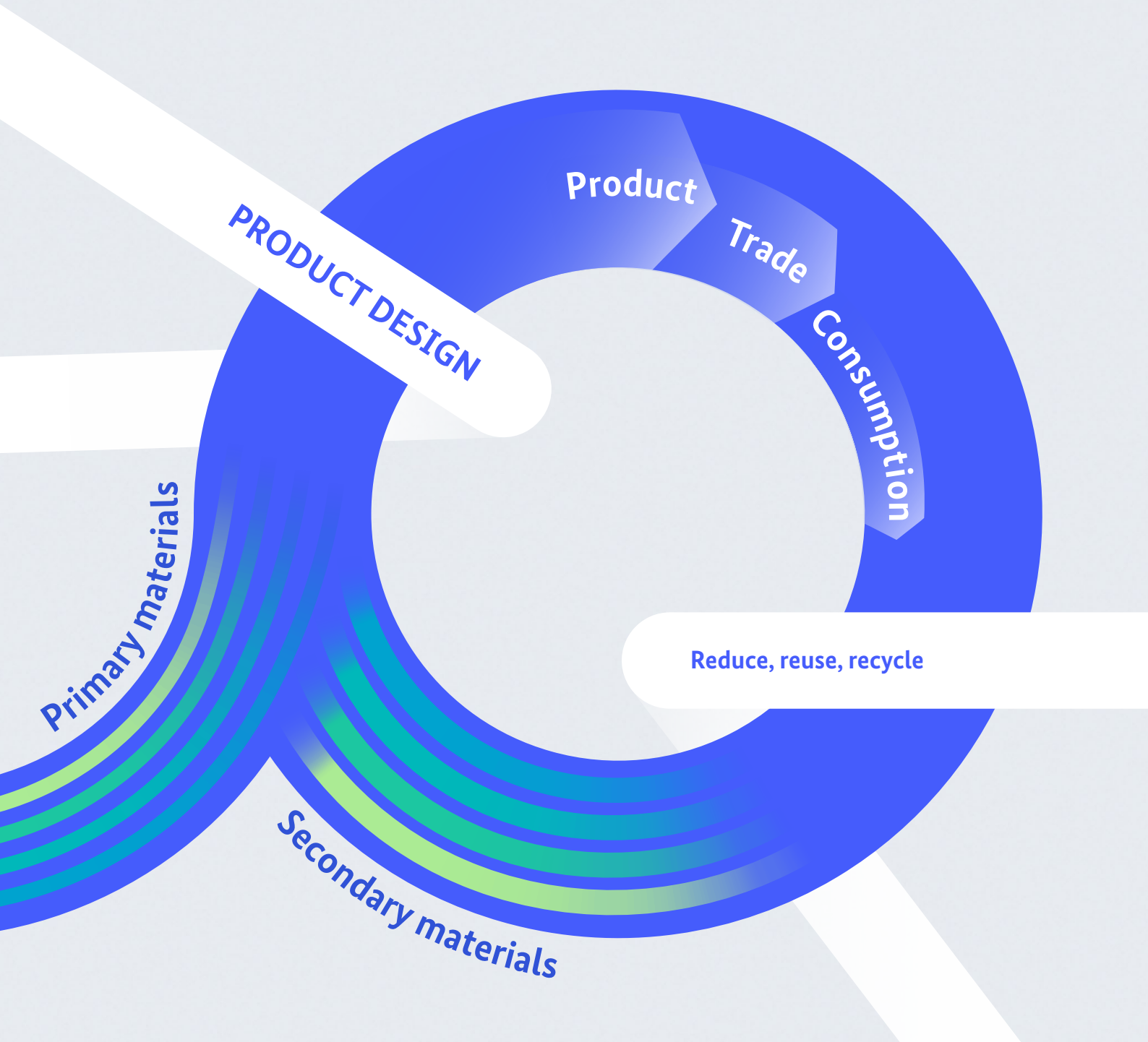
Federal Ministry
for the Environment, Nature Conservation,
Nuclear Safety and Consumer Protection

The National Circular Economy Strategy

Fundamentals for the process of transforming to a circular economy



Contents

Our starting point

The vision of a circular economy and the transformation to sustainability

The vision of a circular economy and the transformation to sustainability: the German Sustainable Development Strategy and the UN 2030 Agenda for Sustainable Development provide guidance for transforming to a more sustainable economy. Goal 12 of the 2030 Agenda for Sustainable Development calls for ensuring sustainable consumption and production patterns, particularly through sustainable management and efficient use of natural resources (Target 12.2). It also urges the progressive improvement of global resource efficiency in consumption and production and efforts to decouple economic growth from environmental degradation (Target 8.4).

A circular economy that spans all phases of material and product life cycles is a crucial element in achieving these Sustainable Development Goals and bringing about the transformation to a sustainable and carbon-neutral economy. This approach can considerably reduce the negative impacts of materials and products across their entire life cycles – for example, by saving primary materials and substituting secondary materials. The aim of circular economy is to conserve natural resources, protect the environment and human health and ensure a secure supply of raw materials. Circular economy can and needs to play role in climate action because of its strong potential to mitigate emissions of greenhouse gases.

Circular economy entails more than simply closing material cycles. It includes product design for extending product lifespans and improving repairability and resource-efficient production processes, among other things. We cannot lose sight of other product-specific aspects such as safety and the innovative potential of a product. The German government will therefore orient its strategy on the vision of circular economy that forms the basis for the EU Circular Economy Action Plan.[1,2]

1 In the EU action plan, circular economy covers all phases of the value chain – from product design and production to consumption, repair, waste management and return of secondary materials to the economy.
In Germany, the Circular Economy Act (KrWG) provides a legal definition that specifies how the term “circular economy” is used in the framework of the law: “Circular economy within the meaning of the present Act shall constitute the prevention and recovery of waste” (KrWG Section 3(19)).

2 See https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0098

With this environmental and climate policy basis, we want to examine production and consumption over the entire life cycle and highlight ways to fully harness opportunities for conserving resources through resource efficiency and circularity in all phases.

To do this, value creation as a whole must be designed to be as circular as possible. Because many value chains start in developing countries and emerging economies, German development cooperation also has a key role to play. The German government will review suitable market instruments and legal frameworks to give long-lasting and resource-efficient products the best chances on the market.

Political framework

The German government coalition partners have agreed to draw up a National Circular Economy Strategy (Nationale Kreislaufwirtschaftsstrategie, NKWS) that will consolidate existing raw material strategies. The aim is to bring together goals and measures on circular economy and resource efficiency from all relevant strategies. It will create a framework that links the raw material strategies of the German government so that the coalition agreement goal of reducing overall demand for primary raw materials is achieved. The strategy will provide a framework for the government to define goals, basic principles and strategic measures that support all strategies relevant to raw material policy. It will harness synergies but also identify potentially conflicting objectives. At the same time, the strategies that contribute to the goals of the National Circular Economy Strategy need to remain stand-alone. The German Raw Materials Strategy also addresses the use of secondary materials as a key pillar of a sustainable and secure raw material supply; for this reason, these strategies will be closely interlinked. The goals and measures of the German Resource Efficiency Programme (ProgRess) will be integrated and further developed.

Other important pillars for circularity include: the National Bioeconomy Strategy (NBÖS), which aims to achieve a circular bioeconomy and focuses on the natural circularity of biogenic resources; the National Biomass Strategy (NABIS), which creates the framework for sustainable, resource-efficient and climate-friendly biomass production and use (prioritising its use as a material, cascaded uses, recycling of biogenic carbon, etc.); the National Lightweighting Strategy, which addresses improved circularity and recyclability in the area of lightweighting and harnesses the potential of material-efficient, sustainable lightweight technologies to save resources and promote climate action; and finally, the Carbon Management Strategy, which focuses on closing carbon cycles or using carbon that was previously emitted as CO_2. The use of secondary materials is also anchored in the definition of climate-friendly (low-carbon or zero-carbon) basic materials, which is being (further) developed in the German Economic Affairs and Climate Ministry's stakeholder process on green lead markets.

Circular economy and raw material consumption in Germany

As a leading global economy, Germany requires large quantities of raw materials. However, in the next few years, the raw material demand is expected to rise even more in light of the current high demand for new investments, for example in housing, renewable energy and defence. Furthermore, raw material consumption per capita in Germany is well above the global average.[3] The goal set out in the German Sustainable Development Strategy to decouple raw material demand from economic growth has been achieved, however not on the envisaged scale.[4] In the last 30 years, Germany has built up high quality waste management and crucial structures for a circular economy, not just in waste collection, sorting and recycling but has also established comprehensive product responsibility.

However, raw material flows in the German economy remain more linear in structure in most areas. The data collected by the Statistical Office of the European Union (EUROSTAT) shows that secondary materials only account for around 13 percent of overall raw material consumption.[5] Primary raw material consumption is accordingly high and will continue to increase without targeted measures. We want to change this trend and start the transformation to a resource-efficient, circular system aimed at reducing primary raw material consumption.

3 https://www.umweltbundesamt.de/daten/umweltindikatoren/indikator-rohstoffkonsum#die-wichtigsten-fakten
https://www.bmuv.de/fileadmin/Daten_BMU/Pools/Broschueren/ressourceneffizienz_programm_2020_2023.pdf. p. 25

4 https://www.umweltbundesamt.de/daten/umweltindikatoren/indikator-gesamtrohstoffproduktivitaet

5 https://ec.europa.eu/eurostat/databrowser/view/cei_srm030/default/bar?lang=en

Our goals

Environment and climate action

We want our circular economy strategy to make a decisive contribution to reducing impacts on the environment, protecting biodiversity and mitigating climate change – nationally, in Europe and globally. Circular economy and resource efficiency can contribute to carbon neutrality and decarbonisation. For example, in the basic materials industry (e.g. production of steel, aluminium, plastics and cement/concrete), increased recycling and use of secondary materials can reduce greenhouse gas emissions and energy consumption. In our economy's key industries, the majority of greenhouse gas emissions are not caused by manufacturing end products, but by extracting the raw materials and manufacturing upstream products. In the chemicals industry, mechanical engineering and vehicle manufacturing, these upstream Scope 3 greenhouse gas emissions account, for example, for between 60 and 80 percent of emissions.[6] The reduction potential is therefore considerable. According to BDI, the greenhouse gas emissions can be significantly decreased with a circular economy: taking into account the entire supply chain, a net savings of 5.5 million tonnes of carbon per year is possible for Germany.[7]According to a study published in May 2022, biodiversity loss could not only be stopped, it would even be possible to increase biodiversity again if there is a systematic shift to circular economies worldwide.[8]

Secure raw material supply

At the same time, the National Circular Economy Strategy needs to play a major role in resolving scarcity issues by ensuring a secure supply of raw materials, including critical raw materials such as rare earths. We want to make ourselves progressively more independent from raw material imports through circularity and conserving resources for as long as possible, thereby strengthening the resilience of the German economy. Industry has long recognised how important this is for Germany's future competitive position. Leading companies have already begun to develop new recycling technologies for critical raw materials such as nickel, lithium, phosphorous and cobalt.[9] Our goal is a level playing field for all market participants and technologies in and for the production of recyclates, so that they can be traded and increasingly used on the market for raw materials under fair conditions.

6 https://www.ressource-deutschland.de/fileadmin/user_upload/2_Service/f_ESTEM/Abschlussbericht_ESTEM.pdf, p.19
7 https://bdi.eu/artikel/news/schluesselrolle-fuer-klimaneutrales-und-wettbewerbsfaehiges-industrieland/
8 https://www.sitra.fi/en/publications/tackling-root-causes/#methodology
9 https://www.press.bmwgroup.com/global/article/detail/T0393733EN/bmw-group-creates-closed-recycling-loop-for-high-voltage-batteries-in-china?language=en
https://www.volkswagenag.com/de/news/stories/2019/02/lithium-to-lithium-manganese-to-manganese.html#

We want to achieve this with an appropriate legal framework including the required economic incentives. Urban mining, or the extraction and use of secondary raw materials from buildings, infrastructure or durable goods, can also make a key contribution to expanding the raw material base.

Securing our prosperity

The German government wants to create conditions that allow Germany to take advantage of the opportunities offered by a fully sustainable, resource-efficient circular economy for securing prosperity, value creation and stable jobs in Germany and Europe. Numerous studies find that the potential positive impacts of a circular economy are considerable.[10] We therefore want to identify and harness the significant potential in new technologies and innovations to create added value and increase competitiveness, particularly in small- and medium-sized enterprises (SMEs). Products, services and technologies for a circular economy hold key growth opportunities for the future. With the National Circular Economy Strategy, we want to create the necessary framework to enable German companies to become market leaders in the future.

Our goal is for Germany to continue to play a leading global role in circular economy and the associated products, services and technologies. The further development of the legal framework and funding instruments should be based on economic impact assessments for relevant industries.

Social justice

The federal government will create the necessary conditions to make the transformation fair and socially equitable and ensure that sustainable consumption is and remains affordable for all consumers. Principles like prioritising use over ownership and repair over disposal pave the way for new business models and can benefit consumers, particularly those with low and middle incomes.

Avoiding and removing hazardous substances and pollutants

The National Circular Economy Strategy also aims to prevent the introduction of hazardous substances or substances detrimental to circularity into the value chain and to remove pollutants from material cycles. In this conext, hazardous substances and pollutants are defined as all substances that are harmful to health and the environment, meaning they are either already covered by international or European chemicals law or have the corresponding classification under the CLP Regulation. To avoid future issues, products for a sustainable circular economy should be safe and sustainable by design.

10 https://bdi.eu/artikel/news/schluesselrolle-fuer-klimaneutrales-und-wettbewerbsfaehiges-industrieland/

Our approach

Next steps in developing the national and EU legal framework

The transition to a comprehensive circular economy requires legal provisions at national and EU level. We are not starting from scratch. There is an existing foundation in German and European waste management law, which is now being further developed with the broader European concept of circular economy. The key pillars include product responsibility, ambitious basic obligations to implement the waste hierarchy and dual responsibility for disposal shared by the private sector and municipalities. These provisions will be further developed in line with the European Commission's "New Circular Economy Action Plan – For a cleaner and more competitive Europe"[11] (Circular Economy Action Plan, CEAP).

The further development of the legal framework also requires specifications on eco-design, i.e. the design of products, over and above conventional law on closed-cycle management and waste. Requirements under the EU Ecodesign Regulation and the approach of covering the entire life cycle of a product in a single law (as is the intention with the draft of a new Battery Regulation and the Construction Products Regulation) create a legal framework for high standards on the European internal market. In addition, we want to minimise the environmental problems associated with waste exports using the updated EU Waste Shipment Regulation as a basis. This is an area where customs authorities play an important role. The European internal market aims to become the leading market for circular economy, resource efficiency and sustainable consumption and to support national efforts. We will also use our national strategy to specifically identify the actions and measures that can supplement and strengthen the EU-wide framework.

Roadmap: Goals – Indicators – Measures

The goal is to reduce primary raw material consumption. We will develop a roadmap with specific goals and binding measures for the necessary transformation.The measures will be specially designed to improve market conditions for secondary materials with the aim of significantly increasing their share in raw material use and advancing resource

11 https://eur-lex.europa.eu/resource.html?uri=cellar:9903b325-6388-11ea-b735-01aa75ed71a1.0016 .02/DOC_1&format=PDF

efficiency and product design with a focus on durability, repairability and circularity. In this process, the goal is to maintain sufficiently high quality in secondary raw materials and products based on them. We will monitor progress on the goals and measures using a suitable set of indicators to track the impact on the security of the raw material supply, environmental benefits, climate change mitigation and resilience and, as needed, make course corrections in line with the 2030 Agenda for Sustainable Development.

Material flows and product groups

The National Circular Economy Strategy will analyse key material flows and product groups and develop specific goal-oriented measures for them. Examples of these types of material flows include mineral building materials, metals, plastics and biogenic raw materials. We want to create frameworks that help ensure that all stakeholders involved in the supply and value chain are guided by the vision of a resource-efficient circular economy and protection of the environment and human health and develop the necessary forms of organisation, technologies and structures.

This includes international stakeholders, for example in low- and middle-income countries. Beyond this, the strategy will also cover product groups that are especially important to the goal of a resource-efficient, circular and carbon-neutral economy. The selection will be made on a scientific basis and coordinated among the federal ministries. The strategy will also be compatible with the EU Circular Economy Action Plan.

Efficient use of renewable biogenic resources to fight climate change

Renewable raw materials have a special status due to their natural characteristics as part of biological cycles. Bio-based products and processes can play a key role in circular economy (see the National Bioeconomy Strategy). Biogenic materials also have the potential to deliver significant progress on the idea of circularity. For them to do this, it is essential that these finite, soil-based biogenic resources are produced sustainably, used efficiently to benefit the climate within the planetary boundaries and kept in the material cycle as much as possible. This is where the planned National Biomass Strategy (NABIS) comes in, supplementing the National Circular Economy Strategy on this key issue in the area of soil-based biogenic resources.

Sustainable consumption

Circular economy can only succeed if product design priorities the use of secondary materials, durability, repairability, reuse and material recovery. Consumers must be able to clearly identify sustai-

nable products when making purchasing decisions. This is why we will develop and implement measures to provide a suitable legal framework and create the right incentives for companies and consumers. We want to provide further support with measures on green product design, information (for example labelling) or empowering consumers with regard to product repairability (right to repair). At the same time, we want to hold industry more accountable with transparency obligations in the context of the EU Ecodesign Regulation, reduce the destruction of returned and unsold new merchandise and support alternative sustainable consumption patterns.

Industry and SMEs

Companies form the backbone of the German economy. In particular, small- and medium-sized enterprises, as major players in circularity and drivers of innovation, are key to making Germany a green leading market for circular economy. The policy goal of shifting production from linear to resource-efficient circular processes has significant implications for the strategies, business models and cost calculations of German businesses. It can create challenges for them, in particular for those that compete internationally. In addition, secondary materials have different product characteristics in some cases and (still) differ in quality compared to primary raw materials. We want to support industry and in particular industrial SMEs by removing unnecessary regulatory barriers and establishing the right complementary frameworks. This includes R&D funding for innovation, advisory programmes on resource-efficient production and further development of norms and standards (e.g. on the basis of the Standardization Roadmap Circular Economy by DIN, DKE, VDI) on the path to a circular economy. International standards are also needed to enable business models to be scaled up in the area of recycling. We will improve the ability of industry to innovate, invest and compete in the area of circular economy, also so that Germany can prevail in international competition among technologically advanced countries. The mechanical engineering sector contributes to circular economy by providing cutting-edge machinery for complex production systems and resource- and energy-efficient goods production. Machine and systems design facilitates circular economy and recycling with the help of modern recycling and waste treatment technologies.

Public procurement

Public procurement can and must be a main driver of a resource-efficient circular economy. Annually, the public sector awards contracts worth hundreds of billions of euros to private companies. Public contracts are therefore a significant factor in raw material consumption. In the circular economy act for federal authorities, we have already created legal requirements and are advocating that procurement at federal, federal state and municipal level be aligned with the vision of circular economy, thereby strengthening the markets for innovative products and services. We want to align procurement rules with this approach and will provide input along these lines for procurement law at national and European level. Our activities here will not jeopardise

legal certainty in procurement decisions or increase the barriers to access for SMEs. Procurement offices need to be given clear and binding guidelines for their decisions in practice.

Opportunities of digitalisation

We will leverage the enormous potential of digitalisation for a resource-efficient circular economy. Information can "transform" waste into valuable raw materials. On the one hand, this requires ensuring that digital technologies and infrastructure are themselves resource efficient and designed for circularity. On the other hand, we also want to use the opportunities of digitalisation for environmentally friendly production, create new business models, e.g. in the area of the sharing economy and sustainable consumption, establish digital marketplaces for secondary materials and products, and incentivise technological and social innovations. Digitalisation offers options for significantly reducing material use, e.g. by collecting product and process data. Real-time management of production and new informational tools like the digital product passport support materials transparency and circularity. We also uphold the principle of data minimisation and support companies with implementation. In addition, we want to fully capitalise on the new area of artificial intelligence (AI) and promote the use of approaches and technologies from Industry 4.0 and building information modelling (BIM). The digital transformation of society is having major impacts on people's everyday lives and on social cohesion.

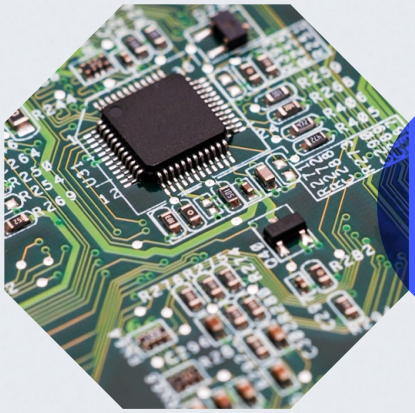
From a circular economy standpoint, we also want to ensure that the transformation helps us achieve the goals of the 2030 Agenda.

Areas of action

PLASTICS

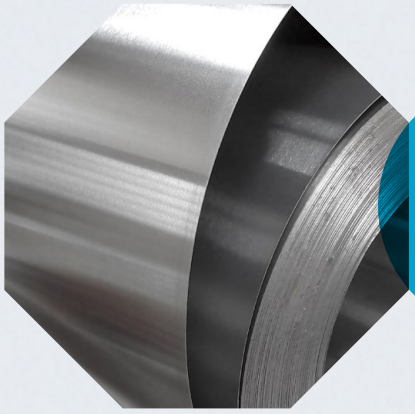
PUBLIC PROCUREMENT

VEHICLES & BATTERIES



ICT & ELECTRONICS

CIRCULAR PRODUCTION PROCESSES



METALS

BUILDINGS

GARMENTS & TEXTILES

Making our vision a reality

Science and research

Researchers are working right now on solutions for the resource-efficient circular economy of tomorrow. This capacity for innovation has made Germany a global leader in many areas. German industry is already a world leader in the export of green technology. With the National Circular Economy Strategy, we want to build on this research and expand it to other areas of application.

The BMBF's research strategy on a resource-efficient circular economy has already kicked off activities in this area. The strategy describes fundamental research needs for turning our linear economy into a comprehensive circular economy. Material research as a basis for technical innovation can also play a major role in resource efficiency and conservation as well as environmental protection. Innovations and new technologies have the potential to increase material efficiencies and greenhouse gas savings by making previously unused or unusable material flows accessible for recycling and improving the product characteristics of secondary materials. We will create a living laboratory and free zone law to provide uniform and innovation-friendly conditions and create new scope for testing innovations.

Social initiatives

Numerous industry, science and civil society initiatives show that many market participants are open to resource-efficient production, research and consumption. Examples include the BDI's Circular Economy Initiative, the VDI Roundtable Circular Economy for plastics, the Circonomy Hub of the Fraunhofer Gesellschaften, the Circular Futures network, acatech's Circular Economy Initiative Deutschland and the WWF's proposed Model Circular Economy Germany, but also the many, often locally organised civil society initiatives experimenting with sustainable lifestyle and consumption.[12] We want to foster greater inclusion of these kinds of initiatives so that circular economy becomes a shared project moving forward with broad support.

International cooperation and law

Our strategy must also send the right message internationally, specifically at the level of multilateral environmental agreements, particularly the Basel

12 https://circonomy.fraunhofer.de/ https://www.circularfutures.org/ https://en.acatech.de/project/circular-economy-initiative-deutschland/

Convention, and in UNEA, UNEP, UNFCCC, the OECD, the G20 and the G7 as well as in bilateral cooperation. This is in regard to, for example, the rules for the export of waste or trade with products, materials and systems.

In addition, we want to serve as a model for the future internationally, initiate targeted cooperation for this purpose and also support low- and middle-income countries in moving towards resource efficiency together with us. It is crucial to support and promote the social and environmental transformation of the economy in each country to ensure that these countries are not technologically, economically and socially outpaced or excluded from the value chains of the circular transformation and to accelerate environmental protection and climate action globally. Germany supports its partners in building up (recycling) infrastructure and capacity, promoting innovation, creating access to financing and provides advice on strategies, standards and legislation. This will close global material cycles and avoid potentially negative impacts in these countries. Germany founded the G7 Resource Efficiency Alliance (2015) and the G20 Resource Efficiency Dialogue (2017), creating a good basis for international cooperation. We will continue to support the discussions on circular economy that have already begun in these forums and work for their continuation and expansion.

The National Circular Economy Strategy as shared mission

In accordance with the coalition agreement, existing raw material strategies will be brought together in the National Circular Economy Strategy. The content of the strategy will be developed step-by-step in a systematic ministerial process.

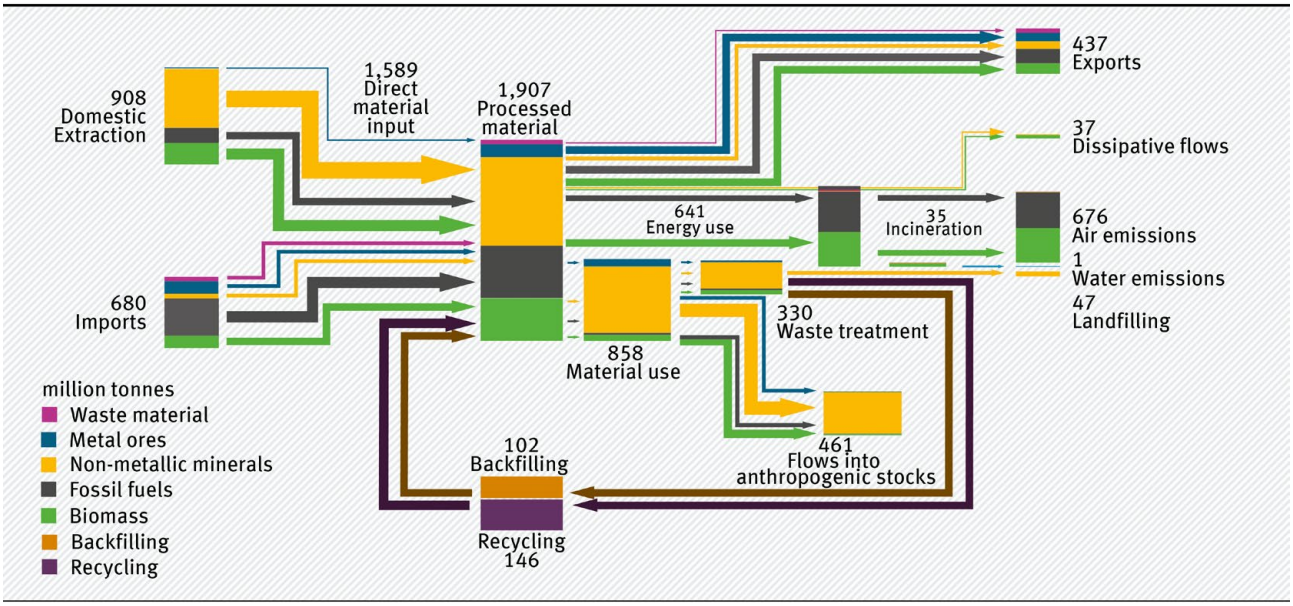
Every ministry will contribute measures and programmes for a circular economy within its remit and areas of action. The BMUV will support this work, e.g. by drawing up guiding questions and discussion papers. Legislative projects and other measures in the various areas of circular economy will be pursued in parallel. The results of these different processes can flow into the strategy and in turn, the insights gained in the strategy process can be used in national legislation or in the German government's position in the European Union and the broader international context. The relevant stakeholders from industry, civil society, science, the federal states and municipalities need to be actively involved in creating the National Circular Economy Strategy. We will set up a stakeholder process that will be launched in 2023 and ensure broad participation and inclusion of ideas. This will be supplemented by expert roundtables for key areas of action, where proposals for circularity and resource efficiency will be developed. Existing initiatives will be incorporated and supported. The dialogue process will be systematically monitored and evaluated to ensure that the results can be used for the strategy. An interministerial project group will ensure communication regarding the ongoing process.

Timetable: Work on the strategy began in 2022 with a discussion within the federal government. The gradual development of the goals and measures is taking place in 2023, in parallel with broad participation from stakeholders in the dialogue forum. The process is being supported by researchers and proposals from the scientific community. A decision by the federal government on the strategy is expected in mid-2024.

Appendix

Data on raw materials use

Direct raw material flows through the German economy, by raw material group, 2019



Data as reported by Eurostat.

Source: UBA Resources Report 2022

Figure 1

Percent share of secondary materials in raw material use (circular material use (CMU) rate according to Eurostat)

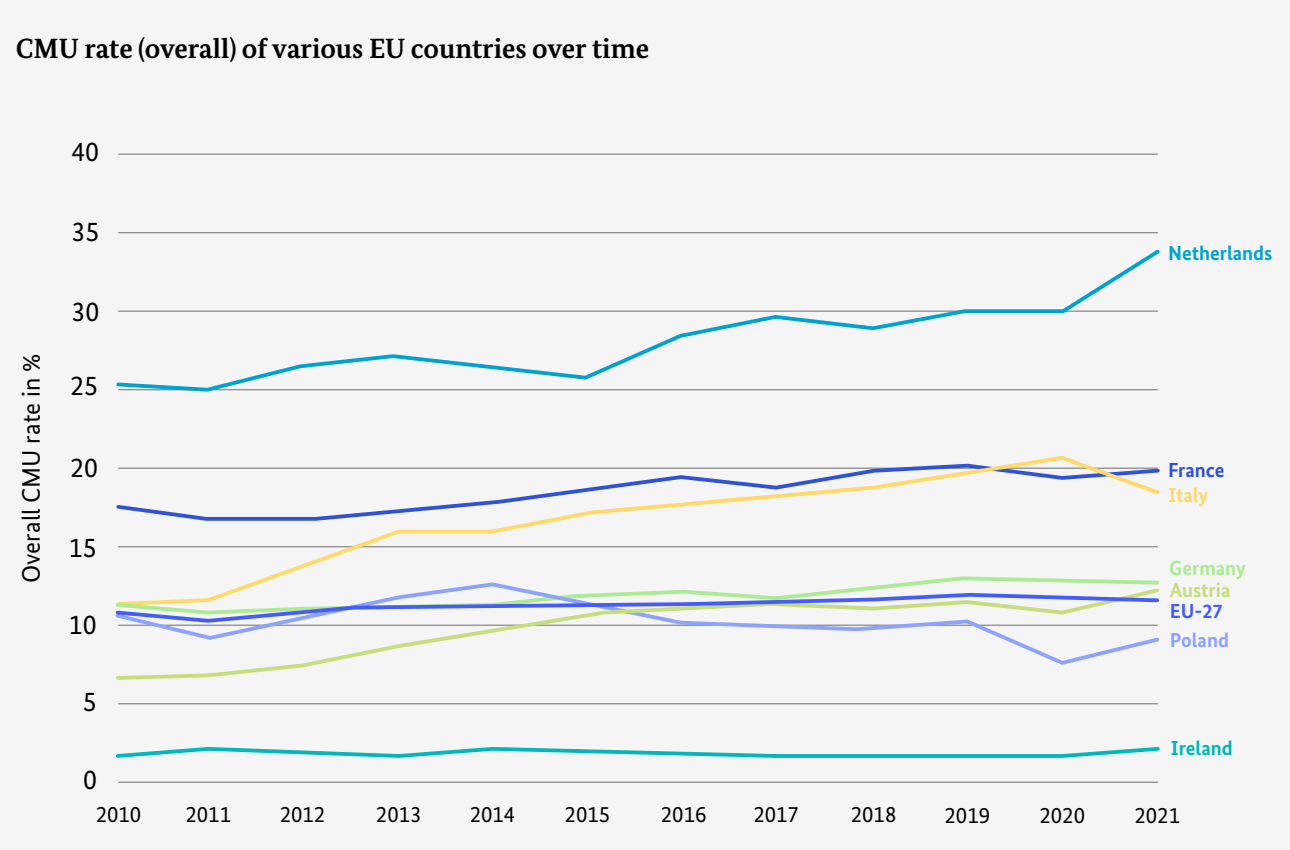


Figure 2

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