C2C NETWORK

GUIDE ON C2C BEYOND WASTE MANAGEMENT

European Union
European Regional Development Fund

INTERREG IVC
INNOVATION & ENVIRONMENT
REGIONS OF EUROPE SHARING SOLUTIONS

Colophon

This Guide on C2C beyond waste management provides insight in the major challenges Europe and its policies have for making the transition towards a society where waste has become resource. This Guide is the cornerstone of the Cradle to Cradle Network INTERREG IV C project and builds on the experience of 10 regions in Europe, a Cradle to Cradle Framework, four perspective studies in the areas on industry, area spatial development, governance and the build theme and a guide of C2Cinspired practices in these four areas. Just as these studies are not formal academic literature reviews, this Guide on C2C beyond waste management is also developed from a practical point of view with regard to policy makers.

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Disclaimer

The Cradle to Cradle concept was developed by W. McDonough and M. Braungart. The term Cradle to Cradle is a registered trademark. The Cradle to Cradle Network project is not designed to develop a criteria-based evaluation tool to determine whether the applications are Cradle to Cradle. It considers that C2C is an approach designed to assist (the search for) better solutions (and ultimately (at) good solutions). Rather than being a score sheet for compliance, the Cradle to Cradle Network approach is oriented to help people understand what the wider implementation of Cradle to Cradle principles in the areas of industry, buildings, governance and area spatial development might look like; and, to disseminate and learn from current and emerging good practice.
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Summary

The Guide beyond waste management contains four chapters. An introductory chapter explains Cradle to Cradle. The objective of the second chapter is to identify the actual status of the EU waste legislation, based on a review. It aims to give insight in the strategic policy lines which were followed in the past and how these are meant to evolve in the future, with a clear link to the actual policy documents. The third chapter builds a view on how society could or should look like in the future. The final chapter presents recommendations in order to build an eco-effective society.

1. Cradle to Cradle foresees the transition from the current industrial model, that 'takes, makes and pollutes', to a system with healthy and safe products whose materials are renewable on short term (biological nutrients) or stay in cycles (technical nutrients). This new model will require a shift from ownership to 'usership' for products that are made of technical nutrients. The Cradle to Cradle concept does not only apply to products but also to urban and regional planning. Making reference to how nature is managed, Cradle to Cradle stimulates to design our buildings as trees and our cities as forests. Cradle to Cradle must be understood as an essential step in the transition from eco-efficiency to eco-effectiveness.

2. In its Europe 2020 strategy to put Europe's economy back on track, the European Commission considers innovation and resource efficiency as two of its seven flagship initiatives to reach its goal. Almost all initiatives with respect to avoiding or reducing environmental damage are ultimately motivated by an appeal to the economic objective of more growth and jobs, the aim of reducing import dependency and/or to urgency to offset the consequences of climate change. The EU approach with respect to waste sticks almost exclusively to the 3R paradigm (reduce, recycle, reuse). On the good side, although C2C is a new concept also at the EU level, the ideas promoted by C2C are partly and implicitly present in the introductory visionary statements of the more recent policy frameworks. However, they lack in the operational development of the EU policy documents. There is thus a clear and urgent need to speed up this change in order to meet the societal challenges and the ambitions put forward.

3. EU 2020 notably aims for an economy that is more energy and resource efficient, greener and more competitive. Europe should be energy and material independent. But what does that mean in practice? One of the main consequences is a shift with respect to hazardous materials management installing a totally new concept, which could be named a lego approach. In a Cradle to Cradle society consumers buy a service, not a product. Materials carry use functions and should move freely within society. A complete shift towards a service economy may and should be expected. This will have major consequences for the energy debate driving mainly on renewable energy. 'Doing things right from scratch' also applies to policy making. The application of C2C principles is no longer hindered by laws and regulations. To make this happen, Europe has a solid home market for C2C products. This can only work if the market is steered into a direction where innovation with environmental benefits is rewarding. Radical innovation underpins the transformation towards and the further development of the C2C society.

4. The recommendations focus at the strategic, rather than the operational level, guiding EU policy towards eco-effectiveness. The recommendations are proposed on four levels (1) Create a common framework for an eco-effective society (2) Stimulate demand (3) Stimulate supply and (4) Innovation through partnerships.

1 Cradle to Cradle Framework

Challenged by the Cradle to Cradle philosophy and in line with Europe's strategies, the Dutch Province of Limburg mobilised nine other regions to make an application under the INTERREG IVC program for their Cradle to Cradle network. The C2C Network is a Capitalisation network (INTERREG IVC) which aims to reduce raw materials' utilisation, to generate less waste and less environmental pollution, as well as to enhance innovation and economic development. The C2C network brings together EU regions to share and capitalize on regional good practice in implementing C2C principles in relation to waste prevention and management. And do so by producing sustainable solutions, economic development opportunities and social well-being.The overall objective of the C2C Network is to develop regional action plans, reflecting the principles of the Cradle to Cradle concept, systematising its regional interpretations and setting out how C2C inspired good practices will be implemented within regional mainstream Structural Funds Programmes.

Cradle to Cradle is a new business model with the ambition to develop products which are safe, healthy and reusable. Since 1987 the "Environmental Protection Encouragement Agency" (EPEA), founded by Prof. Michael Braungart, works step by step on the development of the framework and the principles of Cradle to Cradle DesignTM[1]. The definition of materials and products and their optimisation by Cradle to Cradle creates a new dimension of product quality, based on materials that serve as nutrients for either biological or technical systems. The framework is developed in accordance with how nature has managed to evolve to a very diverse set of ecosystems and populations where waste is unknown.

Cradle to Cradle sets the beacons and directions where innovation should lead to. It is a shift from eco-efficiency towards eco-effectiveness. It is not about 'doing more with less' and reducing waste (cradle to grave) but about 'doing right from scratch.' Developing a growth path to these newly set goals is needed and continuous improvement is thus an implicit requirement of engaging towards Cradle to Cradle.

Cradle to Cradle foresees the transition from the current industrial model, that 'takes, makes and pollutes', to a system with healthy and safe products whose materials are renewable on short term (biological nutrients) or stay in cycles (technical nutrients). This new model will require a shift from ownership to 'usership' for products that are made of technical nutrients. These products are only used by consumers for the time needed and the product will then return into the remanufacturing chain. This demands a completely new kind of cooperation between suppliers, producers, customers, consumers and material managers. An intensive cooperation between these parties is needed to come to Cradle to Cradle products. Cradle to Cradle is by consequence a strategy for product and process innovation in which creation of continuous material loops is key. As technological materials are considered to be the means by which services are delivered, cooperation between producers becomes a new challenge as well. This leads to the creation of innovation platforms in and between sectors around material pools.

The Cradle to Cradle concept, however, does not only apply to products but also to urban and regional planning and architecture. Here 'Doing right from scratch' means that from the design stage on the various functions of living, working, recreation, transport, nature, food production,... are fully integrated. The use of resources and renewable energy and water treatment is conceived from a life cycle perspective including production, use and recovery. The quality of the built environment has to ensure a safe, healthy and pleasant environment for its users. Making reference to how nature is managed, Cradle to Cradle stimulates to design our buildings as trees and our cities as forests.

Three **principles** are essential in developing Cradle to Cradle:

- **"Waste equals food":** The main trademark of Cradle to Cradle is undoubtedly the "waste = food" concept. Cradle to Cradle is based on the idea that after the use of products and services, the embedded materials, water and energy cannot be wasted. Cradle to Cradle would however make optimal use of these resources by pertinently creating continuous material loops. In short, this is understood as closing the material cycle.
- **"Use of current solar income":** The use of energy sources that are renewable in the timeframe they are used. Living organisms thrive thanks to the energy of the sun. Plants produce food through solar energy, a continuous source of energy for our planet. As solar energy can be considered to be an eternal overabundant energy source. McDonough and Braungart promote the use of this renewable energy source for heating, electricity and day lighting within buildings and for manufacturing processes within the industry. In addition to the direct use of solar energy, wind, biomass, hydro, tidal, wave and geothermal (partially) energy are also positive effects of solar energy. The use of renewable energy as such is an accepted broadening of the second Cradle to Cradle principle.

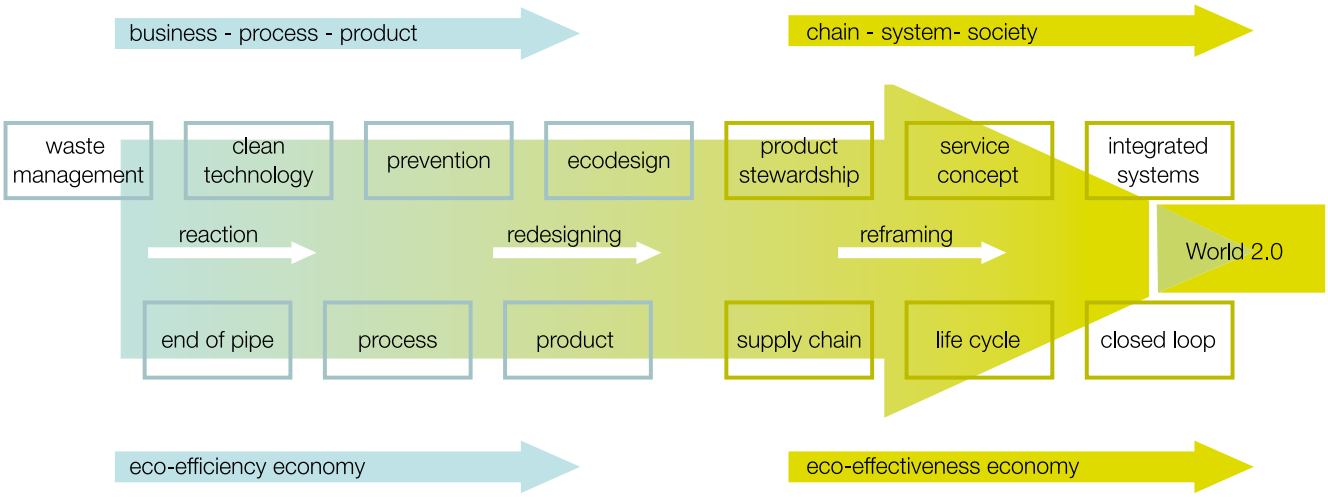
1 The term Cradle to Cradle is a registered trademark

- **"Celebrate diversity":** promoting and combining biological, cultural and conceptual diversity. Healthy ecosystems are complex networks of living organisms. Each of them is involved in maintaining the system as a whole and each member of the ecosystem works creatively and effectively together growing the system. Diversity in nature builds resilience. Such diversity should serve as a model for human design, which would lead to more resilient organisations and even economies. So not only biodiversity should be encouraged, but diversity in its different forms.

Cradle to Cradle is the next step in the evolution towards an eco-effective society. Similar approaches exist that work towards the same goal. Industrial symbiosis engages traditionally separate industries in a collective approach to competitive advantage involving physical exchange of materials, energy, water, and/or by-products. Drawing on industrial ecology, industrial symbiosis incorporates many elements that emphasize the cycling and reuse of materials in a broader systems perspective. Biomimicry is the application of biological methods, systems and design principles to the study and design of engineering systems and modern technology, often in an attempt to optimize resource use.

Figure 1 describes the evolution of sustainable materials management approaches showing the shifts from reactionary to proactive approaches and from focus on business-process-product towards a focus on the integrated chain-system and society interaction.

Figure 1: Sustainable materials management approaches: evolution from an efficiency towards an effectiveness approach[2]



Such **high aspirations** require among other things a different way of product development/design and intelligent handling of materials after use. In an economy driven by innovation rather than efficiency, strategies can evolve through partnerships and cooperation to meet these new societal challenges. This development is proactive rather than reactive. Moreover, producers assume central responsibility for their product and service. It is clear that the transition from efficiency to effectiveness concerns not just a small step but essentially a rethinking and redevelopment of the economic and social system.

2 Sustenuto, KULeuven, Wuppertal Institute (2010), Sustainable Materials Management for Europe, from efficiency to effectiveness, background paper for the informal Environmental Council on the 12th and 13th July, 2010

2 EU Waste Legislation

In its Europe 2020 strategy to put Europe's economy back on track, the European Commission considers innovation and resource efficiency as two of its seven flagship initiatives to reach its goal. The new strategies aim to create growth and jobs whilst making Europe a recycling society. Integrated Product Policy principles, which are based on lifecycle thinking, are becoming integrated in the new Waste Framework Directive. Also the Thematic Strategies on the Sustainable Use of Natural Resources and on the Prevention and Recycling of Waste have endorsed the lifecycle thinking and the call for continuous improvement, as well as the principle of working with the market. This will reduce the negative environmental impact on natural resources and increase the resource efficiency of the European economy, which is essential for sustained economic development.

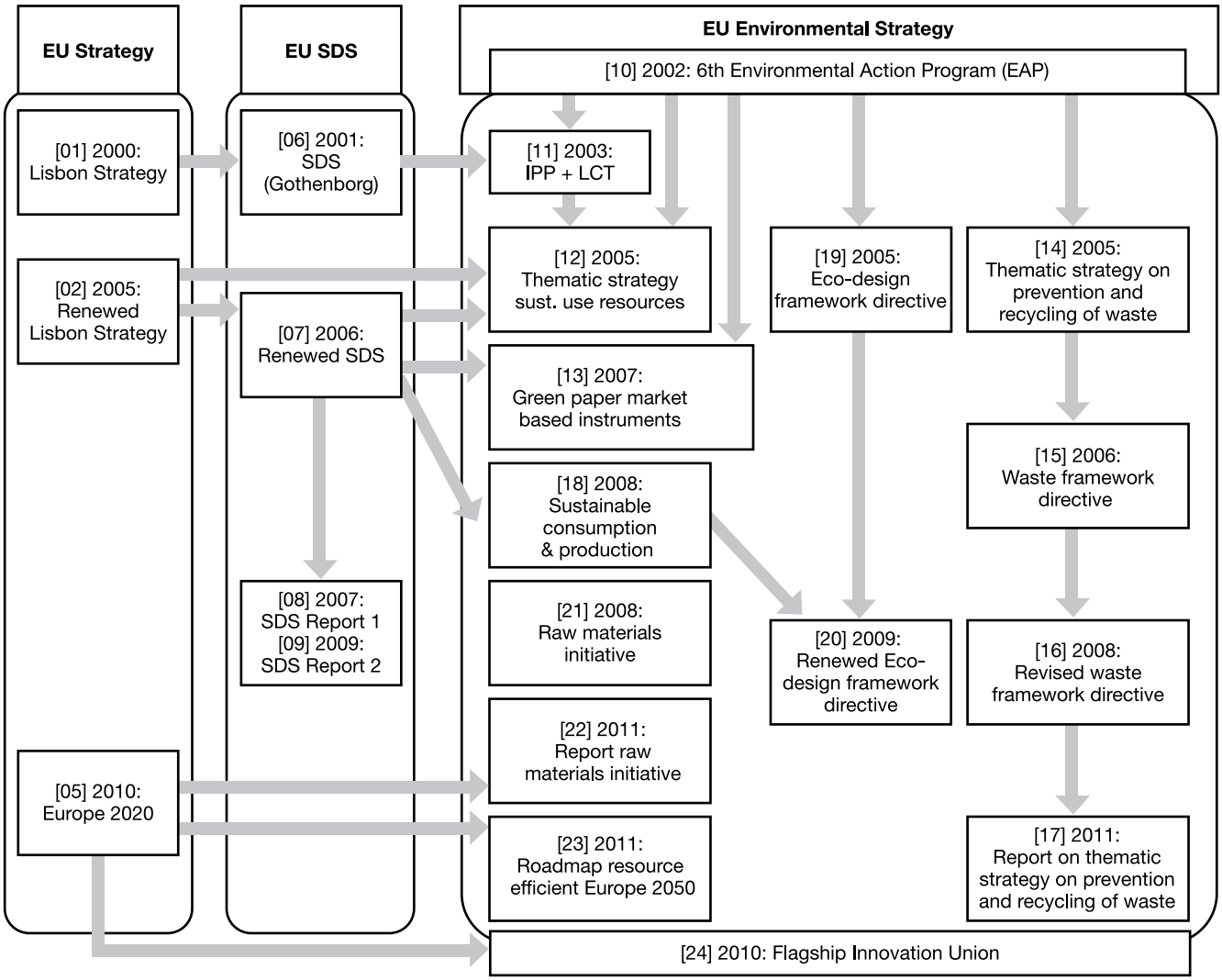
The objective of this chapter is to identify the actual status of the EU waste legislation, based on a review. This chapter neither aims to be fully comprehensive nor to produce an exhaustive list of all EU waste legislation. It should however give insight in the strategic policy lines which were followed in the past and how these are meant to evolve in the future, with a clear link to the actual policy documents.

The EU has also seen important developments in the formulation of goals and the stimulation of renewable energy in the past 10 years. The impact hereof on sustainable materials management is not always positive. Think for example of using biomass as a green energy source or the attention for waste incineration that hinders re-use of materials. A detailed analysis of EU Energy policy falls however outside the scope of this guide.

This chapter will thus present the status of EU Waste legislation and policies. It identifies key strategic lines, elements and trends reflected in those laws and policies. First, three broad lines of EU strategy inspiring the EU waste legislation are briefly presented: the EU strategy, the EU sustainable development strategy and the EU environmental strategy. Then, the specific action plans, policy guidelines and thematic strategies implementing the strategy are discussed in detail and relevant links are established.

Figure 2 visualizes these developments and links. Finally, an overview will be given of the main topics of the current EU waste legislation and of the expected evolutions.

Figure 2: Developments EU Waste Legislation



2.1 The EU Strategy

The current EU waste legislation and policies do not come out of the blue but are part of an evolution in European strategic thinking about sustainability and the environment. This evolution is reflected in the sequence of changes made to the original Lisbon Strategy of 2000.

In the **Lisbon Strategy of 2000** [01] the European Union sets itself a new strategic goal for the next decade: *"to become the most competitive and knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion". This "sustainable economic growth"* did not refer to the three dimensions of sustainability (economic, social and ecological), but rather to having a permanent and high economic growth.

In **2005**, a **revision of the Lisbon strategy** [02] took place, due to the mixed results and certain shortcomings of the original document [03]. Under the banner of rising interest in climate change and rising oil prices, this revision paid more attention to the sustainable use of resources. As President Barroso stated in his communication: *"The Commission will step up its promotion of environmental technologies. It will also take necessary steps to promote the development of approaches and technologies that allow the EU to make the structural changes needed for long term sustainability, for example in the areas of sustainable resource use, climate change and energy efficiency"* [02]. Hence, first steps towards sustainable resource usage were made.

In **2010**, after a thorough evaluation of the **Lisbon Strategy** [04], a **Europe 2020** strategy [05] was set out to put Europe's economy back on track and emerge stronger from the economic and financial crisis. Three reinforcing priorities were put forward[3], one of them being the promotion of *"a more resource efficient, greener and more competitive economy"* [05]. Having a *"resource efficient Europe"* is one of the main goals in this Europe 2020 strategy and is considered as one of the seven flagship initiatives. In comparison with the 2005 revised Lisbon strategy, the sustainable use of resources is much more emphasized and further elaborated and concretized in this Europe 2020 strategy.

2.2 The EU Sustainable Development Strategy

One year after the Lisbon Declaration the European Council decided that the EU sustainable development strategy should complete and build on this political commitment by including an environmental dimension. This recognizes that in the long term economic growth, social cohesion and environmental protection must go hand in hand.

The Gothenburg European Council of 2001 [06] set out the **first EU Sustainable Development Strategy (SDS)**. Aiming at decoupling resource consumption from economic and social development, it sets its hopes on a major reorientation of public and private investment towards new, environmentally-friendly technologies. By promoting innovation, new technologies may be developed that use fewer natural resources, reduce pollution or risks to health and safety, and are cheaper than their predecessors. The focus of this first SDS remains basically on research and development to **reduce** resource consumption and environmental, health and safety hazards. Re-use, recycling, eco-design and other related topics are not on the radar yet.

The European Council of June 2006 [07] adopted an ambitious and comprehensive **renewed Sustainable Development Strategy** for an enlarged EU. It builds on the Gothenburg strategy of 2001 and is the result of an extensive review process that started in 2004.The EU SDS forms the overall framework within which the Lisbon Strategy, with its renewed focus on growth and jobs, provides the motor of a more dynamic economy. These two strategies recognize that economic, social and environmental objectives can reinforce each other and they should therefore advance together.

The renewed EU SDS sets out a single, coherent strategy on how the EU will more effectively live up to its long-standing commitment to meet the challenges of sustainable development. It recognizes the need to gradually change our current unsustainable consumption and production patterns and move towards a better integrated approach to policy-making. It reaffirms the need for global solidarity and recognizes the importance of strengthening our work with partners outside the EU, including those rapidly developing countries which will have a significant impact on global sustainable development.

3 Smart growth, sustainable growth, inclusive growth ('A strategy for smart, sustainable and inclusive growth') Brussels, 3 March 2010, COM (2010)

The renewed EU SDS identifies 7 key challenges and corresponding targets, operational objectives and actions. Only the third and fourth key challenges are relevant for this chapter. The third key challenge *"Sustainable Consumption and Production"* aims at decoupling economic growth from environmental degradation, improving the environmental performance for products and processes, increasing Green Public Procurement (GPP) and promote environmental technologies and eco-innovations.
The fourth key challenge *"Conservation of Natural Resources"* aims at improving resource efficiency to reduce the overall use of non-renewable natural resources, promoting eco-efficient innovations, avoiding over-exploration of renewable natural resources, halting the loss of biodiversity and, finally, *"avoiding the generation of waste and enhancing efficient use of natural resources by applying the concept of lifecycle thinking and promoting reuse and recycling"*. The focus has clearly shifted from reducing waste towards prevention, efficiency, reuse and recycling.

Since the launch of the renewed SDS in 2006, **two progress reports** on the EU SDS have been published. The first one (**2007** [08]) reports on the third key challenge that positive progress has been achieved with respect to the implementation of the eco-design aspects of the Energy Using Products Directive, the EU Environmental Technologies Action Plan and the development of an Environmental Technologies Verification System. More could have been done on implementing the Integrated Product Policy approach, strengthening Green Public Procurement and fostering research into less resource intensive production processes. On the fourth key challenge the report spends a lot of attention to progress made towards reducing the use of non-renewable natural resources (especially regarding fishery) and to plans to protect bio-diversity. Nothing is reported on waste.

The second progress report (**2009** [09]) praises the EU Raw Materials Initiative [21] and the revised Waste Framework Directive [16] (see below). The report not only testifies of past progress but also looks ahead. Under the heading *"Taking sustainable development into the future"* it admits that the strategy could focus more on contributing to a rapid shift to a low-carbon and low-input economy, based on energy and resource-efficient technologies and sustainable transport, and shifts towards sustainable consumption behavior. Neither the concept nor the ideas of C2C are mentioned in this document.

It also tries to answer the critique that there are so many cross-cutting strategies in the EU such as the SDS and the Lisbon Strategy. However, merging cross-cutting strategies does not seem feasible given the different roles they fulfill. The complementary nature of the SDS and the Lisbon Strategy were set out in the renewed EU SDS. Nevertheless, there may still be room for further clarification of the specific role of the EU SDS in relation to other EU strategies and for it to be streamlined accordingly.

2.3 The EU Environmental Strategy

The **sixth Environment Action Programme** (EAP) [10] laid down in July **2002** contains a number of strategic recommendations that form a third line of strategic inputs to the development of waste legislation.

The 6th EAP introduced the concept of Thematic Strategies, to be developed by the Commission by the third year of operation of the 6th EAP. The Thematic Strategies are a modernization of EU environment policy-making, taking a broader, strategic approach. The Thematic Strategies build on the existing EU legal/regulatory framework and include new knowledge on threats to human health and the environment. They focus on an integrated approach (the effects of decisions in one policy area which has consequences on the others) and on implementation issues.

The Thematic Strategies can be seen as key elements of the Commission's Better Regulation strategy: they are all accompanied by a thorough impact assessment, assessing the economic, social and environmental impacts of different policy options, extensive stakeholder consultations were held and they aim, where possible, at simplifying the existing regulatory framework. Thematic Strategies cover the following fields: Air, Waste prevention and recycling, Marine Environment, Soil, Pesticides, Natural resources, Urban Environment. The thematic Strategies "Waste prevention and recycling" and "Natural resources" [10, Art. 8] will be discussed in detail below.

2.4 The (cross-cutting) EU strategies in action

During the past decade, the cross-cutting EU strategies discussed above have been given body and flesh in action plans, policy proposals and thematic strategies. The most relevant initiatives are presented in chronological order.

2.4.1 Integrated Product Policy and Life Cycle Thinking (2003)

The first policy inspired by the 6th EAP and by the Gothenburg European Council, where an environmental dimension was added to the Lisbon process in the form of a strategy for Sustainable Development, is the Integrated Product Policy (IPP) which builds on environmental Life Cycle Thinking (LCT) [11]. In the area of managing natural resources more responsibly, the European Council agreed *"that the EU Integrated Product Policy aimed at reducing resource use and the environmental impact of waste should be implemented in co-operation with business"*. The Commission developed the EU Integrated Product Policy gradually in cooperation with stakeholders and with the aid of studies. The IPP approach is now generally recognized as being a potentially very effective way to address the environmental dimension of products. It is based on five key principles of which the first two are the most relevant for this chapter:

1. **Life Cycle Thinking:** *"it considers a product's lifecycle and aims for a reduction of its cumulative environmental impacts - from the "cradle to the grave". In so doing it also aims to prevent individual parts of the lifecycle from being addressed in a way that just results in the environmental burden being shifted to another part. By looking at the whole of a product's lifecycle in an integrated way, IPP also promotes policy coherence. It encourages measures to reduce environmental impacts at the point in the lifecycle where they are likely to be most effective in reducing environmental impact and saving costs for business and society."* Although life cycle thinking has potential to be linked to closed loop thinking, the document fails to establish that link. Also the topic of waste management is underdeveloped. An interesting notion is that EU Member States may change the classic waste treatment hierarchy based upon life cycle thinking.

2. **Working with the market:** *"setting incentives so that the market moves in a more sustainable direction by encouraging the supply and demand of greener products. This will reward those companies that are innovative, forward-thinking and committed to sustainable development."* The use of market-based instruments (MBIs) for environment and related policy purposes has further been explored in a Green Paper published in **2007** [13]. Whether by influencing prices (through taxation or financial incentives), setting absolute quantities (emission trading), or quantities per unit of output, MBIs are praised for their ability to correct market-failures in a cost-effective way. The **Green Paper** focuses on the application of MBIs in influencing energy use and in environment policy (transport, resources, biodiversity, air pollution). Waste management is reduced to a discussion on landfill taxation. A possible link with C2C is the attention paid to the energy content of products. MBIs, and more specific subsidies and financial incentives, come through government intervention (i.e. taxpayers' money) and could therefore be seen as a cost for society. However, C2C reduces the costs for society to get rid of waste and it limits the burden of the exploitation of non-renewable resources. As these C2C benefits overweight the costs associated with government intervention, MBIs could be adequate and intelligent instruments to promote C2C. The Green paper does not make such a proposal.

2.4.2 Thematic Strategy on Natural Resources (2005)

The sustainable use of resources, involving sustainable production and consumption is a key ingredient of long-term prosperity, both within the EU and globally. Indeed, the EU Strategy for Growth and Jobs endorsed by the Spring Summit of 2005 [03] gives high priority to more sustainable use of natural resources. It also calls for the EU to take the lead towards more sustainable consumption and production in the global economy. Europe therefore needs a long-term strategy that integrates the environmental impacts of using natural resources. The **Thematic Strategy on the Sustainable Use of Natural Resources of 2005** [12] is a response to that challenge. It has to be seen in context with the reviewed Sustainable Development Strategy [07] and contributes to it. It was the 6th EAP which called for the preparation of *"a thematic strategy on the sustainable use and management of resources …"* [10].
The overall objective of this Thematic Strategy is to reduce the negative environmental impacts generated by the use of natural resources in a growing economy – a concept referred to as decoupling. Quantifying the environmental impact of resource use, improving resource efficiency and eco-efficiency and applying lifecycle thinking to existing policies are the main strategic challenges set out in the paper. However, the lack of quantitative targets, the absence of any reference to eco-design and C2C thinking could be considered as serious shortcomings. On the other hand, the Thematic Strategy plans to launch *"several sectoral initiatives with economic operators"* to achieve its ambitions. These could be an opportunity for C2C. For the first time, the cradle to grave approach is mentioned as such. But no alternative is suggested.

2.4.3 Thematic Strategy on Waste (2005)

As prescribed in the 6th EAP [07], the Thematic Strategy on the Prevention and Recycling of Waste (2005) [14] sets objectives and outlines the means by which the EU can move towards improved waste management. In the process it substantially simplifies and clarifies the current legal framework, in line with the EU's better regulation objectives.

EU waste policy aims to contribute to the reduction of the overall negative environmental impact of resource use. Preventing waste generation and promoting recycling and recovery of waste will increase the resource efficiency of the European economy and reduce the negative environmental impact of use of natural resources. The basic objectives of current EU waste policy – to prevent waste and promote re-use, recycling and recovery so as to reduce the negative environmental impact – are still valid and will be supported by this impact-based approach. The long-term goal is for the EU to become a recycling society, *"that seeks to avoid waste and **uses waste as a resource**".*

In order to achieve these objectives, the proposal is to modernize the existing legal framework – i.e. to introduce life cycle analysis in policymaking and to clarify, simplify and streamline EU waste law. This requires a combination of measures promoting waste prevention, recycling and re-use in such a way as to produce the optimum reduction in the accumulated impact over the life cycle of resources. *"Environmental policy traditionally focused on the early and the final phases of the life cycle: extraction, processing and manufacturing at one end and waste management at the other. It is now recognized that the environmental impact of many resources is often linked to the use phase. All phases in a resource's life cycle need to be taken into account as there can be trade-offs between different phases and measures adopted to reduce environmental impact in one phase can increase the impact in another. Clearly, environmental policy needs to ensure that negative environmental impact is minimized throughout the entire life cycle of resources."* Not mentioned in the Thematic Strategy is the 'design phase' of the life cycle. It only mentions that China is pursuing the objective of promoting "the circular economy" – without explaining what it means. The Thematic Strategy plans to incorporate the lifecycle approach in EU legislation by clarifying the objectives of the Waste Framework Directive so that they explicitly consider the lifecycle perspective.

The **Waste Framework Directive** (2006) [15] intends to limit the generation of waste and to optimize the organization of waste treatment. Member states must prohibit the abandonment, dumping or uncontrolled disposal of waste, and must promote waste prevention, recycling and processing for re-use. The Directive provides for cooperation between the member states with a view to establishing an integrated and adequate network of disposal installations, taking account of the best available technologies. The underlying idea is to enable the EU as a whole to become self-sufficient in waste disposal and each member state to move towards that aim individually. This network should enable waste to be disposed of in one of the nearest appropriate installations, so as to guarantee a high level of environmental protection. The Directive also contains requirements for the accreditation and inspection of companies treating, storing or tipping waste. These must obtain a permit from the relevant authority relating to the types and quantities of waste to be treated, the general technical requirements to be met and the precautions to be taken.
In 2008, agreement was reached on a **revised EU Waste Framework Directive** [16]. Member states had until December 2010 to transpose it into national legislation. Compared to the previous version, the new Waste Framework Directive devotes more attention to prevention, re-use and recycling; clarifies which waste treatment processes can be considered as recovery; and contains new provisions on the distinction between what is and what is not waste. From our perspective, article 8 on extended producer responsibility is of particular importance. *"In order to strengthen the re-use and the prevention, recycling and other recovery of waste, Member States may take legislative or non-legislative measures to ensure that any natural or legal person who professionally develops, manufactures, processes, treats, sells or imports products (producer of the product) has **extended producer responsibility**. Such measures may include an acceptance of returned products and of the waste that remains after those products have been used, as well as the subsequent management of the waste and financial responsibility for such activities. These measures may include the obligation to provide publicly available information as to the extent to which the product is re-usable and recyclable. ... Member States may take appropriate measures to encourage the **design of products** in order to reduce their environmental impacts and the generation of waste in the course of the production and subsequent use of products ..."*

In 2011 the European Commission published a **progress report** on the Thematic Strategy [17]. Significant progress has been achieved on a number of fronts, particularly in the improvement and simplification of legislation, the establishment and diffusion of key concepts such as the waste hierarchy and lifecycle thinking, on setting focus on waste prevention, on coordination of efforts to improve knowledge, and on setting new European collection and recycling targets. In its conclusion it recognizes the importance of consistency between waste and product design policies and potentially opens the opportunity for funding of C2C initiatives. *"New initiatives to support innovation through Framework Programme and Innovation Partnerships and better incorporate life cycle thinking in policy development will deserve particular attention. This would imply more consistency **between waste and product design policies**, including considering rules on the uptake of minimum content of recycled materials in priority products, the recyclability and durability of products and reducing the use of hazardous substances. The use of structural and cohesion **funds** will be encouraged along the lines of the waste hierarchy and for adoption of best available technologies."*

2.4.4 Sustainable Consumption & Production and Sustainable Industrial Policy Action Plan (2008)

The core of the **Sustainable Industrial Policy Action Plan** (2008) [18], due for a review in 2012, is a dynamic framework to improve the energy and environmental performance of products and foster their uptake by consumers. This includes setting ambitious standards throughout the Internal Market, ensuring that products are improved using a systematic approach to incentives and procurement, and reinforcing information to consumers through a more coherent and simplified labeling framework, so that demand can underpin this policy. The approach will address products that have significant potential for reducing environmental impacts.
In this Action Plan a set of integrated actions are proposed to work in synergy with and complement the policy for **smarter consumption** and **better products**, by extending, amplifying and accelerating its impact. Action will focus on the following three areas: boosting resource efficiency, supporting eco-innovation and enhancing the environmental potential of industry.

As price is one of the main determinants of purchasing choices, market-based instruments can also help get prices right and **internalize environmental costs**, thereby supporting the uptake of energy and environmentally efficient products. In this respect, the Commission is **examining** inter alia options for revising the energy taxation framework and possible fiscal incentive mechanisms at EU level. These evolutions should be carefully monitored.

It also suggests to renew Directive 2005/32/EC establishing a framework for the setting of eco-design requirements for energy-using products, also known as the **Eco-design Framework Directive of 2005** [19]. Eco-design is a method of designing that takes into account the impact of products on the environment at all stages of their life cycle. Eco-design can result in a reduction in energy consumption, a reduction in waste generation, a longer life-span, etc. The eco-design framework directive stipulates that minimum eco-design requirements have to be set for energy-using products with a large market share, with a negative impact on the environment and with the potential to improve the environmental performance. Examples of such products are refrigerators, lamps, hairdryers, computers, etc.
The 2005 Eco-design Directive only applies to energy-using products. These represent 'only' 35 to 40% of the environmental impact of products. Therefore, the Sustainable Industrial Policy Action Plan [18] proposed to extend the scope of the Eco-design Framework Directive to all energy-related products. Examples of such energy-related products are windows, the insulating properties of which have an effect on energy consumption, and shower heads, which determine water usage. In 2009, the **renewed Eco-design Framework Directive** was launched [20], adopting a proposal for a Directive on establishing a framework for setting Eco-design requirements (such as energy efficiency requirements) for all energy using products in the residential, tertiary and industrial sectors. The renewed directive does not introduce directly binding requirements for specific products, but does define conditions and criteria for setting requirements regarding environmentally relevant product characteristics (such as energy consumption) and allows them to be improved quickly and efficiently.

2.4.5 The Raw Material Initiative (2008)

In 2008, the **Raw Materials Initiative** [21] was launched in order to secure a reliable and undistorted access to raw materials. The critical dependence of the EU on certain rawmaterials underlines that a shift towards a more resource efficient economy and sustainable development is becoming even more pressing. The EU communication proposes that the EU should agree on an integrated raw materials strategy. Such a strategy should be based on the following 3 pillars: (1) ensure access to raw materials from international markets; (2) set the right framework conditions within the EU in order to foster sustainable supply of raw materials from European sources; (3) boost overall resource efficiency and promote recycling to reduce the EU's consumption of primary raw materials and decrease the relative import dependence.
The third pillar - Reduce the EU's consumption of primary raw materials-states that EU policy should promote resource efficiency, recycling, substitution and the increased use of renewable raw materials. This should be seen as part of the transition towards sustainable production and consumption patterns and a resource efficient EU economy.The Commission is promoting research projects that focus on resource-efficient products and production under FP7. Research will also play a major role in developing substitutes, in the interests of flexibility in the production process and reduced vulnerability to import dependence. For the first time, the topic of (research on) substitution is so prominently present in an EU policy document. However, the document sticks exclusively to the 3R –reduce, recycle, re-use – paradigm.

In 2011, a **report on the Raw Materials Initiative** was published [22]. This work is part of the Europe 2020 strategy to ensure smart, sustainable and inclusive growth and is closely linked to the flagship initiative for a resource efficient Europe [5].The main objective of this report is to tackle the growing impact of finance on commodity markets, especially the significant increase in financial investment flows into commodity derivative markets. This report also presents an overview of what has been achieved in each of the three pillars of the 2008 Raw Materials Initiative [21] and of the steps which are planned to take the work forward. Important is the special attention going to 'urban mining' and the urgent need for innovation along the entire value chain, including extraction, sustainable processing, eco-design, recycling, new materials, substitution, resource efficiency and land use planning.

2.4.6 Roadmap to a Resource Efficient Europe (2011)

The Europe 2020 Strategy [05] and its flagship initiative *"A Resource Efficient Europe"* called for a roadmap *"to define medium and long term objectives and means needed for achieving them"*. This **Roadmap to a Resource Efficient Europe** [23] builds upon and complements the other initiatives under the flagship, in particular the policy achievements towards a low carbon economy, and takes into account progress made on the 2005 Thematic Strategy on the Sustainable Use of Natural Resources [12].

Transforming the economy onto a resource-efficient path will bring increased competitiveness and new sources of growth and jobs through cost savings from improved efficiency, commercialization of innovations and better management of resources over their whole lifecycle. Transformation will need a policy framework that creates a playing field, where innovation and resource efficiency are rewarded, creating economic opportunities and improved security of supply through product redesign, sustainable management of environmental resources, greater reuse, recycling and substitution of materials and resource savings.

Contrary to the short-term approach of other policy documents, the roadmap projects a long term (2050) vision for a resource efficient Europe and sets milestones for 2020.The milestones are ordered under four headings.***1) Sustainable consumption and production.*** As of 2012 member states should assess, among other things, *"measures to extend producer responsibility to the full life-cycle of the products they make (including via new business models, through guidance on take-back and recycling schemes and support for repair)"*. It points to the relevance of stimulating new innovations in efficient production methods but misses the opportunity to include stimulating innovations in new products. ***2) Turning waste into a resource.*** Most of the attention goes to collecting, recycling, and re-use of waste. The roadmap seems to underestimate the role the design phase could play to maintain the quality of the used resources. ***3) Supporting research and innovation.*** A milestone mentions that EU research funding should focus on key resource efficiency objectives and should support innovative solutions. In this context the concept "smart design" is mentioned. The proposed development of "Innovation partnerships" (from 2011), "Joint technology partnerships" and the launch of an "EU Resource Efficiency Transition Platform" (2012) are of interest for the creation of a 'circular' economy. ***4) Environmentally harmful subsidies and getting the prices right.*** The latter means that taxation should help internalizing environmental externalities. As discussed above, such step could only be favorable for eco-effectiveness.

2.5 EU 2020 Flagship Initiative Innovation Union

Innovation is at the core of the Europe 2020 Strategy, underpinning the smart, sustainable and inclusive growth the Strategy is aiming for. 'Innovation Union' [24] is one of the seven flagships. The European Commission sees innovation as *"the best means of successfully tackling major societal challenges such as climate change, energy and resource scarcity, (…), which are becoming more urgent by the day"*. However, a big challenge for the EU and its Member States is to adopt a much more strategic approach to innovation: *"An approach whereby innovation is the overarching policy objective, where we take a medium- to longer-term perspective, where all policy instruments, measures and funding are designed to contribute to innovation, where EU and national/regional policies are closely aligned and mutually reinforcing, and last but not least, where the highest political level sets a strategic agenda, regularly monitors progress and tackles delays"*.

It follows that the concretisation and implementation of the flagship will see an increase in the role and importance of innovation in policy objectives and measures, including those related to waste management. Already the flagship identifies the launch of 'innovation partnerships' in key areas that address major societal challenges such as climate change and resource efficiency. However, eco-effectiveness is not mentioned as such in the flagship.

2.6 Conclusion

Almost all initiatives with respect to avoiding or reducing environmental damage are ultimately motivated by an appeal to the economic objective of more growth and jobs, the aim of reducing import dependency and/or to urgency to offset the consequences of climate change. The EU approach sticks almost exclusively to the 3R paradigm (reduce, recycle, reuse).

C2C is a new concept, also at the EU level where a lot of attention currently goes to green growth and resource efficiency. The ideas promoted by the C2C movement – e.g. close-the-loop, up-cycling, importance of the design phase, waste = food - are partly and implicitly present in the introductory visionary statements of the more recent policy frameworks. However, they lack in the operational development of the EU policy documents. Existing instruments and initiatives are mainly aimed at one theme or challenge. Although steps have been taken to streamline policy, an integrated approach still lacks. This will be important in order to avoid spill-over effects into other policy domains (for instance relation between renewable energy and materials management). The broader eco-effective view and a full policy support for a C2C approach remain absent to date.

However, there is reason for optimism as resource efficiency and raw materials have established themselves really quick in the EU policy making mindset. The competitive aspect for businesses is seen as an important driver for this. EU policy can be envisaged to change towards eco-effectiveness, albeit slowly and step by step. There is a clear and urgent need to speed up this change in order to meet the societal challenges and the ambitions put forward in the EU policies.

3 Desired future situation

On a strategic level, Europe has a clear vision of the future. Already in 2020, Europe aims to realize smart, sustainable and inclusive growth. Smart growth means improving the EU's performance in (amongst others): education (encouraging people to learn, study and update their skills), and research/innovation (creating new products/services that generate growth and jobs and help address social challenges).Sustainable growth means (amongst others) building a more competitive low-carbon economy that makes efficient, sustainable use of resources; protecting the environment, reducing emissions and preventing biodiversity loss; capitalizing on Europe's leadership in developing new green technologies and production methods; helping consumers make well-informed choices. Inclusive growth aims at a high-employment economy delivering economic, social and territorial cohesion.

EU 2020 notably aims for an economy that is more energy and resource efficient, greener and more competitive. On the energy side Europe should be low carbon. This would also mean that Europe could be energy independent. On the material side Europe should be a closed loop society with sustainable materials use, and hence, be material independent. But what does that mean in practice?

3.1 From a reductionist to a lego approach

One of the main consequences of introducing a closed material loop society is to work with materials which are aimed for being continuously nutrients. This means healthy materials in every stage of products' (re-)use phase. Just as waste management was initially introduced from a health perspective (banning waste from uncontrolled community landfills in order to reduce health risks) the link to the health perspective should be introduced again. The aim should be to ban toxic substances in products. Health risks resulting from them have become chronic and highly invisible.

This introduces a completely different approach with respect to hazardous materials management and its policies. Present policies, such as REACH, are based upon a reductionist approach (reducing levels of desired presence of dangerous substances). REACH is the European Community Regulation on chemicals and their safe use. The Law entered into force on 1 June 2007.The REACH Regulation places greater responsibility on industry to manage the risks from chemicals and to provide safety information on the substances. The Regulation calls for the progressive substitution of the most dangerous chemicals when suitable alternatives have been identified. A reductionist approach is changing towards a Lego approach (selecting the right building blocks for materials and products).

3.2 A shift towards a service economy

In a Cradle to Cradle society consumers buy a service, not a product. The producer or a new third party remains owner of the materials that make up the product. Consumers continue to pay for the service for as long as they need and can upgrade the service as often as desired. A consumer pays for the design, use and maintenance of the product (materials). Upon termination of the service the product (materials) returns to the manufacturer who reuses them in new products. This provides an incentive to innovate for producers if they can provide the service at a lower cost during the service contract.

This means that in a closed loop society materials somehow need to find their way back to producers. These are not necessarily the same producers of the original product. Materials carry use functions and should move freely within society. A complete shift towards a service economy may and should be expected. Business models will have changed with a more direct link between producer and user. Initially, it may be the producer who takes the lead in organizing closed, or even better, continuous loops. However, true innovation may be expected from other players in the market who are providing the service business model in which materials are continuously cycled. Already now, it can be seen that a large array of traditional and new players is being involved in the development of these new systems. The shift towards a service economy has also major consequences for the energy debate. Logistics will become more important. This can only work from a global climate perspective if society drives on renewable energy.

3.3 Design is the first signal of human intention

C2C is about 'doing things right from scratch'. Attention for design and easy disassembly, coupled with information about the substances in products mean that any producer is able to re-use the materials. Society will have found ways in order to tag and identify materials in order to create and manage efficiently material streams. 'Doing things right from scratch' also applies to policy making. A C2C society does not know toxic subsidies, it does not support initiatives leading down unsustainable paths. It also applies to the design of a service oriented society, with all the consequences for designing new business models and new systems in logistics (such as reversed logistics).

3.4 Solid home market with respect for diversity

To make this happen, Europe has a solid home market for C2C products. This can only work if the market is steered into a direction where innovation with environmental benefits is rewarding. Creating a solid home market requires that C2C is a normal part of life. It is commonly understood as a concept and with regard to its implications on products, buildings and spatial development. It is fully integrated in supply and demand. The creation of a solid home market takes the different context of member countries into consideration with regard to the potential development speed.

3.5 Innovation tackles societal challenges

Radical innovation underpins the transformation towards and the further development of the C2C society. A closed loop economy desires new business models, new ways of collaboration and engaging with stakeholders, and innovation in processes, products and entire systems. Innovative solutions are developed to facilitate material flows, for example in tagging/identifying materials in closed loop economies.

The current EU innovation-weaknesses such as under-investment towards C2C, unsatisfactory framework conditions and too much fragmentation are turned around into strengths supporting the transition towards a closed loop society.

4 Recommendations

The diversity of EU members with regard to actual waste management and the introduction of resource efficiency measures (to start with) presents a challenge in finding the right balance for new policies. What is too ambitious for one is not enough for the other. For example, the top priority in (new) member countries lies with installing new landfills to cope with growing amounts of waste or with closing illegal landfills. In both cases it is something completely different than talking about eco-effectiveness. Based on the analyses in the previous chapters, the following recommendations are presented. They focus at the strategic, rather than the operational level, guiding EU policy towards eco-effectiveness. The recommendations are proposed on four levels:

1. **Create a common framework for an eco-effective society**
2. **Stimulate demand**
3. **Stimulate supply**
4. **Innovation through partnerships**

4.1 Create a common framework for an eco-effective society

A common framework is needed as C2C represents a new transition for the European policy arena, towards an eco-effective society. While a common framework will give structure and direction, the actual difference in existing waste infrastructure and policy will ask for a flexible implementation. Part of the common frameworks objective will be to create a level playing field in order to drive the change.

a. **Creating a common understanding.** EU-regions have different backgrounds and find themselves at different stages in the process of dealing with waste. Some regions have taken more steps than others and the actual debate may thus be quite different. In order to create a level playing field for a C2C market, the EU should make sure that a common understanding of C2C and a closed loop economy is in place. To support policy coherence and acceptance of C2C by businesses and consumers, a common framework is needed. Within this framework, it could be helpful to develop and communicate an understanding of the linkages, overlaps and synergies between related concepts such as eco-efficiency, eco-effectiveness, industrial symbiosis, sustainable development, …
b. **Integration in education.** Creating a circular economy demands significant changes on many levels of thinking. Children ought to be in contact with this concept so that it may become part of their DNA. The whole society will need well educated and trained employees for making the radical changes to happen. Europe could support this by installing programs for supporting the integration of eco-effectiveness in education.
c. **Horizontal integration in policies.** A common framework does not necessarily mean a separate C2C directive. It does mean that a coherent approach for integration of the C2C principles in existing policy lines becomes possible. This would for instance mean the integration of a resource and material focus in the Eco-design Directive (rather than one criterion such as energy efficiency) or even the more advanced inclusion of functional design (in line with development of a service economy, new business models and Smart Public Procurement). A closed loop economy needs a holistic approach to policy making with the aim to integrate lego thinking (see Chapter 3). It integrates and balances policies with respect to a closed loop economy by considering the intended and unintended consequences of linked policies and the synergies or barriers resulting from them. A common framework will make it possible to remove policy obstacles for an eco-effective society. It means getting rid of toxic subsidies and other public support mechanisms supporting initiatives and practices that don't take into account life cycle costing and/or lead to lock-in effects of not eco-effective solutions. It also means not providing subsidies that disguise real costs and support unviable initiatives. It redirects the financial means to provide incentives towards eco-effective innovation and implementation.
d. **Redefining waste as a resource.** If the EU wants to move away from end-of-pipe thinking and better define the future framework, the EU will have to look again at definitions. Often at the national level the formulation or interpretation of waste legislation hinders the adoption of closed loop production systems. An essential part of the common framework will be the transition in order to label 'Waste' no longer as such but as a 'resource'. When designing new policy initiatives to deal with waste and to support the transition towards an eco-effective society the EU should pay extra attention to the design phase of the product. This could ease disassembly and the reuse of materials, thus preventing the creation of waste.

e. **Defining objectives and targets.** In order to get a full commitment from business and finance (investment) to go for a closed loop economy the EU needs to take away the uncertainty surrounding the development of the market. Future EU policies should define common EU-wide strategic objectives and targets and put these objectives in reality with respect to the creation and support of demand and supply.
f. **Measuring progress.** Convincing business and policy to adopt C2C remains a challenge. For a closed loop economy to become operational, indicators, accounting measures and better disclosure and reporting must be developed that make sense in economic terms while including the cost for externalities. This entails the simultaneous pursuit of developing operational closed loop indicators at the company level and the development of strategic indicators at the system level beyond for example Gross Domestic Product. In other words, both at the level of the individual company as at the level of society indicators are needed to track the progress towards an eco-effective society.

4.2 Stimulate demand

A C2C-approach reduces the costs for society to get rid of waste and limits the burden of the exploitation of non-renewable resources. In economic words, C2C internalizes the externalities to society and subsidizing C2C is a zero-sum operation – if not a positive sum game. The positive sum game may not expected to be realized from day one. C2C implies a thorough redesign of our production and consumption system, which will generate (huge) investments in an initial phase.The money gained by less externalities could (and maybe should) be invested in C2C initiatives. In other words, the negative impacts prior C2C disappear in the C2C concept. C2C reduces (eliminates) costs for society and therefore public support for C2C is warranted. This public support may essentially impact the demand and supply side. With respect to stimulating demand, governments may act on prices and MBI's and can take a lead as being a major purchaser on the European market.

a. **Getting prices right.** As mentioned in Chapter 2 the European Commission is examining, inter alia, options for revising the energy taxation framework and possible fiscal incentive mechanisms at EU level. This revision is essential in the creation of a closed loop economy. The price of products now seldom accurately reflects their full cost, including environmental and social impacts caused throughout their product life cycle. Product prices can thus be considered as a market failure obstructing the breakthrough of sustainable products in general. Costs must also be allocated to the right actor (in the chain/system) to make incentives work. Market based instruments (MBI's) could in this respect be adequate and intelligent instruments to promote C2C. MBI's include charges, subsidies, tradable permits and other financial incentives. For example, lowering VAT for products that comply to C2C/closed loop criteria should be considered as support for these products. Stimuli to help companies with eco-innovation and using taxes on waste, for example by focusing on life cycle thinking in producer responsibility, are other mechanisms the EU can use.
b. **Leading by example.** In terms of stimulating demand, public authorities play an important role through procurement. Sustainable public procurement means that public authorities seek to achieve the appropriate balance between the three pillars of sustainable development - economic, social and environmental - when procuring goods, services or works at all stages of the project. Integrating closed loop criteria in the procurement process can have a big impact on the creation of a C2C market. Innovative public procurement can help to achieve this goal by challenging the market to come up with innovative answers. Sustainable public procurement combined with the change towards innovative procurement procedures offers opportunities, for instance to focus on producer responsibility by including life cycle costing in the tendering procedure.
c. **Making C2C visible.** C2C is not solely applicable to a product environment. The C2CNetwork also looked at what C2C means in the context of the built environment and area spatial development. By means of example and by showing stakeholders the EU is serious about its commitment to a closed loop economy, it could initiate an actual flagship C2C project in construction or in area spatial development. Examples at the regional level exist, for example Green port in Venlo, The Netherlands or Blue Gate in Antwerp, Belgium. These regional examples may as well be used to create a community of leading practices, offering the possibility to link more closely to the different member states. A common charter with specific criteria could guarantee the quality of the projects at stake.

4.3 Stimulate supply

With respect to stimulating supply, governments may act on clarification of what C2C means with respect to European product standards, on the creation of a solid knowledge base and by taking choices with respect to existing financial means.

a. **European product standards.** Measures supporting the demand side should be supplemented by action on the supply side such as integrating closed loop production characteristics in European product standards. Clarifying the concept of C2C and translating this into concrete characteristics will create a level playing field and take away product and market uncertainty producers now face.
b. **Strengthening the knowledge base for eco-effectiveness.** C2C is something relatively unknown in most European regions. Having clear, inspiring examples is seen as a crucial step to not only raising awareness at the business and at the policy making level but also to help organisations with their practical implementation of C2C.This should not only focus on business examples but should also offer practical tools to put C2C in practice, such as material databases offering relevant information for producer and consumer. In answer to this call for inspiring examples the EU could support and promote an EU-wide database or platform to exchange concrete closed loop examples and instruments. This can build on the work done in the C2CN.
c. **Financing the transition.** The transition towards a C2C society needs adequate financial means. In the current economic environment access to finance, both public and private, poses a challenge in itself. In this context of 'scarce financial resources' it is the more important to steer existing funding instruments towards supporting the closed loop economy. The EU has possibilities by integration of C2C in the Structural and Cohesion funds. The common framework, by creating a level playing field, a common understanding and strong, clear goals, will also be an essential support for making it possible to set direction with regard to investment decisions in public and private funding. In other words, policy and regulatory frameworks should support informed investment decisions for both public and private investors.

4.4 Innovation through partnerships

A closed loop economy is based on governance structures that allow all actors to meet their shared responsibilities. Governance structures at local, regional, national and global level need to be aligned and mutually reinforce each other for innovation to occur. A closed loop economy requires working through new approaches that facilitate innovative collaborations and partnerships between business, government and civil society. Such collaborations can take many forms including public private partnerships, business value chain engagements and alliances with academia and consumers. The EU may take a leading role in stimulating stakeholder cooperation towards eco-effective innovation.

a. **From Fast Track to Follow Track.** It is clear that the present INTERREG project (and others) have created a network where knowledge and cooperation has increased. The EU has already improved its connection to these networks by interacting more closely by means of the Fast Track label. The actual network presents a capital in knowledge and cooperation which will in part end with the closure of the project, although it may be of more use for the EU. A new kind of follow-up engagement could be installed, a Follow Track Label. This could guarantee the continuation of the interaction and follow-up with the network for creating a circular economy. This Follow Track Label should ensure on the one hand further policy integration and on the other hand an increased use and dissemination into the regions.
b. **Stimulate the European transition networks.** A transition network or (multi-stakeholder) platform brings stakeholders together with different backgrounds in order to co-create a circular economy. Europe could take a supporting and leading role in the co-creation of national (regional) transition networks. A meta platform (facilitating and experience sharing) could be the right governing role on the European level. The EU could build on the leading role Belgium (specifically the Flanders Region) and the Netherlands have with respect to transition management. Using the present experience and unfolding it on a European scale could significantly speed up the process of transition towards a circular economy.
c. **Eco-effectiveness in innovation.** Innovation at present mainly focuses on efficient production methods. When aiming for an eco-effective society, stimulating and supporting innovation in new products and new business models becomes more important. The EU should include eco-effectiveness ambitions in Innovation policy.

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More information on:

- www.c2cn.eu
- ec.europa.eu/enterprise/policies/raw-materials/index_en.htm
- ec.europa.eu/enterprise/policies/sustainable-business/ecodesign/index_en.htm
- europa.eu/legislation_summaries/environment/waste_management/index_en.htm\ec.europa.eu/europa2020/index_en.htm
- www.eea.europa.eu/themes/waste/publications

The Cradle to Cradle Network (C2CN) is an Interreg IV C capitalisation project consisting of ten partners from ten European regions which aims to reduce raw materials' utilisation, to generate less waste and less environmental pollution, as well as to enhance innovation and economic development.

Province of Limburg (NL)
www.limburg.nl

Flemish Public Waste Agency (BE)
www.ovam.be

Milano Metropoli Development Agency (IT)
www.milanomet.it

Department for Economics and Tourist Development of the City of Graz (AT)
www.wirtschaft.graz.at

ARDI Regional Agency for Development and Innovation (FR)
www.ardi-rhonealpes.fr

Kainuun Etu Ltd (FI)
www.kainuunetu.fi

West-Transdanubian Regional Development Agency (HU)
www.westpa.hu

Suffolk County Council (UK)
www.suffolk.gov.uk

North-East Regional Development Agency (RO)
www.adrnordest.ro

Government Office for Development and European Affairs (SI)
www.svrez.gov.si

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