# A CIRCULAR ECONOMY IN EUROPE – POLICIES AND PRIORITIES

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## Introduction

In this chapter, we provide an overview of three crucial elements concerning the development of a circular economy in Europe. The first is the need for a 'policy mix', and the policy toolbox that may be employed, to enable and deliver the required transformation. The second element is the state of the current policy landscape across Europe, and components thereof that are driving and constraining this transformation. Following this, the third element is key principles and priorities for policy action to reduce these constraints, and amplify the drivers, towards a circular economy. Insights presented in this chapter are largely drawn from those generated by the European research project POLFREE[1].

## Web of Constraints to Resource Efficiency and a Circular Economy

It is common to consider resource inefficiency to be the result of a collection of individual issues or market failures, including market externalities, split incentives, information failures, 'irrational' behaviour by individuals and other actors in society and the economy, and governance and regulatory inadequacies. However, Kemp & Dijk (2013) conclude that rather than a collection of discrete, largely independent barriers, there exists a 'web of constraints' to resource efficiency - the direct and indirect relationships and dynamic interaction between institutions, organisations, societies and individuals, and the policies, norms and behaviours they set and exhibit. The specific form of the web of constraints depends on the focus (spatial, temporal, sectoral, etc.), and by its inherent nature, alters over time.

Due to its dynamic nature, an alteration to one aspect of the web of constraints may induce changes in another aspect (either towards or against the establishment of a circular economy). Over time, windows of opportunity for the development and implementation of radical technologies and practices, or the policy instruments to drive or facilitate them, that were previously untenable, may be opened (Kemp & Dijk, 2013). As such, strategic policy interventions may transform the web of constraints into a 'web of drivers' for resource efficiency and a circular economy.

## Policy Toolbox for a Circular Economy

Due to the multi-aspect nature of resource use and its consequences, and the web of constraints constraining resource efficiency and the delivery of a circular economy, a 'first-best optimum' approach of applying a single policy instrument to counter the problem is insufficient. A policy instrument mix, applying 'second-best' theory and the Tinbergen Rule (i.e. for each policy objective, there must be at least one policy instrument), must be employed (Wilts et al, 2014a).

[1] 'Policy Options for a Resource Efficient Economy' (Grant Agreement Number: 308371). For more information, see www.ucl.ac.uk/polfree

Policy instruments and action may be subject to various typologies, based on the characteristics of interest. However, few provide guidance for how instruments may be selected to form an appropriate policy mix to deliver transformational change. Figure 1 illustrates the concept of three 'domains of change' and corresponding 'pillars of policy', developed by Grubb *et al* (2014). Although originally developed in the context of climate change mitigation, the concept is applicable to other systemic environmental and resource use concerns.

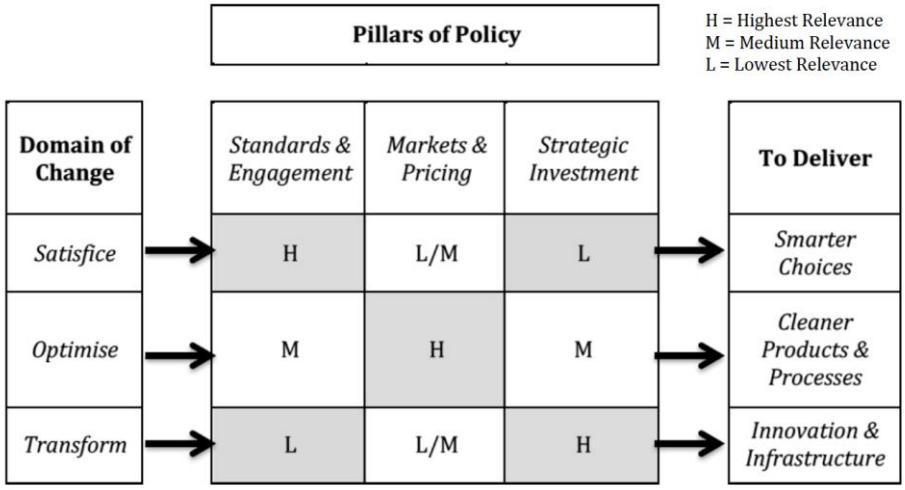


**Figure 1 - Three Pillars of Policy and Domains of Change (Source: Grubb *et al*, 2014)**

Each domain of change reflects a distinct sphere of economic decision-making and development. The first, satisficing, describes the tendency of individuals and organisations to base decisions on habit, assumptions and rules of thumb. Such phenomena link to behavioural and organisational economics, for which the first pillar of policy, standards & engagement, may be employed to produce 'smarter choices'. Examples of such instruments related to resources include minimum performance or material requirement standards, the provision of information and instruments targeting behaviour change.

The second domain, optimising, describes the 'rational' approach of actors making optimal choices on economic factors. This reflects traditional assumptions around market behaviour and corresponding theories of neoclassical and welfare economics. The second pillar of policy, related to markets & pricing, employs market-based instruments to deliver 'cleaner (and more resource-efficient) products and processes'. Environmental taxation is a key example of an instrument falling into this pillar of policy.

The final domain, transformation, encapsulates the ways in which complex systems develop over time under the influence of strategic choices made by large entities, particularly governments. The insights of evolutionary and institutional economics are employed in the third pillar of policy, in which strategic investment delivers 'innovation and infrastructure'. Such instruments would include any that seek to encourage the development and deployment of niche or immature technologies or practices. Subsidies for the deployment of renewable energy, and R&D funding for new materials, would be key examples.

Each of the three domains and policy pillars, whilst presented as conceptually distinct, interact in a variety of ways. As Figure 1 illustrates, each of the pillars of policy have at least some influence on all three domains of change. A policy mix spanning all three pillars of policy is required to deliver the transformation to a circular economy.

## The Policy Landscape in Europe

Resource efficiency and the circular economy has received increasing attention in the environmental policy agenda in recent years, driven significantly by price volatility in commodity markets and its potential impact on supply chains and industrial competitiveness (Domenech et al, 2014). The 'Europe 2020 strategy for smart, sustainable and inclusive growth', with its 'resource-efficient Europe flagship initiative', currently provides the strategic framework for resource efficiency and circular economy policy development.

The Waste Framework Directive (2009/98/EC) and Ecodesign Directive (2009/125/EC), and their antecedents, have been key drivers for resource efficiency in the EU (Kemp *et al*, 2014). The Waste Framework Directive consolidated existing and established new common definitions and requirements for waste management across the EU, including a reduction of biodegradable waste to landfill (a reduction of at least 65% of 1995 levels by 2016), recycling and recovery targets for municipal waste (50% by 2020), and the establishment of the Polluter Pays Principle (for example, for landfill cost recovery). Between 1995 and 2015, the share of municipal waste sent to landfill fell by 58%, whilst the share of municipal waste recycled rose from 11% to 29% (Eurostat, 2017a).

The Ecodesign Directive sets minimum standards on energy-using and energy-related products (ranging from space and water heating, to lighting and consumer electronics) for material, energy and water resources, waste, emissions to air, water and soil, hazardous substances, and physical impacts in the 'use' phase of a product. However, to date the focus has been largely on 'in use' energy consumption. For products covered by the Directive (and its predecessor) by 2010, energy savings equivalent to 9% of total EU energy consumption in 2014, GHG savings equivalent to 7% of the EU total in 2010, and savings of 336 million $m^3$ of drinking water, are projected by 2020. This is expected to be achieved with a €110 billion net saving on consumer expenditure (VHK, 2014).

The 'Circular Economy Package' and the enclosed 'Circular Economy Action Plan', adopted in December 2015, included a range of specific legislative and other supporting proposals and initiatives with the aim of supporting the transition to a circular economy in Europe. Key examples include[2]:

- **Production-side** – Emphasis on circular economy under the Ecodesign Directive (Directive 2009/125/EC), inclusion of guidance on circular economy into Best Available Technique reference documents (BREFs) for several industrial sectors, and improving uptake of the EU Eco-Management Audit Scheme (EMAS).
- **Consumption-side** – Improve effectiveness of 'Ecolabel', feasibility assessments for requiring inclusion of repair information under the Ecodesign Directive, development of a testing programme for 'planned obsolescence', the inclusion of Product Environmental Footprints to measure and communicate environmental information, and to enhance circular economy requirements for Green Public Procurement.
- **Waste Management** – Revisit definitions of waste, and revise legislation on waste management (including a common 65% target for recycling of municipal waste by 2030, a binding target to reduce landfill to a maximum of 10% of municipal waste by 2030, and a ban on landfilling of separately collected waste), industry-led voluntary certification of waste/recycling facilities, inclusion of 'waste

[2] For further information and detail, including on timetable for implementation, see European Commission (2015).

to energy' in the framework of the Energy Union, and identification and dissemination of good practice in waste collection systems.

- **Secondary Raw Materials** – Development of quality standards for secondary raw materials (particularly plastics), minimum requirements for reused water for irrigation, electronic data exchange to facilitate waste shipment across the EU, and further development of the EU raw materials information system.
- **Sectoral Action** – Development of a strategy on plastics in the circular economy, a common methodology and indicators to measure food waste, standards for material-efficient recycling of electronic and other complex end-of-life products, and development of core indicators for the assessment of lifecycle environmental performance of a building.
- **Innovation and Investments** – 'Industry 2020 and the circular economy' funding stream under the Horizon 2020 research programme, support to member states and regions to strengthen innovation for the circular economy through smart specialization, and a feasibility assessment for launching a platform (with the European Investment Bank and national banks) to support the financing of the circular economy.
- **Monitoring** – Development of a monitoring framework for the circular economy

The European Commission (2017) suggests that the Circular Economy Action Plan 'has undoubtedly contributed to mainstreaming the concept' of the circular economy. However the existing policy landscape, and the proposed developments under the Circular Economy Package, are likely to be insufficient for achieving it. There are three key reasons for this.

Firstly, there is a clear focus on the 'output' side of resource consumption, or the lower tiers of the waste hierarchy (Figure 2). Many of the more ambitious policy objectives and binding targets focus on the end-of-life of products and the prevention and handling of waste, with relatively little attention placed on the higher tiers of the waste hierarchy (e.g. prevention and re-use). Where such attention is paid, it is largely through aspirational, non-binding objectives and targets, voluntary mechanisms and information sharing.

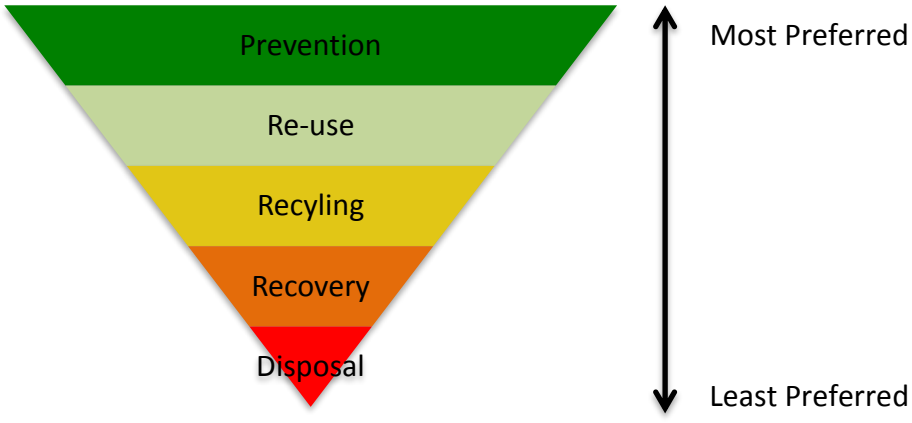


**Figure 2 - Waste Hierarchy**

Indeed, the absence of a more comprehensive set of indicators and associated targets on resource (including materials) efficiency, such as a resource productivity target (e.g. GDP per unit of raw material consumption), is a key gap in the current EU strategy on resource efficiency and the circular economy (Domenech *et al*, 2014). However, the presence of a 'joint-decision trap', whereby there is a tendency for agreement and decisions to be taken at the level of the lowest common denominator, results in largely incremental policy shifts, rather than in more radical, innovative policy objectives and approaches (Kemp *et al*, 2014).

The second reason is the varied ambition and policy landscape related to resource efficiency and circular economy within member states. There is substantial variation across member states in terms of resource productivity, with several countries experiencing relative and even absolute decoupling between domestic material consumption (DMC) and economic growth. However, attributing resource use outcomes to policy initiatives is a highly complex exercise, as the dynamic interaction between factors in the 'web of constraints' makes it difficult to isolate individual 'success factors' (Bahn-Walkowiak *et al*, 2014). Additionally, the outsourcing of primary material extraction is likely to be a significant factor in improvements in domestic resource productivity, rather than a reduction in total material requirement (TMR) (Kemp *et al,* 2014).

Bahn-Walkowiak *et al* (2014) highlight some key weaknesses in the policy framework that may be found in many member states. A key example is the low level of environmental taxation[3], particularly on resources. In 2015, revenue from environmental taxes in the EU28 represented 2.4% total GDP, and 6.3% of total government revenues from compulsory levies. Of this, taxes on pollution and resources together represented just 3.5% (with energy and transport taxes accounting for the remaining 96.5%) (Eurostat, 2017b). This is exacerbated by the presence of environmentally harmful subsidies for resource-intensive activities and sectors (particularly in the form of non-taxation, discounts and exemptions for fossil fuel production and consumption). Various other common weaknesses may be highlighted, such as policy inaction, the use of qualitative rather than quantitative targets, insufficient policy coherence (including a lack of clarity regarding the division of institutional responsibility), information deficits and the strong influence of vested interests (Bahn-Walkowiak *et al*, 2014).

The third reason the existing and proposed policy landscape is likely to be insufficient to deliver the transformation to a circular economy is the interaction between different policy strategies and instruments, and their component objectives, targets and operating mechanisms, within and between different levels of governance (from supra-national EU, to local and city level). From the perspective of resource efficiency and the circular economy, and in line with the concept of the web of constraints, such interactions may be synergistic or conflicting in nature. Figure 2 illustrates mutually re-enforcing (green) and conflicting (red) relationships at the EU level.

Figure 3 illustrates that recycling, for instance, could in principle also reduce the consumption of primary raw materials, and associated land use change and $CO_2$ emissions. However, examples of conflicting relationships are also prominent. For example, the promotion of renewables may require substantial increases in some materials, including critical raw materials and biomass, which in turn may have land use implications. Such conflicts occur laterally, but also over time. For example, following years of waste policy encouraging investment in incineration infrastructure, the EU shifted focus to emphasise the role

[3] Defined by EUROSTAT as a tax levied on a physical unit (or a proxy) of something that has a proved, specific negative impact of the environment

of recycling and a limit on incineration of non-recyclable materials. Whilst justified from a resource efficiency perspective, this implies a double investment in waste management infrastructure and competition for waste streams, increasing costs substantially and potentially producing stranded assets (Domenech *et al*, 2015).

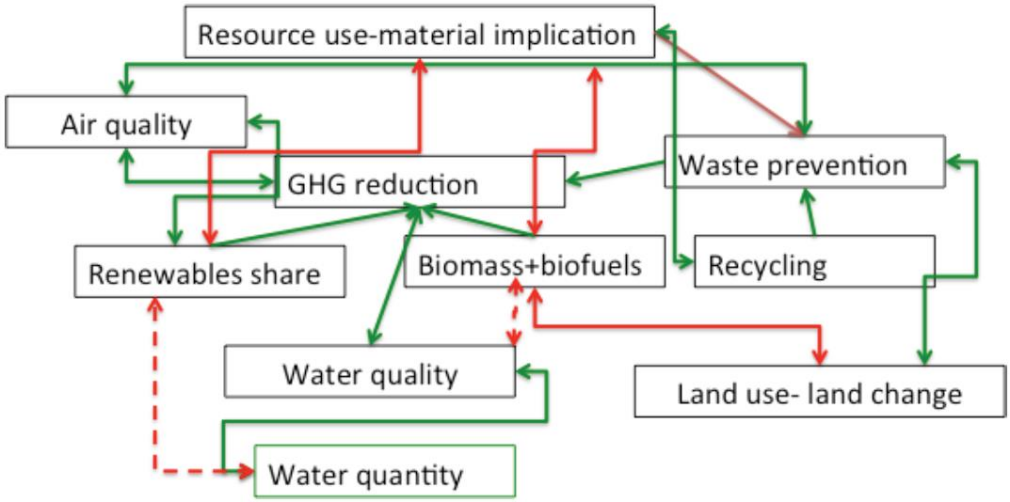


**Figure 3 - Synergies and conflicts for resource efficiency in the EU policy landscape (Source: Domenech *et al*, 2014)**

## Policy Principles and Priorities for a Circular Economy in Europe

As proposed by Rogge and Reichardt (2013), regardless of the specific policy strategies, targets and instruments adopted in the future in order to encourage the transition to a circular economy, a policy mix must adhere to three core principles to be effective, cost-efficient and feasible:

### *Consistency*

This principle may be defined in terms of 'weak' consistency (the absence of contradictions or conflicts within or between instruments and elements of the policy mix), or 'strong' consistency (the presence of complementarities, mutual support and synergies between instruments and elements of the policy mix). Therefore, a priority action for the EU should be the introduction of new (or amendment of existing) instruments that generate synergies, and that reduce the presence of negative interactions or side effects. Broadly, any instrument that internalises negative externalities, or reduces perverse subsidies, acts to improve the overall efficiency of market processes and acts in a mutually supportive manner with other categories of policy instrument (in a well-designed mix) (Wilts *et al*, 2014a). As such, a focus should be the removal of environmentally harmful subsidies, and the wider application of effective environmental taxation instruments.

### *Coherence*

This principle refers to the processes for the development, implementation and monitoring of policy instruments, within and between different levels of governance, ensuring that elements of the policy mix are not in contradiction, and may be reinforcing. Thus, there is a clear link between coherence and consistency, although coherent process alone is not a sufficient condition for consistent policy mix (Rogge and Reichardt, 2013). Given the web of constraints to a circular economy, it is clear that no

single actor is able to develop and implement a comprehensive unified resource efficiency policy mix that tackles the web of constraints, using instruments from across the three pillars of policy, and applied to all relevant sectors and geographies of the European economy. As such, a priority action in the EU should be to ensure policy processes between actors within and between different levels of governance (i.e. EU, national, local/city), are at least not in contradiction and, where possible, are re-enforcing (either explicitly or implicitly).

*Credibility*

The third and final principle refers to the perceived credibility of the policy mix from the perspective of targeted entities and other market actors, to provide confidence in the market for long-term investment in resource-efficient and circular technologies and practices. Credibility is influenced by a range of factors, such as political commitment, the presence of overarching strategies and targets, the operationalisation of these targets by the instrument mix, and the delegation of competences to independent agencies (Wilts *et al*, 2014a). Consistency and coherence of the policy mix and related processes are also important factors in whether actors perceive the instrument mix to be credible. In the first instance, given the complexity and systemic nature of the transformation required, the development of long-term core strategies and targets for achieving a resource efficient and circular economy is a key precondition to its achievement (Wilts et al, 2014b). As such, a priority action should be the development of long-term (post-2020), clear and credible strategy, with holistic, clear and measureable targets, for the development of a circular economy in Europe.

**Key Conclusions**

- ► There is a 'web of constraints' to resource efficiency - the direct and indirect relationships and dynamic interaction between institutions, organisations, societies and individuals, and the policies, norms and behaviours they set and exhibit.
- ► To enable and deliver the transformation to a circular economy, a policy mix is required, with instruments spanning three 'pillars of policy', addressing processes that occur across three 'domains of change', reflecting distinct spheres of economic decision-making.
- ► The existing and proposed policy landscape in Europe is likely to be insufficient for achieving a circular economy, for three reasons: (1) a focus on the lower tiers of the Waste Hierarchy, (2) varied ambition at the member state level, (3) sometimes conflicting policy objectives, instruments and mechanisms, laterally and over time.
- ► To be effective, cost-efficient and feasible, a policy mix and its component objectives, mechanisms and processes, must be consistent, coherent and credible. Three priorities for action are to: (a) amend existing (or introduce new) instruments that reduce conflict and increase synergies across the policy mix, (b) ensure policy processes between actors within and between different levels of governance are, at a minimum, not in contradiction, and (c) develop a long-term (post-2020), clear and credible strategy, with holistic, clear and measureable targets, for the development of a circular economy in Europe.

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