TRANSITIONS AND SUSTAINABLE MATERIALS MANAGEMENT
– the case of the EU, OECD and UNEP

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1. Introduction

Attention for Sustainable Materials Management has been increasing throughout the last years, and several international organizations have also shown their attention for the topic. The analysis of our previous research paper (Happaerts (2014)) shows that UNEP, the OECD and the European Union are particularly active on sustainable materials management (SMM), not only on the level of discourse but also in their operations. UNEP was particularly active in the creation of innovative studies in the context of the International Resource Panel (IRP), while the OECD provides more knowledge-building and policy recommendations. The activities of the European Union on sustainable materials management are the broadest and the deepest of all international institutions, mainly by its ability to implement binding legislation, targets and policy instruments. However, significant fragmentation of SMM policies has occurred, as all three organizations have different approaches and apply a different discourse towards SMM (Happaerts 2014).

After this first broader screening of discourses and practices on sustainable materials management, the question remains how theses discourses and practices are operationalized throughout the work and operations of the EU, the OECD and UNEP. Additionally, one could wonder if these activities on sustainable materials management are truly fostering the **transition** towards sustainable materials management, the core theme of the Policy Research Centre for which this paper is written. This paper analyses whether and how transition thinking is operationalized in the policy principles, goals and instruments of three international organizations, being the EU, the OECD and UNEP.

This research paper is structured as follows: first, we explain the research approach and the analytical framework. Then elaborate the discussion on each of the three case studies the EU, the OECD and UNEP. Finally, we make a cross-case analysis and formulate our conclusions.

2. Research approach

In this paper, we analyse whether transitions thinking is present in policies on sustainable materials management on the level of policy principles, policy goals and policy instruments. In order to do so, we developed a step-wise research approach. First of all, we operationalize **transitions theory** by defining **key elements** adjacent to the theory, which will be developed in the next analytical framework chapter. Next, a mapping is developed of relevant policy documents that will be used for the in-depth analysis. We conducted the screening based on the documents' relevance for sustainable materials management policies. The selection of key documents was also discussed with the interviewees, in order to detect any missing flagship documents.

Afterwards, the research approach differed for the EU on the one hand and the OECD and UNEP on the other, because of the different nature of the policy documents. Whereas the focus of the EU lies

more on communications of the Commission (which offer policy guidance for the years to come), the documents of the OECD and UNEP mainly consist of elaborate analyses of SMM issues and policies. This is why we applied a slightly different approach for the two categories.

For the case of the European Union, we conducted our analysis by applying the analytical framework on three levels: the one of **policy principles, policy goals and policy instruments**, as first done by Happaerts (2015). For each of the levels, we analysed whether transition thinking elements were present. In the case of the OECD and UNEP, we applied the transitions framework directly to the policy documents of the organization. The analysis will thus be conducted on each of the elements, rather than on the policy levels of principles, policy goals and instruments, as the latter two are less important for UNEP and the OECD.

Complementing and guiding this in-depth qualitative analysis of the key documents, we also performed **a screening of the relevant policy documents using the freeware 'AntConc'** to perform a corpus linguistic search. The software has a concordance tool that can extract a list of target words from a given text, or set of texts, and present them in such a way as to indicate the context in which the word is used. This format of presenting information is called 'KWIC': Key Word In Context. This means it provides an overview of how a specific keyword is being used in a text (or set of texts) by also listing the flanking words before and after. The software can also distil information on the distribution of specific words across the different sections of the text or across different texts, and allows to identify the most frequently used words throughout the text. These instruments were used to scan the vast amount of pages and offer some first indications of how a specific element of transition is explicitly referred to in the considered documents.

Finally, our analysis was supplemented with in-depth interviews with actors in and outside the three international organizations. The interviews were used to check whether the list of analysed documents was complete, and provide additional information on the practices of the organizations on the level of principles, goals and instruments.

3. Applying transitions theory to SMM policies

3.1 What are sustainability transitions?

In order to execute our analysis, it is important to define what transitions actually are, and what constitutes elemente of a transition. First, we will give an overview of the dominant spheres in transitions thinking, from which we will extract the most important elements of transitions thinking. These elements will form the transitions thinking framework that we will apply to the three cases. It is important to realize that this chapter will not give a thorough overview of transition thinking as a whole, but rather to give a quick overview of the most important elements of transitions thinking[1].

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[11] For more information on transitions thinking, please consult the work of Markard et al. (2012), who list and refer to the most important authors and strands within transitions research. Other important authors are Geels, Rotmans, Loormans and Paredis.

The concept of **sustainability transitions** refers to the fundamental, radical and deep changes in modes of production and consumption in order to overcome persistent problems such as climate change (Happaerts, 2015). Sustainability transitions in the long term could be defined as "long-term, multi-dimensional and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes for production and consumption" (Markard et al., 2012).

Within transitions research, **four main strands** can be identified. For our study, the most important ones are the *multi-level perspective* and the *transitions management approach* (Markard et al., 2012).
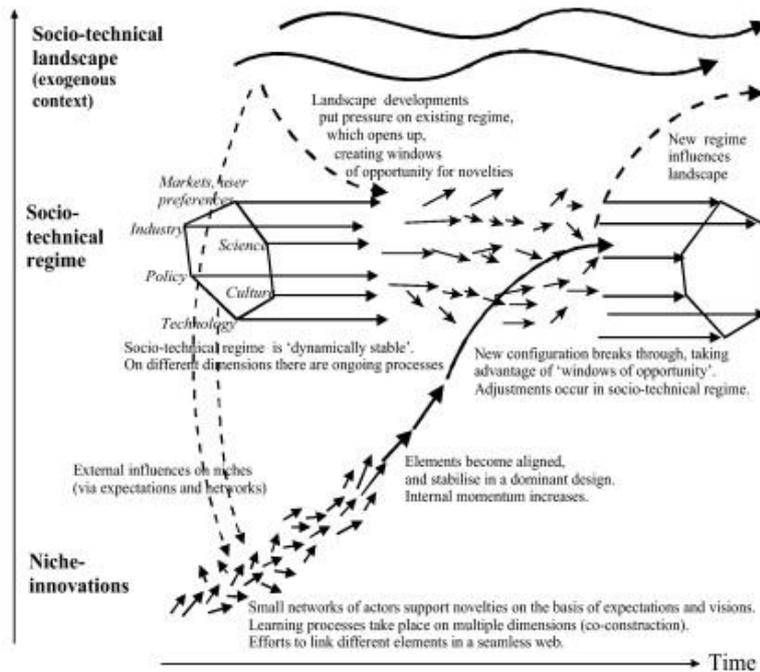
Figure 1: Multi-Level Perspective (Geels 2011)

First of all, the Multi-Level perspective, as elaborated by Geels (2011), provides important insights in transitions as a concept. Within the MLP, the focus lies on a so-called socio-technical systems, which consist of networks of actors, institutions and material artefacts and knowledge (Markard et al., 2012). Central within this approach, and within the multi-level perspective is the regime, which are the current institutions, culture and practices as they are. A regime is seen as dynamically stable and self-reinforcing. However, the regime could change because of two elements: exogenous landscape elements, which are outside of the regime but (could) have an influence on its functioning, and niche-innovations (i.e. small networks of frontrunners who develop alternatives to the regime, in order to overcome the so-called persistent problems that remain (Geels & Loorbach, 2007). Socio-technical regimes are dynamically stable, which means that they do leave room for adaptation towards new situations, but their inner core will stay intact (Paredis 2013).Transitions can occur when landscape development (such as a scarcity of raw materials) and niche developments (new technologies or businesses) put pressure on the existing dominant regime. This opens a so-called window of opportunity, which allows for a new system/regime to take the place of the previous system.

Secondly, **transitions management** can be observed as a major stream within sustainability transition research. Transitions management does not necessarily depart from the multi-level perspective, but focusses rather on the process and the conditions to make a transition happen. The underlying paradigm for transition management scholars comes from the conceptualization of the current regime as "complex, adaptive societal systems" and by understanding management as "a reflexive and evolutionary governance process" (Markard et al. 2012). Elements which further derive from transitions management are the focus on the co-creation of knowledge by all actors in the regime, the explicit participation of frontrunners, the acceptance of the complexity and difficulty in steering societal systems and the focus on reflexivity and learning (e.g. Loorbach 2010; Markard et al 2012).

Other main literature streams are strategic niche management (with a focus on the nurturing and empowering of niche innovations) and technological innovation systems (with a focus on the emergence of new technologies) (Markard et al., 2012). However, we will not discuss them in detail to focus mostly on the MLP and transitions management, as these literature streams provide us with the most practical insights for our study.

Apart from the discussion on the four literature strands, the following remarks need to be made. First, transitions theory seems to suffer from a so-called **bottom-up bias**: much academic attention is raised for the fostering and empowerment of niches, rather than looking at the current regime. However, regimes operate in differing contexts, and this context could determine the level of stability and the willingness of the regime to change (Paredis 2013). Transitions are also inherently **international** in nature: the persistent problems, such as climate change, are of a transnational nature (Happaerts, 2015). However, most transitions literature is oriented on the local or national level, or only looks at niches projects. Another important element within the transitions thinking is the so-called **S-curve of transitions**, consisting of four phases: the predevelopment phase, in which transitions are "prepared", the take-off phase, when the transitions starts to happen, the acceleration phase, when the change becomes more dominant, and the stabilisation phase (e.g. Paredis 2013).

3.2 Analytical framework

The previous short overview has shown that transitions thinking exists within a rich literature field. For our analysis, we need an analytical framework with further delineation. This is based on the most important aspects of transitions thinking, mainly based on Happaerts (2015), who identified six core elements of transitions thinking.

First of all, transitions tend to have a strong focus on **socio-technical systems**: in a transition, traditional policy actions are altered towards more sustainable production and consumption patterns. These socio-technical systems are composed of three central elements:
- Structure: the institutions and material infrastructure which exist in a society
- Culture: consist of the principle images, ideas, knowledge and paradigms
- Practices: behaviour and routines within the system (Rotmans & Loorbach 2010; Happaerts 2015).

Sustainability transitions need to occur in all of the three elements, and policies will have to try and alter all three elements (Happaerts & Bruyninckx, 2014). This is why we will analyse whether the

specific policy document addresses a socio-technical system, and whether the policy specifically recognizes or refers to the three elements of the socio-technical system.

Secondly, transitions imply a deep and fundamental change within these socio-technical systems and regimes (Happaerts, 2015), thus implying a **radical** approach. The transitions approach explicitly renounces the idea of incremental change, it includes the avoidance of a lock-in, where current unsustainable socio-technical systems remain the norm. This is why we will ask ourselves whether the policy contains radical elements, or rather stays within the incremental approach. However, radical changes can also occur gradually.

The third element is the focus on a **long-term perspective** and the design of long-term visions and policies to achieve the transition, as the long-term nature is inherent to a transition (Markard et al. 2012). We define a long-term perspective as beyond 10 years (or the current policy cycle), in opposition to short-term policies which are aligned with the current policy cycle.

The fourth characteristic stresses the **reflexive** character of transitions, in opposition to rational and unidirectional policy planning. It accepts the uncertainties that accompany long-term policy and includes experimenting and learning as one of the main elements of change (Happaerts, 2015). This reflexiveness could also be operationalized by the inclusion of monitoring and evaluation of the transitions itself (Loorbach 2010).

Fifth, the **participation** and inclusion of a broad group of stakeholders in achieving the transitions is important. Most transition programmes today are only partially steered by government programmes, and its policies should ideally be co-developed with different non-governmental actors. This does not only apply for the implementation phase of the transitions programme, but also for the early stages of policy planning, and points to a co-creation of knowledge.

Finally, transition policies have attention for both the **stimulation of niches** and the **destabilization** of the current (unsustainable) **regime**. In order to avoid the often observed exclusive focus on new niche projects, regime destabilization is added as a focus point of our analysis.

Systemic thinking	Radical	Long-term planning
Reflexive	Participation	Niches vs. regime destabilization
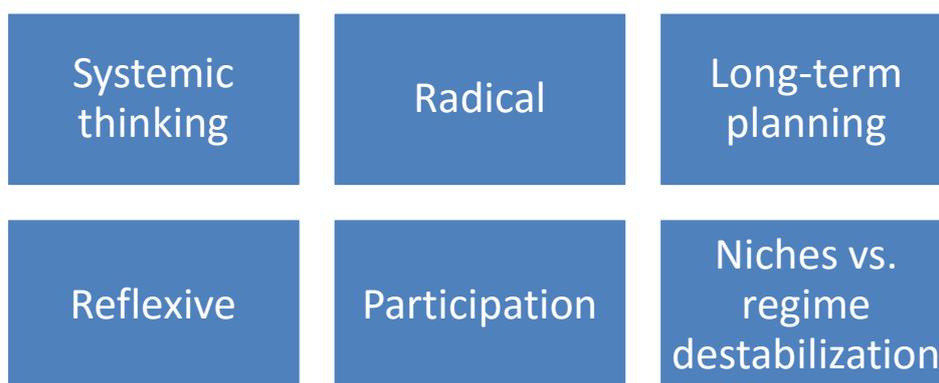
Figure 2: Overview of the analytical framework

Now, we will apply this transitions framework to policy documents of the EU, the OECD and UNEP, by screening relevant policy documents on all of the six elements of our analytical framework. For the EU, we will conduct this analysis mainly for the 2011 Roadmap to a Resource Efficient Europe and the 2014 Circular Economy Communication, on the level of policy principles, policy goals and policy instruments. For the OECD and UNEP we will screen all relevant documents by each element of the analytical framework.

4. Case 1: European Union

4.1 Introduction

Sustainable materials management, resource efficiency and the circular economy have long roots in EU policy. Having its roots in, amongst others, waste policy, product policy and the transversal sustainable development strategy, EU SMM polices really took off with the launch of the Raw Materials Initiative in 2008. The initiative included three pillars: the import of raw materials from outside of the EU, the extraction of raw materials within the EU and raw materials efficiency and recycling (Interviews; European Commission 2008). Afterwards, sustainable materials management was included the broader policy context of Europe 2020, which stressed the need for smart, sustainable and inclusive growth (European Commission 2011; Happaerts 2014). In the wake of Europe 2020, a strategy on resource efficiency was further developed in the 2011 Roadmap to a Resource Efficient Europe, which served as an impetus and a guidance document for the resource efficiency policies for the years to come. After a few years, the Commission again broadened the resource efficiency approach towards the inclusion of the whole value chain, aiming to create a circular economy. This culminated in the 2014 Communication of the Commission, called "Towards a circular economy: a zero waste programme for Europe". The adjacent legislative component of the communication was controversially withdrawn at the end of 2014 by the new Commission. A revised version of the Circular Economy Communication and package was published on the 2nd of December 2015. This means that a thorough analysis of this new package was not included in the analysis, but a first overview was made.

The underlying figure gives an overview of the most important policy documents published by the European Union:
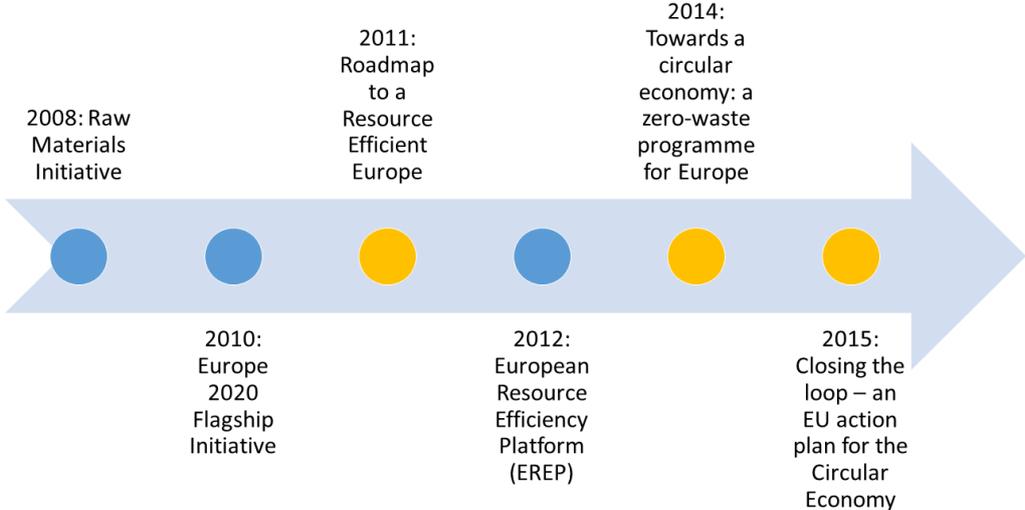

Figure 3: EU SMM initiatives

As the previous figure shows, the European Commission and the European Union as a whole have launched a multitude of actions in the context of sustainable materials management. However, in order to make the research comprehensible, we have decided to focus on the main guidance documents that are relevant for the current discourse, with a focus on 'resource efficiency' and 'circular economy'. First, we will look at the 2011 Roadmap for a Resource Efficient Europe. As the current discourse has changed significantly by the adoption (and partial withdrawal) of the circular economy package by the European Commission at the end of 2014, we will include the 2014 Circular Economy Communication and adjacent package as well. Both of them are so-called Roadmaps, which do not have any legally binding status, but set out the policy programme of the European Commission on a certain topic in the years to come.

As said before, the **2011 Roadmap for a Resource Efficient Europe** was created as the result of one of the flagship initiatives of Europe 2020, which specifically called for medium and long-term policy objectives and trajectories towards these objectives (European Commission 2011). The goal was to "increase resource productivity and decouple economic growth from resource use and its environmental impact" (European Commission 2015). Furthermore, it was to be integrated in the European Semester on economic policy coordination (Flachenecker 2015). This renewed focus on resource efficiency was seen as one of the new spearhead initiatives of the second Barroso Commission, as the Environment Commissioner Potocnik and his DG needed a new focus area after the 'loss' of climate change to the new DG CLIMA (Happaerts 2014).

In 2014, a progress report on the 2011 Roadmap was published, which concluded that although a promising start was made towards the achievement of some 2020 milestones, efforts to achieve absolute decoupling should be scaled up (European Commission 2014a). The progress report concluded that a shift towards a more circular model of consumption and production was needed. This culminated in the **2014 Circular Economy Communication**. The concept of a circular economy goes beyond efficiency gains: it aims to move from a linear mode of production and consumption towards a circular one, with a focus on re-using, repairing, refurbishing and recycling materials, hereby using waste as a resource (European Union 2015). The 2014 Circular Economy Communication was presented as a package, together with a substantive legislative review of the existing waste legislation (ibid).

However, the status of the 2014 Circular Economy Communication was threatened after the Barroso Commission was succeeded by the Juncker Commission. In December 2014, the circular economy package appeared on the list of the Commission of packages to be scrapped. However, the withdrawal was announced to be temporary: the Commission announced that in 2015, a renewed circular economy package would be introduced. The new communication "Closing the loop- an EU action plan for the Circular Economy- was adopted and communicated on the 2nd of December 2015, with adjacent legislative waste proposals. As the adoption of the package after the analysis of this paper, we will not be able to include a full analysis of the new circular economy package. However, we can give insights which are relevant for our further analysis with regard to transitions thinking.

According to the Circular Economy Strategy Roadmap, which has been published in April 2015, the partial withdrawal was motivated by two main elements: first, the Roadmap criticized the previous approach because of its "exclusive focus on waste management", without taking adjacent policies into

account, such as product policies (European Commission, 2015). Secondly, the focus of the new package will also have to include a more country-specific approach and look at the implementation of waste policies (European Commission, 2015).

As mentioned in the 2015 roadmap, the new initiative will consist of a framework which has to combine both a political vision and effective tools (European Commission, 2015). The existence of this (possibly long-term) political vision does align with a transitions approach. However, interviewees have mentioned that the political vision with regard to a transition to a circular economy has been largely omitted from the new circular economy package, because the focus mainly lies on short-term implementation measures and so-called "quick-wins", rather than on long-term policy planning. Furthermore, if we take the 2015 roadmap as a first insight of the framing of the problem, we can expect the new circular economy package to largely focus on an economic analysis: it mentions global competition, the contribution of the circular economy to growth and job creation (European Commission, 2015; European Commission, 2014). Additionally, the roadmap clearly frames the barriers to closing the loop of the circular economy in a rather economic way, such as market failures, governance and regulatory failures (European Commission, 2015). This solely economic focus might hamper a systemic approach. However, in line with transition theory, the focus of the new package is expected to be on the whole value chain, but it states that it will do so "rather than focusing exclusively on one part of the economic cycle" (ibid).

In the following chapters, we will discuss the question whether transitions thinking is present in the fundamental principles, the policy goals and the defined instrument in both the 2011 Roadmap to a Resource Efficient Europe, and the 2014 Circular Economy Communication.

4.2 Fundamental principles

The first element of our analysis focusses on the question whether transitions thinking influences sustainable materials management policies of the EU. As the following analysis will show, transitions thinking does permeate some fundamental principles of both the 2011 Resource Efficiency Roadmap and the 2014 Circular Economy Communication. However, other fundamental principles might go against transitions theory as well, by utilizing a more incremental approach.

4.2.1 The 2011 Resource Efficiency Roadmap

The **2011 Resource Efficiency Roadmap** does include elements of transitions thinking in its principles: a long-term vision has been created, with a focus on a fundamental transformation, the current patterns of production and consumption are seen as unsustainable, and systemic and long-term vision are used. The first element which points to the existence of transitions thinking is the specific mentioning of a vision for 2050:

> *By 2050 the EU's economy has grown in a way that respects resource constraints and planetary boundaries, thus contributing to global economic transformation. Our economy is competitive, inclusive and provides a high standard of living with much lower environmental impacts. All resources are sustainably managed, from raw materials to energy, water, air, land and soil. Climate change milestones have been reached, while biodiversity and the ecosystem services it underpins have been protected, valued and substantially restored.*

Source: European Commission 2011, p. 3

The fact that this vision is specifically mentioned already points to the existence of a **long-term approach**: 2050 has been taken as an anchor point, thus going beyond the traditional short-term policy cycles. Additionally, the Roadmap specifically mentions the need for a **transformation** (not a transition), although it states that the transformation should be a fundamental one, and should occur within one generation (European Commission 2011). This points to a rather **radical** approach, as deep and fundamental change within the socio-technical system will be needed in order to achieve this transformation and the accomplishment of the central vision of the resource efficiency Roadmap. This means that, although the transitions terminology is not used explicitly, elements of transitions thinking are clearly present.

Happaerts (2015) also shows that transitions thinking is rooted in some of the principles of the Roadmap to a Resource Efficient Europe. Several elements of transitions thinking are included in the Roadmap, including the observation of the **unsustainability of our current systems of resource use**, thus implying that a business-as-usual scenario is not an option. This relates to the idea of decoupling resource use from economic growth, rather than optimizing the current system by a few percentage point. A final element which points at the influence of transitions thinking is the use of a **systemic approach**: the 2011 Roadmap specifically targets resource efficiency in a broader way, by the inclusion of milestones on sustainable consumption and production, and the focus on key sectors in which gains can be made, such as food, the building sector and mobility (European Commission 2011). This cross-sectoral approach does point at an advance towards the tackling of a socio-technical system. However, the question remains whether this systemic approach is fully addressed throughout the whole Roadmap: the focus still remains on resource efficiency and adjacent environmental indicators.

Happaerts (2015) also mentions other principles that are present in the Roadmap, but rather go against the idea of a radical system innovation and hereby go **against** the idea of **transitions thinking** as mentioned above. One of these elements is the focus on relative decoupling rather than absolute decoupling, as the Roadmap is set-up as a programme which focuses on resource efficiency and reducing resource intensity (Happaerts 2015), rather than an absolute decrease in resource use. This goes against the radical nature of transitions thinking. Secondly, economic thinking seems to dominate the Roadmap, by focusing on "getting the prices right" and dealing with international competitiveness. This principle points at the idea that market failures need to be addressed, rather than the economic system as a whole. Furthermore, monitoring is seen as an important principle: each of the milestones should be monitored accordingly. One could argue that a focus on monitoring also includes an element of reflexivity, but monitoring is seen on the basis of developing indicators on the basis of the defined milestones (European Commission 2011).

Another element which does not fully point to a radical transition approach is the way **participation** is operationalized. Happaerts (2015) mentions that stakeholders are –according to the roadmap-, mainly involved on the level of developing resource efficiency indicators, and not on the development and execution of policies as a whole. This idea goes against the importance of participation of stakeholders in the co-creation of knowledge and policy in the process. However, it would be too strong to state that the work on resource efficiency of the European Commission is solely based on government-steered work: the European Resource Efficiency Platform (EREP), which has been set up in the wake of the Roadmap, has been specifically mandated with the providence of recommendations on how to achieve the milestones and the 2050 vision (European Commission 2012). The EREP is thus envisioned on the idea of a strong participation of a broad group of stakeholders and includes the idea of a co-creation of knowledge. Finally, the question remains whether regime destabilization and the stimulation of niches are fully present within the 2011 Roadmap: as the roadmap is mainly focused on decoupling of the (current) economic system, unsustainable practices are not necessarily avoided.

4.2.2 The 2014 Circular Economy Communication

The **2014 circular economy communication** starts off by explicitly mentioning the need for a transition towards a more circular economy, hereby specifically adopting the transitions terminology. The roadmap also stresses the need for a "**full systemic change**", where the focus does not only lie on technologies, but "also in organisation, society, finance, methods and policies" (European Commission, 2014). This aligns with our interpretation of a socio-technical system, by looking at the structure, culture and the practices, including social elements. A clear indication of this focus on systems can be found in the figure which is used in all communications on the circular economy by the Commission:

 Figure 4: Circular Economy (DG ENVI)

Additionally, the unsustainability of the current system is recognized, by looking at possible lock-ins, stating that "existing infrastructure, business models and technology, together with established behaviour keep economies locked-in into the linear model" (European Commission, 2014, p. 3). This aligns with the previous need for a full systemic change. The systemic approach also goes beyond the environmental sphere, and includes several other policy domains, such as mobility and energy. The 2014 circular economy communication strongly emphasises the need for industry and consumers to

drive the transition towards a circular economy (European Commission 2014), and mentions the need for **participation** in order to make the transition towards a circular economy work.

Finally, attention for **regime destabilization** on the level of principles is increasing: the communication specifically mentions the need for measures to support new businesses in order to create a level playing-field for existing and new businesses to adapt to global resource megatrends, … to encourage new entrepreneurs to develop the business solutions of tomorrow, to test them on the market and to provide credible information to consumers" (European Commission 2014). Additionally, the main objective of the package is stated "to create conditions for the development of a circular economy by addressing barriers and enabling the development of new markets and business models"(European Commission, 2014). The focus on barriers and finding ways to overcome then can be seen as a way of creating a level-playing field between niche and regime actors, thereby being an element of regime destabilization. Furthermore, a **bottom-up approach** – fuelled by the participation of non-state actors and the stimulation of niches- is operationalized in the communication: businesses are seen as driving the change, and apparently discovered the business potential of the circular economy before the EU policy level did (European Commission 2014). One could make the remark that most of the actions which focus on niches and regime destabilization focus on businesses and SME's, although consumers are also mentioned throughout the roadmap.

However, apart from the language used above, most attention throughout the communication is placed on the 'modernization' of waste policy and the need for a resource efficiency target, rather than including an elaborate analysis of the other parts of the circular economy value chain, although further implementation of the Ecodesign Directive is mentioned (European Commission, 2014). This could be seen as an indication of an **incremental** approach, opposed to a radical change. This is especially the case for the review of the waste legislation: the communication especially mentions the need for simplification and better implementation, rather than a complete review of the current package. As mentioned before in the 2015 Roadmap, this rather narrow focus on waste was stated as one of the reasons for the withdrawal of the legislative components of the 2014 package.

4.3 Policy goals

4.3.1 The 2011 Roadmap for a Resource Efficient Europe

As stated in the previous chapter, the **2011 Roadmap for a Resource Efficient Europe** defines the policy goals on three levels: first, the long-term vision for 2050 was formulated. This long-term vision has been accompanied by so-called *milestones* for 2020, which describe the conditions needed in order to achieve the long-term vision (European Commission 2011). Third, the milestones are complemented with actions will be undertaken by the European Commission on the short term (between 2012 and 2020). Our analysis will show that, although elements of transitions thinking are present in the vision and (partially) in the milestones, the short-term actions are more incremental and align mostly with the optimization of current policy processes.

First of all, the 2050 **vision** can be seen as rather vague (Happaerts 2014). However, as we stated in the previous chapter, the fact that the long-term vision exists is already a positive step. Furthermore, a relatively vague vision could also be beneficial, as it avoids the lock-in in certain policy paths and allows for a reflexive policy process. However, it can also lead to a loss of direction and lack of fulfilment of the transition programme, which means that the other policy goals on mid- and short-term need to be aligned with this long-term vision. The analysis of Happaerts (2014) confirms the interpretation of a semi-radical long-term vision but shows that, although the vision for 2050 does contain transition elements, this does not necessarily account for the other milestones.

The analysis on the level of **milestones** gives a mixed result: while some milestones are conceptualized in a broad and rather ambiguous way, (e.g. the milestone that by 2020 all natural capital and ecosystem services will be properly valued), others are much more aligned with current policy practices (e.g. the milestone that in 2020 all WFD River Basin Management Plans will be implemented) (European Commission 2011). Happaerts (2014) also states that the milestones were not necessarily positively received by other stakeholders in and outside the Commission: most of the milestones are formulated on the level of an environmental indicator, rather than on the level of a socio-technical system, in order to avoid the impression of competition of DG Environment with other policy domains. The **actions**, needed to be taken on the short term, mainly align with existing policies and actions. According to Happaerts, half of the actions focus on better implementation or the improvement of current policy measures, while only about a fifth of the actions deal with new policy measures (Happaerts 2014). Most of these new measures are also formulated in a vague way (e.g. the establishment of a "reinforced partnership to support research and innovative policies for the circular economy" (European Commission, 2011, p.6).

The analysis shows that, although the European Commission clearly defines a rather radical change in its 2050 vision, it fails to integrate this transitions perspective in its milestones and its actions. It tends to stick to the optimization and better implementation of current policies. When the goals are to be translated in mid-term milestones and short-term actions, the approach shifts more towards incrementalism and diverts from the radical and systemic approach which is pivotal for the application of a transitions approach.

4.3.2 The 2014 Circular Economy Communication

The policy goals of the 2014 Circular Economy Communication are not structured like the 2011 Roadmap for a Resource Efficient Europe, where a long-term vision is explicitly translated into medium-term milestones and short-term actions. However, policy goals do have a prominent place. The - rather obvious - overall goal of the communication is to foster the transition towards a circular economy. In doing so, the Commission defines three main courses of action which should be taken. First, an enabling policy framework should be created, with the following sub-themes:

- Designing and innovating for a circular economy: here, the explicit aim of the communication is to minimize the amount of resources that are 'escaping' the circular economy. This is done by focusing on every step of the value chain, going from design to production, collection and recycling.

- Unlocking investment in circular economy solutions: here, the focus lies on mobilizing sufficient private finance to make the transition work, supported by e.g. green public procurement and the integration of circular economy priorities into EU funding.
- Harnessing action by business and consumers and supporting SMEs: by supporting the exchange of best practices and support stakeholder cooperation under innovation platforms such as the Raw Materials EIP and Horizon 2020
- Additionally, another policy goal is adjacent to this enabling policy framework, being the engagement of the Commission to "further analyse the major market and governance failures which hamper the avoidance and the reuse of materials waste" (European Commission 2014, p. 4).

If we frame these four elements in the transitions framework, the following elements stand out. First, no reference to timing has been made, thereby hindering the long-term perspective. Furthermore, the specific actions which are developed under this target area are rather vague, e.g. by the goal of "establishing a reinforced partnership to support research and innovative policies for the circular economy". Secondly, by solely focusing on investment and economic solutions, more radical approaches towards a circular economy are not properly integrated into the policy goals. However, elements of transitions thinking are also present: e.g. by placing particular emphasis on investment in new business models and on innovation from SMEs, niches are indeed stimulated.

The second element of policies for the evolution towards the circular economy is the focus on *waste* policy, elaborated in the following subthemes:
- definition of waste targets: here, several mid-term targets are defined, e.g. to increase the recycling rate of municipal waste to 70% by 2030, and to ban landfilling of several recyclable materials such as plastic by 2025, coming to a complete ban on landfill by 2030
- simplification and better implementation of waste legislation, e.g. by addressing overlap and simplify reporting obligations
- focus on specific waste challenges, e.g. by setting a target on the reduction of marine litter by 30% by 2020 (European Commission 2014)

Here, the picture is rather different than the one of the enabling policy framework: more stringent mid-term targets are set-up in order to achieve the long-term goal of a circular economy. The goals also move away from the idea of a socio-technical approach, especially by solely setting stringent targets on waste management issues, but not on other parts of the value chain, such as the design phase. Other elements of our transitions framework are not present in the waste targets, such as reflexiveness, participation or the stimulation of niches. However, the destabilization of the regime is actively fostered by the definition of the targets, especially by the ban of landfilling as an unsustainable practice of the current regime. It also stimulates new niches, e.g. by allowing SMEs to collect non-hazardous waste (European Commission 2014).

The third pillar is the creation of a *resource efficiency* **target**, which has already been defined in the 2011 Roadmap and the 7th Environmental Action programme (European Commission 2014). It can be seen that, although the Commission already defined the need for a resource efficiency target for monitoring and evaluation, it has not been implemented in the three years between the two communications. The resource efficiency target is not a legally binding measure, but it is envisioned as

"an impetus for those member states that do not already have a target at national level to develop measures that take account of resource use" (European Commission 2014). The question remains whether the development of a new resource efficiency target will be taken up in the new circular economy package, as several interviewees have made critical remarks about the inclusion of the target.

All in all, it can be seen that the 2014 Circular Economy Communication consists of a mix of policy goals: most of them are rather soft and build on the support of existing practices, while the waste targets are more stringent. This need for strict targets has been specifically addressed as needed by the Commission, as the 2014 Circular Economy Communication states that "strong policy signals are needed to create longer-term predictability for investment and change" (European Commission, 2014).

4.4 Policy instruments

4.4.1 The 2011 Resource Efficiency Roadmap

The analysis of the 2011 Resource Efficiency Roadmap shows that the Roadmap does not rely on the creation of radically new instruments, but rather stays within the current instrument spectrum used by the Commission. This does not mean that the Commission only sticks with traditional legislative instruments: a whole 'spectrum of governance strategies' is included in the Roadmap (Happaerts 2014).

The roadmap first shows a high reliance on internal market and **economic instruments** (Happaerts 2014). A clear example of this can be found in the chapter on ecosystem services, where the promotion of "innovative financial and market-based instruments" is seen as one of the major targets, in addition to assessing the economic value of these ecosystems (European Commission, 2011, p. 12). Another important economic instrument which is proposed is the inclusion of resource efficiency into the so-called European Semester, where economic policy guidance is created for the next six months (Happaerts 2014). This use of economic instruments, which are mostly not newly created instruments but mainly move towards an alignment with existing economic policies and practices, could question the idea of a transitions approach, as the economic paradigm might prevail.

Furthermore, **information instruments** are used. A clear example of the use of information instruments is of course the proposed creation of a non-binding resource efficiency target, which provides information for the Member States on their performance on this issue (European Commission 2014). The inclusion of monitoring and evaluation by the inclusion of several indicators can be seen a response to the critique that was given to the Lisbon Strategy, where indicators were obsolete (Happaerts 2014). The fact that monitoring and evaluation are explicitly used as instruments could point to a reflexive approach, if learning is coupled towards this monitoring. However, it is unclear whether this is the case, as the attention for experimenting and learning is not explicitly mentioned, nor is the idea that the policy goals of the previous step could be altered by these.

Finally, Happaerts (2014) stressed the importance of **cooperation instruments** in the Roadmap. This does not only account for the way in which the Roadmap itself was conceived (by an "unprecedented" interdeparmemental consultation), but cooperation is encouraged throughout the Roadmap as a

whole. A clear example of this cooperation is the set-up of the EREP (European Resource Efficiency Platform) which, as said before, has the mandate to provide recommendations towards the achievement of the goals in the Roadmap (European Commission 2012, Happaerts 2014). Another example can be the focus on international cooperation in the context of resource efficiency, by improving and promoting dialogue and cooperate on research and innovation (European Commission 2011). All in all, it can be seen that the use of cooperation instruments is in line with the transitions framework, but most of the emphasis still lies on more traditional EU-instruments, such as economic instruments (Happaerts 2014).

4.4.2 The 2014 Circular Economy Communication

If we look at the 2014 Circular Economy Communication and its instruments, one can see that the European Commission itself proposes a mix of policy measures, combining "smart regulation, market-based instruments, research and innovation, incentives, information exchange and voluntary approaches" (European Commission 2014, p. 4). If we analyse the Communication more thoroughly, the following instruments stand out.

First, the focus on **economic instruments** is very present throughout the roadmap, in all of the three previously mentioned parts on the policy framework, the waste challenges and the setting of a resource efficiency target. This is also particularly acknowledged in the chapter on waste management, by stating that "economic measures have proved instrumental in improving national waste management" (European Commission 2014, p. 10). Additionally, the support of investment in a circular economy is also seen as pivotal for a change, e.g. by including innovative financial instruments (European Commission 2014). As stated in the analysis of the 2011 Roadmap, the risk of relying on these economic instruments is that the approach could lead to a preference of economic, rather than environmental goals, thus leading to the optimization of current policies and practices, rather than making a full transition. This remark is partially altered by the focus on the economic stimulation of the niches (or innovation), e.g. by focusing on the inclusion of circular economy principles in EU funding (e.g. in Horizon 2020 calls). Shifting money from unsustainable practices towards innovation does align with a transitions approach.

Furthermore, **information and cooperation instruments** are again pivotal in the change towards a circular economy. Especially the cooperation instruments are promoted throughout the whole roadmap, e.g. by establishing a reinforced partnership to support research and innovation in circular policies, or by focusing on stakeholder cooperation in the context of the Raw Materials EIP (European Commission 2014). Another important instrument is the creation of the Resource Efficiency target which should enable Member States to compare their performance (European Commission 2014). Finally, the traditional **regulatory instruments** are also used, e.g. by the evaluation of and the new proposal of the waste directive. However, as pointed out in the interviews, it is this legislative part of the circular economy package which was withdrawn, not the Communication itself, which again questions this use of this legislative instrument. Additionally, the legislative component is only used for waste, i.e. the end of the value chain. We can conclude that the 2014 Circular Economy Communication relies on a broad range of policy instruments, which was also the case with the 2011 Resource Efficiency Roadmap. The proposed legislative part was more stringent, but withdrawn later.

4.5 The 2015 Circular Economy Package: first considerations

As said before, the 2015 Circular Economy Package has been published a few days before the delivery of this paper. This timing does not allow for a thorough analysis of the package in the paper, but we make some remarks based on a first screening.

First of all, the balance between transitions thinking and economic principles seems to have moved more towards the **economic** paradigm. Although the roadmap starts off by mentioning a transition towards a more circular economy, most of the 2015 Communication is dominated by economic thinking rather than transitions thinking. Interviewees have stated that this is not necessarily bad or surprising, as the transitions rationale has been sufficiently applied and developed in the previous package. Furthermore, the fact sheet on the circular economy gives a good overview of the benefits of the package, which are first defined in terms of jobs and growth, and only later on in terms of environmental gains (European Commission 2015c).

Secondly, As the Commission withdrew the previous circular economy package because it lacked **ambition**, the question remains whether the level of ambition is indeed raised. At first sight, this does not seem to be the case. If we look at the waste targets, it can be seen that they are actually less ambitious than in the previous package: waste targets have been lowered, e.g. going from a 70 % to a 65% reuse and recycling rate by 2030 (European Commission 2015a). Other elements included in the action plan are mostly non-binding or do not adhere to a specific target (e.g. the encouragement of reuse activities) (European Commission 2015b).

Third, as the previous package was criticized because of its exclusive focus on **waste** management, one could wonder whether the scope of the new package has expanded. At first sight, this seems to be the case, as substantial chapters are included on design, production and consumption. However, if we look at the elements in more detail, the specific actions which are promoted under this topic are not dramatically different than those of the 2014 Circular Economy Communication. An example of this is the action on Green Public Procurement and the subsequent integration of circular economy principles in the Green Economy. Otherwise, most emphasis is placed on ecodesign measures, which were also included in the previous package, but have now received a more prominent place. Finally, the adjacent legislative package is still highly focussed on waste, as the four directives proposed specifically focus on waste, packaging waste, landfill and electrical and electronic waste.

This first screening brought up some critical remarks to the new circular economy package. However, a more detailed analysis is needed to make a more in-depth review.

4.6 In summary

In this section, we have asked ourselves the question whether transitions were present in the sustainable materials management policies of the European Union. In doing so, we applied the transitions framework to the two main recent guidance documents on resource efficiency published by the Commission, being the 2011 Roadmap to a Resource Efficient Europe and the 2014 Circular Economy Communication and the adjacent package. By focusing on the presence of transitions thinking on the level of principles, policy goals and policy instruments, the following elements stand out:

First of all, the transitions discourse is increasingly used by the Commission, as the approach towards materials broadens. As Happaerts (2014) described, the so-called milestones in the sustainable materials management approach have moved from the issue of raw materials to resource efficiency, and partially to the green economy. As for now, one could say that the circular economy has added a new dimension to this debate. The circular economy as such is more in line with the transitions approach, whereas the debate on raw materials and resource efficiency mainly focuses on the optimization of the current socio-technical regime, rather than taking the transitions perspective as a whole. However, as the legislative package has been withdrawn and the communication has not been fully pursued, it is questionable whether the new circular economy package will still contain the same transitions perspective, as this is questioned by our interviewees.

Secondly, we conclude that the transitions perspective is more present on the level of principles, and less on the level of goals and even less on the level of instruments. The latter seem to build more upon existing policies and instruments, thereby falling into the "trap" of incrementalism, rather than proposing a radical new approach towards sustainable materials management in practice. However, this can be explained through the nature of EU policies, where radicalism is not actively endorsed as the EU voting system (with co-decision between the Council and the Parliament or even unanimity voting) does not allow for radical approaches. Several interviewees confirmed this interpretation, while also stating the belief that through incremental steps a more radical change could be made as well.

Finally, the framing of raw materials and resource efficiency was mainly an economic one: economic barriers were important in the framing of the barriers towards the resource issue, and a transformation of the economy is necessary in order to overcome these barriers (Happaerts 2015). As our analysis shows, this economic framing permeates the approach on the level of principles, policy goals and policy instruments. This economic framing might also be limiting to a certain extent, as e.g. social elements or environmental targets might get on the background.

5. United Nations Environment Programme

Previous research suggested that the UN's activities related to sustainable materials management are less entrenched by transition language than is the case for the EU and OECD (Happaerts & Bruyninckx 2012: 4). Again, we take this as an observation to be tested and explore to what extent the UN's main environmental body, UNEP, has embedded elements of transition in its key documents and activities on the issue of sustainable materials management.

5.1 Introduction

It can be argued that UNEP has been conducting activities related to SMM since its very establishment, for example through its lead role in the management of chemicals and other hazardous substances or through its work on waste management. However, what has put UNEP on the map as a key actor when it comes to SMM is: 1) the establishment of the International Resource Panel (IRP) in 2007 under UNEP's guardianship; 2) the adoption of the Medium-Term Strategy 2010-2013 with 'resource efficiency – sustainable consumption and production' as one of six thematic priorities, and its continuation in the Medium-Term Strategy 2014-2017; 3) the reconfirmation of UNEP's role on sustainable production and consumption when it was granted the coordination of the 10 year - Framework of Programmes on Sustainable Consumption and Production Patterns in 2012; and 4) its contribution to the elaboration and promotion of the concept of 'green economy', for example through its Green Economy Report (2011) and the RIO+20 outcome document 'The Future We Want' (Happaerts 2014). This brief overview also shows that, despite being a key player on the issue, the concept 'sustainable materials management' has not been put in the picture much. Instead 'resource efficiency' is the central concept of UNEP's SMM activities, and 'green economy' has provided an overarching narrative.

Again, the specific constellation, mission and scope of the organization is an important starting point to better understand the policy it makes. UNEP is the environmental arm of the UN. Its mandate and the 2012 Rio+20 Outcome Document direct UNEP to "promote the coherent implementation of the environmental dimension of sustainable development within the UN system and to serve as an authoritative advocate for the global environment" (UNEP 2016). It is deeply involved in the development of international guidelines and treaties on environmental issues, such as for example the international trade in potentially harmful chemicals, transboundary air pollution, and contamination of international waterways. It also has the explicit mission to assist developing countries in making environmentally sound policies and encouraging sustainable development through sound environmental practices. As its website states, UNEP aims to achieve "increased understanding and implementation by public and private decision makers, as well as civil society, of policies and actions for resource efficiency and sustainable consumption and production"(UNEP 2016b) in both developed and developing countries. Its key approaches to contribute to this goal are delivering expert scientific assessments and providing international platforms for negotiation and decision-making. Important to

note is that UNEP is governed by all 193 UN member states: since 2012 UNEP's main governing body, the United Nations Environment Assembly of UNEP, has been extended from 58 countries to a full representation.

5.2 UNEP's track record on resource efficiency

UNEP's work relevant for sustainable materials management is diverse and hard to cover comprehensively. Figure 5 lists the recent most important documents on the issue of resource efficiency. The remainder of this chapter will dig more deeply into a selection of documents that - according to our own analysis, previous research (Happaerts, 2010; 2012) and interviewees - can be considered 'flag ship' publications that have left their mark on the international policy framework regarding sustainable materials management (highlighted in orange).
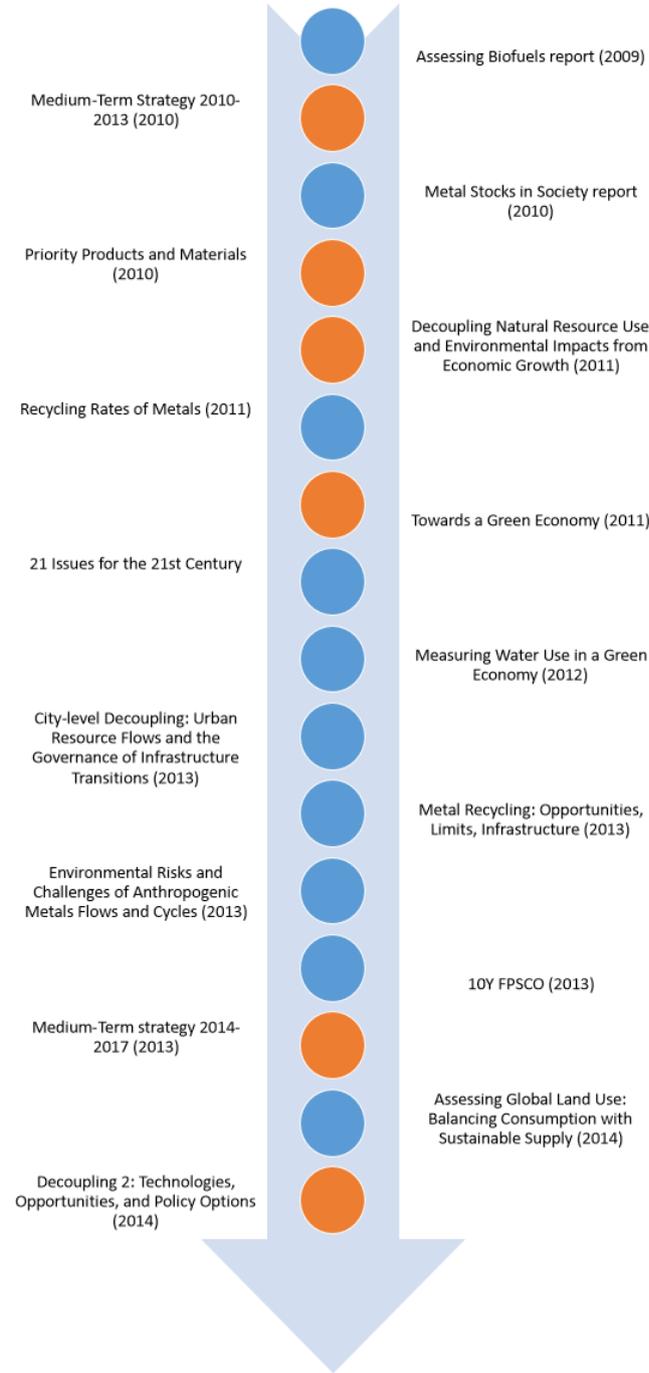
In the case of UNEP these include both its Medium-Term Strategies (2010 and 2013) that have put and kept resource efficiency firmly on UNEP's agenda. Also key in this regard is the 10Y FPSPC, but due to its broad scope this was not included in the detailed screening. Looking for the most important contribution to policy thinking on sustainable material management and resource efficiency, the Green Economy Report (2011) easily makes the selection. The report aims to demonstrate that the greening of economies can go hand in hand with growth, decent jobs and the elimination of persistent poverty. It also points out what investments can be made to drive the transition towards a green economy. The work on green economy is considered as an overall narrative for UNEP's work on resource efficiency. Additionally the most recent Decoupling Report (2014, building on the first Decoupling Report of 2011) is an important contribution to the international policy making on materials management. It has

The figure contains the following items (left column and right column):

- Medium-Term Strategy 2010-2013 (2010)
- Priority Products and Materials (2010)
- Recycling Rates of Metals (2011)
- 21 Issues for the 21st Century
- City-level Decoupling: Urban Resource Flows and the Governance of Infrastructure Transitions (2013)
- Environmental Risks and Challenges of Anthropogenic Metals Flows and Cycles (2013)
- Medium-Term strategy 2014-2017 (2013)
- Decoupling 2: Technologies, Opportunities, and Policy Options (2014)

- Assessing Biofuels report (2009)
- Metal Stocks in Society report (2010)
- Decoupling Natural Resource Use and Environmental Impacts from Economic Growth (2011)
- Towards a Green Economy (2011)
- Measuring Water Use in a Green Economy (2012)
- Metal Recycling: Opportunities, Limits, Infrastructure (2013)
- 10Y FPSCO (2013)
- Assessing Global Land Use: Balancing Consumption with Sustainable Supply (2014)

Figure 5 UNEP SMM activities

strengthened the case for absolute decoupling of natural resource consumption and economic growth. It explores technological possibilities, opportunities, and successful policy option, for developing and developed countries to accelerate decoupling and reap the environmental and economic benefits of increased resource productivity. Also on the reading list was the IRP's report on Priority Products and Materials, an assessment of the best available science on the environmental and resource impacts of production and consumption, leading to an identification of priorities amongst global consumption activities, industrial sectors and materials from primary industries in terms of their environmental impacts and their resource use. UNEP and in particular its IRP has more publications focusing on specific sectors or on specific materials, but due to their specific scope these have not been taken into consideration.

The scale of UNEP activities being deployed under the label of 'resource efficiency' is broad. Understanding its toolbox of instruments starts, as with OECD, with the recognition that UNEP, like OECD, does not generate binding policy and is not a policy implementer. A first set of tools in UNEP's toolbox could be labelled 'building the knowledge base for resource efficiency' and covers UNEP's extensive research and different types of publications. UNEP collects data and offers synthesized information on the environmental state of play. This includes the Global Environmental Outlook as well as environmental alerts. More specifically geared towards resource efficiency, UNEP does studies and analysis of trends in current resource efficiency and consumption and production. It also offers economic analysis and scoping studies on green economy and publishes sector specific handbooks methodologies and policy support documents. Part of this body of work are the regional Resource Efficiency: Economics and Outlook (REEO) reports that present a regional analysis of requirements for decoupling environmental degradation from economic development. Three (sub)regional-level REEO reports have been completed so far, one for the Asia Pacific region (2011), one for the sub-region in Latin America comprising Mercosur, Chili and Mexico (2011) and one for China (2015). Most key for its 'assessment', is the International Resource Panel that aims to provide independent, coherent and authoritative scientific assessments of policy relevance on the sustainable use of natural resources and to contribute to a better understanding of how to decouple economic growth from environmental degradation. So far it has published 13 reports covering topics from recycling rates in metals, over international trade in resources to decoupling.

A second set of tools, in part overlapping with the previous, could be labelled 'building governmental capacity'. This is in part achieved through the publications mentioned above, that also offer policy support. UNEP also provides more hands-on support. It offers Green Economy Advisory Services consisting of policy advice, technical assistance and capacity building to governments in support of their national and regional initiatives to transform and revitalize their economies. International expert networks and platforms, and links with technical and policy bodies and government agencies are set-up, and capacity building tools for sustainable management, operations approaches and product choices are set up.

A third set of tools would be about 'partnerships' and is currently focused on consolidating and extending partnerships with business and industry. The 10-Year Framework of Programmes on Sustainable Consumption and Production (10YFP on SCP) aims at enhancing international cooperation to support regional and national initiatives to accelerate the shift towards SCP. Fourthly, UNEP also works on 'influencing consumer choice'.

5.3 Spotting transition elements

All the flagship documents selected above, together worth more than a thousand pages and almost half a million words, have been taken into account in the analysis using word count and the concordance tool. In addition, an in-depth screening of the documents using the analytic framework as a guide was done to provide a more qualitative analysis of how 'deep' transition elements are being embedded in the considered policy documents. To manage the vast amount of pages, the more qualitative analysis used the summary for policy makers of the Green Economy Report and the first Decoupling Report instead of their full versions. Combining these two methods led to the following observations and reflections regarding transition thinking in UNEP's recent work on sustainable materials management or in UNEP's case, 'resource efficiency'.

5.3.1 UNEP policy

As is the case with the OECD, UNEP contributes to the development of policy on resource efficiency of its member states but has no role in policy implementation at the national level. Consequently, its output address the levels of principles, targets and instruments in two ways. Firstly, UNEP has principles, targets and instruments regarding its own work. Secondly, UNEP's work is designed to offer inspiration and scientific foundation for the introduction of specific principles, targets and instruments in the policy of member states.

Its latest medium-term strategy gives a clear account of the first. It summarizes five key **principles** for UNEP's work:
- timely and efficient delivery;
- leadership that fosters a sense of common purpose and direction, maintaining an internal environment in which staff can be fully engaged in the achievement of the organization's objectives;
- keen understanding of stakeholder needs and providing opportunities for increased participation of civil society;
- external and internal communication to ensure that staff is motivated and stakeholders, starting with the Member states, are aware and proud of the achievements of UNEP;
- availability of information and systems to facilitate management decisions, monitor effectiveness and efficiency, and improve the organization's performance (UNEP 2014 p. 47).

It can be argued that at least the latter three principles are linked to elements of transition, and in particular to participation and reflexive learning. This is backed by the fact that the strategy specifies as one of the lessons learned on past operation achievements, the need for an iterative process to ensure that the UNEP's accomplishments and outputs are driven by demand the demand of countries and in line with the priorities of other stakeholders (UNEP 2015 p. 18). Telling for the place of participation in UNEP's current and future operation is the note that "consultations with various stakeholders, including major groups, revealed a desire for the creation at all levels of enabling conditions that will ensure better participation of the public" (UNEP 2015 p. 18) and the fact that a participatory foresight process was at the basis of the formulation of the medium-term strategy (UNEP 2015 p. 18). An additional, broader element when looking at UNEP's strategies is its reference to green

economy approaches "in the context of sustainable development and poverty eradication" (UNEP, 2015 p.7) thus drawing attention to all three –economic, ecologic and social – components of sustainable development and introducing its explicit mandate to support developing countries into its guiding narrative.

When it comes to **targets**, UNEP's medium-term strategy lists a set of results they expect to accomplish in their work on resource efficiency. From a transition viewpoint, they are relevant and revealing. They cover three areas: enabling environment, sectors and supply and lifestyles. The first refers to the scientific assessments, research and tools to be developed and to be applied by policymakers. The second is about the instruments and management practices that UNEP aims to insert in sectoral policies and in business and financial operations globally. Thirdly, UNEP wants to enhance the enabling conditions for promoting more sustainable consumption choices and lifestyles (UNEP 2014 p. 22). Especially with the third result area, indirectly but explicitly referring to the importance of culture, values and norms in a socio-technical system, UNEP stands out. This aspects already featured in the previous medium-term strategy 2010-2013 where the observed need for increased consumer awareness led UNEP to formulate the following expected accomplishment: "That consumer choice favours more resource efficient and environmentally friendly products" (UNEP 2010 p. 11).

The medium-term strategy also names UNEP's main **instruments**, first and foremost its scientific assessments (on key trends in the environment and environment policy, and on investment opportunities for alternative business-models and life-cycle improvements). Additional instruments are policy advise and early warning; catalysing and promoting international cooperation, by providing technical advice to countries and by promoting partnerships; and facilitating the development, implementation and evolution of environmental laws, norms and standards (UNEP 2014 p. 21). Less clear are the instruments UNEP puts into play to influence consumer behaviour. An independent evaluation of the 2010-2013 medium-term strategies sheds some additional light on this, by identifying the organisation of public awards, public campaigns, support for eco-labelling, support to sustainable public procurement by providing practical tools for capacity building as instruments in this domain. The evaluation also stated that: "However, interview partners and documentation recognize that changing consumption patterns is difficult to tackle because of perceptions that consumer choice and lifestyles are developed world issues that UNEP should not prioritise, because partners at policy and product levels are not obvious and because of growing target audiences. There are apparently very few examples to inspire change at scale. Thus, achieving more sustainable consumption patterns remains work in progress." (King, 2013: 21).

The linkages between these instruments and the different elements of transition can be found when considering the content of the flagship reports have been published as part of the first instrument. The Decoupling reports have put absolute decoupling central to the approach to resource efficiency and sustainable materials management. The Green Economy provides an overall narrative, integrating ecological and economic dimensions, and explicitly promoting green economy approaches "in the context of sustainable development and poverty eradication" (UNEP, 2015:7) thus drawing attention to all three – economic, ecologic and social – components of sustainable development and its mandate to support developing countries. Both medium-strategies subscribe to the main principles put forward in these reports. This is where the analysis turns to the way UNEP offers inspiration and scientific foundation for the introduction of specific principles, targets and instruments in the policy of member states.

5.3.2 UNEP's policy advise

Table 1 UNEP's policy advice

Term	Systemic	Culture	Technology	Radical	Long-term	Participation	Learning	Niche
Count	12	27	398	20	197	46	54	14

On a total of 487435 words and 1056 pages

Consulting the word count for a first indication of the most prominent elements and where they occur offers the following observations. Only 12 references to '**systemic'** are found, all in the Decoupling reports and the Green Economy report. They refer most often to the systemic risks, consequences and changes that we face today. One exception aside, the documents do not hold any specific reference to a 'socio-technical system'. However, this does not necessarily contradicts a systemic approach. The decoupling reports and the Green Economy report all hold explicit references to the 'landscape' as the combination of trends at the macro-level that influence the 'regime', and all three refer to 'niche' innovations. The multi-level perspective on transition clearly has found its way in UNEP analysis. 'Culture' (27) features only a few times in both decoupling reports. More mentions appear in the Green Economy report but they most often refer to 'traditional culture' as an important element to take into account when working towards sustainable tourism. However, the Decoupling 2 report holds quite some references to 'habits'. It also shares with the Green Economy report 23 explicit references to a 'lock-in'. The occurrence of these terms and the concordance associated with it, show that UNEP's work on resource efficiency looks at systems in a holistic way and addresses the different components within them. The qualitative analysis confirms this observation, but also adds some nuances.

UNEP's report on Priority Products and Materials studies the place of the economic system within the earth's natural system. By putting the spotlight on current practices in production, on consumption patterns, link to the perception of well-being, and by looking at the interaction of these two with natural resources, the report touches on structure, culture and practices of the broader economic system and specific sectors within it (i.e. agriculture and the use of fossil fuels). The report uses DPSIR (driving force, pressure, state, impact, response) as a central analytic framework for its system analysis, and looks for promising 'levers' to change damaging dynamics (UNEP 2010:5). This too shows parallels with key elements in transition thinking, such as the idea that trends in the landscape put pressure on the system and the possibility to identify levers that can change the dynamics in a system.

The search for levers is even more evident in both reports on decoupling. In particular in the Decoupling 2 report (2014), a systemic approach and the explicit attention for structure, culture and practice are in the forefront. In fact, the report discusses extensively the causes and dynamics behind the current and deepening system 'lock-in' devotes another chapter on how to overcome these barriers.

In the Green Economy report there are no explicit references to 'socio-technical systems' and again, not one single socio-technical system is at the core of this report. However, due to its broad scope and its rationale to build a case for a green economy, the report does take a systemic approach. It lists key findings that support the need for a green economy and in these sections - for example about agriculture, cities and urban living, jobs, or low-carbon mobility - socio-technological systems are

implicitly present in the analysis. However, overall the economic, environmental, and infrastructural aspects are far more prominent than reflections on the political systems and the underlying cultural systems and practices. Although very broad in scope and on the look-out for interconnectedness, the reports pays relatively limited attention to underlying cultural patterns. Some exceptions include its reference to "an exploitative 'frontier' mentality" that "in a largely unpopulated world allowed for the discovery of new resources", recognizing that "the habit of stewardship has been hard to form, and harder still to reconcile with prevailing business models." (GER summary, UNEP 2015: 23).

An observation could be that UNEP's work on resource efficiency actually transcends a socio-technical system viewpoint and attempts to bring together its insights of different socio-technical systems and their interplay. Taking into account the different IRP publications focusing on specific materials or sectors may change this impression.

A screening for the word '**radical'** delivers only 20 mentions across all 1056 pages. However, a more qualitative analysis of the selected policy documents shows that UNEP has defined absolute decoupling and the green economy as the main beacons for its work on resource efficiency. If applied fully, these concepts would definitely go beyond introducing incremental change and represent the radical change. This radical undercurrent in UNEP's work is visible across all considered documents, since references to the principle of decoupling are being made in all of them, but is seems most pronounced in the decoupling reports and far less so in the Green Economy report.

Introducing and concluding sections of the Green Economy report argue in favour of absolute decoupling and promote the equal (monetary) value of natural and economic capital. These are radical ideas. Additionally, there are a few explicit references to radical change. For example, when discussing the manufacturing sector, the report warns that radical change is seldom painless (p. 262), and in the section on waste management, the need for a radical change to supply-change management is affirmed (p. 295). However, overall, the analysis as well as the suggested pathways towards a green economy remain rather general. This means it will be in the translation of the principles into instruments and in the implementation that will be determined whether the actual impact will one of incremental or radical change.

There is some convergence with OECD, as both organizations took the lead in crafting a framework that combines 'greening' with either economy or growth, and this win-win approach has become a new paradigm for sustainable development. This gave the work on resource efficiency and sustainable materials management a new boost, but also favoured the economic perspective at the cost of the environmental one (Happaerts 2014: 42), especially in OECD's Green Growth approach. In that regard UNEP is considered to offer a more environmentalist and more radical approach. Its interpretation of resource efficiency is, in contrast to OECD and EU, more focused on environmental impacts and less on resource productivity. In line with its mandate to support developing countries, it also takes into account a redistributive perspective, by arguing for absolute decoupling in advanced economies to allow developing countries more space.

In the Decoupling 2 report, UNEP's radical ambitions are more explicit than elsewhere. UNEP argues for "an urgent rethink of the links between resource use and economic prosperity" and states that "a global economy, based on the current consumption models is not sustainable and carries significant economic consequences" (D2 UNEP 2014: XIV). In its further analysis it devotes quite some attention (chapter 5) to explain how conservative forces in the current system limit the manoeuvring space for

policy makers to put the system on the path towards decoupling, and how political leadership is needed to overcome this obstacle.

All considered documents convey a clear **long-term perspective**, for example as expressed by the title 'Toward a Green Economy'. Another way are the manifold references to the work of other organisations such as IPCC, US EPA, other UN institutions where clear long-term time frames are used. In fact, the selected documents refer 180 times to the year 2020, 570 times to 2050 and 12 times to 2100. Despite this occurrence, none of the documents define a clear timeframe for the vision put forward, nor targets or instruments with specified deadlines.

With just over 50 references to '**learning**', most of them in the Decoupling report (2010) and the Green Economy report, one cannot claim learning is totally absent from UNEP's policy on resource efficiency. However, the qualitative analysis confirms that it is not very present either. None of the considered documents have a separate section in which the reflexive nature of transition processes is put strongly forward. As the word count suggests, there are sporadic references to the importance of 'learning', to 'learning from practice' and 'learning-by-doing', to 'learning experiments' and the 'diffusion of learning', but these are scattered. The Green Economy report does look for measure to track the progress toward a green economy, and holds some suggestions for indicators that could prove helpful in this regard. Measuring and monitoring are important drivers for learning in reflexive processes, but the report does not go into depth on this issue. The same goes for the reports on decoupling that hold references to learning and the need for experiments, but do address learning and reflexiveness in a way that reflects how important learning in transition actually is.

At the same time it should be recognized that UNEP too has a whole system of monitoring and evaluation to track the progress and impact of its own work. This may deliver lessons learned that may feed into its approaches towards members states as well as into its conceptual work. However, in the scope of this research it was not possible to investigate this further.

Looking across the selected documents, **participation** is a recurrent topic. Taken together with the terms 'stakeholder' or 'multi-stakeholder' it gets over 70 hits. In many cases these are not oblique references to participation, but statements on how crucial participation is in UNEP's work and on its intentions to improve the possibility for participation further (see 6.3.1). Looking at the level of what policy UNEP is promoting vis-à-vis its member states, shows a far less prominent position of participation. At this level UNEP refers to different stakeholders, such as supranational and national governments and private sector, as key actors in the implementation of the proposed views, but not to the need for co-creation in policy development or implementation at these levels. Its specific reference to participation apply mostly to governments.

Tracking the element of participation in any policy principles, targets or instruments developed or promoted by UNEP should take into account its institutionalized approach to participation. In the Rio +20 outcome document 'The future we want' Heads of State and Government called for ensuring the active participation of all relevant stakeholders. An immediate first step in this regard was the introduction of universal membership to the United Nations Environment Assembly, opening up the assembly to the participation of all UN member states. Additionally, UNEP has developed new modalities for stakeholder engagement to ensure the active participation of all relevant stakeholders, in particular those from developing countries, drawing on best practices and models from relevant

multilateral institutions and to promote transparency and the effective engagement of civil society in its work and that of its subsidiary bodies (UNEP 2014).

As a result UNEP's view on participation stresses five main partners: the governments, business and industry, other UN organisations, the major stakeholder groups and the research community. When 'unpacking' the major stakeholder groups, this shows Business & Industry and Scientific and Technological Community are again represented, complemented by Children and Youth, Farmers, Indigenous Peoples, Local Authorities, NGOs, Women, and Workers and Trade Unions.

With only 18 hits in a body of more than half a million words, the term '**niche**' does not win any prizes. 'Innovation' on the other hand gets 324 hits. This already hints at the fact that UNEP did not neglect this aspect of transition. The qualitative analysis shows that UNEP takes a strong stand when it comes to identifying and championing certain niches as well as identifying and condemning detrimental practices, values, policies, etc. embedded in the system.

In its Green Economy report, UNEP proposes clear suggestions for policy measures that could create more space for green economy. This included suggestions on how to stimulate niches as well as proposing measures aimed at addressing obstacles in the regime (e.g. tax shift from support to fossil fuels to support to renewables). Using a variety of examples from a variety of sectors, the report succeeds in illustrating the variety of approaches already available to both directly stimulate niches and indirectly addressing regime obstacles that hold them from emerging and scaling.

This is even more apparent in the Decoupling 2 report. It provides an account of the existing technological possibilities and the economic advantages (UNEP 2014: XV). In The foreword of the Decoupling 2 report states: "This new IRP report also explores the enabling environment required for national economies to promote decoupling and prosper in the future, through identifying and removing barriers, including technical and institutional lock-in, which can hold back effective policy change" (UNEP 2014: XV). Across all documents considered, this report holds to most explicit references to 'deconstructing' the regime or put differently, to address obstacles inherent to the existing regime that hold back transition.

5.4 In summary

In its original work on resources, UNEP took a more traditional 'material approach' by focusing on a specific material and on the question how it can be used more efficiently. However, an encompassing answer to such a question also takes into account the other biotic and abiotic resources involved in the use of this material. This led UNEP to the broadening of its approach, which is reflected in the key concepts used. UNEP's steppingstone for the work related to sustainable materials management has been 'resource efficiency', further translated in three key spear points: a life cycle approach to resource management, the quest for absolute decoupling and the transition to a green economy. The latter in fact offers an overall narrative that will be integrated in all of UNEP's work (UNEP 2015). Across the different policy documents considered, it becomes clear that all elements of transition are in one way or another reflected in UNEP's work on resource efficiency.

The document analysis suggests that most present are the systemic approach, the introduction and promotion of radical ideas into the debate and reflections on how to stimulate niches and address

those features of the current regime that inhibit or complicate change. Interestingly, interviewees do not feel UNEP's work on resource efficiency is radical. Some ideas may have radical consequences if implemented in an absolute sense, but their quick and full implementation is not the objective. Instead, UNEP is seen as approaching resource efficiency as a persistent challenge that needs to be addressed by persistent, continuous efforts to retrofit the current system. The analysis and the interviewees seem to agree that reflexivity is part of UNEP's work in that sense that the organisation has periodic reviews and strategic planning exercises that allow it to reorient its work. The awareness for reflexiveness as a key driver of transition processes and a clear case for embedded this strongly in resource policy is not visible. A similar critical note can be made for the element of participation. Participation is embedded in all of UNEP's work, but there are limitations to its depth. UNEP's main clients remain the governments of its member's states. Although a lot of emphasis is placed on broad participation and a multi-stakeholder approach, the mechanism to do so mostly reaches institutionalized stakeholder representation. This leaves little room for more divergent voices outside of these vested representations. Also, in its policy advise on resource efficiency relatively little attention is given to how member states could organize their policy development and implementation in a participatory way. The process of broadening its scope from a focus on a specific resource, to looking at a nexus of resources, to also including biotic resources has been driven by the felt need for a systemic approach. Thinking in systems is considered a necessity, as are long term visions, although the latter is evident only at the level of analysis and principles but far less operationalized at the level of targets and instruments.

6. Organisation for Economic Cooperation and Development

Happaerts & Bruyninckx (2013) discussed a double-sided trend: they pointed out that from the theoretical point of view transitions are inherently international and observed that more and more international steering initiatives or policy strategies are adopting a discourse on transitions.

They argued that the OECD's discourse on sustainable materials management illustrates this and is moving toward the language of sustainability transitions (Happaerts & Bruyninckx 2013: 4). This second case study digs deeper into that observation and explores to what extent the transition discourse actually features in the OECD's activities and policies on SMM.

6.1 Introduction

Naturally, the OECD's work on SMM is influenced by its constellation and mandate. The OECD serves a limited group of economically advanced countries and its key task is to assist its members in developing national policy as well as to guard policy coherence between the members. It does so, firstly, by being an extension to national governments' analytical capacity and by providing policy-

relevant analysis and recommendations based on reliable data, outlooks and cross-country experiences, and secondly by creating a forum where governments and representatives from business and civil society can engage in constructive dialogue on how best to develop and implement policies across the OECD and other countries.[2]

By its own account the OECD's current work on SMM has its roots in the international waste policies that the OECD developed and promulgated since the early 80s. However, an explicit focus on sustainable materials management was first introduced in the wake of the adoption of the OECD Environmental Strategy in 2001, and further intensified after the launch of a work programme on sustainable materials management in 2005 (Happaerts 2013; OECD 2015). As previous research revealed, the OECD explicitly uses the label 'sustainable materials management' to frame part of its work ever since. However, the OECD also works on resource efficiency, circular economy, and green growth. Interviewees confirm that in practice the lines between these different domains are not clear-cut and defining and debarking each of these concepts and the related work is not considered the best use of the OECD's time. Consequently, although SMM provides a clear focus, the work on other domains comes into the picture as well when screening the OECD's work on SMM.

It must be recognized that compared to the domains of trade, economic policy or energy, environment ways less heavily in the overall work of the OECD. Still, interviewees confirm that the OECD deserves a place in our top 3 of international organisations developing international environmental policy, in particular on the issues of resource efficiency, circular economy, green growth and sustainable materials management. In line with its mandate and constellation, the OECD's role on SMM is mostly one of agenda setting, providing well-founded and conceptually well-developed policy advice, and championing possible synergies between the environmental and the economic policy. Translating this to concrete policy targets, instruments, and the actual implementation remains the national business of the member states. This also has implications for the type of instruments that the OECD has to actually weigh on the implementation of SMM.

6.2 OECD's track record on SMM

Figure 6 lists OECD's key policy-oriented publications related to sustainable materials management over the past decade and a half. With the publications of policy-oriented reports at the core of its work, OECD obviously has many more relevant publications under its belt. Its publications cover a lot of ground from, for example, providing a general overview of possible principles and instruments for policy making on SMM to getting to the bottom of specific cases (e.g. metals for mobile devices, wood fibres). The selection presented here lists those documents that have been key in shaping OECD's policy framework on SMM and that are considered milestones in OECD's track record on SMM.

As stated in the introduction, OECD's 2001 Environmental Strategy has been considered key as the starting shot for a more explicit attention to SMM. With the effective management of natural resources as its first objective, the strategy effectively consolidated resource and materials management on OECD's agenda. Next comes a succession of workshops (Paris in 2001, Seoul in 2005, Tel Aviv in 2008) and the adoption of two Council Recommendations on resource productivity (2004 and 2008) have confirmed SMM's spot on the OECD agenda and in its policy expectations vis-à-vis its members and candidate members.

From a conceptual and knowledge-building perspective, the following key outputs can be added to the list. The OECD 2001 Global Forum on Sustainable Materials Management in Belgium and the 2014 Global Forum on Environment: Promoting Sustainable

Environmental strategy (ES) 2001

Workshop Paris Waste Prevention 2001

Recommendation of the Council on Resource Productivity 2004

Workshop Seoul 2005

Workshop Tel Aviv 2008

Recommendation of the Council on Material Flows and Resource Productivity 2008

OECD Global Forum: SMM 2010

Report: Resource Productivity in the G8 and the OECD 2011

Report: Potential GHGE mitigation from MM 2012

Review of implementation of ES 201

Book: Sustainable Materials Management - Making Better Use of Resources 2012

OECD Global Forum on Environment: Promoting SMM EPR 2014

Figure 6 OECD SMM activities

Materials Management through Extended Producer Responsibility (EPR) in Japan. Both fora have been occasions to boost exposure of a central concept in OECD's SMM approach: in 2010 this was the life-cycle approach, in 2014 the extended producers' responsibility. Additionally, OECD's book 'Sustainable Materials Management: Making Better Use of Resources' should be considered as a comprehensive overview of OECD's body of work on SMM. This book outlines a series of policy principles for SMM, examines how to set and use targets for SMM, and explores various policy instruments for SMM. Also included in our list of important stepping stone publications are two more topical reports. The report "Greenhouse gas emissions and the potential for mitigation from materials management within OECD countries" provides support to governments in showing the importance of using a life-cycle approach to analyse GHG mitigation options from materials management. The report "Resource Productivity in the G8 and the OECD" (also available in French), responds to a request by G8 Environment Ministers, presents an evaluation of progress on resource productivity. Finally, although not under the SMM-label, the Green Growth Strategy is another important ingredient in OECD's contributions to a policy framework. It can be considered as the match of UNEP's Green Economy Report in the sense that it too provides an overall narrative to frame policy lines on resource efficiency, circular economy and SMM.

The shortlist of key documents, interviews and the document analysis also provided a better insight in OECD's toolkit of instruments to influence SMM. It is important to pay particular attention to this because unlike EU, OECD and UNEP have a policy advisory function. In their contribution to international policy on SMM, they can suggest interesting instruments for implementation but they cannot make binding recommendations or do the implementation themselves. They do, however, develop instruments of their own that allow them to increase their policy influence maximally.

Five important instruments can be distinguished through which OECD attempts to exert policy influence. The most prominent one is its role in knowledge-building through research and the publication of policy-oriented reports. Secondly, the OECD organises global fora on the issue of SMM. These are moments of stock taking and knowledge-sharing between member states but even more importantly with non-members. In the current economic world order, OECD does no longer represent the vast majority of world economy, as was the case at its establishment. Especially the global fora can be considered as an occasion to collect input in and feedback on OECD work from other major players, such as India and China. Interviewees seem to agree that such events allow countries with an un(der)developed policy to learn from frontrunners, and frontrunners to learn from each other. Thirdly, OECD also has its Environmental Performance Review (EPR) programme, aimed at producing independent assessments of country progress in achieving domestic and international environmental policy commitments. Although the environmental performance reviews do not include a section on SMM explicitly, they are considered as an important tool to raise certain challenges in a member state's policy and formulate recommendations to address them. They are considered as a tool that is directly useable on the national level, which is their main merit. At the same time they remain recommendations only backed by a peer review and with no obligation to actually act on them. Fourthly, there are the resolutions of the Council. Finally, a tool that is often overlooked, is the accession process of candidate member states. This process provides a window of opportunity to screen a country's policy on different domains, identify the gaps between the national state of play and the obligations OECD members have accepted in these domains, and negotiate how to address them. Using the membership as leverage, this can lead to the development of a plan of action that lists all the policy reforms needed and the timeline to deliver, as well as to a certain sense of urgency in a

candidate country to provide relevant administrations with the necessary competences and resources to implement these changes.

6.3 Spotting transition elements

Again a set of documents was screened using a combination of word count and concordance search with a more in-depth qualitative analysis. The first took into account the Environmental Strategy of 2001, two subsequent Recommendations of the Council, OECD's flyer summarizing its work on SMM, its 2012 book on SMM and its Green Growth Strategy. The second covered the same policy documents, but used the summary for policy makers of the latter two instead of the full versions.

6.3.1 OECD policy

Since OECD is an advising and not an implementing policy body, the search for elements of transition can take into account two different dimension: it can track elements of transition in OECD's own policy and working, and it can trace elements of transition in the policy advice OECD gives towards its members states. A reading of OECD's Environmental Strategy (2001) and of its two Recommendations of the Council on this matter, reveals the following observations concerning the former.

Although the strategy does not explicitly defined key **principles,** it did intend to provide a clear direction for the work of OECD in the field of environment, as well as for environmentally sustainable policies in OECD member countries. In its description of the future work of OECD it conveyed several key principles. These include the recognition for a special responsibility of industry and business, and for the need to take an evidence-based approach. On the more radical side are the principles of decoupling, the need for an integrated effort to address both the production and the consumption side, and the importance of the balance among and integration of economic, social and environmental concerns. The importance of taking an evidence-based approach is also reflected by the focus of both Council Recommendations that call upon the member states to improve data collection and analysis on materials and resource management. The Council Recommendation of 2008 also recommends member countries to "promote integrated life-cycle approaches (…) as an input in decision making" and to "develop and promote the use of new technologies and innovations aimed at improving resource productivity" (OECD 2008: II). Since no new council recommendations have been formulated on the topic. This confirms the analysis of interviewees that despite its considerable work on sustainable materials management, OECD's pressure on its member countries to actually translate this in policy implementation is rather friendly.

The strategy puts forward a fundamental question: How do we reverse unsustainable trends and guarantee vital environmental functions by 2010 and beyond? It does so in response to OECD's Environmental Outlook that identifies 'pressures or concerns' that need to be urgently addressed by OECD countries in the first decade of the 21st century (OECD 2001: 4). In many ways this account of challenges, summarized in the 2001 strategy, shows an awareness of the interconnectedness of different domains and could be interpreted as a charting of landscape trends putting pressure on the system. Discussing in more detail the challenges and changes needed in the different domains, the stagey covers several socio-technical systems such as agriculture, transport, energy, etc. It can be argued that although the strategy is not based on a system analysis, it does take into account socio-

technical systems and their dynamics indirectly. The emphasis is clearly on the level of structure however, leaving very little attention for culture and practice. In its time scope is the first decade of the 21st century, definitely not a long-term perspective.

The strategy also offers some insight on OECDs SMM governance at the level of **objectives**. The strategy states five key objectives for OECD member countries[3] to work towards and lists quite bluntly what OECD countries will need to do in order to book progress in these domains. The sections on how members should work towards the objectives are quite interesting, as they also refer to **instruments** members can put into play as well as the work OECD will do to further the objective. They also suggest indicators that can be used to track the progress on both fronts. Looking at the instruments OECD will deploy (see previous section) nothing radical comes up, but looking at the instruments members are suggested to activate this seems different. These lists of to do's indirectly also touch on stimulating or protecting niches as well as deconstructing detrimental features of the current regime, and in fact also holds some radical ideas. For example: "OECD countries will need to remove or reform subsidies and other policies that encourage unsustainable use of natural resources – beginning with the agriculture, transport and energy sector(…) and ensure the internalization of the full external costs of natural resources use through market or other policy instruments" (OECD 2001: 7).

6.3.2 OECD policy advice

Table 2 OECD policy advice

Term	Systemic	Culture	Technology	Radical	Long-term	Participation	Learning	Niche
Count	20	8	149	3	66	21	9	0

On a total of 183669 words

A simple word count, reveals that '**systemic**' is not that often used, and most often in the context of describing systemic risks, changes or challenges and far less in describing solutions. Other key terms used in transition thinking such as 'landscape' and 'lock-in' also feature a few times, 'regime' pops up twice (property rights regime and deposit regime) and 'niche' not once. Scoping the attention for the different levels within a system: structure, culture and practice, the word count also delivers some interesting indications. With 149 counts, the word 'technology' scores far better than 'culture' (8) and 'behaviour' (45) and 'habits' (7) combined. Nearly all references to 'culture' were in the context of an appeal to fostering the culture of target setting.

In many ways the more qualitative analysis of the selected documents confirms these indications. The considered documents definitely convey a strong awareness of the complex, interdependent nature of the domains and challenges discussed, especially in their problem analysis. OECD's green growth strategy explicitly integrated the environmental and economic perspective (OECD 2011: 10), and in that sense definitely contributes to a systemic approach. However, the considered policy documents

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[3] These include: 1) maintaining the integrity of ecosystems through the efficient and appropriate management of natural resources, 2) decoupling environmental pressures from economic growth, 3) improving information for decision making by measuring progress through indicators, and 4) working on the social and environmental interface to enhance quality of life, and 5) improving cooperation and governance (OECD, 2001: 7-19)

are not consciously and explicitly centred on specific socio-technical systems and their different levels. The identified challenges and suggested approaches and solutions are mostly situated at the level of structure, and there is very limited reference to the levels culture and practices. For example, the Green Growth strategy devotes three out of 144 pages to the topic of enabling changes in consumer behaviour (OECD 2011: 49-50).

'**Radical'** occurred three times and in all three instances as an adjective to 'innovations'. Decoupling economic growth from environmental pressures, the internalization of external environmental costs and using a life-cycle perspective in the design and management of materials, processes and products are put forward as important principles in OECD's work (OECD 2001, 2011 2012). However, in general there is no fundamental/explicit questioning of economic growth as can be understood from the focus on green 'growth'. Still, the ideas conveyed in the Green Growth strategy can be considered as radical, since it describes exactly a transition from the current economic system to a new economic system and touches on the obstacles as well as possible resistance within the existing system. Descending from the level of principles, to the level of targets and instruments, the challenges and proposed actions are too noncommittal and are formulated too broadly to be considered as radical, although they could have radical impact if really implemented.

When it comes to a **long-term perspective**, a key element in transition processes, the OECD takes the same approach as UNEP. It does not itself formulate visions, targets, or instruments with a clear timing. An exception to that rule seems to have been its Environmental Strategy for the First Decade of the 21st Century, stating that "The strategy should be implemented before 2010" (OECD 2001: 4). However, although the deadline has passed, the strategy has not been renewed since and remains in force (Happaerts 2012). OECD does incites its members to introduce a long-term perspective, often also warning for the limiting effects of a short term perspective. OECD also refers extensively to existing visions, targets, or prognoses of other institutions. In total the documents refer forty times to 2020 and forty times to 2050. By building on long-term visions and prognoses it does draw in a long-term perspective in its analysis and consequently, although implicitly, in the approaches it proposes.

References to '**learning'** are scarce. However, the role of OECD as a knowledge-builder and facilitator of information-sharing and dialogue is put forward strongly. A recurring action to be taken is to build better insight, collect lessons learned and good practices, and to develop new/better approaches on which member states can build. Across the different policy documents OECD also appeals to its member states to invest in measuring, monitoring, data collection, analysis and knowledge-sharing. As both Council Recommendations illustrate, improving data collection and analysis is a key concern of OECD, as is knowledge-sharing among members and between members and non-members. The strong attention OECD has, for indicators that can track progress and its promotion of monitoring (OECD 2001: 8, 9, 13).

Although '**participation'** and 'multi-stakeholder' feature only a few times, the qualitative analysis suggests this does not reflect the importance given to participation in the policy development on SMM. Many documents have explicit and recurrent mentions of the need to seek active partnership with private sector and civil society and promote cooperation amongst stakeholders (OECD, 2001:4, 7). For example, the essence of the global fora was exactly to bring together experts representing governments (members and non-members), private sector and NGOs. In the chair's summary the principle of engaging all parts of societies is reiterated as key to SMM policy. While engagement with

non-Members has always been important to the Organisation, since the early 1990s, its importance has increased in a number of ways: the accession of new Members, strengthened co-operation with "Key Partners" and closer involvement of non-Members in subsidiary bodies through various forms of partnerships.

Its work on sustainable materials management OECD include both actions that are aimed at protecting or promoting **niches**, as well as actions that aim at addressing systemic obstacles to change. The latter includes OECD's work on ecological tax reform, economic instruments and environmental harmful subsidies.

6.4 In summary

The OECD definitely plays an important role in developing the international policy framework on sustainable materials management. Its role at the service of a limited group of advanced countries puts it in a position where its conceptual work, its assessments, its reviews and partnership building can influence the policy processes at the national level. However, negotiations during the accession process a part, it has limited levers to enhance the uptake of its work at the national level. Its mandate and constellation also explain its rather economic perspective, compared to a more environmentalist approach of UNEP.

Less so than is the case in UNEP's material on the topic, does OECDs work on sustainable material managements explicitly and consciously refer to transition thinking and its key elements: niche, regime, landscape, lock-in. Still, different elements of transition take a solid place in OECD's SMM work. This is definitely the case for a systemic approach and a long-term perspective. Although OECD does not have a clear long-term vision or planning to guide its work on SMM, its analysis of the challenges we face and the possible solutions clearly convey a long-term perspective. Least developed are the elements of participation and reflexiveness. They are included but in a superficial sense and mostly referring to the work and work cycles of OECD itself, whereas the question how states can ensure both aspects in their policy on SMM remains underexposed.

7. Comparative analysis and concluding remarks

In this paper, we raise the question whether transitions thinking is present in the policies and practices of sustainable materials management of the European Union, the OECD and UNEP on the level of policy principles, policy goals and policy instruments. We have operationalized transitions thinking by developing an analytical framework which consisted of six elements, and applied it to policy documents of the respective organizations. We will now reflect on our analysis, by stressing the different nature of the three organizations, by reflecting on the elements of our transitions framework and on our contribution to literature.

In general, our analysis supports the observation of Happaerts (2014) that the EU, the OECD and UNEP are the key players in sustainable materials management policies at the international level. This has also been agreed upon unanimously by all interviewees. All three have made key contributions to the international policy framework on SMM. However, the nature of these contributions differs, in line with the different roles these organisations play and the different mandates they have. UNEP is particularly active as a knowledge builder and policy advisor on a wide array of resource efficiency topics. With all UN member states under its belt and a specific mandate to support developing countries, it also caters for the broadest constituency. The OECD also functions as an important knowledge builder and policy advisor, but has a limited set of advanced countries as members and more institutionalised direct lines to their policy makers. The role of the EU is very different because the EU's mandate also includes setting (binding and non-binding) targets and general policy steering on SMM within its boundaries. These differences have an effect on the way these organisation (can) apply the transitions framework.

Tracking the key elements of the **transitions framework** throughout key policy documents of the three cases, we note that elements of transitions thinking are present in the policies of all three organizations. However, not all elements feature equally prominent: a systemic approach and the endorsement of the need for a long-term vision are present throughout the documents and across the different organisations. This is only partially true for the case of 'participation' and the niche-regime destabilization dynamic, and the explicit attention for reflexivity and a radical approach bas key elements in transition processes was limited.

First of all, a systemic approach is very present in the work of all three organisations: the organisations' perspectives on sustainable materials management clearly transcend a limited focus on for example on materials or waste. Also noteworthy is that their analyses go beyond addressing one socio-technical system at the time. In key documents, UNEP's and OECD's problem analysis, although implicitly, looks at several socio-technical systems and how the interact in order to get a full grasp of the challenges and their complexity. The EU did this too, e.g. by including design and consumption explicitly in their work on the circular economy. Second, the importance of a long-term vision was endorsed by all three organizations in their documents. However, endorsement of the need for a long-term vision was not necessarily translated in long-term policy planning, which can best be understood in the light of the different mandates of the organisations. The EU did use long-term policy planning rather explicitly, by

setting goals for e.g. 2020, 2030 and beyond. The OECD and UNEP did not explicitly develop long-term targets and roadmaps to achieve them. They do however subscribe to the need for long-term vision in policy making on this subject and actively support this by including long-term trends and prognoses in the materials the develop.

Third, elements of participation were present in all the analysed documents of all three organizations, but participation has been interpreted rather narrowly. All three organizations actively endorsed participation on the level of policy principles but the instruments used to put this into practice are mostly the traditional participation channels. Since these institutionalized channels for participation in policy developed often involve representative organisations of different stakeholder groups, they have limitations: they bring the common positions of these stakeholder groups to the table, meaning the more divergent voices of frontrunners within these groups or niches outside of these groups may not be heard.

Fourth, reflexivity was not explicitly endorsed throughout the documents of the OECD, UNEP and the EU. Of course monitoring and evaluation are applied by all three organizations. For example the EU provides for periodic evaluation of its resource efficiency policies and provides update reports. However, reflexivity as a concept goes far beyond monitoring alone: it is about making room for a short-loop sequence of experimentation, learning and adapting the approaches. However, experimentation and learning as a driver of transition processes are not explicitly endorsed or promoted in the principles, goals and instruments on sustainable materials management of the three organisations.

Radicality, a fifth element of transition, proved hard to assess, especially when taking into account the different levels of policy principles, targets and instruments. Whether an idea is radical depends on normative assumptions on the current system and the ideal situation to which the policies should contribute, and whether an organisation takes a radical approach depends on how far it goes in implementing potentially radical ideas. Interesting differences between the organisations can be noted. In the case of UNEP and the OECD, policy makers that have the mandate to develop and implement specific national policies, are not the ones that develop the ideas, concepts and approaches put forward. In the EU this is the case: all policy frameworks developed will have to earn acceptance of the European Parliament and their Member States, and will depend on the Member States for implementation into practice. Although not considering itself radical, UNEP seems to be particularly able to introduce some radical ideas in their thinking on resources, e.g. by the specific inclusion of well-being (and not growth) in their concept of green economy. The OECD has the same comfortable position of policy advisor, and in that sense can also launch ideas that if fully implemented would lead to radical change. However, it takes a less critical stance vis-à-vis the current economic system than UNEP, for example by holding in place a firm focus on economic growth. Finally, the EU is able to be radical on the level of policy principles (e.g. the idea of moving to a completely circular economy could be interpreted as rather radical), but sticks to more incremental approaches when it comes to policy goals and instruments.

The sixth and final element of our analytical framework looked at the attention for niche developments vs. regime destabilization. We can see that all three organizations attempt –to a certain degree-, to include regime destabilization measures. The UNEP is the most explicit in doing so, e.g. by explicitly stating the need for thinking about how to create space for new and innovative niches to break

through, and by recognizing the conservative forces that are at play in any regime and that limit policy makers in their manoeuvring room for change. In this regard, the UNEP that addresses transition explicitly and strategizes at the meta-level on how policy makers can drive transitions despite the vested interests in the regime. The OECD is also active on regime destabilizing measures, e.g. by working on taxation and subsidy reform. The European Union also tries to create a level playing field for new innovators and old regime actors e.g. by shifting research budgets towards an inclusion of circular approaches, but does this in a less radical and explicit way than UNEP.

As a final general conclusion, we believe this paper makes three **contributions** to **literature** on sustainable materials management and transitions thinking. First, the paper contributes to the analysis of transitions thinking in an international policy context, an aspect that has been underexposed in the body of transitions literature, where focus is most often on niches or local and national transition programmes. Furthermore, the analytic framework of six key elements of transition, developed for the purpose of this paper offers an interesting and accessible tool to screen policy approaches for 'ingredients' of transition thinking. The paper also provides an overview and discussion of the most important documents and instruments on sustainable materials management of the three key international players in this domain. Finally, it offers an elaborate analysis of transition in the EU Roadmap to a Resource Efficient Europe and the two Circular Economy Communications, and an exploratory overview of the presence of transitions element in OECD's and UNEP's on sustainable materials management and resource efficiency.

8. Bibliography

Websites

OECD

- Sustainable Materials management, http://www.oecd.org/env/waste/smm.htm (26 December 2015).

UNEP

- http://www.unep.org/newscentre/default.aspx?DocumentID=2711&ArticleID=9441#sthash.62DmyDKU.dpufEngaging major groups & stakeholders

European Commission (2008). Raw materials Intiative. Retrieved from https://ec.europa.eu/programmes/horizon2020/en/area/raw-materials .

European Commission (2011). The Roadmap to a Resource Efficient Europe. Retrieved from http://ec.europa.eu/environment/resource_efficiency/about/roadmap/index_en.htm

European Commission (2012). European Resource Efficiency Platform (EREP). Retrieved from http://ec.europa.eu/environment/resource_efficiency/re_platform/index_en.htm .

European Commission (2015). Towards a circular economy: A zero waste programme for Europe. Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52014DC0398R%2801%29

European Commission (2015a). Press release. Retrieved from http://europa.eu/rapid/press-release_MEMO-15-6204_en.htm

European Commission (2015b). Communication – action plan for circular economy. Retrieved from : http://ec.europa.eu/priorities/jobs-growth-investment/circular-economy/docs/communication-action-plan-for-circular-economy_en.pdf

European Commission (2015c). Circular economy fact sheet. Retrieved from http://ec.europa.eu/priorities/jobs-growth-investment/circular-economy/docs/circular-economy-factsheet-general_en.pdf

Flachenecker, F. (2015). Sustainability, resource efficiency and copetitiveness. An assessment of resource efficiency policies in the European Union. Bruges European Economic Research Papers, 32:2015.

Geels, F.W. (2011). The multi-level perspecitve on sustainability transitions: responses to seven criticisms. *Environmental Innovation and Societal Transtitions 1* (1), 24-40.

Geels, F. W., & Loorbach, D. (2007). Typology of sociotechnical transition pathways. *Research Policy, 36*, 399-417.

Happaerts, S., Bruyninckx, H. (2012). Upscaling transition governance. An exploratory analysis of the Roadmap to a Resource-Efficient Europe. International Conference on Sustainability Transitions. Copenhagen (Denmark), 29-31 August 2012.

Happaerts, S., Bruyninckx, H. (2013). The Discourse and Practice of Transitions in Global Governance. An Exploration of the International Transition Towards Sustainable Materials Management. ISA Annual Convention 'The Politics of International Diffusion: Regional and Global Dimensions'. San Francisco, California, USA, 3-6 April 2013.

Happaerts, S., Bruyninckx, H. (2014). Sustainable development: the institutionalization of a contested policy concept. In: Betsill M., Hochstetler K., Stevis D. (Eds.), Palgrave advances in international environmental politics. Basingstoke: Palgrave Macmillan, 300-327.

Happaerts S. (2014*). International Discourses and Practices of Sustainable Materials Management* (Research Paper nr. 5). Leuven: Policy research Centre on Sustainable Materials Management.

Happaerts, S. (2015). The discourse and practices of transitions in global governance. In *Handbook of Sustainability Transitions and Sustainable Peace*, edited by H. G. Brauch, U. Oswald Spring, J. Grin and J. Scheffran. Cham: Springer.

Loorbach, D. (2010). Transition Management for Sustainable Development: A Prescirptive, Complexity-Based Governance Framework. *Governance: An International Journal of Policy, Administration and Institutions 23*(1), 161-183.

Markard, J., Raven, R., & Truffer, B. (2012). Sustainability transitions: an emerging field of research and its prospects. *Research Policy 41,* 995-967.

OECD (2001). Environmental Strategy. Retrieved from http://www.oecd.org/env/indicators-modelling-outlooks/oecdenvironmentalstrategy.htm

OECD (2008). Recommendation of the Council on Resource productivity. Retrieved from https://www.oecd.org/environment/ministerial/40564462.pdf

OECD (2011). Resource Productivity in the G8 and the OECD. Retrieved from https://www.oecd.org/env/waste/47944428.pdf

UNEP (2010). Mid-term strategy. Retrieved from http://www.unep.org/PDF/FinalMTSGCSS-X-8.pdf

UNEP (2011). Decoupling natural resource use and environmental impacts from economic growth. Retrieved from http://www.unep.org/resourcepanel/decoupling/files/pdf/Decoupling_Report_English.pdf

UNEP (2011). The Green Economy report. Retrieved from http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_final_dec_2011/Green%20EconomyReport_Final_Dec2011.pdf

UNEP (2012) The 10 year framework of programmes on sustainable consumption and production. Retrieved from

http://www.unep.org/resourceefficiency/Portals/24147/scp/10yfp/document/Brochure%2010YFP%20-071212%20Final.pdf

UNEP (2014). Medium-term strategy. Retrieved from http://www.unep.org/pdf/MTS_2014-2017_Final.pdf

UNEP (2016). About UNEP. Retrieved from http://www.unep.org/About/

UNEP (2016b). Resource Efficiency. Retrieved from http://www.unep.org/resourceefficiency/Home/UNEPsResourceEfficiencyProgramme/tabid/55552/Default.aspx

9. Annexes

A1.1 List of interviewees

Peter Börkey (OECD)

Shaoyi Li (UNEP International Resource Panel)

Griet Verhaert (LNE-ALBON)

Werner Bosmans (DG ENVI EU)

Nancy Da Silva (FOD Leefmilieu)

Victor Dries (Kabinet Flemish minister Homans – formerly OVAM)

For this paper, interviews made in the context of the previous SuMMa-paper were also consulted.