Sustainable waste management in a circular economy

A Policy Brief from the Policy Learning Platform on Environment and resource efficiency

March 2020

Interreg Europe
European Union | European Regional Development Fund

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Summary

The shift from a linear to a circular economy is a major challenge that requires a much stronger commitment to sustainable management of waste and resources. In the first place, less waste needs to be generated through the development of sustainable products and the massive deployment of an infrastructure for reuse and repair. Secondly, it calls for investment in greater recycling capacities in particular for food waste, plastic and packaging waste that achieve only low recycling rates today or that have been exported for recycling to China in the past. Finally, incineration and landfilling have to be reduced to a minimum whilst at the same time tackling the legacy of European landfills to regain land and eco-systems.

A range of binding European targets for waste management in a circular economy have been newly set or increased recently, and many new and additional obligations are putting Member States and their regions and municipalities under pressure as compliance comes at the price of changing the status quo. Indeed, waste management business as usual with only gradual improvement will not be an option anymore; more radical, systemic transformations are necessary. Luckily, many policy instruments for reuse and repair, food waste reduction and recycling and landfill rehabilitation have been tried and tested and are readily available to inspire regions and cities that wish to address these challenges to keep resources in the loop and to create new local jobs. And the next generation of Regional Funds can help putting these new policies into place across Europe.

Moving from a linear to a circular economy

In recent years, Europe has made substantial progress towards more sustainable management of Municipal Solid Waste (MSW). The average amount of waste per capita has been reduced from 527kg in 2002 to 487kg per year in 2017 even though this amount varies significantly across EU Member States. At the same time, recycling has gone up to 30% and composting to 17% whilst landfilling has dropped to 25% with the majority of landfills operational today being sanitary thanks to the EU Landfill Directive[1]. These positive developments are instigated and supported by progressive European and international policies and regulations such as the Sustainable Development Goals[2], the Circular Economy Action Plan[3], the European Green Deal[4] and the European Plastics Strategy[5].

Nevertheless, Europeans are pre-dominantly still living in a linear economy where products are produced, used and disposed or incinerated, often after a short, single use. Today, only 12% of the input material that European industry uses comes from recycling. In its European Green Deal, the European Commission underlines: *"From 1970-2017, the annual global extraction of materials tripled, and it continues to grow posing a major risk. About half of greenhouse gas emissions and more than 90% of biodiversity loss and water stress come from resource extraction and processing of materials and food."* Indeed, humanity is currently using nature 1.75 times faster than our planet's ecosystems can regenerate.[6]

The European Union aspires to move away from a linear economy to **a circular economy that keeps materials as long as possible in the loop**. Implementing a European circular economy will help:

- Decreasing Europe's dependence on imports of raw material;
- Reducing pressure on natural resources;
- Halting biodiversity loss and achieving the climate-neutrality target by 2050;
- Ensuring that the EU does not export its waste challenges to third countries.

[1] Figures for 2016, https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20180123-1
[2] https://sustainabledevelopment.un.org/?menu=1300
[3] European Commisssion, A new Circular Economy Action Plan, COM(2020) 98 final, 11.3.2020
[4] European Commission, The European Green Deal, COM(2019) 640 final, Brussels 11.12.2019
[5] European Commission, A European Strategy for Plastics in a Circular Economy, COM(2018) 28 Final, 16 January 2018
[6] Earth Overshoot Day has moved up two months to 29 July 2019, the earliest ever - www.overshootday.org

Moreover, the circular economy will have net positive benefits in terms of GDP growth and job creation, since applying ambitious circular economy measures in Europe can increase the EU's GDP by an additional 0.5% by 2030 creating around 700,000 new jobs.

The key challenges for sustainable waste management in a circular economy are the durability, recyclability and reparability of products, the reduction of food and packaging waste that are discarded every year and the massively encouragement of avoidance of waste at household and industry level.

The Circular Economy Action Plan

In December 2015, the Commission adopted a Circular Economy Action Plan[7] to give a new boost to jobs, growth and investment and to develop a carbon neutral, resource-efficient and competitive economy. The European Commission pursued the implementation of the circular economy package with a lot of drive and determination. On 4 March 2019, it published a comprehensive report[8] pointing out that 54 actions under the action plan have now been completed or are being implemented including the new European waste legislation with ambitious new targets for recycling.

> *"The new Plan will make circularity the mainstream in our lives and speed up the green transition of our economy."*
>
> Virginijus **Sinkevičius**
>
> Commissioner for the Environment, Oceans and Fisheries

Making circularity mainstream

On 11 March 2020, the European Commission adopted a **new Circular Economy Action Plan** presenting new initiatives along the entire life-cycle of products that should allow a major modernisation and transformation of Europe's economy whilst at the same time protecting the environment and giving new rights to consumers. The Plan is one of the main building blocks of the European Green Deal that sets an ambitious roadmap towards a climate-neutral circular economy. With the new plan, the European Commission put forward the following main building blocks:

- **Make sustainable products the norm in the EU:** Proposing legislation on Sustainable Product Policy, to ensure that products placed on the EU market are designed to last longer, are easier to reuse, repair and recycle, and incorporate as much as possible recycled material instead of primary raw material. Single-use will be restricted, premature obsolescence tackled and the destruction of unsold durable goods banned.
- **Empower consumers:** Consumers will have access to reliable information on issues such as the reparability and durability of products to help them make environmentally sustainable choices. Consumers will benefit from a true 'Right to Repair'.
- **Focus on the sectors that use the most resources and with a high potential for circularity:** This encompasses launching a 'Circular Electronics Initiative', a new regulatory framework for batteries, new mandatory requirements for packaging and for recycled content, new EU Strategies for Textiles and for a Sustainably Built Environment, as well as a new legislative initiative on reuse to substitute single-use packaging, tableware and cutlery by reusable products in food services.
- **Ensure less waste:** The focus will be on avoiding waste altogether or transforming it into high-quality secondary resources that benefit from a well-functioning market for secondary raw materials. The Commission aims to ensure that the EU does not export its waste challenges to third countries and will explore setting an EU-wide, harmonised model for the separate collection of waste and labelling.

[7] European Commission, The Circular Economy Action Plan, COM(2015) 614
[8] European Commission, Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and Committee of the Regions on the implementation of the Circular Economy Action Plan, COM (2019) 190 final

European waste legislation and targets

On 23 February 2018, the European Union endorsed the four legislative proposals of the waste package that aspires to lead to more recycling of waste and to contribute to the creation of a circular economy. The agreements establish binding waste reduction targets and updated rules to decrease waste generation, ensure a better control of waste management, encourage the reuse of products and improve recycling in all EU countries.

The Waste Framework Directive

Under the revised Waste Framework Directive, European households and businesses will have to recycle at least 55% of their municipal waste by 2025 and to reach 65% in 2035. Stricter rules will be put in place to guarantee separate collection of additional waste streams, including all bio-waste (by 2023) and used textiles (by 2025).

The Packaging Waste Directive

A separate directive covering packaging requires governments to ensure that 70% of product packaging is being recycled by 2030. The figure is different for individual packaging materials: 30% for wood, 55% for plastic, 75% for glass, and 85% for paper. Governments must ensure an interim overall target of 65% is met by the end of 2025. Extended producer responsibility schemes[9] will become mandatory for all packaging by end-2024.

The Landfill Directive

No more than 10% of waste may go to landfills by 2035. Currently the EU28 average is 28% with very mixed realities across countries. Estonia, Greece, Croatia, Latvia, Malta, Romania and Slovakia secured a five-year extension, providing they reduce the level of municipal waste going into landfills to below a quarter by 2025. The Commission will then consider, by 2024, setting a quantitative per capita target on landfilling.

New EU harmonised methodology to count recycling rates for municipal waste

The European Commission is imposing on all Member States a harmonized methodology of measuring the recycling rates for municipal waste[10]. The methodology only allows those materials to count towards the recycling targets that do not undergo further processing before entering a recycling process, such as for example a glass furnace, a pulping operation, or an extrusion process. Hence the recycling rates are not established anymore according to the amounts collected for recycling but on the amount of waste that is de-facto directly entering recycling processes as secondary raw material. This new way of counting will set countries back several percentage points in their recycling performance and will make achieving the new targets even more ambitious.

Reducing the incineration of valuable resources

With its Communication on “The role of waste-to-energy in the circular economy”[11] the European Commission emphasises the importance of framing new investment in future waste treatment facilities

[9] https://europen-packaging.eu/policy/9-extended-producer-responsibility.html
[10] Commission implementing decision (EU) 2019/1004 of 7 June 2019, laying down rules for the calculation, verification and reporting of data on waste in accordance with Directive 2008/98/EC of the European Parliament and of the Council and repealing Commission Implementing Decision C(2012) 2384
[11] European Commission, Communication “The role of waste-to-energy in the circular economy”, COM(2017) 34 final

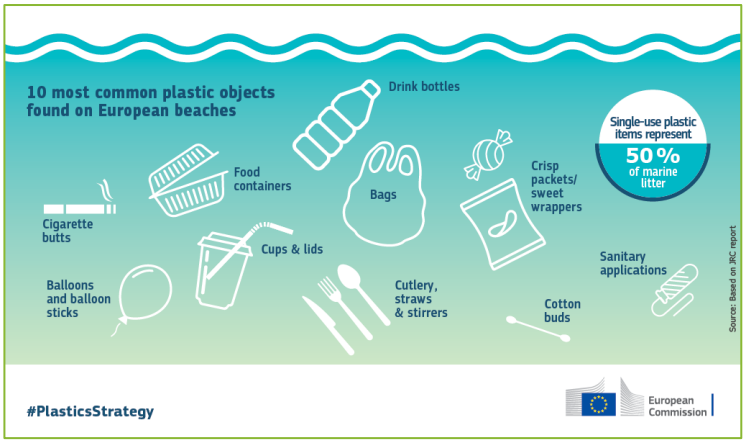
in a long-term circular economy perspective and in coherence with the EU waste hierarchy and the EU targets.

Based on the expectation that the volumes of mixed waste will fall with the separate collection obligations and more ambitious EU recycling targets, the EU advises Member States to gradually phase-out public support for recovery of energy from mixed waste. High rates of incineration are inconsistent with more ambitious recycling targets. While anaerobic digestion of organic waste with production of fertiliser is formally classified as "recycling" and thus counts toward a regions' recycling targets, waste incineration, with or without energy recovery has been classified as "other recovery" and "disposal" and will not help with the fulfilment of the recycling targets.[12]

The first-ever European strategy for plastics

On 18 January 2018, the European Union adopted the 'European Strategy for Plastics in a Circular Economy'. The Strategy aims at a stronger protection of the environment from plastic pollution whilst bringing new opportunities for innovation, competitiveness and job creation. Under the new plans, all plastic packaging on the EU market will be recyclable by 2030**,** the consumption of single-use plastics will be reduced and the intentional use of micro-plastics will be restricted. The European Strategy for Plastics aspires to transform the way products are designed, produced, used, and recycled in the EU towards a more circular approach. The goal is to protect the environment and lay the foundations to a new plastic economy, where the design and production fully respect reuse, repair and recycling needs. With the plastic strategy, the Commission has adopted a Monitoring Framework[13], measuring progress towards the transition to a circular economy at EU and national level. The Commission will also provide guidance for national authorities[14] and businesses on how to minimise plastic waste at source and scale-up support for innovation with an additional €100 million financing.

EU rules on single use plastics



EU rules on single-use disposable plastic products, adopted in May 2019, target the 10 plastic items that most often pollute Europe's beaches and seas, along with lost or abandoned fishing gear. This waste accounts for 70 % of marine litter. From 2021**,** a ban will be in place for single-use plastic cotton bud sticks, cutlery, plates, straws, drink stirrers and balloon sticks, as well as food and beverage containers – including cups – made of expanded polystyrene. These items will all have to be made from more sustainable materials or replaced with reusable alternatives.[15] There will also be a binding target of at least 25% of recycled plastic for PET beverage bottles from 2025 onwards and a target of at least 30% of recycled content for all plastic bottles by 2030.[16] Wet wipes, sanitary towels, tobacco filters and cups will be labelled if they are made with plastic. Packaging labels will warn consumers of environmental damage they do by disposing of these items incorrectly.[17]

[12] *Jose-Jorge Diaz Del Castillo, European Commission – DG ENV, in Covenant of Mayors BiogasAction webinar* - Cities and *Regions* unlocking the potential of *biogas* for their energy transition, 12 Dec 2018
[13] European Commission, Communication on a monitoring framework for the circular economy, COM(2018) 29 final
[14] European Commission, Annexes tot he Communication 'A European Strategy for Plastics in a Circular Economy', COM(2018) 28 final, ANNEXES 1 to 3
[15] https://www.beready tochange.eu/en/
[16] https://www.consilium.europa.eu/en/press/press-releases/2018/12/19/single-use-plastics-presidency-reaches-provisional-agreement-with-parliament/
[17] https://www.theguardian.com/environment/2019/mar/27/the-last-straw-european-parliament-votes-to-ban-single-use-plastics

Inspiration from Interreg Europe good practices

Interreg Europe provides support to policy makers wishing to adopt sustainable waste management solutions in a circular economy. Several funded projects already identified good examples and offer insights and inspiration in the following main areas:

- Reduce-reuse-recycling of waste
- Food waste prevention
- Landfill rehabilitation.

Focusing on reusing and reducing waste

Major emphasis has been put on avoiding waste altogether or transforming it into high-quality secondary resources that benefit from a well-functioning market for secondary raw materials. A forthcoming Sustainable Product Policy will ensure that products placed on the EU market are designed to last longer, are easier to reuse, repair and recycle, and incorporate as much as possible recycled material instead of primary raw material. Single-use will be restricted, premature obsolescence tackled the destruction of unsold durable goods banned and consumers will benefit from a true 'Right to Repair'.

The WINPOL and INTHERWASTE projects provide good practices for sustainable waste management and the recent CECI project adds experience on changing consumption patterns and lengthening product life cycles through reuse, repair, remanufacturing and refurbishment as well as energy saving. The project partners are keen to adopt sharing economy approaches and promote initiatives that raise awareness (www.salon-antigaspi.com) or mobilise volunteers (www.aremacs.com) or the app www.smartcycle.org that allows anyone to geolocate abandoned objects in the street that someone might be interested in reusing.

INTHERWASTE
Interreg Europe

Public re-use and repair centre (France)

In Nice, the local authority deals with the collection of bulky waste from the district "Les Moulins" and delivers it to a reuse and repair centre on giving bulky waste a second life. At the facility, waste is sorted in order to recuperate what can be repaired and then sold at the retail store. The reuse and repair centre is not only focused on repairing bulky waste, but also serves a wider social purpose employing people who have difficulties in the labour market. Nine out of 12 workers on the site are employed temporarily through an integration programme, providing them with the opportunity to gain confidence in their capabilities of finding a better job.

Further information about the practice is available here.

Image Source: http://www.urban-waste.eu/nices-new-reuse-centre-bulky-waste-model-replicated-attracts-big-attention/

Re-Use Box – New collection scheme for reusable items (Austria)

The Re-Use Box is a new collection system for small reusable items such as books, crockery, tools, toys, sports equipment, electrical appliances etc. that are no longer used and often end up in the residual waste bin or are send for recycling. At the same time, Reuse Shops complained about insufficient amounts of reuse goods available as they could sell significantly more of them.

The Re-Use box is similar to a moving box, but its size has been optimised so that the filled boxes do not become too heavy. During the introduction phase, 40,000 boxes were produced and the availability of the new Re-Use boxes was widely advertised. As a result, an additional 500 tonnes of useful items could be collected and sold in Reuse Shops. This not only made a significant contribution to waste avoidance, but also helped the socio-economic operators of the Reuse Shops to preserve jobs and create new ones. The Re-Use box can be produced by all waste management facilities or by operators of Reuse Shops. In addition, a durable and reusable carrying bag has produced.

Further information about the practice is available here.
Image Source: www.umwelt.graz.at

Deposit system for reusable cups at public events (Estonia)

Every year, half a trillion disposable cups are manufactured around the world. That is over 70 disposable cups for every person on the planet (www.ecoffeecups.com). Most cups are used for a very short time and often end up in our water ways and oceans. Replacing single-use cups with reusable ones at public events, in coffeeshops and take-aways can significantly reduce the amount of waste generated and the resources needed for collecting and handling the waste. In Estonia, the non-for-profit organisation 'CupCycle EST' is replacing disposable, single-use cups with reusable, washable cups. A smart chip on the bottom of each cup allows for automated return and mobile deposit repayment on the spot. At public events, CupCycle offers a full service with three different types of cups including logistics, washing up, and if necessary, their own service staff. This approach is very successful. For a pilot project in summer 2016, CupCycle attended a big festival involving 24,000 visitors and 20 caterers in the reusable cup system. This prevented at least 55,000 disposable cups from being thrown away. Following the successful pilot, the City of Tallinn has developed a regulation that prohibits using single-usage plastic cups and dishes in public events.

Further information about the practice is available here.
Image Source: www.interregeurope.eu/intherwaste/

Increasing recycling capacity

The Commission also aims to ensure that the EU does not export its waste challenges to third countries. With China's ban on the import of 24 categories of waste in 2018, the pressure to drastically increase European recycling capacities has been mounting. In 2017, the EU still shipped 60% of plastics and 13% of paper collected for recycling to China; by 2019, the export to China has already been totally phased out. Subsequently, European waste has been deviated to other countries such as Malaysia, India, Indonesia and Vietnam. Not only are these countries ill-equipped to deal with the waste, the 'waste-tourism' does not make any sense. This is a wake-up call for Europe that offers huge opportunities for the European recycling industry, for job creation, for innovation in product design and for the production and use of secondary raw materials at local level.

Increased recycling capacity starts with separate collection systems for different waste fractions. There is for example an increasing need to provide for the separate collection of cardboard, a waste material that is more and more generated. The neighbourhood La Marina, Ibiza has installed underground waste containers and the local business sector had difficulties to deposit large quantities of cardboard in these containers. As a result, the waste collection company found cardboard in the wrong containers and all over the sidewalks. Most of this cardboard had thus been spoiled and could not be recycled anymore. The town hall resolved the situation by installing specific containers for commercial cardboard and by increasing the frequencies of collection.

The SYMBI project focusses on the implementation of regional development policies and programmes to promote industrial symbiosis and a circular economy. From Slovenia comes the recycling project 'Plastic bottle for plastic bottle' that closes the loop between the beverage industry and the collection and recycling of waste plastic bottles. Thanks to the approach the local beverage company raised the recycled PET content in their plastic bottles from 30% to 50%. An Italian good practice presents an innovative process for the recycling of diapers or Absorbent Hygiene Products (AHP). AHP waste represents between 2-4% of the total Municipal Solid Waste. Each year, 900,000 tons of AHP waste are incinerated or landfilled in Italy, 8,500,000 tons in Europe and over 30,000,000 tons in the world. The new process allows to transform diapers into new secondary raw materials and can serve as an inspiration from many European regions.

Food waste: prevention and recycling are key priorities

The amount of food waste that is generated in the EU is difficult to quantify, as there is no harmonised methodology to define and measure food waste along all stages of the value chain (also see Interreg Europe Policy Brief on Food waste).

In 2012, it was estimated that in the European Union alone, up to 30% of food production is not consumed and 88 million tons of food are wasted every year: a staggering 173kg by each European citizen.

Considering that the total amount of food produced is 865 kg/person, this would mean that **20% of the total food production is wasted**. More than 50% of food waste is generated by households and the costs associated with food waste in the EU-28 were estimated at around EUR 143 billion.[18]

> *"It is estimated that more than 50% of food waste is generated in households. Cities and regional authorities can help citizens to adopt a more sustainable behaviour regarding food consumption and food waste."*
>
> Samuel **Feret**
>
> CIHEAM – IAMM, ECOWASTE4FOOD

[18] www.eu-fusions.org

Whilst food waste prevention has the absolute priority, food waste and other bio-waste[19] such as biodegradable garden and park waste can be valorised twice after they have been discarded: 1) through the capture and use of the biogas emanating from anaerobic digestion (AD) and 2) through the preparation of the organic matter into high-quality compost and fertiliser. Unlike waste incineration, anaerobic digestion with production of fertiliser is formally classified as "recycling" and thus counts toward a regions' recycling targets. However, **despite the great potential, the recycling rates of biowaste lag behind the steadily growing rates of material recycling**. The majority of the biowaste that Europe generates each year is still lost through landfilling and incineration thus wasting the great potential of recycling this organic material as compost or animal feed and for anaerobic digestion. But this practice is being prohibited by various Directives now, as food waste is neither allowed onto landfills nor into incinerators any longer.

In line with these priorities, the challenges of food waste prevention and biowaste recycling are addressed by the ECOWASTE4FOOD and BIOREGIO projects. They aim to improve the effectiveness of regional policies and are identifying interesting good practices throughout Europe demonstrating the environmental and social benefits of creating and sustaining a culture of reduction of food waste and food donation. The ECOWASTE4FOOD project aspires to address the crucial issue of food waste, not only to stop an unacceptable situation which causes the loss of up to 50% of the agricultural production, but also to demonstrate that food waste is a valuable resource. To that end, the project showcased a large number of technological and organisational eco-innovations for the following areas:

- Limitation of waste production in the food processing industry;
- Conception and design of products that help reducing the food waste by the end users;
- Use of products that are currently considered as unusable or unserviceable;
- Services that could help reducing food waste.

Drying extends fruit shelf live - Decreasing food losses through resource-efficient drying methods in the food industry (Poland)

The shelf life of fresh fruit can be extended through innovative yet simple technologies such as drying machines. In this way, new food products can be created from fresh fruits and vegetables that can otherwise not be sold due to overproduction or non-compliance with conformity and quality standards. Fruits, vegetables, cheese and other food raw materials can be dried in a very short time and at low temperatures whilst maintaining very high levels of nutrients in the finished products. The Marshal Office of the Wielkopolska Region supports two innovative companies specialised in drying food through their clustering and innovation programmes. There is good learning and transfer potential for several ECOWASTE4FOOD partners who have been inspired by this technology and refer to it in their action plan in order to support resource-efficient process in the agri-food industries.

Further information about the practice is available here.

Image Source: Breakingpic from PEXELS

[19] Directive 2008/98/EC on waste and repealing certain directives (2008) defines biowaste as *"biodegradable garden and park waste, food and kitchen waste from households, restaurants, caterers and retail premises and comparable waste from food processing plants."*

The ResQ Club – Online marketplace to sell food surplus from restaurants (Finland)

The ResQ Club is a mobile app for restaurants to sell their surplus portions at a discount and for individual consumers to buy surplus portions near them. Portions are announced by the restaurants and depending on the settings a consumer has chosen, the application notifies users nearby. Consumers purchase the portions directly in the app and pick up the orders in person from the restaurant within the timeframe the restaurant has specified. ResQ Club has proven to be a very efficient way of reducing food waste and attracting new customers. By July 2018, the Club had saved the following results could be reported

- Over 700,000 meals and 80,000 tonnes of food were saved;
- 1,900 venues announced their portions and 300,000 registered users purchasing them;
- On average, 65% of the surplus portions announced in the app are sold;
- The concept spread from Finland to Sweden, Germany and The Netherlands.

Further information about the practice is available here.

Image Source: Victor Freitas from PEXELS

Community composting in the City of Nitra (Slovakia)

The City of Nitra introduced community composting for 50 households, to improve the local environment by using the fertiliser in already existing ornamental planting and to reduce the amount of landfilled bio-waste. Moreover, the project aimed to familiarize the local community with the composting technique, to understand the benefits of composting and to change current perceptions of bio-waste.

Each household obtained a manual for bio-waste sorting (i.e., what raw materials can be composted), a bio-waste bucket and a key for the composter which is locked to ensure that inappropriate materials are not thrown in by unauthorized persons. The bio-waste is stored and decomposed in one of the three chambers. After a year of bio-waste disposal, the first chamber is closed and the compost enters into a maturation phase. In the meantime, a second chamber is available for bio-waste disposal.

Further information about the practice is available here.

Image Source: www.urbangreenup.eu

Landfill rehabilitation

For most of the last century, the preferred waste treatment method has been dumping or landfilling with the related negative effects on the environment and the enormous loss of valuable resources.

Thanks to the provisions of the 1999 EU Landfill Directive, most of the landfills still operational today are now 'sanitary', equipped with protection layers that avoid leachate getting into the soil and water cycle.

Photo Credit: Tom Fisk from PEXELS

Overall, however, Europe has an enormous legacy of landfilling with recent estimates suggesting that there is a total of at least 500,000 operational and closed landfills in the EU-28.

The vast majority (90%) of these landfills are 'non-sanitary' and feature none or little protection technologies to limit the environmental impact on water, soil, climate and health. Even a closed landfill is issuing leachate and greenhouse gases for up to 25 years. Moreover, landfills are often located in the perimeter of cities which restricts the use of land and potential health risks.

COCOON
Interreg Europe

Landfill mining to develop a housing area in Veenendaal (The Netherlands)

Landfill mining to regain land for housing is particularly suitable for regions with high land pressure. In the Dutch City of Veenendaal, two former landfills where mined to enable the development of a housing area. The landfill mining project included the complete removal of 54,000 m3 of waste and the separation of material into partly reusable fractions. In total, 80% of the excavated waste was treated for reuse in city development (soil, sand and rubble). The remainder (mainly of plastic, car tyres and asbestos) was transported to a sanitary landfill where landfill tax was paid. Polluted underground was removed and transported to an off-site soil cleaning facility. The increase in the price of land, together with a subsidy from the province of Utrecht, made the complete removal economically viable.

Further information about the practice is available here.

Image Source: COCOON

The COCOON project aims to improve the policy on landfill management and extensively exchanged experience and describing good practices related to the management of old, new and future landfills. In its recent handbook, COCOON features good practices to reduce or eliminate the environmental impact of landfills, to recover closed landfills for the urban landscape and to create economically viable resources through the integration of landfills into a circular economy.

The anaerobic conditions in a landfill will produce methane, a potent greenhouse gas that can be used for the production of electricity, heat and fuel. A former landfill in the Achterhoek region (The Netherlands) is extracting this landfill gas for the production of renewable electricity. BioZon cooperative runs the 80 kW's gas installation. Above ground the landfill was transformed into an attractive green hill for hikers and other recreational activities.

As the gas concentration in the landfill is reducing over time, the landfill in Lübben (Germany) has installed an additional storage facility for retaining the gas. The Combined Heat and Power Plant (CHP) now operates when the stored gas volume is sufficient and the demand for energy is high. The REGIO-MOB project featured an installation to purify landfill gas at the inoperative landfill in Niepołomice (Poland). The upgraded gas can fuel vehicles such as buses and waste trucks with compressed biogas.

Turning an old landfill into a buffer basin to prevent flooding (Belgium)

With the urban sprawl starting in the 1950s, a lot of land got sealed with concrete and buildings. But when surface water cannot infiltrate anymore, it runs off and collects at the lowest local point. After intense rains, this has caused repeated flooding in one of these local low points: a residential area in the municipality of Zaventem. Many landfills in Flanders are in fact local depressions of rivers and streams and the problem in Zaventem was solved by turning a local landfill into a buffer basin that stores the excess water. To this end, one metre of mixed waste was partially recycled: the waste was sieved, the soil was redeposited on site and used to mould the edge of the basin. A HPDE layer was added and on top of this concrete porous blocks to create a semi-natural dike.

Further information about the practice is available here.
Image Source: COCOON

Recommendations

The recent Circular Economy Package and the related waste legislation represent not only a gradual increase in the ambition to manage our waste more sustainably. The package contains obligations and targets that are meant to disrupt the status quo and to induce a real change. This will require resources: knowledge, human resources and financing.

The next generation of Regional Funds are being programmed at present and interregional cooperation provides inspiration as it offers the possibility to learn about good practices and policies, explore synergies and discover new perspectives for sustainable waste management in a circular economy.

My Circular Region

- Appoint a circular economy responsible at policy-making level and in the administrations
- Set local circular economy targets that are ambitious yet achievable and dynamic over time, then monitor and communicate the progress
- Raise awareness, especially amongst school children
- Identify, network, mobilise and incentivise local stakeholders and industry to create new circular economy businesses and business models
- Set-up capacity building and training programmes for new technologies and business models
- Use the opportunities of the circular economy for job and value creation at local level
- Prioritise Green Public Procurement, see SYMBI guidelines on Green Public Procurement

Reduce and reuse

- Put a negative price tag on mixed waste for households and business that increases with the quantity of waste generated
- Encourage local businesses to offer reusable, durable and recyclable products
- Support circular design with local businesses to develop resource efficient products
- Encourage local shops to use sustainable packaging, sell in bulk and offer refill packaging
- Introduce voluntary schemes for reusable cups in your municipality in collaboration with local restaurants and coffee shops and at events, see CupCycle EST (EE) and FreiburgCup (DE)
- Set up public library boxes e.g. in old telephone cabins where citizens can place the books they no longer want and others can take them for free
- Foster and advertise repair cafés and second-hand centres for textiles, electronic and electric waste (WEEE) and bulky waste, possibly coupled with social reinsertion measures for long-term unemployed that are re-skilled in repairing products i.e. Les Moulins (FR), Re-Use Box (AU), Bulky Bob's (UK)
- Get inspiration from ECOWASTE4FOOD to support local initiatives reducing food waste such as ResQ Club (FI) and Fruit drying (PL)

Recycle

- Introduce separate collections schemes for paper, cardboard i.e. La Marina (ES), glass, drinking cartons, plastic in line with EU Directives, communicate the reasons and the objectives to citizens and businesses, then monitor and incentivise (reward or punish)
- Recycle organic waste into compost animal feed and biogas by either promoting home or community composting as in Nitra (SK), or supporting the setup of biogas plants for separately collected organic waste in areas of dense population
- Close the loop by fitting the biogas plants with compressors and fuel your local waste trucks or public buses by compressed biogas (CBG) as in Niepołomice (PL)
- Encourage the local recycling industry and industrial symbiosis projects in your region
- Fund and deploy deposit return schemes for PET to obtain clean PET waste streams and achieve top recycling rates

Tackle landfilling

- Take inspiration from the COCOON project to rehabilitate and close non-sanitary landfills to reduce the negative environmental impact on soil, water and air
- Make the land available again for nature parks, housing, energy production, etc. Veenendaal (NL) Marsascala Family Park (ML)
- Where possible, use the resource available in landfills through urban mining and capturing landfill gas Achterhoek (NL) and Lübben (DE)

Sources for further information

Policy Learning Platform information:

- Interreg Europe Policy Learning Platform, Policy Brief on food waste
- Interreg Europe Policy Learning Platform, Policy Brief on sustainable management of biowaste
- Interreg Europe Policy Learning Platform, Policy Brief on Green Public Procurement
- ECOWASTE4FOOD project, 'Food waste innovations'
- COCOON Project, Good Practice Handbook, December 2019
- Interreg Europe Policy Learning Platform Webinar, 'Creating regional opportunities through landfill rehabilitation', March 2020

Other sources:

- The European Green Deal
- The new Circular Economy Action Plan
- The revised EU waste legislation
- The European Plastics Strategy

Interreg Europe Policy Learning Platform on

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March 2020