COMPETITION IN THE CIRCULAR ECONOMY

OECD Competition Policy Roundtable Background Note

OECD

Please cite as: OECD (2023), Competition in the Circular Economy, OECD Competition Policy Roundtable Background Note, www.oecd.org/daf/competition/competition-in-the-circular-economy-2023.pdf.

This document was originally released on O.N.E. as an unclassified document under the reference code: DAF/COMP(2023)5.

Foreword

As a circular economy based on the reduction of waste and on the re-use and recycling of resources and materials is increasingly recognised to be at the core of supply chain resilience, financial risk mitigation and the green transition, two important questions arise: i) whether competition laws and policies as currently designed and applied are compatible with its paradigm; and ii) if so, how these elements can be considered under the competition framework.

This paper focuses on how competition, economic growth, and the shift to a circular economy interact. The circular economy leads to different incentives, dynamics and business models than traditional linear economy systems. The paper therefore looks at whether competition policy and its economic efficiency goal is well-suited to embrace the move towards a circular economy. More specifically, it addresses the following questions:

- What circular economy market characteristics and dynamics are relevant for competition policy?
- In which cases competition law interacts with the circular economy and how?
- What are the advocacy and enforcement activities that competition authorities can take to pro-actively support the transition to a circular economy?

This note was written by Cristina Volpin (OECD Competition Division). It benefitted from research support by Vivian Ianelli (OECD Competition Division) and from comments by Elena Buzzi and Peter Börkey (OECD Environment and Economy Integration Division), Ruben Maximiano (OECD Policy Studies Branch of the Economics Department), and Antonio Capobianco and Ori Schwartz (OECD Competition Division). It was prepared as a background note for discussions on “Competition in the Circular Economy” taking place at the June 2023 session of the OECD Competition Committee, https://www.oecd.org/competition/competition-in-the-circular-economy.htm. The opinions expressed and arguments employed herein are those of the authors do not necessarily reflect the official views of the Organisation or of the governments of its member countries.

Table of contents

Tables

Figures

Boxes

1 Introduction

In the lack of timely additional policy initiatives, the global consumption of raw materials is projected to more than double by 2060, with severe impacts on human wellbeing, the economy and ecosystems (OECD, 2019[1]). It is estimated that the demand for some metals, such as steel and aluminium, cement and plastics could be four times as much as the current one in 2050.[1] Waste generation is also increasing, while recycling rates remain low (OECD, 2021[2]). According to the World Economic Forum, "[…] *we're using about 60% more of the Earth's resources than it can regenerate every year. By 2050, with an increased global population and a resulting rise in consumption, that "overshoot" could get to 3-4 earths, which is clearly unsustainable*."[2]

Increasing demand for raw materials may lead to shortages, severe price increases, and supply chain disruptions. For instance, many critical elements, such as lithium, cobalt and rare earth elements, are supplied only by a limited number of countries and changes in their prices and production volumes may significantly affect prices downstream and resilience of supply chains for a large number of products (IEA, 2021[3]). Firms need to be able to obtain in a timely fashion and at competitive prices the necessary raw materials for all sorts of products, ranging from new green technologies to energy sources, vehicles, buildings, and food.

While technological innovation will progressively aid in the decoupling of productivity growth from resources consumption, improving resource efficiency is a fundamental objective for governments and businesses to accelerate the transition and secure the economic stability required to continue flourishing (OECD, 2019[1]). The gap between available raw materials and rising commodity prices, as well as the needs for security of supply mean that circularity is high up on the global policy agenda (OECD, 2021[2]). Furthering the transition to a circular economy will help ensure such security, while also improving economic and environmental outcomes (Livingstone et al., 2022[4]; Yamaguchi, 2022[5]).

The economic impact of a shift to a circular economy is significant. It can contribute to economic growth by creating new revenue streams, reducing unnecessary costs and untapping innovation potential for the equivalent of USD 4.5 trillion (Lacy and Rutqvist, 2015[6]). There is also an increasing recognition that investments in circular economy reduce risks to investors. For instance, a recent research study conducted with more than 200 listed companies across 14 different industries in Europe finds circular economy strategies and investments to lower debt default risks and to increase risk-adjusted returns. This is thanks to the progressive dissociation between consumption and extraction, protection from resource price volatility, diversification of business models, readiness to new regulatory standards and anticipation of changes in consumers' preferences (Bocconi University, Ellen MacArthur Foundation and Intesa Sanpaolo, 2021[7]).

Further, a move to the circular economy will strongly benefit the environment (OECD, 2021[8]). It plays an important role in the fight against climate change but also in addressing the negative impacts on the environment of the use of certain resources and materials, such as biodiversity loss and pollution, for instance by limiting the extraction of raw materials, thus also resulting in a reduction of GHG emissions associated with virgin material extraction, keeping materials within the economy, reducing landfill, and preserving ecosystems (McCarthy, Dellink and Bibas, 2018[9]; Wang, 2022[10]; OECD, 2019[1]). To understand the potential magnitude, suffice it to mention that the extraction and processing of materials, energy sources and food represents half of greenhouse gas emissions across the world and more than

90% of biodiversity and water degradation (UN Environment, 2019[11]). See further, on the relationship between sustainability and circularity in Section 2 below.

The shift to the circular economy, and its focus on resource efficiency, raises questions about the role of competition authorities in accompanying or promoting the transition to a circular economy. This background note focuses on exploring how competition, economic growth and the transition to a circular economy can co-exist. It does not discuss the relationship between competition and sustainability, even if it makes reference to some sustainability cases that are useful, by analogy, to understand the interplay between competition and the circular economy. The OECD explored in detail the relationship between competition and sustainability and competition and environmental protection, including in relation to waste management and recycling, in various roundtables, such as Environmental Considerations in Competition Enforcement (2021), Sustainability and Competition (2020), Competition Law and Responsible Business Conduct (2015), Competition Issues in Waste Management (2013), and Horizontal Agreements in the Environmental Context (2010).

Given that the circular economy poses different incentives to market players and creates different dynamics and business models compared to traditional linear economy systems, this background note examines whether and how competition law is suitable to embrace this shift. Specifically, the paper addresses the following questions:

- What is the relationship between the circular economy, sustainability and competition law and policy? Are the goals of competition law and the incentives and dynamics created by the circular economy in alignment? (Section 2)
- Does competition law hinder or promote the transition to a circular economy and what are the main competition concerns arising in the circular economy? How can the current analytical framework best capture competition harms and efficiencies in the circular economy? (Section 3)
- How can competition authorities proactively support the transition to a circular economy, beyond enforcement? (Section 4)

It should be noted that the debate around the circular economy is often conflated with the long-standing debate around de-growth[3] and whether de-growth is the only possible solution to the climate, given finite resources, and even considering technological progress. This paper does not allow to tackle or, even less, settle this debate. The paper does tackle the interaction between the circular economy and competition starting from the premise that a shift to a circular economy that is informed by competition principles would not undermine economic growth, but rather meaningfully contribute to it, by enhancing resource efficiency and productivity growth.[4] This would be attained by enabling innovation and green technologies, as fundamental levers of economic growth and progress (Aghion, Antonin and Bunel, 2021[12]), preserving Earth's resources, allowing finite resources to have a longer economic life span and addressing other negative environmental impacts of materials' use.[5]

As this view allows conciliating the goals of competition and of the circular economy within the currently adopted paradigm, in that both pursue resource efficiencies (Zachmann, 2022[13]), its practical implications are more readily useful to competition authorities across the world in the short-term and are, for this reason, examined below.

The below analysis revealed that, while competition as currently applied does not alone necessarily stimulate a transition towards circular business models, there is in principle significant alignment between circular economy targets and competition goals, in that both create significant incentives for private companies to increase resource efficiency and extract as much value as possible from input and raw materials. As a result, competition principles, when correctly applied, can stimulate investments in innovation, the development of new circular business models, exploitation of complementary skills and synergies, standardization and market creation. By protecting productive efficiency, competition authorities are able to prohibit anticompetitive conduct as well as block mergers that are harmful for the circular

economy. They can also provide clarity on which lawful agreements that lead to efficiency gains relating to the circular economy are allowed.

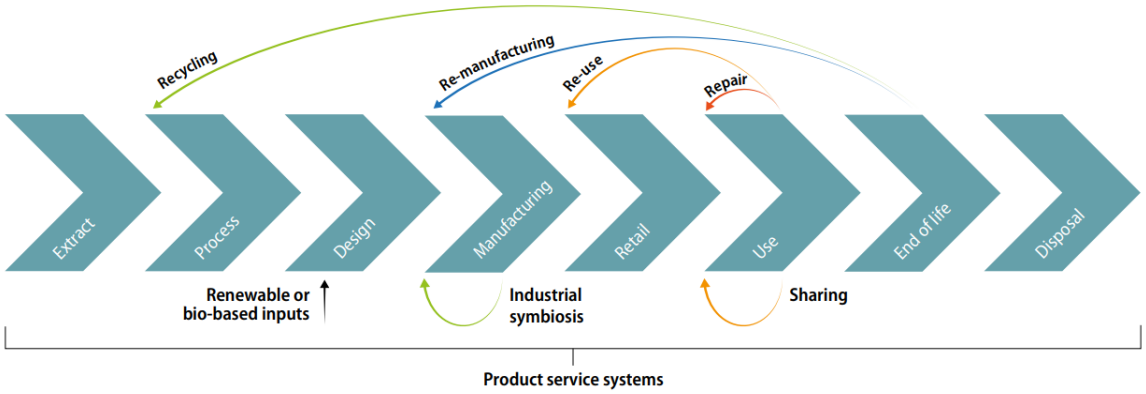
Importantly, since both the circular economy and competition can promote productive efficiency, it seems possible to integrate circular economy considerations relatively effortlessly into competition analysis within the current framework. In many cases, and typically more often than in relation to sustainability effects, the protection of circular economy considerations will likely coincide with the protection of competition, and vice versa, harm to the circular economy will often coincide with a reduction of productive efficiency and negative impacts on competition. This may be particularly important to recognise for those competition authorities which, for various reasons, may not be able to take into account sustainability considerations in their competitive assessment, which will instead conceivably be able to consider circularity when looking at concrete cases and when shaping competition policies.

2 The relationship between circular economy and competition

2.1. Circular economy and sustainability

Various definitions have been provided for the circular economy, at least 114 have been identified by researchers (Kirchherr, Reike and Hekkert, 2017[14]). Broadly, it can be defined as "*a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling*" (Geissdoerfer et al., 2017[15]). Following a 2004 initiative by the Japanese Government aimed at promoting a "*sound material-cycle society*",[6] it is also sometimes referred to as an economic system based on "3Rs": reduction of waste, reusing and recycling of resources and materials to the maximum extent possible.[7]

Figure 2.1. Circular business models value chains



Source: OECD (2019), Business Models for the Circular Economy: Opportunities and Challenges for Policy, OECD Publishing, Paris, https://doi.org/10.187/g2g9dd62-en

According to the Ellen MacArthur Foundation, the circular economy is thus founded on the following three principles:

- Avoiding the creation of waste and pollution;
- Saving and preserving energy, labour and materials, including by prolonging their duration or enabling their re-use;
- Protecting and enhancing renewable resources.[8]

The notion of circularity is distinct from the one of sustainability in that sustainable development aims at promoting the efficient use of resources in the long-term perspective of meeting "*the needs of the present without compromising the ability of future generations to meet their own needs*" (World Commission on Environment and

Development, 1987[16]). The notion of sustainable development has several dimensions, encompassing environment, economy and society aspects (OECD, 2020[17]), but the main points of commonality with circularity are likely found in relation to the conservation of resources and the environmental considerations. There is, however, significant uncertainty as to the relation between sustainability and circular economy goals. As noted by (Velenturf and Purnell, 2021[18]),

> *from a conceptual perspective it is debatable whether the pursuit of a circular economy will necessarily promote sustainable development; whether circular economy is better than, a condition for or fully interdependent with sustainable development; or whether circular economy is one of the tools for sustainable development. Analyses suggest that circular economy is integral to delivering various UN Sustainable Development Goals (SDGs) […] i.e. in order to achieve the SDGs, circular economy practices will have to be implemented, but it is important to distinguish different types of circular economy and their ability to contribute to sustainability.*

There are indeed concerns that a vague definition of circular economy may include circular economy solutions that have a feeble connection or are even in conflict with the notion of sustainable development. To give an example, unused waste may be diverted from landfill to be burned to produce heating as part of circular economy objectives of landfill reduction but that may, when not suitably managed, contribute to GHG emission increases or toxic substance releases which are not in alignment with sustainable development efforts (Velenturf and Purnell, 2021[18]) and may be a sub-optimal choice from the perspective of recycling and re-use of materials (Farmer, Shaw and Williams, 2015[19]). There are also concerns relating to the lock-in effects of committing to maintain a certain amount of waste to run recycling plants.

While it is recognised that circularity may support sustainability goals in several ways (for instance, by contributing to emission reduction from production processes or waste management, see (Wang, 2022[10])) the two do not necessarily align and it is therefore only a case by case analysis that may reveal whether a specific circular economy initiative is actually sustainable.

It is however to be noted that, while the recent debate concerning the integration of environmental sustainability consideration in the competition assessment has not focused explicitly on circular economy, some of the initiatives considered by competition authorities when issuing sustainability agreement guidelines, for example, can be categorized as “circular” and their treatment may be subsumed in that context. The practical importance of a separate analysis of the interplay between the circular economy and competition is given by the fact that while, in some jurisdictions, sustainability considerations may remain difficult to consider (particularly as regards collective out-of-market effects, see for more details, Section 3), circular economy considerations, due to their closeness to productive efficiency, are likely to be easier to evaluate in the context of any traditional analysis of the competitive effects (harm and efficiencies).

2.2. Circularity as resource efficiency

As noted above, the notion of circular economy hinges on the effectiveness with which natural resources are used (OECD, 2015[20]). This includes technical efficiency, resource productivity, and reduction of negative environmental impacts and is calculated in economic terms as resource intensity, i.e. “*the ratio between the value of economic output from a particular sector or economy, and the amount of resources (typically in terms of weight) used to produce it […]. An improvement in resource efficiency therefore describes a situation where more economic value is being produced with a particular amount of resources (or one where fewer resources are being used to produce a particular level of economic value)*” (McCarthy, Dellink and Bibas, 2018[9]).

The circular economy aims at minimising or eliminating product waste and harm to environment, by promoting alternative technical solutions that maximise the use of materials that remain in the supply chain and the amount of time for which they are used. This is “*to slow depletion of scarce natural resources, reduce environmental damage from extraction and processing of virgin materials, and reduce pollution from the processing, use and end-of-life of materials*” (Ekins et al., 2019[21]). For instance, about 50 million tons of electric waste containing raw materials like iron, aluminium, gold, but also lithium, cobalt, tin and tungsten are created each year for an

annual value of approximately EUR 55 billion (Forti et al., 2020[22]; PACE (Platform for Accelerating the Circular Economy), 2019[23]). Metals, however, can be recycled, without loss of function, virtually innumerable times. Lithium batteries for example are recyclable at 95%.[9]

As opposed to a linear economy, which is based on extraction of natural resources, transformation into capital and products, and disposal, the circular economy is focused on increasing productivity and improving asset utilisation in the face of finite resources, and acts on decoupling economic growth from resource depletion. The implementation of circular economy systems therefore challenges the assumptions and incentives of a linear economy.

2.3. Circular economy market characteristics and competition dynamics

Circular economy markets have some distinctive features that may be relevant under a competition analysis in a concrete case, depending on the circumstances. For example, these markets may often be characterized by one or more of the following:

- Infrastructure may be costly and natural monopolies may be present. In municipal solid waste management, for example, evidence shows that "*costs increase when more than one collector is used. Consequently, municipalities usually arrange for MSW [municipal solid waste] to be collected from households by a provider that is granted the monopoly for this service, either the municipality itself (directly or as a municipal company) or a private company"* (OECD, 2013[24]).
- Markets may be local, and transportation costs may be quite relevant (e.g., the market for the collection of heavy scrap metals or for waste collection and management). Long transportation journeys may make the recycling or re-use of resources more costly and the relevance of local infrastructure higher given the transport costs.
- Data collection and information exchange may be necessary to provide the product or the service or to make it circular. Sharing data may enable technological research for the reduction of waste, it may enable more efficient transport coordination along the supply chain; or it may allow collective switching to electric vehicles.[10] To ensure that resources are used in the most efficient way, it is particularly important to preserve their quality to ensure their re-use and to enable coordination along the supply chain. The type of information that may need to be exchanged may entail anticompetitive risks (see, for more details on the exchanges that may be problematic, Section 3 below), ranging from time windows and modalities for material returns, repair services, inventory, and costs of collection and recycling (Serafimova and Hörnig, 2023[25]).
- The service offered may be associated with a by-product or production waste that has a negative rather than a positive value (e.g., disposal of waste, scrap metal, exhausted tyres, or batteries). For example, extended responsibility obligations require producers to take charge of the disposal of the by-product, which is therefore considered as a cost, rather than a source of revenue. This, however, may shift once a market for the re-use of the by-product has been established, affecting its appreciation, significantly so for high-value materials (Laubinger et al., 2022[26]).
- The players may operate in an "eco-system" or so-called industrial symbiosis (Desrochers and Leppälä, 2010[27]), using the waste or by-products from one production process as an input for a different one (with related conglomerate-type of effects). For instance, an incinerator in Suffolk, United Kingdom, is using the additional heat produced by the incineration to warm greenhouses for tomatoes production.[11] Rolls-Royce's extra electrical power is used to supply local greenhouses farms.[12] A British Sugar's factory in Norfolk produces as many as 12 different products from previously wasted energy and materials (for instance, it produces bioethanol fuel from beet sugar syrup and recovers yeast to sell it as high-protein animal feed).[13]
- Different business models may be used to the purpose of keeping materials as long as possible within the economy. This leads to the development of business models based, for example, on

sharing infrastructure and limited goods or on product-service systems, where products are offered as a service (see, for more details (OECD, 2019[28])and below).

- Innovation and R&D investments may represent extremely important part of a circular business and inform competitive commercial strategies and acquisitions. For the purposes of competition analysis, it is also useful to remember that, due to path dependency, companies which have in the past invested in non-circular technologies (say, for the extraction of primary resources) are more likely to continue investing in such technologies (Aghion, Antonin and Bunel, 2021[12]), rather than switching to circular ones. There may therefore be incentives for anticompetitive dynamics between circular and non-circular players when they interact in a specific market, particularly if the former meet costumers' or consumers' preferences.

2.4. Sources of market power in the circular economy

Based on the above-described features of the circular economy, there are a few characteristics of the circular economy that may theoretically lead or contribute to market power and potentially raise competition policy challenges, depending on the circumstances and if left unaddressed. Some of the main ones are discussed below.

2.4.1. Infrastructures, economies of scale, and network effects

In many circular economy markets, the presence of infrastructure (for instance, for recycling or waste collection) may be relevant. At times it may even be a necessary condition to operate in the market and its duplication may not be economically viable. Further, in some cases, involving, for instance, recycling or waste management initiatives, significant economies of scale may be present. It may also often be the case that the service offered becomes increasingly more valuable for the consumers if more consumers purchase or participate in it (as it may be the case for the establishment of a waste disposal initiative or take-back scheme). These three features, alone or in combination, may create the conditions for market power and, in some circumstances, anticompetitive concerns (in particular in the form of vertical restrictions and abuses of dominance, see further below). In some cases, such conditions may also emerge following the granting of public concessions which establish an incumbent to create a market but may unduly persist, thus preventing market entry by alternative suppliers of the service.

In this context, an important distinction may be drawn in these scenarios between competition *for the mark*et and competition *in the market*. Competition *for the market* occurs in those situations where the market features lead players to compete for the whole market rather than for only a share of it. This may happen because the market is more suitably served by only one player (e.g., a significant infrastructure), which means that that tends to be the most efficient scenario for that market. Examples include natural monopolies (where only one company can fully exploit available economies of scale), legal monopolies (where the monopoly position of the market player is protected by law, such as by means of intellectual property rights), publicly funded monopolies (where the government only purchases from one supplier) and platform monopolies (where network effects are significant) (OECD, 2019[29]).

Since all these categories of markets may be relevant for the circular economy,[14] it must be observed that, while competition *in the market* tends to be always desirable, in some markets where circularity may be important (e.g., recycling waste), competition *in the market* may not take place due to specific circumstances. Where this is the case, and governments decide to opt for the award of time limited exclusive rights to enable market entry and create competition *for the market* in the short run, these should be allocated by means of competitive tendering, as a preferable option to the direct granting of privileged rights.

In such scenarios, it is also important for competition authorities to monitor the situation to avoid competition concerns linked to the advantage of the incumbent and to be ready to tackle any abuses of dominance linked, for instance, to creating strategic barriers to potential entrants, as well as carefully scrutinize mergers that may reinforce dominance (Macmillan, 2019[30]). In some cases, long-term exclusive agreements may be justified economically to allow for satisfactory returns on investment, but they should not extend in time beyond what strictly necessary for such recoupment (see, on this point, also Section 3 below). It is also important to be ready to allow competition *in the market* as soon as the conditions for such competition to occur are present.

Box 2.1. Deposit-return system for non-reusable packaging in Romania

Romanian Competition Council

Romania is introducing a new deposit-return system ("DRS") for non-reusable packaging operated and implemented by a legal entity at the national level, which should enter into effect in November 2023. The DRS creates a new set of requirements to optimize sustainable management of packaging to achieve and surpass the environmental objectives set at the European level.

The DRS manager, an entity formed by industry associations with at least 30% of DRS packaging units in the Romanian market, standardises the implementation of the system nationally.

The Romanian Competition Council ("RCC") engaged in advocacy and formulated recommendations on the amendment proposal with the aim to ensure a level-playing field in the waste management market, based on the principle of minimum harm to competition.

Among other proposals, the RCC stressed the importance of verifying the need and efficiency of having a single operator in the market, recommending the Ministry of Environmental to ensure that the establishment of a single DRS manager is the "only real and efficient possibility" for this waste management system.

It also recommended limiting in time the granting of the license to a single operator, which could result in significant anticompetitive distortions in the long run. It recommended putting in place mechanisms to enable the separation of the DRS manager duties from the commercial activities of its representatives, as well as to avoid any exchange of sensitive information. The conditions to entering the system must be equal and transparent for all players, thus preventing any form of discrimination, especially of those producers and retailers that do not hold shares of the DRS manager.

Source: OECD (2023) 'Competition in the Circular Economy – Note by Romania' https://one.oecd.org/document/DAF/COMP/WD(2023)44/en/pdf; OECD (2021) 'Environmental considerations in Competition Enforcement – Note by Romania' https://one.oecd.org/document/DAF/COMP/WD(2021)56/en/pdf; Schönherr, Romania introduces deposit-return system for beverages packaging, 3 December 2021, https://www.schoenherr.eu/content/romania-introduces-deposit-return-system-for-beverages-packaging/.

2.4.2. Vertical integration as barriers to entry and local markets

As mentioned above, circular economy supply chains and business models may require significant infrastructural or technological investments or vertical integration. This may facilitate the creation of barriers to entry for players that do not have the size or the necessary access to capital to compete. For example, a circular economy player which owns a necessary infrastructure may attempt to prevent competitors from entering the market or, if present both upstream and downstream, engage in margin squeeze type of behaviour. The presence of the infrastructure or vertical integration may provide the opportunity, under specific circumstances, to lessen competition. See, for example, Section 3 below.

Further, markets may often be local, given that recyclable inputs are often linked to high transport costs, as many may be heavy and bulky, as well as due to licensing of some circularity services. This means that market power may more frequently be observed at local level. For example, when household packaging waste is collected at city level, the recycling company which provides the service may have significant market power.

2.4.3. Intellectual property rights

Intellectual property (hereafter, IP) rights play an ambivalent role in stimulating the transition to a circular economy. The way in which they allow competitors to protect returns on their investments provide significant incentives to circular innovation and R&D. At the same time, especially if they go beyond what is strictly necessary to stimulate innovation, they may enable market players to restrict access to circular technologies or processes or their essential inputs via various forms of anticompetitive exclusionary conduct.

Box 2.2. German waste disposal system

European Commission

In 1991, Germany adopted an Ordinance imposing manufacturers and distributors to retrieve and recycle packaging waste.

In a very important case for the German market for waste collection and recycling, the European Commission found in 2001 that Duales System Deutschland AG (DSD) had abused its dominant position in the market for organising the collection and recycling of sales packaging in Germany. It found that the company implemented a payment system that created significant barriers to entry in the market and discriminated against customers. As noted by the then Competition Commissioner Mario Monti, the decision was aimed at ensuring "*an improved choice of service providers and lower costs for companies complying with their environmental obligations*".

DSD was dominant with an 80% market share and the owner of the "Green Dot" trademark (Der Grüne Punkt). DSD customers were required to pay fees proportional to the volume of packaging bearing the Green Dot trademark, rather than to the volume of packaging for which the company effectively provided its take-back and recycling service. The recovery of the packages could be done in two ways: (i) as a self-management solution – manufacturers and distributors themselves would retrieve their own packages from the consumers and/or (ii) as an exemption system, whereby manufacturers and distributors could rely on a third party to do the recovery and management of the packages.

The European Commission considered that a "no service, no fee" principle should apply whereby no fee would be due to DSD when the service was carried out by means of self-management or by competitors, regardless of the use of the Green Dot trademark. The European Commission considered that the licence fee obligation imposed by DSD prevented customers from switching to competitors of DSD, as this would have meant incurring in double costs, and that they could not, for this reason, develop in the market.

The decision was later upheld by the Court of Justice on these points.

Source: European Commission, AT.34493 – DSD Duales System, 20 April 2001, https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_AT_34493; C-385/07 P - Der Grüne Punkt - Duales System Deutschland v Commission, 16 July 2009, ECLI:EU:C:2009:456 (Appeal Case before the General Court T-151/01).

2.5. Practical ways in which competition policy supports the circular economy

There seems to be a significant alignment between the goals of competition policy and those of the circular economy. As mentioned above, the two can reinforce each other, putting in place the right incentives for market players to engage in competitive dynamics that support the maximization of productive efficiency and the transition to a circular economy.

The complementarity of competition and the circular economy is further supported by a recent study on the relationship between extended producer responsibility (hereinafter EPR) schemes and competition (Ahlers et al., 2021[31]). EPRs are schemes whereby the responsibility for the end-of-life management of a product is given to the producer, instead of the final consumers, citizens or municipalities. Examples include take-back schemes, advance fees or deposit and refund schemes. EPRs have become increasingly more common (there were about 400 EPRs in operation worldwide in 2016) in different sectors (e.g. packaging waste, electronics, batteries, tyres, pharmaceuticals, cars) and they are central to the development of a circular economy (for details and guidance on EPRs, see OECD (2016[32]). The study examines the effects of a competitive setting, based on several performance indicators, including collection rate, waste collection per capita, recycling and treatment rate, cost for producers, cost for collection, cost for waste recycling and treatment, stakeholder satisfaction, innovation potential and awareness creation potential. Looking at waste of electrical and electronic equipment, batteries and packaging, it finds that producer responsibility organisations perform better when they operate in competitive markets, which pressures them to strive for innovative solutions and higher quality services. Producer responsibility organisations are more effective and cost-efficient in market with more than one player (Ahlers et al., 2021[31]).

Some of the main ways in which competition law and policy, as traditionally interpreted and applied, may support the circular economy are described in more detail below.

2.5.1. Creation of incentives for an efficient use of resources

As mentioned above, one of the main objectives of competition law and policy is economic efficiency, which is typically intended as encompassing static and dynamic efficiency.[15] Static efficiency, which relates to the most efficient production and allocation of resources considering the technology available, has two components. Productive efficiency, which involves minimising resource waste (i.e., production occurs with the lowest cost per unit given the technology available), and allocative efficiency, which involves matching production to consumers' demand. While these are static parameters of efficiency, economic efficiency also includes dynamic efficiency, which is about improvements in production processes and quality of products via technical progress (Dunne, 2015[33]; Motta, 2004[34]).

As the circular economy pushes companies to focus on reducing intake of new materials, re-use of those that are already in the supply chain and increase their productive efficiency, it goes to the very essence of productive efficiency. Competition and circular economy both increase incentives for overall productive efficiency, by ensuring that companies are vigilant to keep their costs low, produce as much output as possible from a given input, and their production is attuned to consumers' preferences.

This alignment can be observed in at least five ways in which competition may promote circularity, by stimulating:

- innovation investments;
- the development of new circular business models;
- collaboration with other companies for the exploitation of synergies;
- standardisation; and
- market creation.

Each of these factors is analysed below.

2.5.2. Innovation

Competition typically encourages businesses' rivalry on multiple dimensions, including price, product quality product, and innovation.[16] As the circular economy requires companies to explore ways to optimise their use of input, capture more value from resources and reduce their non-recyclable waste, it will also tend to encourage product and process innovation. This typically constitutes an important stimulus to investment in product design and research and development (hereafter R&D) which support recycling, repairing and reuse of materials. In many cases, thanks to the target of productive efficiency, circular economy investments will lead to both higher innovation and to lower prices.

Competition may be significantly more effective and work better to stimulate circular innovation in association with consumer protection regulation to raise consumer awareness, environmental regulation or State measures[17] to direct innovation investments to new markets (Aghion, Antonin and Bunel, 2021[12]). When accompanied by well-designed regulation that is goal-based and flexible, however, competition plays a very important role by increasing the likelihood of innovation occurring in the circular economy (Cecere and Corrocher, 2016[35]).

2.5.3. Development of circular economy business models

Competition can push companies to innovate to meet consumers' demand by minimising waste and preserving resources' value as long as possible, which can promote the development and adoption of new circular economy business models. The main business models for the circular economy are identified as follows (OECD, 2019[28]):

- Circular supply, where renewable and recovered input is used instead of extraction of virgin resources;
- Resource recovery, where the use of secondary input materials derived from waste is maximized to avert extraction of new resources;
- Product life extension, where the end of life of products is extended as late as possible;
- Sharing, where existing infrastructure and scarce goods are shared to avoid under-use and reduce demand for new raw materials;
- Product-as-a-service, where the products are marketed by the supplier as a service, encouraging recycling and refurbishing of products (e.g., Xerox leasing printers and copiers).

Competition may stimulate companies to adopt one or more of these businesses models, in order to benefit from a competitive advantage, for instance because they allow it to reduce costs, be present in a remunerative secondary market or aftermarket or provide consumers with a more innovative product, while also serving circular economy requirements.

2.5.4. Pro-competitive collaboration and exploitation of synergies

Competition can also encourage businesses to collaborate by combining complementary skills and technologies to offer new and better circular products to consumers. Various forms of pro-circularity co-operation and "innovative co-operation", such as those aimed at providing a new solution to a technical problem or at creating a new product, do not typically raise competition concerns, provided that the exchange of information that they involve is limited to what is strictly necessary for the collaboration to be successful (OECD, 2020[36]). Examples may include temporarily pooling resources or joining investment efforts to the purposes of investing in R&D that will lead to circular methods and solutions. Sharing resources or platforms may also enable firms to optimise their use of resources and reduce waste.

While the internalization of environmental externalities would be preferably attained by way of regulation, (Tirole, 2022[37]; Schinkel and Treuren, 2021[38]), where this is missing or insufficient competition authorities

may play an important complementary role in ensuring that these objectives are attained with little to no harm to competition[18] (see, for ways in which competition authorities can integrate environmental considerations in their assessment, OECD (2021[39])). Further, as noted by Tirole (2022[37]),

> *The absence of sufficient governmental action (as is unfortunately the case for climate change) confronts us with a second-best situation. Sustainability agreements such as a boycott of highly polluting input suppliers or a coordination on environmentally friendly packaging have the potential of raising social welfare when stand-alone responsible behaviour runs the risk of loss of market share. The competition authority may be able to acquiesce to such agreements provided it has a clear objective trading off harm to the consumer or competition against the environmental benefit (which requires putting a price on carbon) and that it carefully monitors the industry's compliance with its societal pledges.*

Similarly to the case of sustainability agreements, in some instances, the combination of a regulatory void and the presence of market failures in circular markets such as coordination problems, first-mover disadvantage, and information asymmetries, or as the existence of consumers' behavioural biases, may have to be taken into account by competition authorities in their assessments of circularity collaborations and may make it so that co-operation or synergies between businesses may be, in certain circumstances, a way to achieve economic efficiency in alignment with circular goals. The co-operation should of course be genuinely aimed at generating synergies and market benefits and not an excuse for collusive practices.[19]

Box 2.3. Collection and management of electric and electronic devices in Switzerland

In 2005 the Swiss Competition Authority (ComCo) closed an investigation into possible concerns raised by an agreement between Swico (Swiss Economic Association for the Suppliers of Information, Communication and Organizational Technology) and S.EN.S (Foundation for Waste Management and Recycling in Switzerland).

The agreement aimed at establishing which entities would collect different types of electric and electronic appliances (specialisation agreement) and that manufacturers, sellers and importers of new appliances would levy the advance recycling fees, which they would then pay to Swico and S.EN.S.

ComCo analysed two main horizontal concerns: (i) the fee charged by the companies and (ii) the market allocation according to type of devices. ComCo found that manufacturers, sellers and importers remained free to pass on the fee, which was a relatively small element of the price compared to the total and was unlikely to impact the final prices to consumers. Regarding the market allocation, ComCo found that it was economically justified as it reduced transaction costs and increased economies of scale, making the recycling more effective.

ComCo thus concluded that the agreement did not give rise to any anticompetitive concerns thanks to the economic and environmental efficiencies it yielded. ComCo kept monitoring the companies' activities to prevent any abuse of collective dominance, such as discriminatory treatment of waste disposal companies.

Sources: ComCo (2005) Press Release, La ComCo clôt sans suite l'enquête sur l'élimination des appareils électriques, https://www.newsd.admin.ch/newsd/message/attachments/14278.pdf; OECD (2006) 'Environmental Regulation and Competition' https://one.oecd.org/document/DAF/COMP(2006)30/en/pdf.

2.5.5. Standardisation

Standardisation agreements are those arrangements that aim at setting technical or quality requirements for a certain product or service. Standardization is largely beneficial from the competition viewpoint,[20]

because it may allow compatibility and interoperability of products, with positive impact on consumers; technological advancement; creation of new products and markets; lower transaction costs and innovation (OECD, 2023[40]). A transparent standard that is not mandatory to comply with and made accessible to all market players on fair, reasonable and non-discriminatory terms, for example, is typically considered unlikely to create anticompetitive concerns.[21] Standardisation may, however, lead to preventing market access or enable discrimination and foreclosure opportunities against competitors, as well reduce competition on prices.[22]

Well-designed standards and labelling initiatives play a particularly important role in the circular economy, because they may enable reparability, recyclability, and keeping the value of the materials as long as possible in the supply chain with minimal to no harm to competition. When they involve only some market players (as opposed to the whole market), standardisation may strengthen the ability of those companies to differentiate their offer and compete with other players, informing business partners' and consumers' choices. When they involve the whole market, they may allow entire sectors of the economy to progress towards a more advanced circularity target or away from less recyclable options, benefiting consumers and society as a whole with minimal to no harm to competition. Competition can therefore encourage businesses to invest in creating, setting, and obtaining such standards and certifications, promoting the transition to a circular economy.

This is acknowledged by the European Commission in its Draft Horizontal Co-operation Guidelines which considers that some agreements may be needed to enable competitors to recycle or reduce waste.[23] It also establishes a soft safe harbour for these agreements (which include more broadly all types of sustainable initiatives), when the following 7 conditions are met:

- The standard is transparent and the setting process is accessible to all interested competitors;
- The standard is not mandatory;
- The standard is not limiting, i.e., standards going beyond the set standard are always possible to adopt and implement;
- There is no exchange of commercially sensitive information beyond what strictly necessary for the standardisation;
- Access to the standardisation process is allowed on an effective and non-discriminatory basis;
- There is no significant impact on price or reduction in the product choice;
- A monitoring mechanism to check standard compliance is set up.[24]

Market-driven standardisation may also, in fast moving technology markets displaying significant degrees of uncertainty, provide the advantage of a flexible alternative to regulation (Blind, Petersen and Riillo, 2017[41]; OECD, 2023[42]). Standardisation may also untap benefits on the demand-side, enhancing consumer awareness about circular products, which may limit the negative impact of some behavioural biases (see, for an analysis of behavioural biases relating to environmentally-friendly choices (Dolmans, 2020[43]) and (Volpin, 2020[44])) and drive changes in preferences (Inderst and Thomas, 2021[45]). This can contribute to reinforcing the positive feedback loop of increased demand for such products and competition to offer them in the market.

Among these types of agreements, one could include agreements aimed at discontinuing less recyclable products while the circular quality of the products that continue to be sold is maintained or improved. These agreements are unlikely to be problematic, particularly if they do not lead to significant price increases of the products that continue to be sold.

Box 2.4. Agreement among soft-drink producers to reduce plastic production

Dutch Competition Authority

In 2022, the Dutch Competition Authority gave a favourable opinion on an agreement between various competing soft-drink producers, including Coca-Cola and Vrumona, and some supermarkets (Albert Heijn and Jumbo) to phase out plastic handles on soft-drinks and water multipacks (i.e., to set a standard to eliminate this product element with no additional costs for the consumers).

The agreement allowed the participants to individually determine their contribution to the common target set by the agreement, autonomously deciding when and how to discontinue the production of the plastic handles.

Asked to issue an opinion, the authority considered that consumers did not see that product feature as a competition parameter on which the soft-drink producers competed. The change did not reduce product quality or choice nor add costs for consumers. It allowed the multipacks to become more recyclable, reducing the amount of plastic involved in their production for more than 70% of multipacks produced.

Among the categories provided for by its guidelines, the Dutch Authority considered that the agreement could fit two of the allowed categories: first, as a non-binding agreement that allowed the involved companies to reach a sustainability objective; and second, as an agreement that allowed to phase out a more polluting product, whilst improving product quality.

Source: Dutch Competition Authority, Press Release, ACM is favourable to joint agreement between soft-drink suppliers about discontinuation of plastic handles, 26 July 2022, https://www.acm.nl/en/publications/acm-favorable-joint-agreement-between-soft-drink-suppliers-about-discontinuation-plastic-handles.

2.5.6. Market creation

Competition pushes market players to respond to consumer demands in the best and most efficient way. Innovative ways to reuse or recycle waste materials may therefore enable the firm to enter and compete in new markets, for example, where such materials are valuable input in the production process. This may also lead to market creation and the development of entirely new circular products which in turn attracts market players and generates more competition in circular markets, further promoting efficiency, choice, and innovation.

In sum, it can be concluded that competition is largely supportive of the circular economy by providing incentives for productive efficiency, which in turns leads to innovative business models and products, new markets, co-operative and synergy-creating settings, and standardization.

As noted by Egypt,

> *While there is a clear connection between competitive market outcomes and the goals of the circular economy, it is important to acknowledge that circular business models will not necessarily develop organically in competitive markets. In some instances, competition can even lead to a dysfunctional circular economy and suboptimal investments. Therefore, competition authorities have a crucial role to play in facilitating the transition to a circular economy, namely, accounting for circular economy considerations in their competition enforcement and proactively mitigating any potential adverse impacts of competition on the development of circular economy practices (OECD, 2023[46]).*

While some of the characteristics of the circular economy may create the opportunity for anticompetitive behaviour, competition authorities can use their current tools to ensure that harm to competition and consumers does not ensue. Hence the importance for competition authorities to carefully assess competition concerns arising in the circular economy (see Section 3 below), as well as engaging in different types of advocacy efforts to facilitate circular economy initiatives, regulatory activity and adoption of state measures that promote circular economy while preserving competition (Section 4 below).

3 Competition enforcement issues in the circular economy

3.1. Main anticompetitive conduct and theories of harm relating to the circular economy

The present section focuses on the main anticompetitive conduct and theories of harm that also harm circularity. A separate analysis of all the anticompetitive issues and cases that may arise in relation to sustainability considerations in competition and merger control can be found in OECD (2021[39]).

Table 3.1. Examples of anticompetitive conduct and theories of harm relating to circular economy

Anticompetitive conduct	Example
Horizontal restrictions of competition	Agreements and/or exchanges of commercially sensitive information between players with access to circular input or technology to reduce the use of that input, increase its price or slow down the development or the implementation of the technology (see, for relevant examples, Box 3.1, Box 3.2, and Box 3.3).
	Cartel and/or exchanges of commercially sensitive information between buyers of the recycled material (which they use as input in their production) to collectively fix its price (see, for relevant examples, Box 3.1 and Box 3.4).
Vertical restrictions of competition	Agreements between manufacturer and resellers imposing fixed or minimum resale prices for the recycled product.
	Selective distribution agreements where quality criteria implicitly exclude recyclable materials.
	Exclusive supply obligations to make the supplier sell recyclable input or the recycled product only or mainly to one buyer and affecting a significant part of the market.
	Exclusive purchasing obligations to make the downstream customer buy only or mainly from a specific non-circular supplier and affecting a significant part of the market.
Mixed horizontal and vertical restrictions	Exchange of commercially sensitive information between different manufacturers, facilitated by the supplier of scrap material coordinating the recycling and not necessary for setting up the recycling scheme (hub-and-spoke arrangement).
Abuse of dominance	Refusal to supply or provide access to indispensable infrastructure by the dominant player (see, for a relevant example, Box 3.5).
	Exclusivity provisions aimed at preventing trading partners from recycling more (see, for relevant examples, Box 3.6 and Box 3.7).
	Preventing customers from developing or implementing more circular product or production process.

3.2. Agreements and exchange of commercially sensitive information to slow down or limit the repairability, longevity or recyclability of products

When looking at anticompetitive distortion between circular economy players, companies may collude to reduce competitive pressure from rivals. In order to meet a specific circular economy objective (e.g. increased recyclability of the materials or reduction of waste) or implement a circular business model or

production process, companies may wish to engage in exchanges of information, which may include information aimed at ensuring a better matching between supply and demand (e.g., capacity of the industry or demand volumes) or at reducing the level of information asymmetry, for instance, on expected amount of waste or production times.

If recyclability of materials is a parameter of competition, or if it represents a cost they do not wish to incur, companies may try to coordinate on refraining from competing on the recycling activities or on use of recycled materials, which may at once distort competition and hurt the circular economy.

One common scenario is also that of a co-operation agreement, such as a specialisation, purchasing, standardisation or R&D agreement aimed at meeting a circular economy objective or implementing a circular business model or production process that ends up going beyond what is strictly necessary for the collaboration to meet its objective and spills over into an unlawful exchange of information or collaboration. Depending also on the frequency of the exchange, the market coverage, the level of aggregation, age and non-public nature of the data, such an exchange may end up including commercially sensitive information on current and future prices, production costs, expected production quantities, etc. that reduces the strategic uncertainty of the firm's market behaviour and thus results in an anticompetitive conduct.

Four examples of anticompetitive agreements that originated from exchange of commercially sensitive information are provided below, first, in Box 3.1 and Box 3.2, directly in relation to the circular economy, and then, by analogy, in Box 3.3, in relation to reduction of emissions and sustainability. While the first two examples focus on competition in the circular markets (scrap metal purchasing and end-of-life vehicle recycling), the second two focus on ensuring companies compete on the development and deployment of emissions reduction technologies.

Box 3.1. Exchange of commercially sensitive information in the scrap metal purchasing market

Spanish CNMC

In 2022, the Spanish competition authority, CNMC, imposed a total of EUR 23.3 million on three steel companies operating in the scrap metal purchasing market. The authority found evidence of two separate anticompetitive information exchanges between AG Siderúrgica Balboa and Sidenor Aceros Especiales in 2017 and between Sidenor and Arcelormittal Aceralia Basque Holding in 2018.

According to the authority, the following sets of commercially sensitive information were unlawfully exchanged among the companies:

- Data on future purchase prices to offer to scrap metal suppliers;
- Timings of technical stops of the steel mills production, which could be used to forecast demand reduction in the purchase of scrap metal;
- Own prices and prices of competing third-party not publicly available.

For another nine companies in the sector the investigation did not reveal sufficient evidence of an infringement.

Source: CNMC, Resolución Chatarra y Acero S/0012/19, 4 March 2022, https://www.cnmc.es/sites/default/files/3971475.pdf; Press Release, La CNMC multa con 24 millones a tres empresas siderúrgicas por dos infracciones muy graves en el mercado de compra de chatarra en España, 14 Mar 2022, https://www.cnmc.es/prensa/sancionador-chatarra-acero-20220314. See also PaRR, 30 July 2020, Spain launches scrap metal purchase information exchange inquiry, https://app.parr-global.com/intelligence/view/prime-3080501.

Box 3.2. Restrictive agreements on recycling end-of-life vehicles

UK Competition & Markets Authority and European Commission

In March 2022, the CMA opened an investigation into the BMW Group and some industry associations on the grounds that they may have been involved in anti-competitive agreements to avoid competing:

- in relation to the recyclability and retrieval of end-of-life vehicles (cars and vans) and the use of recycled materials in the manufacture of new vehicles, including by making public announcements; and
- on paying service providers for take-back, dismantling and recycling of end-of-life vehicles.

A similar investigation has also been launched by the European Commission, which is closely co-operating with the CMA on this matter.

Source: European Commission (2022), Press Release - Antitrust: Commission carries out unannounced inspections in the automotive sector, 15 March 2022, https://ec.europa.eu/commission/presscorner/detail/en/ip_22_1765; CMA (2022), Suspected anti-competitive conduct in relation to the recycling of end-of-life vehicles, 15 March 2022, https://www.gov.uk/cma-cases/suspected-anti-competitive-conduct-in-relation-to-the-recycling-of-end-of-life-vehicles.

Box 3.3. Car manufacturers collusion on the deployment of emission reduction technology

European Commission

In 2021, Volkswagen, Audi and Porsche (together "VW Group") and BMW were fined a total of EUR 875 million by the European Commission for colluding on slowing down the development and deployment of nitrogen oxide (NOx) cleaning technologies. Daimler, which also participated in the conduct but applied for leniency, was granted full immunity from the fine.

The companies' unlawful co-operation involved the development of selective catalytic reduction ("SCR") systems for diesel passenger cars which allows to reduce polluting emissions of NOx by mixing AdBlue with the exhaust gas of the car. They exchanged commercially sensitive information by agreeing to coordinate on the dimensions and ranges of AdBlue storing tanks and on the average AdBlue consumption, thus avoiding competing in the development of NOx cleaning technologies for diesel cars. The European Commission considered the agreement a by object restriction of competition under Article 101(1)(b) TFEU, imposing a limitation of technical development.

As noted by the European Commission, "*Internal documents and public statements show that Daimler, VW, and BMW considered environmental performance in respect of NOx-emissions to be a factor relevant for competition. Occasionally, car manufacturers also used environmental performance in respect of NOx-emissions for advertising purposes. Furthermore, the manufacturers internally discussed the possibility of promoting their cars on the basis of their environmental performance*" (para. 89 of the decision).

The European Commission separately indicated what types of collaboration or information exchanges between the car manufacturers could be considered unproblematic from the competition viewpoint. These included, for example, the standardisation of the AdBlue filler neck and the definition of quality standards for AdBlue, likely leading to efficiencies and cost savings.

Korean Fair Trade Commission

A similar conduct was investigated by the Korean Fair Trade Commission in 2023. The authority fined Mercedes-Benz, BMW and Audi for a total of approximately EUR 300 million, for colluding to use a dosing software that would decrease the amount of AdBlue injected in the gas exhaust stream. The authority noted that the case "*expands consumer choice in the eco-friendly car market by recognising sustainability as a key competition parameter in addition to product, price and amount*".

Source: KFTC (2023) 'KFTC sanctions German car manufactures for colluding to avoid competition on the development of emissions cleaning technology' 문서뷰어 (ftc.go.kr); European Commission (2021) Case AT.40178 – Car Emissions, 8 July 2021, https://ec.europa.eu/competition/antitrust/cases1/202146/AT_40178_8022289_3048_5.pdf; European Commission (2021) Letter to the parties, 8 July 2021, https://ec.europa.eu/competition/antitrust/cases1/202146/AT_40178_8022302_3050_5.pdf.

Other forms of collusion may involve bid rigging schemes for contracts relating to the collection, transportation, and recycling of waste.

3.3. Buyers' cartels to fix the input price for the recycled material

As the circular economy often hinges on the re-use and recyclability of the production input, a particular important anti-competitive concern may relate to competitive restrictions taking place in upstream markets. Joint purchasing agreements may include collective purchases or collective negotiation of price or price components or other purchasing conditions. While they may strengthen buyer power vis-à-vis a strong seller in a beneficial way, pushing the purchasing price towards the competitive level, expanding output and leading to consumers' benefits, when they lead to significant buyer power, they may result in deadweight loss upstream and harm to consumers.

Further, joint purchasing agreements relating to specific competitive parameters such as fixing or coordinating the purchasing prices or its components, purchase volumes, or allocation of suppliers are typically harmful and may be consider as by object/per se cartels, irrespective of the market share affected by the agreement.[25]

In relation to the circular economy, these types of buyer cartels may be particularly problematic as they may reduce incentives to recover input materials for suppliers as well as limiting the amount of recycled output compared to the non-recycled one. In its Draft Horizontal Co-operation Guidelines, the European Commission offers the example of several small mobile phone retail shops collecting end-of-life phones at the time of the purchase of a new one. It notes that, if different manufacturers collectively agree to set a cap on the price to pay for the discarded phones, which they buy to extract valuable metals to re-use in their productions, that arrangement qualifies as a buyer cartel that does not require an examination of market impacts (irrespective of the manufacturers' market shares).[26] The Spanish competition authority, for example, fined three purchasers of scrap metal for exchanges of information in the case mentioned above (see Box 3.1). In the context of a prioritisation of buyers' cartels, an investigation was also opened in 2020 by the Dutch Competition Authority in relation to price-fixing of reusable waste.[27] A cartel in the car battery purchasing market was fined by the European Commission in 2017 (see below Box 3.4).

Box 3.4. Car batteries cartels

European Commission

In 2017, the European Commission fined three companies, Campine, Eco-Bat Technologies, and Recyclex for an agreement, between 2009 and 2012, aimed at setting the purchasing price of discarded lead-acid car batteries in Belgium, France, Germany and the Netherlands. It imposed a fine of EUR 68 million.

The scrap batteries were collected by garages, maintenance and repair workshops, battery distributors and other collectors or resellers. Since the agreement aimed at decreasing the price of the recycled batteries, it reduced competition in the recycling market of lead, which is bought by battery producers. It was therefore considered particularly harmful to the circular economy.

In the appeal decision on the European Commission's decision, which reviewed the amount of the fine following a reconsideration of the duration of the participation in the collusion of one of the parties, the General Court of the European Union agreed with the European Commission that the agreement was a by object restriction of competition that did not require an examination of its downstream market effects. The General Court stated, in para. 305, that

> *it must be held that the exchanges of information between the cartel participants clearly have an anticompetitive object, in that they clearly run counter to the requirement of independence, which is a key feature of the market conduct of undertakings operating within a system of effective competition. Through those exchanges of information, which concerned in particular current and future purchase prices and expected volumes of purchases, that is to say highly sensitive commercial information, the cartel participants communicated to each other how they intended to conduct themselves on the market with regard to factors that were decisive for their input purchasing policy. Those exchanges were aimed not only at eliminating or reducing uncertainties over the conceivable conduct of those undertakings, but also at enabling those undertakings to agree on the purchase prices of scrap lead-acid car batteries and at limiting the bargaining power of their suppliers. Accordingly, such exchanges of information in themselves reveal a sufficient degree of harm to competition and can be regarded, by their very nature, as being harmful to the proper functioning of normal competition.*

Source: European Commission, Case AT.40018 Car Battery Recycling, 8 February 2017, https://ec.europa.eu/competition/elojade/isef/case_details.cfm?proc_code=1_40018; General Court of the European Union, T-240/17, Campine NV and Campine Recycling NV v European Commission, Judgment of 7 November 2019, ECLI:EU:T:2019:778.

3.4. Vertical restrictions

Anticompetitive risks in relation to the circular economy may therefore also stem from restrictive agreements between players at different levels of the supply chain. Vertical agreements will often be unproblematic, for instance, when they address hold-up or free-ride problems, or when they affect a relatively small part of the market. The EU Vertical Block Exemption Regulation, for example, provides for a safe harbour for agreements involving players each with market shares below 30%, provided that no hard-core restrictions of competition are included.[28]

Examples of potentially problematic agreements could thus involve the recycler imposing fixed or minimum resale prices for the recycled product on the resellers, which is aimed at protecting the manufacturer's margin but may, in specific circumstances, make it difficult for resellers to continue using the recycled input and make the virgin material the only commercially viable alternative. Another example could be the imposition of export bans on recycled materials to preserve the sale of extracted virgin materials in the country of origin, or selective distribution agreements where quality criteria implicitly exclude the recyclable materials.

Pro-competitive selective distribution criteria may also be promoting circularity. For example, the 2022 EU Vertical Guidelines refers to admissible qualitative criteria based on limiting the use of natural resources. They provide the example of the distributor being requested to offer recycling services or facilities in their shops.[29] It is also possible that non-compete obligations are used to enable long-term investments into circular technologies. This would be the case, for instance, of a packaging material supplier wanting to invest in recycling facilities. The imposition of a non-compete obligation may be justified, depending on the circumstances, to insure the supplier from the investment risk and long depreciation, ensuring that the buyers are willing to enter long-term contracts that will justify the large expenditure.[30]

3.5. Hub and spoke type of arrangements

Anticompetitive concerns may also arise in relation to indirect exchange of commercially sensitive information among businesses in a vertical relationship that is coordinated or facilitated by a common hub (which is normally active at different level of the supply chain) This case may be particularly frequent in those closed-loop supply chains which are based on collaboration among actors at different levels of the supply chain and coordinated by a central planner (Serafimova and Hörnig, 2023[25]).

An example could be that of a supplier of scrap material coordinating the recycling of such material from different manufacturers, which uses the scheme to knowingly circulate information among different manufacturers about their sale volumes or prices.

3.6. Abuses of dominant position

3.6.1. Refusal to supply or provide access to indispensable infrastructure by the dominant player

By reason of some of the characteristics of the circular economy which may lead to market power (costly infrastructure, natural monopoly, economies of scale, use of IP rights, see for more details Section 2), incumbent players may adopt strategies to ensure their market power is not threatened by new entry.

One example would be a situation where a dominant provider of waste collection and management services denies access to new entrants. For such a case, and based on the essential facility doctrine, it is typically required that the refusal meets the following conditions:

- it must concern a product which is indispensable to compete in a market;
- it must be likely to lead to lesser competition in the concerned market;
- it must not be objectively justified or offset by efficiencies.[31]

Competition authority will typically assess whether access to the input or the infrastructure can be easily replicated by the actual or potential competitor in a reasonable amount of time. This is typically considered to be difficult when network effects are substantial, or there is a natural monopoly due to economies of scale or scope.[32]

Box 3.5. Refusal to provide access to an indispensable infrastructure in the waste management market

European Commission

In 2016, the European Commission imposed a EUR 6 million fine on the Austrian company Altstoff Recycling (ARA) for abusing its dominant position by refusing to give access to an indispensable infrastructure in the household packaging waste management market for four years in Austria.

The Commission found that ARA imposed unnecessary access conditions on the use of its household collection infrastructure to potential competitors, limiting it to individual regions. It also assessed the non-duplicability of ARA's household collection infrastructure, which made it is indispensable to enter and operate in the market. Reasons for the indispensability and non-duplicability of the infrastructure centred on landscape and environmental protection, including the following:

- the duplication would increase the number of containers, which, particularly in densely populated areas, jeopardises the appearances and the liveability of the surroundings;
- it would increase the number of waste transport journeys, which are polluting and disturb public quiet;
- it would raise costs; and
- it would require consumers to divide waste between different systems.

In addition to the fine, the European Commission also accepted a structural remedy in the form of the divestiture of part of the ARA's infrastructure.

As noted by Margrethe Vestager, EU Competition Commissioner, the case showed the importance of free access to infrastructure for encouraging circular economy and how "*Effective competition is vital for making recycling affordable for consumers*. "

Swedish Competition Authority

A similar abuse of dominant position was analysed by the Swedish Competition authority in 2008. The Swedish company FTI had the monopoly over the collection of used plastic packaging materials in Sweden. A competitor, TMR, faced significant barriers to entry in the market, being prevented from using the infrastructure owned by FTI.

The Swedish competition authority found that it would represent a major cost to duplicate FTI's infrastructure and that the denial to provide necessary access to the recycling stations constituted an anticompetitive abuse of dominant position. The case was closed with an agreement whereby FTI would enable TMR's access to the necessary infrastructure, to the benefit of plastic recycling and competition.

The recent termination of the agreement by FTI was also found to infringe competition under the Swedish Competition Act, but, while the Swedish Patent and Market Court upheld the authority's decision, in 2020 the Court of Appeal ruled in favour of FTI.

Sources: European Commission (2016) AT.39759 – ARA Foreclosure, https://ec.europa.eu/competition/antitrust/cases/dec_docs/39759/39759_3071_5.pdf; European Commission (2016) 'Antitrust: Commission fines ARA €6 million for hindering competition on Austrian waste management market' https://ec.europa.eu/commission/presscorner/detail/en/IP_16_3116; Swedish Competition Authority (2020), Press Release, The termination of a contract with a competitor did not constitute an abuse of a dominant position, 28 January 2020, https://www.konkurrensverket.se/en/news/the-termination-of-a-contract-with-a-competitor-did-not-constitute-an-abuse-of-a-dominant-position/; Swedish Competition Authority (2020), Press Release, Continued Competition in the Recycling Industry, 21 January 2019, https://www.konkurrensverket.se/en/news/continued-competition-in-the-recycling-industry/.

3.6.2. Exclusivity provisions and other exclusionary abuses aimed at slowing down or limiting repairability, longevity or recyclability of products

Dominant market players may also attempt to impose exclusivity clauses to trading partners to exclude such alternative providers from the market. For instance, a waste management company may attempt to contractually impose on waste producers to only source services from it.

Box 3.6. Exclusivity obligations in the waste management of electrical and electronic devices

Italian Competition Authority

The Italian competition authority (AGCM) found that Erion, a company operating in the market of the collection and management of electrical and electronic devices, abused its dominant position by engaging in three types of conduct:

- Imposing a most favoured nation clause on waste management suppliers, demanding that they apply the best price to Erion when providing transport services and waste-treatment fees, as long as Erion is their largest supplier of electrical and electronic devices to be processed. Erion's large market position (around 70%) enables it to meet the condition;
- Applying below-cost prices for the environmental contributions it collects from electronics producers. This was possible, according to AGCM, because of Erion's use of surplus budget from previous financial years, an advantage available to it because of its large market presence, and that also violated the "no waste, no fee" principle;
- Adopting exclusivity clauses in its bylaws, according to which producers could not join competing waste management systems.

The AGCM considered that the combination of these three behaviours could prevent entry and exclude competitors from the market. It accepted remedies proposed by Erion to address the concerns.

Source: Italian Competition Authority, A544 – Erion WEEE, https://www.agcm.it/dettaglio?db=41256297003874BD&uid=6AD18FE62F7ECF1DC125884400438182&view=&title=A544-ERION%20WEEE/CONDOTTE%20ANTICONCORRENZIALI&fs=Abuso%20di%20posizione%20dominante.

In some cases, the imposition of exclusivity provisions may be unproblematic, because, for instance, they are justified by the need for the dominant player to adopt long-term investments specific to that commercial relationship and needed to fulfil its requirements. A period of exclusivity may be required to ensure that important investments are recouped (e.g., investments in the infrastructure to set up an exhausted batteries stewardship take-back scheme in exchange for the obligation to only use that scheme).[33] However, the use of long-term clauses may also create significant barriers to entry, building a framework known as "long-term capacity booking" (Fumagalli, Motta and Calcagno, 2018[47]). See, for an example in relation to sustainability, Box 3.7.

Box 3.7. Electric vehicles charging sector

United Kingdom CMA

The UK Competition and Markets Authority (CMA) undertook a market study in the context of the UK's commitment to reduce greenhouse gas (GHG) emissions by 28% by 2035 and achieve Net Zero by 2050. The study, focusing on public and private charging for passenger vehicles, was published in July 2021. It focused on two main questions: how to develop a competitive sector while attracting private investment for growth (supply side), and how to strengthen the confidence of users of electric vehicle charge points in the service and its infrastructures (demand side).

The study identified three areas of concern on the supply side. First, there is patchy growth in the sector with weak infrastructure investments in remote areas. Second, there is limited competition on motorways, with one main provider and barriers to entry, such as constraints on electricity grid capacity and long-term exclusive contracts, resulting in the risk of "charging deserts". Third, there are demand-side problems including reliability issues (such as damaged charging points) and difficulties in accessing charge points due to different payment methods, pricing comparison challenges, and potential lock-in risks due to bundling and subscription services in different formats.

Recommendations to address the situation included, among others, building infrastructure to meet the demand, address consumers' trust concerns, accelerating grid connections, enhancing strategic investments, and lowering connection costs.

Following the study, the CMA also opened investigations in the supply of electric vehicle charge points on or near motorways to address monopolistic practices. The investigation concerned long-term exclusive agreements between the Electric Highway Company and three motorway service area operators and revealed concerns that the long-term agreements could foreclose competing charge point operators from contracting with motorway service area operators. Commitments offered by Electric Highway included:

- Not enforcing exclusive rights in contracts with the three motorway service area operators after 2026 and reducing the duration of exclusive rights for the following period;
- Not enforcing exclusive rights in those contracts if the relevant sites have received funding aid from the UK Government under the Rapid Charging Fund (so as to allow competing charge point operators to access those sites).

Sources: UK CMA, Electric Vehicle Charging Market Study - Final Report, 23 July 2021, https://www.gov.uk/government/publications/electric-vehicle-charging-market-study-final-report/final-report; UK CMA, Press Release, CMA to open up electric vehicle charging competition on motorways, 17 November 2021, https://www.gov.uk/government/news/cma-to-open-up-electric-vehicle-charging-competition-on-motorways.

Other examples of possible abuses may include instances of discriminatory pricing or discounts that are aimed at excluding as efficient circular economy competitors, cases of a dominant non-circular economy player offering tied products to exclude from the market the circular economy product, or cases of a dominant non-circular economy player imposing commercial conditions on customers that prevent them from providing a more recyclable, repairable, or durable product.[34]

There may also be other ways for the circular player to make it harder for competing recyclers to enter the market for the collection, sorting and treatment of waste. In an investigation for possible abuse of dominance, the Spanish competition authority, CNMC, imposed interim measures on the dominant player Ecoembes to ensure publicity and transparency of the tender relating to plastic waste recycling services. The authority also limited the volume that could be contracted out to an individual recycler with the auction in certain markets.[35]

Problematic may also be all anticompetitive practices that prevent modularity or repairability by design, as they may prevent entry in neighbouring markets or aftermarkets (for instance, maintenance or repair services) where the dominant player also operates. The importance of these anticompetitive concerns is shown by some regulatory initiatives in different countries aimed at reinforcing the right to repair of consumers. For example, the 2021 President Biden's Executive Order on Promoting Competition in the American Economy encourages the FTC to make use of its rulemaking power against "*unfair anticompetitive restrictions on third-party repair or self-repair of items, such as the restrictions imposed by powerful manufacturers that prevent farmers from repairing their own equipment*"[36] but also to fight the restrictions imposed by big tech on the diagnostics, distribution of spare parts and repairing.[37] Similarly, regulatory initiatives on the right to repair are a central part of the New Consumer Agenda and the Circular Economy Action Plan in the European Union.[38]

3.7. Merger control

Competition authorities may be called to scrutinise anticompetitive mergers that also jeopardise circularity-enhancing outcomes. Theories of harm that may threaten both competition and circularity at the same time may include:

- **Unilateral effects in circularity differentiated products.** As consumers may increasingly prefer circular products, that will more and more become a parameter of competition for companies. This is illustrated by those cases where companies engage in anticompetitive agreements to suppress competition on that parameter (see, for examples relating to sustainability and circularity respectively, (OECD, 2021[39]), Box 3.3, and Box 3.2). Similarly, after a merger, companies relieved of competitive pressure exercised by competitors on that parameter, may unilaterally degrade the quality/circularity of that product, as well as potentially impose higher prices, or lower innovation or output. For instance, this could be the case of an acquisition between suppliers of salvage vehicles raising concerns about a possible reduction in the amount of salvage vehicles available to suppliers of recycled parts (see, for an analysis of these concerns in a concrete case, the UK CMA, Copart, Inc./Green Parts Specialist Holdings Ltd (Hills Motors) merger).[39]

Box 3.8. Remondis/DSD merger

German Bundeskartellamt

In 2019, the German Bunsderkartellamt prohibited the acquisition by Remondis, the largest German waste management companies, of Duales System Holding (DSD), the largest dual system provider, active in recycling services for packaging waste management for manufacturers, importers and retailers. See, for an analysis of the DSD licence fee system, Box 2.2 above.

The analysis revealed concerns that the merger would enable Remondis to raise prices for collection, sorting and reprocessing services in the packaging waste management sector for DSD competitors, to raise prices on the market for dual systems for packaging recycling, as well as creating a dominant position in the sale of recycled hollow glass cullet like drink bottles and food jars.

Remedies offered by the parties were not found to dispel the German competition authority's concerns.

A subsequent appeal was dismissed by the Dusseldorf Higher Regional Court.

Source: German Bundeskartellamt, Press Release, Bundeskartellamt prohibits Remondis/DSD merger, 11 July 2019, https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2019/11_07_2019_Remondis_DSD.html;jsessionid=22A2DCF7ECD8A2CF38AC2B539A449E44.1_cid378?nn=3591568; Case VI-Kart 3/19 (V) before the Oberlandesgericht Düsseldorf.

- **Increased buyer power.** As circularity hinges on the re-use of materials, it is important to preserve the incentives of involved actors to sell the by-product as an alternative to its disposal. This may be affected by transactions that create monopsony power or significantly strengthen buyer power of the purchasers of the recyclable material (OECD, 2021[39]). This is because the less competition on the purchasing market exists, and the lower the price of the recyclable materials is, the lower the incentives to recycle it may be, as opposed to simply discarding it. Some of these concerns emerged in the Aurubis/Metallo merger (see Box 3.9), which involved the largest European copper producer and the biggest copper recycler worldwide. One of the elements of the analysis conducted by the European Commission was whether the larger buyer power post-merger would enable the new entity to reduce copper scrap prices and whether that could stifle the incentives to recycle this material.

Box 3.9. Aurubis/Metallo

European Commission

The acquisition of Metallo Group, an innovative important player in the copper scrap refining market, by Aurubis, the biggest copper producer in Europe, was approved by the European Commission in 2020. The merger was carefully analysed and it was found that it did not give raise to a significant impediment of effective competition in the recycling of copper.

An important part of the analysis was the concern relating to the horizontal overlap in the purchase of copper scrap that could increase the buyer power of the merged entity and allow to reduce prices paid to industrial producers of copper scrap as an inevitable waste of their production. The concern was that those lower copper scrap prices (equivalent to higher costs for the sellers) would be passed-on in the form of higher prices to final consumers, which would hurt incentives to recycle this by-product.

Evidence showed, however, that significant competition to buy copper scrap would remain in place after the merger, also outside of Europe, and that therefore prices would not be significantly affected.

The European Commission, therefore, considering (i) the existence of different relevant markets of copper scrap and its uses; and (ii) the availability of alternative suppliers and purchasers of copper scrap, concluded that there was a low risk of competition concerns in the post-merger scenario.

Potential efficiencies related to the technology investments in improved metal extraction from the copper scrap, also relevant to the circular economy, were not found decisive for the clearance.

Source: European Commission (2020), M. 9404 – Aurubis/Metallo Group Holding, 1 July 2020, C (2020) final, https://ec.europa.eu/competition/mergers/cases/decisions/m9409_3908_3.pdf.

- **Unilateral innovation effects**. Merger may distort companies' incentives to compete on innovation for the circular economy, for instance to slow down or divert away investments or research for technologies that allow a better use of the primary materials, which means lower need for new extractions (see Box 3.9 and (OECD, 2021[39])).
- **Green killer acquisitions**. There is also a risk that circular economy players may be either taken off the market by incumbent non-circular economy players to alleviate competitive pressure on their current products (via so-called "green killer acquisitions") or acquired to eliminate the target's R&D investments which may threaten the buyer ("green killer reverse acquisitions") (Crawford, Valletti and Caffarra, 2020[48]; OECD, 2023[42]; OECD, 2021[39]).
- **Vertical effects**. These effects may emerge as a result of a transaction between firms which operate at different levels of the supply chain. They typically entail input or customer foreclosure

theories of harm. An example would be the case of a merger entity operating in the supply of salvage vehicles refusing to supply such input (total foreclosure) or increasing the price or deteriorating the quality of the recyclable parts (partial foreclosure) to downstream customers operating in the sale of green parts.[40]

3.7.1. Circularity-enhancing merger remedies

As important a role the consideration of circular economy may play in the assessment of a transaction, equally important might be the role played by competition authority when accepting remedies, which may shape the market for the following years. This will manifest particularly prominently in cases that threaten access to indispensable facilities or that threaten innovation in circular products, and which may be corrected by imposing remedies aimed at maintaining or enhancing the level of investments in circular product quality or the choice of circular products (see, for example, CADE's Videolar-Innova merger below, Box 3.10). In Austria, remedies were imposed, in the context of a 50/50 joint venture, to provide non-discriminatory access to storage facilities to third parties for the recycling of waste wood, otherwise very expensive to transport.[41]

Box 3.10. Videolar/Innova merger

Brazilian Competition Authority

This case was firstly analysed in 2014 when the Brazilian Competition Authority (CADE) approved the case with commitments. Videolar acquired Innova, both operating in the plastic resin market, specifically the polystyrene (PS) and the styrene monometer (MS). One of the remedies imposed at that time was that the merged company should keep the same PS production volume in two of the cities they had industrial plants for the following ten years. CADE also imposed the obligation to invest a percentage of the company's turnover in R&D to develop new types of plastic resins.

Following a decrease of the resins output, the General-Superintendence (SG) considered that the parties failed to comply with their obligation and re-opened the scrutiny of the transaction in 2019, suggesting blocking the merger and the divestment of the production plants. CADE's Tribunal initially agreed, but in 2021 a new appeal was brought by the parties.

CADE's Tribunal decided favourably on the appeal, with the majority of votes, concluding that the detangling of the merger would have a negative impact on the market and that the volume quota obligation would not solve competition concerns in the PS selling market. To address the horizontal effects and the loss of innovation concerns relating to future product quality improvements, the parties committed to investing a higher amount of their turnover from the sale of PS "*in the improvement and development of plastic resins, both in terms of product and distribution (logistics, packaging, etc.) and the sustainability of the material (collection, recycling and treatment of the materials) or a combination of materials*". The investment obligations will be monitored by a trustee for five years.

Source: CADE (2022) Videolar/Innova case CADE clears the acquisition of Innova by Videolar, https://www.gov.br/cade/en/matters/news/cade-clears-acquisition-of-innova-by-videolar.

3.8. Efficiency gains, benefits to consumers, and pro-competitive justifications

Competitive assessments in cases with an impact on circular economy markets may involve an examination of anticompetitive harm and efficiencies. Common criteria in many jurisdictions for allowing an otherwise anticompetitive agreement or conduct is that the agreement or conduct i) bring benefits to consumers; ii) is needed to originate the benefits or the benefits cannot be obtained with a lesser restriction of competition; iii) the efficiencies offset the harm; and iv) some competition is left in the market.

For merger control, recurrent requirements across jurisdictions include that the benefits must go to consumers, they must originate from the transaction and be supported by clear evidence.

In the evaluation of efficiencies arising in circular economy markets, competition authorities may be confronted with several questions that may require to be addressed within the traditional competitive assessment:

- What types of circularity-enhancing efficiencies may be considered in the assessment?
- Can the assessment consider benefits arising to non-consumers, such as citizens in other jurisdictions?
- How far away in time can the benefits arise for them to be considered transaction-specific or for the agreement or conduct to be considered necessary to produce them?

3.8.1. What types of circularity-enhancing efficiencies may be considered in the assessment?

There are a number of circularity-enhancing efficiencies that may arise from agreements, behaviour and transactions with an impact on the circular economy. These may include, for example, choice and quality improvements, for instance as regards the enhanced recyclability, durability and repairability of the product. They may include innovation improvements, such as the introduction of new process or product innovation and technologies that enable circularity. Further, they may include cost savings on raw materials thanks to enhanced recyclability, increased economies of scale and scope, R&D synergies that address innovation spillovers, or enabled interoperability that delays product obsolescence.

For instance, the 2022 EU Vertical Guidelines explicitly refers to information that may be exchanged to implement a vertical agreement and be considered necessary to produce efficiency gains, namely to improve the production or distribution of the product. It includes "*technical information relating to the contract goods or services, including information relating to the registration, certification, handling, use, maintenance, repair, upgrading or recycling of the contract goods or services, notably where such information is required to comply with regulatory measures, and information that enables the supplier or buyer to adapt the contract goods or services to the requirements of the customers*."[42] Similarly, as mentioned above, some anticompetitive restrictions may be justified by the need to protect investments, address hold-up[43] or free-rider problems, or cope with the first-mover disadvantage (Serafimova and Hörnig, 2023[25]).

The Egyptian competition authority noted that, while anticompetitive concerns arose by the concentration of the two largest ride-hailing companies in the Uber/Careem merger, circularity and sustainability efficiencies could emerge. As a result of the use of data analytics and algorithms, these would, for example, include optimized vehicle routing, reduced under-utilisation of vehicles, reduced emissions and reduced negative environmental effects (OECD, 2023[46]).

In some cases, it may, however, be more complex to determine whether any consideration should be given to non-economic benefits (or, more precisely, efficiencies of non-immediate economic nature). These may include, for example, extraction reduction that is not directly linked to cost savings on raw materials, prevention of soil degradation, landfill waste reduction, reduced negative impacts on biodiversity or natural resources and so on. The focus of circularity on productive efficiency, however, suggests that, in many cases, benefits arising in circular economy cases will also be economic efficiencies, likely more so, for example, than in other types of sustainability cases.

3.8.2. Can the assessment consider benefits arising to non-consumers, such as citizens in other jurisdictions?

This is the issue of the consideration of out-of-market effects,[44] which most often arises in relation to sustainability rather than circular economy markets, for instance with regard to the reduction of greenhouse

gas emissions. In relation to the circular economy, this issue should be more unlikely to arise, because most of the economic effects mentioned above (cost savings, economies of scale and scope, R&D synergies, interoperability, etc.) will tend to benefit the same category of consumers that is potentially affected by the anticompetitive harm.

Out-of-market effects in these cases would most likely come about in association with the above-mentioned non-economic impacts of the conduct or transaction. Examples could possibly include extraction reduction that is not linked to cost savings on raw materials, soil enhancement, landfill waste reduction and so on. These would be more difficult to take into account for competition authorities in the traditional competitive assessment, particularly in the lack of specific safe harbours, presumptions or guidelines recommending otherwise (see for examples of such guidelines, Section 4).

If an agreement or conduct, however, is also shown to bring about significant benefits of economic nature that are related to the maximisation of productive efficiency relating to the circular economy, these could be presumed to benefit the relevant categories of consumers. A determination in this sense has been made, for example, by the Austrian legislator, in a recent amendment to the Cartel Act (see, for details, Box 4.1).

Such agreements or conduct would likely benefit consumers in the form of enhanced choice of circular products or enhanced circular quality of the product, which may include the non-use value of the product,[45] regardless of whether the immediate positive externalities of the specific conduct or agreements are also felt elsewhere. For example, one could think about a voluntary agreement to phase out a certain type of non-recyclable plastic from the manufacturing process that makes the product more recyclable, but also more expensive. Such an agreement will likely bring about the benefits of reduced plastic production and plastic waste (quite likely arising in a different jurisdiction than the one where the competition restriction takes place), but also of enhanced recyclable quality of the product for the same consumers that compensates for the price increase.

One question arising in many jurisdictions will therefore be whether, in the lack of stated preferences by consumers for the recyclable product, that could be considered by the competition authority as an increase in quality offsetting the price increase. This is the recurring problem of consumers behavioural biases, which may mean that revealed preferences of consumers do not fully show how much they value circular products.[46] Such biases may have to be considered by the competition authority in their assessment in order to determine whether the agreement or conduct effectively lead to benefits for those consumers,[47] at least until significant information asymmetries continue to affect consumer goods (Volpin, 2020[44]). As noted by (Serafimova and Hörnig, 2023[25]), "*A the CLSC [closed-loop supply chain] operators are able to build upon the knowledge of consumers' preferences when the latter returns the input of the product, it may be easier for businesses to show the existence of individual use value benefits, e.g. also through customer satisfaction surveys showing increased customer satisfaction*."

This, however, does not mean that circularity benefits cannot also be considered to fall within the categories of collective benefits when recognised by the relevant competition authority.[48]

3.8.3. How far away in time can the benefits arise for them to be considered transaction-specific or for the agreement or conduct to be considered necessary to produce them?

It is possible that efficiencies relating to circular economy market may take some time to materialise. In these cases, competition authorities may apply a discounting criterion, by means of which the further away in time the efficiencies materialise, the stronger the demonstration of the causal link with the agreement, conduct or transaction may have to be. A similar question arises, for example, in relation to sustainability agreements, where some competition authorities have shown to remain open to consider such future benefits.[49]

For a full analysis of the benefits and risks connected to these questions in relation to sustainability, see (OECD, 2021, pp. 17-19[39]).

4 Competition advocacy and the circular economy

In addition to enforcement, competition authorities may make use of several other powers to promote and support the transition to a circular economy. As the interaction between competition and other relevant policies (such as industrial strategy, innovation, trade and finance policies) is very close, it is difficult to overestimate the importance of a whole-of-government approach that is built on principles of effective competition for the green transition (OECD, 2023[42]).

Particularly important may be the protection of investments in innovation and ensuring that regulatory constraints do not create undue obstacles to the circular economy. Specifically with regards to financial policies for the green transition, competition authorities can also contribute by addressing businesses' anticompetitive conduct that prevents access to investments to develop circular initiatives, products and technologies.

Competition authorities can thus interact with governments and businesses to ensure that the most market-friendly solutions are adopted to promote a circular economy. Competition advocacy can thus support the maximisation of the use of State resources and private investments in the transition to a circular economy. Some practical examples of such initiatives are listed below.

4.1. Enforcement guidelines, comfort letters and regulatory sandboxes

Competition authorities may issue guidelines to ensure that the uncertainty as to the application of competition law is not an obstacle to pro-competitive sustainability initiatives and to the promotion of a circular economy or is not perceived as such by businesses. For instance, sustainability guidelines or studies have been issued or are under discussion at the European level,[50] as well as, for example, in the UK,[51] Austria,[52] the Netherlands,[53] Greece,[54] Germany,[55] Spain,[56] and Japan.[57]

Box 4.1. The Austrian Cartel Law Amendment and Guidelines on Sustainability Co-operations

The Austrian Bundeswettbewerbsbehörde adopted guidelines following an amendment to its cartel law specifically introducing a sustainability exemption. Such an exemption allows to presume, in the presence of an agreement falling under the Austrian Cartel Act which yields consumers' benefits (i.e., improvements to the production or distribution of goods or technical or economic progress) and that demonstrably and significantly contributes to "*an ecologically sustainable or climate-neutral economy*", that such benefits are enjoyed by consumers (i.e., a fair share of those benefits are enjoyed by them).

The 2022 Guidelines, published by the Austrian Bundeswettbewerbsbehörde after a public consultation, include a specific reference to the circular economy, explaining that a contribution to "*an ecologically sustainable or climate-neutral economy*" includes the "*transition to a circular economy*". A contribution is considered to be made

> *"if products' durability, reparability, upgradability, reusability or recyclability, or the manner in which they are provided are improved, and the consumption of resources is therefore reduced. Such a contribution may also be made if the quantities of waste produced or incinerated are reduced, or the reuse and recycling of waste is improved. A reduction of hazardous substances in materials and products may also contribute to the transition of a circular economy."*

Source: Austrian Bundeswettbewerbsbehörde, Guidelines on the Application of Section 2 para. 1 Cartel Act to Sustainability Co-operations (Sustainability Guidelines), September 2022, https://www.bwb.gv.at/en/news/detail/afca-publishes-final-guidelines-on-sustainability-agreements-for-companies.

In addition to ensuring that they do not actively discourage pro-competitive initiatives that foster circularity, competition authority may also be able to perform individual assessments or to provide informal guidance in specific cases. For example, the Australian regime enables the Australian Competition and Consumer Commission (ACCC) to clear collective initiatives, taking into account the potential anticompetitive harm and the public benefit deriving from the conduct. With this power, the ACCC has in the past authorised tyre and batteries stewardship schemes to the purpose of coordinating safe discarding of such products and to benefit the circular economy (for a detailed explanation of the Australian authorization regime, see note by Australia[58] and OECD (2021, pp. 43-44[39])).[59]

Authorities operating in self-assessment regimes, such as in the EU, may still discretionarily allow companies to request *ad hoc* guidance in specific instances, which may lead to the issuance of comfort letters,[60] or other green lighting mechanisms.[61] Further, in Greece, the Hellenic Competition Commission developed a "sandbox for sustainability and competition", i.e. a protected space where "*industry [can] experiment with new business formats that aim to realize more quickly and efficiently sustainability goals, and which involve cooperation between competing undertakings or even more permanent changes in market structure in order to be accomplished*" (OECD, 2021[49]).

Competition authority may also ensure that they do not actively discourage or, when individual assessment or informal guidance is requested, explicitly allow collective private initiatives between competitors in relation to finance for the circular economy, such as banking or insurance alliances, that do not have anticompetitive effects on the market. For example, recently concerns have been raised in the US that collective initiatives in insurance, asset management and banking sectors aimed at progressively withdrawing coverage to fossil fuel projects may infringe antitrust rules.[62] Depending on the case, competition authorities may assess whether there are genuine reasons to fear antitrust liability or whether it is possible to reassure the involved players on the legitimacy of their initiatives aimed at promoting the circular economy.

4.2. Power to issue opinions to Governments

Many competition authorities are endowed with the power to provide opinions to Government on planned reforms or individual pieces of regulation. This power allows them to influence Governments and to ensure they consider the principles of competitive neutrality and of competition when adopting new pieces of legislation.

A recent example of the usefulness of this power is provided by the French Competition Authority, which gave its opinion on the assessment of the necessity and proportionality of the exclusivity rights granted to the eco-organisms for organising the chain of plastic packaging recycling.

Box 4.2. Opinion of the French Competition Authority on EPR for household packaging

The French Minister of Economics, Finance and Recovery recently requested the opinion of the French Competition Authority on a draft order aimed at modifying the requirements of producer responsibility organisations for the recycling of household packaging.

The Order of 15 March 2022 provided eco-organisations with the exclusive rights to organise the collection and recycling of some types of household plastic waste that met specific conditions. This is aimed at facilitating the achievement of plastic retrieval and recycling goals quickly, allowing eco-organisations to structure their investments and to focus on plastic waste that are not or not very recyclable.

The French Competition Authority in the use of its power of providing an opinion on a proposed piece of legislation looks at whether any anticompetitive restrictions can originate by the reform and, if it finds any, it balances it against the public interest that the provision aims at serving, checking whether the restrictions are necessary and proportionate to reach that objective.

In this case, it found that the granting of exclusive rights to organise the retrieval of household waste could lead to foreclosure effects that may prevent new entry in the markets of retrieval and recycling of plastic materials. According to the authority, "*this exclusivity is likely to restrict competition between recovery operators, limit the choice of the local authorities in their recovery options and deprive them of the profit generated by the marketing of this waste*".

It therefore recommended to include a time limitation on the granting of the exclusivity right that would not exceed end of 2029. It also advised to include a review mechanism that would allow to monitor the implementation of the new system in 2025.

The authority also examined the Government's proposal to include a balancing mechanism according to which eco-organisations with small market share upstream would be ensured a presence in the downstream market. The mechanism would aim at better distributing take-back and recycling obligations between eco-organisations and in a way that is proportionate to their upstream market shares. This mechanism was found by the authority to be disproportionate in that it would risk strengthening the market position of the Citeo group in a market already characterised by significant barriers to entry.

Source: French Competition Authority, Opinion 22-A-05 of 16 June 2022 on the balancing mechanism provided for by the draft amending order on the approval procedure and specifications for eco-organisations in the household packaging, https://www.autoritedelaconcurrence.fr/fr/avis/relatif-au-mecanisme-dequilibrage-prevu-par-le-projet-darrete-modificatif-relatif-la-procedure.

4.3. Market studies

One very effective way in which competition authorities may support the circular economy is with market studies (sometimes referred to as market investigations, market enquiries, or fact-finding surveys) of relevant sectors. They typically involve a thorough analysis of a specific market, in consultation with relevant stakeholders, and may result in recommendations to improve competition. The notion of "market" in market studies may be broader than the one typically applied in competition enforcement and may extend to a whole sector or practices across different products (OECD, 2020[50]).

Market studies to support the circular economy may be initiated to conduct analysis of legislation to ensure that it respects the principles of competition or serve as information-gathering tools to improve knowledge of a specific sector, analyse widespread practices for potential anticompetitive issues, or understand demand-side issues that affect competition. Competition authorities can therefore conduct market studies to understand whether there are barriers to private investments that can be addressed by them or by government measures or advise governments to help minimise market distortions from policy and regulatory interventions aimed at supporting the circular economy, for example by promoting access to credit for circular start-ups or new technologies.

Several OECD countries (such as, for instance, Germany,[63] Sweden,[64] Italy,[65] Spain[66] and the United Kingdom[67]) have undertaken studies or are currently analysing the electric vehicle plugging sector, as a result of governmental commitments to reduce or block sales of non-electric vehicles in the future. The European Commission has also just published an extensive study in the market for electric vehicle charging across different EU countries, with a deeper focus on four European markets (Ireland, Italy, Croatia and Belgium).[68]

This can be done for markets of particular relevance to the circular economy, such as it was done recently by, for example, by the Japan Fair Trade Commission (JFTC), which launched a fact-finding survey of the polyethylene terephthalate (PET) bottle recycling sector, to investigate concerns that some companies or trade associations may restrain competition in the household and the business PET recycling;[69] the Spanish CNMC, which opened a market study on packaging waste management,[70] and the German Bundeskartellamt, which conducted a sector probe into waste collection, revealing high levels of concentration and high barriers to entry in the collection and transport of household waste and decreased intensity of competition.[71]

4.4. Competition-friendly procurement in circular markets

Competition authorities also have an advocacy role in influencing the design of competitive tenders for public procurement that is pro-circular economy. This is very important, for instance, in relation to the waste management sector or other sectors where services can be offered via procurement contracts.

Evidence from different countries shows that competitive tendering of household waste management is associated with significant cost savings and does not lead to a decline in quality. A 2006 study conducted by the Irish Competition Authority analyses evidence from the US, the UK, Sweden, Denmark, Ireland, and Canada, and concludes that "*Competitive tendering does not lead to a lower quality of collection service; [it] yields significant cost savings compared to provision by public authorities*" (Irish Competition Authority, 2006[51]).

The specific conditions with which the tendering procedure is conducted are also fundamental to ensure competitive outcomes and competition authorities may provide guidance on what tender rules may be adopted to enable them. For instance, in Germany, the Bundeskartellamt recommended the largest waste management player, DSD, to amend its tender rules to prevent large companies to cluster together to win the bid (so they would instead submit competing bids), and to enable smaller companies to participate in the tender by tendering out different services separately.[72]

In quickly developing technological areas, it may be important to ensure that tender criteria are formulated in a way that allows competition from new providers and incentivise the participation of alternative technologies. This can be done by focusing the tender on solution-oriented requirements rather than technology-specific approaches (OECD, 2021[39]).

4.5. Competition assessment and other ways to reduce regulatory barriers

The circular economy may be characterised by significant amount of regulation, which may be important to set hygiene, safety and quality standard but may also impose important constraints on business operators. The industries involved are often very sensitive to technological changes and may exhibit significant levels of innovation, such as the impact of clean tech, and that may require a certain amount of flexibility in the regulatory framework or, at least, its revisiting for fitness of purpose should be undertaken at frequent intervals (OECD, 2023[42]).

In a recent study on regulation and competition, the UK CMA found that countries with more pervasive product market regulation typically enjoy lower levels of competition and that the most detrimental type of regulation is that which creates or increases barriers to entry. The study also finds that "*there is insufficient prominence given to the impact of proposed regulation on dynamic competition and the process of innovation in the template used by government officials to produce Regulatory Impact Assessments. In cases where competition is not sufficiently considered, there is a higher risk that a regulatory measure could have major unintended impacts on competition and innovation in a market*" (CMA, 2020[52]).

One example is the one of building code requirements for structural concrete. This is a standard that is aimed at preserving safety in construction and, as such, it is of fundamental importance to public policy. If unduly detailed, however, its requirements may prevent other types of product from being brought to the market, and research investments to be poured into them (Gates, 2021[53]).

It may be important that competition authorities contribute to ensure that regulation in sectors that are important for the circular economy are not unduly burdensome for the market players and do not create obstacles to investments and new entry. This may include industries where circular innovation and technologies are prominent but also markets with indirect pervasive effects across economies such as energy and transport (OECD, 2021[39]). In some cases, particularly in those areas where technological developments occur very fast, it may be helpful to introduce sunset clauses for new regulation to allow its re-evaluation over time or to dispose *ex ante* their rolling back after a fixed period of time (CMA, 2020[52]; OECD, 2023[42]).

The OECD published a Competition Assessment Toolkit which is aimed at helping governments, regulators and competition authorities to review regulation with the purpose of reducing the costs of doing business and enabling market entry.

5 Conclusions

To ask whether competition is compatible with the circular economy is also to ask whether our current economic model is at odds with the long-term conservation of our planetary resources. The above analysis showed that there are various ways in which competition policy and circular economy goals dovetail and reinforce each other.

Although competition alone does not necessarily drive the adoption of circular business models, there is a significant alignment between the goals of the circular economy and competition. Both encourage businesses to increase resource efficiency and to maximize inputs and raw materials value. To the extent that productive efficiency and an efficient use of natural resources coincide, competition is therefore one of the organic drivers of the shift to a circular economy.

As a result, the activity of competition authorities can provide a fundamental contribution to the transition to a circular economy, including where regulatory action may be missing or insufficient, within the current analytical framework and by means of the traditional tools.

Specifically, competition policy can support the circular economy in at least three ways. First, competition authorities can consider the impact of anticompetitive agreements, conduct and mergers on the circular economy, ensuring that they prohibit initiatives that dampen productive efficiency and competition. The move from a linear to a circular economy will also be demand-led, as informed consumers will opt more and more for products issued by a circular economy and companies will increasingly compete to provide them. Competition agencies can thus use their enforcement tools to prevent non-circular economy players from hindering circular economy competitors and from artificially staggering the release of the more recyclable version of their own products to protect the market shares coming from the non-circular ones. They can also prohibit circular economy players from foreclosing input or customers to other circular players and ensure that they do not collude to slow down the release of the modular, recyclable or repairable version of their products.

Second, competition authorities may ensure that they allow consumers to reap the circularity benefits yielded by several forms of pro-competitive business co-operation, such as standardisation and R&D agreements. Competition authorities can provide concrete guidance to businesses on how competition law can consider and, when appropriate, facilitate unproblematic circular economy initiatives, such as with exemptions or by issuing guidelines exemplifying what pro-competitive collaborations contribute to circular economy goals.

Since both the circular economy and competition promote productive efficiency, it is relatively easy to integrate circular economy considerations into the current competition analysis framework. In many cases, behaviour and transactions that harm competition will lead to negative effects on the circular economy and, vice versa, circularity efficiency gains will also be pro-competitive. This recognition is particularly important for competition authorities that may find obstacles in fully considering sustainability efficiencies within their current frameworks (for instance, as regards out-of-market effects), because they will conceivably be able to consider circularity effects with more ease.

Third, competition policy can be used as a proactive tool to support the transition to a circular economy. Competition authorities can engage in advocacy efforts to promote awareness and understanding of the value of competition principles for a well-functioning circular economy among policymakers, businesses,

consumers, and other stakeholders. This can be done, for instance, by issuing opinions to inform government action, by conducting market studies in strategic sectors, by influencing the design of competitive tenders in circular economy markets, and by monitoring regulatory barriers that may unduly hinder competition, innovation and circularity.

Endnotes

[1] See for more details, https://ellenmacarthurfoundation.org/articles/we-need-to-talk-about-renewables-part-1#:~:text=Building%20the%20renewable%20energy%20sector,principles%20of%20a%20circular%20economy.

[2] See https://www.weforum.org/agenda/2021/10/7-surprising-facts-to-know-about-the-circular-economy-for-cop26/. See also the WWF, Living Planet Report 2016, http://awsassets.panda.org/downloads/lpr_living_planet_report_2016.pdf. See https://www.weforum.org/agenda/2021/10/7-surprising-facts-to-know-about-the-circular-economy-for-cop26/. See also the WWF, Living Planet Report 2016, http://awsassets.panda.org/downloads/lpr_living_planet_report_2016.pdf.

[3] For a fuller discussion on de-growth theory, see, among others, (Latouche, 1989[63]), Chapter 9 of (Aghion, Antonin and Bunel, 2021[12]), (Raworth, 2017[59]), (Hickel, 2021[60]), (Schmelzer, Vetter and Vansintjan, 2022[61]) and (Pisani-Ferry and Mahfouz, 2023, pp. 45-52[71]).

[4] For a definition of productivity gains, see (OECD, 2021[64]), which defines them as "*the ability to produce more output by better combining inputs, owing to new ideas, technological breakthroughs and augmented business models. These transform the production of goods and services, fostering economic growth and rising living standards and well-being*".

[5] For a discussion see for example, Chapter 9 of (Aghion, Antonin and Bunel, 2021[12]) and (Raworth, 2017[59]).

[6] Article 2, para. 1 of the Japanese Basic Act on establishing a sound material-cycle society defines the concept as "*a society where the consumption of natural resources is minimized and the environmental load is reduced to the greatest extent possible, by preventing or reducing the generation of waste […] and by promoting proper cyclical use and disposal of products*". See https://www.env.go.jp/en/focus/docs/files/20120301-28.pdf.

[7] See https://www.env.go.jp/recycle/3r/initiative/en/index.html.

[8] See https://ellenmacarthurfoundation.org/the-circular-economy-in-detail-deep-dive.

[9] Recycling instead of dumping lithium-ion batteries into landfills also avoids significant toxic chemicals leakage that contaminates water, reducing externalities and saving significant amounts of money for society on water treatment and health, see, for instance, Jacobson (2022, p. 63[57]). Such batteries are used in products such as electronics, toys, wireless headphones, handheld power tools and electric vehicles.

[10] The value of information sharing in this area is also highlighted by the fact that, at the time of writing, several proposals have also been put forward to introduce digital product passports in the EU to enable market players to share, along with the product, written information relating to its manufacturing and recyclability across the entire value chain (including, for instance, carbon footprint, material composition, percentage of recycled materials used, or recycling guidelines). See https://hadea.ec.europa.eu/calls-proposals/digital-product-passport_en; https://circulareconomy.europa.eu/platform/sites/default/files/cisl_digital_products_passport_report_v6.pdf.

[11] See BBC News, 2 December 2014, https://www.bbc.com/news/uk-england-suffolk-30302961.

[12] See Jessica Aldred, Supermarket goes green with tomato power, 28 January 2008, https://www.theguardian.com/environment/blog/2008/jan/28/supermarketgoesgreenwithto.

[13] See https://circulareconomy.europa.eu/platform/en/good-practices/make-most-these-beets-increasing-diversity-and-building-resilience-sugar-industry.

[14] On the role of digital platforms in the circular economy, for example, see (Blackburn, Ritala and Keränen, 2022[70]).

[15] X-efficiency is also recognised as the level of efficiency in the production of output given a certain amount of input based on behaviour and performance.

[16] For an analysis of the relationship between competition and innovation, see also (OECD, 2023[66]).

[17] See, for an example of governmental target setting on waste minimisation, the UK summary of targets in their 25-year environment plan, 23 February 2023, https://www.gov.uk/government/publications/25-year-environment-plan/25-year-environment-plan-our-targets-at-a-glance.

[18] For a detailed analysis of why regulation is typically considered the preferable way to deal with externalities and in which circumstances competition policy may be a complementary tool, see (OECD, 2021[39]).

[19] See also Margrethe Vestager, Speech, EVP Vestager keynote speech at the Global Competition Law Conference: Competition policy for greater resilience and effective transition, 20 April 2023, Brussels, https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2381: "*Antitrust rules should support the green transition. But when an entire industry aims to become more sustainable, the very mechanism by which competition keeps prices low can make the transition more difficult. If a company must incur higher costs in order to achieve a better sustainability outcome, it can face a 'first mover' disadvantage - the more competitive the market, the greater this disadvantage can be. That means there are times when cooperation can be a good thing. This is when a market failure is not fully addressed by regulation, so there is space for private actions to complement. We want to enable these actions, but we want to draw a clear line around what constitutes greenwashing: the last thing Europe needs is cartels using sustainability as a cover for illegal collusion.*"

[20] See, for instance, US FTC In the Matter of Rambus, Inc., 2006-2 Trade Cas. (CCH), 2 August 2006, 75364 4, stating that "[*t*]*ypically, the procompetitive benefits of standard setting outweigh the loss of market competition. For this reason, antitrust enforcement has shown a high degree of acceptance of, and tolerance for, standard-setting activities*." See also European Commission, Draft guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip, para. 465, and (OECD, 2014[62]).

[21] European Commission, Draft guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip , para. 477.

[22] European Commission, Draft guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, https://competition-

policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip, para. 466.

[23] European Commission, Draft guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip, para. 561, which states that "*In order to contribute to sustainable development, […] Competitors may […] wish to agree to harmonise packaging materials to facilitate recycling or harmonise packaging sizes (and hence product content) to reduce waste*."

[24] European Commission, Draft guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip, para. 572.

[25] See, for a fuller analysis of purchasing agreements, also (OECD, 2022[55]).

[26] European Commission, Draft guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip, para. 349.

[27] ACM, Press Release, ACM investigates purchasing cartel for reusable waste, 20 February 2020, https://www.acm.nl/nl/publicaties/acm-onderzoekt-inkoopkartel-herbruikbare-afvalstoffen.

[28] Articles 3 and 4 of Commission Regulation (EU) 2022/720 of 10 May 2022 on the application of Article 101(3) of the Treaty on the Functioning of the European Union to categories of vertical agreements and concerted practices, C/2022/3015, OJ L 134, 11.5.2022, p. 4–13, http://data.europa.eu/eli/reg/2022/720/oj.

[29] European Commission, Guidelines on vertical restraints, C/2022/4238, 30 June 2022, OJ C 248, p.1-85, para. 144.

[30] European Commission, Guidelines on vertical restraints, C/2022/4238, 30 June 2022, OJ C 248, p.1-85, para. 316: "Such vertical agreements with buyers may be pro-competitive, as the long-term non-compete obligation may be necessary for the investment to take place at all, or for it to take place on the foreseen scale or within the foreseen time".

[31] For example, in the EU, see judgment of the Court of Justice of 26 November 1998, Oscar Bronner v Mediaprint, Case C-7/97, para. 41 and judgment of the General Court of 10 July 1991, Radio Teelfis Eireann (RTE) v Commission, case T-69/89, EU:T:1991:39, para. 73. The "essential facility doctrine" has been developed by the US jurisprudence in United States v. Terminal Railroad Ass'n of St. Louis, Supreme Court (1912). See also MetroNet Servs. Corp. v. Qwest Corp., 383 F.3d 1124, 1128-29 (9th Cir. 2004); MCI Commc'ns Corp. v. AT&T, 708 F.2d 1081, 1132-33 (7th Cir. 1983); Hecht v. Pro-Football, Inc., 570 F.2d 982, 992-93 (D.C. Cir. 1977); United States v. AT&T, 524 F. Supp. 1336, 1360-61 (D.D.C. 1981); Aspen Highlands Skiing Corp. v. Aspen Skiing Co., 738 F.2d 1509, 152021 (10th Cir. 1984), *aff'd*, 472 U.S. 585 (1985).

[32] Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings, amended by 2023/C 116/01, C/2023/1923, OJ C 116,

31.3.2023. See consolidated version, https://competition-policy.ec.europa.eu/system/files/2023-03/guidance_paper_article_102_redline_post_amending_communication.pdf, paras. 80 ss.

[33] Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings, amended by 2023/C 116/01, C/2023/1923, OJ C 116, 31.3.2023. See consolidated version, https://competition-policy.ec.europa.eu/system/files/2023-03/guidance_paper_article_102_redline_post_amending_communication.pdf, para 46.

[34] For examples and further details in relation to environmental considerations and unilateral conduct, see (Kingston, 2011[68]).

[35] CNMC, Press Release, The CNMC adopts interim measures to ensure publicity and transparency for the upcoming auctions of PET and HDPE plastic waste organised by Ecoembes, 29 December 2022, https://www.cnmc.es/sites/default/files/editor_contenidos/Notas%20de%20prensa/2022/20221229_NP_MC-Ecoembes_en_GB.pdf. For the main proceedings, see https://www.cnmc.es/expedientes/s002121.

[36] United States' White House, Executive Order on Promoting Competition in the American Economy, 9 July 2021, https://www.whitehouse.gov/briefing-room/presidential-actions/2021/07/09/executive-order-on-promoting-competition-in-the-american-economy/.

[37] United States' White House, Fact Sheet on the Executive Order on Promoting Competition in the American Economy, 9 July 2021, https://www.whitehouse.gov/briefing-room/statements-releases/2021/07/09/fact-sheet-executive-order-on-promoting-competition-in-the-american-economy/#:~:text=and%20repair%20tools.-,In%20the%20Order%2C%20the%20President%3A,your%20own%20devices%20and%20equipment.

[38] By supporting repairing choices throughout the whole product lifecycle, and as part of the broader objectives of the European Green Deal, they aim at i) promoting repairability of products at the design phase (Ecodesign for Sustainable Products regulation, Directive 2009/125/EC, https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/sustainable-products/ecodesign-sustainable-products_en); ii) promoting transparency and consumers' awareness to empower them to make better purchasing choices (Proposal for a Directive on empowering consumers for the green transition, https://commission.europa.eu/live-work-travel-eu/consumer-rights-and-complaints/sustainable-consumption_en#empowering-the-consumer-for-the-green-transition; and iii) eliminating obstacles that make it more expensive or difficult for consumers to access repair services.

[39] See UK CMA, Copart, Inc./Green Parts Specialist Holdings Ltd (Hills Motors), Issues statement, 13 January 2023, https://assets.publishing.service.gov.uk/media/63c16c34d3bf7f580ca8fc75/Copart_Hills_Motors_-_Issues_Statement_.pdf.

[40] See, for an analysis of these concerns in a concrete case, the UK CMA, Copart, Inc./Green Parts Specialist Holdings Ltd (Hills Motors), Issues statement, 13 January 2023, https://assets.publishing.service.gov.uk/media/63c16c34d3bf7f580ca8fc75/Copart_Hills_Motors_-_Issues_Statement_.pdf.

[41] Bundeskartellanwalt (BMJ) zieht Prüfungsantrag zum Gemeinschaftsunternehmen zwischen Saubermacher und Pölzleitner zurück und genehmigt somit den Zusammenschluss mit Auflagen, 8 March 2023, https://www.bwb.gv.at/news/detail/bundeskartellanwalt-bmj-zieht-pruefungsantrag-zum-

gemeinschaftsunternehmen-zwischen-saubermacher-und-poelzleitner-zurueck-und-genehmigt-somit-den-zusammenschluss-mit-auflagen.

[42] European Commission, Guidelines on vertical restraints, C/2022/4238, 30 June 2022, OJ C 248, p.1-85, para. 99(a).

[43] European Commission, Guidelines on vertical restraints, C/2022/4238, 30 June 2022, OJ C 248, p. 1-85, para. 316.

[44] For a detailed description of out-of-market effects and how they may be taken into account in the competition analysis, please refer to (OECD, 2021, pp. 17-18[39]).

[45] See, for an analysis of non-use value and related examples, European Commission (2022), Draft Revised Horizontal Co-operation Guidelines, 1 March 2022, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip.

[46] See, for a full analysis of the effects of consumer behaviour biases in the context of sustainability and competition, (OECD, 2021[39]).

[47] See, for instance, European Commission (2022), Draft Revised Horizontal Co-operation Guidelines, 1 March 2022, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip.

[48] European Commission, Draft guidelines on the applicability of Article 101 of the Treaty on the Functioning of the European Union to horizontal co-operation agreements, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip, para. 601 ss.

[49] See, for instance, UK Competition and Markets Authority (2023), Draft Guidance on the application of the Chapter I prohibition in the Competition Act 1998 to environmental sustainability agreements, CMA 177, 28 February 2023, https://www.gov.uk/government/consultations/draft-guidance-on-environmental-sustainability-agreements.

[50] European Commission (2022), Draft Revised Horizontal Co-operation Guidelines, 1 March 2022, https://competition-policy.ec.europa.eu/document/download/c3388b84-153b-4848-a920-31ed69e74c0a_en?filename=draft_revised_horizontal_guidelines_2022_all_languages.zip.

[51] UK Competition and Markets Authority (2023), Draft Guidance on the application of the Chapter I prohibition in the Competition Act 1998 to environmental sustainability agreements, CMA 177, 28 February 2023, https://www.gov.uk/government/consultations/draft-guidance-on-environmental-sustainability-agreements and UK Competition & Markets Authority (CMA) (2021), "Environmental Sustainability Agreements and Competition Law", https://www.gov.uk/government/publications/environmental-sustainability-agreementsand-competition-law/sustainability-agreements-and-competition-law.

[52] Austrian Bundeswettbewerbsbehörde, Guidelines on the Application of Section 2 para. 1 Cartel Act to Sustainability Co-operations (Sustainability Guidelines), September 2022, https://www.bwb.gv.at/en/news/detail/afca-publishes-final-guidelines-on-sustainability-agreements-for-companies.

[53] Dutch ACM (2021), Second Draft of the Guidelines on Sustainability Agreements, https://www.acm.nl/sites/default/files/documents/second-draft-version-guidelines-on-sustainability-agreements-oppurtunities-within-competition-law.pdf.

[54] Hellenic Competition Commission (HCC) (2020), Staff Discussion Paper, Competition Law & Sustainability, https://www.epant.gr/en/enimerosi/competition-law-sustainability.html and Hellenic Competition Commission (HCC) and Netherlands Authority for Consumers and Markets (ACM) (2021), Technical Report on Sustainability and Competition, https://www.epant.gr/en/enimerosi/publications/sustainability/item/1284-technical-report-on-sustainabilityand-competition.html.

[55] Bundeskartellamt (2020), Offene Märkte und nachhaltiges Wirtschaften - Gemeinwohlziele als Herausforderung für die Kartellrechtspraxis, https://www.bundeskartellamt.de/SharedDocs/Publikation/DE/Diskussions_Hintergrundpapier/AK_Kartellrecht_2020_Hintergrundpapier.pdf?__blob=publicationFile&v=2..

[56] Spanish CNMC (2020), Position Paper in the context of the European Commission's public consultation on how competition policy can contribute to the Green Deal, available at https://www.cnmc.es/sites/default/files/editor_contenidos/Notas%20de%20prensa/2020/SPANISH%20COMPETITION%20AUTHORITYs%20COMMENTS%20EU%20CALL%20FOR%20CONTRIBUTION%20ON%20HOW%20COMPETITION%20RULES%20AND%20SUSTAINABILITY%20POLICIES%20WORK%20TOGETHER_0.pdf.

[57] Japan Fair Trade Commission (2023), Draft of Guidelines Concerning the Activities of Enterprises, etc. toward the Realization of a Green Society under the Antimonopoly Act, 13 January 2023, https://www.jftc.go.jp/en/pressreleases/yearly-2023/January/230118.html.

[58] OECD (2023), Competition in the Circular Economy – Note by Australia, https://one.oecd.org/document/DAF/COMP/WD(2023)32/en/pdf.

[59] OECD (2020), Sustainability and Competition - Note by Australia and New Zealand, https://one.oecd.org/document/DAF/COMP/WD(2020)62/en/pdf and Australian Competition & Consumer Commission, Authorisation AA1000476 of 4 September 2020, Battery Stewardship Council. See also Gaetano Lapenta and Matteo Giangaspero (2021), Greening Antitrust: Lessons from the ACCC's Authorisation of a Recycling Co-Operation Agreement, Journal of European Competition Law & Practice, https://doi.org/10.1093/jeclap/lpab072.

[60] For instance, see the legislative amendment in Greece of Article 37A of the Law 3959/2011, according to which the President of the Hellenic Competition Commission may, under proposal of the Directorate-General for Competition and at the party's request, issue a no-action letter based on public interest grounds, including for the implementation of sustainable development targets. For an analysis, see Alexandra Mikroulea and Triantafyllia Mavridopoulou, Greece: Introducing Comfort Letters and Tackling Attempts to Collude and Signalling, Concurrences, February 2023, https://www.concurrences.com/en/review/issues/no-1-2023/international/greece-introducing-comfort-letters-and-tackling-attempts-to-collude-and.https://www.concurrences.com/en/review/issues/no-1-2023/international/greece-introducing-comfort-letters-and-tackling-attempts-to-collude-and. See also, in the context of sustainability initiatives, the UK Competition and Markets Authority (2023), Draft Guidance on the application of the Chapter I prohibition in the Competition Act 1998 to environmental sustainability agreements, CMA 177, 28 February 2023, https://www.gov.uk/government/consultations/draft-guidance-

on-environmental-sustainability-agreements, para. 7.3 ss. and the Dutch ACM (2021), Second Draft of the Guidelines on Sustainability Agreements, https://www.acm.nl/sites/default/files/documents/second-draft-version-guidelines-on-sustainability-agreements-oppurtunities-within-competition-law.pdf, para. 71. This regime had also been used by the European Commission in the context of Covid-19 agreements, Comfort letter of 08 April 2020, COMP/OG – D(2020/044003), https://ec.europa.eu/competition/antitrust/medicines_for_europe_comfort_letter.pdf.https://www.gov.uk/government/consultations/draft-guidance-on-environmental-sustainability-agreements, para. 7.3 ss. and the Dutch ACM (2021), Second Draft of the Guidelines on Sustainability Agreements, https://www.acm.nl/sites/default/files/documents/second-draft-version-guidelines-on-sustainability-agreements-oppurtunities-within-competition-law.pdf, para. 71. This regime had also been used by the European Commission in the context of Covid-19 agreements, Comfort letter of 08 April 2020, COMP/OG – D(2020/044003), https://ec.europa.eu/competition/antitrust/medicines_for_europe_comfort_letter.pdf.

[61] See, for instance, European Commission, Press Release 8 July 2021 'Antitrust: Commission fines car manufacturers EUR 875 million for restricting competition in emission cleaning for new diesel passenger cars'. See also, (OECD, 2020[36]).

[62] FT, US banks threaten to leave Mark Carney's green alliance over legal risks, https://www.ft.com/content/0affebaa-c62a-49d1-9b44-b9d27f0b5600.

[63] German Bundeskartellamt, Preliminary findings of sector inquiry into charging infrastructure, 12 October 2021, https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2021/12_10_2021_charging_stations_%20Preliminary%20findings.html; Charley Connor, Germany studies e-mobility charging sector, 9 July 2020, https://globalcompetitionreview.com/article/germany-studies-e-mobility-charging-sector.

[64] Olivia Rafferty, GCR, Sweden launches electric charging market study, 2 February 2023, https://globalcompetitionreview.com/article/sweden-launches-electric-charging-market-study.

[65] AGCM, 2023, A557 - Italian Competition Authority: investigation initiated against Enel for possible abuse of dominant position in the e-mobility sector', https://en.agcm.it/en/media/press-releases/2023/4/A557.

[66] See Spanish CNMC, Press Release, 22 February 2023, https://www.cnmc.es/prensa/estudio-recarga-vehiculo-electrico-20230222.

[67] UK CMA, Electric Vehicle Charging Market Study - Final Report, 23 July 2021, https://www.gov.uk/government/publications/electric-vehicle-charging-market-study-final-report/final-report.

[68] European Commission, Charles River Associates, Competition Analysis of the Electric Vehicle Recharging Market across the EU27 + the UK, https://competition-policy.ec.europa.eu/system/files/2023-04/kd0323122enn_electric_vehicles_study.pdf; Margrethe Vestager, Speech, EVP Vestager keynote speech at the Global Competition Law Conference: Competition policy for greater resilience and effective transition, 20 April 2023, Brussels, https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2381https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2381.

[69] PaRR, JFTC surveys PET bottle recycling sector, 8 February 2023, https://app.parr-global.com/intelligence/view/intelcms-qx27qz.

[70] See Spanish CNMC, Press Release, 22 February 2023, https://www.cnmc.es/prensa/estudio-residuo-envases-consulta-publica-cnmc-20220222.

[71] German Bundeskartellamt, Sektoruntersuchung - Erfassung von Haushaltsabfällen, December 2021, https://www.bundeskartellamt.de/SharedDocs/Publikation/DE/Sektoruntersuchungen/Sektoruntersuchung_Haushaltsabfaelle.pdf?__blob=publicationFile&v=3; German Bundeskartellamt, Press Release, Decreasing competition in the collection and transport of domestic waste, 21 December, 2021, https://www.bundeskartellamt.de/SharedDocs/Meldung/EN/Pressemitteilungen/2021/21_12_2021_SU_Haushaltsabfaelle.html?nn=3591568.

[71] See DG Competition, Issues of Competition in Waste Management Systems, https://ec.europa.eu/competition/sectors/energy/waste_management.pdf.

References

Aghion, P., C. Antonin and S. Bunel (2021), *The Power of Creative Destruction: Economic Upheaval and the Wealth of Nations*, Harvard University Press. [12]

Ahlers, J. et al. (2021), *Analysis of Extended Producer Responsibility Schemes*, https://adelphi.de/system/files/mediathek/bilder/adelphi_study_Analysis_of_EPR_Schemes_July_2021.pdf (accessed on 13 April 2023). [31]

Blackburn, O., P. Ritala and J. Keränen (2022), "Digital Platforms for the Circular Economy: Exploring Meta-Organizational Orchestration Mechanisms", *Organization and Environment*, https://doi.org/10.1177/10860266221130717/ASSET/IMAGES/LARGE/10.1177_10860266221130717-FIG2.JPEG. [70]

Blind, K., S. Petersen and C. Riillo (2017), "The impact of standards and regulation on innovation in uncertain markets", *Research Policy*, Vol. 46/1, https://doi.org/10.1016/j.respol.2016.11.003. [41]

Bocconi University, Ellen MacArthur Foundation and Intesa Sanpaolo (2021), *The circular economy: a de-risking strategy and driver of superior risk-adjusted returns*, https://emf.thirdlight.com/link/29wifcw68gx1-yw31dj/@/preview/1?o (accessed on 11 May 2023). [7]

Carlton, D. and J. Perloff (1994), *Modern Industrial Organisation*, Harper Collins. [69]

Cecere, G. and N. Corrocher (2016), "Stringency of regulation and innovation in waste management: an empirical analysis on EU countries", *Industry and Innovation*, Vol. 23/7, pp. 625-646, https://doi.org/10.1080/13662716.2016.1195253. [35]

CMA (2020), *Regulation and Competition - A Review of the Evidence*. [52]

Competition & Markets Authority (2021), *Environmental Sustainability Agreements and Competition Law*, https://www.gov.uk/government/publications/environmental-sustainability-agreements-and-competition-law/sustainability-agreements-and-competition-law (accessed on 24 March 2021). [56]

Crawford, G., T. Valletti and C. Caffarra (2020), "'How tech rolls': Potential competition and 'reverse' killer acquisitions", *Vox EU CEPR*, https://cepr.org/voxeu/blogs-and-reviews/how-tech-rolls-potential-competition-and-reverse-killer-acquisitions (accessed on 14 May 2023). [48]

Desrochers, P. and S. Leppälä (2010), "Industrial Symbiosis: Old Wine in Recycled Bottles? Some Perspective from the History of Economic and Geographical Thought", *http://dx.doi.org/10.1177/0160017610375441*, Vol. 33/3, pp. 338-361, https://doi.org/10.1177/0160017610375441. [27]

Dolmans, M. (2020), "Sustainable Competition Policy", *Competition Law & Policy Debate*, Vol. 5-6/4-1, pp. 4-23. [43]

Dunne, N. (2015), *Competition Law and Economic Regulation -Making and Managing Markets*, Cambridge University Press, https://www.cambridge.org/core/books/competition-law-and-economic-regulation/E04AE766B9E8C0E6CD81CDF0FDFFACC4 (accessed on 12 May 2023). [33]

Ekins, P. et al. (2019), *The Circular Economy: What, Why, How and Where*, OECD, https://www.oecd.org/cfe/regionaldevelopment/Ekins-2019-Circular-Economy-What-Why-How-Where.pdf (accessed on 24 April 2023). [21]

Farmer, T., P. Shaw and I. Williams (2015), "Destined for indecision? A critical analysis of waste management practices in England from 1996 to 2013", *Waste Management*, Vol. 39, pp. 266-276, https://doi.org/10.1016/J.WASMAN.2015.02.023. [19]

Forti, V. et al. (2020), *The Global E-waste Monitor - Quantities, Flows and the Circular Economy Potential*. [22]

Fumagalli, C., M. Motta and C. Calcagno (2018), *Exclusionary Practices*, Cambridge University Press, https://doi.org/10.1017/9781139084130. [47]

Gates, B. (2021), *How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need*, Penguin Random House. [53]

Geissdoerfer, M. et al. (2017), "The Circular Economy – A new sustainability paradigm?", *Journal of Cleaner Production*, Vol. 143, pp. 757-768, https://doi.org/10.1016/j.jclepro.2016.12.048. [15]

Hickel, J. (2021), *Less is more: how degrowth will save the world*. [60]

IEA (2021), *The Role of Critical Minerals in Clean Energy Transitions*, https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions (accessed on 11 May 2023). [3]

Inderst, R. and S. Thomas (2021), "Reflective Willingness to Pay - Preferences for Sustainable Consumption in a Consumer Welfare Analysis", https://www.wiwi.uni-frankfurt.de/fileadmin/user_upload/dateien_abteilungen/abt_fin/Dokumente/PDFs/Allgemeine_Dokumente/Inderst_Downloads/Neuere_Arbeiten_seit2015/Inderst_and_Thomas_Reflective_WTP_5_July_2021.pdf (accessed on 30 September 2021). [45]

Irish Competition Authority (2006), *Submission to the Department of the Environment, Heritage and Local Government - (Response to Consultation Paper "Regulation of the Waste Management Sector"*, https://www.ccpc.ie/business/wp-content/uploads/sites/3/2017/04/S_06_007-Waste-Regulation.pdf (accessed on 17 April 2023). [51]

Jacobson, M. (2022), *No Miracles Needed*, Cambridge University Press, https://doi.org/10.1017/9781009249553. [57]

Kingston, S. (2011), *Greening EU Competition Law and Policy*, Cambridge University Press, https://doi.org/10.1017/cbo9780511758522. [68]

Kirchherr, J., D. Reike and M. Hekkert (2017), "Conceptualizing the circular economy: An analysis of 114 definitions", *Resources, Conservation and Recycling*, Vol. 127, pp. 221-232, https://doi.org/10.1016/J.RESCONREC.2017.09.005. [14]

Latouche, S. (1989), *La décroissance*. [63]

Laubinger, F. et al. (2022), "Deposit-refund systems and the interplay with additional mandatory extended producer responsibility policies", *OECD Environment Working Papers*, No. 208, OECD Publishing, Paris, https://doi.org/10.1787/a80f4b26-en. [26]

Livingstone, L. et al. (2022), "Synergies and trade-offs in the transition to a resource-efficient and circular economy", *OECD Environment Policy Papers*, No. 34, OECD Publishing, Paris, https://doi.org/10.1787/e8bb5c6e-en. [4]

Macmillan, R. (2019), *Competition for-the-market: Enforcement issues with concession contracts*, https://one.oecd.org/document/DAF/COMP/GF(2019)12/en/pdf (accessed on 26 April 2023). [30]

McCarthy, A., R. Dellink and R. Bibas (2018), "The Macroeconomics of the Circular Economy Transition: A Critical Review of Modelling Approaches", *OECD Environment Working Papers*, No. 130, OECD Publishing, Paris, https://doi.org/10.1787/af983f9a-en. [9]

Motta, M. (2004), *Competition Policy*, Cambridge University Press, https://doi.org/10.1017/cbo9780511804038. [34]

Mulvaney, D. et al. (2021), "Progress towards a circular economy in materials to decarbonize electricity and mobility", *Renewable and Sustainable Energy Reviews*, Vol. 137, p. 110604, https://doi.org/10.1016/J.RSER.2020.110604. [58]

Nordhaus, W. (2021), *The spirit of green : the economics of collisions and contagions in a crowded world*, Princeton. [67]

OECD (2023), *Competition and Innovation - A Theoretical Perspective*, https://www.oecd.org/daf/competition/competition-and-innovation-a-theoretical-perspective-2023.pdf (accessed on 23 May 2023). [40]

OECD (2023), *Competition in the Circular Economy - Note by Egypt*, https://one.oecd.org/document/DAF/COMP/WD(2023)43/en/pdf (accessed on 23 May 2023). [46]

OECD (2023), *Pro-Competitive Policies for a Sustainable Economy*, https://www.oecd.org/daf/competition/high-level-symposium-on-procompetitive-policies-for-a-sustainable-economic-recovery.htm (accessed on 23 April 2023). [42]

OECD (2023), *The Relationship between Competition and Innovation*, https://www.oecd.org/daf/competition/the-relationship-between-competition-and-innovation.htm (accessed on 12 May 2023). [66]

OECD (2022), *Purchasing Power and Buyers' Cartels*, https://www.oecd.org/daf/competition/purchasing-power-and-buyers-cartels.htm. (accessed on 26 April 2023). [55]

OECD (2021), *Environmental Considerations in Competition Enforcement*. [39]

OECD (2021), *Environmental Considerations in Competition Enforcement - Note by Greece*, https://one.oecd.org/document/DAF/COMP/WD(2021)48/en/pdf (accessed on 10 May 2023). [49]

OECD (2021), *OECD Compendium of Productivity Indicators 2021*, OECD Publishing, Paris, https://doi.org/10.1787/f25cdb25-en. [64]

OECD (2021), *Policy scenarios for a transition to a more resource efficient and circular economy*, https://www.oecd-ilibrary.org/environment/policy-scenarios-for-a-transition-to-a-more-resource-efficient-and-circular-economy_c1f3c8d0-en (accessed on 11 May 2023). [8]

OECD (2021), "Towards a more resource-efficient and circular economy - The role of the G20", https://www.oecd.org/environment/waste/OECD-G20-Towards-a-more-Resource-Efficient-and-Circular-Economy.pdf (accessed on 23 May 2023). [2]

OECD (2020), *Co-operation between competitors in the time of COVID-19*, https://www.oecd.org/competition/Co-operation-between-competitors-in-the-time-of-COVID-19.pdf (accessed on 14 November 2020). [36]

OECD (2020), *Sustainability and Competition - OECD Competition Committee Discussion Paper*, http://www.oecd.org/daf/competition/sustainability-and-competition-2020.pdf (accessed on 23 March 2021). [17]

OECD (2020), *Using market studies to tackle emerging competition issues*, https://www.oecd.org/daf/competition/using-market-studies-to-tackle-emerging-competition-issues.htm (accessed on 24 May 2023). [50]

OECD (2019), *Business Models for the Circular Economy: Opportunities and Challenges for Policy*, OECD Publishing, Paris, https://doi.org/10.1787/g2g9dd62-en. [28]

OECD (2019), *Competition for-the-market*, https://one.oecd.org/document/DAF/COMP/GF(2019)7/en/pdf (accessed on 25 April 2023). [29]

OECD (2019), *Global Material Resources Outlook to 2060: Economic Drivers and Environmental Consequences*, OECD Publishing, Paris, https://doi.org/10.1787/9789264307452-en. [1]

OECD (2016), *Extended Producer Responsibility: Updated Guidance for Efficient Waste Management*, OECD Publishing, Paris, https://doi.org/10.1787/9789264256385-en. [32]

OECD (2015), *Material Resources, Productivity and the Environment*, OECD Green Growth Studies, OECD Publishing, Paris, https://doi.org/10.1787/9789264190504-en. [20]

OECD (2014), *Intellectual Property and Standard Setting - Note by the United States*, https://one.oecd.org/document/DAF/COMP/WD(2014)116/en/pdf (accessed on 9 May 2023). [62]

OECD (2013), *Waste Management Services*, https://www.oecd.org/daf/competition/Waste-management-services-2013.pdf (accessed on 23 April 2023). [24]

PACE (Platform for Accelerating the Circular Economy) (2019), *A New Circular Vision for Electronics - Time for a Global Reboot*. [23]

Palgrave Macmillan (ed.) (2015), *Waste to wealth: The circular economy advantage*, Palgrave Macmillan, https://doi.org/10.1057/9781137530707. [6]

Pisani-Ferry, J. and S. Mahfouz (2023), *Les incidences économiques de l'action pour le climat*, https://www.strategie.gouv.fr/sites/strategie.gouv.fr/files/atoms/files/2023-incidences-economiques-transition-climat-rapport-de-synthese_0.pdf (accessed on 23 May 2023). [71]

Raworth, K. (2017), *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. [59]

Schinkel, M. and L. Treuren (2021), "Corporate Social Responsibility by Joint Agreement", *Amsterdam Law School Research Paper No. 2021-01*, https://doi.org/10.2139/ssrn.3878784. [38]

Schmelzer, M., A. Vetter and A. Vansintjan (2022), *The future is degrowth: a guide to a world beyond capitalism*. [61]

Serafimova, M. and J. Hörnig (2023), "Circular supply chains - Where the need for coordination meets competition law", *European Journal of Consumer Law* 1, pp. 69-85. [25]

Siderius, T. and T. Zink (2022), "Markets and the Future of the Circular Economy", *Circular Economy and Sustainability*, https://doi.org/10.1007/s43615-022-00196-4. [54]

Terzi, A. (2022), *Growth for Good*, Harvard University Press, https://www.hup.harvard.edu/catalog.php?isbn=9780674258426 (accessed on 12 May 2023). [65]

Tirole, J. (2022), *Socially Responsible Agencies*, https://www.tse-fr.eu/sites/default/files/TSE/documents/doc/by/tirole/socially_responsible_agencies_071222.pdf (accessed on 23 April 2023). [37]

UN Environment (2019), *Global Resources Outlook*, https://www.unep.org/news-and-stories/story/were-gobbling-earths-resources-unsustainable-rate (accessed on 11 May 2023). [11]

Velenturf, A. and P. Purnell (2021), "Principles for a sustainable circular economy", *Sustainable Production and Consumption*, Vol. 27, pp. 1437-1457, https://doi.org/10.1016/J.SPC.2021.02.018. [18]

Volpin, C. (2020), "Sustainability as a Quality Dimension of Competition: Protecting Our Future (Selves)", *Competition Policy International*, https://www.competitionpolicyinternational.com/sustainability-as-a-quality-dimension-of-competition-protecting-our-future-selves/#_edn42 (accessed on 29 March 2021). [44]

Wang, K. (2022), "Circular Economy as a Climate Strategy: Current Knowledge and Calls to Action", *World Resources Institute Working Paper*, https://pacecircular.org/sites/default/files/2022-11/Circular-Economy-as-a-Climate-Strategy-paper-11.22-PACE-WRI-CH-NREL.pdf (accessed on 24 April 2023). [10]

World Commission on Environment and Development (1987), *Our Common Future: Report of the World Commission on Environment and Development*, https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf (accessed on 19 May 2023). [16]

Yamaguchi, S. (2022), "Securing reverse supply chains for a resource efficient and circular economy", *OECD Trade and Environment Working Papers*, No. 2022/02, OECD Publishing, Paris, https://doi.org/10.1787/6ab6bb39-en. [5]

Zachmann, G. (2022), *The Role of Competition in the Transition to Climate Neutrality*, Bruegel, https://www.bruegel.org/sites/default/files/2022-06/WP-11-2022-240622.pdf (accessed on 23 May 2023). [13]

www.oecd.org/competition