



YOUNG EUROPEANS: HOW TO ACT ON THE CLIMATE CRISIS?

Unlocking the climate mitigation potential of the circular economy

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Cristina Dans Iglesias

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ABSTRACT

Since the release of the first circular economy package, in 2015, the transition towards a circular economy has gained momentum at the EU policy level. The European Commission has been working in its acceleration through legislative proposals and a wide range of policy tools. However, while the European Union is playing the role of facilitator, those who must lead this transition are actors at the national, regional and local level, including citizens, public authorities and the industry sectors concerned.

Circular economy principles, which are now starting to be applied at the local, regional and national level within the European Union, open new paths for addressing the fight against climate change and put the focus, not only in high-emissions industry sectors, but also in the functioning of the economy as a whole. This gives room for all actors, notably young europeans, for contributing to a carbon-neutral future.

From the analysis made in the paper, it can be concluded, firstly, that circular economy has the potential to notably contributing to the achievement of the objective of a climate-neutral European Union by 2050. Its mitigation potential could be unlocked in key industry sectors, ranging from construction to the food industry. Secondly, given that the main actor of these transitions are business, along with local, regional and national authorities and citizens, paving the way towards a circular economy requires the cooperation and dialogue between all stakeholders both at the industry level and also between governments and business. Thirdly, this generation of young Europeans will have to lead the way during the coming years. Thus, they must be at the heart of this transition. In this regard, policy-makers should put the emphasis on facilitating the creation of new business aligned with the circular economy as well as the consolidation of a skilled labour force.

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INTRODUCTION

For ensuring that the world stays in a 1.5 °C scenario, traditional approaches, including moving from a fossil-fueled economy to one powered by renewable energy sources and reforestation, will not be enough. For this reason, unlocking the mitigation potential of the circular economy should also be at the heart of climate policies. The European Commission, in its Communication “Closing the loop - An EU action plan for the circular economy” takes note of this potential.

This paper is aimed at giving insight into the ways in which the circular economy can add to the action that it is currently being taken on the climate emergency. In its first section, this paper takes stock of the policy measures put forward by the European Union with regards to the circular economy. This policy background, which includes regulatory and non-regulatory policy measures, is followed by a second section in which this paper explores the interlinks between the circular economy and climate change by addressing two key sectors: the food industry sector and the construction sector, as well as the potential of circular design. This second section also includes the in-depth analysis of three particularly problematic materials: aluminium, steel and plastics. The last section includes policy recommendations supported by selected best practice examples.

1. THE TRANSITION TOWARDS A CIRCULAR ECONOMY IN THE EUROPEAN UNION.

1.1 THE CIRCULAR ECONOMY CONCEPT

The concept of the circular economy was applied for the first time by Pearce and Turner for describing an economic model that takes into account the links between the economic and environmental flows¹. It has been later defined by the Ellen MacArthur Foundation as "an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models"².

The Ellen MacArthur Foundation laid, as well, the three main principles for the functioning of the circular economy in its publication "Towards the Circular Economy. Economic and business rationale for an accelerated transition", that serve also as a vision for the future. The first of these principles is to "design out waste". The basis of the circular economy concept is to eliminate the concept of waste by designing products that can be disassembled and reused, avoiding waste disposal and also unnecessary recycling processes, which are costly. The second is the introduction of a "strict differentiation between consumable and durable components of a product": "consumables" should be composed of non-toxic substances, so they can be returned to the environment, while "durables" should be composed by products that have a long useful

¹ Rizos, Vasileos et al "The Circular Economy A review of definitions, processes and impacts ", Centre for European Policy Studies, retrieved 20 January 2018, <https://www.ceps.eu/publications/circular-economy-review-definitions-processes-and-impacts>, p.2.

² Ellen Macarthur Foundation, "Towards the Circular Economy. Economic and business rationale for an accelerated transition", Ellen Macarthur Foundation, retrieved 20 January 2018, <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf>, p. 7.

life, as they include materials that prevent its return to the environment. The third principle refers to the energy used, which should be "renewable by nature".³

A definition of the concept of the circular economy is also provided by the European Commission in its Communication "Closing the loop: An EU Action Plan for the circular economy", where it is described as an economy "where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste minimized"⁴. In this Communication, the Commission acknowledges that, while local, regional and national authorities are "enabling the transition" the role of the EU consists in "supporting it" and highlights the role of stakeholders indicating that "economic actors, such as business and consumers, are key in driving this process"⁵.

The transition to a more circular economy is indeed highly complex, as it affects actors and industry sectors with diverse preferences and, often, conflicting interests. As a result, different approaches are needed in order to address the particularities of each sector⁶. For instance, in the field of waste management, the preferences of citizens, waste management and recycling companies, municipalities and the packaging industry converge. Thus, when looking for solutions, some actors put the focus on the improvement of the recycling process while others focus on the production stage.

In essence, the European Union should play the role of "facilitator" in the transition to a Circular Economy, building adequate conditions for it to happen. The actors that should lead this process are, therefore, stakeholders, Member States, and regional and local authorities.

³ Ibid.

⁴European Commission, Closing the loop - An EU action plan for the Circular Economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, 2.12.2015 COM(2015) 614 final.

⁵ Ibid.

⁶Taranic, Igor et al, "Understanding the Circular Economy in Europe, from Resource Efficiency to Sharing Platforms: The CEPS Framework", Centre for European Policy Studies, retrieved 20 January 2018, <https://www.ceps.eu/publications/understanding-circular-economy-europe-resource-efficiency-sharing-platforms-ceps>

This role of facilitator implies a deep understanding of the different preferences and capacities of these actors in order to identify areas of common ground and foster collaboration among stakeholders.

1. 2 THE EU APPROACH

1. 2 .1 A REVIEW OF THE CIRCULAR ECONOMY PACKAGES

In the European Union, Circular Economy was firstly addressed in an initial Circular Economy Package⁷, published in July 2014. As indicated in the Communication "Towards a circular economy:^[1]_[SEP] A zero waste programme for Europe", this package represented the will to make a "full systemic change" in order to transition from a "linear model" based on "take-make-consume and dispose" to a system that "keeps the added value in products for as long as possible and eliminate waste"⁸.

In December 2014, right after the start of the Juncker Commission, this initial Circular Economy Package was withdrawn with the aim of presenting a new one that would cover "the full economic cycle"⁹. This decision responded to the principle of political discontinuity, based on the article 39 of the Framework Agreement on relations between the European Parliament and

⁷. It included the review of waste management targets contained in the Directive 2008/98/EC on waste, the Directive 1999/31/EC on the landfill of waste, and the Directive 94/62/EC on packaging and packaging waste as well as "elements of simplification of the reporting requirements" included in Directives 94/62/EC on packaging and packaging waste, 2000/53/EC on end-of-life vehicle, and 2006/66/EC on batteries and accumulators and waste batteries and accumulators as well as the Communication "towards a circular economy: A zero waste programme for Europe"

⁸. European Commission, Towards a circular economy:^[1]_[SEP] A zero waste programme for Europe, Communication to the European Parliament, the Council, the European Economic And Social Committee and the Committee of the Regions. Brussels, 25.9.2014, COM(2014) 398 final/2.

⁹ European Commission, Closing the loop: Commission adopts ambitious new Circular Economy Package to boost competitiveness, create jobs and generate sustainable growth, press release. Brussels, 2 December 2015.

the European Commission¹⁰, which enables the new Commission to review all pending proposals at the moment of taking office¹¹. Prior to its withdrawal, the President of the Commission, Jean-Claude Juncker, asked the Commissioner for Environment Maritime Affairs and Fisheries, Karmenu Vella, to assess the state of play of the Circular Economy Package taking into consideration the reactions of the European Parliament and the Council in order to determine if the proposal was consistent with the "jobs and growth agenda" and the "broader environmental objectives" of the Commission¹². These two aspects were, later, the main changes in the approach of the new package.

The Juncker Commission introduced changes at the organisational level with a view to promoting horizontality. In particular, the creation of the so-called Project Teams, together with the strengthening of the role of vice-presidents and the new position of First-Vice President.

In essence, the change in the structure of the Commission has been accompanied by a change in the approach to the circular economy portfolio, as the Juncker Commission sought to enhance the link between environmental protection and economic growth¹³. As part of this evolution, there was also a change in the main actor involved in the file. Given that, as mentioned above, the new Commission sought to enhance the link between environmental protection and economic growth¹⁴ the file evolved from the environmental approach to a more business-oriented one.

While, in the initial Circular economy package, the Commissioners involved were the Environment Commissioner, Janez Potočnik, and the Commissioner for Research, Innovation and Science, Máire Geoghegan-Quinn¹⁵, the drafting of the new Circular Economy Package was

¹⁰ European Commission, Closing the loop: Commission adopts ambitious new Circular Economy Package to boost competitiveness, create jobs and generate sustainable growth, press release. Brussels, 2 December 2015.

¹¹ European Commission A, Questions and Answers: the 2015 Work Programme, Fact sheet. Strasbourg, 16.12.2014.

¹² Jean-Claude Juncker, ^[1]_[SEPP] President of the European Commission, Mission letter to the Commissioner for Environment, Maritime Affairs and Fisheries, Karmenu Vella. Brussels, 1.11. 2014, p.4.

¹³ Op. Cit, European Commission.

¹⁴ Ibid.

¹⁵ European Commission, Environment: Higher recycling targets to drive transition to a Circular

led by a “core project team” co-chaired by the First Vice-President Frans Timmermans and the Vice President for Jobs, Growth, Investment and Competitiveness, Jyrki Katainen, with the “close involvement” of the Commissioner for Environment, Karmenu Vella and the Commissioner for Internal Market, Industry, Entrepreneurship and SMEs, Elżbieta Bienkowska. In addition, at least half of the Commissioners were involved in the file to some extent.

In December 2015 the Juncker Commission released its new Circular Economy Package, which included a Circular Economy Action Plan containing the measures that were outlined by the Juncker Commission. This Action Plan included measures on product design, consumption, waste management, secondary raw materials and water reuse and specific action on priority sectors, namely, plastics, food waste, critical raw materials, construction and demolition and biomass and bio-based products. It also included horizontal measures on innovation and investment¹⁶.

This first Circular Economy Package also included a series of proposals¹⁷ that conformed the revised legislative framework on waste. These proposals, which entered into force in 2018, set recycling targets for municipal waste, packaging waste, food waste and landfill. The

Economy with new jobs and sustainable growth, press release. Brussels, 2 July 2014, p.1.

¹⁶ European Commission, Closing the loop - An EU action plan for the Circular Economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, 2.12.2015 COM(2015) 614 final.

¹⁷ The proposals that are part of the revised framework directive are the following: Regulation (EU) 2018/848 of the European Parliament and of the Council of 30 May 2018 on organic production and labelling of organic products and repealing Council Regulation (EC) No 834/2007, Directive (EU) 2018/849 of the European Parliament and of the Council of 30 May 2018 amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment, Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste, Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste, Directive (EU) 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste, Decision (EU) 2018/853 of the European Parliament and of the Council of 30 May 2018 amending Regulation (EU) No 1257/2013 and Directives 94/63/EC and 2009/31/EC of the European Parliament and of the Council and Council Directives 86/278/EEC and 87/217/EEC as regards procedural rules in the field of environmental reporting and repealing Council Directive 91/692/EEC.

Communication “Closing the loop - An EU action plan for the circular economy” takes note of the potential of circular economy for reducing carbon dioxide emissions¹⁸.

A second Circular Economy Package, published in 2018, delivered on some of the measures included in the Action Plan. Particularly relevant was the release of the Plastics Strategy, which builds upon four pillars: the improvement of the economics and quality of plastics recycling, curbing plastic waste and littering, driving investment and innovation towards circular solutions and promoting global action¹⁹.

The Strategy includes “a vision for Europe’s new plastics economy”, defined as a “a smart, innovative and sustainable plastics industry, where design and production fully respects the needs of reuse, repair, and recycling, brings growth and jobs to Europe and helps cut EU’s greenhouse gas emissions and dependence on imported fossil fuels”.

This vision, as well as the Strategy, puts the focus on increasing plastic recycling rates, stating that by 2030 "all plastics packaging placed on the EU market is either reusable or can be recycled in a cost-effective manner" and "more than half of plastics waste generated in Europe is recycled". It also addresses the importance of achieving a more integrated value chain, in which the chemical industry and plastic recyclers work together. This is relevant as the presence of some substances, such as flame retardants, prevents certain categories of plastic goods from being recycled. In the view of the Commission, by 2030, these substances must "have been replaced or phased out"²⁰.

This new vision of the Commission also acknowledges that higher plastic recycling rates can contribute to curbing CO₂ emissions while reducing the current dependence of the European Union on fossil fuels, as the annual energy savings in a scenario in which all the plastic that is

¹⁸ European Commission, Closing the loop - An EU action plan for the Circular Economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, 2.12.2015 COM(2015) 614 final.

¹⁹ European Commission, A European strategy for plastics in the circular economy, p. 1-5.

²⁰ Ibid.

currently produced globally is also recycled would be as high as 3.5 billion barrels of oil per year²¹.

The Directive 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment, also referred as “Single-use plastics Directive”, is one of the key outcomes of this Strategy. It contains relevant provisions on waste prevention, including a ban both on products made from oxo-degradable plastic and those single-use plastic items that are more frequently found on beaches in the European Union, such as cotton bud sticks, cutlery, plates, straws and beverage stirrers²². The Directive also includes the obligation for Member States to implement measures for achieving "ambitious and sustained reduction in the consumption" of certain single-use plastic products, namely, cups for beverages, including their covers and lids, and food containers. The aim of this provision is to reverse consumption trends, achieving "measurable quantitative reduction" in these products between 2022 and 2026²³. The above-mentioned measures can take a wide range of forms, going from national consumption reduction targets and initiatives to ensure that re-usable alternatives are placed in the market, to economic instruments aimed at charging and an extra fee when buying those single-use plastic products that are covered by this provision. In line with this obligation, Member States must report to the European Commission the measures implemented as well as data on the single-use plastic products that are subject to these measures on an annual basis²⁴.

These measures add to previous initiatives, such as the Directive 2015/720/EU amending Directive 94/62/EC as regards the consumption of lightweight plastic carrier bags, which establishes the requirements that must be adopted by Member States to cut the consumption of plastic bags.

²¹ Ibid.

²² Art. 5 of the Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment.

²³ Art. 4 and Annex part A of the Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment.

²⁴ Art. 13 of the Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment.

The Plastics Strategy also includes actions oriented to the restriction of intentionally added microplastics. To this aim, the European Commission has requested the European Chemicals Agency (ECHA) to prepare a proposal on its restriction in the context of the European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH Regulation). ECHA has published a proposal in March 2019, which was open to public consultation until September 2019²⁵.

Finally, a third Circular Economy Package was released in 2019. This last Package included a Report on the implementation of the Circular Action Plan accompanied by a Staff working document detailing the progress made on each of the 54 measures contained in the Action Plan.

Particularly relevant for the contribution of the circular economy to the reduction of CO₂ emissions is the position of the Commission with regards to waste-to-energy systems. In its Communication "The role of waste-to-energy in the circular economy", the Commission states that, while these processes can have a place in the transition towards a circular economy, it is essential to ensure that they are guided by the EU waste hierarchy so that they don't create barrier to waste prevention, reuse and recycling. This is particularly important because waste hierarchy guarantees the best scenario in terms of energy savings and CO₂ and GHGs emissions²⁶.

The European Commission and the European Economic and Social Committee also launched the Circular Economic Stakeholder Platform in 2017 as an answer to the proposition made by the European Economic and Social Committee in its opinion on the 2015 Circular Economy Package²⁷.

²⁵ ECHA, Submitted restrictions under consideration, retrieved on 1 September 2019:
<https://echa.europa.eu/restrictions-under-consideration/-/substance-rev/22921/term>

²⁶ European Commission, The role of waste-to-energy in the circular economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, 26.1.2017 COM(2017) 34 final, p.11.

²⁷ European Economic and Social Committee, opinion on the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Closing the loop - An EU action plan for the circular economy – COM(2015) 614 final, Proposal for a directive of the European Parliament and of the Council amending Directive 94/62/EC on packaging and packaging waste -

The Platform counts with a Coordination Group, composed by twenty-four stakeholders, that aim to represent the diversity of stakeholders involved in the 28. This platform organizes a Circular Economy Conference each year.

1. 2. 2 NON-REGULATORY POLICY MEASURES

"Unilateral voluntary commitments" or "voluntary commitments" are defined by the OECD as “programs set up by firms and communicated to their stakeholders (employees, shareholders, clients, etc.) in which the definition of environmental targets, as well as of the provisions governing compliance, is determined by the firms themselves but, nevertheless, firms may delegate monitoring and dispute resolution to a third party in order to strengthen the credibility and the environmental effectiveness of their commitments”²⁹.

Both categories differ from "voluntary agreements" in the sense that the latter takes place when the participating firms agree on standards established by public authorities³⁰.

In the context of the circular economy, the main examples of voluntary approaches are the following: the Vynil Plus Voluntary Commitment, which includes the main actors of the PVC value chain, the three voluntary agreements aimed at implementing the Eco-design Directive. Finally, two voluntary commitments were published by PlasticsEurope and the Plastics industry when the Plastics Strategy was released.

COM(2015) 596 final – 2015/0276 (COD), Proposal for a directive of the European Parliament and of the Council amending Directive 2008/98/EC on waste - COM(2015) 595 final – 2015/0275 (COD), Proposal for a directive of the European Parliament and of the Council amending Directive 1999/31/EC on the landfill of waste - COM(2015) 594 final - 2015/0274 (COD) and on the Proposal for a directive of the European Parliament and of the Council amending Directives 2000/53/EC on end-of-life vehicles, 2006/66/EC on batteries and accumulators and waste batteries and accumulators, and 2012/19/EU on waste electrical and electronic equipment - COM(2015) 593 final - 2015/0272 (COD). NAT/676.

²⁸circular [economy](#)

²⁹ Organisation For Economic Co-Operation And Development, *Voluntary Approaches for Environmental Policy. Effectiveness, Efficiency And Usage In Policy Mixes*, Paris, OECD Publications Service, 2003. p, 18.

³⁰ Ibid.

For the Commission, voluntary commitments are one of the tools envisaged for the achievement of its policy objectives, taking place when a specific industry sector is willing to commit in this direction. In those areas in which the Commission considers that voluntary commitments are the most suitable policy tool to meet the objectives, the Commission will try to foster them. However, they will only take place if the major part of the industry sector wants to be involved.

The main reason for the Commission to choose voluntary approaches as policy instruments is its flexibility. For instance, voluntary agreements can be updated if the conditions change due to technological progress. At the same time, they are a valuable source of information for the Commission, enabling it to assess the capacity of the industry to meet the objectives and also to identify the barriers that are hindering its achievement.

The actions for boosting the recycled content in the context of the Plastics Strategy included the launch of an "EU-wide pledging campaign" aimed at "calling on stakeholders to come forward with voluntary pledges to boost the uptake of recycled plastics". The goal is to go from the current state of play, 3.5 tonnes of recycled plastic per year, to ten million tonnes of recycled plastics by 2025³¹

In the view of the Commission, there are several barriers that explain the limited market share of recycled plastic companies. Recycled plastic are between 4% and 6% of the demand for new plastics in the European Union. Among these barriers, the Commission has identified "resistance to change among product manufacturers" and "lack of knowledge of the additional benefits of closed-loop recycled plastics"³² but the primary reason is that, unlike other materials, the market price of plastic is so low that there are no economic incentives for the industry to absorb recycled plastic.

³¹ European Commission, A European Strategy for Plastics in a Circular Economy, Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Annex III. Brussels, 16.1.2018 COM(2018) 28 final, p.4-23.

³² Ibid.

With the aim of solving this problem, the Commission organised four workshops in which the four industrial sectors that use more plastic material in their production process are addressed: packaging, building and construction, automotive and electronic or domestic appliances. The horizon of the pledge was 2025, thus, an example of pledge was "By 2025, my PET bottles will contain xx% of recycled PET"³³_{SEP}. It must be acknowledged that the Commission, through its pledging campaign, was not only pursuing to increase the amount of recycled plastic produced, but also to foster a change in the plastic value chain by boosting the demand for recycled plastic³⁴.

Despite of the efforts made by the Commission, the response of the industry was modest. Thus, following the preliminary assessment of the pledges, which showed that, while the pledges received from recycled plastic suppliers were enough, the pledges made by companies that integrate recycled plastic in their products did not reach the goal of 10 million tonnes by 2025 established by the Commission.

Later, the Commission launched the Circular Plastics Alliance with the aim of bringing together 30 key stakeholder organisations and boosting the use of recycled plastics into new products. It resulted in a declaration, signed in September 2019 by 100 stakeholders covering the whole plastics value chain, that included the initial target of using 10 million tons of recycled plastic to make new products every year by 2025³⁵.

As in the case of voluntary commitments, pledges are from a voluntary nature and, as a consequence, the Commission cannot enforce them. Its implementation relies on the commitment of the companies and sectors and the negative reputational impact that non-compliance would cause to them.

³³ Ibid.

³⁴ Ibid.

³⁵ European Commission, EU Plastics Strategy: Commission welcomes voluntary pledges from industry to boost the market for recycled plastics and encourages further action, press release. Brussels, 20 November 2018.

2. HOW CAN THE CIRCULAR ECONOMY CONTRIBUTE TO CLIMATE MITIGATION?

Projections show that complying with the Paris Agreement will not be enough for staying in a 1.5°C scenario. On top of the traditional measures, which include renewable energy, energy efficiency, methane abatement and avoiding deforestation, the circular economy can unlock the mitigation potential of recycling and waste prevention measures³⁶.

As shown in Figure 3 for steel and aluminium and in Figure 5 for plastics, the production of recycled materials emits considerably fewer emissions than the production of primary materials. The potential for increasing recycling rates across materials lies in the improvement of collection systems, striving for uncontaminated materials and the production of high-quality secondary materials that can actually substitute primary materials³⁷.

The European Union is committed to the Paris Agreement and has shown its concern on the impacts of the global warming of 1.5°C above pre-industrial levels reported in the IPCC Special Report³⁸. In accordance with Article 4, Paragraph 19 of the Paris Agreement "all Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies", "taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."³⁹ Following this commitment, the EU aims at submitting a long-term strategy that is ambitious and, at the same time, takes into account the particular context of Member States, which should submit their national long-term strategies to the European Commission⁴⁰.

³⁶ Circle Economy, "The circularity gap report", Circle Economy, retrieved 1 October 2019, p. 44, https://bfc732f7-80e9-4ba1-b429-7f76cf51627b.filesusr.com/ugd/ad6e59_ba1e4d16c64f44fa94fbd8708eae8e34.pdf

³⁷ Op. cit, Material Economics, p. 26.

³⁸ European Council, Conclusions of the European Council meeting of the meeting of 21-22 March 2019, 22 March 2019, EUCO 1/19.

³⁹ UNFCCC, Adoption of the Paris Agreement. Report No. FCCC/CP/2015/L.9/ Rev.1.

⁴⁰ European Council, Conclusions of the European Council meeting of the meeting of 21-22 March 2019, 22 March 2019, EUCO 1/19.

Following the regulation on the Governance of the Energy Union and Climate Action⁴¹, EU Member states developed integrated National Energy and Climate Plans (NECPs) for the period 2021 to 2030 that should be finished by 31 December 2019 and report on its implementation. The NECPs must cover “the current situation for each of the five dimensions of the Energy Union⁴², including of the energy system and greenhouse gas emissions and removals at the time of submission of the integrated national energy and climate plan or on the basis of the latest available information”⁴³. Member states should also include projections for each of the five dimensions of the Energy Union⁴⁴.

The European Council, in its conclusions of 22 of March 2018, invited the Commission to present "a proposal for a Strategy for long-term EU greenhouse gas emissions reduction in accordance with the Paris Agreement, taking into account the national plans"⁴⁵.

The proposal for a strategy was published by the Commission on 28 November 2018 and was presented as a 2050 strategic long-term vision under the title “a clean planet for all”⁴⁶. The European Commission acknowledges in the proposal that the status quo is no longer an option and indicates that, for achieving net-zero emissions, there is a need for a systemic change. This

⁴¹ European Parliament and Council, Regulation (2018/1999) on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, Official Journal of the European Union, of 11 December 2018, L 328/1.

⁴² Security, solidarity and trust, a fully-integrated internal energy market, energy Efficiency, climate action-decarbonising the economy and research and technology and innovation.

⁴³ European Parliament and Council, Regulation (2018/1999) on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, Official Journal of the European Union, of 11 December 2018, L 328/1, art. 8.

⁴⁴ Ibid.

⁴⁵ European Council, Conclusions of the European Council meeting of 22 March 2018, Brussels, 23 March 2018, EUCO 1/18.

⁴⁶

change includes, following the Commission, long-term planning, improving knowledge of the opportunities for transforming the economy and bring on board all economic actors. The transition to a circular economy is an essential part of the economic and societal transformations that are needed for achieving the goal of net-zero greenhouse emissions by 2050⁴⁷.

Building on the Commission Communication "A Clean Planet for all" and the outcome of the COP24, held in Katowice, the European Council, in its conclusions of 14 December 2018, invited the Council "to work on the elements outlined in the Communication" and to "provide guidance on the overall direction and political priorities" with a view of preparing a long-term strategy that the EU should submit in order to comply with the Paris Agreement⁴⁸. Following this mandate, the Council held several debates for discussing the Communication⁴⁹.

As outlined in the European Council conclusion of June, the Council will finalise a guidance on the EU's long-term strategy by the end of 2019, with a view to submitting the EU's long-term strategy to the UNFCCC in 2020. The European Council considers that, building on the measures already agreed, the transition to a climate neutral EU "must preserve European competitiveness, be just and socially balanced, take account of Member States' national circumstances and respect their right to decide on their own energy mix"⁵⁰.

2.1 TOWARDS A CIRCULAR FOOD SYSTEM

⁴⁷ European Commission, A Clean Planet for all. A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, Brussels, 28.11.2018 COM(2018) 773 final.

⁴⁸ European Council, Conclusions of the European Council meeting of 13-14 December 2018, Brussels, 14 December 2018, EUCO 17/18.

⁴⁹ Following the European Council of 14 December, the Council, in its various configurations, held several debates with the aim of discussing the Commission Communication "A Clean Planet for all": the Competitiveness Council on 18 February 2019, the Transport, Telecommunications and Energy Council on 4 March 2019, the Environment Council on 5 March and the Agriculture Council on 14 May 2019.

⁵⁰ European Council, Conclusions of the European Council meeting of 20 June 2019, Brussels, 20 June 2019, EUCO 9/19.

The food system accounts globally for between the 21% and the 37% of total net anthropogenic GHG emissions, including those emissions that are associated with pre-production and post-production activities⁵¹.

The production of vegetable oils and meat has experienced an increase of more than the 50% while the supply of food calories increased in around one third. At the same time, between the 25% and the 30% of the food produced globally is now lost or wasted. Following the IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems, both the increase in food production and food losses are associated with additional GHG emissions⁵².

According to this IPCC Special report, the food system, through production, consumption and food loss and waste management has the potential to scale up in climate adaptation and mitigation⁵³.

The reduction of food loss and waste across the supply chain can come from the improvement of harvesting techniques, storage, infrastructure, transport, packaging retail and education⁵⁴. This is particularly relevant as the emissions coming from the food system are expected to increase in 3 billion tonnes CO₂, going from 8.4 billion tonnes CO₂ to 11.4 billion tonnes CO₂ per year⁵⁵.

Figure 1: Emissions from the global food system in billion tonnes CO₂ per year.

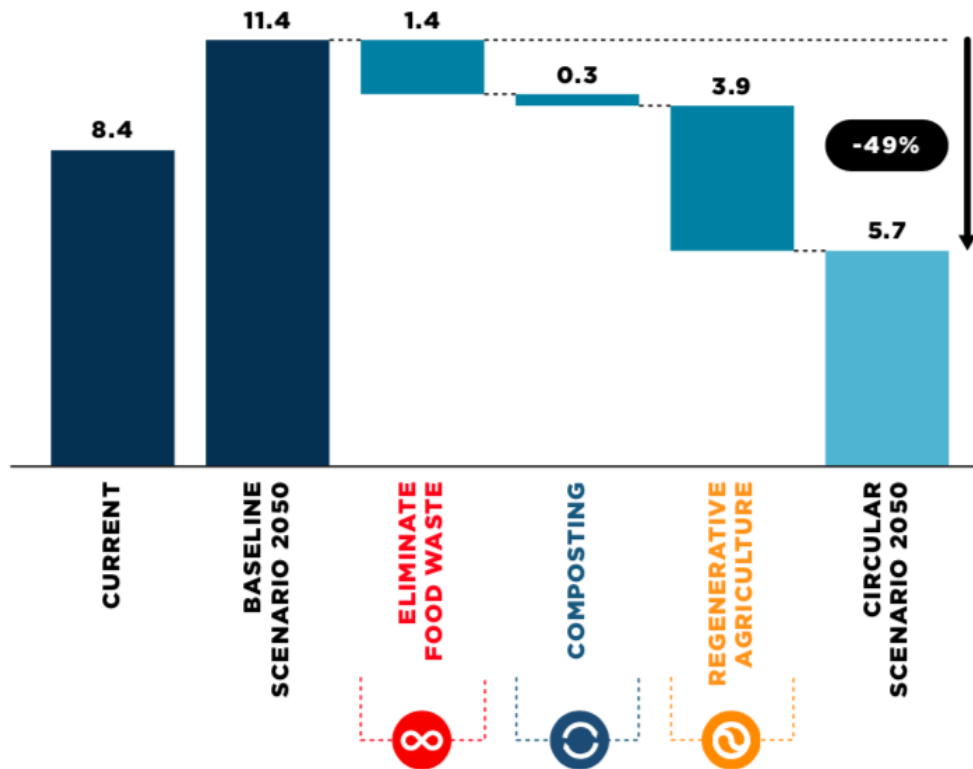
⁵¹ Intergovernmental Panel on Climate Change (2019) IPCC Special Report on Climate Change, Desertification, Land Degradation, Sustainable Land Management, Food Security, and Greenhouse gas fluxes in Terrestrial Ecosystems, p. 3-26.

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Ibid.

⁵⁵ Ellen MacArthur Foundation, “Completing the picture. How the circular economy tackles climate change”, Ellen MacArthur Foundation, retrieved 20 August 2019, <https://www.ellenmacarthurfoundation.org/publications/completing-the-picture-climate-change>.



Source: The Ellen MacArthur Foundation (2019)

The report "Cities and circular economy for food", published by the Ellen MacArthur Foundation, lists three main ambitions for achieving circularity in a world where cities will consume the 80% of food: to grow food locally and in a regenerative way, to optimise the use of food, for example, by using by-products to its highest value and, lastly, to design and put on the market products that are both healthy and produced sustainably⁵⁶. Figure 1 shows that by eliminating food waste (1.4), composting (0.3) and implementing a regenerative agriculture (3.9), we could reach a decrease of the 49% in the emissions expected by 2050.

Regenerative food systems, which are an essential part of a circular food system and have the greatest potential in terms of CO₂ emissions reduction within the global food system, are closely

⁵⁶ Ellen MacArthur Foundation, "Cities and circular economy for food", Ellen MacArthur Foundation, retrieved 20 August 2019, <https://www.ellenmacarthurfoundation.org/publications/cities-and-circular-economy-for-food>.

linked to composting. Compost has proved to be a solution for regenerating soils. Even when carbon dioxide and methane are released during the composting process, its amount is lower when compared to landfilling. The outcome of the composting process is soil that is rich in organic matter, containing, among other elements, carbon, nitrogen and phosphorous⁵⁷. Thus, this is an option for valorising food waste and boosting separate collection. Community composting can also reduce waste transport, which is particularly relevant in rural areas. It is important to note that compost can also act as a carbon reservoir when used in agriculture. While carbon is not locked up in compost irreversibly, it can reverse the lack of organic matter in the soil. This contributes to the stabilisation of the organic fraction, effectively locking-up carbon⁵⁸.

2. 2 TOWARDS A CIRCULAR BUILT ENVIRONMENT

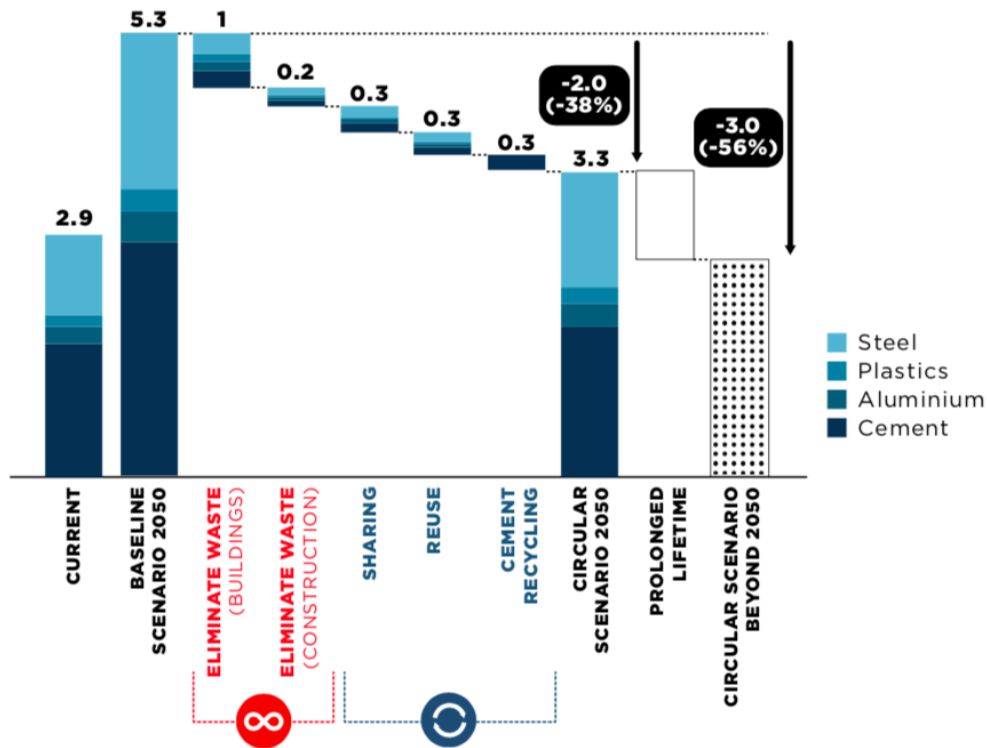
The built environment is particularly relevant with regards to the contribution of the circular economy to the action on the climate emergency, as it uses around half of the materials that are extracted at the global level. Emissions coming from construction amount the 28% of total new building emissions, but it is estimated that in 2050 they will reach almost half of these emissions. This scenario signals that, on top of the efforts that are currently being made in the field for designing buildings that are powered by renewable energy and are also energy efficient, the focus should also be put on choosing materials and designs that are in line with the circular economy⁵⁹.

⁵⁷ Ellen MacArthur Foundation (2019) Cities and circular economy for food, p. 6.

⁵⁸ Eunomia, Arcadis (2010) Assessment of the options to improve the management of bio-waste in the European Union. Annex F: Environmental assumptions, p.29.

⁵⁹ Ellen MacArthur Foundation (2019) Completing the picture. How the circular economy tackles climate change, p.32.

Figure 2: Emissions from four key materials used in buildings in billion tonnes of CO2 per year, globally.



Source: The Ellen MacArthur Foundation (2019)

In this regard, the Ellen MacArthur Foundation, in its report "Completing the picture. How the circular economy tackles climate change", estimates that a circular scenario, in which the demand for primary steel, aluminium and plastic is reduced, could decrease global CO2 emissions from building materials by 38% by 2050, which would be the equivalent of 2.0 billion tonnes CO2. This scenario is based in designing out waste and keeping products and materials in use. For designing out waste, we would need design measures, which could reduce CO2 emissions in 1 billion tonnes per year and the elimination of waste in construction, as currently construction and demolition waste amount for the 40% of urban solid waste, and which could reduce CO2 emissions in 0.2 billion tonnes Co2 per year. Keeping products and materials in use through sharing business models, extending the "functional" lifespan of building with approaches such as modular designs, and reusing building materials.

In the case of cement, while it is not possible to recycle it, its circularity potential lies in reusing some of its structural elements⁶⁰. It is essential to find substitutes for those materials that are higher in emissions. As an example, cement represents from 7% to 20% of concrete, however, when it comes to emissions is the material with the largest CO₂ footprint: 95% or higher⁶¹.

2. 2. 1 THE CASE OF STEEL

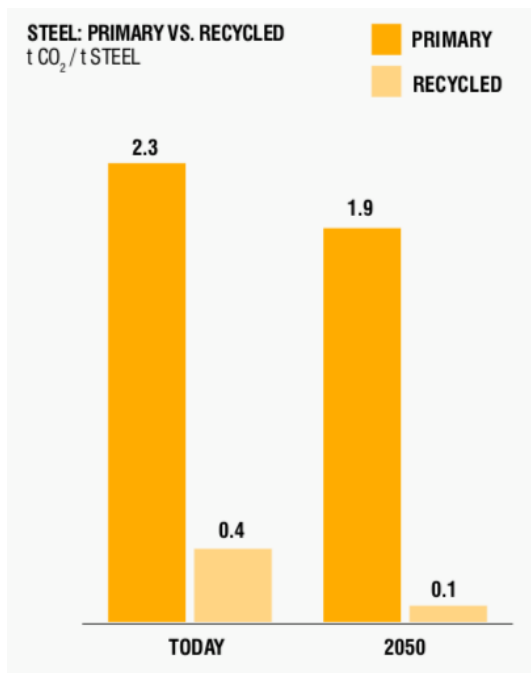
Given that the production of primary steel involves a large number of emissions, which amounts up to 2 tonnes of CO₂ per tonne of steel, the promotion of steel recirculation is key. The production process required for obtaining secondary steel, which is made in electric arc furnaces (EAF) does not generate CO₂ emissions itself while the production of primary steel, which is, in its majority, made through the basic oxygen furnace (BOF) process, generates the majority of its emissions during its making process. As a result, CO₂ emissions could be reduced to one-fifth when producing secondary steel if most of the power comes from fossil fuels and, most importantly, the emissions would drop almost to the point of decarbonisation if the electricity comes from renewable energy sources⁶².

Figure 3. CO₂ emissions from primary and recycled steel.

⁶⁰ Op. cit, Material Economics (2018), p. 26.

⁶¹ Ellen MacArthur Foundation (2019) Completing the picture. How the circular economy tackles climate change, p.23.

⁶² Op. cit, Material Economics (2018), p. 60.



Source: Material Economics (2018)

However, there are some barriers to secondary steel production, in particular, downcycling and copper contamination. The major challenge for recycling steel scraps is that mixing scraps with different composition results in a decrease in the quality of steel. As a consequence, the steel is downcycled, which means that it cannot be used for its initial purpose. Downcycled steel can be used for construction purposes, such as rebar or structural elements. The achievement of high-quality secondary steel requires to control in detail the scrap supply. Copper contamination is a key barrier as it decreases the quality of secondary steel, even at low rates, making it not suitable for the production of certain products. As an example, the percentage of copper present in steel scraps in the OECD, which goes from 0.2 to 0.5 , % and makes this material not suitable for most steel products⁶³. Copper contamination takes place at the recycling stage, being very frequent on the end-of-life vehicles dismantling process.

Construction and infrastructure is the sector where most of the steel production ends (around 50%), following by transport and machinery and electrical equipment (around 20%) and, lastly,

⁶³ Op. cit. Material Economics (2018), p.68-69.

metal products and appliances (around 15%)⁶⁴.

As the recycling rate for steel is already high, around 80% and 90% of end-of-life steel depending on the country, the potential for increasing the circularity potential of this material relies on steel scraps. In some sectors, such as the automotive, new scraps amount for around 25% and 30% of the steel used during the production process. While scrap collection rates are generally high, there are still some industries for which rates are low, the rate for consumer good products being 50%⁶⁵.

2. 2. 2 THE CASE OF ALUMINIUM

Aluminum is a very versatile material whose uses range from the packaging sector to the automotive or built one. Trade in aluminium is high, including in its scrap form. Its use has been growing in developing countries and the higher demand is now concentrated in China, where it has grown up to 70% in the last decade. Furthermore, 55% of aluminium is currently produced in China⁶⁶.

With regards to aluminium, the key for its recirculation is to ensure a demand for the post-consumer scrap⁶⁷.

Recycling aluminium implies both energy savings, as the remelting process uses just the 5% of the energy that would be required for producing new material and an important reduction in carbon emissions, which can be lowered up to a 98% compared to the production of primary aluminium using coal-fired electricity⁶⁸.

The amount of emissions released during the production of primary aluminium depends to a

⁶⁴ Op. cit, Material Economics (2018), p.6-98.

⁶⁵ Ibid.

⁶⁶ Ibid.

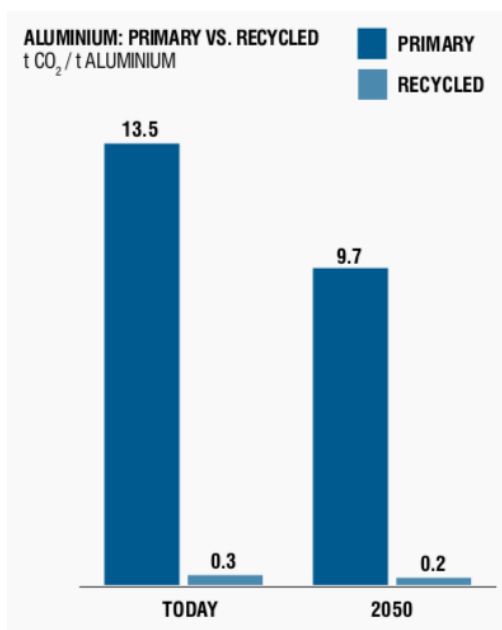
⁶⁷ Ibid.

⁶⁸ Ibid.

great extent on the origin of the electricity used during the production process. For aluminium produced using coal-fired electricity, which represents the 60% of the global production, emissions per tone are as high as 18 tonnes CO₂ per tonne, while in the case of aluminium coming from decarbonised energy sources, emissions are 3 tonnes of CO₂ per tonne ⁶⁹.

Recycled aluminium represents the 20% of the global aluminium demand. However, there is an opportunity for increasing circularity, as the total amount of material available from end-of-life products could grow from the current 27% up to 55% in 2050⁷⁰.

Figure 4. CO₂ emissions from primary and recycled aluminium.



Source: Material Economics (2018).

For boosting the circularity of aluminium it will be key to ensure the availability of scrap that enables the production of high quality secondary aluminium. For achieving this goal, it will be necessary to reduce the losses of aluminium and avoiding downgrading⁷¹.

⁶⁹Op. cit, Material Economics (2018), p. 102.

⁷⁰ Op. cit, Material Economics (2018), p. 104.

⁷¹ Op. cit, Material Economics (2018), p. 104.

At the global scale, the percentage of aluminium that is recovered from end-of-life products is currently around 70%. However, rates differ largely depending on product categories. Aluminium beverage cans collection schemes have proved to be particularly successful. For reducing aluminium losses in the next decades it will be key to increase collection rates of post-consumer scrap, as now around 30% of this material is lost. Efforts for lowering the amount of new scrap generated during the production process will also contribute to this aim⁷².

While aluminium, in its pure form, can be remelted indefinitely, there are two main barriers for the recycling of this material. The first is that aluminium is alloyed with other elements during the production process in order to obtain the properties required for producing a particular good. Plus, these alloying elements cannot be separated from the aluminium during the recycling process. This situation is addressed by downcycling. As a result, while two-thirds of aluminium goods are made of wrought aluminium, just 20% of the scrap coming from end-of-life products is turned again into wrought products. The main destination for secondary aluminium is the automotive sector, but given that some of the components made of aluminium include those that are part of internal combustion engines, the transition to electric vehicles is likely to reduce the demand of this material in the automotive sector⁷³.

The production of aluminium scrap, which is notably growing, is expected to exceed the demand for casting alloys. This situation is an opportunity for boosting the recirculation of this material, but it will only be a reality if the aluminium coming from end-life-products fits the standards required for producing wrought aluminium goods, as the demand for secondary aluminium in the automotive sector is expected to decrease⁷⁴.

An exception from downcycling, which can also signal the way forward, are closed-loop aluminium beverage cans collection schemes. Through these systems, which have proved to be

⁷² Op. cit, Material Economics (2018), p. 104.

⁷³ Op. cit, Material Economics (2018), p. 107-108.

⁷⁴ Ibid.

particularly successful, the metal from used beverage cans is transformed again into new ones⁷⁵.

2.3. TOWARDS PRODUCT DESIGN THAT ALLOWS FOR REUSABILITY, REPARABILITY AND RECYCLABILITY

Following "The circularity gap report", published by Circle Economy, circular carbon mitigation strategies include: firstly, the extension of the lifetime of products as well as boosting its use-intensity, both strategies would make up about a quarter of the circular mitigation potential in the EU. This includes sharing economy models. Secondly, enhancing recycling, which amounts to half of the potential of circular mitigation in the EU. This is because the use of secondary materials generates, in general, more greenhouse emissions. Lastly, circular design is key. Design that fits a carbon neutral circular-economy includes reducing material content, as lightweight products constitute a quarter of the circular mitigation potential in the EU, and also substituting high-carbon materials for low-carbon ones, such as bamboo⁷⁶. Product design has also a direct impact in the life-span of products and resource efficiency, it determines its potential for reusability, reparability, recyclability and end-of-life disassembly.

2.3.1 THE CASE OF PLASTIC

Mixed and downgraded quality plastic pose a barrier for recycling. Given that the low economic incentive for recycling plastic, lowering its material value can make the recycling process unviable⁷⁷.

Since the 1960s global plastic production has grown very rapidly. In 2015, 322 billion tonnes of plastic were produced. While market demand has boost aluminium and steel recycling, the demand for recycled plastic is low: the 6% of the total plastic demand in Europe. In Europe, just the 30% of the 25.8 million tonnes of plastic that are generated per year are recycled. This can

⁷⁵ Ibid.

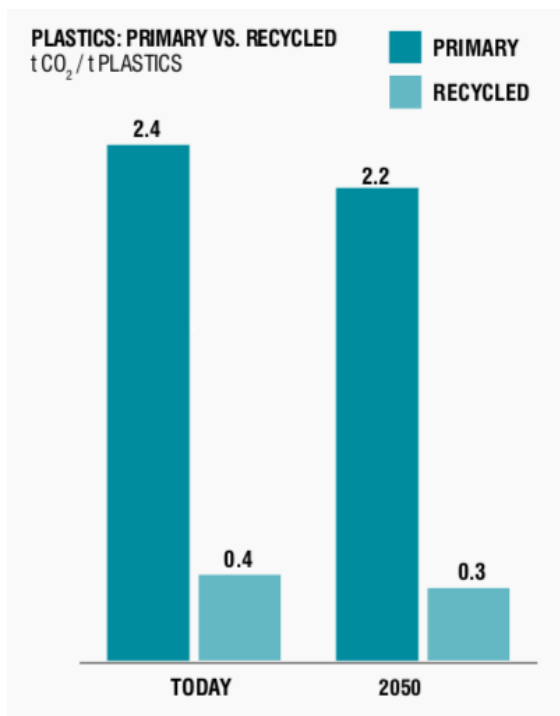
⁷⁶ Circle Economy (2019) The circularity gap report, p. 45

⁷⁷ Op. cit. Material Economics (2018), p.6.

be explained by its low commodity price in the market which, added to market uncertainty, prevented investments in plastic recycling capacity⁷⁸.

Plastic recycling has the potential to both reduce fossil fuel dependence and Co2 emissions. With regards to the later, if we take together those emissions coming from plastic production and plastic incineration they amount to 400 million tonnes CO2 ⁷⁹.

Figure 5. CO2 emissions from primary and recycled plastic.



Source: Material Economics (2018)

In order to achieve higher plastic recycling rates, it is key to make cross-industry dialogue happen. The Commission has been working to this end. To make sure that, at the design stage, recyclability is taking into consideration is key, as now companies producing plastic goods have

⁷⁸ European Commission, A European Strategy for Plastics in a Circular Economy. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels, 16.1.2018 COM(2018) 28 final, p.3-7.

⁷⁹ Ibid.

no incentives for taking recyclability criteria into consideration. As an example, including certain additives or choosing darker colors can increase recycling costs to the point of making the process economically unviable⁸⁰.

In its report "The New Plastics Economy. Catalysing Action" The Ellen MacArthur Foundation identified four plastic segments of plastic packaging, representing around the 30% of the market weight, which cannot be reused or recycled and that will require redesign or innovation. Namely, small-format packaging, such as lids, tear-offs or caps, multi-material packaging, which refers to packaging made off multiple layers of different materials, such as beverage cartons. uncommon materials, such as PVC, EPS and PS and, lastly, plastic packaging that is nutrient-contaminated, such as organic waste bags and takeaway food packaging⁸¹.

Following the waste hierarchy, before recycling, reuse must be prioritised. Currently, reuse is an option for, at least, 20% of plastic packaging. Some of the products for which reuse is currently an opportunity are: personal and home care bottles, carrier bags, beverage bottles, pallet wraps, large rigid packaging and e-commerce packaging⁸². In this regard, the report "The New Plastics Economy. Catalysing Action" of The Ellen MacArthur Foundation also identifies four changes in the design with high impact in the economic viability of the plastic recycling process: format design, polymer choice, pigment choice and additive choice⁸³.

3. POLICY RECOMMENDATIONS

1. Promote rental schemes

⁸⁰ Ibid.

⁸¹ Ellen MacArthur Foundation, "The new Plastics economy. Catalysing action", Ellen MacArthur Foundation, retrieved 20 August 2019, <https://www.ellenmacarthurfoundation.org/publications/new-plastics-economy-catalysing-action>.

⁸² Ibid.

⁸³ Ibid.

As part of the transition to a circular economy, ownership models are meant to evolve. This evolution comes hand in hand with the rise of sharing economy business models, thanks to which consumers can become users.

Policy-makers should assess regulatory barriers with a view to promoting the creation of new companies oriented to lending products and the conversion of existing companies, when feasible.

However, new business models should take into consideration its climate impact. As an example, clothing rental schemes would work at their best at the local level, so that transport CO₂ emissions are minimised.

When analysing the benefits of these models, which often rely on home delivery, we also have to take into consideration the packaging needed for delivering goods to each new customer. The case of Repack dives into this question.

Best practice example: RePack

RePack is a packaging system for online retailers and shoppers. It is based in delivery packages that can be returned and reused⁸⁴.

RePack is returned to reuse in letter size. Its users can fold and drop the empty bag to a postbox. Repack will afterwards take it back, check, clean and redistribute it for reuse.

Every returned bag removes the need to manufacture a new single-use plastic bag or a cardboard box.

The carbon footprint associated to producing a new cardboard box is between 100 and 300g CO₂ and between 200 a 500g CO₂ for a plastic bag. Whereas, according to data published by the

⁸⁴ Clima-KIC, Start-ups, alumni. Retrieved on 2 September 2019, <https://www.climate-kic.org/start-ups/repack/>

International Postal Company, the carbon footprint associated to sending a letter is 37 grams CO₂ per shipment⁸⁵.

In conclusion, the carbon footprint associated with returning a reusable bag is notably lower than producing new single-use packaging. Repack bags are made from recycled Polypropylene and have an expected lifetime of, at least, 20 uses. Once that the bags are no longer fit for use, they are upcycled into new prototypes and leftover pieces are recycled⁸⁶.

2. Facilitate the consolidation of skilled labour force

The transition to a circular economy is expected to increase the EU GDP by 0.5% and create 700.000 jobs when compared to the baseline scenario.⁸⁷

Circular activities, including reuse, recycle, repair and refurbish, will require skilled labour force. Thus, circular economy policies need to take into consideration labour aspects and promote skill learning. Given that there are significant differences across EU countries with regards to this matter, the exchange of best-practices in the context of skill learning could help those countries in which labour force is less skilled.

The case of the Recy-K center, located in Brussels (Belgium) and funded by the FEDER 2007-2013 Operational Program of the Brussels-Capital Region is a successful example of training and socio-professional reinsertion oriented to the circular economy.

Best practice example: Recy-K

⁸⁵ RePack, impact, retrieved on 4 September 2019: <https://www.originalrepack.com/impact/>

⁸⁶ Ibid.

⁸⁷ European Commission (2018) Impacts of circular economy policies on the labour market, p.6.

Recy-K, located in Anderlecht, Brussels, is a circular and social economy platform, specialised in reuse, repair and recycling waste/resources, as well as in training and socio-professional reinsertion.

The project is supported by Bruxelles-Propreté and received funding from the FEDER 2007-2013 Operational Program of the Brussels-Capital Region, under the title "Regional competitiveness and Employment". It integrates both the social and the circular economy approaches. The Recy-K reuse center was renovated following high environmental and eco-construction standards and is aimed at establishing models and processes to define new lines of productions⁸⁸.

Finished in 2016, it holds a 5000 square metre platform in which actors working on the circular and social economy are gathered. It also includes activities oriented to vocational reintegration⁸⁹.

Some examples of the initiatives fostered at the Recy-K reuse center are Usitoo, a "bibliothèque d'objects" which collects unwanted goods and rents, through a subscription scheme, a large variety of items and The MicroMarché, which is open to those seeking a workspace to develop their projects and makes available for them professional tools. They also include showrooms and a "ressourcerie", where diverse types of waste are collected and later used for research and educational activities⁹⁰.

3. Boost community and household composting

Compost has proved to be an effective option for valorising organic waste. However, separate collection is not enough for achieving good quality compost. The role of citizens is key, as poor sorting of organic waste and large quantities of foreign materials can result in a final product that

⁸⁸ Bruxelles-propreté, Recy-K. Retrieved on 6 September 2019 <https://www.arp-gan.be/en/Recy-K.html>

⁸⁹ Ibid.

⁹⁰ Zero Waste Europe, Zero Waste Study Tour 2018. Retrieved on 6 September 2019 <https://zerowasteurope.eu/2018/12/study-tour-2018/>

is not suitable for use, posing a risk with regards to soil pollution, for instance, due to the presence of microplastics.

Successful examples of community and household composting have proved that citizen engagement can be achieved when these programmes are accompanied by educational activities, some supervision and data collection that allows for identifying issues in the composting process at an early stage.

Best practice example: The Revitaliza project

The Revitaliza project started in 2015 with the aim of creating a decentralised, community-led system of bio-waste management in the province of Pontevedra, which is situated in the North of Spain. 50% of the population of the province of Pontevedra, which covers 61 municipalities, live in rural areas⁹¹.

The project offers three different composting solutions that fit diverse contexts:

1. Individual composting (COIN): intended for households situated in those areas in which the population ranges between 100 and 1.000 inhabitants and in which population groups are scattered, it consists of household composters that are distributed to citizens.
2. Community composting (CCC): intended for densely-populated areas, ranging from 100 to more than 1.000, it consists of 3 to 10 composting boxes which are placed together.

⁹¹ Zero Waste Europe, “The story of Pontevedra”, Zero Waste Europe, retrieved on 1 September 2019, <https://zerowasteurope.eu/downloads/the-story-of-pontevedra/>.

3. Local Composting Plants(PCC): intended for those areas that are particularly densely-populated, it consists of small composting plants with a capacity limit of 2.000 tonnes of biowaste per year⁹².

Data-collection is at the heart of the Revitaliza project. Specific monitoring and data collection processes were set up in the community and household composting systems. For the community composting systems, "master composters", who are in charge of doing maintenance tasks, such as ensuring that it keeps the right level of moisture, also keep track of data, such as compost's temperature or pests. For this, master composters use a mobile app that is connected to a web platform in which the data is recorded. In the case of household composters, master composters visit households to keep also track of the data⁹³.

Three years after its implementation, 44 of the 61 councils that conform the province of Pontevedra joined the Revitaliza project and 2.052 tonnes of bio-waste were composted, avoiding incineration and landfilling⁹⁴.

4. Integrate circular economy principles into public procurement

At the EU level, circular public procurement is part of the broader concept of "green public procurement", which is defined as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured" ⁹⁵.

⁹² Ibid.

⁹³ Ibid.

⁹⁴ Ibid.

⁹⁵ European Commission, Public procurement for a better environment, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Brussels, 16.7.2008 COM(2008) 400 final.

As indicated in its report on the implementation of the Circular Economy Action Plan, the Commission integrates the circular economy Green Public Procurement criteria. Circular public procurement criteria has a voluntary nature and is meant to evolve as new innovative solution emerges and the industry changes.

When it comes to public procurement at the local or regional level, it is key to promote the exchange of information and the dialogue between companies and public institutions. The latter are often not aware of the state-of-art in very technical domains, which can hamper the establishment of circular economy criteria. As shown in the case of the Green Deal of Circular Purchasing, implemented in Flanders (Belgium) promoting the dialogue between companies and purchasers can also be very useful for identifying regulatory barriers present, for instance, in the field of competition law.

Best practice example: The Green Deal on Circular Purchasing

The Green Deal on Circular Purchasing was launched by Circular Flanders in November 2017. The goals of the project were the following: to speed up the transition towards a circular economy through public procurement, to develop and share knowledge on circular procurement and to further expand a public-private learning network.

The participants of the Green Deal conform a public-private learning network that has conducted more than 200 experiments with the aim of building knowledge and testing tools, methods and new ways of chain collaboration. The ultimate goal of the project is to develop circular projects that can be scaled up and copied.

Two types of participants were part of the project: purchasing organisations, which committed to setting at least two circular procurement projects between September 2017 and the end of June

2019, and supporting organisations, which made concrete commitments for facilitating circular procurement in the region of Flanders.

In particular, buyers have to choose one or more goals that will guide them towards circular products and services. These goals were: reducing the total amount of materials, reducing non-renewable virgin input, extending the use/lifetime of products, optimising the potential reuse of products and components and optimising the potential recycling of products and materials⁹⁶⁹⁷.

5. Reinforce stakeholder cooperation

Cooperation, not only at the value chain level, but also across sectors and between companies and the public sector is key for a successful transition towards the circular economy. To this aim, the Commission has fostered diverse non-regulatory measures, including voluntary agreements, voluntary commitments made by the industry in the context of the Plastics Strategy, and a pledging campaign that was followed by the launch of the Circular Plastic Alliance, which brought together 30 key stakeholder organisations and was aimed at increasing the demand from users of recycled plastic in order to meet the target of 10 million tonnes of recycled plastics used in the EU by 2025.

Dialogue and cooperation are also essential for discovering innovative solutions and implementing them. EU funded projects can contribute to this end. An example of this is PlastiCircle, an Horizon 2020 funded project whose partnership includes local governments, recycling companies and stakeholder organisations.

Best practice example: PlastiCircle

⁹⁶ Circular Flanders, Green Deal Circular Purchasing. Retrieved on 8 September 2019
<https://circulareconomy.europa.eu/platform/en/commitments/green-deal-circular-procurement>

⁹⁷ Ibid.

PlastiCircle is an Horizon 2020 funded project which aims at developing smart containers for separate waste collection, improving transport routes and sorting and reprocessing technologies, and, eventually converting packaging waste into value-added products such as foam boards, automotive parts, roofing membranes, garbage bags, asphalt and urban furniture⁹⁸.

PlastiCircle will also promote the replication of the solutions found in the context of the project through training and awareness-raising activities for citizens, institutions and private companies. Three European cities will be the scenario for implementing pilot projects: Alba Iulia (Romania), Valencia (Spain) and Utrecht (Netherlands)⁹⁹.

Partners of the project include the municipality of Alba Iulia, which is a town of 74,233 inhabitants in Romania, the trade association PlasticsEurope, ICLEI – Local Governments for Sustainability, which is the world's leading association of cities and local and regional governments dedicated to sustainable development, and leading plastic and recycling companies¹⁰⁰.

Valencia was the first city to implement a PlastiCircle pilot, which took place in the neighbourhood of Sant Marcel·lí under the local name of 'ReciPlàstic'. Citizens could deposit their bags, containing light packaging waste, in one of the containers that were placed in the neighbourhood. These containers have a smart device attached, which issues a label with a bar code that identifies the user. This label should be stuck to the bag by the user before placing it in the container. This scheme allows recycling companies to know how waste was sorted by each user and, therefore, to reward those who did it correctly with a bonus in the form of "ecopoints", which can be later exchanged for various rewards. This gives citizens an incentive to improve the way in which they sort out waste¹⁰¹.

⁹⁸ PlastiCircle, retrieved on 7 September 2019 <http://plasticircle.eu/>

⁹⁹ Ibid.

¹⁰⁰ Ibid.

¹⁰¹ Ibid.

CONCLUSIONS

On the basis of the analysis made on this paper, three main conclusions can be extracted. First, the circular economy has a great climate mitigation potential. While recent studies have focused on the impact of rising the recyclability rates of high emissions materials, such as steel or aluminium, which are also addressed in detail in this paper, its potential also includes a wide variety of measures, such as waste prevention and building regenerative agriculture systems.

Secondly, in the circular economy field, numerous industry sectors with different preferences and capacities converge. Given that the main actor in these transition are business, along with local, regional and national authorities, cooperation and dialogue between stakeholders will be

essential for paving the way towards a circular economy. Both at industry level, including in the context of value chains, and between governments and business.

Lastly, citizens, and particularly the youth, must be at the centre of this transition. To this end, policy-makers should put the emphasis on facilitating the creation of new business aligned with the circular economy as well as the consolidation of a skilled labour force.

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