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Everyday politics of circular futures

Doctoral thesis

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Thesis for the Degree of Philosophiae Doctor

Trondheim, May 2023

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Abstract

This thesis deals primarily with the ideas about a circular economy (CE). A branch of critical studies about CE has emerged in recent years. These critical studies take the nexus of consumption and production as its point of departure but expand the questions to the social contexts and effects of how CE is conceived and performed. As CE has entered mainstream sustainability discourses, policies, and practices, we see the contours of a dominant version of CE. This mainstreamed version of CE affirms the social structures that some have referred to as the cause of most global environmental crises by prioritizing technical change, profit-making, and economic growth.

Positioned as contribution to critical studies about CE, the work in this thesis recognizes that the concept of CE offers an opportunity to question the aspects that sustain and reproduce current consumption and production systems as part of social life. If framed this way, CE is considered a transition that requires a profound societal transformation to foster more just societies. To open the space of possibility in transitioning towards a CE means opening its futures to common senses and social imaginaries that organize production and consumption differently.

The thesis is based on a research-for-design approach, meaning its contributions inform the relationship between CE and the design discipline. This orientation acknowledges that many conventional practices in the design industry also affirm current ways of organizing production and consumption. Thus, the critique of CE is also reflected in a critique of design.

The main research aim of this thesis is to identify opportunities for design to support CEs based on social imaginaries that contest the currently dominant organization of production and consumption. This aim implies that design covers activities that reach beyond professional designers. Moreover, it supposes that other forms of organization, doing, and being are possible despite the dominant structuration of social life.

In terms of theory, the work in this thesis is based on critical perspectives, most prominently an understanding of social life employing social practice theory to analyze the normality of social life and the persistence or change of dominant projects as part of everyday life.

This thesis derives from three empirical studies conducted in Trondheim, a major city and municipality in the Trøndelag region in Norway, to elucidate alternative possibilities for CE. The first study looks at CE as part of the discourses of actors involved in its emergence in the public sector at different scales, in the private for-profit sector, and the organized civil society. The second study looks at social practices that contest consumerism by incorporating modalities of consumption based on repair and

reuse. Finally, the third study looks at the general political context of governance for a CE; this study derives from two workshops, one about climate change conducted with youth citizens of the Trøndelag region and one about what is considered to be necessary production and consumption.

The results of the studies show evidence of a possible social reconfiguration concerning consumption. In the first study, an alternative discourse emerges in Trondheim, diverging from the imperative of economic growth as proposed by the discourses in the policies and proposals by the national – Norway– and European institutions. This divergent discourse points towards the reduction of consumption. It is enacted in practice by the municipality and local organized civil society through services prioritizing other welfare aspects –i.e., sharing and public access– over economic growth. The second study shows a contestation of consumerism anchored on practices that do not rehearse the competences of the market –buying and selling. Instead, these practical engagements organize around the social circulation of knowledge and material resources. The social circulation of knowledge also connects to identities and technical skills. Finally, the third study used participatory futuring to demonstrate that the core aspects of a CE are included in other societal discussions, in which CE does not need to be explicitly addressed –for example, about climate change and the governance of production and consumption. It shows that other aspects of the critique of CE can be questioned and explored by decentering the discursive load of the concept –and how it predisposes its enactment, such as the power dynamics, responsibilities, and expectations of the different actors as part of their roles in the production and consumption system.

To conclude, the results from the empirical studies present alternative social imaginaries in the configuration of another common sense in Trondheim. Furthermore, this alternative common sense is linked to an alternative CE based on priorities sustained by a welfare system. This alternative CE emerges from the contestations to economic growth, market competences, and knowledge production modes that do not consider the affected actors. Finally, following a research-for-design orientation, these contestations are posed as opportunities to be advanced by design. In this sense, design acts integrating CE should consider these contestations and their broader political implications.

Preface

This thesis binds together the research studies conducted as parts of a three-year doctoral project. The project's original title was "Everyday life in circular futures." The initial research plan addressed and translated three main concepts found in this title:

1) Everyday life as the conditioning of human activity and the consumption of material resources – delimited in time and space.

2) Circularity as derived from the ideas about a circular economy –from material loops to reasons about the consumption of materials.

3) Futures as open alternatives for change –with visions, expectations, and enactments. These three concepts were integral to the conducted studies and the discussions that came out of them.

These three concepts were the core of this research. However, the inclusion of aspects in their scope had to be reformulated, dropped, or toned down for this thesis –to prioritize the messages presented here.

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1 Introduction

The idea that a circular economy (CE) is a strategic solution to decouple economic growth from environmental impacts is increasingly gaining popularity (D'Alisa, 2019). For example, Stahel (2019) proposes a CE as an industrial model where the preservation of material resources is the prevention of economic loss. In his model, a CE requires changes in ownership and responsibilities over who cares for material resources while offering opportunities for more economic activity. However, the possibilities to achieve this decoupling are challenged by accounting for the impossibility of separating economic growth from its physical consequences –the ever-increasing consumption of materials for products and energy (Parrique et al., 2019).

D'Alisa (2019) calls not to dismiss the principles and applications of CE and instead involve actors – such as grassroots movements– that engage with CE by challenging other aspects of the organization of society, such as private ownership of knowledge and information. In the same vein, Temesgen et al. (2019) argue that establishing a CE raises issues of onto-epistemological demarcation, meaning that a CE and its communities can vary depending on different values and views about what it is, how and when it is achieved. For Temesgen et al. (2019), a CE can be positioned between the atomistic views of neoclassical economics (i.e., individual independence) and the holistic views of ecological economics (i.e., reciprocity and interdependence).

The two previous paragraphs have introduced two issues commonly raised as part of the critical turn in studies about CE (e.g., Genovese & Pansera, 2021). The first issue concerns the goals that should be pursued as part of a CE –and its physical basis. The second issue concerns the type of social organization a CE requires –and if it self-perpetuates or challenges the shortcomings and negative aspects of the capitalist status quo. These two issues are raised in response to a specific way of understanding CE, which Isenhour (2019) calls the mainstream version of CE. As the ongoing struggles to define CE show, the mainstreaming of CE has certainly not produced one monolithic version of what a CE is or should be. However, as will be argued in detail in this thesis, all mainstream versions share that they are affirmative of high consumption; they have technocratic tendencies, take capitialistic market-economies for grantedand do not take responsibility for social consequences. The insistence on these basic tenets of mainstream CE is not academic, but is motivated by a concern for the social and environmentral consequences of a transition to CE. For example, Velenturf & Purnell (2021) argue that 'ill-positioned circular economy measures' could aggravate negative environmental and social effects.

In this thesis, CE is approached as an open-ended opportunity for the future (Welch et al., 2017; Bauwens et al., 2020). While some activities for production and consumption may already be deemed

circular, the full extent of circularity that can be reached remains unknown. De Man (2022) argues that this extent may remain incomplete forever because CE's most optimistic proponents disregard physical realities. However, the mainstreaming of CE provides a dominant set of assumptions that shape what a CE can be and how different actors address it. Isenhour (2019, p.28) points out that the mainstream version of CE is *"highly consistent with the technocratic and market-based solutions."* Moreover, Isenhour (2019) notes that this mainstream version is prompted as part of apolitical climate change mitigation strategies –following the Paris Agreement– and deemed good for the climate and the economy. According to Isenhour (2019), although CE is purported to be a systemic solution, it may not be enough to deal with the unjust effects and inequalities of production and consumption across different geographies and social groups.

The mainstream version of CE is not yet inescapable; alternative discourses exist that promote alternative versions of CE (c.f., Calisto Friant et al., 2020; Bauwens et al., 2020). To open the multiple possible versions of a CE, research must consider its technological proposals as embedded in a politico-economic system. As Pinyol Alberich et al. (2023) propose, repoliticising CE is required to uncover more radical alternatives. This repoliticisation of CE implies seeing the transition towards a CE as a process of social construction, i.e., as the building of a common sense based on a shared intersubjective world.

Organizing a CE is a process of making a common sense. According to Berger & Luckmann (1991, p.37), common sense is the intersubjective world shared with others. As a set of ideas about the future, a CE is a proposal for a social arrangement that depends on those possible shared intersubjective worlds. The task for this thesis is to evidence a space of possibility to open the future of CE and its opportunities for socio-technical transformation. Although some prescribe CE solutions through science without any reference to society (Nobre & Tavares, 2021), others have shown inequalities in how common sense to support CE is constructed (Fratini et al., 2019; Anantharaman, 2021; Wuyts & Marin, 2022). Moreover, any CE's solutions depend on a priori assumed social relations and distributions of agency in society –for example, keeping certain people as consumers while opening opportunities for others to become producers– or in power distribution –allowing some to control resources.

The common sense of a CE is also present in policy-making, as the intersubjective world of everyday life is shared by humans and institutions. These policies range from requirements for physical products to strategies with specific targets and indicators for producers (Morseletto, 2020; Völker et al., 2020). These policies are indicative of particular social imaginaries. For example, Pinyol Alberich et al. (2023) show that European Union programs for a CE fit a modernist model, where the social imaginary means

that technical-scientific elements are prioritized over social elements in governing the relations between humans and material resources. Nevertheless, as part of particular social imaginaries, these relations sustain the make-up of social life.

Here, I have borrowed Taylor's (2004) concept of social imaginary:

> *"Our social imaginary at any given time is complex. It incorporates a sense of the normal expectations we have of each other, the kind of common understanding that enables us to carry out the collective practices that make up our social life."* (Taylor, 2004, p.24).

The concept of social imaginaries encompasses ordinary people's political and economic understandings and limits in carrying out their everyday lives. It is also compatible with the shared common sense described by Berger & Luckman (1991). This thesis refers to alternative social imaginaries that form as other common senses –in this case, of CE.

In most current literature, CE is framed as a depoliticized project relying on a techno-corporative agenda (Corvellec et al., 2021, pp. 6-8). In this context, the mainstreaming of CE aligns with a common sense and social imaginaries based on a form of capitalism that sustains consumerism, economic growth, and a reduced role of the state. Ghisellini et al. (2021) noted that this is due to the neoliberal economic paradigm that does not consider resource constraints and requires a shift towards a virtuous economic cycle. Moreover, Ghisellini et al. (2021) call for the revision of the role of States and other social actors:

> *"We emphasised a model of economy underpinning CE transition… that implies a redesign of the current role of the State intervention as well as the role of responsible consumers, companies, and institutions with the purpose of creating a virtuous cycle between these three fundamental actors."* (Ghisellini et al., 2021, p.164)

In this thesis, the agencies of these actors are essential, as they define a shared reality with neoliberalism as common sense. Therefore, the research task of opening for alternatives to the mainstream version of CE requires looking at alternative social imaginaries that could make possible a different reality.

As part of the critical CE studies, this thesis is positioned among the calls for seeing CE as an ongoing redefinition of consumption and production, where the effects of modern progress are still under debate but condition the space of possibilities for the futures of society (e.g., Calisto Friant et al., 2020; Genovese & Pansera, 2021; Temesgen et al., 2019). This process of redefinition through CE reorients relations between people, concepts, and material resources around different modes of understanding, agendas, and interests at different scales. For example, in setting up a CE between

China and Europe, Luo et al. (2021) call for CE cooperation to step out of eco-modernist and neoliberal discourses to advance ecological goals. The coming together of different actors' understandings, agendas, and interests imply a politicization of CE (Pansera et al., 2021), which calls for a revision of how knowledge and political contexts work together (Hermann et al., 2022). Furthermore, addressing CE revives some of the longstanding debates about the use of material resources and the environmental effects of human activity.

1.1   Research for design and circular economy

The positioning of this thesis aligns with a growing acknowledgment that current ecological crises demand a fundamental societal change. Prominently, the latest report by the Intergovernmental Panel on Climate Change calls for: *"a societal transition focused on attributes that drive innovation, the evolution of patterns of consumption and development and power relationships among societal actors"* (IPCC, 2022, p.172). The IPCC also points out that *"the tendency for certain worldviews to dominate the policy discourse has the potential to exacerbate social, economic and political inequities as well as ontological, epistemic and procedural injustices"* (IPCC, 2022, p.2712). The same report also mentions critiques of economic growth and the need for alternative development models (IPCC, 2022, pp.2717-2718), a political issue that also engages with how scientific knowledge is used:

> *"… while scientific and technology knowledge may be useful, in some cases, they remain subordinate to political agendas, or are controlled by actors in positions of power and thus not equitably distributed."* (IPCC, 2022, p.2718)

In this thesis the definition of transitions offered by Loorbach et al. (2017, p. 600) is adopted, in which sustainability transitions are referred to as *"large-scale disruptive changes in societal systems that emerge over long periods of decades."*

Considering the need for 'large-scale and disruptive changes', it becomes necessary to acknowledge that the recent emergence of CE is not disconnected from other concerns about the environment and the capacity of humans to sustain their lives and the planetary systems. Indeed, these concerns present a trajectory that has shaped and informed designers' discourses and practices for decades. For example, Fallan (2022, p.25-59) writes about these concerns in the Nordic countries –where the work for this thesis is conducted– during three decades in the aftermath of the Second World War while consumer societies were rising. In Fallan's (2022) account, the environmental issues got entwined in debates and critiques about politics, responsibilities, and design concerning disposability as a promise of modern progress that gave way to a discourse on recycling and reusing.

The work in this thesis assumes that the modes of doing, making, and knowing in conventional commercial design practices are not fit to open a CE's many futures. Critiques of such design practices are now common in critical design discourse, particularly in transition design (c.f., White, 2021). However, as White (2021) claims, there are gaps in these critiques that do not allow for a proper contestation of the political-economic status quo. In addition, to White (2021), these critiques overstate the world-changing capacities of design by not acknowledging that design and designers are also part of the division of the labor of the current organisation of production and consumption. Reformulated in the terms introduced above, design practices are also part of the common sense that must change. That said, conventional modern design is only one of the forms in which design –making and doing– can appear (Tonkinwise, 2022).

The introduction of CE into design has followed an established tradition in eco-design but distinguishing from it by considering the need to include product care –in addition to remanufacture and recycling strategies (den Hollander et al., 2017). In conventional design, technical and material issues are the *a priori* occupation of knowledge creation. The designer seeks to answer questions about what materials to use, which functions to include, and what styles to accommodate for the aesthetic taste of the products in specific contexts. However, as noted by Lofthouse & Prendeville (2018), some of the ethical questions and radical humanist approaches that design could integrate by including users' social lives are not addressed in conventional design and are missing from design for CE as well. In this sense, some of the discourses about CE evoke the need for designed material solutions, such as reinventions of products and services (c.f., De los Rios & Charnley, 2017).

The mainstreaming of CE relies on techno-scientific progress, particularly innovations and the expectations they create. This version of CE emphasises the topics and orientations –subjects of knowledge and traditions– of particular academic and professional disciplines, including industrial ecology, waste management, and business sciences. Design disciplines are also instrumental in expanding a techno-oriented CE –which some have argued can be reframed by expanding the focus toward the systemic effects of production and consumption (e.g., Wizinsky, 2021; Chapman, 2021).

Different disciplines make sense of CE differently (c.f., Blomsma & Brennan, 2017). Notwithstanding, the onto-epistemological problems of CE are not only about disciplinary demarcation but also about the political positioning of CE proposals (Valenzuela & Böhm, 2017; Hobson, 2021; Pinyol Alberich et al., 2023; Isenhour, 2019). The concerns about CE cover more than its definition as CE proposals have effects in legitimizing or refusing agencies.

While the mainstream version of CE proposes changes in how resources are used, a more fundamental question is whether another common sense can result from CE or whether CE is necessarily just a way

to maintain "business as usual." Particular interest is given to calls to strongly define CE (Reike et al., 2018) based on emerging opportunities for CEs that are rooted in radical change (Temesgen et al., 2019; White, 2021) and how these CEs could be shaped to support alternative realities based on the inclusion of multiple perspectives.

In the context of a politicization of CE, design approaches are useful when these explicitly include social, ecological, and political issues –for example, following a longstanding design discourse engaged in critiques about social and environmental issues in capitalist production (c.f., Boehnert, 2018, pp. 19-26). In the inclusion of social and political concerns, design takes on practices that center the effects of material and technological arrangements as mediators of reality and the conditions for just transitions –requiring *"creative labour and inventive praxis"* (White, 2020, p. 17).

Expanded versions of design consider not only the definition of products and services but actively seek to change the world and produce eco-social benefits through identification of and action targeting the systemic causes of particular forms of harm (Margolin & Margolin, 2002; Dilnot, 1982). In this regard, Boehnert (2018, pp. 38-48) distinguishes between design and the design industry; while the values of design and designers are increasingly motivated towards eco-social benefits, the industry is driven towards profits. Some discourses of design, advocating for less harmful practices of designing, call for the inclusion of multiple actors and forms of knowledge that integrate the many ways in which the social can be brought about to/with/by design (c.f., Tonkinwise, 2019).

Here, the research framings within design disciplines move from the insular level of products to the higher level of social systems –a design for sustainability perspective (c.f., Ceschin & Gazilulusoy, 2020). This move is not to disregard the importance of product research but to question the foundations of the need for constant renewal of products and the limits in a world where social mediations through the artificial –namely, human-made– appear inescapable (Dilnot, 2020).

Leipold et al. (2022) contend that there are three ways of approaching CE: being optimistic about its possibility, intending to reform it by including a social dimension, or being skeptical about what CE sustains. Similar critiques can be found directed toward design. On the one hand, a practice of design that considers only the product (or outcome) in its conception and the functions received by users aligns perfectly with a mainstream CE, as it does not require questioning the common sense that mobilizes said practices or their outcomes. On the other hand, a design practice could be reformist by focusing on adding social dimensions –which acknowledges the limitation of design capacities for transformation (c.f., White, 2021). However, a design practice that includes skepticism about what is sustained in production and consumption would evidence the role played by design in said system (e.g., Fry, 2017). A reformist approach to design, whether in the same system or by radical

transformation, aligns with alternative and more radical modes of circularity –of the likes called on by Lofthouse & Prendeville (2018) and Pinyol Alberich et al. (2023).

Design has the potential to overcome the over-reliance on technologies as solution-making that spring from specific realities and sideline or ignore others (c.f., Escobar, 2020a, pp. 79-104). Isenhour (2019, p.38) notes a lack of discussions about alternative global political-economic arrangements, propitiated by the mainstreaming of CE that maintains the status quo of production and consumption unchanged. Similarly, in design, Julier & Kimbell (2019) have pointed to the depoliticization of design practices. However, it is also acknowledged that political modes of designing are possible –Boehnert (2018, p.182) refers to ecological literacies as the basis for politicizing design. Moreover, the political modes encompass doing and making that differ from the mainstream ways of designing for production and consumption under the logic of the modern-industrial world. Hence, change of the status quo is a problem for design research that intends to be critical while integrating concepts or knowledge created outside the standard scopes of (conventional) design, i.e., offering aesthetic and functional parameters of production without considering social and planetary limits.

For the development of this thesis, a problem is what kind of CE research to do within the design discipline –more than adding an industrial systems orientation to technical products, e.g., Moreno et al. (2016); Whicher et al. (2018); van Dam et al.(2020). Some of the issues raised about CE are mirrored in the issues raised about design: which types of knowledge it supports and the power distribution in designing. In its conventional western and modern versions, design has played an essential role in the great acceleration –the increasing expansion of consumption levels during the second half of the 20th Century– and the weakening of collective goods and welfare systems as a process of neoliberalism –under the guise of problem-solving (Boehnert, 2018, pp.15-26). Moreover, design offers the aesthetic means that condition the symbolic aspects governing resource consumption. Although the inclusion of CE as a set of principles for designing could positively impact how resources are used, a rapid rate of product replacement based on a capitalist imperative of growth would still result in a rehearsal of the problems that CE intends to palliate.

1.2   Research aim and questions

In this thesis, the integration of CE in design is approached as a potential factor for a substantive change in how design is practiced –of design's initial reasons, means, and ends. With design as its disciplinary vantage point, this thesis argues for seeing and thinking about design through CE to delve into the production and consumption system's broader political and social implications.

Considering the broader political and social implications of the production and consumption system, this thesis aims to identify possible alternative social imaginaries to ground other CEs –more socio-

ecologically responsible ones which accounts for different human and environmental agencies. For this task, the main research objective is:

- To identify opportunities for design to support CEs based on social imaginaries that contest the organization of production and consumption in the current status quo.

Here, design is meant to also include research activities aiming at uncovering alternative social imaginaries representing socio-technical change. These social imaginaries compete and are leveraged through specific discourses and practices by different stakeholders. Focusing on social imaginaries in this thesis is a move away from solutionism and methodological individualism. The latter is based on the causality of individual choices –common in behavioral studies (Shove, 2010)– and the former on the problem-solving orientation in the design industry (Boehnert, 2018, p.15).

Uncovering alternative social imaginaries implies an interrogation of possibilities. These are the possibilities to break away from dominant social imaginaries and their common sense. This task requires analyzing discourses and practices of CE that emerge as imagined or enacted in contestation, negotiation, or conflict with the current structuration of production and consumption as part of living through CE as a transition –that can be guided by design (c.f., Irwin et al., 2015).

To support the task of looking at alternatives grounded in another common sense, the general question that drives the work in this thesis is:

- How can design contribute to CEs supporting other common senses for production and consumption?

Three secondary questions guide the research in the three studies conducted.

1. Which existing institutional structures may foster or hinder the agencies of alternative social imaginaries?

2. Which alternatives of resource use in production and consumption can contribute to alternative social imaginaries?

3. How can design aid the formulation of CEs that sustain alternative social imaginaries and agencies?

1.3   Research studies and objectives

The research activity followed a scheme based on three studies. Each study focused on one specific subject. The first examined CE's structuration as discourse and practice. The second study took consumption as its locus, the substantive dimension of the economic and social arrangement through social practices. Finally, the third study focused on design as part of the co-production of expectations about the future. The research conducted in this thesis looks at the localization of CE. It considers how a CE becomes normalized in discourse and practice and enters everyday life.

The research looks at the transition to CE in Europe and its effect in Norway –in cases in the region of Trøndelag and the City of Trondheim. The cases are studied and analyzed through qualitative data collected with descriptive-interpretative methods. Following is a summary of the studies and their objectives (see Table 1.1).

Study: focus	Literature concepts	Research methods	Observations	Main operational concepts
#1: Discourse	- CE: Discourses, narratives, imaginaries, visions, policies.	Discourse analysis (coalitions)	- Interviews with local actors (Non-profit organizations, industry, government) - Policy documents.	- Visions (imaginaries) - Structuration (discourse-practice) - Expectations - Institutional and organizational scale.
#2: Practice	- Critical CE: Alternative framings. - Consumerism and consumption: sustainable and alternative.	Short-term ethnography and constructivist grounded theory	- Interviews with locals (local initiatives promoting repair, reuse, and waste avoidance). - Non-participatory observation online and in public activities.	- Social practices - Conditioning (institutional and infrastructure) - Consumption and consumerism. -Understandings -Spatio-social proximities.
#3: Design	- CE and design. - Futures and time horizons. - Governance.	- Design reframing - Participatory design - Discursive design	-Workshop with youth (future workshops). - Method formulation (pilot).	- Open futures - Necessary production and consumption. - Participation modes. - Socio-technical system governance.

Table 1.1. Summary and scope of each study

A. First study: research on CE prospects at the institutional/organizational level. The study deals with visions of circular futures held and formed by policymakers and administrative authorities in Norway in interaction with private sector actors (seeking for-profit and non-profit social and technical change). Objectives in this study are:

> 1. Identify and map the existing structure for material circularity and obstacles or opportunities for developing alternative futures.

> 2. Analyze the discourses of private and public actors about the circularity of resources – specifically the coming into being of a CE.

B. Second study: research on practices with alternative modes of consumption. This study identifies experiences in practical engagements that contest consumerism. In this study, the focus is on activities

found in the urban environment of Trondheim, a city and municipality in Norway, which includes practices of repair, reuse, and recirculation to avoid waste and extend the lifetime of products. Objectives in this study are:

3. To identify experiences in alternative production, distribution, and consumption of resources.

4. To analyze the experiences in alternative forms of consumption concerning a CE and its contestation of the linear economy.

C. Third study: reflect on design as more than intervention/action opportunities, but as the co-production of expectations at the local level in Trøndelag; this study considers the proposal of a program or agenda to design and research beyond products and to facilitate the inclusion of citizens' agency as part of CE. Objectives in this study are:

5. To propose and test methods for expanding the concept of CE and the inclusion of citizens.

6. To propose an agenda for further work in design that contributes to opening the futures of CE in support of alternative social imaginaries.

This thesis is article based; Table 1.2 presents the articles that make up the main research corpus.

Study	Publications	Type of publication and status	Role of author
#1: Discourse	**Article. 1.** Ortega Alvarado, I. A., Sutcliffe, T. E., Berker, T., & Pettersen, I. N. (2021). **Emerging circular economies: Discourse coalitions in a Norwegian case.** Sustainable Production and Consumption, 26, 360–372. https://doi.org/10.1016/j.spc.2020.10.011	Journal article, published	Main author
#2: Practice	**Article 2.** Ortega Alvarado, I. A., Pettersen, I. N., & Berker, T. (2022). **Contesting Consumerism with a Circular Economy?** Circular Economy and Sustainability. https://doi.org/10.1007/s43615-022-00218-1	Journal article, published	Main author
#3: Governance	**Article 3.** Ursin, M., Lorgen, L. C., Alvarado, I. A. O., Smalsundmo, A.-L., Nordgård, R. C., Bern, M. R., & Bjørnevik, K. (2021). **Promoting Intergenerational Justice Through Participatory Practices: Climate Workshops as an Arena for Young People's Political Participation**. Frontiers in Psychology, 12, 727227. https://doi.org/10.3389/fpsyg.2021.727227	Journal article, published	Co-author
	Article 4. Ortega Alvarado, I. A., & Pettersen, I. N. (2022). **Designing for what? Approaching necessary production and consumption for a circular economy.** DRS2022: Bilbao. https://doi.org/10.21606/drs.2022.767	Conference article, published.	Main author

Table 1.2. Summary of academic articles from which this thesis is derived

1.4   Thesis structure

This thesis is structured into seven chapters (see Figure 1.1). Chapter 1 is this introduction, which offers a background for the research conducted and its scope. Chapter 2 looks deeper at CE as an object of study, offering seven interpretations to frame it as a concept. Chapter 3 describes the theoretical approaches used in the three studies and a strategy to bind them together. Chapter 4 describes the operational concepts taken from the theoretical approaches and the methods used to collect and analyze data. Chapter 5 describes the context of the studies, the city of Trondheim in Norway. Chapter 6 presents a summary and discussion of the results from each study and an overall appraisal of them. Finally, Chapter 7 goes through each research question, offers specific conclusions about the research conducted, and reflects on the contributions as a research-for-design.
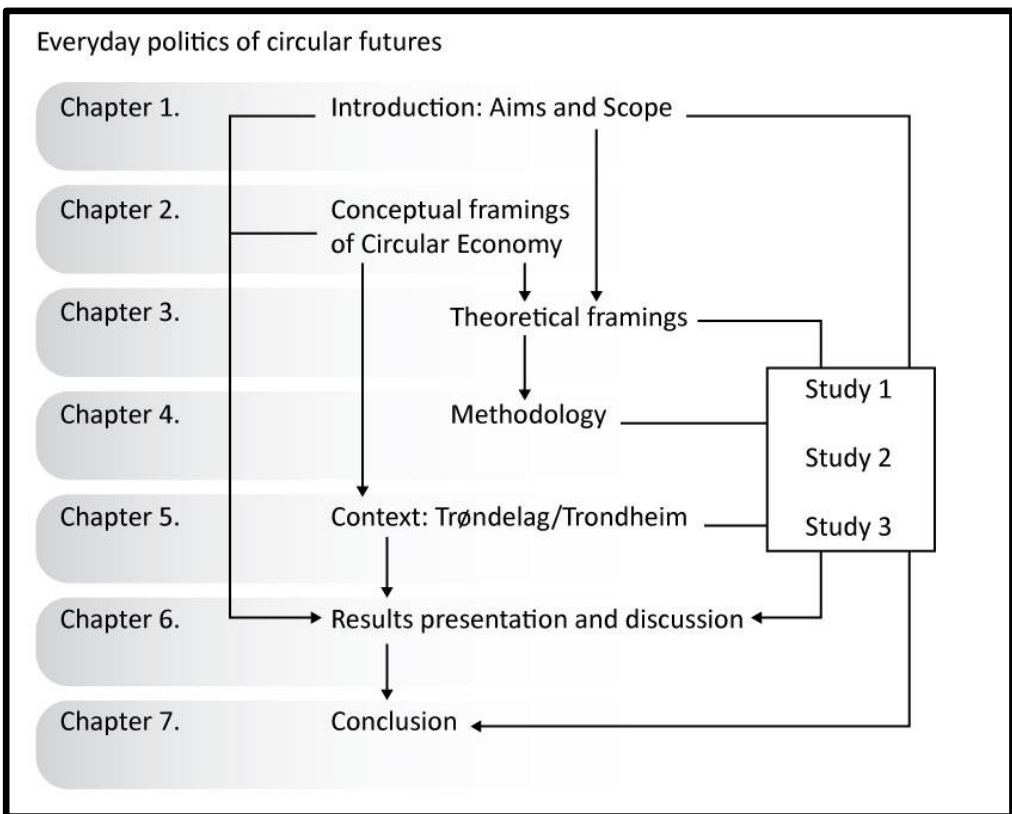
Figure 1.1. Diagram of the structure of this thesis

2 Conceptual framings

This chapter reviews existing literature about CE and other concepts implicated in its construction as an object of study. The literature about CE has significantly grown since 2015. Some evidence of this growth is observable in the yearly distribution of publications in Scopus and Web of Science, two popular academic research indexing databases (see Figure 2.1). Additionally, the growing number of publications is not limited to scholarly literature. CE is also found in gray literature, such as business reports and policy documents. CE is reported mainly in normative ways for its application in industry, commercial, and social projects. The term is coupled with sustainability and sustainable development, sometimes replacing these terms and others appearing in support (Geissdoerfer et al., 2017).
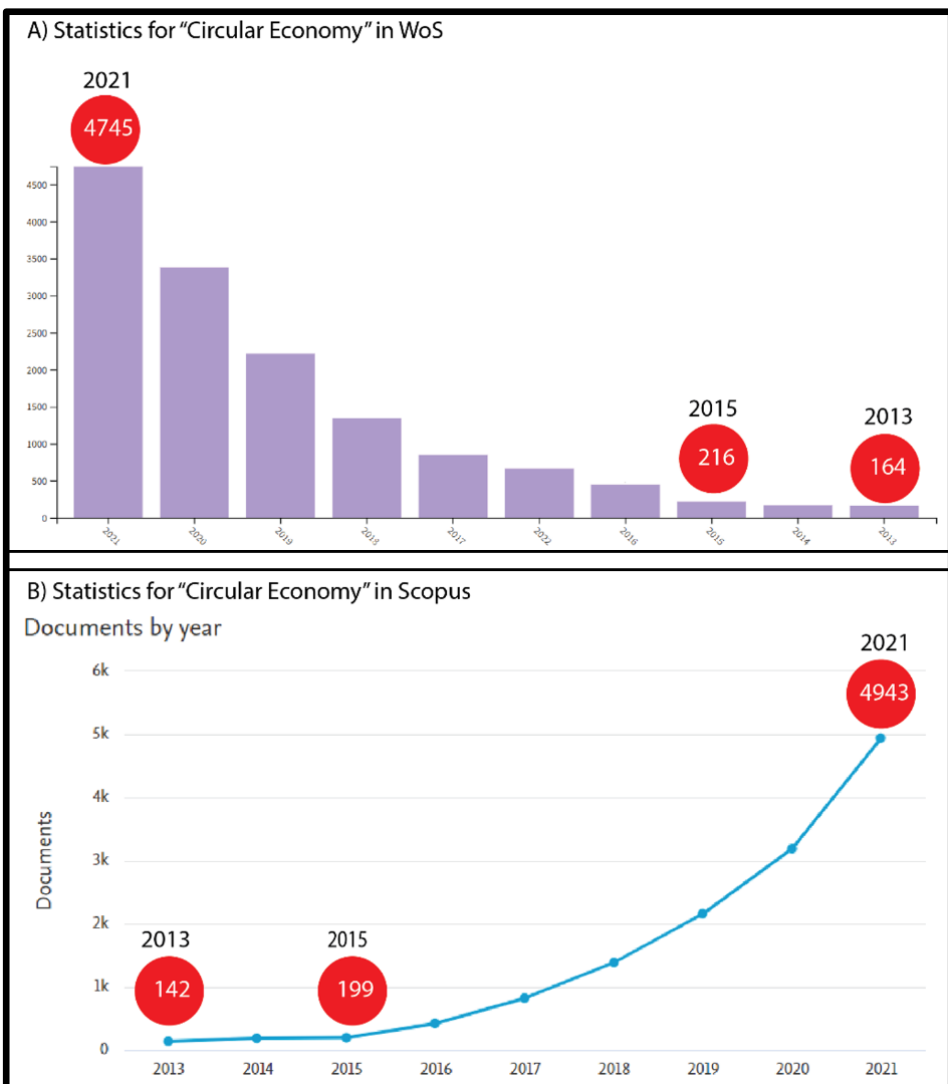
Figure 2.1. Statistics for publications from Web of Science (WoS) and Scopus (2013-2021)

The ideas included in CE follow an epistemic history (Blomsma & Brennan, 2017). This history shows a transference of the term from fields linked to environmental studies, waste management, and engineering to economics and, more recently, the social sciences. For example, in Scopus, the publications indexed in subject areas related to social issues accounted for less than 20% of all the publications about CE[1].

2.1 Circular economy as a concept

The concept's origin is unclear, but most claims give authorship status to Pearce &Turner (1990). In chapter two of their book, Pearce & Turner (1990) explained a CE model that brings together environmental systems (resource and waste) with economic ones (production, consumer goods, and capital) by interfacing them through resource recycling and accounting for dissipation by considering thermodynamic principles –roughly answering concerns posed by Georgescu-Roegen (1975) about the continuously increasing energy consumption for production. This model of CE is also based on previous ideas about managing Earth's resources as a closed system with several flows of inputs and outputs. For example, in 1966 Boulding (2011) claimed the need to manage, energy, matter, and information. These are also the base for the ideas of Earth as a machine that supports life (a spaceship). These ideas were already popular in the 1970s and kickstarted the discourse around resources –for example, Fuller (1963) promoted it in his design science decade project from a technocratic perspective:

> *"This is a superb opportunity to clarify for all humanity that the fundamental and prior problem of man's surviving successfully on this little sun-orbiting space ship, "Earth,", cannot be solved by political theory and is not to be left to the politicians"* (Fuller, 1963, p. 91)

The idea of circularity as the management of resources in closed loops or systems precedes any formulation of CE. Stahel (2019) proposed circularity as the principle governing nature. The circularity of natural cycles defines a system's capacity to use resources many times to satisfy the functions of several subsystems; examples are the water cycle and the nutrient cycle in trophic chains –Pearce & Turner (1990) called it the waste assimilation function of natural environments.

A system's capacity to cycle resources also depends on the system's limits –such as the pace of loading and unloading of substances within systems. In other words, capacity for systemic homeostasis. The notions of carrying capacity, systemic thresholds, or overshoot were the grounding ideas in The Limits to Growth (Meadows et al., 1972). This publication gives early evidence of the disconnection between

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[1] The percentage of publications in Scopus corresponds to the indexing including subjects of social sciences, business and management, and economics for the period between 2001 and 2021, and retrieved in October 2022.

economic growth and the environmental load capacity of Earth (based on the intensification of financial exchanges requiring more production and consumption), leading to a call for societal change (behavior). Other models have later supported the integration of limits, such as the planetary boundaries (Rockström et al., 2009; Steffen et al., 2015).

Most CE models proposed after Pearce & Turner (1990) have intended to operate according to the notion of limits by offering alternative solutions to decrease material and energy dissipation[2]. In the text of Pearce & Turner (1990), the primary solution proposed is using renewable resources to avoid a decline in the economy (i.e., circumventing the lowering of living standards). Natural systems can process and decompose renewable resources into new resources without technical intervention. However, even renewable resources need the intervention of humanly created solutions to avoid an overload at the expense of the system itself.

Any application of circularity should contextualize systemic limits. More clearly, it should consider the system's capacity to support and regenerate when impacted by certain extractive and discharging activities and the pace of load and unload introduced by those activities. Most human activity for consumption is an activity of extracting and discharging. Pearce & Turner (1990, p.36) also refer to this notion: *"The basic difference between natural and economic systems, however, is that natural systems tend to recycle their waste. The leaves decompose and are converted into an organic fertilizer for plants and for the very tree creating the waste in the first place".* However, the notion of recycling decontextualizes the processes and other subsystems providing those recycling functions, such as the soil, insects, bacteria, and fungus involved in decomposing and transporting those resources as a nutrient for other plants and trees. One of Georgescu-Roegen's (1975) critiques of recycling is the lack of understanding about the intensive energy and how technological systems may not be enough to match the system limits.

The "basic difference" that Pearce & Turner (1990) noted is not so basic. The application of circularity to human activity cannot be limited to recycling. Instead, it requires an understanding of how the environment works and how the different material systems interact –in other words, it requires an ecological perspective. Most contemporary CE proponents have considered this fact by integrating the concepts of cascading loops through multiple use cycles and diverse material recovery strategies (e.g., Ellen MacArthur Foundation, 2013; Morseletto, 2020). The loops are organized according to waste management hierarchies, representing specific modes of material discharge. These loops range from 1) avoiding waste discharge by reusing and recirculating functioning products –in good

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[2] Here dissipation refers to the loss of material properties that would render a resource no longer usable in the economy. Thus, losing its use and exchange values.

condition– 2) product repair and refurbishment, and 3) the least desired material recycling from waste recovered resources –some models include energy conversion methods as part of CE. The difference between loops is in the energy required to process materials and the probability of value loss (as downgraded products and materials can no longer be used within the economy). Bocken et al. (2016) offer an example of the integration of loops and cycles into business models through product design.

The epistemological approach of CE has been limited by a disciplinary orientation that has dominated its emergence –mainly from engineering and business management. Epistemologically, most discourses about CE in the academic literature have centered around optimizing products and sorting waste for material recovery (i.e., preparing for resource mining for waste as a source); according to Mahanty et al. (2021), this is a simplified and reductive vision about what CE can advance. In addition, quantifying resources extracted and emissions discharged have occupied the center of development, particularly following traditions in industrial ecology. Saavedra et al. (2018) argue that the contributions of industrial ecology may not be enough for CE, as it also requires the involvement of economic and political disciplines –their socially normative aspects.

A lack of definition of what CE is attracts diverse groups of practitioners who work on sustainability (Kirchherr, 2021). Moreover, that same lack of definition may result in an ever-expansion of the concept that includes everything and becomes so complex that it may not produce any advancement and instead become a buzzword or a fad. More productive discussions about the use of CE, beyond its definition, and as a politically oriented concept, are starting to feature in academic literature, directly linking to its potential for a revision of goals and priorities on production and consumption systems (Genovese & Pansera, 2021; Jaeger-Erben et al., 2021; Bauwens, 2021; Hofmann, 2022). The politicization of CE does not solve its lack of definition. However, it introduces a way of seeing and thinking about CE as multiple alternatives, which bounds the onto-epistemological questions of CE to the politics involved in its making. Moreover, it reframes the questions around the legitimization of CE through the kinds of knowledge it recruits (Anantharaman, 2021; Wuyts & Marin, 2022).

The lack of definitional consensus around CE is not ignored in previous literature and has been the primary source of concerns about what to research (c.f., Corvellec et al., 2021, pp.3-6). Moreover, research formulations based on questions about the best way to define or implement CE usually result in normative models to deploy CE initiatives. In this line of thought, Temesgen et al. (2019) signal two contrasting views in which CEs could be demarked. On the one hand, the neoclassical economics perspective with its imperative for economic growth. On the other hand, the ecological economics perspective with its normative imperative on quality of life and sustainable scales.

In academic discourse, CE's inclusion as part of neoclassic economics or ecological economics perspectives results in a dialectic struggle. Some proponents intend to position CE as a techno-scientific progression of sustainability, an opportunity to offer a material fix to the imbalance in the use of environmental resources while accomplishing other economic goals –such as growth and creating job or business opportunities (Stahel, 2016). Other, more skeptical proponents view CE as a social construct that offers opportunities for well-being through material and energy reductions but requires more than growth-oriented economic goals (Ghisellini et al., 2016). In this second perspective, reconstructing the immaterial aspects that govern social relations is necessary to reach an ecosystemic balance (Moreau et al., 2017). This dialectic struggle extends to what constitutes and supports the current production and consumption systems (Genovese & Pansera, 2021). However, the support gained by CE has usually been based on its potential to replace the technologies for production in the business as usual –neoliberal economic models but decoupled from consumption (Schröder et al., 2020).

That CE takes its grounding in technology is not a problem as long as it is responsible innovation (Pansera et al., 2021). The issues with CE come from the lack of intention to recognize the many unjust and unequal situations a given CE could sustain or further deepen –for example, in not considering the role of economic growth and technologies in satisfying needs (Clube & Tennant, 2020). There are also concerns about the proposal of resource and waste management technologies and business models that could create more harm by increasing inequality gaps (Hobson & Lynch, 2016; Velenturf & Purnell, 2021) or even be gateways to greenwashing (Kopnina, 2021).

2.2   Circular economy promotion

CE, as a concept, was already known and used in the 1990s and promoted in Germany and Japan. It was linked to sustainable development and waste management prospects for recovery and revalorizing waste resources (Ghisellini et al., 2016). The primary model was the 3R (reduce, reuse, and recycle) based on a waste hierarchy and waste management principles (Blomsma & Brennan, 2017). Still, most of the attention and effort favored recycling above other resource life extension strategies –other initiatives also found their place in business and policy during this decade by promoting systemic strategies to work on product design (Madge, 1997; den Hollander et al., 2017).

Around 2010, the Ellen MacArthur Foundation, a non-governmental organization, was launched in the United Kingdom to promote the Circular Economy –particularly for businesses and industry sectors aiming at specific policies (Hobson, 2021; Blomsma & Brennan, 2017). By 2014 the European Commission had introduced a communication towards policy instruments to work around CE, which resulted in the first CE action plan in 2015 (de Man & Friege, 2016). That same year, the concept

reached its momentum as a global concept (centralized and influenced from Europe) –entangled with the Paris Agreement as one of the strategies to mitigate greenhouse gas emissions and to protect or improve the environment (c.f., Serrano et al., 2021; Sauvé et al., 2016). Since 2015 popularity of CE has increased. However, its potential for eco-innovation lies between a weak version –a buzzword supporting "business as usual" and a stronger version –bringing about real systemic change (Colombo et al., 2019).

The main push for CE towards practitioners came in the first decade of the 21st century. The promotion of CE as an agenda for sustainable development took a stronghold in China (Yong, 2007). This promotion led to the promulgation of the China Circular Economic Promotion law in 2009 (Su et al., 2013), the first significant CE policy by an industrialized country. Around this time, two policy frameworks were also published in Europe, the eco-design directive (European Parliament, 2008) and the waste directive (European Parliament, 2009), focusing mainly on energy efficiency and waste management for electric and electronic waste.

The central premise conveyed by organizations promoting a CE concept is based on the division between environmental and economic systems –by taking the latter as a formal expression of how resources are used but not as its physical implications. The assumption is that the impacts of material use can be minimized by containing consumption within the economy as a closed system of already extracted materials with as little interaction as possible with the environment as an external or tangential system. Hence, the idea is that the economy can be isolated not only in the abstract sense, as presented in the interface of production and consumption through market transactions, but also physically by eliminating extraction and discharge. This promise can only be sustained by proposing techno-fixes based on resource utilization efficiency –eco-efficiency, not economic efficiency (c.f., Bimpizas-Pinis et al., 2021). Furthermore, metaphors such as the spaceship Earth support the idea that economic (i.e., artificial) and environmental (i.e., natural) systems can be isolated through the incursion of technological mechanisms and artifacts –furthering the eco-modernist reliance on technology as a given solution (Grunwald, 2018).

To account for the impossibility of isolating the economy –human activity– from the environmental systems, CE proponents have resorted to calling for decoupling the environmental impacts (material) from economic growth (financial transactions) as the ultimate goal (Ghisellini et al. 2016; Kjaer et al., 2019). One proposed strategy is to move to product-service systems, access, or a performance-oriented economy (Stahel, 2016; Kjaer et al., 2019). In this strategy, financial transactions support an ecosystem of services that circulate products without needing more production or waste management –or at least reducing the pace of new production without reducing consumption. But again, these

claims are debunked by considering the thermodynamic principles of entropy, the time horizons for technology deployment, the shifting problems from rebound effects, costs, and the abstractness of technology expectations (Parrique et al., 2019). Moreover, a recent study by Bianchi & Cordella (2023) argues that gross domestic product growth-oriented CE interventions require four times more resource extraction than the savings they achieve.

Other versions of circularity account for services and reduction of consumption, which means that environmental impacts are not decoupled but diminished and managed concerning consumption's pace and scale (Parrique et al., 2019). Such are the cases of product longevity or lifetime extension strategies, which require that products are used longer and produced according to their localized contexts, not only designed to be used longer (Chapman, 2021). These strategies could be advanced by businesses restricting their activity to sufficiency principles (Bocken et al., 2022) or by noncommercial sharing services through public commons (Bradley & Persson, 2022; Bradley & Pargman, 2017). So, instead of zero-waste, it accounts for less waste and fewer harmful materials according to the limits of a contextualized environmental system, which depending on the modality of production and consumption, could expand the inequality gaps in access (Hobson et al., 2021).

2.3   Circular Economy expectations

Reducing circularity to recycling rates is one well-established shortcoming of using CE as a concept (Fellner & Lederer, 2020). By approaching circularity as recycling and abstracting the economy as a closed system, any project for a CE becomes dependent on a techno-fix. Furthermore, perfect recycling without material degradation would make circularity possible without facing social or political systemic change. In a scenario where an ideal recycling economy is in place, the environment would be a contingency because there would not be new extractions or discarding of materials. This is the hypothetical scenario that Pearce & Turner (1990) intended to solve by accounting for using renewable resources and compensating the load capacity of systems through removal.

The relevance of CE is posited in its potential contribution to sustainability. Some CE proposals offer scenarios for win-win situations or small transformations (Termeer et al., 2019) that, at their best, reform capitalism and provide the opportunity for a less savage version than the one proposed by neoliberal accounts. However, a mainstream version of CE is usually constructed as an apolitical endeavor supported by technical issues (Flynn & Hacking, 2019). In the ideal neoliberal CE, deploying technologies would allow economic growth to be decoupled from environmental impacts.

CE is touted ambiguously in relation to sustainability. In this regard, Geissdoerfer et al. (2017) note that sustainability is also an open-ended concept, which has become institutionalized and into which

CE's definition has been embedded. This creates gaps in the strategies of CE, particularly the lack of clarity about their scale and scope (Schröder et al., 2019; Ghisellini et al., 2016).

According to Lazarevic & Valve (2017, p.66), CE takes the narrative characteristics of a hero – anthropomorphized as a savior of the environment. This way of relying on concepts or technologies to save humanity through technoscientific progress is not new and has been one of the central critiques made by ecological economists. For example, Georgescu-Roegen (1984) referred to this thinking as expecting a new Promethean gift that could save humans in a crisis –without acknowledging that this new technological Prometheus may not appear as it relies upon increasing energy consumption.

Other modes or strategies for circularity –not based on recycling– maintain resources as products in use for longer, avoiding new production and operating on reduced consumption patterns. For example, reuse and repair are less-energy-intensive strategies of circularity as they reduce the need to process large amounts of materials in manufacture (Morseletto, 2020). Similar contentions were raised by Georgescu-Roegen (1975; 1984) in contrast to an overreliance on technologies that may never be achieved. The main strategies usually mentioned in the framing of CE are devised from the commercial context, where profit maximization goals would likely cause rebound effects (Zink & Geyer, 2017). In the European context, the influence of the eco-design directive has led to a CE around product and service design aligned with economic growth and accommodating growing consumption levels (Polverini, 2021).

If a CE is supposed to be more than introducing recycling modalities, it supposes that other technical systems and practical challenges will emerge. Moreover, these other technical systems have been identified and proposed in the literature about product lifetime extension and product service systems. For example, these alternatives include accounting for policy-making challenges, a common knowledge base (Vezzoli et al., 2015), and practical implications (Mylan, 2015) for adoption and diffusion and, even so, for the centralized management of planetary resources (Fuller, 1963). These other technical challenges are also social in that even the longest-lasting products could fail to stay in use if the services attached to them do not consider what people do with those services (Hobson, 2020a). The possible failure of other forms of circularity is also related to the common sense that organizes society, through which completely functional products also end up in waste landfills (Chapman, 2021).

Designers have approached the challenge of recyclability and applications of renewable resources to products during the last 30 or 40 years. Chapman (2021) argues that this approach has not resulted in less waste or extraction. From a design perspective, making products better suited for long-lasting use

or preparing them for disassembly and recyclability has failed as it only introduces material solutions negotiated with the same logic of refuse in the linear economy. Chapman (2021, p.152) notes: *"the current system likes it the way it is, and will defend against anything that does not resemble itself."* Chapman (2021) also proposes that designers should recognize the problem of production and consumption as systemic rather than as the technical challenge of making products last longer. To this author, being systemic does not mean changing or challenging what design is, but instead how designers integrate themselves with production, concerning their context and following an ecological position, making their participation long-lasting and oriented (context bounded over time).

The challenge for designers working on a CE is understanding the role of materials and products in their micro and macro interactions. In these interactions, product preservation depends on matching the logic of conception (production) and reception (consumption) (Hobson, 2020a). In the past, the challenge has been to adapt products as "green" alternatives where consumers, as citizens, can make choices. However, in a world of global material flows, these choices are constrained to what actors with more power (agency) decide are the alternatives. For example, Gregson & Crang (2019) argue about the disruptions created in the secondary resource recovery markets by the decision of the Chinese Government to ban some of the importations of waste from the Global North –particularly affecting the exports of wasted materials from the municipal sector in western countries.

2.4 Circular economy organization

CE as a mode of organizing the economy has been described mainly for industry and businesses. This limitation of CE to production incorporates the assumption that only industry and business actors are required to change and lead this transition. Nevertheless, while businesses and industries need changes, a CE that does not question what kind of businesses and industries and the goals for their production by only focusing on solving the technological side of production can backfire through rebound effects in consumption (e.g., Bianchi & Cordella, 2023). Hence, delving into CE's social and political dimensions requires questioning the potential of CE from the consumers' perspective. Moreover, what they consume, the pace of their consumption (in size and frequency), and how they discard or preserve materials (Maitre-Ekern & Dalhammar, 2019; Hobson et al., 2021).

The technical aspect of CE is usually addressed through throughput flow accounting models (Korhonen et al., 2018) and life cycle assessments (Peña et al., 2021; Mestre & Cooper, 2017). These models explain the loops and the cycles as inputs and outputs of material resources in production and consumption. Most of these models follow a logic similar to the one used by Pearce & Turner (1990) and aim to find the best or most optimal material use options (i.e., less impactful). Hence, these models intend to identify which combination of economic activity, material use, and environment load

capacity produces the less harmful impact. Furthermore, models of the economy representing relations of production and consumption in terms of materials interactions (flows of material) are usually used in distinction to models representing financial transactions (economic). However, the correlation or causality between economic imperatives of growth and the high material throughput of societies is also a topic of study in ecological economics –for example, in degrowth literature (Kallis et al., 2018) and the work about needs and satisfaction and sufficiency (e.g., Max-Neef, 1994; Princen, 2005). In summary, the epistemological approaches to environmental and economic systems –as integrated or separated– are the initial problems that CE research must engage in –an argument raised previously by Sandberg et al. (2019).

Although the interface between environmental and economic systems has been the core aspect that CE models intend to address, the economic system has been framed under market proposals of exchange value to justify the need for a CE. For example, Ranta et al. (2018) argue that recycling is easier to implement and could generate more value for businesses –in capitalism, as Hickel (2020, p.84) argues, the purpose is profit making. The focus on business models prioritizes exchange-value over use-value, particularly concerning symbolic and organizational aspects of the economy that cannot be measured (c.f., diverse economies by Gibson-Graham, 2008). Hence, reducing a CE to another venue for capital maximization of gains is an epistemic limitation that hinders experimentation through alternative modes of social organization and their material supports.

Considering the participation of different actors in the constitution of CE or who gets to participate is also a relevant question. Studies of CE are starting to look at consumers from institutional perspectives –for example, Mak & Terryn (2020) study the regulatory law frameworks protecting consumers concerning servitization. Hobson (2020b) also positions a question about the identities and roles of citizens, which, for example, does not necessarily need to be reduced to being consumers –as consumers are an aspirational role that gained centrality in the 20th Century. Instead, the position of an individual consumer in a CE can be framed differently from the perspective of more collectively oriented forms of consumption.

In framing people as consumers, a distinction is made between service providers and service receivers. Hobson (2016) raises the question about this distinction, which is problematic as it reduces the agency of most people to that of accepting or rejecting circular behaviors made on their behalf –by designers and engineers. Hence, a consumer is understood as a passive actor with an agency limited to acquiring products and services.

More recent accounts of economic and environmental interactions recognize both as intertwined in social relations (Sandberg et al., 2019; Padilla-Rivera et al., 2020). For example, the Doughnut

Economics proposed by Raworth (2017) is a type of circular economy that is based on ecosystemic limits (planetary boundaries) and socially acceptable limits (well-being). In Raworth's (2017) proposal, the economy is presented as an operation space, which could be normatively embedded between a social foundation (of equity) and an environmental ceiling (planetary boundaries). Under this understanding, the role of the economy is to offer a safe and just space for all people. For a CE, it means working with the cycles of the living world, not against or in abstraction. Thus, it represents a challenge that is not technical but ecological. It portends the need to embed human activity within the environment and to thrive together.

2.5 Circular economy consumption

As mentioned earlier, the CE model by Pearce & Turner (1990) did not account for social or political systems. Therefore, one could assume that the technocentric version of CE was not intended to be a force for social change as it is negotiating resources and waste from a particular professional framing. In this framing, the role of products (as commodities) is simply a function of an organically occurring exchange pattern between humans, free of a load of power and social interactions. However, as socio-technical studies (e.g., Pinch & Bijker, 1984) have argued, technical systems are also the result of social and political interaction. This interaction is also evident in the co-influence of objects, meanings, and competences as understood in Shove et al.'s (2012) social practice theory model. In the relation between the object and the system, one must also give merit to Actor-Network Theory, for describing objects as more than mere systemic nodes but as having an agency that is also politically and ethically inscribed (Latour, 2005). In this relation, objects are equal participants in the configuration of everyday life.

Concerning sustainable consumption studies, Evans (2019) called to rekindle the denunciation of consumerism as part of consumption studies. This perspective requires looking at consumption in connection to production, where consumption covers a repertoire of practices that occur at different moments and are related to production, distribution, and destruction –disposal. In other words, Evans (2019) is calling to look at the phases of consumption, production, use, and discard from the perspective of the people using the products, each moment inscribed in a logic of being and doing. This call assumes that consumerism is part of the common sense that structures everyday life.

To recognize the social and political systems interacting when a CE is put forward, particularly in aspects related to consumption within or against a consumerist social arrangement, is to understand that this social arrangement also drives the modes in which materials are acquired, used, and disposed. Furthermore, the technical applications –or the physical systems deployed as part of CE– are conditioned to the requirements of this social arrangement, particularly by the pace of

consumption. A problem already springs from, for example, the global export and import of materials for recycling (Gregson & Crang, 2019) became a problem when the capacity of recycling by the importing countries was outpaced by the capacity of producing waste by the exporting countries.

Objects are central to the discourse on CE and consumption. Objects, as materials resources, are the substance of circularity. In design, the relation between the object –usually a commodity– and the system it responds to has been acknowledged in literature with political and social dimensions (Willis, 2006; Björgvinsson et al., 2012). Moreover, the object and the system offer hierarchies of design orders, as discussed by Buchanan (2001) and Ceschin & Gaziulusoy (2016). Later understanding of how the thing interacts in the social and political systems is also described in Gaziulusoy and Ceschin's (2020) discussion about design for sustainability, where the social is presented as a multilevel problem that frames Design for Sustainability (Ceschin & Gaziulusoy, 2020). The relationship between the object and the system bridges production and consumption. Social order is sustained in the object; equally, the object reproduces and sustains the system. This realization announces a theory of social change based on changing these mutual influences in the modes of consumption.

Consumption is an aspect of the most critical interest in the social sciences, particularly consumption as a dimension of everyday life that helps describe inequalities and sense-making of context and reality. For example, Yates (2022) refers to everydayness, which equals everyday life, everyday consumption, and everyday politics, as part of an orientation to research how the social life is directly experienced. The everydayness of consumption is expressed in social embeddedness, as Warde (2022) points out. The social embeddedness of consumption means that although there are symbolic, material, and practical "matters" in consumption, each matter is part of modes of consumption that are not in a vacuum; they happen to be linked to production and provision. As Warde (2022, p.20) puts it:

> *"These different avenues for acquiring goods and services shape consumption and hence the degree to which everyday practices can be accomplished more or less economically, effectively, familiarly, respectably, equitably, aesthetically and morally."*

Consideration of the relationship between consumption, production, and provision brings about the need to study the political and economic structuration of consumption as an operation of making society. The making of society also refocuses on the relationship between things consumed and social relations. As Chin (2016, p.33) argues:

> *"It is not the things in and of themselves that are bad and hateful. What is hateful and bad is the social system creating these objects, its contradictions, and confusions..."*

Chin (2016) also intends to demonstrate that consumption results from people's embeddedness within a specific sense of reality –what some call culture, what Shove et al. (2012) understand as a constellation of practices that make the social. Here, things find their purpose as salient points about the position of people in life –a social distinction, in the words of Baudrillard (1998). These are other forms of talking about the making of society and the shared world through a common sense.

For Bauman (2007), consumption is distinct from consumerism. Consumption is an ahistorical individual trait of humans; people consume to survive. Consumerism is a social arrangement based on the excess of luxury as an attribute of specific societies. For Bauman (2007), consumerism is linked to the speedy replacement of objects, marked by a renegotiation of time where necessity is never satisfied. Furthermore, necessities are constantly replaced by new necessities as the system needs people who are not completely satisfied to renew themselves. Thus, the consumerist social arrangement relies on excess, waste, and deception –with unfulfilled lives being its primary source. Bauman (2007) links the unfulfillment of lives to a lack of caring and the rising volume in the intensity of desires imposed on people living in a liquid world. In this liquid world, change is a constant, relations are weak, and care is contradictory. In design discourse, Manzini (2019) has taken this concept to talk about the emancipatory political role of design for the autonomy of everyday life.

In summary, when it comes to CE and consumption, the contributions must take a grip on the objects and the technologies as part of the system's common sense or social arrangement where it will be inscribed. Furthermore, increasing consideration must be given to how CE could contribute to systemic change –or in support of not having systemic change. Finally, anyone working on CE will have to navigate concerns about the societal change a CE can bring about.

2.6   Circular economy futures

When it comes to the relationship between CE and the future, an obvious fact is that there is no CE yet. Some economic activities are already circular as they diminish or avoid extraction of raw resources while preventing waste and preserving functions in use for extended periods. As production networks, examples of existing circularity can be found in industrial symbiosis (Abreu & Ceglia, 2018; Neves et al., 2020). However, these are pockets of circularity that depend on a productivist interrelation framed by profit maximization. A system-wide CE, thus, remains a non-realized project. Hence, a CE can only be put prospectively, describing a preferred future (a goal to be achieved) and a dynamic transformation process (a transition).

As a contingency for the future, a CE has a dual ontological status: on the one hand, it is an achievable potential state that reveals itself through visions and expectations of desired situations –which can be the result of individual or social imagination in different circles –for example, scientific, business,

academia (Borup et al., 2006). On the other hand, CE as a transition is a world-building or future-making process that becomes evident through specific actions –which can influence the visions and expectations that are socially shared by closing or opening the opportunities of subsequent developments to prescribed formulations (Mazé, 2019).

These two natures of CE are mutually intertwined. The definition of what a CE is (what is expected) as a goal influences how a CE is made (its transition); at the same time, how a CE is made influences what is expected –forcing CE to be conceived in relation to certain anticipable aspects. However, anticipation occurs within the constraints of an a-priori-built world. CE emerges due to a critique of certain aspects of the economy but not others –for example, linked to decoupling consumption of material resources from economic growth or focusing on eliminating a systemic behavior ("take-make-waste") but not questioning the bases for the rehearsal of such aspects.

CE is prefigured concerning a predefined set of ideas about the economy –as a fact, this is the main trait of CE as a concept. Therefore, the conceptualization of CE can be seen as functioning as a set of socio-technical imaginaries about the future use of materials. As defined by Jasanoff (2015), the concept of sociotechnical imaginaries helps understand the future orientation of technological arrangements, of which CE is an example. Furthermore, the concept of socio-technical imaginaries incorporates another layer to the expectations and common understandings that allow people to carry out social life –social imaginaries in Taylor's (2004) terms. In socio-technical imaginaries, there is a shared notion of the enactment and mobilization towards particular technical deployments according to expectations from techno-scientific promises. In this sense, a CE incorporates a political implication in mobilizing resources and actions to bring up one of its possibilities. In other words, CE's objectives and the strategies for its transition reflect a transformation –or preservation– of the existing social organization and common sense.

The concept of a sociotechnical imaginary has some weaknesses because it does not describe how particular futures and expectations compete against each other and the mechanisms that make them socially shared and mobilized. Brown et al. (2000) shed some light on how futures become contested by different futures, the past and the present. Visions are primarily used in future studies as the definition of a particular desired future apprehended by some actors, while expectations are the outcomes described or felt as possible for a specific future; both are prospective modes of understanding, one imagined as a defined something and one as part of the intersubjectivity of individuals. In any case, futures are also political tools that mobilize through discourses. As a political tool, futures are also a camp for social struggle; then, some futures can be marginalized and co-opted (translated) by powerful actors:

"The orchestration of futures by powerful groups suggests that, perhaps, the future is not so uncertain and unpredictable […] It is as important then to recognise the need to strike a balance in our analysis between interrogating how futures are constructed and the openness and contingency this involves, and who constructs the future, and the relative closure that this involves." (Brown et al., 2000, p. 14)

In any of these concepts, the main feature is the presence of alternative future situations which compete for realization and action. However, the competition for futures is more than ideas about how things ought to be and function. The existence of alternative futures and open opportunities for their coming into being also expresses social relations and their power struggles, particularly in preserving or challenging a status quo (politico-economic). What is supported may reveal the power structure behind it and the possibilities for the imagination –for example, a peer-to-peer sharing economy is co-opted by neoliberalism due to profitable business models through online platforms (Martin, 2016).

The political situation of imagination and action is fundamental to the apprehension of change as technical and social. The apprehension of technologies shapes the panoramas of possibility, desirability, and probability (or believed feasibility). Innovation –the feature of change in contemporary capitalist societies– is signified through the imagination of fast and constant change driven by the production of needs as a means of profit (Vinsel & Russell, 2020). In these societies, radical projects that require cultural change over long-term horizons or scales of adoption may not be as desirable as projects offering faster results through techno-scientific artifacts.

The mainstream CE is constructed as a single and perfectible model, for example, in research about CE focusing on identifying definitions to propose a final and normative version (e.g., Nobre & Tavares, 2021; Geisendorf & Pietrulla, 2018). Yet, it is increasingly common to refer to CEs in the plural as a set of possibilities based on different understandings about what it means for the future (Bauwens et al., 2020; Calisto Friant et al., 2020). Moreover, in practice, CE may be experimented with and organized through different interpretations of what circularity means and the social orders it supports (e.g., Rosenbaum & Kehdy, 2022). Mainstream CE futures mainly look at technical implementations, or the organization in businesses, while other futures consider CE as an opportunity to support well-being through commons, sharing, and care. In these different futures, alternative actors' roles are prospected, particularly State governments, private for-profit and not-for-profit organizations, and the non-organized civil society. For instance, a CE that contests neoliberalism can be formulated from the work of Ghisellini et al. (2021), which involves rethinking the role of the State and market interventions.

The future orientation of CE can be understood as a bundle of coexisting and competing alternative versions, which become apparent or embodied in discourses and practices that mobilize a CE –as a dynamic process over time. This notion of multiple alternative CEs competing to become the dominant project is paradoxical. CE, a critique of a linear economy, becomes a process of critique about CE (e.g., Jaeger-Erben et al., 2021; Hofmann, 2022).

As a dynamic future-making process, the critiques, contestations, and allegiances within CE discourse and practice offer the opportunity to study the intertwining of knowledge production and power. Taking CE as a dynamic process, a future in the making expands from onto-epistemological questions –what is and what to know about– to political questions –who makes these futures, who benefits from these futures. For example, most critiques of the mainstream version of CE do not deny the need for a CE. Instead, these critiques identify aspects that could reproduce the linear economy due to inequalities in access, control mechanisms, technologies that do not consider people's desires, capacities, limitations, and unintended rebound effects that would increase the use of resources.

The future orientation of CE drives its transition. The openness to alternative imaginations or the placation and enclosing of specific futures is another question that can be addressed by studying CE (Kovacic et al., 2019a). The expectations about the socio-technical change and context in which a CE is embedded may offer diverse opportunities for its imagination. This process will depend on who does the imagination and who is included. A transition to a democratized knowledge production may appear as a tangential aspect in the epistemology of CE. However, it offers an entry to explore CE's political dimensions, which connect power distribution and social control.

The traction gained by CE discourse relies on promises about it as an opportunity to grow the economy while reducing the environmental impact –as a form of green growth. Defined by and for power-holding actors –and supported by specific knowledge (Anantharaman, 2021; Wuyts & Marin, 2022). From the perspective of the mainstream CE, one could expect investment for accelerating bio-materials as renewable resources and recycling technologies for exhaustible resources. Still, less attention is given to answering why those resources are used or how they may create larger divides locally and globally (Barrie et al., 2022). A future-making of CE can also be conceptualized as a device to deliver and reveal the current governance of resource use and the social interactions it supports.

2.7 Circular economy regions and cities

As a result of the expectations, modes of organization, and futures that a CE could bring about, other authors have proposed a translation of circularity as the central aspect for the definition of more holistic modes of understanding. For example, Calisto Friant et al. (2020) have proposed using circular societies, which encompass more than the economy and set circularity as a cause and effect of social

organization. In addition, Williams (2019; 2022) has proposed the concepts of circular cities and circular development. These concepts frame circularity's futurity and impact to a smaller scale –much less than the planetary scale. At the city scale, aspects of consumption and provision are linked to the lifestyle of people, which answer to the reasons for consumption and are assumed to be manageable by having defined geographic limits.

The relation between citizens as dwellers of cities and a CE is also about the kind of governance that a city can put forward concerning aspects of production and consumption –but more generally, waste contention and provision of services. A primary orientation in the literature about CE in cities is the participation of people as more than consumers in their roles as citizens. These roles are usually assumed to be promoted or enabled by municipal governments (Bolger & Doyon, 2019; Campbell-Johnston et al., 2019; Lica, 2019). The participation of citizens is also relegated to particular aspects of waste collection and data provision of types of waste generated (Zeller et al., 2019; Girard & Nocca, 2019; Vrijhoef, 2018; Cavaleiro de Ferreira & Fuso-Nerini, 2019), and about their uptake of consumption motivated by new businesses for reuse and repair (Gravagnuolo et al., 2019; Prendeville et al., 2018).

Citizens are also regarded in their agency to initiate businesses and organize collaborative initiatives (Boeri et al., 2019; Fleischmann, 2019; Paiho et al., 2020). Previous literature about circular cities calls for citizens to change their attitudes toward materials to participate in a CE (Krysovatyy et al., 2018; Kębłowski et al., 2020; Cerreta et al., 2020; Carrière et al., 2020; Girard et al., 2019; Meskers et al., 2019; Jones & Comfort, 2018). Some forms of participation in support of a CE are considered potentially harmful. For example, an over-dependence on technical solutions and statistical data could make citizens invisible and abstract entities to the local governments (Marin & De Meulder, 2018; Turcu & Gillie, 2020).

The citizen is situated in two modes in the literature about circular regions and cities. In one mode, the citizen takes its situation in relation to other actors –what Fratini et al. (2019) call the major incumbent actors– or in the triad of fundamental actors mentioned by Ghisellini et al. (2021), which are State, private sector, and citizens. On the other mode, the situation is part of lived experiences, which Hobson (2020a) claims are socio-spatial and more than the implementation of service offerings but about what people actually do.

A circular city also supposes local management of material resources, whether at the micro-level, for example, through product lifetime extension to prevent waste generation, or at the macro-level, by regulating material flows (cf., Lucertini & Musco, 2022). However, it is unclear what role global product provision may play in shaping the circularity of cities or the extent of cities' agencies in controlling

what happens within their territorial boundaries. Moreover, notions against cities seen as finite containers of social life also challenge this aspect of managing scales; controlling what enters or leaves a defined region is challenging when other institutional frameworks support free flows of materials as a requirement for free markets.

The governance of a CE in cities requires interactions between actors in several sectors, where responsibilities are assigned to each. For example, in many current policy frameworks, said responsibilities are linked to waste management, focusing on extended producer responsibility schemes (cf. Atasu & Subramanian, 2012). Most of these extended user responsibility schemes rely heavily upon citizens doing the proper work or exerting the "right citizenship" (cf. Brand, 2007). In addition, the legitimization of these responsibilities and their impacts –weak or strong– is also an aspect embedded in the formulation of indicators (cf., Völker et al., 2020)

Concerning the containment of material flows at the scale of cities or regions. The deployment of material flow tracking technologies and indicators appears to be one of the prerequisites of CEs and city planning. On the one hand, Meijer et al. (2019) argue that communication technologies in a CE could lead to a new form of open governance. On the other hand, although material flow tracking could be a desirable feature and future, reliance on data can be regarded as a form of technocratic governance that does not address multi-actor dynamism. Furthermore, it could lead to putting the project of CE on the shoulders of the citizens as an "individual responsibility" (cf., Soneryd & Uggla, 2015).

Beyond dealing with individual responsibilities, the roles of governing local authorities can be positioned through their implications as providers of services. In this regard, Wuyts et al. (2020) discuss how local authorities can help uptake skills necessary to take on 'circularity.' In the case presented by Wuyts et al. (2020), the city authorities participate in the makings of CE by acting as an intermediary for the preservation of local resources through the provision of public service, while the citizens acquire the capacity to operate on their own terms. However, this example does not consider the incumbency and interests of commercial actors and whether public efforts reduce their opportunities to participate in market offerings. In this case, a public service that provides citizens with skills to repair their houses may be acceptable in underpopulated towns. At the same time, an intervention like this could be rejected by professional repairers and the building industry in populated cities.

The sharing and distribution of responsibilities is an aspect to prioritize in studies about CE. However, it is still absent from most examples in the literature. This absence can be explained by a lack of political perspective (Marin & De Meulder, 2018). According to Völker et al. (2020), CE priorities exist

between scientific and political knowledge. However, recognizing the political implications of a CE in a city or region is at odds with including citizens as only consumers but should also acknowledge the influence of a global consumption system that positions most citizens as consumers rather than producers. Thus, there may be limits to how much citizens can do as part of a regional or city scale in a CE. At the same time, there are limits to what the local authorities can put forward as part of their work within particular contextual frameworks (cf., Sutcliffe & Ortega Alvarado, 2021).

2.8   Summary and relation to the conducted studies

This chapter introduced the concepts to address CE as an object for study. First, CE's mainstream version derives from environmental economics. Notably, the mainstream version of CE regards technical solutions and their adoption as the main contribution of CE. However, centering technical solutions in a binary between acceptance and rejection fails to recognize that political and social interactions influence resource production and consumption.

From a critical perspective, CE is not an object to be defined but a process of contestations about the future –power distribution, justice, and equality. These contestations raise questions about social and political relations in CE's conceptualization. Moreover, it requires the study of CE in context and questioning the reasons for production and consumption, the actors, logics, institutions, and infrastructures involved in the imagination of CE. In this sense, it requires co-questioning CE as the result of a current socio-technical system and the prerequisite for future socio-technical systems. Finally, these questions are expanded to aspects of governance.

In synthesis, CE is not a single proposition. As such, it cannot be studied as only one technology. The multiple visions and proposals for implementing a CE generate knowledge for questions about production and consumption. These questions point to the core motivations of designing: what is done and why? The answers require studying the dynamics and interactions that mobilize the coming into being of production and consumption within economic, environmental, social, and political systems. In the overlapping imagination of these systems, a CE takes the form of discourses, practices, and technologies which constitute an object of study with a future orientation. The dynamism of CE as an emerging transition is framed conceptually in the movement from techno-scientific knowledge to political knowledge. See Figure 2.2.
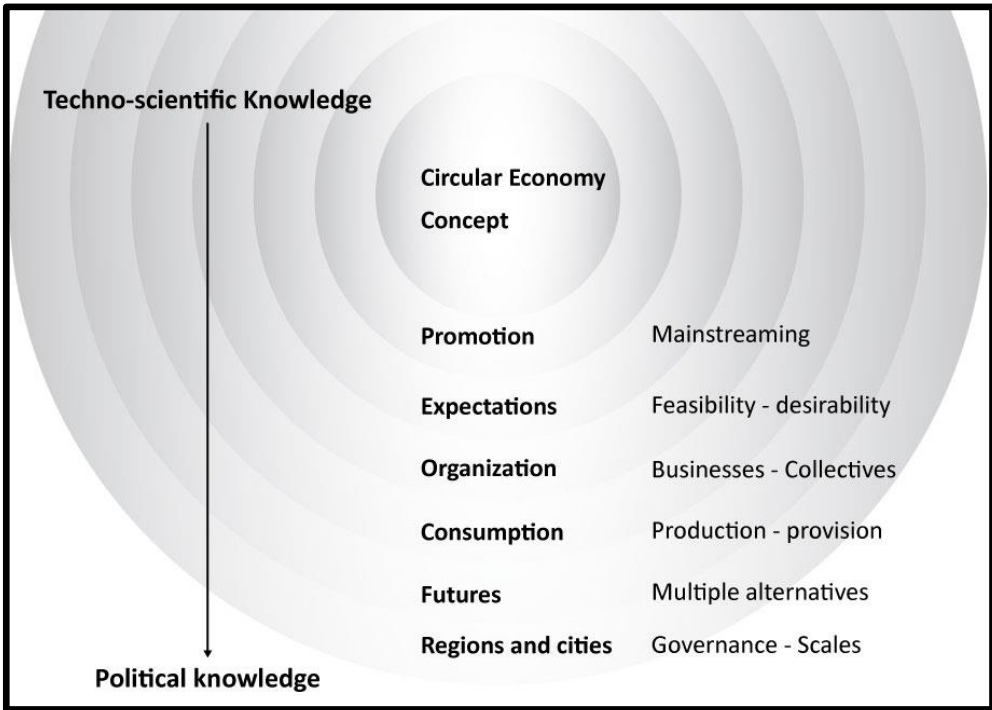
Figure 2.2. Conceptual framing as an expansion from techno-scientific knowledge to political knowledge

Table 2.1 describes the operationalization of CE as an object of study in each study for this thesis. It also describes the system relations and how the study addresses them concerning a transition. The following chapter focuses on the operational theoretical approaches, particularly the ones in the published articles.

Study	CE as an object of study	Systemic relations
#1: Discourse	- CE as visions (futures) - CE as discourses and practices (storylines and projects)	Shared understandings of CE result in discourse coalitions that favor particular practices and modes of understanding (ideology). The study illustrates the alternatives in emerging CEs.
#2: Practice	- CE as practical performance - CE as a contestation to consumerist society (alterity) - CE as alternative consumption	General understandings condition the participation in alternative modes of consumption. CE that departs from these modes of consumption may contest or adapt to the current understandings (institutional logic). The study illustrates contestations to consumerism as compatible with CE.
#3: Governance	- CE as an open future - CE as an opportunity for reframing the relation to products and production - CE as a discursive device	If CE is more than a techno-fix, interventions or actions in designing for CE should consider and propose alternatives appropriate to multiple contexts (social and political). The study illustrates a proposal to approach and open a CE transition beyond the product level.

Table 2.1. Summary of CE conceptualizations and their systemic implications per study

3   Theoretical approaches

One of the challenges throughout the research was to reconcile the different scales and perspectives from which a concept –CE– can be studied. In this thesis, the concerns in the conceptualizations of CE are framed as social imaginaries (Taylor, 2004) that emerge from common sense (Berger & Luckman, 1991), which influences or conditions the agencies of different actors –particularly of government, private sector organizations, and citizens (Ghisellini et al., 2016).

Furthermore, the introduction mentions that by focusing on social imaginaries, methodological individualism and solutionism is avoided. Through social imaginaries, social life is understood as co-produced in a collective –not only individual choices. Solutionism is avoided to prevent approaching CE through its technocratic orientation. Avoiding solutionism implies that solutions should not be reduced to techno-fixes put upon people but instead aim for co-production processes –the making of common sense.

In addition, the focus on social imaginaries is marked by questions about why things are done in particular ways and what they preserve or contest. Answers to these questions require a critical positioning and understanding of the makings of social life. However, these critical positions and understanding are not part of the conventional discourses and practices of design. In the conventions of the design industry, profit is the main priority (c.f., Boehnert, 2018, pp.38-48), and the professional ethos calls for a rendition of design under the political views of its commissioner –a central point in the description of design practitioners by Monteiro (2019).

Taylor (2004, p.24) states that social imaginary incorporates "… the kind of common understanding that enables us to carry out the collective practices that make up our social life". Here, it is understood that social life is made up of practices. This understanding of social life as made of collective practices is taken by several strands of social theory that set their subject of study on practices (Rouse, 2007). Moreover, Reckwitz (2002, p.246) characterizes practice theories as part of cultural theories that *"… highlight the significance of shared or collective symbolic structures of knowledge in order to grasp both action and social order".* Schatzki (2002, p.77) defines a practice as a nexus of action composed of doings and sayings linked together by four types of knowledge or know-how, practical understandings, rules, teleoaffective structures, and general understandings. For Reckwitz (2002, p.249):

> *"A 'practice' (Praktik) is a routinized type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge."*

The definition by Reckwitz (2002) is the basis for the simplified model of social practice theory offered by Shove et al. (2012), which considers three main elements: materials, competences, and meanings.

Returning to Taylor's (2004) definition of social imaginary and considering Shove et al. (2012) model of social practice theory, it is then possible to say that social life is made up of meanings, competences, and materials that get linked together when a practice is performed. This understanding of social life is followed in this thesis.

Warde (2014) formulated a critique of social practice theory attacking its inability to position itself critically. According to Warde (2014), practice theories do not explain what governs change or if there are hierarchies to understand what gets prioritized or influences change. For example, in Shove et al.'s (2012) model, there is no substantial distinction of influence between materials, meanings, or competences. However, Shove et al. (2012) recognize that the nexus of practices can become dominant and create conditions of unequal access. With this in mind, a possibility is to couple the understanding of the social with a social critique as a way of recognizing the sum of practices as an already made-up social life –one that persists in practices– but that can be studied in characteristics that are routinized and can be subject to critiques.

A social critique particularly relevant to this thesis is Lefebvre's critique of modern/capitalist everyday life (1971, 1991). In Lefebvre's (1971, 1991) perspective, the capitalist/modern world is taken as a structure. Still, more than a structure, capitalist/modern is seen as a conditioning aspect that can be confronted dialectically, offering space for other possibilities and realities. The dialectic of Lefebvre (1971, 1991) means that even under an oppressive mode of life, different modes of organizing, doing, and being can emerge. These other realities are structured under a different common sense that reproduces at multiple levels of understanding. To Lefebvre (1971), the structuration of reality as sub-systems risks separating content from form –for example, in critiques of trade and consumption by focusing only on imagined and symbolic aspects (form) while not looking at its reality in production and consumption (content). Thus, Lefebvre (1971, 1991) offers an entry point to examine social life as a dialectic of the rehearsal of imagination and praxis that opens or closes possibilities.

3.1 Combining perspectives

There is risk in combining a social perspective (Lefebvre, 1971; 1991) based on a critique of a particular structure (capitalism/modernism) with a perspective which aims to be ontologically flat –i.e., not to recognize other locations for the social than in practices. The main risk is ending up with a perspective that does not see beyond the wrongness or rightness of particular actors and institutions that the critical perspective brings up. However, concerning sustainable consumption and production research, this coupling is functional and facilitates the analysis by focusing on aspects repeatedly

pointed towards as the leading causes of environmental damage. Thus, these aspects are routinized and part of practices that make up the social life.

On the one hand, through social practice theory (Shove et al., 2012), particular routines and their elements (competences, materials, and meanings) get framed as units of analysis, including discourses and possibilities to identify influencing aspects for practical change. On the other hand, practices are considered as being performed in bundles or nexuses, which means that practices are never performed alone but in relation to other practices. This understanding of practice bundle or nexus imposes a methodological difficulty in describing each individual practice that forms part of it –adding complexity to the research by imposing the study of practices and their relationships from the perspectives of particular practices or particular performers. For example, imagine drawing a diagram with the constellations of a person's social practices during a single day. A shortcut for the study is acknowledging the systemic aspects in materials, competences, and meanings raised as causes for environmental damage. Some of these are the modern/capitalist ideals of progress, which Lefebvre (1971, 1991) took as contention for his critique of everyday life.

The model of social practice theory by Shove et al. (2012) acknowledges the potential implication of dominancy as social practices become engrained with other social practices and compete for time and resources, giving way to unequal patterns of access as a result. This dominancy pre-exists performances of any practice. Dominance is routinized and persists as part of what is considered normal –or standard. However, changes in the elements and practices result from practical performance, particularly the dynamism for recombining existing or emerging elements. In a way, the elements of practice are the a priori and the a posteriori of social practices and can only be changed in the performance of social practices. Thus, the ontology of social practice theory remains flat.

The critical perspective of Lefebvre (1971; 1991) focuses on everyday life as the organization of modes of life in a dialectic way between scales, rhythms, and materialities that confront a predefined mode of life. Modern/capitalist standards define this dominant mode of life. In this case (Lefebvre, 1971; 1991), the confrontation emerges from the distinctions between bourgeoise and workers. This confrontation is tightly related to a capacity for individuals to leave a state of alienation and enter a state of total consciousness. Lefebvre (1991) goes further and positions the critique on those who look for change –for possibilities to escape the dominancy the modern/capitalist modalities:

> *"… our towns will show us something quite different: the rebirth and reforming of community in factories and working-class neighborhoods. There, other modes of everyday living, other needs, other requirements, are entering into conflict with the modalities of everyday life as imposed by the capitalist structure of society and life, and tending to re-establish a solidarity,*

an effective alliance between individuals and groups. How does this conflict manifest itself? Constantly beaten down, constantly born again, how is this solidarity expressed? How does it translate in concrete terms? This is exactly what the positive side of the Critique of Everyday Life should discover and describe." (Lefebvre, 1991, pp. 233-234).

In the social practice theory model of Shove et al. (2012, p. 81-96), the dynamic connection between practices gives pace to the rhythm of society, which in turn defines the standards for the normal –or the normal as emerging from a reproduction of practices that influences what is done. For example, the introduction of refrigerators in the UK impacted food preservation practices –displacing some previous ways of doing it and bringing in new ones. Furthermore, the rise of some practices to dominance is acknowledged in the work of Shove et al. (2012, pp.63-79) by recognizing that practices circulate in social networks –e.g., communities with institutional means and ends. However, this perspective intends to be universalist and does not claim one particular set of social networks but instead points toward a generic concept referred to as dominant projects: *"Dominant projects are influential on several fronts at once. In concentrating priorities and energies they focus time and attention in some directions and not others."* (Shove et al., 2012, p. 79).

The "dominant projects" referred to by Shove et al. (2012) seem to offer agencies that structure the possibilities for change. In this sense, pointing to those dominant projects by defining them, not leaving them as abstract concepts, becomes necessary. For example, Lefebvre's (1971, 1991) critique of everyday life straightforwardly points out a dominant project, more specifically capitalism and modernism as structures in which meanings, materials, and competences are oriented towards particular ideas of progress.

Concerning standards of living, Lefebvre (1991) acknowledges a duality: *"Human life can decline, and it can progress."* (Lefebvre, 1991, p. 228). Moreover, Lefebvre (1991) also notes that modern progress is a partial truth by referring to it as a material and moral progress of capitalism but a decline in the social relations that constitute everyday life –a decomposition of communities. To this author (Lefebvre, 1991), the material –of towns and the living standards raised through technologies– expresses modalities of life that *"… result of the activities and way of life of a bourgeoisie which still dares claim that it represents 'the general interest'"* (Lefebvre, 1991, p. 233).

Lefebvre (1991) calls to look at the material –in different scales from towns to tools– as a representation of the class struggle between the bourgeoisie and the workers in the capitalist/modern modes of everyday life and between individualization and community. Furthermore, Lefebvre (1971, 68-109) critiques the structuration of reality in social studies that consider systems as sub-structures between levels that distinguish ideologies and images, imagination, and praxis. To Lefebvre (1917),

such a division intends to separate form and content –for example, in studying the symbolic level of publicity (i.e., advertisement) apart from the material level of trade and production as part of a systemic control of consumption. For Lefebvre (1971), there is no distinction between levels because ideologies and imagination are always expressed in praxis.

The indivisibility of form (praxis) and content (symbols) in Lefebvre's (1971) critique is similarly reflected in the model of social practice theory by Shove et al. (2012). However, Shove et al. (2012) express it more generically through the concepts of meanings and competences, which describe social life's mental or symbolic elements.

In the summary of a critique of everyday life, Lefebvre (1991, pp.251-252) offers four aspects to the study of everyday life:

a) Contrasts between modern life (contemporary), the past, and what is possible (future).
b) The study of oppositions –e.g., reality and dreams, the trivial and the exceptional.
c) Confrontation of effective human reality (practice) with its expressions (doctrine, normative institutions, values-norms).
d) The study of the relation between individuals and groups.

Identifying these aspects concerning a CE as socio-technical change is not as straightforward as pointing to how materials will be used; the structuration of how things work or should work is only reached through experience. Lefebvre (1991) notes:

> "To see things properly, it is not enough simply to look. People who look at life - purely as witnesses, spectators - are not rare; […] professional spectators, judges by vocation and witnesses by predestination, contemplate life with less understanding and grasp of its rich content than anyone else. There really is no substitute for participation!" (Lefebvre, 1991, p.237).

Regarding the possibilities for other modes of organizing in social practice theory, Shove et al. (2012, p.126) point out: *"… agency is loosely but unavoidably contained with a universe of possibilities defined by historically specific complexes of practice."* In this thesis, the historically specific complexes of practices are understood critically as the structures of modernism and capitalism.

3.2   Ideology and imagination as progress

As previously pointed out, one of the critiques by Lefebvre (1991) is about the use of technical and scientific knowledge to signal progress while hiding away other social declines. The ideas about progress are a rehearsal of imagination, which follow a program determined by the modern world. In this sense, imagination is subjected to what is believed to be possible, which originates in what is expected from technoscience (Borup et al., 2006) or what is politically viable –of which Jasanoff & Kim (2015) offer enough evidence.

In the case of CE, it is backed by an academic discourse –techno-scientific– which is translated to public actors under promises of particular progress. Those notions of progress or problem-solving support the mainstreaming of CE –as Isenhour (2019) points out, an already mainstreamed CE is considered a solution to climate change under a technocratic and neoliberal perspective. Thus, the actors mediating an organization of such a CE are not interested in participating or dealing with the best information about CEs' postulates and possible effects. However, these actors mobilize a CE based on the possibilities it offers for progress dictated by profit or economic growth as a priority –i.e., decoupling economic growth from the environmental impacts of production and consumption. CE is also structured from what is believed –thought possible, or desired. What is rendered contradictory to economic mandates will fall in the category of not believable. For example, proposals that contradict the current logic of distribution of and access to products as forms of value.

The imagination of CE as alternative futures that will restructure everyday life offers a space for political analysis of everyday life. It requires uncovering which actors will participate in its formulation and, equally important, which modalities of everyday life are impeded by the current structures (symbolic or material) at the levels described above. Many examples in the academic discourse about CE propose experiments with products and services that intend to move CE forward concerning economic value. Still, they represent solutions thought to function within the same consumption system that rehearses the linear economy –without considering the social changes a CE would bring about or whether these are planned or happening by chance. Furthermore, the level of ideologies is rarely questioned (for example, economic mandates of efficiency and growth). While technical experiments offer make-believe venues, the projects change little to nothing because they stick to the same consumption norms of the linear economy (i.e., "business as usual").

A CE –as a concept for a societal transition– exists mainly at the make-believe level. The make-believe translates to discourses and practices that mobilize particular futures – for example, supported by sociotechnical imaginaries (Jasanoff, 2015). Furthermore, the discourses and practices of a specific CE organize around specific economic principles. For example, the case of CE posed by Pearce & Turner

(1990) organized around recycling. Although the authors (Pearce & Turner, 1990) intend to link environmental and economic systems, the economic systems are once again isolated by resorting to recycling. Isolation of the economy is not mentioned, but instead, it is replaced by other communicational devices, such as closed loops or closed systems.

Lefebvre (1971) argued that make-believe requires language and rhetoric to become social. In the use of language, thought is negotiated, shared, and structured –it also includes symbols and images. Part of the structuration of reality is the formulation of information as part of narratives that make sense through storylines that evidence a cause-solution duality –for example, in the results by Lazarevic & Valve (2017), which exposed that CE is seen as a heroic solution. The information can be factual or fictional, but narratives operate at the make-believe level, resulting in the structuration of new images and ideology and affecting the level of poiesis-praxis.

In the structuration of CE, ideas –such as equating planet Earth to a spaceship or a machine– represent a technocentric narrative that centers on human ingenuity and the environment as something that can be controlled. The narrative of economic growth decoupling from environmental impacts is another trope used to defend CE. Both cases repeat a storyline in which technical solutions can isolate the economy from environmental systems. Alternative narratives could result in the structuration of radically different CEs, such as those based on the ecological integration of human life by using fewer materials and living in simpler ways. For example, using only local resources and acknowledging the cycles and pace of recovery of each environmental ecosystem affected by a specific human activity. In this same line of thought, the calls for reduced consumption of materials –for example, through organized reduction of unnecessary production and consumption in Degrowth (Hickel, 2020).

3.3   Mundane experiences as practices

Lefebvre (1971) argued that all imaginations and ideologies take real effects at the praxis level. Imagination and ideologies become real in forms and patterns of consumption. Thus, reality is structured from experiences in mundane activities in everyday life. In turn, it also makes 'what is possible' believable or not according to the experienced and contextual nature of everyday life. However, this perspective does not offer an account of how to study these mundane activities. In this regard, a more suitable approach is the study of social practices as a unit and the performance of routinized doings and sayings (Shove et al., 2012).

Concerning the persistence, change, and reproduction of practices over time, there is a historical aspect that primes the study of practices, what Shove et al. (2012) refer to as the trajectory of the practice, in which practices are studied as snapshots in particular time and space but interweaved to other practices. Thus, it becomes clear that the study of practices and what is possible to experiment

with is also a function of a trajectory that normalizes some doings and sayings as part of a historical arrangement –or so, within a historical period, some practices can persist while others disappear.

As mentioned earlier, Warde (2014) has proposed that social practice theory may need to be coupled with a hierarchical theory. However, there have been developments regarding these concerns. For example, social practice theory is entwined with institutionalism (Smets et al., 2015). In practice-driven institutionalism, practices are still a flat ontology, but the bundle of different practices over time under a common sense (or logic) is what results in institutions. Under this explanation, social change is a change in the logic that governs practice that is effected through experimentation with the grammar of the elements of practice (material, competences, and meanings), which persists by recruiting more performers (i.e., becoming shared logic).

A practice approach offers the opportunity to focus on the aspects that rehearse CE as forms of doing and being different from the linear economy, as experimentation in negotiation to a current understanding of the world. The practice approach emphasizes everyday life by considering what can be done and experimented on when faced with a priori considerations of what making an economy means.

For example, specific widespread practices make a recycling-based CE believable in Norway, such as implementing waste sorting by material categories at each household and reverse vending systems to collect plastic and aluminum bottles. These practices are aided by infrastructure aimed at solving the waste problem from a technical perspective and assuming models based on convenience and monetary incentives for consumers and producers (c.f. Estrada & Dominique, 2019). However, the reasons for having such technologies for specific types of products can be questioned as the production of surplus waste.

To overcome the challenges of circularity[3], believable alternative CEs must center on the practical aspects that could make possible the production and reproduction of other social arrangements –by changing meaning, competences, or materials, as well as the associations between these elements and the practices concurrently in performance. The elements of practices and practices are combined in a grammar for social arrangements that align to, dissent from, or contest high-material consumption or consumerism (c.f., Bauman, 2007). Thus, it necessitates looking at experiences embedded in contemporary everyday life but posing different features to what is possible. Some possibilities could be based on experiences from history (see Casson & Welch, 2021), while others

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[3] Circularity challenges as those that reduce circularity to technical solutions for dominant modes of consumption based on fast pace of material replacement.

speculate alternative future narratives (see Bauwens et al., 2020) but require the inclusion of people as the performers of those practices and experimentations.

Concerning design, Pettersen (2015, p.214) proposed that a *"practice-oriented design also requires attention to skills and meaning, and how they are integrated with material elements."* A practice-oriented design recognizes that innovation and social change are co-productions that do not prioritize humans, materials, or their interactions. This orientation also recognizes that designers are not privileged actors in making change as part of transitions, and *"changes to the conditions upon which design and development work are contingent may be needed to open up for change in new directions"* (Pettersen, 2015, p.216).

A venue to study these alternatives is the interrogations of practical performances constrained by specific variables in experimental setups, such as living labs, that introduce conditions prototyped and negotiated in experiments by particular actors. For example, the experiments in living labs are conducted at different scales of organization, such as cities (e.g., Cuomo et al., 2020) and households (e.g., Sutcliffe, 2022). In the living labs approach, the intention is to provide an ambiance for practical experimentation around questions about what could be challenging or obstacles for a particular innovation –direct or indirect– for example, the requirement of changes in policy or the need for infrastructure. Although the living labs are supposed to facilitate open co-innovation with users of a particular solution, the conditioning of the experiments provides artificial make-believe situations.

In artificial situations that include using products or services over a short period, a problem arises from over-optimistic views from actors as participants that temporarily suspend their disbelief but also offer time for routines to form. As a possible downside, a distortion in the perception of what a particular intervention could produce concerning practices may result. For example, Coulton et al. (2016) describe how design fiction can be deceptive depending on whether or not its fictionality is made explicit or ambiguous. A solution's plausibility becomes more believable when fiction or speculation is not deliberatively presented as such. A well-defined example of deception is Theranos (c.f., Straker et al., 2021; McGinn, 2022), a United States-based start-up that collected millions of dollars from private investors by promoting a failed single blood drop medical test device and resulted in a scandal as the assumptions made for the technology were based on fake experiments and wrong techno-scientific knowledge.

Solutions tested based on inappropriate material setups out of the context of "everyday lives" can also prospect failure –for example, how information is used and apprehended in home energy solutions (c.f. Strengers, 2011).

In contrast to the artificial situations, alternative practices can also be found in the "wild," which exist in different organizations that denote another modality of everyday life –of the likes mentioned by Lefebvre (1991). Moreover, studying the production of practices in a dialectical mode implies bringing up those issues of dissent, contestation, and deviation between what is lived, conceived, and perceived.

The contingency raised here is that everyday life phenomena should be studied directly in the modalities that express alternatives to the capitalist/modern world with its common sense. Social practice theory (Shove et al., 2012) offers an access point to the landscape of possibilities with two possible alternatives, one in the proposition of artificial situations and one through the visit to the lived or experienced.

Under this perspective, the study of CE must look at the possibilities. It offers a landscape of opportunity between what can be proposed and what is already experienced and known. The assumption here is that practices compatible with a CE are prefigured in the absence of CE. However, these practices are prefigured in alternative modalities of everyday life.

3.4 Discourses and domination as futures

Lefebvre (1971) refers to the make-believe of the consumption system in capitalism by remarking on publicity (i.e., marketing and advertisement) as a system of meanings that replace other meanings (or signs, as argued by Baudrillard, 1998) before changing the material. Thus, the proposed and imagined has a real effect on production and consumption.

Contemporary or modern societies that follow capitalism imperatives are based on constant cycles of production and destruction –a social rhythm, as Lefebvre (2004) argues. Bauman (2007) also mentions a rhythm of never-satisfied necessities. The new objects and services people constantly acquire result from a world of practice made believable through images and discourses portrayed to people as consumers. Introducing new artifacts signifies social progress (Vinsel & Russell, 2020). Deception comes from the belief that something might improve as long as new things are coming, a contention also found in the critique by Lefebvre (1991).

The rhythm of everyday life is the mechanism through which the system perpetuates. In addition, as argued by Lefebvre (1971) and by Baudrillard (1998), the rhythm of constant replacement is taken advantage of by publicity (i.e., advertisement or marketing). Mattelart & Mattelart (2003) also mention the substitution of social action by sense-making artifacts so that communication that makes something believable replaces social action –thus, there is a conflation between a lack of practical

engagement and suspended disbelief when things are a given. Hence, consumption in everyday life is no longer about the lived common sense but about the conceived –in thought previously.

The dialectical positioning between what is possible and feasible also occurs within communicational acts that define the interrelation between the world as it is and the world as it could be. The practices described as discursive design by Tharp & Tharp (2019) also take a communicational perspective, but refrain from commercially oriented practices (e.g., advertisement) and call for discursive encounters as making the world and questioning it:

> *"Discourse is not merely a consequence or possibility of an object's existence —something that a discursive design shares with all artifacts. Instead, discourse is why it exits."* (Tharp & Tharp, 2019, p.77)

People's involvement in specific communicational acts, in one-time events, multiple or iterations may also construct a different understanding of how society ought to be ordered. Thus, a participatory approach combined with a future orientation could leverage the formation of long-lasting communication acts –where the future acts as a resource for believability and social performance (Oomen et al., 2021). Furthermore, this formulation could aid people in taking ownership of specific discourses and images of circularity –which at the praxis level would also mean requiring responsibilities and accountabilities.

Communicative acts precede practical experimentation as they bring new meanings that open the use of competences in ways that involve the materials available or require new materials –its consumption as part of practices (Warde, 2005). The questions about who, where, and how ideas are communicated are also the drivers of their futurity.

Communicative acts extend to everyday life. Introducing practical changes requires acknowledging the many ways the world is already understood. Hence futurity as discursive practice in participatory design is a venue to introduce and test the introduction of new meanings or at least look at how they are negotiated by the people who will be affected (Ollenburg, 2019).

Thus, the communicative or discursive act is not only a function of the make-believe; it also influences and is part of practices; what can be done is also conditioned to what is said, structured, and shared. From a political perspective, it is more important to question who defines what is said and why it is prescribed. In the case of CE, this means moving its definition to a public sphere where it can be confronted by people who will be affected by it.

The rhythms of everyday life in a CE cannot be thoroughly studied as long as a CE is not experienced, although some aspects can be referenced to previous experiences of what a CE could be about.

Therefore, everyday life in circular futures must be formulated in discursive mechanisms. However, it requires awareness of how it is influenced by what is believable –particularly by proposals that reproduce the social life as it is– and what can be practiced –particularly in modalities of everyday life that organize a different common sense.

Although a process of concealing CE to the imperatives of the modern/capitalist world with a common sense based on consumerism is already in action, one must look at CE as an open future as it represents an opportunity to conceive other modalities of being and doing. Two types of discursive activities for the make-believe can be distinguished in the formulation of CE as an open future: 1) Those that result from understandings that differ from the norm –capitalism and consumerism– and call to an agency that dissents. And 2) Those that continue the current social arrangement but intend to adapt it to some limits in the material conditions. Both processes imply a negotiation of meaning and shared sense, in which design can facilitate the opening of the future or its concealment.

The relationship between CE and its futurity is not well studied. For example, the study by Chamberlin & Boks (2018) shows that the landscape of possibility is also present in communication:

> *"… If consumers are to be engaged not just with new brands and alternative products but with the new behaviors and ways of consuming suggested by a circular economy, then it appears that new types of communication and marketing strategies may also be necessary, and that the field of design may be able to suggest tools and frameworks that provide useful insights."* (Chamberlin & Boks, 2018, p.15).

Markets also have an agency, as Callon (2021) points out by referring to an agentive model of markets. The use of market strategies is also a futuring device, and as referred by Chamberlin & Boks (2018), should be revised according to what they instrumentalize. In Lefebvre's terms (1991), this revision should answer to more than the modalities of everyday life of the capitalists. Furthermore, a CE can be instrumentalized as a tool to sell more and prospect a better situation (Vonk, 2018), and there is awareness of this process in previous literature (e.g., Wieser, 2016). In communication, advertisement or marketing efforts are essential in conditioning what is possible –at the make-believe level.

Hobson (2016) has criticized CE as being conceived by others on behalf of consumers. On the one hand, this critique can be interpreted as the need to open the futurity of CE. An opening to the multiple stakeholders affected by it could eventually mean everybody and require a democratization of CE. But, on the other hand, this also opens the question about how to future CE, which knowledge and actors to incorporate while simultaneously contributing to the understanding of planetary and social limits.

3.5   Summary and relation to the conducted studies

This chapter has offered a discussion of two theoretical perspectives; one is a social critical theory perspective (Lefbevre, 1971; 1991), which focuses on a critique directed toward the modern/capitalist organization of society, which seems to intend to flatten the social by bridging different scales of analysis. The second, social practice theory (Shove et al., 2012), is a theory based on a flat ontology that explains changes in the social but without a proper or distinct critique about what supports the world as it is; instead, it loosely defines dominant projects. Combining these two perspectives provides a theoretical framing to use social practices as a unit to enter a dialectical study with the modern/capitalist society. This dialectical study means looking for legitimizations, negotiations, and contestations. See Figure 3.1.
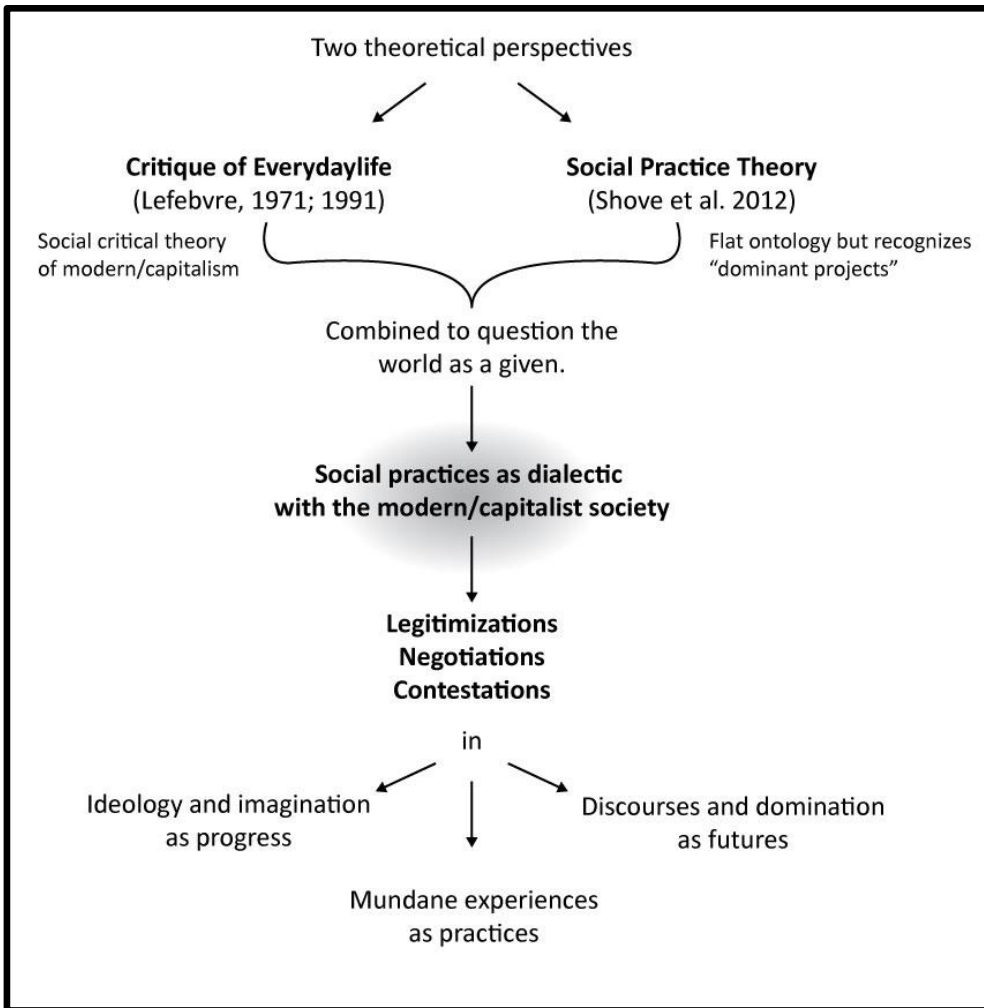
Figure 3.1. Diagram of the theoretical perspectives combined in this thesis

Lefebvre's (1991) critique bridges different scales of "everydayness" from the mundane to the political. The theoretical approaches used in the three studies are framed concerning three levels of social reality critiqued by Lefebvre (1971) to produce a coherent program based on the critique of the modern/capitalist world as given (see Table 3.1). In Lefebvre's (1971) critique, these three levels are indivisible, as the contents (image and ideologies) are also present in the form (poiesis and praxis), which means a co-influence between symbolic and real effects. However, this connection between the symbolic and real effects (i.e., physical or material) is better explained in the interrelation of elements in social practice theory (Shove et al., 2012).

	Image and ideology	Poiesis and praxis	Make-believe
The approach in the study of CE	- Discourse coalitions. (Storylines and metaphors)	- Practice-driven institutionalism. (Logics and grammars)	- Participatory futuring (Speculative and discursive)
Politico-economical subject	- Economic growth as an ideology.	- Consumerism as a social arrangement.	- Necessary production and consumption
Locus of study	- Discourses about CE	- Consumption practices	- Governance

Table 3.1. Reframing of the approaches based on Lefebvre's (1971) critique of levels of social reality

Discourses, practical experiences, ideologies, and imagination are addressed through the studies conducted and the articles that make the base for this thesis. These theoretical perspectives bring them forward as part of a whole social arrangement –consisting of social practices (Shove et al., 2012). From a political perspective, the critique by Lefebvre (1991) opens the understanding that the status quo may favor some forms of knowledge and living as a proxy for progress. With this background, the opening of CE becomes necessary as it could be the rehearsal of a dominant project that creates pockets of exclusion.

4   Methodological approaches

This chapter focuses on the research methodology, data collection methods, their appropriateness in matching the theoretical perspectives, and related ethical challenges.

The research process for this thesis relied on qualitative methods and tools for data collection. In principle, the qualitative methods used are interpretative, which means inductive thinking using the researcher's background and critical skills as tools for analysis. Including the researcher as an interpreter taints how the research is conducted and what are obtained as conclusions –this is a potential limitation of the studies. However, an advantage of the interpretative methods used in the studies is that they reveal the researcher's orientation in selecting themes and topics.

4.1   Research-for-design

A research-for-design approach orients the questions in this thesis. It helps in elucidating some of the aspects that design before designing. Thus, the work in this thesis acknowledges design as an agency that does not belong only to professionally trained designers.

From a disciplinary perspective, this thesis looks at opportunities for design to contribute to a CE. CE in design has been mainly approached at the level of products and corporate interactions (Dokter et al., 2021). However, design literature engaged with social research has called for including social dimensions (Pitkänen et al., 2020; Lofthouse & Prendeville, 2018). Moreover, the transformation of society has also long been sought by design (c.f., Dilnot, 1982). From these concerns, this thesis joins the calls to learn about the possible implications and effects of CE as a transition.

This thesis also takes a "research-for-design" approach (c.f., Frayling, 1993; Galdon & Hall, 2022). This approach means that the contribution is in knowledge useful to designing, whether as knowledge for application or critical about aspects concerning designing. Galdon & Hall (2022) present this approach as follows:

> *"... 'research-for' approach where the practices observed are not those of a design studio or a classic designer, and neither are they conventional academic approaches. The core practice becomes a designing research approach which is neither industrially-led nor conventionally academic but seeks to leverage the designerly permissions to embrace new forms of design research knowing."* (Gladon & Hall, 2022, p. 17)

It becomes imperative to have a social analysis conversing with material and technical discourses, particularly those of production and consumption, contributing to the onto-epistemological questions about CE in the conception and reception of material means for a social arrangement.

Critical perspectives about design's disciplinary capacity to produce discourses and practices in dialectic with the status quo have emerged in recent years. For example, Fry (2020) proposed defuturing as a method that *"removes the liberatory fictions of freedom from the past that come with the rhetorics of development, change and progress."* (Fry, 2020, p.392). In the proposal of defuturing, Fry (2020) contends that critically informed design necessitates a revision of the causes of current unsustainability and questioning what is sustained. In Fry's (2020) perspective, this is not an ecological nor a technological problem, as design has a more pervasive role in what has already been designed –what Fry (2020) call the unsustainable. In Fry's (2020, pp.396-397) contention:

> *"We act in and on our world through that which is designed, that which designs and through our designing, which is why a knowledge of Design is an essential knowledge that is basic to being informed and responsible."*

In this thesis, to reach a critical perspective of designing with a CE that is not imposing an everyday life based on the illusions of progress (Lefebvre, 1991), a revision of context and causes became a first methodical concern. This concern is based on revising the contextual formulation of CE before dealing with its capacity to change the economy and, more so, to offer social imaginaries that renew social life. The need to change in a societal transition is extended to design. Design is one of the actors that sustain the unsustainable, and a critique of design concerning CE is also necessary.

4.2   Research scope and situatedness

The results in this thesis describe and interpret cases in Trondheim City in the Trøndelag Region in Norway. Through these cases, the formulation of a future circular economy is questioned in its emergence, contestations, and broader political context. This thesis frames a working definition of CE as a process aimed at two goals: reduce or avoid material extraction and reduce or eliminate waste. This working definition was reframed to reduce unnecessary production and consumption. This definition was used throughout the research process.

The research in this thesis is organized into three studies looking at the structuration of discourse, contesting practices, and design as embedded in an institutional framing –i.e., a social reality sustained in practices (Schatzki, 2001; Shove et al., 2012). Furthermore, the space of the possibility and its relation to the status quo (a modern/capitalist common sense) is questioned by looking at the other modalities of everyday life following Lefebvre's (1991; 1971) critiques.

Some aspects of my situation as a researcher also frame this thesis. I actively describe my situation in this research and how it drove the research process. First, I have an educational background in design (engineering), which means an engagement with material and technological matters as a hands-on

experience. My background is expanded with studies in communication as social science, which puts me in the convenient position of having a formal education in the so-called techno-social space.

Second, my previous professional engagements were linked to commercial projects, mainly marketing, and advertisement. So, on the one hand, it puts me in the inconvenient position of having recognized and internalized some of the decision-making processes that drive the over-commodification of every aspect of life, the same that I came to later reject as part of a concealing of agencies to the dominant project of capitalism. But on the other hand, it gave me an understanding of the entanglements between material consumption and their structuration as part of businesses – the normality in industry.

Third, I participated in this research as a foreigner –I'm not Norwegian, but I'm researching a case in Norway– coming into a society with order and rhythm different from what I was used to –including other institutions, traditions, and practices. Thus, my capacity to perceive certain aspects of this society is also limited. However, seeing or elaborating on things a local gaze would take for granted is also advantageous. However, I was not alone in any of the stages of the research, and there were always other local colleague-researchers involved.

Fourth, the timeline and progression of this research were affected by the CoVid-19 pandemic, which is still an ongoing global issue at the time of writing. Although this is an important factor, this thesis is finished and delivered. However, the outcomes were also tainted by the happenings in this period – for almost two years.

Fifth and finally, this thesis is prepared within a research program in design, focusing on sustainability and collaboration with researchers in science and technology studies and education. This context puts me in an epistemic conundrum about where to direct the research contributions and how to return them to design discourse. However, at the same time, it helps me look at a problem that pertains to designers from a perspective not limited by a framing overly focused on material aspects in disconnection to their social context. Instead, it was an opportunity to look at the, metaphorically speaking, shapings of the social.

The framing of the research problem intertwines social and technical systems as imagined and co-constructed. However, some aspects of CE, such as the involvement of ecological systems, have a lesser presence. However, the reduced presence of ecological systems does not mean that they have less importance or relevance, but instead that the production of benefits for the environment is an assumed position that is a priori. Research about CE requires assumptions to support changes in how material resources are used and their impacts. However, this thesis does not address the bio-physical

evidence for these assumptions. This evidence is, for example, quantitative environmental indicators, such as the quantities of pollutants to be avoided or the expectations from projections about specific technical implementations and scenarios (i.e., CO_2 equivalences).

As previously mentioned, the research used qualitative data from cases in the Trøndelag region in Norway, specifically in the city of Trondheim (discussed in Chapter 5). Three reasons drove the decision to study this region: 1. An orientation or conviction that the academic activity of universities should be linked and influence their immediate geographical contexts. 2. The personal opportunity to gain access to a network of actors with discourses and practices already shaping a CE –while immersing myself as a foreigner– and making sense of what a CE could bring about and of the Norwegian society as a whole. 3. CE was already a topic emerging in the region in plans for the industry, waste management, environment, and sustainability –the topic is still emerging and could be steered according to different priorities.

4.3   Concepts operationalization

Most associations and relations this thesis describes are not generalizable to other contexts. Although the social described here shows a mode of researching and understanding a CE, the results are limited by context. However, they describe existing subjectivities within a societal arrangement characterized by widespread high living standards and high material consumption supported by two ideals in tension: individual freedom and equality. In principle, these two ideals are not in tension, but tension forms when an institutional order mediates the two. Tension builds between freedom of the market and a welfare State in contemporary Norway. In other words, the individual freedom to profit and accumulate capital –as a right– against a State that plays an essential role in intervention for wealth distribution (c.f., Schoyen & Takle, 2022).

People living in Norway find ways of making sense of the contradictions their institutional system provides while carrying on with their everyday lives. These describe a modality of everyday life that aligns with ideas of progress in the modernist/capitalist sense.

There is a first notable confrontation between politics and mundane activities. This confrontation is noted by Lefebvre (1971, p.142) as a series of ambiguous dualities between a rationalized theoretical system of consumption and the incoherence of quotidian activities. An economic system is ordered through policies and production efforts by actors with institutional mandates (such as Ministries, Municipalities, and lawmakers). Yet, at the same time, quotidian consumption activities define everyday life in the satisfaction of needs and wants. The material aspects of consumption are also a reflection of its symbolic elements. What is consumed might rationally make sense when put under specific ideals –economic– but consumption might be irrational or absurd in practice –or under an

ecological understanding. This notion of a common sense –structure or order– is also one that CE can reconfigure.

Concerning ideologies and images, this thesis pays attention to the structuration and institutionalization of discourses through the perspective of discourse coalitions (Hajer, 2005, p. 302):

> "A discourse-coalition refers to a group of actors that, in the context of an identifiable set of practices, shares the usage of a particular set of storylines over a particular period of time."

CE is elucidated through discursive means that are structured and institutionalized following ideologies –socially shared foundational beliefs that control and organize systems of thought and are the base for discourse and social practices (Van Dijk, 2006, pp.116-117). For example, such an ideology can be found in the structuration of the economic system under the imperative of economic growth, which puts the aggregation of exchange value as the main social goal (Hickel, 2020). See Article 1.

In praxis, this thesis pays attention to mobilization in favor of CE but not having it as an a priori mandate. The central perspective is practice-driven institutionalism (Smets et al., 2015), which assumes that logics is a foundational component of both practices and institutions, where institutions are formed by the persistence of practices over time. Institutional logic, thus, can only be changed through experimentation with the grammars of practice –experimentation in meanings, competences, and things (c.f., Shove et al., 2012).

Following the practice-driven institutional perspective, concepts of consumption and consumerism (Bauman, 2007; Baudrillard, 1998) can be understood as defining institutional logics of action that can only be changed through practical engagements in experimental ways (i.e., resulting in new arrangements that can be institutionalized or discarded). In CE, it is in the practical engagements that new grammars of practice can be discovered, which do not re-rehearse the linear economy and move away from the institutionalized logics of acquisition, using, and discarding. See Article 2.

Finally, concerning imagination and making-believe, this thesis acknowledges the indivisible nature of ideological and poiesis-praxis levels by looking at discursive instances without the load of the make-believe already over-imposed by a CE concept –its mainstream version. Instead, the focus is on opening CE as a means for participatory governance through politicizing CE. The politicization of CE moves away from the expectations it generates as a techno-scientific project (Borup et al., 2006). Furthermore, efforts aim at reconfiguring opportunities for the deliberate enunciation of what is wanted and desired by considering discursive futuring methods (Jungk & Müllert, 1997; Tharp & Tharp, 2019; Hajer & Pelzer, 2018). These design modes consider the participation of multiple actors

to imagine alternative ways of being and doing –in a way, a metadesign (Vassão, 2022) that incorporates new and proper language (Lockheart, 2022). See Article 3.

The data analysis in each study followed the operationalization of concepts according to the theoretical approach selected for each. For the first study, the operational concepts were structuration and institutionalization of discourse. Structuration is the diffusion of a specific discourse used by a population. Institutionalization is the effective legitimization of one discourse through policies or physical artifacts. In this study, discourses include metaphors and storylines to identify what a CE is equated to and what is believed about it. In addition to the existence of different metaphors and storylines about CE, the sharing of these by other actors over time and their enactment in practice can be interpreted as a discourse coalition (see article 1). Existing CE discourse coalitions compete for legitimization. This legitimization is usually based on a dominant common sense, in this study interpreted as the ideology of the status quo. A process of institutionalization happens against the predominance of the imperative of economic growth as the main objective for policy and governance.

The second study's data analysis is operationalized through practice-driven institutionalism concepts. In this approach, social change happens in practice. Practices persist or change according to their legitimization or contestation of particular institutional logics –the grammar of practice. Institutions are understood as the performance of a bundle of practices. Hence, changes in practices weaken or drive possible institutional change. In this study, consumerism is understood as a particular social arrangement with institutional logic for production, consumption, exchange, and value. The data analyzed looks at the practice cases as negotiating consumerism by introducing new grammars of practice and weakening the institutional logic of consumerism (see article 2). Consequently, the cases are analyzed as data for identifying practice elements, looking at the meanings, competences, and materials as describing the grammars of practice and a possible new logic of consumption –their general understandings (c.f., Welch & Warde, 2016) or teleoffective formations (c.f., Welch, 2020).

The third study considers how to open the futures of CE. This opening is framed by CE's relation to production and consumption, where consumption and production are seen as a cause of climate change and an element of governance (see articles 3 and 4). Thus, the analysis reflects on the processes of future opening, introducing participation and speculation as means to gain insight into possibilities to access a CE from other modalities of everyday life. Most importantly, the reflections in this study are about the bases for engaging in discussions and enacting a CE –as an action to repoliticize it. Regarding CE, the proposal of a re-questioning about the modes of production and consumption and their governance is presented as a possibility to work on CE without prioritizing first its technical aspects.

The following sections describe the methods used in each study –in some cases, as heuristics. In addition, each study had its data collection and analysis with qualitative methods. The characteristics of such analyses are summarized at the end of this chapter (section 4.8).

4.4   Methods in the three studies

For this thesis, the methods used in the studies are operationalized concerning Lefebvre's (1971) critique of social reality and his proposal to look for other modalities of everyday life (Lefebvre, 1991).

How people order their thoughts and priorities addresses images and ideologies (Lefebvre, 1971). Thus, it requires observation of what is said and shared. For a CE, it involves paying attention to the storylines –time orientation and change as bettering or worsening– and the metaphors used to frame what a CE is or not. To this end, the first study in this thesis considered the shared meaning and understanding in the local process of futuring a CE. The first study involved actors in sectors where CE is already part of the discourses in use –concurrently adding to the co-production of practices.

As a heuristic, the first study used the method of discourse coalitions (Hajer, 2005). This method sets analytic categories to look at discourses from the perspectives of their formation –structuration and institutionalization. The structuration of a discourse responds to the shared understanding and meaning among several actors. At the same time, institutionalization is the stabilization of discourse in policies or physical objects under the influence of one specific alternative discourse (coalition).

An alternative method considered for the first study was the narrative policy framework (Jones & McBeth, 2010). This method derives from narrative studies and looks directly at storylines as done in more traditional narrative studies by following descriptions of improvement and decline and assigning particular agencies to actors (e.g., hero, problem, solution). Using this method would have implied framing the interpretation of the qualitative data as part of a story with specific events described in succession from past to present and future. However, not every data entry was related to an ordered sequence of events or the involvement of actors; discourse analysis proves more suitable as it is based on stories and metaphors that show evidence of an order of ideas without making them dependent on temporality.

The level of praxis (Lefbevre, 1971) is addressed by looking at social practices, which can inform the future orientation and the formation of competing social imaginaries and arrangements. Concerning Lefebvre's dialectic, this level is *"to go beyond philosophy and theory and to arrive at practice and action"* (Schmid, 2008, p.43). Here, the challenge is to learn from these experiences about 'what is thought possible' and the struggles at the margins of a modern/capitalist society marked by market consumerism. As an approach, framing practices in a dialectical mode requires focusing on how the

oppositions and confrontations are negotiated in front of the current economic system, particularly how the relations between individuals and groups are negotiated towards a renewed social arrangement but always circumscribed by the existing common sense.

In this second study, the method to gain access to practices was short-term ethnography (Pink & Morgan, 2013), which involved a short period of visits and online searches to find the whereabouts of possible practices to include as the sample in the data. In this study, there is an essential distinction between the methods to gain access, study, and interpret the data. While the practices are accessed through the short ethnography, their study is made by isolating them as units of analysis and interpreting their elements and relations as part of social practices.

This second study could have taken a different orientation; for example, if the research had been oriented as a thick description of the social relations around a perceived social practice, which would have implied the iteration of multiple contacts with practitioners around the same practice to interpret the causes and effects of the performance of said particular practice, the material and social arrangements that allow for the reproduction of those practices –for example, in the bimonthly participatory observations conducted by Hector & Botero (2022). An approach like this could be used to further describe alternative practices as part of the study of their persistence over time. Still, the second study aimed to describe aspects across several practices that appear in contestation to a particular institutional arrangement.

The make-believe level (Lefebvre, 1971) is addressed by incorporating futuring activities –design futuring. This level is present in the three studies as part of the opening of futures. However, it is explicitly explored in the third study. For the third study, it was decided to integrate the perspectives of others through participation in more than the translation of a normative vision of CE. Instead, it looks for circularity as a condition of the world and what it could be. Furthermore, the characteristics of a CE or CE-related possibilities come from a view taken without involving CE as a ready-made concept.

Mangnus et al. (2021) propose a typology of four approaches through which futures are understood and practiced, those being 1) Predictive. 2) Plausible, 3) Experimental, and 4) Critical. The first one refers to methods aimed at forecasting the future in a way that anticipates what could happen given specific conditions. The second one refers to uncertain and collective investigations of the future. The third relates to the methods that approach the future as an opportunity to experiment in the making. At the same time, the fourth poses the need to apply reflexivity about what could go wrong about a particular future development. Of course, this is not the only existing typology of future approaches. However, it indicates different future approaches –each requiring different other methods. The

methods used in the third study are positioned between plausible and critical approaches. These two approaches are participatory in nature as they need the involvement of people as those who define plausibility and reflexivity about particular futures. The specific methods used in article 3 lean more toward plausibility, while the ones in article 4 lean towards criticality.

Other research results would have emerged if predictive or experimental approaches had been used. However, these two approaches are better suited for studies that have already taken a position on a normative aspect of change –for example, in proposing a particular development as part of a CE– or in intending to construct how the situation would behave by comparing scenarios or prospected outcomes –in forecastings.

4.5   Data collection and sampling

In the first study about discourses, the data collection was through unstructured interviews. A guideline with questions and topics was used to provide a common ground in all the interviews. An essential aspect of the interview process was to avoid definitions or particular views about CE and to allow the participants to come up with their vocabulary of what CE meant (metaphors), how it has happened, and what it will solve (storylines). Another essential aspect of the data collection was the participants' enactments and their position on what should be the result (a vision). A challenge in these interviews might have been the spoken language, as most of the interviews were conducted in English. Although most of the participants agreed to be interviewed in English, in some cases, the interviewees used Norwegian words to refer to particular aspects. In some few instances, the interviews were entirely conducted in Norwegian. In these two cases, the challenges posed by the language were surpassed by the collaboration with fellow PhD Candidate –at the time– Thomas Edward Sutcliffe, a native speaker of Norwegian.

The sampling in the first study was purposive with a snowball technique. The first participant was a crucial actor in spreading CE in Trøndelag, working with one of the local authorities. This first interview provided a grounding for other possible participants in the public and private sectors. The subsequent interviewees were recruited by asking the participants about other potential actors. A total of 26 interview transcriptions and memos were in the final sample, covering different authorities at three government scales –national, county, and municipality— and private activities –non-profit organizations, profit organizations, and civil society. These interviews were conducted over seven months, from February to September 2019, ranging between 39 and 86 minutes, with a median of 60 minutes. Eighteen of these interviews were conducted in person in Trondheim –in public offices, public places, and offices at the university; six interviews were conducted online with participants in other parts of Trøndelag and two in Oslo. A national strategy for a Circular Economy in Norway was

still expected during this period. In this study, while the interviewees and their professional positions are important, the most important aspect was their communication of CE. The sampling for this study was conducted in collaboration with the fellow PhD Candidate mentioned earlier, who is a native of Norway and has a science and technology studies background. Additionally, the sampling was reinforced using policy documents (see article 1).

The second study took the findings of the first study as a grounding. In consequence, a decision was made to focus on consumption reduction. One of the results from the first study indicates a structuration of the discourse of CE around the individual reduction of consumption. The data collected for this study included cases found in the city of Trondheim, Norway. The cases were part of a short-term ethnography (Pink & Morgan, 2013) aiming to identify alternative consumption modes; the study was conducted between August 2020 and February 2021. As a short-term ethnography, it involved a period of immersion, looking for possible actors or practices to recruit as cases to observe. In total, 13 cases of alternative consumption practices were part of the main entries for analysis. The most relevant aspect of recruitment was the opportunity to contact carriers of the practice or to have access to their perspectives as performers of the practice. Therefore, the final sample in this study includes interviews and observations (see article 2).

The data collected for the practices included as the sample in the second study came from the following sources: recruitment of participants for eight interviews, one interview from the data collection in the first study, observations in locations where the practices are performed, and the revision of social media content related to groups of carriers of two of three practices. The data collected for these cases emphasized why the practice is performed (meanings), how it is practiced (competences), and the presence or association to things (materials) and the a priori understandings that led to performing the practice (logic). Although the data comes from specific sources, the practices are reconstructed and interpreted for analysis.

The data for the final study comes from two workshops. Although some visual outcomes represent a joint work made by the participants, other forms of data were also registered during the workshops. These other forms of data are about the participation and the production of knowledge involved. The visual objects from the workshops embody some work that can be analyzed. However, a richer knowledge or experience is elucidated from the happenings around the workshop and the modes of participation and futuring involved. In plain words, the data from these workshops is more than the visible results from the workshop. Instead, they offer a source for self-reflection about the work being done and the role of designing in research and decision-making processes.

The workshops were conducted in September 2019 and September-October 2021. The first was a Climate Workshop with 37 youth participants from the region of Trøndelag, recruited by the local-regional officials of Trøndelag for a participatory activity as part of their process for co-construction of a regional strategy for climate adaptation and mitigation. From this first workshop, the final sample included 40 visual creations from the participants, which enunciated their central positions about climate change, what they consider causes, and solutions. This first sampling focused on collecting ideas about the future, which are found in an exercise on future storytelling. The second sampling came from two iterations of a workshop testing the use of speculation and deliberation around the specific topic of consumption and production governance through questioning on necessary consumption and production. The participants in this sample were university students in Trondheim, mostly foreigners. As a pilot sample, the results of this workshop are used to inform possible future research using similar methods and, more importantly, focusing on deliberations about the governance for necessary and needed forms of production and consumption. See articles 3 and 4.

4.6   Data Analysis

As mentioned earlier, the analysis in each study used qualitative data as a source and interpretative methods. In the first study, the primary sources were interviews. The transcripts of the interviews were reviewed, looking for common topics and themes. This review used three dimensions to organize the analysis: 1) The position of the participant's discourse concerning waste management or avoidance. 2) The belonging of the organization –public or private, for-profit- civil organization. 3) The level of proximity to the citizen. See Figure 4.1 and Table 4.1. Distribution of interviews, sector, type of meeting, place, and date for an overview of the participants' sectors and the scale of influence of their represented organization. The intention with these dimensions was to organize the discourses concerning technological visions, shared understandings, and their link to the experienced everyday life of citizens in Trøndelag/Trondheim.
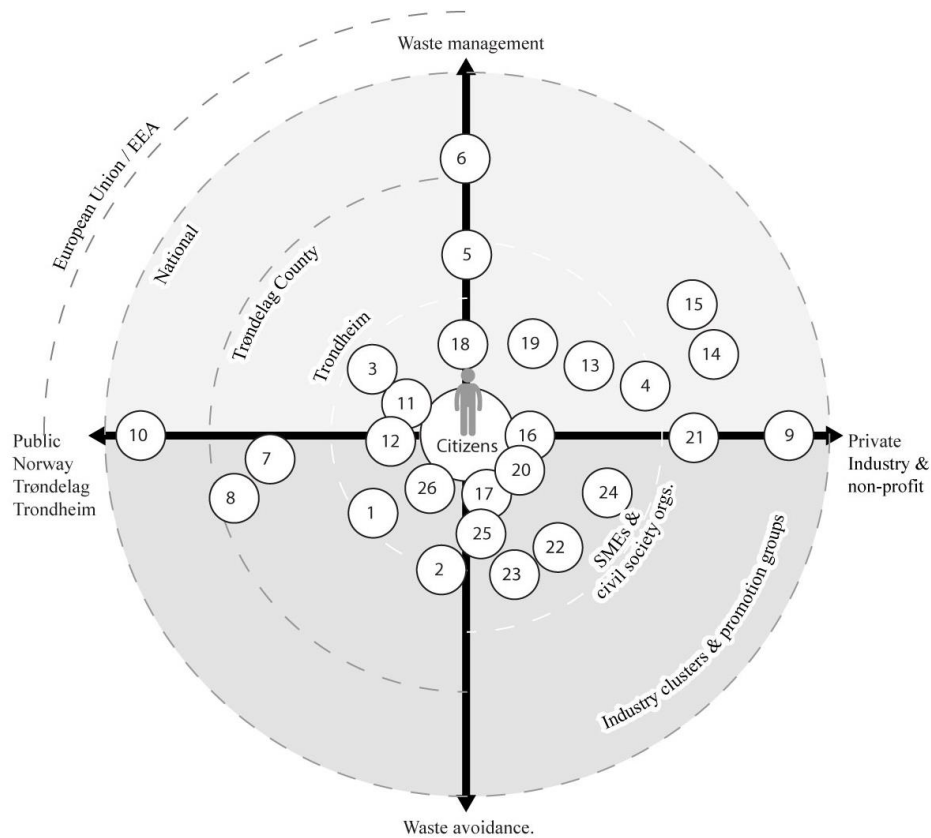
Figure 4.1. Dimensions of analysis in Study # 1: Discourse

Informant	Sector	Meeting	Place	Language	Date	Influence scale
1	Public	In-person	Trondheim	Norwegian	04/2019	City & county
2	Public	In-person	Trondheim	English	05/2019	City & county
3	Public	In-person	Trondheim	English	06/2019	City & county
4	Private	In-person	Trondheim	English	05/2019	City
5	Publicly owned	Online	--	English	06/2019	County
6	Publicly owned	Online	--	English	06/2019	National
7	Public	In-person	Trondheim	English	06/2019	County
8	Public	In-person	Trondheim	English	11/2019	County
9	Private	Online	--	Norwegian	07/2019	National
10	Public	Online	--	Norwegian	07/2019	National
11	Public	In-person	Trondheim	English	06/2019	National – County – City
12	Public	In-person	Trondheim	English/Norwegian	06/2019	Organizational
13	Private	Online	--	English	05/2019	Local
14	Private	Online	--	English	08/2019	National
15	Private	Online	--	English	08/2019	National
16	Private	In-person	Trondheim	English	05/2019	City
17	Not-for-profit	In-person	Trondheim	English	08/2019	City
18	Publicly owned	In-person	Trondheim	English/Norwegian	08/2019	City
19	Private	In-person	Trondheim	English	08/2019	City
20	Private	In-person	Trondheim	English/Norwegian	09/2019	City
21	Private	Online	--	English	09/2019	County
22	Private	In-person	Trondheim	English	10/2019	National – County – City
23	Not-for-profit	In-person	Trondheim	English	10/2019	National – County – City
24	Not-for-profit	In-person	Trondheim	English/Norwegian	09/2019	National – County – City
25	Private	In-person	Trondheim	English	09/2019	City
26	Public	In-person	Trondheim	English	10/2019	City

Table 4.1. Distribution of interviews, sector, type of meeting, place, and date, and influence scale in Study #1

Interviews and observations as primary sources supported the second study. In this case, the data was interpreted by organizing the 13 practices in three dimensions: 1) Grammar of practice –Institutional (consumerist) against contestation (alternative consumption). 2) Performance of the practice, individually or collectively. 3) Prioritization of value –exchange or use. See Figure 4.2. These three dimensions helped organize the 13 practices in the study according to their alignment with consumerism.
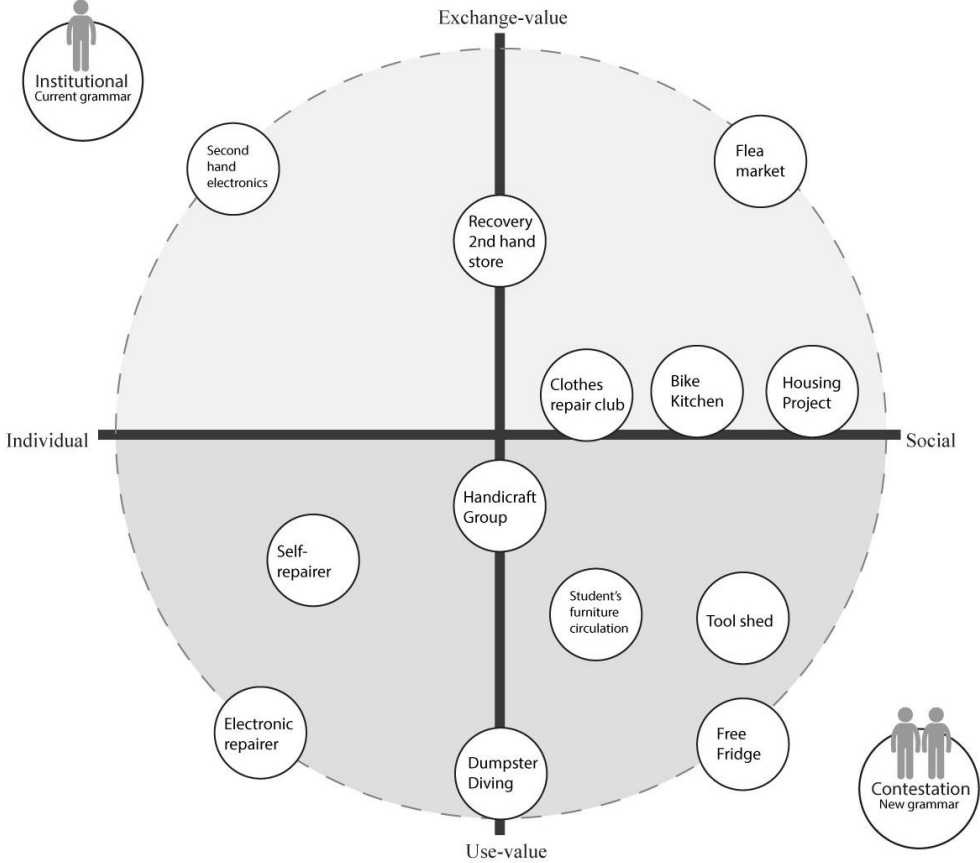
Figure 4.2. Dimensions of analysis in Study #2: Practices

The third study followed a different analysis; the analyzed data came from two separate instances in which participation and speculation were the methods. In this study, the reflection comes from delving into insights about the relationship between consumption and production modes and their effects –clearly seen by the youth citizens regarding climate change. These insights are organized in three dimensions: 1) Politics, which has a double meaning, one related to the position of people about the freedom to produce and consume, and one about the role of the government and private parties in organizing consumption. 2) Knowledge production, this dimension is tightly linked to what can be

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known about production and consumption. 3) Everyday life is about the experience of organizing life with a practical contingency. Expectations about possible futures appear in the linkage between these dimensions. See Figure 4.3.
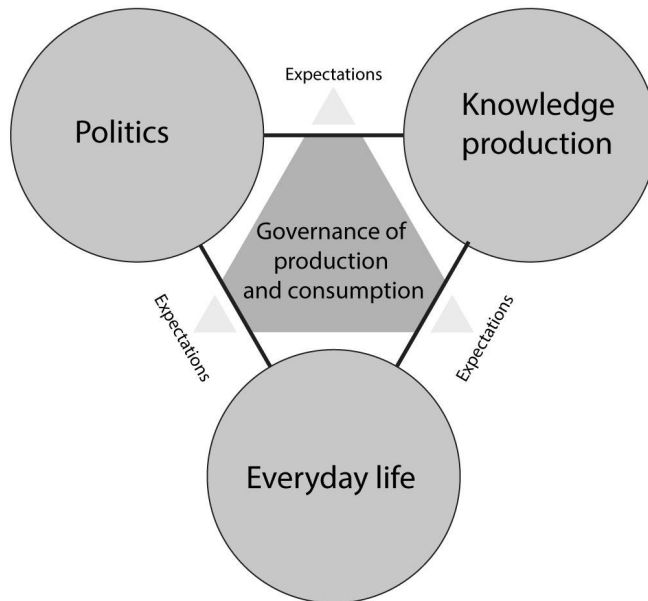

Figure 4.3. Dimensions of analysis in Study #3: Governance

4.7 Limitations and Ethical challenges

Aside from the typical limitations in doctoral-level research that comes as part of the process of doing research as a training process, the research in this thesis suffered some delays and changes of scope in relation to the ongoing Covid-19 pandemic. These changes did not affect the data analysis in a significant way but caused a reduction in the scope (recruitment of participants) in the second and third studies.

Other limitations of this thesis relate to the type of approaches and data collected, as some of the claims made about CE are not evaluated against specific goals as for example, regarding their capacity to reduce emissions of greenhouse gas emissions or to contribute to reducing the need for new material extractions or the generation of less waste. Notwithstanding, there is no evaluation of a right or wrong CE, at least not an attempt to normativize CE through *the* right definition or *the* appropriate method to work on it. Instead, this thesis has worked on how to open the transition from what is already available about CE as discourses, practices, and future-making.

Within the scope of this thesis, a normative prescription of CE is not the goal. However, the final study in this thesis identifies a strategy to work on the core matters of CE without centering CE as a discursive

device based on the production of new things. This approach avoids using CE as a discursive or rhetorical device to support the need for new products or services has been a significant decision in conducting this research. It has oriented the three studies and required questioning how to study CE without becoming promoters of one specific technology for its realization. In other words, how to not reduce the research to a particular understanding of the future.

An encompassing question for the research was how to avoid becoming another actor in promoting CE while researching it. In broad lines, it can be said that it is an unattainable end as the study of CE and its messy onto-epistemological issues put the researcher at a crossroads. On one side, the tenets of a particular CE can be accepted, and research can be done to advance it. But on the other side, research about CE becomes a critique of the model on which it stands (the mainstream CE) so that its ends and means can be improved, which results in a prescription or normativization of CE.

A difficulty in discerning what is right and wrong about a CE is also a limitation, particularly as it becomes evident that the research process does not respond to a particular definition of circular economy from which to evaluate all other research efforts. This reframing presents a new problem because it becomes a prescription that can enclose CE as much as any other. A more critical question is how to make those prescriptions an organized democratic decision. In this sense, a CE can also be subjected to fit some more encompassing debates between green growth and degrowth –in the schism between arguments of techno-optimism and moral hazards (Wagner & Zizzamia, 2021).

Study	Sample	Reasons for recruitment	Recruitment method
#1: Discourses	- 28 professionals working in organizations (public and private sector) related to CE.	- The participants were already working or related to the public discussions of CE in Norway, Trøndelag, or Trondheim.	- Snowball method. - Contacted and referred by other participants. - Focus on their relation to the Trøndelag region.
#2: Practice	13 practices	- These practices are already performed in Trondheim/Trøndelag and evidence an alternative mode of consumption/acquisition and maintenance of material resources.	- Short-term ethnography. - Visits to local activities and following on social media.
#3: Governance	- 37 youth citizens. - 9 university students	- The first group includes politically involved or concerned youth. - The second group involves people from different academic backgrounds interested in sustainability.	- Trøndelag's County Council recruited the first sample as part of their work on their local Strategy for Climate Change. - The second sample was recruited through a public call made online.

Table 4.2. Samples of participants in the three studies

Finally, there is always the ethical challenge of representing participants recruited for research and their interests. The three studies did not intend by any account to evaluate who is right or wrong in the formulation of a CE, instead to look at how the concept fares in different social circles and how it becomes what it is –in discourse and practice. There is, however, the possibility of misinterpretation

of the sources –a weakness in interpretative methods where the researcher is also an instrument of the research. This aspect cannot be avoided and requires a more thorough data revision from different angles. This thesis supports the final interpretation of results by conducting three studies with different participants (see Table 4.2). In summary, this diversity of participants helps corroborate similar contentions in understanding and practice about consumption and production and what a CE could change.

The samples for the three studies were not without ethical challenges. For example, the first study focused on the professional and organizationally backed discourse about CE. Notwithstanding, in some cases, it was hinted or found through other instances that the participants did not personally agree with the position taken by the organization they represented. In these cases, it was decided to stick to the organizational position in the discourse. Therefore, although the participants were anonymized, their individual disagreements were not delved into as part of the study.

In the second study, the focus was on the practices. However, there is always the recruitment of participants as performers of the practice. Due to the study context, there is a risk of identifying individual participants, even though they are anonymized. In most cases, this is innocuous, but in one instance, it was made clear that the participant's anonymity was more critical due to the legal status of the practice conducted. In this case, the practices are described with as little detail about identifiable particularities as possible.

In the third study, the focus is given to the workshops as tools for design and reflection. However, this study was not without challenges. In the workshop with youth citizens, a particular challenge emerged from the activity not being framed as a research study but as an instance for public consultation by Trøndelag's County Council. This situation taints how the material can be used and the type of insights that could be informed. Furthermore, each step required the conscious participation and inclusion of some participants. For example, participants are co-authors in article 3, collaborating with their perspectives. In contrast, in the second workshop, the framing to the participants is given as pilot testers of a research method. In this second case, the results are also used to reflect on the method and not to generalize the results.

From the design perspective, questions about representation are also raised about why participants' knowledge is recruited and to what end. More particularly, what is proposed from the knowledge obtained, what does it inform, and how to avoid interventionism that does not consider the context of the recruited participants. This questioning considers those who perform the practices in the second study and the possibilities of experimentation attained through the third study. A particular limitation is how to advance an agenda for the open futurity of CE in a form that is more than

descriptive –one that mobilizes action. The contribution of this thesis is a small step in that direction. Still, practical experimentations with a particular understanding of circularity could have provided more salient points about the challenges of transitioning guided by other social imaginaries.

The matters of representation in the samples also have implications for possible biases introduced by the sampling methods. For example, in study #1, the snowballing process relied on the mentions by previous participants of likely prospected participants, which means that the included interviewees were already members of a network around CE. This initial network was constructed and guided by the first interviewees from the public sector –at the Trøndelag County Council and Trondheim Municipality. However, it is also possible that a different network –through which CE circulates– and discourse coalitions could have been identified if the sampling had followed other actors. For example, actors related to the information and commercial sectors are also present in Trondheim and for whom a CE could have a different meaning and set of implications. However, it is assumed that these actors do not feature in the sample because they are not part of the initial activities in the introduction of CE. Still, these actors could eventually become integrated as the concept spreads in society.

Another possible bias is introduced in the selection of alternative consumption practices, which was purposive. Defining what entails an alternative form of consumption is also problematic. Some practices that appear to contest consumerism could also be the result of systemic exclusions and inequalities. Graziano & Trogal (2022) demonstrate this by evidencing that repair can be possible in two antagonistic forms: solidarity or poor economies. Moreover, this problematization evidences that the ways, reasons, and feelings that motivate the performance of alternative consumption practices should lead to more than finding strategies to enable practices. Instead, it raises the call to politically question the distribution of resources in sufficient ways among people in society.

Finally, biases in the study of futures –in study #3– result from the difficulty of returning to the participants after the workshops were conducted. Thus, the studies offer a partial apprehension of how an intervention could affect the making of the future. For example, a better-structured research initiative should consider the workshops' transformational capacity and potential follow-up over time to determine what it implicated for the participants.

4.8   Summary of chapter

This chapter described the recruitment of participants and the units of analysis sampled in each study by reflecting on the theoretical approach selected for each and operationalizing their particular concepts (see Figure 4.4). The methods for data collection and analyses are qualitative and interpretative. Therefore, some dimensions were used to analyze the data in each study.
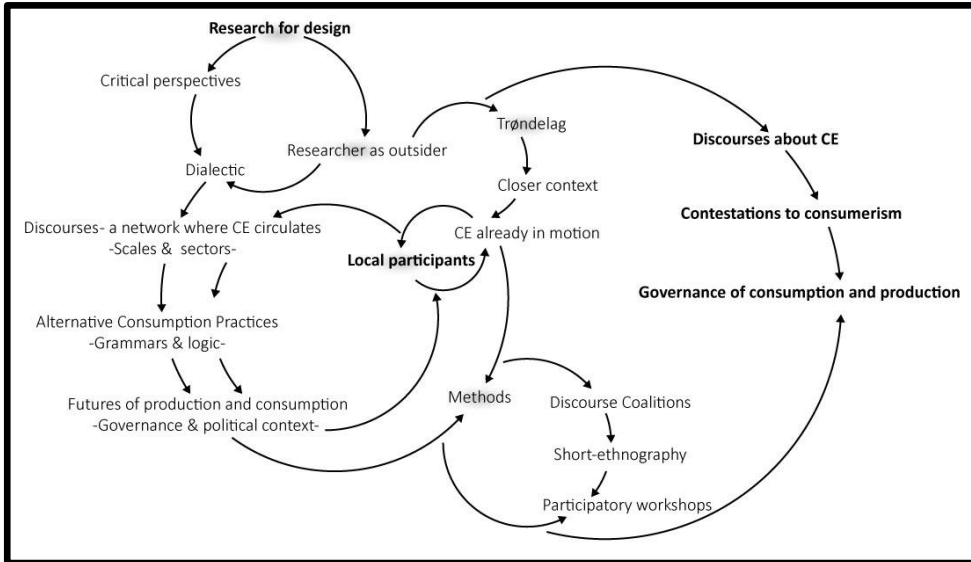

Figure 4.4. Summary of the methodological framings in this thesis

Each study offers a prefiguration of CE, the first as discourses, the second as consumption practices, and the third as future governance-making. Table 4.3 summarizes the methods for data collection, units of analysis, and subjects. More information about the methods is found in the articles for each study.

Study	Qualitative data sources	Operational units of analysis	Data collection methods	Subjects
#1: Discourses	24 interview transcriptions. 2 memos	- Discourses (structuration and institutionalization) - Visions - Storylines - Metaphors	- In-depth unstructured Interviews. - Discourse coalitions	26 (interviews)
#2: Practice	9 interview transcripts. 8 memos from observations. 4 memos about social media monitoring.	- Social practice elements - Logic (grammar, general understandings, teleoaffective formations).	- Unstructured interviews. - Non-participatory observation.	13 (Cases)
#3: Governance	40 visual artifacts and 1 memo from the first workshop. 24 worksheets and 1 memo from the second workshop. 9 partial audio recordings from the second workshop.	- Imagined futures - Modes of participation. - Agreement and disagreement (friction).	- Participatory workshop. - Futuring (future workshops)	1 Future workshop (37 youth citizens). 2 Exploratory workshops (9 university students)

Table 4.3.Units of analysis and subjects per study

5   Contextualizing the study on circular economy

This chapter focuses on the specific context in which the research of this thesis took place. The contextualization of this research was the main driver for the selection of the subjects of study. The units and subjects of analysis were explained in chapter 4.

A CE transition mobilizes action toward different ways of doing and being –at least in how materials are appropriated and used in production and consumption, drawing on some orders of worth (Welch et al., 2017). However, as an anticipated and planned future, the practical implementation of projects and initiatives emerges from specific social sectors linked to existing institutional means and goals. Therefore, any emerging arrangement in a CE will be conditioned by the continuity of other existing social projects and relations –sustaining the good and the bad. For example, a CE focused on job creation opportunities without considering global exploitative and value-extractive labor relations would keep unequal wealth distribution unaffected.

Although the study of orders of worth can be taken at a global planetary level, distinctions between regions and governance modes link CE's emergence to local contexts. The differences between regions are well noted in the circularity divide addressed by Barrie et al. (2022). A circularity divide implies that an approach to circularity is also a co-production between actors and agencies defined by the particularities and histories of a production and consumption system. These particularities include an institutional framing marked by geographical proximities and a material circulation history. A local contextualization of CE offers the opportunity to question how an established production-consumption system –local but influenced globally– hinders or supports the emergence of possible other imaginaries of circularity.

5.1   From a European plan to the local governments in Norway

There are important precedents in the promotion of CE in Europe. CE gained importance after the Chinese "Law for the promotion of the circular economy" was introduced in 2009. This law put forward the government's interest in a major industrial-based economy in applying some of the precepts of CE, particularly those related to reducing costs by using secondary materials and gaining access to a wealth of resources that were disposed of as waste in other parts of the world. As Gregson et al. (2015) have argued, CE quickly became a matter of geopolitical interest driven by local resource security and efficiency discourses. In the European Union, the orientation towards resource security took a stronghold and had precedents with the Roadmap to a Resource Efficient Europe (European Commission, 2011) and the Critical Raw Materials Lists –first presented as communication in 2011 (European Parliament, 2020).

In addition, a CE in Europe is supported by previous policies. Before the introduction of CE, the Waste Framework Directive (European Parliament, 2008) already included specific targets based on a Waste Hierarchy and, most importantly, the roles of extended producer responsibility and waste prevention programs in addition to waste management categories for hazardous products and recovery of materials.

The introduction of CE as a concept also changed how the policy on materials is approached. It expanded the scope of material resources from waste management to consumption and production patterns. The promotion of CE, however, came from more than policy bodies; it is also the result of the work of think tanks and non-profit organizations. For example, the Ellen MacArthur Foundation is a prominent actor in the promotion of CE, and it started in United Kingdom in 2010 (Kovacic et al., 2019b). This non-profit organization has partnered with some of the biggest corporations in the European Market. It promotes a mostly business and private sector agenda, linked to developing public-private partnership projects.

Additionally, other local non-profit organizations –such as Circle-Economy, based in The Netherlands– have taken a prominent role in communicating and translating the concept to businesses and political authorities in the public sector as part of Green Growth. Examples of a CE concept translation include the butterfly diagram by the Ellen MacArthur Foundation and designed by design consultancy IDEO, which has become a standard visual reference for CE. Another example is the annual Circularity Gap Report published by Circle-Economy.

Much has changed since the first years of the promotion of CE in Europe (Skene, 2022), primarily since the first Circular Economy Action Plan by the European Commission was published in 2015 (see European Commission, 2015). That year the UN State Members also adopted the 17 Sustainable Development Goals as the 2030 agenda. Additionally, the Paris Agreement was adopted by 196 countries as parties to The United Nations Framework Convention on Climate Change. With these precedents, 2015 became a year of inflection for work on CE. CE became a conceptual instrument for sustainability (Isenhour, 2019). The role of CE as a path to sustainability is more explicit in the second CE action by the European Commission (2020). In this second plan, CE is put at the core of the Green Deal of the European Union.

Although Norway is not a European Union Member state, it is still a European country with regional and historical ties. Norway shares historical and economic links to the European Union, some binding through international and mutual treaties (Fossum, 2021). The most important is the European Economic Area Agreement –a free trade agreement. Through this treaty, Norway has to comply with

equal governing rules for markets as the countries in the European Union –meaning that Norway is part of an international market with regional boundaries at the European level.

Rules related to products and materials circulated in the EEA member states, such as energy efficiency and hazardous material regulations, become binding for Norway. These matters are relevant to a CE in Norway because the legal framing may shape what can be done at the local level (municipalities) and poses challenges about what kind of circularity can be imagined locally. In addition, CE must also contemplate competition rules based on the maximization of economic growth.

In Norway, the local public sector must maneuver its action against the national and European regulations –in policies and instruments. A maneuvering degree of freedom means that municipalities must coordinate vertically with other actors at the upper levels (county councils and national government) and horizontally with other actors at the same level (other cities/municipalities and private sector actors). For example, regarding climate change action, Keskitalo et al. (2016) argue that soft measures can give municipalities more action capacity; they can also become a hindrance when no specific central instruments coordinate these actions. Hence, the political and administrative bodies must negotiate their inclusion when new frameworks are introduced against the institutionally possible.

In Norway, the introduction of CE became official in 2017 with the white paper "Waste as resource – waste politics and circular economy" (Klima- og miljødepartementet, 2017). This white paper initially focused on CE from a waste management perspective, with a particular emphasis on plastics. Moreover, the white paper also aimed at introducing the role of waste politics as part of a future CE, which meant a task for the waste management sectors and municipalities to find mechanisms and instruments to develop their local strategies for a CE.

A formal Norwegian National Strategy for a Green Circular Economy was presented in 2021 (Klima- og miljødepartementet, 2021). This strategy draws on most of the tenets in the European Action Plan (European Commission, 2020). The strategy focuses on product and business strategies that use local and regional resources. It also seeks to strengthen waste management as the sector that takes care of resources. The role of the public authorities is also mentioned, for example, in procurement. It leaves out the roles of citizens as part of CE, other than having more rights as consumers or as involved in businesses. The strategy also promotes CE as a way to implement a bioeconomy and use of renewable materials. CE is also put as a way to safeguard the resource interest of Norway concerning the European Union. A final aspect is a reliance on competitiveness and servitization through digital tools and financial instruments based on green growth:

> *"The transition to a sustainable low-emission society opens up an opportunity for new green growth. This requires innovation, technology development, and the development of new markets and products to improve resource utilization in the economy. The Government will assess how various economic tools can contribute to more socially profitable circular solutions."* (Klima- og miljødepartementet, 2021, p.10, own translation)

Although the strategy is based on green growth, it does not offer specific implementations and leaves many of its contents open for interpretation. Hence, it is a soft instrument that, while directed toward regional and local authorities, does not enclose the kind of action that local governments can take in its execution. Most of the empirical research in this thesis is from before the publication of the Norwegian National strategy for CE. However, it remains valid as a CE's understandings, discourses, and practices are still being negotiated and co-produced between governmental expectations and implementations.

5.2 The Norwegian institutional background

A CE in Norway is also conditioned by the administrative-political organization and division of the government in Norway and its relation to the other European States –particularly the European Union. The Norwegian administration is politically divided into three levels, national, County (regional), and municipal. The government structure in Norway means local authorities have to negotiate with the other levels as a sub-national authority. While some mandates have to be directly implemented from the national policies, others may respond to the concerns of the local populations (Dannevig & Aall, 2015).

In Norway, the municipal or local level takes care of many of the essential services given to citizens by the government, such as education, primary health and care, waste management, and leisure. In addition, at the municipal level, mandates from the national level are executed as part of the service delivery. At an intermediate level, the county has authorities with a role that is more of coordination (particularly for the industry and public transportation services). The county authorities include county councils (in Norwegian Fylkeskommune) and the controlling organ called the county governor (in Norwegian Statsforvalteren, previously known as Fylkesmannen). The county councils coordinate several municipalities' work, especially in industry development, roads, high schools, and public transportation (Hanssen et al., 2011). Democratic elections happen every two years, at intervals between local councils (municipalities and county councils) and national members of the parliament (Stein et al., 2021; Ministry of Local Government and Regional Development, 2021a).

The municipalities and county councils are financed through tax revenues, State grants, and services fees (Ministry of Local Government and Regional Development, 2021b). Furthermore, the

municipalities have budgetary autonomy and receive around 70% of the government's tax revenue. The political common ground for assigning these resources is that municipalities and counties must operate mainly from the government-assigned share of the tax revenue. In this context, the municipalities have some political limitations to how the money is used for services and how much they can gain in service fees: *"The local government sector's use of resources is significantly linked to the responsibility for national welfare services."* Therefore, the municipalities must ensure that their services and possible operating costs do not conflict with welfare objectives. In addition, it also means that municipalities should not compete in acquiring external financial means unless it is through the mechanisms established by law for the public sector (e.g., grants or new taxes).

Although the parliament and the National Government of Norway oversee and decide about most issues related to the welfare of the residents in Norway, the municipalities and county councils have a great degree of freedom when it comes to decisions about how to execute programs and strategies to accomplish the goals given by national policy (e.g., Kasa et al., 2012). Hofstad et al. (2013) note that the national government does not create plans but presents expectations to the municipalities. The local-national relations are particularly relevant to introducing new policies that intend to norm production and consumption, which a CE would, in principle, promote to reach changes such as reduction of raw material extraction and waste production. Although a CE does not have to be regulated or promoted through policies, policies have been part of the devices in enabling this transition in the Norwegian case –at least thought to be an enabler.

5.3   Trøndelag and Trondheim as context for a circular economy

The studies in this thesis take a local contextualization to situate the futuring of a CE. In this context and situation, other modalities of CE are elucidated. Trøndelag is one of Norway's 11 Counties (Fylke in Norwegian). Counties are administrative regions with governance that serves as an intermediate level between the National and the Municipal governments, offering the opportunity to organize and plan some of the services and actions that affect multiple municipalities –such as roads and industry strategies. For example, Trøndelag's County coordinates matters related to 38 Municipalities. Trondheim is by far the most inhabited municipality.

According to Trøndelag's County Council Statistics online Portal (Trøndelag Fylkeskommune, n.d.a), in 2022, around 45% of the inhabitants of Trøndelag (474131 inhabitants) were residing in Trondheim (210496 inhabitants). Approximately 39% of the economic and employment activity in Trøndelag 2022 takes place in Trondheim – in 2022, there were 20588 companies in Trondheim out of 53204 in Trøndelag (Trøndelag Fylkeskommune, n.d.b). Most of the population in Trondheim work in various services covering information and communication, commerce, retail, hotels, restaurants, transport,

finance, property and real estate management, education, health, social and personal services, public administration, and social security. In 2020, 85% of the population was employed in these economic activities (Trondheim Kommune, 2022b), around 14% worked in industry (manufacturing), and less than 1% in agriculture, forest, and fisheries.

The share of economic and employment activities in Trondheim does not represent the whole region. In 2020, up to 20% of the jobs in municipalities outside Trondheim were industry, agriculture, forestry, and fisheries. However, in the municipalities outside Trondheim, employment is still high in services – for 2020, jobs in education, health, and social services accounted for almost a third of all the jobs in Trøndelag outside Trondheim (Statistics Norway, 2022b). Although this data does not directly show the region's production, it gives a picture of a service-based economy where people participate less in manufacturing activities for daily consumption.

In this region, the inhabitants' material needs and wants, including their basic needs in food sources and clothing, are sustained mainly through imported goods. Moreover, around 10% of the population in Trøndelag –between 2018 and 2020– lived in households with persistent relative poverty, with an income of less than 50-60% of the national median income (Trøndelag Fylkeskommune, n.d.c). However, poverty in Trøndelag, as in the rest of Norway, is experienced differently than in other countries. This is because the government in Norway has a strong provision of services as part of institutionalized welfare policies, which ensure that the State collectively covers the basic necessities. These necessities include services for health, education, child welfare, and social security assistance for unemployment.

Regarding Climate change, in Trøndelag during 2021, the most polluting activities by tonnes of greenhouse gas emissions are related to the industry, oil, and gas, which produce 31% of the locally produced carbon-dioxide equivalent emissions (Trøndelag Fylkeskommune, n.d.d). These emissions come primarily from a chemical plant in the municipality of Heim in the south of the county. The following two most greenhouse gas emission heavy activities are road traffic (18%) and agriculture (26%). These quantities only account for the local emissions of greenhouse gases related to local activity. However, the greenhouses of products and materials imported for production and consumption elevate the emission footprint of the inhabitants. Although these are not accounted for in gas emissions, the pollution of consumption is present in solid waste.

Data on household waste amounts from 2015 to 2021 shows Trondheim's inhabitants produce around a third (between 32% and 37% depending on the year) of the waste in Trøndelag. Furthermore, data about waste production per capita varies depending on the source. For example, from the statistics used by Trøndelag County's portal, it can be obtained that household waste production per capita in

Trondheim amounts to around 300 kg in 2021 –when dividing the number of tons reported between the population of that year (Trønelag Fylkeskommune, n.d.e.). However, suppose this amount requires adding other sources of waste. In that case, Trondheim inhabitants could be producing something more similar to the amounts reported by the OECD for Norway (OECD, 2023), which goes up to 720 kg/per capita in 2020 and puts Norway as the third most per capita generator of waste in OECD member nations, after Denmark and Luxembourg.

Regarding population size, Trondheim is the third largest city in Norway, with around 211000 inhabitants (Trondheim Kommune, 2022a). Trondheim is a small city by most standards. Still, its historical background as the first capital of Norway (c.f., Hernández-Palacio, 2017) and the influence of housing the largest university in Norway make it fare as an important city (at least perceived as such). The perception of Trondheim as a historically and institutionally significant city gives the local authorities room to operate that other –similarly small– municipalities in Norway may not have. In addition, Trondheim operates as the urban center for the more rural communities in Trøndelag, serving as the model, main service center, and attractor for densification (c.f. Hofstad et al., 2013; Hernández-Palacio, 2017).

Trondheim is not as central to Norway's national politics as other urban centers –such as Oslo, the Capital City of Norway, and where most of the National Authorities are physically located. However, in Trondheim, local plans also consider the impact on the suburban municipalities, for which Trondheim acts like an urban center (Engebretsen, 2018). Furthermore, the events in Trondheim are also influenced by the policies deployed by Trøndelag's County Council, such as transportation policy (Forbord & Hansen, 2020).

On the one hand, the local authorities at Trondheim's Municipality may have more room to operate individually, as it is an urban center with a less dense urban clustering. Unlike more tightly connected urban clusters (e.g., Oslo, Bergen, and Stavanger), Trondheim's service provision and economic activity do not directly affect a large population in the surrounding municipalities (see Figure 5.1 for reference). On the other hand, Trondheim shares some of the marginality of rural municipalities that are not part of urban clusters. Due in part to the distance from the biggest city and political center – approximately 390 km North of Oslo.

Although Trondheim Municipality has some operative freedom due to its geographical isolation and low density of urban clusters, decisions such as implementing a CE can only be negotiated within the current institutional framework –going through the national and county institutions of the government. In the case of Trondheim, for the municipality, it means sticking to the expectations given by the national government.
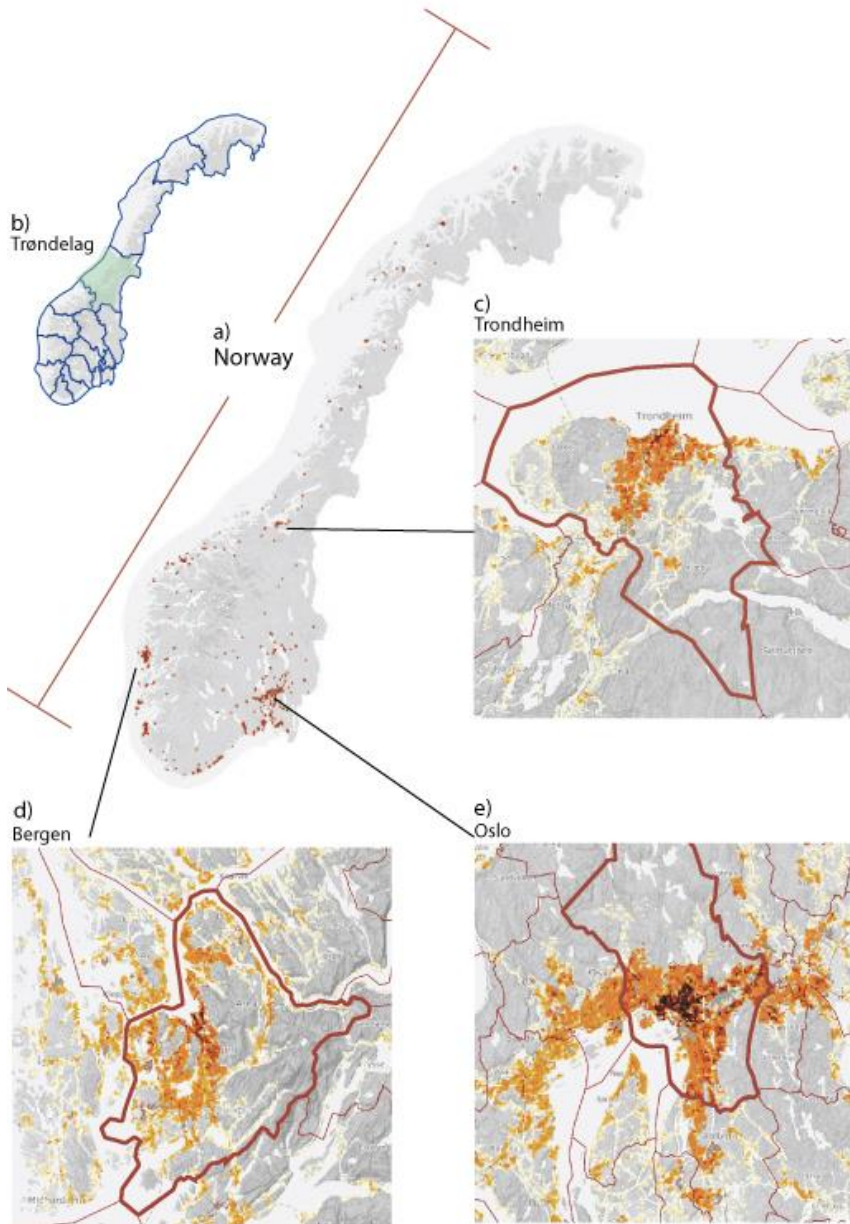
Figure 5.1. Urban settlements and urban clustering

Figure 5.1 presents a) Full range of Norway with urban settlements in color red. b) Trøndelag region in relation to Norway. c) Density map of Trondheim city. d) Density map of Bergen. e) Density map of Oslo. The density maps are proportional to each other; the darker colors represent more density of inhabitants —map source Statistics Norway (2022a).

5.4   Material consumption in Norway

The case of a CE in Norway is relevant for analysis for several reasons. First, Norway is a well-known leading and exemplary country in international discussions about sustainability –despite the controversy of oil extraction as its central productive sector. Second, there is experience in implementing waste management and recycling practices (Jones, 2021). These experiences include the country-wide sorting of waste in different material categories and the implementation of waste collection mandates as part of the social responsibility of retailers and producers. For example, all supermarkets are equipped with reverse vending machines for plastic bottles and aluminum cans.

Norway is also a country with a society with high material consumption. According to OECD (2022a) data, Norway's domestic material consumption (DMC) is measured at 31.1 tons per capita. In comparison, the DMC of Norway is two-thirds of Qatar's –the country with the highest DMC per capita at 48.3 tons; and 24 times the DMC of Haiti –the country with the lowest DMC per capita at 1.3 tons (Figure 5.2).
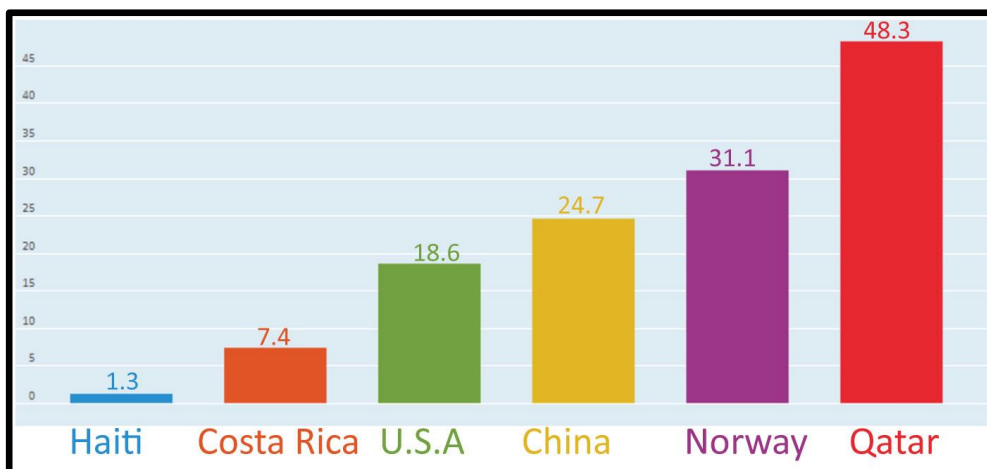

Figure 5.2. Domestic (National) Material Consumption of Norway and selected countries for comparison (OECD, 2022a)

Although the DMC indicates a high material consumption in the Norwegian economy as a whole, it does not distinguish between materials used for production activities and materials used for consumption activities. In other words, it is unclear how many tons per capita are driven by people's consumption as part of everyday life and not for industrial activities, such as oil extraction. Another indicator, more easily related to CE, is municipal waste, which accounts for all the waste collected and treated as a service given by municipalities. Data for OECD (2023) puts Norway above the average of the 27 OECD member countries, with 772kg per capita of waste generated in 2022 (see Figure 5.2). This data is revealing of the amount of waste locally managed. However, this data does not assess the

percentage of discarded materials that are not managed as waste. For example, clothes that were given as donations to secondhand stores or electrical and electronic products brought to stores and collected by private waste collection companies, as in the case of Norway.

Another driver for high material consumption is household disposable income. Norway is considered a high-income country with a household disposable income of about 40 thousand USD per year per capita (OECD, 2022b). A situation aided by a solid and functioning welfare state that satisfies most of the needs of the nationals and foreign residents. The welfare policies in Norway make services such as education and medicine cheaper and available to almost all the population. As a result, a big part of the Norwegian population has enough available money to use at will in leisure activities and non-sumptuary consumption (such as luxury items). Of course, it does not mean that forms of material scarcity cannot be found. Still, scarcity and poverty are experienced differently and according to higher material standards –for housing or extra property acquisition (Andvig et al., 2022).
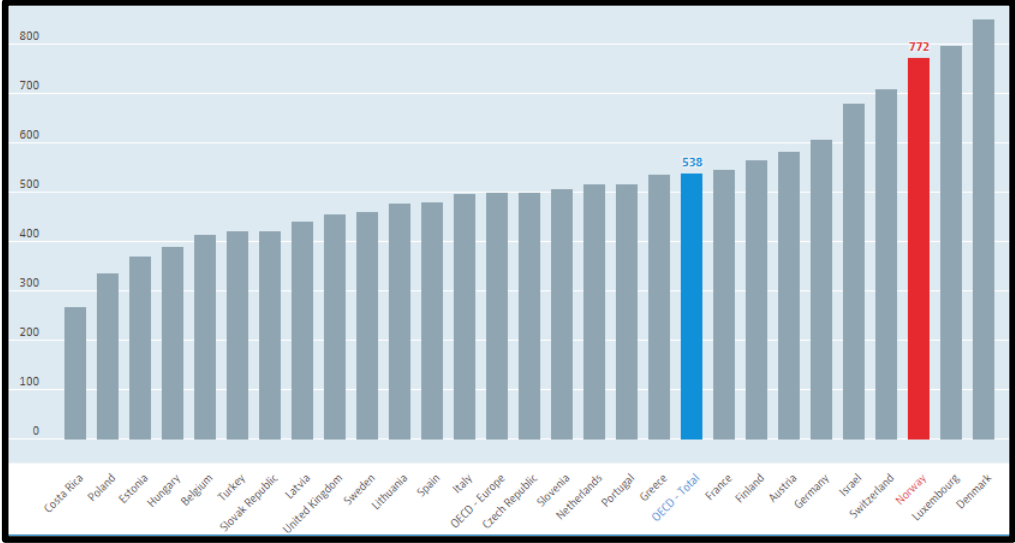

Figure 5.3. Municipal waste in Kg per capita by 27 OECD country members (OECD, 2023)

5.5   Circular economy as a living concept

In Norway, the concept of CE is alive in discourse and practice. This aspect comes in addition to high material consumption and the experiences with an infrastructure for waste management –waste sorting. Thus, CE is not a concept introduced by this research. Instead, there is an interest and history around the use of the concept (Karstensen et al., 2020). Furthermore, the fact that CE is a living concept means that a CE transition is already in negotiation –or has been negotiated– by some of the involved actors.

The private sector, non-profit organizations, and governmental actors have adopted CE in Norway. CE acts as a discursive device that gets institutionalized in projects and initiatives (Karstensen et al., 2020). However, the introduction of CE to Norway can be linked to changes in policy regarding waste management, particularly to the technologies and the normative aspects of material recovery – secondary materials– and indicators for waste avoidance (Jones, 2021).

Another aspect of adopting CE is the diversity of interpretations, which fuels the creation of instruments to measure the changes expected and promised by a CE transition. Such instruments usually present indicators that follow mandates for material use from goals found in legislation and policy documents (Völker et al., 2020). The need to define goals for the transition is also part of the institutionalization of CE at different levels and scales of organization, which prompts the question of which actors are currently involved in the future-making of CE and through which mechanisms.

Regarding the involvement of different actors, "Norway's strategy for developing a green, circular economy" (Klima- og miljødepartementet, 2021) was based on three studies commissioned to the consultancy company Deloitte (2020) and focusing on potentials for industrial sectors. In addition, CE as a concept is also tightly linked to the waste management sector. Waste management in Norway is rooted in services provided by public and private organizations. In Norway, the concept was brought to waste management by politicians following the European Union's developments, which, from a retrospective perspective, links to broader efforts to transform waste management from landfilling to actions in waste prevention (Williams, 2015). The politics of waste in Norway are also a contingency for CE; as Torsteinsen & Genugten (2016) note, the transformation process of the waste management sector in Norway is a process of corporatization and privatization that lessens the decision power of municipal authorities in benefit of private providers of services.

5.6   Summary and relation to the conducted studies

This chapter characterizes the context for the studies in this thesis. The cases in this context include events, initiatives, and organizations related to a CE in the public sector, the private sector (for-profit and non-profit), and civil society. By locating CE in time and space, one can define the opportunities for its futurity within a specific system and not in a vacuum, which means an existing common sense and a particular modality of everyday life.

The selection of a particular time and space puts CE within a timeline and a time horizon, which connects back to the societal transition it intends to be. Although some have pointed out that CE is a global transition –with global planetary effects– the impacts of the restructuration it necessitates will differ according to the characteristics of particular regions.

In Norway, a CE is expected to be advanced by a public-sector agenda. While Norway has a functioning welfare state model, Norway is also a capitalistic-oriented market society, which could favor the privatization of certain services or functions of services. The varying ways of understanding the interaction between the public and the private sectors create a struggle for the governance of specific policies necessary for transitions, which results in waves of privatization and re-politicization–re-municipalization (Moldenæs & Torsteinsen, 2017). This sort of struggle could represent a deterrence for projects and initiatives on CE, as they may add nuances to what is thought possible by specific actors.

Study	Type of subjects	Systemic contextual roles	In Norway (2019-2022)
#1: Discourse	- Public institutions and private organizations (for-profit and non-profit). - Specific discourses and practices. - Specific degrees of actions with limited scopes (waste management, recycling, service offering)	- Providers of services: Actively shape a CE. In the private sector, for-profit organizations are businesses and industrial actors. Those vary in size and scope, from industrial clusters to small enterprises. The public sector has three levels of government and different proximity to the inhabitants. Civil society, in the form of established organizations and volunteering activities. -Users of services: Adopt or reject the services given but are not passive receivers.	- National Strategy for CE (2012) - CE as part of Trøndelag's County Council's work with industry and climate change adaptation and prevention. - Trondheim's Municipality urban planning, service provision, and procurement. - Waste management sector, intercommunal coordination. - New services by start-ups and voluntary organizations. - Adoption of CE by private companies and organized civil society.
#2: Practice	- Small businesses. - Individual actions. - Informal organization - Social practices	- Individual participants: people who take on circular practices by themselves. Their participation is negotiated with and mediated by existing institutional forms. -Organized groups: are people who create conditions for the participation of others in circular practices. The current politico-economical structuration also mediates their mode of participation.	- Consumerism is the social and institutional arrangement of Norway's affluent society. - Marketization of all aspects of life and individualization. - -- Waste as a result of surplus production. - Alternative practices of consumption not considered by formal economic models (substantive economies). - Taxes for repair services and secondhand products; and legal situation of waste collecting as hindering aspects.
#3: Governance	- Citizens' participation - Design methods and goals - Consumption and production assumptions.	- Initiators: are the institutional/non-institutional means that initiate actions for citizen participation. - Citizen participation: the understanding of the inclusion of citizens in the organization of society-wide transitions. - Production and consumption regulations are particularly important to a CE considering socially defined limits. - Design interventions are the modes and methods used to introduce elements to shape or redirect the transition.	- Waste as an evident problem related to high consumption. - Waste treated as pollution, e.g., plastics in the oceans. - Link between production-consumption and climate change. - Governance and policies for production and consumption. - Societal priorities and people's education.

Table 5.1. Summary of subjects of study and contextual roles per study

Table 5.1 describes each study's specific subjects and the identified general systemic roles. The subjects are categories for which specific examples are identified and observed qualitatively to describe their systemic roles in CE negotiation as an ongoing future process. Figure 5.4 is a diagram presenting a summary of the contextual implications for a CE in Norway. The first study focused on the interactions between the institutional forms –government levels and public-private sector–where systemic roles are identified according to the distance between the civil society as providers and users of services that would impact the provisioning system for production and consumption. The second study focused on examples of practitioners advancing practices that could benefit a CE. These modes of practice have implications for people's capacity to mobilize activity connected to CE and their interactions with the existing institutional means. The third study focuses on methods for participation and their implication in revealing and re-directing ways of understanding production and consumption, especially the construction of common discourses. The third study is more abstract because the intention is to observe –try or test– intervention methods and critically question the potential for redirection according to an expansion of CE as an open future.
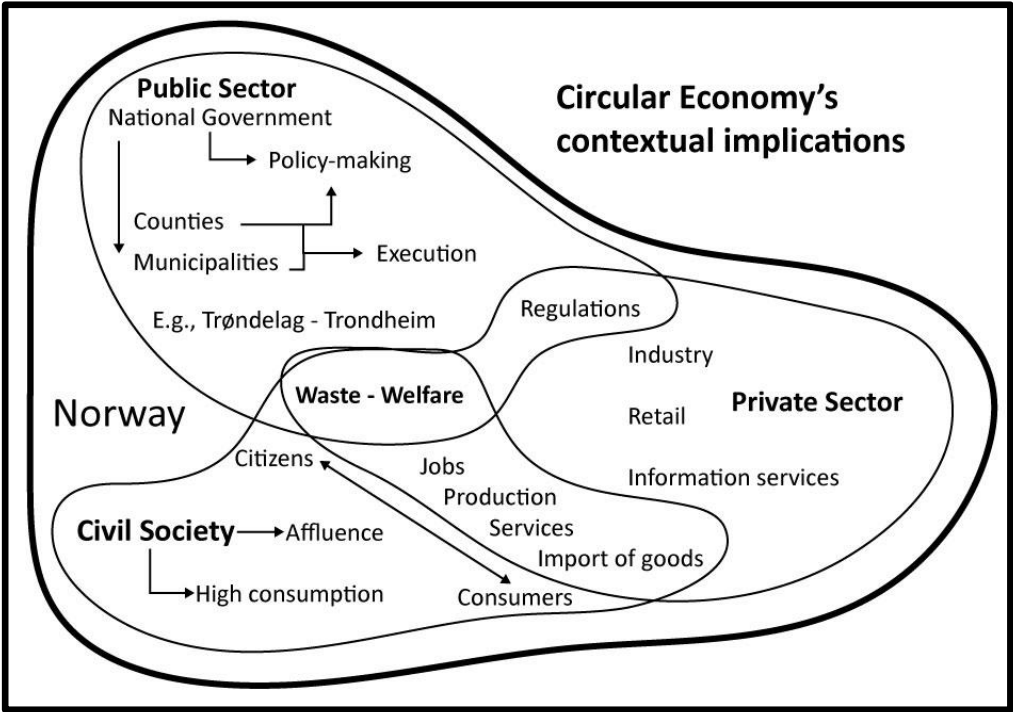

Figure 5.4. Contextual implications for a circular economy in Norway

This chapter has described this research's spatial and temporal limits –Trondheim, Trøndelag, Norway, 2019-2022. The next chapter presents the research results within the previously offered theoretical, methodological, and contextual frameworks.

6   Presentation and discussion of results

Figure 6.1. Two refrigerators on the Streets of Trondheim

The two pictures in Figure 6.1 were taken on the streets of Trondheim. These objects were designed and used as refrigerators, facilitating passersby access to food and drink products. Although differing in some functions and affordances, the two belong to a similar ontological category. These are things that use energy for the preservation of food. The difference between them is that each belongs to an alternative social imaginary –meaning they constitute part of an alternative common sense.

One of these refrigerators is dressed as a vending machine. This refrigerator preserves food at a desired temperature but also performs in a constellation of social practices for market competence –the skills to buy and sell. This thing makes complete sense in the capitalist/modern arrangement, where materiality accommodates the priorities of monetary value capture. Whether the transaction provides some benefit, nurture, or satisfaction is left to the decision and wants of a consumer. In any case, it is an option available to those with the material means to access it.

The second refrigerator offers a window into a social arrangement that is not fully fleshed out. This social arrangement accommodates materiality to the priorities of a social imaginary that puts first community links and solidarity between neighbors –and strangers. This refrigerator co-performs social practices that require competences based on sharing and caring. However, the social practices mobilized by this social arrangement are fragile and must compete with the social practices imposed by the capitalist/modern arrangement. The electricity this refrigerator uses to function and the space it occupies has to be provided and paid for by someone –charity and volunteering are a way out. The class struggles in the modern/capitalist arrangement are also against this refrigerator. Undoubtedly, this refrigerator invites thoughts and doubts about the people who gain access to food through this material configuration. After all, it is breaking away from the normality of earning one's bread and butter.

This chapter presents and discusses the results of three studies based on the specific research question considered in each. These results also take Lefebvre's (1971; 1991) dialectical critique of everyday life as a contention to elucidate other modalities of CE emerging from the contestations to the current social arrangement. This contention means identifying social imaginaries already emerging and informed by people's experiences and common sense.

The example of the two refrigerators at the beginning of this chapter offers a glimpse of two social arrangements from which diverse CEs could emerge. If the first refrigerator were the model to follow, a CE would emerge based on the capacity to maintain consumption and production of commodities and their monetary exchanges as the central economic aspect. Unfortunately, this is already the mainstream CE (Isenhour, 2019), a model denounced for its possible more harmful effects (Velenturf & Purnell, 2021). Another model for CE could emerge from the second refrigerator, but it necessitates questioning the role of responsibilities around it. For a future social arrangement, it means designing the product in its technical functions and considering the social system that will interact with and care for its proper function. Moreover, it requires a collective definition of an appropriate function and who has access to its benefits. Finally, it involves designing a governance system based on different priorities and likely an alternative ethos.

The following sections of this chapter present the results according to the secondary research questions.

6.1 Discourses and institutionalization of circular economy

This first section presents the results for the research question:

> Which existing institutional structures may foster or hinder the agencies of alternative social imaginaries?

In article 1, the discourse coalitions approach (Hajer, 2005) helped describe competing visions about circularity (their technical implementation) and CE as a societal project. Furthermore, it helps provide evidence that CE is a concept already circulating in a network of local actors. The first study's main result is the identification of three discourse coalitions (Figure 6.2). The first discourse coalition is based on an understanding of waste as a source of valuable resources. In this coalition, the proponents take a position that favors a CE based on recycling and a techno-fix. The discourse in this coalition had principally the support of the waste management sector and companies working on recyclability (in the case of plastics). In Trøndelag, this means the proposal for an inter-municipal waste collection plant that would include near-infrared sensors to mechanically sort the different materials for recycling –which could partially reduce the burden of waste sorting as an activity done at home.
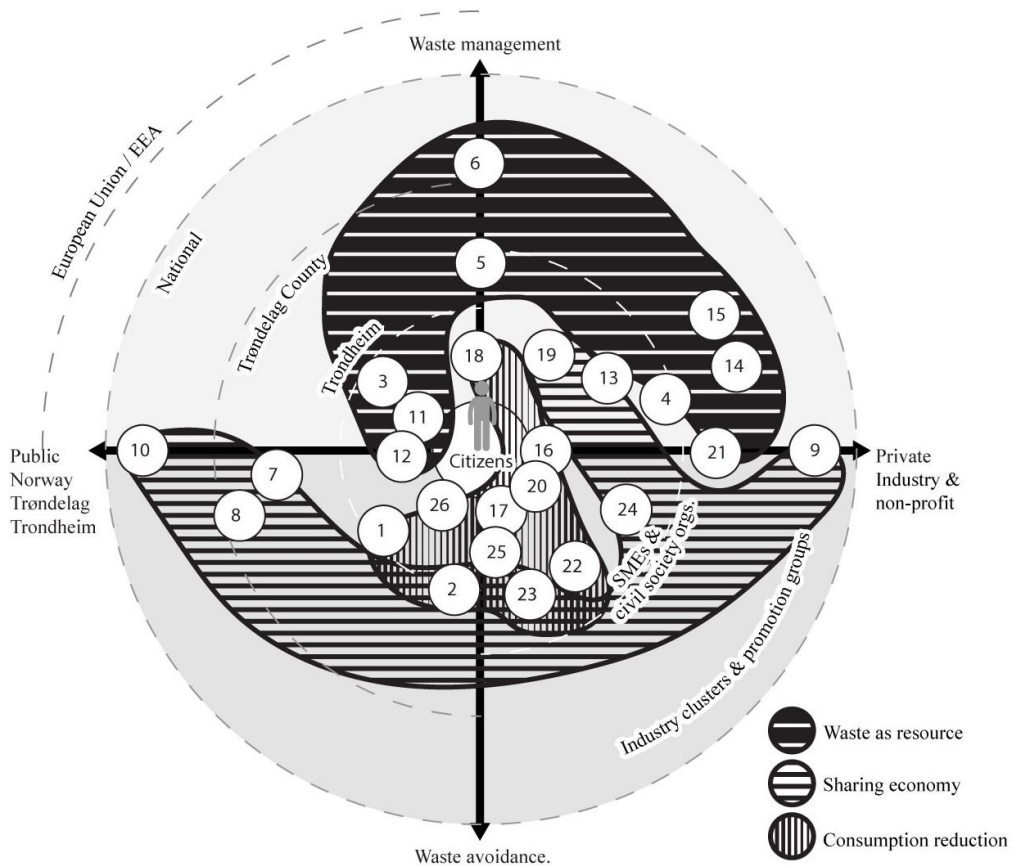
Figure 6.2. Map of discourse coalitions between the participants in study 1

Additionally, the supporters of the first discourse coalition see the importance of design in the definition of new products and materials that facilitate the recycling of materials, the recovery from waste streams, and the reduction or avoidance of material in certain products –without changing the consumption or production volumes. In this discourse coalition, the challenges to a CE are considered to be of technical and financial feasibility. The failure or success of a CE is seen in the capacity of the public-private organization to offer technical solutions in the short and middle time to accomplish upcoming material use targets in the context of the European Economic Area Agreement.

The second discourse coalition is based on opportunities for local industrial symbiosis and collaboration of productive sectors by creating new services in the sharing economy and co-locating resource streams. The support for this discourse comes principally from Trøndelag's County Council, and it was related to their work with industry and economic actors in the region. This discourse's main solution is not about the technical possibilities but the mobilization of industrial and commercial

actors to uptake CE principles and modify their practices for sourcing materials. This discourse aims to reduce waste and material extraction based on locally available resources. There is also a competent translation of the tenets of CE by the European Commission, which emphasizes using local resources as a form of material security to avoid future scarcity. The challenge for a CE in this discourse coalition is the mobilization of enough local actors. A particular project promoted by those supporting this coalition was the co-location of some small and medium enterprises that could reduce their material input by sharing resources and processes.

The third discourse coalition identified in the first study is based on individual consumption reduction through local services and infrastructures for product sharing. The support for this discourse comes from Trondheim Municipality, civil society organizations, and small companies. In this discourse, the main challenge noted is consumption levels, which according to its supporters, require changes that can be supported by the public sector and against the priority of profit-making. In this sense, at the local level, the Municipality of Trondheim has been putting forward examples of reuse and repair –for example, through the use of local libraries to lend tools. The main challenge considered for a CE in this discourse coalition is related to how the commercial system is structured and the consumption levels of individuals. In this aspect, there is a discordance between the expectations put by the national government (green economic growth) and the local initiatives (more related to degrowth).

The main distinction between these three coalitions is in the expected roles taken by each sector. In the waste as resource coalition, the leading role is given to the waste management companies and the technology as a solution for a problem that is seen as economical. The second coalition emphasizes manufacturers' and businesses' capacity to organize their business offers around local material streams. Finally, the third coalition relies on an organization of the civil society around a service provider or organizer of consumption, potentially the local government. On the one hand, the first two coalitions are understood as opportunities for green economic growth. Notwithstanding, the second could result in fewer financial exchanges as the import and export of materials would reduce when replaced by local streams. On the other hand, the third coalition presents some incompatibilities with economic growth. In this third coalition, depending on how the services for product sharing are implemented, these could contribute to a reduction in consumption –understood as the reduction of material use and financial exchanges.

The study also questions the possibilities for organizing a green growth CE versus a consumption reduction CE, where green growth (economic growth decoupled from environmental impacts) or consumption reduction (material consumption) become the goals for two distinct CEs. The green growth one is not different from the mainstream CE (c.f., Isenhour, 2019); it formulates techno-fixes

and new profit-based business models. The second one requires organization around goals other than profit and transaction maximization, which can be a function taken by the public sector or the organized civil society –this is closer to a degrowth CE. In any case, the insertion of CE as part of green growth or degrowth depends on a normative definition of circularity.

The normative understanding of CE is also required to elucidate visions. It may be related to the favored strategy and the roles given to the actors in different sectors. For example, in Trondheim, the case in this thesis, there is an ongoing translation of CE from waste management and businesses to civil organizations and the public sector, but mainly focused on the profit-making potentials for the former two sectors. In essence, the framing of the imagination of CE is entwined with the mobilization of a particular mode of production of value (exchange value).

Concerning the research question in this thesis, from this study, the result is that economic growth is the main institutional structure that hinders the emergence of alternative social imaginaries. As a result, a CE based on a social imaginary supporting the coordinated reduction of individual consumption and aided by public sector services (commons) is seen as not politically attainable. The politics of imagination in CE are thus rendered against economic growth as a political mandate. In contrast, the local initiatives' experiences and proximity to the citizens –of the Municipality in Trondheim and the organized civil society– fosters the ideation and recognition of other forms of organization.

Consequently, the institutional organization in Norway hinders the possibilities for other modalities of CE. This hindering is evidenced in adopting tenets for a CE modeled without a local context and following the abstract priorities of policymaking based on the economic imperative of growth. Instead, another CE could be fostered by organizing work close to the citizens.

6.2 Alternative practices and consumerism

The second research question in this thesis is formulated as follows:

> Which alternatives of resource use in production and consumption can contribute to alternative social imaginaries?

This question is addressed in the second study (article 2), which takes consumption as its central locus. This study considers that a particular social arrangement defines a mode of production and consumption –in Lefebvre's (1991) critique, it is a social arrangement based on certain types of progress and the imposition of a capitalist/modern modality of everyday life. This study considers the characteristics of the linear economy, usually expressed concerning production, as a mirror of consumerism. Thus, linear economy and consumerism are two ways of calling a particular and

historical mode of organizing production and consumption by giving preponderance to exchange value—however, consumerism center on a specific actor, the consumer. For consumerism to persist, consumers must perform the social practices that make up this social arrangement –for example, in the descriptions of consumption by Bauman (2007), Baudrillard (1998), or Lefebvre (1971). In this sense, the consumer is limited to the performance of some market-oriented activities.

The economy is organized in favor of formal economic models –as evidenced in article 1, through economic growth mandates. For example, under the neoclassical economic understanding, a growing economy provides better chances for more people to attain well-being (c.f., Kogelmann, 2022). However, a growing economy quarrels with some of the tenets of CE, mainly when seen through strategies that seek to reduce the environmental impacts of new production –which require avoidance of consumption and production and the prolongation of use of already existing products.
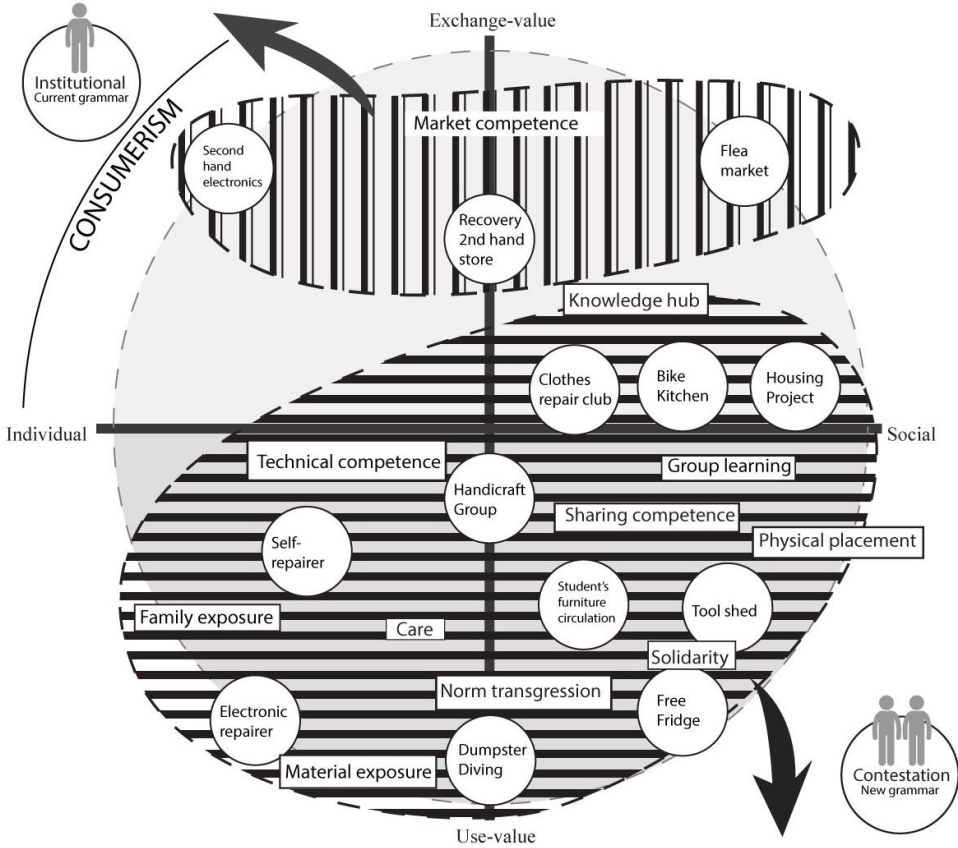
In this study, the organization of social life is seen from the perspective of practice-driven institutionalism (Smets et al., 2015). This perspective takes the flat ontology of social practice theory and identifies institutional logic as the result of persistence in the concurrency of practices. Under this perspective, a social arrangement results from the persisting performance of practices, which over time also result in the co-production of competences, meanings, and materiality as a priori requirements to perform practices. However, these a priori requirements are commonly identified as logic in institutional theory (Smets et al., 2015), general understandings (Welch & Warde, 2016), or teleoaffective formations (Welch, 2020) in social practice theory. Moreover, they are also a result of practice and explain how alternative practices tend to be negotiated and adapted to fit the logic and the concurrent performance with other practices. Thus, it is a common sense that is constructed in action –in this case, in practical engagements.

This study interprets Norwegian society as organized mainly by a consumerist social arrangement. This interpretation is supported by evidence about consumption and waste production levels. In addition, most citizens in Norway have the means to participate at will in the market society (i.e., a high disposable income). However, this is not a generalization about all the people in Norway. The study acknowledges that other practices performed in Norway result in different consumption by modifying the modes of acquisition, use, and discarding of material resources. These practices are not put into formalized economic models; instead, they represent a substantive economy.

As described by Callon (2021), the agency of markets is about the capacity of their participants to make exchange transactions –i.e., to sell and buy. These two –buying and selling– represent the primary practices and competence in the consumerist model. Around these two practices, the whole of the other social practices and everyday life is organized. The consumerist arrangement necessitates

the persisting performance of these two practices. However, not all practices emerge from a market agency and do not necessitate the logic of selling and buying to be sustained. In particular, the practices that oppose the market or exist at the margins of the market for other reasons.

Figure 6.3. Map of relations of alternative practices in Study 2 in relation to the mainstream CE

The practices identified in Trondheim are related to repairing, reusing, and recovering products from waste in the urban space –before reaching the waste management and treatment facilities. Some of the practices, namely those related to secondhand stores and flea markets, rehearse the competences of the market –selling and buying– and are closer to the mainstream circular economy. These practices are still alternatives to recycling or waste management. However, they are closer to a nexus of practice that requires financial transactions – where something is sold and registered as an exchange of value through money circulation.

The other practices in the study are not emerging from a market agency. Instead, they rehearse practical creativity linked to social relations (family and community) and technical knowledge in confrontation with material availability (physical placement and learning). There is also an aspect of the individual transgression of norms, which is also aided by the formation of groups around the practice –i.e., socialization that facilitates performing the practice (see Figure 6.3).

In Trondheim, there are general reasons to perform alternative practices for consumption. These can be regarded concerning the high price of new products of good quality –that are designed and produced to last longer–, the high taxes on repair services –which means that people do not repair or have to do it by their own means–, and the legal status around the handling of products after they have been discarded as waste. However, these general reasons are also a reflection of the consumerist arrangement. In this context, the performers of alternative practices also need to accommodate these reasons as contestations. These contestations result in a co-production of the practice over time by adapting parts of the practice to fit other concurrent practices but having the potential to radically change these concurrently performed practices –and, in doing so, the institutional logic.

Although there is potential for a different CE that emerges from these practices, as a CE that contests consumerism, the results in the study show that some of the practices require a social circulation –of materials and knowledge– that is hindered by a consumerist arrangement. To accomplish the practice's socialization, some carriers adapt it by rehearsing marketing competences (selling and buying), resulting in an organization that resembles a small business.

In its conclusion, the study suggests that new institutional means can contribute to forming new social imaginaries based on the socialization of these alternative practices. Still, these new institutional means must center around competences that do not rehearse the consumerist arrangement (selling and buying). To do so, the institutionalization of an alternative social arrangement needs to identify other opportunities for socialization (i.e., family, communities, learning activities, and availability of tools and materials in place).

In this identification of new institutional means, the acquisition of technical knowledge by practitioners is also an aspect that bridges the worlds of production and consumption, gives the practitioner an entrance to experimenting with circularity, and can be enhanced with a group or social reinforcement. For example, acknowledging the competence of certain performers as repairers within a community, pointing towards the role that identity plays in a different sense than showing off identity through conspicuous consumption.

All these aspects of a substantive economy point towards a common sense that differs from the consumerist model (characterized by individual desire, accumulation, and competition). Instead, a CE that spans from a non-consumerist model would necessitate collaboration, solidarity, and community formation, for which practical experience already exists and could be made part of CE –similar contentions are made by Graziano & Trogal (2022). Moreover, experimentations with similar alternative modes of consumption could provide rich insights about organizing a CE model that will not re-rehearse the linear economy.

6.3   Futuring and governance of a circular economy

The third research question for this thesis is formulated as follows:

> How can design aid the formulation of CEs that sustain alternative social imaginaries and agencies?

This research question is addressed in study 3 (see articles 3 and 4). This study takes the results from two workshops to reflect on the possibilities for designing –for/toward– a CE as part of a broader political context. This reflection considers design as a discipline that adopts and adapts CE discourses (e.g., Melles et al., 2022). In this consideration, design is relevant for CE as it provides discursive tools that rehearse the ontological orientation of things and the social imaginaries they sustain –their futurity.

The workshops did not work directly on the topic of CE. The first one (article 3) was organized by the regional authority (Trøndelag's County Council) to include the participation of youth citizens as the kickstart of their consultation process to create a local climate change adaptation and mitigation strategy. The futures workshop method was applied as a participatory design method (Jungk & Müllert, 1997). In this workshop, CE did not feature as a concern. However, some perspectives relevant to a CE can be derived from the position taken by the participants about production and consumption as one of the –perceived– main causes of climate change.

As part of this workshop, the youth citizens were tasked to imagine a future when climate change is no longer a problem –in 2030. This task had an orientation toward the future, in which the participants could imagine and co-produce ideas about the future they envision. The process of imagination was partially guided –for example, by offering the participants cues about how to make a story about a day in the future, the kind of things that someone young like them would be living, and the things or technologies available.

The participants created six stories about the future they envisioned. These stories did not encompass direct solutions or proposals, which would be the case in a straightforward survey. Instead, these

stories require an interpretation of the kind of social life expected by the participants. Moreover, concerning a CE, these stories show a production and consumption model's affinity to an imaginary world. In Figure 6.4, an example of a story is presented visually.

Figure 6.4. Example of future everyday life by participants in the Youth Climate Workshop

The picture in Figure 6.4 is a good example of the concerns presented by the participants in this workshop. It conveys ideas about energy production –wind and solar power–, waste management –a boat that cleans water, police that enforces the correct disposal of waste–, local food production, and even reusable bags. Of course, this example is only a glimpse of the options and possibilities brought and discussed by the participants. However, they show that expectations exist about the roles of technologies and other possible solutions.

Regarding the expectations about the future, the workshop did not intend to confront the participants' knowledge with the knowledge of others (i.e., scientists). The nature of this participation was more in line with a consultation that could provide some insights about the participants' expectations. However, the insights provided by the participants were later used as discussion materials with other actors on the road toward a climate strategy. This situation represents a counterpoint in my reflection on the process and function of the workshop.

Although the workshop provided a venue for Trøndelag's County Council to contact youth citizens concerned with Climate Change, the formulation of the workshop as an activity with political relevance can also be seen as a way of placating or coopting a process that the youth citizens mobilized. In this context, my participation as a design researcher in the workshop was to provide tasks to visualize the concerns of the youth –which they already were doing in their protests– and to facilitate part of the work by the participants without intervening with external perspectives.

The specific discussions about which solutions or goals to focus on did not occur in the workshop. However, there is awareness by the research team and participants (see article 3) that the material created in this workshop opened a stream of discussion in other spaces/events. Furthermore, the workshop, although limited in itself, created a timeline of interactions beyond the workshop. It shows that the materials produced, while not fully adopted by the political actors, open the opportunity for more discussions and interactions considering the participants' expectations (see Figure 6.5).

In this first workshop, design's role was not in producing proposals for solutions. Instead, a design orientation provided the space to question climate change, its causes, and the expectations that essential actors, such as youth citizens, have about a situation that will affect their everyday life. The expectations of these actors also show the possibilities for alternative modalities of everyday life where another CE could be inscribed. In this sense, some of the most radical insights provided by the youth participants, which were about consumption and their education programs, did not make it to the final strategy. This result invokes a political dimension that limits or increases the influence and agency of different actors. In article 3, this dimension is referred to as an aspect of intergenerational justice. However, it is also about how the decision-making process is made and the institutional structures that append the process of local decision to some national expectations.

The final workshop (article 4) considers the results from the first workshop (article 3), study 1 (article 1), and study 2 (article 2). From these results, it is assumed that some discussions on production and consumption become diluted when people talk about the urgency of acting on climate change and that CE is already loaded with meaning –as a mainstream CE exists. Therefore, this study did not aim to gain knowledge about particular solutions but to test the capacity for the imagination of the participants and confrontations about other possible modes of organization. The workshop iterations tested the centering of questions around production and consumption and the possibility of speculating about desired positive or negative outcomes.
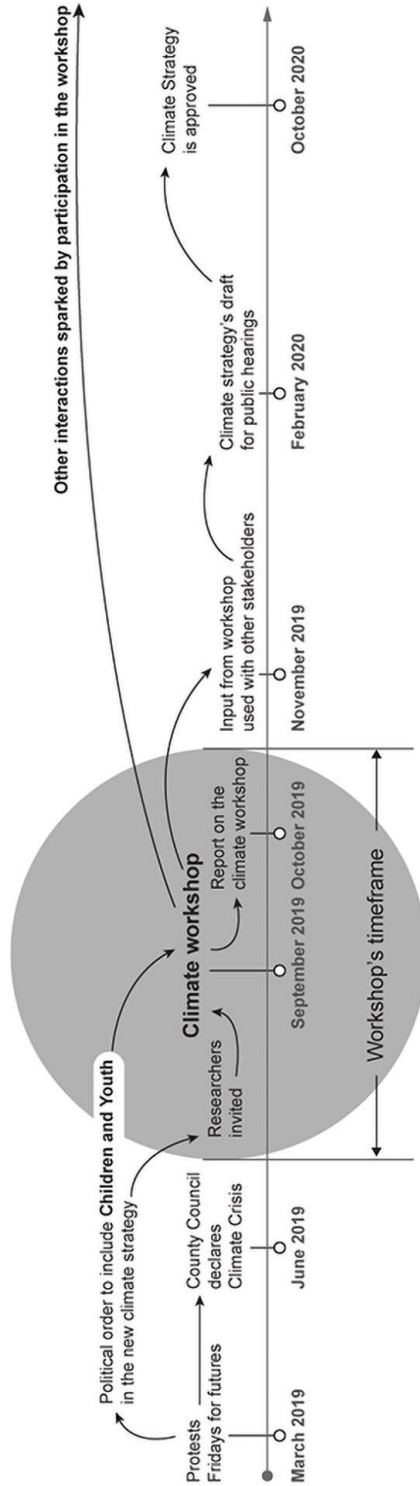
Figure 6.5. Diagram of the first workshop's time horizon (reproduced from article 3)

In the second workshop, the participants were neither directly asked about a particular CE nor how to implement it. Instead, the questions concerned production and consumption modes, and the governance around material use, considering the distinctions between necessary and unnecessary forms of consumption. Without planning it, the discussion in the two iterations of this workshop became about the politics of freedom and education and the cultural aspects that sustain certain types of consumption –for example, rooted in the migrational background of the participants. Unlike mainstream discussions about CE, it did not focus on technical implications but on the social desirability of specific policy measures. As one of the participants summarized it in the second iteration of this workshop:

> *"… education should be about consuming to the complete extent… not about punishing. Maybe, you are not scared, but it scares me"* (Participant in the second iteration of the second workshop).

In the previous quote, the participant referred to *"consuming to the complete extent"* as a goal for education. With this goal, the participant conveyed the notion that material things should be used until they have no other use-value –for example when the materials are degraded and cannot serve any other purpose. This position has a subjacent aspect of technicality and assumes that people can be taught to deal with materials in a not-wasteful way –it also supposes that there is a gap in how people are educated. In contrast, this participant also referred that the goal of education should not be *"about punishing."*. The latter position of the participant concerned the governance mechanisms for the improper use of materials, which in education should not encapsulate only negative consequences for the consumers –for example, future scarcity or the increasing authoritarian control over materials and products. Moreover, none of these positions should be taken at face value; they reveal that the knowledge of possible adverse outcomes can be scary. However, focusing on an aspect as important as education without dealing with these adverse possibilities could also result in undesirable futures.

Another participant reflected on the position of the government, particularly in trying to think of what kind of policies could be proposed:

> *"It is really hard to put on the government's shoes because you need to have this balance between controlling and the freedom of people."* (Participant in the second iteration of the second workshop).

These two quotes are just a glimpse of the discussions in this second workshop (article 4). Still, they show that people can take precise positions about the aspects that need to be balanced and even

prioritized as part of the definition of the governance –strategies, and policies– of production and consumption. These aspects also evidence, to some degree, the participants' feelings about what they consider good or bad. A question here is how the designers –of strategies or policies as decision-makers– can deal with the frictions and tensions while avoiding an over-focus on only what appears positive.

The two iterations of the second workshop provided insights about working on necessary consumption and production, which are the core aspects of CE. By focusing on necessary consumption and production, the participants could formulate their ideas without focusing on production or the incumbency of actors in the for-profit private sector. Instead, the participants could concentrate on the roles of different actors by taking on positions related to the government, the producing companies and retailers, and the consumers or citizens. With these exercises, it is also possible to say that a problem of CE is its presence as a preconceived notion. To this end, a metadesign approach (Vassão, 2022) provides a framing that can better serve the need to incorporate the aspects that CE intends to palliate by reconstructing its discourse before its signifiers.

The result from these two workshops shows that to work on expanding CE, design research should first focus on the conditions that a particular CE would sustain. Whether it is a green growth CE or a degrowth CE, an initial step should be to delve into what kind of consumption and production is supported and how those can be arranged from the desires and expectations of people. Of particular importance is to decenter CE as a solution and address the core problems and the inconveniences in what it intends to ameliorate –related to the production and consumption arrangements, planetary boundaries, and common sense (as limits).

The workshops that are the source for this study used participatory futuring to give evidence and gain insight into the potentially imagined and socially acceptable limits and the roles expected of different actors (describing governance). However, the ownership and distribution of responsibilities in the future of production and consumption may require more thorough research engaging power issues through design research for democratic or deliberative decision-making[4]. In conclusion, a hypothesis results from this study: to formulate a CE that sustains alternative social imaginaries, delving into the power issues in the futures of production and consumption is necessary.

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[4] Concerning the work in this thesis, an exploration of the aspects to consider pertaining to the idea of opening futures by design is addressed in a conference paper (Ortega Alvarado, 2022).

6.4 Overall results

Here, it becomes necessary to go back to the main research question:

> How can design contribute to CEs supporting other common senses for production and consumption?

In summary, three ways of framing the social imaginaries around a CE come from these three studies. First, as a process of legitimization against or supporting economic growth, particularly in policies. Second, as a process of practical experimentation conditioned or framed by practices marginal to the market, particularly in the socially accepted –consumerist– modes of consumption and production. Finally, as a process of co-ideation and decision-making about the future, which is particularly necessary for the relocation of meaning and power distribution.

In Table 6.1. Summary of main results in the studiesTable 6.1, I reconstruct the analysis based on Lefebvre's (1971) critique of social reality. First, economic growth's backdrop encompasses everything concerning competition, market freedom, and capitalism: these images and ideologies frame CE or any other organization for production and consumption. At the level of poiesis and praxis, the institutionalization of markets and value exchange that supports consumerism is the main logic limiting the possibility to experiment and improvise with consumption – constraining the formation of new grammars for everyday life. Finally, at the make-believe level, the work of social movements – for example, youth protesting against the government's inaction in dealing with climate change– is to mobilize others to take action for the co-production of the future. In the case of CE, the make-believe of CE is mainly mobilized by powerful actors in the business sectors. Thus, it is not at odds that these actors focus on technologies and not changing the social arrangement.

Study	Images and ideologies	Poiesis and praxis	Make-believe	Results in
#1: Discourse	Economic growth is the central goal.	Competing discourses.	Techno-business is the default solution.	Policies and indicators
#2: Practice	Consumerism as a social arrangement.	New practice grammar based on sharing and caring in social relations aided by technical competences	Diffused technical competences and social relations.	Negotiated renditions of reuse, repair, and sharing.
#3: Governance	Limits through organization or crisis.	Expectations for positive and negative effects of alternative futures.	Production and consumption reduction through organization.	Instances for the co-ideation of socially acceptable consumption limits and stakeholders' roles and responsibilities

Table 6.1. Summary of main results in the studies

In the argumentation about a program to study everyday life, Lefebvre (1991) mentions the importance of studying oppositions and confrontations and the relations of individuals and groups. In anticipation of a future circular everyday life, which was the original purpose of this research, some of

these confrontations can be expected. However, these do not define the process of imagining the future but how thought and action are legitimized as a profoundly political process.

The legitimization of certain futures, their preference over other futures, is, without a doubt, a political issue. However, one aspect of the mainstream CE is the lack of integration with its interfacing and contextualizing socio-political systems. Those systems shape individual and group relations and societies' distribution of wealth and power.

In the specific case under study, in the city of Trondheim, the introduction of the CE concept is politically oriented and linked to issues about waste, pollution, and environmental damage –as a fix to the damages already done to the environment. However, the causes of such damage are provoked by a social arrangement that requires high consumption levels and the rendition of needs to wants. In this context, hope is put in the CE concept to circumvent the need for raw materials through technical fixes. Moreover, the concept is introduced as a political tool but transferred to the private sector, where it is sought after as a venue for "economic growth" under the promise of "decoupling environmental damage." However, as mentioned in chapter 2, it is a perspective that shallowly connects the economy with the environment as it does not recognize the ecological nature of the economy and keeps the environment as an externality.

Aside from the "green growth" orientation in the national –Norway Government– and European Commission discourses for CE, there appears to be some confrontation about the right way to proceed in the public sector. Specific actors at the municipal level –Trondheim– contest the very meaning of "economic growth" through local practices. However, the institutional means grants them some operative freedom under the logic of the welfare system –for example, by offering services for tool lending in the local libraries or supporting the opening of a store for second-hand products recovered by the local waste management company. Notwithstanding, some services that the public employees could take care of as one of their responsibilities might not come to fruition because of the current ideological and institutional order that sees service solutions as a function of markets –in support of economic growth.

The results in studies 1 and 2 show two foreseeable futures by design. On the one hand, there is an opportunity to seek interventions to promote more public services –through commons or shared services paid by the public budget under tax collection –i.e., mobilizing political support for the work done in Trondheim's Municipality. On the other hand, there is also space in the private sector for the organization of citizens in the reduction of consumption without the intervention of the public sector –as evidenced in study 2. However, this second path requires the social circulation of knowledge,

technical skills, and material availability to avoid co-optation by capitalistic and consumerist imperatives.

The results from the first two studies align with bigger discussions about sustainability. Specifically in the debates about degrowth –post-growth– and eco-modernism, as both sides of the discussion take different positions about what the solution to sustainable lifestyles should be. On the degrowth side, the answer points toward consumption reduction and societies organized around just wealth distribution (c.f., Kallis et al., 2018; Hickel, 2020). On the eco-modernist side, the answer lies in new technologies that can circumvent and repair the environmental impacts (c.f., Grunwald, 2018).

Concerning CE, the question is from which side a CE transition should be approached. Notably, as a transition with a future orientation, it means into which efforts to put resources (investment, time, and energy) and what actions to focus on. The answers to these political questions will affect how humans relate to each other and other agents (alive or not) in the environment. Particularly in a time marked by an environmental crisis (including the urgency of global warming), the proposed futures could represent venues for the success or failure of life on the planet.

Futures that promise incremental solutions (eco-modernism) and futures that promise other forms of organization (degrowth) are not always in dire opposition, as evidenced in a CE shaped in Trondheim. However, the main confrontation comes from the priorities that the economy serves. Although in a growth-based economy, technology is an instrument that locks in profit-making opportunities, technology does not only have to be at the service of this priority –as evidenced in the example of the two refrigerators at the start of this chapter. In contrast, in a non-growth-based economy, technology should be at the service of just and equal wealth and resource distribution.

Deepening on the quest about CE, the challenge is to have a CE that makes sense in people's everyday life, and that emerges connected to goals that are not solely profit-making. However, in the case of Trondheim, there is already an ambiance of doubt around the purposes of having more (economic) growth-oriented strategies (even if they are green), while practical endeavors to facilitate material and product recovery (through reuse and repair) lack solid support and have to adapt to the agency and competences of market practices.

To work against a CE's undesirable social effects and reclaim CE's futurity for more than powerful actors, the politicization of CE should consider what expectations are put on the roles played by these actors in the current system. Mainly the reliance on agendas that could displace opportunities and create adverse situations of unjust or unfair access. For example, in the third study, in the workshop with youth citizens (article 4), some stories about the future point towards local production of food

products and materials such as wool. This kind of imagination can be problematic if applied as a solution because it emphasizes people living in conditions that allow for food production and supported by a community made of their family. If the case called for implementing this as a project, it would require adjusting the expectations over time and probably require the mobilization (and geographical relocation) of people and knowledge over a longer time horizon.

The type of thinking in the example in the previous paragraph is also challenging to put into practice by the local and regional authorities. It requires planning that may, in many cases, be impossible to put forward by the national government because of government-period restrictions. The point here is that although imagination can be radical enough, there is still an aspect of real politics that must be negotiated –between what is feasible and what is possible. Although real politics may hinder the implementation of imagined futures, the work around them and the acknowledgment of already structured imaginations (as social imaginaries) may prove fruitful to transformations that overcome the limitations of real politics.

Regarding real politics, as social imaginaries go, CE is already loaded with meaning. The mainstream CE can be seen as legitimizing green growth, which could be deemed part of the "business as usual" mentality. This situation put actors trying to advance other modes of CE –for example, in the local governments at Trøndelag's County Council and Trondheim Municipality– in a marginal situation. This marginality means prioritizing actions that "pay the bills" over those that could have transformational effects on the material organization of society. However, the fact that other social roles are given to materials in discourses and practices tangential to the mainstream CE, means that there is an opportunity to reclaim CE and mainstream another version of it. Still, mainstreaming another specific CE is not without problem, as it could repeat the same tunnel vision of the already mainstream CE.

Finally, the third study supports the case for more deliberations with citizens without the preconceptions of narratives of degrowth or eco-modernism, not even explicitly engaging CE. Instead, it is a call to bring up the matters that a CE intends to solve –namely, climate change and aspects related to the governance of production and consumption– in honest questioning about the responsibilities and accountability mechanisms for the different involved actors.

Returning to the design context, questioning what gets produced and the kind of world it reproduces has been featured as a design concern in recent literature –particularly in ontological and transition design (Escobar, 2020a). Including a CE as a set of techno-fixes, disconnected from contextual political aspects, may prove a regression in advancing design discourse that is more self-aware about its political roles. In this line of thought, an uncovering of CE as a process of construction of governance

and relationality is in line with an effort to (de)future (Fry, 2020) by sustaining just and equitable modes of production and consumption.

In this regard, Escobar (2020b) reflects that design offers a dialectical entry to think of other realities and other possibles: *"Design is a conversation about possibilities of being, doing, and knowing"* (Escobar, 2020b, p. 140). This perception about design or the designed –as Fry (2020) refers to the made world– aligns with the critique of everyday life made by Lefebvre (1991). However, design is positioned here as a discipline with a pervasive influence that could help reconfigure and redirect social life. Design is also about the capacity to look for other modalities of everyday life –but as Lefebvre (1991) noted, these modalities emerge linked to experiences in circuits of everyday life that organize despite the imposition of particular mandates about progress. Thus, an end is to decenter the design of products or services until it is understood what kind of societal arrangements design can support –and in turn, following the tenets of ontological design (Willis, 2006), which design is supported.

The evidence in the three studies supports the interpretation that existing alternative social imaginaries could contribute to other CEs. These alternative social imaginaries are grounded on different priorities within Norway's welfare system, allowing local actors to provide services that do not align with economic growth. Another grounding for these social imaginaries is the technical skills and their social circulation as part of communities or groups –through practices that do not rehearse the competences of the market (buying and selling). Finally, a third grounding for alternative social imaginaries comes from issues at the core of a CE by focusing on the experiences and knowledge of people regarding their relations to production and consumption and their consequences –for example, in climate change. Figure 6.6 presents these results as three tensions.
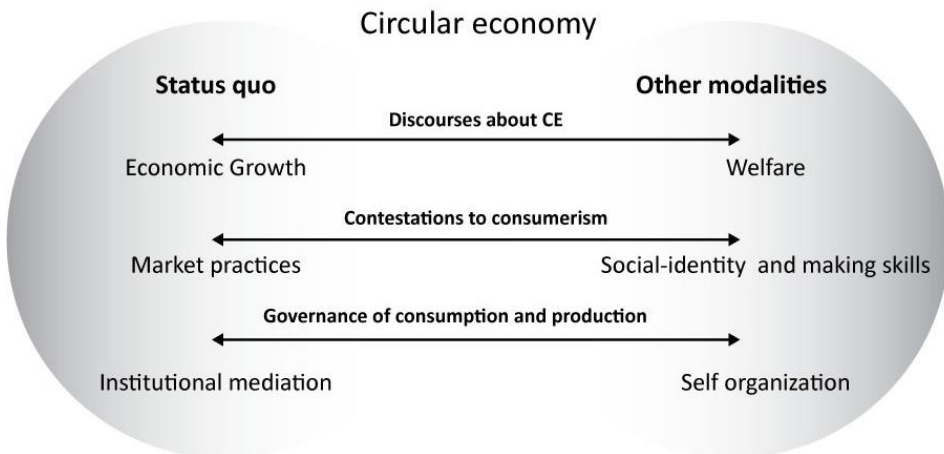

Figure 6.6. Diagram of main results from the contextualized study of CE in Trøndelag/Trondheim as tensions

In synthesis, the evidence in these three studies poses a plausible path for design to contribute to CEs different from the mainstream one. As an entry point to those other possibilities, design for CE requires 1) Prioritization of production and consumption from aspects other than economic growth or market competences (i.e., do not focus production as commodities). 2) Base design for products or policy advice about a CE on the practical engagements and experiences of those who deal with alternative production and consumption at a practical level. 3) Engage the participation of actors as a political issue where knowledge production and experiences will be a source for confrontation and critique. 4) Look for ways to co-produce and adapt practices without subjecting them to preconceptions about specific concepts or illusions about progress.

7   Conclusion

The conclusions offered by this thesis rely on observations done for the three studies –in the context of Trondheim in the Trøndelag region in Norway. Although the specific results –related to the context– do not offer generalizable conclusions about CE or how to engage it in design, there is content of relevance and significance for a research-for-design about everyday life. This content describes the role of looking at other modalities of everyday life (Lefebvre, 1991). In researching CE for design, these roles complement normatively and critically the thought and discourse on production and consumption by moving it away from partial ideas of progress based on a techno-orientation supporting economic growth's mandate.

Although a CE is, in principle, about changes in the use of materials in production and consumption, change is conditioned by contextual factors –social organization and institutional framings– that limit the spectrum of possibilities. The possibilities for what a CE can be are legitimized, negotiated, and contested between institutional logic and the expectations for change –and get inscribed in a social life made up of practices through a particular notion of normality. However, the possibilities for other CEs get expanded by looking at them as linked to other modalities of social organization based on different conceptions of normality and performing different social practices. Designers can use such knowledge to promote a societal transformation or to reproduce the status quo. Moreover, the opening of these possibilities refers to the step that design –and designers– should take before proposing projects or specific futures.

In summary, four assumptions are offered here to start opening the possibilities of a CE:

1. CE as a research object comes with onto-epistemological challenges. These challenges span from a lack of definition of a CE, but the work should not focus on the strict or normative definition. Simultaneously, the work on CE should create space for the critical contestation and expansion about what a CE can solve and the participants and knowledge it must recruit. In consequence, CE as an expanded object of research should look at more than the strategies to put forward a particular mode of production and consumption (e.g., moving from cycles of recycling to cycles of reuse and repair) as it also requires the construction of CE around the relations and practices that configure the modalities of everyday life.

2. The research about CE is incomplete if it only focuses on scientific and technical facts, as it is a transition inscribed in political and institutional contexts. Moreover, providing a description of CE that only sees the potential for technological change misses the influence of social arrangements in the co-production of sense and meaning that drives the evolution of technical and scientific knowledge in particular directions. In this regard, Lefebvre's (1991) critique of everyday life makes a central point

about the illusion of progress in scientific and technical expertise, which hides some forms of social decline. This point is particularly important to the expectations around a CE, which can be overstated or produce adverse rebound effects by not acknowledging social changes.

3. There is not one universal way of reaching a CE and particularly not a universal model for implementations. Therefore, it could be a mistake to prescribe the same formula or model of CE for all contexts. Instead, the prescriptions about a CE should come from the immediate practice context. For example, in the case of Trondheim, while a discourse from the European Union influences the introduction of CE, the local actors find ways to make do with it as part of their administrative execution of welfare services. In a context without a strong local government and a welfare system, the priorities for a CE could more easily deepen inequality in access. Even in Norway, whether the welfare system will sustain and ensure just access to the provision of materials and products is unknown.

4. A criticality about CE's possible effects should accompany any project or proposal. First, this criticality means pointing clearly toward the problem being intervened –a circular economy cannot be a panacea (Corvellec et al., 2021). Secondly, it requires transparency about which actors are included and the benefits each derives from particular CE projects. Moreover, it requires a political will to make public the possible interests and agendas of implicated actors.

These four assumptions precede any activity for design, for example, in applying the framework for Transition Design (Irwin, 2015; Irwin et al., 2015). Therefore, before defining any vision, mindset, or posture about CE, it is necessary to cover the above four assumptions. Furthermore, this contention aligns more with defining a context-oriented design that considers transformations as a co-production between different social elements –already advanced by practice-oriented design (Pettersen, 2015).

The following sections in this chapter present specific conclusions according to each secondary research question. Finally, the chapter and thesis deliver the conclusions regarding the general research question and offers recommendations and suggestions for further research.

7.1   Which existing institutional structures may foster or hinder the agencies of alternative social imaginaries?

The participation of different actors is also a characteristic of the mobilization and futuring of a CE. In the empirical study in Trøndelag, Norway, this mobilization has been driven by public authorities, the university, the waste management sector, businesses (small and big), industrial sector organizations (clusters), joined later by non-profit organizations, and more recently by regular citizens. However, this mobilization is discursively influenced by the vision put forward by the European Commission.

Although a CE discourse is structured at different scales of organization, the institutionalization of expectations appears only to permeate from the bigger scales (European Union, National Government, clusters of companies, or productive sectors) to the smaller scales (municipalities, small companies, citizens). However, the smaller scales are better suited to conduct experiments about CE but have the challenge of transferring these experiences to organizations on the bigger scales.

The directionality of the discourses creates an asymmetry in the production of a CE, where policymakers' expectations –for example, for sustained economic growth at the national scale– do not match the experiences of practitioners –for example, in implementing services for reuse to reduce individual consumption. Here, there is a first look at an alternative modality of everyday life that could be organized around public services but does not feature in the discourse in the policies at the national scale.

The politico-economic imaginaries of CE are constrained to specific understandings of economic growth and the responsibilities assigned to different actors. For example, technologies for recycling could bring convenience to households but also fail if people are unwilling to do their share in sorting waste. These imaginaries also reflect a hierarchical organization of the government, where the local government (the municipalities) has a certain operational space. Still, the municipality should operate according to mandates and expectations that come from higher levels (national government, European Union).

A more general answer to this research question is that two structures may hinder alternative social imaginaries. One is the ideology that structures thought about economic growth, which is supported in practice by an overabundance of practice performances that depend on the competences of the market (selling and buying). The other one is the institutional structure of the government and the scales of influence by levels, where the national level can input expectations for the municipal level, which complicates the degree of freedom for local action and autonomy.

In contrast, alternative social imaginaries are fostered by proximity with citizens, where the practitioners –workers at the municipality or in organized civil society– have the opportunity to experiment with services for reuse, repair, and circulation of products according to the expectations and needs of the citizens. Furthermore, this proximity to citizens may offer the practitioners a perception of the possibilities in organizing and offering services that contest high consumption, with the limitation that their lived experience may not align with the priorities established in policy instruments. Additionally, in the Norwegian case, the welfare system represents an institutional opportunity for prioritizing services and provisions that do not center around profit-making but on other aspects of the well-being of citizens.

7.2   Which alternatives of resource use in production and consumption can contribute to alternative social imaginaries?

The alternative practices that can be included within CE are related to modes of consumption and production based on repair, reuse, and sharing. These modes of production-consumption are also explored in the literature about CE regarding new business models. However, unlike business models, a radical alternative would prioritize use-value and the social circulation of knowledge, skills, and materiality required to participate in these practices by means that are not only supported by the market agencies and competences (buying and selling).

These alternatives for resource use in production and consumption have organizational logic co-produced with the social relations of the carriers of practice. Moreover, this type of organizational logic prioritizes the identity of people in their association and connection to others. On the contrary, consumerist modes of production-consumption do not support this prioritization of relations. Instead, consumerist infrastructure facilitates individualization of consumption. When it comes to production, in the consumerist modality of everyday life, there are no interactions between producers and consumers, and production practices are usually not seen or known by consumers.

The distinction between production and consumption is an essential characteristic of consumerism, supported by infrastructures for providing, distributing, and discarding materials and products as commodities. The role of such infrastructures is to maintain the social lives of production and consumption as separate. Those with technical knowledge and skills for repairing and working with materials reduce the perceived distance that this separation creates. However, a real unification of production and consumption is only attainable in practical engagements as a lived experience that links use in consumption to making in production.

The reconstitution of a social life –of communities (Lefebvre, 1991)– requires the reconstitution of production and consumption as a unity in common sense. This double reconstitution points toward the redistribution of power over the material world, which in the capital or modern sense is only attainable through the accumulation of exchangeable value –and registered in economic growth. However, as seen in the examples in studies 1 and 2, there are more reasons to engage in practices that make for a different socio-material world than those driven by market competences –buying and selling. These alternative practices represent a nexus of practice that organizes a CE that could reconstitute production, consumption, and the social.

A reclaiming of production-consumption as fundamentally linked to social life is in itself a new social imaginary. Still, it presents problems in the practical sense. Traditionally on the side of production,

knowledge creation is tightly linked to particular expertise oriented to technological and business disciplines –a specific kind of progress, as noted by Lefebvre (1991). Simultaneously, consumption is subjected to market practices, where money as the material aspect of these practices generates an uneven landscape of opportunity and an unequal pattern of access –paraphrasing Shove et al. (2012, p.135.)). A CE that promotes knowledge creation and experimentation for more social forms of production and consumption would still need to deal with this unevenness in opportunities and access while opening knowledge creation to other orientations.

7.3 How can design aid the formulation of CEs that sustain alternative social imaginaries and agencies?

The answer to this question is already partially given in the conclusions offered for the previous two research questions. First, institutional structures can aid the formulation of CEs based on alternative imaginaries, including the experiences of those working in proximities to citizens and the use of priorities put into policies but not focusing on economic growth. Second, people's experiences in alternative practices that unify consumption and production while contesting the primacy of market competences. The alternative social imaginaries come from an understanding of different priorities – other than profits– as the role of service providers and a nexus of practice that organizes a social life on grounds different from the rules of the market.

In addition, to delve into possibilities for consumption and production that do not frame CE, the third study took a participatory futuring approach as part of an endeavor about climate change and necessary consumption. These two topics are linked to the core tenets of CE but do not need to engage it directly. Furthermore, this study pointed towards the role of design in fostering discourses and encounters of actors and visions, which also contributes to forming other ways of designing – as a process of designing before design.

An implicit message about the contribution of design to a societal transition is made in the two workshops. The results from the workshops prefigure concerns relevant to the governance of the consumption-production nexus. These concerns put forward the relations and responsibilities of three actors in the production-consumption nexus. These actors include the public sector, the producers, and the citizens. Moreover, the arguments raised by the participants in the two workshops invite questions about the actors' role in knowledge production. It is in knowledge production that the roles of experts and education play a central role. A reflection on design's contribution to knowledge production is relevant to the participation of designers in the political definition of a CE.

Regarding the process of metadesigning and opening the futurity of CE, design has a role that should encompass the kind of society desired and the processes through which those societies are reached.

The critique of everyday life offered by Lefebvre (1991) is once again a handy reference for looking at other modalities –of being, doing, and organizing. In the third study, these other modalities are expressed in the future orientation in the two workshops, where the participants described situations of speculative futures under the gaze of their current perspective of the world. However, these efforts can result in futile interventions unless they reassemble the decision-making process by moving from gaining insights to organizing experiments with real impact.

Following a deliberate decision to avoid promoting a mainstream CE and by drawing on the results from the two workshops, participatory futuring is considered a viable option to facilitate the reflection about the core aspects of CE and one component in the elucidation of political processes. Still, it does not substitute the need for formal experiments where designers should attempt more speculation about alternative CEs in the practical sense and through discursive artifacts.

To answer the research question, this thesis proposes decentering CE as a concept or set of principles and instead going back to the fundamental questions about production-consumption and the social purposes products and services intended to cover. Thus, focusing on the needs of people and the kind of society expected while opening a CE to others by offering design acts that do not conceal knowledge production.

7.4 How can design contribute to CEs supporting other common senses for production and consumption?

The answer to the general research question is self-reflective. This answer comes from the orientation of the thesis as a research-for-design. It is summarized by following other calls about expanding CE in research and becoming critical of the societal arrangements a CE will support and rehearse. In this sense, design practices –for production– should openly embrace the limitations of production proposals. For example, designers could start by recognizing how a capitalistic/modern organization describes a common sense that renders almost any production into a possible problem for society and the environment. This problem is linked to the priority placed on economic growth, which locks any progress made in the social life to a capacity for value exchange.

However, even in societies with high consumption levels, as in Norway, opportunities exist to propose other prioritization in the arrangements configuring everyday life –alternative social imaginaries. In the examples in Trondheim, these opportunities loom in services by the local government, small business offerings, and local non-governmental organizations' services. These opportunities span from the priorities of a welfare system and the proximity to the lived experiences of citizens. Moreover, the cases of practical engagements in alternative consumption through the repair, reuse, and recovery of products show the potential for experimentation, which interweaves more socially oriented forms of

production and consumption and repositions the role of the individual within groups or communities. Finally, there is a political nature in identifying other priorities for everyday life. The political nature of this re-prioritization is essential for design and concerns the relations of actors and their agencies in knowledge production and fostering discourses and practices in the consumption-production nexus.

Designers can also engage themselves and their practices in more experimentation about other modes of production and consumption. Hence, designers can engage politically in the organized definition of the needed and socially accepted limits for manufacture, retail, and consumption, which means engaging in how to organize production. However, in the face of the current status quo, it may require a role similar to that of an activist designer. In turn, activist designers would also need other forms of institutional support for the work and expertise that they can bring in.

Designers can assume a completely discursive approach as part of their integration into CE as political actors. In this approach, the designer's function is to evidence the common sense and opportunities for other modalities of organization –as this thesis has done. In this situation, a designer acts as a researcher by evidencing the potentially different modes of doing, being, and organizing.

In the case of Trondheim, reconfiguring the social life under alternative social imaginaries –that prioritize otherwise– can substantially impact the production and consumption system. Moreover, this reconfiguration is undeniably a political process that centers on contestations against the status quo –economic growth, market competences, and expectations about progress and governance. Consequently, the advancement of any CE will have to deal with this reconfiguration. Thus, the integration of CE into design has to be acknowledged as part of political action –whether it is for the support and sustainment of alternative social imaginaries for just futures and societies or for the preservation of the status quo and its current dominant project.

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Article 1. Emerging circular economies: Discourse coalitions in a Norwegian case
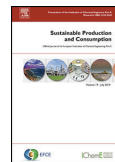
Emerging circular economies: Discourse coalitions in a Norwegian case

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A B S T R A C T

The transition to a circular economy (CE) remains an anticipated future with alternative pathways for its fulfillment. Most research on CE is normative about technological approaches and interpretations for production and sustainable development. However, critical reviews of CE help understand that CE's emergence is constrained to current dominant goals. As a set of imagined futures, the visions of CE are produced and shared in discursive practices. We hypothesize that the existence of alternative discourses about CE originates from alignment with or divergence from current dominant goals. Green growth holds the dominant position as a goal in the European discourse about CE. In this study, we present an empirical case of an emerging CE in the region of Trøndelag in Norway. This case uses qualitative data collected through interviews with informants in the public and private sectors (profit and non-profit organizations). The analysis of these interviews involved the use of a discourse coalition framework as a method. We identified three discourse coalitions: 1) Waste as resources: a vision of better product design and waste sorting technologies making recycling more efficient. 2) Sharing economy: a vision of industrial symbiosis, and new business models for local commercial offerings in sharing, reuse, repair of products. 3) Reduction of individual consumption: a vision of individual changes in lifestyle, coupled with local services and skill acquisition/transfer for reuse and repair. The first two operate in alignment with the political goal of green growth. The third one diverges by questioning it and setting focus on individual consumption reduction. We found discursive competition in CE when the focus is on the goal underlying its enactment. From this finding, we raise the question of which kinds of technological implementation and political challenges would come from shifting CE's policy goal to reducing individual consumption. To illustrate an alternative CE that emerges from consumption reduction, we discuss its implications based on the insights from our empirical case. The main contribution of the article is to provide evidence and an example of an emerging aspect that can be integrated more prominently in CE and that requires a stance that is not based on economic growth.

1. Introduction

The transition from a linear to a circular economy (CE hereafter) is yet unrealized, and it remains an anticipated future. CE is expected to engender positive change in how people assess, value, and use material resources (Stahel, 2019; Wastling et al., 2018).

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The dual nature of resource usage in consumption and production (Savini, 2019) opens an opportunity to question CE's emergence concerning its visions and practical enactment as alternative pathways for its fulfillment (see Clube and Tennant, 2020; Genovese and Pansera, 2020).

From an environmental perspective, CE comes as a response to the current inefficient and unsustainable use of material resources (Stahel, 2016; Morseletto, 2020). Reports from international organizations (Roy et al., 2018; Hertwich et al., 2019; UNFCC, 2019) have included CE as an enabler for low carbon futures. CE could contribute to the reduction of greenhouse gas emissions (Wysokińska, 2016) by avoiding new extraction of raw materials, excessive production, and waste. Despite this, the ex-

tent of CE's impact on the environment and the social system is both technically and socially contested (Korhonen et al., 2018; Corvellec et al., 2020).

CE is an elusive concept; a plethora of previous literature reviews have studied its multiple interpretations (see Kirchherr et al., 2017; Geisendorf and Pietrulla, 2018; Homrich et al., 2018; Korhonen et al., 2018; Kalmykova et al., 2018; Prieto-Sandoval et al., 2018; Millar et al., 2019; Suárez-Eiroa et al., 2019). These previous literature reviews summarize constitutive principles and formulate new operational definitions of the concept. Although some of these works acknowledge a lack of political and social aspects in CE's definition, they do not address the existence of alternative visions. Furthermore, CE is considered an umbrella term (Homrich et al., 2018), which is contested (Korhonen et al., 2018) concerning a vision linked to production, business models, and environmental damage decoupled from economic activity. Focus is mainly given to approaches and interpretations in scientific, public, and commercial documents. Most of these reviews address production and sustainable development requirements, which contribute to normative views that advance certain technical implementations (Clubbe and Tennant, 2020). These approaches to CE are circumscribed to a narrative that, in the terms used by Genovese and Pansera (2020, p.12), follows a depoliticized technocratic eco-modernist vision, which limits the potentiality of CE to offer alternatives that question not only how we produce but why or what we produce. Thus, to study alternative visions of CE requires a different starting point.

The enactment and planning of CE is profoundly influenced by the imaginations of those who promote it; apparently, it is constrained by the renewal of the rehearsed ideas of economic growth. Völker et al. (2020) put this rehearsal as a set of indicators embedded in policy, both representing the current world and the shape of the future from which CE gets its value. These are imagined sociotechnical orders that motivate action (Jasanoff, 2015, p.20). Furthermore, these imaginations and future expectations (see Borup et al., 2006) operating under specific worldviews and power dynamics (Dye, 2020; Beckert, 2013). As a concept, CE is a container for multiple imaginations (Corvellec et al., 2020). It acts as an 'empty signifier' (Valenzuela and Böhm, 2017), filled with the discourses and practices of specific actors. As any other imagined future (see Hajer and Pelzer, 2018, pp.223–224), CE visions are put forward by aligning with or challenging current dominant political and economic ideas.

Academic literature offering critical revisions of CE does a better job in addressing the alternative imaginations and visions that may coexist in CE's discourses and practices, as done, for instance, by Welch et al. (2017) in questioning CE as a new model of consumption concerning everyday life. Another example is Temesgen et al.'s (2019) work, which enquires about the core values of CE and considers necessary to examine the worldview in which it operates. A review of values within CE is also present in the work of Hobson (2016, 2019, 2020), which offers a trajectory of questioning the impacts CE will have in the redistribution and reconfiguration of social relations once societies become CEs. This questioning departs from the exploration of links between CE, capitalism, and alternative economics such as degrowth (Hobson and Lynch, 2016). Similarly, Temesgen et al. (2019) establish a relation between mainstream visions of CE and economic growth, concluding that any discussion in shifting to a CE should include a conviction in reducing resource consumption even at the expense of economic growth. These critical views contribute to our understanding of CE as a set of emerging alternative visions. These visions are constrained by current goals that limit their performance. Thus, these critical reviews are our point of departure; as they imply, first and foremost, questioning CE in relation to economic growth.

We base our following study on the hypothesis that CE's alternative discourses and practical performances originate from alignment with or divergence from current dominant political goals based on economic growth, which results in competing visions of CE. This article aims to identify alternative pathways in emerging CE discourses and visions.

1.1. Background: from the EU to a regional and local CE focus

The shift to a CE has been adopted and actively promoted by the European Union's (EU) governing bodies during the last decade, most visibly with the adoption in 2015 of the Circular Economy policy package "Closing the loop – An EU action plan for the Circular Economy" (European Commission, 2015). It initially focused on material recovery and recycling from waste as a route for regional resource security and efficiency. In its latest iteration (European Commission, 2020), the plan includes sustainable product policy actions. The plan is adapted to the guidelines of the European Green Deal (European Commission, 2019), which is the EU's new growth strategy *"where economic growth is decoupled from resource use"* (European Commission, 2019, p.2).

Green growth is a continuation of the economic imperative of growth; it is problematized as an inhibitor for necessary societal change (see Wiedmann et al., 2020; Sandberg et al., 2019). Green growth proposes the decoupling of economic growth from environmental impacts. However, according to Hickel and Kallis (2020, p. 1), *"there is no empirical evidence that absolute decoupling from resource use can be achieved on a global scale against a background of continued economic growth."* Despite this, questioning economic growth is not politically acceptable (Hickel and Kallis, 2020, p. 15). The dominance of economic growth explains its adoption as the current goal for EU's CE.

Although Norway is not an EU country, Norway is highly influenced by the EU as a European Economic Area (EEA) member. Furthermore, it appears to be no different in the formation of a CE discourse through policy. Norway's National government's earliest intention for the creation of a specific policy on CE was put forward through a communication to the National Parliament in 2017 entitled "Waste as resource – Waste politic and Circular Economy" (Klima- og miljødepartementet, 2017). CE entered this political space by reproducing the European Commission's expectations and aligning with green growth discourse:

"It is expected, especially at the European level, that a greater degree of material recycling of waste will contribute to developing new business opportunities and jobs and access to secondary raw materials. It will also contribute to lower greenhouse gas emissions. This is the basis for the European Commission's work on circular economy." (Klima- og miljødepartementet, 2017, p.7, our translation).

Lately, studies have shown that counties and municipalities' role in the shaping of policies has increased in some Nordic countries. Sjöblom (2018), for example, writes that since the 1990s in Finland, there has been a reallocation of authority from national to sub-national levels to improve their decision-making abilities. In Sweden, Lidström (2018) describes that top-down influence from the EU has spurred local and regional levels to mediate this influence over the Swedish state in some cases. For Norway, we find three levels of governance: national government, counties, and municipalities. The role of the subnational authorities is to operate within the laws and regulations set by the state. However, these authorities are self-governed, which means they also need to govern according to their local context, but within national guidelines (Kommunal- og moderniseringsdepartementet, 2020).

In Norway, a report about participation in EU projects shows that municipalities and counties engage in such projects to en-

hance knowledge and improve competence about new measures affecting citizens and policy areas (Schou and Indset, 2015). Even though EU's regional politics is not a part of the EEA membership, Norwegian municipalities and counties engage in the European Territorial Cooperation (ETC) Interreg, which seeks to enhance social and economic transregional and transnational integration (Indset et al., 2018). Borghetto and Franchino (2010) explain that sub-national authorities play increasingly important roles in relation to the implementation of EU directives and policies. The current Norwegian government is working on a national strategy for a CE, while Trøndelag County has already included CE as one of its main pillars for regional development. Hence, it is relevant for the paper to examine the regional context as it is an ongoing transition to a CE.

1.2. Approach

Concretely, we delve into discourses uttered about CE to gain insight into alternative visions supported or hindered in practice. Through an empirical case, which is a situated case constructed with interviews from actors influencing the implementation of a local CE in the County of Trøndelag in mid-Norway. The actors include public servants, but also a much broader array of positions in society. Three research questions guide this work:

1) Which visions are promoted as pathways to reach a CE?
2) What is prioritized in envisioned CE pathways?
3) How does economic growth influence the emergence of specific pathways for a circular economy?

The article is structured in six sections. A preamble has been presented in this introduction. The second section offers the aspects used to frame the discourses of CE and serve as a bridge to the empirical study conducted in the region of Trøndelag in Norway. Section three presents the material and methods used to construct and analyze this empirical case. In section four, the results are presented, offering a review of three identified discourse coalitions. In section five, the dimensions of discourse are assessed in relation to economic growth as the current goal for CE. The article finalizes with a conclusion section in which the study's limitations and an agenda for further research are presented.

2. Framing: discourses and CE

In this section, we present the aspects that frame our understanding of CE — regarding it as a set of discourses about a yet unrealized future. One future stabilizes in specific imaginaries that are socially shared and co-produced (Völker et al., 2020). These stabilizations emerge from the practical enactments of alternative CE visions, which mainly consist of discursive utterances at the time of the study. In this regard, our CE framing as discursive practices resembles De Angelis & Ianulardo's (2020) work. CE is seen as a cognitive framework shaping positive rhetoric (practices for persuasion) towards more environmentally, economically, and socially sustainable production and consumption systems. We go beyond their framing of CE by acknowledging the existence of competing visions under the same concept.

We take on discursive methodologies (see Schmidt, 2011; Isoaho and Karhunmaa, 2019) to operationalize the study of CE discourses in practice. We depart from a definition of discourses as shared understandings of the world (Dryzek, 2013) that are produced and reproduced in practice (Hajer, 1995). This means that we understand discourses as uttered in alignment with or in divergence from goals that may not always be transparent of an ideology (Van Dijk, 2006). Our focus is on these underlying goals that support specific visions of CE, which can be taken as an ideological formulation, even if it is not a conscious decision.

We consider the concept of ideology (Van Dijk, 2006; Griffin, 2006). It is tightly linked to specific political goals, such as economic growth which plays a role as a contention in CE discourses. Griffin (2006) notes the cultural role of ideology in its coercive and emancipatory functions in maintaining or challenging the social, economic, or political status quo. Van Dijk (2006, pp. 116–117) defines ideologies as socially shared foundational beliefs that control and organize systems of thought and are the base for discourse and social practices, as they allow members of a society to organize and coordinate actions, as an interface between social structures and individual agency.

2.1. Discourse coalitions

Our purpose is to identify competing visions[1] of CE and their position in relation to economic growth as emerging new modes of organizing the economy. For this reason, we have identified discourse as the unit in which the visions can be located, and economic growth as an already stabilized foundational belief or status quo. However, an analysis of isolated discourses is not enough to identify the competing visions. To aggregate the available discourses, we operationalize our study under the framework of discourse coalitions (Hajer, 2005). This framework enables us to identify CE's alternative visions as stabilized or institutional discourses and their structuration (or presence) among a set of actors. It also provides the tools to take a stance about their situation concerning foundational beliefs that underlie the practitioners' utterances. Hajer's (2005, p.302) framework defines discourse coalitions as:

"A discourse-coalition refers to a group of actors that, in the context of an identifiable set of practices, shares the usage of a particular set of storylines over a particular period of time."

As for other discursive approaches (Hewitt, 2009), in discourse coalitions, the focus is on the language used. Unlike other analytical frameworks, such as advocacy coalitions (e.g., Pierce et al., 2017), discourse coalitions do not pay attention to actors' actual interactions, networks, or physical proximities that influence the dissemination of ideas. Instead, it directs attention towards the presence of similar socially shared understandings (structuration). This presence represents an alignment of the actors through storylines and metaphors that explain or validate their mode of thinking.

In discourse coalitions, the analysis takes an argumentative form (see van Eemeren et al., 2015). Therefore, the intention is to reconstruct this thought or belief system found behind the utterances that support or reject one or another way of doing and being. The subject of power/knowledge is also essential in discourse analysis; as uttered discourses legitimize or diverge from the status quo. Jørgensen and Phillips (2002, p.14) put it this way:

"*Power is responsible both for creating our social world and for the particular ways in which the world is formed and can be talked about, ruling out alternative ways of being and talking.*"

The coercive and emancipatory functions of ideology (Griffin, 2006) are present in the two dimensions offered by Hajer (2005). In structuration: through reproduction and acceptance of socially shared ideas; and in institutionalization: through the stabilization of specific forms of understanding. For a CE, its alternative visions could challenge or support dominant social and political goals; in this case, green (economic) growth. What an actor utters is also framed within prevailing structures, such as holding to the goal of economic growth over other ones.

The discourse coalitions framework (Hajer, 2005) allows for identifying adopted or rejected metaphors and storylines as part

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[1] We could here also use the wording sociotechnical imaginaries of prospected futures, social orders in the terms of Jasanoff (2015).

of discourses, enabling the reconstruction of an underlying ideology. This type of study offers the opportunity to argumentatively reconstruct shared belief systems (Van Dijk, 2006) that do not appear explicitly in the discursive statements.

2.2. Discourses in CE literature

Regarding the study of CE as discourses, we identified two previous studies taking a discursive approach: 1) Nylén and Salminen (2019) apply the concepts of discursive space and discursive structuration (Hajer, 1995), and identify a controversy about the meanings given to maintaining materials in their higher quality. 2) The second study (Persson, 2015) focuses on meanings given to CE. It proposes a definition based on CE's shared meanings from the workers' perspective in the Swedish public sector. Although these two studies follow a discursive approach, they do not reveal the underlying ideologies that support or hinder the emergence of alternative forms of CE.

We also acknowledge two recent works, one by Johansson and Henriksson (2020), which identifies CE as a weak form of circularity that does not include social aspects in its discursive framing. The second is the work of Nikitina (2020), who studied public discourses of waste management and CE in radio broadcasts in Russia. This author identified a poor representation of CE, which had practical repercussions as spontaneous circular practices that emerged with citizens' support were cut short when the government introduced a transport monopoly for waste. Thus, it distinguishes a CE that is merely technological from one that emerges as part of the life support system shaped by the economy. The four studies identified are evidence to assert that CE operates a set of contested alternative discourses and practices.

Aside from these discursive studies — emerging from reviews of content and empirical data; a recent literature review by Calisto Friant et al. (2020) has made a comprehensive presentation of discourses related to circularity, particularly in how they are approached as an evolving set of discourses. A collection of challenges or gaps in the literature about CE is offered and furthered with the formulation of a discourse typology based on a translation of meaning from circular economies to circular societies. The first set of results addresses one specific challenge as "alternative visions of circularity" (ibid., p.6). However, the study does not refer to alternative visions within CE's framing; instead, it looks at ideas that could be approached as circularity but are alternative to CE. Thus, it focuses on the researchers' interpretations of alternative concepts instead of studying how CE is understood and apprehended by the sources. Despite this difference to our approach, the typology offered (ibid., pp. 10–12) provides a good starting point to further discuss the kinds of CE discourses available. In this review (ibid.), four types of discourses are identified based on two dimensions: 1) social, economic, environmental, and political integration. And 2) technological innovation and ecological collapse. It also shows that CE does not have to be studied as a concept lacking consensus, as Merli et al. (2018) pointed out. Different discourses can instead be regarded as competing visions. We will refer to these later in our discussion in section five.

Although there are not many studies approaching CE as discourses, there are examples of studies that look at the content of CE policy implementation in Europe (Gregson et al., 2015; Lazarevic and Valve, 2017; Fratini et al., 2019). These studies seek to reveal the structuring ideas behind emerging modes of CE. These studies are closer to the kind of argumentative reconstruction position that we assume. Some foundational ideas behind CE found in these studies are: 1) CE as a moral project, achievable through local production and recycling (Gregson et al., 2015). 2) CE as a set of expectations to solve environmental problems without hindering economic growth while assuring renewal, security, and competitiveness of material resources (Lazarevic and Valve, 2017). 3) CE as an opportunity for social co-production beyond the technological fix (Fratini et al., 2019). We frame these studies as discursive as they also look at the shared meanings of CE. Notwithstanding, the politics, expectations, or co-productions revealed do not point to CE as a set of alternative visions. We consider alternative discourse coalitions as a categorization in which alternative visions can be identified. The empirical study we present in the following section describes the analytical elements and dimensions used to approach our empirical case.

3. Material and methods

Our empirical study is a case of discourse coalitions on a local emerging CE from qualitative data obtained through 26 semistructured interviews conducted from April to November of 2019 in Norway (find interview guidelines in the supplementary material).

Three aspects make this region a relevant case for studying discourses on emerging CEs at a local level within Europe: 1) The discursive influence of the EU is easy to follow in this region. Initial evidence is found in the participation of the County of Trøndelag in an interregional project between Sweden and Norway to co-create an innovation arena for CE (SMICE, 2020). 2) Norway is also bound to European commercial rules, through the EEA Agreement (EEA AGREEMENT, 2016). The fact that Norway is not a full member of the EU makes it easier for some informants to establish a discursive distance from EU policy mandates. 3) The increasing importance set on the contention of material flows at the meso–level (cities and regions), which is possible to evidence due to the autonomy given to local authorities in Nordic countries.

We identified the presence of CE in four strategic regional government documents:

1) The strategy for innovation and value creation in Trøndelag (Trøndelag fylkeskommune, 2017) presents CE as one of their priority areas.
2) The waste management plan for Trondheim Municipality 2018 – 2030 (Trondheim Kommune 2019) presents CE concerning a waste hierarchy.
3) In Trondheim Municipality's plan for energy and climate (Trondheim kommune, 2017), as part of the strategy for consumption and waste.
4) In the proposed climate strategy for the County (Trøndelag fylkeskommune, 2020) as one of the strategies to reach a carbon-neutral society.

Trondheim Municipality documents are included because Trondheim is the biggest city in this region, Norway's third largest population (Statistisk sentralbyrå, 2020), and the region's leading political and industrial center with significant influence over other municipalities.

3.1. Data collection

The data collection started as a mapping of initiatives related to CE, in both the public and private sectors – non-profit initiatives included. A first informal interview was conducted with the person in charge of the work on CE at the County council. Following this meeting, the criteria used for the recruitment of informants were: 1) Presence or influence in the Trøndelag region. 2) Existence of written communication, in their website, or working documents indicating CE as a related activity. And 3) suggestions by some of the other informants. By situating the case in this geographic region, it was possible to understand the kind of actors leading the local shift to a CE and their position regarding the Eu-
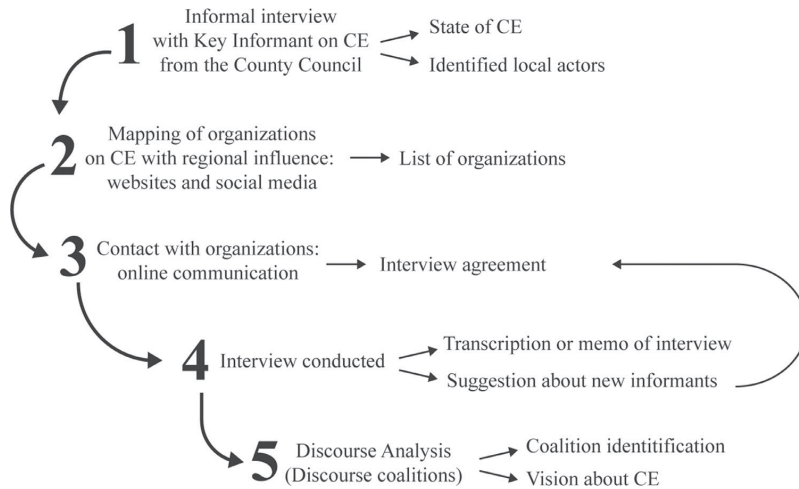
Fig. 1. Steps followed for the data collection.

Table 1
Distribution of informants' organization by sector and subcategory.

Sector	n=	Subcategory	n=
Public	7	Public sector local authority	5
		Public sector national authority	1
		Public sector services	1
Hybrid	3	Public interest - waste management	1
		Public interest association – Group	2
Non-profit	6	Public sector research (University)	2
		Private sector civil society (Diffuse interest)	4
Private	10	Private sector interest association	1
		Private sector small and medium enterprise	4
		Private sector industrial enterprise	1
		Private sector cluster	4
Total			26

ropean Union's vision and the dominant goal of economic growth (Fig. 1).

Some limitations emerged from the data collection and were related to the novelty of the concept and its recent introduction in the region. On the one hand, we can confidently assume that we reached key views representing the different sectors with participation and influence in the regional CE, as we found when the stories and relations between actors kept repeating. On the other hand, it is possible that we left out some views, particularly those that are not regarded as CE or have no direct interaction with the network of actors we approached.

The informants were actors from the County of Trøndelag and other organizations and institutions with influence in the region. The interviewees were purposively selected from public and private sectors (see Table 1), at different levels (National, Trøndelag County, Trondheim Municipality). New informants were included until we reached theoretical saturation.

The sector categorization in Tables 1 and 2 corresponds to the source of the informants' organization's financial resources. It includes, 1) Public: belong to authorities within the organization of the Norwegian State. 2) Private: financed by commercial activity. 3) Hybrid: autonomous organizations that receive financial resources from private and public sources. 4) Non-profit: these are organizations that receive financial resources from public or private sources but are primarily motivated by other factors than profit maximization.

The data gathered was recorded as audio and later transcribed or documented as interview memos. In total, 26 documents (Table 2) constitute the primary sources of analysis. The content was analyzed and categorized according to Hajer's (2005) elements of discourse coalitions. The identified coalitions were analyzed under Hajer's (2005) two dimensions, structuration, and institutionalization. Later, we discuss the discourse dominance in alignment with or divergence from economic growth.

3.2. Analytical method

Hajer's model (2005) is the base for our argumentative interpretation based on three elements:

1) Discourse: the production and reproduction of ideas, concepts, and categories that structure the meaning given to social and physical phenomena in a set of practices.
2) The metaphors: the meaning is given to one concept in relation to others, which must be studied under specific questions and subjects from the focus by the research design.
3) Storylines: these are condensed narratives that help in understanding how the problem is framed. It has a temporality, in the sense that it explains the causes of a past event or the formation of a future expectation.

The most important aspect of discourse coalitions, according to Hajer (2005), is to discuss these elements in relation to power. Two dimensions are offered to elaborate on power, discourse structuration, and discourse institutionalization. Structuration is the extent to which discourse is used by several actors to make sense of reality. In complement, discourse institutionalization happens when the discourse is stabilized in specific systems, physically or in policies. If both processes take place, then a discourse is considered dominant.

We expand on the three elements by adding two more:

1) Alignment to the discourse: it is directly linked to the structuration dimension and represents the informants in a sample who are identified within a specific coalition.
2) Enacted vision: it is the aspect of the discourse which is performed in support of a prospected future. It is also the physical or policy system that stabilizes and may become institutionalized.

Table 2
Sample of participant and sources for analysis.

Informant	Position	Sector	Source
1	Municipal advisor for environmental unit	Public	Transcription of Interview
2	Municipal advisor on green businesses	Public	Transcription of Interview
3	Municipal advisor on waste management	Public	Transcription of Interview
4	Advisors on digitalization & circular economy	Private	Transcription of Interview
5	Regional waste management project coordinator	Hybrid	Transcription of Interview
6	Director at the cluster for municipal waste management companies	Hybrid	Transcription of Interview
7	Advisor for planning, economy, and development at County council.	Public	Transcription of Interview
8	Advisor and climate coordinator at County council	Public	Transcription of Interview
9	Coordinator at an organization for the promotion of CE	Private	Transcription of Interview
10	Advisor for Norway's Environmental Agency	Public	Transcription of Interview
11	Director of Sustainability at public university	Non-profit	Transcription of Interview
12	An employee at service unit at public university	Non-profit	Memo of Interview
13	Design advisor at a recycling company	Private	Transcription of Interview
14	Design advisor at packaging industry cluster	Private	Transcription of Interview
15	Research and development manager at packaging industry cluster	Private	Transcription of Interview
16	Founder of a second-hand clothing store	Private	Memo of Interview
17	Founder at a voluntary organization for reuse of furniture	Non-profit	Transcription of Interview
18	Manager at recovery station for local waste management	Hybrid	Transcription of Interview
19	Founder of a start-up for reuse of building materials	Private	Memo of interview
20	Founder of a former second-hand clothing store	Private	Transcription of Interview
21	Coordinator for forest industry cluster	Private	Transcription of Interview
22	Organization advisor for an environmental conservation civil organization	Non-profit	Transcription of Interview
23	Project leader for an environmental conservation civil organization	Non-profit	Transcription of interview
24	Volunteer for an environmental and solidarity organization	Non-profit	Transcription of Interview
25	Founder of a vegetarian restaurant	Private	Transcription of Interview
26	Librarian and project coordinator at the local library	Public	Transcription of Interview

These two elements facilitate the integration of the two dimensions considered by Hajer (2005). This way, the framework can be used as our analytical tool. Section four presents the results we obtained from applying the framework of discourse coalitions on the 26 documents included in the data we gathered from our informants.

4. Results

Three discourse coalitions resulted from the dialogues with the informants (Table 3.) by following Hajer's (2005) method and considering the enacted vision in each. We elaborate on the discursive elements and later, on the dimensions of structuration and institutionalization.

4.1. Discourses

The following discursive patterns were identified. In the first pattern, a CE is enacted by focusing on material recovery and re-design of products, including new technologies and new materials, particularly beneficial from the perspectives of waste management and producer responsibility. This is extended to the bioeconomy, with mentioned examples about the use of local resources such as seaweed and tree fibers, but it is mainly focused on the success of recycling targets.

The second pattern is identified in the discourse uttered by informants envisioning a CE enabled by supporting new production models (industrial symbiosis) and services in the private market. This is reached through the sharing of resources and experiences that generate revenues without requiring new material inputs, and it includes ideas about market self-regulation, facilitation of sustainable consumer choices and establishment of new businesses.

The third pattern supposes that a CE can be enacted by reducing consumption and maintaining products in use for longer through reuse and repair. It requires transference of knowledge and skills to consumers about product repair and reuse, coupled with the environmental impacts of their consumption. Locally there are some initiatives promoted by private sector — civil organizations

dealing with reduction of consumption. Some of these initiatives are supported by the local government, but there is still an orientation towards business creation, the main example is a project for co-location of small enterprises along with streams of used materials and products recovered from waste management, with the intention of promoting reuse and repair as a path for lowered consumption.

4.2. The shared understanding of CE

The three discourses identified are also accompanied by specific understandings of what a CE is, in addition to the explicit discursive forms of CE.

The first group understands CE in the metaphor of waste as resources, complemented by recovery and second source material markets. It is easily assessed in the weight in tons of materials that are recycled or reused. This set of metaphors is well in line with those found in CE as promoted by the European Commission (2015). This understanding was already present in the waste management sector and supports the creation of systems, for waste collection and sorting of materials, based on advanced technologies.

The second group understands CE as a political goal. It is about framing the recruitment of industrial and financial sectors in support for new business models. It can be rendered as a frame for collaboration on industrial symbiosis and sharing economy platforms. It supports the creation of new revenue streams and the conversion of industrial activity.

The third understanding is based on consumption as the cause for environmental problems. In this framing, consumer behavior patterns are relevant as well as local market offerings and regulations in the relations between public sector politicians/administrative staff, private sector manufacturer/retailers, and citizens/consumers. It is hindered by free market competition and self-regulation. It supports local small businesses in the reuse and repair sectors, as well as the transference of skills to citizens, necessary for the tasks of maintaining and sharing products.

Table 3
Summary of identified coalitions.

	Coalition 1: Waste as resource	**Coalition 2:** Sharing economy	**Coalition 3:** Individual consumption reduction
Discourse	**Techno - design - recycling** Based on waste management through technical solutions. Supported by sorting of resources at home, design of products for recycling, and producer responsibility. It is assessed by quantitative targets for material recycling (tons).	**Local production - symbiosis** Based on enabling new business models and economic sectors. While facilitating sustainable decisions to consumers and provision of shared resources in the collaborative and shared economy. It requires the creation of new indicators.	**Reduce - reuse - repair** Focuses on consumer power. Changes in behavior and lifestyles must be supported by acquisition of knowledge and skills for repair and reuse, and it can be done through local offering. It also claims the need to regulate markets and producers.
Metaphors (about CE)	- CE is about resource management. - CE's main problem is technical (recovery of materials). - CE is about the recovery of materials (second source materials in the market). - CE is measurable in tons of materials recycled/reused.	- CE is a buzzword (a frame for collaboration that is broad). - CE is an approach to solve environmental problems (emissions). - CE is a way of thinking that requires integration (Green shift). - CE is about industrial/sector integration (industrial symbiosis and scaling of solutions). - CE is the/a sharing economy.	- CE is sharing. - Consumption reduction is achievable through repairing and reuse of products. - The main barrier in consumption reduction is consumer behavior (culture and knowledge). - Local capacity for reusing and repairing products enables consumption reduction. - Overconsumption is the cause of environmental damage. - Value is more than profits.
Storylines	- Planetary limits. - CE is not new. It has been there for many years and now promoted under this concept (since 2015 with the EU CE package). - New targets from the EU for recycling are a motivation to hold on to the concept.	- Planetary limits. - EU CE policy package in combination with the need for local and national policy. - Introduction of CE, through EU projects, such as SMICE and work at the County level. - Climate change (CO_2 emissions reduction) - Need for indicators (assessment tools). - Public procurement.	- Planetary limits. - People/consumers have power but will do the same if there are no regulations on producers. - A local offer of services and Small and Medium Enterprises (SMEs) - Need for a political mandate on consumption.
Aligned informants by sector	**Public:** 1 **Private:** 5 **Hybrid:** 2 **Non-profit:** 2 **Total:** 10	**Public:** 4 **Private:** 3 **Hybrid:** 0 **Non-profit:** 1 **Total:** 8	**Public:** 2 **Private:** 2 **Hybrid:** 1 **Non-profit:** 3 **Total:** 8
Semi- aligned informants by sector	**Public:** 2 **Private:** 0 **Hybrid:** 0 **Non-profit:** 0 **Total:** 2	**Public:** 1 **Private:** 3 **Hybrid:** 2 **Non-profit:** 1 **Total:** 7	**Public:** 4 **Private:** 2 **Hybrid:** 0 **Non-profit:** 2 **Total:** 8
Enacted vision	Waste is managed in inter-municipal plants with technology to mechanically sort material fractions (e.g. near infra-red technology for plastic). These plants provide the resources required to the local market of manufacturers, alongside novel materials from local sources (tree fibers).	The private sector innovates to provide new services for sharing resources (like collective car ownership). The industrial sectors are integrated to produce using local resources and a local value chain (industrial symbiosis and use of seaweed in farming).	Local SMEs are co-located with streams of used products and materials (Similar to ReTuna in Sweden). While the local authorities provide services for the sharing of tools and learning of skills for repair and reuse (library services).

4.3. Storylines

There are common traits in the discourses of almost all the informants. The first one is the adoption of an explanation based on the planetary limits, which requires humans to discontinue the current form of resource consumption. This is coupled to the need to reduce CO_2 emissions to tackle climate change goals. Among the informants from the public sector and those in waste management, there is acknowledgement that CE is not a new concept, instead, it is seen as a buzzword that is not easily put into a practical application.

We identified that some of the informants do not explicitly refer to CE when they talk about different ways of approaching material resources. Particularly, those who set the importance on consumption reduction, do not make a direct link between resource usage and CE. Similarly, those who were already working on new

materials and recycling recognize the importance of a CE, but they do not frame their work as part of it. However, the scope of CE is broad and flexible enough to allow their inclusion by some of the other informants. As a political discourse, CE encompasses several activities, even ones in which the practitioners do not see themselves as part of it.

4.4. Structuration

A first result in the dimension of structuration is that some informants did not refer to CE explicitly, however, they mentioned aspects related to material resources, such as material replacement, local resources, reuse, or recycling. Although these informants do not refer to themselves as carrying activities of a CE, they share some of the storylines and metaphors with those who do. The adoption of CE in the discourse is part of the structuration process.

It means that reframing of existing practices happens in support of specific modes of CE. This reframing is also found in the promotion of a CE by the local government to align actors:

"We cannot have any collision or a different mindset, so we have to be a part of that [CE]. *(…) In that setting, we have to be doing the same things."* (Informant from County council).

Some informants mentioned that their specific understanding of a CE based on principles for material use (reduce, reuse, repair, recycling) also molds their practice, as an example:

"So, we have started more and more to focus on the consumption level. Try to reduce the consumption and more reuse and recycle." (Informant from a civil society organization).

CE had become part of the discourses related to material resources, but lacking content about what to do, which makes it a concept open for reinterpretation:

"… we would like to hear someone saying what a strategy for the CE should look like and answer which questions. There is still no one to say it because it is an area where development is moving very fast, and we are learning new things all the time." (Informant from national government).

The County is self-governed and acts in its own interest in regional development. In this regard, the statement from the national government informant has no direct influence on the shaping of CE to our knowledge. However, it seems that the regional focus of the County, but also the other interviewed actors, may influence national policy development as the government has openly sought for local and regional examples of how CE can be enacted. As a concrete example of CE implementation, the County has come far in establishing a new facility for reducing waste and prolonging product lifetime of products in the region (co-location project).

Other informants pointed to the management of resources, with reuse or recycling as central issues, but struggled to identify the main aspects to assess it as part of their integration to CE. However, they take on CE by adopting the term and later assessing their practices:

"So, Trøndelag says that the circular economy is one of the five most important things, and the companies at [name of an industrial park], *they did not know what the circular economy was."* (Informant from a local industrial park).

"… we don't have any formal competence within our organization, or anyone educated on circular economy, no real advisors on circular economy at the organizational level, but it all comes from the work with it [recycling].*"* (Informant from a local recycling company).

Another aspect of the structuration of CE in Trøndelag is related to the diffusion of the concept. The government and industrial production clusters promote it based on abstract aspects (such as policies and instruments for assessment). While at the practical level, such as in the municipal services, the retailers, and small enterprises, CE's adoption is part of an ongoing discussion with other actors.

"It started when [advisor from Trøndelag County] *came here and told us about this. Then we said yes to try to be one of the businesses or people that organize it, try to make it happen."* (Informant from local small business).

The structuration of discourse is also related to shared storylines. In this case, we identify a shared storyline about the planetary limits, which implies that resources should not continue to be exploited or used as they currently are. Nevertheless, motivations for acting are different according to the organization's proximity

to citizens. Informants closer to citizens/consumers, in municipal services or trade of second-hand products, see resource consumption as part of individual behavior and needs. Those in government agencies and industrial clusters, look at resources as part of political goals. Two quotes exemplify it:

"Being efficient with your resources happens more by necessity than by idealism. So, people are more willing to look at less wasteful ways of doing things when they can't afford to be wasteful." (Informant from a local civil society organization).

"Politically, we have two priorities, and they are cutting greenhouse gas emissions and taking care of nature… I don't think we will succeed either in cutting enough greenhouse gas emissions or taking care of nature if we do not change the way we use our resources, and that is when the CE comes in…" (Informant from national government).

In the structuration of CE in the region of Trøndelag, indicators seem to have a strong role. The CE vision by the EU imposes specific goals on recycling but not on other aspects such as consumption as exemplified in the following quote:

"… resource consumption [referring to individual consumption] *is not sustainable, then you have to find out through indicators and numbers what is the problem you want to deal with."* (Informant from municipal government).

In summary, the process of structuration of CE discourses is currently unfolding. At the national and county levels, in both the discourses of those in the public sector and those in organizations with private interest, it is actively promoted as waste management and new business models. At the municipal level, small enterprises, and civil society organizations, the concept is contested by including concerns related to individual consumption and challenging economic growth as the central goal. This is exemplified in the following two quotes:

"… by saying that it's only the increase of revenue of businesses that will make the city center livelier. Then we are really stuck with our own shit in a way, in capitalism everything must be money.(…) But the State hinders the more sustainable, more local driven, all these, like grassroots initiatives, which are probably not reported as properly as possible." (Informant from municipal government).

"… we have too much money, too much of everything, and of course if you go back to my grandparents (…) They didn't have much… it's not that many years [since] *and the mentality has changed… if something is broken you have to repair it. But now, we say that if something is broken, I have to buy a new one… If you think about Norway, after the 1950′s and forwards, we have more and more money, and better and better lives. Not for everyone of course, but for many."* (Informant from local library)

4.5. Institutionalization

The dimension of institutionalization refers to the stabilization of discourse in systems, physically or in policies. We have identified three sets of visions that compete to be stabilized systems of CE, each corresponding to one of the three coalitions. The first one prioritizes recycling and technology required to reach the targets set by the European Commission. The second prioritizes sharing economy and new businesses as it is promoted by the County council. Furthermore, a third one prioritizes reducing consumption through individual actions by acquiring less, reuse, and repair of goods with local offerings.

In the waste management sector, informants share an awareness of CE as something they must put forward by following a po-

litical mandate on recycling targets and markets for recycled mate-rials, as established by the EU for 2030. In this perspective, CE has a risk of failing if there is no local market for secondary resources, and if recycling is not made more efficient. For example:

"They [the government] *only used policy instruments in one end* [waste management] *without doing anything to help out in the other end* [producers] *when we have sorted out the fractions, and the fractions must be used* [have a market]. *If it is not used, it is going to be burnt."* (Informant from the cluster of municipal waste management companies).

"… we recommend using technology, as it is done in ROAF, a plant north of Oslo, where they have some machines that separate the fractions, and it should be the model for all of Norway." (Informant from a cluster of packaging producers).

Solutions to the implementation of CE are also framed as about sharing existing resources, whether in the industrial sector as in-dustrial symbiosis or in the small business, in collaboration to share materials and knowledge. Unlike in recycling, the targets for sharing, or the way to proceed with it, has no political mandate. Informants from the public sector frame it as something they can-not take on, and the private sector must provide the solutions. An example mentioned is membership service for car sharing:

"… the sharing economy, it is super important… the carpool, for instance… with them, you do not own the car, but you are owning the ownership of a lot of cars, and then you're just using it when you need a car." (Informant from a civil society organization).

The third set of solutions expressed in some informants' dis-courses relates to the repair and reuse of existing products. As with sharing, there is no political mandate about consumption reduc-tion, as that would suppose a transgression of the public sector into the private ones. That's why it requires the effective use of knowledge to convince other stakeholders in the region:

"… we do not go out and say that now consumption will go down. We go out and talk about it being "smart" to share." (Informant from the municipal government).

There is general recognition about the need for overall reduc-tion of consumption of resources. However, at the local level, in the discourses by two informants at the municipality and those in small enterprises in Trondheim, reduction of consumption is about individual consumption of products, and there is aware-ness about a need for regulations or restrictions to be imposed on manufacturers and commercial actors. We can assume that con-sumption approaches and debates will become relevant to CE dis-courses in Norway, for instance the Circularity Gap Report Norway by Circle Economy (2020) – a non-profit organization for the pro-motion of CE in Europe, reports that the Norwegian economy is only 2,4% circular and sets part of the blame on the high consump-tion patterns in the country.

At the Trøndelag County level, consumption concerns are en-acted by prioritizing the sharing economy and putting it forward through the provision of support for small businesses, more specif-ically in a project for co-location of commercial offerings for repair and recirculation of used products. However, an alternative path is the voluntary work of repairers in teaching repairing skills and the provision of spaces for people to meet to engage in repair and reuse practices. Trondheim Municipality also promotes reuse by of-fering tool sharing services at local libraries and has targets for product reuse at the local waste management company set through a second-hand store.

Although the enactment of the three discursive visions is in place to some extent, the institutional dimension is dominated by waste recovery targets, as evidenced in the adoption of EU's

quantitative targets for material recovery, particularly of plastics. The targets are used to measure reuse and recycling from waste streams, as indicated by an informant from a local waste manage-ment enterprise: *"… we do have the goal of x kilograms per inhabi-tant, so it is like lean - we have some KPI's. We will start with it by kilograms."* This dominance aligns with the goal of green growth through revalorization of waste as resource and has a political mandate established by default. In contrast, concerns about indi-vidual consumption are an emerging discourse.

The informants in this study show agreement on a storyline about planetary limits. Despite existing academic contributions supporting this understanding (e.g., Rockström et al., 2009), eco-nomic growth and market competitiveness dominate in practice. This dominance favors the emergence of a CE based on businesses and profitable green technologies for recycling under the so-called green growth, which argues that it is possible to decouple eco-nomic growth from nature's degradation. We set out to look closer at the relationship between our informants' storyline of planetary limits and policies supporting green growth. To showcase this, we present some excerpts from policy documents.

In Norway's current national governmental political platform 'Granavolden' (Statsministerens kontor, 2019) it is stated that "[t]he government wants to lead a policy which strengthens Norway's com-petitiveness, creates green growth and new green jobs while climate gas emissions are reduced" (our translation). "The global challenges related to the climate and the environment require a readjustment to a society in which growth and development take place within na-ture's sustainability limits. Society must go through a green shift." (Trøndelag Fylkeskommune, 2019). Growth is latent in work to-wards a more sustainable future. At the municipal level, in Trond-heim, consumption reduction also appears in the discourse. The energy and climate plan for 2017–2030 states that "reduction in consumption is, therefore, a key to reach long-term goals of reduc-ing climate gas emissions" (Trondheim Kommune, 2017). The plan also argues that "green workplaces within energy production and en-vironmental technology are expected to become a significant source of growth globally" (ibid., p. 37). This evidence shows that continued growth is politically motivated, in line with Hickel & Kallis' (2019) assumption of policies being drivers of (green) growth thinking.

5. Discussion

We start this section by mentioning some limitations we en-countered during the analysis. A first limitation of this study re-lates to the identification of key informants in the region, which we have already addressed in section three. We do not think this invalidates our analysis, but it opens the door to reframe and ex-plore through research the presence of other actors whose dis-course and practices are 'circular in nature' but not yet recognized as such.

A second limitation is how discourses and visions relate to practices under CE, to support its realization. Although we meant to illustrate and exemplify them through our inclusion of enacted visions in the empirical case, we acknowledge that there is a gap between the utterances and the actual practices that will be en-acted based on the visions formulated. Particularly in CE, it is diffi-cult to take a stance on competing aspects in practice. We do think that we have covered this to some extent by providing insight un-der the light of economic growth, but it could also be fruitful to conduct a similar analysis connected to other aspects, for example, social justice.

Under the two dimensions put forth by Hajer (2005) and link-ing emerging CEs to the dominance of (green) growth, we find that growth underlies the institutionalized vision in Trøndelag. It is a result of the process (practice) by which it has been adopted, i.e., mainly by following the ideas exposed by the European Commis-

sion. Under this adoption, the enactment of CE's follows the goal of economic growth decoupled from environmental impacts. This way of thinking favors discourses based on technical solutions, such as those for recycling. The national government has taken on the European Commission's stance on waste as resource which furthers the political desire to develop recycling facilities. Despite this, it is the local companies dealing with waste management that decide how to take care of waste and which solutions to pursue. However, there is a rupture in CE's local discourses, which appears in some of our informants' utterances as cautious incursions that question economic growth as the central goal.

The economic imperative of growth is a political goal supported in the foundational belief that accumulation of wealth leads to general wellbeing, so economic growth acts as an ideology (Van Dijk, 2006) that underlies these discourses. CE discourses that align with the European Commission's targets and strategy do not diverge from economic growth's status quo. However, when a reduction in individual consumption is part of the discussion, this foundational belief becomes weakened.

Questions to the centrality of economic growth appear when matters of individual consumption are part of the discourse. This discursive divergence from economic growth is not constitutive to CE; instead, it is a tangential aspect that is not concerned with its technical implementation. It is mainly ignored by informants that align with the coalition based on waste as resource and recycling; it is taken as a solvable dilemma by those in the sharing economy coalition, and it is more strongly present in the speech of those in the reduction of consumption coalition. To some extent, Trondheim Municipality and some of the civil society organizations act on it. Some of these informants take a stance on money and capitalism as dominant mediators for human relations but seem unable to break with the business as usual of economic (green) growth or come to terms with an alternative proposition.

We found that none of the CE discourses are competing or contradicting each other in their technical implications. However, two of them are dominant because they align better with the current goal of economic (green) growth, making them the institutional default. On another end, the third coalition represents a pathway that requires breaking from economic growth dominance. It means that discursive and practical incursions on consumption reduction could be the base for an alternative CE. Rethinking CE's technical implementation may also be necessary if recycling or new business models are not the priorities. A different infrastructure and organization for material circulation and provision will be required if aspects of individual consumption are the focus. Such predicament implies actively integrating the collective aspects of consumption.

In section two, we introduced the typology of CE discourses proposed by Calisto Friant et al. (2020), which classifies discourses of circularity according to their integration of social, economic, and environmental consideration, crossed with their perspective on technological innovation and ecological collapse. If we use this typology, in our empirical case we find that the CE discourse in Trøndelag is dominated by a view of reformist circular economy, which sees compatibility with capitalist forms of organizing the society — included with the goal of economic growth. But there is also an opportunity to go a step further and reach a transformational society discourse through CE, which appears through the coalition based on consumption reduction. Although this opportunity is open, it would fall short if social aspects are not deliberately included.

Considering the points made by Johansson and Henriksson (2020) and Nikitina (2020), to become a more than a reformist discourse, consumption reduction requires an integration of social aspects, which include social justice and questioning what is produced and why (Genovese and Pansera, 2020). We reiterate that some of these aspects are already present in the discursive utter-

ances of some of the informants, however, they are not articulated as they compete with the dominance of economic growth in support of the creation of new revenue-creating business opportunities.

The coalitions based on waste management and sharing economy reproduce technocentric, eco-modernist solutionism. However, a CE which emerges from the acknowledgement that resource depletion is inevitable within systems of capitalistic accumulation (Savini, 2019) would require to recast CE as an integral aspect of the living system of consumers, implying new modes of organization and distribution of work, more active forms of participation of the citizenship and uptake of services by the local authorities or organized groups of citizens.

In the case of Trøndelag, it means a reevaluation of the mechanisms for the introduction and disposal of new materials and products, which is an aspect that currently cannot be put forward without the political involvement of citizens. It also requires a local autonomy that is not possible due to current governance forms mediated by EU market regulations (enforced via EEA rules) and national policies.

A CE including consumption reduction and social aspects is more than just a discursive divergence from the political authorities. It represents a need for a restructuration of the everyday life of citizens. In reduction of consumption, as assumed in the identified coalition, CE would imply restrictions to production and retail, and therefore loss of convenience. This is a divergence that is similarly addressed in discourses that are tangent to CE, such as degrowth, sufficiency, and minimalism. But even those require a recalibration of the technical expectations put on materials and products. Table 4 presents a comparative speculation of what an alternative CE in the sense described here could be.

The speculation in Table 4 does not encompass all the aspects concerning the material dimensions in a CE. However, it offers a glimpse of some of the factors that could directly affect the technical development of CE when the priorities and goals from which it emerges are modified. The integration of consumption reduction means creating spaces and opportunities for citizens to have an everyday life with fewer interactions in commercial activities, thus moving away from the consumer's society. This is well pictured in our empirical case in the activity developed by the local libraries in becoming centers for the loan of tools, in addition to the realization by informants in the non-profit sector and the SMEs about the need of intervening on the market system. This latter aspect is better exemplified in an organization that freely circulates products, such as furniture and bicycles, among students in the city, supported by the voluntary work of other students.

The role of the market, an aspect that is amplified in economic growth driven societies (Wiedmann et al., 2020), is reflected in the concerns raised by the informants, at the local government level (county and municipality), about the kind of activities that should take place as part of the regional development. It is also supported by informants from SMEs in the form of regulations to production and retail. This means that the role of the market in society would have to be reduced or regulated. That is, however, an aspect to be questioned in further research. We found that steps in support of this alternative CE are being taken in the region we presented, but they are still not well articulated because of the dominance that economic growth has over the modes of thinking. It is exemplified in the project for the co-location of CE related initiatives and resources; it is framed in support of new business models and possibly their profitability, but it also has the potential to be a space for the formation of a local community for transference of skills and materials for slow paced consumption and production. This aspect is framed in mentions about repair and reuse practices promoted through education programs and activities for skill transference. The latter put to practice by the local libraries in Trondheim.

Table 4
Comparative speculation of alternative emerging CEs.

	Linear economy	Economic Growth CE	Consumption reduction CE
Material circulation	- Global import/export of raw materials. - Local waste management.	- Recycling technology. - New renewable materials. - Local markets for secondary materials.	- Fewer products to satisfy life's necessities. - Local markets for re-use of products and materials.
Product life	Short life, fast pace of replacement.	Long life, replacement when desired.	Long life, replacement of components when no longer functional.
Production	Continuous production.	Provides services for repair and recovery of materials.	Restricted and distributed.
Responsibility over materials	Transferred with ownership at retail point.	Manufacturer, in some cases maintaining ownership of materials.	Organized citizens or public authorities.
Consumption	Based on commodities and as frequent as possible (keeps sales up).	Supposes dematerialization and access to products when needed (as a service).	Planned, and restricted. Expected forms of production for own consumption.
Source of resources	Mining from natural sources.	Material mining from waste streams.	Local available sources first and conservation.
Value of resources	Availability of raw materials.	Supply and demand.	Attributes given and personal attachments.
Distribution	Global value chains.	Local providers.	Local providers and self-production.
Role of markets	Central to all aspects of life	Central to all aspects of life.	A regulated space.
Infrastructure for materials	Transportation by commercial actors and waste management as a public task.	Transportation and stock tracking by commercial actors.	Stock tracking and open spaces for reuse and repair.
Consumer skills	Capacity to pay for the acquisition of products.	Knowledge about care for product-services systems.	Assessment capacity for product reparation and material quality. Knowledge about a local network of skilled people.
Waste	Externality of the economy.	Valuable resource that can be recovered and re-cycled many times.	Avoided by avoiding overconsumption.

The emergence of this local CE, however, can be hindered by the decisions taken at EU and national levels.

6. Conclusion

In the introduction, we set the task of identifying CE discourses and their visions to discuss them as CE's alternative pathways. We identified that economic growth is a foundational goal that drives the current discourse of CE. We studied discourses of CE in practice through an empirical case of an emerging CE in the region of Trøndelag in mid-Norway, and identified three discourse coalitions, with actors from different sectors, supporting or reproducing three visions:

1) Waste as resources based on a vision of better product design and waste sorting technologies making recycling more efficient.
2) Sharing economy based on a vision of industrial symbiosis and new business models for local commercial offerings in sharing, reuse, repair of products.
3) Reduction of individual consumption based on a vision of individual changes in lifestyle, coupled with local services and skill acquisition/transfer for reuse and repair instead of acquiring new products.

The visions in these coalitions are not mutually exclusive; instead, they represent different priorities on how to enact a CE. With regards to our hypothesis: CE's alternative discourses and practical performances originate from alignment with or divergence from current dominant political goals based on economic growth, which result in competing visions of CE. We see competition in the priorities emerging in relation to the goal of economic growth, this was not so evident where only the technical solutions were addressed.

Focusing on structuration and institutionalization of discourses, we concluded that two discourse coalitions are dominant by default as they build on notions about economic growth. Ideas related to the reduction of individual consumption compete with those about economic growth, and could be the basis for the emergence of plausible alternative CEs. Furthermore, this competing aspect is evidence of economic growth's function as an ideology that is maintained or challenged as part of the status quo. The focus on recycling or new businesses as venues for economic growth is only questioned when individual consumption is raised as a concern. Thus, the practical enactment of a CE, its visions and priorities, are also subject to the requirements for economic growth.

By problematizing economic growth as a foundational belief, a question emerges about which central goals could drive alternative CEs. For example, in a hypothetical scenario in which reduction in individual consumption becomes the central policy goal, how would the necessary reduction be assessed? What would be the technical challenges? Would the general civil society back government-regulated consumption? Moreover, which roles would current commercial and waste management actors assume? These questions are material for a future research agenda. With our empirical case, we offer evidence that the central goal of economic growth hinders at least one emerging way of thinking about CE.

The main contribution of this article is that we have provided evidence that CE can be conceived as emerging from a different center, that of consumption reduction, which we found to be present in an existing discourse coalition that can be better articulated in practice. We believe that this evidence can contribute to the formulation of technical and political proposals, which consider this alternative perspective as a plausible pathway while envisioning concrete interventions required to move it forward.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.spc.2020.10.011.

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Article 2. Contesting Consumerism with a Circular Economy?

Contesting Consumerism with a Circular Economy?

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Abstract

The circular economy (CE) concept has recently entered the public discourse. A CE should contest the reproduction of a so-called linear economy. However, it is largely promoted as a normative top-down fix for business models and waste management. A branch of CE research calls for critical revisions of the concept to support the integration of social aspects. A related shortcoming is the lack of definition of the change that CE can bring about. Two research questions guide the work presented in this article: (1) What should be included in a socio-cultural and institutional framing to study CE? (2) What could leverage an alternative CE? We address the first question by proposing practice-driven institutionalism as a relevant perspective, focusing on studying consumption practices — practical engagements and alternative logics. We further apply a practice-driven institutional framework to an empirical study of cases from sources in a city in Norway, where consumption and production practices are highly embedded in consumerism. For the second question, we describe consumerism and its institutional dimension as the backdrop against which practical engagements are negotiated. Finally, we identify aspects of alternative logics bundled with these practical engagements. In conclusion, the article proposes a practice-driven institutional approach to socio-culturally frame CE and to identify grammars of practice that can leverage change that does not rehearse consumerism. In the specific case of our study, we highlight contextualizing use-value through social relations as a critical part of an alternative CE.

Keywords Circular economy · Practice-driven institutionalism · Consumption · Alternatives · Consumerism

Introduction

The circular economy (CE) concept has recently entered the public discourse. Most CE proponents engage normatively in structural change at the macro-level of society — for example, in Europe through an action plan as part of the European Green Deal [1].

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However, approaching change top-down from institutions disregards complex micro-level dynamics (c.f., [2]). Although CE is an expected transition prescribed as part of public policies and environmental responsibility programs of private companies and non-profit organizations [3, 4], previous literature from social sciences posits that a CE could be "a recalibration of our socio-material lives" [5, p.173]. In its discourse, a CE can serve diverse narratives [6] with space for contestations and controversies [7]. In this article, we take a substantive perspective of the economy (c.f., [8]) to elucidate contestation from the micro-level.

Public discussion about CE has mainly taken an eco-modernist narrative [9] based on promises to strengthen business opportunities [10] through technologies and waste management strategies — enabled through policymaking. These promises are logical expectations within current production and consumption institutions. In these institutions, capitalistic principles of market competition and accumulation signal the potential of waste as a valuable source [11] without questioning the social arrangement that leads to high consumption of resources and waste creation [12] — which could cause more harm than benefits [13, 14]. In this sense, following formal economic objectives would quarrel with the substantive functions of the economy (i.e., the reasons to use materials).

The need for a socio-cultural framing to research CE is at the center of the agenda proposed by Hobson [5, 15, 16]. Such a socio-cultural framing should comprise methods and knowledge to uncover what, how, and why materials are consumed. This agenda is part of an emerging branch of critical CE research. It expands the concept of CE beyond market-based techno-fixes, in the words of Hobson [16, p.112]: "so that our collective ability to participate in called-for transformations is not limited to just the shopping mall or the recycling bin." Research that critiques limitations of the current implementation of CE complements research that seeks to include social aspects into CE (e.g., [17]) and shares an awareness about the need to consider which type of society a CE requires [18, 19]. Critical research on CE intends to answer some of the concept's shortcomings and, at the same time, refocus or rethink the goals for CE implementation — for example, looking at temporality, space, and material flows of practices [20] and consumption work [21]. Thus, it calls for an approach to study CE that integrates the micro-level and contextualizes people's agency in negotiation with the macro or more structural aspects.

A particular shortcoming is the lack of definition of what kind of change a CE brings about. This shortcoming concerns the goals and priorities beyond the incumbent institutions following a formalist economic model. In this regard, Anantharaman [22] argued that CE can only be an ecological and equity win–win if it does not emphasize growth and profit. For this author [22], resistance against hegemonic expertise could be integrated into CE to avoid appropriation or displacement of what people already do — the everyday CEs. Wuyts and Marin [23] also questioned the reliance on particular technical knowledge that "nobodies" CE actors whose aims are incompatible with CE's mainstream business setup. These "nobodies" are invisible in the core of CE "because the nature of their work is small-scale and they operate in a landscape (city, region) where more technocentric discourse dominates the funding and marketing of CE transitions" [23, p.3]. Furthermore, these everyday circularity experiences may offer access points for alternative institutional forms and means.

Mainstream CE — discourse — sideline consumption or demand-side interventions. According to Isenhour [24, p.28], "[CE] is highly consistent with the technocratic and market-based solutions that have characterised sustainability efforts to date." Moreover, Welch et al. [25, p.50] argued that a CE presupposes a new consumption model "that embraces… novel norms of consumption and emotional and motivational engagements in

consumption." In line with these arguments, CE is a spectrum of opportunities for change in institutions and practices (further explained in "Making Sense of a CE").

Two research questions guide the work presented here: (1) What should be included in a socio-cultural and institutional framing to study CE? (2) What could leverage an alternative CE? For the first question, this article considers a practice-driven institutional framing ("Making Sense of a CE") and a theoretical discussion about consumerism and its logic ("The Logic of Consumerism"). For the second question, the article studies cases of alternative practical engagements ("Practical Engagements") to elucidate the potential for a CE that considers aspects bundled in practices that engage actively with the logics of consumerism ("Discussion"). Finally, the prospect of alternative logics is discussed as an opportunity to drive institutional change ("Conclusion"). The following section presents our approach to the socio-cultural framing of a CE.

Making Sense of a CE

A CE considers the interactions between economic activity and ecosystems to reduce or eliminate environmental degradation. In 1990, Pearce and Turner [26] offered one of the first formalizations of the concept. In their definition [26], the environment provides two main functions: (1) a source of resources and (2) a sink for waste — economic activity is situated in the interim between resource extraction and waste sinking. Based on this definition, these authors propose an economy that is a closed-loop system through recycling and renewable resources, avoiding new resource extraction and waste sinking but requiring more energy to transform materials.

More recent definitions of CE make it compatible with a slow economy. These definitions integrate repairing [27], the sharing economy [28], consumption reduction as proposed in de-growth [29], sufficiency [30], and political systems of provision for urban transformation [31]. This integration of CE is often captured in definitions and applications of CE in catalogues of so-called R-strategies, which organize the use of materials according to cycles or loops of consumption based on a waste management hierarchy formulated as principles of reducing, reusing, and recycling [32]. R-strategies that do not destroy the properties of materials are of particular importance to a slow economy, as these extend the lifespan of products while avoiding the tradeoffs of recycling and recovery.

Operationalizing CE

We operationalize the expansion of CE from a closed-loop system to lists of R-strategies under three conceptual assumptions. First, there is not only one CE but multiple alternatives resulting from different political-economic resource use and distribution arrangements, requiring different logics, practices, and institutions [7, 24]. Possible CEs have been identified and classified in alternative discourses [18], governance or technological alternatives [19], or even imaginaries about everyday life and consumption [25] — each alternative is based on different uses of technology, resource distribution, and social arrangements. As Morseletto [32] notes, the targets for a CE depend on R-strategies, but some strategies avoid the need for intensive implementation of others. For example, the higher recycling and recovery targets become obsolete by refusing to have new products or functions. We understand this as the need to first focus on reducing the sources of waste before dealing with waste as a technological problem.

Second, a CE is supposed to organize the material throughput of societies within the constraints of the load and regeneration capacities of environmental systems — what some have called an integration to a safe space of planetary boundaries (c.f., [33–35]). Furthermore, a CE is based on achieving circularity, which requires keeping extracted resources in use for extended periods while preventing their leakage as waste. However, the means to reach circularity is what differentiates each alternative CE (the selected R-strategies and targets). Zotti and Bigano [36] have pointed to a distinction between circularity and strategies to achieve it. Circularity is a goal, but approaching it depends on what is prioritized. For example, from a neoclassical economics perspective, it is seen as a tool for decoupling resource use from economic growth [37] through technological means — not affecting consumption levels and avoiding demand-side interventions, which are included in alternative approaches [9, 20, 38]. We translate this into two modes of organizing the material throughput. In the first one, providing technological innovations is expected to make it easier to deal with waste without requiring changes in consumption. In the second mode, changes in consumption are deemed necessary to reduce the need for technological innovations.

Third, the concept of a CE emerges in parallel and opposition to the concept of a linear economy (LE). Any CE is, first and foremost, an alternative to a LE. Although the LE is simplified as a logic of "take-make-use-dispose" that remains from industrial societies, its foundation in a social arrangement is seldom discussed by CE proponents. An earlier inspiration for CE, by Boulding [39], acknowledged a social structure by referring to it as the "cowboy economy," but its logics are not framed. In this social arrangement, production and consumption are entwined with the formalist economic imperative of growth; as Jackson [40] describes, the focus on economic growth also drives growth in material usage. Notwithstanding, economic growth — measured as growth in the gross domestic product of countries — has been the core of policies in most of the world in the last century. It has led to both an increase in living standards and overall material consumption, in most cases without considering the bio-physical limits of the planet [40].

This article takes a practice-driven institutional perspective (PDI, hereafter) on change [41–43]. From this perspective, a CE that is driven by institutional forms, norms, and values that thrive in the LE cannot produce the required socio-cultural change. In extension, the logics for a new societal arrangement — and institutional forms — could be met by looking at the logics in practices at the fringe of the mainstream CE discourse.

Practice-driven Institutionalism as a Socio-cultural Framing

We propose a PDI perspective, which borrows characteristics from practice theory [42], for example, a flat ontology that connects the macro and the micro by assuming that institutions are bundles of practices with intrinsic and extrinsic connections to other practices (i.e., larger ontologies). Levels of organization in institutional theory, as individual, organizational, or societal, are considered helpful when analyzing practice bundles but not as a model of reality [41]. At the same time, the origin of institutional change is tracked down to practice change. Thus, it is necessary to look further at social practice theory.

Social practice theory models intend to bridge social structure and individual agency theories by recognizing learning modes and bodily dispositions through which social practices are inculcated (see [44]) — as a cultural theory based on bodily and mental routines [45]. Practice theory can be modeled to explain practice change from the interactions of meanings, competences, and materials (e.g., [46–48]). According to Shove et al. [49],

practices have to be analyzed as a duality. First, practices are entities with specific socially shared routines involving materials, meaning, and competences. Second, practices are performances carried out by people and materials while negotiating mental and physical dispositions. The study of practices as entities and performances facilitates the identification of competing links and elements for recruiting participants to alternative practices.

In Shove et al.'s [49] model, practices are connected in bundles or complexes that organize time and space. Practices are carried within the limits of, at the intersection of, or instead of other practices (including alternatives). Shove et al. [49, p.135] noted that "the emergence, persistence, and disappearance of practices (guided and structured by dominant projects) generates highly uneven landscapes of opportunity and vastly unequal patterns of access." Similarly, Bourdieu's [50] concept of habitus explains how practices are produced and reproduced within a determined set of conditions that make possible the production of only some thoughts, perceptions, and actions. From a PDI perspective [41], the institutional logics pose an understanding that frames the possibilities for experimentation and improvisation in alternative practical engagements.

PDI [41] presents a framing based on logics. It assumes that logics are a foundational component of both practices and institutions and that they change through practical engagements. Smets et al. [41] propose looking at bundles of practices using grammar as a metaphor, where practices are like sentences, activities as words, and bundles are paragraphs or whole texts. To Smets et al. [41], the grammar of practices is related to what institutionalists refer to as logics, and what Schatzki [51] and other practice theorists [52] call "practical," "general," "shared" understanding, or "organization rules." These are as "ideational elements common to multiple practices" [52, p.184]. For example, it is possible to perform cooking activities inside a toilet. Still, it breaks the grammar of the practice of cooking, making it shocking or unintelligible for others — unless it becomes the norm. An example of grammar breaking is presented by the study of Debnath et al. [53], where qualitative changes in housing (rehabilitation) drive changes in the acquisition of electric appliances and increase electricity consumption.

The extent of the changes that a CE could bring about cannot be understood by focusing only on the material aspects — in loops or efficiencies [5, 54, 55]. Furthermore, a CE requires knowledge and intervention to target what people want and think they can do as part of their everyday lives [16, 56]. The logics necessary to carry out practices in the consumerist social arrangement [12] will influence any given CE. Material circularity could ensure that resources are used within a safe space or closed system. However, the influence of a more extensive politico-economic logic could result in similar forms of environmental and social harm as in the LE [13]. For example, shared micro-mobility services with small electric vehicles (e-scooters) follow a different logic than walking or using a car. These practices are normalized through infrastructure made available in cities and individual mobile devices. These vehicles replace other forms of transport such as non-electric bikes, mass public transportation, or walking while increasing energy use and the replacement rate of e-scooters, sometimes without reducing the use of individually owned cars [57].

Circular Economy in Practice and Institutional Change

As a top-down transition, CE aims at change within the current institutions without replacing said institutions. Anantharaman [22] mentioned that the institutionalized CE discourses make little room for conflict between groups and competing interests. Similarly, Völker et al. [58] pointed to CE as a moral narrative for a future that is not concrete but desired

and expressed in the formulation of indicators. Accordingly, it is necessary to look at CE from a non-normative perspective based on its practical implications, recognizing that current logics and institutions will condition any CE. For example, Casson and Welch [59] argued that some forms of material consumption that could be deemed "circular" existed in the past and were legitimated under logics corresponding to class and distinction, not under ecological imperatives.

Then, why is it necessary to look at practical engagements to study the change in a CE? The LE can be taken as a group of ideas that helps people make sense of their participation in specific modes of production and consumption [60], with grammar for practical engagements that are negotiated against institutional logics. Mainstream versions of CE originate in waste and resource management [61] and are translated into a sustainability program oriented by the logics of market and business organizations [30, 62]. But there is space for reclaiming the concept [22, 23, 63] from alternative logics.

Logics connect practices and institutions as representative concepts of micro and macro-level societal foci, where logics are required to perform practices and sustain institutions (c.f. [41]). Within the LE, the link between production and consumption is determined by the dominant logic of market and mass consumption — consumerism [12]. Furthermore, CE can be assimilated to and conditioned by this prevailing logic. In response, the articulation of alternatives within CE discourse is addressed in previous literature (e.g., [6, 9, 18–20, 22, 37, 60, 63–65]). These include contentions about the narratives and worldviews that a CE serves [6, 37], the need to resist techno-fixations [9, 64], and the incorporation of bottom-up approaches [22, 23, 63, 65]. Holmes et al. [20, p.71] argued that for a consumer discourse on CE to be successful, it must recognize "labour and skills involved-labour which often blurs the boundaries of production and consumption." Said boundaries remain blurred in modes of CE that focus on providing services that move people from consumers to users of servitization and platforms, an argument raised by Hobson [15]. Although services provide alternative modes of acquiring products, these do not address why, what, and how people consume and could instead rehearse the norms of the LE. From our perspective, the study of alternative logics recognizes people as doers and not just users of a CE [60].

Case Studies of Alternative Logics in Norway

We apply PDI as a socio-cultural framing to research CE by taking consumption as the locus of study. A PDI change perspective is a recent development in social research. From this perspective, institutional change is explained as a result of change in practical engagements [41]. Therefore, we focus on cases of practical engagements that do not rehearse the LE.

This study is a short-term ethnography [66] with a purposive sample of cases of practices of repair and reuse — as part of R-strategies that do not destroy the properties of materials. The sampling included "niche" practices carried on by individuals without profit goals, that negotiate, improvise, or adapt in relation to the grammar of consumerism. The sample emphasizes alternative consumption practices as an opportunity to gain insights into new grammar for consumption. The opportunities for an alternative CE come from the degree of legitimization that the practical engagements make of the institutional logics of consumerism.

The qualitative fieldwork was conducted in Trondheim, a city and municipality in Central Norway. This fieldwork was conducted between August 2020 and April 2021. Trondheim's population presents characteristics of affluence [67] — for example, high disposable income per capita. Norway has a high-income population, occupying position five in disposable income per capita among the 38 OECD [68] countries and a high volume of material consumption per capita — nine in a list of 164 countries [69]. This means that most people in Norway — including Trondheim — can fulfill their material, financial and social needs — as is shown in data by Statistics Norway [70]. Moreover, the population of Trondheim is both highly educated and also removed from production labor — around 85% of the inhabitants work in the service economy, and 46% have completed 3 or more years of university education [71]. The affluence in Trondheim also means that most consumption practices and everyday life are highly embedded in the consumerist grammar shaping the LE. Our interest is to identify and construct aspects bundled with practical engagements, pointing to alternative logics of consumption negotiated within consumerist institutional logics.

A previous study [72] gave the authors an in-depth understanding of private and public actors engaged in CE in Trondheim — where consumption reduction in support of CE is featured against the dominance of the techno-business in discourse. Consumption reduction requires a grammar of practice and logic different from the ones rehearsed in consumerism.

The research method followed four steps:

1. Immersion in the local context. In addition to the previous study [72], the first author did exploratory fieldwork by monitoring events and social media of organizations and activities related to climate change, waste reduction, and circular economy. The exploratory fieldwork was unstructured and conducted from August 2020 to October 2020, mainly aimed at identifying and recruiting sample cases (see Appendix 1.A).
2. Data collection through interviews, and observations. After identifying a range of practical engagements in the city, the researchers contacted the carriers of the identified practices to do observations and interviews. Most of the collected data came from interviews, while some came from observations (see Appendix 1). The participants in interviews and observations were contacted through digital means (viz., e-mail, Facebook pages).
3. Primary data sources. Interview transcriptions (9) and memos from observations (8), and social media monitoring (4) were the main data sources.
4. Data analysis. Analysis was inspired by constructivist grounded theory [73] and informed by previous research and literature, particularly the selection of themes presented in "Practical Engagements". The data analysis followed these steps:

   a   The cases were grouped concerning the similarity of the practice.
   b   The logics of each practice were interpreted as part of a practical engagement (a grammar of practice).
   c   The logics in each group were analyzed as a negotiation of practice –against the backdrop of consumerism.

The results of the study are presented in "Practical Engagements". First, "The Logic of Consumerism" builds on consumerism as the backdrop to the practical engagements in the sample.

The Logic of Consumerism

Bauman [12] distinguished between consumption and consumerism. For this author, consumption is ahistorical and necessary to support human life. Unlike it, consumerism is a historical social arrangement, making sense only in capitalist industrial and post-industrial societies based on market freedom. In consumerism, excess is an attribute of society, where a constant increment in volume and intensity of desires prompts a speedy replacement of objects. Bauman [12] argued: "… the advent of consumerism augurs the era of 'inbuilt obsolescence of goods offered on the market and signals a spectacular rise in the waste-disposal industry…" [12, p.31].

Bauman's [12] contention is that consumerism is an economy of excess, waste, and deception, supported by ideas of market freedom — with people as consumers free from the self and free from others based on choice. Furthermore, according to the author, care — or caring for others — is a counterpoint to these freedoms, and because of it, it does not feature in consumerist utopias.

In a critique of the consumer society, Baudrillard [74] conceived consumption as a system of signs that shapes individuals and group relations — in other words, as the site of social struggle. In this critique [74], consumption is a system that creates distance from the reality of production. Products appear like magic for those who cannot control the means of consumption and production. From Baudrillard's [74] perspective, consumption substitutes subsistence needs while atomizing, disorganizing, and alienating individuals. In this way, linearity results from production and consumption as one process of reproduction and control of the productive forces [74].

The evident nature of certain forms of consumption in visible signs [74] led to consumption studies of conspicuous activities, such as subcultures, identity, and self-expression in style. However, not all consumption practices are visible; most consumption is inconspicuous and embedded in practice performance [75]. These two modes of studying consumption can be exemplified, for example, in a person's public appearance vs. what a person does to attain that appearance. The logic dividing consumption — into seen or unseen — is also present in what is considered part of the economy (and not). Toffler [76] had a similar argument about a dominant (visible) economy comprising all production of goods and services for sale or swap through markets and a passive (invisible) consisting of all production for self, familiar, or community consumption.

According to Warde [75], consumption of materials has specific moments of acquisition, appropriation, and appreciation, later complemented by Evans [77] with devaluation, divestment, and disposal. In a LE, these six moments are not cyclical. Moreover, the logics of consumerism described by Bauman [12] and Baudrillard [74] mediate those six moments and play an essential role in the un-cyclability of materials through the influence of consumers [78].

The Institutional Dimension of Consumerism

In the LE, convenience and commodification frame practical engagements. While some people can participate in production, for most consumers, products appear like magic [74]. This is particularly evident because some countries have become production centers, while others do most of the consumption [79, 80]. The material setups for global commercial activity systematically hide the resources' origin. Similarly, as it occurs with electricity

demand, as Shove and Walker [81] argued, demand serves to justify more production. Under this conditioning, "supply creates its own demand," making consumption a function of production (see [82]).

Many economic metaphors of consumption [83] put people as agents with desires that can be satisfied by rational decisions. Ecological imperatives for preserving resources collide with notions about freedom of choice. Princen [84] raised this point in his proposal about sufficiency based on the self-organization of individuals. However, the institutions supported by consumerism have little to do with organization, freedom, sufficiency, or efficiency and more with monetary transactions and individual satisfaction. Money is part of the things people must obtain to participate in the social world. The competence for buying truncates the competences in dealing with material transformation. Thus, competences for product and service acquisition — buying and selling — become the imperative logic for social participation [85].

The relation between consumption and monetary exchange can be partly explained by what Callon [86] called the agencement model of markets. It is a substantivist model focusing on the practices performed to sell things, not the quantitative balance of offer and demand — the interface model in formalist economics. However, this is not the only way to organize, share, and distribute resources — a point Gibson-Graham [87] made in their framework for alternative economies, including non-market, unpaid, and non-capitalist forms of exchange. Moreover, it recognizes that not every exchange is monetary: e.g., family relations follow at least partly a moral economy. By understanding that monetary transactions are not the only way to structure an economy, consumption can be formulated as more than buying services or products.

The appreciation of materials as resources in everyday life is also a necessity against consumerism. Wieser [88] mentioned that planned obsolescence is an aspect of production that CE may not resolve by focusing only on product longevity through design. Obsolescence is a core aspect of today's business models, encompassing functional and symbolic obsolescence. For example, Vonk [89] noted how an electronics company uses a CE narrative to obscure their practices for planned high rates of product replacement — introducing circular elements in production while simultaneously presenting the newest version of a gadget as a must-have.

Alternatives to Consumerism for an Alternative CE

Regarding the study of an alternative logic for a CE, it is essential to mention the call by Evans [77] that consumption (studies) should take critical stances on the excesses of consumerism. Evans [77] proposes moving from a proxy on decisions and behaviors as a consumer responsibility when buying things to the critique of overconsumption and its reasons — institutions and practices. The contentions in this critique have previously been raised by the likes of Max-Neef [90] when criticizing development discourses as an economic model that increases the spectrum of available artifacts without satisfying needs. Greene [91] has also noted the importance of contextually situating consumption in particular biographic and socio-technical settings.

Forms of circularity performed at the fringes of consumerism are the basis for what we call alternative consumption. Alternative consumption is a contestation to consumerism in its practices and institutions. Here, we are particularly interested in incompatibilities with consumerism (Table 1). The following section presents the results of our empirical study.

Table 1 Characteristics and institutional logics of consumerism

Consumerism characteristics	Institutional logics of consumerism	Institution examples
Material excess	Obsolescence	Fast fashion industry
Hidden production and waste	Division of production and consumption	Global value chains
Class distinction	Conspicuous consumption	Branding and advertisement industry
Market agencement	Growth of financial transactions (economic growth)	Gross domestic product measurement
Individual (atomization)	Freedom of choice	Consumer responsibility schemes
Renewal of desires	Techno-science innovation	Smart devices

Practical Engagements

A general description of the cases for the study is provided in Table 2 with a categorization of the cases. All participants and specific initiatives or social media groups are anonymized. This sample of practical engagements considered competences in acquisition alternative to the competence of buying and the no-profit goals intended by the carriers as a distinction from the logics of consumerism. The following subsections present themes interpreted as logics for alternative consumption.

Clubs for Repair

This category includes three cases: (1) An online club for clothes repair. (2) An organization sharing tools and knowledge about bike repair. (3) An organization promoting local and traditional hand-craft techniques. Their common attribute is knowledge sharing in a group with no other bonds than an interest in the practice. The people initiating these clubs take a role similar to entrepreneurs in traditional institutionalism (c.f., [92]). However, from a PDI perspective, their role emerges from their practical engagements.

For instance, the initiator of the online clothes repair club took the initiative by observing a lack of others with similar interests and skills for clothes repair in her community. First, however, the kind of organization is negotiated as a viable small business. Furthermore, the kind of organization is related to the professional background of the initiator person (in marketing) and a recognition of the high prices in available repair services — higher in comparison to the acquisition of new clothes.

> … when I created my Instagram account, you get this online community, but in the real world, it is not normal [to repair]… I wanted to create a place where I can gather all of them, all my community so that people can learn from each other… people pay a monthly amount, but it is cheaper than paying for repair. (Online repair club initiator)

The other two cases are membership organizations; people join as volunteers or paying members, getting some service in return, including access to basic tools and help from others. However, unlike in commercial services, the members are not customers, and most are required to be active in the knowledge-making, thus gaining skills through direct interaction with others in a Do-It-Yourself fashion:

> So, we're all getting better, and we're getting better together, and we're sharing the things that we do know. And then if there's a question, we just ask each other and find ways to deal with it. (Bike repair organizer)

Regarding repair practices, the three cases promote knowledge sharing and skills development. However, this depends on the access that the members have to tools. For instance, in the Online repair club, the lack of physical sharing of tools is replaced by tutorials about what kind of tools to get. However, the acquisition of tools is a practical challenge — for example, a sewing machine:

> … I always encourage them to check things out. And if they haven't been sewing before, I want them to rent a sewing machine before buying it. So, they can see if

Table 2 Categories of practice and sources

Category label	Practice-category	Data sources
A	Clubs for repair	- Three interviews (with the initiators of two repairing clubs and one with two workers from a group promoting hand-crafts) - Website (for subscribed paying users) - Social media of the group - A small workshop to use a sewing machine - Two online meetings organized by a local NGO - One physical event organized by a local NGO - Observation in one meeting of one repair cafe
B	Individual repair	- Two interviews with people repairing products for their own, friends, or family use
C	Communal spaces	- Three interviews (one with a housing project inhabitant, one with a worker from the same project, and one with a person managing a public tool shed with tools for a neighborhood) - One guided field visit to the housing project
D	Recovery from waste and waste avoidance	- Content from two groups, available on social media - Observations around containers (for waste)
E	Secondhand offerings	- Four field visits to three local flea markets and a pop-up store by the local waste management company - Field visit to the warehouse of a project for furniture circulation among students - One physical event organized by a local NGO

there is something they enjoy. Because I don't want this to become another hobby, where you have many accessories you don't use. (Online repair club initiator)

For the other two cases, the physical encounters represent an opportunity to get acquainted with tools and formalize knowledge sharing. For the local hand-craft technique organization, it is about meetings where people share beyond techniques:

… [project name] is about learning or trying to share knowledge about fibers and materials. Not only textiles but also in wood, for example…But I also think people need a lot more knowledge to know and recognize what the local produce is… (Organizer of the organization promoting local and traditional hand-craft techniques)

In this sense, the practices of repair function in a bundle with practices of socialization and knowledge creation:

… ideally, we would want it to be that you don't have to be so interested in repairing bikes to go there, you just enjoy being there. And maybe you get into repairing bikes while you hang out. (Bike repair organizer)

The bike repair group meets weekly at a café, where their tools are kept and shared. The online clothing repair club did not — initially — have physical meetings, but online platforms replaced the physical space to accomplish a similar role in allowing social interactions. Finally, the hand-crafts promotion organization relies on local meetings and space for tool sharing. Using spaces for physical or online encounters is a requirement for practical engagement as a social endeavor.

It becomes clear that repair practices are bundled with knowledge sharing and socialization. However, the initiators also show they had access to the practice through previous experiences. For example, the initiators of the online clothes' repair club mentioned their relation to sewing from a younger age and the education they received. But there is also an element of exposure to the practice through their family:

I think my dad is always making repairs, so, they don't have to buy anything new… Because my dad is repairing, I have the same values… my kids, if their toys get broken. They come and ask: can you repair this? (Online repair club initiator)

In the three cases, the initiators intend to recruit more people to repair through exposure to skills. Although skill acquisition is part of the personal career with the practice, it also gives the practitioner the understanding necessary to identify which products or materials to use in repair and where to seek advice:

So, I think we are quite open about not being experts. But we try to guide through the things we do know. And then as a community kind of trying to put out different ideas and thoughts. (Bike repair organizer)

The logics to enter these practices also include ideas about gender roles, the sustainability of repairing, and money-saving — for example, the stewardship of clothes for the family as a women's activity. These logics are not restricted to these practices but play a role in their grammar. For example, making sense of who participates:

… the situation now is that our members are like de facto women and they're more than 40 [years old]. For them it is a leisure activity. Now that's kind of how it's been for quite some years. (Organizer from organization promoting hand-craft techniques)

The following category presents two instances of repair practitioners who make sense of their participation with different logics.

Individual Repairers

This category includes two repair practitioners who participate in repair inconspicuously and individually. These are not easily identifiable practitioners, mainly because they are carriers of the practice in a private setting (i.e., non-visible signs of consumption). However, in both cases, technical skills were previously acquired through formal education — short and longer courses:

> I went to this one year where I studied music. And one of these extra activities was costume making. And then we were making costumes for this big show. Yeah, so I guess I was also like, oh, I can make clothes. (Pastime repairer)

The practitioners took the example of family members with technical skills for repairing and transforming materials. The exemplary nature disrupts the "magic" of consumption and opens the way to the knowledge of production:

> I liked going to the recycling station with my dad; we took things that people threw away and saw what was functioning…my dad works as an electronic engineer, he draws circuits. (Electric device repairer)

The first case is a person who repairs clothes and other products at home — during her free time. For her, repair represents a way to enact some "hands-smart" abilities that can be shown to family and friends — enabled by social media. However, she mentions a lack of interest in participating in a repair group or similar — as it would imply teaching others instead of simply experimenting. Yet, this person is also interested in repairing to connect to her daughter and form her skills:

> Of course, it depends on what you think about a community… No, I think that everyone who knows me knows that I like to make stuff and pick stuff … She's my daughter. I think she's kind of used to getting her stuff fixed. She thinks this is positive. (Pastime repairer).

The second person became interested in repairing through his relationship with his father and his engineering education. He started repairing out of convenience while being exposed to a diverse set of electronic and electric goods that were supposed to be wasted. His motivation for recovery is based on the use-value that products have for him. In this case, exposure to wasted electronics resulted in recovering and repairing fully functional products in the electronic shop where he used to work. However, under current laws in Norway, electronic shops are not supposed to repair or reuse products that are given for waste treatment — unless they are donated for this purpose. This situation represented a complication for how this repairer engaged in the practice — he was eventually removed from his job:

> Things are fully functional; people don't know they still work when they bring them to waste. I started taking them, but my boss did not know…others in the store don't do it, because they are stupid… I had to show them, sometimes it is just the reset button… my boss told me, he was not going to call the police if I quit. (Electric device repairer)

For these practitioners, a motivation to repair is bundled with previously acquired technical skills. However, the skills are not enough to become carriers of the practice. The practice results from the situation to which the carriers are exposed. For example, one is exposed to a stream of functional products about to become waste; and the other has accumulated materials at home from previous projects. By repairing, the practitioners can also show their expertise — or smartness — to a close group of friends, family, or co-workers. Thus, their practical engagement is also social, but it plays a role in their distinction from the others.

Regarding the logics, the identity of the practitioners plays a role in sustaining the engagement with the practice. In this case, having skills and knowledge to repair — and transform materials — allows the carriers to engage in other forms of socialization:

> I made these reusable fruit nets. You know, when you buy fruits? And I made a bunch. And they are made of an old curtain from IKEA… So now, I have this experiment when I give it to people I believe are capable of using them, then they send me pictures. But I think some people are too embarrassed to use it. (Pastime repairer)

As mentioned earlier, the exposure to material streams is also an opportunity to engage in repairing. For instance, the same two individuals exposed to different material arrays — exposure to products and social media — could have resulted in the absence of the practice. Thus, the hidden aspects of production/consumption are in tension with the technical skills and the material arrays the practitioner is exposed to — for example, obscured in the institutional arrangement by laws or made visible through social media:

> … the information about the products in the container is sent to the Miljødirektoratet [Norwegian Environmental Agency] in kilos, but they don't know what is in the container or if it works or not… It doesn't matter if there are cellphones, ovens, or T.V.s; it is only kilos.
> I see a product, and I don't know if it works. So, I use YouTube to see what could be wrong; most of the time, I don't need to repair it; I just change the battery or reset it … People don't know it works. (Electric device repairer)

Exposure to an arrangement of materials and meanings may have resulted in the individual acquisition of competences to participate in repair. However, their practical engagement is also influenced by their distinction as experts in the practice. The next category focuses on material arrangements for organized communal repair.

Communal Spaces

The cases in this category are: (1) A housing project (or neighborhood) started from the organization and protest by a social group in the 1990s. The project has evolved to incorporate aspects of conviviality and mutuality. (2) A tool shed for tool sharing in another city neighborhood. One person administers this tool shed and other communal spaces, such as a publicly accessible fridge and a public bench. Collective socialization is at the center of this category, directly influencing how the physical spaces are arranged. Here, the practice is bundled to the proximity of the dwellings and not a personal interest:

> So it's most of electric and hand tools you need for houses … I'm going to have my tools borrowed by the neighbors... But it was like, it's nice. It's, it's easy and nice… to share things in your neighborhood... Then you think, this is a different way of living than most Norwegian neighbors or towns have. (Tool sharing organizer)

The neighbors' autonomy in making changes to their houses characterizes the first source. In one instance — of an interviewed inhabitant — even the construction of the house was a project that represented autonomy, particularly in the use of recovered construction materials, and only limited by safety regulations. The local municipality and an association of neighbors own the housing project. However, the inhabitants share responsibility for maintenance, collaborating with a dedicated technical professional, and sharing tools:

> If they want to paint everything pink, from ceiling to floor, they can do that, if they want to put up an extra wall, they can do that. If they want to change the kitchen, they can do that. So they have a lot of freedom… If it's electricity, or if it's a pipe, like where we need professionals, we need to get in professionals. (Worker in the housing project)

The second source is sui generis, in a neighborhood where one neighbor decided to take socialization into his own hands by providing access to tools in his tool shed and the eventual collection of tools from other neighbors. Here, the other communal spaces are part of the person's house, which becomes a sort of public space:

> … people always ask someone for a printer: I need to print something. And why can't one person or one cafe or maybe the food store up here, buy a nice one and you can go there?… We can have it close by, but we don't have to own it ourselves. And that's also with the tools here. So, it is better that I own a really good machine, then everyone in the neighborhood shouldn't buy one for 200 Kroners that doesn't work. (Tool sharing organizer)

The two instances here are practices of sharing. These practices include sharing tools or products and people sharing time when interacting. Another common aspect is the need for spaces that allow collaboration as part of everyday life, overriding the need to make money and supporting people from different backgrounds — in a more just or inclusive way. The practice of sharing is also bundled to material limitations:

> It's also what you use those tools for. If you have a perfect flat, what do you need all those tools for? It has to be a bit shabby. You need all that maintenance? So you need all those tools. (Housing project inhabitant)
> They don't have room for having ten winter coats; they don't have room or space to have five pairs of skis or having all these things. So, they have to find ways of borrowing and exchanging things. (Worker in the housing project)

In this category, the carriers of sharing practices hinted at technical skills as an essential aspect of community integration based on repair and sharing — knowing how to use the tools. However, the relations supported by the material arrangement appear to be more important. For example, the housing project inhabitant hinted at the importance of knowing others in the community:

> …we have met very many people during construction, and we know all the people who use the tool shed and whom we share the tools with now as neighbors. (Inhabitant in the housing project)

These arrangements would not function in communities with more dispersed inhabitants. In the tool shed case, sharing material and tools is seen as necessary to community building — as a point for encounters. Thus, the collectivization of material means is bundled with the strengthening of social bonds:

> … this is a really nice street, of course. But that, like a bench, is really nice if more people have a bench outside, just connecting with the neighbors… People are sitting here. And it's people coming by, and it's life all day on this bench when the weather is nice. (Tool sharing organizer)

Sharing works as a social function in the two practices — for interaction. It represents a disruption to consumerism because it means caring for others through the options available in the communal space, which is also bundled with notions of trust. More about this is found in the following category.

Recovery From Waste and Waste Avoidance

There are two cases in this category; the first one is dumpster diving, which in Trondheim is practiced mainly to recover food from the waste containers of supermarkets. However, the practice is viable for recovering durable commodities (appliances, furniture, means of transport, clothes, among others). The second practice is limited to food recovery through infrastructure in the public space (a refrigerator).

The first practice, dumpster diving, is mapped from a local group found on social media. There are three core aspects in the messages of group members: (1) Openness to welcome others to the practice, without offering strict guidelines or rigorous practical advice; other than loosely looking for the waste containers near big stores, companies, and construction sites, emphasizing containers that are not locked — otherwise the waste is privately owned. (2) Sharing information and pictures about the location and qualities of batches of products found publicly (food or materials) — mainly when found in large amounts or if the finder is not collecting it for their own consumption. (3) Information sharing regarding safety issues, such as warnings about contaminated food, public and store policies, and rules for those getting things from waste containers on private grounds.

The second practice, around a free fridge, is one of the longest-running free fridges found in Trondheim. It is provided by the person who started the tool shed (mentioned in "Communal Spaces"). The fridge owner keeps the fridge connected to his house and does some maintenance — "keeps an eye" on its cleanliness. The fridge users have appropriated it by filling it, keeping it clean, and communicating — through social media — when large batches of food have arrived. The idea behind the fridge is to promote social inclusion, without distinction of class. The idea is now replicated in other parts of the city, and it is increasingly bounded to the value of food and no longer about access to the less disadvantaged:

> I feel really good, especially with the fridge, because when it started, people were really skeptical; it was mostly very poor people coming. But now, the richest people in the neighborhood are coming here and getting some sweet cakes and bread, fresh fruit and everything… So, it is the sharing and the idea of not throwing things. (Tool sharing organizer)

The carriers of these two practices must transgress one or more conventions to perform their practical engagement. Engagement in direct recovery from waste containers and acquiring things from public spaces requires the practitioner to look at places and objects that most others would immediately ignore — such as waste containers and abandoned items. For example, a chair on the street could be treated as waste or as something to be collected by a rightful owner. For an abandoned chair to become recoverable, someone must assume that it still has value and belongs to no one. One of the individual repairers

in subsection "Individual Repairers" faced a similar situation. In that case, the recovery of materials was from a place that was not public — and the former owners had given the items as waste — not for recovery — which meant the practitioner had to transgress what is considered legal to bring back the value of the product:

> It is illegal because people give it to the store for waste management, and the owner is [waste collection company]… If someone takes it from the container, my boss says I'm stealing it. (Electric device repairer)

Here, there is a tension between the logics of recovery — the meaning of waste — and the institutional frameworks for waste and recovery — which include a lack of proper channels for material circulation and favor private ownership of waste as resources. While these practices help in circulating some materials, most recoverable ones get out of consumption and are removed as forms of waste — a profitable waste collection industry.

Finally, we decided not to include the product recirculation category in secondhand offerings — used products that are sold, given, or handed down to new users. Still, we highlight a tension between use-value and exchange-value. This tension regards people's practical doings in reappreciating and reappropriating the value of products. Following a market logic, a reappropriation of value results in flea markets and secondhand stores. However, charitable action and riddance convenience are also an element of circulation (e.g., donating or handing down furniture among students). This tension between value types is bundled with available channels facilitating peer-to-peer circulation of products — supported by social media and mobile payment apps.

Discussion

The main contention developed in the article is that the baseline for CE research should not straightforwardly focus on business opportunities but on a socio-cultural framing of CE, looking at the how, why, and what of consumption practices. To advance this framing, we have introduced a PDI perspective, and taken it as a starting point for a study describing grammars of practice that make sense of what a CE can be without normative expectations from the top-down. Table 3 presents some of the aspects bundled with the practical engagements from the cases in our study.

We have gained insights from the practical engagements that do not follow consumerism's institutional logics and could leverage an alternative CE. Our study took a PDI approach [41] and the concept of logics to cover the shared or general understandings bundled into the practices — as a kind of a priori knowledge that facilitates practical engagement. With this approach, we look at the grammar negotiated by legitimizing or contesting consumerism as the backdrop to any CE. In other words, consumption grammar that may not rehearse the norms of the LE is an issue that has been problematized by others [15, 22–24].

As shown in Table 3, an aspect featured in all these practical engagements is the use of digital means for communication. We interpret this bundling as an effect of the current structuration of communications — particularly in Norway, where access and use of the internet are high (94% of males and 92% of females, aged 9–79) [93]. Digital platforms such as YouTube and Facebook are used as means for information sharing. The use of digital communication becomes a prerequisite for practical engagement when, for example, used to communicate skills through social media (as done by repairers and recoverers) and when it serves the function of gaining expert knowledge through videos and tutorials

Table 3 Summary of aspects bundled to the practical engagements

Aspect bundled to the practice	Present in categories (refer to Table 2)
Knowledge sharing in a community of practice (regular encounters)	A, E
Adopting market forms of distribution and sustainment	A, D
Focused on individual identity (expert vs. inexpert)	A, B
Exposure to similar experiences when growing up	A, B, C
Previously acquired technical skills	A, B, C
Disabled by the current institutions (laws, policies, taxes)	A, B, D
Openly available tools and materials	B, C, D
Transgression of the norm	A, B, C, D
Savings and less disposable income (an economic reason)	A, B, D, E
Appreciation of products through use-value	A,B, D, E
Appreciation of products through socialization (with peers)	A, B, C, D
Particular spaces for practical engagement	A, C, D, E
Use of digital communication channels as part of the practice	A, B, C, D, E
Bounded on normative identities (gender, socio-economic status, profession, children)	A, B, C, D, E

online (as done by repairers). None of the practical engagements in the sample rely on digital trading or rental platforms [94], as these align better with CE initiatives with profit as a goal.

Internet is also a means for material acquisition. In Norway, secondhand products can be acquired through platforms such as Facebook market and finn.no — and other bartering options — which describe an alternative acquisition mode without reconnecting production and consumption. For example, in the repairing clubs, advice given to the participants is to acquire secondhand tools before spending money on expensive new equipment.

The sampled practical engagements are bundled into some normative roles given by identity, ranging from the individual identity (such as being a hand's smart person) to the professional identity (being a marketer or an engineer). Identities also play a role in the intersubjective dynamic of the practice. For example, being a mother or a father, or being a woman of a certain age versus being the smart person of a group of workers. All these identities describe different access points to the practice.

The practices are also bundled with moments of reappreciation of materials, which change consumption from its usual acquisition and discarding modes. The reappreciation of materials is not straightforwardly linked to economic incentives (such as saving money). Instead, it is related to the recognition of use-value in combination with modes of socialization, where skills and knowledge play a role in breaking the institutional logics of consumerism. For instance, by having acquaintances who can perform the practice of repairing a product that is still appreciated and can be reappropriated.

Another access point to these practices is situational exposure, skill acquisition from previous experiences, materials, and products to experiment with, and examples offered by people in a familiar environment. These are aspects that the clubs for repair intend to replicate in their organization arrangements. However, it is challenging to emulate them when there are no other bonds between the participants than just an interest in the practice. We interpret this as another access point to practical engagement — having strong bonds with

others, by and for whom the practices are performed. Examples of these bonds range from individual skill demonstration to family and friends, to acts of caring for their children and neighbors, and to caring for fellow peers — e.g., saving them money or giving them the chance to procure furniture or electronic devices for free.

A final aspect that is bundled with all practices is the institutional framework provided by laws and policies. One particular to Norway is the tax and wage system, which makes professional repair expensive compared to acquiring new and cheap products — many of lower quality. This situation gives reason to engage in repair; however, it is counteracted by most people having enough disposable income for consumption (i.e., to buy things). In addition, in some cases in the sample, the practices are linked to forms of social justice and environmental sustainability.

Norm transgression is significant for practices such as dumpster diving or, in the case of the individual repairer that took products supposed to be waste — committing an illegal act. But it also features in, for example, wearing clothes that are not perfect or adding materials that make the imperfections more noticeable — as in the case of the clothes repairer, who mentioned that all clothes have an opportunity. The transgression of norms quarrels with what is socially accepted and bundles the practices to negative aspects in the institutional logic.

Normalizing practical engagements at the fringes of the mainstream CE requires logics that contest consumerism. These are logics that transgress norms and change the practice grammar, which would drive another institutional framework. Our main contention is that the bundle of logics present in this sample is an access point to an alternative CE that is not coopted by consumerism but must negotiate it to gain legitimacy.

The sample approached here emerges against the backdrop of consumerism, rearranging the grammars of consumption. In particular, the creative nature of repair and reuse reconnects production and consumption in one place — reorganizing time and space — while centering the use-value of products and materials as part of substantive objectives. The use-value that we refer to not only encompasses the functions provided by products — beyond the servitization of a performance economy — but also includes value sustained by the social relations of the practitioners. Building on this, further work is needed to identify transformational paths for the institutional logics that would support a use-value based on more than momentary access to products and rather on sustaining these contextualized social relations.

Conclusion

To conclude, we address the two research questions in the "Introduction." For the first one: What should be included in a socio-cultural and institutional framing to study CE? We engaged in the description of consumerism [12, 73] as a contemporary arrangement that rehearses the norms of the LE. This way, we put consumption as our locus of study, consumption as a set of practical grammars and institutional logics that should be studied in specific contexts. Furthermore, we conduct a study of CE from a PDI perspective [41], looking to integrate the aspects of logic that could open up for new practices and necessitate new institutions — forms and means. Thus, this means three inclusions: (1) The contestation of consumerism. (2) The focus on consumption as a locus of study. (3) The attention to the logic and grammar of practice and their consequent negotiation of consumerism. With these inclusions, we propose PDI and the contestation of consumerism as a viable socio-cultural framing to study CE.

For the second question about what could leverage an alternative CE, we conducted an empirical study of "niche" consumption practices alternative to consumerism. The grammar in these practices is negotiated against the institutional logics of consumerism. Therefore, these practices are not fully detached from consumerism but offer aspects that could help rearrange the grammars of consumption and its logics. This could leverage an alternative CE based on use-value that considers social relations — as part of an access model. Although we identified aspects particular to the case of Trondheim and Norway, we contend that consumerism is not an inescapable arrangement. However, a CE that does not look to change the institutions – by contesting consumerism — risks repeating a "nobodization" of actors in favor of incumbent expert knowledge [22, 23]; or, worse yet, rehearsing the norms of the LE [15].

In our empirical study, we have integrated practice-driven institutionalism to study alternative practices that contest consumerism as a social arrangement specific to the cases in Trondheim (Norway). We use this study to show the viability of learning from alternative CEs that potentially can be leveraged from other grammars of practice and logics. From a PDI [41] perspective, change should focus on improvisation and experimentation in practical engagements. In this specific case, the practical engagements contextualize use-value through social relations. For the context of this study, practical engagements supported by appropriate institutional arrangements — from the public sector or the organized civil society — could leverage a CE that contests consumerism by highlighting those social relations.

Declarations

Consent to Participate Informed consent was obtained from all the individual participants included in the study.

Consent for Publication Informed consent was obtained from the participants for the anonymous use of the information provided during interviews (quoted text) in publications for research purposes.

Competing Interests The authors declare no competing interests.

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Article 3. Promoting Intergenerational Justice Through Participatory Practices: Climate Workshops as an Arena for Young People's Political Participation

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Promoting Intergenerational Justice Through Participatory Practices: Climate Workshops as an Arena for Young People's Political Participation

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In the fall of 2019, Trøndelag County Council, Norway, organized a Climate Workshop for children and youth. The intention of the workshop was to include children's and youth's perspectives as a foundation for a policy document titled "How we do it in Trøndelag. Strategy for transformations to mitigate climate change". The workshop involved a range of creative and discussion tools for input on sustainable development and climate politics. In this article, we aim to (1) describe and discuss innovative practices that include children and youth in policymaking related to climate action, and (2) discuss the theoretical implications of such policymaking in relation to children's rights, young citizenship, and intergenerational justice. We employ a generational framework and perceive climate politics as inherently ingrained in intergenerational justice, where no generation has a superior claim to the earth's resources, yet power is unfairly concentrated and accumulated among adult generations. We draw on contributions by various stakeholders involved: Two young workshop participants, two county council policymakers, and an interdisciplinary team of researchers from Childhood Studies and Design.

Keywords: children, youth, participation, participatory methods, climate, intergenerational justice, citizenship, children's rights

INTRODUCTION

In the fall of 2019, Trøndelag County Council, Norway, organized a Climate Workshop for children and youth aged 10–18 years. The backdrop for the event was the growing global movement where children and young people demonstrate against the lack of political will to realize the goals set out in the Paris Agreement. In Trøndelag, this led to a school strike in Tordenskioldsparken on March 22, 2019, when around 3,000 students demanded political action to ensure a more sustainable future. This mobilization triggered local politicians to invite children and youth into the process of preparing a new Climate Strategy for Trøndelag County. Politicians sought not only to include, but also promote ownership of an environmental strategy among the region's youth. In collaboration with researchers, Trøndelag County Council designed the Climate Workshop where children and youth were asked about their experiences with climate issues in their everyday lives as well as their visions for a sustainable future and ways to achieve this vision. The participants shared

both frustrations and solutions for climate politics. Thirty-eight children and youth participated in the two-day workshop, which included a range of creative and discussion tools deriving from Participatory Design and participatory methods within Childhood Studies.

In this article, we aim (1) to discuss the inclusion of children and youth in policymaking related to climate action, and (2) to discuss the theoretical implications of such policymaking in relation to children's rights, young citizenship, and intergenerational justice. We employ a generational framework and perceive climate politics as inherently engrained in intergenerational justice, where no generation has a superior claim to the earth's resources, yet power is unfairly concentrated and accumulated among adult generations. We draw on contributions by the various stakeholders involved: two young workshop participants, two county council policymakers, and an interdisciplinary team of researchers from Childhood Studies and Design. The article thus is inclusive of multiple viewpoints on potentials and challenges when including children and youth in political processes across research disciplines, sectors, and generations. However, the article has an 'unitary voice' where authors' ownership of ideas and arguments remain obscured. We contributed on equal terms to avoid 'othering' of non-academic authors. Elsewhere, we have taken advantage of multivocal co-authorship, allowing tensions to emerge (see Ursin et al., in review[1]).

The article is structured as follows: first, we explore how intergenerational justice can be understood and approached in climate politics. In the "Materials and Methods" section, we describe the methodology and methods of the Climate Workshop. In results, we first illustrate the material generated in the workshop before we describe themes identified in the assessment of the workshop. In the discussion, we examine some strengths and weaknesses with the Climate Workshop, and critically reflect on the degree to which participatory workshops with children and youth are useful in enhancing their participatory rights, sense of citizenship and intergenerational justice.

INTERGENERATIONAL JUSTICE AND CLIMATE LEGACY

Emission-generating activities grant the present generation numerous benefits—e.g., infrastructure, industrial goods, food, transportation—while the effects are likely to be harmful for generations to come (Meyer, 2012). Due to the time lag of anthropogenic climate change, an increasing number of theorists within Law and Philosophy call for new legal principles that recognize this intergenerational connection among human societies and articulate the rights and corresponding duties that underpin intergenerational equity (Weston and Bach,

2009). The legal principle of intergenerational justice concerns 'justice between generations,' a transgenerational respect for the rights and fulfillment of duties vis-à-vis future and past generations (Meyer, 2012). It concerns intergenerational conflict of interests, seeks to solve inter-temporal distributive questions (Barry, 2012/1999), and calls for temporal solidarity across past, present, and future generations (Weston and Bach, 2009). Intergenerational justice bears many similarities with social justice though a class dimension is substituted with a generational dimension. Although valid in all matters concerning distribution of resources, it is especially fruitful in environmental politics, anthropogenic climate change, and global warming, as intergenerational equity is key to sustainability (Barry, 2012/1999). The dilemma of intergenerational justice is its inter-temporality, where distributive justice entails the ability to take into consideration both the concrete and lived present and the uncertain future.

According to Meyer (2012), environmental politics solicits global intergenerational distributive justice:

> Assuming that future people will suffer serious harm in terms of the violation of their basic rights when temperatures rise above a certain level and, further, that currently living people can hinder such temperature rise by limiting their emissions to a certain amount, a global cap on emissions is required for currently living people to be able to fulfill their minimal duties of justice vis-à-vis future generations (xix).

Rawls' principle of "just savings" is of importance, where parties must agree to a savings principle that ensures that each generation receives its due from its predecessors and does its fair share for those to come (Rawls, 2012/1971, p. 18). It is futile to agree as to what 'just savings' encompasses. To solve this, Parfit (2012/1984) suggests that "[w]hen we cannot ask for someone's consent, we should instead ask whether this person would later regret what we are doing" (p. 45). Because of time's arrow, we cannot do anything to make people in the past better off than they were (Barry, 2012/1999, p. 197), encapsulating the dilemma of reciprocity-based intergenerational justice between present and future generations. As Gardiner (2012/2003) notes, there is a generational asymmetry, involving an asymmetric independence of interests (interests of earlier groups are independent of interests of later groups) that rules out intertemporal exchange for mutual advantage. This form of indirect reciprocity is what Weston and Bach (2009) refer to as the "stewardship model."

Intergenerational justice can also be seen as a transgenerational global social contract that is founded on human solidarity. According to this perspective, the "common heritage" of earth's natural resources, freshwater systems, oceans, atmosphere, and outer space all belong to generations in an intertemporal partnership (Weston and Bach, 2009). Time is not seen as a three-point linear order of past, present, and future, but humanity is rather perceived as consisting of transgenerational communities with lifetime-transcending interests (Campos, 2018). Responsibilities toward non-overlapping generations will ensure the preservation of the cultural identity of communities over time and ensure survival of the planet and all life therein.

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[1]Ursin, L., Alvarado, S., and Nordgåar (in review). "Children and youth participation in climate policy: a dialogue beyond the workshop," in *A New Handbook of Children and Young People's Participation: Conversations for Transformational Change*, eds B. P. Smith, N. P. Thomas, C. O'Kane, and A. T.-D. Imoh (Abingdon-on-Thames: Routledge).

Regarding global climate politics and policymaking, an intergenerational perspective has been vital from the onset. The first world conference to make the environment a major issue, the United Nations Conference on the Environment in Stockholm in 1972, included an intergenerational approach in the final Declaration: "To defend and improve the human environment for present and future generations has become an imperative goal for mankind" (United Nations, 1972, section 6). In the so-called Brundtland Report, the United Nations (1987) further explicated the connection between intergenerationality and climate politics, as it is deeply embedded in the concept of sustainable development, that is, our "ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs" (p. 43). Likewise, the United Nations' Education for Sustainable Development initiative now also seeks to integrate the values and practices of sustainable development into all aspects of education, envisaging children and young people as powerful agents of change (Walker, 2017).

Within the literature on intergenerational justice, discussions on definitions of 'future generations' are manifold. Weston and Bach (2009) draw on Boulding's (1978) conceptualization of the '200-year present' as a continuously moving moment, a sort of fluid present, stretching 100 years in either direction from the current moment. Future generations, they conclude, are the three and a half generations of persons that exist from this day forward, including children (i.e., persons under 18) because "they usually are poorly positioned to determine their future and thus, like future generations, require others to represent their interests" (ibid: 18, see also Gardiner, 2012/2003). Thus, children and youth hold an important position as betwixt-and-between. According to Davies et al. (2016), children's position in regards to climate change, politics and intergenerational justice is marked by four factors: (1) Children are vulnerable to climate change and climate induced effects due to their physiology and immature immune systems, lack of access to financial resources and means of transit, high care needs, and dependence on adults; (2) Children and unborn generations will bear the brunt of of long-term climatic changes; (3) Children are our closest connection to future generations; and (4) Children's views are traditionally excluded from legal and political debates concerning climate politics. The Climate Workshop described below was aimed at countering this by including children's and youth's perspectives in the shaping of regional climate policy.

MATERIALS AND METHODS

Methodological Approach: Participatory Design

The Climate Workshop was not a research project, but an initiative organized by Trøndelag County Council and informed by participatory methods originating within two different scholarly traditions: Participatory Design and Childhood Studies. Participatory Design has its roots in Scandinavian countries, where it served to democratize the decision-making process in factories by including workers—as the affected group—

in the formulation of solutions regarding the use of new technologies that could result in job displacements (Kensing and Greenbaum, 2012). The original idea behind Participatory Design was to minimize the negative effects on workers by co-producing solutions that included their perspectives and required their involvement in the implementation. Participatory Design processes are about opening decision-making and solution-enactment from the perspectives of implicated actors. Participatory methods are used to engage people in inquiring about problems and thinking about solutions. Participation thus requires the active engagement of participants as co-creators of solutions (Sanders and Stappers, 2008).

In Childhood Studies, participatory research is based on a view of children as *social agents* (they hold valid knowledge) and *subjects of rights* (not objects). Research should be done *with* rather than *on* children (James and Prout, 1997). Traditional research has tended to underestimate the competencies of children and young people, often relying on adults to represent their perspectives (van Blerk and Ansell, 2007). In Childhood Studies, children and youth are recognized as experts of their own lives, having their own agendas and interests. Participatory research enables children and youth to express their perspectives and opinions freely whilst also ensuring their human rights (Ennew et al., 2009). Drawing on the UN Convention of the Rights of the Child (United Nations, 1989), Beazley et al. (2009) describe a rights-based approach as securing children and youth the right to the highest possible standards in work with them (Article 3.3), the right to provide opinions (Article 12), the right of expression with a medium of their own choice (Article 13), and the right to be protected from exploitation (Article 36). Translating into research and policymaking, this entails involving children and youth as participants, using methods that allow them to easily express their opinions, views, and experiences (not limited to verbal expressions), and protecting them from any harm that might result from their participation. Using methods that allow children and youth to express views in *a variety* of ways, not only verbal, is a central feature of participatory research within Childhood Studies (Ennew et al., 2009). Task-based and visual techniques are often presented as 'child-friendly' (Punch, 2002), enabling a more 'direct' expression of views. An important rationale for drawing on a range of methods is maximizing young participants' willingness and ability to express views (Punch, 2002).

The Climate Workshop was inspired by the method for future workshops (Jungk and Müllert, 1997), a well-known method in Participatory Design with two main purposes: (1) Attainment of the vision of participants in a way that is respectful to their perspectives, and (2) legitimization of participants' perspectives without the intrusion of 'expert' knowledge. Collective future envisioning by young people sought to gather and attest imaginary preferred futures from participants' expectations through collectively drawn or written stories about future everyday life. We found this method suitable for young citizens because it allows for exploration of what they see as main issues, what they want, and what they are willing to do. Alminde and Warming (2020) discuss the application of future workshops as democratic research with children and youth and regard it as "a

creative participatory process rather than merely a collection of opinions and data" (ibid, p. 444). Following the suggestions by Brandt et al. (2012, p. 152), we decided to include the everyday life perspective as it is the present circumstance in which climate change is recognized as a problem and arguably where children and youth have the most room for agency. The future workshops method consisted of three steps: (1) Critique, where participants express what they understand as the problem; (2) Fantasy, where participants create a desirable or idealized future situation; and (3) Realization, where participants create an action plan. These steps were carried out through an overall focus on everyday experiences of climate related challenges on Day 1 and a focus on visions for a sustainable future on Day 2 (elaborated below). Realization was addressed both days by inviting participants to suggest solutions for identified challenges and ways to achieve their visions for an ideal future.

For the recruitment of participants, open invitations (see example in **Photo 1**) aimed at 13–19-year-olds were created together with Trøndelag youth county committee and distributed through messaging boards in high schools and social media (Snapchat, Instagram, and Facebook). The county council also sent an invitation to an umbrella organization of 40 local youth organizations and the School Student Union. Young people were invited to 'make an effort for climate' through giving 'advice to those in charge.' A Facebook event informed potential participants that the results from the workshop would be used in the development of a new strategy for climate mitigation in Trøndelag. This was repeated in the welcoming speech of the Climate Workshop. Participation was free of charge and included an overnight stay at the hotel where the workshop would be held on a weekend in September 2019; the county council aimed to

ensure that finances would not be a barrier for participation. Despite primarily targeting youth above the age of 13, younger children who expressed an interest in participating were also welcomed. Thirty-eight children and youth between the ages of 10 and 18 signed up for the workshop. The majority was aged 13–18 years while three participants were 10–12-year-olds. Fifteen participants were from the city of Trondheim and the rest from other areas in the county. Most participants were girls (25 girls, 12 boys and one participant who identified as non-binary), and half of the participants were active in organizations such as political councils, political parties, or environmental groups.

The time frame for the activities in the workshop was limited, with four hours on Day 1 and three hours on Day 2. Before the activities started, there was a lunch with short speeches from the organizers and youth activists. The participants were organized in seven groups of four to six people. The groups were sorted by age–three groups of 15–18-year-olds gathered in one room, and four groups of 10–15-year-olds in another. We reasoned that although communication across a wider age span could be productive, it could make participation a daunting experience for the younger ones due to unbalanced power dynamics (Langevang, 2009). Each group was assigned a youth facilitator with a background from Trøndelag's youth county committee and the organization UngEnergi. They were briefed to ensure a good understanding of their tasks: To facilitate discussion, attend to power dynamics in the groups, and if possible, to observe and take notes about how participants worked together and solved tasks. The county council provided various art supplies and materials, including large cardboard posters, paper and permanent markers in assorted colors, pens, rulers, scissors, post-its in different sizes and colors, and decorative stickers.

PHOTO 1 | Open invitation for Climate Workshop for youth.

Lorgen and Ursin wrote a report of the results after the workshop, while a youth facilitator read a draft and provided feedback. The county council published the report (Lorgen and Ursin, 2019). Input from the workshop was presented at workshops arranged by the county council with other (adult) stakeholders during the fall of 2019. A hearing draft for the climate transition strategy, as well as the report (Lorgen and Ursin, 2019) and input from the Climate Workshop were presented at a youth county council meeting in November 2019. The final strategy is based on the Climate Workshop report in addition to input from other stakeholders and knowledge from international climate research and national expert papers on how to tackle climate change in Norway (Trøndelag County Council, 2020). Although the workshop—as an event—had a limited timeframe, events around it went beyond its time horizon (see **Figure 1**).

Day 1 – Description of Activities

Day 1 activities focused on everyday experiences with climate related challenges and possible solutions. Each participant was asked to spend 10 min on writing a list of climate related issues and challenges they consider central to a political strategy. Participants then discussed their lists in groups. The individual activity was designed to provide space and time to articulate viewpoints before entering a group dynamic, thus working to include views from all participants and prevent some group members from dominating the discussion. Groups were then tasked with a ranking-activity, where they made a list of five numbered issues with a written explanation for why the issue was included in the priority list. Lists were written on large sheets of paper, and various tools and materials were made available to invite visual and creative solutions of the task. With the introduction of this visual aspect, we saw group dynamics evolve with some groups spreading out on the floor, actively using the tools and space available, contributing to a relaxed but energetic atmosphere. After lists were completed, the rankings were displayed and presented by participants to facilitate exchange of views across the groups.

In preparation for the workshop, participants were asked to select three to five photos, screen shots, or news clippings that illustrate climate related challenges or opportunities. The

PHOTO 2 | Collage about challenges and opportunities in sustainable everyday life.

images were meant both as a way of inviting reflection on the topic in advance and provide visual material for the workshop. Participants showed their images and explained what they represented for their group. After everyone had presented their images, the groups were tasked with making a collage about "challenges and opportunities in sustainable everyday life," using a large poster, tools and materials, and printed images (see **Photo 2**). Day 1 concluded with a final task, where the groups, based on discussions and resulting collage, were invited to consider where, when, and in which situations sustainable living is difficult to identify and in which areas where youth, families, or others need support. Each group again ranked important challenges and ideas for addressing them. Collages and ranking lists were displayed, and participants walked around and looked at each other's work after the final task for the day was completed to facilitate a flow of ideas across groups and invite reflection before the final workshop day.

Day 2 – Description of Activities

Day 2 centered on fantasy and realization. In the first activity, participants were asked to create a vision of life in Trøndelag 10 years into the future. They could write a story or draw a
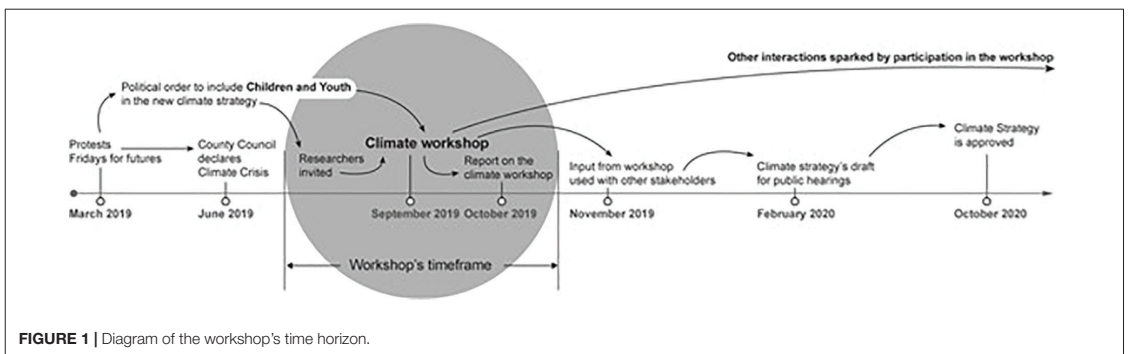

FIGURE 1 | Diagram of the workshop's time horizon.

PHOTO 3 | List of objectives and evaluations of degree of difficulty.

TABLE 1 | Summary of visual objects available for analysis.

Future workshop step	Result	Quantity
Critique	Priority lists	7
	Collages depicting problems	7
	List of challenges	7
Fantasy	2030 stories	7
Realization	Lists of actions	7
	List of easy vs. difficult actions	2

TABLE 2 | Summary of main priorities identified.

Priorities:

Renewable energy: cheap and green replacement of fossil fuels.
Transportation: public transport, cheap and electric options.
Environment: conservation, biodiversity, and nature management, stop deforestation.
Plastics: waste that pollutes forests and oceans, use of alternatives like wood to reduce the use of plastics.
Local production: less importation and exportation of goods.
Sustainable consumption: reuse versus overconsume.
State regulations: policies for production and consumption and the environment.
Knowledge to youth and children: inclusion in educational content
Reduction of CO_2: from manufacture and transportation.
Food: waste as a problem and local production as a solution.

comic strip about a day in the future life of a young person like themselves. It was made clear that it should be an ideal future world – without climate crisis – and that they were free to imagine any solution possible – even those that require technology that is not currently available. Participants were given questions to support their vision, such as: *How do you and your family live in the future? How do people live in a more sustainable way? What would you change to make everyday life more sustainable in 10 years?* Participants presented their desired scenario, illustrating their hopes for the future. Presentations concluded the activity.

The remaining tasks were designed to address realization by inviting participants to create a plan for action. The groups first wrote down things they liked about the different future visions presented and some objectives (what do we want?). They then made a list of what they *themselves* could do and what *others,* like schools, institutions, and politicians could do to realize these objectives. Lists were displayed and participants were asked to walk around, read the suggestions, and classify them as easy or difficult using gold and red stickers (see **Photo 3**). Each participant then selected one 'easy' and one 'difficult' suggestion that they liked by writing these suggestions on post-its and sticking them onto two boards, one marked 'easy' and one 'difficult.' Participants were invited to indicate which actions they would be willing to take and which ones they expect others to do. Through this and the previous day's ranking lists, political issues became evident as the participants indicated what they would put forward and what they were expecting politicians to carry out. The use of stickers and post-its to identify easy and difficult solutions also offered insight into participants' expectations toward themselves and others.

The activities from the workshop provided a set of visual objects, which was the primary input for work on the Climate Strategy (**Table 1**).

At the end of Day 2, the participants and youth facilitators were asked to offer feedback regarding the workshop, including both positive aspects and areas for improvement. We coded and categorized the feedback and discussed it. In addition, we exchanged reflection notes detailing their experiences with the workshop. Based on these materials, Ursin suggested five main themes that emerged from participant feedback and author reflections. We address these five themes in the discussion section after offering insight into the results of the workshop itself below.

RESULTS

Overall, the expectations of participants are centered on local, communal, and shared use of resources. At the same time, plastics and pollution from overconsumption are concerns. **Table 2** presents priorities.

Negative and positive connotations of materials were identified from the collages presenting opportunities and challenges in everyday life. Images and texts used in the collages were visually categorized under themes and connotations— positive or negative—resulting in 17 categories (see **Figure 2**). Initially the categorization included eight themes, 'energy,' 'transportation,' 'plastics,' 'food,' 'waste,' 'production,' 'people,' and 'environment.' The theme 'people' was renamed 'consumption.' Furthermore, 'waste,' 'environment,' and 'production' were recategorized under 'pollution,' finally 'energy' was included in transportation as summarized in **Table 3**.

Aside from the negative and positive connotations, we see in the future stories which material entities support the type of society that participants envisioned (**Table 4**). Expectations are about local production—such as wool—accompanied by technologies like windmills and solar cell panels in a thriving natural environment. The expected material supports were extracted from a visual analysis of the stories, coupled with the transcription of the text of the stories (6 out of 7).

FIGURE 2 | Snapshot of the visual categorization of one collage using the software NVivo 20.

When it comes to actions, participants pointed toward changes in behavior and lifestyle, such as traveling by bike or growing food at home and communal sharing. Furthermore, they call on politicians to provide the conditions for those changes to happen based on information and regulations (**Table 5**). In dissonance to the future stories, school does not occupy a central role in the proposed actions but are mentioned (**Table 6**). Tasks were transcribed and categorized according to themes (see **Figure 3**).

In the report published after the workshop, there were eight main themes: (1) Transport, (2) Food, (3) Plastics, (4) Clothes and reuse, (5) Waste, (6) Buildings and energy, (7) Care for nature, forests, and woodwork, and (8) Knowledge, awareness, and attitude change (Lorgen and Ursin, 2019). These themes represent concrete actions. The final strategy is more general, focusing on six areas for transformation to mitigate climate change: (1) Buildings, (2) Carbon sequestration, (3) Food, (4) Materials and Plastics, (5) Transport, and (6) Meeting places (Trøndelag County Council, 2020). The first five areas encompass concrete examples proposed by the children and youth. However, the sixth one represents an interest by the county council to open their engagement channels.

The written feedback shows that the participants perceived the Climate Workshop as an initiative that "takes our opinions seriously" (participant feedback), generating ideas of how to prevent the destruction of the earth through everyday changes. Some of the participants highlighted a sense of making an impact, as stated by one participant, "I feel like I have made a difference." Getting to know young people who share the same passion and interest in climate change and sustainability was also perceived as valuable, and several formed new friendships. One participant said: "We have become a big community." The feedback also reveals a sense of optimism, stating for instance: "The earth must be saved, and this weekend

made me believe that we might succeed. So many are engaged!"

Many participants highlighted that the workshop was educational and that they learned a lot from each other, stating for instance "It has been really fun and educational." As a youth facilitator explained: "I am really impressed with the level of knowledge and engagement in the group, and I think the activities were good in showing this [their knowledge] and generating ideas for new solutions." Yet, some participants had wanted more information about the climate crisis in advance, arguing that "[t]hrough inviting experts people get to know the facts and get a better understanding." Several participants highlighted the value of hearing group members' perspectives on climate change and mitigation. Some underlined that everyone was invited to speak and that everyone was engaged. As one participant explained: "[The workshop activities] required thinking and not only relaxing, [it] actually got everyone involved and included all our ideas." Another participant reported: "I learned a lot – since many had different priorities concerning climate. We got to listen to different perspectives."

Overall, the participatory design of the workshop seems to have been experienced as fun, creative, and meaningful to participants and youth facilitators. The task-based activities were met with enthusiasm as expressed through feedback such as "I liked that we got to be creative through writing, drawing and discussing both today's problems, possible solutions, and what the future might look like." One participant commented that "You get to illustrate your thoughts so that it's easier to others to see what we think." Some, however, noted that "It was a little hard to be drawing all the time – I'm not that creative."

DISCUSSION

Drawing on the workshop material, participants' and youth facilitators' feedback, and our own experiences and reflections,

TABLE 3 | Themes identified with negative and positive connotations in the collages.

Theme	Negative	Positive
Transportation	- Cars and airplanes - Fossil fuels	- Collective: buses, trains, bikes - Electricity from windmills and bioenergy
Food	- Meat – importation - Waste	- Local – vegetarian - Composting
Consumption	Overconsumption	Reuse – reduction
Pollution	- Solid waste in nature (forests, oceans) - CO_2	- Cleaning - Removal
Plastics	- Pollutant	- Replacement - Prohibition - Removal

TABLE 4 | Summary of objects appearing in the stories.

Theme	Expected objects
Energy	Solar cell panels, plus-buildings, [1]windmills, bioenergy, nuclear power plants.
Food	Vegetarian, homegrown, local, free-food refrigerators, [2]insects, vegetables grown in windowsill.
Transportation	Free electric bicycles, bicycles, electric buses and trains, flying buses, drones.
Waste	Edible plates, environmental police, bio wax film to protect food.
Clothes and others	Made from local wool and hemp, bamboo or wooded toothbrush, hand-me-down clothes, reused clothes.
Housing	"Common garage," kitchen with space for vegetable growing. Greenhouse for each house.
Education	"Climate and environment" course, history on climate crisis.
Environment	Birds tweeting, sun light coming through the window, flower fields, few cars, sunlight on solar panels.

[1]Plus-buildings are buildings that produces more energy than it uses.
[2]Refrigerators with free food soon to expire.

this section is divided into five themes: (1) Enabling a sense of citizenship, (2) Generating meaningful conversations and new perspectives, (3) Being creative and producing visual material, (4) Creating a social space of optimism, and (5) Sparking intergenerational power redistribution.

Enabling a Sense of Citizenship

Participants expressed appreciation for being included and taken seriously, recognizing that the workshop created an arena of political inclusion for them. They also underscored the importance of increased information about climate-related issues in education in the workshop, which suggests a view of young generations as important stakeholders in climate politics and action. In addition, the workshop materials and subsequent report (Lorgen and Ursin, 2019) sent a message to the politicians, bureaucrats, and citizens of the county that the young generation matters. The workshop was an acknowledgment of children's and young people's agency, similar to the approach described by Collin and Swist (2016) for using youth's expertise for campaigns that are directed to youth. Children and youth are typically marginalized in the political sphere (Lorgen and Ursin, 2021),

including in climate politics (Percy-Smith and Burns, 2013; Davies et al., 2016). Climate issues are extremely complex and often left for specialists to discuss and address. Some of the young workshop participants expressed similar views, pondering "Why are they asking *us*? We're not scientists." However, an increasing number of politicians, policymakers, and researchers are supporting the inclusion of children and youth in politics as part of advancing democracy (see Wall, 2014; Lorgen and Ursin, 2021). As Wall (2014) contends, the views of children and youth in politics will inform and improve decision-making: "Since nobody can rightly claim a monopoly on what is best for groups in society, it is wiser to allow the greatest possible diversity of voices to influence public debate" (p. 114).

In terms of citizenship, inclusion, and democracy, it is important to critically reflect on processes of recruitment and participation. Children and youth are not a homogenous group with one set of agreed upon opinions. The open invitation to an event, free of charge, was meant to ensure the participation of young people independent of gender, ethnicity, and cultural, geographical, and socio-economic background. The county council made a massive effort in facilitating for the participation of all interested, regardless of their geographical location (for example by bringing some participants from remote areas in by taxi). Although geographical diversity was achieved—young people from the whole region participated—the group of participants seemed somewhat homogenous in other ways (socio-economic class, ethnicity, political engagement). We might have achieved a more diverse group by more actively recruiting in schools in more disadvantaged and ethnically diverse urban areas. However, the Climate Workshop was not intended to be a general hearing or referendum. More participants would require a larger budget and more time in addition to a different methodology. The intention of the workshop was rather to provide an opportunity for young citizens to offer their opinions on climate issues. The choice to run the workshop as a two-day event at a conference hotel during a weekend is likely to have appealed to those who had an existing engagement in climate action. Young people are often expected to bring an air mattress, sleep in gyms, and eat cheap food in similar climate initiatives. As many participants expressed in the written feedback, holding the workshop at a hotel represented importance. We therefore underscore the importance of organizing the workshop free of charge and covering costs such as transportation, meals, and hotel.

The involvement and empowerment of children and youth citizens through participatory events also posits a dilemma about their influence on the to-be strategy for climate mitigation and adaptation. Debates around participatory efforts with disempowered citizens are present in planning and public organization literature. For example, Arnstein (1969) proposed a typology of levels of participation to answer the debate on redistribution of power—citizens with no power being under control vs. having control. Furthermore, the real power of children and youth could be undermined by being represented as a community—that appears empowered—while officials hold decision-making authority (a political body in this instance) (Levine, 2017). The question is whether the workshop increased

TABLE 5 | Identified topics and actors' tasks.

Topics	- Clothing – Consumption – Energy – Food –Plastics – Transportation – Regulation – School
Individual tasks	- Changes in behavior
	- Knowledge sharing
	- Market offers and demands
	- Political action
	- Reuse
	- Self-production
	- Use less
Political tasks	- Infrastructure
	- Provision of information
	- Public sector actions
	- Regulations for market
	- Support mechanisms
	- Development of targets

TABLE 6 | Tasks categorized under the topic "School."

Liked	Individual tasks	Politicians' tasks
Environment and climate in the school	- Take to student council. - Discuss with teachers. - Discuss among students.	- Include in the curriculum. - More resources to work with and learn about the environment. - Climate and environment as an elective class.
Sustainable food offer	- Buy sustainable food. - Take to student council	- Support sustainable food in school canteens

or reduced the process that some children and youth activists had already started by actively engaging in climate protests—to leverage governmental action. Their concerns may not be the same as those purported by the institutions on the governing side (Trøndelag County Council), which could be in part the result of a generational gap or a dissonance of expectations (Angheloiu et al., 2020). However, the workshop was an opportunity to involve children and youth at the grassroots level and the county council as an institution with participatory approaches as intermediation (Teli et al., 2020). In terms of enhancing intergenerational justice, such initiative can be interpreted as an effort to re-distribute intergenerational power and to cater to interests and aspirations of both the lived present and the unknown future. This is of particular importance when we bear in mind the asymmetric independence of interests (Gardiner, 2012/2003) where young people depend on adults' climate actions; not vice-versa.

In climate politics as in politics in general, adults are perceived as having the necessary maturity and expertise, and they have the duty to protect the rights of children and the unborn (Davies et al., 2016). Cohen (2005), however, questions whether parents represent their children's interests at the ballot box (that is, whether they know what their children wish and whether this corresponds with their own wishes). Regarding climate action, there is undoubtedly an intergenerational conflict of interests, touching upon vital inter-temporal distributive questions where people must commit to radical change to fulfill their minimal duties of justice vis-à-vis future generations (Meyer, 2012). As decades of environmental politics on local,

national, and global levels have demonstrated, there is a general lack of will to pursue policymaking that ensures intergenerational environmental justice. Policies and lawmakers are generally more concerned with present addressees and short-term (often electoral) effects than with the long term (Campos, 2018). According to Birnbacher (2012/2009), although most adults accept future-oriented ethical principles, they compete with other and present-oriented motivations and are less likely to be given priority in concrete practice. To empower children and youth in climate politics can be seen as a way of reducing intergenerational conflict of interests and solving inter-temporal distributive questions, as youth participants in this case envision a future shared with next generations.

Generating Meaningful Conversations and New Perspectives

The workshop activities were designed to share knowledge, stimulate individual reflection, exchange viewpoints, and shape collective messages. Participants were encouraged not only to share their worries but also their ideas about solutions. The activities intended to encourage reflections and comparisons through exchange of viewpoints and group discussions. This process allowed for different viewpoints to emerge, as participants were faced with each other's perspectives and had to come to a consensus through collective ranking and visual messages, an aspect appreciated in the participants' feedback. As one youth facilitator reported, one group had to reach consensus when one participant shared a photo of an avocado to symbolize unnecessary emissions while another shared a photo of vegetables, including an avocado, as an argument for fewer emissions through veganism. The group discussed the complexities of eating climate-friendly food.

The exchange of ideas and opinions invited consideration of familiar problems in a new light, offering new outlooks and insights. This was particularly evident in the encounter between urban and rural participants, as many of the urban activists urged for vegetarianism as an important step to more sustainable living whilst young rural people emphasized the benefits of a local food system, shortening the distance between food producers and consumers and favoring locally produced fruits, vegetables, and meats. Although reaching a consensus could be difficult, the youth facilitators noted that the groups would discuss back and forth before writing anything down, interpreting this as an effort to include everyone in the message conveyed by the group. Age and maturity were raised as a potential barrier of inclusion, where a youth facilitator reported that it was challenging at times to engage the youngest participants in group discussions. Contributing by drawing and writing was helpful in this regard.

The participants' feedback reveals that most of them learned from each other, an aspect often cherished, while some also missed the opportunity to learn more about climate issues from professionals (see Ursin et al., in review for more). Manzini (2016, pp. 57–58) calls it "participationism" when facilitators do not offer expert perspectives. In some cases, this could hinder knowledge exchange. The process of developing the strategy reveals the tensions between public and expert
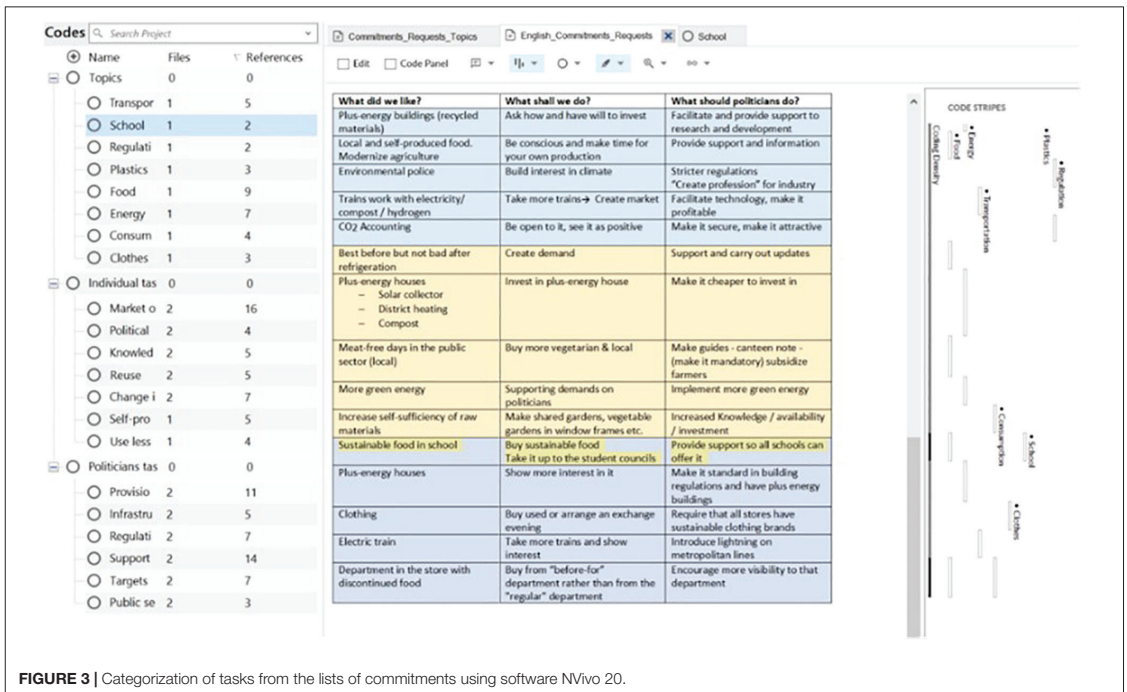
FIGURE 3 | Categorization of tasks from the lists of commitments using software NVivo 20.

knowledge: One of the difficulties that participatory methods in design seeks to resolve is utilizing and integrating a diverse knowledge base in seeking solutions. While expert knowledge is legitimate, for example scientific knowledge on climate change, this knowledge does not consider the implications for different groups of people and their lived experiences (DiSalvo et al., 2012). Nevertheless, the workshop is a co-optation of children and youth's knowledge by institutional means—at the risk of erasing the contestation and adversarial nature of the original protests. Yet, as Teli et al. (2020) recommend, the participatory design process should look at follow-up and methods as actions for making the future. Furthermore, the workshop's success should not be measured by the knowledge produced but by the new conversations between previously unrelated actors in this instance, opening up for an intergenerational dialogue.

The intention in gathering public knowledge is to identify gaps between the pathways proposed by experts and what participants desire to be put forward. An ethical principle that applies here, as noted by Robertson and Wagner (2012, p. 65), is respect for (young) people's expertise. In the case of children and youth, this means elucidating what is understood or imagined about climate change, how it is encountered in everyday life, and the actions that are expected. As Qvortrup (2009) underscores, children as a generational category might have different priorities than adults. This is particularly relevant in climate politics, where the youngest generation are most vulnerable to climate change and climate induced effects and will bear the brunt of the impacts of long-term climatic changes (UNICEF, 2008;

Davies et al., 2016). For instance, while experts could be setting their hopes on individually owned electric vehicles, the young participants leaned toward public transportation by combining the use of publicly owned bikes and other modes of transit such as trains and buses. Although the county council originally showed skepticism toward the open-ended participatory design, resting solely on the input of the participants rather than lectures being part of the event, they were pleasantly surprised by the richness of material that the workshop generated. An open-ended approach also guaranteed legitimacy of the final report, as participants had not been influenced by other stakeholders in the process (see also Punch, 2002).

Being Creative and Producing Visual Material

The workshop activities encouraged various forms of expression, including discussion, writing, drawing, and using photos and news clippings to convey messages. A youth facilitator expressed being impressed by the workshop design, noting that it "felt like something different than just another workshop." Task based activities can also allow more freedom of movement than for example interviews, potentially contributing to an atmosphere that is comfortable, yet dynamic and active. As we moved from the first initial discussions to task-based activities, participants began to engage more with each other and 'took over the room' by utilizing the space in different ways, some of them spreading out on the floor, making posters (see **Photo 4**).
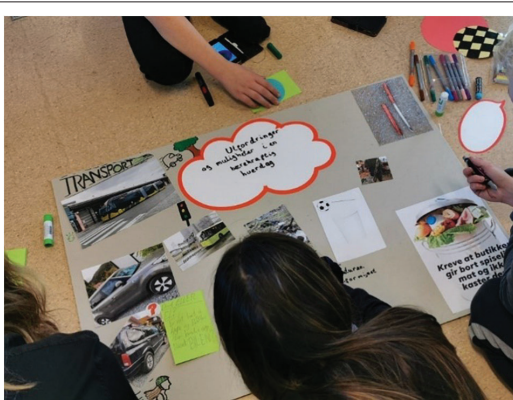
PHOTO 4 | Participants utilizing the workshop space.

However, tasks were time-consuming, and the tight time schedule presented a challenge for both participants and the research team throughout the weekend.

The workshop was perceived as fun and met with enthusiasm. Some also found that the visual tools eased the process of communication, overcoming the logocentric tendencies of talk, as one participant noted, "You get to illustrate your thoughts so that it's easier to others to see what we think." According to Elden (2012), to communicate ideas visually enables the abstract to become concrete. In agreement with Buckingham (2009), we do not see some methods as offering "privileged access to what people 'really' think or feel" (p. 635). However, we see benefits in drawing on a 'tool kit' of various methods as a way of making research understandable and to aid in acknowledging different preferences and abilities (Ennew and Plateau, 2004). This helps reposition children and youth in policymaking in climate politics (cf. Gardiner, 2012/2003; Davies et al., 2016)

PHOTO 5 | Materials displayed in 'corridors of power.'

and ensure their participatory rights as they may provide their opinions (United Nations, 1989, Article 12) by using a medium of their own choice (Article 13). Some also found it challenging to be visual and creative; some participants felt they lacked artistic competence and may feel constrained and uncomfortable with methods like drawing (Punch, 2002; Buckingham, 2009). We aimed at allowing flexibility in how tasks were solved by inviting participants to choose means of expression. However, as preferences vary from person to person, it is challenging to create a workshop design that accommodates all. The event was open to children and youth of different ages, levels of knowledge, and political engagement, making it a challenge to balance; acknowledging different preferences and competencies while not being patronizing (Punch, 2002) or homogenizing children and youth (Thomson, 2007).

Visual and creative tasks can be seen as less political. Some participants expressed a wish for more "actual politics" and debate in a more traditional manner. In the process of writing this article, we reflected on how the task of creating a positive story about the future may be experienced as slightly belittling and an obstacle to political involvement. Being invited to create a story about a *fictional* character in the future can be experienced as being asked to write 'make-believe stories' rather than dealing with political questions (see Ursin et al., in review). Yet we used this method as a means for participation and an effective way of envisioning futures that engenders ethical questions (Baumer et al., 2018). The creation of stories engages the imagination of participants in a (politically) enabling way (see Borup et al., 2006). The future workshops method is commonly used with adult participants. However, considering the potential sensitivity of the activity, when working with children and young people, communicating the reasons for using this method and its political dimensions in a clear manner is important.

The task-based and visual methods produced visual outcomes that are useful as research material and boundary objects in discussions with other groups or communities around the same topic (Ehn, 2008). Immediately after the workshop, the visual material (posters and collages) was displayed in the hallway outside the political and administrative wing in the county municipality hall as a teaser before the report was published (see **Photo 5**). Through this, the voices of children and youth were made visible in the 'corridors of power,' carrying substantial symbolic meaning. The inputs – in form of photos taken at the event, the physical posters and collages made by the participants and the final report (Lorgen and Ursin, 2019) – became the foundation for the succeeding workshops and conferences held with different groups of (adult) stakeholders (see **Photo 6**). The visual material turned out to provide a good angle from which to look at the specific inputs and worked as icebreakers and conversation catalysts resulting in meaningful conversation.

Creating a Social Space of Optimism

The social dimension of the Climate Workshop was appreciated by the young participants who enjoyed the opportunity to socialize with like-minded and establish new friendships. Some participants arrived alone, others with friends. They socialized through workshop activities as well as during breaks, meals,

PHOTO 6 | Presentation of input from the Climate Workshop at EnergyChange conference 2019 in Trondheim.

and other social gatherings throughout the weekend. Being a young activist can be a lonely experience (Hondsmerk, 2021), particularly in small towns. In addition, psychologists are becoming increasingly concerned about the strain the climate crisis is putting on young people's mental well-being and report environment-related stress and anxiety (i.e., Clayton et al., 2017; Clayton, 2020; Skauge and Haugestad, 2020). Promoting a sense of connectedness with others through climate action is vital in reducing climate anxiety (Clayton et al., 2017; Skauge and Haugestad, 2020; Hondsmerk, 2021).

The workshop also fostered a sense of optimism, a feeling of "having made a difference" (participant feedback). One youth facilitator reflected on a shift from a pessimistic to a positive tone when participants were made aware that the future visions task was to be an optimistic portrayal. The workshop results were permeated with anticipation: Participants envisioned radical change and increased life quality of citizens (Lorgen and Ursin, 2019). The initiative thus had outcomes beyond the democratic and political intention, nurturing a sense of well-being among the young participants. Participants expressed a belief that a society with substantially lower environmental impact is a better one, in terms of life quality, solidarity, and health. They imagined a green society marked by biodiversity (birds tweeting, flowers in the city, few cars), where we eat locally produced food (homegrown in windowsills or roof greenhouses), our transit options are smart (electric bicycles, electric buses and trains and flying buses), our buildings are climate friendly (solar panels and plus-buildings), and our habits and behavior are focused on sharing, repairing, and being together. Indeed, when activism cultivates a sense of meaning and purpose, active engagement in efforts to mitigate climate change is reported to reduce feelings of fatalism, helplessness, hopelessness, and lack of understanding (Clayton et al., 2017; Clayton, 2020; Hondsmerk, 2021).

From an ethical perspective, we were wary of the risks of causing emotional distress or environment-related anxiety among our participants (Clayton et al., 2017; Clayton, 2020). In addition, we wondered whether it is fair to ask children and youth about solutions on complicated issues that they are

not responsible for. As elsewhere, young Norwegians engaged in climate activism have adopted a common identity as 'the future' and report higher environment-related stress than older generations (Skauge and Haugestad, 2020). Although one might ask whether young people embrace this label of futurism as a response to policy instruments that hinge on the planetary legacy for 'future generations,' it is also worth considering whether such initiatives further chisel out their status as agents of change (see Walker, 2017), making them responsible for the mistakes of previous generations. Making matters worse, due to their intergenerational positioning, children and youth have little real political agency (Walker, 2017; Ursin and Lorgen, 2019) and their participation in environmental politics remains "naïve, simplistic and tokenistic" (Percy-Smith and Burns, 2013, p. 324).

These concerns suggest a need for careful consideration of methodological choices to help ameliorate distress. In the Climate Workshop, the activities focused on a positive future, and areas and actions of improvement. As such, they were imbued with anticipation, hope, and optimism. As recommended by the American Psychological Association, to promote resilience in the face of the climate crises, the workshop also brought young people together for mutual support and provided opportunities for meaningful action (APA as cited in Clayton et al., 2017). Furthermore, to be ethical, research must be of sufficient importance, and the benefits must outweigh the risks, ensuring participants' rights to be protected from exploitation (United Nations, 1989, Article 36) (Ennew et al., 2009). As the results from the workshop informed the region's strategy for transformations to mitigate climate change, it can be argued that the participation of children and youth as representatives of the future (Weston and Bach, 2009) leverages their positions at the margins of political arena, this outweighing potential risks of causing distress and anxiety. Furthermore, their cross-temporal position renders climate mitigation as of particular importance to them, as they may live longer and experience the birth of their children and grandchildren.

This might suggest that children and young people are less concerned with short-term investments and politics and more

prone to embrace environmental issues and the well-being of future generations. As in the words of climate activist Hondsmerk (2021), young activists are willing to commit civil disobedience and even get arrested for future generations. This fits well with Rawls' 2012/1999 'chain of concern model,' where action promotes indirect future-oriented reciprocity (Rawls as cited in Weston and Bach, 2009). The young participants called for the need for environmental police and legal sanctioning of climate offenses and showed great concern for biodiversity, calling for the protection of all species' habitats, for instance by cleaning plastic from the ocean. Their attitude is aligned with a respect-based intergenerational justice, based on the idea of a transgenerational and transtemporal global social contract founded on the notion of human and non-human solidarity (see also Campos, 2018).

Sparking Intergenerational Power Redistribution

The young Swedish climate activist Greta Thunberg provided young activists new legitimacy in raising their voice and criticizing the neglect of environmental concerns in decision-making, both related to industries and politics, demanding a more rapid and transformative change. Inspired by Greta Thunberg and her followers, young people in Trøndelag mobilized through school strikes organized by the global 'Fridays for future' movement. The politicians in the County Executive Board of Trøndelag expressed a wish to understand the underlying motivations of the youth climate strike. The Climate Workshop was an opportunity to empower the perspective of these already active participants and inform public and politically elected authorities, influencing the making of a new strategy to mitigate climate change. However, participation is not inherent to research methods (Thomson, 2007), and organizing a participatory workshop does not guarantee real participation in policymaking. To ensure participatory rights of children and youth, their views must be given due weight (United Nations, 1989). In addition, any participatory process should ensure that the solutions put forward are for the benefit of all affected groups. This requires a political commitment toward enacting and inspiring social change and challenging unequal power relations (Grant, 2017). Initiatives where children and youth are consulted but not taken seriously are tokenistic, a form of non-participation in decision-making (Lundy, 2018).

The process from the Climate Workshop until the final strategy shows how policymakers addressed issues raised by the young participants and demonstrates that their views were taken seriously. Crucial was the *timing* of the event. The Climate Workshop was held early in the political process of developing a climate mitigation strategy (see **Figure 1**), which enabled children's and youth's perspectives to form a *foundation* rather than a *supplement* to the resulting policy. The young people clearly stated that the solution to the climate crisis lies in cross-sectoral solutions, where various actors in society work together to achieve the goal of a net-zero society. Their input followed the rest of the process of making the strategy in various ways. The initiative was partly *youth-led* (see Landsdown, 2010) as it originated through young people's public protests and social mobilization, inspiring the county council to invite young people to share their opinions. Members of the youth

county committee were consulted throughout the process, and their views influenced the final strategy. In the process, various groups had the opportunity to voice opinions, including youth operating within the political system, young activists from outside the political establishment, and children and youth who were not organized or formally politically active, but engaged in the issue.

Although workshop participants were homogenous in some regards, a heterogeneity of young voices was thereby included, which in our view strengthened the knowledge foundation produced. Trøndelag County Council has institutionalized youth involvement through the youth county committee, which can influence policymaking and make recommendations to politicians. Both the youth county committee and local environmental organizations participated in the planning of the workshop and reviewed the ways in which the results were present in the final strategy, strengthening the quality of the workshop and the process before and after it. However, young people were not involved in all aspects of planning and carrying out the workshop (primarily done by researchers and administration in county council) and implementing the results into the final strategy (decided by county council members). As such, the Climate Workshop was situated in the nexus between consultative and collaborative participation (Landsdown, 2010), sharing views and ideas in an adult-led and managed event and influencing the process, but simultaneously being excluded from decision-making processes. This was, however, also the case for other interest groups such as researchers and adult stakeholders.

The climate transition strategy of Trøndelag (Trøndelag County Council, 2020) is based on input from the report on Climate Workshop in addition to knowledge from international climate research and national expert papers on how to tackle climate change in Norway. It may be hard to discern the actual impact of the Climate Workshop as the workshop inputs are overlapping with priorities of experts on climate mitigation. The emphasis on materials and plastic, however, undoubtedly stems from youth engagement. A divergence between the youth's wishes and demands and the final strategy concerns time. The solutions and timeframe proposed do not meet the youth participants' expectations in terms of time and radicality of societal changes. Despite a joint goal, the timing of crossing the finish line is significantly later in the final strategy than it would be had it been up to the youth. The outcome of the Climate Workshop thus suggests that there is a divergence in what the youngest generation perceives as 'just savings' for generations to come (cf. Rawls, 2012/1971) and what the adult population is willing to do.

The photos and illustrations from the Climate Workshop in the strategy document situates young people visually at the heart of the strategy. However, this also raises critical and ethical questions, such as whether it leads to an exaggerated impression of their inclusion in the political process. One can ask if the strong visual position of children and youth is a rhetorical utilization of their symbolic power. Children and young people embody our perception of 'the next generation,' a symbolic evocation of hope, futurity, and social change, that commonly calls for concerted public and political action on climate change (Walker, 2017). However, as Walker (2017) points out, the use of children and young people as symbols of change is inherently problematic

when they are seen as citizens-in-the-making (Lorgen and Ursin, 2021), marginalized in decision-making processes.

In addition to having an impact on the climate strategy, the Climate Workshop and the subsequent report affected the work of the youth county committee. It strengthened the competence, capacity, and awareness related to climate change transformation in the committee, making climate transition one of four action areas in their yearly work plan. The committee has also worked on several projects related to the Climate Workshop, such as the production of an informative video about how youth can make their municipality help fight climate change. They also informed the President of the Parliament about the workshop and the importance of including youth in decision-making related to climate change and inspiring youth across the country to demand climate action (UFT/UFU, 2020).

In retrospect, we realize that one area of improvement is the structure of feedback sent to the youth participants. The participants received a newsletter specially made for them. However, since politicians ordered the workshop and asked the young people to contribute, feedback from these politicians on how the input was received and implemented would have been preferable. This would have provided transparency in the decision-making process and encouraged accountability, conveying the message that youth's suggestions were or would be implemented (see Lundy, 2018). In addition, the material is co-produced knowledge, thus the youth participants could have received a summary of the raw material of the workshop to increase their sense of ownership, allowing them to use it (e.g., showing it to family and friends, presenting it in school, using it in organizational work, etc.). This might also have led to amplified effects of power redistribution.

Lastly, a common criticism of participatory design methods is that participation is reduced to administrative—one time—events that undermine the possibility for long time committed interactions between multiple interested parties (Botero and Hyysalo, 2013; Manzini, 2016). The current process was limited in the sense that it did not result in multiple iterations, however, the current climate strategy is not fixated on specific solutions. This is an opportunity for young people to articulate their participation even more by putting visions into concrete solutions. While Trøndelag County Council intents to mediate participation, it is unclear how this will occur.

CONCLUSION

Children and youth hold a vital position in climate politics and are perhaps the most important stakeholders. They hold a key position in sustainable politics, as Heft and Chawla (2006) point out, "if practices consistent with sustainable development are to be carried forward through time, then children must be the bridge conveying their value and ways" (p. 199). Based on our experiences with the Climate Workshop, we propose that participatory workshops, focusing on intertemporal aspects and the (desired) future of the participants (Jungk and Müllert, 1997), may ensure their participatory rights and enhance their sense of citizenship as well as strengthen intergenerational justice by a redistribution of power in the present. In addition, such

initiatives provides intergenerational perspectives and reduces the intergenerational gap. There is, however, a need for longer term participation with children and youth, both to foster a sense of ownership and to ensure continuity for their visions (Botero and Hyysalo, 2013; Teli et al., 2020). Therefore, we suggest that such workshops become permanent mechanisms of citizen participation in decision-making in community development to recognize and protect the human rights of present and future generations.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author/s.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin. Written informed consent was obtained from the individuals and minors' legal guardian for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

FUNDING

ACKNOWLEDGMENTS

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Article 4. Designing for what? Approaching necessary production and consumption for a circular economy

Published as:

Ortega Alvarado, I. A., & Pettersen, I. N. (2022). Designing for what? Approaching necessary production and consumption for a circular economy. DRS2022: Bilbao. https://doi.org/10.21606/drs.2022.767

Jun 25th, 9:00 AM

Designing for what? Approaching necessary production and consumption for a circular economy

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Designing for what? Approaching necessary production and consumption for a circular economy

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Abstract: Circular economy (CE) is currently a 'hot topic' in design discourse. The focus of these discourses has centered on product design, which is a core aspect of material circularity. However, CE is more than products. This assumption is the base for a research question: what should be the intention in designing for a CE? The recognition of CE as a systemic transition opens up opportunities for other forms of design. These forms should contribute to societal goals concerning why and what is produced –more than the profit-making. We contend that a CE should not be approached from the perspective of the usual actors, reduced to business/industry and waste management. We propose instead to take discussions about the governance of production and consumption as the starting point. Finally, we demonstrate the opportunity to open the futuring of CE through participatory and discursive methods based on cycles of speculation and visioning.

Keywords: circular economy; governance; necessary production; design contributions

1. Introduction

Circular economy (CE) is currently a 'hot topic' in design discourse. CE has evolved from waste management to value retention strategies (Reike et al., 2018), representing multiple opportunities for diverse design contributions across several design sub-fields. For example, in preparation for forms of consumption that extend the lifetime of products (Selvefors et al., 2018; Selvefors et al., 2019), in product design strategies for business models (Bocken et al., 2016). Empirical studies have also looked at how design practitioners address and understand CE (Dokter et al., 2021) and the challenges faced in designing products for or with materials recovered from waste (Singh & Ordoñez, 2016). In addition, there is growing acknowledgment of the need for product design processes to achieve material circularity –for example, identifying design roles for specific business strategies (De los Rios et al., 2017).

In most accounts of CE, product design is regarded as the stage when circularity is defined. Therefore, extensive literature focuses on product strategies or principles to consider when designing for a CE, including categories of products and materials for different recovery and

maintenance strategies (maintaining the value of products and materials). This type of litera-ture follows a tradition of design for sustainability that has evolved from eco-design to circu-lar design, going from preparation for recycling to planning for product integrity for multiple use cycles and product service systems (den Hollander et al., 2017; McAloone & Pigosso, 2017).

Undeniably, product design is an essential aspect of material circularity (Aguiar et al., 2021), which is not only relevant to the business context (profit-oriented goals). For example, re-search about material circularity can be framed from people's motivation to repair or to keep products in use for longer (Ackermann et al., 2018; Terzioğlu, 2021). This thus suggests that the transition towards a CE covers more than products. Furthermore, it raises questions about underlying social relations, organization, and distribution of resources –in just or un-just manners "by design" (Berry et al., 2018).

Raworth (2017) stresses the need to consider biophysical –planetary– and social limits as an economic aspect to be translated to actual implementations, constraining production –a dis-cussion featuring in CE debates against the current backdrop of prospected endless eco-nomic growth (Kirchherr, 2021; Bauwens 2021). Furthermore, from a socio-technical per-spective, it makes sense to expand CE's basic notions to look at more than its technical im-plementation – moving forward to the kind of society it supports. Similarly, in design dis-course, particularly in academia, a socio-technical perspective calls for the recognition that design forms more than products (Dilnot, 1982). If a CE is supposed to be a sustainable path-way, it requires a change of perspective, zooming out from products to people and systems (Ceschin & Gaziulusoy, 2016). Thus, design to advance a CE should focus on more than prod-ucts –which is an aspect that could also contribute to the general discourse and practice of CE, integrating discussions about technologies and consumption (Schröder et al., 2019). The point is not to leave products outside the debate but to question what is produced and why (Genovese & Pansera, 2021), to contribute to making the discussion on material circularity and its social effects more fruitful.

The extent and scope of the effects of a CE are an aspect that is not widely discussed or un-derstood. Questions concerning larger societal goals, institutions' roles, and responsibilities are usually lacking (Moreau et al.,2017). As a result, deliberation about CE is usually reduced to the negotiations by powerholding actors in the industrial and financial sectors, with the support of governmental platforms (Berry et al., 2018; Fratini, 2019). The transition towards a CE risks becoming an empty signifier –worst, a signifier of greenwashing– or an unrealiza-ble panacea (Corvellec et al., 2021). In this context, an aspect such as product longevity is framed as a dilemma between competitiveness (profit-making advantages) and social well-being, and would impact how designers operate (Cooper, 2017).

In practice, CE becomes, in many cases, a buzzword, entailing multiple meanings –from recy-cling to reducing or reusing and sharing, from top-down and bottom-up (Henry et al., 2021). Moreover, the kind of CE supported by coalitions of actors reflects the practices and under-standings of those actors (Ortega Alvarado et al., 2021). Therefore, any CE will be socially

constructed, but this does not mean that it will be opened up to society as a whole. Instead, those enacting CE projects will have the main influence on its outcome. As an alternative for the future, the CE discourse still lacks recognition of plural political and intellectual programs. Instead, it appears to be subsumed by technological solutions and incrementalism of mainstream eco-design (cf. Fry, 2003). In response to these missing aspects, this paper proposes a reformulation of what design should "design for" by considering that it opens the opportunity to make plural futures possible (Escobar, 2021).

Thinking about opening to plural futures can be a daunting task for designers because it implies the recognition that others have equal or similar capacities to imagine and convene solutions about their future. Here, the challenge is how to mix design expertise –for example, in reflecting in and on action (Schön, 1983)– without the normativity of neoliberal orders of design (Julier, 2013). Thus, a research question is: what should be the intention in designing for a CE? Alternatively, and referring to Julier's (2013) call, could designers use the design of a CE as part of design activism? This would imply including goals that seek more than the win-win scenarios of commercial actors. Although ideas about CE and design contributions are still ill-defined, this paper aims to present another way of framing these contributions.

The structure of this paper includes five sections—first, this introduction. The second section discusses futuring for a CE and reviews some literature about CE in design and other disciplines. The third section presents a proposal for an approach to address CE from concerns other than products. The fourth section presents the results of a test of this approach with participatory methods. Finally, the fifth section discusses some strengths and shortcomings of the approach concerning the CE and offers some conclusions for further research.

2. What to future in a circular economy

In the context of transformations for a CE, the studies of Dokter et al. (2021) and Dan and Østergaard (2021) suggest that design practitioners are becoming more aware of a need to work with others and act as connectors –within a context or a system. However, a shortcoming of these studies is that the design practice studied is only concerned with projects for productive sectors (e.g., architecture, manufacture, fashion). These studies evidence an integration of circularity as a component of design practice. However, it does not consider other possibilities for design contribution–for example, forms of design that do not conform to a commercial agenda (Tharp & Tharp, 2019)– not surprising in the business context. In this regard, Pedersen and Clausen (2019) move design contribution capacity a bit further by focusing on the co-design (or negotiation) for integrating CE through the concept of value chains in clothes washing services at hospitals. Although not open to the whole society, this last example uses design in its capacity to enact moments and objects that connect different participants in spaces for negotiation.

Van Dam et al. (2020) have reviewed some of the modes of design that can contribute to CE. Their study categorized design contribution opportunities in four: for circular production processes, for circular consumption, to support policy, and education for CE. The relevance

of this study is that it shows that CE in design research is looking at those four components, but usually from the understandings of the commercial agenda –with neoliberal features (cf. Julier, 2013).

Hobson (2021) has noted that CE implies a socio-material reconfiguration. Thus, it means that the form of design cannot only be focused on technical artifacts but instead on the re-configuration of both the use of materials and the social arrangements that structure the practices and logics through which those materials are used (Welch et al., 2017). Following on the questions posed by White (2020) about design futuring for just transitions, one can wonder what it would take to democratize CE and what it would mean for design politics to democratize a CE. These are questions that talk not only about the CE people want but also about the design we want and the political issues that come with it.

Lofthouse and Prendeville (2018; p.465) suggest reframing the positioning of design regard-ing CE. This reframing would begin from the user's role and move to more participatory de-sign approaches. In this perspective, design is seen as a form of radical humanism, which ne-cessitates including people's everyday life problems, guided by the question of "*for whom the CE might be conceived*." This reframing of the design position is closer to the focus on systems and people as proposed by Ceschin and Gaziulusoy (2016).

Reframing design for a CE will require thinking and doing differently (Dorst, 2015). Further-more, it requires looking beyond solutions and paying attention to the bigger picture, the networks, complexities, and dynamics resulting from the interaction between individual agencies and social structures –a long-standing divide of sociological research that design will not solve. A CE can be framed as a wicked problem of design (Buchanan, 1992). It deals with a series of issues that are primarily concerned with material objects. Still, the proposed objects will depend on understandings involving signs, actions, and thoughts external to the product. This task requires, without doubt, a systemic understanding –a kind of design ex-pertise to see the systemic consequences and interconnections of a CE (for more about de-signers as system thinkers, see Design Council–UK, 2021).

Although CE is referred to as a system, the system perspective usually considers only materi-als for production (manufacture efficiency) and waste streams in interactions to achieve some environmental indicators and revenue creation opportunities. However, the use of materials and energy is not the end goal of people. What is used for manufacture or wasted results from people's participation in social practices (Warde, 2005; Shove & Walker, 2014). Following a proposal to look at CE as a path to limit or reduce consumption (Ortega Alvarado & Pettersen, 2021), a reframing from design would require recognizing what people think they can do (and not) within a CE, in addition to their contextual situations.

People act according to what they think is possible, what they expect (Brown & Michael, 2003), and what is collectively imagined (Jasanoff, 2015). Likewise, people's understanding of what they can do and say conditions their participation in practice (Welch and Warde, 2016). These aspects may appear individual, but most are socio-material, referring to what is

collectively normalized and accepted. The normalization and acceptance –of certain forms of being and doing– becomes what is politically enabled or enforced. It is more than individual preferences, and it falls into matters of infrastructured conditions and governance.

Regarding governance, research on CE has focused on material flows and waste indicators. Futuring CE is driven by a rehearsal of technological innovation and financial ideas, which can be measured and presented as win-win scenarios. Thus, making it difficult to criticize the uncertainties of circularity, particularly the social effects that cannot be measured. However, quantitative indicators also have a central role in the imagination about CE. Products and in-dicators are discussed, because as Völker et al. (2020, p.116) note, "nobody would argue for less circularity." These leave out more fundamental discussions, such as the relations be-tween actors in the civil society, industrial and retail sectors, and the government, and how these structure the linear economy.

We propose reframing CE discussions by focusing on consumption and governance. We do that to add to the questioning about what is produced and why (Genovese & Pansera, 2021). This shift also offers the opportunity for design to contribute to CE by taking on modes closer to activism (Julier, 2013), systemic thinking (Ceschin & Gaziulusoy, 2016), just transi-tion (White, 2020), and radical humanism (Lofthouse & Prendeville, 2018). It represents a move from commercial agendas to more discursive approaches (Tharp & Tharp, 2019). More experimentation on reframing (Dorst, 2015) will be necessary to contribute to the debates and discussions about CE without falling into the traps of proposing new product re-design for the sake of mere production. In the following section, we present a formulation of a pro-posal to start working on a reframing of CE.

3. Futuring the governance of production and consumption

The approach proposed in this section draws on debates about the intrinsic goals of CE. These debates question CE's congruence or compatibility with other movements or political projects, such as degrowth, sufficiency, eco-modernism, green growth (Hobson & Lynch, 2016; D'Amato, 2021; Bauwens, 2021) –debates that can also be framed for product design as alternative technology criteria (Ralph, 2021). These debates present core dilemmas about production and consumption limits and the possibilities for their governance, which interact with concerns about freedom –individual agency vs. control– and technology –incremental-ism vs. steady-states (Bauwens et al., 2020). Moreover, the governance of production and consumption is hidden by the techno-determinism of most CE proposals, particularly the ends that policies and projects in the private sector intend to enable or enforce.

The question about the governance of a CE and its intrinsic goals may result in specific pro-grams bound to local or regional contexts (Sutcliffe & Ortega Alvarado, 2021). To integrate those political concerns that could influence the coming into being of a CE, we propose to use participatory methods –in line with previous calls (Lofthouse & Prendeville, 2018; Peder-sen & Clausen, 2019). Instead of answering what products or services to design, the methods

used should help identify and evidence controversies and opportunities for the governance/organization of circularity focusing on the social aspects that could influence the future (Monda, 2018). Thus, for us, this means working around what is understood as necessary/sufficient for production and consumption and the roles different actors would take (market actors, public sector, civil society).

In practice, CE takes many different meanings, and most people may be unaware of what it entails. Topically CE can be understood as an end or as means. In both cases, people's consumption and production are modified, whether it is in products or habits –that drive material resource consumption. Therefore, we assume that opening the future of CE by questioning the concept's meaning could be unfruitful. The focus should be on the nexus of consumption and production and their future governance. Not to imagine futures, but to reveal the opportunities to co-construct them.

To formulate a formal proposal, we agree with Lofthouse and Prendeville's (2018) position about the need to reframe the CE. However, we contend that this reframing should not come from designers alone –nor a group of experts, or from actors in the usual sectors (manufacture, retail, and waste management). If a CE emerges, it should be based on the understandings of regular citizens –the logic of their everyday life and their political positions.

3.1. An approach proposal

The ground for this proposal is the identification of expectations of citizens about the future of production and consumption. This workshop takes two perspectives from design. 1) Participatory design to include interested or affected people in co-producing the solutions related to their everyday lives. 2) Futuring to evidence and stimulate present reflection about probable, desired, and possible outcomes. While identifying expectations is the core aspect of this proposal, the process suggested here is coupled with deliberation and visioning of plans (discussion).

We deploy our approach using workshops as spaces for discussing and integrating a diversity of meaning –to open up the futures of production and consumption. Workshops are suggested here for their facility of execution, however other participatory methods could also be applied. The main factor of our approach is the emphasis given to "necessary production" as the aspect to question. We focus on products and their social significance. To do so, we recur to expectations and deliberation in their broadest sense to partake in a futuring practice that is both participatory and discursive (Tharp & Tharp, 2019; Hajer & Pelzer, 2018). Thus, we propose opening the futures of CE by not talking about CE but instead about the core aspects it intends to palliate. At the same time, promoting the transfer of design capability to people –at least for identifying strategies to deal with dissenting and contradictory visions.

The workshop's exercises address expectations through speculation –reflection upon specific objects, situations, or scenarios. Deliberation is addressed through visioning techniques.

Both suppose two different forms of thinking that can be complemented. In speculation, the thinking process reflects present conditions (fears and hopes or positive and negative). Visioning is about the conscious planning for action or the declaration of a desired state of being. These two approaches can be applied in iterative cycles (Figure 1).
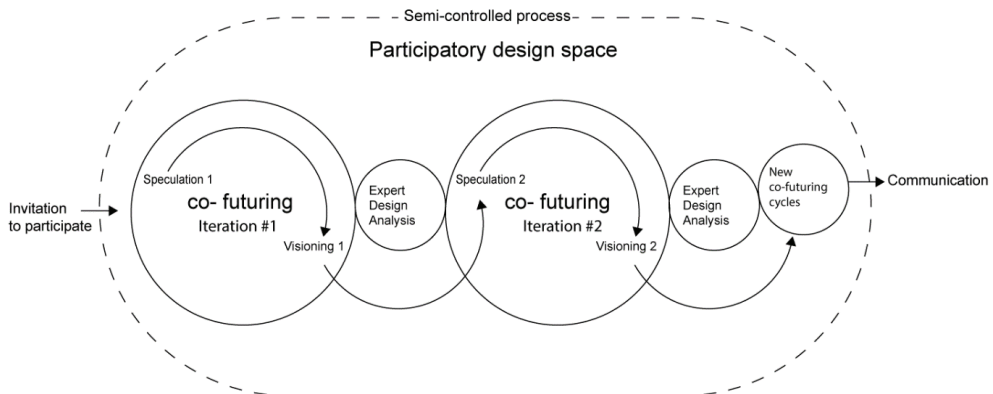

Figure 1. Diagram of the components of the proposed workshop

Each workshop comprises two activities, one of speculation and one of visioning, which offers the opportunity for reflection and deliberation. The use of speculation and visioning could be as open or closed as desired by the facilitators, which means flexibility of tools from normative visualizations and prototypes to more open-ended discussions. However, this proposal also considers a guided or semi-controlled participation, and it requires tools for the progression of the conversation around pre-defined topics. In this case, it means the involvement of materials (templates) to present ideas around specific generative questions that follow a planned script based on the debates mentioned at the start of this section –this mode of designing considers the interactions between expert and diffuse design (Manzini, 2015). The following chapter presents a run of the workshop with two iterations to test the assumptions made here about our approach.

4. A test of the workshop

Two workshop iterations were conducted at the end of September and October of 2021 with students at a public university in Norway (Figure 2). Six students from different study programs participated in the first workshop. Although the context of the workshop was Norway, the participants were all immigrants to the country. The second workshop had three participants; two were immigrants, and one was a native Norwegian. The workshops were conducted in a physical space, using English, and lasted around three hours (including a pause for food and refreshments).
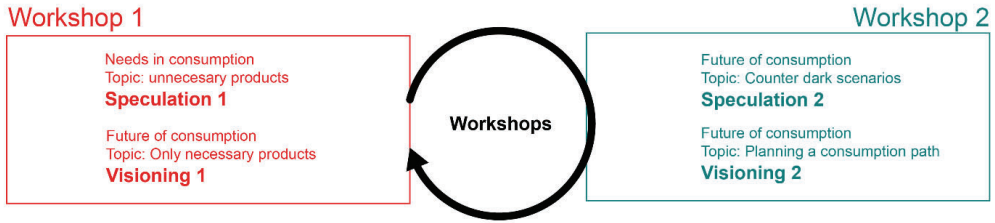
Figure 2. Topics covered in each workshop.

Before each event, a script and a presentation were prepared with generative questions and materials for speculation and visioning (Figure 3). In addition, large sheets of paper (templates) with titles and questions guided the pre-scripted narrative. These materials were the work of expert design.
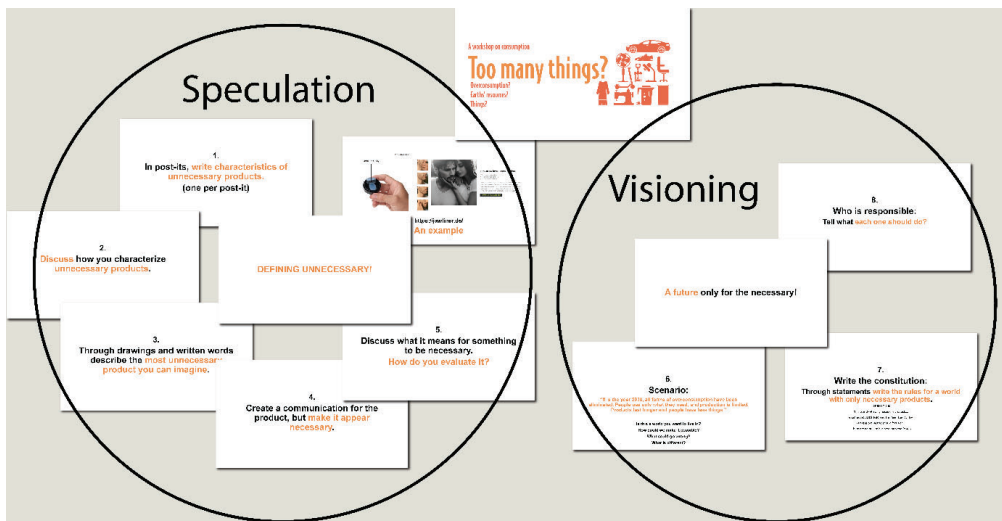

Figure 3. Example of scripted exercises for the first workshop.

4.1. The first workshop

In the first workshop, the participants were divided into pairs, resulting in three subgroups for discussion, and they had to complete eight exercises using seven templates (Figure 4). For the second workshop, three templates were used.
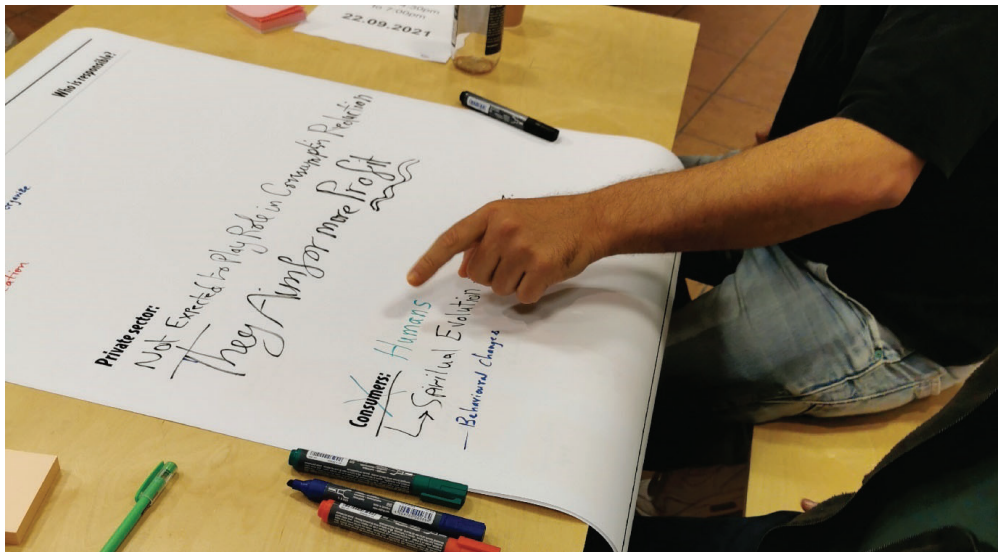
Figure 4. Picture of a participant in the first workshop.

The first workshop was oriented towards reflection and speculation about necessary and un-necessary production. The participants were given the task of defining examples and characteristics for products that they considered unnecessary, "the most unnecessary product they could mention." Then they had to come up with a way of presenting that product in a positive way to convince others to buy it. The following exercises included the definition of examples and characteristics of necessary products. After a pause, the participants went on to formulate scenarios for a world –in 2030– in which only necessary production is allowed. They were also requested to imagine the governance of that world. The final exercise was to define the responsibilities of different actors in the current system.

Speculation: defining unnecessary/necessary

The participants found it easier to point at examples of products that are unnecessary than pointing at characteristics. The three examples of unnecessary products given by the participants were: 1. The TV, as a product that becomes unnecessary under the current technological context. 2. Plastic packaging for fruits and vegetables, as a product that is an addition but contributes nothing –a debatable perception. 3. Any product with only one specific function (for example, egg slicer).

To further their reflection about how unnecessary products come to the market, the participants had to create a short communication about the example of unnecessary products. This exercise had the purpose of creating dissonance in the participants' reflections. Most of the participants took it as an opportunity to be satirical, for example, about the egg slicer: "*Be a perfect wife — get the slicer for beautiful egg slices.*"

The following exercise was about the definition of characteristics in the opposite spectrum, concerning what is necessary. During the discussions, the participants mentioned aspects related to culture, needs, satisfaction and education. Particular aspects about culture and context were related to products that are normative; for example, toilet paper, as put by one participant: *"I think toilet paper is quite unnecessary. You can have one of those water hoses or a shower."*

Visioning: a world with only necessary production

Besides discussing and reflecting around necessary or unnecessary products, the participants had the opportunity to put forward their perspective about the transition towards future governance of consumption and production. These included three tasks: saying what changes, mentioning a set of rules (policies), and indicating specific actors' responsibilities.

Scenario:
"It is the year 2030, all forms of overconsumption have been eliminated. People use only what they need, and production is limited. Products last longer and people have less things."
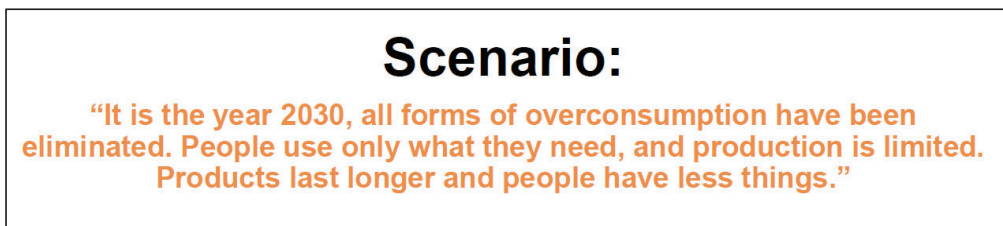
Figure 5. The scenario used in the first workshop.

For the first task, the participants were given a short scenario (Figure 5). Then, regarding what must change –to reach that scenario– the participants mentioned aspects related to the way of thinking of people. The participants pointed at education and the need to have mind shifts to avoid possible clashes with the governance. As one participant puts it:

> "We might think that there are so many things, and we get confused and bombarded with choices. There is analysis paralysis. So, it's not that things are making our lives miserable. We haven't learned how to derive utility from our miserable lives. And we have the frustration and can redirect it to opposing the government, if it imposes what's necessary, or whatever, for a party or group, it can lead to people clashing."

When it comes to the rules to govern production and consumption, there was a mixture of mentions about promotion through campaigns and incentives such as tax-cuts. This could mean in gross lines that the role of the government is understood as enabling more than enforcing actions. However, one group mentioned strict restrictions to producers (Figure 6), which means a more interventionist form of government or even an authoritarian one. This does not indicate that the two people in this group were pro-government to all their extent, but that there could be space to negotiate the role of the government in enforcing specific rules backed by regular people.
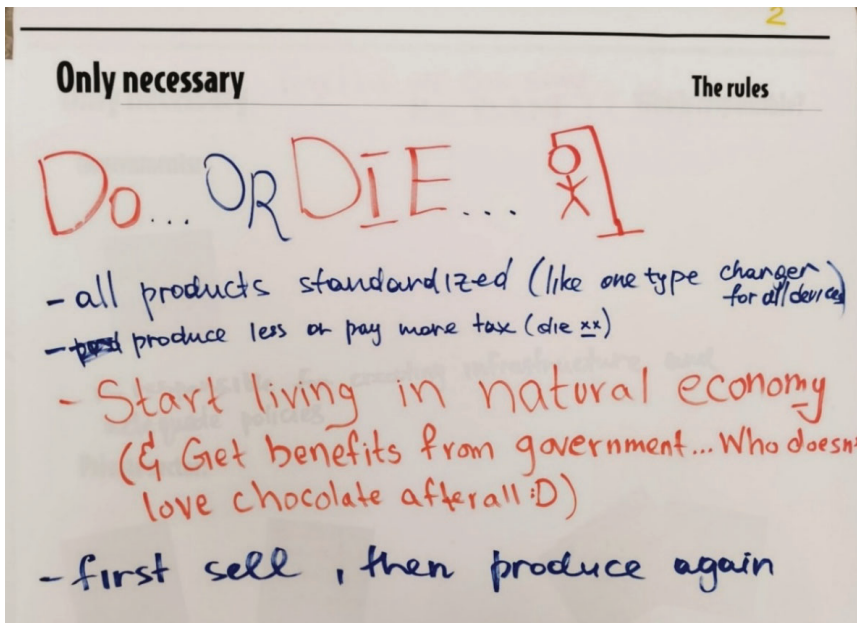
Figure 6. Rules indicated by one group of participants for a world with only necessary products.

Regarding responsibilities, a point was the role of the government in promoting change. For example, education and taxation were pointed out. However, there is also recognition about the need to change the role of the private sector, to focus on more than profit-making (Figure 7).
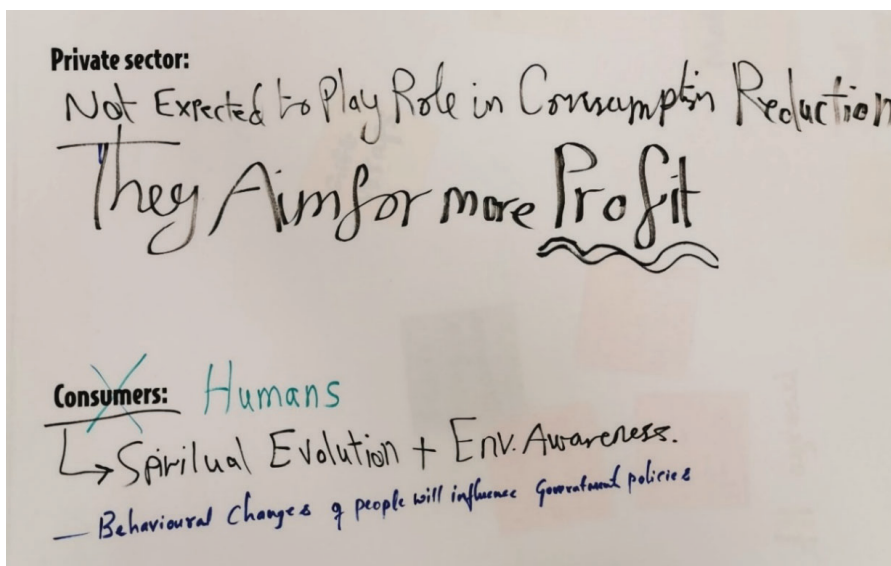

Figure 7. Example of responsibilities indicated by one of the groups.

4.2. The second workshop

As mentioned before, the second workshop was more self-contained because there were only three participants, and it was more of an in-depth discussion. With the materials from the first workshop we elaborated five fictional scenarios of Norway in the year 2030. These fictions were presented to the participants as text. Each text had a title coming from one of the concerns identified from the first workshop. However, the content of the scenario was about negative aspects under the question "What could go wrong?" (Table 1). These scenarios were the translation and curation of the concerns that emerged from the first workshop.

Table 1 Summary of concerns from workshop 1, the title of fictional scenarios, and examples of content.

Concerns from workshop 1	Incentives for low consumption (extended to production) (What kind of incentives?)
	Education for self-sufficiency
	(What is self- sufficiency?)
	Investment in research
	(What kind of knowledge to invest in?)
	Producers are given rules
	(How strict or flexible are these rules?)
	Markets are regulated
	(What kind of regulation will be accepted?)
	Encouragement for change
	(What is encouraged as change?)
	Self-sufficient production and consumption
	(To what extend should people be self-reliant?)
	Business reform
	(What more than profit?)
Title of the fictional scenarios	1) Encouragement of low consumption and production
	2) Education and skill transference for self-sufficient production and consumption
	3) Investment in research (self-sufficiency, materials and lifespan of products)
	4) Production and retail regulations
	5) Business reform (organization more than profit)
Examples of fictional content	"A mandate by the national government made sharing of products and material circulation a core service of all local governments from the year 2025."
	"Using or modifying materials from products registered by global brands is considered a breach of intellectual property under the business protection and repair assurance law of 2024."

Each participant read the scenarios and discussed them with the group. Each scenario was jointly discussed and classified into believable, possible, and wanted. The participants were also invited to declare what they found good and bad about each scenario and to select the best and worst ones (Figure 8 and Figure 9).

Figure 8. Template for the evaluation of the scenarios.

Figure 9. Two participants of the second workshop while reading the scenarios.

After reading and evaluating the scenarios, the participants were invited to imagine a different or integrative scenario. This task proved helpful for two reasons: 1. The participants realized that limits have to be negotiated or imposed, and together defined the concept of "acceptable limitations." 2. The participants discussed about education and the role of freedom, which prompted a discussion about the participants political leaning, in friction with control over education (Figure 10).
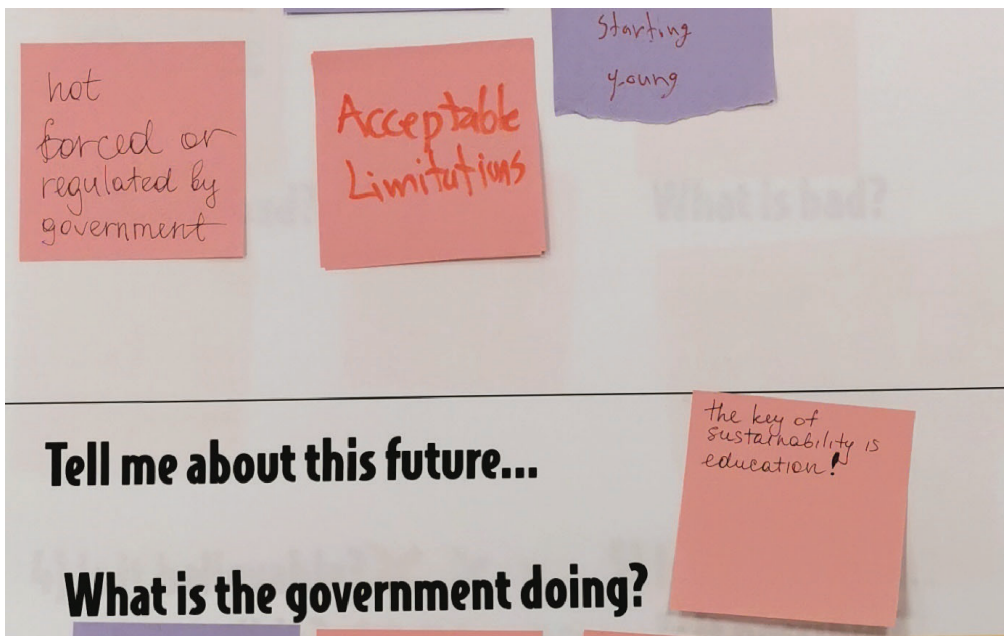

Figure 10.The participants indicated acceptable limitations and education as "key of sustainability."

The final task was about specific policies or ideas to make the changes in consumption happen; the participants found it easier to pose what they wanted than to talk about policies. It appears that although they understand the role of government, it is not something they take as their task to be propositional about, unless it comes from the place of individual wants (Figure 11).
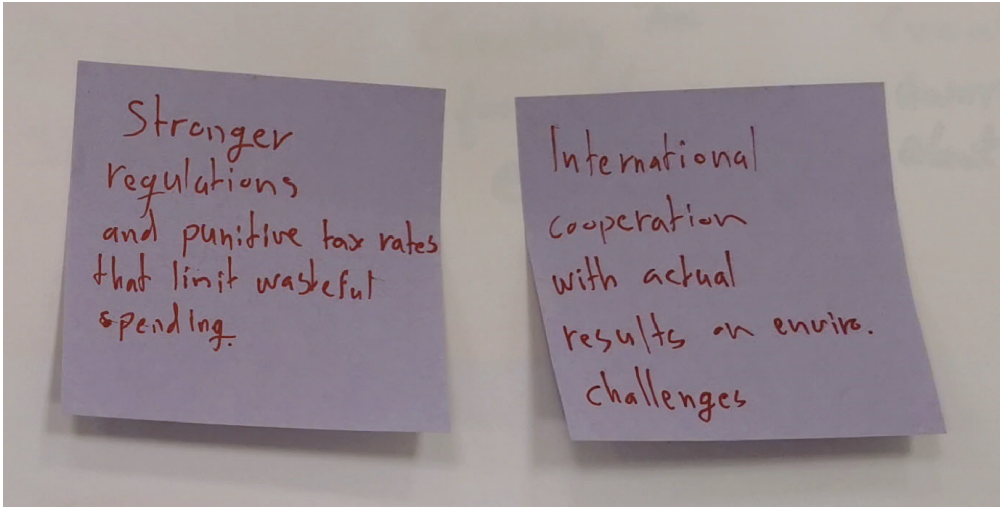

Figure 11. Example of wants declared by one participant.

The description of the workshops and the results presented here are not supposed to lead to conclusions about how people understand consumption and production and their governance, but instead to demonstrate that it is possible to open the future of CE from this position and through design modes that are not focused on defining products –which does not exclude talking or discussing about products. The following section presents a final discussion and conclusions.

5. Discussion and conclusion

In the introduction of this paper, we asked: what should be the intention in designing for a CE? We have approximated an answer through the review of literature in section 2, which allowed us to propose an approach to open up futures from discussions about the core aspects of CE without having to speak directly about CE. We then presented an example deploying this approach in two iterations of a workshop based on speculation and visioning through participatory methods. Thus, we posit that the intention in designing for a CE should be more than products and should be about opening it to the issues underlying consumption and production, those that are the motivations –why– and the socially acceptable productions –what.

These workshops allowed us to test some of our assumptions about the core aspects that could emerge from discussing consumption and production in relation to governance. This aspect is relevant to any CE because it says more about having one or another type of CE. While previous literature in design has focused on people as users of products and services and their capabilities to repair, there are still gaps in the notions people have about the roles of other actors, such as producers, retailers, and governments. What people have to say and understand about the role of different actors is also crucial to how a circular economy is structured. For example, if governments were to regulate the pace of production and innovation to stay within the planetary limits, would that gather the support of a larger population?

The issues that emerge in the discussions could be exploited depending on who is deploying the approach proposed. For example, it is a good tool to collect data for research, as it provides rich information from multiple actors and is presented together at once. Still, it could also be used by the public or private sector in their planning activities and by non-profit organizations in their discussions about sustainability. Other issues that emerged in the workshops, such as the political inclination of participants, could be better integrated with other methods, for example, by grouping people who are pro or against the state's intervention on matters of production and consumption; or by testing their assumptions through serious games which involve role playing.

Finally, by integrating participatory design methods with speculation and visioning, we demonstrate that the contribution of design to CE can be more than the definition of products. Here, we tested an approach to discursive design in the form of a workshop, but the possibilities for other forms of experimentation are open. Our main contention is that methods and interventions reframing CE from design should reflect on questions about the limits to production and consumption. The approach exemplified here works on CE without being normative or falling into the proposal of incremental solutions. This way of addressing CE will enable the expansion of both design and CE to be the socio-material reconfiguration that others have claimed. Future research about CE could take a similar approach by understanding that a CE will depend on the system (of consumption and production) from which it emerges.

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