
How can we explain the success of Circular Economy and assess its transformative potential in the Anthropocene Era?

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I am writing this paper as an engaged scholar as I believe that — like other actors such as policymakers, managers, investors or NGOs — academics also have an important role to play in fostering change to move towards a more sustainable society. Building on my interest in circular economy, I am going to address two main questions as a contribution to the current debates about how our societies can cope with major grand challenges such as climate change, biodiversity loss and resource depletion. I will try to *explain the success of the circular economy (CE) concept*, which is gathering momentum around the world, in many spheres from the political to the business world, but also in the academic field⁽¹⁾. I will then share some ideas on a second paramount question, concerning *the transformative potential of CE in moving towards strong sustainability*. In the environmental economics field, two different orientations regarding sustainability have been acknowledged and contrasted: weak sustainability (relying on the assumption that natural capital can be replaced by

other types of capital, such as financial and human) and strong sustainability (which rests on the objective of preserving all the different types of capital without substitutions among them). Unlike weak sustainability, strong sustainability puts the emphasis on ecological preservation over economic gains. Strong sustainability implies that man-made activities should be carried out within the boundaries of our natural ecosystems which provide us with several "services" (food and water, or regulation of floods, erosion, etc.), but need to be preserved and restored in the long term (Davies, 2013).

To explain the success of CE and to investigate its transformative potential, the remainder of this paper is organized as follows: the following section will introduce and define the current context in which our societies are developing: the Anthropocene. The second section will discuss recent literature highlighting the archetypes of the "Anthropocene society", which will serve as an analytical framework, inspired by institutional theory and relying on a socio-political grammar, to interpret the dif-

ferent models of CE which are put forward in the political, entrepreneurial and academic world (section 3). We'll conclude by sketching out some answers to our two questions.

1. From the Anthropocene to Circular Economy

The term "Anthropocene" was coined in the early 2000s to refer to the current, human-dominated time period (Crutzen, 2006). It is being considered as a new geological epoch where all the chemical, biological and geological processes of the natural Earth are increasingly affected by human activities. According to this theory, the *Anthropocene* would follow the *Holocene*, a geological era lasting for the past 11,000 years, during which humankind settled down, developed agriculture and spread all around the world. Beyond the debates within the geology scientific community, the Anthropocene concept resonates strongly in the social sciences for its ability to point to the overwhelming impact of human-dominated habitats on the other species and components of natural ecosystems. The Anthropocene, according to Crutzen, began at the end of the 18th century with the industrial revolution. The central idea is that climate change and the multitude of human and non-human consequences that it entails, marks the advent of a new temporal age, both geological, in that human action is reconfiguring the fundamental dynamics of the Earth system, and social, since these evolutions in turn are having adverse consequences on human activities and living conditions. The 6th report of the IPCC Working Group 1 published in August 2021 is

unequivocal about the influence of human activity on climate change and seems to confirm the entry of humanity into the Anthropocene era. Beyond climate change, there is agreement among scientists nowadays on the anthropic devastating impact on other phenomena, such as resource depletion and biodiversity loss — other symptoms of the Anthropocene.

To fully grasp the issue of resource depletion, we should keep in mind what the dominant development model of our economic systems has been during the last few decades: a model of global value chains (Elms and Low, 2013), characterized by an intensive process of extracting natural resources from the Earth to fuel global trade in the world market. "Extractivism" leads to over-consumption of natural resources, including air, water and land. Minerals, ores, biomass and fossil fuels are critical resources that need to be monitored nowadays due to their depletion rate and/or intensive use, which is generating competition among industries and alternative destinations. While the global population has doubled since the 1970s, the quantity of extracted resources has multiplied by 3.5, reaching about 100 Gigatons per year (Circle Economy, 2021). These figures support the thesis that demographic expansion alone doesn't explain the boom in resource consumption, which is also driven by the high resource intensity of our production models. According to the *Circularity Gap Report* (2021), the yearly quantity of extracted resources is set to double by 2050 if our pace of production continues to follow current trends. The same document shows that of the total amount of resources extracted, one third goes

into durable goods (streets, cars, bridges, buildings, etc.), one third goes into goods which become waste within the same year, and one third goes into goods which will become leakages through emissions and polluting effluents reaching our seas, forests and other natural ecosystems. On a global scale, less than 9% of all the resources that we extract go into new cycles of transformation or usages, through repurposing and recycling.

Connecting the issue of natural resource exploitation with biodiversity loss, another important symptom of the Anthropocene, a recent article published in *Nature* (2020) shows that, for the first time, human-made mass (all our produced goods) has reached the same level as the total living biomass on Earth, after having doubled roughly every twenty years during the last century. In its Global Biodiversity Assessment, the International Panel on Biodiversity and Ecosystem Services (IPBES, 2019) makes it clear that concerted efforts toward transformative change are urgently needed to slow the precipitous global decline in biodiversity, which dramatically threatens the functioning of all the main natural cycles.

How did we reach the Anthropocene era? Several explanations have been formulated, including the “Great Acceleration” thesis (Steffen et al., 2015). This group of scholars presented a dashboard containing a set of indicators that depict the dramatic acceleration in human enterprise and the impacts on the Earth system over the last two centuries. Their dashboard is built like a mirror, where trends of social economic activities are reflected in the Earth system. Changes in human production and con-

sumption, indicated by gross domestic product, foreign direct investment, energy consumption and telecommunications, are reflected in connected changes in the Earth’s natural systems: climate (greenhouse gas levels, global temperature), ocean acidification, terrestrial biosphere degradation and fish capture. The great acceleration leads to the concept of “planetary boundaries” (Rockström et al., 2009), which warns us that we live in a finite world and that we are reaching some thresholds — tipping points — beyond which it is dangerous to go, and from where it would be extremely difficult to recover. Destructive, dangerous phenomena, such as sea-level rise or permafrost melting that liberates methane, may be hard to control.

Suggesting that we cannot tackle the big issues of the Anthropocene (climate change, biodiversity loss and resource depletion) without giving a full account of their historical roots, leading critics have called for a different conceptual framework that places global change in a new, ecologically oriented history of capitalism: the *Capitalocene* (Moore, 2016). They suggest that the radical ecological and societal transformations needed in the Anthropocene era cannot happen without challenging the dominant economic and political power of financial actors and multinational companies, and without revisiting the prevailing model of an economy where everything is cheap (food, nature, money, work, energy, etc.). Although we may consider these positions as extreme and politically oriented, it is interesting to note that even the *Financial Times* — usually a pro-business newspaper — in one of its front pag-

es was recently calling for a “reset of capitalism”.

The backbone of our capitalistic system is a linear economy, where we have been taking, making, and disposing of our goods at an increasingly fast pace since the second industrial revolution. The circular economy represents a counter-model to this problematic linear “take–make–dispose” conception of the economy, where resources and energy are cycled in a closed loop (EMF, 2015). A circular economy is theoretically consistent with the condition of living in a finite world with planetary boundaries and is presented as an opportunity to meet resource needs in an era when global demand is increasing and expected to double by 2050, while the linear economy is increasingly criticized for its huge negative impact on the natural environment. The circular economy concept is relatively new, although it has roots in ecological, environmental, and industrial economics where scholars have investigated the relationship between the environment and economic systems. (For a comprehensive overview of the evolution of the concept and key debates, see Ghisellini et al., 2016; Geissdoerfer et al., 2017; Rosa et al., 2019). Beyond the different forms that a circular economy may take in the business world, three general and shared principles are identified as the main levers that can drive the shift towards this alternative model, which is presumed to re-embed economic activities within planetary boundaries. The first is *biomimicry* which encourages humans to consider Nature as a template and should lead us to engage in symbiotic relationships, repeated cycles and

restorative models, as observed in natural cycles and mechanisms (Benyus, 1997). The second overarching principle is the *decoupling* of economic activities from the usage of resources achieved mainly through resource efficiency and process improvement (Kjaer et al., 2019). The third pivotal idea is a *life-cycle perspective*, mobilized to assess the environmental impact of our activities and to bring about sustainable change, without overlooking the many trade-offs and tensions which may arise in the different stages of any product or service life cycle (Peña et al., 2021).

2. Five societal archetypes in the Anthropocene society

Once we have understood the challenges of the *Anthropocene* and highlighted the promises of circular economy to move towards more sustainable production and consumption models, I would like to introduce the grammar through which I will try to answer the question of why circular economy is so popular nowadays in the political, business and societal spheres. I will build on a socio-political and institutional approach, developed by Organizational Theory scholars Hoffman and Jennings (2018) who have identified several societal “archetypes” in what they call the “Anthropocene Society”. Archetypes can be defined as ideal representations of the values and actions of a social unit. According to Weber (1949), they help to understand the meaning (intended or not) of a social group. Archetypes are therefore tools to help observers understand how different worldviews guide cognition and behaviors. More specifically, in or-

Table 1 The Features of the Three Archetypes of the Anthropocene Society

THREE ARCHETYPES OF THE ANTHROPOCENE SOCIETY			
	Market Rules	Technology Fix	Cultural Re-enlightenment
Main attitude and logic	Reduce the impact, preserve lifestyle and growth	Technology will save the world	Frugality, de-growth Abandon the dominant culture and behaviors
Justification	Saving the planet can generate business opportunities and create jobs	Any bad event can be “fixed” by technological progress and science	We are the problem. Change yourself and you’ll change the world
Role of regulation	The market rules the world	The State and the market are subordinated to the possibilities of technology	The market and technology are subject to education, ethics, community or religious organizations.
Dominant organizations	Huge power of the Big companies, and facilitating role of the State	Scientific institutions + informed engineers who develop solutions and have them accepted.	Institutions are more numerous and varied; they produce new imaginaries
Relationship between mankind and nature	Mankind and nature opposed. Anthropocentric vision. Nature is separate from mankind. It must be controlled and exploited	Rational man, who tames nature, to master and enslave natural resources. Mechanistic view	Mankind and nature reconciled beyond the naturalistic vision of the West. Organic view

Source: developed by the author, based on Hoffman and Jennings (2018).

organizational theory, an archetype is a set of structures and systems that systematically embodies a common interpretive schema (Greenwood and Hinings, 1993). Hoffman and Jennings (2018) are interested in the different norms, values and cognitive frames at work when individuals, organizations and social groups deal with climate change, biodiversity loss, resource depletion and the other manifestations of the Anthropocene.

Hoffman and Jennings have identified and characterized five archetypes structuring the spectrum of possibilities between dystopia and utopia through gradual transformations and progressive adjustments, based on different dominant logics: blindness towards the Anthropocene grand challenges, which hinders any transition, the collapse of our societies, the persistence of a market logic, the search

for solutions through technology, and the cultural renaissance. These archetypes were originally labelled *denial*, *collapsed systems*, *market rules*, *technology-fix* and *cultural re-enlightenment*. Each of them embodies alternative ways of thinking, imaginaries, values which are shared by a certain group of people and organizations in their endeavor to define and tackle problems, thus leading to very different frames and initiatives.

For the purpose of our analysis, we set aside *denial* and *collapsed systems*, as we are using Hoffman and Jennings’ heuristic model (2018) to analyze the success and transformative potential of CE, which implies that we acknowledge and accept (we don’t deny) the existence of climate change, biodiversity loss and resource depletion. Therefore, we are looking for a way out, a possible counter model to

navigate towards sustainable futures (we don't think it is too late to act, as is assumed in the collapsed system archetype). The Table 1 above summarizes the main features of the three archetypes, highlighting both the socio-political and cultural-normative dimensions.

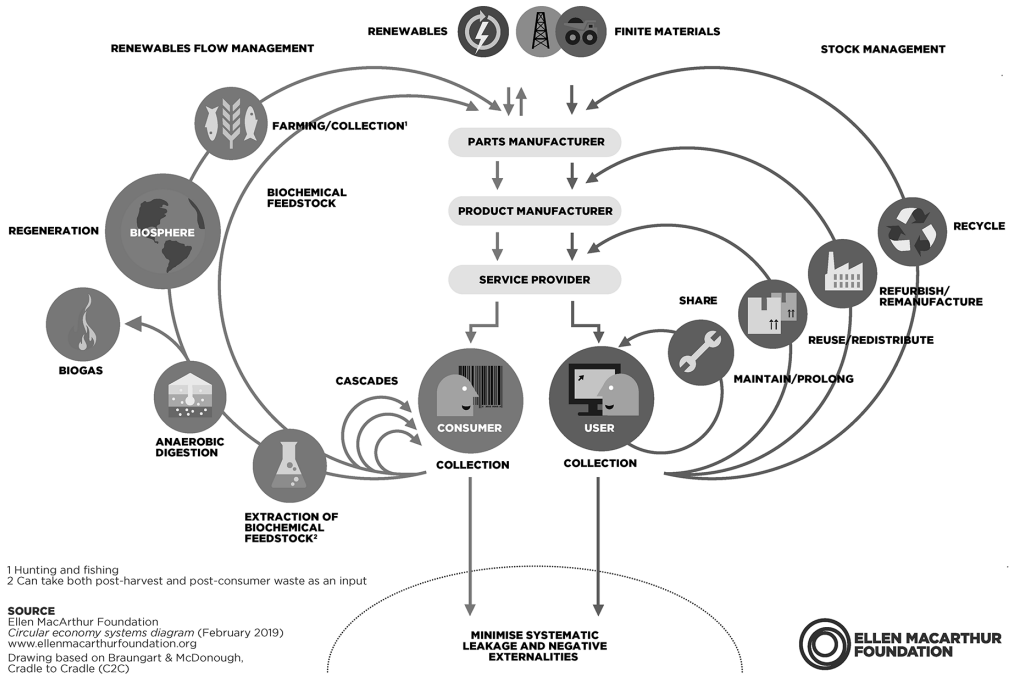
In the first archetype of Anthropocene Society, the market dominates the institutional structures of society, following the idea that the market can solve all problems including climate change, while at the same time generating business opportunities. The easy reconciliation of environmental and economic pillars in a simplistic win-win approach is led by big companies deploying their political and financial power, while the State acts as facilitator. Human relationships with Nature are very instrumental and exploitative. This underlying logic also feeds into scholarly work in the business and society field, such as the *shared value* approach (Porter and Kramer, 2011) which promotes and celebrates the power of business to cope with contemporary societal challenges. On a more macro scale, the *green growth* paradigm perfectly fits the market rules archetype (Bowen and Hepburn, 2014).

The second archetype shares with the previous one its hybrid nature, aimed at combining the pursuit of economic value creation with the provision of solutions for the common good. What differentiates it from the Market rules archetype is the emphasis on the logics of professions, particularly in science and technology, on the "Techno-fix" dominant view. Entrepreneurs in this archetype would be those that provide technological solutions, as long as these solutions align with

the technological logic of the system. As conveyed by many successful tech entrepreneurs (cf. the example of Elon Musk and his investments in TESLA giga-factories), technology is thought to be able to save our world, repair our relationship with natural resources and free us from our dependence on fossil fuels. However, such blind optimism, relying on absolute faith in technology, lacks critical perspectives and fails to consider the possible unintended consequences of new technologies. Power relationships in society and the political-economic order that drives environmental degradation are also overlooked (York and Clark, 2010).

In these two archetypes, people and organizations strive to preserve today's life style — either by trusting the market (green growth) or technology (geo-engineering initiatives) — deeply believing that corporate innovation and technology can save the world and the capitalistic model. While they somehow defend the relevance and power of the market and innovation, the last archetype explicitly challenges these assumptions. The Cultural re-enlightenment archetype designs a new world, profoundly changing human behavior and lifestyles, through philosophical and spiritual renewal, which values simplicity, frugality and, in its most radical forms, de-growth. It recalls the idea of "sustainability-as-flourishing" (Ehrenfeld, 2008). In this archetype, a new society and production system would emerge from grassroots innovation, local communities and ethical engagement. Typical examples of re-enlightenment might be permaculture and regenerative agriculture initiatives trying to

Figure 1 Circular economy butterfly diagram



move away from the intensive agriculture model and its huge negative externalities on natural ecosystems, to rely instead on local and symbiotic relationships with nature. A distinctive feature of this archetype is the explicit balance between ecological and social dimensions for a transition towards a sustainable world (Raworth, 2017).

3. How does Circular Economy relate to these archetypes?

I will now elaborate on the proposition that circular economy is enjoying great success because it cuts across all the archetypes of the Anthropocene Society, with particular emphasis on a few of them. I will take into consideration the visual representations of CE which frame the way we make sense of this

counter-model and the different actors, principles and initiatives emerging in the business and political spheres.

3-1. Circular Economy and Market rules

The most famous image of CE is the “butterfly diagram” (Figure 1), produced by the Ellen MacArthur Foundation, a true institutional entrepreneur in the field. This Foundation is actively engaged in the emergence and generalization of CE models, by bringing businesses, governments, local municipalities and start-ups together around its many initiatives. The butterfly image conveys a positive, desirable way of coping with the externalities of the linear economy, with the ultimate objective of decoupling the usage of resources from economic growth. The dual representation of

biological and technical cycles suggests that man-made systems can replicate Nature's way of functioning (here the reference to biomimicry, and the principle of "Nature as a template" is very explicit), thus allowing us to preserve natural resources:

In a circular economy, we eliminate waste and pollution, circulate products and materials, and regenerate nature. The circular economy system diagram, known as the butterfly diagram, illustrates the continuous flow of materials in the economy. There are two main cycles — the technical cycle and the biological cycle. In the technical cycle, products are kept in circulation in the economy through reuse, repair, remanufacture and recycling. In this way, materials are kept in use and never become waste. In the biological cycle, the nutrients from biodegradable materials are returned to the Earth, through processes like composting or anaerobic digestion. This allows the land to regenerate so the cycle can continue (<https://ellenmacarthurfoundation.org/circular-economy-diagram>).

This diagram contains multiple repetitions of another image, the loop, which recurs frequently in the CE representation in its closed form. Closing the loop of the traditional linear flows of the linear economy is presented as reasonable and easy, and would allow us to take our products back, reuse, repair or recycle them to then start a new cycle. In this image there are no signs of the hurdles of circularizing flows, nor of the losses and waste which are intrinsically linked to any industrial

process, such as remanufacturing or recycling. The idea of this infinitely reproducing virtuous circle seems extremely optimistic and tends to overlook the radical shifts needed to break away from the linear organization of our production models and the power dynamics at play among capitalist firms and their stakeholders.

We find the same optimism and "call to action" in the high number of voluntary commitments made by big multinational companies to shift towards a circular economy, with a focus on different industrial sectors. For example, led by the Ellen MacArthur Foundation, in collaboration with the UN Environment Programme, the "New Plastic Economy Global Commitment" has united more than 500 organizations behind a shared vision of a CE for plastics. Each business and government signatory has committed to a set of concrete 2025 targets at the global level and reports progress publicly every year using common definitions and measurements. With the ambition of amplifying the impact of individual actions, a Network of national and regional "Plastic Pacts" has been developed where solutions are meant to be tailored to local contexts. Each Plastic Pact is a joint commitment made by businesses, governments, NGOs and other relevant organizations in the local plastics value chain at a national or regional level. However, the ambitious targets defined and communicated by these initiatives have been poorly achieved so far, and the marginal progress observed has been largely driven by recycling (Rhein and Sträter, 2021), with minimum effort shown on the reduction of plastic pack-

aging introduced in the market (for example, through the elimination of single-use packaging). Nonetheless, these actors still claim that by 2040 such initiatives may reduce the annual volume of plastics entering our oceans by 80%, reduce greenhouse gas emissions by 25%, generate savings of USD 200 bn per year and create 700,000 net additional jobs (<https://ellenmacarthurfoundation.org/the-plastics-pact-network>).

This exemplifies the underlying logic of the Market rules archetype: the very actors (big multinational companies) which are at the origin of the problem are also meant to tackle and solve it through their voluntary commitments and pledges. The aim of saving the planet comes together with the eternal objective of continuing to grow and sustain profit. While such a market logic is naturally espoused by multinational companies and backed by the Ellen MacArthur Foundation, it is also foundational in most programs and visions developed by international organizations such as the OECD, the UN (cf. the Environmental Programme) or the European Commission (cf. European Green Deal, 2020). These organizations support a CE which rests on the green *growth* paradigm: it will save and value scarce resources, will cut greenhouse gas emissions, will break down silo thinking and promote cross-policy actions, thus making the economy more competitive, sustainable, and fair.

The EU's transition to a circular economy will reduce pressure on natural resources and will create sustainable growth and jobs. It is also a prerequisite to achieve the EU's

2050 climate neutrality target and to halt biodiversity loss (A new circular economy action plan, European Commission 2020 <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1583933814386&uri=COM:2020:98:FIN>).

The eco-efficiency idea is central to the green growth paradigm. It suggests that by improving efficiency in the usage of energy or resources, we may be able to achieve decoupling. However, while resource efficiency is important and beneficial for the planet, it cannot compensate for the large scale effects of the Anthropocene.

3-2. Circular Economy and Technology fix

In addition to images of the circular economy conveying inspirational relations with Nature, a different, widespread type of CE representation focuses on digitally enabled connections: the power of digital technologies will allow us to create and process data and information required for circular business models and the complex demands of circular supply chains. These images bring together the idea of circularity with the idea of digital transition as best allies in the shift towards sustainable futures. Accordingly, the goals of optimizing functionality on the one hand and developing products-as-a-service, on the other, directly call upon digital technologies such as the Internet of Things (IoT) and Blockchain. Furthermore, the aim of dematerialization is associated with a sustainable transition away from our extractivist/linear economy and is closely related to the development of digital technologies such as digital twins, artificial intelligence

and virtual reality.

Other technologies characterize the CE appetite for product, service and business model innovation, with eco-design, new materials, quality and traceability as the main domains of experimentation for both big companies and start-ups. As revealed by a recent study on CE start-up innovations, the issue of waste management is increasingly being addressed: solutions include generating resources from waste, optimized waste collection with IoT, and AI-powered waste sorting (<https://www.startus-insights.com/innovators-guide/top-8-circular-economy-trends-innovations-in-2021/>). Besides mechanical recycling, one of the biggest circular economy trends is to upcycle waste into energy through incineration, gasification, anaerobic digestion, and pyrolysis. Among hundreds of initiatives around Europe, SEaB Energy is a UK-based startup that offers solutions to generate on-site energy from organic waste. The startup's containerized anaerobic digester, called Muckbuster, turns slurry and farm waste into electricity and heat, generating fertilizer as a by-product (<https://seabenergy.com/category/muckbuster-anaerobic-digester-waste-to-energy/>). In the plastic recycling field, Carbios is a French biological chemistry company specializing in the design and development of enzymatic processes for the biodegradation and bio-recycling of plastics. Their revolutionizing innovation made the front page of the scientific journal *Nature* (Tournier et al., 2020). Start-ups are also investing in AI to predict demand for perishable products in order to reduce waste.

Consistent with the Techno-fix archetype,

state institutional logic is important although subordinated to the role of tech-entrepreneurs, engineers and experts in innovation. Several national initiatives led by the French government have been launched to finance and support the development — and with a bit of luck — the scaling up of sustainable innovations. For example, in the “France 2030” investment plan, launched in 2021 to revitalize France's industrial future by the year 2030, technological innovations for decarbonizing the economy through CE were explicitly targeted as priority measures. In this, I see an implicit assumption that innovation would allow companies to keep on growing while compensating for their environmental impact, and job creation may be an additional bonus.

Although the number of promising innovations for sustainable products, materials and processes is increasing, skeptical observers argue that solutions with technological promise often lack the economic opportunity to be developed on a large scale. Notwithstanding the dozens of “revolutionizing” techniques for plastic recycling, out of the 9 billion tons of plastic waste that we have generated since we started using plastic, we have only been able to recycle 0.5 billion. We mustn't think that these new technologies are easy to scale up; there are multiple operational, regulatory, and political hurdles to overcome. Other critics point to the resource intensity of several technologies, which may address one problem while creating a new one, as has been shown for the bio-fuel issue, which may increase food insecurity in the long run and have controversial environmental effects (Naylor et al., 2007).

3-3. Circular Economy and Cultural re-enlightenment

The preceding paragraphs show that the way CE is framed and practiced resonates clearly with the Market rules and Techno-fix archetypes. Nonetheless, more emergent, local, frugal models of circular economy also exist. The caring metaphor — often represented in CE images, through hands holding our planet or through tools and handcraft activities aimed at extending the lifespan of our products — reveals a third way for CE, which echoes the “sustainability as flourishing” concept and the Cultural re-enlightenment archetype.

Turning our attention to public policies in Europe and in individual countries, two pillars of a frugal and responsible approach to production and consumption are central in recent regulations: product durability and reparability. The “European Green Deal” and the second EU circular economy package (adopted in March 2020) institutes for each consumer the “right to repair” in addition to measures seeking to mainstream eco-design and waste prevention practices. More ambitiously, the Anti-Waste for a Circular Economy Act (AGEC), promulgated in France in 2020, takes a step further, introducing practical measures on such aspects as mandatory consumer information and the extension of product lifespans. It affirms the obligation to display the availability of spare parts, the creation of “repair” and “reuse and recycling” funds, but above all, it introduces a pioneering reparability index for several families of electrical and electronic products (EEE). Waste from electrical and electronic equipment is currently considered to

be one of the fastest growing waste streams in the European Union, growing at 3-5% per year. Since January 2021, manufacturers and distributors present in the French market, including marketplaces, are obliged to publish a “reparability score” for their products, under the threat of heavy fines. The main objectives of such measures are to empower consumers to choose more sustainable products and to foster eco-design practices on the manufacturer's side. The underlying philosophy is to foster a frugal relation to consumption, in opposition to the increasing reduction of product lifespans and related negative externalities in terms of resource consumption and amount of waste produced.

A culture of repair is also developing at a community level in the form of “citizen-driven, locally organised public events, in which volunteer repairers and people with an object in need of repair are matched” (van der Velden, 2021, p.1). The first Repair Café took place in Amsterdam in 2009 and nowadays more than 2000 Repair Cafés operate in 37 different countries. In this type of initiative, volunteer repairers and people needing to fix things meet in a local, non-profit space and together try to solve the problem. In contrast to commercial repair services, community-building sharing experiences go hand in hand with reducing the environmental impact of consumerism and fighting against a waste society. Such collectivist and non-profit approaches bring new perspectives and values to the circular economy, in line with the Cultural re-enlightenment archetype.

Nowadays, “zero waste” has become a new

lifestyle that is seducing consumers all over the world, mainly after the publication of the book *Zero Waste Home: The Ultimate Guide to Simplifying your Life by Reducing your Waste* by a French-American woman, Bea Johnson. Such a lifestyle positions itself as a clear alternative model to the consumer society, putting frugality and reduced shopping behavior at the center of a responsible way of living within planetary boundaries. It is interesting to note that the Zero waste concept was originally linked to recycling, whereas this is seen today as a last resort for modern engaged Zero Wasters. Adherents engage in waste prevention as opposed to end-of-life waste management. Fighting the "disposable mentality" is at the heart of the Zero Waste approach. It consists in promoting alternatives to daily one-use products, which are responsible for the huge amounts of waste generated by our wasteful consumption models.

On the production side, radical circular economy initiatives question the compatibility between capitalism and sustainability, and above all the capacity of innovation to achieve a decoupling of economic growth and environmental degradation. Permaculture farms (Mollison and Holmgren, 1978), for example, propose a deep transformation of the agricultural socio-economic system where individuals would reconnect in a harmonious way with the Earth and their communities by challenging anthropocentric, materialistic and productivist approaches. Similarly, local production is emphasized, as a counter-model to the unfair distribution of value and resources inherent in global value chains, especially through cooper-

ative and collaborative economic structures and using open source and grass-roots innovations and technologies with low environmental impact.

4. Conclusion

Let's go back to my initial question: How can we explain the circular economy *momentum* in the political, business, and societal spheres? Through the previous examples, I've tried to highlight the plurality of approaches and visions of CE according to its position on fundamental social, technological, political and ecological issues, as typified by the three archetypes of the Anthropocene society. In so doing, I suggest that circular economy is so successful because its discourse and main initiatives resonate with the different archetypes, and especially with the Market rules and Techno-fix ones.

The blissful, win-win framing of circular economy, coupled with its promises to cope with resource depletion, climate change and biodiversity loss create a reassuring discourse on the potential of this model to save the planet, without threatening business as usual nor diminishing our faith in innovation. Big companies, governments and policy makers have made numerous commitments and promulgated regulations that tend to integrate the CE paradigm in the current capitalistic system. However, voluntary commitments very often fail to achieve the initial boastful announcements, as they do not need to comply with any form of coercive or punitive measures (cf. the engagement on plastic waste /

recycling reduction). Moreover, CE seems to be focused on rethinking technological innovation and economic prosperity to include the dimensions linked to natural resources and energy waste optimization, but with limited attention paid to other critical social and ecological components. The diverse unintentional effects generated by technology are certainly overlooked, eclipsed by the fascination for and the deeply rooted faith in technological innovation, coupled with an anthropocentric approach to it. A typical example of this phenomenon is the rebound effect of efficiency-oriented measures, where reduced costs for a given product or service lead to increased demand for it, while also creating savings that incentivize consumption in other areas.

Nonetheless, we have also highlighted CE discourse and initiatives resonating with the Cultural re-enlightenment archetype. These require massive socio-cultural change that CE could trigger by transforming the dominant consumption and production models based on materialism, convenience, and ownership to ones based on collaborative consumption, community engagement and frugal lifestyles. The main idea underpinning this less developed vision of CE is that a “general economic downscaling and a philosophy of sufficiency leads to simpler, slower and more meaningful lives” (Friant et al., 2020, p.11).

Generally speaking, the first two prevailing and widespread forms of CE initiatives espouse a vision of sustainability where technical and human capital can compensate for the loss of natural capital. This means that they

tend towards weak sustainability; in order to harness the transformative potential of CE to move towards strong sustainability, we would require a much more significant diffusion of the third type of CE. This would entail radical changes and the promotion of frugality and simple living. It would thus challenge the *growthist* paradigm, which has deeply shaped our societies and is at odds with the physical planetary boundaries. The flourishing logics underpinning CE as a cultural re-enlightenment would allow us to move beyond the purely quantitative, “rational” and objective measures of “progress” to re-consider the ethical, experiential and spiritual dimensions of the immaterial world. The first two forms of CE discourse and initiatives can easily fit in with the current capitalistic model and the Cartesian mechanistic view of our societies, which may explain their success, while the third form would require profound institutional, cultural and political change in our societies. This paper has no intention to be prescriptive about a definitive hierarchy among these varied CE models, but it does call for a more inclusive and comprehensive discussion on CE, which opens up possibilities regarding the many circular futures that might exist. The cross-fertilization of strategies, policies and solutions would be beneficial and help us to evolve towards strong sustainability and avoid the risk of embarking on a circular transition that lacks the substantial sustainable impact needed to cope with Anthropocene existential challenges.

(1) I will mainly develop my analysis from a Euro-

pean perspective, which I know better than other realities in the rest of the world.

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抄訳：本論文の結論（編集部）

人新世におけるサーキュラーエコノミーの成功と、それがもたらす社会変革力の考察

本論文の目的は、サーキュラーエコノミー（CE）の推進力を、政治、ビジネス、そして社会的側面から説明しようとするところである。本論では、Hoffman & Jenningsによる人新世社会の5つの型（archetypes）の内、「拒絶」と「システム崩壊」を除く3つの型：「市場ルール」、「技術による解決」、「文化的復興（ルネッサンス）」を活用し、CEの位置づけをそれら人新世の3つの型について社会、技術、政治、および生態学的観点から検討し、その多面性を明らかにした（Table 1）。その結果、CEの成功を支えているのは、それが人新世社会の型の中でも「市場のルール」と「技術による解決」にとりわけ共鳴するからだ、ということが明らかになった。

資源の枯渇、気候変動、そして生物多様性の減退に抑制効果をもたらすであろうCEの考え方は、至福でありウィンウィンのモデルである。このモデルには、日々の企業活動やイノベーションへの信頼に脅威をもたらすことなくこの地球という惑星を救うポテンシャルがある。大企業、政府、そして政策策定者たちは、既存の資本主義的システムにCE的パラダイムを統合するような幾多の活動に取り組み、無数の規則を設定してきた。しかしながら、そうした活動が自発的な取り組みに委ねられ、規則が強制力と罰則を伴わない場合、当初の自慢げな目標を達成することはほぼ間違いなく失敗に終わる（例：廃プラスチック問題への取り組みや、

リサイクリングへのコミットメント）。さらにCEは、技術革新や経済的繁栄に対し、天然資源やエネルギーの浪費を解消する視点を組み込むように修正を促すことはあっても、それ以外の社会的・生態学的な重要な観点に十分な配慮を払わない傾向があるようだ。その結果、技術革新への誘惑と深い信頼、そして人間中心主義とも相まって、技術が引き起こす多様な意図せざる副次的効果は看過されてしまう。こうした現象の典型例は、効率主義的測定指標が持つリバウンド効果である。つまり、ある製品やサービスのコストが低下するとそれら製品・サービスへの需要が高まったり、他の財を新たに消費するための資金源を逆に増やしてしまうのである。

とはいうものの、CEの考え方は人新世の3つ目の型、文化的復興にも共鳴している。CEと文化復興を関わりあるものにするためには、巨大な社会文化的変化を引き起こすことが必要になる。それは現代を支配する物質主義、利便性、所有権に基づいた消費と生産のモデルを、共同消費、地域レベルの取り組み、節約型のライフスタイルに基づくモデルにシフトさせることである。この未だ十分な発展を見ていないCEの側面は、いわば広範にわたる人類の経済活動の縮小と、足るを知ることによる単純で、より低速度で、より意義深い生活を希求する哲学に基づいている。

一般的に言って、人新世の最初の2つの型、「市場ルール」、「技術による解決」をベースに

したCE活動はすでに広く受け入れられている。しかしここでは、技術と人間資本が自然資本の棄損を補填するという「弱い」持続可能性(weak sustainability)が追求されているに過ぎない。では「強い」持続可能性(strong sustainability)を目指すには何が必要なのか。それは第3の型(文化的復興:ルネッサンス)に基づくCEの強力な伝播・普及、すなわち劇的な変革を伴う節約とシンプルライフの奨励である。現代社会を深く規定している成長主義的(growth-ist)パラダイムは、地球の惑星限界(人間が安全に生存可能な境界線)に明確に反しているが、新たな第3のCEの奨励は、この成長パラダイムへの抵抗である。文化復興的・啓蒙的なCEの考え方は、純粋に定量的で、合理的で、進歩を客観的指標で捉えるわれわれの態度を改めさせ、その代わりに非物質的世界の持つ倫理的、経験的、精神的側面を考えさせる。最初の2つ

の型のCE(「市場ルール」や「技術による解決」に親和性のあるCE)は、現代の資本主義モデル、および現代社会をデカルト的にメカニズムとして捉える思想と整合的であり、それがそれら2つの型のCEの現在の成功を説明している。その一方で、第3の型のCEを成功させるためには、制度的、文化的、政治的な根本的変革を社会に生じさせる必要がある。本論文は、これら3種類のCEの間に階層的な序列をつける意図はないが、より包括的かつ総体的なCEの議論を行えば、さらに多様な循環型未来の可能性が開拓されていくであろう。そして、戦略、政策、そして解決策が相互に育みあい、それらが私たちを「強い」持続可能性の実現に向けて導いてくれること、さらにはわれわれの経済社会における循環が、持続可能なインパクトを持たないような類のものに進化するリスクを回避させてくれることを願う。