

July 2019

BUSINESSEUROPE PRIORITIES ON CIRCULAR ECONOMY FOR THE NEXT EU POLITICAL CYCLE

KEY MESSAGES



- 1** **Businesses across Europe are fully engaged** to maximise the value of materials, transition to circular business models and achieve a circular economy, which can be best achieved through a functioning market for secondary raw materials (SRMs) and circular products. Several challenges and untapped opportunities still remain to create such a market.
- 2** The next EU political cycle should put more emphasis on removing inconsistencies and filling the gaps in the current policy framework, starting with a **better implementation of the existing waste acquis**, including more guidance to Member States and performing ex-post impact assessments on the benefits of full compliance.
- 3** An **enhanced investment strategy for SRMs** can also help the market, supported by more public and private spending on innovation, education and reskilling, an effective circular public procurement strategy, and a smart eco-modulation of fees.
- 4** **Integrate circular economy thinking into other legislation** to maximise its benefits, in particular in the fields of product and material design, climate change, digitalisation, bioeconomy, security of supply and waste shipments.
- 5** A real market for SRMs requires a **global level-playing field with similar regulatory frameworks and standards** across the G20.
- 6** EU leaders should collaborate with stakeholders to **improve consumer engagement** by reducing barriers and increasing incentives, improving awareness and knowledge on consumption behaviour and the lifecycle of materials based on a common EU methodology, and boosting the opportunities for industrial symbiosis.

1. Introduction

Circular economy at the heart of EU policy

The circular economy has become one of the most prominent themes on the European agenda during this political cycle. Apart from the many policies that came out of the Circular Economy Action Plan in the past five years, European institutions also created a range of mechanisms to improve stakeholder engagement, including the Circular Economy Stakeholder Platform, the Circular Economy Finance Support Platform, as well as the annual Circular Economy Stakeholder Conference.

The **Circular Economy Stakeholder Platform** was created in March 2017 as a joint initiative between the European Commission and the European Economic and Social Committee (EESC). It is a space for the exchange of ideas between different stakeholder groups on how to make circular economy happen faster to benefit all Europeans. BusinessEurope is an active member of the Coordination Group, allowing us to provide inputs from the business world on how to scale up effective solutions and address specific challenges.

<https://circulareconomy.europa.eu>



European business is fully engaged to provide circular economy solutions

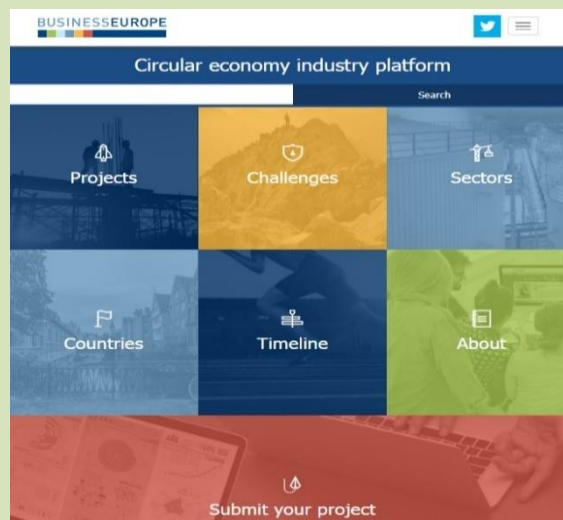
Circular economy is about maximising the value of products, materials and resources. Industry initiatives in Europe are widespread, such as several sector initiatives¹ as well as specific company examples as showcased on www.circularity.eu. Through these efforts, the European institutions, national initiatives² and businesses have enabled Europe to become the global leader for ideas related to circular economy. This includes forward-looking legislative frameworks and stakeholder engagement on how to turn traditional linear economies into more circular ones.

¹ Examples include the [Circular Plastics Alliance](#) and the [Alliance to End Plastic Waste](#)

² Such as the ["Feuille de route économie circulaire"](#) in France.

How European companies add to the circular economy (more details in Annex)

BusinessEurope in May 2017 created www.circular.eu to show innovative ways on how industry, SMEs and other businesses add to the circular economy in Europe. At the same time, it highlights the regulatory and non-regulatory challenges these businesses still face to scale their current initiatives or to start new ones. The platform is a unique bottom-up business-led hub of knowledge and expertise. Starting with about 40 examples initially, the platform now boasts 170 examples from 24 countries.



Examples of how EU businesses add to the circular economy include:

- **Design circular products and services**, such as recyclable, lime mortar-based bricks for construction by KALK A/S, DSM's recyclable Niaga carpets, Revicomfort's reusable porcelain flooring and circular furniture by Progetto Arcadia. Others have created refurbishment, repair and remanufacturing businesses, such as EcoMatelas' refurbished mattresses and retrofitted LED technology by Fischer Lightning.
- **Engage in industrial symbiosis** where one industry's waste is another industry's input, such as Metsä Group in Finland's forestry industry, Kemira in Sweden's chemical, food and transport industry, Yara in the Dutch horticulture-heat sector, and ACCIONA in Spain's construction value chain.
- **Boost recycled content** in products and processes, such as the use of recycled high-density polyethylene (HDPE) by Henkel and Total, Versalis' recycled content in industrial polyethylene packaging, KLM's cabin interior carpets from recycled uniforms, and Zeme's scrap aluminium conversion into sustainable high-value eco alloy ingots. Others use CO₂ to create new products, such as STEELANOL and ThyssenKrupp's Carbon2Chem for chemicals, and Twence to produce NaHCO₃.
- **Engage in chemical recycling** to create new virgin raw materials, such as BASF's ChemCycling project, Lenzing AG for high-quality fibres and the PolyStyreneLoop for polystyrene (PS) foam.
- **Improve waste management systems**, such as Suez for French shopping malls, AFRA for retired aircrafts, and Veolia's Energido technology for recovering heat from wastewater.
- **Resource-efficient sourcing** of raw materials from companies in Europe, such as Dundee Precious Metals.

2. Market realities in the circular economy



To keep the momentum of the circular economy going during the next political cycle, the European Union should further develop a **real market for secondary raw materials and circular products**. Such a market if designed properly can help to bring more circular processes, products and services into the mainstream, both in domestic and export markets. It may also help to reduce Europe's dependence on critical raw materials and make Europe the frontrunner for initiating ideas, solutions and global standards related to circular designs, reuse, recycling, repair, remanufacturing and refurbishment.

A functioning market for secondary raw materials (SRMs) and circular products requires us to identify key challenges and untapped opportunities

In order to maximise the value of our resources, the circular economy priority from a business perspective is to develop this market for quality SRMs and circular products. This will require both supply- and demand-side measures, including a much stronger engagement by consumers. Many companies on www.circularity.eu show a large willingness to move forward and become even more circular, but identify barriers and untapped opportunities to create such a market. These relate in particular to:

- **Access to finance.** Many companies identify issues to attract investments to develop circular business models. This is partly because there is still a lack of transparency and knowledge about the opportunities for such business models by investors. For example, some circular business models accrue income over time by leasing products as a service or at the end of the first life rather than actually selling the product. Leasing is also different from a contractual point of view compared to a purchase, and it can be difficult to benchmark total cost of ownership versus total cost of usage.
- **Awareness.** Greater consumer awareness may influence consumer behaviour, which will be important as they in turn can create markets for SRMs through their buying power. A lot of companies are improving awareness and cooperation of all actors in their value chain to boost circularity, but more needs to be done. Awareness of the importance of proper end-of-life management should not just be a concern for the disassembly and recycling stage, but should be embedded throughout the value chain. It is also challenging sometimes to explain to customers the benefits of using circular products and services. Other companies stress that consumers are not aware of their environmental footprint and are not always ready to pay the “true” price for sustainable products. The same holds true for the appropriate disposal of waste from products and packaging, where consumer participation is key to increasing the collection of recyclables and reducing contamination.
- **Consumer demand.** At the end of the day, circular economy needs to make business sense. Consumers look for affordability, availability, safety and performance when buying a product. Some companies find a strong bias towards ownership of a product, which makes circular business models focussed on leasing more challenging. Convenience can also be a strong factor. For example:
 - Durability, access to remanufactured options and reparability are more important for large and/or valuable items.

- The need to find a repair shop and go there can already be an important barrier.
 - The difference between values stated to the surveyor and actual engagement towards circular economy activities is significant.
 - New products are generally preferred over circular options if they are cheaper.³
- **Government enforcement & cooperation.** Good waste management implementation by Member States maximises the opportunities for companies to use Europe's waste streams and minimises landfilling, which rather removes SRMs from the market. It is therefore worrying that the Commission recently found 14 Member States to be at risk of missing their 2020 targets for municipal waste, and another 10 their landfilling targets.⁴ Companies also pointed to the lack of predictable and reliable policy frameworks in their countries for long-term investment decisions. Others state that there is not a uniform interpretation of EU legislation across different regions and countries concerning material reuse and end-of-waste, leading to difficulties and barriers from a managerial and operational point of view. Some also stress the need to preserve the unity and effectiveness of the single market, thereby avoiding isolated local or regional measures that could lead to market fragmentation. Finally, several companies face challenges related to the shipment of SRMs.
 - **Input and output quality and quantity.** The reuse of SRMs will only increase if they can be traced and prepared in such a way that they meet specific norms and standards. However, it is often still challenging for companies to rely on a regular availability of high-quality SRMs for their production in sufficient quantities and at a competitive price. The ongoing work done as part of the Interface between chemicals, products and waste legislation is important in this regard.

3. The way forward for circular economy

While we remain concerned about certain provisions in recent legislation, it must be noted that the EU institutions have done a lot in the past years to create more investment certainty to help address the aforementioned challenges. Much legislation has been passed to help address technical and regulatory challenges over the period to 2030. Nevertheless, we believe more can be done to increase consistency and fill in the gaps between the current pieces of legislation. In order to maximise the opportunities of circular economy to the European economy, we believe the next EU political cycle should focus on the following key priorities:

Prioritise proper implementation of existing legislation

Non-compliance with the EU's Waste legislation is costing the EU up to EUR 4.8 billion annually.⁵ Business cannot stress enough the importance of swift and proper implementation by Member States. The European Commission should continue leveraging its existing tools to **provide guidance** to Member States on how to do so. In addition and in line with the Better Regulation agenda, the Commission should continue

³ [Trinomics](#) et al., 2018. Behavioral study on consumers' engagement in the circular economy.

⁴ [European Commission](#), 2018. Report on the implementation of EU waste legislation.

⁵ [COWI and Eunomia](#), 2019 (Commissioned by DG Environment, European Commission). The costs of not implementing EU environmental law.

to publish **ex-ante impact assessments** together with its proposals, as well as more **ex-post impact assessments** on the potential costs and benefits for the EU if Member States fully implement existing legislation, such as the reformed Waste Framework Directive, Single Use Plastics Directive and other legislations that make up the EU's new *waste acquis*.

Enhance the investment strategy for secondary raw materials

The development of a market for secondary raw materials is still hindered by a number of factors, such as the availability of materials of sufficient quality, the lack of waste management infrastructure and, the cost of materials. It is therefore important to level the playing field between raw materials (primary, secondary, domestic and imported), which is why more consideration should be given to a cost-effective financial framework to encourage investments. In particular:

- **Dedicate more public and private financing** such as structural funds and innovative tools for green financing to research, development and – importantly – deployment phases of new circular processes, products and services. This includes scaling up Member State financing for the deployment of next generation collection, smart sorting, robotic disassembly technologies, material production, recycling technologies and infrastructure.
- **Invest in education and reskilling the labour force** to allow companies to better access high-skilled labour that delivers high value and circular production practices. This also means that new entrants are encouraged into the labour market through apprenticeships and graduate schemes.
- With an estimated 14% of the EU's GDP being spent on **public procurement**, finding ways to make such procurement more focused on circularity can provide a significant boost to the uptake of secondary raw materials and circular products. While green public procurement (GPP) is one of the priorities from the 2017 Public Procurement Package by the Commission, there are strong indications that **Member State implementation is lacking**: The purchase price during a public procurement process is still more influential than the life-cycle costs of a product or service.⁶ This requires an informed discussion with businesses and other stakeholders on how to bring more circular thinking into public procurement practices. For example:
 - The **use of functional criteria**⁷ allows procurement objectives to be achieved in the best possible way, favours competition for circular ideas, innovation in public procurement, and makes the whole process less prescriptive.
 - **Circular public procurement should be requested from the highest levels of government**, which gives public procurement officers a clearer mandate to apply circular public procurement rules.
 - **Allow companies to propose variations to the calls for tenders** in order to offer different solutions to the same problem.

⁶ EPC, 2018.

⁷ For example, instead of prescribing a road or pavement to be made of a certain material, the functional criteria should be that people can safely walk or drive over it.

- Another option is to consider **smarter ways to eco-modulate fees** in extended producer responsibility (EPR) schemes (see below). Such a financial framework could support innovation for circular solutions to compete on equal footing with traditional, linear techniques.

Smart eco-modulation of fees

Virtually all Member States have extended producer responsibility (EPR) schemes in place for packaging waste, each scheme including some kind of fee modulation. However, these fees are often charged on all packaging material, providing few incentives to producers for offering more circular designs. The revised EU Waste Framework Directive introduces the possibility for eco-modulation to certain criteria like recyclability. Such fees are already further developed in France (CITEO) and Italy (CONAI), applying lower fees to reusable and recyclable packaging, or packaging that does not disrupt the ability to recycle.

If eco-modulated fees are to be applied in more EU Member States, it should be done so in a coherent manner. In particular:

- **Harmonise essential requirements and EPR fee modulation criteria.** The Waste Framework Directive (in Article 8a.4) states that the criteria are “aligned with the requirements set by relevant Union law, and where available, based on harmonised criteria in order to ensure a smooth functioning of the internal market”.⁸ Ensuring this is important, because businesses will face unnecessary costs if packaging design requirements or economic incentives diverge significantly across Member States, money that instead can be used to invest in circular innovations. Therefore, EU definitions and criteria on recycling, recyclability, reusability and closed loop⁹ should therefore be clarified, harmonised at EU level and aligned with existing EU legislation (and where possible with international standards).
- **Apply simple, evidence-based calculations for fees and accounting.** Readily quantifiable and/or verifiable characteristics should feed into fee modulation. To keep things simple, the eco-modulation can be in the form of a fee differentiation expressed as a share of the total cost. Furthermore, the eco-modulated fees should be based on harmonised principles and on actual recycling rates, which in turn is based on the quantity and quality of the waste as well as the management infrastructure.
- **Allow flexibility for future innovations.** Smart fee modulation boosts rather than hampers innovation and progress in packaging design and waste management infrastructure. Therefore, periodic reviews should also be made to ensure that technological progress is accounted for, and that the EPR schemes remain financially sustainable.

⁸ [DIRECTIVE](#) (EU) 2018/851.

⁹ The definition of “closed loop” should not limit the future reuse or recycling of secondary raw materials, for example by obliging a PET bottle to be reused or recycled again to become a PET bottle. Businesses should decide how to best reuse SRMs.

- **Consider packaging together with the packaged product**, as changes to the packaging design can have environmental consequences in other stages of the packaged product's lifecycle. This needs to be coordinated well to prevent confusion, since there are separate EPR schemes for packaging and other waste streams (e.g. for products under the Waste Electrical and Electronic Equipment Directive).
- **Ensure proper enforcement of EPR provisions**. In addition to having harmonised rules, enforcement is improved with clearly defined roles for Producer Responsibility Organisations (PROs), authorities and other stakeholder in the value chain.

In sum, **smart eco-modulation of fees should minimise complexity** of compliance as well as administrative and operational burdens for companies.

Integrate circular economy thinking into other regulation

In order to maximise benefits of circular economy, it is important to link circular economy-related legislation with other Directives that are relevant for circular economy. For example:

- The **Ecodesign Directive** provides EU-wide rules to improve the environmental performance of energy-related products from a lifecycle perspective based on scientific evidence. By doing so, it contributes to realising almost half of the EU's 2020 targets on energy efficiency.¹⁰ Therefore, there needs to be an informed debate about how the Ecodesign Directive or a similar instrument for products outside its scope can improve the circularity of products. Regarding its current scope, we appreciate the efforts related to standardisation of Ecodesign related to material efficiency (M/5343). These efforts need to be accompanied by:
 - **Scientific evidence, quality standards and market surveillance** to ensure that products, and the SRMs that go in them, will actually fulfil any relevant EU requirements. These rules should apply equally for domestically sourced SRMs and those imported.
 - **Efforts to prevent regulatory overlaps**. Products that are already covered by the Ecodesign Directive should remain the legal basis to keep investment certainty and trust in the ongoing implementation high.
 - **Efforts to increase higher quality SRMs and make material streams cleaner**, for example by ensuring a better coherence between manufacturing and waste management processes. The Commission should continue to facilitate better cooperation across the value chain on Ecodesign and similar discussions, such as through the existing Circular Plastics Alliance and Ecodesign Consultation Forum. We should also step away from the sole focus on quantities and tonnage and give more weighting to the quality of SRMs.

¹⁰ [European Commission](#), 2016. Ecodesign Working Plan 2016-2019.

- **Climate change: The European business community stands behind the EU ambition of net-zero greenhouse gas emissions (climate neutrality) to reach the objectives of the Paris Agreement.**¹¹ Circular economy can play a big role to reduce GHG emissions, whether it's through recycling and reusing materials, remanufacturing or refurbishing existing products, using fewer raw materials or applying innovative techniques like carbon capture and utilization (CCU) techniques in production, or by switching to new business models to increase product life expectancy. At the same time:
 - Circular economy can increase GHG emissions as it entails a large logistical exercise of bringing together large numbers of small batches of different quality grades of SRMs in order to create the necessary volumes to recycle and reuse such materials cost-effectively. Such movements can actually increase global emissions if not done with zero- and low-emission modes of transport.
 - Processes such as chemical recycling could be a solution under certain circumstances to be further examined and supplementary to the mechanical recycling. This could be especially interesting for plastics for which there are no recycling solutions today, such as mixed waste and plastic packaging that cannot be further recycled. However, their energy-intensive nature needs to be managed. Therefore, cost-efficient, low-carbon solutions will be needed to reduce emissions while moving to a circular economy in order to respect the objectives of the Paris Agreement.
 - Competition could arise between European recycling targets from the Waste Directive and the Renewable Energy Sources Directive. It is important that the European Commission and the Member States do not act in a market-distorting manner in the implementation of both goals, although material preservation is preferred.
 - The use of materials that can be recycled several times without losing their inherent properties and where it makes sense to reach other environmental targets should be ensured and promoted, especially in this transition period towards circularity.

Emerging circular practice: Chemical recycling

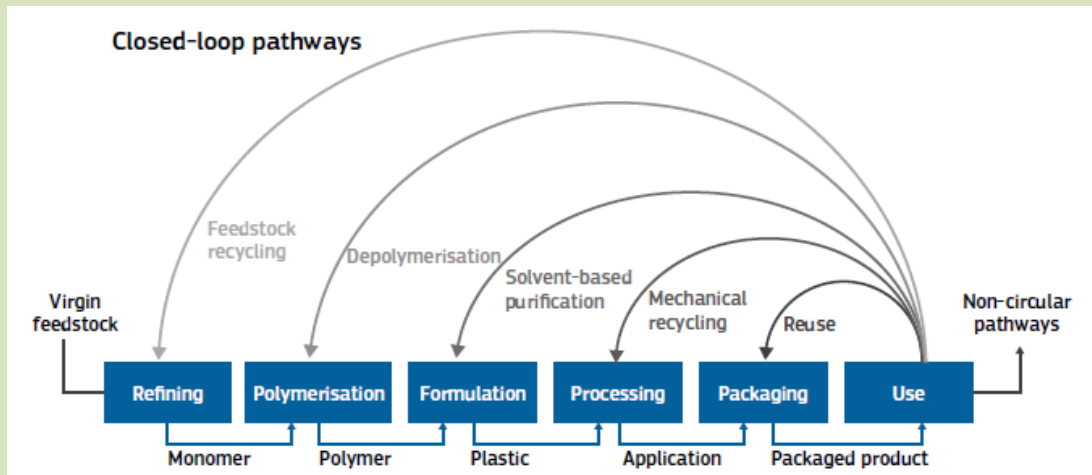
All sectors are actively seeking solutions to circular economy and fully acknowledge the EU's waste hierarchy, which puts prevention and reuse of waste as the top priority. Some sectors are facing challenges however, such as the plastics sector, in particular to recycle plastics for which there are no recycling solutions today (e.g. mixed plastics waste streams and composite packaging).

One solution for these final fractions could be **chemical recycling**. This is applied in different ways, such as:

- Feedstock recycling by converting polymers into simpler molecules (such as hydrocarbons or syngas). This is done not by burning but heating the plastic waste, either in the absence (**pyrolysis**) or presence (**gasification**) of oxygen, allowing it to break down into oil, gas and black carbon components.

¹¹ For more details, see [BusinessEurope](#), 2019. European business views on a competitive energy and climate strategy.

- **Solvent-based purification** and **depolymerisation**, where polymers are separated from additives, colourants and contaminants. This can turn plastics back into purified polymers (purification) or monomers (depolymerisation).



Source: For more details on the opportunities and challenges of chemical recycling, consult “A circular economy for plastics” ([European Commission](#), 2019) and “How plastics waste recycling could transform the chemical industry” ([McKinsey](#), 2018).

Though chemical recycling is said to be energy intensive, some studies find a substantial CO₂ reduction potential to be feasible compared to incineration across the value chain, depending on the technique used.¹² The development of chemical recycling techniques in Europe could therefore be further investigated (e.g. common EU approach and definition for recycling, impact assessments into the CO₂ reduction potential along the value chain, etc.).

- **Digitalisation:** Cloud computing, big data and Internet of Things (IoT) solutions could help reduce emissions, unnecessary consumption, improve efficiency and support fair data sharing in circular industries.¹³ In other words, the circular economy will entail a large data collection exercise, so it is important to understand how digital solutions can help here. Specific examples include:
 - Sensors and connected devices to allow companies to monitor processes and the usage of products by the consumer to stimulate sustainable consumption patterns, create new circular business models (e.g. product as a service) and improve monitoring on required maintenance to extend a product’s lifetime.¹⁴
 - Smart solutions for packaging, robotic waste sorting and treatment, innovative material production technologies and blockchain-enabled infrastructure to support the large logistical exercise of bringing secondary raw materials to the recyclers in a controlled way.
 - Tracking and tracing of critical raw materials and hazardous substances to monitor them across the value chain. Data processing could be encrypted at

¹² For example, see [CEDelft](#), 2019. Exploratory study on chemical recycling (in Dutch).

¹³ Note that data collection can be an energy-intensive exercise, therefore digital solutions might not be sensible in all circumstances.

¹⁴ [EPC](#), 2018. How the circular economy can benefit from the digital revolution.

the source in order to respect consumer privacy during the use phase, after which it is decrypted when it reached the recycler.

- 3D printing to reduce costs and material demand.

EU institutions could therefore play an important role during the next political cycle to support digital innovation and help clarify existing regulatory frameworks on digitalisation related to the free flow of data, online platforms and digital skills for circular economy practices. If necessary, this can be accompanied by establishing protocols on how the General Protection Data Regulation (GDPR) can be effectively applied in practice. All these efforts can help boost trust and confidence in these new digital technologies by addressing concerns over data privacy, liability and intellectual property.

- **Bioeconomy.** Circular economy can contribute to promote the use of energy from renewable sources, for example in order to mainstream the use of renewable energy in the transport sector. This includes using biomass fractions, by-products and residues from municipal, industrial and agricultural waste, as well as feedstocks for the production of bio-based products such as bioplastics, and for biogas and advanced biofuels for transport when reuse for energy purposes has a positive environmental impact (compared to the non-use on an LCA basis). Another advantage of the bioeconomy is that it enables us to use biomaterial instead of fossil resources for producing products, for example biochemicals, textiles and plastics. This calls for funds for innovation and research platforms to be further developed.
- **Security of supply.** There are significant opportunities to develop recycling markets for critical raw materials that are needed for Europe's transition towards a fully functioning circular and low-carbon economy, but for which Europe is mostly dependent on imports such as cobalt, copper, graphite, lithium and advanced biofuels. At the same time, incentives could be created that reward the circularity embedded in products and reduce the need for such imports. To address the challenges and grasp the opportunities, there is a continued need to ensure that decision makers are well informed by sound science and a sound understanding of materials flows.
- The current **Waste Shipment Regulation (WSR)** is outdated and hinders the creation of a functioning market for SRMs by making the transport of waste across Member States difficult. This therefore causes significant inefficiencies in the field of international waste management, including for products destined for remanufacturing and refurbishment. It is also problematic for smaller Member States for which national recycling facilities are expensive. Reviewing the WSR will therefore be important to:
 - Ensure the correct management of hazardous waste and avoid illegal routes.
 - Improve the access to non-hazardous waste for recycling and recovery.
 - Minimise the administrative burden for trading high-quality secondary raw materials by clarifying inconsistencies, differences of interpretation between other pieces of legislation, as well as dissimilarities in enforcement within the EU Member States.

Put circular economy in the global context

Global cooperation, in particular at G20 level, is crucial in order to address the issues with our linear economy and bring the circular economy to life across global value chains. European policymakers need to lead in negotiation progressively as well in order to enable European businesses to offer expertise, logistics and other solutions to help other economies to deal with their waste issues. An important example here is for plastics, where about 90% of plastic waste ending up in the world's oceans comes from just ten rivers, eight of them in Asia.¹⁵

European businesses stand ready to export technologies, expertise, logistics and other solutions to help these regions in their circular economy challenges, including waste issues. As many value chains are global, a well-functioning market for secondary raw materials and circular products requires a global level-playing field. This can be achieved by creating the same regulatory conditions under which EU businesses have to compete with non-EU businesses both within the EU as well as outside. Starting with G20 countries, the next Commission can export – by means of diplomacy and trade discussions – the many potential benefits of the EU's circular economy-related regulatory frameworks, standards and products (such as remanufactured products considered in the EU-Vietnam Free Trade Agreement), taking into account local specificities. In the context of the ongoing Monitoring Framework, it could also try to agree with other major economies a set of key common indicators to measure progress in the circular economy, noting that the circular economy is more difficult to frame in a set of common indicators than are, for example, emission reductions.

To be a credible player in this global debate, Europe's Member States must be vigilant on implementing the EU's current circular economy-related legislation. In fact, only by showing the social, environmental and economic benefits that stem from proper implementation of ambitious policies will the EU inspire other regions of the world promote the transition to a fully functioning circular economy.

Engage consumers

In addition to the Circular Plastics Alliance and public procurement, it will be vital to nudge consumer behaviour both in business-to-business (B2B) and business-to-consumer (B2C) markets towards accepting new circular business models, where prevention, reuse, repair, remanufacturing, recycling, and products as a service (sharing, renting, leasing) are central.

Examples are mentioned below. All these should be further explored in a cooperative setting between policymakers and stakeholder groups, for example through dedicated **high-level groups on consumer engagement** on both EU and Member State level. The EU level group should be established rapidly after the instalment of the new European Commission and provide a concrete action plan within the first year of the group's existence.

- **Reduced barriers and increased incentives to consumer engagement.** Governments should engage in public-private partnerships with stakeholders to

¹⁵ [Smidt et al.](#) (2017). Export of Plastic Debris by Rivers into the Sea.

improve reparability options and availability of re-used or remanufactured goods for consumers, and to incentivise the reduced use of unnecessary packaging. Furthermore, these partnerships can help increase consumer awareness of product performance to guide consumer choices beyond the product's price, such as durability or ease of reparability.

- **Awareness raising campaigns** about the importance of separating waste and minimising littering across all levels of society, including primary, secondary and university education.¹⁶ Consumer perceptions could also be nudged to consider the advantages of durable and repairable products. Governments should focus on rewarding good behaviour by citizens in combination with providing appropriate waste disposal infrastructure and increasing financial penalties to discourage littering.
- **Improved knowledge on consumer behaviour.** There are still knowledge gaps on the exact drivers that can influence consumer attitudes towards durable product purchases, leasing, repairing and waste prevention. Behavioural economics studies could be funded to fill these gaps. Such studies could also better explore what type of product information works best to engage consumers with circular economy, and how Member States can cope with e.g. a lack of trust towards the quality of repaired products or a continued desire by consumers to buy new products.¹⁷
- **Transparency** about the lifecycle of materials. If not managed well, replacing certain materials could lead to higher energy consumption and greenhouse gas emissions, and globally have higher environmental costs in areas such as water and land use. Consumers should therefore be informed and educated about the lifecycle of products in order to have a clear view of their ecological footprint and performance.
- In a B2B setting, companies should be made more aware of the opportunities of **industrial symbiosis**, which can also help maximise the cascading use of by-products. Measures to help Member States to support research and innovation in this field should be supported.

In sum, European businesses are fully onboard with the shift towards a circular economy. In order to further develop circular business models, Europe should find ways to fill the gaps in the existing policy framework so as to create a real market for secondary raw materials and circular products.

Our platform www.circularity.eu shows that businesses in Europe are already engaging and will continue to do so with policymakers in the next five years.

¹⁶ This is for example done by the [Government of Slovenia](#), 2018. Campaign on the impact of excessive consumption of light plastic carrying bags on the environment.

¹⁷ [Trinomics](#) et al., 2018.

4. Annex – Innovative company examples on circular economy

ACCIONA Construcción (Spain) engages in industrial symbiosis with others in the construction and demolition value chain through the FISSAC project to foster a zero-waste approach under a life-cycle approach: <http://www.circularity.eu/project/accionas-fissac-project/>

BASF (Germany) launched its ChemCycling project to recycle mixed, multi-layer or other complex plastics: <http://www.circularity.eu/project/basf-chemical-recycling/>

DSM (Netherlands) helps to reduce the EU's 1.6 million tons of annual carpet waste by offering a fully recyclable carpet based on its Niaga technology, minimising water use and reducing energy use by 85%: <http://www.circularity.eu/project/dsm-niaga/>

Dundee Precious Metals (Bulgaria) uses a long hole stoping with fill (LHSF) approach to reduce mining waste in Bulgaria's Chelopech mine: <http://www.circularity.eu/project/dundee-precious-metals/>

EcoMatelas (France) has created the world's first process for refurbished and fully recycled mattresses and bed bases: <http://www.circularity.eu/project/ecomatelas/>

Fisher Lighting (Denmark) developed a LED-retrofit method allows customers to install the latest LED technology in their buildings without changing the entire fixture, reducing energy usage by 50-80% and extending the life expectancy of existing fixtures: <http://www.circularity.eu/project/fischer-lighting/>

Henkel (Germany) produces detergent bottles with 20% recycled high-density polyethylene (HDPE) meeting the same qualities as traditional bottles: <http://www.circularity.eu/project/henkel-perwoll/>

KALK A/S (Denmark) uses hydraulic lime mortar to make bricks that allow buildings to breathe, free from harmful substances, and be 100% recyclable: <http://www.circularity.eu/project/kalk/>

Kemira (Sweden) and 20 other companies in chemical, food and logistics engage in industrial symbiosis to increase energy efficiency and reduce waste streams and consumption of virgin raw materials: <http://www.circularity.eu/project/kemira-industrial-symbiosis/>

KLM (Netherlands) is reprocessing old staff uniforms into cabin interior carpets, after which the carpets themselves are recycled: <http://www.circularity.eu/project/klm-cabin-interior-carpet/>

Lenzing AG (Austria) has created the first commercially available cellulosic fiber featuring chemical recycled content: <http://www.circularity.eu/project/tencel-lenzing/>

Metsä Group (Finland) participates in industrial symbiosis with other companies in Äänekoski to produce (bio)gas, pulp, renewable energy and closed loop chemicals: <http://www.circularity.eu/project/metsa-group-industrial-symbiosis/>

PolyStyreneLoop (Netherlands) separates the flame-retardant HBCDD from polystyrene (PS) foam via chemical recycling, finding a unique solution for difficult to recycled plastics: <http://www.circularity.eu/project/polysterene-loop/>

Progetto Arcadia (Italy) defines the future of furniture with its RE-EASY design, allowing each product to be easily assembled and disassembled: <http://www.circularity.eu/project/re-easy/>

REVICOMFORT (Portugal) creates fully reusable and easily removable porcelain flooring that does not need glues or cement: <http://www.circularity.eu/project/revicomfort/>

Suez (France) collaborates with the La Part-Dieu shopping mall in Lyon, one of the largest in the world, to achieve a 100% collection and sorting rate of waste: <http://www.circularity.eu/project/suez-part-dieu/>

STEELANOL (Belgium) reuses steel mill gases to produce ethanol, methanol and other chemical compounds, saving fossil fuels annually equal to 100,000 cars: <http://www.circularity.eu/project/steelanol/>

Total (France) produces bottles and heavy-duty containers with 25 or 50% recycled HDPE for household and industrial liquids: <http://www.circularity.eu/project/total-pcr/>

Twence (Netherlands) reuses CO₂ that it captures from flue gases of its waste-to-energy plants to use in the production of sodium bicarbonate, which in turn it uses for cleaning purposes: <http://www.circularity.eu/project/twence/>

Thyssenkrupp (Germany) Carbon2Chem uses emissions from steel production as a raw material for chemicals, potentially saving Germany's steel industry 20 million tCO₂ emissions annually if fully implemented: <http://www.circularity.eu/project/carbon2chem/>

Veolia (France) recovers heat from wastewater with its Energido technique to provide heating to municipalities and others: <http://www.circularity.eu/project/energido/>

Versalis-Eni (Italy) increases the circularity of polyethylene industrial packaging by incorporating a certain amount of recycled content in it: <http://www.circularity.eu/project/versalis-industrial-packaging/>

Yara (Netherlands) has the "WarmCO₂" public-private partnership with Zeeland Seaports to provide residual heat and CO₂ from its Yara Sluiskil fertilizers plant to the horticulture sector and local industry: <http://www.circularity.eu/project/yara-warmco2/>

Zeme (Cyprus) transforms low value mixed aluminum scrap into high quality aluminum alloy ingots for industrial reuse: <http://www.circularity.eu/project/zeme-aluminium/>