

EU and UK must work harder to meet circularity goals

Despite ambitious policy goals, the EU and UK are making slow progress towards a circular economy. Circularity is a crucial part of the strategy to achieve a climate neutral society by 2050. But so far, reducing material consumption has lagged behind reducing and greening energy consumption



Circularity is key to combating climate change

The call to combat climate change was louder than ever this summer. First, the European Commission launched its ambitious ['Fit for 55' strategy](#), and then the new [IPCC report](#) unambiguously underlined the need to take action.

'Global resource consumption has increased eightfold in the last century and is projected to double again by 2050. The result is a 70% increase in annual waste production', says Roy Vissers, Global Circular Economy Lead at DSM, in het Financieele Dagblad.

When it comes to reducing CO2 emissions, 'energy transition' has been getting the most attention. The role that material consumption plays has been somewhat overlooked. The UN Global Resources Outlook 2019 states that natural resource extraction and processing make up approximately 50% of the total greenhouse gas (GHG) emissions. Resource-related impacts on water stress and biodiversity loss due to land use are even more significant at over 90%. This emphasises the importance of transforming the global economy into a circular system. The Oxford Institute for Energy Studies, in a study published a few months ago, also confirmed the need to look beyond energy. Despite this, the world has become slightly (about half a percent) less circular in recent years. In 2017 (the last year measured), a record 100 billion plus tons of material was needed to keep the world economy going, of which only 8.6% was cycled back into the economy.

Three indicators for measuring circularity

The circularity of individual economies is difficult to quantify. Accurate indicators of circular performance are still being developed. The World Business Council for Sustainable Development delivered a [second version of its Circular Transition Indicators Framework](#) in early 2021. In this article, we focus on material consumption, waste, and recycling in Europe's larger economies. These are common indicators for making a rough assessment of circularity at the macro level.

1 Material consumption

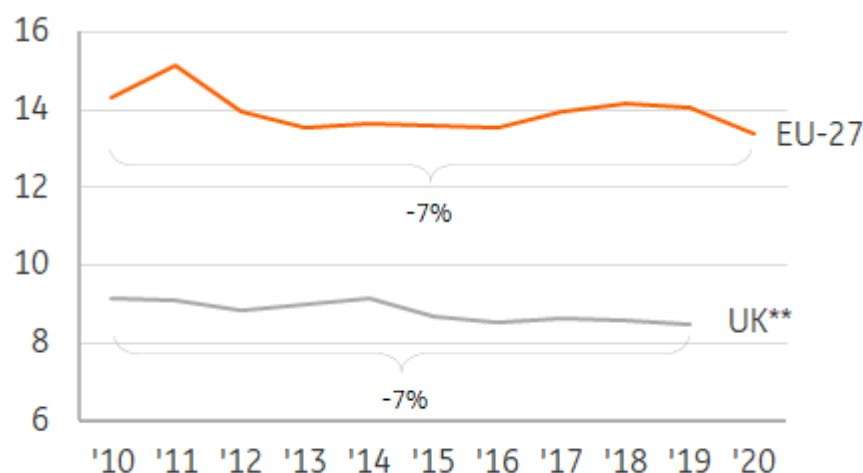
Consumption decreases and efficiency grows in the EU and UK

In the past decade, both the EU and UK have managed to reduce material consumption by roughly 7% per capita. Bear in mind that the EU showed a 5% decrease in just one year, due partly to Covid-19. However in 2019, the EU's total material consumption was only 2% lower than in 2010. There are still no 2020 figures available for the UK, but here too, reduced consumption and production during the pandemic likely led to a sharp drop in material consumption.

The resource productivity indicator compares total material consumption to the size of the economy by dividing gross domestic product by domestic material consumption. According to this indicator, since 2010, the UK has created more value per kilogram of consumed material than the EU countries as a whole. In the UK, resource productivity increased by 19% between 2010 and 2019, while the increase was 14% between 2010 and 2020 for the EU. Not only does the UK consume less material, but it also gets about 1.7 times more value out of that material than the EU. In terms of the absolute quantity of consumption, the UK also far outperforms the EU. The EU consumes one and a half times more material per capita than the UK.

Domestic material consumption per capita*

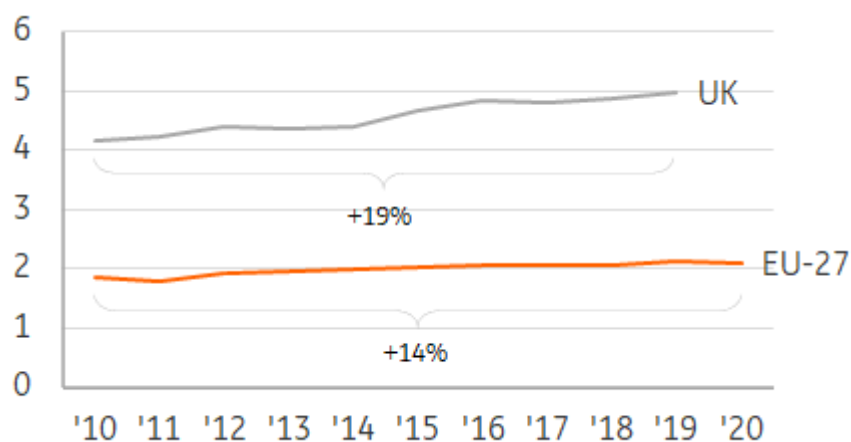
*tons per capita **2019 latest available year



Source: Eurostat, edited by ING Research

Resource productivity*

*gross domestic product divided by domestic material consumption, in euros per kilogram, chain linked volumes (2015)



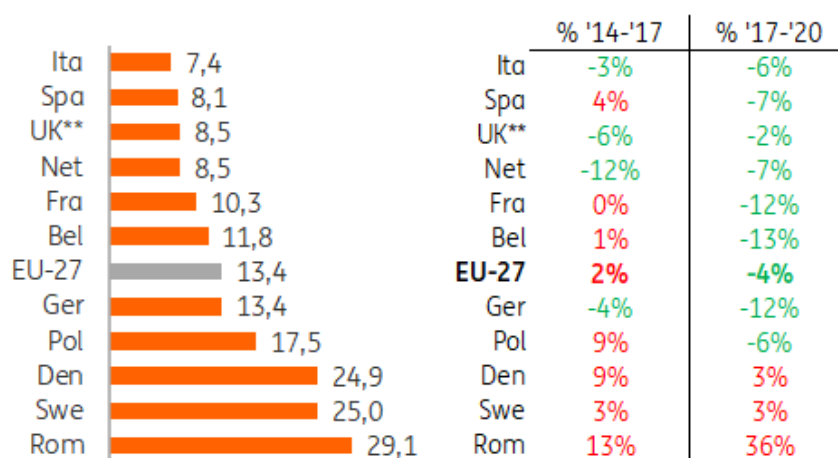
Source: Eurostat, edited by ING Research

Italy has the lowest material consumption while the Netherlands is the most productive

There are big differences between countries within the EU. The UK has a relatively low level of material consumption and relatively high level of material productivity compared with most individual countries in the EU. Compared with the UK, only Italy and Spain consume less material per capita and only the Netherlands has a higher level of material productivity. Among the larger countries in the EU, two Eastern European countries (Poland and Romania) and two Scandinavian countries (Denmark and Sweden) rank lowest in material consumption and highest in material productivity, see tables below.

Domestic material consumption per capita, 2020*

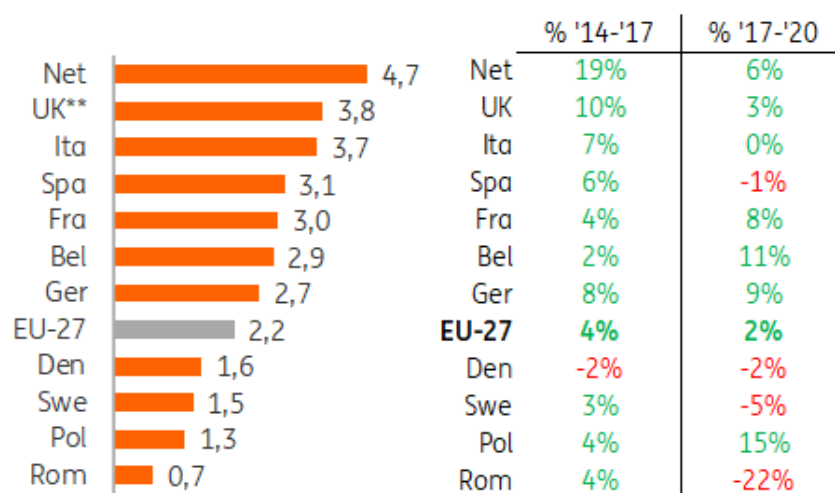
*tons per capita, ** 2019 latest available year



Source: Eurostat, edited by ING Research

Resource productivity, 2020*

*Purchasing power standard (PPS) per kilogram, ** 2019



A large services sector results in lower material consumption

Material consumption per inhabitant depends not only on policy measures, but also, and perhaps especially, on the structure of the economy. By nature, the material input per euro earned is structurally much higher in manufacturing sectors (agriculture, industry and construction) than in service sectors, where added value is mainly created through services – using materials produced elsewhere – and much less new material is consumed.

Economies with relatively large manufacturing sectors, such as those of Romania and Poland, consume relatively large amounts of materials. In Sweden, another country at the bottom of these rankings, mining and quarrying play a relatively large role. These are activities in which the extraction of raw materials causes a high consumption rate, while the

added value of these activities per kilogram is relatively low.

The comparative shift provides more insight into the results of circular efforts. The countries at the top of the rankings have made substantial steps towards reducing material consumption and increasing material productivity in recent years. In contrast, with the exception of Poland, the bottom four countries show no substantial improvement in the reduction of material consumption.

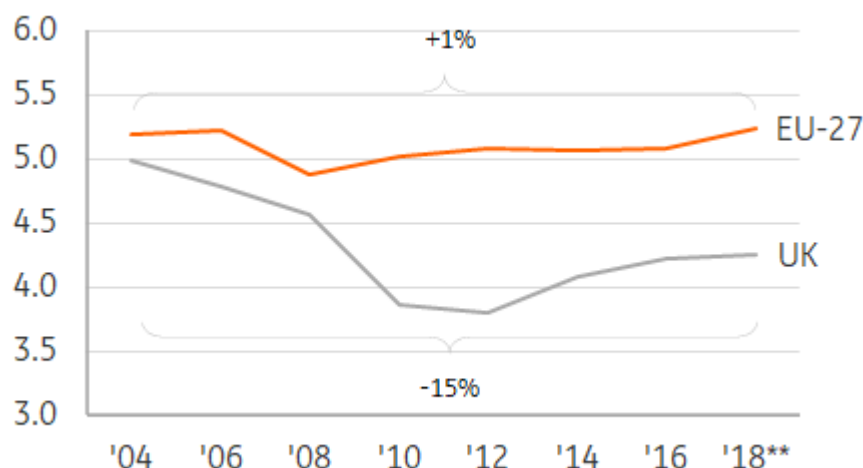
2 Waste generation

The UK outperforms the EU in long-term waste reduction, but waste increases in recent years

While the UK and EU are both consuming less material, they have also both been producing more waste per capita in recent years. The amount of waste (which is handed over to waste management systems) per capita has been increasing structurally since 2008 in the EU and since 2012 in the UK. The UK has reduced total waste by 15% since 2004 but the improvement in this trend has trailed off in recent years. On the bright side, the amount of waste as a proportion of gross domestic product is structurally decreasing in both the UK and the EU. This means that for every euro and pound earned, less waste is being generated.

Total waste per capita*

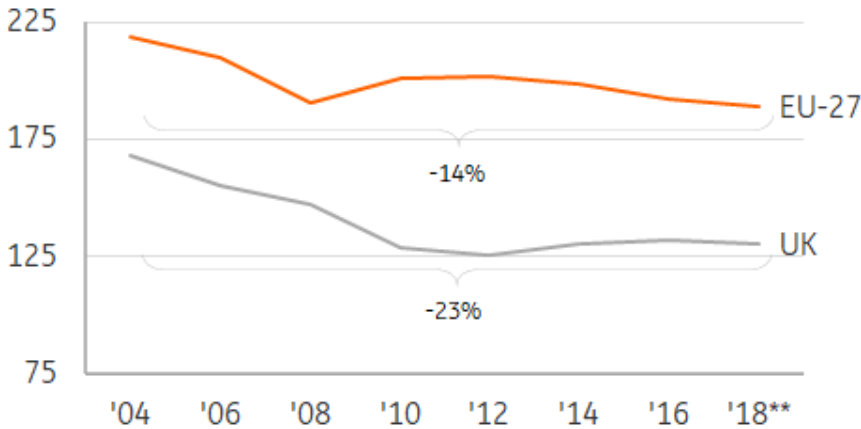
*tons per capita **latest available year



Source: Eurostat, edited by ING Research

Total waste in % of GDP*

*total waste in tons, GDP at market prices, chain linked volumes (2010) **latest available year



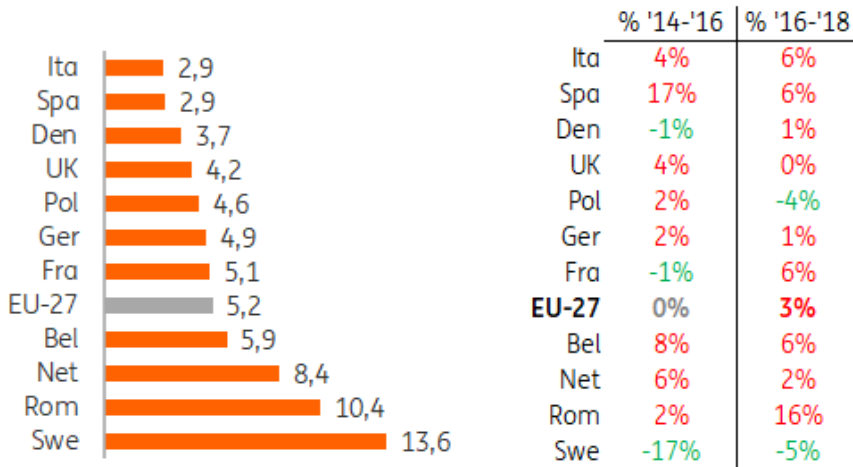
Source: Eurostat, edited by ING Research

Italy, Spain and Denmark top UK; greatest reduction in waste by outliers Sweden and Poland

Within the EU, the amount of waste generated varies greatly from country to country. Sweden produces more than four times as much waste per capita as Italy or Spain. The latter two countries, like Denmark, are ahead of the UK, which comes in fourth in terms of the least waste produced. Denmark has the smallest amount of waste compared with the size of its economy. Sweden and Poland are the only countries to have reduced their waste per capita between 2016 and 2018, see tables below.

Total waste per capita, 2018*

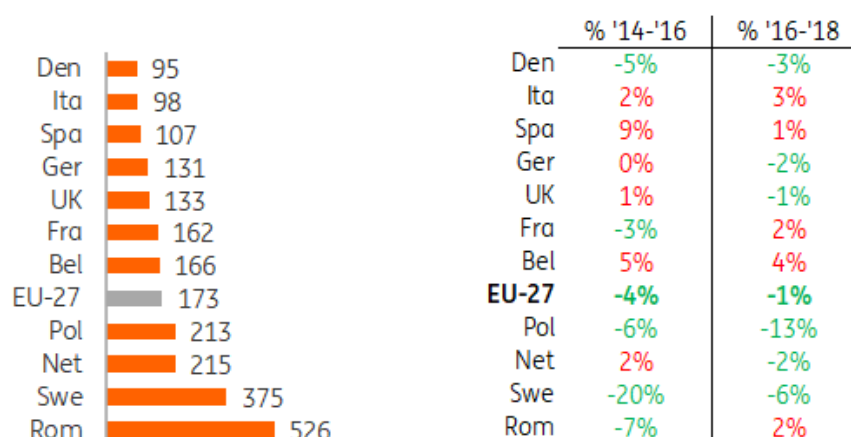
*tons per capita, ** latest available year: 2018



Source: Eurostat, edited by ING Research

Total waste in % of GDP, 2018*

*total waste in tons, GDP at market prices and in million purchasing power standards, ** latest available year



Source: Eurostat, edited by ING Research

Mining, quarrying, and construction generate a lot of waste

Sweden and Romania are at the bottom of the list due to their relatively large-scale mineral extraction. On average, this sector generates 27% of all waste, but for these two countries, the size of the sector makes that figure 75% and 88%, respectively. Excluding mineral waste, Romania produces the least of the countries analysed here. Besides the latter countries, the Netherlands also produces a remarkably large amount of waste. This is mainly due to the construction industry, which accounts for 70% of all Dutch waste, while the EU average is 22%. Within the construction sector, the relatively large Dutch dredging sector is responsible for this high figure, although a large amount of dredging services takes place across the border. The Dutch industrial sector produces about 38% more waste than the EU average. This is partly due to its relatively large food industry. In the Netherlands alone, this accounts for around 60% of all industrial waste. The waste mainly consists of plant and animal products with a limited shelf life and usability. As a result, a large part of the animal or plant organism still goes unprocessed.

3 Circular material use

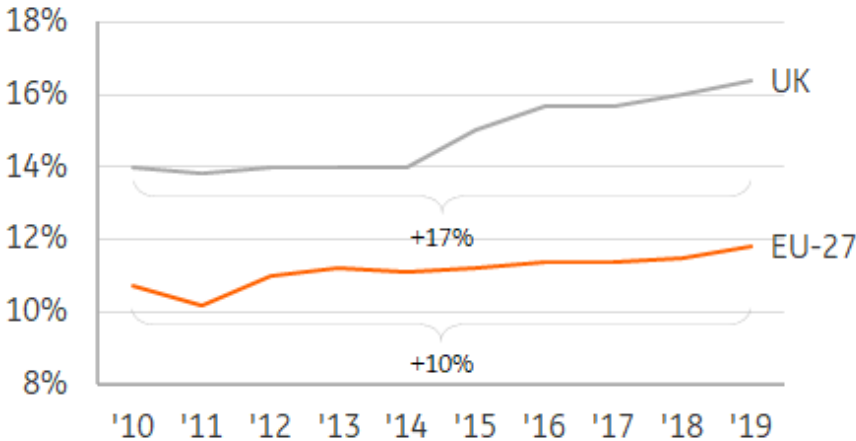
The Netherlands and Belgium are the biggest recyclers

The circular material use rate, also known as the circularity rate, measures the proportion of material that is recovered and reinvested in the economy in relation to total material use. The UK also scores better than the EU in this indicator, both in terms of the level (16% to 12%) and increase (+17% to +10% between 2010 and 2019). There are also countries in the EU that score better than the UK on this indicator – Belgium and the Netherlands lead the way. Only the lowest-ranking countries reused less material between 2015 and 2019, while

the majority have made clear progress.

Circular material use rate*

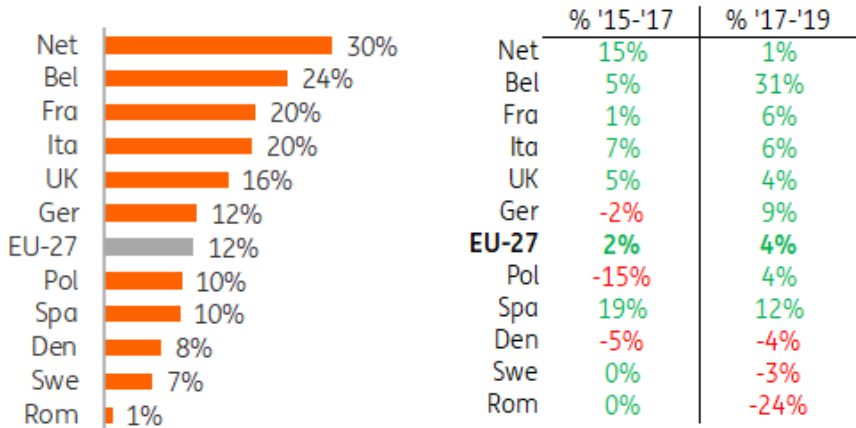
*Use of recycled materials in % of total domestic material consumption



Source: Eurostat, edited by ING Research

Circular material use rate, 2019*

*ratio of circular use of material to overall material use



Source: Eurostat, edited by ING Research

Limited circular progress until now

Judging by the circularity rate, most European economies are steadily increasing their circularity. However, on average, this has only led to a limited reduction in material consumption within the EU by 2020. The UK has made a noticeable improvement but is trailing four countries in terms of recycling. In fact, both the UK and EU have produced a higher amount of waste in recent years. Note that the structure of a sector is very decisive

to a country's 'circular performance'. This creates a distorted picture, making it difficult to make an objective comparison.

Why businesses should take circular steps

A growing number of manufacturers recognise the importance of using raw materials more efficiently in order to minimise the negative impact on our surroundings and environment. They also have four more reasons to actively pursue circularity:

1. Scarcity of materials – the decision to adopt circular manufacturing still doesn't usually come down to a lack of raw materials. However, supply risk is increasing, especially for industrial companies that depend on rare earths. The European Commission (EC) has said that the supply risk of those materials is very high. These are used, for example, in machines, as parts for transport equipment, and in electronics. They are also important for the energy transition. The total number of scarce materials on [the list](#) issued by the EC every three years is increasing and has already reached 30. In addition, dependence on imported resources creates the risk of man-made scarcity in a world of geopolitical tensions and sometimes disrupted supply chains.

2. Circular demand – Social and consumer needs are changing. Sustainable and circular methods and products are more often becoming a selling point or even a requirement for doing business. For example, Dutch authorities and non-profit organisations are applying more and more circular purchasing requirements.

3. Regulations – The European Commission is striving for a fully circular economy by 2050, with an intermediate target of 50% less consumption of primary raw materials by 2030. To meet these targets, the EC has launched the [European Green Deal](#) and the [Circular economy action plan](#). The [EU taxonomy](#) on Sustainable Finance (a classification system for sustainable economic activities) will have a positive impact on allocating finance to sustainable initiatives. Criteria for climate change mitigation and adoption are already adapted, the criteria for a transition to a circular economy will be adapted next year. Another example is the [Single-Use Plastics Directive](#): by 2025, 77% of plastic bottles must be individually recycled. That number should rise to 90% by 2029. As of 2025, PET bottles must also be made from at least 25% recycled plastic, and that percentage should increase to at least 30% for all plastic bottles by 2030.

As of 2021, new regulations are coming into effect:

- The European Union's Ecodesign Directive is imposing new rules for making consumer appliances 'repairable'.
- A European plastic waste tax that EU member states pay to Brussels for non-recycled plastic waste.

4. Cost savings – Circular production could also improve operating results when it comes to costs. Recycling a final product or parts of a final product can reduce production or purchase costs. But so far, the costs of secondary material are usually higher than the price of the primary material. This may change in due course as secondary material markets mature and recycling methods become more efficient.

Reducing environmental impact starts with product design

Strategies higher up the so-called '[R-ladder](#)' - such as those for rethink, reduce, reuse and repair - are also needed in order to make greater circular advances, as these require fewer resources.

According to medical equipment producer Philips, this is how 80% of the total environmental impact of products is already defined in the design phase. By taking circular requirements into account at the design stage, a product's lifespan can be extended, for example, through reuse, repair or overhaul, and models for sharing or rental. The key is to include as many renewable or recyclable materials into the design as possible, and also to design products with replaceable parts.

Circular business models in practice

Philips aims to attribute 25% of its revenue to circular products and services by 2025. They have been offering 'access for service' concepts for large-scale medical equipment for several years and recently also for smaller equipment such as medical monitors. Linking up hundreds of devices within hospitals enables resource optimisation and allows more patients to be treated while using less equipment. Philips is also experimenting with new business models for consumer products, such as 'try and buy' concepts. By having two of their own refurbishments factories, Philips is learning a lot about recycling complete systems, components, and materials. 'Sometimes you have to create the cycle yourself. We couldn't find enough recycled plastic with the right properties to make our circular vacuum cleaners. That's when we closed the cycle by partnering with Coolrec/Renewi and Veolia. When consumers hand in their Philips vacuum cleaner at a local recycling point, Coolrec breaks it down and the plastic is eventually returned to Veolia to be used in a new Philips vacuum cleaner,' says Harald Tepper, Program Lead for Circular Economy & Transformation at Philips.

Bosch Siemens Household appliances Group (BSH) is looking into the potential of access over ownership through [various initiatives](#). Established in 2017, [BlueMovement](#) (BM) gave BSH the opportunity to separate customer needs and material requirements. 'We fix almost all the appliances that people return to us. We're talking about thousands of them at this point. We're also trying to recycle components from obsolete appliances,' explains Patrick Hyscher, BM lead at BSH. Subscriptions for household appliances help BSH offer circular and new market opportunities by enabling a direct service to consumers.

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