0
Sweden	12.0	4.9	6.6	76.3	0.2
United Kingdom	48.5	7.8	3.4	37.5	2.7
Iceland	25.0	51.0	0.4	22.3	1.3
Norway	43.5	2.6	34.0	19.5	0.5
Montenegro	0.8	0.0	0.2	98.9	0.0
Serbia	2.8	0.8	0.2	96.3	0.0
Turkey	33.0	0.0	0.8	:	0.2
Kosovo (*)	0.0	0.0	0.0	100.0	0.0

(*) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.
Source: Eurostat (online data code: env_wastrt)

eurostat

Waste generation, 2016 (kg per inhabitant)



POLAND

RE-USE/REPAIR IN POLAND

Some products, even those sold and designed to be disposable, can be reused without too much processing. This reduces the need to buy more products, which means less waste. Moreover, this principle reminds us that it is possible to reuse already used objects in a different, creative way, which extends their life and builds a culture of producing less waste, even those that can be upcycled and recycled - it must be remembered that every recycling process requires energy and there are losses in it.

The REUSE rule focuses on extending the life of the product.

WHAT EXACTLY CAN WE DO?

If things break, repair them or have them repaired. Upcycle items you would otherwise throw away. Buy second hand and give back things you don't need anymore. Remember: some things you don't have to actually own, it's enough to have a possibility to borrow (i.e. movies, music, books, tools, or even cars or office space).

REPAIR!

One of the most important principles of Zero Waste is to repair. During the year we buy so many things that we don't have enough space for them - in the kitchen, wardrobes, bathroom, desk... We explain ourselves by the lack of time to repair, and in fact often we can't simply stop buying new clothes or equipment.

Best practices:

Older furniture that has lost its appearance can once again amaze you if you just take a moment and instead of buying new ones, you'll refresh the ones you liked so much.

The problem of electro-waste disposal and the waste of working laptops is more and more often addressed by companies dealing with electronic renewal (REFURBISHING). Thanks to their actions, equipment has a chance to gain a new life, instead of going to landfill prematurely. Both the sale and purchase of refurbished post-leasing laptops allow to take care of the environment. When a device is reused, the Earth does not lose resources used in the production of new electronics and is not polluted with new waste. It should be remembered that by purchasing refurbished post-leasing computers, you can gain a device that complies with current technological standards and at the same time reduce your carbon footprint, i.e. the total amount of greenhouse gas emissions caused directly or indirectly by a given person. Buying post-leasing laptops - proven, refreshed and ready for re-use - doesn't mean buying obsolete equipment. Most devices are high-end computers with a business background, much more efficient than many of the new models on their price list. Interestingly, often renewed electronics turn out to be less reliable than a completely new product. Although it may seem strange, the explanation for this is quite simple. A brand new product goes through all the standard quality checks once, while a post-leasing laptop goes through all the standard checks twice. This makes it possible for the customer to get reliable, cheaper and, what's more, to opt for the Zero Waste idea.

WoshWosh is the first company in Europe and Poland that deals with professional shoe care advertises. Instead of buying a new pair of shoes. Renew your old, beloved shoes. You will save not only your money but also our planet!

Repair Cafés are free meeting places and they're all about repairing things (together). In the place where a Repair Café is located, you'll find tools and materials to help you make any repairs you need. On clothes, furniture, electrical appliances, bicycles, crockery, appliances, toys, et cetera. You'll also find expert volunteers, with repair skills in all kinds of fields. The Repair Café was initiated by Martine Postma. Since 2007, she has been striving for sustainability at a local level in many ways. Martine organised the very first Repair Café in Amsterdam, on October 18, 2009. Check if you can find the Cafe in your city:

UPCYCLE!

Is a giving a second life to unnecessary objects in such a way as to create a new product of a higher value than the base object. It is the effect that distinguishes this trend from recycling, where the aim is to recycle the material as cheaply as possible so that it can be reused. Examples? Pallet, barrel and tarpaulin furniture, tire dog pens, shelves for fruit box books, bottle vase... Upcycling is mainly used in the decoration, furniture and fashion industries.

BEST PRACTICES:

ZEROBAN - a young, polish, well-developing company that uses old advertising banners to produce toilet bags, backpacks and pencil cases. They sew gadgets for conferences and business events. Check what they're doing: https://www.nieladafundacja.org/shop.

BUY SECONDHAND!

We're addicted to fast fashion. In shopping malls, in city centres, on the main shopping streets - cheap chain stores. At home - equally cheap online shops and a wardrobe in which not everything is necessary. We don't usually know what it costs the environment: the clothing industry is the second largest in the world in terms of pollution, after the oil industry. The data provided by Eurostat show that in the European Union it is spent on clothes of approx. EUR 400 billion per year, of which EUR 800 per person.

According to 'The Guardian', the market for second-hand, clothes can, within a decade, surpass the fast fashion if we are more aware of how the production of cheap clothes affects our environment. And it does not only affect our environment through CO2 emissions. The use of toxic chemicals, the increasing amount of textile waste and the enormous water consumption also play an important role. This includes road and sea transport and the use of non-organic fabrics (polyester is a petroleum product; leather comes from industrial animal husbandry).

BEST PRACTICES:

ReTuna Återbruksgalleria is the world's first recycling mall, revolutionizing shopping in a climate-smart way. Old items are given new life through repair and upcycling. Everything sold is recycled or reused or has been organically or sustainably produced.

The mall opened its doors in August 2015 and is located next to the Retuna Återvinningscentral recycling center at Folkestaleden 7 in Eskilstuna. It is easy for visitors to sort materials they are discarding into the containers and then drop off reusable toys, furniture, clothes, decorative items, and electronic devices in the mall's depot, called "Returen". In the depot, staff from AMA (Eskilstuna Municipality's resource unit for activity, motivation and work) perform an initial culling of what is usable and what is not. The items are then distributed to the recycling shops in the mall. The shop staff then perform a second culling, where they choose what they want to repair, fix up, convert, refine – and ultimately sell. In this way, the materials are given new life.

FREECYCLE!

Give things that you do not want to other people to use instead of throwing them away, especially when this is arranged using the internet. Freecycle is run by volunteers and day-to-day decision making is made by grassroots local groups, encouraging local members to use their group sensibly and safely. Each group is run by local Moderators who check messages and help members. These are volunteers who give up time to help run groups - they're not paid. Join a Freecycle Network: https://www.freecycle.org.

When cleaning your wardrobe you do not know what to do with unnecessary clothes? First of all, don't throw anything away. Your clothes and shoes can help those in need.

BEST PRACTICES:

It is estimated that the Polish market of textile waste is about 2 million tonnes annually. An average Pole throws away about 30 kg of unnecessary clothes every year, which could be used by another person. This problem was noticed by the creators of the first in Poland fundraising portal ubraniadooddania.pl. What is it all about? Anyone who has unnecessary clothes can pack them in a garbage bag and write about it on the platform. The courier will collect the bags free of charge at the chosen place and time. At the same time, you should indicate the organization you want to support with your actions. For each kilogram of unnecessary clothes, the indicated organization will receive 1 zloty. Where does this money come from? The collected clothes are sold to specialized companies. Thanks to this, the clothes go to new owners or are processed in an ecological way, instead of going to a landfill.It is estimated that the Polish market of textile waste is about 2 million tonnes annually. An average Pole throws away about 30 kg of unnecessary clothes every year, which could be used by another person.

REUSE WATER!

What is one of the most precious resources without which life on earth would not be possible? WATER!

Water reuse is the use of treated wastewater for beneficial purposes such as:

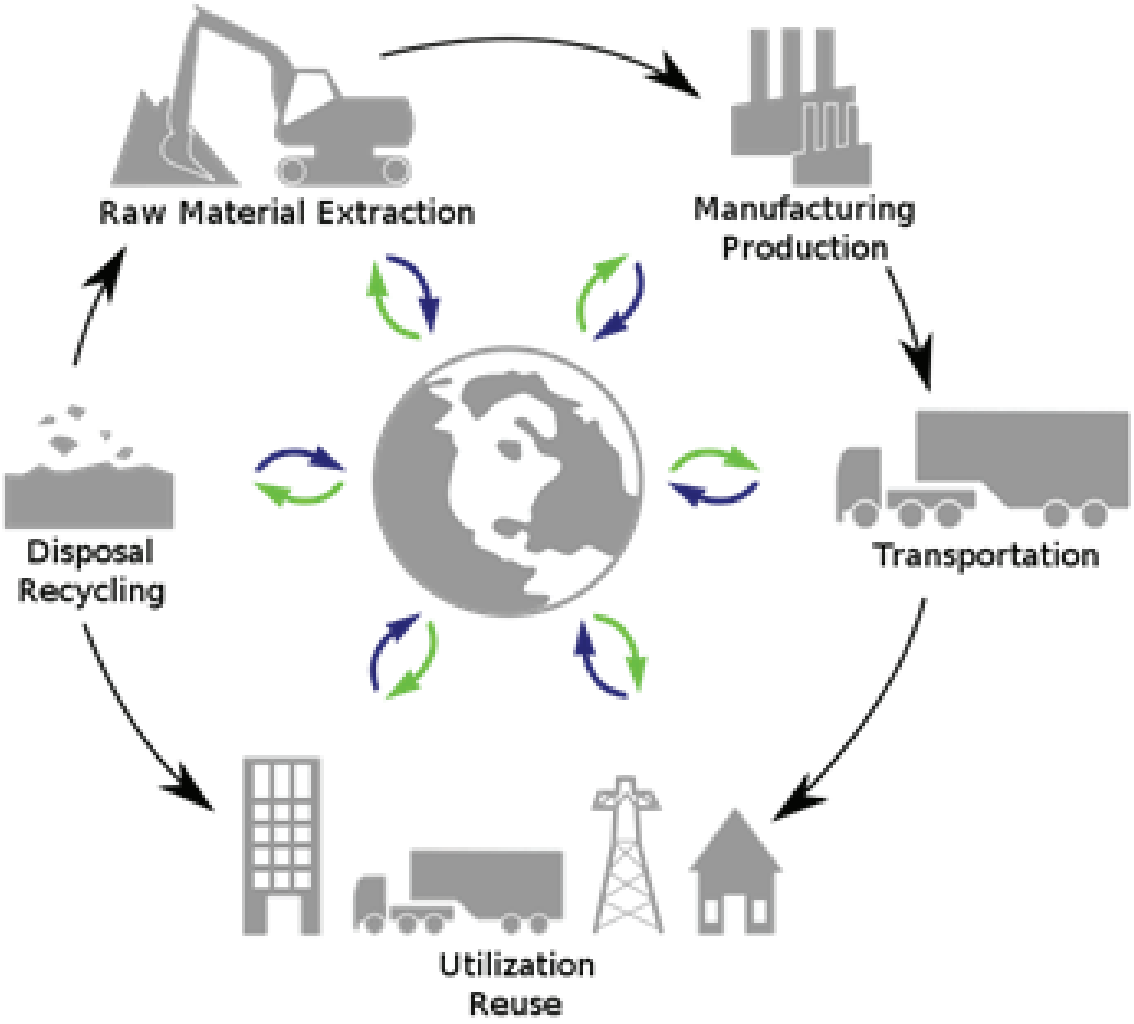
- agricultural and landscape irrigation,
- industrial processes,
- toilet flushing,
- replenishing a ground water basin,
- which increases a community's available water supply and makes it more reliable, especially in times of drought.

Water recycling offers resource and financial savings .

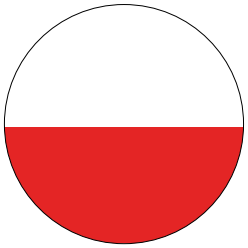
Thinking about buying take into account the whole life-cycle of the product, i.e. the raw material extraction phase, production, transportation, distribution, use, as well as the phase including what happens to the product after it has been used. Whether the item is durable and suitable for use over a long period of time, or is it designed to make it waste quickly? Is will be a problematic waste, or one from which we can easily to get the raw materials back?

RECOMMENDATIONS:

- introduction of rules to abolish VAT on repairs - when the price of a repair is only a small percentage of the price of a new product, people will become more open to repairing broken items,
- extension of guarantee periods for electronic items,
- preferential prices for premises that will sell recycled and second-hand items.



INTERESTING



POLAND

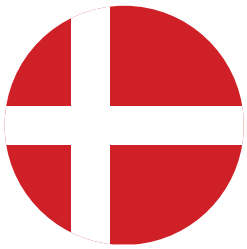
"Nielada Historia" foundation is a young, well-developing company that uses old advertising banners to produce toilet bags, backpacks and pencil cases. They sew gadgets for conferences and business events. The Polish market of second-hand clothes is worth PLN 5-6 billion, which constitutes about 12% of all clothes sales. The Polish resale market is not only about stationary stores. On the mobile market there is a Polish Clotify App, which is a virtual wardrobe, a social network and a shop in one.

The secondary clothing market in Poland is becoming more and more important as part of the so-called second hand trade. The development of this phenomenon is influenced by such factors as fashion for ecology, economy, willingness to search for the best opportunities and sharing economy.

SWEDEN

In 2017 Sweden gave tax benefits for repairing bicycles, shoes, leather goods, clothing, household linen and repair and maintenance of white goods carried out in the home. The loss in the budget is balanced with income from a new tax on white goods using harmful chemicals. Sweden has a very developed second-hand market. Most of the second-hand stores are NGO's who receives things as a donation. Profit from sales is used to support different humanitarian projects all over the world.

In 2016, sores started to charge for plastic bags. In 2017, 17 companies joined "One bag habit" campaign in which they started to charge for plastic bags and offer customers shopping bags that are made of more sustainable materials and are recyclable. As a result, the sale of plastic bags dropped between 30-50%. Instead of buying plastic bags more people started to reuse bags they already have



DENMARK

Each year, the Red Cross receives more than 6,000 tons of recycled clothing. You can also hand in damaged clothing that cannot be recycled. Instead of being sold in stores, it is used as textile fibers in industrial production and in this way becomes new textiles.

In Denmark we have more than 1062 shops which only offers clothes for reuse.

The municipal recycling sites are so popular that their number of visitors can compete with several of the country's major tourist attractions.

In six years, recycling of citizens' waste has increased by 11 percentage points - from 37% in 2011 to 48% in 2016, the latest figures from the Danish EPA. The development is due to the fact that municipalities and municipal waste companies have expanded the number of fractions at the recycling sites and rolled out new sorting systems and waste containers throughout the country.

A beer bottle in Denmark is filled and emptied e.g. 35 times before the bottle is so worn that it must be melted.

INTERESTING

LITHUANIA

Clothes-special bins to donate them, second hand stores, giveaway facebook groups

Everyone who wants to give away some clothes in Lithuania can do so by putting them into the special fabric disposal bins located all over the cities. In case the clothes are in good shape there is an Lithuanian app called Vinted, that is now being used internationally in countries such as Germany and USA and serves as an online marketplace for people to sell their clothes. This way of exchanging clothes is very popular in Lithuania also through Facebook groups and online forums. Thrift shopping is getting more popular as well as local sustainable brand are competing to fast fashion.

As in all north eastern European countries, there is a tradition of making jars filled with pickled products as well honey and jams. These jars can be reused by Lithuanians, all over the house either to be refilled with these products or containers for other kinds of products or things around the house.

Same as Vinted there is another version of the app called "Musu mazyliai" where Lithuanian parents can exchange and sell their children's clothes and toys. Another way that Lithuanians are reusing the plastic toys of their children is by selling them in special markets that are organized year-round.

Klaipeda city offers to exchange furniture, citizens are invited to bring the furniture they don't use to special containers while others can come and take it for free.

GERMANY

The worldwide Freecycle™ network organizes the exchange of free items in local groups. With "Freecycle" you can offer or search for items to give away, the website directs visitors to the various local groups in Germany.

With the German sharing network "Tauschticket" you can exchange your articles economically and comfortably with other members. The participation with "Tauschticket" is free of charge, in order to be able to exchange, one needs so-called "tickets", the exchange currency.

Replace disposable bottles with returnable bottles - preferably made of glass. Returnable bottles can be refilled up to 50 times. Disposable bottles, on the other hand, immediately end up in the garbage, by 2015 this was 17 billion one-way drinks packages and 2 billion cans in Germany.

Clothes can be repaired. It is estimated that in Germany we donate around 100,000 tons of clothing a year, in old clothes containers, street collections and recycling yards. Other estimates suggest up to 1.5 million tons of textile waste per year. That would not have to be necessary…

From September 07-13 the annual "Zero Waste Week" took place even in Germany. This year's theme was "Reuse".

RECYCLE: RECLAIM THE RAW MATERIALS

By separating items such as aluminum cans and plastic, we can reclaim the raw materials from these items which would have otherwise been thrown away. While recycling takes added effort compared to simply throwing the item in the garbage, there are many benefits in doing so. Recycled materials typically require less energy to process compared to developing new materials altogether

RECYCLE: Recycling means any recovery operation taking place after collection and by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

Recycle materials to put them back in the product loop and save resources!

In order to ensure that waste materials get recycled, selective collection and the sorting of waste is essential. Successfully establishing selective collection schemes and encouraging citizens to sort their waste are thus crucial for improving recycling rates.

Recycling is the process of converting waste materials into new materials and objects. It is an alternative to "conventional" waste disposal that can save material and help lower greenhouse gas emissions. Recycling can prevent the waste of potentially useful materials and reduce the consumption of fresh raw materials, thereby reducing: energy usage, air pollution (from incineration), and water pollution (from landfilling).

Recycling is a key component of modern waste reduction and is the third component of the "Reduce, Reuse, and Recycle" waste hierarchy. Thus, recycling aims at environmental sustainability by substituting raw material inputs into and redirecting waste outputs out of the economic system.

There are some ISO standards related to recycling such as ISO 15270:2008 for plastics waste and ISO 14001:2015 for environmental management control of recycling practice.

Recyclable materials include many kinds of glass, paper, cardboard, metal, plastic, tires, textiles, batteries, and electronics. The composting or other reuse of biodegradable waste—such as food or garden waste—is also a form of recycling. Materials to be recycled are either delivered to a household recycling center or picked up from curbside bins, then sorted, cleaned, and reprocessed into new materials destined for manufacturing new products.

In the strictest sense, recycling of a material would produce a fresh supply of the same material—for example, used office paper would be converted into new office paper or used polystyrene foam into new polystyrene. This is accomplished when recycling certain types of materials, such as metal cans, which can become a can again and again, infinitely, without losing purity in the product. However, this is often difficult or too expensive (compared with producing the same product from raw materials or other sources), so "recycling" of many products or materials involves their reuse in producing different materials (for example, paperboard) instead. Another form of recycling is the salvage of certain materials from complex products, either due to their intrinsic value (such as lead from car batteries, or gold from printed circuit boards), or due to their hazardous nature (e.g., removal and reuse of mercury from thermometers and thermostats).

"Recyclate" is a raw material that is sent to, and processed in a waste recycling plant or materials recovery facility which will be used to form new products. The material is collected in various methods and delivered to a facility where it undergoes re-manufacturing so that it can be used in the production of new materials or products. For example, plastic bottles that are collected can be re-used and made into plastic pellets, a new product.

QUALITY OF RECYCLATE

The quality of recyclates is recognized as one of the principal challenges that needs to be addressed for the success of a long-term vision of a green economy and achieving zero waste. Recyclate quality is generally referring to how much of the raw material is made up of target material compared to the amount of non-target material and other non-recyclable material. For example, steel and metal are materials with a higher recyclate quality. It's estimated that two thirds of all new steel manufactured comes from recycled steel. Only target material is likely to be recycled, so a higher amount of non-target and non-recyclable material will reduce the quantity of recycling product. A high proportion of non-target and non-recyclable material can make it more difficult for re-processors to achieve "high-quality" recycling. If the recyclate is of poor quality, it is more likely to end up being down-cycled or, in more extreme cases, sent to other recovery options or landfilled. For example, to facilitate the re-manufacturing of clear glass products there are tight restrictions for colored glass going into the re-melt process. Another example is the downcycling of plastic, in which products such as plastic food packaging are often downcycled into lower quality products, and do not get recycled into the same plastic food packaging.

The quality of recyclate not only supports high-quality recycling, but it can also deliver significant environmental benefits by reducing, reusing and keeping products out of landfills. [35] High-quality recycling can help support growth in the economy by maximizing the economic value of the waste material collected. Higher income levels from the sale of quality recyclates can return value which can be significant to local governments, households, and businesses.[35] Pursuing high-quality recycling can also provide consumer and business confidence in the waste and resource management sector and may encourage investment in that sector.

There are many actions along the recycling supply chain that can influence and affect the material quality of recyclate. It begins with the waste producers who place non-target and non-recyclable wastes in recycling collection. This can affect the quality of final recyclate streams or require further efforts to discard those materials at later stages in the recycling process. The different collection systems can result in different levels of contamination. Depending on which materials are collected together, extra effort is required to sort this material back into separate streams and can significantly reduce the quality of the final product. Transportation and the compaction of materials can make it more difficult to separate material back into separate waste streams. Sorting facilities are not one hundred per cent effective in separating materials, despite improvements in technology and quality recyclate which can see a loss in recyclate quality. The storage of materials outside, where the product can become wet, can cause problems for re-processors. Reprocessing facilities may require further sorting steps to further reduce the amount of non-target and non-recyclable material. Each action along the recycling path plays a part in the quality of recyclate.

Although many government programs are concentrated on recycling at home, 64% of waste in the United Kingdom is generated by industry. The focus of many recycling programs done by industry is the cost-effectiveness of recycling. The ubiquitous nature of cardboard packaging makes cardboard a commonly recycled waste product by companies that deal heavily in packaged goods, like retail stores, warehouses, and distributors of goods. Other industries deal in niche or specialized products, depending on the nature of the waste materials that are present.

The glass, lumber, wood pulp and paper manufacturers all deal directly in commonly recycled materials; however, old rubber tires may be collected and recycled by independent tire dealers for a profit.

Levels of metals recycling are generally low. In 2010, the International Resource Panel, hosted by the United Nations Environment Programme (UNEP) published reports on metal stocks that exist within society and their recycling rates. The Panel reported that the increase in the use of metals during the 20th and into the 21st century has led to a substantial shift in metal stocks from below ground to use in applications within society above ground. For example, the in-use stock of copper in the USA grew from 73 to 238 kg per capita between 1932 and 1999.

The report authors observed that, as metals are inherently recyclable, the metal stocks in society can serve as huge mines above ground (the term "urban mining" has been coined with this idea in mind). However, they found that the recycling rates of many metals are very low. The report warned that the recycling rates of some rare metals used in applications such as mobile phones, battery packs for hybrid cars and fuel cells, are so low that unless future end-of-life recycling rates are dramatically stepped up these critical metals will become unavailable for use in modern technology.

The military recycles some metals. The U.S. Navy's Ship Disposal Program uses ship breaking to reclaim the steel of old vessels. Ships may also be sunk to create an artificial reef. Uranium is a very dense metal that has qualities superior to lead and titanium for many military and industrial uses. The uranium left over from processing it into nuclear weapons and fuel for nuclear reactors is called depleted uranium, and is used by all branches of the U.S. military for the development of such things as armour-piercing shells and shielding.

The construction industry may recycle concrete and old road surface pavement, selling their waste materials for profit.

Some industries, like the renewable energy industry and solar photovoltaic technology, in particular, are being proactive in setting up recycling policies even before there is considerable volume to their waste streams, anticipating future demand during their rapid growth.[56]

Recycling of plastics is more difficult, as most programs are not able to reach the necessary level of quality. Recycling of PVC often results in downcycling of the material, which means only products of lower quality standard can be made with the recycled material. A new approach which allows an equal level of quality is the Vinyloop process. It was used after the London Olympics 2012 to fulfill the PVC Policy.

WHY IS RECYCLING IMPORTANT?

Recycling reduces the amount of waste that is landfilled or incinerated and secures that waste material, after being transformed, forms part in manufacturing new products. Through recycling, waste constitutes a source of secondary raw material. Recycling therefore helps to decrease the use of material and energy resources and reduces pollution and natural capital degradation.

BENEFITS OF RECYCLING

- Reduces the amount of waste and resources lost in landfills or burnt;
- Prevents pollution by reducing the need to collect new raw materials;
- Saves energy needed to make new products from raw material;
- Reduces greenhouse gas emissions that contribute to global climate change;
- Helps sustain the environment for future generations;
- Helps create new well-paying jobs in the recycling and manufacturing industries.

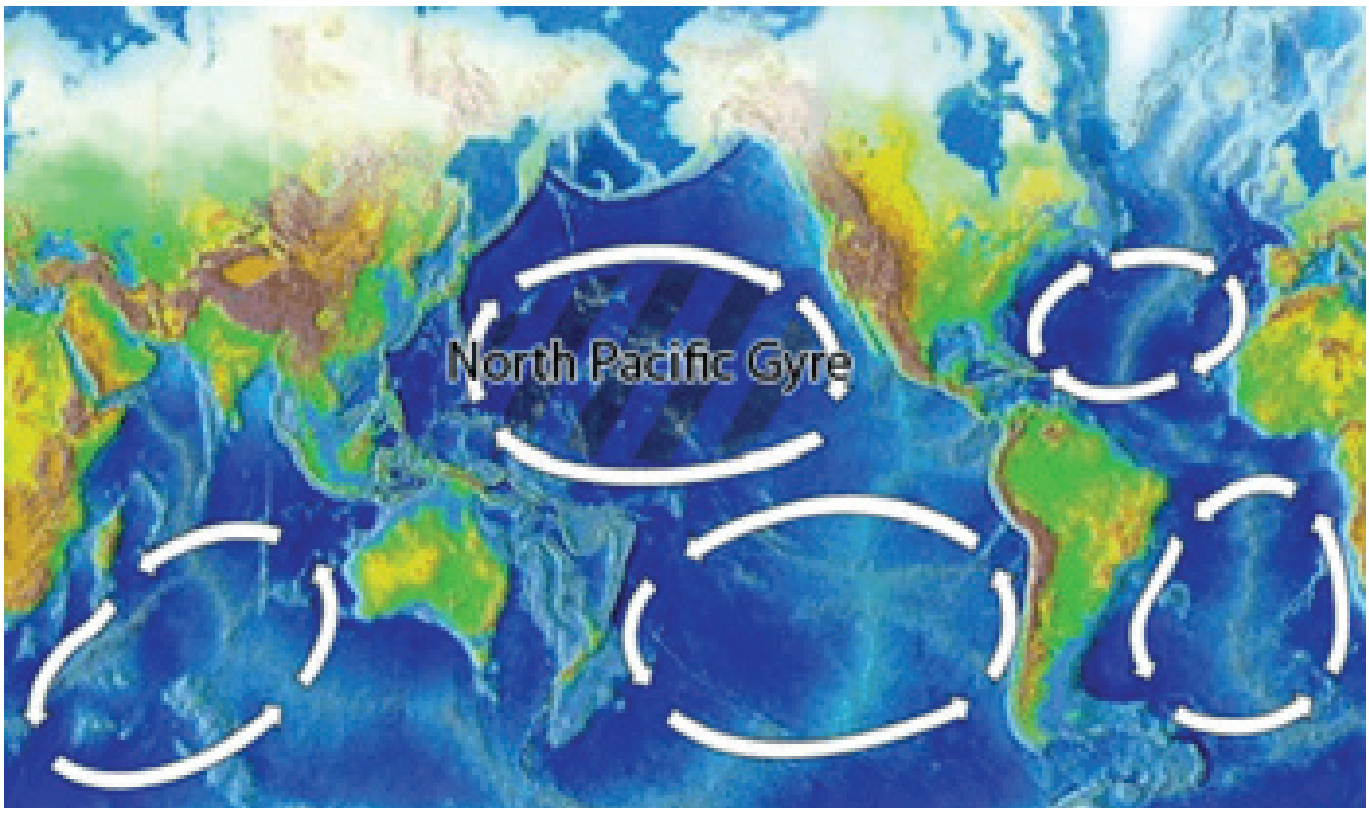
WHY DO WE NEED TO RECYCLE?

Recycling is a way of extending the usefulness of something that has already fulfilled its initial purpose. A new product can be made out of it, and it will be useful again! Every time we recycle, we save our environment a little more. We cut fewer trees, use less water and energy. All products require natural resources to produce and our growing population is straining our planet with our need for more raw materials.

Let's keep our trash away from the landfills and recycle what we can. Your effort can go a long way in saving our environment. We all know about recycling, but knowing about it and living it is not the same thing. What we need to do is make it a part of our lives.

79% of all the plastic ever produced is still in the environment. 2050 the estimated date where there will be more plastic than fish in the sea. 60% of UK households are now recycling more than a year ago due to environmental concerns.

GREAT PACIFIC GARBAGE PATCH



The area of increased plastic particles is located within the North Pacific Gyre, one of the five major ocean gyres.

The Great Pacific garbage patch, also described as the Pacific trash vortex, is a gyre of marine debris particles in the north central Pacific Ocean. It is located roughly from 135°W to 155°W and 35°N to 42°N.The collection of plastic and floating trash originates from the Pacific Rim, including countries in Asia, North America, and South America. The patch is actually "two enormous masses of ever-growing garbage". What has been referred to as the "Eastern Garbage Patch" lies between Hawaii and California, while the "Western Garbage Patch" extends eastward from Japan to the Hawaiian Islands. An ocean current about 6,000 miles long, referred to as the Subtropical Convergence Zone, connects the two patches, which extend over an indeterminate area of widely varying range, depending on the degree of plastic concentration used to define the affected area. The vortex is characterized by exceptionally high relative pelagic concentrations of plastic, chemical sludge, wood pulp, and other debris trapped by the currents of the North Pacific Gyre.

Despite the common public perception of the patch existing as giant islands of floating rubbish, its low density (4 particles per cubic meter) prevents detection by satellite imagery, or even by casual boaters or divers in the area. This is because the patch is a widely dispersed area consisting primarily of suspended "fingernail-sized or smaller bits of plastic", often microscopic, particles in the upper water column. Researchers from The Ocean Cleanup project claimed that the patch covers 1.6 million square kilometers. The plastic concentration is estimated to be up to 100 kilograms per square kilometer in the center, going down to 10 kilograms per square kilometer in the outer parts of the patch. An estimated 80,000 metric tons of plastic inhabit the patch, totaling 1.8 trillion pieces. 92% of the mass in the patch comes from objects larger than 0.5 centimeters, while 94% of the total objects are represented by microplastics.

Some of the plastic in the patch has been found to be over 50 years old, and includes fragments of and items such as "plastic lighters, toothbrushes, water bottles, pens, baby bottles, cell phones, plastic bags, and nurdles". It is estimated that approximately "100 million tons of plastic are generated [globally] each year", and about 10% of that plastic ends up in the oceans. The United Nations Environmental Program recently estimated that "for every square mile of ocean", there are about "46,000 pieces of plastic". The small fibers of wood pulp found throughout the patch are "believed to originate from the thousands of tons of toilet paper flushed into the oceans daily". The patch is believed to have increased "10-fold each decade" since 1945.

Research indicates that the patch is rapidly accumulating. A similar patch of floating plastic debris is found in the Atlantic Ocean, called the North Atlantic garbage patch.

SOURCES OF GREAT PACIFIC GARBAGE PATCH

In 2015, a study published in the journal Science sought to discover where exactly all of this garbage is coming from. According to the researchers, the discarded plastics and other debris floats eastward out of countries in Asia from six primary sources: China, Indonesia, the Philippines, Vietnam, Sri Lanka and Thailand. In fact, the Ocean Conservancy reported that China, Indonesia, Philippines, Thailand, and Vietnam dump more plastic in the sea than all other countries combined. China alone is responsible for 30% of worldwide plastic ocean pollution.Efforts to slow land generated debris and consequent marine debris accumulations have been undertaken by the Coastal Conservancy, Earth Day, and World Cleanup Day.

In September 2019, when research revealed that much ocean plastic pollution comes from Chinese cargo ships,an Ocean Cleanup spokesperson said: "Everyone talks about saving the oceans by stopping using plastic bags, straws and single use packaging. That's important, but when we head out on the ocean, that's not necessarily what we find."

SWEDEN

RECYCLE IN SWEDEN

WASTE QUANTITY IN 2017

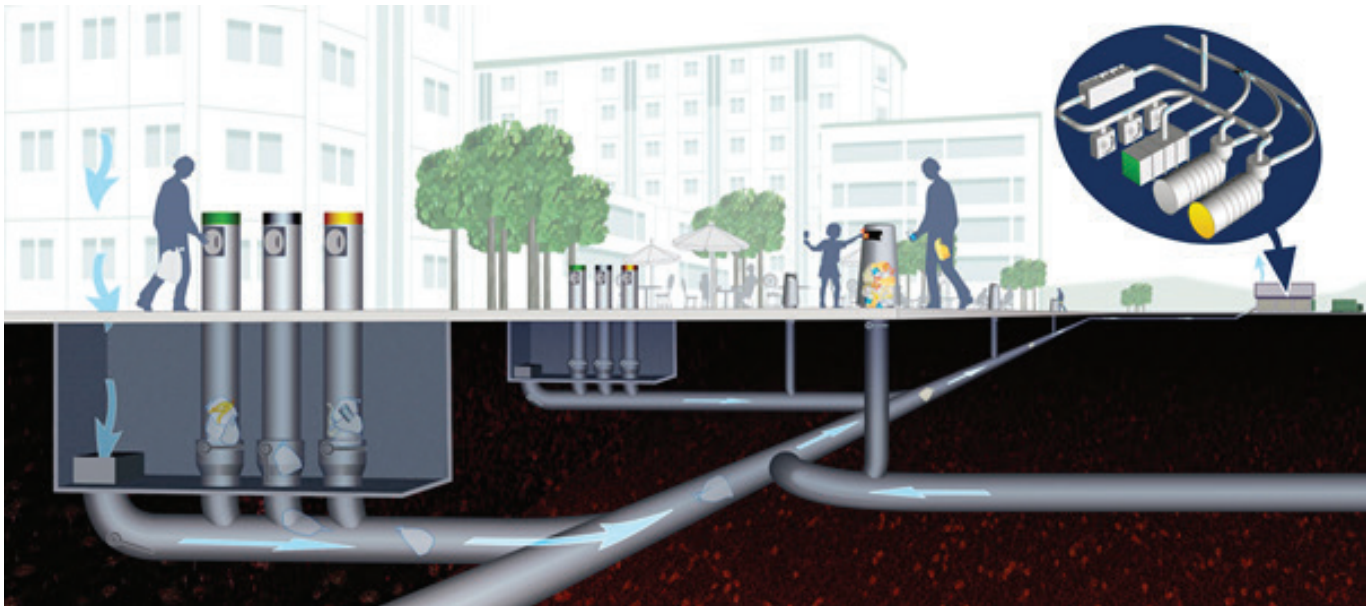
In 2017, the quantity of household waste treated was 4,783,000 tonnes. 33.8 percent, 1,617,640 tonnes, went to material recycling. This corresponds to 160 kg/person. Biological treatment decreased by 2.1 percent to 741,280 tonnes, or 73 kg/person. This means that 15.5 percent of household waste underwent biological treatment in 2017. The amount of food waste going to co-digestion plants decreased by 1.5 percent, while food waste going to central composting plants fell by 42 percent. Landfill accounts for 0.5 percent of the total amount of the waste managed.

Over 60 percent of the contents of household rubbish bags could be recycled. This can be food waste, packaging and recyclable paper. Half a percent of the contents of rubbish bags consists of hazardous waste, batteries and waste from electrical and electronic equipment. This is shown in a survey from Avfall Sverige. The survey conducted by Avfall Sverige from 2013 to 2016 showed that households in single-family houses produce more waste than households in apartment blocks, but it is better sorted. (Avfall Sverige)

WASTE COLLECTION SYSTEMS

Vacuum waste collection is a fully automated system which reduces the need for transports, particularly in residential areas. It collects waste pneumatically in an automated vacuum system. This is then transported through underground tubes from the refuse chutes to large containers located in a terminal.

Vacuum collection system explained: https://www.youtube.com/watch?v=jqJqJuaRPeQ



Underground container systems are another fast-growing collection system. Containers placed underground reduce the need for space at street level. The temperature underground is relatively low, which prevents odors. The containers are emptied using a vehicle with loader crane. Because underground containers hold larger volumes, the number of trips is reduced.

Underground waste containers in Gävle (Source: http://www.compoman.com/)

Recycling centers. Municipalities manages recycling centers where households can hand in bulky waste, garden waste, WEEE and hazardous waste. Bulky waste is household waste that is too heavy, too bulky or otherwise inappropriate for collection in bags or bins. In 2017, households dropped off 1,760,140 tonnes of bulky waste, mostly at manned municipal recycling centers. This amount of bulky waste corresponds to 174 kg/person. There are 580 recycling centers throughout the country which combined receive about 29 million visits annually.

Recycling stations. The producer system, with some 5,800 unmanned recycling stations for handling packaging and newspaper, is designed to cover the entire country. Collection systems should be based on consultation between the producers and municipalities. The recycling stations have separate containers for newspaper and various packaging materials.

Collecting cooking oil. There are municipalities that collect source-separated cooking oil, mainly to reduce operating problems and blockages in drainage systems but cooking oil can also be recycled or reused. There are different methods of collecting and treating the oil. One system is that households pour cooking oil into sealed containers and then hand it in at a recycling center. An alternative is to pour the cooking oil into a container that is then collected with combustible waste and goes to energy recovery. There are various recovery and treatment options for the source-separated and collected cooking oil. It can be used: "as a raw material for the chemical industry" in anaerobic digestion for biogas production "in the production of biofuel" energy recovery.

RECYCLING OF HOUSEHOLD WASTE IN SWEDEN

PACKAGING AND PAPER

Packaging and paper are processed at different facilities in the country depending on materials. Most material is recycled and becomes new products and packaging. For paper and glass, recycling levels are high, while material recycling of plastic, for example, is significantly lower.

BULKY WASTE

At the municipalities manned recycling centers households, and sometimes even smaller companies, can leave bulky waste, electrical waste and hazardous waste. The amount of waste to the municipal recycling centers is steadily increasing, as are the opportunities for material recycling and treatment of a variety of materials.

From recycling center, for example, scrap metal is sent directly to processing plants, which municipalities cooperate with. There, it is controlled, sorted by metal type, fragmented and finally used for the production of new products at various steel and metal plants.

Garden waste such as branches and fall fruit is processed through biological recycling. It can either be composted to become nutrient-rich soil or digested to become bio-fertilizer and biogas. Part of the garden waste goes to energy recycling.

Stones, ground, bricks and ceramics are made into fillers that can be used in various forms of construction work.

Carboard is a large fraction and is sent for recycling to new cardboard. A paper fiber can be recycled 7-8 times.

There are now also recycling methods for materials that were previously difficult to recycle, such as gyps and flat glass. Gyps plates are ground down to powder which is used in the manufacture of new gyps plates. The sheet glass is mostly recycled as isolation material but also for new glass.

Glass and metal are materials that can actually be recycled as many times as long as they are not contaminated. Plastic recycling, on the other hand, is complicated as plastic waste is a mix of a variety of different plastic types and the products often also consist of several composite materials.

Studies show that in 2015, 49 million tonnes of plastic were used in the EU. The levels of plastic recycling are generally low in the EU. Some types of plastics, such as PE, HDPE and PET, are easier to recycle and have higher recycling levels. Other types of plastics have low sorting and recycling levels.

It is important to increase the material recycling of plastics, especially as it is largely fossil. Municipalities have paid attention to this and many are now arranging the collection of plastic that does not consist of packaging, so-called municipal plastic.

Technology development for automated sorting and material recycling is steadily increasing, as is the quality of the secondary raw material. In parallel, it is important to increase the demand for the recycled material, not least among manufacturers, developers and designers of new products.

TEXTILE

Textiles are another fraction that has increased the environmental focus and is increasingly being collected separately, usually in collaboration with non-profit organizations. Today, textiles are collected mainly for recycling and further processing for recycling via sorting plants in Europe to other markets outside Sweden. The focus and demand for material recycling of textiles is high globally, but only a limited proportion of textiles can today be technically recycled. However, many new initiatives for textile material recycling are underway in Sweden. Several actors, researchers, research institutes, colleges, industrial networks, municipalities and recyclers collaborate in various initiatives and methodologies with promising results.

RECYCLING OF HOUSEHOLD WASTE IN SWEDEN

In 2017, the Swedish market was supplied with 1.3 million tonnes of packaging for different types of goods. More than 70 percent, 942 100 tonnes, were submitted for material recycling. We are best at recycling glass and metal. The packaging that does not go to material recycling ends up mainly in the garbage and goes to energy recycling.

In 2017, Sweden was best at recycling glass and metal packaging. 93 percent of the glass packaging and 84 percent of the metal packaging ended up in material recycling.

Material recycling of plastic and wood packaging have to be improved; only 44 per cent of the plastic packaging and 50 per cent of the wooden packaging went to material recycling. PET bottles are not included in the plastic packaging but are counted as a separate type of packaging. The material recycling rate of PET bottles was 84 percent.

NATIONAL TARGETS FOR MATERIAL RECYCLING

There are national targets for the percentage of each type of packaging that will go to material recycling.

In 2017, Sweden reached all the targets, with the exception of PET bottles and deposit cans. For glass, wood, paper, metal and plastic packaging, material recycling exceeded the defended goals.

When it comes to the plastic, the target is relatively low compared to the other types of packaging. The goal is for us to recycle 30 percent of the plastic packaging in Sweden. From 2020, several of the targets will be raised, including that for plastics. From 2020, the goal is for 50 percent of plastic packaging to go to material recycling.

Type of packaging	Before 1st January 2020 (percent)	After 1st January 2020 (percent)
Deposit cans	90	90
PET-bottles	90	90
Glass	70	90
Metal	70	85
Paper	65	85
Plastic (exl. PET-bottles)	30	50
Wood	15	15
Other materials	15	15
Total packaging waste	55	65

HOW IS PACKAGING RECYCLED

A used packaging can be reused or recycled in many ways:

The steel in metal packaging can be used for rail rails.

The aluminum in metal packaging can be used for vehicle parts.

Soft plastic can be recycled into new bags.

Hard plastic can be used for buckets, flower pots and plastic furniture.

PAPER PACKAGING IS THE MOST COMMON

In 2017, paper packaging accounted for the largest amount of packaging on the market, 565,700 tonnes. In second place came glass packaging, closely followed by wood and plastic respectively. Glass, wood and plastic packaging accounted for approximately 220,000 tonnes each.

THE RESPONSIBILITY OF PRODUCERS

Producer responsibility is a framework, which was adopted by the Swedish Parliament 1993, that have a principal approach that the environmental responsibility for a product lies with the producer. Producers are also responsible for managing their packaging materials when consumers are finished with them.

Producer responsibility is based on the polluter pays principle. The concept entails that the party responsible for the pollution is responsible for paying for the damage done.

According to the law "Ordinance of Producers' responsibilities for packaging" all companies that produce, import or sell packaged goods are subject to a number of obligations. The company shall:

- ensure that a collection system exists, through which customers and other end consumers can return used packaging
- ensure that customers receive the information they need about the collection of used packaging
- ensure that collected packaging is recovered, recycled and put to good use as either new raw material or energy.
- Sweden has producer responsibility for:
- recovered paper
- packaging
- waste electrical and electronic equipment (WEEE)
- tyres
- cars
- batteries
- pharmaceuticals.

Producers are responsible for collecting and disposing of end-of-life products. This means that there must be suitable collection systems and treatment methods for recycling.

Producer responsibility is also intended to encourage producers to develop products that are more economic with resources, easier to recycle and do not contain substances which are harmful to the environment.

INNOVATION IN RECYCLING

2. UNIQUE RUBBER TYRES RECYCLING

Swedih company Enviro Systems has patented so-called CFC technique, (Carbonized by Forced Convection) solution for recycling tyres using pyrolysis, a process in which the material is decomposed so that the component parts can be recycled. When the tyres are heated in the absence of oxygen, a porous rather than combusted product is created, which enables the material to be processed. The CFC process extracts carbon black of high quality, oil, steel and gas from the used tyres – valuable resources that can be re-used.

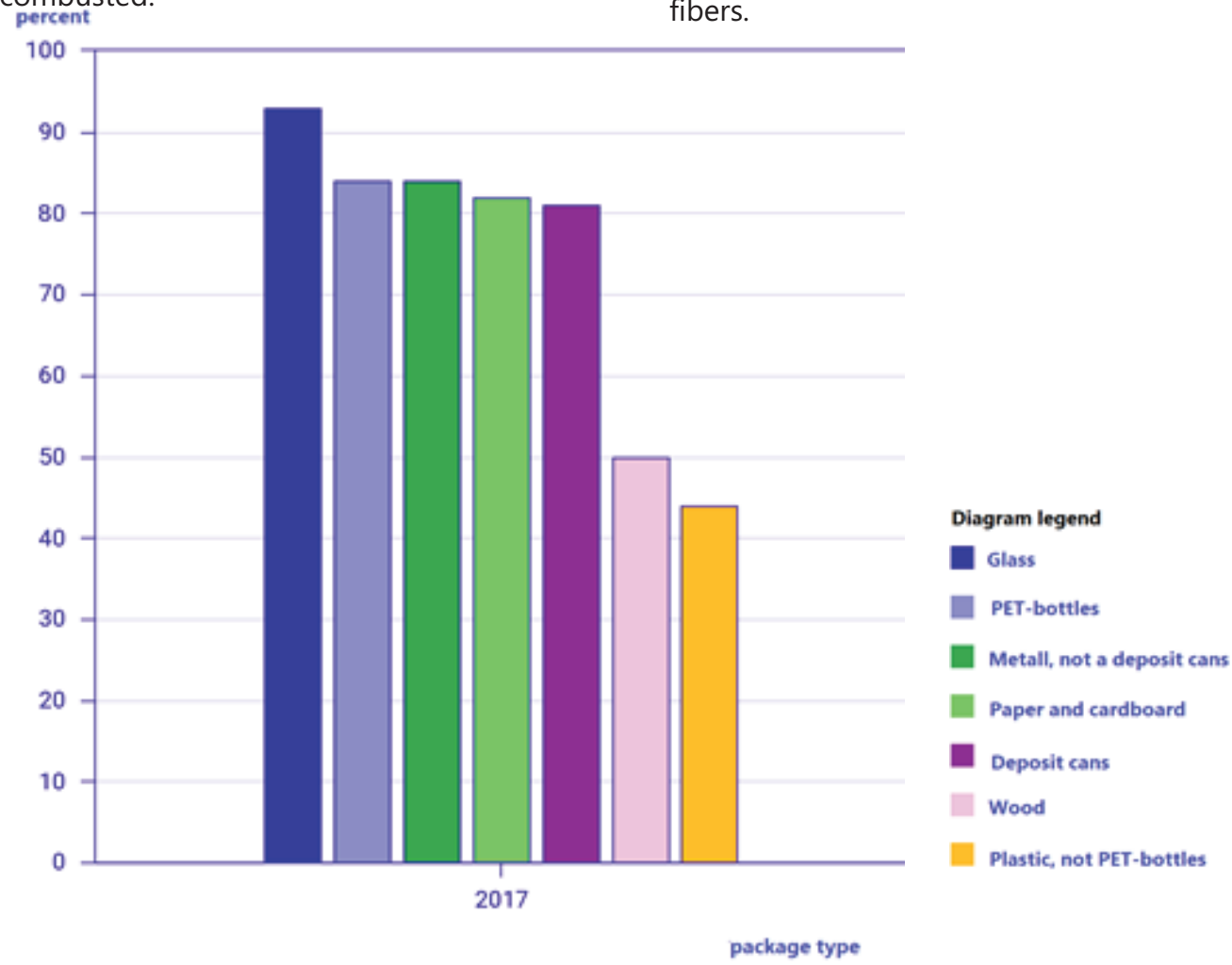
The CFC process involves heating the tyres in a reactor so that the material is decomposed, and the different components can be separated. The patented CFC technique enables full control of the temperature throughout the process. The thermochemical decomposition in an environment free of oxygen means that the tyres are decomposed with gas instead of combusted.

The foremost end-product from the decomposition process is carbon black, which is a core ingredient in tyre manufacturing. The World Wide Fund for Nature has stated that the CFC technique contributes to a considerably more environmentally friendly process for producing carbon black than is otherwise the case, as the CO2 emissions are 60 percent lower.

2. BLEND RE:WIND SEPARATION PROCESS – TEXTILE SEPARATION PROCESS

Many textiles are blends of materials that are difficult to recycle, as the mixed textiles must be separated mechanically, which significantly deteriorate quality of the fabrics.

Mistra Future Fashion has developed a new process, which is unique in the world, separating fabric chemically instead of mechanically. The fabrics are broken down into three pure products; cotton and the two building blocks of polyester, one in a solid the other in liquid form. The cotton can then be reused in new, high-quality viscose filament, while the polyester can be rebuilt into new fibers.



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Innovation in recycling

3. UNIQUE RUBBER TYRES RECYCLING

Swedih company Enviro Systems has patented so-called CFC technique, (Carbonized by Forced Convection) solution for recycling tyres using pyrolysis, a process in which the material is decomposed so that the component parts can be recycled. When the tyres are heated in the absence of oxygen, a porous rather than combusted product is created, which enables the material to be processed. The CFC process extracts carbon black of high quality, oil, steel and gas from the used tyres – valuable resources that can be re-used.

The CFC process involves heating the tyres in a reactor so that the material is decomposed, and the different components can be separated. The patented CFC technique enables full control of the temperature throughout the process. The thermochemical decomposition in an environment free of oxygen means that the tyres are decomposed with gas instead of combusted.

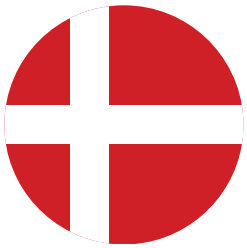
The foremost end-product from the decomposition process is carbon black, which is a core ingredient in tyre manufacturing. The World Wide Fund for Nature has stated that the CFC technique contributes to a considerably more environmentally friendly process for producing carbon black than is otherwise the case, as the CO2 emissions are 60 percent lower.

4. BLEND RE:WIND SEPARATION PROCESS – TEXTILE SEPARATION PROCESS

Many textiles are blends of materials that are difficult to recycle, as the mixed textiles must be separated mechanically, which significantly deteriorate quality of the fabrics.

Mistra Future Fashion has developed a new process, which is unique in the world, separating fabric chemically instead of mechanically. The fabrics are broken down into three pure products; cotton and the two building blocks of polyester, one in a solid the other in liquid form. The cotton can then be reused in new, high-quality viscose filament, while the polyester can be rebuilt into new fibers.

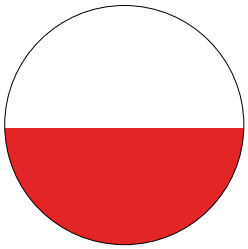
INTERESTING



DENMARK

- According to the report "Denmark without waste", which was the SRSF government's proposal for a new recycling policy, 61 percent of the total Danish waste volumes are recycled, 29 percent incinerated, and six percent landfilled, ie. that the waste is placed in a landfill. The last four percent are temporarily stored or receive special treatment.
- The Danes are quite good at delivering empty cans and bottles. In fact, 9 out of 10 packages sold return, and aluminum, plastic and glass are re-melted and used to make new cans and bottles.
- 87 percent of the waste from the construction and construction industry is being recycled in Denmark.
- Every year, one million old tires are burned off across EU countries instead of being recycled. This is what the Danish company Elysium Nordic wants to do something about by constructing one of the world's largest pyrolysis plants for reuse of tires at Nyborg Harbor. The plant will, as one of the first, be able to recover the material carbon black, which is part of the production of tires and other rubber-based materials.
- In Holbaek Municipality All private households, including holiday cottages, sorts their waste in:

a. residual waste
b. biowaste
c. Glass
d. Paper and cardboard
e. batteries
f. Small electronics
g. Plastic
h. Metal



POLAND

- For several years now, there has been a surplus of secondary raw materials on the Polish market, and some of them are practically unsold. Only a few years ago, 600 PLN could be obtained per ton of plastic waste, now it is 280 PLN. What is the reason for the oversupply of plastic waste on the market? This is mainly due to the policy of China, which has stopped accepting the import of recyclable goods from many countries including Poland.
- The recycling rate of municipal wastes in Poland in 2018 was 26%. In 2020, EU Member States are expected to recycle municipal waste at least of 55% in 2025, 60% in 2030 and 65% in 2035.
- The vast majority of municipal waste produced in 2018 in Poland, as much as almost 84% of the total (12 485 thousand tonnes) came from households. Therefore, it is worth remembering that every choice we make, every purchase decision has an impact on how quickly and in what amount we produce waste that we will have to deal with in the end.

INTERESTING

SWEDEN

Zero-waste Vision

Today only 1 per cent of waste in Sweden end up on landfills. 99 per cent of household waste is reused. In 2017, around 15.5 per cent was used for biological recycling, 33.8 per cent for material recycling and 50.2 per cent went to energy recovery.

Energy recovery and waste import

Sweden use 50% of its waste to produce energy which is used to heat more than one million houses. This is done by incineration (burning) process. Incantation is not an ideal environmental solution since carbon dioxide is produced during the process. However, leaving waste on a landfill would produce 500kg of carbon dioxide per one tonne of waste more.

The recycling process does not end at the burning stage. The remaining ashes constitute 15 per cent of the waste volume before burning. Metals in these ashes are recycled again, with the rest used in road construction. Just one per cent remains and is deposited in dumps.

Moreover, smoke from burning the waste is filtered through dry filters and water. And the dry filters are used to refill abandoned mines.

To maintain a stable supply, Sweden have to import waste from other countries. In 2016, Sweden imported almost 2.3 million tonnes of waste. But unlike in the regular import, Sweden gets paid by other countries to import their waste.

Waste collection system

Sweden has a waste collection system with recycling stations located no more than 300 meters from residential areas. There are also pipelines under roads that vacuum garbage which is sent by households to the stations.

The waste collection system helps to get rid of the smell of rubbish from neighborhoods thanks to the use of underground deposits, it also means the rubbish does not occupy any space at street level.

The Swedish company, Optibag, owns sophisticated machinery that can separate different colored bags from each other. The machine sorts these bags automatically, which solves the problem and cost of sorting stations.

LITHUANIA

74% of packaging of products was recycled in Lithuania in 2018, this not only including paper but also plastic and metals. As everything is getting more modernized there are more ways to recycle the paper and plastic waste, by putting them in the assigned bins. There are special bins where people can also put their electronic devices to be recycled, as well as cans and other recyclable materials.

There are 15 recycling centers in Lithuania that gather waste from 14175 container sites, that recycle around 400 000 tons of waste. Lithuanians understand the importance of recycling that is why except for building a great recycling system and being responsible for it they also have build an educative branch for younger generations called "Zaliasis taskas", an initiative that presents children and young people with ways on how to save the environment and how to practice recycling.

INTERESTING

GERMANY

German consumers dispose of their recyclable packaging waste via the so-called "yellow bin" or the "yellow sack".

The official recycling rates for plastic waste in Germany are relatively high. They were around 45 percent in 2016. However, on closer inspection, Germany operates with a creative interpretation of the term "recycling". In Germany, for example, the amount of waste delivered to recycling companies or plants is used to calculate the recycling rate, but not the amount that is actually recycled.

In Germany are special collection boxes available for batteries that can no longer be used. But of the 44,000 tons of batteries purchased in Germany in 2012, only 18,000 tons were returned. This means not only that important raw materials cannot be recycled, but also that toxins are disposed of to normal household waste.

The DIY Academy in Cologne offers ideas and professional help for upcycling beginners, advanced students and professionals meet at the upcycling festival "Trash up!" in Dortmund, which will take place for the fourth time in 2019. Even the German retail dealer "Rewe" offers upcycling instructions on the Internet - for example on how to build lamps from juice bottles.

Many recycling centres in Germany, but of course also wine merchants collect corks. Cork is a sought-after raw material. Therefore, the cork oak forests are almost overused. From recycled corks biological insulating materials and floor coverings are made.

REPLACE/REBUY: NEXT TIME CONSIDER RECYCLED AND GREEN CONTENT

Consumers can promote recycled products by purchasing items that incorporate recycled. We make these items in whole or in part from material recovered from the waste stream. Consumers can look for labels on packages that include a percentage of recovered materials. If the demand for these products is present, businesses have an incentive to continue producing items that are more environmentally friendly.

REPLACE OR REBUY:

To substitute a thing that is broken or inefficient or lost or no longer working for another. To put in the place of another and switch seemingly equivalent items that can be interchanged:

- Use water-based paints instead of solvent-based paints,
- Use durable items instead of one-off disposable items (e.g. replace paper/plastic cups with mugs/glasses),
- Replace paper towels with hand-dryers or cloth towels,
- Choose environmentally friendly alternatives if available, such as biodegradable cleaners and garbage bags, also use less toxic chemicals,
- Rent instead of buying equipment like copiers and computers to minimize unnecessary waste when systems need to be upgraded.

Consumers can promote recycled products by purchasing items that incorporate recycled materials. We make these items in whole or in part from material recovered from the waste stream. Consumers can look for labels on packages that include a percentage of recovered materials. If the demand for these products is present, businesses have an incentive to continue producing items that are more environmentally friendly. In addition, consumers can choose to replace a majority of their goods with green products. These products often contain fewer harmful chemicals, reduced emissions in production and/or incorporate renewable materials into their production. By reviewing green certifications and recovered material percentage labels, consumers can make better informed buying decisions that promote sustainable practices.

Wherever possible people should replace the use of finite, energy-intensive materials with renewable, low-energy biomaterials. Thus the modified hierarchy would be Reduce, Replace, Reuse, and Recycle.

The waste management hierarchy should include a "replacement" strategy where resources with low embodied energy "replace" resources with high-embodied energy. This is important because the hierarchy is a tool for reducing the environmental impacts of human activities. A replacement strategy tends to favor renewable products such as wood, paper, and other bio-based fibers. Numerous studies have shown that renewable materials have fewer negative impacts on the environment than non-renewable materials.

- Select plastic lumber made from recycled bottles and bags for benches and other outdoor structures.
- Incorporate rubberized asphalt (made from recycled tires) for parking lots, walking, running, bike, or cart paths.
- Purchase patio blocks and lawn edging containing recovered plastic or postconsumer rubber.
- Use recycled glass for golf course bunker sand, beach sand, or filter media.
- Install composting toilets in remote locations such as parks and golf courses to save on waste disposal costs.
- Buy hoses, tubing, trickle irrigation systems made from recovered plastic and old tires.
- Use biobased1 cleaners and solvents for equipment.Install a green vegetated roof to reduce or eliminate stormwater and "heat island" effect.
- Purchase and incorporate plants that require minimal or no supplemental watering.
- Purchase biodiesel and biobased1 lubricants for your equipment.
- Plant trees to replace those removed or damaged during construction.
- Buy locally produced goods and services whenever possible to reduce transportation emissions and costs.
- Purchase or rent fuel efficient vehicles for your fleet.
- Use high efficiency lighting for roadways, parking lots, security, and landscaping.
- Use solar powered lighting and signage wherever possible.Utilize solar, wind, and other renewable energy sources.
- Purchase "green power" from renewable energy sources if available.
- Purchase organic, biobased1, or slow-release fertilizers.
- Use biopesticides instead of conventional pesticides.

DENMARK

REPLACE/REBUY IN DENMARK

REPLACE - Confidence and credibility through regulations and control

Consumers across the world have great confidence in Danish organic food. This is largely attributable to the many rules and regulations that govern all aspects of food production in Denmark and which are monitored by meticulous government control.

FOR MANY YEARS,

Denmark has been one of the world's leading food nations and is, therefore, strongly focused on food safety and traceability. For decades, the main priority has been to produce healthy and safe food for the global population.

WORLD'S FIRST ORGANIC LEGISLATION

Denmark introduced organic legislation in 1987 and was thus the first country in the world to introduce regulations for organic production. These regulations build on general Danish agricultural and food legislation. This means that, in addition to complying with organic regulations, organic farmers and feed companies also comply with all the other rules and regulations pertaining to the environment, nature, animal welfare, traceability, hygiene, food safety, etc. in food production. Danish organic food is produced in accordance with the EU's organic regulations. In addition, Denmark has a number of stringent conditions that go beyond the EU's regulations. According to Danish regulations, for example, it is not permitted to use copper in organic fruit growing. Nor is it permitted to use nitrite in the processing of organic products. Moreover, we require significantly more planting at organic chicken farms than stipulated under EU regulations.

ORGANIC CONTROL FROM FARM TO FORK

Denmark was the first country in the world to establish government organic control. This was in 1987 and is still the consumers' guarantee that all stakeholders from farm to fork comply with organic regulations. Government inspectors from the Ministry of Environment and Food verify that organic production is conducted in accordance with the regulations. All organic farms, suppliers and organic food companies are inspected by government inspectors at least once a year.

By conducting physical inspections of the farm or company, inspectors ensure that organic regulations are complied with. In addition to the regular annual inspection visits, a number of farms and companies are selected on an annual basis for random inspections.

FURTHER DEVELOPMENT

Organic food production is not of a static size. In Denmark, the organic sector has focused on consistently developing and improving organic production as consumers become increasingly demanding and new knowledge and technology offer new possibilities. Organic organisations have, therefore, put together a range of recommendations for organic cattle and pig production, which exceed those required by the EU. This is because we want a continued dynamic development of organic production with a view to raising standards within animal welfare, the environment, climate and ethics in organic production. Both farmers and companies support the voluntary, additional organic regulations and produce accordingly. Random cross-checks are also carried out at food companies. These ensure that the company's own information with regard to the purchase of organic raw materials is consistent with the suppliers' reports on how much they have sold to the company concerned. Organic farmers and companies welcome organic inspections. Efficient inspections from farm to fork help to reinforce the credibility of organic production and ensure consumer confidence in organic products.

LABELS – THE CONSUMER'S GUIDE TO ORGANIC FOOD

In the EU, member states' organic farming has been protected by Council Regulation (EC) No. 834/2007 on organic production and labelling of organic products and Commission Regulation (EC) No. 889/2008 laying down detailed rules for the implementation of the Council's Regulation. A new revised regulation will come into force from 2021. The rules include mandatory use of the EU organic logo on pre-packed organic roducts produced in any of the EU member states, which meet the necessary standards. The EU organic logo can be accompanied by national or private organic logos. Processed products where 95 per cent or more of the ingredients are from organic farming may carry the organic logo and make reference to organic farming in their sales description. Products that bear any reference to organic farming always include an identification number of the inspection authority/body.

THE EU ORGANIC LOGO AND THE DANISH LOGO

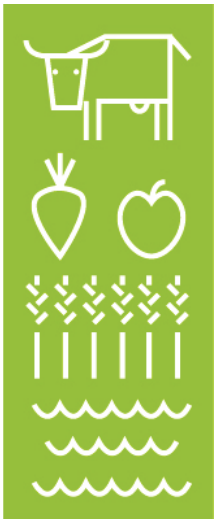
Organic products sold in Denmark today are often labelled with both the green 'EU-leaf' logo and the Danish national logo. The Danish national logo was created in 1989 and indicates that the product is grown and processed according to the organic rules laid down by the EU and controlled by the state. Almost all Danish consumers (98 per cent) are familiar with the national label. The organic logos and labelling system provide the basis for maintaining confidence in organic food.

DENMARK WAS THE FIRST COUNTRY,

to introduce an organic label, organic rules and public inspections. It was also the first nation to raw up an Organic Action Plan in 1995. Innovative political policy has been a driving force for new knowledge, new markets and development of the organic sector in Denmark.

INVOLVEMENT OF MANY STAKEHOLDERS

Visitors to Denmark are often struck not only by the degree of involvement between organic farmers and food companies but also by the interaction between consumers, the labour market and environmental and farm organisations in the creation of organic food policy in Denmark. The political support for organic farming across the spectrum of political parties and changing governments has also attracted international attention. In the Organic Food Advisory Council to the Minister of Environment and Food, these organisations meet and discuss initiatives for the development of the organic sector.



A TOOL IN BROAD NATIONAL POLICIES

One of the unique features of Danish organic policy has been the concept of embedding – the active use of organic farming as a tool in broad national policies for the protection of nature, drinking water supply, climate, green growth, and rural development. At local level, cities and counties have used organic conversion to protect nature and drinking water resources.

60 PER CENT ORGANIC IN PUBLIC SECTOR KITCHENS

The power of ambitious organic policy, combined with the mobilisation of the organic sector, is nowhere more striking than in the trailblazing Danish initiatives for more organic food in public sector kitchens. A political goal of 60 per cent organic in all public sector kitchens, a Danish organic cuisine label for 30, 60 and 90 per cent organic, and an allocation of more than EUR 15 million for training are among the organic-promoting initiatives in public sector kitchens.

ORGANIC RESEARCH

The development of organic production is based on knowledge and innovation. More than 20 years of targetted research into organic farming and food production has contributed to the success of organic production in Denmark – and the research work continues.

In the wake of the first Organic Action Plan of 1995, the Danish Ministry of Environment and Food initiated the first national research programme in organic farming and food production in 1996. This was a four-year programme which included 11 Danish research institutions. A number of successful research programmes were launched, and Denmark gained an international reputation as one of the leading countries in organic farming. We also founded the forerunner to ICROFS - the International Centre for Research into Organic Farming and Food Systems. The course was thus set for a strong research tradition in organic farming and food systems.

RESEARCH TOPICS

Organic research supports the development of new solutions and new knowledge throughout the supply chain, from farm to fork. New knowledge that can move the Danish organic sector towards ever greater sustainability, more climate friendly production, increased productivity and a sound economic position. Research topics include:

- How to achieve increased yields from Danish organic crop production;
- How to extract protein from clover grass, which can be used for pig and poultry feed, and produce biogas from the residual product;
- How to increase carbon bonding in the soil to benefit the climate;
- How to increase animal welfare in animal production.

STAKEHOLDER-DRIVEN RESEARCH

A particular characteristic of organic research is that it is stakeholder-driven. Scientists, ractitioners, advisers and other professionals work together to develop new solutions and opportunities that are practical and strengthen organic production. This helps to ensure a short pathway from new knowledge to practical implementation on farms and at companies.

RESEARCH ON THE POLITICAL AGENDA

The industry's organisations work with ICROFS to continually promote organic research and development on the political agenda. It is important that funds are regularly allocated specifically for research into the special challenges of the organic sector in order that it can continue to develop and contribute to the social good.

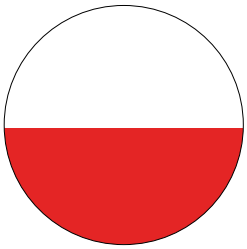
INTERESTING

LITHUANIA

- Vermicompost - easily build at home with soil, EU giveaway
- A popular way to treat organic waste is to create a system called vermicompost, that disposes organic ways in a natural way by using soil, worms and a special basket. European Union is supporting the usage of this technique by giving away the baskets needed to create a vermicompost, and more and more people in Lithuania are giving this technique a try.
- Despite the Vermicompost that is more convenient to be done in apartments, majority of people In Lithuania live in a house with a garden.
- Another form of organic waste is the grass and leaves that fall during autumn. It was popular to gather the grass and leaves in plastic bags before, but now the municipalities have provided some special bins where people that have a garden or that collect the fallen leaves can dispose this form of organic waste.

SWEDEN

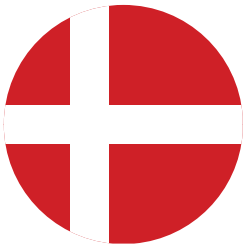
- Malmö By Bike is a very successful bicycle renting project. Because of the low price of early pass and availability of bikes, more people don't buy bikes but use rented ones for everyday transportation.
- A lot of people in Sweden don't buy water in plastic bottles anymore. Instead, they use reusable water bottles.
- In 2014 the Swedish government has made "Strategy for sustainable consumption". The strategy focuses on what the State can do, together with municipalities, the business sector and civil society, to make it easier for consumers to act sustainably. One of the goals is to motivate citizens to use ecofriendly products through education in schools, tax deductions, etc.



POLAND

- A growing trend to replace plastic single-use cutlery, plates and straws with biodegradable or reusable products.
- A growing trend to replace meat with vegetarian and vegan menu during conferences and events. For example, during the BeZee Trends in Education international conference, only vegetarian catering is served from the very beginning.
- Promoting cycling to work instead of driving by car id getting more and more popular.
- Activy is the first mobile game to reward cycling in the city. The solution is not only healthy but also ecological, because the more people switch to two-wheelers, the less exhaust fumes will get into our air. The App developers noticed trends related to the promotion of ecological attitudes and sustainable transport by companies among employees, so they decided to help employers in convincing them of healthy and ecological habits.

INTERESTING



DENMARK

- Each year, the Red Cross receives more than 6,000 tons of recycled clothing. The value of eight pieces of recycled clothing is equivalent to the Red Cross being able to provide temporary shelter to a family on the run.
- Each year, the Red Cross receives more than 6,000 tons of recycled clothing and the value of three bags of recycled clothing equals an entire month's food for a child on the run.
- According to Statistics Denmark, sales of organic products grew by 14 percent from 2017 to 2018. This means that on average, every Dane ate organic food for around DKK 2,750 last year.
- The least sustainable clothing consumption is when you buy clothes that you do not use or only use once, after which it ends up in the closet. This resource waste is KALO Copenhagen trying to get rid of with their subscription service. Here you pay a fee every month, choose between three or more pieces of clothing that you get delivered, and when the month is over, it will be picked up again (and washed and cleaned). Then a new user can enjoy the clothes, and you are ready to order another round.
- In Denmark, we see an increasing trend for the purchase of recycling. More parents express that they like driving country and kingdom around too to buy exactly that piece of clothing, they are missing. They gladly pay 60-100 DKK for the clothes, but on top of that they have to pay for gasoline. That's why Rebuybaby has come up with the buisnessplan, that you can subscribed to used baby clothes. The advantages are that you save time and gasoline, but you also save money on the clothes.

GERMANY

- In Germany, separate collection of organic waste began in 1985. The first collection of organic waste was introduced in Witzenhausen near Kassel. In Germany, there are now around 800 composting plants and 80 fermentation plants available.
- In 2006, approx. 65 % of all inhabitants in Germany were connected to the organic waste bin. The collected waste is transported to special biowaste treatment plants where it will be composted or fermented.
- Since 1 January 2015, cities and municipalities in Germany have been obliged to provide their inhabitants with a system for the separate collection of bio-waste from households, i.e. kitchen and garden waste.
- In 2016, about 15.6 million tons of organic waste were biologically treated in Germany. This mainly includes bio- and green waste from households, maintenance of municipal green, as well as food waste.
- Organic waste bin refers to a plastic container in which the organic waste generated in the household can be disposed of. In Germany and Austria, the organic waste bin is coloured brown or green.

SB BRIDGE

SB BRIDGE Project is about bringing students and the green and blue labour market closer together.

CHALLENGES

• reduce the mismatch between higher education and their graduates and the green and blue labour market

• improve motivation of young people for green and blue related studies and jobs

The project is jointly developed by partners from 5 Baltic Sea countries: Denmark, Germany, Lithuania, Sweden and Poland.

EVENTS:

1st green camp in Schwerin - May 7-9, 2019

The first green camp in Schwerin focussed on renewable energy sources. Students from Germany, Poland, Denmark, Sweden, Lithuania met in Technikcenter, where they took part in workshops of Design Thinking Method and afterwards visited the energy company WEMAG. Participants had two creatively fueled days to come up with a feasible idea to solve the problem - "How big a storage system should be so that there is no need to buy energy from other grids?".

2nd green camp in Gdansk - October 7-9, 2019

More than 60 international students arrived to Gdansk for a 3 day World rescue mission in search of solutions for waste management. During the second green camp in Poland participants had a chance to hear about waste management and zero waste solutions that are already in use and come up with the ideas how else could they reduce waste on our planet and around it (space).

1st Technolympics in Lithuania - January 8-9, 2020

5R - Green Technolympics theme - making a sustainable impact with 5R. refuse; reduce, repair (re-use); recycle; replays or reject.

5R are dependent on the rethinking. It is that moment of pause, that hesitation to throw out something that still has value; it's the recognition of that value that creates change. While it may take practice, as most habits don't develop overnight, over time an individual's conscious efforts may become part of her character. Living a life that supports sustainable practices may influence others to do the same as there are many long-term benefits in doing so. In order to reap the benefits though, it takes the willingness to change for the better.

3RD GREEN CAMP IN DENMARK -

February 26-28, 2020

**Dates may be slightly changed, so please have a look to project website – sbbridge.eu*

4TH GREEN CAMP IN LITHUANIA -

October 7-9, 2020

2ND TECHNOLYMPICS IN DENMARK -

January 12-12, 2021

5TH GREEN CAMP IN SWEDEN -

February 24-26, 2021

Interreg South Baltic

EUROPEAN UNION

European Regional Development Fund

SOUTH BALTIC BRIDGE

Refuse Reuse Recycle Replace Reduce

SOURCES

- www.resume.se
- www.sweden.se
- https://www.europarl.europa.eu/resources/library/images/20181130PHT20677/20181130PHT20677_original.jpg
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- https://www.epa.gov/recycle/reducing-and-reusing-basics
- http://www.wrap.org.uk/content/re-use-new-research-shows-so-fa-so-good-so-many-more-opportunities
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- https://www.government.se
- www.expressen.se
- https://www.ewwr.eu/en/ideas/recycle
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- https://www.reusethisbag.com/articles/reduce-reuse-and-recycle-tips-for-kids/
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- https://www.wm.com/thinkgreen/what-can-i-recycle.jsp
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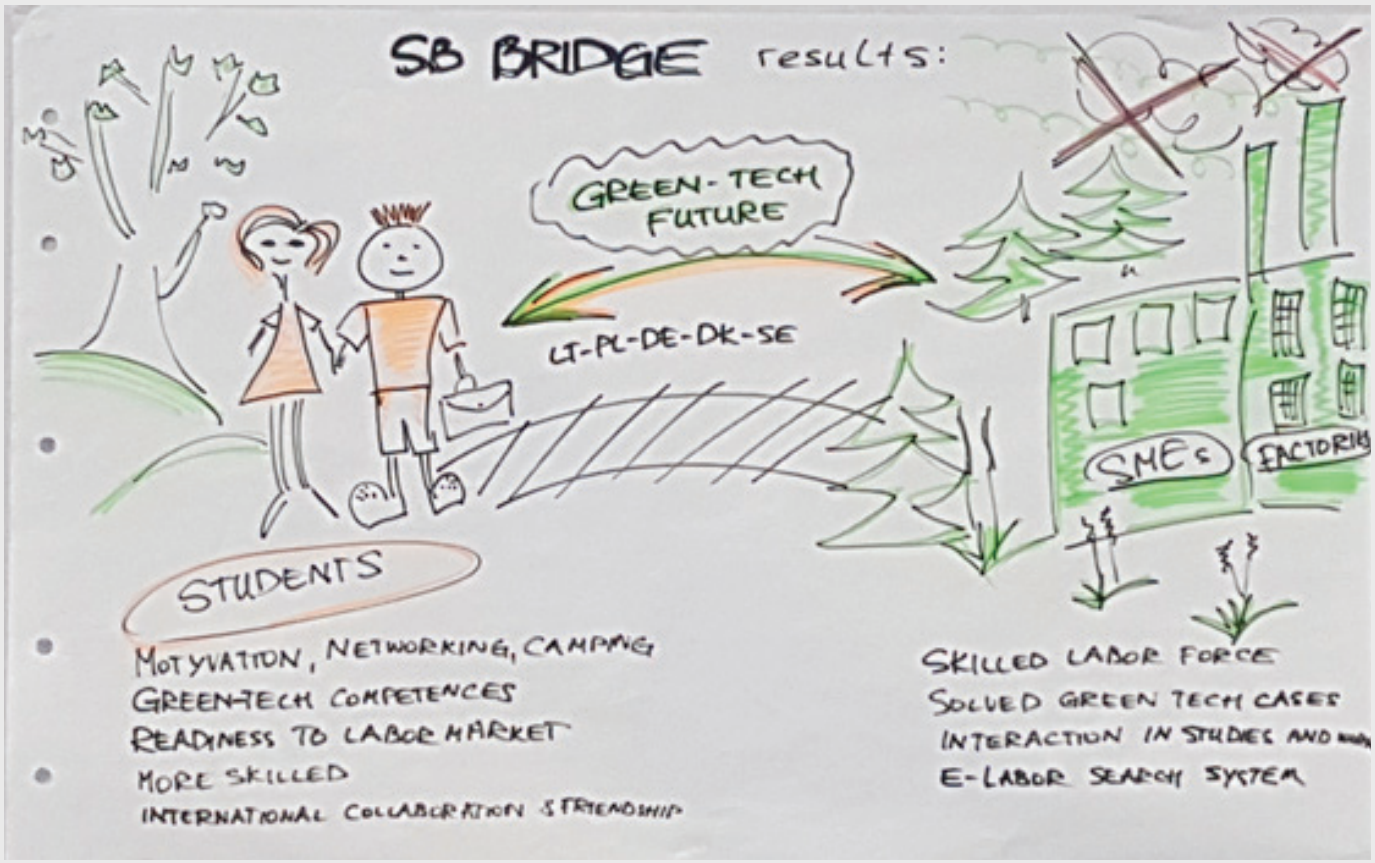

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