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Adopting and Diffusing the Circular Economy as a policy concept: The Case of the European Union

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Abstract

This paper contributes to a recent strand of work within the field of sustainability transitions that combines the multi-level perspective on socio-technical transitions with techno-economic paradigm thinking. Schot and Kanger (2018) and Kanger and Schot (2018) developed a framework which aims to explain the emergence, acceleration, stabilization and directionality of deep transitions. They define a deep transition as "a series of connected and sustained fundamental transformations of a wide range of socio-technical systems in a similar direction" (Schot and Kanger 2018: 1045). This promising framework has hardly been tested empirically so far. Given its large scope, our paper specifically focusses on proposition 5 of Schot and Kanger (2018: 1954) which claims that it is international and transnational organisations that contribute to the circulation of rules beyond individual socio-technical systems and national boundaries and play an important part in the frenzy phase. The aim of this paper is to theoretically further develop and empirically test this proposition to obtain a better understanding of the role of international organisations in deep transitions. This addresses a gap in the existing transitions literature more generally, which has paid scant attention to the role of such organisations. Conceptually, we are drawing on the international relations literature focussing on the role of international expert networks and international organisations in creating shared rules. On that basis we develop a framework which aims to explain why and how international organisations absorb new ideas and rules and through which channels they contribute to their diffusion internationally. The framework is applied to a case study of the emerging meta-regime 'circular economy' which is hoped to globally re-define systems of production and consumption in line with sustainability concerns. Our analysis focusses specifically on the role the European Union (EU) has been playing in promoting this norm internationally as it is seen as a frontrunner and promoter of the concept of circular economy. The paper concludes with lessons from the specific case study but also wider considerations about how to better conceptualise the role of international organisations in deep transitions.

Keywords:

Deep transitions, governance, meta-rules, international organisations, circular economy

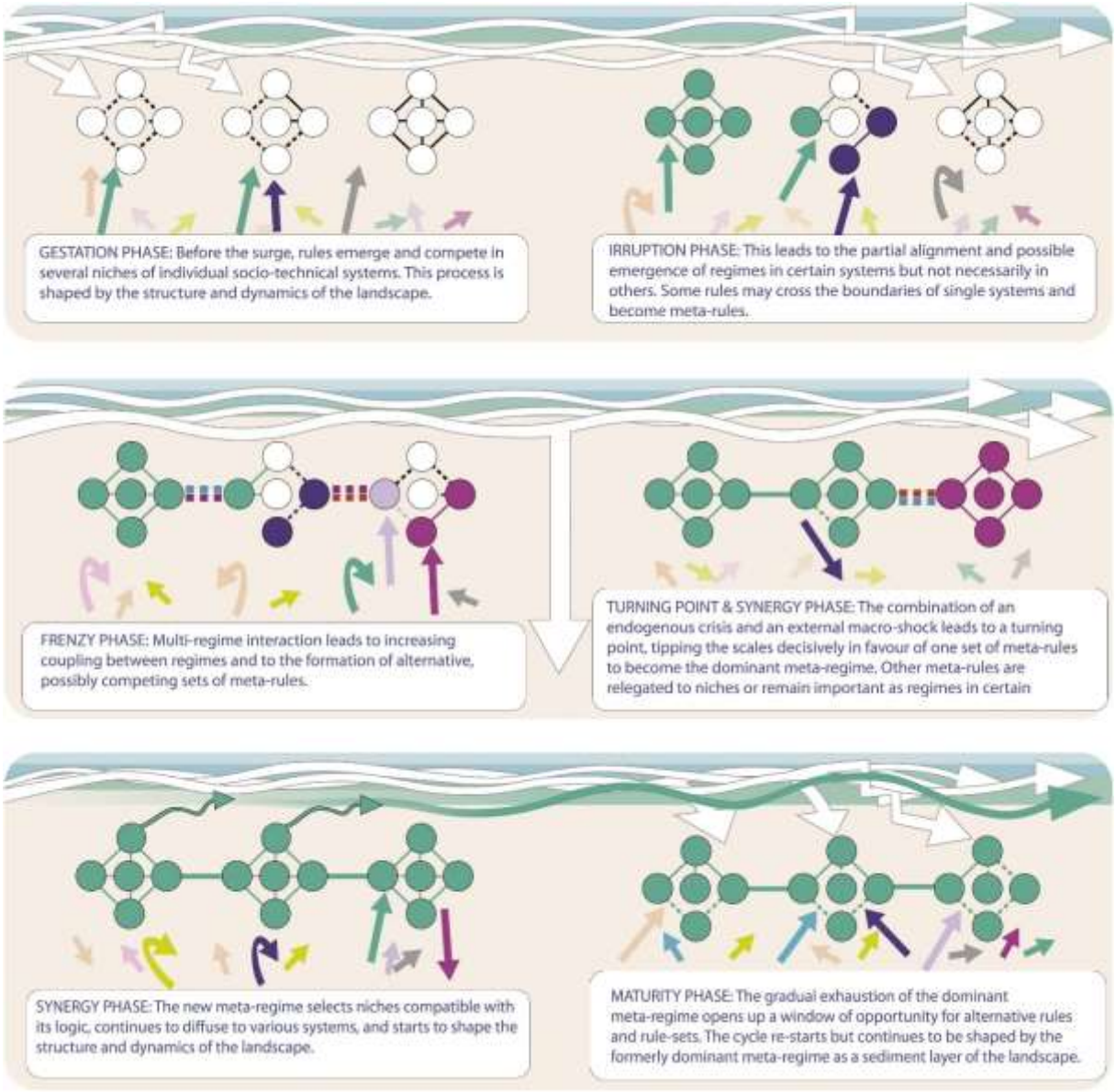
1. Introduction

This paper contributes to a recent strand of work within the wider field of sustainability transitions (Grin et al., 2010; Markard et al., 2012): the deep transitions framework. This novel framework combines the multi-level perspective on socio-technical transitions (Geels, 2002) with techno-economic paradigm thinking (Freeman and Perez, 1988) and was developed by Johan Schot and colleagues. They define a deep transition as "a series of connected and sustained fundamental transformations of a wide range of socio-technical systems in a similar direction" (Kanger and Schot, 2018, p. 1045). Compared to work in the tradition of the multi-level perspective, the framework considers a much longer timeframe, "zooms out" from individual socio-technical systems and focusses on the role of rules that shape behaviour of actors across a range of socio-technical systems such as in energy, agriculture or transport and thereby drive the directionality of deep transitions. Compared to work in the techno-economic paradigm tradition, it has a clearer focus on multi-level dynamics which lead to surges of development. Schot and Kanger (2018) and Kanger and Schot (2018) propose that a limited number of meta-rules, which are shared across socio-technical systems, have driven innovation and system evolution into particular directions for the past 250 years. One example of a meta-rule is the drive to use fossil fuels in systems such as agriculture, energy or mobility. This direction of development (what they call the first deep transition towards industrial modernity in the 19th and 20th century) has led to a significant negative social (inequality) and environmental (climate change, biodiversity loss) consequences. They therefore argue that such meta-rules need to change in line with demands for sustainability and that a second deep transition might emerge as a response to these challenges. Their framework aims to explain the emergence, acceleration, stabilization and directionality of such deep transitions.

The framework distinguishes between different phases in deep transition processes: (1) a *gestation phase* in which rules emerge and compete in several niches of individual socio-technical system; (2) an *irruption phase* which leads to the partial alignment and possible emergence of regimes in certain systems; (3) a *frenzy phase* in which multi-regime interaction leads to increasing coupling between regimes and to the formation of alternative, possibly competing sets of meta-rules; (4) A *turning point and synergy phase* in which the combination of an endogenous crisis and an external macro-shock leads to a turning point, tipping the scales decisively in favour of one set of meta-rules to become the dominant meta-regime; (5) a *synergy phase* in which the new meta-regime selects niches compatible with its logic, continues to diffuse to various systems, and starts to shape the structure and dynamic of the landscape; and (6) a maturity phase in which the gradual exhaustion of the dominant meta-regime opens up a window of opportunity for alternative rules and rule-sets (Schot and Kanger, 2018) (see Figure 1). Meta-regimes are defined as "semi-coherent rule sets directing the behaviour of a set

of actors in multiple socio-technical systems" (Schot and Kanger, 2018, p. 1055). An example is the general logic of mass production which has been applied across industries after the Second World War.

Figure 1: The multi-level explanation of a great surge of development



Source: Schot and Kanger (2018, p. 1056)

It also differentiates between different types of rules (see Table 1). In line with this thinking, a deep transition can be seen as a process by which some rules emerge, come to be aligned to each other and diffuse to various systems, thereby obtaining differing degrees of scope and systemicity.

Table 1: Types of rules and rule sets in the deep transitions framework

Systemicity **Scope of rules**	Single rule	Rule set

Single system	**Rule** *Example: The drive to optimize fuel efficiency (rule in the automobility system).*	**Regime** *Example: Fordist mass production at the beginning of the 20th century (a regime characterizing the automobility system).*
Multiple systems	**Meta-rule** *Example: An imperative to use fossil fuels in many systems such as agriculture, energy provision or mobility.*	**Meta-Regime** *Example: Global mass production after World War 2 (a meta-regime characterizing multiple socio-technical systems).*

Source: own illustration based on (Schot and Kanger, 2018)

This promising framework has hardly been tested empirically so far and Schot and Kanger themselves explicitly point to the tentative nature of the ideas in their framework which they consider an "extended adventurous set of propositions" (2018, p. 1055). In that sense the emerging framework can be seen as a 'hopeful monstrosity' following Mokyr (1990), because like new technologies it promises new functional possibilities, but the early performance (in terms of being able to explain deep transitions) may be low. Therefore, a series of micro-inventions may be needed for the macro-invention (the deep transitions framework) to improve its performance. Given the ambitious nature of the framework, covering its entirety is beyond the scope of an individual paper. We therefore focus on the role of inter- and transnational organisations (IOs) in deep transitions as this is a weakly developed aspect in the socio-technical transitions literature more generally.

Much of the existing work on the governance of transitions (see Köhler et al. 2019 for a recent review) focuses on the role of national policy-makers (Hendriks, 2008; Smith et al., 2005; Tukker and Butter, 2007) or local actors (Ehnert et al., 2017). Some work has shed light on international expert networks such as the role of large consultancy firms in globally pushing certain technologies (such as water desalination, see Fuenfschilling and Truffer (2016)). However, there has been very limited attention to the role of IOsin (deep) transition processes specifically and therefore little conceptualisation of such actors and processes. Given this relative neglects of studies on the role of IOs within transitions research, this paper focusses on further developing and testing proposition 5 of the Schot and Kanger framework (2018, p. 1054) which states:

> "The fifth proposition is that an additional mechanism, further facilitating and accelerating the creation of between-system links, is the aggregation and intermediation work of inter- and transnational organizations. These actors bring together experiences and ideas from different sectors, nurture mutual learning processes, help to establish networks between various stakeholders, and shape expectations about the future of the niches. The nature of these activities is markedly different from the dynamics of the irruption phase: instead of largely uncoordinated interactions, the aggregation work performed in the frenzy phase is much more

> purposeful, geared towards homogenization and standardization" (Schot and Kanger 2018: 1054).

As an example of such processes Kanger and Schot 2018 point to the League of Nations, the International Labour Organisation (ILO), the Marshall Plan with its Productivity Missions and the Fulbright Programme as channels of influence which diffused mass production ideas to Europe and shaped industrial practices post World War II.

While constituting an interesting claim as to the role of international organisations, the proposition is rather underspecified (i.e. in terms of the nature of international organisations or their "channels" of influence) and merits further development. This is especially the case since there is significant work outside the field of transitions studies investigating the activities and impacts of international organisations on international coordination processes – notably in the field of international relations – which can productively be drawn on. Therefore, this paper aims to 1) theoretically further develop proposition 5 of the deep transitions framework and 2) empirically test it with a case study to obtain a better understanding of the role of IOs in the shaping of meta-rules.

The remainder of the paper proceeds as follows: In the next section we develop our analytical framework by drawing on the international relations literature which contains a large body of relevant work on the role of international expert networks (e.g. Haas, 1992) and international organisations (e.g. Barnett and Finnemore, 2004) in creating shared rules. After setting out our research design and methodology in section 3, we apply our framework to a case study of the emerging meta-regime 'circular economy' which could become one of the key rules for more sustainable production and consumption systems globally. The analysis focusses on the role the European Union (EU) has been playing in the evolution and promotion of this norm internationally. The paper concludes with lessons learnt from the case study as well as resulting implications for conceptualising the role of international organisations in deep transitions.

2. Inter- and transnational organisations and deep transitions

Schot and Kanger (2018) propose as one central element of their deep transitions framework (proposition 5) the work of inter- and transnational organisations as an important mechanism, "further facilitating and accelerating the creation of between-system links" within the frenzy phase. What they describe as the "aggregation and intermediation work" of IOs, we understand as two interconnected but somewhat distinct processes: (1) new ideas and meta-rules influencing practices are taken up, further developed and attributed meaning to by an IO, thereby aligning them to other meta-rules; (2) the new set of meta-rules is diffused by the IO, geared towards homogenisation and standardisation of rules and associated practices, and hence, contributing to the emergence of a new meta-regime. In

an effort to further conceptually develop Schot and Kanger's proposition, we elaborate on the following questions:

1. Why and how do international or transnational organisations take up meta-rules emerging in the transnational sphere?
2. How do international or transnational organisations disseminate new sets of meta-rules to states and other international organisations?

While we acknowledge that there are other strands of social science literature to approach these questions, we draw on international relations (IR) research for its comprehensive and well-developed insights on the role of international organisations in seizing, promoting and deploying norms and ideas. Especially constructivist theories offer useful understanding regarding the complex interrelation between structure and agency, also central to the deep transitions framework (Kanger and Schot, 2018).

International organisations as purposive bureaucracies

For our conceptualisation, we first draw from Barnett and Finnemore's work on IOs, which has been widely recognized and which we believe to be equally relevant for studying transnational organisations. Barnett and Finnemore conceptualise IOs as bureaucracies that exercise authority. Their power lies in authority, which is gained and preserved by the IO's external perception as serving a "legitimate social purpose […] in an impartial and technocratic way using their impersonal rules" (Barnett and Finnemore, 2004, p.21). Their rational-legal authority defines the basic form and behaviour of IOs. However, there are also three further types of authority IOs can hold: delegated authority from member states, moral authority, as IOs are often created to protect shared principles, and expert authority. They argue that the "greater the appearance of depoliticization, the greater the authority associated with the expertise" (Barnett and Finnemore, 2004, p.25).

This interpretation differs from how classic, realism inspired IR work sees IOs (as mere agents of states with limited independent influence). Rationalists apply principal-agent theory to understand why states delegate authority (Barnett and Finnemore, 1999; Nilsson 2017). In contrast, Barnett and Finnemore (1999) argue that "the rational-legal authority that IOs embody gives them power independent of the states that created them". They also claim that their bureaucracies create social knowledge and hence shape IO behaviour (Barnett and Finnemore, 1999). In summary, such a constructivist approach, which we argue is very relevant when studying the creation of meta-rules or meta-regimes in deep transitions, implies that: (1) IOs are purposive actors, (2) they can exert power independently from their member states and (3) they need to be evaluated critically based on norms (Barnett and Finnemore, 1999).

Epistemic communities and the role of expertise

To understand how an IO's authority, based on its perception as impartial and technocratic actor working in a depoliticized context, is obtained and maintained, looking at the role of expertise is critical (e.g. Barnett and Finnemore, 2004; Carayannis et al., 2012; Demortain, 2017; Alawattage and Elshihy, 2017). Seminal work in this area is the research by Haas and colleagues on the role of international expert networks, which they term 'epistemic communities'. Haas argues that decision makers are confronted with growing technical uncertainties and complex problems of global concern, hence facing the increasing importance – but also difficulty – of international policy coordination. He proposes an analytical approach that focuses on the role of epistemic communities in "articulating the cause-and-effect relationships of complex problems, helping states identify their interests, framing the issues for collective debate, proposing specific policies, and identifying salient points for negotiation" (Haas, 1992, p.2). Haas defines an epistemic community as "a network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy relevant knowledge in the issue-area" (ibid, p.3). While in Haas' original conceptualization expertise was mainly associated with scientists and academics, more recent contributions tend to agree that expert knowledge underpinning policy action is more diffuse and is also found in other actors such as NGOs, transnational business networks, states and international bureaucracies (e.g. Demortain, 2017), therefore epistemic communities and their influence needed to be understood and conceptualized more broadly.

Building on Haas' work from the 1990s, there has been extensive research on epistemic communities over the last three decades, providing useful insight into two analytical aspects that are most relevant for our research interest here: (1) the contextual conditions and mechanisms by which an epistemic community's influence (developing new meta-rules or emerging meta-regimes) is most likely to materialize in an IO and (2) the different ways in which the meta-rules are then further diffused by the IO.

Meta-rule absorption by international organisations

Over the last three decades, IR research has shown that not all IOs are equally likely to consult or defer to knowledge and advice from epistemic community members and not every political issue attracts involvement from experts to the same extent. In light of our analytical focus, this further accentuates the question: What are the contextual factors that facilitate the absorption of new meta-rules by an IO and what are the central mechanisms through which this happens?

Contextual factors

In terms of enabling contextual factors, the literature highlights the specific characteristics of a policy problem that are most likely to lead to an interaction between an epistemic community (providing a new meta-rule) and an IO (absorbing a new meta-rule). Often, these aspects are summarized as the *complexity and uncertainty* of a policy problem that occurs in a situation of deep crisis (e.g. Haas, 1992; Carayannis et al., 2012; Dunlop, 2015; Demortain, 2017). Both complexity and uncertainty thereby often stem from the same characteristics of a policy issue, namely it being transboundary in scope and its underlying cause-effect relations as well as assumed solutions being seen as inherently scientific or technical as opposed to political (Haas, 2016). To add to the complexity and uncertainty of a policy issue, there needs to be at least a certain degree of differing assumptions regarding the appropriate policy options to meet the challenges (ibid.). Furthermore, organisational aspects factor into the equation. For example, IOs with a strong science and technology portfolio are more likely to engage with an epistemic community than other IOs: "It is there that the scientific culture of epistemic communities will have a close affinity, and new groups will be able to quickly articulate new policy initiatives" (Haas, 2016, p.135). Demortain (2017) also outlines the political context that facilitates epistemic communities' influence on an IO: The political and institutional environment has to tie policy-makers to potential knowledge-providers; they "must be in search of validated knowledge" (ibid. p. 79). This again highlights the argument that the underlying causes of the problem have to be seen as complex and the outcome of available policy options as uncertain. But, and this has become a popular argument during the last few years, the "search for validated knowledge" can also stem from policy-makers seeking to justify certain preconceived political approaches as impartial and scientifically validated (Dunlop, 2015; Dunlop, 2017; Stone, 2017). As there is a general trend of technocratization of policy processes and a growing need for technical and scientific expertise (Carayannis et al., 2012), it seems consistent to conclude that the general political and institutional context has evolved to accentuate the significance of epistemic community-IO-interaction in the creation and diffusion of new meta-rules. Moreover, in light of the inherently technical nature of the rules and meta-rules associated with socio-technical transitions, the aspects of *uncertainty and complexity* as described above are highly relevant in the context of the deep transitions framework where there are no easy answers on how to move away from global unsustainable production and consumption systems.

Modes of Absorption

There are a number of mechanisms outlined by the existing literature on epistemic communities that are central to understanding the absorption of new meta-rules by IOs. Often these are discussed within the concept of institutional learning, meaning the ways in which an IO takes up new ideas as part of their organisational agenda (e.g. Littoz-Monnet, 2017). As Haas (2001) states, "learning occurs directly,

through interpersonal persuasion, communication, exchange and reflection, that leads to the recognition or appreciation of new causal models and shared values" (p.11582).

Dunlop describes Haas' original framework as depicting a "deficit model of learning" (p.237), where institutional learning derives from an extreme epistemic deficit. As decision makers experience this deficit, their bounded rationality leads them to seek advice, thereby allowing an epistemic community to enter the policy arena. In this understanding, epistemic communities are either "self-regulating enclaves of experts that existed 'out there' in the academic and research world" (p. 238), responding to the decision-makers' call for advice or they can be "governmental", meaning that they have been deliberately selected by decision-makers. Another prominent logic is what Dunlop describes as "learning as calculation" (p. 239), which highlights that both decision-makers and epistemic communities may engage based on interest rather than simply on value or technical rationale. Decision-makers may use expert knowledge strategically to control a policy domain or gain political advantage. Epistemic communities "while they do not have direct pecuniary incentives, […] are still interested parties. Because of their socio-technical beliefs these are experts who want rather than need to be in the policy arena. They are self-selecting policy actors driven by normative and policy beliefs" (p. 239). Lastly, institutional learning may even occur "unreflective" in settings where an epistemic community has already become institutionalized and "decision-makers may be content to unquestioningly adopt its ideas" (p. 239).

Summarizing central research on epistemic communities' influence on institutional learning, Dunlop (2015) argues that none of these logics on their own suffice to explain policy learning between an epistemic community and decision-makers but, as conceptual lenses, should be considered in combination. For example, the funding of specific research ("coproduction" of knowledge) or the formal inclusion of epistemic community members through e.g. expert advisory bodies or expert panels can lead to members of the community slowly coming to populate the bureaucracies themselves (Demortain, 2017). Through the gradual recruiting of epistemic community members to the secretariat of an IO, the epistemic community's influence becomes more and more institutionalized and institutional learning and the absorption of new meta-rules become more likely (Haas, 2016; Cannon, 2017).

Meta-rule diffusion by international organisations

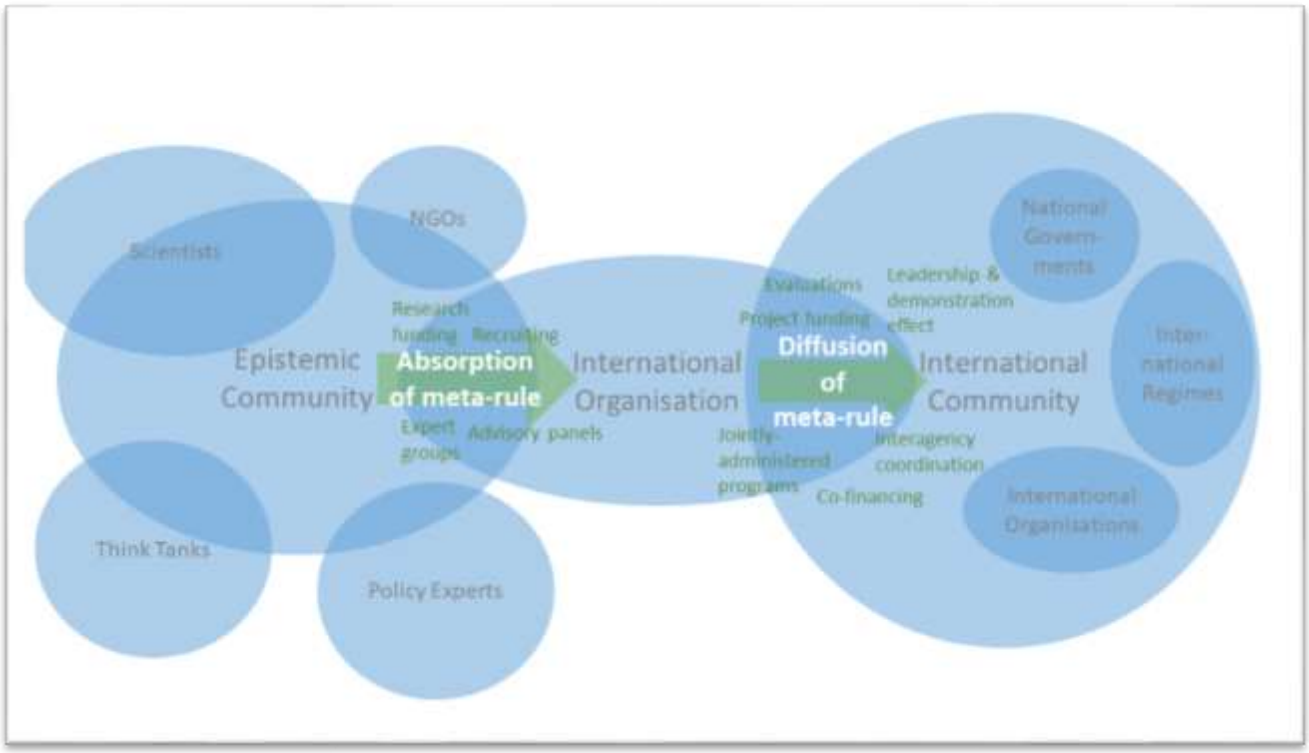
Having developed some ideas about when and how IOs absorb meta-rules emerging in the transnational sphere in the context of transnational epistemic communities, we now turn to the second guiding question about how IOs contribute to the diffusion of such norms. In the epistemic communities literature it is oftentimes assumed that only when an epistemic community's influence has been institutionalized to a certain degree in an IO that its ideas and rules can become "more deeply

diffused and embedded internationally" (Demortain, 2017, p. 79). In this sense, once absorbed by an IO, there are many channels and mechanisms by which the further diffusion of the meta-rule may occur. In their efforts towards international policy coordination, IOs can use a combination of these channels and mechanisms to diffuse the new idea, also depending on the specific contexts. The two channels that are of most analytical interest in the context of our research are the diffusion from IOs to national governments and to other international arenas (e.g. other IOs). As the most common mechanisms that are used by IOs to diffuse new ideas towards other international fora and organisations, Haas highlights interagency coordination, jointly administered programs and co-financing. Concerning diffusion to governments Haas underlines training, demonstration effects, project funding, anticipation of project funding, leadership by IO officials and sponsor meetings as central mechanisms, though depending on what kind of states these are directed at. While incentives and inducements (e.g. technology assistance or financial transfers) will facilitate "diffusion to states with weak capacities", rather communication oriented or exemplary mechanisms are considered relevant especially in open democratic systems (Haas, 2016, p. 13). Other literature (e.g. Broome et al., 2018; Littoz-Monnet, 2017) moreover highlights the growing significance of "observing, measuring and evaluating performance" in policy diffusion and international policy coordination. This includes tools like targets, indicators, league tables or benchmarking.

There are also mechanisms that operate towards other IOs and national governments at the same time, such as international regime negotiations (such as the international climate change or biodiversity conventions), where both national governments as well as international organisations are involved. Another more indirect but nonetheless important mechanism that has been gaining attention in the literature is the role of epistemic community members as "science diplomats". These experts over time accumulate different roles in a variety of national or international contexts and therefore support the diffusion of new ideas (Stone, 2017).

Figure 2 below summarises the conceptual framework we developed above: the two main processes of interest (absorption and diffusion) are depicted in white, while the mechanisms contributing to these processes are displayed in green.

Figure 2: The absorption and diffusion of meta-rules through International Organisations



The conceptual considerations above therefore nuance and further develop the understanding of the role of inter- and transnational organisations as developed in the deep transitions framework. In the deep transitions framework, these organisations are simply conceptualised as bringing together experiences and ideas from different sectors, nurture mutual learning processes, help to establish networks between various stakeholders and shape expectations about the future of niches. In our understanding we see the bureaucrats of IOs as potentially active participants of transnational epistemic communities which develop ideas to solve uncertain and complex policy problems and whose power lies in authority, which is gained and preserved by the IO's external perception as serving a "legitimate social purpose […] in an impartial and technocratic way using their impersonal rules" (Barnett and Finnemore, 2004, p.21). We understand aggregation processes not as purely rational processes of figuring out what works in a given situation where policy-makers look to experts for validated knowledge, but partly as political processes in which IOs seek to justify certain preconceived political approaches as impartial and scientifically validated and in which experts may act on their own initiative based on their normative and policy beliefs. In that sense, IOs' intermediation work of bringing together relevant actors with expertise is not neutral but can be deeply political, even though ironically the "greater the appearance of depoliticization, the greater the authority associated with the expertise" (Barnett and Finnemore, 2004, p. 25). In the absence of hierarchical power relations, they also use their authority to spread rules to other international organisations and national governments through a variety of mechanisms in order to achieve coordination and increase their reach. This conceptualisation deepens and nuances the claims by Schot and Kanger (2018) but fits well with their

view that the aggregation and intermediation work performed by IOs in the frenzy phase is purposeful and geared towards homogenisation and standardization of rules and practices internationally.

3. Research Design and Methodology

The research design for this paper involves testing the framework developed above, specifying proposition 5 of the deep transitions framework in a case study of an emerging meta-regime and specifically focusing on the role of a selected inter- or transnational organisation in absorbing, shaping and diffusing the norm. A case study approach is an appropriate research strategy for our purpose where we are interested in testing and further developing our conceptual framework in order to enrich the deep transitions framework, rather than aiming to generalize findings to populations of other IOs. Since the second deep transition is not a completed process, the only option we have is to select a contemporary case in which some of the processes of interest are already unfolding.

Selection of emerging meta-regime: circular economy

The wider deep transitions project team discussed a number of possible meta-rules or meta-regimes in the making to be the focus of the analysis, including circular economy, decentralized production, or the sharing economy. At a project workshop a final decision was made in favour of circular economy (CE) because compared to the alternatives considered, it has made more progress in terms of informing policy making and practices on the ground and inter- and transnational organisations have been involved which is key for our analysis.

There is a great variety of definitions of what a circular economy might be[1]. For example Geissdoerfer et al. (2017) define the circular economy "as a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing, and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling" (p. 766). Similarly, the Ellen Mac Arthur Foundation stresses that a CE is "an industrial economy in which material flows keep circulating at a high rate without entering the biosphere unless they are biological nutrients", while WRAP in the UK envisages the CE as "an alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life" (both cited in Kalmykova et al., 2018). Kirchherr et al. (2017) examined 114 definitions of CE and conclude that "circular economy is most frequently depicted as a combination of reduce, reuse and recycle activities" (Kirchherr et al., 2017, p. 221). About 40% of all definitions incorporate the so-called 3R framework. The official EU policy framework has

[1] For a review of different definitions see Kirchherr et al. (2017) and Korhonen et al. (2018).

been extended by a fourth R: recover (see Table 2). An essential idea at the basis of all R frameworks is that of a hierarchy, often referred to as a 'waste hierarchy' (Kirchherr et al., 2017). In case of the 4R framework, this means that activities related to reducing take priority over reusing, followed by recycling and lastly by recovering.

At a global scale, implementation of the CE is widely perceived to be at an initial stage, yet there are various examples of how the concept has started to guide behavioural changes in some sectors (Lewandowski, 2016; Kalmykova et al., 2018). To date, CE has mostly shaped practices in waste management and recycling, for example in the UK, Denmark, Switzerland and Portugal, where CE has been applied to the waste sector (Winans et al., 2017), while practices of reusing or remanufacturing materials and systematically reducing material consumption are still niche phenomena (Ghisellini et al., 2016; Ritzén and Sandström, 2017; Reike et al., 2018). Nevertheless, some companies are increasingly working towards extending their products' life cycle by offering maintenance and repair services (Lewandowski, 2016). Well-known examples include the clothing brand Patagonia, which won the Accenture Strategy Award for Circular Economy Multinational at the Davos World Economic Forum in 2017, and the Swiss office chair manufacturer Giroflex. In terms of national CE implementation, China is referenced most frequently. The country already adopted the CE concept as a national development strategy in 2002 (Yuan et al., 2006; Kalmykova et al., 2018) which since then has particularly shaped industrial production processes. It has influenced production at the level of individual companies, notably through requirements for cleaner production (Ghisellini et al., 2016) and at larger scales, through the introduction of eco-industrial parks (Winans et al. 2017) and plans to turn major urban centres into 'eco-cities' (Geng and Doberstein, 2008; Ghisellini et al., 2016).

CE is not bound by a specific socio-technical system but stands for a transformation of all production and consumption processes. The change envisaged to occur in terms of moving from a linear 'cowboy economy' (as Boulding called it in 1966) to a circular economy globally is therefore potentially on par with the magnitude of changes ushered in by the global mass production meta-regime after World War II, which is why we categorise CE as an emerging meta-regime (a set of rules which is starting to guide behaviour in multiple socio-technical systems). We argue that the 4Rs mentioned above – reduce, reuse, recycle, recovery – are meta-rules (i.e. single rules in multiple systems), which together constitute a set of rules for the coming circular economy replacing the linear economy, thus making CE a meta-regime (i.e. a rule-set in multiple systems) according to the classification of Schot and Kanger (2018)(see Table 1).

Table 2: Circular Economy as an emerging meta-regime with four constitutive meta-rules

Meta-rules	Description

Reduce	Consuming less natural resources and materials in processes of product manufacture and use
Reuse	Discarded products which remain in good condition and still fulfil their original function are reused by other consumers
Recycle	Processing materials to obtain materials of the same or lower quality
Recovery	Recovering energy from incineration of materials

Source: based on Kirchherr et al., 2017: 224

Selection of inter- or transnational organisation: the European Union

This case study analysis focusses on the role the European Union (EU), and more specifically the European Commission (EC), has been playing in the evolution and promotion of the CE norm internationally as the EU can be seen as a frontrunner in and promoter of the concept of circular economy. It is also a multi-policy issue organisation (rather than sector specific) and can therefore potentially play an important role in facilitating the diffusion of the rule set across socio-technical domains and in homogenisation and standardization processes within the EU and beyond.

While many academic publications of the last decade have focused on CE case studies – especially from China, where CE was already adopted as a national development strategy in 2002 – more recent work on policy developments comes primarily from European actors and a few international organisations (Kalmykova et al., 2018). Important contributions have been made by the European Commission (EC 2011, 2015a, 2018), the European Environmental Agency (EEA, 2014, 2016, 2017, 2018), other trans- or international organisations (OECD 2008, 2011, 2012; UNEP 2012, 2018a, 2018b, 2018c, 2018d), the World Economic Forum (WEF, 2014, 2016), as well as non-governmental research and advocacy organisations (Ellen MacArthur Foundation 2013a, 2015a/b; Circle Economy, 2018, 2019). However, in their reports, the OECD and UNEP have focused mostly on notions of resource productivity and value retention under the broader agenda of 'sustainable consumption and production' instead of circular economy (an exception being one of the latest reports by the International Resource Panel, UNEP 2018a).

The European Union in 2010 named resource efficiency as one of seven signature projects to pursue the Europe 2020 Strategy (Wilts and O'Brien, 2019). Subsequently, CE was mentioned in the Roadmap to a Resource Efficient Europe (EC, 2011) and the idea of a transition to a CE was further manifested in the EU Action Plan for the Circular Economy (EC, 2015a) , which was part of the Commission's Circular Economy Package (Bourguignon, 2016). Next to suggestions for legislative changes (formulated in the Action Plan (EC, 2015a)), the package also included funding of research projects with a volume of €650 million (Velte et al., 2018, p.775). The EU has therefore become one of the most important funders of CE ideas and practices. Importantly, the Commission's conceptual work on CE has influenced other

international organisations in defining targets of a CE and in recognizing their importance for policy-making – most notably the United Nations Environment Programme (UNEP 2018b; UNEP 30.11.2018). Therefore, we have selected to focus the case study on the EU and their role in promoting the transition to a circular economy. This is despite the fact that within the international relations literature the EU would not be classed as an international organisation since it has in many respects much more 'state-like' qualities (e.g. the ability to develop directly applicable law in member states through directives) but for the processes of interest in our analysis (the outward effects on other IOs or governments outside the EU) this is not pertinent.

Data collection and analysis

Data collection was undertaken mainly through documentary desk research and has been complemented by 9 semi-structured interviews with key actors knowledgeable about the concept of circular economy and the role of the EU in developing and spreading it internationally. The documentary evidence that was considered included central research findings on the evolution and development of circular economy concepts and debates as well as well as primary material (reports, policy papers, briefings) published by the EU itself, other international organisations, think tanks and charities. The documentary evidence was used to establish a rough timeline of events, inform the interviews as well as triangulate claims made by interviewees. The selected interviewees came from different types of organisations and involved both people from inside and outside the EU (see Annex 1). The interviews were conducted as semi-structured interviews based on a questionnaire, which operationalised the key concepts of the analytical framework developed above (see Annex 2). The interviews were recorded and transcribed and the transcripts were coded using the concepts from the analytical framework while being open for other influences which could not be ascribed to one of the processes conceptualised in the framework.

4. Case study: Circular Economy and the European Union

The framework developed in section 2 is in this section tested by applying it to a case study. After first introducing some background on the discussions about a circular economy as well as providing a short chronology of its evolution as a policy concept in the EU, we then turn to answering our two research questions:

1. *Why and how did the EU take up the concept of circular economy emerging in the transnational sphere?*
2. *How does the EU disseminate this emerging meta-regime to states and other international or transnational organisations?*

Academic origins and early developments of the circular economy concept

The concept of the Circular Economy (CE) has gained increasing attention from actors in science, policy-making and industry over the past decade. Valuing materials within a closed-loop system as opposed to dominant "linear take-make-dispose practices" (Blomsma and Brennan, 2017, p. 603) is regarded a promising approach to balancing economic development with human and environmental health (Winans et al., 2017; Ghisellini et al., 2016). The circular economy can be defined as "a regenerative system in which resource input and waste, emission, and energy leakage are minimised by slowing, closing and narrowing material and energy loops." (Geissdoerfer et al. 2017, p. 766)[2]. Despite the recent surge in interest in CE and use of CE language, the idea is not as new as is often assumed (Reike et al., 2018). Its origins are rooted in ecological and environmental economics as well as industrial ecology (Ghisellini et al., 2016). CE cannot be traced back to a single originator; it rather developed out of a variety of contributions and concepts including spaceman economy (Boulding, 1966), limits to growth (Meadows et al., 1974), cradle-to-cradle (Stahel and Reday-Mulvey, 1981) and steady-state economy (Daly, 2005). Table 3 gives an overview of different authors and publications that influenced the development of CE. Based on a review of current academic literature on the historic development of the CE concept, we traced the origins of CE thinking as outlined in these papers.

Table 3: Contributors to the conceptual development of circular economy.

Field/Concept **Author(s), Publication**	**Referenced by**
General System Theory Von Bertanlaffy (1950): An outline of general system theory Von Bertanlaffy (1968): General System Theory	Ghisellini et al. (2016)
Problematizing toxicity and scarcity Carson (1962): Silent Spring	Blomsma and Brennan (2017), Winans et al. (2017)
Spaceship economy Boulding (1966): The economics of the coming spaceship Earth	Ghisellini et al. (2016), Blomsma and Brennan (2017), Geissdoerfer et al. (2017), Winans et al. (2017), Kalmykova et al. (2018), Korhonen et al. (2018), Reike et al. (2018)
Limits to growth Club of Rome/Meadows et al. (1972): The Limits to Growth	Winans et al. (2017), Kalmykova et al. (2018)

[2] This definition draws from previous conceptualisations of CE. It has been adopted in the United Nations Environment Programme's first report on CE (UNEP 2018) and thus has been adopted by an organization from the international policy-sphere.

Closed Loop Economy Stahel and Reday-Mulvey (1981): Jobs for Tomorrow: the Potential for Substituting Manpower for Energy **Cradle to Cradle** McDonough and Braungart (2002): Cradle to Cradle: Remaking the Way We Make Things	Ellen Macarthur Foundation (2013), Blomsma and Brennan (2017), Geissdoerfer et al. (2017), Winans et al. (2017), Kalmykova et al. (2018), Korhonen et al. (2018)
Industrial ecology Frosch and Gallupoulos (1989): Strategies for Manufacturing Graedel and Allenby (1995): Industrial Ecology	Ellen MacArthur Foundation (2013), Blomsma and Brennan (2017), Geissdoerfer et al. (2017), Kalmykova et al. (2018), Korhonen et al. (2018)
Environmental economics Pearce and Turner (1990): Economics of Natural Resources and the Environment	Andersen (2007), Su et al. (2013), Ghisellini et al. (2016)
Ecological economics Daly (1996): Beyond Growth: the Economics of Sustainable Development Daly (2005): Economics in a full world	Winans et al. (2017), Kalmykova et al. (2018), Korhonen et al. (2018)
Regenerative design Lyle (1994): Regenerative Design for Sustainable Development	Ellen MacArthur Foundation (2013), Geissdoerfer et al. (2017), Winans et al. (2017)
Performance economy Stahel (2010): The Performance Economy	Ellen MacArthur Foundation (2013), Geissdoerfer et al. (2017), Kalmykova et al. (2018), Korhonen et al. (2018)
Biomimicry Benyus (2002): Biomimicry **Blue Economy** Pauli (2010): The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs.	Ellen MacArthur Foundation (2013), Geissdoerfer et al. (2017), Korhonen et al. (2018)

The evolution of CE as a policy concept in the EU: a short chronology

Reike et al. (2018), distinguish three historical phases of how the idea of a circular economy developed in political and industrial contexts, which we find to resonate with the specifics of the development inside the EU. This distinction largely overlaps with a previous one by Blomsma and Brennan (2017) who focus on the conceptual evolution of CE.

Phase one: waste (1970-1990)

In characterizing the first historical phase, Reike et al. (2018) point to a strong focus on waste as the output of production processes until the 1990s. This, as one of the interviewees describes, was very much related to widespread concerns of how to handle waste that emerged in the 1980s:

> *"There was this cover of a German magazine in the late 80s that showed these huge mountains of waste. And that, especially for policy-makers at the municipal level, was at that time the most pressing concern: If, as certain prognoses say, the volume of waste is going to double over the next few years, where do you want to go with all the waste?" (Interview 6).*

But not only the volume of waste was seen as a problem that needed to be tackled: Principles like "polluter pays" had not sufficed in limiting pollution so "end-of-pipe" treatment became the new rule (Reike et al., 248). Waste management and recycling in consequence became the focus of new legislation in several European countries, e.g. Germany, Austria and the United Kingdom.

Phase two: eco-efficiency (1990-2010)

In the context of broader international sustainability debates, mainly around the Rio-Summit in 1992, the rather exclusive focus on waste reduction was expanded by a shift to eco-efficiency thinking. It became increasingly apparent that next to waste and pollution, growing resource consumption was also causing environmental degradation. In avoiding environmental harm, not only output materials (as in waste) needed to be considered but also the reduction of input materials (as in natural resources). In terms of EU policy, this thinking was incorporated in the "6th Environmental Action Programme" (EC, 2002), where "waste" and "natural resources" were one of four thematic focal points, followed by the "Thematic Strategy on the Sustainable use of Natural Resources" in 2005 and the "Sustainable Consumption and Production Action Plan" (EC, 2008). In this period, the idea of a circular economy initially gained prominence within the sustainable resource management sector, as it allowed to view waste as a resource – an input material – and seemed to resolve the problem of too many unrelated concepts in this field (Blomsma and Brennan, 2017).

Phase three: resource-efficiency and circular economy (2010-present)

While thinking around eco-efficiency and sustainability already steered debates towards a more integrated way of conceptualising resource use (as being relevant in environmental, social and economic terms), they were still very much framed from an inherently environmental perspective (avoiding environmental degradation). Growing resource scarcity was mainly seen as a restrictive factor by business. This changed in 2009, when the new Commission started their work and the reduced use of resources was increasingly portrayed as not only being beneficial but more importantly a strategy to maximize value retention and to secure future economic competitiveness. Language at

that time also shifted from what was formerly framed as the "Natural Resources Strategy" or "Sustainable Consumption and Production" (SCP) to "Resource Efficiency". In terms of policy, this manifested in the adoption of the "Roadmap to a Resource Efficient Europe" (EC, 2011) as well as the creation of the "European Resource Efficiency Platform", a high-level body of member state representatives, MEPs as well as representatives from academia, industry and trade unions providing recommendations on how to achieve the visions set out in the roadmap.

It was in 2012 that the concept of the "Circular Economy" then became a central focus and more or less very suddenly replaced "Resource Efficiency" as the central label in EU policy debates that were concerned with achieving the aims set out in the Roadmap:

> *"They were just going, hang on, we're working on 'Sustainable Consumption and Production' and then it's gone to 'Resource Efficiency' and now there is the 'Circular Economy'-thing." (Interview 5).*

This manifested in a first legislative proposal (often referred to as the first Circular Economy Action Plan) in 2014, called "Towards a circular economy: a zero waste programme for Europe", which was then withdrawn by the new incoming Commission in the same year, only to be relaunched in 2015 as a new plan called "Closing the loop - An EU action plan for the Circular Economy" (EC, 2015a). But the shift from "Resource Efficiency" to "Circular Economy" was more than just a new label. Several aspects constituted a new way of thinking about necessary policies:

- An acknowledgement that not only existing waste legislation (e.g. waste directive 2008) needed changes (leading to amendments of four waste directives) but there was also a need to develop a specific strategy on handling plastics (which led to the "EU Strategy for Plastics" – the first EU policy to address a specific material) (Pardo and Schweitzer, 2018). The strategy includes a ban on several single use plastic products, such as cutlery, plates, cups, straws, and cotton bud sticks (EC, 2019a).
- An acknowledgment of the necessity to focus on all stages of a product's life-cycle led to an incorporation of debates and existing policy initiatives around eco-design (e.g. Ecodesign Directive from 2009) and to further develop them (resulting e.g. in the "Ecodesign Working Plan 2016-2019"). As a result, new requirements for material efficiency have been put in place to ensure the availability of spare parts, ease of repair and end-of-life treatment for several products (EC, 2019a).
- An acknowledgement that *"sustainability models needed to come out of the exclusive environmental corner"* (Interview 3) but also bear reference to economic topics such as innovation and industrial policy. This resulted e.g. in a communication by the European Commission on "A renewed EU Industrial Policy Strategy" (2017), stating an objective to build

on EU leadership in circular economy to support companies with innovations and in adapting to a CE transition (Pardo and Schweitzer, 2018).

In its Circular Economy Action Plan (EC, 2015a) the EC continuously stresses the role of member states in implementing the circular economy and pledges to engage with governments to change national legislation in areas such as product design and waste management. Following the action plan, several member states have indeed developed CE initiatives, ranging from national strategies, which in some cases specify legislative proposals and specific targets, to monitoring frameworks and initiatives at municipal or regional level. An overview of such initiatives is provided in

Table 4 and Table 5. In order to monitor progress made at the member state level, the EU developed a "Monitoring Framework for the Circular Economy" (EC, 2018a).

Table 4: Circular Economy initiatives by EU member states (based on Pardo and Schweitzer 2018)

Types of legislation	Member State examples
National circular economy strategies with targets	Denmark, France, Germany, Netherlands, Scotland
National circular economy strategies with qualitative objectives only	Finland, Italy, Luxembourg, Slovenia
National circular economy assessments	Greece, Spain
National indicator frameworks	France, Netherlands
Municipal or regional circular economy initiatives	Brussels, Catalonia, Flanders, London

Table 5: National circular economy strategies with targets by EU member states (adapted from Pardo and Schweitzer 2018)

Member State	Initiative	Description	Key objectives and targets
Denmark	Advisory Board for the Circular Economy – Recommendations for the Danish Government (2017)	National recommendations from the Ministry of Environment and Food	Increasing resource productivity and recycling, reducing waste production, increase employment in sharing economy, increase the share of eco-labelled products and services
France	50 measures for a 100% circular economy (2018)	Joint initiative from the Ministry for Ecological Transition and the Ministry for Economy and Finances	Reducing waste production, 100% recyclable plastics, reduce carbon emissions, job creation
Germany	Resource Efficiency Programme (ProgRess II) (2016)	National programme led by the Ministry for the Environment, Nature Conservation, Building and Nuclear Safety	Increase raw material productivity, enhance municipal recycling
Netherlands	A Circular Economy in the Netherlands by 2050 (2016)	Government wide programme for circular economy transition	Reduce the use of primary raw materials

Scotland	Making Things Last – A Circular Economy Strategy (2016)	Scottish Government led Circular Economy strategy to build a strong economy, protect resources and support the environment	Increase recycling and reuse of household waste, reducing overall waste production
Slovenia	Roadmap towards the circular economy in Slovenia (2018)	National Strategy contracted by the Ministry of Environment and Spatial Planning	Priority areas: food, manufacturing and mobility.

The meta-rules of reduce, reuse, recycle and recover have not only been manifested in EU policies, but also started to reshape business practices[3]. A popular example is the electronics company Philips, a partner of the Ellen MacArthur Foundation, who started selling lighting services instead of lighting products (Bonciu, 2014; Lewandowski, 2016; Ellen MacArthur Foundation, 2017b; Kalmykova et al. 2018). This way the company retains greater control of its products, which facilitates maintenance and provides an incentive to build products with a long life-span (Lewandowski, 2016; Ellen MacArthur Foundation, 2017b). Another example is the car manufacturer Renault which started experimenting with forms of recycling cars and manufacturing new cars from recycled materials entirely – an undertaking co-funded by the EU LIFE Programme (Bonciu, 2014; Ellen MacArthur Foundation, 2017c).

The EU and circular economy: meta-rule absorption

The different aspects of concept development as pictured support the claim that CE indeed constitutes a meta-regime in the making as a concept that has been absorbed by the EU and already influences policy and business practices.This leaves open the question of why and how the EU took up the concept in the first place (research question 1).

In short, we found this to be the case due to an interplay between various factors and developments, ranging from the specifics of the **political and institutional context**, the **characteristics and perception of central policy problems** that needed to be tackled and a variety of **influential actors from inside and outside EU institutions** which also led to a combination of different **learning mechanisms** that were at play.

What can be seen as an influential turn in the dynamics of debates (also initiating “phase three” as illustrated in the preceding section) was the appointment of the new College of Commissioners under the second term of José Manuel Barroso as president of the Commission in 2009. Janez Potočnik, who had already been Commissioner for Science and Research during the first Barroso-Commission from

[3] Various examples for CE business models implemented in practice can be found in Lewandowski, 2016; Ellen MacArthur Foundation, 2017a; and Kalmykova et al., 2018.

2004-2009, was appointed Commissioner for the Environment. Several factors characterized the general context in which Potočnik (and the rest of the Commission) started his work:

On the one hand, there was an increasingly pressing ecological crisis in which the link between resource use and climate change as well as biodiversity loss became increasingly apparent. This also led to the co-founding (and co-funding) of the International Resource Panel (IRP) by the United Nations Environment Programme (UNEP) and the EU. Made up of leading scientists from a range of academic backgrounds the panel should provide "authoritative and independent advice to decision makers globally" (EC, 2005).

On the other hand, there was a body of rather ineffective existing environmental and climate legislation at both global level *("You just had the Copenhagen Conference of the Parties in 2009 which was a disaster."* Interview 8, also mentioned in interview 6) and EU-level *("We were aware that a lot of existing environmental legislation wasn't being fully implemented."* Interview 2, also mentioned in interviews 3 and 5). Aside from an ecological crisis there was also an economic crisis fuelled by a variety of developments, one of it being the global financial crisis in 2007 and 2008: *"It was just after the financial crisis and we were aware that there wasn't much appetite for new legislation."* (Interview 2, also mentioned in interview 4 and 6). Another factor was the growing awareness of *"the volatility of a lot of commodity prices and the increased perception of a growing scarcity of natural resources."* (Interview 8). It was more and more acknowledged by both policy-makers and businesses that to secure the competitiveness of EU industries (which was also a main focus of the 2009 Lisbon Treaty) there was a need for a strategy on critical raw materials, also against the background of *"experiences with access to rare earths, which China started to reserve for their own future requirements."* (Interview 7, also mentioned in interviews 2, 4, 5 and 8).

With the new Commission coming in in 2009 there was also an institutional restructuring as the new Directorate-General (DG) on Climate Action was created and therefore climate was no longer an issue that was handled by DG Environment. This led to a shift in portfolios, leaving DG Environment in need of *"a new identity"* (Interview 6) and a portfolio that would sustain or even extend cross-cutting influence (interviews 6 and 7). And it was Potočnik as new Commissioner of the Environment and his Cabinet who were especially influential in shaping the new portfolio and putting "resource efficiency" on the agenda as a focal point:

> *"I would say the most important driver was Commissioner Potočnik himself. A lot of it came from his initial thinking when he was preparing his brief for his parliamentary hearing to be confirmed as Commissioner and his outlook on things. […] It [the environment] was a portfolio that he really wanted. But he is an economist."* (Interview 2).

Confronted with the outlined political and institutional context it seemed central to overcome the win-lose perception of environmental policy *"that environmental benefits would have to come at the cost of industrial competitiveness or general competitiveness and that doing good for the environment involved restrictive legislation and interfering with people's behaviours"* (Interview 2, also mentioned in interviews 1, 3, 6). One of the results of his efforts in this regard was that "resource efficiency" became one of seven "Flagship Initiatives" under the Europe 2020 strategy which was proposed by the Commission in March 2010.[4] This was followed by the "Roadmap for a resource efficient Europe" (EC, 2011) that served to spell out and substantiate the aims and visions laid out in the flagship initiative. To support this search for an alternative approach and facilitate policy development and implementation efforts, Potočnik brought together an expert group of economists on "The economics of environment and resource use"[5] in 2011 who should support him with independent advice during his time as commissioner (interviews 2, 7). In 2012, Potočnik and his team established the "European Resource Efficiency Platform" (EREP), a high-level body consisting of Members of the Commission and European Parliament, member state representatives, academics (including Prof Paul Ekins who was also the chair of the economists' expert group) as well as representatives from business, trade unions and consumer organisations.[6] Against the background of the Roadmap as the central policy plan at the time, the Platform should provide high-level policy advice on how to achieve implementation and therefore facilitate *"the transition process towards a more resource-efficient economy"* (EC, 2011).

It was also in the context of the first meeting of the EREP in June 2012[7] that "circular economy" gained attention in the Commission:

> *"I became aware of the work that was being done on circular economy by the Ellen MacArthur Foundation but also by others. So we invited Ellen MacArthur to come to Brussels in 2012 to give a presentation to about 90 top officials in the Commission, Directors, members of Cabinet and so on and she did that brilliantly. […] She was talking to a lot of very educated economists and lawyers and so on. But her explanation of the logic behind circular approaches was very compelling and very convincing. And that was really what I guess was the first thing that put circular economy on the map in the Commission."* (Interview 2, also mentioned in interview 5).

While resource efficiency, in substance, continued to be a central guiding principle, language from that point forward quite quickly shifted towards "circular economy" (interviews 4, 5). One of the reasons for this shift was that resource efficiency did not quite suffice in bringing together the environmental and economic perspective *("It wasn't really that overarching in the end.",* Interview 4) which is why it

[4] https://www.bmu.de/en/topics/economy-products-resources-tourism/resource-efficiency/resource-efficiency-in-the-eu/
[5] http://ec.europa.eu/archives/commission_2010-2014/Potočnik/expert_group/index_en.htm
[6] http://ec.europa.eu/environment/resource_efficiency/re_platform/index_en.htm
[7] http://ec.europa.eu/environment/resource_efficiency/re_platform/about/meetings/index_en.htm

did not quite appeal to other stakeholders outside the environmental corner (interviews 2, 3). As one of the interviewees summarized: *"Essentially it is about shifting concepts to try and find resonance within a shifting and dynamic group of stakeholders inside and outside of the policies."* (Interview 5).

What can be noted is that the influence of the Ellen MacArthur Foundation on why the concept of a CE suddenly gained quite a lot of traction in EU debates was argued to be very central by all of the interviewees. This also resonates with academic analyses on the origins and concept development of CE which quite uniformly portray the reports by the Ellen MacArthur Foundation "Towards a Circular Economy" Volume 1, 2 and 3 (2012, 2013, 2014) as having been very influential on the development of CE as a policy concept (Geissdoerfer et al., 2017; Kirchherr et al., 2017; Kalmykova et al., 2018; Korhonen et al., 2018). One of the central arguments was that through very effective communication and cooperation with stakeholders from both policy and business, the Ellen MacArthur Foundation in their reports and overall activities managed to developed a "positive" circular economy narrative that also resonated with business stakeholders (interviews 1, 3, 4, 5, 8):

> *"The way in which the Ellen MacArthur reports are done is a more effective communication than policy-makers have managed to date. So you've read the commission documents and it's just pages, they didn't even used to have any diagrams in it. And the Ellen MacArthur Foundation have been sending slide packs, something the business community is used to. And, not worried about science quite as much, but about headlines and storytelling. Because it's basically what works in business. And that I think was probably a key factor in the way that this disseminated."* (Interview 5).

The shift of language was then also followed by a first legislative proposal in 2014 called "Towards a circular economy: A zero waste programme for Europe" (EC, 2014a; mostly referred to as the first Circular Economy Action Plan) but was withdrawn only shortly after when the new Commission came in at the end of the same year (Domenech and Bahn-Walkowiak, 2019). Jean-Claude Juncker followed Barroso as the new President of the Commission, bringing in ten new priorities for his presidency but environment *"was nowhere to be seen among his priorities"* (Interview 3). Rather his top priority was "jobs, growth and investment"[8]. However, the withdrawal of the first Circular Economy Action Plan sparked very controversial debates from a range of stakeholders that had been involved in the development of the Action Plan but also from inside the European Parliament (interviews 2, 3, 5, 9):

> *"The initial huge public discussion that we had on whether the first Circular Economy Action Plan should actually just be put into the dust bin or whether we should continue work was very helpful because it actually brought out the industry stakeholders. While they were probably not too happy with the first package of July 2014, they actually wanted to continue to discuss this and continue to engage."* (Interview 3, also mentioned in interview 4).

[8] https://ec.europa.eu/commission/priorities_en

Following those public debates, the new Commission eventually started to consider a potential re-launch of the Circular Economy Action Plan. More specifically, it was under the responsibility of First Vice-President Frans Timmermans that the Commission started work on a potential new Circular Economy Action Plan: *"What the College of Commissioners and especially Timmermans said was that we need to construct a system-wide model actually bringing together the economic, social and environment narrative and insert it into the priorities of the commission."* (Interview 3).

Kurt Vandenberghe, former Head of Cabinet under Potočnik and then Director for 'Climate action and resource efficiency' at DG Research and Innovation in the new Juncker-Commission, then brought in another group of experts on a "Systemic Approach to Eco-Innovation to achieve a low-carbon, Circular Economy". The group was composed of *"three or four representatives from industry and a handful of likeminded academics"* who should work out an expert report for the commission that *"convinces us, the Commission, that circular economy is indeed a viable concept"* (Interview 8). The report called "From Niche to Norm" (EC 2015c) was completed and presented to the Commission and the European Parliament by the expert group *"right during the last days and weeks of the final vote about the second Circular Economy Package in the Commission"* (interview 8). While other factors and activities certainly also influenced the adoption of the second Circular Economy Action Plan (not least the reports and activities from EMAF), the expert group successfully managed to elaborate the holistic and systemic dimension of circular economy as a new economic model, thereby directly connecting it to Juncker's top priority of jobs, growth and investment (interview 3, 5, 8).

As already stated, we would argue that the adoption of the second Action Plan could be characterized as a central indicator that the idea of a circular economy has been ultimately absorbed by the EU as a new policy concept. Of course, as we showed in the preceding section, concept development did not stop in 2018. There were a number of EU policies (e.g. on eco-design or plastics) that can be seen as an attempt to fill the emerging space of the broad vision that was drawn by the new Circular Economy Action Plan with more specific content and therefore further facilitate concept development as well as practical implementation.

Summary

So, why did the EU take up circular economy as a new policy approach? This can only be explained as a combination of several factors that range from the specifics of the context (restructuring in the Commission) and the perceived policy problem (ecological and economic crises) to the specific actors that turned out to gain special influence (Potočnik and his Cabinet; Ellen MacArthur and her foundation; Timmermans and Vandenberghe; expert groups; expert panels) but whose activities were very strongly influenced by the contextual conditions that opened certain windows of opportunity for

them (policy ineffectiveness and need to overcome win-lose perception of existing environmental legislation; incoming Juncker-Commission with priority on jobs, growth and investment).

Regarding the question of *how* the absorption took place the picture is also not very clear-cut. Reflecting on our analytical framework and the different logics of institutional learning that Dunlop (2015) proposed, it can be noted that it was indeed a combination of learning mechanisms that led to the evolution of circular economy as a new policy concept. To some extent it can be said that some of the learning was organised as "governmental", meaning that it was policy-makers who, acting on an epistemic deficit or to underpin certain pre-existing policy beliefs, brought in experts in panels or expert groups to provide expertise on a complex policy problem. This can be said for the case of both expert groups as described in this section and also to a certain extend for the establishment of the "European Resource Efficiency Platform" and the founding of the International Resource Panel. On the other hand, there was a lot of purposeful activities by a network of business and advocacy oriented actors that formed around the Ellen MacArthur Foundation who gained very meaningful influence in a very short period of time. These actors were not (at least not primarily) brought in by policy-makers but acted upon their own normative and policy beliefs. So it was a combination of different logics of institutional learning, whereby some research would suggest that the activities around the Ellen MacArthur Foundation and the Network of practitioners turned out to be the actual substantially significant influence on the development of circular economy as a policy concept (Korhonen et al., 2018).

The EU and Circular Economy: global meta-rule diffusion

As already outlined in the previous sections, within the EU CE has not only influenced policy practices (at EU level but also within member states) but to a certain extent also practices of production (and to a lesser extent consumption). However, in line with the proposition in the deep transitions framework on the role of IOs, we are especially interested in how the "aggregation and intermediation work" of the EU diffuses the emerging meta-regime of CE to other states and other international or transnational organisations. Regarding our second research question about how the EU contributes to the diffusion of the emerging meta-regime around circular economy, we found that the EU uses multiple instruments.

Since adopting the second Circular Economy Action Plan, the EU has been frequently involved in international debates, trying to "sell" the idea of the circular economy. This quote from one of the interviews summarizes quite well, what an EU civil servant claims what they have been doing in this regard:

> *"We have used all the tools. We have used the approach of establishing a Memorandum of Understanding or partnership statements to do work on specific lines under circular economy. We have funded projects within international organisations and programs. We are working on inserting the concept into free trade agreements. We use it horizontally, wherever we have an entry point we do it. We've pushed this in G7, we have pushed this in G20 and most recently, at the 4th United Nations Environment Assembly, we managed to adopt a resolution on 'Innovative pathways to sustainable consumption and production' which talks extensively about circular economy and there is also a specific reference in the Ministerial Declaration from that same meeting."* (Interview 3)

For many of these instruments the central question is whether there actually has already been a diffusion in a sense that these efforts actually influenced (policy and other) practices in the 'receiving' countries and organisations. In the following section, we therefore take a closer look at the different instruments and how they can be categorized in relation to our analytical framework, in what sense they aim at influencing practices and whether there already is evidence that they have been successful in doing so.

'Bilateral' diffusion towards third countries

Memorandum of Understanding with China

One of the key instruments named by the people we interviewed is the "Memorandum of Understanding on Circular Economy Cooperation" between the EU and China which was signed in July 2018 (EC, 2018b). The Memorandum can be characterized as a high-level policy dialogue in the form of bilateral and multilateral meetings, information exchange on research, capacity building, training programs, workshops and personnel exchange activities. The Memorandum has been signed between the European Commission and the National Development and Reform Commission of the People's Republic of China. The aim is to establish yearly meetings to work on thematic issues, e.g. for 2019 it will be plastics. While one of the interviewees characterized the Memorandum as *"the most comprehensive"* instrument with a *"structured approach"* (interview 3), another interviewee said: *"This could have happened a little bit faster and also with a little more substance. And as far as I know, nothing really has come out of it yet."* (Interview 6). It is also unclear whether this can be interpreted as an attempt to diffuse the concept since China is one of the frontrunner countries when it comes to the circular economy and adopted it as a core policy principle significantly before the EU did. In that sense the exchange between experts from the EU and China could rather be interpreted as a form of international policy coordination and an attempt to share best practices which the deep transitions framework considers to be an important part of aggregation and intermediation work.

SWITCH to green Flagship Initiative

Another instrument that is used by the EU to diffuse the concept of CE and associated meta-rules to third countries is the "SWITCH to Green Flagship Initiative" which *"should be seen in the context of the EU action plan on circular economy, which acknowledges the global dimension of the circular economy and foresees EU cooperation with international organisations and other interested partners as part of the global efforts to reach the 2030 Sustainable Development Goals."* (SWITCH to Green, 2019) The flagship initiative thereby builds on several initiatives, in particular the three SWITCH regional programs in Asia, Africa and the Mediterranean. As one of the interviewees summarized, the SWITCH Programs are "*400 Million Euro worth of EU spending on propagating Sustainable Consumption and Production, Green Economy and Circular Economy in developing countries"* (Interview 8). The SWITCH programs each have three components, (1) a policy component (*"helping countries to develop and apply policies for sustainable consumption and production…that's what it has been framed originally"*), (2) a project funding component *("They make a call for tender and get institutions in the countries to send in proposals for projects")* and (3) a network facility component *("It is kind of a hub inside the program, which is supposed to stick the various bits together to insure information transfer, so the results of the projects feed into the policy advice that's given. And vice versa the policy advice that's given has some relevance to the projects when they are helping governments make policy.")* (Interview 8). This seems a promising instruments as it covers both policy development aspects as well as learning by doing through the project funding as well as networking and knowledge exchange. However, there is no information available to ascertain the impacts of this programme in the three target regions.

Circular Economy Missions

The EU Circular Economy Missions are a series of high-level political and business delegations to third countries that should serve a range of different (and rather vague) aims (EC, 2019b):

- communicate and promote sustainable and resource-efficient policies;
- connect European institutions, NGOs and companies with relevant stakeholders in third countries;
- support European businesses (esp. SMEs) in expanding their activities abroad (through establishing business partnerships).

Past missions between 2016 and 2019 went to Chile, China, South Africa, India, Colombia, Mexico, Japan and Indonesia, and planned missions will be going to Malaysia and Singapore in June 2019. The missions have a focus on topics related to eco-innovation, chemicals and plastic, waste, water management, marine pollution and urban environmental best practices. In a rather targeted, country-specific way, the overall aim is *"to have a policy discussion about circular economy and to see whether the country in question could be interested in interacting with us or even considering to see how that [circular economy] would sit with its own strategies for industrial and economic development"* (Interview 3). But apart from a general policy dialogue there is also an interest in

diffusing best-practice in terms of innovative business solutions as well as with regard to new technologies. There are several references to business representatives presenting such solutions, e.g. with regard to sustainable sourcing of raw materials (representative from Tetra Pack during mission to Indonesia) or on waste processing (representative from BASF also in Indonesia). There is no evidence yet on whether theses missions actually influenced practices in terms of national policies or business practices in the respective countries. But the potential of these Missions should not be underestimated as one of the interviewees stated:

> *"I have got this feeling that if some of these countries where they have taken Circular Economy Missions really run with it, this could have a real impact on the rest of the world. If you have a Circular Economy mission, what does that do for the competitiveness and net gains you make from using your natural resources? If you get more product out of fewer resources, if you get less pollution out of the same amount of product, and if you reduce your costs and increase your competitiveness, why would you not do Circular Economy?" (Interview 8).*

Trade agreements

Several of our interviewees pointed to the possibility that trade agreements would provide a good bilateral instrument for the further diffusion of the circular economy concept (interviews 3, 4). Indeed there already are isolated examples of such an incorporation of CE in trade agreements. The trade agreement between the EU and New Zealand e.g. contains the commitment that "New Zealand will also aim [for] the transition to a circular economy" (EC, 2019c). There is also the Free Trade Agreement between the EU and Vietnam that contains a paragraph on the "remanufacturing" of goods which can be seen an important part of the circular economy concept. These rather isolated examples do not really resonate with the assessment by Pardo and Schweitzer (2018) who state that "the EU has become a frontrunner by pushing for the adoption of global standards related to product durability, reparability and recyclability and by including the circular economy in the Sustainable Development chapters of its Free Trade Agreements" (Pardo and Schweitzer, 2018, 4) while not mentioning specific country examples. Since the use of trade agreements is also a rather new instrument it is not yet clear if this actually leads to influencing national policies or business practices in the respective countries. But from what was stated by officials from the commission during the interviews but also the assessment by Pardo and Schweitzer, this could be interpreted as high on the agenda in the EU context.

Multilateral diffusion towards other inter- or transnational organisations

United Nations Environment Programme

As of yet, multilateral efforts of the EU in terms of CE diffusion seem to be mainly geared towards United Nations contexts. One recent example of what could be interpreted as the successful use of

multilateral negotiation as a diffusion instrument is the 4th United Nations Environment Assembly which took place in Nairobi in March 2019. The EU *"has tried very hard to put the circular economy concept into the discussions on Sustainable Consumption and Production in the United Nations Environment Assembly resolutions. […] So now the sustainable production and consumption definition is basically circular economy"* (Interview 5). Indeed there is now a reference to circular economy in the resolution on "Innovative pathways to sustainable consumption and production" as well as the related Ministerial Declaration.

Another example of diffusion in the context of UNEP is the International Resource Panel. As already outlined in a previous section, the EU and UNEP are co-founder and co-funder of the IRP, and the EU and UN Environment are also both members of the steering-committee, alongside states and other "strategic partners" such as OECD, EMAF, the International Council for Science (ICSU) and others. Moreover, in 2014, former EU Commissioner for the Environment Potočnik has been appointed co-chair of the IRP. This rather tight bond between the EU and the IRP makes clear that the relationship between both is not just a learning relationship but the IRP can also be characterized as a diffusion instrument, as one of the interviewees stressed:

> *"So for example at UNEA there was the Global Resource Outlook produced by the IRP. That is basically the international diffusion of the science on why you need resource efficiency, circular economy and SCP. And you know because they are funding the IRP, then the EU certainly partly funded that report, which had a critical role in framing a lot of the discussions at the UNEA Forum"* (Interview 8).

G7 and G20

The role of the European Union towards other multilateral fora such as the G7 or G20 are not easy to assess. Apart from the EU saying that they "are pushing it" in both G7 and G20 contexts, there is rather little evidence on specific activities that could be conceptualized as diffusion efforts by the EU. It can be noted that in terms of *language,* Circular Economy has not been particularly present in both multilateral fora. There have been, however, some events, high-level meetings or thematic workshops in the realm of resource efficiency which the EU itself summarizes as follows: *"The European Commission has organised thematic events to foster the G7 and G20 resource efficiency agendas, showcasing opportunities and challenges, best practices and policy recommendations."* (EC, 2019d). This best practice orientation of the EU work towards those multilateral fora is also underlined by one of the interviewees who has been involved with the Commissions work towards the G7:

> *"It is basically fixing up workshops to try and introduce exchanges of best practices of policies. And typically that's on specific policies because to people who don't understand the systems dynamics of transitions that [circular economy] is very difficult to sell. So you're really looking*

at what we could do on plastics, what we could do on marine litter, what we could do on extending the lifetime of products and then introducing them to those things" (Interview 5).

As with other policy discussion in the G format, there is a possibility that the discussions at these fora can influence national policies: *"The G7 was talking about plastics and Canada didn't have an agenda on plastics. And so they had to write a domestic agenda"* (Interview 5).

Summary

The analysis of the international diffusion activities shows that the EU is indeed very active in promoting CE norms globally and uses a variety of 'bilateral' and multilateral channels for this. For most of those, however, it is rather difficult (and maybe also too early) to determine whether they are successfully influencing behaviour of relevant actors through these activities. Much of the focus seems to be on 'bilateral' instruments and there is at least some detail on these activities which helps to ascertain their potential pathways to impact. However, especially in the context of activities towards multilateral fora it seems to be very hard to determine whether EU activities actually influence behaviour. To follow up on this in more detail is unfortunately beyond the scope of this paper but is an important avenue for further research.

In any case, according to proposition 5 of the deep transitions framework, IOs "bring together experiences and ideas from different sectors, nurture mutual learning processes, help to establish networks between various stakeholders, and shape expectations about the future of the niches" (Schot and Kanger, 2018, p. 1054). This seems indeed to be what is happening, although it is less clear from our analysis presented above whether the EU is particularly aiming at bringing together actors from different sectors to facilitate and accelerate the creation of between-system links. Further research is needed to nuance out findings in this regard.

Our conceptualisation presented above argued that the power of IOs depends to some extent on their authority which is gained and preserved by the IO's external perception as serving a "legitimate social purpose […] in an impartial and technocratic way using their impersonal rules" (Barnett and Finnemore, 2004, p.21) and that the "greater the appearance of depoliticization, the greater the authority associated with the expertise" (Barnett and Finnemore, 2004, p.25). It is therefore curious that one of our interviewees' points out that the EU is partly working through multi-lateral fora and an expert body like the International Resource Panel in order to increase the legitimacy of CE:

"What I took away from my understanding of what makes an impact from science is that there is new information, which is one point, but only a very small part. The rest depends on timing, relevance, a form of communication, a messenger and trust in that messenger and the format. […]

What the Commission is doing in trying to work through the IRP and the G7 and the UN, is to create a messenger which is trusted." (Interview 5).

This could be interpreted in two ways: In one sense, this suggests that the EU is not sufficiently seen by non-member states and international or transnational organisations as being 'impartial and technocratic' and therefore indirectly seeks to work through other bodies and actors who have a higher 'appearance of depolitization'. Alternatively, a more positive interpretation could be that the EU - alongside its 'bilateral' work - is also committed to working with other relevant organisations and promotes the further emergence of a transnational (policy) expert community on the issue of circular economy in order to create a network and share lessons.

Having summarised the answers to our two core research questions, in the following section we reflect on some of the insights from the case study and discuss wider points related to the role of international organisations in deep transition processes as conceptualised in the deep transitions framework.

5. Discussion

Our analysis of the processes through which the EU absorbed circular economy thinking (RQ1) identified a range of influential actors involved in the process, but conceptually left us with two questions: Was there actually something that Haas and colleagues would define as an epistemic community? If so, how would we characterize this community?

On the one hand, the set of different key actors that influenced the development of CE as a policy concept in the EU can be interpreted as the formation of an epistemic community including academic experts, commission officials, business representatives as well as the Ellen MacArthur Foundation. This network of actors has successfully been institutionalised within the EU or is at least very closely linked to formulating agendas and policies given its impact. We argued that the institutional learning was partly organised as "governmental", with policy-makers actively looking for a solution to solve a complex policy problem but that the perception of this epistemic deficit was also influenced by certain pre-existing assumptions (policy beliefs) held by a group of policy-makers, namely that if sustainability issues should be solved you needed to create a more positive economic narrative. Apart from learning initiated by policy-makers, we argued that there were also many purposeful activities by a network of business and advocacy oriented actors that formed around the Ellen MacArthur Foundation who acted upon their own normative and policy beliefs and gained influence on Commission thinking.

On the other hand, experts significantly disagree about how to conceptualise the circular economy and specifically about how to best achieve the transition towards a circular economy. Reike et al. (2018) argue that there are three main, interrelated points of disagreement between what he calls a reformist

and a transformationist school of CE: the need for absolute resource input reduction (i.e. absolute reduction vs eco-efficiency), the need for a modification of the economic order (i.e. the capitalist system) and the balance between sustainability dimensions (so whether or not social considerations are explicitly included). In the reformist school Reike et al. place actors like the Ellen MacArthur Foundation, the EU, OECD and WEF, while the transformationist school consists of a 'handful of critical scholars'. Reike et al. (2018, p. 2050) further argue:

> "Taking these controversies in CE into account, it is apparent that there are still fundamental paradigmatic divides in conceptualization. Arguably, the reformist school copies the more general 'win-win' framing of sustainability which emerged during the 1990s and which was indeed successful at encouraging sustainability efforts of businesses. In that sense, it is understandable why scholars have claimed the good fit between CE and other approaches for ecological modernization. Still, writings stressing the easy fit or embedding it in a healthy growth rhetoric for persuasion, and failing to point out the new elements of CE, hardly carry legitimacy in calling CE new and transformational, instead rendering it merely a refurbished concept to be placed – also evolutionary speaking – among other sustainability initiatives. Conversely, if creation of circular systems implies clear recombination of the established teachings, as to imply major institutional changes or even modifications to our economic model, then CE can legitimately be termed a new approach with potential for transformative impact."

In this sense one can interpret CE as an emerging meta-regime that is not only contested from mainstream regime actors who have little interest in making the shift to a circular economy, but also from academic critics who argue that the concept has been stripped of some of its more radical connotations and is instead promoted by powerful actors focussing on notions more in line with continued economic growth and business opportunities.

This may be regrettable from an environmental point of view and may initially limit the outcomes in terms of reducing material throughput for example, but at the same time, this (selective) focus arguably made the rule set politically more attractive and therefore potentially more successful. This dilemma ties in closely with discussions within the transitions literature about 'fit-and-conform' and 'stretch and transform' strategies. Smith and Raven (2012) argue that the empowerment of niche innovations can be understood either as processes that make niche innovations competitive within unchanged selection environments (fit-and-conform) or as processes that contribute to changes in mainstream selection environments in ways favourable to a path-breaking niche innovation (stretch-and-transform). Based on a number of case studies, Raven et al. (2016) unsurprisingly find that fit-and-conform strategies are more prevalent than stretch-and-transform strategies as they enrol powerful established interests more easily. While actors may initially focus on fit-and-conform strategies (in this case tying the concept of circular economy to dominant values and worldviews around the necessity for economic growth and new business opportunities), gaining political momentum may provide them

with opportunities to also pursue more radical stretch-and-transform strategies in terms of changing such underlying world views and institutions to enable the circular economy idea to fulfil its full social and environmental potential.

Our analysis of how the EU disseminates the emerging meta-regime to states and other IOs (RQ2) showed the variety of bilateral and multilateral channels the EU has been using to promote the concept of CE internationally. On reflection, one of the special features of the case study is that the EU in some respects is more powerful and potentially more effective than other inter- or transnational organisations, since – as pointed out above – it has several aspects in which it has 'state-like' qualities (e.g. the ability to develop directly applicable law in member states through directives). Above we argued that such EU-internal powers are less relevant for the processes of interest in our analysis (the outward effects on other IOs or governments outside the EU). However, our analysis showed that the EU has at its disposal and makes use of a variety of additional channels other IOs do not have (e.g. bilateral and multi-lateral foreign diplomacy, negotiating free trade agreements) as well as more resources than "normal" IOs (e.g. significant research or project funding) in order to promote the diffusion of the emerging meta-regime circular economy. This may also mean that if the EU is not successful at the aggregation, intermediation and standardization work (which currently is still an open question), then other IOs have even less of a chance. This does not mean that international or transnational organisations are not important actors in the spreading of meta-rules, but it nuances the high expectations placed on them in the deep transitions framework.

The deep transitions framework sees IOs mainly playing a role in the frenzy phase in which multi-regime interaction leads to increasing coupling between regimes and to the formation of alternative, possibly competing sets of meta-rules. Based on our empirical analysis we argue that the concept of CE can indeed be understood as a set of meta-rules (a meta-regime) in the making. It mainly comprises of several meta-rules (reduce, reuse, recycle, recover) that had already been evolving in formerly more or less separate strands of (policy) discussions (but not necessarily in different regimes). According to the deep transitions framework, IOs play a key role in this phase as they help with facilitating links across systems through aggregation and intermediation work. By taking up these different meta-rules, aligning and complementing them under the narrative of a circular economy and diffusing the language and idea behind it, the EU is playing an important role in the development and diffusion of this emerging meta-regime, using a variety of mechanisms identified in our framework. Judging on the basis of our analysis, it is also possible for such sets of meta-rules to be emerging and gaining traction without first becoming dominant in a specific socio-technical system. The circular economy set of meta-rules is rather a set of rules which influences niches in various socio-technical systems from waste management, to energy production to business models and consumer practices in the textile industry.

This process is still in its early stages – there has been rather little implementation as of now (most impact has been in waste management but CE is not yet rearranging global industrial strategies to majorly reduce environmental impact). Another indication of this process still being in a rather early stage is that internationally, CE is still competing with other potential meta-regimes which e.g. focus more on demand/consumption in addressing resource depletion (e.g. international discussions about sustainable production and consumption). Hence, CE is generally far from becoming *the* dominant meta-regime advanced by leading countries and from providing directionality across many socio-technical systems (Schot and Kanger 2018) which is envisaged to happen in the turning point and synergy phase. One can only speculate that for example the increased attention to and condemnation of plastic waste polluting the oceans will be the kind of accumulation of a longer-term trend mentioned by Schot and Kanger which could provide an impetus for tilting the playing field towards the circular economy set of meta-rules away from the linear cowboy economy. The recent ban on some single-use plastic products in the EU by 2021 (European Parliament, 27.03.2019) could point in that direction.

In contrast with the deep transitions framework, our analysis points to international organisations and their associated epistemic communities potentially also playing an important role in earlier phases of deep transitions, not only in the frenzy phase which is about homogenisation and standardisation of rules. While such work by IOs may be important, our case study shows how the EU was also very active in the initial development of the set of meta-rules. In the case of CE, the European Commission was very much involved alongside actors such as the Ellen MacArthur Foundation to create a powerful framing which provided a solution for the complex environmental policy problems governments are facing globally. Together with a range of diverse actors (incl. the government of China) it is now involved in 'filling' this idea with content in terms of how policy, industrial and consumer practices will have to change in order to implement this concept, rather than only sharing established 'best practices'. This finding potentially suggests a much more pervasive role of IOs in deep transition processes than the framework allows for. The challenge for the transitions community therefore remains to pay more systematic attention to IOs as active and purposeful actors in transition processes at various stages and in various ways. We hope our paper will inform further work in this direction.

6. Conclusion

This paper builds on the emerging strand of work on deep transitions within the sustainability transitions research community and focussed on the role of international organisations in deep transitions. While the deep transitions framework presents some initial ideas on the role of IOs, and in the context of a dearth of literature on IOs in transitions more generally, this papers makes two novel

contributions: Conceptually, it complements proposition 5 of the deep transitions framework with a more detailed understanding of the nature of IOs, the processes through which they absorb and co-develop new rules in interaction with transnational expert networks, as well as processes through which IOs can contribute to the further spreading of rules internationally. Empirically, it makes a novel contribution by focussing on the emerging meta-regime of the circular economy which we argue has the potential to contribute to the second deep transition by transforming the current linear mass production and consumption model of make-use-dispose towards a circular economic system which focusses on closing energy and material loops.

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Annex

Annex 1: List of interviewees

	Organisation/Interviewee	Type of organisation	Interview date
1	European Environment Agency	Public Sector Agency	15.03.2019
2	European Commission, DG Environment	Policy-Making	19.03.2019
3	European Commission, DG Environment	Policy-Making	20.03.2019
4	European Policy Think Tank	Think Tank	08.04.2019
5	Policy Expert EU environmental diplomacy	Policy-Making	17.04.2019
6	University Researcher	Research	25.04.2019

7	Public Research Institute	Research	29.04.2019
8	United Nations Environment Programme	Policy-Making	29.04.2019
9	European Environmental Bureau	Civil Society	02.05.2019

Annex 2: Operationalisation of key concepts

Central concept	**Definition**	**Operationalisation through interview questions**
Epistemic community	- Self-regulating enclaves - Governmental - Interested parties, self-selecting policy-actors driven by normative and policy beliefs - Already institutionalized part of the IO/EC as part of the winning political coalition in the IO	Difficult to ask about directly, but guiding questions are: What (coalition of) actors were active in promoting the concept of the circular economy (CE)? What are their key characteristics? This will also come out through the specific questioning but it should most likely be covered by questions regarding context/absorption.
Characteristics of a policy problem / the general context	When does institutional learning occur? Complexity and uncertainty of a policy problem that occurs out of a situation of deep crisis. Both complexity and uncertainty thereby often stem from the same characteristics of a policy issue, namely it being • transboundary in scope and • its underlying cause-effect relations as well as assumed solutions being seen as inherently scientific or technical as opposed to political • certain degree of differing assumptions regarding the appropriate policy options to meet the challenges IOs with a strong science and technology portfolio are more likely to engage with an epistemic community	Which policy problem was the concept of CE supposed to solve? Specific incidents/crises/widely publicized shocks that led to the search for validated knowledge and policy advice? Transboundary in scope? Pan-european in this case? Technical rather than a political problem? What were other potential solutions to the same problem? Why has the EU been a central policy actor regarding the specifics of the policy problem (unlike other IOs or states)?
Absorption	How does institutional learning occur? - Initiated by IO because of epistemic deficit through recruiting, research funding, selected advisory panels or other bodies - Initiated by EC because of normative and policy beliefs through direct persuasion, advisory panels, …	Where did the concept of a “circular economy” originally come from to be taken up by the EU? On whose initiative?

Diffusion	- training, demonstration effect, project funding, anticipation of project funding, leadership by IO officials and sponsor meetings - observing, measuring and evaluating performance, through targets, indicators, league tables and benchmarking - interagency coordination, jointly administered programs and co-financing - science diplomats	Who are the EU's efforts towards promoting a circular economy aimed at? What are the channels and mechanisms the EU uses to deploy circular economy policies to other IOs or states? Examples?