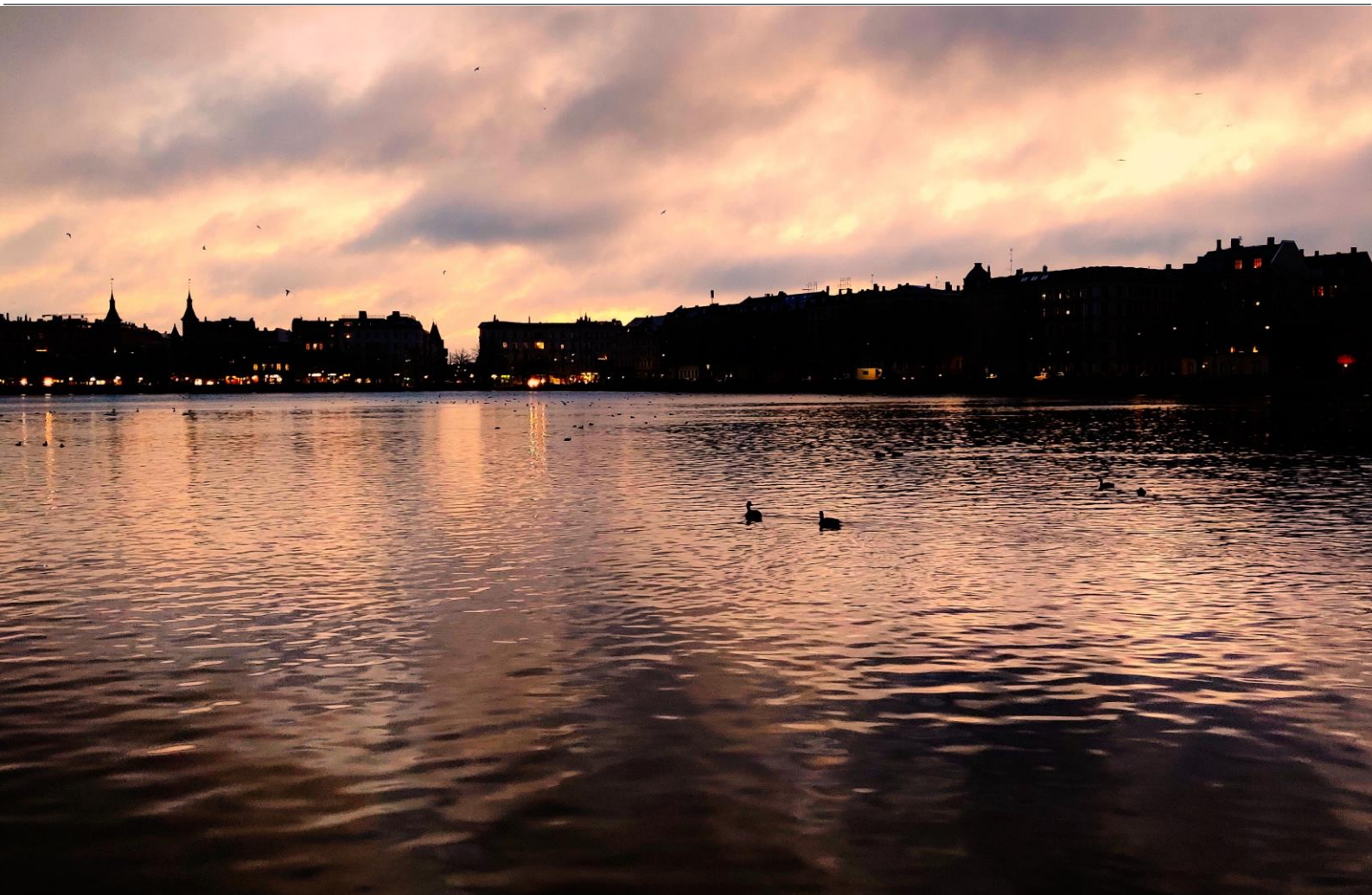


## Circular economy country profile – Germany



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## **Publication Date**

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## Introduction

The European Commission requested the EEA to produce EU country profiles that offer an updated view of the following elements:



- circular economy policies being implemented at a national level with a particular focus on elements that go beyond EU mandatory elements; and
- best practice with a focus on policy innovation.

While implementing the EU Circular Economy Action Plan (CEAP 2020), Member States are encouraged to advance circularity at a national level by adopting policies and initiatives that go beyond EU regulations, while preserving the Single Market.

This circular economy country profile is based on information reported by the Eionet network and, in particular, the Eionet Group on Circular Economy and Resource Use in the second quarter of 2022. The information was reviewed and edited by the European Topic Centre on Circular economy and resource use (ETC CE). A selection of Eurostat data was made to further complement this country profile.

The information is current as of 23 September 2022 (final review), when members of Eionet verified the content of this profile.

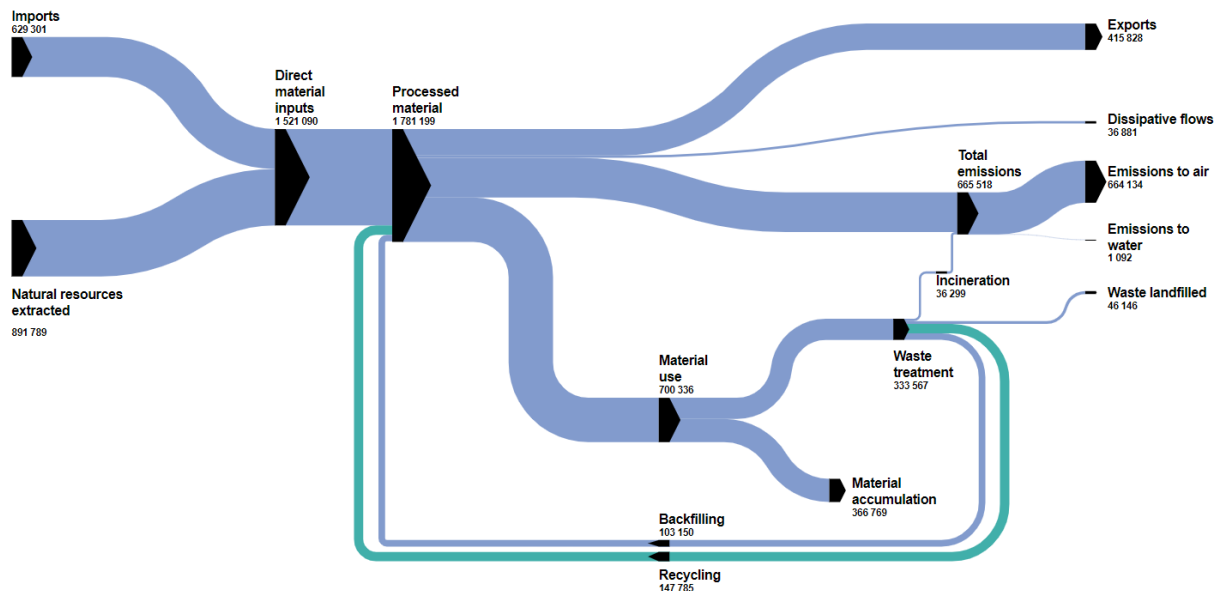
## Germany – facts and figures

 	<p><b>GDP:</b> EUR 3 367.6 billion (25.1 % of EU27 total in 2020)</p>
	<p><b>GDP per person:</b> EUR 40 490 (purchasing power standard) (122.4 % of EU27 average per person figure in 2020)</p>
	<p><b>Use of materials (domestic material consumption (DMC))</b>            1 105.3 million tonnes DMC (18.4 % of EU27 total in 2020)            13.3 tonnes DMC per person (98.7 % of EU27 average per person in 2020)</p>
	<p><b>Structure of the economy:</b>            Agriculture: 0.8 %            Industry: 20.3 %            Services: 69.9 %</p>
	<p><b>Employment in circular sectors:</b>            680 199 are employed in circular economy (CE) (19.2 % of EU total in 2018)            People employed expressed as a percentage of total employment:            1.5 % (EU average 1.7 %)</p>
	<p><b>Surface area:</b> 357 376 square kilometres (8.0 % of EU27 total)</p>
	<p><b>Population:</b> 83 166 711 (18.6 % of EU27 total in 2020)</p>

Note: all definitions and metadata used in this profile are taken, as shown, from Eurostat

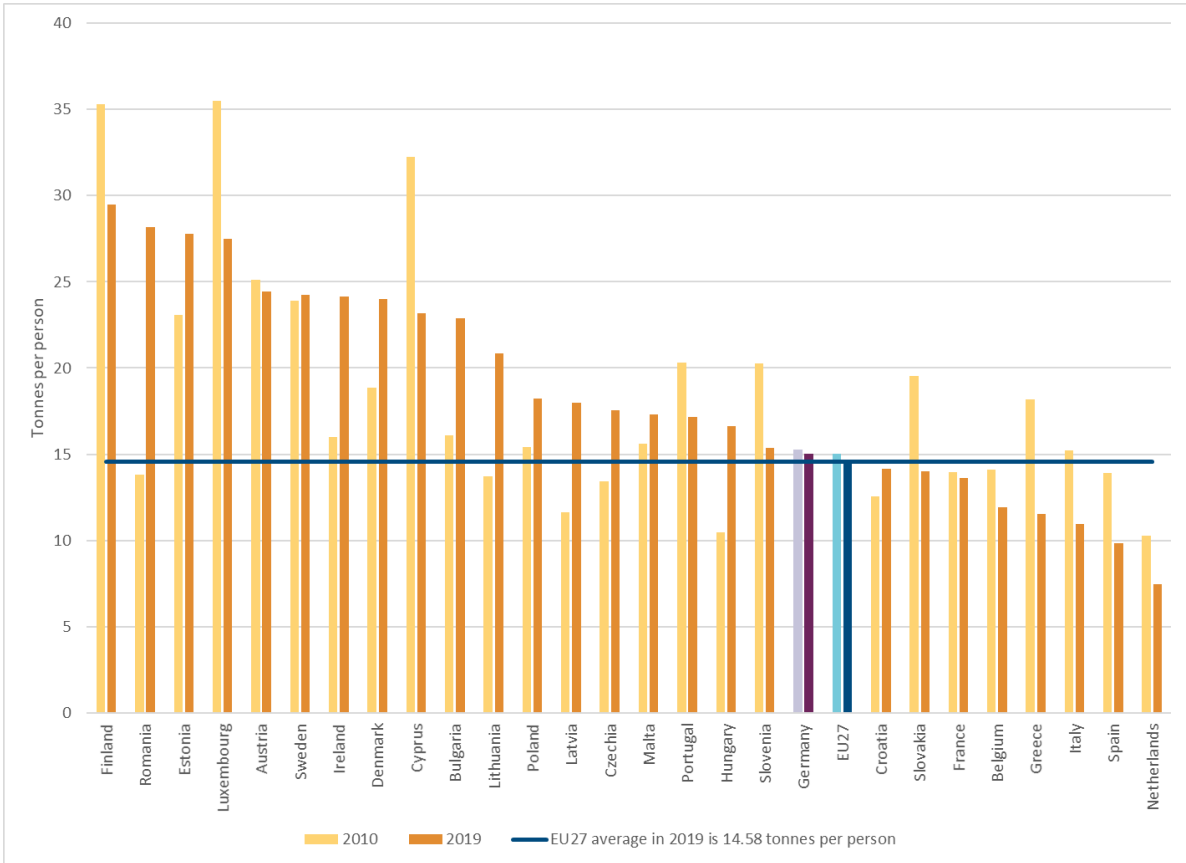
Source: Eurostat datasets, EU27 2020 (accessed 20 June 2022)

Figure 1 Material flow diagram for Germany in 2020, '000 tonnes



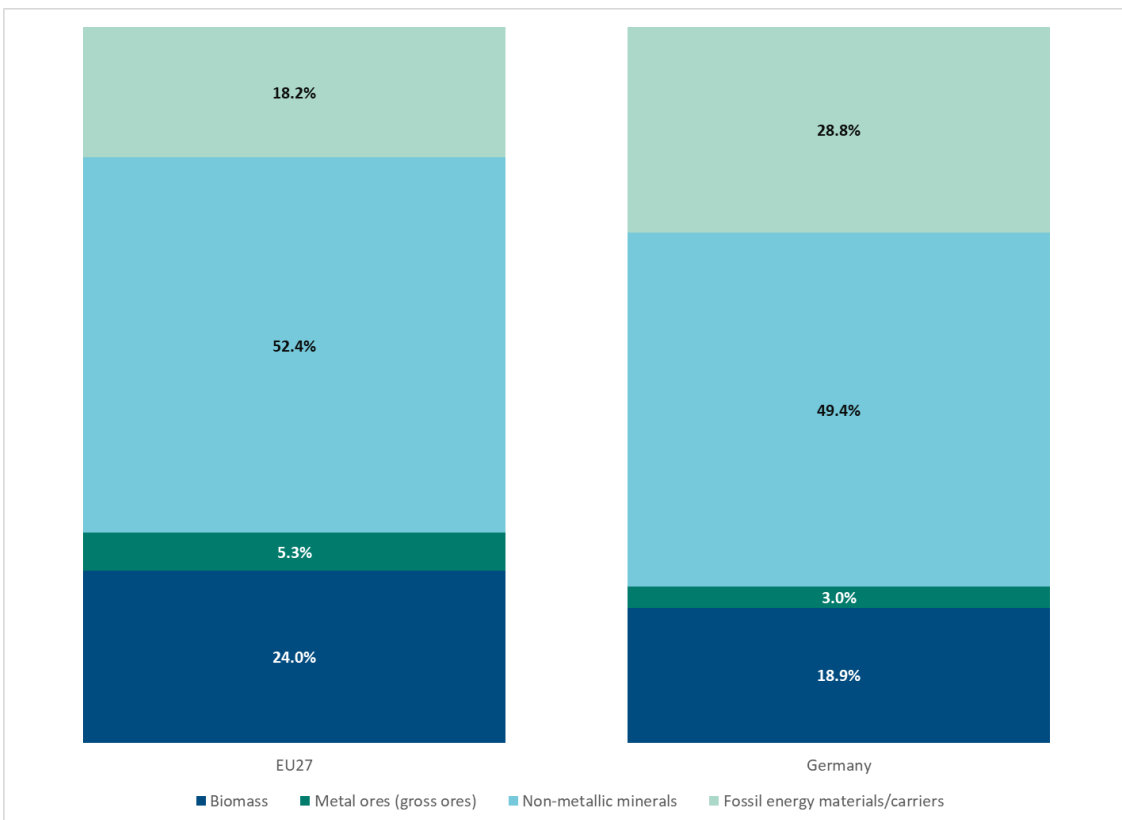
Source: Eurostat (2022) [env\_ac\_mfa], [en\_ac\_sd], [env\_wassd] (accessed 20 June 2022)

**Figure 2 Material footprint (raw material consumption), EU27, 2010 and 2019, tonnes per person**



Source: Eurostat (2020) [env\_ac\_rme] (accessed 4 July 2020)

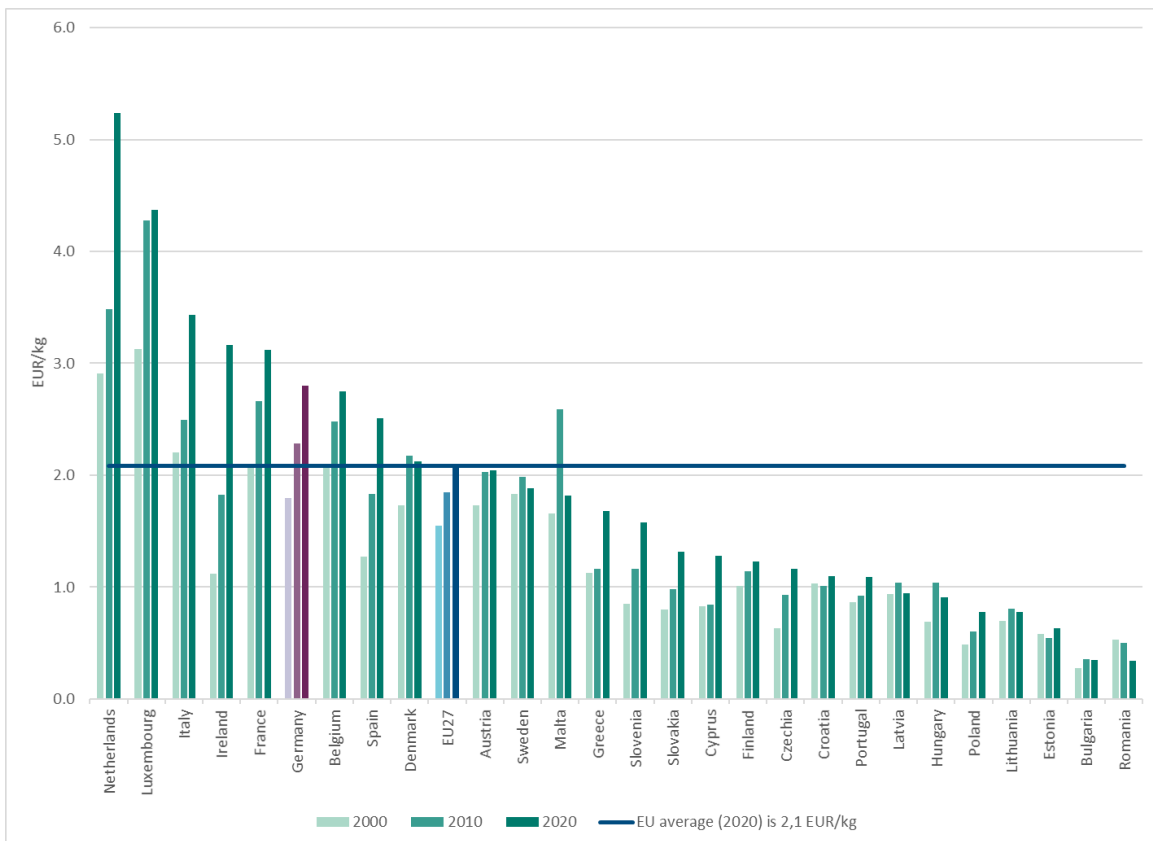
**Figure 3 Domestic material consumption by selected material category, EU27 and Germany, 2020, per cent**



Note: totals may not sum to 100 % due to rounding

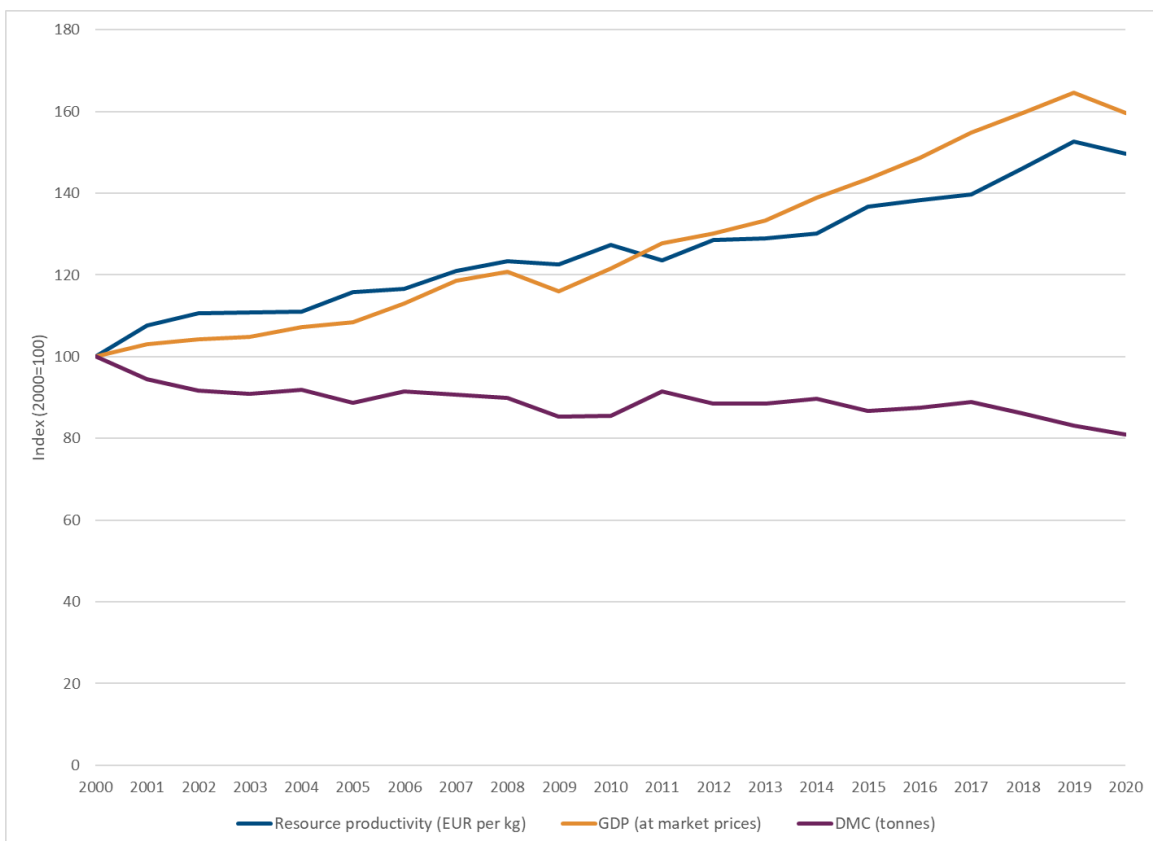
Source: Eurostat (2022) [env\_ac\_mfa] (accessed 20 June 2022)

**Figure 4 Resource productivity (gross domestic product/domestic material consumption), EU27, 2000, 2010 and 2020, EUR per kilogram**



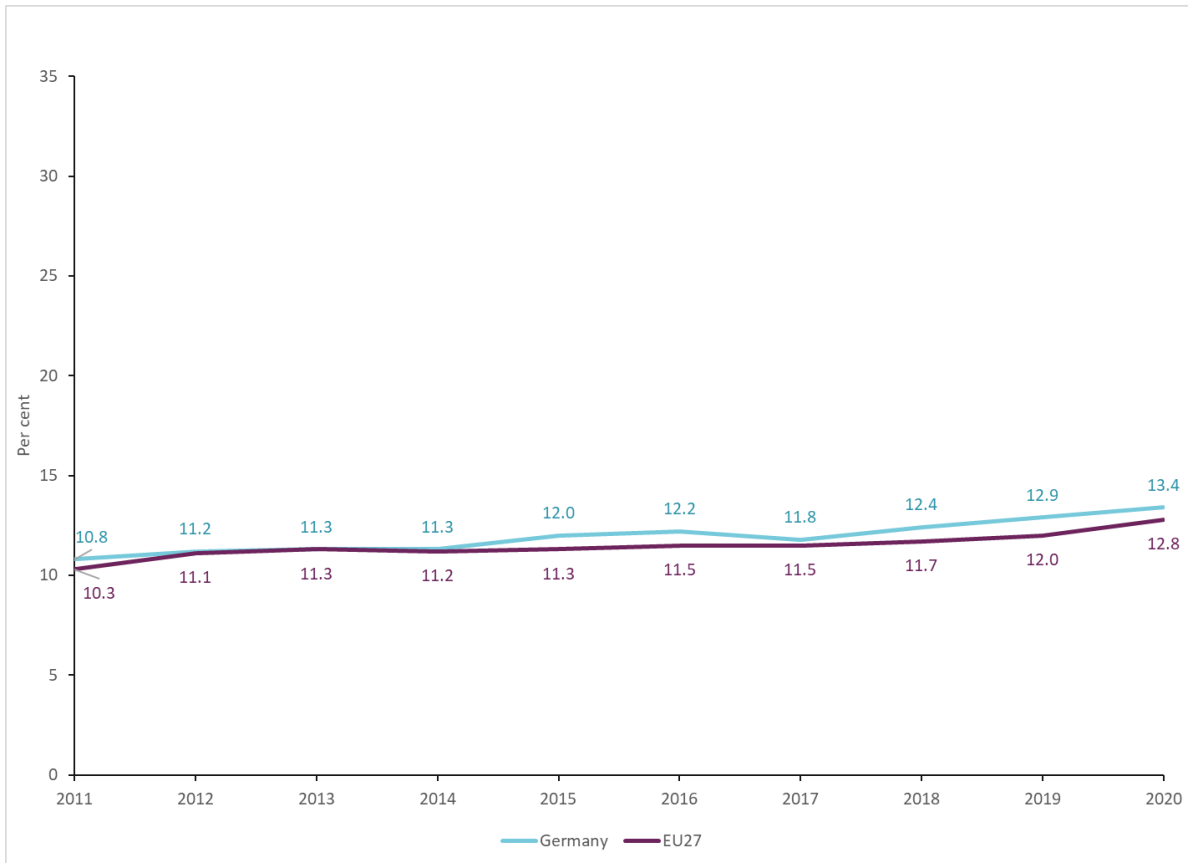
Source: Eurostat (2022) [env\_ac\_rp] (accessed 20 June 2022)

**Figure 5 Gross domestic product, domestic material consumption and resource productivity trends, Germany, 2000–2020, index (2000=100)**



Source: Eurostat [env\_ac\_mfa], [env\_ac\_rp] & [nama\_10\_gdp] (accessed 4 July 2022)

Figure 6 Circular material use rate in Germany, 2011–2020, per cent



Source: Eurostat (2022) [env\_ac\_cur] (accessed 20 June 2022)



## Existing policy framework

### Dedicated strategy, roadmap or action plan for circular economy

Even though the German Resource Efficiency Programme<sup>1</sup> was not developed and published as a dedicated CE strategy, its second update (ProgRess III<sup>2</sup>), published in June 2020, can be interpreted as such.

The overarching goal of the **German Resource Efficiency Programme (ProgRess)** is to make the extraction and use of natural resources more sustainable and meet the country's responsibility to future generations by helping to secure the natural foundations of life for the long term. To achieve this goal, ProgRess III describes measures that can contribute to the conservation of natural resources by increasing resource efficiency. These measures are mainly presented along the value chain, from the extraction of raw materials to product design, production and consumption through to waste management, i.e., its avoidance and recycling. ProgRess III also aims to close material cycles as far as possible and emphasises the special importance of product design in this context. With its nearly 120 measures along the whole value chain and various overarching measures, ProgRess III is considering all 10 R-strategies<sup>(3)</sup> of a CE. It is important to note, however, that ProgRess III focusses on the material use of abiotic and biotic raw materials, as other natural resources, such as water, land and soil, are addressed by specific policies and strategies. The use of fossil and biotic resources for energy generation is addressed in a range of other strategies and measures in connection with Germany's energy transition. In addition, natural resources such as water, air, land and soil as well as ecosystem services and biotic resources such as food and feed are already incorporated in various programmes, processes or legislation, so are excluded from the scope of ProgRess III.

#### The main objectives of ProgRess III:

- to decouple economic growth as far as possible from resource consumption and reduce associated environmental burdens: this objective is mainly monitored with the indicator-based target on total material productivity. The goal for this indicator is to continue the trend of the years 2000–2010, an annual increase of 1.5 % on average, until the 2030.
- to make the German economy more future-proof and competitive, thus promoting stable employment and social cohesion.

#### ProgRess is based on the following four guiding principles:

1. combining ecological necessities with economic opportunities, innovation and social responsibility;
2. see global responsibility as the central orientation of Germany's national resource policy;
3. gradually make the German economy and production methods in Germany less dependent on primary raw materials, and further develop and expand the recycling economy;
4. ensure the sustainable use of resources in the long term through social orientation towards qualitative growth.

Compared to the two predecessor programmes (ProgRess I and II), ProgRess III was expanded and supplemented to further develop it as a CE strategy.

Primarily, ProgRess III stresses the importance of resource efficiency for achieving Germany's climate targets and analyses the potential and risks of a digital transformation with respect to resource efficiency. Beside measures to increase resource efficiency along the value chain, from raw material extraction, product design, production and consumption to the recycling economy, i.e., its avoidance and recycling of

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<sup>1</sup> <https://www.bmuv.de/en/topics/water-resources-waste/resource-efficiency/german-resource-efficiency-programme-progress-an-overview>

<sup>2</sup> <https://www.bmuv.de/publikation/deutsches-ressourceneffizienzprogramm-iii-2020-bis-2023> (in German)

<sup>3</sup> Refuse, rethink, reduce, re-use, repair, refurbish, remanufacture, repurpose, recycle, recover

waste, ProgRes III also aims to close material cycles as far as possible and emphasises the particular importance of product design in this context.

In addition, it contains measures for three consumption domains – working and living, mobility, and information and communication – to create the necessary framework conditions for the transformation to a resource-efficient society and sustainable consumption. Furthermore, for the first time ProgRes III identifies priority measures that are expected to make a particularly large contribution to resource efficiency or are intended to respond to important current challenges.

Lastly, the development of ProgRes III was supported by a citizens' dialogue, which focused on measures that are particularly relevant for citizens and where they can be involved in the implementation. The resulting Citizen's Advice has been attached to the programme as an appendix.

Although ProgRes can now also be understood as a CE strategy, the Federal Government elected in 2021 has decided in its coalition agreement to develop a CE strategy that will combine the Federal Government's raw material-relevant strategies and programmes, which already show overlaps and duplications in some fields of action. The examination of merging ProgRes and the waste prevention programme was announced in ProgRes III. In addition to this, the new CE strategy will probably include elements of the raw materials strategy, the bio-economy strategy and the programme for sustainable consumption. Work on this started in 2022.

### Circular economy policy elements included in other policies

Circular economy policy element	Included in policy
Promotion of regional second-hand shops	<a href="#">Waste Prevention Programme (WPP)</a> (2013, updated in 2020) (in German)
Criteria for strengthening the CE for products	<a href="#">Eco-label Blue Angel</a>
Promotion of reusable packaging	<a href="#">Waste Prevention Programme (WPP)</a> (in German); <a href="#">German Packaging Act</a> (as of 2021) (in German)
Incentives for producers to use either materials/material mixes for sales or grouped packaging (including shipping packaging) which can be recycled to a high degree or use recycled material for such packaging	<a href="#">German Packaging Act</a> (2021) (in German)
Annual reporting duty for dual systems (producer responsibility organisations responsible for setting the incentives for the recyclability of packaging) on implementing the incentives	<a href="#">German Packaging Act</a> , Section 21 para. 1, 2 (in German)
Establishment and publication of annual minimum standard for determining the recyclability of packaging	<a href="#">German Packaging Act</a> (2021), Section 21 para. 3 (in German)
Promotion of reusable beverage packaging	<a href="#">German Packaging Act</a> Section 1 para 3 (in German)
Deposit and take-back obligations for single-use beverage packaging	<a href="#">German Packaging Act</a> Section 31 (in German)
Recycling target for sales and grouped packaging (including shipping packaging); obligatory volume flow record <sup>4</sup>	<a href="#">German Packaging Act</a> Section 16 para 1-6, section 17 (in German)
Duties for producers and distributors of certain packaging concerning take-back and waste recovery	<a href="#">German Packaging Act</a> Section 15 para 3 (in German)
Requirement to develop, produce and sell packaging in such a way that reuse or waste	<a href="#">German Packaging Act</a> Section 4, no. 2, 4 (in German)

<sup>4</sup> Volume of packaging material participating in the system and the quantities collected and on the quantities sent for preparation for re-use, recycling, mechanical recycling or energy recovery (see [German Packaging Act \(Section 17\)](#))

Circular economy policy element	Included in policy
recovery, including recycling, in accordance with the waste hierarchy, is possible and the environmental impact is limited to a minimum	
Description of waste prevention measures	German Circular Economy Act <a href="#">Section 46 para. 2</a> (in German) <a href="#">German Packaging Act Section 14 para. 3</a> (in German)
Further development of existing treatment requirements for waste electrical and electronic equipment (WEEE) with regard to the management of natural resources/resource efficiency	<a href="#">WEEE treatment ordinance</a> (in German)
Increased focus of public procurement on resource-saving and waste-avoiding products	German Circular Economy Act <a href="#">§ 45 KrWG - Einzelnorm (gesetze-im-internet.de)</a> (in German)
Worldwide promotion of projects on waste and the CE (e.g., recycling and reuse of old electrical appliances, solar panels and batteries) and advice for partner governments on sustainable circular economy concepts (e.g., product design, awareness raising, innovative business models and the development of recycling infrastructure)	<a href="#">Raw Materials Strategy</a> (update 2019) , p. 23 (in German)
Support of research and development (R&D) projects in the fields of processing technology and metallurgy to optimise complex recycling processes, in particular regarding rare earths elements – indium, gallium, germanium, lithium, etc. Support, also, for innovative design concepts and new business models to extend the use of products – the aim is the development a resource-efficient circular recycling economy.	<a href="#">Raw Materials Strategy</a> (update 2019), Measure 12, p. 24/25 (in German)
Platform for dialogues to enhance the recycling of metals and mineral raw materials	<a href="#">Raw Materials Strategy</a> (update 2019), Measure 13, p. 26 (in German)
Sustainable consumption: change in consumption patterns and consumer behaviour; many measures in different consumption areas (buildings, energy use, mobility, nutrition, textiles, and products); will be supported with an indicator set on sustainable consumption (expected to become public in 2022). The Programme also has an institutional basis within ministries and national agencies, which run a national network on sustainable consumption and provide communication materials and expertise to the public	<a href="#">German National Programme on Sustainable Consumption</a> (2016, update 2021)
Food waste reduction	<a href="#">National Strategy for Food Waste Reduction</a> (2019)
Funding and research to foster sustainable business, in cycles	<a href="#">High-Tech strategy 2025</a> (in German)

## Monitoring and targets

### Assessment of circular economy performance

To date, there is no official assessment of Germany's performance within the EU CE Monitoring framework. Therefore, a more general assessment of the overall trends is given here.

Even though the amount of municipal waste in Germany is still relatively high, also in comparison to other European countries, a slight downward trend could be observed until the Corona pandemic. It should be noted that despite the only slightly reduced amount of waste, the goal of decoupling the amount of waste from economic growth was achieved: while the German economy grew by 25 % and the number of households by 8 % between 2002 and 2019, the amount of municipal waste decreased during this period. The increase in 2020 is probably due to the Corona pandemic, such as the significantly increased volume of packaging waste.

Further efforts are nevertheless needed to reduce waste volumes at all stages of the value chain. The recycling rate of municipal waste in Germany increased from 56 % in 2002 to 68 % in 2019. This means that the target set by the Federal Government to increase the recycling rate of municipal waste to 65 % by 2020 has been achieved. There is still a need, however, for action in individual subgroups of municipal waste.

With respect to packaging waste, Germany has a relatively high recycling rate, which is in line with the EU average, despite the increasing amount of packaging waste. Due to technical development and progressive waste management in Germany, however, the possibilities are far from exhausted.

With regard to the development of the Circular material use rate (CMUR) in Germany, a study was published in 2021 <sup>(5)</sup>. It shows that the development of the CMUR is relatively constant and near to the EU average. The values for the individual material groups, however, differ greatly. For fossil raw materials, which are predominantly incinerated, the CMUR is lowest at a good 2 %. For metals that can be recycled very well, the CMUR is highest, at just under one third. The study also compared the development of CMUR in Germany with that in other EU countries. It concludes that different developments can be explained on the one hand by differences in raw material consumption and waste management, and by differences in the management of collection and allocation of waste, on the other hand. In addition to this, it is stated that the trade of recycled waste accounts for a fairly small share overall. For non-metallic minerals, the share of traded wastes in the volume generated in Germany is lowest at 1–2 %, while for metal scrap, which is imported and exported to a greater extent, it is highest at around 40 % and 73 % respectively.

### Circular economy monitoring frameworks and their indicators beyond the ones from Eurostat

Currently, there is no official CE monitoring in Germany. The development of a corresponding monitoring system is, however, planned as part of the preparation of the new CE strategy.

At present, various indicators and indicator systems, related to different strategies in the individual sections of the material cycle, are used.

- **ProgRes III** uses the following indicators:
  - **Total raw material productivity:** the value of all goods delivered to the last use (in Euros, price-adjusted) in relation to the mass of raw materials used for production at home and abroad (in tonnes).

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<sup>5</sup> Dittrich et. al (2021): Sekundärrohstoffe in Deutschland.  
[https://www.nabu.de/imperia/md/content/nabude/konsumressourcenmuell/2104-22-ifeu-studie-sekundaerrohstoffe\\_in\\_deutschland.pdf](https://www.nabu.de/imperia/md/content/nabude/konsumressourcenmuell/2104-22-ifeu-studie-sekundaerrohstoffe_in_deutschland.pdf) (in German)

- **Raw material consumption per person** (or material footprint): this represents the mass of raw materials used for domestic use, i.e., for consumption and investment, for example, for the construction of infrastructure, per person.
- **Direct effect of recovery and Direct and indirect effect of recovery:** the Direct Effect of Recovery (DERec) shows the extent to which primary raw materials, semi-finished and finished goods are imported or production patterns and technologies would have to be imported or extracted domestically if no recycling of secondary raw materials would take place. The Direct and Indirect Effects of Recovery (DIERec) shows the extent to which primary raw materials would have to be extracted globally, assuming the same production patterns and technologies, if no recycling of secondary raw materials were to take place. Both indicators were only calculated on an irregular basis and a regular update is currently not planned.

**Waste-related and recycling indicators** are reported mainly with regard to the respective legal acts, such as the German Packing Act, or strategies, including the Waste Prevention Programme. For example, general statistics on waste management such as waste arisings, waste intensity, decoupling of waste generation from economic development or transboundary shipment of waste are reported on an annual basis, in general online on different websites.

Most indicators are calculated and published by the Federal Statistical Office <sup>(6)</sup>. In addition, the Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection <sup>(7)</sup> and the German Environment Agency <sup>(8)</sup> re-publish these indicators including an assessment of selected indicators.

An indicator framework for the National Programme on Sustainable Consumption is presently under development.

### Circular economy targets

- ProgRes III focusses on economy-wide targets related to total raw material productivity. The Federal Government's goal for this indicator is to continue the trend of the years 2000–2010, an average annual increase of 1.5 %, to 2030. The recycling and waste related targets are now set in the respective legal acts, such as the German Packing Act.
- In addition, the German Resource Efficiency Programme (ProgRes II) defines targets for recycling and secondary material use, e.g., a permanent increase in the recycling rate for municipal waste to more than 65 % from 2020 onwards or a collection rate of WEEE of at least 65 % from 2019 onwards. Besides such waste related targets, there is no specific CE target in Germany. No targets have yet been set for DERec and DIERec.
- The use of, as well as a target definition for, CMUR in Germany is currently being discussed, but so far neither the CMU rate is reported officially nor a desired development defined.

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<sup>6</sup> [https://www.destatis.de/EN/Themes/Society-Environment/Environment/Waste-Management/\\_node.html](https://www.destatis.de/EN/Themes/Society-Environment/Environment/Waste-Management/_node.html)

<sup>7</sup> <https://www.bmu.de/en/topics/water-resources-waste/circular-economy/statistics-on-the-different-areas-of-waste-management>

<sup>8</sup> <https://www.umweltbundesamt.de/daten/ressourcen-abfall> (in German) and <https://www.umweltbundesamt.de/en/data/environmental-indicators>

## Innovative approaches and good practice

### Examples of public policy initiatives (national, regional or local)

- ➔ *Good practice examples: product-related policies, including on the R-strategies (repair, reuse, remanufacturing, etc.)*

#### **Repair Bonus in Thuringia** <sup>(9)</sup>

The repair bonus is a financial incentive (repair premium) for the repair of electrical and electronic devices in the German Federal State Thuringia. Local people of Thuringia who repaired a broken household electrical appliance are reimbursed half of the repair costs - up to a maximum of 100 euros per person and calendar year. The Repair Bonus Thuringia is a joint project of the Thuringian Ministry for the Environment and the Consumer Advice Centre Thuringia.

#### **Hessian ReUse Network** <sup>(10)</sup>

In implementation of the Resource Conservation Strategy, the State of Hesse has commissioned *gemeinnützige Gesellschaft für Wiederverwendung und Recycling mbH* (GWR) to establish a Hesse-wide ReUse network. The two-year project is funded in equal parts by the Hessian Ministry of the Environment and the Environmental Agency of the City of Frankfurt am Main. The ReUse network is intended to promote communication and the exchange of information between recyclers and reusers in Hessen, so that best practice can spread quickly within the state and synergies can be optimally utilised. In the two-year project phase that began in mid-February 2021, a concept for a network structure will be developed. This will also include proposals for securing the organisation and financing of the network in the long term.

One task of the network is the joint development of a vision. This can result, for example, in common positions for strengthening the second-hand market, common marketing strategies, clear quality requirements for second-hand products, an umbrella brand and cooperation with other networks. In this way, effective contributions can be made to the comprehensive CE with a focus on the efficient use of raw materials by extending the life of products. Potential actors for cooperation in the network are organisations with headquarters or branches in Hessen from the fields of re-use and repair centres, recycling centres and specialist disposal companies, regionally and locally sponsored second-hand shops and other second-hand shops and repair initiatives. The aim is to create a close-knit network with strong regional clusters in northern, central and southern Hesse.

#### **Re-Use Berlin initiative** <sup>(11)</sup>

The Re-Use Berlin initiative of the Berlin Senate's Department for the Environment, Transport and Climate Protection aims to strengthen the market for second-hand goods, including electronic equipment, in Berlin. To this end, comprehensive conceptual and operational measures have been implemented, such a website that informs citizens where they can drop off and purchase second-hand goods, the bundling of existing second-hand shops in Berlin in a network and the development and establishment of an umbrella brand as well as the implementation of competitions through which ideas were sought from the city's population to strengthen reuse in Berlin. So far, the city of Berlin has established three centres for re-use: the *NochMall* and the Re-Use Supersore, which are huge second-hand warehouses. The Re-Use Centre for climate-friendly resource use<sup>12</sup>, established in June 2021, focusses on, beside shopping for second-hand goods, sharing, repairing and upcycling. It offers, for example, bicycle repairs, a repair café and open workshops for the repair and upcycling for textiles. In addition, it offers a zero-waste construction and creative market, where someone can get second-hand battens, fabrics, hardware, sheet metal, beams, felts and fleeces, paints, decorations, tarpaulins and more.

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<sup>9</sup> <https://www.reparaturbonus-thueringen.de/so-funktioniert-der-reparaturbonus-thueringen> (in German)

<sup>10</sup> <https://www.re-use-hessen.de/> (in German)

<sup>11</sup> <https://www.berlin.de/sen/uvk/umwelt/kreislaufwirtschaft/projekte/re-use-berlin/> (in German)

<sup>12</sup> <https://www.berlin.de/sen/uvk/umwelt/kreislaufwirtschaft/projekte/re-use-berlin/re-use-zentrum/>

→ *Good practice example: research and innovation; awareness-raising*

### **German Ecodesign Award** <sup>(13)</sup>

The German Ecodesign Award recognises sustainable products, services and concepts, the design of which are outstanding. Since 2012, the award has been given annually by the Federal Ministry for the Environment and the German Environment Agency in cooperation with the International Design Centre Berlin.

The German Ecodesign Award is aimed at companies in all sectors and of all sizes, as well as individual designers. Startups or market leaders, local providers or global players are all eligible, alongside design studios, marketing agencies, and architectural and engineering offices. It is essential that the submitted product is available on the German market, or in the case of services and concepts that they are oriented towards the home market. International companies are permitted to participate in the competition under these premises. The competition is not limited to specific product groups, industries or design sectors. Possible subject areas include sustainable construction and housing, nutrition, interiors, communication, mobility and fashion. Products, which are available on the German market or exist as market-ready prototypes that are soon to be released to it compete in the product category; services and system solutions compete in the service category under conditions, while pioneering concepts, studies and pilot projects are considered in the concept category.

→ *Good practice example: financial support programme, education (consultancy and training), innovative business models*

### **Circular Economy Initiative Germany** <sup>(14)</sup>

With funding from the German Federal Ministry of Education and Research (BMBF), the Circular Economy Initiative Germany was initiated in 2019. The initiative was carried out under the guidance of the German Academy of Science and Engineering (Acatech) in cooperation with SYSTEMIQ, a consulting agency.

In three interdisciplinary and cross-sectoral working groups on the topics of circular business models, traction batteries and packaging, some 130 experts from more than 50 institutions from science, industry, politics and civil society discussed how to enable and establish CE systems. They explored potential fields of application and discussed what framework conditions could lead to its successful implementation. Specific recommendations for action were developed and summarised in the Circular Economy Roadmap for Germany. The Roadmap was published on 11 May 2021 and officially handed over to the Federal Ministry of Education and Research (BMBF).

→ *Good practice example: change in consumption patterns and consumer behaviour*

### **Citizen Science Project: Germany rescues food** <sup>(15)</sup>

Around half of all food waste in Germany is generated by private households. That is why the Citizen Science Project is looking into three questions:

- How do can food waste be avoided in our own kitchens?
- What quantities can be reduced?
- What measures are effective?

In the process, citizens themselves become researchers by first measuring the food waste in their own households and then checking which measures they can best use to reduce it. The core of the project is a digital kitchen diary in which food waste can be entered from the comfort of one's own home. The project is divided into three phases. Phase 1 starts with the use of the digital kitchen diary. This records what and how much food waste is produced each day and in total for a week. In the Phase 2, exciting activities to help reduce food waste are presented through a website. After selecting an action, it is

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<sup>13</sup> <https://www.bundespreis-ecodesign.de/en>

<sup>14</sup> <https://www.circular-economy-initiative.de/about-the-initiative>

<sup>15</sup> <https://www.zugutfuerdietonne.de/jetzt-engagieren/citizen-science> (in German)

implemented in everyday life. The final phase focusses once more on the digital kitchen diary; a record is kept for one week on how food handling behaviour has developed after the campaign period. All the data will be scientifically evaluated to figure out which measures work best to avoid food waste.

→ *Good practice example: change in consumption patterns and consumer behaviour, education (awareness-raising and training)*

#### **Network: LernOrt Nachhaltigkeit Rheinland-Pfalz (Rhineland-Palatinate as a place of learning) <sup>(16)</sup>**

The concept of extracurricular places for learning about waste or recycling management was developed by the Ministry for Climate Protection, Environment, Energy and Mobility of the Federal State of Rhineland-Palatinate, in cooperation with the Heidelberg University of Education. The basis of this concept was developed through experiential education, project teaching, value education and neurophysiological findings, according to which knowledge linked to positive experiences is retained more easily and for longer. For learning about waste, the extracurricular venues offer exemplary starting points for education on sustainable development, with the learning sites each focussing on certain waste management processes. Some of these are located at waste management facilities, with the facilities themselves included in the teaching. Due to the modular structure of the excursions, learning modules can be adapted and new ones added at any time. Excursions to learning sites are generally understood as an extension to the curriculum; a learning site can thus be visited several times in the course of pupils' educational careers with each visit focussing on different aspects. The activity and experience-oriented excursions, which are adapted to the age of the participants, are generally divided into an introductory phase, an information phase and a reflection phase.

#### **Campaign: Too Good to Go <sup>(17)</sup>**

In order to support the implementation of the Food Waste Strategy, the German government has developed the Too Good to Go campaign. The core is an information website that provides tips and advice on how to avoid food waste, from how to store food properly to recipe suggestions for using leftovers.

→ *Good practice example: research and innovation/financial support programmes*

#### **Funding measure: Resource-efficient Circular Economy – Innovative Product Cycles <sup>(18)</sup>**

The funding measure Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK) of the Federal Ministry of Education and Research (BMBF) supports the research and development of innovations for a resource-efficient CE. The aim of the research projects is to close product cycles by developing appropriate business models, design concepts and digital technologies, and thus to contribute to the implementation of a resource-efficient CE. The research results will then be transferred into economic practice and marketable products as quickly as possible in order to strengthen companies in Germany as competitive suppliers of CE solutions.

The projects address a broad range of topics and sectors. The projects focus on:

- promotion of the use of recycled materials;
- extension or intensification of product use;
- improving the recyclability of electric vehicles;
- optimisation and expansion of remanufacturing;
- general developments of the block chain.

In addition, the networking and transfer project RessWInn represents a central contact point for all participants in the ReziProK funding measure and supports the dialogue between the projects and beyond.

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<sup>16</sup> <https://mkuem.rlp.de/de/themen/klima-und-ressourcenschutz/kreislaufwirtschaft/ausserschulische-lernorte/> (in German)

<sup>17</sup> <https://www.zugutfuerdietonne.de/> (in German)

<sup>18</sup> <https://innovative-produktkreislaeufe.de/resswinn/en/>



### **Special programme: Circular Economy and Resource Efficiency** <sup>(19)</sup>

As part of the North Rhine-Westphalia programme to deal with the consequences of the Corona pandemic, the Federal State of North Rhine-Westphalia launched the Circular Economy and Resource Efficiency programme, to run until the end of 2022, with funds of EUR 10 million. The special programme supports companies in making their entire business processes cycle oriented and in developing new concepts for product design. Among other things, the State's successful Resource Efficiency. The North Rhine-Westphalia advisory programme is being expanded for this purpose. In addition, the State provides *pro rata* funding of up to EUR 500 000 for novel resource-efficient technologies or recycling technologies that are to be applied on a large scale for the first time.

### **Examples of private policy initiatives (sectoral)**

#### **Consumer information campaign: Plan E**

With Plan E, the Stiftung elektro-altgeräte register<sup>20</sup> has been educating the public about WEEE since 2019. The educational work is intended to contribute to a significant increase in the proper disposal of e-waste, to trigger climate-positive behaviour and to achieve the specified collection rate of 65 % in the long term. The Stiftung elektro-altgeräte register (stiftung ear) registers the producers of electrical and electronic equipment and coordinates the provision of collection containers and the collection of WEEE from the public waste management authorities in the Federal Republic of Germany. For this purpose, the German Environment Agency has partly transferred responsibility for WEEE from the Electrical and Electronic Equipment Act (ElektroG) to Stiftung elektro-altgeräte register.

#### **Extended producer responsibility is established for batteries, electrical and electronic equipment and packaging in Germany**

The respective producer registers are available online for the general public (Packaging register<sup>21</sup>; electrical and electronic equipment (EEE) register<sup>22</sup>; batteries register<sup>23</sup>). Making the registers public, free and available online at any time is essential for reducing free riding/avoiding producer responsibility obligations and thereby both lessening potential environmental harm and furthering fair competition between economic actors. It enables economic actors to confirm whether their business rivals/business partners – or their authorised representative – adhere to their producer responsibility obligations as well as making it possible for potential customers to make informed choices before buying a product. Additionally, it allows the responsible enforcement authorities to easily confirm whether a certain actor is adhering to the obligations. Producers/authorised representatives are required to report the amounts they place on the market in all three areas.

In Germany, anyone who places packaging filled with goods on the market for the first time on a commercial basis (Section 3 (14) of the Packaging Act) is a manufacturer/first distributor of packaging within the meaning of the Act. This applies to packaging that typically accumulates as waste with private final consumers or equivalent sources such as schools, hospitals, doctors and small businesses. They are required to register on the Packaging Register LUCID of the Central Agency Packaging Register<sup>24</sup> (ZSVR). They are also required to contract a so-called dual system with their amounts of packaging and therefore bear the costs of waste management for their packaging waste. The respective amounts of packaging must be reported to the system and the ZSVR – this reduces the risk of under reporting. From

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[https://www.lanuv.nrw.de/fileadmin/lanuv/landesamt/foerderprogramme/Sonderprogramm\\_Kreislaufwirtschaft\\_und\\_Ressourceneffizienz\\_/Sonderprogramm\\_Kreislaufwirtschaft\\_Circular\\_Economy\\_und\\_Ressourceneffizienz.pdf](https://www.lanuv.nrw.de/fileadmin/lanuv/landesamt/foerderprogramme/Sonderprogramm_Kreislaufwirtschaft_und_Ressourceneffizienz_/Sonderprogramm_Kreislaufwirtschaft_Circular_Economy_und_Ressourceneffizienz.pdf) (in German)

20 <https://www.stiftung-ear.de/en/home>

21 <https://oeffentliche-register.verpackungsregister.org/Producer> (in German)

22 <https://www.ear-system.de/ear-verzeichnis/hersteller#no-back> (in German)

23 <https://www.ear-system.de/ear-verzeichnis/battghersteller#no-back> (in German)

24 <https://www.verpackungsregister.org/en>

1 July 2022 onwards, **all producers** will be subject to registration with the ZSVR, i.e., also producers of packaging not subject to the system, such as reusable packaging. Further amendments to the Packaging Act can also be found on the ZSVR website <sup>(25)</sup>.

#### **reGIOcycle project (Bavaria)** <sup>(26)</sup>

The reGIOcycle project stands for avoidance, substitution and a sustainable CE for plastics using the example of the Augsburg region. Its goal is the development and testing of a feasible concept for a sustainable CE, with the participation of various actors and stakeholders from municipalities, research institutions and locally operating companies.

In Germany the so-called dual systems – producer responsibility organisations (PROs) – are responsible for setting the above-mentioned incentives for the **recyclability of packaging**. The minimum standard for determining the recyclability of packaging shows how it can be determined for the German market. Thereby recyclability always refers to high-quality and mechanical recycling by means of the sorting and processing methods actually available in practice<sup>27</sup>.

**For used EEE (UEEE)**, several rebuy and refurbish business models have been implemented<sup>28</sup>. This is a non-exhaustive list, as the Federal Environment Agency does not have a complete list of such firms available.

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<sup>25</sup> <https://www.verpackungsregister.org/en/information-orientation/knowledge-base/overview-of-amendments/changes-to-the-provisions-of-the-act-since-3-july-2021-1>

<sup>26</sup> <https://www.regiocyclus.de/> (in German)

<sup>27</sup> <https://www.verpackungsregister.org/en/foundation-authority/minimum-standard-pursuant-to-section-21/2021-edition>

<sup>28</sup> For example <https://www.refurbed.de/>, <https://www.rebuy.de/>, <https://www.afbshop.de/> (all in German)

## The way forward

### Addressing barriers and challenges

One remaining obstacle to the successful implementation of the CE in Germany is the unclear understanding of the term. In Germany, the term *Kreislaufwirtschaft* (CE) is understood to mean looking at the economy from the point of view of waste and thus more in the direction of closing the loop. Material cycles should be closed as far as possible by making waste available to the economy again as secondary raw materials. Waste is thus a valuable raw material that can be used effectively to conserve natural resources. This also leads to different strategies, programmes and legal regulations considering and addressing the different aspects of the CE. For example, the Closed Cycle Waste Management Act focusses on waste, recycling and closing material cycles. The Raw Materials Strategy focusses on the supply of raw materials, whereas the bioeconomy strategy has a particular focus on the use of biotic resources. The National Programme for Sustainable Consumption focusses on the consumption perspective. The resource efficiency programme ProgRes addresses the CE the most, as it takes the entire lifecycle and the entire value chain into account, and therefore the focus of the programme is also on the efficient use of raw materials. The different strategies and programmes do not overlap and are sometimes inconsistent, which impairs the implementation of the CE. The division between different strategies also means that there is no consistent system of indicators, which makes it difficult to monitor and evaluate measures to implement the CE.

In addition to these more institutional barriers, legal barriers in individual sectors and product flows also hamper successful implementation. For example, the use of recycled building materials is hampered by building regulations. A relevant barrier is also that in many consumer sectors, new products are still cheaper than the repair of products. Furthermore, a certain scepticism and restraint can still be seen both in the economy and in the area of private consumption. There is still some scepticism as to whether reused products or products made from secondary raw materials meet the same quality standards as new ones. This scepticism is also partly reinforced by the corresponding framework conditions. For example, the use of recycled construction materials is often still restricted by building regulations.

### Ranking types of barrier

High barrier ↑ Low barrier	Institutional challenge to develop policy for a complex cross-sectoral issue
	Market barriers for recycled resources
	Companies' ability to grasp opportunities      Consumer behaviour and awareness
	Good indicators and targets

### Future policy plans

#### → New Circular Economy Strategy

Germany has started to tackle these obstacles. The current government agreed to **develop a consistent CE strategy in the coming two years**, including a monitoring system and combining all relevant strategies already in place. The development of CE strategies has also begun at the level of the Federal States. In addition, various research and information campaigns support the transformation towards CE in companies as well as in personal consumption. An interesting composition of various measures is provided by the Circular Economy Initiative Germany led by the National Academy of Science and Engineering. They provided ten action points for achieving the transformation to a CE within their Circular Economy Roadmap for Germany<sup>29</sup>:

<sup>29</sup> [https://www.circular-economy-initiative.de/s/Circular-Economy-Roadmap-for-Germany\\_EN\\_Update-Dec-2021\\_DOI.pdf](https://www.circular-economy-initiative.de/s/Circular-Economy-Roadmap-for-Germany_EN_Update-Dec-2021_DOI.pdf)

- circular economy business models: data-driven use- and results-oriented service business models;
- standardisation: corresponding norms and standards within established national and international committees;
- transparency: make CE-relevant information commercially available;
- regulatory instruments: define a coherent product policy framework for the CE;
- economic incentives: set financial incentives in such a way as to encourage climate- and resource-optimal business decision making;
- infrastructure for reuse, continued use and recycling: accelerate the expansion and development of infrastructure for reuse, continued use and recycling;
- technical development and research: promote technology-neutral development of relevant material, product and process innovation with an environmental benefit;
- public procurement: boost demand for circular products and business models;
- institutional embedding: provide a central institutional body with the aim of ensuring Germany's transformation to a CE;
- Education and knowledge transfer: provide CE-relevant education and training to raise public awareness.

These ten action points are translated into policy recommendations for policy makers, business and academia.

#### → National recovery plan <sup>(30)</sup>

The **German national recovery plan** contains six focal areas with ten components in total. The first focal area Climate policy and energy transition is divided in three components: decarbonisation, climate-friendly mobility and climate-friendly building and refurbishment. CE-related activities (substitution and recycling) are included in the last component on building and refurbishment. According to the Recovery Plan, this will contribute to the energy transition and the achievement of the German 2030 climate targets. In the building sector, annual emissions are to be reduced from the current level of around 120 to 70 million tonnes of carbon dioxide by increasing energy efficiency and the share of renewable energy in final energy consumption for heating and cooling in buildings. In addition, the reduction of greenhouse gas emissions in the building sector is to be supported by flanking measures in the area of further development of timber construction, which can be seen as a CE measure with respect to the substitution of materials leading to less material demand. The component addresses the country-specific recommendation for investment in Environmental Change, in particular housing and the flagship, renovation.

One main measure in this component is the further development of climate-friendly construction with wood. The aim of the measure is to accelerate the development, introduction and dissemination of innovative technologies, processes, products and services (digital transformation) to increase the use of wood as a climate-friendly building material. The measure is also intended to help remove structural disadvantages and obstacles in order to promote timber construction in large-volume, multi-storey construction on an equal footing. The measure also aims to improve the networking and cooperation between companies, institutions, science and research, thereby helping to overcome obstacles and structural disadvantages in the further development of climate-friendly construction with wood and the optimisation of material and energy efficiency in the production and business process.

The main activities foreseen include area advisory services – analyses, assessments and recommendations – with the aim of increasing the use of softwood/deciduous wood as a construction material and the promotion of innovation clusters. This measure addresses the CE in two ways:

- (i) the substitution of steel and concrete with wood can reduce the overall material demand of a building, especially along the value chain with regard to use of fossil energy;

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<sup>30</sup> [Recovery and Resilience Facility | European Commission \(europa.eu\)](https://ec.europa.eu/euipo/euipo-recovery-and-resilience-facility/)

- (ii) timber construction is often done with prefabricated components and in modular systems which normally reduce offcuts and other wastes.

A second measure is called **Carbon dioxide building refurbishment: Federal funding for efficient buildings**. The aim of the measure is to stimulate investment that increase energy efficiency and the share of renewable energy for heating and cooling in residential and non-residential buildings in Germany and to reduce the carbon dioxide emissions of the building sector.

The measure obliges those carrying out the building renovation to ensure that at least 70 % (by weight) of the non-hazardous construction and demolition waste generated on site is prepared for re-use, recycling and other material recovery. This is in accordance with the waste hierarchy and the EU Protocol on the Management of Construction and Demolition Waste, including backfilling operations where waste is used as a substitute for other materials. The measure also includes technical specifications for the durability, reparability and recyclability of the equipment for the production of energy from renewable sources.

European Topic Centre on  
Circular economy and resource use  
<https://www.eionet.europa.eu/etcs/etc-ce>

The European Topic Centre on Circular economy and  
resource use (ETC CE) is a consortium of European  
institutes under contract of the European  
Environment Agency.

