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Circular economy as a performative concept based on a rational utopia

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Abstract

The concept of Circular Economy has attracted increasing attention from scholars in the last ten years as a new paradigm to reconcile economic value creation with environmental frugality. Hitherto, researchers have mostly tried to found this concept on scientific grounds or analyzed how organizations are trying to implement it. But few works have studied the reasons why Circular Economy gets such a momentum and fosters collective action within society. The question we raise in this paper is: what mechanisms underpin the collective dynamic currently shaped by Circular Economy? To answer this question, we have analyzed the mechanisms through which organizations commit to Circular Economy. We conducted a qualitative study to explore a group of heterogeneous organizations which are involved in Circular Economy projects in the building and furniture sectors in Paris region. We show that Circular Economy has been built and works as a rational utopia (Metzger, 2001) which has the ability to wield performative effects (Callon, 2007). By performative effects, we analyze how this rational utopia is concretely mobilized in the course of action to provide cognitive resources for collective action, and particularly to materialize idealized visions into projects and commitments. Eventually we propose a framework conceptualizing the organizational processes through which the underlying rational utopia of Circular Economy becomes performative and materializes.

Introduction

Over the past ten years, Circular Economy has gained a real momentum and seems pretty appealing for many different actors (international organizations, small and large companies, public local authorities, associations...). The concept of Circular Economy is perceived by all these actors as a relevant approach to tackle environmental challenges and achieve a sustainable transition. Actually, numerous practitioners and researchers consider that Circular Economy (CE) is a new paradigm to conciliate economic growth with sustainability (Merli et al., 2018; Korhonen et al., 2018b). However, so far, there is not any official or standard definition of this concept; as a result, a lot of works in the recent academic literature on CE have been focusing on settling a common and shared definition of CE (Korhonen et al., 2018a, 2018b, Kirchherr et al., 2017; Prieto-Sandoval et al., 2018). Besides, as many organizations are struggling to develop and implement circular products and services, other researchers have also carried out studies to unveil the issues faced by organizations that are trying to implement CE (Kirchherr et al., 2018), or designed methods and tools that can be used by organizations in order to set up circular products and services (Lieder et al., 2016).

Consequently, few works have studied the reasons why so many organizations are attracted by the concept of CE and are willing to design and produce circular products and services, and why so many organizations are prompt to initiate projects fostering the rise of CE within society. As a result, in this paper, we address the following question: what organizational mechanisms underlie the collective trend and dynamic around CE? A few years ago, scholars have introduced the concept of “rational utopia”, showing it can be particularly relevant for analyzing the cognitive and organizational mechanisms which underpin organizational and societal change (Aggeri, 2017a, Metzger, 2001). Therefore, to answer this question, we have chosen to study a group of heterogeneous organizations (large private companies, small & medium enterprises, consulting companies, public local authorities, public administrations) which are interested in CE and have decided to embed CE into their own organizational processes, or to launch CE related projects.

We have also chosen to focus on the building and furniture sectors because, due the countless construction projects which are on progress in Paris Region, they represent key issues regarding waste management and recycling. Thus, we have conducted a qualitative

study to analyze how these organizations are dealing with CE from a theoretical and practical point of view. In the following parts of the paper, we present our literature review, then we show that CE has been built by key players and works as a rational utopia (Metzger, 2001), then, we show that this rational utopia has the ability to exert performative effects (Callon, 2007) on organizations and conceptualize the mechanisms through which this rational utopia provides cognitive resources for collective action allowing organizations to materialize idealized visions into projects and commitments.

Literature review: Circular Economy, Rational utopia and Performativity

In our literature review, we first discuss the theoretical approaches that have been used to conceptualize Circular Economy (CE) and design implementation strategies and tools; then we analyze the concept of rational utopia, highlighting why philosophers and sociologists have been interested in this concept to analyze societal and organizational change and why it can represent a relevant concept to scrutinize CE's performative effects.

Conceptualizing and implementing Circular Economy (CE)

CE does not constitute yet a real field of research recognized at the academic level; rather, it is a recent concept coming from practitioners, which is now at the crossroads of engineering and social sciences. This still emerging concept is articulated with other concepts such as Industrial Ecology or Cradle-to-Cradle. The concept of Industrial Ecology has been introduced by Frosch and Gallopoulos (1989) as an engineering approach dedicated to set up industrial "ecosystems" leaving waste from some organizations becoming resources for others on a local area, similarly to material and energy flows existing in natural ecosystems. As for Cradle to Cradle, his objective is to design and manufacture products that can be reused or remanufactured several times, without loss of quality to get new products (Braungart and McDonough, 2002). Insofar as researchers have not agreed yet on a common definition of CE, this concept remains unclear, with competing theoretical approaches seizing it in many different ways.

Even if first academic literature on CE has emerged in the 1990s, the number of publications has mostly increased since the year 2000 (Lieder et al., 2016; Reike et al., 2018).

As this concept is still emerging, several researchers have carried out a historical analysis on the origins and building of this concept (Blomsma et al., 2017; Murray et al., 2017; Reike et al., 2018) and so far, most of academic works dealing with CE have been interested in settling a standard and robust definition of the concept or have tried to provide companies with strategies to overcome the barriers they are facing while trying to implement CE.

Actually, some authors have tried to underline the historical construct of the concept of CE, arguing that it is not new but rather a collection of older practices like Industrial Ecology, recycling, Cradle to Cradle or Eco-design (Blomsma et al., 2017; Korhonen et al., 2018a; Korhonen et al., 2018b; Murray et al., 2017; Reike et al., 2018). They also claim that CE is an equivocal notion, as there are many different definitions existing in the literature. As a result, researchers have also focused on proposing a coherent and solid definition of the concept of CE, building on existing literature and taking into account sustainable development objectives (Korhonen et al., 2018a, 2018b, Kirchherr et al., 2017, Prieto-Sandoval et al., 2018). According to these researchers, reaching to a consensus regarding CE is necessary to avoid the domination of subverted definitions that would prevent the necessary shift in production systems (Kirchherr et al., 2017).

On the other hand, scholars have also tried to analyze the barriers that socio-economic actors face while trying to implement CE (Gregson et al. 2015, Kirchherr et al., 2018) and others proposed strategies and tools to implement it. For instance, Lieder et al. (2016) proposed to implement simultaneously top-down and bottom-up strategies with all stakeholders (policy makers, governmental bodies and manufacturing industries), Nußholz (2018) proposed a visual tool that can be used by companies to design circular business models; Beulque et al. (2018) identified strategies to set up circular value chains while Kalmykova et al. (2018) compiled 45 CE strategies that can be applied to different parts of the value chain. In a nutshell, even though several authors have underlined the rise of CE in society, few of them have analyzed the underlying mechanisms that support the dynamics of collective action. In this perspective, the role of underlying utopia and promises (Borup, 2006) conveyed by the CE to foster collective action and organizational change is still understudied.

Rational utopia and performativity

In spite of the apparent contradiction existing between utopia and rationality, several philosophers have discussed the relationship existing between these two concepts. For instance, Raulet (1992) indicates that an utopia is a “*counter-reality which aims at underpinning rationally the legitimacy of its hopes, with the coherence of the rational system it imagines*” and Redecker (2003) reckons that the utopia exists when rationality and dreams intertwine. Actually, the apparent contradiction existing between rationality and utopia is related to the fundamental tension existing between what is and what ought to be (Bernstein, 1987). This tension turns out to be fecund for conceptualizing societal change, and especially when it comes to think about desirable alternatives, as an utopia allows to “*hold up a critical mirror to society and imagine a novel institutional order which recasts social, political and economic relations*” (Lawson, 2008). Drawing on Agnes Heller’s works, Bernstein (1987) recalls that the point of a rational utopia is to “*enable us to criticize what now exists and guide us in our present actions*”.

But one of the most precise definitions of the concept of rational utopia has been brought by the sociologist Metzger (2001). Metzger uses the term “utopia” and explains how a “rational utopia” can bring and foster change within organizations. Metzger considers that the concept of rational utopia enables to understand how top management can shape a dynamic of change in a large organization and that a rational utopia is composed of three elements: a vision containing simultaneously a critic of the present and a promise for the future; strong images that will spread through collective representations and initiate a powerful cognitive process; and a strategic plan that will guide collective action. In other words, the reason why a rational utopia can foster change is its ability to generate performative effects (Callon, 2007, 2013) materializing its underlying vision and images.

The concept of performativity comes originally from linguistics (Austin, 1962) and has then been brought to social sciences by Callon (2007) who used it in order to analyze how a scientific theory, identifiable through specific narratives, can transform reality, leading socio-economic actors to implement what the theory predicts (Steiner, 2010, Aggeri, 2017b). Callon (1998) studies more specifically the effects of economic theory, and reckons that economics: “*performs, shapes and formats the economy rather than observes how it functions*”. Later, Callon even use the nominative “*performance*” to emphasize the idea of an active process unfolding gradually and analyzes how economic theory performs reality

through the mediation of socio-technical arrangements which provide scientific narratives with performative effects (Callon, 2007, 2013). Whereas the notion of self-fulfilling prophecy explains success or failure in terms of beliefs, Callon highlights the significance of material devices (models, infrastructure, tools, and objects) which constitutes the socio-technical arrangements through which a theory can materialize.

In a book about sociology of market arrangements, Michel Callon clarifies his point of view, pinpointing that what he refers to, using the term of “market arrangements”, is an entry point to study the “performance” of theories in practice, as well as the production of singled out goods, and the setting up of the match between market supply and demand (Aggeri, 2017b). According to Callon, market arrangements are “*modalities for framing commercial activities, the sites where they are operated, the spatiotemporal frameworks they draw, the materials mobilized, the forms of knowledge and instruments implemented and the morphology of networks interdependencies between sites*” (Callon, 2013). Other researchers have analyzed the role of the environment in the spread of a theory, considering that a theory becomes self-fulfilling when it is widely accepted, independently of its content (Ferraro et al., 2005). According to Cabantous & Gond (2011), the performativity of a theory proceeds through three steps: conventionalization, engineering and commoditization (Berkowitz, 2016). With the commodization, the theory is made available widely and transforms into a convention. Then, during the engineering step, this convention is transformed into socio-technical arrangements that will integrate the assumptions and predictions of the theory and eventually, market factors such as consulting firms spread the socio-technical arrangements to organizations.

Methodology

Even though CE is still an essentially contested concept (Korhonen et al., 2018b), as defined by Gallie (1956), mentioning concepts which “*inevitably involve endless disputes about their proper uses on the part of [their] users*”, many actors manage to seize it in order to mobilize allies and shape a dynamic of collective action. In order to understand the mechanisms structuring this dynamic, we posit that CE has been constructed and works as a rational utopia (Metzger, 2001) which produces performative effects on organizations. In order to confirm our assumptions, we have chosen to carry out an empirical and exploratory research.

Step 1: Textual analysis of a rational utopia

The first step of research was to verify our assumption that CE has been designed as a rational utopia (Metzger, 2001).

Archival material

We collected 18 documents and reports (appendix 1) that have been issued by advocates of CE like the Ellen MacArthur Foundation in Europe and the National Institute of Circular Economy (INEC) in France. These documents are pretty relevant, because they influence many practitioners who are involved in CE. For example, Geissdoerfer et al. (2017) claim that the most prominent CE definition has been provided by Ellen MacArthur Foundation, while Murray et al. (2017) recall that the Ellen MacArthur Foundation have commissioned McKinsey and Company to produce several reports on CE.

Interviews

We have conducted 5 semi-directive interviews (appendix 2) with three out of the main CE Advocates in France: The French National Institute of Circular Economy (INEC), The French National agency of the Environment (ADEME), and the association OREE. In the interviews, the participants were asked for their motivations and strategies to promote and spread CE.

Analysis

Building on the concept of rational utopia coming from the literature (Metzger, 2001), we have defined a theoretical framework with 4 main categories (critic of the linear economy; promise of a better future; strong images; methods and tools for collective action). Then, we have performed in depth analysis of our archival material and interviews data to check whether the narratives and discourses used in these documents were matching our theoretical framework (table 1).

Table 1: Examples of narratives of circular economy's rational utopia / source: authors

Rational Utopia	Examples of narratives
Critic of Linear economy	- "Traditional linear consumption patterns ('take-make-dispose') are coming up against constraints on the availability of resources" (EMF, 2013a) - "Declining real resource prices (especially fossil fuels) have been the engine of economic growth in advanced economies throughout most of the last century" (EMF, 2013b)

Promise for the future	<ul style="list-style-type: none"> - "the circular economy offers a viable contribution to climate change mitigation and fossil fuel independence" (EMF, 2013a) - "A €320-billion circular economy investment opportunity available to Europe up to 2025" (EMF, 2015a) - "The concept of a circular economy promises a way out. Here products do not quickly become waste, but are reused to extract their maximum value" (EMF, 2013b)
Strong images	<ul style="list-style-type: none"> - "the demonstrable decoupling of growth and resource demand will also slow the current rates of resource depletion" (EMF, 2013a) - "Cradle to Cradle design perceives the safe and productive processes of nature's 'biological metabolism' as a model for developing a 'technical metabolism' flow of industrial materials" (EMF, 2013a)
Methods & tools for collective action	<ul style="list-style-type: none"> - "This toolkit aims to support policymakers who have decided to transition to a circular economy in designing a strategy to accelerate this process" (EMF, 2015c) - "Business models that move from ownership to performance based payment models are instrumental in translating products designed for reuse into attractive value propositions" (EMF, 2015b)

Step 2: Process analysis of the performative mechanisms of a rational utopia

Secondly, to show that CE works as a rational utopia and has performative power on organizations, we carried out a qualitative research by analyzing how various type of organizations deal with CE in Paris Region, mainly in the building and furniture sectors. Even if the idea was not to set up a representative sample, in this paper, we have chosen to focus on a group of heterogeneous organizations in order to design a research which does not necessarily depend on the type of organization (age, size, public/private).

Interviews

We have collected empirical data through 49 semi-directive interviews (appendix 3) conducted with top and project managers of organizations involved in CE. In order to select our interviewees, we have not referred to any specific definition of CE but have considered any organizations claiming that they are interested and dealing with CE issues, independently of their definition of CE. This approach allowed us to encompass the different representations of CE existing into these organizations. Here are the main guidelines we have used to select our organizations:

- Organization operating into or related to the building or furniture sector
- Organization claiming to develop circular products, services or to be involved in projects related to CE

- Diversity in the organizational types (construction companies, start-ups, consulting companies, local public authorities, public administrations, associations, clusters...)
- Organization operating in Paris Region

Then, we have set up an interview guide containing roughly thirty questions about their perceptions and visions of CE, the methods and tools used in practice, the issues faced while trying to implement CE and any other activities related to CE they could have.

Observation

ADEME, which is the French national agency for the environment has created and developed a network of public and private organizations that gather roughly every six weeks in order to share their respective knowledge about circular economy principles and practices. Usually, each workshop is divided in two parts. First, two or three innovative CE projects are presented to the participants. During the second part, several projects owners share one specific issue they want to tackle, and after having split in small groups, participants use creativity methods to find out solutions for each issue. From September 2017 to February 2019, we have been able to participate to 5 out of these workshops, which made it possible for us to observe in practice how an organization advocating CE (ADEME) contributes to the promotion and spread of CE within Paris region. Furthermore, as a member of the network, we have been able to connect to their digital platform containing the presentations of all the 11 workshops which have taken place.

Archival material

We collected 6 publicly available reports (appendix 4) disclosed by different organizations and institutions about CE topics and issues in the building sector. Most of these reports were about eco-design methods, selective demotion processes, and also about sorting, reuse and repurpose methods or recycling processes in the building industry.

Analysis

Drawing from our literature review, we identified 4 theoretical themes related to CE and organizational change (appendix 5). Then, we analyzed thoroughly the rich diversity of our research material (interviews transcripts and notes, workshops notes, workshops

documents, official reports), performing in depth readings to identify five main emerging themes. And eventually, based on a multi-thematic coding approach (Boyatzis, 1998; Huberman & Miles, 1994; Ayache & Dumez, 2011) with both theoretical and emerging themes, we coded the whole data collected during our interviews (appendix 5).

Main findings: A theoretical framework to conceptualize the performative effects of circular economy on organizations

Building on our analysis, we will show that the CE concept has been designed and promoted as a rational utopia which exerts performative effects on organizations, and then we will propose a framework which conceptualizes the processes through which the underlying rational utopia of CE can transform organizations. In the rest of the paper, we do not rely on any specific definition of CE in order to seize the heterogeneity of the CE visions shared among socio-economic actors.

Construction and promotion of an attractive rational utopia

As mentioned earlier in the literature review, the concept of CE, which emerged in the 1990s, has been increasingly successful since the beginning of 2010. At the European level, it is the European Union that played a key role in the promotion and rapid spread of the concept of CE (Reike et al., 2018). However, it is mainly thanks to the combined initiatives of a set of key players that the concept has really developed in Europe (Ellen MacArthur Foundation) and in France (INEC, ADEME, OREE). In the rest of this paper, we will refer to these specific key players with the term of “mediators”.

Circular economy, a rational utopia designed by key mediators

Some scholars have already shown that the concept of rational utopia is perfectly suited to analyze societal change dynamics (Metzger, 2001, Aggeri, 2017a). In France, the concept of CE has been mainly promoted by the “mediators”, who are actors such as the EMF (Ellen McArthur Foundation), INEC (French Institute of Circular Economy) and ADEME, the French national agency for the environment. Indeed, the results coming out of the analysis we

have performed on their narratives and discourses pinpoint that these mediators have framed CE as a rational utopia. In Metzger's terms, CE encompasses a vision articulating a critic of the existing economic model with a promise of an alternative model (Metzger, 2001). Most of the reports we have scrutinized list several critics referring to the so called "linear economy", like for instance social inequalities (INEC, 2014), natural resources scarcity, environmental pollution (INEC 2013, 2015 ;EMF, 2013a, 2013b, 2015a), climate change (INEC, 2015 ; EMF, 2013a, 2013b), or soil degradation (EMF, 2013b). As a contrast effect, this critic emphasizes the countless promises conveyed by the CE concept.

For instance, we can find in these reports mentions to environmental but also social and economic promises associated to transition to CE, like reduction of carbon emissions and air pollution (INEC, 2015, EMF, 2013a, 2013b, 2015a), economic growth, massive job creation (INEC, 2014;EMF, 2013a, 2013b, 2015a), and enhanced innovation capabilities (EMF, 2013a, 2013b, 2015a). Besides, like in Metzger's definition of a rational utopia, striking images and representations can be found in the reports of these mediators. Most of the time, those discourses refer to attracting images like a "zero waste" society, namely a society without waste, where energy and materials streams would be fully circular, like in Nature (EMF, 2013a, 2013b, 2015a; INEC, 2015, 2018a). These idealized concepts are ontologically attractive because they correspond to pervasive values and aspirations.

Finally, CE contains also a rational system thinking (circular loops) (figure 1) and a list of policy measures drawing some kind of ideal public planning to perform the promise of a transition from linear to circular economy. For example, the EMF has designed and promoted a set of tools for implementing CE to companies (EMF, 2015b) and political decision makers (EMF, 2015c). They also developed a method that can be used by companies to measure the circularity of their products (EMF, 2015d). In France, the INEC has disclosed a study on methods that companies can use in order to develop "circular strategies" (INEC, 2014) and a report proposing ten CE policies that could be applied in order to reduce carbon emissions (INEC, 2015). They also published a report containing a list of indicators that can be deployed by organizations to define and measure circularity goals (INEC, 2018b).

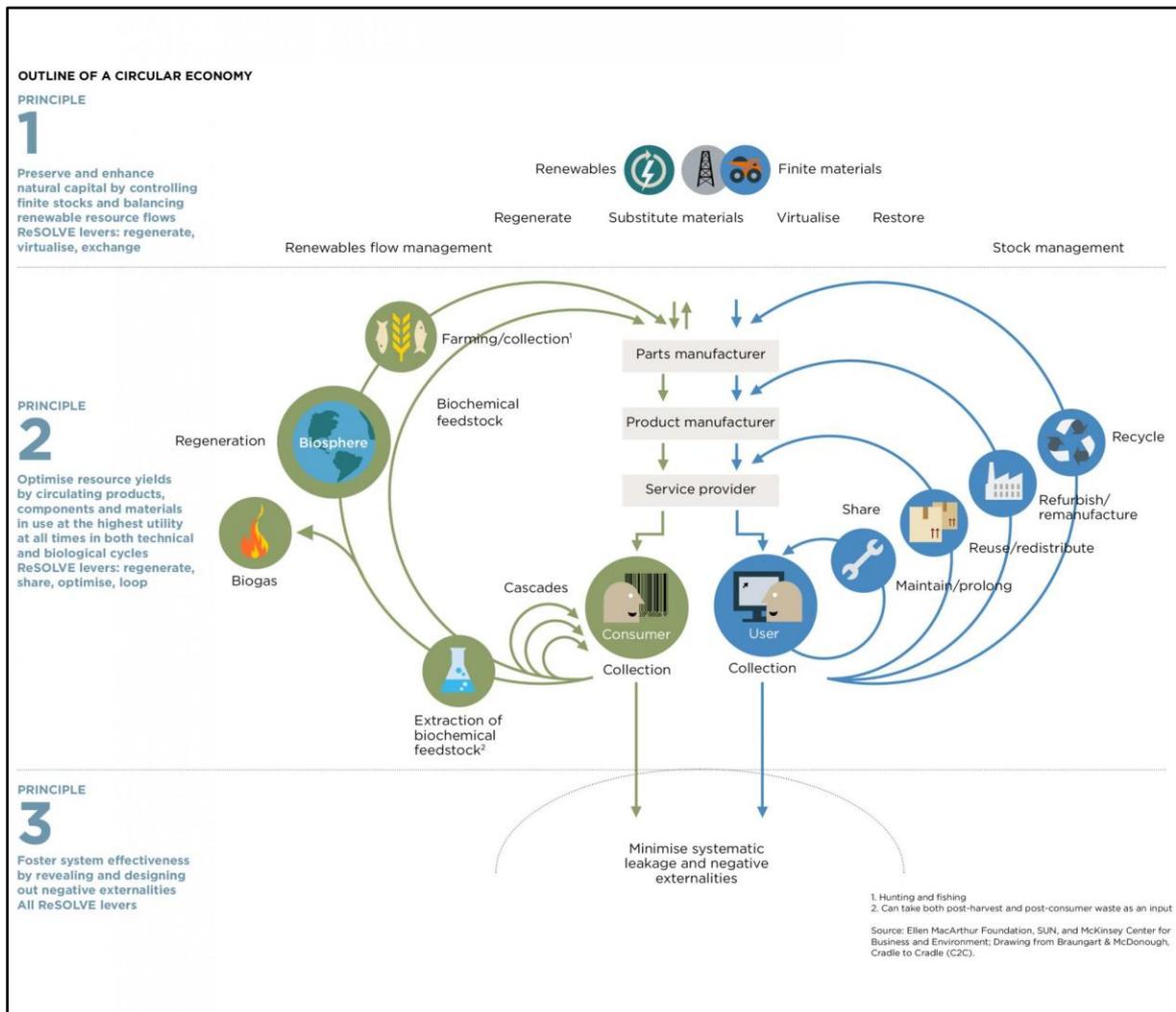


Figure 1: Example of diagram associated to circular economy / source: Ellen MacArthur Foundation (2013a)

The attraction power of a malleable rational utopia

One of the most visible sign of the impact of this rational utopia is the sharp increase of conferences, events and networks which have been set up to promote the concept within society over the past five years. Building on our research data, we reckon that CE's rational utopia is especially appealing because of three main reasons. The first one is the active work of the mediators in promoting the CE concept in Europe (Ellen MacArthur Foundation) and France (INEC, ADEME, OREE). For instance, the association OREE, which was a pioneer in the field of Industrial Ecology, is now one of a main CE advocates in France with over two hundred members (public and private actors, researchers, associations). They carry out a major work to facilitate workshops about issues such as the contribution of CE to alleviate climate change, the role of CE in sustainable urban planning, and the creation of value in the

CE. For each topic, OREE organizes about four meetings a year, inviting experts to share knowledge and skills and spreading this knowledge via various communication channels.

Another explanation for the attractiveness of CE's rational utopia is the profusion of promises it conveys. As a matter of fact, those promises appeal many different kinds of organizations, even those which are not particularly sensitive to environmental issues. For instance, some large organizations of the building sector are really interested by the economic promises of CE, as explained here by a manager working in a company which has over a thousand employees: “[about their decision to develop CE activities] *We don't want to test another kind of service, but really check another business model which can create more value [for us] [...] We are trying to see if there is a real economy, not a theoretical one with beautiful slides stating that there are some reuse opportunities and so on...*”. This organization has started to work with construction companies which are interested in getting new materials from demolition sites, but as explained here by one of their managers, they are only interested in the economic potential of CE and are willing to make sure that it can be a profitable opportunity to invest in.

Eventually, we consider that the rational utopia built from CE concept is especially appealing for many organizations because it is still equivocal and malleable. This concept is so large and controversial that it is pretty easy for any organization to put any product, service or project which is more or less eco-friendly into the box “Circular Economy”, as explained here by the Circular Economy manager of a public organization: “*the fact that it is an equivocal concept make it easy to do what we want with it, depending on potential opportunities*”. For instance, thanks to a public procurement that was initiated in 2015, an innovative platform has been developed (Noe platform) to share equipments between local construction sites. This platform has been launched in 2018 in Bordeaux, in the South West of France by a public organization (Bordeaux Euratlantique) and two large French companies: Eiffage and Suez. While Eiffage and Suez are presenting this platform as a circular initiative, Bordeaux Euratlantique, which is the public organization that originally launched the public tender told us that at this stage, it is just a platform for sharing different equipments, even if a study is being conducted to assess the feasibility to develop exchange of waste and materials between several construction sites.

Performative effects of expectations and promises of the rational utopia

Among the organizations studied during our research (examples below in table 2), we have identified two different ways they rely on in order to seize the CE concept. On the one hand, organizations which are attracted by the promises of the rational utopia usually transform it and change deeply their organizational practices or develop new ones. On the other hand, organizations which are willing to take advantage of the CE dynamic either change slightly their practices, or keep the same practices and adapt their narratives.

Table 2: Examples of organizations studied during the research

Name	Type	Activities related to Circular Economy
Afnor	Association	Afnor is the French national organization responsible for standardization. Afnor have launched in October 2018 a new experimental norm for circular economy
Agilcare	Start-up	Agilcare is a small company created in 2017 which constructs wooden eco-designed and modular buildings that can be removed and rearranged several times during their lifecycle
Backacia	Start-up	Backacia has developed a digital platform for the reuse of building interior fittings (windows, stairs, doors...) which are collected on demolition sites and resold on the platform to construction companies
Edeis	Large company	Edeis is a large company of the French building industry. They provide engineering services to construction companies. Two years ago, Edeis has decided to set up a small team to test circular economy solutions in the building sector
Eiffage	Large company	Eiffage is one of the leading building company in France and is experimenting new solutions for circular economy in the south of Paris region
CoopMu	Small entreprise	CoopMu is a small company which has been created in 2010 and is proving small and large companies with eco-design services to reduce the environmental impacts of their production processes
LesCanaux	Association	"Les Canaux" has been created by the Paris city council to foster the growth and development of social business."Les Canaux" is involved in the program "Circular Booster" which supports start-ups of the furniture industry in the implementation of circular economy
Materiaupole	Cluster	The Materiaupole is a cluster of over 70 organizations (public actors, companies, entrepreneurs, universities, artists) which has launched in 2018 the EcoCirc project to develop circular economy in the Val-de-Marne, a local area in the South-East of Paris.
Paris Saclay	Public localauthority	Paris Saclay is a public local authority gathering 27 municipalities in the south of Paris region. In 2017, Paris Saclay has initiated a strategic action plan to develop circular economy in its own local area
Upcyclea	Start-up	Upcyclea has been created in 2018 with the purpose of designing tools to help public and private organizations in the setting up of circular ecosystems

Transformation and hybridization of the rational utopia to change organizational practices

In the previous section of this paper, we have shown that the plasticity of CE's rational utopia may be an asset as it enables to attract many different actors. However, as for organizations appealed by CE's rational utopia, when it comes to implementing circular practices, this plasticity becomes a pitfall, making CE problematic to implement. As a result, most of these organizations decide to work out their own CE framework, thus transforming the rational utopia. A recent global study performed by the World Business Council for Sustainable Development (WBCSD, 2018) has shown that 74% out of the 39 companies interviewed use their own CE framework. Insofar as organizations interested in developing CE products are not necessarily familiar with the concept, they often rely on consulting companies to get support in the adaptation process of the rational utopia. Indeed, these consulting companies tend to transform the rational utopia which is promoted by the CE mediators, in order to build up and sell their own vision to their customers. For example, the large consulting firm Deloitte has developed its own vision of CE, using the concept of "closed loop value chain" (figure 2). Thus, actors which are willing to implement CE will develop their theoretical and practical knowledge of CE through the vision of Deloitte, contributing to the transformation and evolution of the concept, as it travels across organizations.

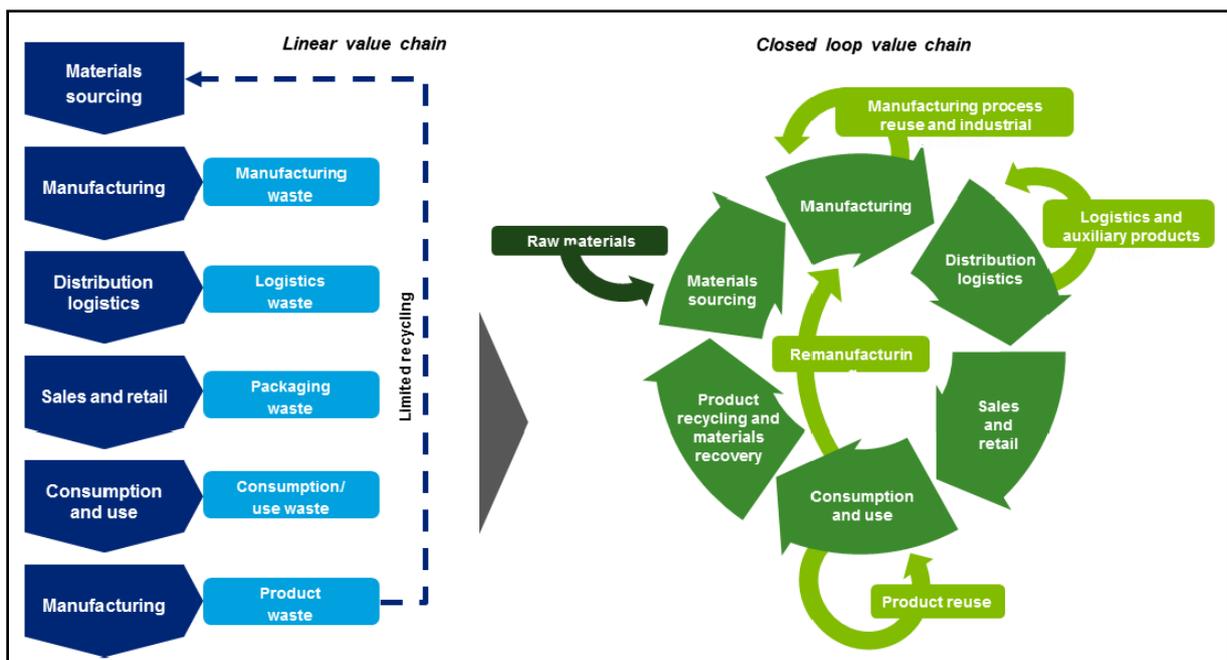


Figure 2: Illustration of linear & circular economy / source: Deloitte (2016)

For example, in Paris, a program called “Circular Economy Booster” has been launched in April 2019 by the association “Les Canaux” (table 2) to support small and medium enterprises in the development of circular furniture. Deloitte is part of this program and delivers CE training, transmitting their vision of CE to the organizations participating. Nevertheless, sometimes, organizations get involved more actively in the transformation process of the rational utopia. For instance, we met the CE manager of a public organization which has launched in 2018 a strategic plan to develop CE. The CE manager explains how they worked in the earliest stages, with a consulting company to set up their own vision of CE: *“We can say that there were two phases: there was the first phase of construction of the thematic, definition of priorities...etc, at this stage we had a very operational vision, focusing on resources and on how we re-inject used resources in the economic system, so it was mainly about recycling, repurpose and reuse. On the one hand, we relied on the seven pillars of ADEME, but not only because we were accompanied by our two consulting firms that do not have this vision at all. But it was very interesting to have the two visions”*.

Our research also shows that some organizations, attracted by the rational utopia, choose not to work with consulting companies but rather, construct a hybrid vision of CE, mixing it with already existing concepts, customizing the rational utopia according to their needs. Those concepts can be close to CE (Cradle to Cradle, Industrial Ecology) or not (Design Thinking). A good illustration of this is provided by the startup Upcyclea which designs tools to help public and private organizations in the setting up of circular ecosystems (table 2). Discourses and practices of Upcyclea’s founders indicate that they have chosen to intertwine the concepts of Cradle to Cradle and Industrial ecology to frame their own vision of CE. Even though they were initially focused on the concept of Cradle to Cradle, due to increasing demand of public organizations to develop synergies and Industrial Ecology on their respective areas, they combined the inter-organizational dimension of Industrial Ecology with the holistic dimension of Cradle to Cradle to propose a comprehensive vision of CE fitting with public actors’ expectations.

However, not all organizations are ready to make such an effort to seize the concept of CE, even though they are sensitive to CE’s rational utopia. Actually, given that the concept of CE is very broad, it is troublesome for them to get a comprehensive understanding of the concept, so they choose to focus on the materialization of a specific dimension of CE. For example, some of them will mostly develop Eco-design practices (Novasirhe), while others will implement methods to reuse (Backacia, Réavie), refurbish (Rejoué), or repurpose

(Maximum) building and furniture materials. Nevertheless, even though they tend to focus on the materialization of a subpart of the rational utopia, they still make the connection with the whole vision through other means. Thus, Backacia, Réavie and Rejoué have decided take part in the project Ecocirc which aims at developing CE ecosystems in the South East of Paris Region and which is led by the Materiaupole, a cluster gathering roughly seventy organizations (table 2). Being sensitive to CE's rational utopia, these pioneers fully engage to mobilize allies, creating a dynamic of collective action.

Organizations willing to leverage the dynamic created by the rational utopia

Departing from organizations seizing and transforming CE's rational utopia, we have also encountered organizations considering mostly CE's concept as an opportunity to develop their own project. Among them, two categories of organizations can be differentiated: those which were already performing innovative CE practices even before the emergence of the concept, and those which were involved in standard practices, but are interested in benefitting from the current dynamic. There is a paradox for organizations in the first category as they discover a new concept, based on a rational utopia reflecting values and visions that inspired them once, that now becomes pervasive. We can mention for instance Agilcare, a construction firm specialized in the building of modular and circular buildings (table 2). Even if the firm has been created in 2017, the founders developed their first prototype of modular and eco-designed buildings since 2010 : "[about the concept of CE] *Actually we discovered it late, meaning that we were doing circular economy even without knowing it, [...] and it is by meeting people, step by step that we realized that we correspond to it, that it can represent places full of networks, synergies, emulation...and we discovered that...I think, not so long ago*".

Consequently, these organizations perceive the emergence of CE as an opportunity for them to confirm their engagement, reinforce their legitimacy and get involved in the current collective dynamic. Thus, one of Agilcare's founders explains also that: "*we should go to get identified by the Institute of Circular Economy, with regards to the big players, so that we can bring our input and experience.*" As a result, to reinforce their legitimacy, they have decided to enhance their CE practices using new tools to measure quantitatively their environmental impacts. Nevertheless, in some cases, those pioneers do not change their practices and choose instead to adapt their discourses in order to get into the current CE dynamic. For instance, we

met an entrepreneur who is the co-founder the start-up “Scale” which has designed the “Scalite” a bio-plastic produced from fishes’ scales. As he explains here, this entrepreneur was not especially interested in sustainability, but more on relocating industrial production: *“I don’t do this to be sustainable or circular; I do this because it is important to re-inject the money I earn on fisheries [...] because for me it matters to have a healthy industrial system”*. However, in their official communication, they also adapt their narratives, making sure to be part of the CE dynamic: *“We invented a process to transform fish scales, a co-product of the sea, into a tough material that can be molded and tinted [...] we thus create a new cycle of the circular economy.”*

During our research, we have encountered also organizations which are involved in regular linear practices and not necessarily convinced or inspired by the underlying vision of CE, but they are willing to leverage the dynamic created by CE. Actually, the trend generated by CE has become a powerful incentive. The collective enthusiasm supported by mediators like the Ellen MacArthur Foundation, is generating processes of mimetic isomorphism (Di Maggio & Powell, 1983) which drive organizations to engage in opportunistic imitation, in order to conform to their organizational field. Thus, public local authorities are often willing to engage in CE projects because they perceive it as an opportunity to improve their own image, or because they consider it as an ongoing trend that has to be followed. For instance, talking about the outcome of workshops that led them to launch a CE project, a CE project manager of a public organization explains that: *“It is at this time that circular economy emerged...plus it arrived at a moment when circular was trendy, so it certainly contributed to the choice of circular economy”*, while another project manager of another public organization explains for example that her organization has recently launched a plan to implement CE because her organization *“is keen on following trends but doesn’t go deep into the subjects”*.

Usually these organizations are large public or private organizations for which a real shift in the organizational processes can be really difficult. However, they want to launch initiatives and projects internally or externally that aim at introducing slight changes in their organizational practices in order to conform to the expectations of their organizational field. For instance, the large company Linkcity, which is a subsidiary of the group Bouygues (leading actor of the building sector in France), has not necessarily changed its main organizational practices, but has decided to take part in a project which has been set up in the North of France in order to experiment new methods for circular building processes.

Collaborating with other companies of the group Bouygues, they will demolish an old logistics site with a “zero-waste” approach that will enable them to reuse and recycle the building materials. In other words, organizations which developed CE practices seem to be either sensitive to CE’s underlying rational utopia or attracted by the collective dynamic occurring around CE. The figure below summarizes the whole process from the rational utopia to the changes that occur in organizational practices (figure 3). In the following part of this paper, we will depict in details the steps 2, 3 and 4 of this process, conceptualizing the process through which organizations change their practices, develop new ones and materialize CE’s rational utopia.

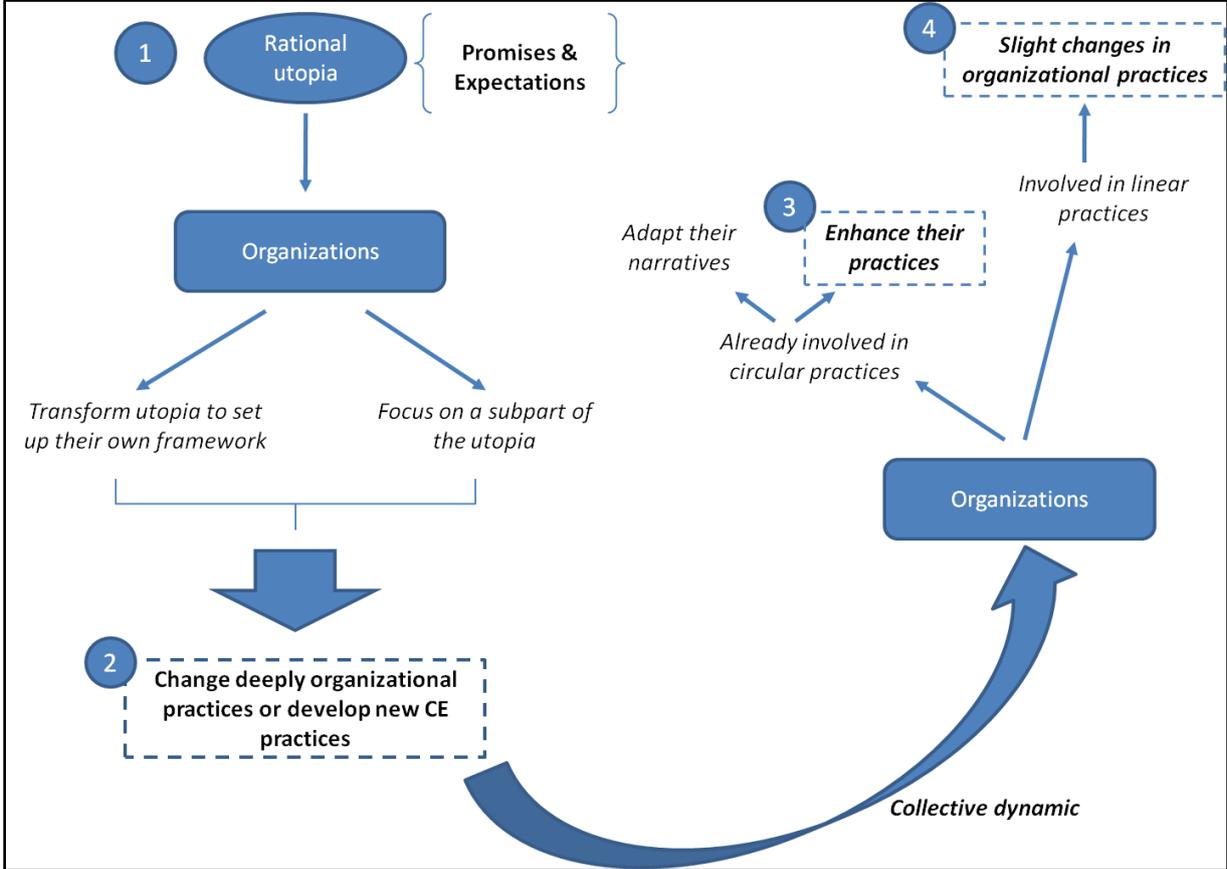


Figure 3: Performative effects of promises & expectations on organizations / source: authors

Materialization of the rational utopia through socio-technical arrangements

In order to change or enhance their practices (figure 3), organizations which are interested in CE's rational utopia and dynamic, design and use socio-technical arrangements (Callon, 2007, 2013) assembling devices, tools, methods and projects that contribute to materialize CE's underlying vision, minimizing resources consumption and waste production while optimizing resources stream by creating energy and material loops. Even if all socio-economic actors do not necessarily believe in CE' expectations, these socio-technical arrangements lead them to materialize its underlying vision.

Materialization of the rational utopia via the design and use of organizational tools

The materialization process of the rational utopia is usually carried out through the implementation of organizational tools that incorporate the rational utopia of CE in organizational practices, thus performing the concept of CE. A performative effect occurs when a tool, encompassing a managerial philosophy and guiding collective action (Hatchuel & Weil, 1995), transforms effective organizational practices according to this managerial ideal. In this perspective, organizational tools are used as mediating instruments (Miller and O'Leary, 2007) that serve to mediate between an idealized vision associated with a concept (here the CE) and organizational practices to be transformed. Accordingly, it is important to analyze the mediating tools used to conduct such a performance process, then to understand how such tools are mobilized in the course of collective action.

During our research, we have observed that organizations design and use different types of organizational tools (IT, business process, HR, logistics). For instance, the leading building company Eiffage has decided to include in its portfolio a CE offer, which allowed them to win an important public tender launched by the city council of Chatenay-Malabry (south of Paris Region) to demolish a campus site and build a new district. But while trying to materialize this CE offer for the city council, Eiffage realized that they did not have the required organizational processes to get enough biosourced materials (wood, straw). As a result they worked with their own purchasing department in order to change the directives that are used to buy raw materials. Thanks to this new sourcing process, they expect to raise significantly the amount of biosourced materials in their portfolio.

Another kind of tool has been used by the public local authority “Est-Ensemble” in order to foster the development of synergies and exchanges of building materials between twelve construction sites located in their area. Est-Ensemble regroups nine municipalities located in the East of Paris Region and has launched a strategic plan to develop CE during the first quarter of 2019. One of their objectives in this strategic plan, is to develop local materials loops, targeting for instance the building and food sectors. In order to materialize these building materials loops, they have been working with a research laboratory to design and set up a comprehensive database containing information regarding the types, quantities, qualities and locations of building materials which are available on twelve demolition sites. Thanks to this database tool, construction companies have reliable data that allow them to locate and reuse local building materials in their construction sites. This project is still recent, so for the time being only a few construction companies or small municipalities have shown some interest in using this database to change their building practices and reuse building materials. Nevertheless, Est-ensemble is deploying a lot of efforts to convince all these building actors, which should strengthen the current dynamic that has been initiated.

All these tools are not only used to implement CE, but also to get legitimacy with regards to their stakeholders. Actually, using tools and methods allow organizations to rationalize their discourses and practices, which is necessary to get support from other actors who are not necessarily sensitive to CE’s rational utopia and dynamic. In order to get support from actors such as public authorities or venture capitalists, the organizations we met look for economic but also environmental legitimacy, trying to get tools that can prove the quality of their sustainable products, services or processes. For example, the start-up Agilcare, which produces eco-designed and removable wood buildings (table 2), has recently carried out a Life Cycle Assessment and a Life Cycle Cost analysis in order to get quantitative data proving both the economic and environmental performances of their solution. As a result, they have included these data in their technical documents dedicated to private or public potential customers, which supports their economic and environmental legitimacy.

Implementation of innovative and collective projects to reinforce and scale-up the rational utopia

In addition to developing new tools and methods dedicated to CE, organizations launch also innovative projects to experiment their CE skills, get new knowledge and eventually enhance their CE practices. The innovations and experimentations developed reinforce CE's rational utopia because they represent tangible artifacts contributing to renew CE's expectations and promises. Most often, public and private organizations cooperate to launch and manage experimental and innovative projects to learn how to materialize CE. For instance, in October 2017, the public local authority "Plaine Commune" which is located in the North of Paris, has launched a public tender won by a consortium of six companies carrying out an innovative project aiming at testing circular practices in the building sector. For one year, the consortium have been experimenting a process of reuse of materials between 30 pilot construction sites and have set up platforms to sort, stock and repurpose building sites resources. They are also supporting the development of a local sector dedicated to the reuse, repurpose and recycling of building materials.

Besides, collective action is also especially important to scale-up the rational utopia as it enables to create relationships between heterogeneous actors that can earn mutual benefits cooperating together. Thus, it enables large companies to discover new innovations and to set up partnership or invest into these innovations. For instance, the CE manager of a large building company explains that her team is involved in many networks and think tanks to identify and work with valuable and innovative circular solutions: "[about the list of workshops she is showing us] *We are involved in many workshops, I mention especially here the ones which are working on circular economy. I work a lot with OREE, and also with a lot of public project owners, building syndicates and so on[...]* *In my opinion, OREE is strong, they always find out new people or small companies who have [new] concepts on circular economy*".

Another example is the program "Circular Economy Booster" mentioned earlier and led by the association "Les Canaux". The program involves the consulting company Deloitte, local public authorities (city council of Paris, Paris region authority, Est-Ensemble), public administrations (ADEME), as well as construction companies and furniture producers. All these partners collaborate to provide small furniture producers with both collective and individual support for developing their circular solutions. The program organizes workshops

on CE matters such as sourcing recycled materials, setting up reverse logistics to reuse old furniture, getting the right norm or eco-label. But participants of the program benefit also of training in design, marketing and business development which nurtures their growth. In a nutshell, launching innovative and collective projects is also an effective approach to share theoretical and practical knowledge regarding CE. It enables organizations to simultaneously benefit from and contribute to the scale-up of CE's dynamic. The figure below summarizes the materialization process of the rational which is mediated by socio-technical arrangements (figure 4). In a sense, we can consider that CE's rational utopia is an artifact built to wield performative effects on organizations when inserted into socio-technical arrangements assembling a set of tools, methods and projects.

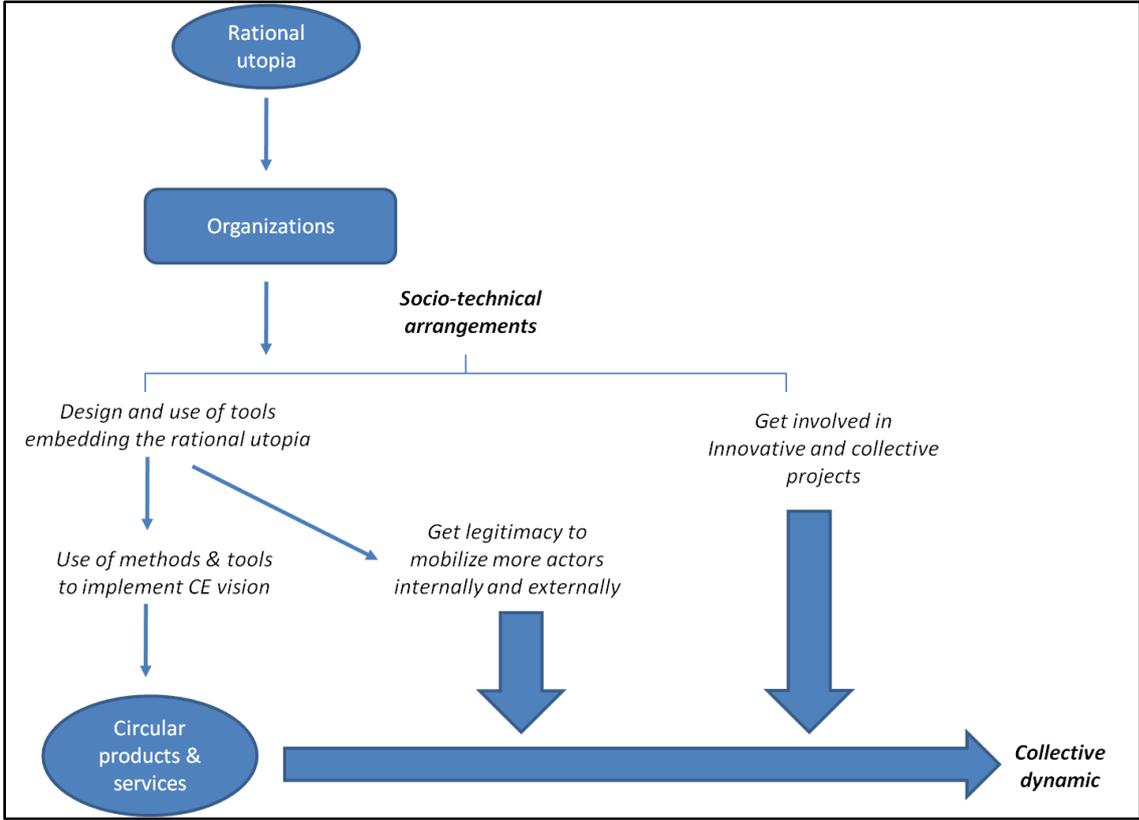


Figure 4: Materialization of the rational utopia through socio-technical arrangements / source: authors

Theoretical and practical implications

Regarding the concept of CE, our research opens a new pathway, analyzing how this concept can wield performative effects of many different types of organizations. So far, the recent literature on CE has mainly focused on defining the concept (Korhonen et al., 2018a, 2018b; Kirchherr et al., 2017; Prieto-Sandoval et al., 2018), understanding the barriers to the development of CE (Gregson et al. 2015; Kirchherr et al., 2018), or designing methods and instruments to implement CE within organizations (Nußholz, 2018, Kalmykova et al, 2018). However, in this paper, we have not tried to define CE's concept but rather to embrace all the different meanings of CE used by socio-economic actors in order to understand how these actors seize and materialize CE's vision. This "black-box" approach, allowed us to propose a framework that shows how the concept of CE provides organizations with cognitive and organizational resources and drive them to materialize the underlying vision which is conveyed by CE. This approach highlights the specificity of CE with regards to sustainable transitions, enriching both CE and sustainability literatures.

Our paper emphasizes also the concept of rational utopia (Metzger, 2001, Aggeri, 2017a), and more precisely, the relevance of this concept for analyzing the performative effects of CE on organizations based on mediating instruments. The literature on CE has already emphasized the significance of the ongoing CE trend (Lieder et al., 2016; Reike et al., 2018), but hitherto, few works have analyzed the underlying mechanisms that explain the current CE momentum. Consequently, based on the concept of rational utopia, the framework we propose here, enables to conceptualize the organizational mechanisms which underpin the current collective dynamic around the concept of CE. Thus, our paper enriches the literature on CE, highlighting the construction process which has been carried out by CE advocates like the Ellen MacArthur Foundation, to build up the concept of CE as an appealing rational utopia.

We consider also that our research contributes to the literature on performativity (Callon, 2007, 2013). Indeed, using the case of CE, our research has shown that the concept of rational utopia can be a relevant theoretical framework to analyze the unfolding "performation" process of a theory, model or concept. Besides, our research also highlights that even if socio-technical arrangements play a significant role in the materialization of CE; the underlying utopia embedded into the CE concept is a key asset to mobilize heterogeneous actors and initiate a collective and appealing dynamic. This idea of interactions between

expectations and material devices (methods, tools, platforms) is at the core of the concept of rational utopia and it could be interesting, in future research, to determine if being structured as a rational utopia can be a key success factor for the performativity of a theory.

With regards to our research's limits, we can indicate that we have chosen to focus our analysis on organizations which are taking part in the current CE dynamic. However, even if CE's concept is currently gaining a real momentum, its emergence is still mitigated by some incumbent organizations, considering it as a threat for their business models. For future research, it could be interesting to study the role of older rational utopias existing within society and competing with more recent rational utopias such as CE. For instance, as explained by Djelic (2014), the so called linear economy, which refers to our current model of resources consumption and waste production, is the outcome of a rational utopia which has been built around the concept of "free-market". Djelic claims that from the late 1950s, a group of pioneers and think tanks have initiated a construction process aiming at "*carrying and diffusing broadly the belief in economic liberalism and free markets economy*". Thus, it could be interesting to study and observe how organizations are dealing with different rational utopias in the course of action.

Another limit of our research is that it has focused mainly on two sectors (construction and furniture) which have their own economic and organizational characteristics, so it could be interesting to conduct this research in other fields where CE can be applied (automotive industry, IT equipments, food, textile and so on...). Another limit of our research is that we have chosen to analyze a large panel of organizations in order to depict a general scheme of the performative effects exerted by CE on these organizations. Here, an interesting path for future research could be to choose a specific organization in order to go deeper into one organization and analyze in more details how this organization builds up its own CE framework and embed it into its organizational and production processes.

In terms of practical implications, our paper sets forth the key role which is played by some CE advocates. Indeed, our framework provides insights that could help these actors to get a better understanding of their own impact. It can also enable them to design organizational tools that could help organizations to advance the implementation of CE and the transition towards sustainability. Besides, our framework can also be interesting for public and private organizations which are willing to drive collection action towards local transitions

towards CE or develop circular products and services. As a matter of fact, our framework can be seized by these actors to improve their methods used to mobilize partners and allies.

Conclusion

Drawing on a qualitative research carried out in the construction and furniture sectors, this research analyzed a group of heterogeneous organizations involved in Circular Economy projects and initiatives, in order to understand the current momentum of this concept. The outcome of our research is first that Circular Economy has been constructed by CE advocates as a rational utopia (Metzger, 2001, Aggeri, 2017a), which exerts appealing effects on organizations. We have studied how such a rational utopia is mobilized in managerial discourses and strategies to gain legitimacy or support, new business models or strategic offers. We have also studied how such a rational utopia is encapsulated in organizational instruments that serve as mediating instruments to provoke a performance process by which idealized vision of CE is transformed into new organizational practices. Furthermore, our research proposes a theoretical framework which conceptualizes the organizational processes through which CE's underlying rational utopia yields performative effects on heterogeneous organizations.

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Appendix 1

List of the reports collected from Ellen MacArthur Foundation and INEC (French Institute for Circular Economy)

Source	Title	Date
Ellen MacArthur Foundation	Towards the Circular Economy Vol. 1: an economic and business rationale for an accelerated transition	2013
Ellen MacArthur Foundation	Towards the Circular Economy Vol. 2: Opportunities for the consumer goods sector	2013
Ellen MacArthur Foundation	Towards the Circular Economy Vol. 3: Accelerating the scale-up across global supply chains	2014
Ellen MacArthur Foundation	Achieving Growth Within: a circular economy vision for a competitive Europe	2015
Ellen MacArthur Foundation	Towards a Circular Economy: Business rationale for an accelerated transition	2015
Ellen MacArthur Foundation	Delivering the Circular Economy, a toolkit for policy makers	2015
Ellen MacArthur Foundation	Circularity indicators, an approach to measuring circularity	2015
Ellen MacArthur Foundation	Vers une économie circulaire : arguments économiques pour une transition accélérée	2016
Ellen MacArthur Foundation	Achieving Growth Within - A €320-billion circular economy investment opportunity available to Europe up to 2025	2017
Institut National de l'Economie Circulaire	Table ronde « Economie Circulaire » conférence environnementale des 20 et 21 septembre, Contribution de l'institut de l'économie circulaire, « l'Economie circulaire, nouveau modèle de prospérité »	2013
Institut National de l'Economie Circulaire	Quelles stratégies d'entreprise pour une économie circulaire moteur de croissance ? Amorcer la transition, construire le modèle de demain	2014
Institut National de l'Economie Circulaire	L'économie circulaire, une trajectoire clé pour la lutte contre le dérèglement climatique	2015
Institut National de l'Economie Circulaire	Avis de l'Institut de l'économie circulaire sur le Paquet « économie circulaire » de la Commission Européenne	2015
Institut National de l'Economie Circulaire	L'Économie Circulaire et ses Bénéfices Sociétaux Des Avancées Réelles pour l'Emploi et le Climat dans une Économie basée sur les Énergies Renouvelables et l'Efficacité des Ressources	2015
Institut National de l'Economie Circulaire	More prosperity, new jobs - Manifesto on Circular Economy Policy in the EU	2015
Institut National de l'Economie Circulaire	Quel potentiel d'emplois pour une économie circulaire ?	2015
Institut National de l'Economie Circulaire	Tri à la source des biodéchets, Focus, Avril	2018
Institut National de l'Economie Circulaire	Les indicateurs de l'économie circulaire pour les entreprises	2018

Appendix 2

List of interviews conducted with organizations promoting Circular Economy in France

Date	Duration	Organization	Position
29/06/2018	1h15	ADEME	Manager - Sustainable Public Procurement
06/09/2018	45 mn	INEC	Manager of public affairs
18/09/2018	1h12	INEC	Head of Research & Manager of public affairs
30/11/2018	35 mn	ADEME	Manager for Sustainable Public Procurement
03/04/2019	1h13	OREE	Mnanger of Circular Economy

Appendix 3

List of interviews conducted with organizations involved in Circular Economy projects.

Date	Duration	Organization	Position	Category
22/05/2018	2h19	Head of Sustainability & Circular Economy Manager	Eiffage	Private
31/05/2018	2h05	Director	Agilcare	Private
08/06/2018	1h45	CEO	IPSIS	Private
11/06/2018	53 mn	Director	Maximum	Private
15/06/2018	2h10	Project Manager - Sustainable Development	Val-de-Marne	Public
22/06/2018	1h30	Account Manager	UpCyclea	Private
09/07/2018	2h19	Business Manager	Eiffage	Private
10/07/2018	1h25	Project Manager - Environment & Waste	Paris Est Marne et Bois	Public
12/07/2018	1h18	Head of construction	Val-de-Marne	Public
13/07/2018	2h45	Account Manager	UpCyclea	Private
24/07/2018	2h15	Project Manager - Circular Economy	Val-de-Marne	Public
25/07/2018	1h15	Regional Director	Linkcity	Private
25/07/2018	1h18	Director & Circular Economy Project Manager	Matériaupôle	Non-profit
22/08/2018	1h05	Manager - Circular Economy	Paris city council	Public
29/08/2018	1h10	Manager - Quality & Environment	Val-de-Marne	Public
29/08/2018	1h18	Director	Novasirhe	Private
13/09/2018	1h29	Director	Matériaupôle	Cluster
13/09/2018	54 mn	Architect & Partner	Univers et Conseil	Private
13/09/2018	55 mn	Production Manager	Matériaupôle	Cluster
21/09/2018	40 mn	Project Manager	Bordeaux Euratlantique	Public
11/10/2018	1h05 mn	Founder & Business Manager	Højer Møbler	Private
06/11/2018	1h02 mn	Communication Manager	Matériaupôle	Cluster
20/11/2018	56 mn	Project Manager	Weco	Private
29/11/2018	1h12 mn	Circular Economy Project Manager	Est Ensemble	Public
03/12/2018	1h02 mn	Head of Public Procurement	Vitry city council	Public
04/12/2018	55 mn	Architect & Partner	Readymader	Private
13/12/2018	1h32	Project Manager	Paris Saclay	Public
08/01/2019	1h05 mn	Co-founder	Backacia	Private
09/01/2019	55 mn	Project Manager	Réavie	Private
17/01/2019	41 mn	Account Manager	UpCyclea	Private
24/01/2019	1h47	Director & Circular Economy Project Manager	Edeis	Private
30/01/2019	1h22	Circular Economy Project Manager	AFNOR	Non-profit

04/03/2019	45 mn	Research on Sustainability	Val-de-Marne	Public
07/03/2019	2h	Chargés de mission "développement économique et durable"	Grand Orly Seine Bièvre	Public
08/03/2019	1h13	Consultant - Innovation & Sustainability	Didaxis	Private
12/03/2019	59 mn	Architect & Partner	Univers et Conseil	Private
14/03/2019	45 mn	Co-founder	Scale	Private
27/03/2019	1h21	CEO	Whitaa	Private
02/04/2019	1h52	Business Development Manager	CoopMu	Private
04/04/2019	54 mn	Founder	Rejoué	Private
09/04/2019	41 mn	Researcher	Cluster Eau-Milieu-Sol	Cluster
16/04/2019	1h20	Project Manager	Grand Paris Aménagement	Public
17/04/2019	2h15	Sustainability Project Manager	Grand Orly Seine Bièvre	Public
09/05/2019	2h10	Circular Economy Project Manager	Les Canaux	Non-profit
13/05/2019	1h15	Consultant	Bton Design	Private
17/05/2019	1h15	Consultant	Design2Earth	Private
17/05/2019	56 mn	Director International Business and Network Development	Isku	Private
03/06/2019	1h07	Sustainability Project Manager	Grand Orly Seine Bièvre	Public

Appendix 4

Source	Title	Date
Danish Environmental Protection Agency	Building a Circular Future — 3rd Edition	2019
WRAP (Waste & Resources Action Programme) - UK	Designing out Waste: A design team guide for civil engineering, Less waste, Sharper design - Part 1 Design Guide	
WRAP (Waste & Resources Action Programme) - UK	Designing out Waste: a design team guide for buildings	
ADEME	Identification des freins et des leviers au réemploi de produits et matériaux de construction	2016
OREE	Comment mieux déconstruire et valoriser les déchets du BTP ?	2019
French Federation of the building sector	Guide for bio-sourced materials	2015

Appendix 5

Theme	Type	Example	Frequency
Utopia and promises	Theoretical	"Our value proposition is based on the desire to show that the circular economy in the construction industry is more viable than the linear economy"	6%
Perception of circular economy	Theoretical	"For me, Circular Economy is the intelligence of materials, so yes we are in it, especially that we repurpose a waste"	6%
Organizational change	Theoretical	"The mobilization part is so new that people just don't get it. We just need 5 or 10 mn with them, and then they are motivated"	16%
Dynamic and collective action	Theoretical	"Our objective is to get into an already established sector. Actors can go towards Circular Economy if we show them that it works and that it's profitable in the Construction sector"	17%
Waste & resources	Emerging	"Given that it's a circular activity, we need to catch the good deposits and avoid getting only waste, improve our product value, make sure that our product is affordable and manage our own waste"	12%
Innovation & circular economy	Emerging	"Very few people were interested by the matter of innovating in materials, few people care about reconsidering current construction processes"	7%
Business model	Emerging	"Even if we are more expensive, we could have bid and then raise their awareness about the life cycle cost"	5%
Methods & tools	Emerging	"We have a method which allows to assess the state of play, identify the levers and use them to create value"	23%
Growth and business development	Emerging	"It's difficult to find out a reliable industrial partner to complete our missing skills such as production, distribution and certification"	6%