Waste Recycling

The amount of recycled municipal waste in the European Union has been steadily increasing. The outlook for all Member States meeting the 2020 target is mixed. The several Member States have achieved, or are well on course to achieving their target goal. The future of recycling looks bright in most of the countries that made an effort.

Recycling is nearly a national hobby **in Germany**. There's a blue bin for paper, a brown or green bin for biodegradables, a yellow one for plastic and a black one for the rest.

Additionally, Germans return their deposit bottles to the supermarket and drop glass bottles at public collecting points. Germans are proud of their recycling system. Even children's books spin the tale of the colored bins.

Indeed, the nation is celebrated as a recycling role model around the world. When Germany introduced its recycling system with the "green dot" as a symbol in 1991, it was unparalleled.

What is the **Green Dot** model?

The **Green Dot** system was thought up by Klaus Töpfer, Germany's environment minister in the early 1990s. The basic idea of the Green Dot is that consumers who see the logo know that the manufacturer of the product contributes to the cost of recovery and recycling.

This can be with household waste collected by the authorities (e.g. in special bags – in Germany these are yellow), or in containers in public places such as car parks and outside supermarkets.

The system is financed by the green dot license fee paid by the producers of the products. Fees vary by country and are based on the material used in packaging (e.g. paper, plastic, metal, wood, cardboard). Each country also has different fees for joining the scheme and ongoing fixed and variable fees. Fees also take into account the cost of collection, sorting, and recycling methods.

In countries that adopt the Green Dot recovery system, what the Green Dot recycle symbol trademark merely does is inform the local regulator which system a particular company engages to recover its packaging waste. It also informs the Green Dot recovery program of whose packaging to collect. Of course, the Green Dot program collectors would only collect the waste packaging from companies that have paid the Green Dot license.

Whether a waste packaging (with or without the Green Dot) gets recycled eventually still depends on many other factors such as the following:

- whether product manufacturers choose to make use of recyclable packaging for their products in the first place;
- a non-recyclable packaging waste simply can't be recycled
- whether consumers make an effort to send their waste packaging to the dedicated packaging recovery bins (Green Dot or not), instead of leaving the packaging with the general waste where it can be contaminated and rendered no longer recyclable
- the level of enforcement in a particular European country in terms of ensuring that companies actually recover their packaging waste, and recycle them as much as possible.

It is the lack of understanding about the Green Dot trademark that has left many consumers confused about the significance of the symbol.

Today, 29 European countries along with Israel and Turkey have adopted the green-dot system, where companies pay a fee to finance the collection, sorting, and recovery of packaging waste.

In Austria, they started in the early 1990s to implement environmentally sound waste management. Based on the Federal Waste Management Act several waste streams have been regulated since then (like packaging waste, ELV, WEEE, construction and demolition waste, biogenic waste, waste wood) and the requirements for different waste treatment options have been prescribed (landfill ordinance, waste incineration ordinance, waste treatment obligation ordinance).

ARA is Austria's leading packaging compliance scheme and a non-profit company. It organizes and finances the collection, sorting, and recovery of packaging waste in Austria. Together with their partners, they provide households and businesses throughout the country with a well-developed collection infrastructure and convenient and cost-efficient waste management solutions that facilitate efficient collection and eco-friendly recovery.

The Geocycle Recycling Center in Retznei processes **Construction and Demolition waste** (CDW), which accounts for approximately **25% – 30% of all waste** generated in Europe. Built on the quarry that serves LafargeHolcim's cement plant in Retznei, the operation is made possible by the cooperation between the Group and a local partner that provides the knowledge and expertise in CDW management. The result? Every year, **100,000 tons** of CDW is processed there for reuse.

Consumers can use our around 1.8 million bins for the collection of waste packaging made of paper, plastic, metal, and glass. Besides, they organize a curbside collection service for packaging (yellow bag/yellow bin) for 1.6 million households.

The considerable increase of the recycling and recovery rates could be realized mainly because of the landfill ban on certain waste types. Additionally, the remediation contribution, to be paid above all in case of landfilling or incineration of waste, provides an economic incentive for recycling and recovery

Electronic data management in the field of waste management was further developed in the last decade. Accurate information on waste streams constitutes the pre-requisite and basis for optimized waste management planning. Furthermore, the transparency of waste management is increased and control is facilitated. Since 2009 waste collectors and treaters have been obliged to fulfill their recordkeeping obligations electronically.

Additionally, public awareness-raising and information campaigns are indispensable to motivate consumers to collect and dispose of their waste correctly.

Every Can Counts – or Jede Dose Zaehlt in German – has been encouraging consumers in Austria to reuse drinks cans properly since 2010. For the first time, the scheme's emblem and call-to-action "please recycle" will appear on cans of Pepsi Cola, as well as Seven-Up. The companies are hoping to motivate young people, especially at festivals and sports events, to collect their empty beverage cans for recycling so that the packaging material can remain in circulation.

What are the keys, concretely, to the success of recycling in Austria?

The regulatory framework prescribing the requirements for sustainable waste treatment, the implementation of economic incentives (producer responsibilities and landfill/incineration tax), regular waste controls and monitoring systems and last but not least education and training program,

as well as comprehensive information campaigns, have been crucial for the successful development of the Austrian waste management.

Also, the companies in Austria promote recycling. For example, Pepsi has demonstrated its commitment to drinks can recycling by becoming the first brand to feature the marque of a major European recycling initiative on the pack.

In Denmark Recycling and reducing any kind of waste is a big deal in Denmark and most households do it not because it is mandatory, but because it is the right thing to do.

The containers available to you will depend on the type of housing you live in. Private homes usually have smaller containers. One container might be divided for both paper and glass/metal/plastic waste. Apartment buildings have multiple containers in the courtyard or underground containers nearby. Usually, pictures and text can be found on the containers to help your sorting process.

All soft drink bottles and cans in Denmark have a fee that is paid upon purchase. These fees are not included in the price tags at stores and are calculated at the register. When the bottles and cans are returned to the machines, a receipt is printed. You can get the money back in cash or used when purchasing at the store.

There is an additional return system currently being tested all over Denmark called **Pant station**. **Pant station** is a new initiative designed to smoothen the process of collecting and recycling packaging considering the consumers' needs.

The concept of the *Pant station* (a packaging deposit system) is part of the further development of the Danish deposit and return system making it easier to collect and recycle packaging. They aim to make it even more efficient and user-friendly to return beverage packaging to motivate Danish consumers to return even more empty items of packaging for the benefit of the environment and to conserve natural resources.

Their goal is for the stations to make the process easy and efficient with it taking less than 30 seconds to deliver 100 items of packaging at a time. Thus, improving the possibility of Dansk Retursystem to collect and recycle packaging.

Making it easier for consumers – The extended return and deposit system enable consumers to collect their bottles and cans in a deposit sack that can hold up to 100 items and deliver everything at one time. Deposit sacks are connected via the microchip to the consumer's deposit card with the deposits being repaid into the person's bank account within 10 days. Bottles and cans without a payable deposit can be returned as well to ensure that they are recycled. Having delivered a sack, consumers can track its progress as it passes through the packaging deposit system.

Dansk Retursystem collects the containers with the deposit sacks from the ***Pant station*** and delivers them to our processing plants. Deposit sacks are emptied upon arrival and the contents of each sack are counted with the deposits credited to the consumer's bank account. Dansk Retursystem subsequently ensures that all the used packaging is recycled so it becomes new bottles, cans, and food packaging and that the high quality is retained so it can be used for the same purpose again. In this way, we save energy and avoid having to extract new raw materials from the earth.

The Netherlands put an admirable amount of effort and resources into environmental preservation. Here are a few examples.

The ‘Ministerie van Infrastructuur en Milieu‘ is in charge of environmental matters. They are the ‘Ministry of Infrastructure and water management’ in the Netherlands. They work in close cooperation with international and domestic partners, to improve the living environment of the country.

Their domestic partners include the many Dutch organizations, working to monitor issues like living space, respect for nature, and raw materials in the Netherlands. Over 4,000 people in the Netherlands are employed to address issues related to living space, housing, and the environment in this country. Efforts are also made to plan, conduct, and supervise government projects, concerned with housing and environmental sustainability policies.

As mentioned above, the waste separation and recycling station is referred to as the ‘Afvalscheidingsstation‘ in the Netherlands. Anything too large to be put in a regular waste container can be taken to a waste disposal station. It can also be used for specific items, such as chemical waste. Here is what you need to know:

If you want to use the station for a one-off piece of household waste, you can simply turn up, and ask for instructions. However, if you are arranging the disposal of a larger quantity of waste, for your business perhaps, you may have to pay.

Usually, you will be questioned upon entering the station. The staff there will ask you what kind of waste you want to discard and will direct you to the right location. There are separate containers for wood, cardboard, tires, stones and construction rubbish, and chemical waste.

The plastics recycling market in the Netherlands is constantly evolving in parallel with the adaptation of more circular business models due to the impact of climate change and resource scarcity. In February 2019, 65 companies including DSM, Philips, will sign the Dutch Plastic Pact aiming to increase the use of recyclates.

This innovative dynamic around recycling is also encouraged by a more collaborative approach, breaking down the traditional silos, and in turn, creating new markets and business models.

The plastics recycling market in the Netherlands is constantly evolving in parallel with the adaptation of more circular business models due to the impact of climate change and resource scarcity. In February 2019, 65 companies including DSM, Philips, will sign the Dutch Plastic Pact aiming to increase the use of recyclates. This innovative dynamic around recycling is also encouraged by a more collaborative approach, breaking down the traditional silos, and in turn, creating new markets and business models.

Two examples of this are:

- **IKEA**, which acquired a 15% minority stake in Dutch plastics recycling plant Morssinkhof Rymoplast, as part of a ¤3 billion budget allocated by the company to sustainability investments. IKEA’s investment in Morssinkhof Rymoplast builds on the company’s goal of making its plastic products (representing around 40% of its total plastic use) using 100% recyclable and/or recycled materials by 2020.
- **LyondellBasell’s** acquisition of a stake in **QCP**, a Dutch producer of recycled plastic compounds that it owns jointly with Suez. This represents a partnership in the Netherlands between one of the largest plastics, chemicals, and refining companies and a waste management player to contribute to circular economy objectives.

The ongoing development of a plastic circular economy also relies on technology innovation, such as the development of chemical treatment of plastics (instead of mechanical treatment) and on standardization and certification of recycled plastics to improve the quality and purity of plastics.

The recycling process in **Norway** is state-of-the-art. The country has one of the most efficient recycling plans in the world and an intricate system that the locals have been taught since childhood.

The green, blue, and white system – The first things people notice is the color-coding. This time, color psychology helps in the recycling process. It tells the people where should they throw their waste.

At home, Norwegians need to have separate bins for different kinds of waste and each should have its own specific bag, so it's easier for waste to be sorted afterward. The food and organic leftovers (anything that can be turned into compost, like food, dirt, leaves, small pieces of wood, etc) should go in a green bag. All plastic packaging (anything from shampoo bottles to food packaging) should be rinsed thoroughly and go in a blue bag. General waste doesn't go to any kind of bag. Norwegians use blue and green bags for their specific purposes, and they are available for free at any supermarket. The paper should be collected in a paper bag and disposed of in the appropriate bins.

Plastic bottles and cans – Once Norwegians mastered the 'green, blue and white' process, they move on acquainting with Norway's pant system. Every plastic bottle of juice, water, or soda, as well as every can of beer or soft drink, has a 'pant' value written on them. This value (usually around 1-2.5 NOK) is what they will have to pay in addition to its regular price when you buy a can of beer, for instance, however, they can get it back when they return the can to the pant machine. The pant machines are stationed in the entrance of all supermarkets; simply people place their bottles and cans one by one on the slot, and the system calculates the pant value they get with each one. Once they're done, the machine issues a receipt with the amount in NOK. Norwegians usually use that to pay for goods at the supermarket or donate it to charity via the machine.

Metal, glass, and more – Metal and glass are slightly less easy to recycle, meaning that there is not a metal and glass recycling bin outside every door. But, there are still several collection points for glass and metal all across Norway's cities – information can be found on the 'kommune' website or Facebook group of the city. Norwegians can also recycle/donate their clothes and shoes at one of Fretex's collection bins; if they're in good enough condition they will be sold on their own, otherwise, the Fretex team will use the fabric to create something new and beautiful. In any case, Norwegians contribute to a very good cause, since Fretex is part of the Salvation Army.

The USA recycles nearly 87 million tons of waste each year — likely think that the plastic and paper thrown into those special blue bins gets sorted by some nebulous government agency and automatically becomes an environmentally-friendly product.

When recycled goods get picked up by the state's waste management corporation, they are taken to a Materials Recovery Facility (MRF) where everything is separated and packaged up to be sent to another facility where it's processed depending on the material.

For example, the paper is processed at a mill where it is turned into pulp to be repurposed.

The **iWARM** tool is based on EPA's Waste Reduction Model (WARM) for solid waste planners and organizations. **iWARM** can be used to calculate how much energy organizations can save and how much greenhouse gases they can avoid by recycling versus landfilling their waste.

EPA created the Waste Reduction Model (WARM) to help solid waste planners and organizations track and voluntarily report greenhouse gas (GHG) emissions reductions, energy savings, and

economic impacts from several different waste management practices. WARM calculates and totals these impacts from baseline and alternative waste management practices—source reduction, recycling, anaerobic digestion, combustion, composting, and landfilling.

The model calculates emissions, energy units, and economic factors across a wide range of material types commonly found in municipal solid waste in the following categories:

- Metric tons of carbon dioxide equivalent (MTCO2E),
- Energy units (million British Thermal Unit – BTU),
- Labor hours,
- Wages ($), and
- Taxes ($).

WARM is currently available as a tool based on a database developed in open life cycle assessment (openLCA) software, with versions available for both Windows and Macintosh users. WARM is also available as a downloadable Microsoft Excel spreadsheet.

The availability of new and updated information has required updates to the energy and emission factors used in the Waste Reduction Model (WARM) and the inclusion of economic factors. The purpose of this page is to explain the changes incorporated into each version.

Starting with the most recent edition, summaries of changes and updates since the previous version are provided below. The objective is to provide users with a transparent picture of the evolution of the tool and to provide context for comparisons of results obtained from different versions of WARM.

Starting with Version 14, WARM is also available as a tool based on a database developed in open life cycle assessment (openLCA) software. Users can download the current version of WARM, which matches the corresponding Excel version of WARM.

EPA – Environmental Protection Agency encourages practices that reduce the amount of waste that needs to be disposed of, such as waste prevention, recycling, and composting.

- Source reduction, or waste prevention, is designing products to reduce the amount of waste that will later need to be thrown away and also to make the resulting waste less toxic.
- Recycling is the recovery of useful materials, such as paper, glass, plastic, and metals, from the trash to use to make new products, reducing the amount of virgin raw materials needed.

Recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products. Recycling can benefit your community and the environment.

Step 1: Collection and Processing

There are several methods for collecting recyclables, including curbside collection, drop-off centers, and deposit or refund programs. Visit How do I recycle… Common Recyclables
After collection, recyclables are sent to a recovery facility to be sorted, cleaned, and processed into materials that can be used in manufacturing. Recyclables are bought and sold just like raw materials would be, and prices go up and down depending on supply and demand in the United States and the world.

Step 2: Manufacturing

More and more of today's products are being manufactured with recycled content. Common household items that contain recycled materials include the following:

- Newspapers and paper towels
- Aluminum, plastic, and glass soft drink containers
- Steel cans
- Plastic laundry detergent bottles

Recycled materials are also used in new ways such as recovered glass in asphalt to pave roads or recovered plastic in carpeting and park benches.

Step 3: Purchasing New Products Made from Recycled Materials

You help close the recycling loop by buying new products made from recycled materials. There are thousands of products that contain recycled content. When you go shopping, look for the following:

- Products that can be easily recycled
- Products that contain recycled content

Below are some of the terms used:

- Recycled-content product – The product was manufactured with recycled materials either collected from a recycling program or waste recovered during the normal manufacturing process. The label will sometimes include how much of the content was from recycled materials.
- Post-consumer content – Very similar to recycled content, but the material comes only from recyclables collected from consumers or businesses through a recycling program.
- Recyclable product – Products that can be collected, processed, and manufactured into new products after they have been used. These products do not necessarily contain recycled materials. Remember not all kinds of recyclables may be collected in your community so be sure to check with your local recycling program before you buy.

Some of the common products you can find that can be made with recycled content include the following:

- Aluminum cans
- Car bumpers
- Carpeting
- Cereal boxes
- Comic books
- Egg cartons
- Glass containers
- Laundry detergent bottles
- Motor oil
- Nails
- Newspapers
- Paper towels
- Steel products
- Trash bags

On America Recycles Day 2019 (November 15), EPA recognized the importance and impact of recycling, which has contributed to American prosperity and the protection of our environment. The recycling rate has increased from less than 7 percent in 1960 to the current rate of over 35 percent. An EPA study found that every 10,000 tons of materials recycled supports nearly 16 jobs and $760,000 in wages.

Composting involves collecting organic waste, such as food scraps and yard trimmings, and storing it under conditions designed to help it break down naturally. This resulting compost can then be used as a natural fertilizer.