

MONITORING REPORT 2023

European Declaration on
Paper Recycling 2021-2030

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1 EUROPEAN PAPER RECYCLING RATE 2023: 79.3%

Since 2000, the European paper value chain has been committed to the two-fold aim of improving recycling and increasing efforts to remove obstacles hampering paper recycling in Europe. The signatories of the new European Declaration on Paper Recycling 2021-2030¹ committed to reach a 76% paper recycling rate by 2030.

The recycling rate increased in 2023. 79.3% of all paper and board consumed in Europe was recycled. The recycling rate is defined as the ratio between the recycling of used paper, including net trade of Paper for Recycling (PfR), and consumption of new paper and board. In a year to year comparison, the total amount of paper and board collected and recycled in the paper sector in 2023 decreased by 1.9% to 53.7 million tonnes, while consumption of paper and board decreased by 12.0% to 67.7 million tonnes. As consumption of paper and board decreased much more than the recycling of paper and board within and outside Europe, the recycling rate increased from 71.1% in 2022 to 79.3% in 2023.

In order to better understand the market developments behind those changes, it is useful to look back in 2022. The sudden surge of energy prices in 2022, as with many sectors, impacted the Paper for Recycling (PfR) market. The high electricity and gas prices had

a disproportionate impact on the operation of paper mills utilising PfR. Those mills are more dependent on gas supply for their energy consumption compared to mills using virgin fibres as feedstock. This resulted in a small decrease in the utilisation of PfR despite significant investments made in new recycling capacities in Europe during the previous year. The decrease in utilisation of PfR, drove the decreased recycling rate in 2022.

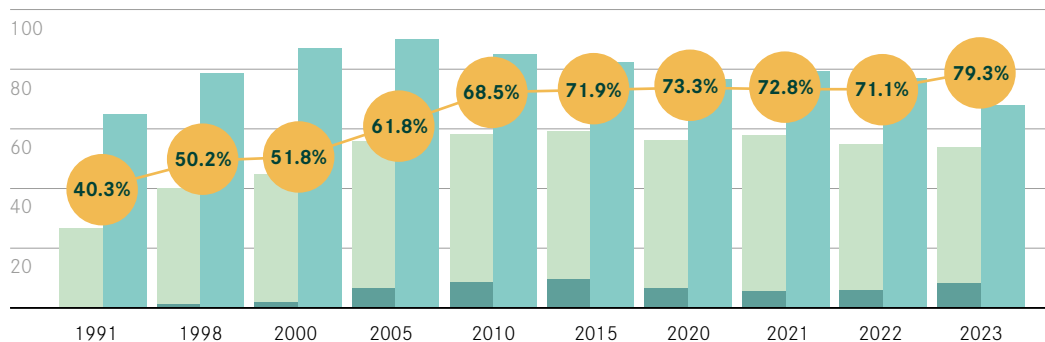
In contrast, in 2023 the recycling rate strongly increased. New investments in recycling mills started in 2023 but the increase is, to some extent, explained by the relatively low level of the apparent consumption. The apparent consumption does not take into account large volumes of stocks of paper and board which were consumed along the supply chain throughout most of the year.

In a free market economy external factors, such as the Covid-19 crisis and the energy crisis, cause annual fluctuations in the consumption of paper and board which ultimately impact the paper recycling rate. It is therefore appropriate to look at the full period of the past three years. As a rolling average of the last three years, the paper recycling rate is at 74.4%, which means we are on track to meet our recycling target of 76% by 2030.

EUROPEAN PAPER RECYCLING 1991-2023

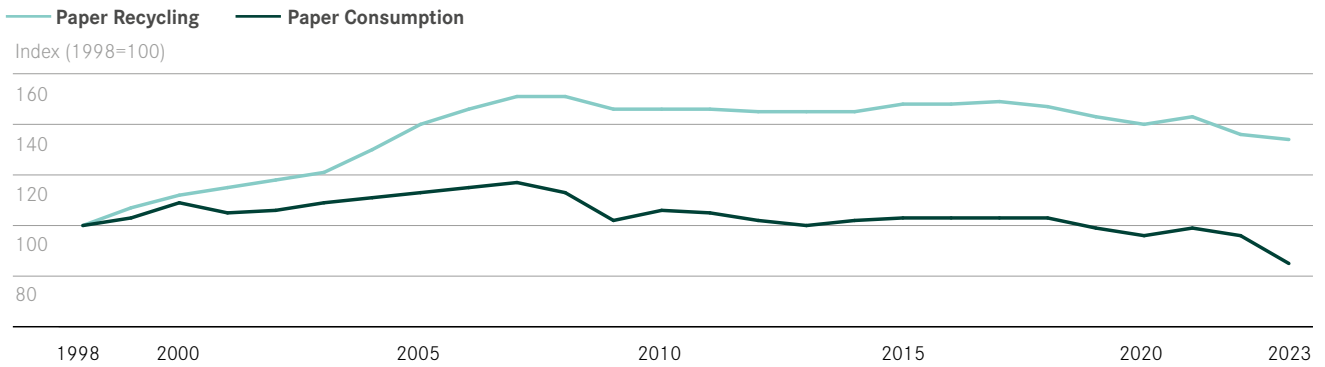
Source: Cepi 2023

- Recycling inside Europe
- Recycling outside Europe
- Paper and Board consumption in Europe
- Recycling Rate



¹<https://www.paperforrecycling.eu/publications/>

PAPER RECYCLING vs PAPER CONSUMPTION



Looking back at the progress made since 1998 - the base year for the first voluntary commitment set in the European Declaration on Paper Recycling - recycling has increased by 34.2% (13.7 million tonnes). In strong contrast, consumption of new paper and board since 1998 increased up until 2007 and dropped back to the level of the 1990s in the following years.

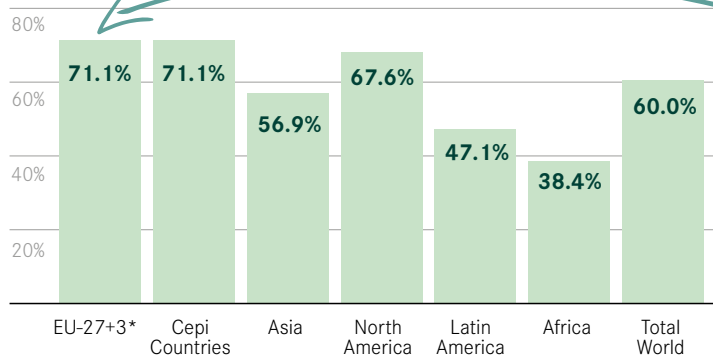
At regional level, the number of countries with a recycling rate below 60% was 4 in 2023, down from 7 in 2022. In 2023, the number of countries exceeding recycling rates of 70% was 19, from 15 in 2022. Consumption of all grades of paper and board decreased in 2023.

At international level, Europe continues to be the world champion in paper recycling, followed by North America. The paper recycling rates of other world regions are improving, but from lower levels. In Europe, during 2023, every fibre completed on average 4.8 cycles of recycling and use while the world average in 2022 was 2.5 times.

EU legislators renewed the recycling targets for packaging waste²; it is clear that the well-functioning paper recycling chain is a key driver for meeting these targets. According to the latest Eurostat data, the recycling rate of paper and cardboard packaging in EU 27 in 2021 was 82.5%, higher than all other materials.

RECYCLING RATE IN WORLD REGIONS IN 2022

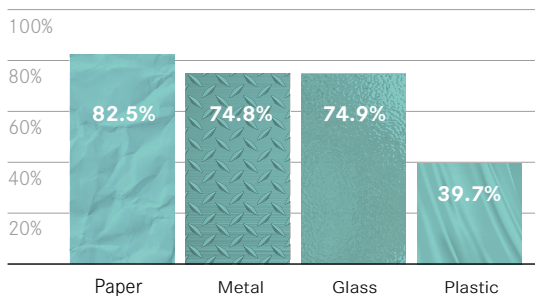
Cepi, Fastmarkets
RISI - 2022
EU-27+3 (The UK, Norway and Switzerland)



EUROPE IS THE PAPER RECYCLING CHAMPION!

2021 PACKAGING RECYCLING RATES

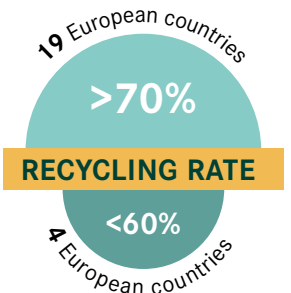
(source EUROSTAT)



NATIONAL RECYCLING RATES IN EUROPE

19 European countries exceeded the 70% recycling rate (15 in 2022).
4 European countries were below 60% (7 in 2022).

Source: Cepi 2023



Reporting on domestic recycling rate and international flows of Paper for Recycling:

The European Declaration on Paper Recycling 2021-2030 introduces a more consistent monitoring of the domestic recycling rate, excluding net trade. The reporting only takes into consideration PFR utilisation in European paper mills excluding net trade (45.4 million tonnes), divided by paper and board consumption. The domestic recycling rate in 2023 was 67.1%.

A net volume of 8.2 million tonnes (15.4% of the total collection of 53.7 million tonnes) was bought by third countries, outside the commitment region (EU-27, the United Kingdom, Norway and Switzerland). The formerly high Chinese demand for European PFR has decreased to

levels close to zero. This is in line with the Chinese government's decision to reduce its dependency on secondary raw materials originating from third countries by 2020. The key importers were India, Indonesia, Vietnam, Malaysia and Thailand. Overall, net exports of PFR outside Europe have increased by 45.0% compared to 2022.

Paper recycling is a "Made in Europe" industry. As collection, sorting and recycling take place in Europe, paper recycling prolongs value creation and job opportunities in Europe from a renewable and predominantly European resource: wood. Making recycling easy and simple, year after year, requires a huge effort by the paper value chain. We explain these efforts in our annual monitoring reports and are proud of the progress. For the commitment period of 2021-2030 the recycling rate calculations are independently verified by Deloitte.

²Packaging and Packaging Waste Regulation

2

PROGRESS IN QUALITATIVE TARGETS

The EPRC members, representing 14 sectors along the European paper recycling value chain, have committed to improving the paper recycling rate by 2030. By joining the European Declaration on Paper Recycling, they demonstrate their commitment to achieving qualitative targets. EPRC members are involved in initiatives to facilitate the recycling process and increase recycling activity. These notably include collection, sorting, handling PFR, and applying ecodesign to paper products.

COLLECTION

Improved collection systems increase the volumes of the secondary raw materials available for recycling and improve their quality. This, in turn, creates a more predictable, high quality waste stream and hence a strong incentive for investment and innovation in sorting and recycling technologies, which creates green economic growth.

As in previous years, including in 2023, The Confederation of European Paper Industries (Cepi) promoted its “Guidance on how to implement separate collection of paper for recycling³” in meetings with institutional and non-institutional stakeholders. Furthermore, the guidance was referenced in several advocacy materials within the scope of the Commission proposal for a Packaging and Packaging Waste Regulation. The guidance underlines that paper and board should not only be collected separately from residual waste but also from other recyclables, such as metal and plastic packaging. Separate collection is required by European legislation, optimises costs in the recycling value chain and is simple and easy for consumers. As well as examples of recycling routes for specific products, the guidance contains action points for municipalities.

The Alliance for Beverage Cartons and the Environment (ACE) has actively advocated at EU and national level in favour of a mandatory collection target for beverage cartons. The beverage carton industry actively supports national strategies to increase the collection of beverage cartons; this is in line with the obligation to separate collection of packaging under the new Packaging and Packaging Waste Regulation.

Improving the quality of our secondary raw material, Paper for Recycling; the project ZAPSA (Quality advancement of paper for recycling), in which the International Association of the Deinking Industry (INGEDE) is involved, continued in 2023. It was enlarged in its scope by assessing the suitability of several camera systems, some of them in connection with AI, for the quality inspection of paper for recycling.

Furthermore, within the 4evergreen Alliance, PROPAKMA on behalf of INGEDE co-led the Workstream which revised the Guidance on the improved collection and sorting of fibre-based packaging for recycling⁴.

ECODESIGN

The European Printing Ink Association (EuPIA), has provided expertise to the revision process of the criteria of different ecolabelling schemes for printed matter as well as the new Blue Angel for printing inks.

ACE, the Alliance for Beverage Cartons and the Environment, continued promoting the 2022 Design for Recyclability Guidelines for Beverage Cartons as a sound basis for the European Commission work on design for recycling guidelines. In parallel, the technical platform for the industry is currently finalising a protocol (“RECYCHECK”) for checking and scoring the Recyclability of Fibre-Based Composite Packaging (FBPC).

INGEDE concluded a study on the deinkability of flyers as several deinking mills had reported brightness issues. High ink coverage combined with low paper grammage were identified as the key reasons. Paper grade and ash content are of minor influence.

During the energy crisis, LED UV printing gained momentum for web-fed offset printing, substituting mostly gas-fired driers. INGEDE carried out several deinking tests and a lot of consulting, including in the context of an exemption for ecolabels for printed products.

Citpa member, FEFCO, revised and published its Corrugated Packaging Recyclability Guidelines Design for Circularity⁵.

RESEARCH AND DEVELOPMENT

ACE has been instrumental in the development of recycling solutions for multi-layered materials. In addition to some initiatives by private companies, e.g. in Italy, the Netherlands and Czech Republic, the manufacturers of beverage cartons have invested in the recycling of plastic/aluminium in Germany and Poland. The aim is to ensure that the fibre and non-fibre components of collected beverage cartons are fully recycled.

INGEDE launched a research study on the recyclability of papermaking pulp from non-wood fibres and co-sponsored a project on this matter. Both projects will be handled in 2024.

Cepi founded the Clean Processes and Products Forum (CPPF). The CPPF strives to accelerate development and implementation of strategies and technologies to remove or mitigate the negative effects of components of concern from our circular value chains. The aim is to create a fact base to support advocacy in questions related to substances of concern as well as raise awareness within its membership and facilitate the exchange of knowledge, expertise and practical solutions. The strength of the Forum lies in attracting expertise from within but also outside the Cepi membership. By reaching out to suppliers, technology providers, research institutes and universities, the CPPF benefits from years of experience in different areas and can provide a good overall understanding of the various topics. INGEDE is a member of the CPPF.

The European Tissue Symposium (ETS) has been exploring ways of increasing the circularity of its products. Including where possible, recycling used paper products back into new paper products. One product line which has shown promise is handtowels. There are now a number of initiatives by ETS companies to collect used handtowels from workplaces and return them for processing into other paper items including handtowels. Currently, the amounts are relatively small but there are plans to further expand the initiatives.

INGEDE worked together with the German Federal Environmental Agency and developer-free thermal paper manufacturers to define criteria in a related Blue Angel for the optical properties of pulp containing these paper items. The objective is to avoid the negative impact on the optical properties of deinked pulp, caused by the blending of developer-free thermal papers with white PFR. The agreed criteria represent a considerable improvement in recyclability.

³https://www.cepi.org/wp-content/uploads/2020/10/19-2905_Industry-position-paper-on-separate-collection_A4_20190903.pdf

⁴<https://4evergreenforum.eu/wp-content/uploads/4evergreen-WS-3-2023-7.12.pdf>

⁵<https://www.fefco.org/sites/default/files/files/FEFCO-Recyclability-Guidelines-UPDATE%202024%20final.pdf>

EDUCATION AND INFORMATION

EuPIA provided information to interested stakeholders relating to the suitability for food packaging of paper and board made from recycled fibres⁶.

ACE members present in 7 EU Member States, UK & Switzerland, via regional directors in Iberia, Italy, central European and Nordic countries, or as companies support awareness campaigns and exchange of best practices on the importance of collection and recycling of used beverage cartons. In some cases, National Associations support collection schemes.

EPRC members ACE, Cefi, EMFA, ETS, INGEDE, and Citpa members as well as by further associations of the paper value chain continued funding INGEDE member PROPAKMA to prepare the revision of ISO 4046. The objective is to draft document containing about 500 terms and definitions of the paper sector.

FEICA organised a webinar⁷ on laminating adhesives supporting flexible packaging recycling. There was a discussion on what laminating adhesives and their benefits are, how they pass through the recycling processes, and the adhesive industry's activities to promote the continuous evolution of recyclable adhesive products.

Cefi, Citpa member (FEFCO), and non-EPRC members ECMA, EPPA, and Pro Carton published a report assessing the impact of mandatory reuse targets compared to recyclable paper-based alternatives in different case studies⁸.

Citpa member (FEFCO), conducted a media campaign for cardboard recycling with the opportunity of the Global Recycling Day⁹.

3 9TH EDITION OF THE EUROPEAN PAPER RECYCLING AWARDS

The Awarding Ceremony of the 9th Edition of the European Paper Recycling Awards took place on 19 February 2024 at the European Parliament in Brussels and was hosted by Member of the European Parliament Susana Solís Pérez.

The European Paper Recycling Awards take place every two years with the goal to highlight and reward European projects, initiatives or campaigns that change the way we recycle paper in Europe and help achieve the paper and recycling value chain's ambitious pledge to reach a 76% paper recycling rate by 2030.

The ceremony awards those who have presented excellent and game-changing projects in two categories: Innovative Technologies and R&D and Information and Education.

The winner of the "Innovative Technologies and R&D" category was the ODiWiP project and its follow-up KIBAPap project. The projects aim to implement AI systems in the paper recycling loop and bring together an impressive number of actors, from manufacturers to recyclers, technology providers and data platforms, as well as regulatory bodies and academia.

Awarded in the "Information and Education" category was the 4evergreen alliance's Guidance on the Improved Collection and Sorting of Fibre-based Packaging for Recycling – a self-regulatory initiative. 4evergreen is a cross-industry alliance of over 110 members representing the entire lifecycle of fibre-based packaging – from forests to producers, designers, brand owners and recyclers. Together, they share expertise to develop tools and guidelines to further enhance the sustainability of the sector.

The host of the 9th edition of the European Paper Recycling Awards, MEP Susana Solís Pérez, congratulated the winners and expressed her trust in paper recycling efficiency: "The

most critical development for the sector during the mandate has been the Packaging and Packaging Waste Regulation. My position from the outset, especially with regards to the paper and cardboard recycling industries, has been to highlight the need for a balanced approach that recognises the high recyclability rate and sustainable management practices that distinguish paper from other materials."

The Chair of the European Paper Recycling Council, Ms. Andrea Orallo, commented on the winning projects: "These projects are trying to push the boundaries of what we know is possible in recycling, both from a technological standpoint and from the point of view of the wider socio-economic systems in which recycling actors operate. While it is important to acknowledge Europe's leadership in recycling rates for paper, the most recycled material, we want to go even further in pushing circularity for paper as a material resource. It is this combination of technology and systemic change that will allow us to achieve our goal."

In his closing speech, Mr. Ulrich Leberle, EPRC Secretary and Raw Materials Director at Cefi, noted the key role of bio-based economies in Europe's decarbonisation and the role of paper recycling in providing raw materials: "Further increasing paper recycling broadens the raw material base for the bio-based economy. The recycling rate for paper-based packaging is even higher than for paper in general. In 2021, it stood at 82.5%. Our general target here includes all paper products ranging from print to hygiene and speciality papers."

⁶The information is available on EuPIA's web page: <https://www.eupia.org/key-topics/food-contact-materials/recycled-materials>

⁷Webinar available here: <https://vimeo.com/938539899>

Presentation slides available here: https://www.feica.eu/information-center/all-information-centre/preview/1214/feica-webinar-laminating-adhesives-supporting-flexible-packaging-recycling?id=829b44c8-7739-47c3-be76-4d1e35c3e00c&filename=FEICA+Webinar_laminating+adhesives+flex+pack_FINAL.pdf

⁸<https://www.cepi.org/wp-content/uploads/2023/04/Impact-Assessment-reuse-targets-PPWR-FINAL.pdf>

⁹<https://x.com/FEFCO/status/176967109494277738>

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4EVERGREEN: THE FORUM FOR THE FIBRE-BASED PACKAGING VALUE CHAIN THAT AIMS TO PERFECT THE CIRCULARITY OF FIBRE-BASED PACKAGING

4evergreen is a cross-industry alliance of over 110 members representing the entire lifecycle of **fibre-based packaging** – from pulp, paper and board manufacturers and recyclers to packaging producers and converters, including brand owners, retailers, and waste management companies. It also comprises non-fibre material suppliers (e.g. adhesives, inks, coatings), technology providers (e.g. machinery, collection, and recycling solutions), leading research institutes, and start-ups.

Together, they share expertise to develop tools and guidelines for an even more sustainable sector. Their goal is to reach a **90% recycling rate** for fibre-based packaging by 2030, up from 82.5% today.

4evergreen's work is structured in four **technical workstreams**, and its toolbox includes:

- the **Recyclability Evaluation Protocol**, which builds on Cepi's harmonised European laboratory test method and, when completed, will give the industry a common tool to evaluate how recyclable current and future packaging materials are;
- the **Circularity by Design Guideline for Fibre-Based Packaging**, to ensure any new fibre-based packaging is designed with circularity in mind;
- the **Guidance on the Improved Collection and Sorting of Fibre-based Packaging for Recycling**, to identify collection and sorting best practices that can support the alliance's aim to increase the fibre-based packaging recycling rate.

A fourth workstream is focused on **innovation** and accelerating the development of technologies and processes that can increase the circularity of fibre-based packaging. Finally, an **information workstream** is in charge of developing a fact base and communication assets across different channels to inform, educate and engage with the 4evergreen target audiences, from industry to policymakers and consumers.

In 2023, all workstreams worked to deliver technical tools and guidelines to enhance circularity and increase 4evergreen's reach to key audiences. Throughout the year, 4evergreen celebrated several important milestones.

The alliance's membership reached **110 member organisations**; on top of that, members agreed to **extend 4evergreen's lifetime** for another two-year period, until at least the end of 2026, and approved a set of strategic recommendations that will shape its future.

In June 2023, the alliance launched the **second version of its Circularity by Design Guideline for Fibre-Based Packaging**, which enhanced previous recommendations for the standard recycling process, and addressed the compatibility of fibre-based composite packaging components (such as beverage cartons and paper cups) with specialised recycling processes.

Members met at the **November Annual Conference** to reflect on 4evergreen's activities and discuss the packaging landscape with key stakeholders. It was also an opportunity to celebrate our first **Circularity Success Stories** initiative, which collected and showcased breakthrough members' projects, whether individual or collaborative, that have been spurred by the alliance and can serve as inspiring examples of fibre-based packaging circularity and sustainability.

In December 2023, the alliance launched the **second version of its Guidance on the Improved Collection and Sorting of Fibre-Based Packaging**, building on the 2022 version and incorporating the latest industry insights, offering practical recommendations to enhance collection and sorting systems.

In 2024, 4evergreen will continue to develop its toolbox with important additions to perfect the circularity of fibre-based packaging.

All 4evergreen documents are publicly available on their website: <https://4evergreenforum.eu/about/guidelinesandprotocol/>



5

DATA QUALITY: 2023 DATA

The data used to calculate recycling rates is collected by Cefi and comes from a questionnaire sent to its national member associations in 18 countries (Austria, Belgium, Czech Republic, Finland, France, Germany, Hungary, Italy, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom). Cefi's national associations supply the data, collected from their members' mills and companies, as well as official sources where appropriate.

The data in this report includes PFR utilisation and trade plus paper and board production, trade and consumption for non-Cefi members of the EU-27 (Bulgaria, Croatia, Cyprus, Denmark, Estonia, Greece¹⁰, Ireland, Latvia, Lithuania, Luxembourg and Malta), and Switzerland. The data is obtained from AFRY Management Consulting.

After submission to Cefi, the data may be adjusted by the source, in particular the trade data obtained from customs authorities. Cefi takes the adjustments into account, with the figures being considered as final and published in the subsequent report (e.g. 2022 figures are given in this report).

Following this rigorous process, the 2022 recycling rate was revised and updated at 71.1%.

For certain countries, the calculation of the mass of recycled paper and board based on PFR utilisation and net trade has not produced a result considered to adequately reflect reality. Consequently, recycling in these cases has been based on actual paper and board collection for the specific purpose of recycling.

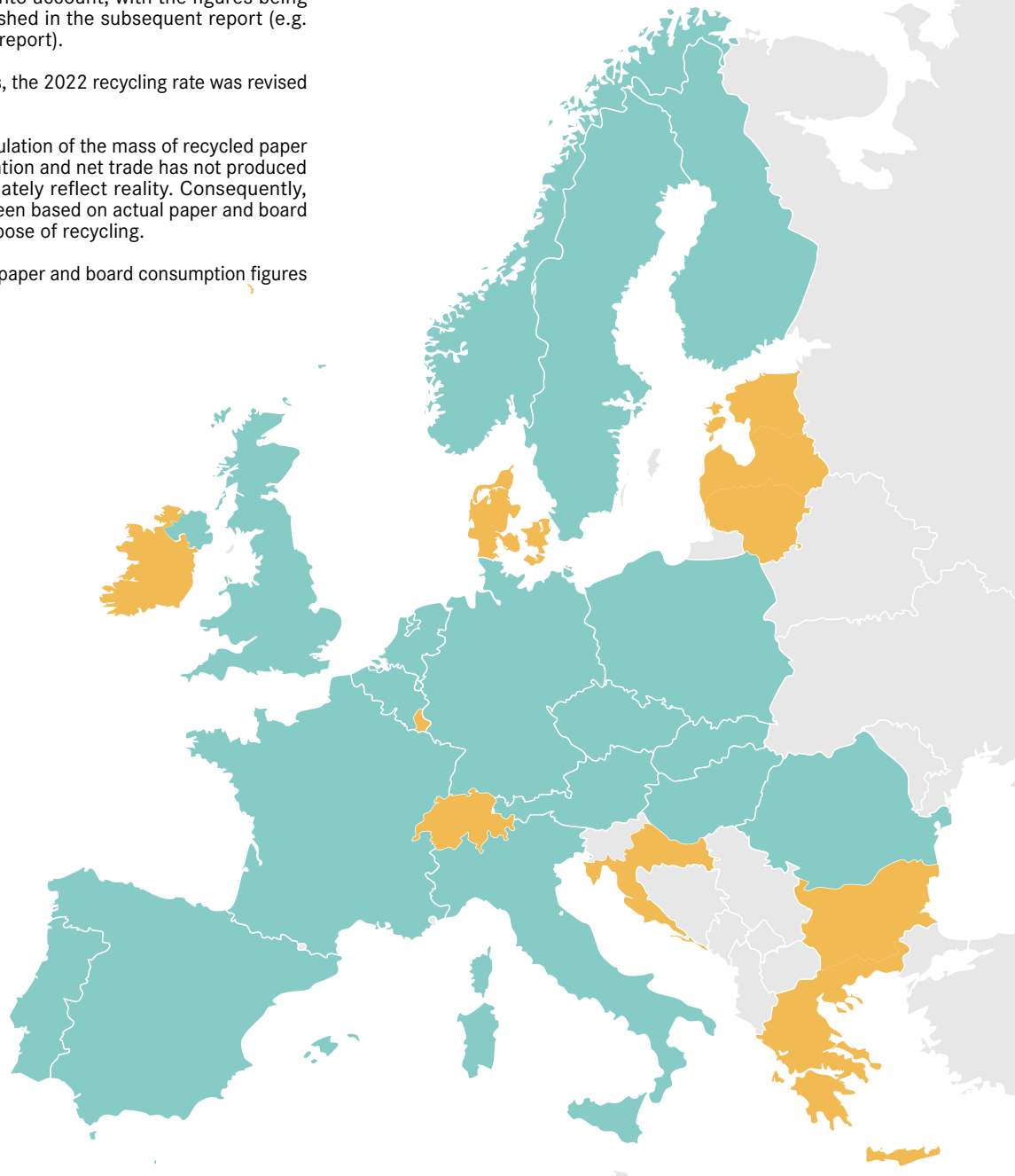
Other countries have adjusted paper and board consumption figures with the opposite impact.

All historical annual recycling rates have been recomputed based on the revised calculation methodology.

Cefi has commissioned an external verification of the recycling rate calculation since 2000 (see Assurance Reports 2011 - 2015 by **EY**, 2006 - 2010 by **PricewaterhouseCoopers** and 2000 - 2005 by **Pöyry** in the respective Annual Reports). Since 2015, external verification has been conducted by Deloitte and this contract has been extended for the ongoing period of the European Declaration.

As an annual exercise, data quality will be assessed using a method recently adopted by the European Commission for organisation and product environmental footprints. Specifically, this will cover geographical representativeness, time-related representativeness, completeness and the uncertainty parameter. Cefi will publish the assessment results on its website.

- Data collected by Cefi members
- Data obtained from AFRY Management Consulting



¹⁰Greece is a Cefi member as of 1 January 2024.

The European Paper Recycling Council (EPRC) was set up as an industry self-initiative in November 2000 to monitor progress towards meeting the paper recycling targets set out in the 2000 European Declaration on Paper Recycling. Since then, the commitments in the Declaration are renewed every five years.

The EPRC has committed itself to meeting both a voluntary recycling rate target of 76% in the EU-27 plus the United Kingdom, Switzerland and Norway by 2030 as well as qualitative targets in areas such as waste prevention, ecodesign, research and development, education and information.

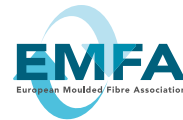
Signatories



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