Beginners:Environment

Environment statistics provide information on the environment around us and the mutual relationship between natural resources and human activities.

Thus, these statistics give information about a wide range of phenomena, ranging from the emission of greenhouse gases to data on biodiversity. In fact, they not only analyse the environment from the point of view of economic production, but they also answer questions about energy and environmental policies, as well as the status of ecosystems.

Furthermore, thanks to practices of reusing, recovering and recycling products and materials, it has now become possible to extend the idea of resource, including in environmental statistics data on circular and sustainable economy.

Why is this information important? Governments can rely on these data to make informed key environmental policies, for example to decide what types of cars can be used or what type of fuel is most efficient to heat houses and buildings.

This article provides an overview of EU environment statistics. It outlines how these statistics help answer important questions and inform key policies, how the different data are collected and how they are brought together in consistent frameworks called ' environmental accounts ' which shed light on the interactions between the environment and the economy.

This article is part of Statistics 4 beginners , a section in Statistics Explained where indicators and concepts are described in a simple way to make the world of statistics easier to understand.

What are environment statistics and what kind of information do they provide?

European environment statistics, accounts and indicators provide a wide range of information on the environment, on the influence of human activities and the interaction between these activities and the environment.

The **material flow accounts** describe how materials move through the economy, from the extraction and trade of raw materials to the transformation processes, until their disposal as waste. As reusing and recycling have become increasingly important, a greater attention is put on waste statistics, recording what and how we recycle, to monitor the development towards a circular economy.

Air emissions accounts provide information on the substances released in the atmosphere by human activities. Globally, indicators on the emission of greenhouse gases are closely monitored as these emissions contribute relevantly to climate change and global heating. Then, other air polluting substances are detected and recorded to give information about the quality of the air we breathe, which affects directly our health and the quality of life.

Water statistics describe how much groundwater and surface water is available, they display how much water is abstracted and used for different human activities, thus they analyse water quality and the related pollution, and how much waste water is treated.

The **environmental accounts** are built on the same principles as the national accounts for the economy, and use the same framework. Since the format of these accounts is harmonised, it is possible to link the information provided by the two . This makes it easier to analyse how different economic sectors (such as different manufacturing sectors, agriculture, transport, households, etc.) affect the environment, and how these sectors make use of various resources and materials.

Statistics on biodiversity and ecosystems provide important information on the status of the natural environment and of different habitats. They record the efforts made to preserve the wide variety of lifeforms, through specifically targeted policies.

How is environmental data collected?

The environment statistics data generally come from national statistical offices, national environment agencies or other administrative bodies in the EU Member States and the EFTA countries (e.g. European Environment Agency).

Eurostat and the reporting countries work together to define which data needs to be collected and to develop harmonised methodologies. The reporting countries are therefore responsible for the data collection at national level and the data transmission to Eurostat, while Eurostat is responsible for collecting, compiling, and disseminating these data.

Which policies do the environment statistics support?

European environment statistics feed into a number of EU policies and initiatives. One of key European Commission policy priorities is the **European Green Deal** . It aims to turn climate and environmental challenges into opportunities and make the EU's economy sustainable.

The European environment statistics support the European Green Deal by providing information on developments in a wide range of policy areas.

Some important examples:

- Eurostat's environmental accounts, including the air emissions accounts, energy accounts and environmental taxes, as well as the forest statistics, support the ambition of making the **European Union carbon neutral by 2050** .

- The environmental accounts, in particular the material flow accounts and the information on air emissions and energy use by industry, as well as the statistics on collection and recycling of waste provide information on material flows and resource productivity and support the ambition of **turning the EU economy into a circular economy** .

- The aim of **preserving and protecting ecosystems and biodiversity** is supported by the environmental accounts and statistics on hazardous chemicals and hazardous waste. The new ecosystem accounts will soon provide information on how nature and its various ecosystems contribute to the wellbeing of our society and the economy.

- The ambition of **moving towards zero pollution and a toxic-free environment** is supported by the air emissions accounts, waste statistics and statistics on hazardous chemicals.

Eurostat's visualisation of key statistics for the European Green Deal provides decision-makers, analysts, researchers, media and citizens with an easy-to-use and continuously updated overview of main developments related to the European Green Deal:

Click on the picture to go to the interactive European Green Deal dashboard

The European Green Deal aims to develop the European economy and society towards a sustainable future. This ambition is closely linked to the United Nations' **Sustainable Development Goals (SDG)** . Eurostat supports these efforts through the European Union SDG indicator set and the an-
nual report on ' Sustainable development in the European Union '. The environment statistics are a key input to these.

What are air emissions and why are they important?

Emissions of greenhouse gases
Climate change is one of the most important challenges the world is facing. To support the EU efforts to combat climate change, Eurostat publishes data on the emissions of **greenhouse gases (GHG)** , which are gases that cause climate change. With these statistics, Eurostat provides facts for the EU's policies against climate change, and for the debate in society on the topic.

The data published take into account the emissions into the atmosphere of seven different greenhouse gases. Even though the most important and most discussed are carbon dioxide (CO_2) emissions, derived from fossil fuels and cement manufacturing, Eurostat also provides data for emissions of methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride and nitrogen trifluoride.

The emissions are measured in tonnes of gas, recording their levels in the EU and its Member States. In order to get an overall picture of the total global warming potential of the different greenhouse gases emissions, data are also measured in tonnes of carbon dioxide equivalent (CO_2-eq). In this way, emissions of each greenhouse gas are converted to the corresponding amount of CO_2 emissions that would equally contribute to global warming.

Emissions of air pollutants
Clean air is essential to our health and to the environment. Air pollution is the most important environmental health problem in the EU. It causes serious illnesses such as asthma, cardiovascular problems and lung cancer, and damages the environment and ecosystems through excess nitrogen pollution and acid rain. Polluting air emissions that worsen the quality of the air we breathe are caused by industry, energy production, heating of our homes, agriculture and transport.

More information regarding the different approaches for measuring air emissions is available in the thematic section on environment on Eurostat's website.

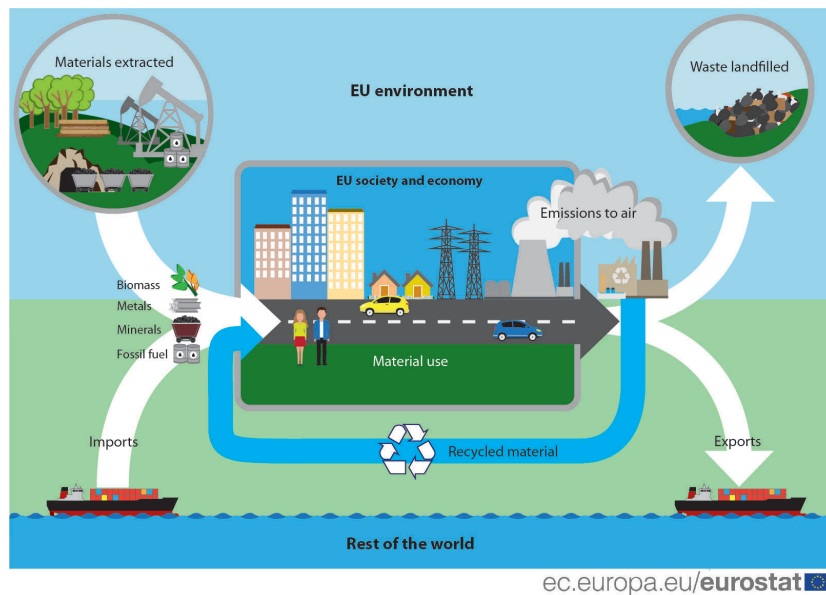## Measuring the flows in circular economy

The Earth has limited natural resources and the current levels of extraction and consumption are not sustainable. The worldwide consumption of materials such as biomass, fossil fuels, metals and minerals is expected to double by 2060, while the amount of waste generated each year is predicted to increase by 70 % by 2050.

In order to turn the EU into a climate-neutral, resource-efficient and competitive economy, it is vital to make economic growth less dependent on the extraction and use of natural resources by creating a **circular economy** . This process of "decoupling" resources and growth could be achieved by recycling as much as possible from waste and by feeding the recovered materials back into the economy as secondary resources or secondary raw materials.

As the European Commission adopted a new Circular economy action plan (CEAP) within the framework of the European Green Deal, Eurostat provides its support through the circular economy monitoring framework .

Because of the growing importance of environmental policies, the circular economy monitoring framework is currently under revision.

As the image below shows, it is possible to get an overview of circular economy by tracking the flows of materials in the economy, which is embedded in the environment. You can see how materials enter, flow within and leave the economy, either to "*re-enter* " the economy as *secondary raw materials* (after being recovered through recycling of waste) or leaving the economy either as exports or as landfilled waste.

Materials extracted

Waste landfilled

EU environment

EU society and economy

Emissions to air

Biomass
Metals
Minerals
Fossil fuel

Material use

Imports

Recycled material

Exports

Rest of the world

ec.europa.eu/**eurostat** 🇪🇺

How much material resources are we using?

Eurostat produces **material flow accounts** , a collection of data on how natural materials flow through the circular economy. The material flows display the amounts of materials available to the economy through extraction and net imports (imports minus exports, all measured in tonnes).

Data for the material flow accounts are produced every year, using already existing data as much as possible. The accounts use data on:

- **extraction of materials** in each EU Member State, broken down by biomass, metal ores, non-metallic minerals and fossil energy;

- **physical imports and exports** of materials;

- **outputs of processed materials** and **emissions to the air** in each Member State.

There are several key indicators, which are calculated from the material flow accounts. More information is available in the thematic section on environment on Eurostat's website.

Eurostat has developed an interactive tool to enable users to get an overview of the material flows within the circular economy in the EU: this sankey diagram shows the flows of materials through the EU economy. It is possible to look at all raw materials, or to isolate the different categories of materials, and to analyse the figures for individual Member States or for the EU as a whole. The different bands correspond to the different flows (see the circular economy illustration above), and their width is proportional to the physical quantity (in tonnes) of the different flows.

The loop represents the flow of secondary raw materials, i.e. materials that are recovered from waste and fed back into the economy as production input, and other backfilled materials.
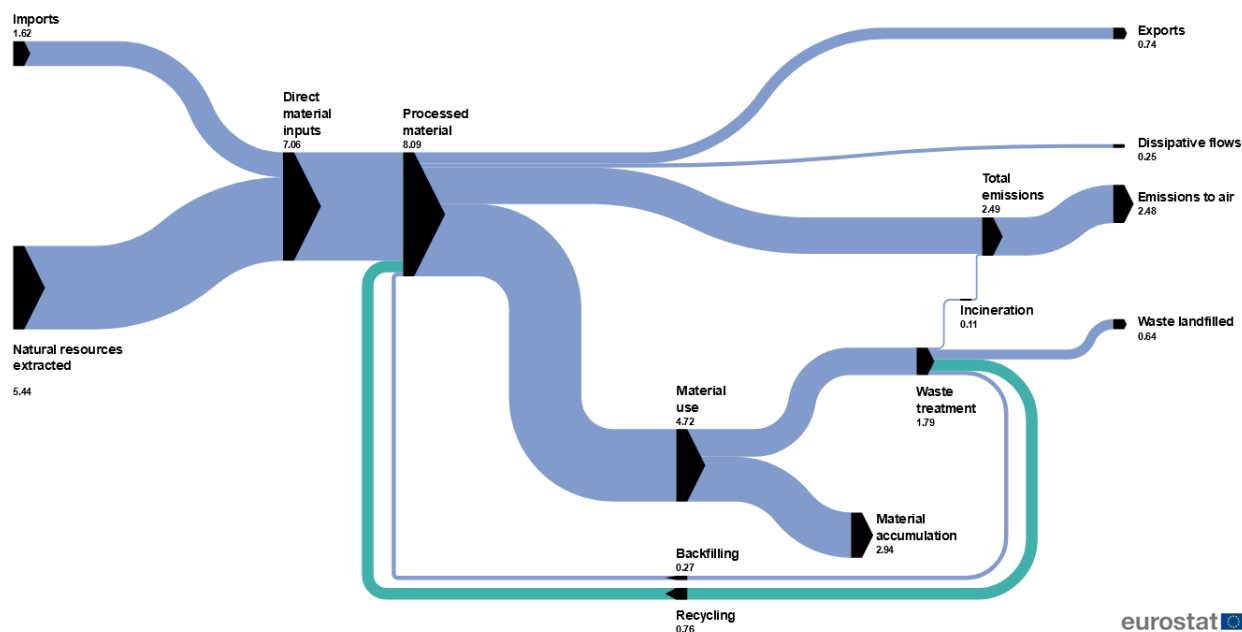
Click on the picture to go to the interactive material flow diagram.

Which information do European waste statistics provide?

EU waste policy aims to address negative environmental and health impacts from waste and implement an energy and resource-efficient economy, where the production of waste is reduced and materials are increasingly recycled.

Eurostat provides statistics on waste generation and treatment on a regular basis, covering both the whole economy and specific waste streams. These data are being used to monitor EU waste policies, they are fundamental for circular economy indicators and for the material flow accounts.

The EU's approach to waste management is based on a 'waste hierarchy', which sets the following priorities:

- **prevention** of waste generation;

- **reuse, recycling and recovery** of material from the waste;

- **disposal** (landfilling and incineration).

Waste prevention is closely linked with improvements in manufacturing methods and with the consumers' demand for greener products and less packaging. One example is the consumption of plastic bags used for shopping. If waste cannot be prevented, for example by bringing your own shopping personal bag, the materials should be recovered as much as possible, preferably by recycling the plastics to create new objects.

Eurostat compiles European statistics on waste generation and management concerning key waste streams. The data are detailed by waste category, economic activity and treatment method (such as recycling or disposal). In particular, they show the developments in the shares of waste collected and recycled.

European waste statistics covers the following topics:

- Waste generation and treatment;

- Management of waste;

- Exports of waste;

- Key waste streams:

    - Batteries

    - End of life vehicles

– Hazardous waste
– Municipal waste
– Packaging and packaging waste
– Annual consumption of lightweight plastic carrier bags
– Waste electrical and electronic equipment
– Waste excluding major mineral wastes

Statistics on water resources in the EU

The European water statistics compiled and disseminated by Eurostat provide key information to develop EU legislation and monitoring policies on water resources, their extraction and use, as well as the treatment of wastewater. Therefore, they are also useful for environmental assessments.

Water statistics are collected jointly by OECD and Eurostat. This data collection provides long term series as well as comparable data for EU Member States and for other OECD countries.

They provide information on:

• freshwater resources in groundwater and surface water;

- abstraction (extraction) of water resources;

- water use by the type of water supply and type of industry or other economic activity such as agriculture;

- the share of the population that is connected to plants for wastewater treatment;

- generation and disposal of sewage sludge from wastewater treatment;

- pollution by source of the wastewater, as well as the discharge of the wastewater by type and level of treatment.

The new ecosystem accounts

Forests, rivers, grasslands, wetlands and other ecosystems supply essential services to our society. These include providing food, filtering air and water, pollinating crops, regulating local climates, protecting against floods, heat waves and other extreme weather events, and many other benefits. How well the ecosystems can supply these services depends on their size ('extent') and health ('condition'). It is therefore vital to understand and measure how human activities affect ecosystems and how our wellbeing is dependent on well-functioning natural systems.

Eurostat and other Commission services over the last years have worked together with the United Nations, national statistical offices and the research community on developing a common framework to measure the value of the different services provided by ecosystems. It also includes monitoring how the economy and other human activities affect the extent and conditions of the different ecosystems, and thus their ability to provide these services.

Based on this work, in March 2021 the UN Statistical Commission adopted the **Ecosystem Accounting** framework of its System of Environmental Economic Accounting. It is a first international statistical standard on ecosystem accounting that brings together environmental and economic information in a consistent framework.

In Europe, Eurostat, the Joint Research Centre, the European Environment Agency, DG Environment and DG Research and Innovation have worked together on the joint INCA (Integrated Natural Capital and ecosystem services Accounting) project. INCA developed pilot ecosystem accounts at the EU level, integrating existing EU data sources.

The Commission (Eurostat) has made a proposal for ecosystem accounts to become mandatory in the EU. This proposal, which is currently discussed by the European Parliament and the Council, would require EU members to produce estimates of ecosystem extent, condition and certain ecosystem services, and transmit these data to Eurostat.

Other articles

Related articles:

- All Statistics Explained articles concerning environment statistics , including Environment statistics introduced , Environment background articles and Environmental accounts background articles .

Glossary items in Statistics Explained:

- Glossary of environment statistics terms

Global warming and air emissions

- Greenhouse gases (GHG)

- Carbon dioxide (CO2emissions

- Carbon dioxide (CO2) equivalent (CO2-eq)

- Global-warming potential (GWP)

- Air emissions accounts (AEA)

Circular economy and material flows

- Resource productivity

- Material flow indicators

- Classification of Resource Management Activities (CReMA)

- Domestic extraction (DE)

- Direct material input (DMI)

- Domestic material consumption (DMC)

- Economy-wide material flow accounts

- Economy-wide material flow accounts (EW-MFA)

- Physical energy flow accounts (PEFA)

- European Environmental Economic Accounts (environmental accounts)

- System of Environmental Economic Accounting - Central Framework (SEEA-CF)

Generation and treatment of waste

- Waste

- Incineration

- Landfill

- Recovery of waste

- Recovered products

- Reuse of waste

- Preparing for reuse

- Recycling of waste

Abstraction, treatment and use of water

- Freshwater resources

- Groundwater

- Surface water

- Water abstraction

- Water use

- Wastewater

- Domestic wastewater

- Urban wastewater treatment plant (UWWTP)

Other terms

- European Union (EU)

- Geographical information system

View this article online at
http://ec.europa.eu/eurostat/statistics-explained/index.php/Beginners:Environment