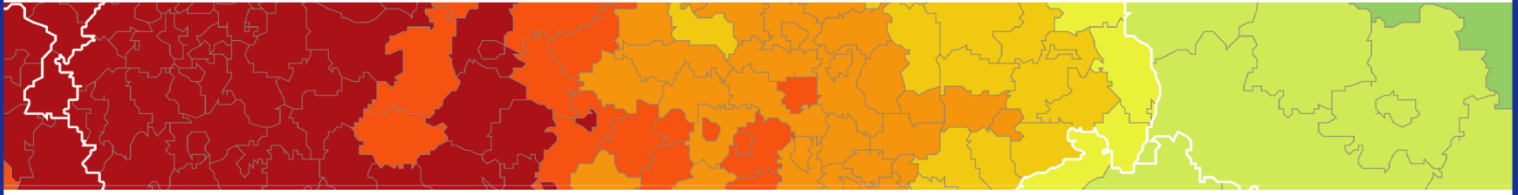


**Inspire policy making by territorial evidence**



# CIRCTER – Circular Economy and Territorial Consequences

Applied Research

**Final Report**

**Annex 8**

Towards place-sensitive policies for circular economy  
development

Version 09/05/2019

# Final Report

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## Abbreviations

B2B	business-to-business
B2C	Business to Consumer
C2C	Consumer to Consumer
CBM	Circular Business Model
CDC	Caisse des dépôts et consignations
CE	Circular Economy
CEAP	Circular Economy Action Plan
CER	European Remanufacturing Council
CLD	Causal Loop Diagram
C&D	Construction and Demolition
DE	Domestic Extraction
DMC	Domestic Material Consumption
DMI	Direct Material Input
EC	European Commission
EEA	European Environmental Agency
EMAS	European Monitoring and Audit Scheme
EMF	Ellen MacArthur Foundation
EPR	Extended Producer Responsibility
ERDF	European Regional Development Fund
ESPON	European Territorial Observatory Network
ETC	European Territorial Cooperation
EU	European Union
GDP	Gross Domestic Product
GPP	Green Public Procurement
GWR	Geographically Weighted Regression
JRC	Joint Research Centre
IS	Industrial Symbiosis
LMM	Last Minute Market
MBT	Mechanical-Biological Treatment
MFA	Material Flow Analysis
MS	Member States
MSW	Municipal Solid Waste
NACE	Nomenclature of Economic Activities
NUTS	Nomenclature of Territorial Units for Statistics
OLS	Ordinary Least Squares/Linear Regression
OVAM	Public Waste Agency of Flanders
P2B	Peer-to-business
P2P	Peer-to-peer
PPP	Purchasing Power Parity
RIS3	Regional Innovation Strategies for Smart Specialisation
RMC	Raw Material Consumption
RMI	Raw Material Input
ResCoM	Resource Conservative Manufacturing
SME	Small and Medium Enterprises
ToR	Terms of Reference
WEEE	Waste from Electrical and Electronic Equipment

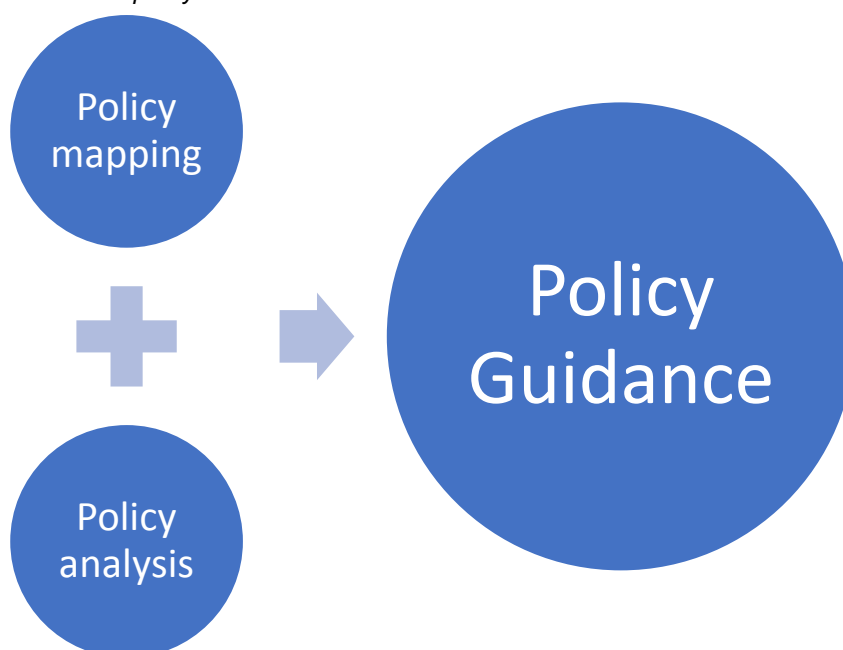
# 1 Introduction: key policy questions to be addressed by the CIRCTER project

## 1.1 Objectives and scope of the report

With the current report we aim at providing, in a synthetic way, an overview and an analysis of different types of circular economy policies and initiatives.

The report analyses the groups of policies identified during the policy mapping exercise and provides some concrete examples without going into details. Details on individual circular economy policies will be available in the Policy Guidance (Annex 11). The current report is also meant to serve as an interpretation tool for the Policy Guidance.

*Figure 1-1: Structure of policy-related work*



*Source: Own elaboration*

## 1.2 Policy mapping

We have carried out a relatively comprehensive but not exhaustive review of policies that have been contributing to the transition towards circular economy on different administrative levels: EU, national, regional and local. Additionally, we have also an-

analysed the identified policies with regards to their circular economy and territorial implications as well as circular economy implications. Given the fact that there are several other inventories of circular economy policies, we have looked for ways of providing additional value added to what already exists. Hence, the overall goal of the policy mapping is to provide better understanding of the links between the (transition to) circular economy and the territories through a policy perspective.

The focus of the mapping was not on the comprehensiveness but rather on the representativeness of the policies in view of drawing territorial conclusions and making useful and actionable recommendations. The usefulness of the policy mix selection in terms of lessons learned and links with the circular economy was the guiding element for us.

The ultimate goal of the mapping is to draw the attention of different stakeholders, from different types of territories to those policies which have worked well in another context. Policies have informed the Policy Guide and will be available for the stakeholders.

### 1.3 Definitions and classifications of circular economy policies

For the sake of the policy mapping exercise and the policy analysis we have adopted a relatively wide definition of a policy. In the proposal we included two types of classifications: one general classification and one classification in line with the EU Action Plan for the CE. The two classifications are complementary and have been used to design the policy mapping tool.

*Figure 1-1: Policy typology*

Type I	Type II
<ul style="list-style-type: none"> <li>• Strategic</li> <li>• Regulatory</li> <li>• Economic (charges, taxes, fiscal)</li> <li>• Financial (subsidies, investments, funding)</li> <li>• Institutional</li> <li>• Voluntary</li> <li>• Information (advisory, help desk, collaboration platform, training)</li> <li>• Tools</li> </ul>	<ul style="list-style-type: none"> <li>• Design</li> <li>• Production</li> <li>• Consumption</li> <li>• Waste management</li> <li>• Secondary material treatment</li> <li>• Multiple</li> </ul>

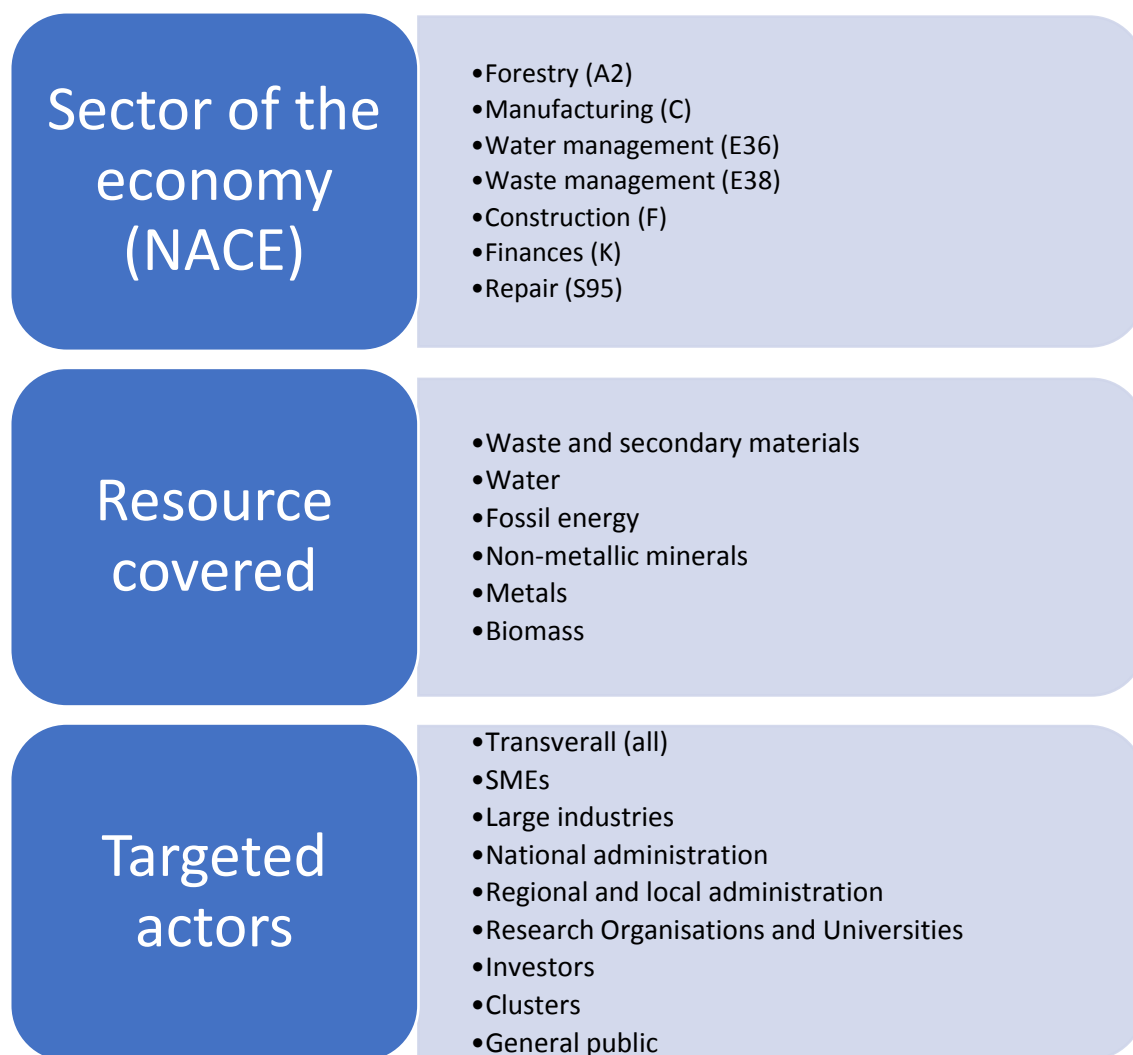
*Source: Own elaboration*



Additionally, the policies have been categorised by:

- Sector of the economy;
- Resource covered; and
- targeted actors.

Figure 1-2: Additional policy classification



Source: Own elaboration

The variety of classifications will allow readers of the policy guide to search different types of policies easier.

## 1.4 Analytical framework

We have analysed each one of the mapped policies with regards to the following criteria:

- Governance;
- Territorial aspects;
- Impact;
- Success factors;
- Replicability potential;
- Financing;
- Circularity;

Figure 1-1: Analytical framework for Circular Economy policies



Source: Own elaboration

#### 1.4.1 Governance

Under the governance part of policy classification we have noted the level of application of the policy - (EU, National, Regional (NUTS 1, NUTS 2, NUTS 3) and city level (LAU 1, LAU 2). This information will feed into the guidance document, facilitate the search and increase the use-fulness of CIRCTER policy work. In addition, the implementing agency is also provided.

### 1.4.2 Territorial aspects

The territorial analysis is of utmost importance for ESPON therefore we have provided sufficient details for it. First, our inventory provides a qualification if the territory is an initiator of the policy. This informs the reader if the regions/cities have a leverage over the policy, if they can change it, make it more ambitious, etc. This information will allow us to filter the policies by this criteria in the policy guide. The degrees (weak, average, strong) denote to what extent the region can leverage the policy.

Secondly, the inventory provides a judgement as to the extent the policies are relevant to the region/city and to what extent they are implemented on the given territorial level. For example, a target might have been adopted on a national level but there will be strong regional implications.

### CIRCTER typology of regions

The policy analysis will also be carried out in line with several regional classifications while taking into account a number of territorial factors.

Policy analysis will take into consideration the:

Urban-rural typology of TERCET<sup>1</sup>:

- Predominantly urban
- Intermediate
- Predominantly rural

and also the typology developed in the CIRCTER project:

- Industrial region losing importance
- Industrial region gaining importance
- Industrial region mixed directions

As well as combinations between these.

### Territorial factors

Where possible, policy analysis will be aligned with the seven territorial factors introduced in the Chapter 5, Annex 1, namely:

- agglomeration factors;

---

<sup>1</sup> <https://ec.europa.eu/eurostat/web/nuts/tercet-territorial-typologies>

- land-based resources;
- accessibility factors;
- knowledge-based factors;
- technology-based factors;
- governance and institutional factors;
- territorial milieus.

### **1.4.3 Impact**

Defining the impact of policies is not the focus of the mapping and no significant efforts have been invested into determining it. However, in certain cases, policies have been evaluated and experts have been asked to briefly describe the impacts of the policies on the economy (GVA generation), environment (reduction of resource consumption, etc) and the society (number of jobs created).

### **1.4.4 Success factors and replicability potential**

Success factors and replicability potential have been analysed based on expert judgement and not necessarily on evidence except from existing evaluations. With regards to the replicability potential of the policies experts have provided judgement if the policy would be of interest to other countries and regions.

### **1.4.5 Financing**

Wherever relevant, the link to Cohesion policy has been indicated: it could be through the fact that these actions have already been financed through Structural and Cohesion policy or could potentially be financed.

We are aware of the fact that ESPON is closely aligning its activities with the work and priorities of DG Regional and urban policy. Therefore, we try to take into consideration with recent developments of the post 2020 Cohesion Policy. The Cohesion policy analysis will be in the following directions:

- Integrating Circular Economy in the programming process (mainstreaming);
- Highlight types of successful initiatives that could be potentially financed by a future Cohesion policy framework.
- Highlight successful policies which could be included in the policy mix required by the European Commission as ex-ante conditionalities (if these will continue to exist) or recommended by the EC as relevant enabling factors.

- Identify successful place-based approaches for different categories of regions.

#### 1.4.6 Circularity

The circularity analysis starts with describing the targets within the policy relevant to circularity. It continues with the description of the transformative character of the policy related to circularity – reactive, incremental, radical, transformative. Policies are designed to achieve a certain objective which is associated with bigger or smaller transformation of individual and/or company behaviour. Usually, the more innovative a policy is the bigger its disruptive impact and hence transformational potential. This analysis is complementary to the policy effectiveness analysis and provides an additional insight into policy dynamics and impacts. The scope of the report (and the big number of mapped policies) does not allow a quantitative analysis of the policies. However, we have provided a qualitative analysis of the circular aspects of the mapped policies.

### 1.5 Structure of the report

The report is structured around the classification of circular economy policies adopted for this project. While no classification is perfect and some policies fall within two or more categories we attempt to make links between the typologies and avoid overlaps.

- **Chapter 1 Introduction** (this Section) covers the objective of the report, an overview of the policy mapping exercise as well as definitions and classifications of circular economy policies. It also provides the analytical framework for the analysis of circular economy policies.
- **Chapter 2 on Circular economy at EU policy level** gives an overview of the overall EU circular economy policy and debate as well as the monitoring framework at EU level. It mentions the European Strategy for Plastics in a Circular Economy and aspects of governance of circular economy within the EU. It also elaborates on the role of the Circular Economy Stakeholder Platform. The Chapter also provides an overview of the changing national paradigms on circular economy and gives examples of dedicated national strategies. Subsequently, the chapter provides some examples of circular economy policies and initiatives on regional and local level.
- **Chapter 3 focuses on Extending the life of products and materials.** It provides an analysis of policies on better repairability through circular design and also dwells on targets for repairability and reuse. The chapter also addresses policies for durability and fighting the premature obsolescence. It

tackles the instrument of warranty as a tool to extend the life of products. It also explores the link between standardisation and circularity as well as reverse logistics as a key enabler for extending the life of products.

- **Chapter 4** dwells on the **sharing economy and collaborative consumption as a circular business models**. It makes an overview of different collaborative platforms.
- **Chapter 5** elaborates on **Soft strategies to support circular systems** including voluntary agreements for circularity between governments and industry actors. The chapter also elaborates on the link between the environmental labelling and circularity as well as the role of public procurement for circular economy.
- **Chapter 6** focuses on the role of **the manufacturing industry and the bio-economy** to close loops for the circular economy. It elaborates on remanufacturing as a major tool for a circular industry and elaborates on EU policies and approaches. The chapter also elaborates on policies for supporting the bioeconomy and bio plastics including the European Bioeconomy Strategy and the EU Plastics Strategy.
- **Chapter 7** emphasises the **role of good governance and behavioural change** as an enabling factor for the circular economy.
- **Chapter 8** explores issues such as the **link between Cohesion policy and circular economy**; it elaborates on the issue of **financing for circularity** by providing examples of national funds, a pension fund and a national financial institution. It also covers the link between Circular economy and Territorial Agenda 2020.
- **Chapter 9** elaborates on the issue of **Circular economy in different territories with geographical specificities** including coastal and mountainous regions but also sparsely populated regions and islands.
- **Chapter 10** includes brief conclusions from the report.
- **Chapter 11** presents CIRCTER recommendations for policy development in different areas of the circular economy.
- **Chapter 12** includes the references used during the drafting of this report.

## 2 The Circular economy at EU policy level

### 2.1 The circular economy within strategic EU documents. Current policy debates

The concept of circular economy has been given a high profile in the EU policy discourse during 2010-2014 by Janez Potocnik, the then Commissioner for the Environment. Circular economy has been organically fostered upon the earlier resource efficiency related policy developments, namely Europe's **Roadmap to a Resource Efficient Europe** (European Commission 2011) – a core instrument of the **Resource Efficient Europe Flagship Initiative** of the **Europe 2020 Strategy** promoting agenda for growth and jobs with an emphasis on smart, sustainable and inclusive growth.

The EU **Circular Economy Action Plan** (European Commission 2015) (hereafter CEAP), was adopted by the Commission on 2 December 2015, and provides the backbone of Europe's Circular Economy Package. It outlines a series of measures and actions which aim to “stimulate Europe's transition towards a circular economy which will boost global competitiveness, foster sustainable economic growth and generate new jobs”. The CEAP includes broad instruments touching on a range of sectors and policy areas, but notably resource efficiency, waste management and innovation. The plan replaced the first EU level proposal on circular economy, the Communication “Towards a circular economy: a zero waste programme for Europe” (European Commission 2014).

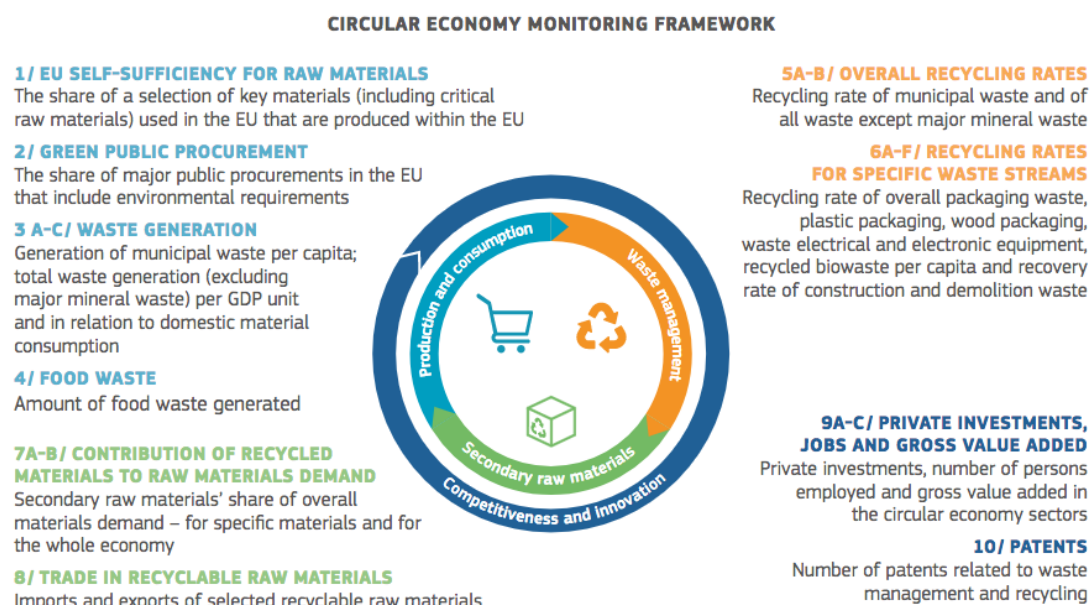
The Commission's Report on the implementation of the CEAP European Commission (2017) notes the contribution of the CEAP in mainstreaming the concept of circular economy, outlining activities in areas as diverse as the online sale of goods, fertilizers, innovation, eco-design, food waste, waste-to-energy and financing to support circular economy. CEAP does not have strong territorial references and regions cannot influence it in any way. However, regions can undertake initiatives and adopt policies for furthering its implementation. Three years after adoption, the Circular Economy Action Plan is fully completed and its 54 actions have been delivered, even if the work on some of them continues beyond 2019. Hence, the Circular Economy package has been finalised.

Since the CEAP, **legislative proposals have been made to revise several pieces of waste legislation** with the goal of adopting higher targets and providing higher degree of circularity. They will be dealt with separately in the Waste Chapter.

The **Circular Economy Monitoring Framework** (European Commission 2018a) has been launched recently to support in tracking the progress towards the circular economy objectives through a set of indicators that will be further improved and expanded.

Today the monitoring framework consists of ten indicators in four areas: (1) production and consumption, (2) waste management, (3) secondary raw materials and (4) competitiveness and innovation. This broadly follows the logic and structure of the Circular Economy Action Plan.

Figure 2-1: Areas and indicators of the EU circular economy monitoring framework



Source: European Commission (2018a)

The CEAP also called for the development of an EU level strategy to address the challenges posed by plastics. Subsequently in January 2018, the European Commission launched the **European Strategy for Plastics in a Circular Economy** (European Commission 2018b). This first ever dedicated EU strategy aims to promote a more sustainable and circular use of plastics in the EU, taking into account the full value chain including design, production, consumption and materials/waste management and also all ecosystems including land and sea. It includes key commitments for EU level action in four main areas: improving the economics and quality of plastics recycling; curbing plastic waste and littering; driving innovation and investment towards circular solutions; and harnessing global action. Waste aspects of the Strategy are discussed in the waste chapter below. The Circular Economy package also contains a report A Circular Economy for Plastics providing insights from research and innovation to inform policy and funding decisions.



## 2.2 Governance within the EU

The CEAP has so far involved the engagement of several European Commission departments, including DG Environment, the Secretariat General, DG Grow, and Eurostat, as well as the cabinets of First Vice President Timmermans, Vice President Katainen and Commissioner Vella. The current Commission is committed to ensuring the ongoing implementation of the CEAP.

Additionally, activities include focused efforts at stakeholder engagement, notably via the **Circular Economy Stakeholder Platform (2018)**, as well as public consultations on specific policies, such as those carried out for the development of options for the interface of waste, waste and chemicals legislation, on reducing marine litter through action on single use plastics and fishing gear, and on options for reducing microplastics. The potential for circular economy transition to touch on different parts of Europe's economy has also led legislators to actively seek the support of the business community. The Plastics Strategy Pledging Campaign to encourage the uptake of recycled plastics is illustrative of this (see Annex III to European Commission 2018b).

The breadth of the EU policy landscape in relation to circular economy, shows the importance it is given by EU policy-makers. However, this complexity also runs the risk of specific issues of importance to the circular economy being the subject of multiple policies and pieces of legislation, or falling between policies/legislation. For example, in the waste policy arena there is a lack of some common definitions/terminology and comparable calculation methods for waste generation/waste management, which can hamper assessments of the true level of progress towards a circular economy in the EU. Litter is another prominent example of an issue that is potentially addressed across many pieces of legislation yet also endures significant legislative gaps. Only recently it was explicitly mentioned in the Waste Framework Directive; it has not been included as a monitored pollutant in the freshwater environment historically and new proposals suggest it only be addressed under the Water Framework Directive if obligations on marine litter under the MSFD are not met.

The complex policy landscape can also be confusing for businesses and citizens, highlighting the importance of engaging stakeholders to ensure they are informed which will allow them to better develop and implement circular economy related policies and legislation.

## 2.3 Changing the national paradigms: dedicated national strategies for circular economy

Every EU Member State has a set of policy measures that can be related to some elements of circular economy. They have been largely shaped under the waste and

resource efficiency policies, mainly focusing on aspects like addressing material resource losses via savings, implementing waste and packaging recycling schemes.

The European Environmental Agency 2016 survey of the Members States showed that also waste prevention plans and initiatives on the use of secondary raw materials featured prominently. Nine EU Member States have adopted their own targets for improving resource productivity (European Environment Agency 2016). These are in addition to the waste and energy target that are defined by the EU legislations.

The circular economy concept has also actively penetrated the policy discourse in the Members States, largely due to its importance at the EU level in recent years (Eco-innovation Observatory 2016). Beyond waste topic, other elements of the circular economy are becoming visible in the policy discourse, such as servitisation, remanufacturing, digitisation, collaborative economic models, etc. Circular economy goals are also being integrated in the economic development strategies, including on regional ones.

By today a number of Member States have developed a dedicated circular economy strategies and roadmaps (see Table 2-1).

*Table 2-1: Circular economy strategies adopted by Member States*

<b>Member State</b>	<b>Strategy document</b>	<b>Scope and objectives</b>	<b>reference</b>
Belgium	<a href="#"><u>Towards a pioneering Belgium in the circular economy</u></a>	At the end of 2015, Belgium's federal ministers responsible for the environment and the economy jointly presented their roadmap for the circular economy ("Vers une Belgique pionnière de l'Economie Circulaire"). It includes 21 measures in support of regional action and focuses mainly on product design (and consumer protection).	Federal Government of Belgium (2014)
Netherlands	<a href="#"><u>A Circular Economy in the Netherlands by 2050</u></a>	Adopted in 2016 The Government-wide programme for a Circular Economy is aimed at developing a circular economy in the Netherlands by 2050. Its ambition is to realise, together with a variety of stakeholders, an (interim) objective of a 50% reduction in the use of primary raw materials (minerals, fossil and metals) by 2030. It has as main priorities: Biomass and food, plastics, the manufacturing industry, construction sector and consumer goods.	The Ministry of Infrastructure and the Environment and the Ministry of Economic Affairs of the Netherlands (2016)
Finland	<a href="#"><u>Leading the cycle – Finnish road map to a circular economy 2016-2025</u></a>	Adopted in 2016 the Finnish Roadmap to achieve a Circular Economy goal is to create a shared mindset in Finnish society to promote the circular economy and determine the most effective means to do it. The Roadmap focuses on 5 focus areas, topics that will initially be used in advancing the circular economy in Finland. Based on Finland's traditional	Sitra (2016)

Member State	Strategy document	Scope and objectives	reference
Germany	<a href="#"><u>Germany's Resource Efficiency Programme (ProgRess) II</u></a>	<p>strengths, these topics include a sustainable food system, forest-based loops, technical loops, transport and logistics, and joint actions.</p> <p>In 2002, the Federal Government had already embedded the goal to double the German resource productivity by 2020 compared to 1994 in its sustainable development strategy, inter alia, through the closing of material cycles. The German Resource Efficiency Programme (ProgRess I and II) now aims to decisively contribute to this end (EIO 2015 report on Germany). The new programme 2016-2019 encompasses in total 116 different proposals for resource efficiency measures. The waste and circular economy policy realm in the programme was fundamentally and strongly expanded and gained the rank of a focus area besides raw material supply, production, consumption, and overarching instruments. Overall, the programme provides some crucial contents for the (further) development of the circular economy.</p>	Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) (2016)
Portugal	<a href="#"><u>Leading the transition: a circular economy action plan for Portugal</u></a>	<p>Adopted in the end of 2017, The Action plan is organised in:</p> <ul style="list-style-type: none"> <li>i) seven macro actions, which include, for example, "Incentivizing a circular market" and "A new life for waste!";</li> <li>ii) sectoral actions for two areas, built environment and public procurement, while three more are envisioned for the near future (tourism, textiles and footwear, retail and logistics), and</li> <li>iii) a call for regional agendas organized around industrial symbiosis, circular cities and circular businesses.</li> </ul> <p>The action plan has a relatively small time frame, covering the period 2017-2020</p>	Ministry of Environment of Portugal (2017)
Italy	<a href="#"><u>Towards a Model of Circular Economy for Italy - Overview and Strategic Framework</u></a>	<p>This document developed in 2017 defines Italy's strategic positioning on the issue in line with the commitments adopted under the Paris Agreement, UN Agenda 2030, G7 Communiqué and within EU.</p> <p>The document calls for a "change of paradigm" for Italy's economy, for a new way to consume, produce and do business. There is a need for a new industrial policy aimed at sustainability and innovation capable of increasing the competitiveness of products and manufacturing.</p>	Ministry for the Environment, Land and Sea Ministry of Economic Development of Italy (2017)
France	<a href="#"><u>Circular Economy Roadmap of</u></a>	Adopted in 2018 the French roadmap includes four key priority areas: better production, better consumption, better	Ministry for Ecological and Solidary

Member State	Strategy document	Scope and objectives	reference
	<a href="#"><u>France: 50 measures for a 100% circular economy</u></a>	waste management, and engaging all stakeholders. In quantitative terms, the roadmap's aims include: Reducing resource consumption 30% by 2030 Reducing the quantity of non-dangerous waste landfilled 50% by 2025 Moving towards a 100% plastic recycling rate by 2025 Reducing greenhouse gas emissions by about eight million tons per year through enhanced plastics recycling Creating up to 300,000 new jobs, including in new business activities	Transition of France (2018)
Slovenia	<a href="#"><u>Roadmap towards the Circular Economy in Slovenia</u></a>	Adopted in 2018 the Roadmap towards the Circular Economy in Slovenia sets the path for Slovenia to become a circular economy front runner in the region. Designed through an inclusive, multi-stakeholder approach, it identifies four priority sectors, give recommendations to the government and identifies best practices. The Roadmap introduces the Circular Triangle, a model which unites three inseparable elements – Circular Economy (business models), Circular Change (government policies) and Circular Culture (citizens), three interdependent aspects that are at the core of systemic change from a linear to a circular economy in Slovenia.	Ministry of Environment and Spatial Planning, Republic of Slovenia & Circular Change Platform (2018)
Spain	<a href="#"><u>Spanish Strategy on Circular Economy (to be published in 2018)</u></a>	The Spanish Ministry of Agriculture and Fisheries, Food and environment started to draft the first Spanish Strategy on Circular Economy (Estrategia Española de Economía Circular) in March 2017, in order to promote the shift towards a model of circular economy in the country. Today it has been consulted and finalised. Among the main action areas of the Strategy on Circular Economy is the focus on product obsolescence . There is no official definition at EU level of what obsolescence is. The strategy makes reference to this term and also highlights the fact that the "Plan Estatal de Investigación Científica y Técnica y de Innovación" has a course of action in this area to promote new design systems of products to promote the extended service life, reparability and reduced obsolescence"	Ministerio de Agricultura, Pesca y Alimentación - Ministerio para la Transición Ecológica (2018)

## 2.4 Circular economy thinking goes down to regional and city levels. Some examples of regional and urban policies

Policy actions to facilitate transition towards circular economy have also been taken by selected regions and cities. Some have already adopted their circular economy strategies, in other cases regions and cities have been introducing the circular economy narratives in their waste, economic, agriculture, bioeconomy, construction and other policies (e.g. Basque Country, Venlo/Limburg, Lazio, Kalundborg), as well as in the Smart Specialisation strategies (e.g. Wallonia, Kymenlaakso, etc). However, the main part of the integration of circular economy in the regional strategic thinking is yet to be done. It is very clear that when regions and cities plan their strategic approach to the circular economy, place-based considerations will have to seriously be taken into account. These also need to build upon existing regional strategic documents such as Regional Smart Specialisation Strategies (RIS3), regional waste management plans, regional energy strategies, etc. These also depend on the legal framework of the country.

Rural regions will be in a position to explore the opportunities presented by the bioeconomy, agricultural waste, etc. Urban regions will be best placed to engage in Construction and Demolition (C&D) waste recycling, the collaborative economy as well as other circular economy business models related to extending product's life cycle. Regional and urban strategies need to take into consideration the local assets, educational level, the accessibility, the local value chains, etc.

There are initiatives and cooperation projects providing opportunities to regions to learn and share experience about promoting circular economy in the regions and cities. E.g. **Interreg projects** such as BIOREGIO (2018), CircPro (2018), CircE (2018), ENHANCE (2018), TRIS (2018), CESME (2018), SYMBI (2018) focusing on various issues and instruments in the context of building a circular economy, including procurement, SMEs inclusion, environmental management, urban planning, Bioeconomy, industrial symbiosis, etc. Over 30 regions are involved in these projects and envisage to make some policy actions to address circular economy from one or another perspective.

**The Horizon 2020 SCREEN project** (2018) brings together 17 regions and aims at developing a systemic replicable approach for funding synergies for eco-innovative solutions in Europe.

**“Covenant 2022 – Circular Economy”** is another initiative facilitating circular economy policy commitments in the cities and regions (European Commission 2018c). The Covenant is a multi-stakeholder initiative which has been inspired by the Covenant of Mayors. It is a ‘voluntary scheme’ and aims to focus on an efficient use of natural resources in a collaborative economy at territorial level (a Region, An Urban

Community, A City, a Rural Municipality as well as between Regions, Cities and Communes). The Covenant sets action plans for regions, cities and other economic and social actors in an open-coordination way to improve value chain performance in the framework of the European Innovation Partnership (EIP) on Raw Materials. It establishes mechanisms for open coordination among actors in seven pillars: sustainable supply chains including sustainable mining, eco-design, Industrial and territorial ecology (more commonly known as Industrial Symbiosis, Economy of the future (how to use more efficiently), Responsible consumption, Extension of the duration of use and remanufacturing, Recycling. The Covenant will lead to action plans at regional level and deliver results by 2022, the time of Rio+30. Nine regions and one city have signed the Covenant 2022.

*Table 2-2: Circular economy strategies adopted by regions and cities*

Region/city	Strategy document	Scope and objectives	reference
Catalonia, Spain	<a href="#">Strategy of the Government of Catalonia: Promoting Green and Circular Economy in Catalonia</a>	The Strategy for Promoting Green and Circular Economy of the Government of Catalonia aims to foster sustainability as a strategic area to attain economic recovery, increase competitiveness, create jobs, and reduce environmental risks. This strategy is structured into key policies' areas for promoting green and circular economy: the generation of demand and creation of markets, the improvement of the access to funding, the stimulation of research, development and innovation, the boosting of internationalisation and the promotion of employment and entrepreneurship. This strategy therefore contextualises the concept of green and circular economy in Catalonia. At the same time, it is a strategic roadmap that establishes the main areas of work for the medium-term, which are essential to promote this model in Catalonia.	Government of Catalonia (2015)
Scotland, UK	<a href="#">Making Things Last: a circular economy strategy for Scotland</a>	This strategy sets out our priorities for moving towards a more circular economy - where products and materials are kept in high value use for as long as possible. It builds on Scotland's progress in the zero waste and resource efficiency agendas. Four areas were prioritised: <ul style="list-style-type: none"> <li>• Food and drink, and the broader bioeconomy;</li> <li>• Remanufacture, which is already contributing £1.1 billion per year to Scotland's economy with potential to grow by a further £620 million by 2020;</li> </ul>	Scottish Government (2016)

Region/city	Strategy document	Scope and objectives	reference
Päijät-Häme, Finland	<a href="#">Päijät-Häme Circular Economy Road Map</a>	<ul style="list-style-type: none"> <li>• Construction and the built environment, as it accounts for about 50% of all waste in Scotland;</li> <li>• Energy infrastructure: there are considerable opportunities such as the reuse of equipment from wind turbines and decommissioned oil and gas platforms.</li> </ul> <p>The vision of Päijät-Häme is to be “the successful resource efficient region” in 2030. The road map process to define vision and goals involved stakeholders like regional and municipal authorities, higher education institutions, a regional development corporation, and private and public companies. The road map work continues with updating and specifying the actions together with regional stakeholders. Road Map has five main themes:</p> <ul style="list-style-type: none"> <li>• Closed loops of technical streams to create added value</li> <li>• Sustainable business from bio circular economy</li> <li>• Towards energy self-sufficiency by sustainable transport and energy solutions</li> <li>• Shared economy generates new consumption models and business opportunities</li> <li>• Piloting and demonstrating innovative circular economy solutions</li> </ul>	Päijät-Hämeen Tiekartta (2018)
Brussels Capital Region	<a href="#">Regional plan for the circular economy, Brussels Capital Region</a>	<p><b>Brussels Capital region Circular Economy strategy</b>, adopted in 2016, sets a 10 year framework to move Brussels' economy towards a circular model.</p> <p>The strategy is focused on three objectives: transform environmental goals into economic opportunities, anchor the Brussels economy, where possible, to local produce and to minimise transportation whilst optimising the use of available territory in order to create additional value for the people of Brussels and to contribute to the creation of employment. It is structured in 4 different axes (combining 111 actions):</p> <ul style="list-style-type: none"> <li>• Transversal ( regulatory framework);</li> <li>• sectorial (specific industries);</li> <li>• territorial and</li> <li>• governance (to bring together 3 ministerial department)</li> </ul>	Be circular be.brussels (2018)
Flanders, Belgium	<a href="#">Circular Flanders kick-off statement</a>	<p>Circular Flanders is the hub for the Flemish circular economy. It is a partnership of governments, companies, civil society, and the knowledge community that will take</p>	Vlaanderen Circulair (2017)

Region/city	Strategy document	Scope and objectives	reference
Extramadura, Spain	<a href="#">Extremadura 2030 - Strategy for a Green and Circular Economy</a>	<p>action together. Each one has committed to carrying out a specific action. OVAM (the Public Waste Agency of Flanders) has been appointed by the Flemish government as the initiator of Circular Flanders.</p> <p>In 2017 the Regional Government of Extremadura has developed a 'Strategy for a Green and Circular Economy' titled "Extremadura 2030". The objective is to encourage the production of goods and services while reducing the consumption and waste of raw materials, water and energy sources, thus based on the principle of closing the lifecycle of production. By doing so the regional government of Extremadura has created an intrinsic link between its overarching regional economic policy goals, European priorities for a sustainable economic future and the global fight against climate change. This strategy calls for citizens, businesses, civil society, public administration and the scientific community to collaborate in realising the circular economy. Implementation is foreseen through 4 horizontal programmes across 7 thematic axes. - Massive citizen participation program; - Citizen training program in green leadership; - Green and bioeconomy R&amp;D support program; - Program for the identification and enhancement of the full potential of the green economy of Extremadura.</p>	Regional Government of Extremadura (2017)
Amsterdam, Netherlands	<a href="#">Circular Amsterdam: vision and action agenda for the city and metropolitan areas</a>	<p>As a pillar of Amsterdam's sustainability policy, creating a circular economy is high on the municipality's agenda. Results from the study 'Circular Amsterdam: A vision and roadmap for the city and region' provide guidance to the municipality regarding potential steps towards increased circularity. The roadmap explicitly connects with and builds on the many initiatives that are already being implemented.</p>	Circle Economy, Amsterdam city government, .Fabric and TNO (2017)
London, UK	<a href="#">London's Circular Economy Route Map</a>	<p>The London circular economy route map outlines a vision of a capital city thriving through the adoption of the principles of circular economy: an economy which keeps products, components and materials at their highest use and value at all times.</p>	London Waste and Recycling Board (2017)
Aquitaine Limousin Poitou-Charentes	roadmap towards a circular economy	<p>The French region Aquitaine Limousin Poitou-Charentes has committed to being a national pilot on implementing a circular economy. Faced with the end of gas exploitation, a system of industrial symbiosis was established connecting new</p>	RECITA collaborative platform (2018)



Region/city	Strategy document	Scope and objectives	reference
		industrial facilities including chemical, bioenergy and carbon fibre industries. In December 2014, the region adopted a roadmap towards a circular economy which outlines twenty proposed actions. Among others, the proposals include mobilising stakeholders with a collaborative tool; observing, capitalising on, and sharing data on material flows and waste; promoting the use of recyclable materials and sorting within public procurement; and deploying operational tools aimed at businesses. One important role that the region has taken on is match-making and facilitating cooperation between stakeholders. In April 2016, the region launched RECITA, a regional platform dedicated to the circular economy and its deployment in the territory	

The **Regional Innovation Strategies for Smart Specialisation (RIS3)** are ‘integrated, place-based economic transformation agendas that focus policy support and investment on priority areas; build on strengths and competitive advantages; support technological innovation; and get stakeholder involvement.’ (RIS3 Guide). RIS3 strategies provide a very good opportunity for integrating circular economy in the regional policy landscape. This raises the profile of the topic and guarantees financial flows for circular economy projects – regional, national and European. In addition, it ensures a higher stakeholder buy-in into necessary innovative actions and projects. For example, the Finnish region of Päijät-Häme included the circular economy in their RIS3 strategy. The city of Lahti also included circular economy in its urban development strategy. (Interreg Europe study visit to Päijät-Häme ). An additional benefit for the regions comes from the fact that by including CE in the RIS3 strategies regions are forced to apply a monitoring framework.

## 2.5 The demise of waste

The EU waste policies developed in the past 30 years have brought a revolution in handling waste in the European Union. EU waste legal framework is complex and comprehensive. The EU Waste Framework directive sets the overall frame, logic and definitions in waste management in the EU. It emphasizes the importance on the waste hierarchy, recovery, recycling and use of Best Available Techniques (BAT). The Thematic Strategy on the Prevention and Recycling of Waste has been the strategy which inspired a number of concrete directives. Then there are directives addressing different types of waste operations such as landfilling (i.e. Waste Landfill Directive)

and incineration (i.e. Waste Incineration Directive). A big number of policy documents tackles different types of waste streams including: Packaging Directive 94/62/EC, End-of-life Vehicles Directive 2000/53/EC, Waste from Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC, Batteries and accumulators 2006/66/EC, Construction and demolition waste Directive 2008/98/EC. Additionally, very targeted waste legislation covers disposal of chemical substances, sewage sludge in farming and management waste from extractive industries. A piece of legislation very relevant to the circular economy is the Waste Shipment Regulation framing waste trade between EU Member States.

Therefore, the overall impact of waste-related policy on the circular economy is significant. All efforts in terms of policy and initiatives to prevent the generation of different categories of waste fit into the notion of circular economy despite the fact that there is no closing of the loop per se. The increase of different recycling targets is a notable example of circular economy-related amendments.

## **2.6 Territorial implications of waste policies**

Regions and cities usually have a significant leverage in waste management. In most cases individual municipalities are responsible for waste management. Also, regions are a suitable geographical level for coordinating the efforts of individual municipalities and setting up systems for integrated waste management.

Additionally, cities are a major generator of different types of waste including Municipal Solid Waste (MSW), Construction and Demolition (C&D) waste and industrial waste because of the high population and industrial density. An urban setting, which tends to support a diverse and compact pattern of production and consumption, is further advantageous to advance the notion of 'industrial ecology' whereas waste from one production is used by another industry (Lowe and Evans 1995). Therefore, cities and regions hold the key to many more exciting policy innovations.

In France, there is an interesting example of an award targeted at different types of territories – Territoires Zéro Déchet Zéro Gaspillage (TZDZG)<sup>2</sup>. (Territories with Zero Waste and Zero Wasting) bringing together the waste issue with the territorial dimension.

Rural regions have different challenges as long as waste is concerned. For example, they need to deal with wastes from agricultural processes (which could be highly polluting) and their reuse in crop cultivation, irrigation and fertilisation. With regards to the CIRCTER regional typologies - industrial regions losing importance and those

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<sup>2</sup> <https://www.ecologique-solidaire.gouv.fr/territoires-zero-dechet-zero-gaspillage>

gaining importance - it is not necessary to differentiate artificially the approach to waste. At the same time, one can argue that regional industrialisation strengthens the case for exploring industrial symbiosis models as well as approaches to greening particular value chains present in the agglomeration economies.

An interesting example of the territorial limitations of the circular economy in the waste sector is the reuse of C&D waste. Because of its high volume and therefore high transportation costs leading to potentially negative environmental impacts, the reuse of C&D waste (if all other obstacles are removed) would only be viable and acceptable on a very local level.

When we discuss the link between waste and the territories we have to mention waste recycling which, in the majority of cases, need to be carried out locally and take onboard spatial considerations.

## **2.7 Major EU waste policies: Latest developments on waste policy reforms for circularity**

Since the CEAP, legislative proposals have been made to **revise several pieces of waste legislation**, namely the Waste Framework Directive (2008/98/EC), the Packaging and Packaging Waste Directive (94/62/EC), the Landfill Directive (1999/31/EC), the Directives on Waste Electrical and Electronic Equipment (2012/19/EU), End of Life Vehicles Directive (2000/53/EC), and Batteries and Accumulators (2006/66/EC), and the Port Reception Facilities Directive (2000/59/EC). The objectives include setting long-term recycling targets for municipal waste and packaging waste; further reducing landfill; promoting greater use of economic instruments; setting general requirements for extended producer responsibility; and simplifying and harmonising definitions and calculation methods. In addition, the Commission is promoting steps to support repairability, durability, and recyclability of products in product requirements under the Eco-design Directive (2009/125/EC). These trends in strengthening EU waste legislation are clearly in line with enhancing its circular economy dimensions.

### **2.7.1 European Strategy for Plastics in a Circular Economy**

The **European Strategy for Plastics in a Circular Economy** (COM/2018/28) deserves a special mention in this chapter because of the seriousness of the plastic problem globally and in the EU. The strategy addresses the whole lifecycle of plastics including plastic waste management. It calls for curbing plastic waste and littering; driving innovation and investment towards circular solutions; etc. Actions to be taken over the coming years include developing definitions/standards on specific aspects

of plastics and plastic waste management. Legislative highlights announced in the Strategy include a new legislative proposal on single use plastics (see below), and revisions of the Packaging and Port Reception Facilities Directives. In January, 2019 the European Parliament has voted a ban on single-use plastics paving the way to a Single Use Plastics Directive. In addition, several marine-litter related measures will be undertaken, e.g. to reduce the loss of fishing gear and of plastic from aquaculture and reduce the intentional addition of microplastics to products. Guidance will also be issued on separate waste collection and sorting and extended producer responsibility, and definitions/standards developed relating to the quality of sorted plastics waste and recycled plastics, compostable and biodegradable plastics, and methods to monitor marine litter. One of the reasons for adopting the Strategy is that for the whole value chain potential for plastics recycling remain largely unexplored.

### 2.7.2 Single-use Plastics Directive Proposal

The EC proposed on May 2018 new EU-wide rules to target the 10 single-use plastic products most often found on Europe's beaches and seas, as well as lost and abandoned fishing gear. Together these constitute 70% of all marine litter items. The main objective of the directive would be to prevent and reduce plastic marine litter from single use plastic. This piece of legislation is elaborated in the wider context of the transition to the Circular Economy. The 10 items include: food containers; cups for beverages; cotton bud sticks; cutlery; balloons; wrappers; beverage containers and bottles; tobacco filters; sanitary items; plastic cups and fishing gears. The proposal envisages several policy approaches to address the plastic waste problem:

- Major focus on Extended Producer Responsibility for most of the items;
- Awareness raising measures for most items;
- Market restriction are envisaged for cotton bud sticks, cutlery and balloons;
- Product design requirements (beverage containers and bottles);
- Consumption reduction (food containers and cups)

Table 2-3: Waste policies and initiatives and circularity

Legislation	Circularity
<b>Landfill Directive/Proposed directive on landfill</b>	Aims at phasing out landfilling by 2025 for recyclable waste (including plastics, paper, metals, glass and bio-waste) in non-hazardous waste landfills, corresponding to a maximum landfilling rate of 25%
<b>Waste Shipment Regulation</b>	Traded wastes are a good opportunity to support circularity and support recycling, reprocessing, etc. However, a regulation was necessary to prevent abuses.

<b>Denmark Without Waste (I &amp; II)</b>	Where waste in Denmark is commonly used to incinerate, the aim of this programme was to recycle it instead.
<b>Food waste prevention in Spain</b>	The strategy focuses on strategy: prevention (of food waste), reuse, recycling and lastly, other types of recovery.
<b>Textile Recycling Association</b>	Textile recycling needs not only commitment from industry, but also awareness of consumers and help to overcome market failure (due to small value of low-grade recycled textile)

*Source: own elaboration*

### 2.7.3 Reduction of food waste

**The EU Platform on Food Losses and Food Waste** aims to support all actors in defining measures needed to prevent food waste, sharing best practice and evaluating progress made over time. The Platform brings together public entities including Member States, EU bodies and international organisations and actors in the food value chain including consumer – and other non-governmental organisations.<sup>3</sup> (

**Last Minute Market (LMM)**<sup>4</sup> is an initiative addressing the need to reduce food waste. Having started as a spin-off from the University of Bologna (Italy), the activities of Last Minute Market have expanded to other sectors. Today LMM is an entrepreneurial society working at national level in Italy focused on developing local projects for recovery of unsold goods in favour of non-profit organisations. LMM supports the creation of a solidarity network and facilitates the contact between non-profit institutions and businesses. The services offered by LMM include: recovery of surpluses (food, meals, medicines, books, non food goods, etc.); data analysis, loss and waste analysis, estimating the environmental and social impacts; training for schools, companies and institutions and communication, marketing projects and content production. Examples of successful recovery projects:

- Recovery from retail sector: After 2 years of work, 200 supermarkets directly did not throw unsold products, but donated them to non-profit organisations. In 2017 the donated goods amounted to 5.5 MEUR.
- Recovery of cooked meals not served by canteens: the recovery of meals is active since 2004 and currently involves multiple structures: canteens, hospital cooking centres; school canteens and catering centres.

Collaboration with public authorities towards promoting zero-waste in legislation is another essential element of the initiative. LMM proved to be successful and can

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<sup>3</sup> [https://ec.europa.eu/food/safety/food\\_waste/eu\\_actions/eu-platform\\_en](https://ec.europa.eu/food/safety/food_waste/eu_actions/eu-platform_en)

<sup>4</sup>

serve as an inspiring example for other regions interested in promoting action towards addressing food waste and promoting more efficient use of resources.

## 2.8 Industrial symbiosis

Industrial symbiosis (IS) is an approach that engages several organisations across different fields in a process of developing mutually beneficial transactions to reuse waste and by-products. This involves often times finding innovative solutions to identify business opportunities that capture the value of underutilised resources and / or optimise the value of the industrial processes in question benefits (Domenech et al, 2018, Lombardi & Laybourn, 2012).

Making industrial symbiosis happen depends on many governance and policy factors, especially due to the current market conditions for by-products and reused materials, as well as the regulatory conditions for specific materials. Industrial Symbiosis initiatives have been emerging through two different approaches, either as self-organised activities (e.g. with the well-documented example in Kalundborg, Denmark) or as managed processes. While self-organised activities emerge in traditional industrial clusters and tend to be locally bound, the managed (and especially facilitated networks) networks can have a larger geographic scope. Domenech et al. (2018) distinguish between two types of managed IS initiatives:

- a) **facilitated networks**, where there is a coordinating entity that promotes the development of the network and works with existing companies to identify IS opportunities; see Figure 6 for a map of the more mature initiatives in EU.
- b) **planned networks**, within generally territorially well-defined areas, where businesses are attracted to shared infrastructures and services. Often times these planned networks are developed in eco-industrial parks.

### 2.8.1 Industrial Symbiosis across industrial regions and territorial typologies

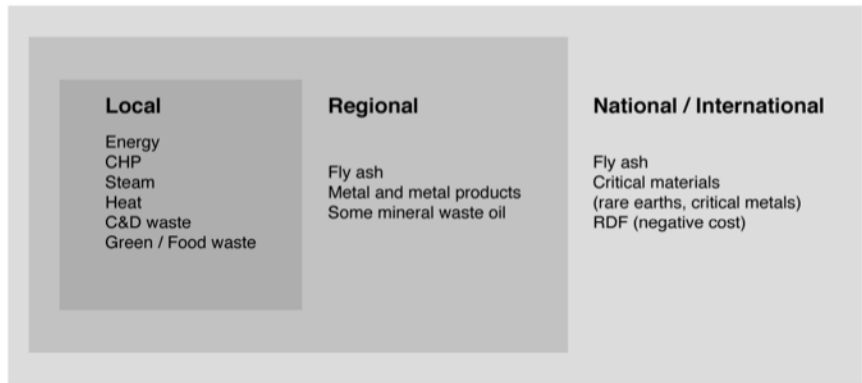
Based on a mapping of IS facilitation initiatives across EU, it appears that self-organised IS activity has been more documented in the Nordic and Central regions of the EU (Domenech et al, 2018). Self-organised activities also tend to have a more local character, being located in urban, rural or mixed areas, as they are especially developed among neighbouring companies. While the initial phases have been driven by private actors, local government support and participation has contributed to scaling up the network and activities. Networks such as Kalundborg (Denmark), Harjavalta (Finland), Landskrona (Sweden), Kemi-Tornio (Finland), Handelo (Sweden) and Styria (Austria) show long-standing IS activities (ibid). Facilitated IS programmes do

not depend on geographical boundaries in principle. However, the majority of them have been developed at regional level, or have regional nodes as part of national programmes (e.g. French PNSI programme, FISS in Finland, SMILE Resource Exchange in Ireland).

IS synergies can be implemented in any type of regions or area, depending of the types of resources transacted. Overall, IS activity has been found to be common in manufacturing clusters across Europe, whether as self-organised or as facilitated networks (Domenech et al, 2018). In fact, clusters show high opportunities for facilitating resource efficiency improvements and industrial symbiosis in companies (Cluster Observatory, 2015). This shows that more industrial regions show more potential for IS.

However, less industrial regions may also be suited for IS, depending on the resources transacted. Figure 2-2 below exemplifies these findings. Overall, the more expensive the materials (eg. critical materials), the larger the distances of exchanges and synergies can be, expanding from national to even international areas. IS synergies that make more business sense at the local level include energy, steam, heat, construction and demolition waste or food waste, while metal and metal products, mineral waste oil or fly ash can be transacted at regional level with businesses still finding benefits (Domenech et al, 2018).

Figure 2-2 Types of resources transacted by area



Source: Domenech et al, 2018

There is no evidence to show that there are clear differentiations between IS initiatives in rural or urban areas. IS synergies can be quite diverse, depending on the characteristics of the area. For instance, in a study on IS networks developed in the Nordic area, three of the five cases documented were in predominantly rural areas, while two in intermediate areas. (Johnsen, et al., 2015) The resources transacted were from very diverse industries, including pharmaceuticals or chemicals, forestry or steel industry, or geothermal energy production, while resources transacted in intermediate areas were related to bioethanol production or metals processing (ibid).

Industrial symbiosis has been suggested as a useful tool to support urban planning for sustainable development, although there have been few systemic IS initiatives at urban level specifically in EU (Mulder et al, 2016). An often cited government-led approach to facilitating IS at urban level was documented in Japan, with the eco-towns programme. The initiative established 26 eco-towns across Japan, providing support for investments in innovative recycling projects, resulting in industry savings and improved environmental results (Van Berkel, 2009). The latter paper finds that opportunities for IS can be facilitated at city level through engaging separate urban cycles in urban areas, to create local circular flows of energy and materials, that give rise to more sustainable urban development (ibid). In EU, the concept of urban symbiosis has been linked to the concept of urban metabolism, which maps the existing flows of materials and energy in a city, as a contribution to urban planning. Mapping cities' urban metabolism has grown as a practice in recent years, with, for instance the city of Amsterdam initiating an urban metabolism project<sup>5</sup>, or more experiences documented through the global platform "Metabolism of cities", which offers a free metabolism analysis tool<sup>6</sup>.

A case study of an urban symbiosis in Hammarby Sjöstad in Sweden demonstrates how combining the experience from facilitating Industrial Symbioses projects, the utilisation of the urban metabolism methodology, as well as encouraging the participation of citizens at district levels can be a route for implementing urban symbiosis (see Iveroth, 2014). The case study finds that formulating an environmental programme at the level of the city, together with formulating goals for the city-level symbiosis was fundamental in achieving a holistic vision for the city and supported the achievement of environmental benefits (ibid). Nevertheless, the success of the programme depends on radical changes in household energy consumption, the implementation of new more efficient technologies and the introduction of stricter anti-landfilling rules.

Overall, the urban symbiosis and urban metabolism projects are not in a mature phase at EU level, and more evidence needs to be collected in order to understand the most effective ways of supporting industrial symbiosis at urban level in EU.

### **2.8.2 Territorial policies in support for IS**

There have been several initiatives in the EU and in the MS which are promoting the facilitation of IS transactions. Regions and cities wanting to support IS can take either a direct or indirect route to supporting the implementation of synergies.

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<sup>5</sup> See <https://amsterdamsmartcity.com/projects/meaningful-circular-metabolism>

<sup>6</sup> See <https://metabolismofcities.org>

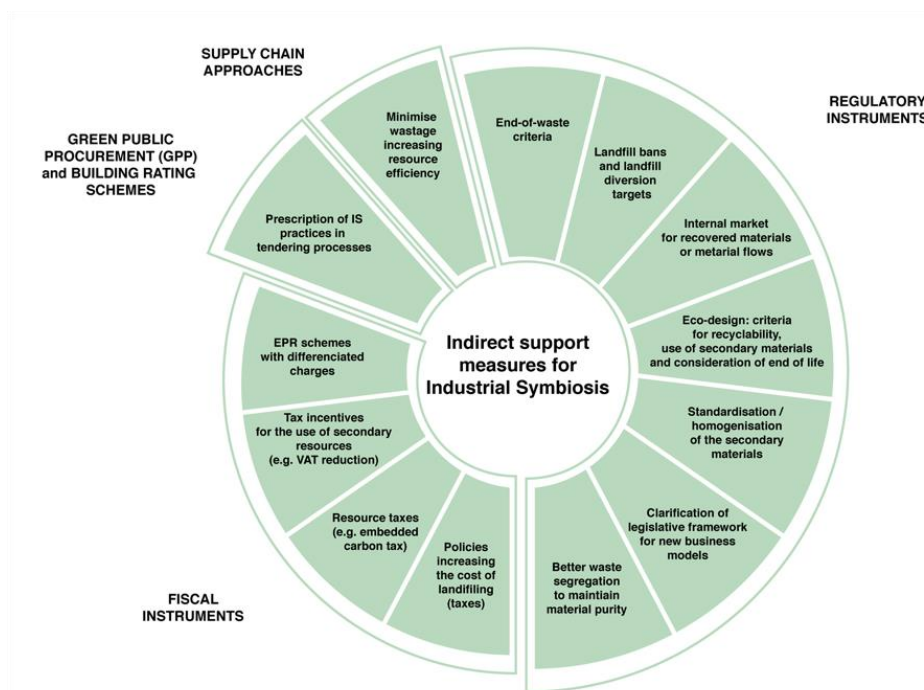


Frequently, direct policies involve providing incentives or grants to organisations facilitating IS networks, with many examples of programmes across EU. One of the early programmes, which has been replicated in the past years in several MS, is the National Industrial Symbiosis Programme (NISP) in UK, which managed to achieve substantial economic and environmental results, due to its lean approach to managing the network and communicating with businesses, but also significant government contributions. Similar programmes have followed in Ireland (eg. [SMILE Resource Exchange](#)), Finland ([FISS](#)), France ([PNSI](#)), or Flanders ([Symbiose Platform](#)), with public financial support in the form of grants. NISP was also replicated in Eastern European states such as Hungary and Romania through the attraction of cohesion policy funding, with good results. There have been many IS facilitation initiatives that have been mapped in the Nordic countries, often times initiated by clusters (e.g. Kemi-Tornio region) (see Johnsen et al, 2015). Based on a study on the role of IS coordination (Domenech et al, 2018), the **main added value** of supporting IS facilitator organisations has been to:

- Mobilise network members and raising awareness about the opportunities of reusing resources and waste streams generated by others
- Support the matchmaking, knowledge sharing and connection of companies
- Support the assessment of benefits of specific IS synergies identified, e.g. through offering funding for feasibility studies, legal advice or access to technology experts, researchers or consultants for e.g. assessing materials flows.

Cities or regions may launch facilitation programmes, however, such an initiative should be based on assessing the potential for IS synergies in the region, as well as good practices in other countries. Employing consultants with strong technical expertise and industry experience is key.

Figure 2-3: Types of policies to support IS at EU, national and regional level



Source: Domenech et al, 2018.

One of the main problems encountered by the facilitators is the lack of sustainability of the initiatives, since they are largely dependent on public funding. An example of public-private partnership that facilitates IS together with private sector partners stems from the Catalisti cluster, in Flanders where the public support that the cluster has obtained from the Flemish government through its Spearhead Clusters policy, has been used to also leverage co-funding from the private sector. The funding is then used for supporting the costs of the cluster team facilitating the innovation process, whose account managers mobilise the partners from different sectors to develop research and innovation project ideas in the plastics and chemistry sectors, including through IS synergies.

Regions and cities can take the example of several other instruments that can be incentivising IS activities and emphasise circularity aspects (see Figure 2-3: ). The difficulties faced by IS facilitators in scaling up and in becoming commercially viable largely stem from the policy environment that is essential in building appropriate framework conditions for the circular economy and IS. In particular, the private sector interest in engaging in IS depends on the incentives structure for environmental policy in the region or country, and especially on the level of landfill taxes. The higher costs of landfilling, or policy incentives for the reuse of waste or by-products generated by economic activities are key drivers for business interest in IS. In addition to landfill taxes, actions such as promoting Green public procurement (GPP) or supply chain

approaches that provide collective solutions to logistical difficulties in IS (e.g. treatment and recovery facilities shared by a number of companies or a circular supply chains voluntary protocol) can also be helpful. These are potential interventions that regional or local actors may be able to introduce to support IS.

At the same time, the above policy actions are necessary but not sufficient conditions for IS to become attractive to private sector players and IS facilitation to become financially sustainable. Concerted action needs to take place at the national and EU level on the regulatory side, in order to improve the market conditions for the IS synergies. For instance, stringent needs have been identified in the area of improving the EU End of Waste criteria, introduce guidance for by-products definitions and harmonize their use across EU. This would render the process of obtaining permits for IS synergies potentially less burdensome and clearer (Domenech et al, 2018).

IS needs to start making sense for businesses if it is to be implemented at scale. An example of a programme supporting companies in realising the fact that generating waste is not only an environmental problem, but an also economic loss is the [Circular Economy Demonstration Projects Programme](#) in Basque Country, managed by the Environmental Department of the Basque Government, including its public agency Ihobe, and the Basque Science, Technology and Innovation Network. Since 2014, the programme has offered direct support to R&D and demonstration projects for circular economy (eco-innovation and eco-design related), to bridge the 'valley of Death' for circular economy projects especially in the manufacturing sector, and develop new innovative alternatives to landfill. Further major aims of the programme included the creation of new circular business in the region, and increase competitiveness through the availability of secondary materials and second life products, as well as increase collaboration inside and between the different value chains in a regional context. Public-private cooperation is a key driver, as it has created demand for the circular products. The programme achieved substantial benefits (e.g. Each public euro spent once mobilised yearly EUR 21.5 and saved a volume of materials reaching an average of 153 kg/year); in addition, feedback from the project leaders indicated that the most valued aspect of this initiative is the access to funding (83%), followed by the potential for cultural change within the industry (75%) (Ihobe, 2016).

Another example is the [Flanders Circular Strategy](#) (in force since 2017), where the Flemish government (through OVAM, its Public Waste Management Agency) together with local stakeholders built an integrated vision for cross-sector cooperation on circular economy in the region. Flanders Circular aims to be the hub and the inspiration for the circular economy in Flanders. It is a partnership of governments, companies, civil society and knowledge partners that take action together, by developing new strategies for financing and business development so that changes in the

use of materials are set against changing market conditions and different models for business returns.

### **2.8.3 Relevance to cohesion policy post 2020**

Cohesion policy has been used to support IS initiatives, especially through using ERDF as funding source for direct facilitation programmes, such as, for example in the case of NISP programmes in the UK, Romania, Hungary, and recently in Finland (FISS Programme). Notably, with the exception of FISS, several IS facilitation programmes have scaled down or stopped working once the funding has expired, due to the fact that it was not viable for the businesses and the government to co-finance the initiatives (Domenech et al, 2018). While it is useful that cohesion policy can maintain its support for IS facilitators, it is important to strengthen their use of monitoring and evaluation of IS synergies' results when offering the support. Moreover, in order to facilitate the success of IS matchmaking processes, cohesion policy can also target the increase in the companies' capacities to develop IS synergies and carry out the innovation processes needed to implement the IS synergies (ibid). Coupling subsidies for feasibility studies with technical expertise support would be welcome at IS synergy development level.

In addition, cohesion policy has supported through INTERREG Europe projects facilitating knowledge exchange on this topic across EU (See INTERREG projects [TRIS](#) and [SYMBI](#)). Further such knowledge sharing has been found very useful and needed by the IS stakeholders.

### **3 Extending the life of products and materials**

#### **3.1 Better reparability through circular design, including targets for reparability and reuse**

##### **3.1.1 EU Policy debate**

At the EU level, repair and reuse legal requirements remain limited, and have not, until recently, been the main focus of policy-makers. Currently, the Eco-design directive is the piece of legislation that offers excellent prospect. Adopted in 2005 to target energy-using products and extended in 2009 to include all energy-related products, it mainly focuses on energy efficiency, but also incorporates some elements of resource efficiency in its Annex I (Egenhofer et al., 2018). However, these requirements have largely been left aside until now, due to lack of standards, fear of regulatory burden and lack of cost-efficiency (European Commission, 2015a).

This has not prevented the legislation from being an overall success, together with the Energy Labelling Directive, with estimations of primary energy savings for the average product amounting to 18% by 2020, and 30% by 2030 (Aarts et al., 2016). Although the policy has met with recent backlash over fears of overregulation, its good results and potential for circularity has led the European Commission to push for its extension to fully cover resource efficiency and reparability.

In its CEAP, the European Commission mentioned both the extension of the Eco-design directive and additional actions to boost repair and reuse. Three main lines of action are foreseen: inclusion of requirements for the availability of spare parts and repair information in the Eco-design directive revision, a testing programme against premature obsolescence under Horizon 2020, and the development of reuse activities as part of the revised Waste proposals. The Action plan acknowledged the role that can be played by Member States, but also regional and local authorities (RREUSE, 2015).

In parallel, the Eco-design Working Plan 2016-2019 includes actions to develop requirements for product durability, reparability, upgradeability, design for disassembly, information and ease of reuse and recycling. A circular economy toolbox for Eco-design will also be prepared to help manufacturers. In order to develop the missing standards in the domain, the European Commission has also published calls for the development of new standards (see below).

While the Eco-design directive and EU policy on reparability in general act at the production level, other types of policies have been implemented at the national level to boost repair at a later stage of the product's life-cycle. The European Commission has welcomed and encourages the introduction of tax incentives for the development

of repair services and jobs in Member States (see below the examples of Sweden and Austria). Because of its labour intensity, the development of the repair and reuse sector is becoming to be widely supported and is likely to develop in the following years. This is also illustrated by the trend in repair cafés and second-hand shops.

### **3.1.2 Policies mapped**

To this day, Spain is the only Member State with a national binding target for reuse. Adopted in 2016 as part of the national 2016-2022 waste management plan, it sets a 50% target of all waste to be recycled and prepared for reuse, and a minimum of 2% of furniture, textiles and electrical items to be sent for repair and resale. This follows a previous law which set a 2% reuse target for large electrical goods and 3% reuse target for IT equipment by 2017 (McDowall, 2016).

Before Spain, other Member States had set targets either at a regional or sectoral level. For example, the Flanders region of Belgium had set a 2015 objective of an average of 5kg of reused goods per resident<sup>7</sup>. In France, national targets for reuse and repair are foreseen in the latest governmental communication on the circular economy, while the sectors under Extended Producer Responsibility (EPR) regulation have started organising for repair and reuse since 2013 (Turchet, 2018).

Apart from binding targets, Member States have implemented a number of measures to improve reparability and reuse. In 2016, Italy adopted the Decree 140/2016, which aims to boost reuse and recycling possibilities of electrical and electronic equipment by incentivising producers to adopt eco-design strategies. The objectives include optimising reparability and increasing durability of products. The incentive comes as a possibility for producers to request a reduction of their eco-contribution.

Acting at a later stage of the product life-cycle, Sweden has put in place tax incentives to support repair services. The RUT-system (RUT standing for Cleaning, Maintenance and Repair) enables tax deductions for the cost of labour when employing businesses for domestic work. Two types of repair services are eligible: repairs of major appliances (such as refrigerators or dishwashers) and repairs, maintenance or installation of computer- or IT-equipment in or in close connection to one's residence. Another tax incentive is the VAT reduction for services which carry out repairs of bicycles, shoes, leather goods or household linen. The VAT was reduced from 25% to 12% starting 2017.

In a similar vein, the Austrian government put forward a proposal in January 2017 to make repair cheaper by reimbursing 50% of the labour costs. Private persons will be

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<sup>7</sup> OVAM. Re-use centres presentation, <http://toep.ovam.be/jahia/Jahia/pid/2412?lang=en>

entitled to a maximum of EUR 600 per year, and the policy would be applicable to bikes, shoes, clothes, leather goods, electric household appliances. The city of Graz already introduced a similar system in November 2016 with a maximum support of EUR 100 per household per year.

Across Europe, many examples can be found of countries that have introduced similar VAT or other tax incentives to boost repair and reuse services, e.g. in Ireland, Luxembourg, Malta, the Netherlands, Poland, Slovenia, Finland, France, Belgium, the UK, and Spain (RREUSE, 2017). Other initiatives have focused on the set up and capacity building of repair and reuse centres, for example the Central Europe Repair and Re-use Centres and Network, an EU funded project.

Another dimension to these policy developments is the boom in private for-profit, and non-for-profit initiatives in the repair and reuse sector. These include the repair café and repair communities, such as the RepairMonitor by Stichting Repair Café (an online tool to monitor volunteer repair activities, defects and results at repair cafés in the Netherlands), or the London Restart project. New consumer products now include repair as part of the commercial offer (examples include Fairphone 2.0, SEB 10-year reparability program, Houdini Sportswear AB, BMA ergonomics and Motorlan).

### **3.1.3 Governance**

In general, tax-based incentives for repair and reuse are set up at the national level. However, other economic incentives can be implemented at a regional or local level depending on public budget. In the case of Austria, the reimbursement of repair services was first organised at city level in Graz. In addition, the development of repair and reuse centres, fostering relations between producers and waste management companies, and the support of the repair and reuse community (e.g. repair shops) offers a bigger opportunity for regional and local authorities.

### **3.1.4 Territorial implications**

Repair and reuse policies can have some territorial implications. Although nation-wide sectors can (and will likely develop), the collect and resell of second-hand products is currently mostly organised at a sub-national level. In Flanders for example, products are collected by the nearest reuse and repair centre<sup>8</sup>, and usually redistributed

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<sup>8</sup> <https://www.dekringwinkel.be/>

in the area. Repair services are also de facto locally embedded. In both cases, mapping the surface of the functional urban area helps in establishing centres in the right location.

Nonetheless, and especially in the case of single-firm examples mentioned above, the territorial embeddedness might not be a requirement: the provision of online information on a company's website and the possibility to ship and receive parts from the company's repair service, provides accessibility without the need for a local physical presence. However, when it comes to hosting such firms on one territory, including SMEs, the existence of a local community plays a key role in providing knowledge, partners to develop the adequate technology and emulation: a good example of this would be the circular business community in the region of Brussels capital in Belgium.

### **3.1.5 Regions and cities**

The capacity of regions and cities to set up economic incentives depend on their power and budget. However, they can play a strong role in the management of local relationship between producers, shops, consumers and waste management centres, but also in the testing of policy pilots before they are implemented at a larger scale. In the case of Graz, the pilot benefited from being implemented in a city with a population large enough to show some results, even though Graz is located in a predominantly rural region. It also shows that pilots need not be implemented in one of the most dynamic parts of the country, Graz belongs, in our territorial classification, to an A1 Region with industrial branches losing importance. The link between circularity and eco-design on one hand and the territory on the other hand is visible in the case of buildings, public spaces, etc (ADEME, 2017).

### **3.1.6 Financing**

These measures require strong financing to reach a critical mass. In the case of reuse and repair centres, they usually include social employment and hence subsidise for hiring employees. Reimbursement of repair and reuse services also come with a cost, especially if the sum offered is supposed to offset customers' administrative burden of asking for refund. European funding is available: parts of Cohesion policy funds are already directed toward support for reuse and repair, improved production processes, product design and SMEs (European Commission, 2015b).



### **3.1.7 Circularity**

Repair and reuse are central elements to the circular economy, and on top of the waste hierarchy. Reaching these sectors potential will therefore be key to the success of circular objectives.

## **3.2 Policies for durability and fighting the premature obsolescence**

### **3.2.1 EU Policy debate**

Premature obsolescence covers different issues linked to product durability. It can include issues such as negligent or avoidable obsolescence, which lead to a product lifespan being shorter than possible. However, in the public debate, people mostly refer to planned obsolescence, which is “a wide range of techniques that certain manufacturers might use to shorten the functional lifespan of products and force consumers to make premature replacements in order to continue selling in saturated markets” (BEUC, 2015), which adds the dimension of the producer’s intention. The well-documented, and yet rare, techniques involve producing more fragile products. However, many other techniques can be employed, for example, the impossibility to repair or replace broken parts, the lack of compatibility with newer products (especially in the case of software updates), or style obsolescence (whereby producers employ marketing technics to push consumers to replace their products before they have reached their end of life).

Planned obsolescence is not specifically addressed in EU legislation, but requirements on durability however exist in several legislations (Consumer sales directive; Eco-design, WEEE; product return legislation). There have been recent calls for policy reform, namely from the European Economic and Social Committee (EESC) and the European Parliament. In the CEAP, the European Commission announced a testing programme against premature obsolescence under Horizon 2020. At the Member States’ level, there is little regulation of planned obsolescence, but the topic is getting traction as well, with France being the first country to legislate on planned obsolescence (see below).

Focusing on product design requirements can help solve most issues linked to shortened lifespan, however, educational programmes aiming at raising consumer awareness on the impact of the throw-away culture will also play a central role, especially in sectors like textile and clothing.

### **3.2.2 Policies mapped**

As mentioned, France is the first Member State to adopt a law on the topic. The Act on Consumption and Prevention of Planned Product Obsolescence (2015), provides

for prison and fines up to EUR 300 000 or 5% of annual turnover for companies who have deliberately reduced their products' lifetime. This law accompanies other new regulations on product durability. Since the publication of the new decree, distributors must indicate the duration of spare parts availability for all products placed on the market from 1<sup>st</sup> March 2015. Extended producer responsibility has also been modified, to propose reduced fees to producers who inform consumers on how long spare parts will be available for the product on purchase.

Other policies aiming at product durability have been implemented throughout Europe. At EU level, the Ecolabel includes durability and reusability of products as criteria. In Austria, the ONR 192102 label for durable and repairable products, adopted in 2014, identifies electrical and electronic equipment meeting the criteria for a durable, repair-friendly design.

A number of research projects are also ongoing to study the impact of design on product durability. For example, the project Longevity and obsolescence in product development, commissioned by the Hans Böckler Foundation in Germany, investigates the extent to which product developers and designers have an influence on the obsolescence and longevity of consumer products.

### **3.2.3 Governance**

As product durability and planned obsolescence are addressed at the production level, any policy will have to be implemented at the European or national level.

### **3.2.4 Regions and cities**

Regions and cities do not play an important role in this domain, neither as initiator or implementing authority. However, they can raise awareness of their citizens. The CIRCTER typologies are not relevant for premature obsolescence.

### **3.2.5 Financing**

In the case of the prosecution of planned obsolescence practices, there is no direct public cost, since they are included in the judicial system. However, associations carrying these cases to court could be supported as far as they contribute to the public good. Awareness raising campaigns would naturally come with a cost. Research projects on premature obsolescence can receive EU funding, but would likely fall out of the scope of the Cohesion policy funds.

### **3.2.6 Circularity**

Planned obsolescence is often linked as much to consumer rights as to concerns over resource efficiency. Circularity is therefore not a primary focus of these policies, apart from the question of how to improve product's durability.

### **3.3 Extension of warranty**

#### **3.3.1 EU Policy debate**

The condition for consumer products warranty (or legal guarantee) are regulated through the Consumer sales and guarantees directive (1999/44/EC), adopted in 1999 and partly revised in 2015 (to adapt digital consumer rights). This directive stipulates that sellers of consumer products must remedy to defects up until two years after the product's delivery. As a result, consumers are protected against faulty products. The goal is to make it costly for sellers to sell products that have a short lifespan is meant to pass on producers and increase the overall product range quality and reduce avoidable waste. In addition, since the directive provides that products must be either replaced or repaired, it is meant to have an impact on the availability, and information thereof, of spare parts by manufacturers.

However, the exact transposition of the directive differs across Member States. For examples, in Czech Republic, Denmark, Germany and Slovakia, consumers cannot use the legal guarantee if a product's defect is a result of wear and tear, which limits the incentive to provide longer lasting products (ECC Net, 2015).

Some Member States have also chosen to adopt a longer legal guarantee (or kept their original legislation when it already exceeded the dispositions of the directive). This is for example the case of Sweden (three years), Norway and Iceland (five years, for products that are meant to last longer than two years, e.g. furniture, cars, household appliances, etc.). In France, legislative work has started to explore an eventual extension to five or ten years. The Netherlands, Ireland and the UK follow the 2-year warranty but extended the time limit to report a defect (up to six years in the British Isles, and without a limit in the Netherlands). Finland adopted a different approach, setting no time limit but extending the legal guarantee for as long as the product is expected to function properly, based on general standards adopted by the Finnish Consumer Disputes Board (ECC Net, 2015).

In addition to the legal guarantee, producers and sellers may offer commercial warranties, that are service extensions which may include a longer warranty period or additional repair services. However, they usually come at a cost to the consumer and do not modify the legal rights under the EU directive.

#### **3.3.2 Governance**

The legal guarantee is in all cases transposed by the national authorities. European Consumer Centres exist in all Member States and provide support and information to consumers. There are no territorial implications. Cross-border issues might arise

when a product is brought outside of a Member States, but the legal requirements cover the whole Single market.

### **3.3.3 Regions and cities**

Regions and cities can play little role in this policy, apart from informing local actors of their rights and obligations. A recurring issue with the application of the directive comes from sellers not being completely aware of their obligations and often redirecting consumers to the producers (ECC Net, 2015).

### **3.3.4 Impact**

By creating a legal obligation to repair or replace faulty products for at least two years, the directive should have an impact on product durability. However, in all Member States, several issues limit the real guarantee period. For example, the burden of proof falls on the sellers only during the first six months, making it much harder for consumers to exert their rights after this early period. Lack of information of all parties and the administrative burden that may come with a complaint also limit the impact of the directive (ECC Net, 2015).

### **3.3.5 Circularity**

The directive aims to foster reparability and durability of products, contributing, overall, to the circular economy, even though this was not especially referred to in the legal text (it originally focuses on consumer rights, and not specifically on resource efficiency or environmental objectives).

## **3.4 Standardisation and circularity**

### **3.4.1 EU Policy debate**

The translation of circular objectives into concrete policy implementation will require the development of standards for “assessing material efficiency aspects”. Although the Eco-design directive made room for the introduction of material efficiency standards, no mandates had been issued until recently. In January 2015, the European Commission issued its first mandates to Standardisation bodies (the European Committee for Standardisation, the European Committee for Electrotechnical Standardisation and the European Telecommunications Standards Institute, respectively CEN, CENELEC, and ETSI) on material efficiency, but they faced a refusal from the standardisation bodies.

A year after, the European Commission issued a new mandate for 40 products' categories, after further consultation with these organisations (European Commission 2015a). This new mandate asks standardisation bodies to develop general standards,

by principle applicable to all products categories, and when impossible, to specify the categories covered. These standards would cover issues of durability, upgradability, ability to repair, reuse and remanufacture, disassembly for remanufacturing and recycling, critical raw materials and how to inform targeted audiences. The results should remedy to the lack of methods, criteria or parameters that currently impede the development of regulations for material efficiency (European Commission, 2015a).

In general, standards for the circular economy remain in their infancy, with most of them focusing on resource efficiency metrics. Policy developments have led standardisation bodies to start framing guidance and references to address all topics, including product durability and reparability.

### **3.4.2 Policies mapped**

As part of EU-level work on circular economy standards, CEN and CENELEC organised a workshop in 2016 to develop quality standards for secondary raw materials, in particular for plastics, and is part of ongoing work by both institutions to develop standards at the EU level addressing the circular economy.

In 2017, the British Standards Institution (BSI) published a new, first-of-its-kind, standard “BS 8001:2017 – Framework for implementing the principles of the circular economy in organisations”. This standard remains at a very general level, providing useful definitions and recommendations, but stopping short of specifying monitoring framework for the implementation, leaving it up for organisations to define internally. By definition, it is not a standard one can comply with or use as a certification (Pauliuk, 2018).

Older certification schemes can be found, such as the ReMade in Italy certification, launched in 2009 by the eponym non-profit, non-governmental organization aimed at promoting recycled products through independent third-party certification. The certification is recognised by Accredia, the Italian national accreditation body. It attests the traceability of production, starting from the verification of the source of raw materials input, to the finished product. In that sense, it is comparable to the EU Ecolabel.

### **3.4.3 Governance**

Standards are established by Standardisation bodies, while certification can be either public or from private institutions. There are no specific territorial implications. There is no obvious role for regions and cities.

### **3.4.4 Impact**

Currently, the absence of EU standards on product durability and reparability impedes the development and implementation of legislation. The definition of such standards could therefore have a strong impact by enabling the setup of efficient legislations.

Taking the example of the Eco-design directive success in energy efficiency, corresponding standards for material efficiency could have a strong environmental and economic impact. However, the issues at stake being different in nature, it is not sure whether this success can be easily replicated (Egenhofer et al., 2018).

### **3.4.5 Circularity**

The concrete implementation of circularity principles is only possible if clear standards are established for the industry.

## **3.5 Reverse logistics as a key enabler for extending the life of products**

Reverse logistics is managing the return flows of materials in a circular economy. It is mainly driven by Extended Producer Responsibility (EPR) policies which are gaining importance in the European Union. Reverse logistics is essential in closing the loop in a circular economy. It consists of the process of collecting and returning good from the point of their consumption to a point of return for the purpose of remanufacturing, refurbishing, reuse or recycling. These different operations have different values from the point of view of the circular economy.

Reverse logistics is closely linked to product design as it should be done in such a way in order to facilitate return. The overall value of reverse logistics is capturing the value of products and keeping it in circulation as long as possible.

One of the main challenges to reverse logistics is the Waste Shipment Regulation which might represent an obstacle to used or end-of-life products being transported across national borders. The variability of flows is another challenge producers should be aware of. Users are an important part of the product cycle and they need to be included in the reverse logistics efforts by being incentivised to return products.

Collective reverse logistics could theoretically be more cost effective than individual firm logistics. In some lower-income countries there is already a very high rate of reverse logistics, but for developed countries it is lower.

The Reverse Logistics Maturity Model of the Ellen McArthur Foundation divides products in several archetypes:

- **Archetype 1:** Low value extended producer responsibility (tires, shipping pallets, consumer electronics) which are subject to increasing EPR legislation. Realising economies of scale is singled out as the key success factor when designing the reverse logistics network, incentivising returns and increasing recovery capability.

- **Archetype 2:** Service parts logistics including machinery and automotive parts. Combination of pick-up of to-be-replaced parts with the delivery and installation of new or refurbished service parts is defined as the key success factor.
- **Archetype 3:** Advanced industrial products where transparency and trusted direct return are key.

The Reverse Logistics Maturity Model elaborates on different modules of reverse logistics including the front end (processes and network), engine (recovery of returned products) and the back end (remarketing the recovered products).<sup>9</sup>

The governance of reverse logistics is mainly with producers but also with retailers. The impact of reverse logistics on the circular economy is significant as it enables remanufacturing, reuse and recycling.

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<sup>9</sup> Ellen McArthur Foundation, Waste Not, Want Nor, Capturing the Value of Circular Economy through Reverse Logistics

## **4 The sharing economy and collaborative consumption as a circular business model**

The collaborative economy (sometimes called the sharing economy) is rapidly emerging across Europe. It consists in a new way to offer and use products and services, mostly through online platforms. Transactions usually involve three parties: the service provider, the online platform and the customer. It covers a great variety of sectors, from sharing houses and domestic services to car journeys and it often encompasses the development of new business models. Notable examples include Peerby for domestic items, Blablacar for carpooling, AirBnb for homestays, LaMachineDuVoisin for laundry machine, Drivy for car rental etc. Collaborative economy also includes the finance and online skills sectors but these are less relevant to the concept of circularity as analysed in this report. Other possible sectors for collaborative consumption include food (mutual procurement, mutual restaurants); clothing (renting, clothes exchange, etc.).

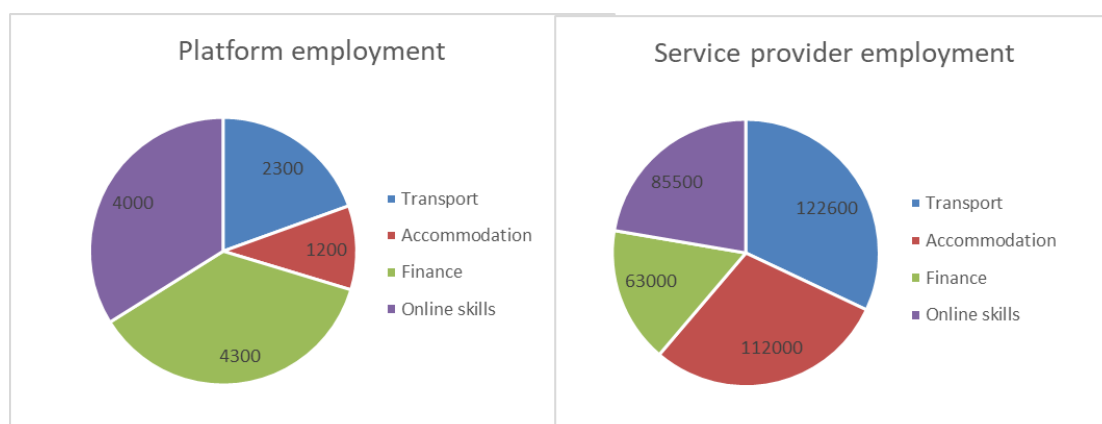
The collaborative economy can create new opportunities for consumers and entrepreneurs that could contribute to competitiveness, jobs and growth. As a disruptive innovation, it can also generate tensions between existing operators and innovative service providers. One major difference between platforms is their underlying commercial or non-commercial activities: platforms can be established for profit or non-profit purposes. In addition, the collaborative economy business model could cover the following types of exchanges: peer-to-peer (P2P) services; peer-to-business (P2B) services; and business-to-business (B2B) services.

Recognising the rapid uptake of these new practices, the European Commission issued a European Agenda for the Collaborative Economy in 2016. The document aimed at providing insights on key issues, such as market access requirements, liability regimes, protection of users, self-employed and workers and taxation, but also set the base for the establishment of a monitoring framework.

A recent study carried out by Technopolis Group estimated the size of the collaborative economy in the EU in 2016 at EUR 26.5 billion and number of jobs at 314,000.



Figure 4-1: Estimated number of persons employed by platforms and service providers in the EU-28 in 2016



Source: Technopolis, 2018, *Study to Monitor the Economic Development of the Collaborative Economy at sector level in the 28 EU Member States*

There are at least 51 EU collaborative platforms operating internationally (15 in transport, 10 in accommodation, 13 in online skills, and 13 in the finance sector). The best known internationally operating platforms are in the transport sector: Delivery Hero and Foodora (Germany), Takeaway (Netherlands), Deliveroo and JustEat (UK), Blablacar (France) and Taxify (Estonia). In accommodation, the best known platforms are Wimdu (Germany) and HomeStay (Ireland). (Technopolis Group).

Many collaborative platforms have a higher uptake in more densely populated urban areas. This is the case for different types of car-pooling, platforms for accommodation sharing, platforms for sharing different tools, used items, etc. These may also function in rural areas but the bigger distances make these business models less tempting.

## **5 Soft strategies to support circular systems**

### **5.1 Voluntary agreements for circularity**

Voluntary agreements between governments and industry actors can be an efficient way to complement the policy legislation in driving progress towards circular economy. A recent example is the adoption of the EU Plastics Strategy (2018) that coincides with voluntary commitments from a number of stakeholders from the European plastics industry to ensure high level of re-use and recycling with the ambition to reach 60% for plastics packaging by 2030 (and 100% by 2040) (PlasticsEurope, 2018). Future developments include potential voluntary agreements as a way to ensure an efficiency of the new EU Plastics Strategy. The Commission has also requested European standardisation organisations to develop standards on material efficiency and guidance on circular economy into Best Available Techniques reference documents (BREFs) (Circle Economy, 2017). In the EU, state support for voluntary agreements and initiatives is widely used in eight Member States (FI, DE, GR, IT, LU, ES, NL and the UK). The Green Deal (NL) addresses regulatory barriers to projects/investments towards sustainability and encompasses energy-saving techniques, efficient water use, sustainable transport, alternative building materials and sustainable production systems in agriculture. In Spain, voluntary agreements are used as a strategic tool to go beyond legal commitments to implement circular economy principles, promote business competitiveness and encourage resource efficiency. The Spanish government promotes a range of voluntary commitments with business associations of various sectors as well as with social enterprises. A prominent example is the voluntary agreement with the Spanish Association of Pulp, Paper and Cardboard Manufacturers (ASPAPEL) that aims to achieve highly demanding emission limit values among businesses in the paper, pulp and cardboard production industry that release process waters into public waterways. This has sparked corporate R&D investments for efficiency measures which has led to a 28% reduction of water at the same time that production levels increased by 14%. The Romanian voluntary agreement on packaging waste prevention, energy-saving techniques, efficient water use etc is an example of a city level scheme (Hirschnitz-Garbers et al., 2015).

#### **5.1.1 Territorial aspects of Voluntary agreements for circularity**

Voluntary agreements are currently applied to all governance levels, both internationally, EU, or regional/local scale. Voluntary agreement can successfully be implemented on a local level, for instance on a city or in a region as the Romanian example above illustrates. To implement on local level can be a way to more efficiently target the priorities of a certain territory with regard to its circular ambitions. Voluntary agree-

ments have large potential to be applied in different types of Territories with Geographical Specificities (TGS). As for instance islands face similar challenges, voluntary agreements to promote circularity among communities/industries in island regions is an efficient way to address specific TGS related challenges. Different types of industry-level voluntary agreements can probably happen easier in regions with gaining industrial importance.

## **5.2 Environmental labelling and circularity**

Eco-labels support the circular economy by establishing transparent criteria that enhance corporate resource efficiency and innovative solutions as well as support consumers in their consumption choices (Taranic et al., 2016). The EU Ecolabel includes criteria relevant to circularity that targets each step of the product life cycle; such as resource efficiency, sustainable supplies, eco-design, sustainable consumption, lifespan lengthening, etc. The other main EU labelling scheme, EMAS, is not explicitly targeting circular economy. Nevertheless, it has inherent potential to contribute to circularity objectives as EMAS implementing organisations have committed to monitoring their processes and constantly improving their resource efficiency. The EU Strategy on Circular Economy states that improving the efficiency and uptake of EMAS and the Ecolabel could benefit business and SMEs in moving towards circularity.

The Green Dot is a License symbol of a European network of industry-funded systems for recycling the packaging materials of consumer goods. It encourages manufacturers to reduce packaging as an incentive to save on the cost of licence fees. Green Dot has achieved success with 20 countries that adopted it as a system for collecting, sorting and recycling; a total of 95,000 licences use the Green Dot trade mark. Other types of labelling tools include Digital tools for product information which is still under development in the EU market. Online tools can be used for comparing and accessing information on products (e.g. health, sustainability, social impact) and provide information to both consumers in choosing products or to companies working with suppliers (e.g. information on packaging or materials for waste management). Products are most often referenced in the national market such as for NABU Siegel-Check and Codecheck (DE). Multi-national examples exist for fish/seasonal products, e.g. Seafood Watch.

### **5.2.1 Territorial aspects of Environmental labelling**

Eco-labelling schemes have the potential to contribute to circular economy objectives, but their specific territorial impacts are not significant as the schemes are usually implemented horizontally across EU territories. Regions and cities have a role as implementers of the schemes, and territorial impacts might be visible when a local product

is promoted, and local production patterns are affected. The resulting impact from such schemes are visible along the chain of producer-consumer impact which depends on where the implementing industries and production centres are located. Local authorities have a role in related waste management. Tools analysing local/short-circuit dimension can help support local production and widespread use has the potential to affect local consumption patterns by better informing consumers and promoting sustainable products. Regions and cities can support their local/circular products by making sure they are referenced in such tools and use them to promote local products and services.

### 5.3 Circular public procurement

Public procurement accounts for approximately 14% of European consumption. The EU Action Plan for Circular Economy recognises public procurement as a key driver in the transition towards circularity. Several actions that can support the integration of circularity in GPP have been identified; emphasising circular aspects in EU GPP Criteria to support a higher uptake of GPP among European public bodies and leading by example in its own procurement and in EU funding. Green Public Procurement (GPP) can boost demand for circular materials, products and services both during the construction phase of a project, like buildings, roads, etc., but also during the project life, like renovation, consumables, etc. (ADEME, 2017). Positive developments include the revised Public Procurement Directives, GPP handbook and circular economy brochure, and the recent initiative for more efficient procurement. Yet, specific circular economy criteria are yet to be developed. Additionally, private sector procurement is also critical, though only not addressed extensively.

The EC has created GPP criteria for more than 20 product groups (as of October 2017), including buildings, computers, textiles and furniture, etc. with a focus on circularity. Circular economy actions supported by GPP criteria can include promoting product eco-design and design for recyclability, extended producer responsibility, waste prevention, packaging material and sharing, collaborative economy, reuse, and refurbishment (European Union, 2017).

Whilst GPP is a voluntary measure on the EU level, Italy has gone a step further and introduced a *mandatory GPP scheme* which include minimum environmental criteria in their public procurement actions. 16 product and service areas have been identified as being the most relevant for public procurement in Italy, and are mandatory for all procurement done of goods, services and works with requirements for energy efficiency. An initial survey of the territorial distribution of the regulatory acts and plans issued by the regions, as well as of the initiatives carried out on these issues, are

currently undertaken to have a up to date framework of the knowledge and dissemination of GPP at the territorial level. Other examples from MS include the *Competence Centre for Sustainable Procurement* at the Procurement Office of the Federal Ministry of the Interior of Germany which is supporting public authorities in the consideration of sustainability criteria in procurement projects. The centre is a support scheme (primarily information platform) to encourage sustainable public procurement and has thus indirect effects related to circular economy. In 2013, the Dutch Government established the *Circular Procurement Green Deal* to accelerate the transition to a circular economy. This programme brought together 45 public and private parties during a pilot initiative to increase experience, share insights, and create a pool of good practice. The success of the programme resulted in the Dutch Government placing special emphasis on circular procurement and the consideration of life-cycle costs in its 2016 Roadmap to a Circular Economy. Moreover, it included an aim to raise the proportion of circular procurement to 10% by 2020.

### **5.3.1 Territorial aspects of Circular public procurement**

It is difficult to assess the territorial impacts of GPP. However, regional and local governments and other local institutions such as universities have a significant role as the implementing bodies of GPP schemes. They therefore have the possibility to influence the demand for local and regional products that are in line with circularity, and thereby promoting growth of the local circular economy. The Italian mandatory GPP scheme is an interesting and promising example and the effects of the regulation will have to be followed up on. Comprehensive information platforms both national, regional or local level should be further encouraged and possibly supported by EU funds, such as fund under the Cohesion Policy.

## **6 Closing the loops in the manufacturing industry.**

### **The bio-economy and the circular economy**

#### **6.1 Remanufacturing**

Recycling processes recover only a portion of the materials and embedded energy from a product. Through remanufacturing, a used product is brought to at least the quality level of a new product through a treatment process consisting of e.g. dismantling, cleaning, testing, processing and remounting collected old parts (VDI ZRE 2017). This prolongs the life of an already manufactured products and helps avoid a significant use of virgin materials and energy in the production phase. It also reduces the import dependency on critical raw materials and is thus a key measure in increasing resource efficiency. Accordingly, it is considered a key element in the transition to circular economy and recognised as such in EU objectives (European Commission 2014).

Currently, the remanufacturing industry accounts for approximately 2% of the total European manufacturing sector (VDI ZRE 2017) and remanufacturing has been largely focused on the automotive industry (Guidat et al. 2015). However, the EU market potential of remanufacturing is higher and estimated to be EUR 90 billion by 2030 (ERN 2015), with the option of expanding onto other sectors and products such as the medical sector, aircraft and railway. Thus, remanufacturing is considered not only vital to the EU circular economy objectives, but also to preserving economic growth and employment in a dematerialised economy and making European industries more competitive on a global level. To further encourage remanufacturing business practices, EU support is available through Horizon 2020, Cohesion Policy funds and through the implementation of the Eco-Innovation Action Plan (European Commission 2015).

Cross-sectoral activities to facilitate knowledge transfer and promote the remanufacturing industry have been neglected in Europe so far. As a consequence, the European economy is threatening to lag behind industrial competitors such as the US and China, both of which already have remanufacturing strategies<sup>10</sup>. For this purpose, the European Remanufacturing Network (ERN) was launched in 2015. ERN is a EUR 1.5 million initiative under Horizon2020. The two-year project is an international partnership of experts in the field of remanufacturing aiming to encourage new businesses

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10 European Remanufacturing Network: European need for a vision. Online: <http://www.remanufacturing.eu/ern.php>

to take up remanufacturing, support innovations as well as to improve the competitiveness of remanufacturers, among other aspects.

The enduring output of this project is the Conseil Européen de Remanufacture (CER, European Remanufacturing Council) set up in 2017, a cross-sector consortium of manufacturers who want to advance the European remanufacturing agenda. The council is primarily focused on reaching policy making bodies, focusing on generating greater public awareness, the dissemination of evidence and good practices, as well as improved framework conditions. Their ambition is to triple the value of Europe's remanufacturing sector to EUR 100 billion by 2030. Although the impact has yet to be seen, the council can be considered to have a high potential to elicit policy changes. Moreover, with the research project ResCoM (Resource Conservative Manufacturing) which concluded in 2017, the EU intends to support companies in realising the transformation from the previously prevailing linear business models to reusable business models. The declared goal is the development of closed-loop product systems including remanufacturing and reuse.

National or regional efforts have been rather limited. Activities at the Member States level are still focused on waste management measures indicating needs for support for a transformation from waste to a circular resource management, which could be achieved by moving towards alternative systems for consumption including remanufacturing (Eco-Innovation Observatory 2016). For example, the German Federal Government announced to systematically invest in research and development of strategies concerning the remanufacturing (BMUB 2016), but no specific measures have been implemented yet. Nonetheless, the potential for growth in the remanufacturing sector has been recognized across EU Member States. Scotland, for instance, estimates remanufacturing to have the potential to create an additional EUR 620 million turnover and 5,700 new jobs by 2020 (Scottish Government 2016).

Several regional initiatives implemented to promote remanufacturing can be named. Most importantly, this is the “De- and Remanufacturing Pilot Network” which was set up in 2014. The objective of the network is to integrate a multidisciplinary set of advanced and innovative technologies and digital innovations and to exploit the Regional Smart Specialization Strategies (RIS3) to offer services to European end-users, mainly manufacturing companies, to solve specific sustainability-oriented problems related to their products. The regional network nodes are meant to act as innovation hubs for circular economy. Over 60 European companies, 69 universities and RTOs as well as seven regions (Lombardy, Scotland, Saxony, Tampere, Flanders, Basque Country and Norte) are involved. Due to the two-level governance comprising of, on the one hand, the European Pilot Network Board, and on the regional level, the Regional Steering Committees, regional stakeholders exert substantial influence. The estimation is that approximately 15,000 new jobs can be created as well as 60,000

KTons of CO<sub>2</sub> of emissions per year can be saved, among other benefits<sup>11</sup>. As a strategic element for regions to promote remanufacturing activities, the network can thus prove to be highly valuable. Moreover, in 2015, several regional conferences by Régis Dando, founder of the French information platform Remanufacturing, were held on remanufacturing (e.g. in the Basque Country or Flanders). The objective of the conferences were, with help from real examples from local entrepreneurs, to sensitize local stakeholders on the state of the art of remanufacturing.

Other than companies focused exclusively on remanufacturing, various established enterprises have adopted remanufacturing practices as well. Automotive supplier Bosch, for instance, implemented the “1:1 Reman” programme, a remanufacturing service covering several thousand different car spare parts. Renault’s plant in Choisy-le-Roi remanufactures automotive engines, transmissions, injections pumps, and other components. These remanufacturing operations use 80 % less energy and almost 90 % less water, generating about 70 % less oil and detergent waste as well, than comparable new production does. The company targets components for closed-loop reuse as well (Nguyen/Stuchtey/Zils 2014).

### **6.1.1 Territorial aspects of Remanufacturing**

Regional and local governments and other local institutions have so far no particular role in implementing measures to promote remanufacturing. Increasing their role may be difficult as remanufacturing is largely business-driven, e.g. comprising of processes between OEMs and suppliers. Still, regional and local government can promote remanufacturing for example through public procurement policies (Karvonen et al. 2017). They therefore have the possibility to influence the demand for local and regional remanufactured products and thereby promoting growth of the local circular economy. Other local actors such as research institutes and universities can support remanufacturing activities through research and education activities to assist potential start-ups as well as current, growing remanufactures and those wishing to diversify into remanufacturing. Events such as the above-mentioned conferences can help stimulate education and awareness. Furthermore, the lack of familiarity with remanufacturing in the finance sector can make it difficult for remanufacturers to access capital (Karvonen et al. 2017). Regions can help promote remanufacturing advantages to financial institutions as well as create financial incentives for businesses wishing to take up remanufacturing. Collaboration support for SMEs to incorporate remanufacturing into their business plan can also be granted on a regional or local level. The

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11 See Colledani, Marcello (2017): De- and Remanufacturing. ESM Demo-case presentation. Online: [http://na.bruselas.site/sites/default/files/fichas-técnicas/2.De-and\\_Remanufacturing\\_2017\\_Final%5B1%5D.pdf](http://na.bruselas.site/sites/default/files/fichas-técnicas/2.De-and_Remanufacturing_2017_Final%5B1%5D.pdf)



De- and Remanufacturing Pilot Network appears to be a particularly promising initiative that other regions than the ones already involved could benefit from. After all, the methodology developed in the project is meant to be replicable in the entire European Union. Through this approach, regional and cross-regional innovation ecosystems for remanufacturing processes and business models can be established. Lastly, raising public awareness about remanufacturing and its advantages through regional and local campaigns may be an important measure.

Measures promoting remanufacturing can be of high importance to different types of regions, from intermediate to predominantly urban and metropolitan regions, less so predominantly rural areas. Most importantly, the regions must be highly industrialised as the implementation of remanufacturing processes requires the existence of a highly developed manufacturing industry (e.g. automotive, medical sector, aircraft, railway) with various local and regional value chain stakeholders. However, these industries often have a global reach due to the complex value chain of Original Equipment Manufacturers (OEMs), suppliers and other actors, which is why regional and local initiatives can be considered highly valuable.

Relevant enablers for the increase in remanufacturing processes are agglomeration, accessibility, knowledge, technology and governance. After all, (predominantly urban) agglomerations ensure the necessary critical mass to implement remanufacturing approaches as in developed manufacturing industries, a vast number of players are involved. Furthermore, increased knowledge and advanced technologies are indispensable to boost innovation in manufacturing. Remanufacturing as a resource-efficient and thus also cost-saving approach may be of particular relevance to regions with industrial branches losing importance (A1) or regions with internal industrial structural changes (A3), such as the automotive industry where resource efficiency will be increasingly important

## **6.2 Policies supporting the bioeconomy**

### **6.2.1 Implementation of bioeconomy strategies at various territorial levels**

The bioeconomy has the potential to address some of the main ecological, environmental, energy food supply and natural resources challenges by boosting the production of renewable biological resources into food, animal feedstuffs, materials and bioenergy.

It represents a contribution to the effort of transition towards a post-petroleum society, by enhancing the production and exploitation of sustainable resources while limiting negative impacts on the environment. Furthermore, the bioeconomy is a source of growth and jobs: in 2012, it represented an annual turnover of around two trillion euros

and employed around 22 million people. In 2012, it was already one of the Union's biggest and most important sectors encompassing agriculture, forestry, fisheries food and chemicals.

The European Bioeconomy Strategy and action plan was adopted in February 2012 and defined the bioeconomy as:

*"the production of renewable biological resources and the conversion of these resources and waste streams into value-added products, such as food, feed, bio-based products as well as bio-energy".*

The major aim of the strategy was:

*"to pave the way to a more innovative, resource efficient and competitive society that reconciles food security with the sustainable use of biotic renewable resources for industrial purposes, while ensuring environmental protection".*

The objective of the strategy was thus to provide a comprehensive approach to address key challenges faced by Europe and the world: increasing population, depletion of natural resources, environmental impacts, climate change, energy independence, replacement of fossil fuel resources, etc. The strategy identified five objectives to which the strategy and its action plans are to contribute:

1. Ensuring food security;
2. Managing natural resources sustainably;
3. Reducing dependence on non-renewable sources;
4. Mitigating and adapting to climate-change
5. Creating jobs and maintaining EU competitiveness, which is directly linked to Cohesion Policy

The main purpose of the strategy was to streamline existing policy approaches in the area of bioeconomy, and it is structured around three pillars:

- Investments in research, innovation and skills;
- Reinforced policy interaction and stakeholder engagement;
- Enhancement of markets and competitiveness.

In total, the strategy has a total of 12 actions, subdivided into 54 sub-actions.

In 2017, the renewed EU industrial policy strategy was adopted. It included elements to further support the uptake of bioeconomy. The process brought together all policies around industry, including a strategy on plastics and measures to improve the pro-

duction of renewable biological resources and their conversion into bio-based products and bio-energy, as a way to accelerate progress towards a circular and low-carbon economy.

In 2017, a review of the strategy was undertaken by the European Commission. The key findings were that:

- The strategy was delivering on key actions. It has mobilised R&I funding, with a doubling of EU R&I funding dedicated to the bioeconomy under H2020 and contributed to the launch of the BioBased Industries Joint Undertaking
- Both the opportunities that the bioeconomy offers and the importance of bioeconomy Strategy coordination are increasingly recognised by EU Member States and regions, with development of national and regional bioeconomy strategies
- Further mobilisation of investments is still needed, which requires a stable regulatory environment, with existing and new technologies and demonstrators needing to be up-scaled and rolled out
- Policy coherence needs to be better addressed, as well as the design and implementation of the Strategy and its Action Plan, as there are discrepancies between the strategic objectives and the actions and a lack of indicators
- The change of the policy context advocates for a need for sustainable, circular bioeconomy, and the 2012 strategy and action plan need to be adapted
- Better monitoring and assessment frameworks are needed to assess progress.

These findings were taken-up in the updated Bioeconomy Strategy adopted in 2018 (COM(2018) 673 final). The updated 2018 Strategy keeps the five strategic goals of the 2012 Strategy and proposes three main action areas to support them:

1. strengthen and scale-up the bio-based sectors, unlock investments and markets;
2. deploy local bioeconomies rapidly across Europe;
3. understand the ecological boundaries of the bioeconomy.

Bioeconomy strategies have been implemented at various territorial levels in Europe. Several countries and regions have adopted national or regional bioeconomic strategies (e.g. Finland, Scotland, Saxony-Anhalt, South-west Netherlands). Each region has a different approach, around its distinctive assets (as one of the driver was the requirement of EU smart specialisation strategies), with a main objective of economic development fostered by the bioeconomy. Each strategy could thus focus on certain types of biomass, or on certain sectors, depending on availabilities and local priorities.

### 6.2.2 Territorial aspects of the bioeconomy

From the bioeconomy perspective, territorial aspects are instrumental. Indeed, the uptake of bioeconomy is partially linked to the availability of bio-materials (terrestrial, marine and maritime biological resources).

Regional and local governments and other local institutions have a role to play in implementing measures to promote bioeconomy. At the local level, the development of bioeconomy strategies concerns different type of regions, from predominantly rural regions to intermediate regions, from coastal to non-coastal regions. Predominantly urban regions are less concerned, as bio-materials are less accessible in urban contexts.

The updated bioeconomy strategy emphasizes that bioeconomy deployment will lead to job creation, notably in coastal and rural areas with the participation of primary producers. For urban areas, the strategy points out that cities should become major circular bioeconomy hubs, with significant and economy gains. It concerns mostly the management of organic waste. The example of Amsterdam is provided, with the recycling of value organic residue streams that could generate €150m of added-value per year, create 1 200 new jobs and decrease CO<sub>2</sub> emissions by 600 000 tonnes.

Whatever the territorial scale, several types of policy instruments can be mobilised to support the development of biosourced materials:

- Regulatory measures, for prohibition or obligation. The specific territorial implementation of such measures is often not relevant, as the measures are usually implemented horizontally across EU territories.
- Fiscal and financial measures. It can be financial support (e.g. subsidies, guarantee) or fiscal incentives (e.g. tax exemption). Some measures can be implemented at the territorial level, such as call for projects or R&I support scheme. In its updated bioeconomy strategy, the Commission indicate that regions and municipalities will be mobilised for pilot action to support local bioeconomy development (rural, coastal, urban) through Commission instruments and programmes;
- Procurement measures, to support the uptake of specific products. Some measures can be implemented at the territorial level;
- Communication and awareness raising measures. While the development of norms, labels or certification schemes might be more relevant at a bigger territorial scale, some communication measures can be undertaken at the territorial level;
- Sector organisation measures. The territorial level can be relevant for the implementation of such measures. The development of a regional or local bio-

economy strategy is often linked to the willingness to foster the regional industry, either because it is losing importance (A1) or they are fears that it will do in the near future, and thus that structural changes need to be supported (A3). For instance, in France, the biorefinery of Pomacle-Bazancourt (Bourgogne) supported industry diversification and fostered the arrival of new industrial stakeholders. Another example is the on-going development of a local strategy in a sub-territory of the Hauts-de-France region, to create new industrial activities in a crisis-affected region.

In its recent *Realising the circular bioeconomy*, the OECD indicates that there is no single policy regime suitable to support bioeconomy development. Numerous factors are to be taken into consideration, depending on the resources (including waste feedstock), the sustainability of the processes encompassed but also on the maturity of the regional bioeconomy sector and technologies mobilised.

### **6.2.3 Bio-plastics**

The European Strategy for Plastics in a Circular Economy (2018) supports the development of alternative types of feedstock (e.g. bio-based plastics or plastics produced from carbon dioxide or methane), to offer similar functionalities as traditional plastics by limiting the use of fossil fuels and reducing environmental impacts. However, the strategy notes that these products currently represent only a small (but growing) share of the market, and that their positive environmental effects still need to be demonstrated. It advocates for the implementation of labelling and adequate waste collection and treatment. These objectives are in line with the renewed EU industrial policy strategy, with a target of having all plastics packaging placed on the EU market be reusable or recyclable in a cost-effective manner.

At the national and regional levels, it is possible to set specific objectives and requirements for bio-plastics. For instance, France set up a ban on single-use non-biodegradable plastic bags, with a periodic increase of the biodegradable content that may come from biomass. However, the lower the geographical scale, the more difficult to implement such mandatory policies. Indeed, it could generate extra charges for companies operating locally, as they are potentially forced to adopt specific and more expensive solutions. It could also create confusion for stakeholders, with coexistence of different systems or requirements from various territories. It would thus be recommended that local policies remain non-mandatory, in order for the market to adopt them autonomously.

## **7 Good governance for the circular economy. Behavioural change**

### **7.1 Good governance for the circular economy**

Societal factors for transitioning to the circular economy include factors varying from policy design, its impact and transformative character through imperceptible and difficult-to-define concepts such as political will and ambition, the quality of strategic planning and the institutional framework and multi-level governance. The role of civil society and the private sector through public engagement and impacting behavioural change is also instrumental for initiating and guiding the transformation of the energy sector.

In some cases, the drive towards circular economy is also happening on a regional level. Regions are different in the way they approach the transition to the circular economy and the strategic, policy and financial efforts that are invested in it. One possible classification of regions would divide them into those which align themselves with national, EU compliant targets and focus on ensuring compliance. They often struggle with human capacity or do not have the necessary financial means needed for the transformation of the economy.

#### **7.1.1 Institutional framework**

Certain regions decide to follow a more ambitious path and often become leaders in a given sector or sub-sector. They have gained significant momentum in the process and have achieved measurable results which further stimulated change and drummed up additional political and business energy. On a regional level, public institutions are the main institutional drivers in using their strategic position for creating the strategic framework. They also use their legal responsibilities in physical planning and enforcement of legislation. The circular economy will require the implementation of more innovative forms of governance structure namely involving a large number of actors and institutions such as: the region, the chambers of commerce, clusters, associations, business intermediaries and the citizens. Different forms of collaborative decision making will be needed (ADEME, 2017).

#### **7.1.2 Human capital**

The quality of governance, political stability, the structure and variety of the institutions and institutional landscape are instrumental for the transition to the circular economy. The diversity of national and regional institutions, the synergies between them and the quality of human resources are a strong factor for enabling the transition to the

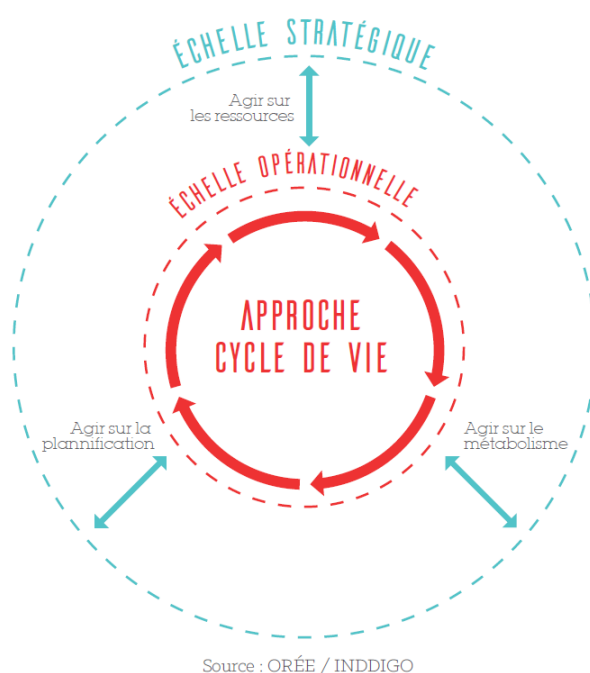
circular economy, for instance through the capacity to implement and enforce circular strategies and new legislation and the capacity to adopt innovative solutions.

Clarity of purpose and setting realistic goals should be at the core of the governance process. A group of UK charities undertook a research project exploring how and why individuals participate in their communities.<sup>12</sup> Being realistic about the purpose of the participation and about what participation can and cannot achieve is of utmost importance. It also requires institutions, organizations and groups to recognize that participation is dynamic and that opportunities need to be flexible’.

### 7.1.3 Multi-level governance

France’s White Book on the Circular Economy differentiates between a ‘strategic scale’ (re-gions, cities, etc.) where resources have to be analysed in their totality) and ‘operational scale’, allowing to shift to project level action (ADEME, 2017). This operational scale allows the integration between circular economy and territorial planning, as shown in Figure 7-1.

Figure 7-1: Relation between strategic and operational level of governance



Source: ADEME, 2017

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<sup>12</sup> NCVO, 2011, Pathways through participation

## **7.2 Behavioural changes for circular economy**

Shifting consumer patterns can be a key factor for a circular economy transition. The sum of our individual or household behaviour has a substantial impact on the economy and the environment. As people have difficulties in establishing a relation between personal behaviour and large-scale problems even if we express environmental concern and awareness, this most often does not translate into behaviour (Kollmuss & Agyeman, 2002). Nevertheless, awareness raising and increasing environmental responsibility can lead to a change in consumer behaviour towards a more sustainable and circular consumption and even pay a higher price, if needed.

A change of behaviour implies adopting a more frugal model of consumption in terms of quantity, but also changing the quality of consumption is at stake. This is especially difficult to achieve in times of economic crisis when recovery is mainly guided by the existing demand and consumption model (Musu, 2014).

Considering all the relevant theories, the promotion of green circular behaviour will require a multi-dimensional view (Jackson, 2005). Kollmuss & Agyeman (2002) have identified the factors important in green behaviour as falling under three headings: demographics, external factors and internal factors. External factors include infrastructure, economic, social and cultural factors. Internal factors include motivation, environmental knowledge, values, attitudes, environmental awareness and perception of control.



## **8 Circular economy, and territorial cohesion policies**

### **8.1 Cohesion policy and circular economy**

Cohesion Policy applies a fully territorial approach and investments are targeted to meet the local and regional needs. The Cohesion Policy is not directly related to circularity as there are no specific provision of such actions and investments. Nevertheless, there are still plenty of opportunities to promote circular economy and two of the policy's thematic objectives are linked to circularity; Low-carbon Economy and Environment and Resource efficiency. Investments supporting circularity are made in recycling, improved waste management, resource and energy efficiency, strengthening the bioeconomy, novel solutions in product design, new business models, etc. Support to cross-border and transnational programmes are fostering interregional cooperation on circular economy activities, such as e.g. projects on industrial symbiosis, awareness-raising and the exchange of knowledge and best practices (European Commission and DG Regio, 2016). ERDF investments are supporting Smart Specialisation Strategies (RIS3) to promote sustainable impact on jobs and growth in EU regions through innovation, and circular economy is a priority that contribute to steering the investments. Moreover, the circular economy is one of the 12 priority themes established under the Urban Agenda for the EU (2016). In this framework, cities will work with the Commission, Member States and other partners on waste, resource efficiency and the sharing economy. The partnership is currently developing an Action Plan on Circular-economy for cities.

Circular economy was not on the agenda at the time of the planning for the Cohesion Policy 2014-2020. There is therefore high potential to give it a more prominent role in the new post 2020 Cohesion Policy. The proposal for the new framework present five main objectives, where objective 1 and 2, Smarter Europe and Greener, carbon-free Europe will be given the highest priority. One of the specific objectives within Policy Objective 2 is called 'promoting the transition to a circular economy'.

In terms of the territorial approach, the new framework proposed will put greater emphasis on the urban dimension of Cohesion Policy. In line with current priorities, increased funding should be allocated to circular economy and related activities in the post-2020 policy. A recent report from the EU Parliament suggest introducing new ex-ante conditionalities as well as relevant tracking methodology for an accurate monitoring of the cohesion policy contribution in achieving circular economy in order to allow the new operational programmes to better reflect circularity (Committee on Regional Development, 2018).

The draft regulation on European Territorial Cooperation proposes to address inter-regional cooperation through cooperation between adjacent regions of Member States but also: between one Member State and one external region; cooperation between outermost regions; scaling up of inter-regional innovation projects, etc.<sup>13</sup> In all these cases, there will be practical and concrete opportunities to engage in circular economy work.

Thematic concentration will require a special spending focus on Policy Objective 1 (PO1 - Smarter Europe) and Policy Objective 2 (PO 2 - Greener, low-carbon Europe). For countries with a Gross National Income (GNI) above 100% of the EU average the PO1+PO2 spending should be at least 85% of the overall spending. For the 75-100% GNI and the below 75% country group at least 30% is proposed to be spent on PO2. According to analysts, the new Multiannual Financial Framework (MFF) will mark a significant shift from funding infrastructure towards innovation, broadband and SME support. Additionally, significant priority adjustments will be needed mainly in EU12 countries where there will be a major reduction in infrastructure allocations. This will potentially lead to absorption problems.<sup>14</sup>

## 8.2 Financing for circularity

Availability of funding for the circular economy is a pre-condition for speeding up transition. The EU Cohesion Policy and the Horizon 2020 funding for research are two of the biggest financial streams available in the EU. However, the take up and mainstreaming of circular economy funding in other financial instruments and in the activity of smaller providers would provide a bigger leverage effect. We will illustrate some of the objectives through several examples.

For example, the **Danish Fund for Green Business Development** has been promoting resource efficiency in Danish businesses by giving grants to selected businesses. The Fund has especially been focusing on exploiting the potential for growth in Danish businesses in the circular economy and the sharing economy.

The Fund has invested in the following themes strongly relevant to the Circular Economy:

- Development of new green business models;

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<sup>13</sup> COM 2018/374 final Regulation of the European Parliament and of the Council on specific provisions for the European territorial cooperation goal (Interreg) supported by the ERDF and external financing instruments

<sup>14</sup> EPRC, University of Strathclyde, Proposals for the MFF and Cohesion Policy 2021-27: a preliminary assessment.

- Product innovation and re-design of products;
- Promotion of sustainable materials in product design;
- Sustainable transition in the textile and fashion industry;
- Reducing food waste;
- Sustainable bio-based products based on non-food biomass.

The **Dutch pension fund PGGM** has an action plan for circular economy, with 7 actions: promoting circularity through investments of their clients; emphasizing the importance of circular economy to consumers; prevent wasting human capital; promote circular business management; contribute to policy making; develop an instrument to measure circularity of companies; knowledge exchange with financial institutions.

The **Caisse des dépôts et consignations** (CDC, France) is a French public financing institution since the beginning of the 19th century. The CDC supports many kinds of initiatives, especially those linked to the territory, the ecologic and energy transition. The CDC funds financial programmes linked to the social and solidarity economy, which, in the French context, includes circular economy<sup>15</sup>.

The French government launches **calls for expressions of interest in favour of the circular economy**. Selected projects focus on various sectors such as waste valorisation, wood, collective catering, construction material, etc.

### 8.3 Circular economy and Territorial Agenda 2020

*The EU Territorial Agenda (2011)* does not contain any direct links to the circular-economy. It stresses the sustainable utilization of territorial capital in form of natural values and ecological services but there is only a limited reference to circularity in the form of efficient and environment friendly production. At the heart of the Territorial Agenda is the notion of territorial cohesion and the recommendation to take the territorial specificities and local endowments into consideration in planning and policy processes. It states that “most policies at each territorial level can be made significantly more efficient and can achieve synergies with other policies if they take the territorial dimension and territorial impacts into account”. This is highly relevant also for the circular economy. The EU Strategy on circular-economy recognise the role of the regions and states that a broader commitment from all levels of government, in Member States, regions and cities and all stakeholders concerned will be necessary for moving towards a circular economy. However, the roles of the regions as well as the

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<sup>15</sup> <http://caissedesdepots.fr/>

impact and potentials of various territorial specifics in developing circular economy could be given even more attention.

## **9 Circular economy in Territories with Geographical Specificities**

Regions in Europe have a strong role in implementing circular economy. Local and regional actors are well positioned to best exploit regional potentials for developing circular economy actions on local level, having a strong influence both on consumers, businesses and other local actors. The regional and municipal jurisdiction is also of relevance, not the least in waste management where municipalities have the responsibility for waste management. The strategies for circular economy should depend of the various assets and specifics of each city or region and is also influenced by the geographical specificities of the territory as well as how well the region is connected in terms of transport and infrastructure networks. In addition, the economic or industrial profile of the TGS is significant. Industrial territories have opportunities for developing industrial symbiosis and closing the loop of production chains while service-oriented territories can better benefit of developing “sharing-economy” initiatives and services for e.g. transportation or accommodation (Taranic et al., 2016). It is therefore necessary that each region analyses its potential and are active in defining needs and in setting local targets, relevant to the specific context and TGS to shape their own path towards circular-economy. The following sections outline some characteristics of developing circular-economy in the respective TGS.

### **9.1 Coastal regions**

The three main challenges faced by coastal regions with regards to the circular economy are the blue bioeconomy, waste management (especially in touristic regions) and ports. These also represent opportunities for the regions to raise the profile of circular economy in these specific value chains.

The blue bioeconomy plays an important role in coastal regions and includes aquaculture, fishery and aquatic biomass, water-based well-being and water-based technology and innovation. There are many possibilities for improving the efficiency in the blue bioeconomy as well as improving its circularity, that includes synergies with land-based food, feed production and processing, production of bio energy, chemicals and nutrients. Innovative solutions involve ocean farming of seaweed and there is also potential for use of algae in fertilisers, bringing nitrogen and phosphorus back into the agricultural food chain (JRC, 2017). There is big potential in ports and the linked industry to promote the circular economy. An example is the port of Rotterdam that acts

as a 'matchmaker' by bringing together producing and recycling industries related to the port; accommodating industries that treat, collect and ship waste. It also acts as a logistical hub for import and export of waste materials and thus offering opportunities for circular and more sustainable use of waste and resources (Port of Rotterdam, n.d.).

## **9.2 Mountainous regions**

The main challenges of mountainous regions with regards to the circular economy are related to the bioeconomy including forestry and agriculture. The bioeconomy is an important sector in mountain areas and can significantly contribute to the implementation of circular economy. Biowaste have a key role with its potential to enhance the use of bio-waste in existing value chains. Innovative solutions such as bio-based, biodegradable and compostable materials, as well as permanent materials, are important for achieving better resource efficiency and retention of valuable materials in circular loops (Committee on Regional Development, 2018). Mountain regions are often home to traditional economic sectors such as forestry and agriculture which raw material can create the basis for increasingly closing the loop of production and where opportunities for industrial symbiosis and renewable energy production are plentiful. The Metsä Fibre company, a new mill in Äänekoski in Central Finland, is an example of how an ecosystem of companies are created by using the regional biomass, know-how and strengths, promoting the forest bioeconomy and circularity and thus maintaining the value of products, materials and resources in the economy if possible while minimising waste generation. The paper pulp is at the heart of the production and the remaining industry park benefits from the side streams and by-products and produces electricity, heat, steam, biogas for transportation, plywood, wood composite products and agri- and forest fertilisers. With a value of EUR 1.2 billion, the bioproduct mill is the largest investment in the history of the Finnish forest industry (JRC, 2017).

## **9.3 Sparsely populated regions**

Territorial concentration of population and economic activity is increasing, and it is expected that this trend will continue with an increased concentration towards urban centres and their vicinity (ESPON, 2017). The circular economy has a strong link to urban areas and to the interconnected parts of Europe and potential benefits of improved circularity might not always reach peripheral regions. The low density of population makes it more difficult to develop e.g. resource-efficient transport systems, district heating systems or expanding the sharing economy than in territories with larger populations and higher concentrations of inhabitants. A challenge for circular economy in SPAs is to reach the critical mass which is necessary for circular systems.

It is therefore particularly relevant for SPAs to increase the level of cooperation and to establish cooperation platforms to improve opportunities for establishing sharing-economy of scale, to develop processes for industrial symbiosis as well as for developing innovative transport systems. Bioeconomy is often an important sector in SPAs and there are plentiful associated opportunities for improving resource efficiency and circularity, as described in the section on mountain areas above. SPAs also have potentials for take advantage of smart specialisation strategies and promoting the development of e-services and ICT solutions.

## **9.4 Islands**

Islands share many potentials for developing circular-economy with coastal regions. More specific for islands are that they are in general isolated regions that often have a limited land availability which leads to that for instance waste management is challenging, including the growing problem of marine littering. The insularity of islands may also create challenges in developing more resource-efficient transport systems. Closing the loop in value-chains is therefore specifically desirable on islands to improve the utilisation of available materials and minimise waste generation. The Danish island of Samsø launched the “Full Circle Island” program in 2015 which aims at making the island the first fully circular place in the world. One of the first projects supported by this initiative is the production of local liquid bio-natural gas for the ferry consumption and the construction of a biogas plant. Samsø is energy-sufficient since 2007 and the objective of project is to extend their independence to more sectors.

## 10 Conclusions

A very big number of policies fall within the definition of circular economy and there is a **need for precise classification of these policies** in line with the legal typology of the policy but also in line with the production and consumption cycle and the sector of the economy.

The breadth of the EU policy landscape in relation to circular economy, shows the importance it is given by EU policy-makers. However, this complexity also runs the risk of specific issues of importance to the circular economy being the subject of multiple policies and pieces of legislation, or indeed of falling between policies/legislation.

Different policies are relevant to a variety of governance levels starting from the European to the local level. **On one hand we need to differentiate the possibility of the different governance levels (regions, cities) to influence the design of the policies but also to implement policies designed at a higher governance level.**

If they are well-designed, the **circular economy policies interact with the territorial factors** developed within CIRCTER by enhancing their effect.

The EU Circular Economy Action Plan provides the backbone of Europe's Circular Economy Package. It outlines a series of measures and actions which aim to "stimulate Europe's transition towards a circular economy which will boost global competitiveness, foster sustainable economic growth and generate new jobs". CEAP has contributed in mainstreaming the concept of circular economy, outlining activities in areas as diverse as the online sale of goods, fertilizers, innovation, eco-design, food waste, waste-to-energy and financing to support circular economy. CEAP does not contain strong territorial references.

The Circular Economy Monitoring Framework was launched recently to provide support in tracking the progress towards the circular economy objectives through a set of indicators that will be further improved and expanded. The finetuning and interpretation of these indicators for the purpose of benchmarking countries and regions with regards to their transition to the circular economy is yet to be completed.

The **complex policy landscape can also be confusing for businesses and citizens**, highlighting the importance of engaging stakeholders to ensure they understand key issues and are informed and supported in ways to enable them to help in the development and implementation of circular economy related policies and legislation.

There is a trend in bringing the circular economy and associated strategic thinking and business models to regional and local level. This is the shift from the strategic to

the operational levels. However, **the main part of the integration of circular economy in the regional strategic thinking is yet to be done.** It is very clear that when regions and cities plan their strategic approach to the circular economy place-based considerations will have to seriously be taken into account.

**Policy actions to facilitate transition towards circular economy have also been taken by selected regions and cities.** Some have already adopted their circular economy strategies, in other cases regions and cities have been introducing the circular economy narratives in their waste, economic, agriculture, bioeconomy, construction and other policies.

Circular economy policies have mainly originated from the waste and resource efficiency policies, mainly focusing on aspects like addressing material resource losses via savings, implementing waste and packaging recycling schemes. Beyond waste topic, other elements of the circular economy are becoming visible in the policy discourse, such as servitisation, remanufacturing, digitisation, collaborative economic models. **Circular economy goals are also being integrated in the economic development strategies.**

The EU waste policies developed in the past 30 years have brought a revolution in handling waste in the European Union. EU waste legal framework is complex and comprehensive. The overall impact of waste-related policy on the circular economy is significant. All efforts in terms of policy and initiatives to prevent the generation of different categories of waste fit into the notion of circular economy despite the fact that there is no closing of the loop per se. The increase of different recycling targets is a notable example of circular economy-related amendments. **Regions and cities have a significant leverage in waste management in a number of countries.** The concept of zero waste territories has been born.

Industrial symbiosis (IS) is an approach that engages several organisations across different fields in a process of developing mutually beneficial transactions to reuse waste and by-products. Making industrial symbiosis happen depends on many governance, policy and territorial factors, especially due to the current market conditions for by-products and reused materials, as well as the regulatory conditions for specific materials. **Cities or regions are in the position to launch facilitation programmes for Industrial Symbiosis.** The higher the value of the material flow the wider the territorial area where transactions could take place. IS needs to start making sense for businesses if it is to be implemented at scale.

At the EU level, legal requirements for repair and reuse remain limited, and have not, until recently, been the main focus of policy-makers. Currently, the Eco-design Directive is the piece of legislation that offers many prospect. **Both repair and reuse are often linked to new local behavioural practices, i.e. Repair Cafes and cities are in a very good position to initiate these new practices.**



Premature obsolescence covers different issues linked to product durability. It can include issues such as negligent or avoidable obsolescence, which lead to a product lifespan being shorter than possible. Planned obsolescence is not specifically addressed in EU legislation, but requirements on durability however exist in several legislations (Consumer sales directive; Eco-design, WEEE; product return legislation).

**The translation of circular objectives into concrete policy implementation will require the development of standards for “assessing material efficiency aspects”.** Although the Eco-design Directive made room for the introduction of material efficiency standards, no mandates had been issued until recently.

The collaborative economy (sometimes called the sharing economy) is rapidly emerging across Europe. It consists in a new way to offer and use products and services, mostly through online platforms. It can create new opportunities for consumers and entrepreneurs that could contribute to competitiveness, jobs and growth in sector such as transport, services, food production, accommodation, etc. **The collaborative economy has strong territorial dimensions as any type of exchange is easier in densely populated areas.**

Voluntary agreements between governments and industry actors can be an efficient way to complement the policy legislation in driving progress towards circular economy. A recent example is the adoption of the EU Plastics Strategy (2018) that coincides with voluntary commitments from a number of stakeholders from the European plastics industry to ensure high level of re-use and recycling with the ambition to reach 60% for plastics packaging by 2030 (and 100% by 2040). **Voluntary agreement can successfully be implemented on a local level, for instance on a city or in a region.** Different types of industry-level voluntary agreements can probably happen easier in regions with gaining industrial importance.

Eco-labels support the transition to the circular economy by establishing transparent criteria enhancing corporate resource efficiency and innovative solutions as well as supporting consumers in their consumption choices. The other main EU certification scheme for organisations, EMAS, is not explicitly targeting circular economy. Nevertheless, **it has inherent potential to contribute to circularity objectives as EMAS implementing organisations have committed to monitoring their processes and constantly improving their resource efficiency.**

The EU Action Plan for Circular Economy recognises Green/circular Public Procurement (GPP) as a key driver in the transition towards circularity. **Because of the high volume of public procurement in the EU increasing the requirements for product/activity environmental and circular performance has a big potential of shaping the future market of services and products.**

While recycling processes recover only a portion of the materials and embedded energy from a product, much of the industrial phases of new product development and production can be avoided via remanufacturing. Through remanufacturing, a used product is brought to at least the quality level of a new product. Cross-sectoral activities to facilitate knowledge transfer and promote the remanufacturing industry have been neglected in Europe so far, however first few initiatives such as the De- and Remanufacturing Pilot Network addressing regional and cross-regional cooperation can be promising. **Regions must be highly industrialised as the implementation of remanufacturing processes requires the existence of a highly developed manufacturing industry** (e.g. automotive, medical sector, aircraft, railway) with various local and regional value chain stakeholders

Bioeconomy strategies have been implemented at various territorial levels in Europe. The bioeconomy has the potential to address some of the main ecological, environmental, energy food supply and natural resources challenges by boosting the production of renewable biological resources into food, animal feedstuffs, materials and bioenergy. It represents a contribution to the effort of transition towards a post-petroleum society, by enhancing the production and exploitation of sustainable resources while limiting negative impacts on the environment. The bioeconomy mainly concerns predominantly rural regions.

Societal factors for transitioning to the circular economy include factors varying from policy design, its impact and transformative character through imperceptible and difficult-to-define concepts such as political will and ambition, the quality of strategic planning and the institutional framework and multi-level governance. **The role of civil society and the private sector through public engagement and impacting behavioural change is also instrumental for initiating and guiding the transition to circular economy.**

**Shifting consumer patterns can be a key factor for a circular economy transition.** The sum of our individual or household behaviour has a substantial impact on the economy and the environment. This can be achieved by a combination of regulatory instruments, voluntary actions and information measures.

Cohesion Policy applies a fully territorial approach and investments are targeted to meet the local and regional needs. The Cohesion Policy is not directly related to circularity as there are no specific provision of such actions and investments. Nevertheless, **there are still plenty of opportunities to promote circular economy in Cohesion Policy** and two of the policy's thematic objectives are linked to circularity; Low-carbon Economy and Environment and Resource efficiency.

The take up and mainstreaming of circular economy funding in other financial instruments and in the activity of smaller providers would provide a much bigger leverage effect.

The EU Territorial Agenda (2011) does not contain any direct links to the circular-economy. It stresses the sustainable utilization of territorial capital in form of natural values and ecological services but there is only a limited reference to circularity in the form of efficient and environment friendly production.

The implementation of Circular Economy in territorial planning will lead to the optimisation of resource management on different scales (region, city, cluster, etc.) thanks to local value chains and local transactions.

The horizontal, multi-stakeholder approach requires a constant shift between different governance levels and constant challenging of all stakeholders.

## 11 Recommendations

### 11.1 General

- The transition to the circular economy is complex and requires the introduction and enforcement of complex policy landscapes on all governance levels ranging from the strategic to the operational. Policies should address all stages of the product from material sourcing to disposal and secondary material treatment. Similar types of policies should be adapted to different sectors of the economy and their specific value chains. This recommendation is mainly targeted at national level and addresses the architecture of policy measures.
- With regards to territories policies need to be analysed from a point of view of policy design but also policy implementation. Policies differ in their contribution to the transition to the circular economy, their capacities to trigger radical changes of behavioural models for companies and citizens. This recommendation is targeted both at national and regional level and addresses the policy enforcement capacities.
- There is no striking difference between policies which could be deployed in different types of regions. However, while rural regions are more suitable to hosting bioeconomy policies and business models, changes in food production, urban regions are more apt to deploy different collaborative methods, municipal waste management, new business models for repair and reuse, etc. This recommendation is mainly targeted at national level and is in fact only a recognition that not all sectors are equally relevant to different types of territories.
- When developing new policies for the circular economy policy-makers should be aware of the territorial factors for the circular economy introduced within CIRCTER. Policies should take into consideration the agglomeration economies; the land-based resources of the territory; its accessibility conditions; knowledge- and technology-based enablers; available technology; as well as governance and institutional drivers. This recommendation is targeted both at national and regional levels.

### 11.2 The Circular economy at EU policy level

#### 11.2.1 The circular economy within strategic EU documents. Current policy debates

##### Circular Economy Action Plan

- The Circular Economy Action Plan is a solid framework for launching actions on national, regional and local levels and for the time being it provides sufficient basis for action in circular economy for the Member States. As knowledge on circular economy fields and policies is constantly evolving

CEAP needs to be updated and enriched on a regular basis. This recommendation is targeted at EU level.

### **Circular Economy Monitoring Framework**

- The recently launched Circular Economy Monitoring Framework provides an initial framework for tracking progress towards circular economy. However, there is a need to further improve it and expand it so that it captures all dimensions of circular economy. As it has been demonstrated by scientific papers and Horizon 2020 projects the assessment of the impact of circular business models on the economy, the environment and the society, and hence on territorial development, is not straightforward and depends on the particular sector and territory. As regions and cities are main actors of the circular economy and as future breakthrough efforts will often take place on this level there is a need to develop the framework in such a way as to capture progress on regional and local level. This recommendation is targeted at EU level.

### **Reducing complexity and engaging stakeholders**

- The complex policy landscape runs the risk of specific issues of importance to the circular economy being the subject of multiple policies and pieces of legislation, or indeed of falling between policies/legislation. The complexity can also be confusing for businesses and citizens, highlighting the importance of simplifying the policy framework and engaging stakeholders to ensure they understand key issues and are informed and supported in ways to enable them to support the development and implementation of circular economy related policies and legislation. This recommendation is targeted mainly at national level.

### **Continuing integration of circular economy in other policy instruments**

- There is already a trend of integrating circular economy goals and discourse in waste and resource efficiency policies on an EU but also on a national level. Other topics such as servitisation, remanufacturing, digitisation, collaborative economic models become more and more integrated with circular economy. Circular economy goals are also being integrated in the economic development strategies. This process of integration and mainstreaming needs to continue on all governance levels starting from the EU, national, regional and city level. This recommendation is targeted both at EU and national levels.

## **11.2.2 Changing the national and regional paradigms: dedicated national and regional strategies for circular economy**

### **Adopt dedicated circular economy strategies**

- Currently, a number of Member States have developed dedicated circular economy strategies and roadmaps. This is extremely helpful to bring the circular economy discourse into life and boost the dissemination and implementation of Circular economy concepts. Hence, Member States without dedicated Circular Economy Strategies should consider adopting one. This goes hand in hand in adopting strategies and/or targets for resource productivity. This recommendation is targeted at national level.

- The development of regional development strategies is also gaining speed in the European Union and should be further stimulated. The regional strategies allow taking stock and focusing on the regional economies and value chains, sectors of specialisation, regional knowledge and other intangible assets, etc. This recommendation is targeted at regional level.

## **11.3 Circular economy thinking goes down to regional and city levels. Some examples of regional and urban policies**

### **11.3.1 Make use of the territorial capital**

- **Cities and regions hold significant assets that are key building blocks on the road to circular economy.** This territorial capital varies across territories (geographical location, natural resources, social capital and institutions, etc.), their economic role in the cities and regions, and how much they can be leveraged to foster transition to the circular economy. The realisation of the potential of the territorial capital depends on a number of factors including policy, institutions, political will and financial context. This recommendation is targeted both at regional and city level.

### **11.3.2 Make use of existing knowledge and financial instruments**

- **Regions with ambitions in circular economy should make use of existing instruments** to exchange experience, embark on a learning curve and engage in research and innovation such as Interreg Europe, Horizon 2020 and ‘Covenant 2022 – Circular Economy’. There is already a body of practical knowledge (i.e. cooperation projects) on circular economy and regions and cities can capitalise on it. For example, such Interreg projects include BIO-REGIO, CircPro, CircE, ENHANCE, TRIS, CESME, SYMBI focusing on various issues and instruments in the context of building a circular economy, including procurement, SMEs inclusion, environmental management, urban planning, bioeconomy, industrial symbiosis, etc. The Horizon 2020 SCREEN project is one such example. This recommendation is targeted at regional level.

## **11.4 The demise of waste**

### **11.4.1 Major EU waste policies. Latest developments. Circularity**

#### **Integrate the Circular economy discourse in all waste legislation**

- EU waste legal framework is complex and comprehensive. The overall impact of waste-related policy on the circular economy is significant. The notion of circular economy is finding its way in the waste legislation. However, there is a need for continuing efforts for mainstreaming circular economy in waste legislation. This recommendation is targeted both at EU and national levels.

## **Regions and cities as main actors in waste management**

- Regions and cities have a significant leverage in waste management in a number of countries. In most cases individual municipalities are responsible for waste management. Also, regions are a suitable geographical level for coordinating the efforts of individual municipalities and setting up systems for integrated waste management. Therefore, the role of cities and regions for enhancing the circular economy dimensions of waste management should be actively promoted and supported. Regions can also elevate the level of their ambitions and strive to become zero waste territories. This recommendation is targeted both at regional and city level.

## **Increase targets within the waste legislation**

- Since the CEAP, **legislative proposals have been made to revise several pieces of waste legislation**. The increase of different recycling targets is a major part of the revision and is a notable example of circular economy-related amendments. Meeting those new targets might be a serious challenge for Member States and regions and cities have an important role to play in order to support the implementation of these targets on local level through local provision, minimization and promoting of re-use, recycling and recovery during the whole life-cycle of the product. This is a transversal recommendation relevant for all governance levels.

## **Regional/city vision for better waste management**

- Meeting the increased targets can happen through setting action plans for the prevention and reduction of different waste streams as a part of their long-term visions and strategies for waste prevention and development of circular economy. Additionally, regional and local authorities can take action to raise consumer awareness on waste by establishing focused educational programmes and providing practical tips to consumers on how to prevent waste. The effectiveness of such campaigns can be increased by using new media and technologies to reach out to consumers. This recommendation is targeted both at regional and city level.

## **Multi-stakeholder cooperation for waste management**

- In stimulating innovation with regards to addressing food waste policy-makers need to focus on development of cooperation mechanisms with universities, other cities and regions, entrepreneurs and civil society organizations. This recommendation is targeted mainly at regional level.

## **Implement the Plastics Strategy**

- The Plastics Strategy calls for curbing plastic waste and littering; driving innovation and investment towards circular solutions. The strategy prompts actions to be taken towards the development of standards and definitions on plastic waste management and also the adoption of a single-use plastics directive. These efforts need to continue. This recommendation is targeted at national, regional and city levels.

## **Better awareness for better plastics management**

- Cities and regions have an important role for the improvement of knowledge in the whole value chain and increase awareness of citizens; improve waste collection systems and better separate collection: in cooperation with waste management operators; increase plastics recycling capacity; extend EPR models and provide economic incentives such as introducing obligatory price

for plastic bags. They can also use public procurement as an instrument to stimulate change of models, better plastics and better recyclability. . Citizens and NGOs should also exert pressure on businesses to sort out the plastic they use through substitution or other innovative ways and also change habits: use less plastics for single use; and sensibilise the citizens on the problem of microplastics. This recommendation is targeted both at regional and city level.

### **Stimulate companies to adopt new business models**

- Regions and cities should also stimulate companies to adopt new business models such as reverse logistics for (plastic) packaging and alternatives for disposable plastics. Policy makers and mainly business associations and NGOs could also have a role here and the main action should be awareness raising and demonstrating successful models. This recommendation is targeted both at regional and city level.

## **11.5 Industrial symbiosis**

### **11.5.1 Application of economic and regulatory instruments**

- Several economic and regulatory instruments introduced by regional and local authorities can drive industrial symbiosis indirectly, through favouring higher and penalising lower waste hierarchy options. Examples include relatively high landfill and incineration taxes, pay-as-you-throw schemes, local landfill bans of various waste streams (e.g. on organic waste), targeted economic incentives. In addition, actions such as promoting Green public procurement (GPP) or supply chain approaches that provide collective solutions to logistical difficulties in IS (e.g. treatment and recovery facilities shared by a number of companies or a circular supply chains voluntary protocol) can also be helpful. This recommendation is targeted both at regional and city level.

### **11.5.2 Development of cooperation platforms**

- The establishment of cooperation platforms can bridge the co-operation and coordination deficit between the suppliers of the production residuals, the potential clients of these residuals and the providers of know- how and technology. Such platforms may help provide potential markets with minimum required scale and scope of industrial symbiosis arrangements, as well as knowledge. The services provided by cooperation platforms can include offering support in 'material scans' and matchmaking for SMEs; providing industrial symbiosis-related technical trainings on the valorisation of material streams; and providing support in securing funding mechanisms. This recommendation could be taken up both at national and regional levels.

### **11.5.3 Assessing opportunities for industrial symbiosis at urban, rural or regional level**

- Local or regional authorities can get involved in understanding the potential for optimising material flows at the level of their region, city or village or in inter-regional exchanges, by undertaking material flow analyses especially in the case of public services or public works. Many opportunities can be found in optimising the management of construction and demolition waste, food waste or waste water. Involving local private or non-governmental partners in



understanding their potential contribution can be beneficial for initiating industrial symbiosis.

- Working with technical experts is recommended for a thorough review and understanding of the opportunities and the business case for IS.

Both recommendations are transversal.

#### **11.5.4 Establishment of eco-industrial parks**

- Regional and local authorities can also take initiative to bring together relevant actors and establish eco-industrial parks with an overall aim to promote industrial symbiosis.

#### **11.5.5 Identification and invitation of potential investors**

- The regional and/or local authorities can undertake a targeted research for potential investors that could make use of a certain by-product available in the area.

#### **11.5.6 Generation of market demand**

- As consumers, local authorities can generate market demand for certain material and energy flows (e.g. biogas that is used in transportation). Interreg Europe programme also supports efforts in this area. Two Interreg Europe projects, TRIS and SYMBI, specifically focus on the environmental and economic benefits that industrial symbiosis brings. While in SYMBI there is an emphasis on green public procurement and innovative programmes, TRIS puts focuses on aspects regarding policy and regulation, networks and tools to improve the capacity of SMEs (Source: Interreg Europe Policy Brief on Industrial Symbiosis). This recommendation is mainly targeted at regional level.
- In addition, approaches to promoting industrial symbiosis could be explored in the context of the future RIS3 (Regional Innovation Strategies for Smart Specialisation) strategies, where regions could identify opportunities for IS as innovation niches in the RIS3. This recommendation is mainly targeted at regional level.
- Cohesion policy may also support further demonstration and experimentation of rural or urban symbioses through, for instance, instruments such as the Integrated Territorial Investments initiative (ITI) or Community-led Local Development (CLLD). This recommendation is mainly targeted at EU level but also national level.

### **11.6 Extending the life of products and materials**

#### **11.6.1 Better repairability through circular design, including targets for repairability and reuse**

##### **Mainstream repair and reuse into other legislation**

- In its Circular Economy Action plan, the EC mentioned both the extension of the Eco-design directive and additional actions to boost repair and reuse. Three main lines of action are foreseen and need to be implemented: inclusion of requirements for the availability of spare parts and repair

information in the Eco-design directive revision, a testing programme against premature obsolescence under Horizon 2020, and the development of reuse activities as part of the revised Waste proposals. This recommendation is mainly targeted at EU level.

#### **Explore options for binding targets**

- Member States can explore options for setting up national binding targets for reuse. Targets for reuse can cover furniture, IT equipment, large electrical goods, etc. This recommendation is mainly targeted at national level.

#### **Strengthening local re-use and repair ecosystem**

- Regions and cities should work on strengthening their local reuse and repair ecosystem, by supporting the local organisations involved, and informing citizens of services' availability. Future Cohesion funds should continue to support this sector. One possible way of doing this is through the introduction of tax incentives for the development of repair services and jobs in Member States. Other efforts should be targeted at setting up and capacity building of repair and reuse centres. This recommendation is mainly targeted at local level.
- Predominantly rural areas are likely to face more difficulty in opening or strengthening a network or reuse and repair centres since their efficiency and capacity to provide the service for a wide range of products is likely to depend on the size that they can reach. Adequate choice of location and products covered, as well as the set-up of exchanges within a network of centres within a region are instrumental in making these services sustainable. This recommendation is mainly targeted at local level.
- Predominantly urban areas benefit from the critical mass to set up not only repair and reuse centres, but also, if governance structures allow, other initiatives such as tax incentives. In countries where these policies are still underdeveloped, they can provide the right environment to set up pilots to test new policies. This can be done at the level of a city or of a region depending on the institutional setting.
- Repair and reuse services usually include social employment, and it can represent an opportunity, to boost local recruitment, in particular for industrial regions that are losing importance (although this is applicable in any region). This recommendation is mainly targeted at regional level.

### **11.6.2 Policies for durability and fighting the premature obsolescence**

#### **Better awareness against premature obsolescence**

- Regions and cities can play a role when it comes to premature obsolescence. Indeed, they can set up and support awareness raising campaigns to help consumers understand marketing techniques that encourage them to throw away products that are still usable. Other actions to fight premature/planned obsolescence includes outlawing this approach and introducing high fines. This recommendation is mainly targeted at regional and local level.

### **11.6.3 Standardisation and circularity**

#### **Introducing circular economy standards**

- The establishment of new, compulsory standards will likely come as a burden for the industry. Such burden might be heavier to carry in less innovative regions. Depending on the definition of the future Cohesion policy, funds may be used to support local producers in implementing new standards, either by financing innovation in product design or the sharing of best practices. This recommendation is mainly targeted at national level.

## **11.7 Sharing economy and collaborative consumption**

### **11.7.1 Regions and cities create the framework for the development of the sharing economy**

- While the uptake of new products and services in the collaborative economy is often realised by private stakeholders, territories often have a role to play. For instance, local governments can create the conditions to foster the development of car-pooling, by creating dedicated areas for travellers to meet or by developing specific platforms. This support can be done by all type of regions, but might be more suitable for predominantly rural and intermediate regions, where individual transport is more present. Predominantly urban regions can further rely on public transport, although it can also implement this kind of measure to decongest road infrastructure and limit pollution. This recommendation is mainly targeted at regional and local level.

### **11.7.2 Support the emergence of start-ups**

- To foster the development of collaborative economy, local or regional governments can also act on the development of a suitable ecosystem for the emergence and growth of start-ups. Indeed, these stakeholders are often at the grassroots of the sharing economy. Such activities could for instance be the creation of innovation cluster and/or the provisions of various services: consulting to strengthen the business models, access to venture capital, trainings, space rental through co-working areas, organisation of fairs and event to ease connections between stakeholders, marketing support at international events, connection to a vibrant ecosystem, etc. This support can be done by all type of regions. However, the critical mass of stakeholders that might be needed to implement a support scheme or the necessity to have adequate technological infrastructures might orient this recommendation mostly for predominantly urban or intermediate regions. In some cases, rural areas might lack the needed infrastructures (e.g. high-speed internet). This recommendation is mainly targeted at regional and local level.

### **11.7.3 Remove market barriers**

- In countries with high level of development of the collaborative economy, the business environment is conducive to its development. Wherever the governments recognise its importance they can work towards the removal of market barriers (regulatory, access to finance, SME support, access to international markets). Additional efforts should be made in ensuring consumer rights, safety of service providers and service users. This recommendation is mainly targeted at national level.

## **11.8 Soft strategies to support circular systems**

### **11.8.1 Voluntary agreements for circularity**

#### **Promote voluntary agreements as a tool for circular economy transition**

- Voluntary agreements and initiatives are widely used in a number of Member States. They are an excellent tool to involve different stakeholders, go beyond legal obligations and address regulatory barriers to projects/investments towards sustainability and encompasses energy-saving techniques, efficient water use, sustainable transport, alternative building materials and sustainable production systems in agriculture. Member States should continue exploring and promoting voluntary agreements as a tool for speeding up the transition to the circular economy. Voluntary agreements can also be applied on local or regional level. This recommendation is targeted at industry associations and business intermediaries.

### **11.8.2 Environmental labelling and circularity**

#### **Improving efficiency of eco-label and EMAS uptake**

- Both the EU eco-label and EMAS, as well as different national labels, indirectly support the circular economy by incorporating criteria on resource efficiency, eco-design, etc. Therefore, improving the efficiency and uptake and penetration of EMAS and the Ecolabel could benefit business and SMEs in moving towards circularity. In addition to that efforts need to be made to incorporate circular economy considerations in the eco-label and EMAS. This recommendation is targeted at EU level but also at national and regional level.

### **11.8.3 Circular public procurement**

#### **Take actions which support circularity**

- National and regional governments are in the position to take actions which support the integration of circularity in GPP such as emphasising circular aspects in EU GPP Criteria to support a higher uptake of GPP among European public bodies and also leading by example in its own procurement and in EU funding. Circular economy actions supported by GPP criteria can include promoting product eco-design and design for recyclability, extended producer responsibility, waste prevention, packaging material and sharing, collaborative economy, reuse, and refurbishment, etc. Other actions could include setting up Competence Centres for Sustainable Procurement supporting public authorities in the consideration of sustainability criteria in procurement projects. This recommendation is targeted at national and regional level.

## **11.9 Closing the loops in the manufacturing industry. The bioeconomy and the circular economy**

### **11.9.1 Remanufacturing**

#### **Promotion of remanufacturing in regions and cities**

- While remanufacturing is largely business-driven and the manufacturing industry a complex ecosystem of various (regional, national, and international) players, regions and cities can play an important role in increasing awareness. For example, public procurement policies can address the procurement of remanufactured products or local events and campaigns can sensitize the public on the benefits of remanufacturing. Moreover, regions can help promote remanufacturing to financial institutions as well as create financial incentives for businesses wishing to take up remanufacturing so that businesses have facilitated access to capital. While remanufacturing may be more relevant in predominantly urban or intermediate regions – at least for the big manufacturing value chains –, such measures can just as well be meaningful in rural areas. This recommendation is transversal and can be taken up by national, regional and local levels.

#### **Close link between research and application**

- Research plays a vital role in developing new and optimized remanufacturing methods. Thus, close cooperation between research institutes and manufacturing industries will be increasingly important. The creation of regional and cross-regional innovation ecosystems for remanufacturing processes and business models, such as the De- and Remanufacturing Pilot Network, are a promising approach. This recommendation is targeted at research institutions and industries but also at national and regional authorities who can facilitate this cooperation.

#### **Dialogue between stakeholders to address barriers**

- To promote the remanufacturing sector effectively, national and international efforts will be vital. A dialogue between policy makers and stakeholders such as the CER will be valuable to stimulate remanufacturing activities by e.g. addressing legal and regulatory barriers or supporting remanufacturing practices through tax incentives. Comprehensive information platforms on international, national or regional level should be further encouraged and possibly supported by EU funds, e.g. under the framework of the Cohesion Policy. This recommendation is mainly targeted at national level.

### **11.9.2 Bioeconomy**

#### **Regional/local strategies for the bioeconomy**

- For the bioeconomy, the territorial perspective is important: indeed, it is linked to the distribution of terrestrial, marine and maritime biological resources. Furthermore, the bioeconomy has the potential to foster the economic development of rural areas, by opening up new opportunities for the agricultural and forestry sectors (e.g. food processing, bio-based industries, bioenergy). The development of local strategies can contribute to identifying priority resources for the territories, settle conflict of usage (e.g. competition between food crops and energy crops) and promote the development of new

economic activities by sustaining the transition towards sustainable agriculture and forestry. A local strategy can create the enabling conditions for the development of the territory and can further assist in identifying the public and private resources that could encourage research and development. This recommendation is more suitable for predominantly rural and intermediate regions, as predominantly urban regions can further rely on public transport.

## **11.10 Good governance for the circular economy. Behavioural change.**

### **11.10.1 Good governance for the circular economy**

#### **Increase the quality of strategic planning for circular economy**

- Strategic planning for circular economy is of utmost importance for driving the transition in the mid- to long-terms. Planning has a number of dimensions including: vision and targets; defining and prioritizing options; identifying necessary policies; adopting financial strategies; and activating public-private collaboration. This recommendation is targeted at national, regional and city levels.

#### **Improve the quality of governance**

- In addition to the strategic vision the quality of governance, political stability and the quality and variety of the institutional landscape are instrumental for the transition to the circular economy. The diversity of national and regional institutions, the synergies between them and the quality of human resources are a strong factor for enabling the transition to the green economy, for instance through the capacity to implement and enforce green economy strategies and new legislation. This recommendation is targeted at national, regional and city levels.

#### **Increased policy ambition would speed up transition to a the circular economy**

- In order to speed up the circular economy transition, more policies need to have a transformative character to support a complete shift in the paradigm on which current patterns of production, consumption, working and living are based. The current EU framework is not truly transformative but rather builds on marginal improvements of the business as usual scenario through introduction of best-of-class technologies and processes. This recommendation is targeted at EU level and national level.

#### **Bigger stakeholder involvement and awareness are key for the success of policies**

- The circular economy will require the implementation of more innovative forms of governance structure namely involving a large number of actors and institutions such as: the region, the chambers of commerce, clusters, associations, business intermediaries and the citizens. Different forms of collaborative decision making will be needed. Additionally, complex strategic documents need to reflect the available expertise in the region which is held by stakeholders from the public, private, academic and non-governmental sectors. This recommendation is targeted at national, regional and city levels.

## **Encourage behavioural change**

- Shifting consumer patterns is a key factor for a circular economy transition. The sum of our individual or household behaviour has a substantial impact on the economy and the environment. Awareness raising and increasing environmental responsibility can lead to a change in consumer behaviour towards a more sustainable and circular consumption. Therefore, different governance levels should provide opportunities for businesses and citizens to improve their understanding of circular opportunities. This recommendation is targeted at national, regional and city levels.

## **11.11 Funding for circularity**

### **11.11.1 Cohesion policy and circular economy**

#### **Take advantage of Structural Funds for circular economy**

- The upcoming, post-2021 programming period will present an opportunity to regions and cities to speed up the transition to the circular economy. Therefore, during the programming process circular economy should be well-integrated in partnership agreements and operational programmes. Criteria for project selection should be developed. This recommendation is targeted at EU, national and regional levels.

### **11.11.2 Financing for circularity**

#### **Create incentives for private financing to follow public financing**

- A key step in the process is to create incentives for private financing to follow public financing. This would require devising a specific set of policy measures to develop an enabling environment conducive to the deployment of private to private finance mechanisms. In particular, in the initial stages publicly leveraged private financing mechanisms and targets to finance institutions may be needed. This recommendation is mainly targeted at national level.

### **11.11.3 Circular economy and Territorial Agenda post-2020**

#### **Take the circular economy into account**

- The EU Territorial Agenda 2020 (2011) does not include any direct links to the circular economy, nor to material consumption or waste management. It stresses the sustainable utilisation of territorial capital in form of natural values and ecological services but there is only a limited reference to circularity aspects in the form of 'efficient and environment friendly production'. Therefore, the principles of the EU Strategy on circular-economy should be integrated with the post-2020 Territorial Agenda especially with the role of regions and cities and the necessary broader commitment from all levels of government for moving towards a circular economy. This recommendation is targeted at EU level.

## 11.12 Circular economy and Territories

### 11.12.1 Circular economy in Territories with Geographical Specificities

- Local and regional actors are well positioned to best exploit regional potentials for developing CE actions on local level, having a strong influence both on consumers, businesses and other local actors. The strategies for circular economy should depend of the various assets and specifics of each city or region and are also influenced by the geographical specificities of the territory as well as how well the region is connected in terms of transport and infrastructure networks. This recommendation is targeted at regional and local levels.
- Industrial territories have opportunities for developing industrial symbiosis and closing the loop of production chains while service-oriented territories can better benefit from developing “sharing-economy” initiatives and services for e.g. transportation or accommodation. It is therefore necessary that each region analyses its potential and is active in defining needs and in setting local targets, relevant to the specific context and TGS to shape their own path towards circular-economy. This recommendation is targeted at regional level.

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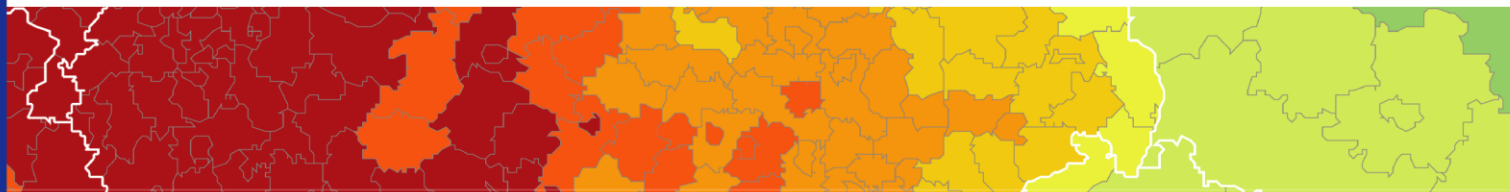
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