Resource efficiency and circular economy in Europe – even more from less

An overview of policies, approaches and targets of Austria in 2018

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Contents

Acknowledgements 1
Austria, facts and figures 2
Policy framework 6
Driving forces for material resource efficiency and circular economy 6
Dedicated national strategies or roadmaps for material resource efficiency and a circular economy 6
Overview of dedicated national or sectoral strategies for raw materials 7
Policies which include elements of material resource efficiency 7
Institutional setup and stakeholder engagement 9
Approaches to resource efficiency and circular economy policy evaluation 10
Monitoring and targets 11
Targets for resource efficiency and circular economy 11
Indicators to monitor progress towards a resource-efficient circular economy 11
Resource efficiency, circular economy and the 2030 Sustainable Development Goals 12
Examples of innovative approaches and good practice 13
Examples of good practice and innovative approaches 13
Seeking synergies with other policy areas 19
Resource efficiency and circular economy policy initiatives from subnational to local level 20
Other resources 22
Examples of policies which go beyond “material resources” 22
The way forward 22
Reflections on future directions of policies on resource efficiency and circular economy 22

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This country profile was prepared as part of the 2019 EEA review of material resource efficiency, circular economy and raw material supply policies, which aimed to collect, analyse, and disseminate information about experience with the development and implementation of these policies in EEA member and cooperating countries.

At the time of writing, a summary report is being finalised. The report reflects on trends, similarities and differences in policy responses, showcases selected policy initiatives from member countries and identifies possible considerations for the development of future policies.

These country profiles were compiled and finalised by members from the European Topic Centre on Waste and Materials in a Green Economy, namely Bart Ullstein, Bettina Bahn-Walkowiak, Jeroen Gillabel, Margareta Wahlström, Jutta-Laine Ylijoki, Dirk Nelen, Theo Geerken, Veronique Van Hoof and Evelien Dils. The responsible EEA project managers for the work were Pawel Kazmierczyk and Daniel Montalvo.

Austria, facts and figures

Note: data in this section was sourced from Eurostat databases (April 2019), except where noted otherwise

GDP: EUR 369.9 billion (2.3 % of total EU28 in 2017)

Per capita GDP: 42,100 Euro (purchasing power standard) (140.0 % of EU28 average per capita figure in 2017)

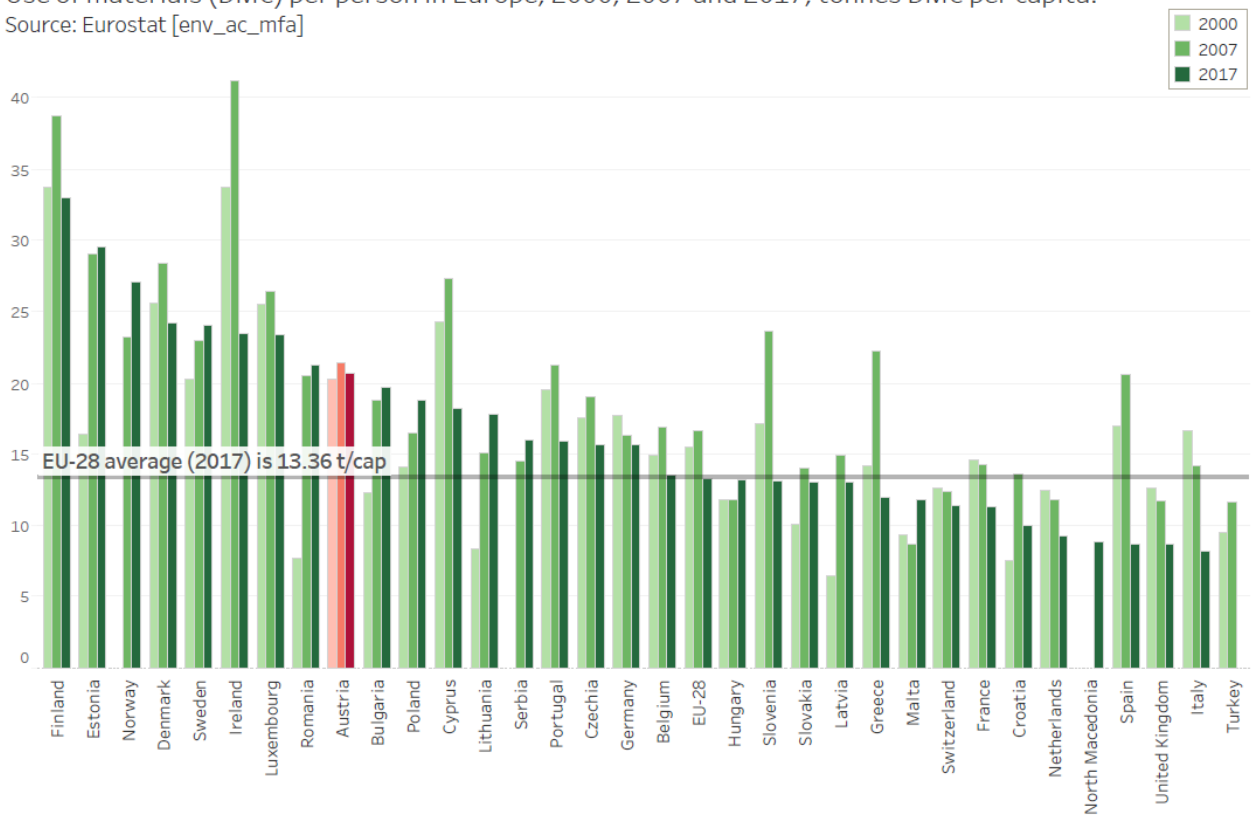
Use of materials (domestic material consumption (DMC))
182.4 million tonnes DMC (2.7 % of EU28 total in 2017)
20.7 tonnes DMC per capita (155.2 % of EU28 average per capita in 2017)

Structure of the economy:
agriculture: 1.4 %
industry: 28.3 %
services: 70.3 %

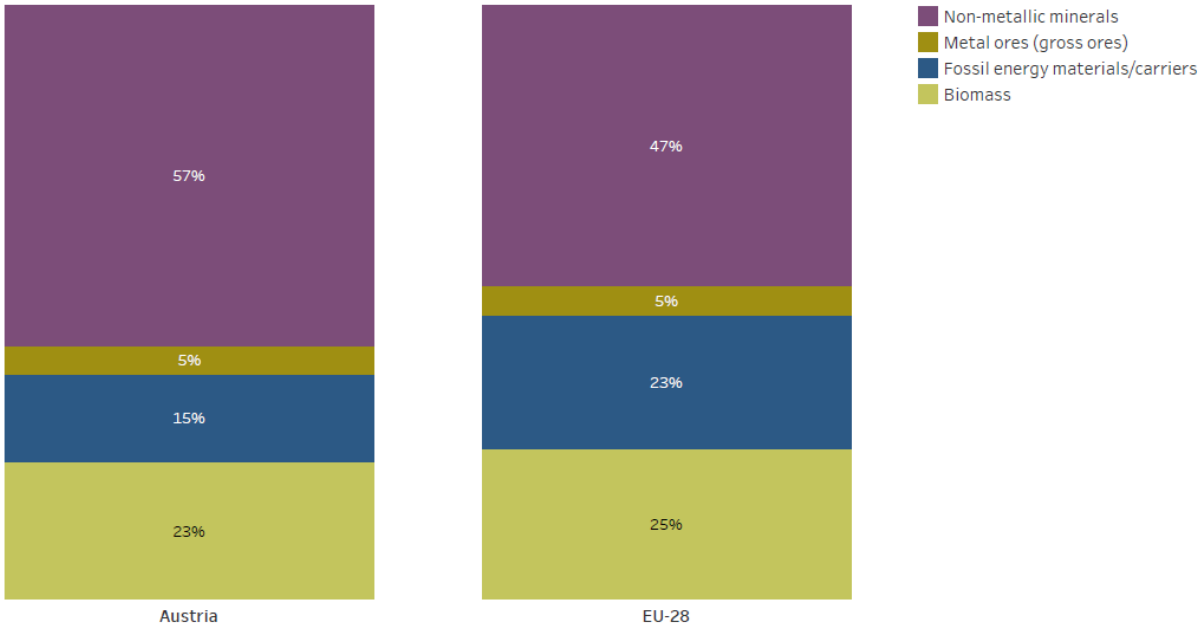
Surface area: 83.9 thousand square kilometres (km^2) (1.9 % of total EU28)

Population: 8.8 million (1.7 % of EU28 total in 2017)

Use of materials (DMC) per person in Europe, 2000, 2007 and 2017, tonnes DMC per capita.
Source: Eurostat [env_ac_mfa]

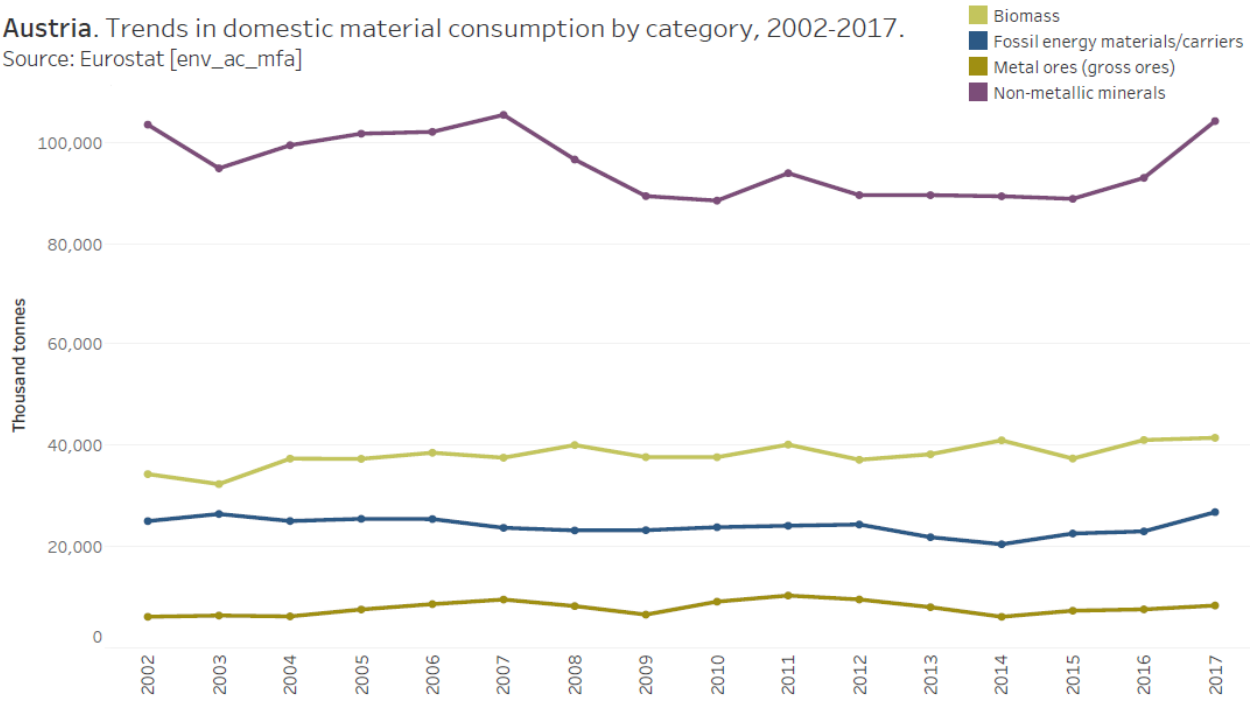


Austria & EU-28. Domestic Material Consumption by material category, 2017.
Source: Eurostat [env_ac_mfa]



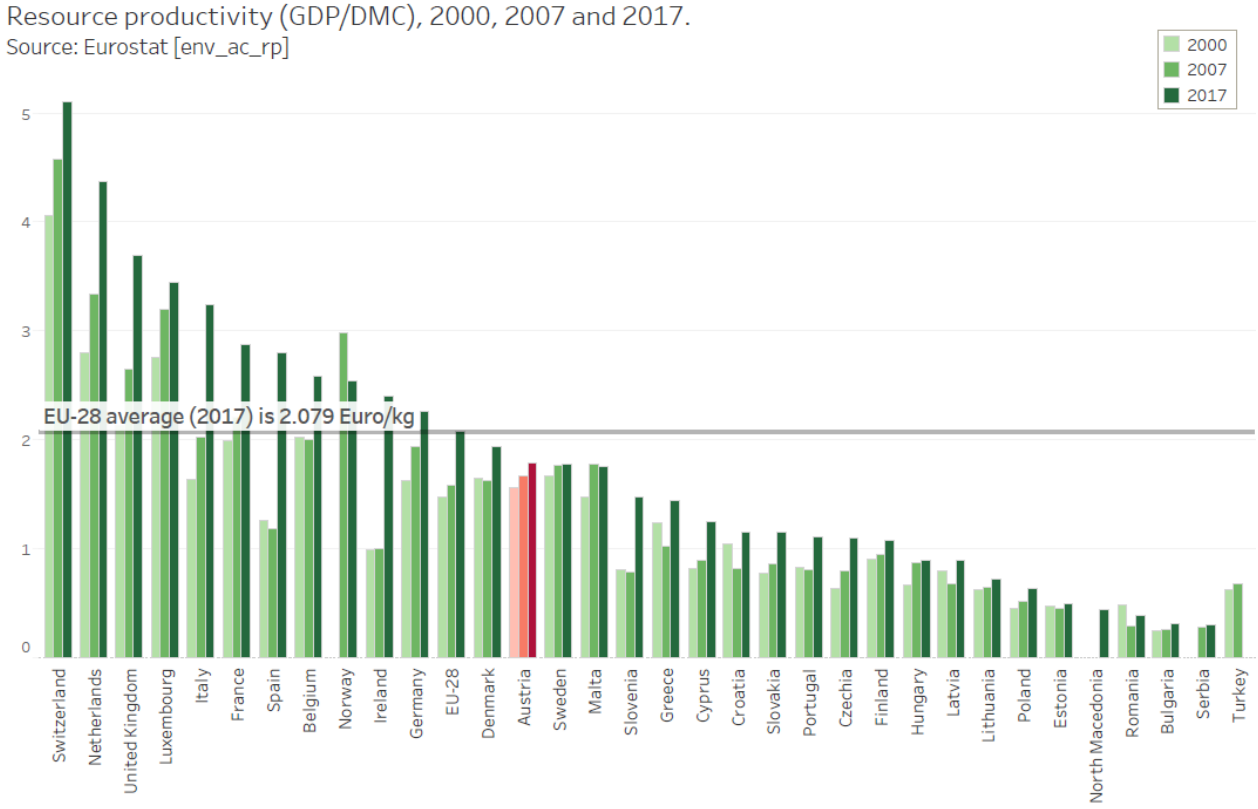
Note: The domestic material consumption categories 'other products' and 'waste for final treatment and disposal' are excluded from the figure.

Austria. Trends in domestic material consumption by category, 2002-2017.
Source: Eurostat [env_ac_mfa]



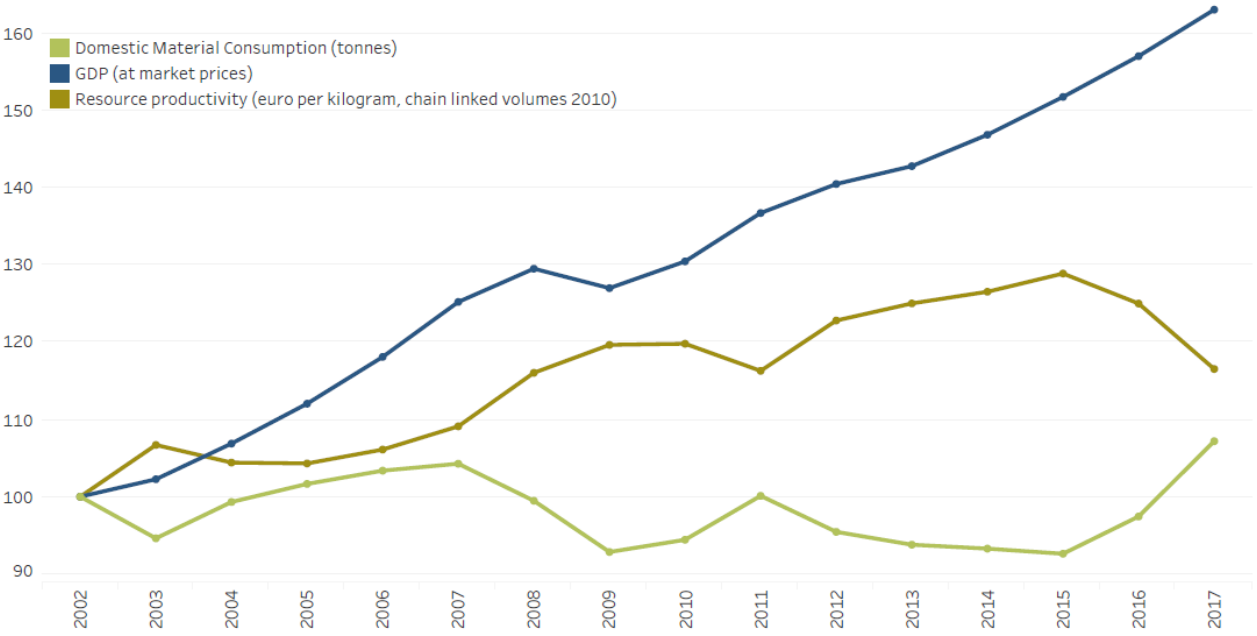
Note: The domestic material consumption categories 'other products' and 'waste for final treatment and disposal' are excluded from the figure.

Resource productivity (GDP/DMC), 2000, 2007 and 2017.
Source: Eurostat [env_ac_rp]

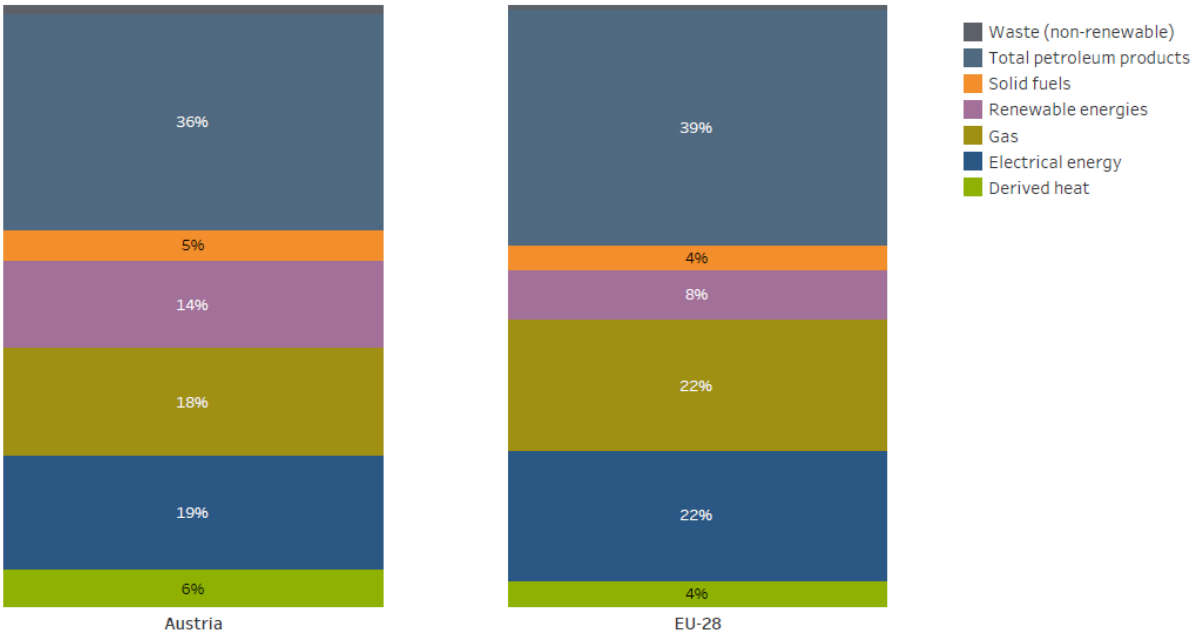


Note: GDP expressed in chain linked volumes 2010.

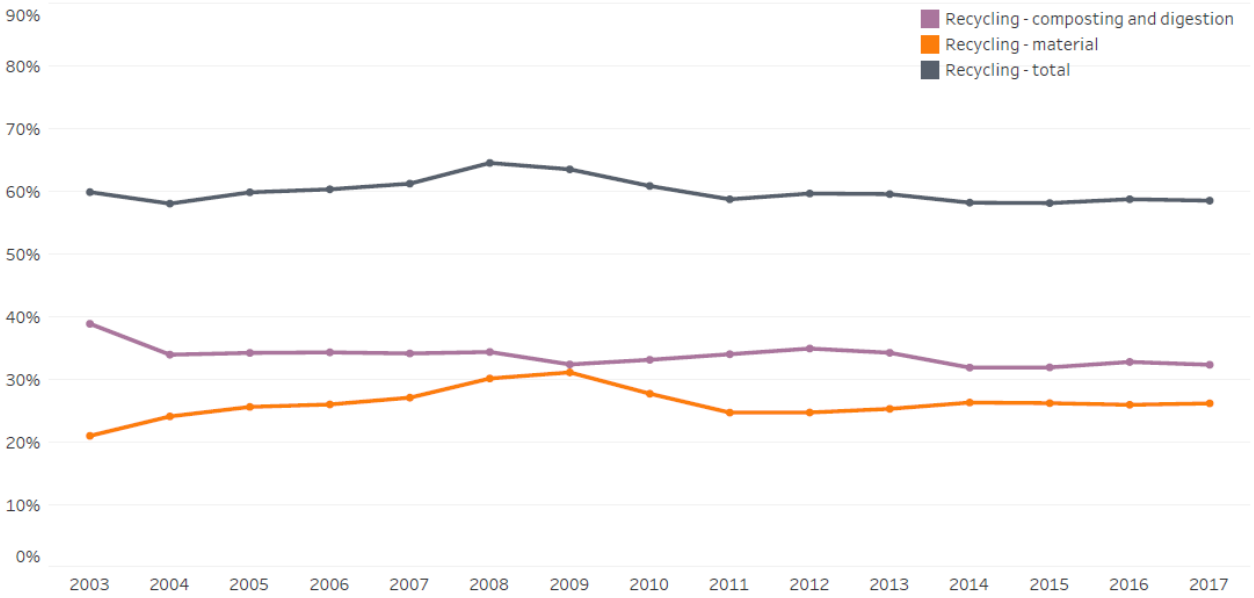
Austria. GDP, DMC and resource productivity trends, 2002-2017, index 2002=100.
Source: Eurostat [env_ac_mfa], [env_ac_rp] & [nama_10_gdp]



Austria & EU-28. Primary energy consumption by energy product, 2016.
Source: Eurostat [nrg_100a]



Austria. Recycling of municipal waste, 2003-2017, as share of total waste treatment.
Source: Eurostat [env_wasmun]



Note: The amount of municipal waste treatment is reported for the treatment operations incineration (with and without energy recovery), recycling, composting and landfilling.

Policy framework

Driving forces for material resource efficiency and circular economy

In Austria, the driving forces are a mix of economic and environmental factors. The fact that the circular economy has received so much attention in past years is attributable to increasing concerns about topics such as the security of resource supply and resource price instability, which are also linked to environmental issues.

It is worth noting that in the 1990s, to prevent harmful emissions to the air and/or (ground) water, efforts were made to divert waste from landfill and almost only to allow non-biodegradable waste to be landfilled. A landfill ban was introduced for waste exceeding the total organic carbon (TOC) limit of 5 per cent. Consequently, the share of recycled or recovered waste has increased.

In general, Austria, as all Member States, needs to comply with European Union (EU) regulations. EU regulation certainly gives impetus to the development and implementation of environmental policies: for instance, it can be argued that the EU Flagship Initiative for a resource-efficient Europe was an important driver of the publication of the Austrian Resource Efficiency Action Plan in early 2012. Nevertheless, it must be pointed out that in certain areas Austria has been able to achieve and even to exceed the EU targets. This is, for instance, the case with the reuse, recycling, and recovery of construction and demolition waste (EU target: 70 per cent; Austrian achievement in 2015: 91.5 per cent) or of packaging (EU target: 60 per cent; Austrian achievement in 2015: 96 per cent).

In other areas, targets set by Austrian law are more ambitious than those prescribed in EU law. A good example concerns efforts to reduce the use of plastic shopping bags: the EU target aims to reduce use to 90 plastic bags per person per year by 2019 and 40 by 2025. In 2014, use in Austria had fallen to about 50 plastic bags per person per year, well ahead of the EU target. Moreover, the Austrian voluntary agreement on shopping bags, published in 2016, aims to reduce the use of plastic shopping bags by 50 per cent by 2019, a target of about 25 plastic bags per person per year by 2019, well ahead of the EU target.

Dedicated national strategies or roadmaps for material resource efficiency and for circular economy

The Austrian Resource Efficiency Action Plan (REAP), was adopted in 2012. The REAP is implemented by strategies and action plans of the Ministry of Sustainability and Tourism (BMNT) concerning a wide range of resource efficiency specific topics.

The BMNT has a number of targeted specific strategies that accelerate the transition to a competitive and resource-efficient circular economy in Austria. In particular:

- the Integrated Product Policy and the Waste Prevention Programme for resource conservation and waste prevention;
- the Action Plan for Sustainable Public Procurement: and
- the Master Plan for Environmental Technology for innovative environmental technologies and services.

For more information, please consult the website[1].

Finally, an Austrian bio-economy strategy is currently in preparation. The BMNT, in cooperation with the Federal Ministry of Mobility, Innovation and Technology (BMVIT) and the Federal Ministry of Education, Science and Research (BMBWF) have been working together on the strategy since May 2018. After publication of the Austrian bio-economy strategy, further action, such as the development of an action plan and monitoring, is also planned for 2019. Next to resource efficiency, also circularity, Research,

[1] https://www.bmnt.gv.at/umwelt/nachhaltigkeit/ressourceneffizienz (German)

Technology and Innovation (RTI) and social acceptance and development of new raw materials are the main topics for the Austrian strategy[2].

The BMNT has a number of targeted specific strategies that accelerate the transition to a competitive and resource-efficient circular economy in Austria. In particular, the Integrated Product Policy (for example, Ecolabel) and the Waste Prevention Programme, the Action Plan for Sustainable Public Procurement and the Master Plan for Environmental Technology.

Overview of dedicated national or sectoral strategies for raw materials

The **sectoral Austrian Minerals Strategy** has the primary objective of ensuring and improving the supply of mineral raw materials to the Austrian economy. Therefore, this strategy is based on three pillars:

(1) securing minerals supply from domestic resources;
(2) securing minerals supply from other countries; and
(3) promoting resource efficiency, substitution, and recycling.

The existing documents that are available today are the Mineral Resources Plan (Rohstoffplan, 2012) and a Raw Material Strategy (Rohstoffstrategie, 2012)[3]. The BMNT is currently working on an integrated raw materials strategy, which should be ready in 2019. The **Mineral Resources Plan** was first prepared together with federal states and municipalities that provided details of their specific needs, and it was meant to be a basis for planning future national mining activities. The Plan also identified categories of accessible minerals in Austria and established conflict-free 'mineral zones' while protecting other properties including residential areas, national parks, water management priority zones, landscape protection areas, and forests, by law.

Austria also identified a **list of critical raw materials** in the Ministry for Mobility, Innovation and Technology (BMVIT) 2018 report *Critical raw materials and potential critical raw materials with reference to Austria* (*Kritische Rohstoffe und potenziell kritische Rohstoffe mit Bezug zu Österreich*)[4]. Besides the critical raw materials, also potentially critical raw materials were identified. Critical raw materials identified are: antimony, beryllium, borates, chromium, graphite, cobalt, coking coal, fluorite, gallium, germanium, indium, magnesite, magnesium, niobium, platinum group metals, rare earth, metallurgical silicon and tungsten. Potentially critical raw materials identified were: bauxite, iron ore, lithium, molybdenum, manganese, nickel, rhenium, tantalum, tellurium, vanadium 3, tin and zinc.

Policies which include elements of material resource efficiency

To date, no overarching circular economy policy exists for Austria. Nevertheless, a number of measures and initiatives covering these topics have been set up by different ministries and government bodies such as the Austrian Chamber of Commerce, which contribute considerably to a circular economy.

In 1992, a **national action plan for the environmentally sound treatment of waste**, prescribing measures to increase the recycling and recovery of wastes (Federal Waste Management Plan 1992), was published and has since been updated regularly. Furthermore, since 2011 a **Federal Waste Prevention Programme** has been elaborated every six years. The Federal Waste Management Plan 2017 has been drafted and was published at the end of 2017.
Waste prevention is intended to be achieved by a mix of instruments and the latest Waste Prevention Programme 2017 sets some priority areas that clearly contribute to the circular economy. These priority areas are:

[2] https://www.bmnt.gv.at/umwelt/klimaschutz/biooekonomie.html (German)
[3] https://www.bmnt.gv.at/energie-bergbau/bergbau/Rohstoffstrategie.html (German)
[4] https://www.ffg.at/sites/default/files/allgemeine_downloads/thematische%20programme/Produktion/rohstoffdefinition_28as_pdz_2018.pdf (German)

- prevention of construction and demolition waste;
- waste prevention in enterprises and organizations;
- waste prevention in private households;
- food waste prevention;
- reuse (of consumer goods).

More than 90 measures are listed in the Waste Prevention Programme 2017 to foster responsible resource management[5].

The Austrian Federal Government adopted the N**ational Action Plan for the Promotion of Sustainable Public Procurement** (naBe Action Plan)[6] as a strategic instrument in July 2010. The central objective is to anchor the principle of sustainability in public procurement and increase demand for resource-efficient and innovative products and services. The public sector has an important role to play. Public clients should be supported in their role as "Change Agents" at national and European levels in line with environmental, resource and climate policy objectives.
The current medium-term objectives and measures of the naBe include:

- taking current policy priorities, technical and market developments into account when updating the naBe criteria to, for example, integrate resource efficiency and circular economy requirements (conservation of resources, waste prevention, extending the useful life of products, reuse and recycling);
- increasing the number of users of naBe in federal states, municipalities and cities, and to strengthen the application of naBe criteria in public organisations which are subject to the Public Procurement Act (BVergG);
- improving the practicability of the naBe requirements;
- expanding public relations work and communication with stakeholders (BBG, Länder, municipalities and cities).

The Austrian environmental and energy technology industry makes a considerable contribution to sustainable growth and improvement of the environmental situation in Austria. In view of the great importance of environmental technology and services, the **Master Plan Environmental Technology** (MUT) has been adopted and will be published in 2019. The MUT aims at the bundling and strategic orientation of the Austrian environmental technology sector by 2030.
The new MUT comprises six strategic fields of action:

1. national market;
2. global market;
3. innovation;
4. digitisation;
5. qualification, education and labour market;
6. business creation and financing;

with 30 measures to strengthen the environmental technology and service sector.
In particular, the MUT should also contribute to the achievement of objectives of the EU's circular economy action plan.

The **Austrian climate protection initiative,** klima**aktiv**[7]**,** established a nationwide quality standard for highly energy-efficient buildings, which serves as an orientation for all stakeholders to assess their projects and provides a basis for training. Architects, planners and builders receive education and further training on these standards. A life-cycle cost perspective is part of the evaluation of the buildings. The klima**aktiv** building and refurbishment initiative also contains a resource efficiency component concerning ecological quality.

[5] https://www.bmnt.gv.at/umwelt/abfall-ressourcen/bundes-abfallwirtschaftsplan/BAWP2017-Final.html (German)
[6] http://www.nachhaltigebeschaffung.at/ (German)
[7] : https://www.klimaaktiv.at/english/buildings/Buildings.html (English)

Klima**aktiv** has introduced building standards: it is not only energy efficiency that is assessed and evaluated in klima**aktiv** buildings but also the quality of planning and execution, the building materials and construction quality, as well as the core aspect of comfort and ambient air quality.

The klima**aktiv** building standard exists for residential and office buildings, both new ones and refurbished ones. The basic criteria, which were formulated in 2011, for klima**aktiv** building include all categories of building. Specific standards are not only available for residential buildings, but also, to enable targeted promotion in the service buildings' sector, for hotels, supermarkets (food), centres for the elderly, schools, nursery schools and nursing homes. Criteria are structured in a 1,000-point system which is used to assess the buildings and establish their compliance. An up-to-date example of the application of the klima**aktiv** building standard is the refurbishment of the 130-year-old Austrian parliament which began in 2017 and will last for three years.

Every two years the BMNT awards the **State Prize for Architecture and Sustainability** to projects distinguished equally by their architectural value and their quality in respect to ecology, energy use and social and economic sustainability.

The **Austrian Green Building Star**, a new international certification system for sustainable building, has been introduced. The certificate is granted to energy-efficient and sustainable buildings abroad which are constructed with Austrian participation.

Beside these awareness programs, the **Austrian environmental subsidy programme** of the BMNT (Umweltfoerderung im Inland, UFI [8]) provides grants for enterprises which reduce their material consumption. The amount of these grants varies from EUR 3 million to EUR 6 million per year for small and medium-sized enterprises (SMEs). In total investments of about EUR 15–20 million were leveraged.

The Austrian regions, co-financed by the UFI, provide **consultancy for material resource reduction**[9] for SMEs. These consultancies result in tailor-made suggestions for material- and cost reduction for the enterprise, which then chooses appropriate ones. An additional programme focusses on the reduction of food waste in restaurants and community kitchens such as hospitals. Details of both programmes are available on the website of the Umweltförderung as well as further links to the regional programmes.

Institutional setup and stakeholder engagement

The work on circular economy in Austria is mostly coordinated by the BMNT and carried out within different directorates and divisions. Competencies and responsibilities are distributed as follows:

- Directorate III: forestry and sustainability;
- Division III/2: sustainability, biodiversity, responsible for natural resources management and sustainable consumption;
- Directorate IV: climate;
- Division IV/3: sustainable finance and regional economic policy, environmental-economic accounting, resource indicators and growth in transition;
- Directorate V: waste management, chemicals policy and environmental technology;
- Division V/3: waste management planning, waste treatment and remediation of contaminated sites (Federal Waste Management Plan – Bundes-Abfallwirtschaftsplan), etc.
- Division V/6: prevention, recovery, and assessment of waste, responsible for the waste prevention programme Food is precious! Lebensmittel sind kostbar!)

[8] https://www.umweltfoerderung.at/betriebe/rohstoffmanagement/navigator/ressourcen-nawaros/rohstoffmanagement-1.html (German)

[9] https://www.umweltfoerderung.at/regionalprogramme.html?no_cache=1&sword_list%5B0%5D=beratung (German)

- Division V/7: Environmental Protection at Company Level and Technology: responsible for integrated product policy and eco-design, ecolabels, sustainable public procurement, environmental management systems (EMAS, ISO) and the Masterplan of Environmental Technology and Green Jobs;
- Directorate VI: energy and mineral industry;
- Division VI/7: raw material and mineral policy, responsible for raw material strategy

In addition, the Austrian Environment Agency (Umweltbundesamt) supports ministries in their work on analysis, evaluation, and implementation of circular economy initiatives. The work is coordinated within the different sections and departments of the BMNT and the Umweltbundesamt. The main instrument of cooperation is the **Working Programme**, which is prepared and agreed on a yearly basis by Umweltbundesamt and the Ministry. The Working Programme specifies the topics to be tackled in the upcoming year and the dedicated budget.

Stakeholder engagement is foreseen for the preparation of the Federal Waste Management Plan as well as the Waste Prevention Programme.

In fulfilling the requirements of the United Nations Economic Commission for Europe Aarhus Convention, the draft of the Federal Waste Management Plan has to be made publicly available for comment from the general public. The procedure for the submission of comments has to be announced in two newspapers which are publicly available throughout Austria. These comments have to be taken into due account in decision making, and information must be provided on the final decisions and the reasons for them.

In addition to public participation, a **consultation process** was established for drafting the new Waste Prevention Programme (see also section on Approaches to resource efficiency and circular economy policy evaluation).

The **Austrian Raw Materials Alliance** acts as a discussion platform for stakeholders interested in improvements of raw material supply. The rationale behind the foundation of the Alliance was the identification of measures for the sustainable securing of raw material supply. The overarching objective of this platform is the reduction of import dependency and increasing the security of supply of raw materials important for the Austrian economy.

Approaches to resource efficiency and circular economy policy evaluation

Evaluation of the Waste Prevention Programme

The preparation of the Waste Prevention Programme builds on a stakeholder consultation process, which assesses the expected effectiveness of specific measures through expert evaluation. During the last revision process, the fields of action were evaluated for the implementation of the next programme (Figure 1). The Waste Prevention Programme is revised every six years.

In detail, stakeholders and experts were invited to a kick-off workshop, the focus of which was a discussion about current waste prevention measures, the challenges to be faced by the Austrian waste and resource economy in upcoming years, and the general focus of the 2017 Waste Prevention Programme.

In addition, an evaluation of the current and recently completed waste prevention measures in Austria was presented. This had been carried out through expert interviews and internet searches, and was meant to highlight the extent to which implemented measures met the expectations of the 2011 Waste Prevention Programme. Furthermore, the vision of the 2011 Waste Prevention Programme was examined to see whether its objectives were still current, necessary and efficient.

Figure 1: The preparation and evaluation of Austria's Waste Prevention Programme

Based on these assessments, measures for the 2017 Waste Prevention Programme were selected in two further stakeholder workshops and were formulated and structured for implementation.

Overall, the development of the 2017 Waste Prevention Programme was based on a methodology recommended by the European Commission in its *Guidelines on Waste Prevention Programmes* (Bio Intelligence Service, 2009a).

Monitoring and targets

Targets for resource efficiency and circular economy

Austria has a number of new targets in place:

Goodbye shopping bag (Pfiat di Sackerl): plastic shopping bags should be reduced to a maximum of 25 bags per person per year by 2019 (voluntary agreement).

- Note: a ban on plastic carrier bags as of 2020 is planned with the exception for bags made from renewable raw materials and which are completely biodegradable.
- According to the decision of the Austrian government the consumption of plastic packaging should be reduced by 25 % by 2025.

Food is precious! (Lebensmittel sind kostbar!): the target of this voluntary agreement between the BMNT and a number of food producers and retailers is to halve food waste by both the food trade and consumers by 2030.

Indicators to monitor progress towards a resource-efficient circular economy

The instrument to assess whether resource efficiency targets are achieved is through the preparation of the **Resource Efficiency Report**[10], produced by the Institute of Social Ecology of the University of Natural Resources and Life Sciences, Vienna and Statistics Austria on behalf of the BMNT. The report presents at-a-glance results of environmental accounts to provide insights into material consumption trends in Austria. The focus is on four material categories: biomass, fossil energy carriers, metals and non-metallic minerals. Domestic material consumption is proposed and used as a headline indicator for resource use.

The report also includes gross domestic product (GDP)/DMC as a headline indicator for resource efficiency, and GDP/raw material consumption (RMC) for describing the total demand for raw materials that a

[10] https://www.bmlfuw.gv.at/dam/jcr:27656ef3-2f2e-4719-a2c2-ca9efe0d86cc/Report_Resource%20Use%20in%20Austria%20%202015_engl.pdf (English)

country consumes, both nationally and globally. Since 2018 RMC has been included in official annual statistics, based on an Excel-tool, created by the Institute of Social Ecology.

The last report was updated in August 2016 and a new update is planned for 2019[11]. The new publication will include special chapters on circular economy, critical raw materials and the nexus between resource-use and climate change.

In addition, the **evaluation of the Austrian Waste Prevention Programme**, described under 'Approaches to resource efficiency and circular economy policy evaluation' above, makes use of indicators to assess the effectiveness of implemented measures.
Core indicators used within the assessment of the previous Austrian Waste Prevention Programme considered the annual generation of the following waste streams:

- waste from municipal and households per person;
- residual waste;
- collected packaging waste;
- separately collected hazardous waste;
- industrial and commercial waste;
- separately collected harmful substances;
- construction waste (excluding excavation).

An extended list of indicators is also used, for example:

- for construction and demolition waste:
  - hazardous fractions;
  - recycling;
  - landfill.
- for residual waste:
  - hazardous fractions;
  - food waste (categorised as avoidable, non-avoidable, edible, non-edible, etc.).
- for the assessment of consumer and business behaviour
  - selected questions on consumption/use behaviour, and knowledge about existing possibilities for waste prevention and reuse, as well as on the handling of waste.

Resource efficiency, circular economy and the 2030 Sustainable Development Goals

Examples of initiatives in Austria, where resource efficiency and/or the circular economy are used as a way of achieving the UN Sustainable Development Goals (SDGs) for 2030 include:

- the Federal Waste Management Plan, which explicitly mentions that Austria will contribute to the Sustainable Development Goal (SDG) 12: Responsible Consumption and Production. In addition, in September 2017 the first SDG Progress Report for Austria was published on the BMNT website[12];
- the Food is precious! (Lebensmittel sind kostbar!) initiative is also a clear commitment and an important step towards the UN goal of halving food waste in food trade and among consumers by 2030 (SDG Target 12.3).

[11] http://www.umweltbundesamt.at/fileadmin/site/umweltgesamtrechnung/renu16_folder_en_web_es.pdf (English)
[12] https://www.bmnt.gv.at/umwelt/abfall-ressourcen/bundes-abfallwirtschaftsplan/BAWP2017-Final.html (in German and English)

Examples of innovative approaches and good practice

Examples of good practice and innovative approaches

Austria implements a number of initiatives that support a circular economy. Examples of good practices include:

1. Research and innovation
    - **Online portal Materialflows.net**[13]
      An online portal for national material flow data and state of the art visualizations and analyses hosted by Vienna University of Economics and Business (WU Vienna), funded by the BMNT. It aims to provide analyses and visualisations of worldwide data on resource extraction in order to achieve a wider application of the material flow analysis (MFA) approach.

      The website is based on the UN IRP Global Material Flows Database. Data and visualisations cover more than 200 countries, the period of 1970–2017, and more than 300 different materials aggregated into 13 categories of material flows.
    - **Smart Packaging 2016 National Awards:** a national award is being organised on different topics by different cooperating ministries, including the BMNT. The 57th National Award was dedicated to smart packaging, with the aim of raising awareness of innovative, sustainable and resource-efficient packaging solutions.
    - **Study on the macroeconomic impact of Austria's classical waste recycling economy**[14]**:** the aim of the study is to analyse the economic impacts of recycling iron and steel, aluminium, paper and glass waste in Austria. In addition to the analysis of employment and value added, the report estimates the effects of recovering secondary raw materials to replace primary raw ones in Austria or for export and the effects of current recycling on greenhouse gas emissions. The analysis is carried out using the WIFO.DYNK model which has been adapted for these purposes. This includes the integration of datasets on primary and secondary production processes, in particular on the use of energy and resources in production, calculated on the basis of physical material flows and prices.
    - **Report on green tech innovations**[15]**:** innovation and technological progress are key drivers for the interplay between business and environmental and resource protection. Environmental technologies open up opportunities for companies to develop new sustainable products, processes and markets. For this reason, the BMNT has conducted a technology screening of the Austrian economy, which shows relative strengths and trends. In a detailed evaluation, the thematic links between material efficiency and waste, recycling, water, and wastewater were examined in more detail.
    - Since 2011, the issue of how to harness biogenic raw materials for use in industry has been tackled by the Ministry of Commerce, Innovation and Technology (BMVIT) programme **Production of the Future** (Fabrik der Zukunft), with a sub-focus on a bio-based industry. As sustainable industry strategies are expected to play a decisive part in future, EUR 10 million have been budgeted till 2019 for this sub-focus to provide systematic support to Austrian industry developing bio-based industries and utilizing bio-based products.

2. Economic instruments

In Austria**, taxes** on landfill, incineration of waste and the production of waste-derived fuels have been implemented in the past two decades

[13] http://www.materialflows.net/ (English)
[14] http://www.wifo.ac.at/publikationen?detail-view=yes&publikation_id=59194 (German)
[15] https://www.bmnt.gv.at/umwelt/nachhaltigkeit/green-jobs/umwelttechnologien/GreenTech-Innovationen-.htm (German)

The Austrian regions, co-financed by the UFI, provide consultancy for material resource reduction for SMEs.

3. Public procurement

The Austrian Federal Government adopted the N**ational Action Plan for the Promotion of Sustainable Public Procurement** (naBe Action Plan)[16] as a strategic instrument in July 2010. The central objective is to anchor the principle of sustainability in public procurement and increase demand for resource-efficient and innovative products and services. The public sector has an important role to play. Public clients should be supported in their role as „Change Agents" at national and European level in line with environmental, resource and climate policy objectives.

4. Change in consumption patterns and consumer behaviour

The BMNT's Goodbye shopping bags! (**Pfiat di Sackerl**) initiative is a voluntary agreement of large Austrian retailers (Bettenreiter, C&A, Deichmann, Handelsverband, Hofer KG, Lidl Österreich, Media/Saturn, M-Preis, REWE Group, Schäfer Shop GmbH, SPAR, Sutterlüty Handels GmbH, Tchibo/Eduscho, Unimarkt, Greenpeace and Global 2000) to drastically reduce plastic shopping bag distribution and consumption. The initiative, agreed in 2016, supports the amended EU Packaging Directive, which aims to reduce plastic shopping bag consumption to 90 bags per person per year by 2019. The Austrian initiative, however, aims to go beyond the EU target and has set its own target of a maximum of 25 bags per person per year by 2019. A reduction in the use of shopping bags made from other materials, including paper and fabric, is also among the project's objectives. Major actions include charging fees for shopping bags and eliminating free bags at the counter. In addition, informative campaigns aimed at consumers will be launched. Finally, the annual reports[17] for 2017 and 2018 have been published.

According to the decision of the Austrian government plastic carrier bags will be prohibited as of 2020, exceptions are intended for plastic carrier bags which are made of renewable raw materials and which are completely biological degradable.

The Informed buying (**Bewusst kaufen)** initiative[18] provides the first web portal promoting sustainable consumption in Austria. The initiative aims to increase consumer awareness of sustainable products and provides extensive information on options for informed, sustainable consumption.

The Austrian Ecolabel (Umweltzeichen) was created on the initiative of the BMNT in 1990. This label provides the general public with information on the environmental impact of consumer goods that arises from their production, use and disposal, and guides consumers to alternative environmentally friendly products. The Ecolabel should also motivate producers and traders to develop and offer less environmentally polluting products. In this way, a dynamic process should be triggered, positively influencing the supply chain towards more environmentally friendly goods. Furthermore, the Ecolabel contributes to more transparency in the evaluation of the environmental impact of products and services. Products carrying the Ecolabel have to meet a number of criteria, compliance with which has to be proved by experts.

Also under this umbrella is the **Green Meeting and Green Events**[19] initiative**,** a platform with information and contact details on tourism, resort and event operators who meet the sustainability criteria set in a dedicated guideline. These criteria include energy and resource efficiency standards, fair trade and organic labels, initiatives for reducing food waste, etc.

[16] http://www.nachhaltigebeschaffung.at/ (German)
[17] https://www.bmnt.gv.at/umwelt/kunststoffe/kooperationmitdemhandel/Bericht_2018.html (German)
[18] http://www.bewusstkaufen.at/ (German)
[19] https://www.umweltzeichen.at/cms/de/home/content.html (German)

The BMNT's **Let's talk reuse** (Sag's am Mehrweg) initiative offers environmentally aware consumers guidance on opting for reusable drinks packaging. Publicity campaigns aim to increase awareness of reusable bottles. The initiative has had an impact, with the proportion of reusable packaging stabilising.

The BMNT's **Food is precious!** (Lebensmittel sind kostbar!) initiative was launched in 2012 with civil society partners, to counteract the negative trend in food waste. By 2018, about 90 organisations/businesses from all sectors had become cooperating partners committed to improving how food is handled.

The initiative includes information and awareness campaigns for consumers as well as for workers in food processing industries and services. It supports the expansion of food sharing and identifies and supports measures for the more efficient production and use of food along the whole supply chain. This includes improvements to better match supply to demand, optimise logistics and make better use of unsold food. The initiative includes a stakeholder dialogue platform for the exchange of experience and the identification of food waste prevention solutions along the whole food life cycle. In addition, it serves as a platform for networking.

The initiative also supports research to identify ways of preventing food waste. This comprises studies on the amount of food in municipal waste, on overcoming barriers to food-sharing, on making better use of food at events, on the prevention of food waste in restaurants, and on food waste prevention in agriculture.

A further focus of the initiative is the preparation of educational material for primary and secondary schools, as well as the implementation of information and sensitisation campaigns including practical projects for pupils.

In May 2017, a step forward was taken when the BMNT signed the Agreement 2017–2030 to prevent food waste in the food trade and food production with a number of food producers and retailers. The target of this voluntary agreement is to halve the food waste in production by 2030. Proposed measures include the donation of surplus food to social and charity organisations and pet food producers, education of employees, regular monitoring of wasted and donated food (including data collection on avoidable and unavoidable, and edible and non-edible food waste), and the application of discounts and price reductions on food reaching its expiry date in shops. The Agreement aimed to double of the mass of edible food waste that was donated by the participating enterprises between 2013 and 2017.

In summary, the Food is precious![20] initiative includes:

- stakeholder dialogue on networking between various sectors;
- information and awareness campaigns – diverse publications on the topic of food waste and food waste prevention;
- the organisation of the VIKTUALIA Awards – the first Austrian anti-food waste prize to bring positive examples and set role models through media reporting; the prize has been awarded since 2012;
- supporting the donation of foodstuffs to civil society institutions and building the first online private-sector exchange platform for food in Austria;
- 'Restl-Koch' competition, an Austria-wide competition on using leftovers;
- drawing and painting competition for primary schools to raise awareness among children;
- preparing class materials for primary and secondary schools;
- studies on information bases;
- co-financing the 'United against waste' project in the catering industry;
- launching a Facebook page on the theme of Food is precious;
- preparing the theme on the homepage of the BMNT with many practical tips on avoiding food waste;

[20] https://www.bmnt.gv.at/land/lebensmittel/kostbare_lebensmittel (German)

- media cooperation to achieve wide-ranging impact.

5. Sharing economy, buying services rather than purchasing products, etc.

RepaNet[21] is a non-profit organisation that aims to connect civil society organisations, private repair-service providers, public and private waste management organisations and other interested businesses and organisations on a regional and inter-regional basis to significantly increase the reuse and repair of products, particularly electrical and electronic equipment. A further aim is to influence policymakers to change the legal and economic framework to encourage prolonged product use. RepaNet is particularly involved in projects and political and professional discussions that promote the lengthening of product lifetimes, especially through reuse, the use of second-hand goods, repair services, exchange, lending, community use, product services and the use of durable, repairable products rather than disposable ones. In particular, the focus is on creating jobs for socially disadvantaged people who have difficulty finding employment, and on providing socially vulnerable people with affordable, long-lasting quality products.
Finally, the BMNT supports chemical leasing as product-as-service model[22]. This business model has been implemented in Austria in different pilot projects for circular business models.

6. Education

Some Austrian universities offer academic programmes on topics related to resource efficiency as bachelor's degrees.
An **engineering bachelor's degree in sustainable resource management**[23] has been offered by the FH Campus Wien since October 2016. The course has a choice of two specialisations:

- sustainable resource management;
- packaging technologies.

The interdisciplinary degree programme on sustainable resource management was developed in partnership with companies and government agencies. The primary focus is on designing and optimising sustainable inter-organizational value chains in companies, from product development to recycling and disposal. Therefore, the degree combines engineering, natural sciences, resource management, business administration and environmental law.

The course on packaging technologies concentrates on an holistic approach to packaging. Both courses combine environmental, technological and economic elements.

The **bachelor's degree in environmental and bio-resource management**[24] at the University of Natural Resources and Life Science, Vienna is characterised by interdisciplinary, application-oriented teaching on the management of bio-resources, with an additional focus on economics and social sciences.

The **international Dual Master's Degree in Sustainable Materials** [25] at Montanuniversität Leoben, together with KU Leuven and the University of Trento, combines a high level of expertise in materials with competences in sustainable materials engineering, the circular economy, recycling and sustainability to educate responsible materials-oriented entrepreneurs, innovators and leaders for the future. This master's programme is quality labeled by the European Institute of Innovation and Technology (EIT).

[21] http://www.repanet.at (German)
[22] https://www.bmnt.gv.at/umwelt/chemikalien/chemikalien-leasing-und-gruene-chemie/einfuehr_chem_leas.html (German)
[23] https://www.fh-campuswien.ac.at/en/study-courses/applied-life-sciences-bachelor/sustainable-resource-management.html (English)
[24] https://www.boku.ac.at/studienservices/studien/bakk/h033227/?selectedTypes=group (German)
[25] https://www.unileoben.ac.at/?id=6541 (English)

Under the **Umpädicus educational programme**, the correct collection and separation of waste are key elements of environmentally friendly behaviour and are therefore taught as early as possible. The BMNT provided funding for the development of a training course on environmental education for young children. The key aim of the Umpädicus programme is to enable waste and environmental consultants to pass on their expert knowledge to children in an age-appropriate manner and in line with the children's personal development. After passing a test, participants receive a certificate stating that they have acquired expertise and knowledge in pedagogy, didactics and business administration.

To facilitate participation in Umpädicus, the BMNT pays 25 percent of the training costs for waste and environmental consultants.

7. Public relations work

The It goes circular (**Rund geht's**) campaign: the aim of this information and media work, in which municipalities, trade associations, industry, businesses and private disposal companies have been invited to cooperate, is to raise awareness among the population of the importance of the circular economy and secondary materials. It aims to enhance the image of waste as a substitute for primary raw materials and increase people's willingness to ensure more waste separation.

School competition
In 2018, a competition for schools was organized by the BMNT to increase the awareness for waste prevention[26].

Re-source symposium
The Re-source symposium is a joint conference organised by Austria, Germany and Switzerland, which has taken place regularly since 2009 to increase public awareness of resources and waste themes. The event is also an occasion for a professional dialogue on the themes of sustainable use of resources, the development of concepts relating to resource conservation with a focus on waste management and increasing networking between stakeholders. Re-source shows the current state of development, possible constraints and the potential to increase resource efficiency and in particular material efficiency.
After successful symposia in Berlin (2009), St. Gallen (2011). Vienna (2014) and Munich (2016), the Re-source 2019 conference took place in May 2019 in Basel.

The waste management award PHÖNIX – ideas instead of waste (PHÖNIX – Einfall statt Abfall)
The PHÖNIX prize is awarded to innovative projects or ideas related to sustainable materials and resource management. The sponsors of the PHÖNIX prize are the Federal Ministry of Sustainability and Tourism and the Austrian Water and Waste Management Association (ÖWAV). The PHÖNIX Prize has been awarded since 1999; since 2012 it has been awarded every two years.

8. Voluntary policy instrument for business

The EU's Eco-Management and Audit Scheme (EMAS) and the Circular Economy[27]: EMAS is a very important management instrument in Austria in evaluating, reporting on, and improving companies' environmental performance. It is also a key instrument in stimulating resource efficiency and circular economy approaches in Austria. Companies that have implemented EMAS have already taken an important first step towards achieving a circular economy by monitoring their processes and constantly reducing their impact on the environment. Their knowledge of resource consumption and environmental

[26] https://www.bmnt.gv.at/umwelt/abfall-ressourcen/abfallvermeidung/schulwettbewerb-abfallvermeidung.html (German)
[27] https://www.bmnt.gv.at/umwelt/betriebl_umweltschutz_uvp/emas.html (German)
http://www.umweltbundesamt.at/umweltsituation/ums/emas/ (German)

impacts enables them to implement measures that optimise the use of resources in line with circular economy principles.

Ecological effectiveness is confirmed by studies of Austria's Environment Agency, the Umweltbundesamt on Austrian EMAS companies, which show that 95 percent of the investigated companies have improved their environmental performance; the most significant improvements concern waste and energy. In Austria, around 250 companies and organisations with 1,167 sites are currently registered by EMAS, employ more than 144.000 people and generate a turnover of around EUR 25.7 billion. To sum up, EMAS has an important role to play in helping Austrian companies and organizations unlock the potential of the circular economy and in supporting Austria to use its resources more efficiently.

9. Institutional and regulatory arrangements to support the transition towards a resource-efficient circular economy

Initiative Growth in Transition: discussions on growth, prosperity, and quality of life. This initiative, initiated in 2008 by the Austrian Ministry of the Environment, invites people from institutions, organisations and the business world to engage with issues related to growth, prosperity and quality of life. The initiative is mainly about offering a platform for dialogue on which stakeholders from various institutions are invited to openly discuss what a sustainable society and the transition towards it might look like. In order to sustain and increase prosperity and quality of life in the long term, economic strategies that use the planet's resources responsibly are needed. The main purpose of the initiative is to network and empower people to start to act and make use of the room-to-manoeuvre within their institutions.
To this end, the initiative organises conferences[28] at regular intervals to engage people in discourse. The last conference took place in November 2018 under the Austrian EU Presidency in Vienna and has been held under the auspices of the Trio-Presidency programme. The main topics of the conference were eco-innovation, circular economy and above all the SDGs.

The purpose of the **Recycled Construction Materials Ordinance**, Federal Law Gazette II No 181/2015 as amended by Federal Law Gazette II No 290/2016, is to promote the recycling of waste from construction and demolition activities and thus ensure that the recycled construction materials produced are of high quality. It also aims to achieve the following:

- the highest possible recovery rate of high-quality recycled construction materials as a replacement for primary building materials in structural engineering applications;
- conservation of natural primary materials – protecting the landscape by removing less material and improving groundwater protection;
- legal certainty in the use of recycled construction materials or recycled construction material products;
- reduction of the remaining substances sent to landfill and hence reduced usage of landfill volumes and cost minimisation due to lower quantities of waste ultimately sent to landfill.

To this end, the Ordinance lays down requirements that must be met when demolishing structures, such as the investigation of pollutants and impurities, the ordered and recovery-oriented dismantling of structures and the proper separation of waste on site. These measures make construction and demolition waste more suitable for producing recycled construction materials. The Ordinance also contains quality specifications for recycled construction materials and prescribes the ranges of applications for recycled construction materials. This will help ensure that recycled construction materials are of high environmental quality, increasing trust and confidence in the use of these construction materials.

The **State Prize for Environmental and Energy Technologies** is the highest state award in the field of environmental technology and is awarded every two years. With the State Prize, companies have the opportunity to signal their innovative strength and market presence and thus strengthen their position.

[28] https://wachstumimwandel.at/conference2018/ (English)

The **Special Prize for Resource Efficiency**[29] is awarded to Austrian companies whose projects make a significant and measurable contribution to increasing resource efficiency in Austria. On October 2018, the State Prize for Environmental and Energy Technology and the Special Prize for Resource Efficiency were awarded as part of envietech2018. The **conference on environmental and energy technology – envietech**[30] also takes place at regular intervals. **Envietech2018** has stimulated out of the box thinking in times of global transformation. In this sense, successful technological innovations from energy and environmental technology were presented at envietech2018. The events were part of the Austrian EU Council Presidency.

The BMNT promotes **cooperation and networking with regional clusters and networks**[31] in the field of environmental and renewable energy technologies. The regular environmental technology network meetings of the cluster managers offer the opportunity to exchange current trends, developments and perspectives in the environmental technology sector.

10. Building sector

The Urban mining cadastre (UMKAT): the UMKAT pilot project developed the first Austrian urban mining cadastre for a district of Graz, identifying and visualising anthropogenic deposits. This cadastre seeks to systematically map which materials have been used in infrastructures and buildings. A system was developed to record urban mining potentials and hence create the basis for identifying, categorising, quantifying and assessing the anthropogenic deposits in regions, from scientific, technical, ecological and economic perspectives. The potential identified was visualised as an example for the test area of Graz-Eggenberg using a geographic information system (GIS). It is planned to extend this cadastre to other districts and cities.

Seeking synergies with other policy areas

Austria has put some initiatives in place that deliberately seek to create synergies and co-benefits between resource efficiency, the circular economy and other policy areas. The initiatives mentioned below deal respectively with energy efficiency, job creation and sustainable industry.

An information platform for high-quality, energy-efficient products – topprodukte.at [32] **–** offers information to help consumers find energy-saving, high-quality products as well as repair shops specialising in electronic products in Austria.

The **Austrian Masterplan Green Jobs**[33] was presented in 2010. It focuses on:

- ensuring a high level of qualification;
- continuous improvement and innovation;
- forcing networking and cooperation;
- support and promotion of internationalisation;
- stimulating business investment in and private consumption of sustainable products and services;
- awareness raising.

[29] http://ecotechnology.at/content/staatspreis-2018-buhne-innovationen (German)
[30] http://ecotechnology.at/de/content/envietech-am-30102018-graz (German)
[31] http://ecotechnology.at/ (German)
[32] https://www.bmnt.gv.at/umwelt/energiewende/energieeffizienz/topprodukte.html (German)
http://www.topprodukte.at/index.php?pid=service&service=108 (German)
[33] https://www.bmnt.gv.at/umwelt/nachhaltigkeit/green-jobs/masterplan.html (German)

The main goal of the Masterplan is to stimulate green jobs and skills, environmental technologies and the transition towards a more carbon dioxide- and resource-efficient circular economy.

In addition, the **environmental qualification portal** [34] is the platform for Austria's environmental education, which offers training and further education in the fields of green energy, resources, environmental technologies and environmental competences.

In cooperation with the regions, the BMNT has developed and established **programmes for environmental protection**. The main goal is to identify existing potentials and measures to improve energy and resource efficiency as well as waste prevention. Resource-efficient production is a key area for industry. The main reason is the potential for cost savings. Therefore, the focus of material efficiency consulting will be further extended. In the **pilot Material Efficiency Lab** [35], a material efficiency tool for companies has been developed and material efficiency measures will be implemented for 10 companies. The pilot is financed by means of the Environmental Funding Programme (UFG).

The **Eco-Business Plan Vienna** [36] provides and co-finances consultancy for production industries. While particularly targeting small companies, it is also open to larger ones. The Plan consists of eight steps which lead from application and a first resource efficiency check through the selection of an in-depth consultation programme, on-site consultation and the selection of implementation measures, to the monitoring and evaluation of achievements. If the achievements are in line with the objectives of the Plan, the company receives an award. The in-depth consultation programme for small companies consists of two workshops and three days of on-site consultation on waste prevention, waste management, energy saving and climate protection.

The more extended in-depth consultation programme **Ecoprofit** consists of eight workshops and five days of on-site consultation focusing on the optimisation of production processes.

When it comes to **importation of materials and making them more sustainable,** there is no strategy at the moment in Austria. Nevertheless, since 2018 Austria's RMC has been published annually in official statistics.

The work on RMC is processed by cooperation between the BMNT, the Institute of Social Ecology of University of Natural Resources and Life Sciences, Vienna and Statistics Austria. It is driven by the fact that looking at national resource efficiency delivers only one part of the picture since resource use connected to intermediate inputs in foreign countries is not taken into account. From an ecological point of view, the outsourcing of resource-intensive production processes to foreign , often developing countries has to be made visible. Thus, RMC is also an indication of which part of the impacts of resource consumption within a country is outsourced to others.

Resource efficiency and circular economy policy initiatives from subnational to local level

Numerous subnational and local initiatives are being implemented in Austria, to contribute to a range of sectors. Among these are:

- The ÖKOPROFIT programme is an advisory programme implemented by provinces with the support of the BMNT to support SMEs. The programme, launched in 1991, aims to help companies implement environmental measures, thereby reducing industrial emissions; decreasing operational costs for companies; strengthening partnerships between public agencies, companies, and experts; and preventing waste.

[34] http://www.ecotechnology.at (German)
[35] https://www.ressourcenforum.at/materialeffizienzlabor/ (German)
[36] http://www.wien.gv.at/umweltschutz/oekobusiness (German)

- Repair initiatives for electronic appliances. Several repair initiatives (repair cafés, repair networks, repair vouchers, etc.) for old electronic appliances are available to Austrian citizens. These are initiated at the local or regional level by municipalities or provincial governments and local/citizen organisations, etc.
- Weniger Brotabfälle (Haubis) and Minimieren von Brotabfällen (Linauer/Wagner) (Less bread waste) are examples of retailers taking initiatives to reduce bread waste. Both initiatives include improved logistic planning for the production and stocking of bread, but the most interesting aspect is probably the decision to reduce the choice of products, for example offering just seven varieties of bread. By limiting the variety of products available, the second retailer reported that it was possible to reduce the amount of bread wasted to just 10 per cent, compared to almost 60 percent when a much wider choice was offered.
- Halving waste (Halbierung der Abfälle (Krainer)). This Austrian meat producer is halving the generation of food waste from meat processing thanks to the use of new technology: in the meat and sausage industry, goods must be shaped, weighed, measured and cut, and modern machines can optimise these processes to avoid production losses.
- Less beer waste (Weniger Bierverlust (Brauunion)): this initiative, started by a brewery, reduced losses in beer production by 15 per cent by improving the hygiene standards of containers and stock rooms.
- Small quantity orders (Kleinstmengenbestellung (Kiennast)): food retailers usually have to order fixed quantities of food products from distributors. In many cases, these quantities cannot be completely sold, causing food waste. The food distributor Kiennast allows food retailers to order small amounts of food products according to their needs, eliminating the purchase of unwanted quantities of food.
- This is still good (Das ist doch noch gut (Pfeiffer)): this is a campaign for raising awareness of the actual expiry date of food products. The initiative included education in schools and the production of recipes for cooking leftovers.
- The Resourceneffiziente Gemeinde project aims to raise awareness and strengthen the exchange of experiences at local and regional levels for more resource-efficient ways of life. Concentrating on a first step in the focus areas of sustainable public procurement, inter-communal cooperation, and smart land use, Austrian municipalities are invited to participate in interactive workshops and test their potential for resource avoiding and resource efficiency by taking an online check. The project is carried out by Resource Forum Austria, the Resource Management Agency and the Austrian Association of Municipalities in cooperation with the BMNT. It is financed by the Austrian Programme for rural development (LE 2014–2020). An online check tool has been developed by the Resource Management Agency. Website: http://gemeindebund.at/ressourcen (German).
- BauKarussell is the first large-scale, social dismantling project in Austria and contributes to the development of a circular economy. In 2018, it was awarded the Phoenix Special Prize for Waste Prevention. The project consortium, on behalf of the builder, removes furniture, components, building materials and other materials that can be re-used in other buildings or can be recycled, thereby reducing the costs of disposal and the negative environmental impact. At the same time, jobs will be created for disadvantaged people in the labour market
- A pilot project for reusing materials from the building sector is an example of an initiative to increase the resource efficiency of construction materials[37].
- The programme for reducing food waste in the gastronomy sector (kuchenprofit.at). Through this programme, chefs in the gastronomy sector receive individual training on how to reduce food waste. This also includes an analysis of the cooking activities which generate waste and the development of tailored solutions[38].
- The online platform Circular Future for a circular economy in Austria. The platform was established as a collaboration between the Austria Umweltdachverband and the European Environmental

[37] http://www.repanet.at/baukarussell/ (German)

[38] https://united-against-waste.at/kuechenprofit/ (German)

Bureau (EEB), the Reuse and Repair Network Austria (RepaNet), and the Verband Abfallberatung Österreich (VABÖ). The objective of the platform is to establish a solution-oriented multi-stakeholder platform as a think tank, incubator and catalyst for projects and initiatives necessary for a successful transition to a circular economy in Austria, aiming at bringing together professionals across relevant industries and civil society.

Other resources

Examples of policies which go beyond "material resources"

Statistics Austria has published an indicator set[39] to measure wellbeing and progress of Austrian society, *How is Austria?,* on an annual basis since 2013. Indicators of resource use and environmental accounting are an integral part of this indicator set. The connections between economic development, social cohesion and environmental conditions are a focus of the set.

The way forward

Reflections on future directions of policies on resource efficiency and circular economy

Austria foresees the following main challenges and ways to tackle them, when it comes to the implementation of resource efficiency, circular economy and raw materials policies.

- Establishing a concrete, binding resource efficiency target at EU level, complemented by a system of monitoring, would help to better establish the resource efficiency issue on the political agenda.
- Linking resource policy with energy and climate policy, and showing the synergies of cooperation.
- Establishment of an official United Nations Intergovernmental Panel on Resources – Ressourcenklimarat – like the Intergovernmental Panel on Climate Change (IPCC), by evolving the existing United Nations International Resource Panel (UN IRP), which could also help attach greater importance to the resource issue.
- By this, we mean that the importance of the UN IRP should be increased. We think it would be essential to link the excellent work done by the UN IRP closer to policy. A first step has already been taken by demanding regular reporting on the part of UN Environment. It would be useful if the UN IRP could gain more weight in international policy considerations, comparable to the IPCC.
- Economic barriers, such as low primary resource prices, definitively decrease the demand for waste-derived materials.
- Some qualities of secondary raw materials are a barrier for material acceptance and risk the dissemination of pollutants within a circular economy. This needs to be kept in mind when setting recycling rates.
- Insufficient consideration of recycling and reuse at the product design and manufacture stage is the main challenge to be overcome.

[39] http://www.statistik.at/web_en/statistics/------/hows_austria/index.html (English)

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