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Thomas Edward Sutcliffe

# Transformation through the 'Middle'

A Study of Circular-Economic Visions and  
Enactments in Norway

**NTNU**  
Norwegian University of Science and Technology  
Thesis for the Degree of  
Philosophiae Doctor  
Faculty of Humanities  
Department of Interdisciplinary Studies of Culture



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Science and Technology



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# Preface



## Summary

This doctoral thesis analyses the recent efforts to make sense of, and implement, measures related to the concept of the *circular economy* in Norway. Globally, a circular transition is anchored to an overarching need to transform the existing and unsustainable linear production, consumption, and discard systems. In Norway, despite a self-image of being a beacon of sustainability, despite an explicit and ambitious national circular strategy, and despite ample resources that could be used to fund a circular transition, reportedly as much as 97.6 % of all resources, including products, are never returned to the economy and are wasted. Due to the existence of a broad and affluent middle class, in Norway, average private consumption volumes are among the highest globally, while domestic industrial production is a minor contributor to resource use – at least compared to other European countries. Thus, the specific challenge for a Norwegian circular transition is that it has to address high levels of private consumption. Four original research articles support this thesis, and by mobilising theoretical resources from Science & Technology Studies (STS), it documents and analyses Norwegian attempts to transition to a circular economy by identifying circular-economic visions and enactments. The ultimate goal of the thesis is to contribute to a better understanding of how circular transitions in Norway and in similar high-consumption contexts can be achieved.

*Article One* identifies the establishment of three discourse coalitions surrounding the circular economy idea, and the metaphors and storylines that underpin these coalitions. Two of the identified coalitions aligned with broader EU circular-economic policies: the mainstream approach of using technology and green growth developments to achieve circular-economic goals. The third coalition diverged and emphasised the importance of individual consumption reduction through support (infra)structures of local knowledge and the transfer of skills. *Article Two* analyses how the state and subnational authorities *domesticate* the circular economy idea. The article found that the state and county municipality operate in a facilitator capacity to create interest and to support businesses and industry in the transition to a circular economy. In contrast, the city of Trondheim *domesticates* the circular economy in a transformative way by changing existing practices. *Article Three* traces the origins and visions of this transformative change: examining the collaborations between the Trondheim Municipality, the

Trøndelag County, and a non-governmental organisation. The article found that the initiative for transformative change adheres to the third discourse coalition, identified in the first article, and is applied through improving municipal services that make changing individual consumption behaviour more accessible. *Article Four* tracks the implementation of circular household activities over a one-month experimental period. Two interlinked implications arose from the study: first, enacting these activities reduced economic exchanges through the domestic circulation of consumption activities; and second, the circular tasks required more time and *consumption work*. The findings of this study raise the issue of standard wage-labour organisation and the ability of individuals to lead more circular lives.

The analyses of enactments and visions show that in the studied contexts subnational contexts have played a central role. In a final step to elevate these findings, this thesis mobilises approaches for how we better can understand the role of subnational authorities in the transition to a circular economy, which has been understudied as the literature, for the most part, has engaged with top-down and bottom-up approaches. The studied local governments as ‘middle’ actors are crucial in socialising circular-economy activities of repair, reuse, sharing, and knowledge transfer through redeveloping existing infrastructures and municipal services. This socialisation entails the facilitation, mediation, and transformation of an alternative circular-economic vision that is important for the circular economy transition.



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In the initial stages of the PhD, I worked alongside co-PhD Isaac Arturo Ortega Alvarado where we gathered data and co-wrote two of the articles in this thesis – thank you for this collaboration. Thanks also to Markus H. Karijord for the good collaboration and inspiration leading to my fourth article. To Professor Wiebe E. Bijker, thank you for sharing your experiences and knowledge through seminars and workshops. I am thankful to you for reading and commenting on my first thesis draft. Thank you also to Professor Roger Strand for reading and commenting on my thesis draft. Our discussion was valuable and inspiring. Thank you, Ida Marie Henriksen, for commenting the analysis draft – it helped me greatly. To Professor Emeritus Knut H. Sørensen, I am grateful for your support in the final stages.

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And to you, the reader, I hope you find this work interesting, inspiring, and provoking because the issues raised within matter.

Trondheim, November 2022

*Thomas Edward Sutcliffe*

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## **Part One – Introduction and Background**



## Chapter One: Introduction

In the early winter of 2019, the then-new conservative Norwegian Government stated that Norway should become a pioneer in developing a green, circular economy (The Granavolden Platform, 2019).<sup>1</sup> This was the first explicit policy statement in which a Norwegian Government envisioned an economy that would diverge from the existing linear production and consumption systems and move towards one that focuses on resource loops. This strong political commitment was not Norway's first engagement with the concept of the circular economy. Like in other European countries earlier references to circularity can be found in environmental policies concerning waste management. And in Norway, like elsewhere, with the European Commission's circular economy action plan, *Closing the Loop*, the circular economy came into political consciousness as more than just better waste management already in 2015.<sup>2</sup>

Fast forward to the summer of 2021, a collaborative effort by the Norwegian Ministries, led by the Ministry of Climate and Environment, published the much-anticipated national circular economy strategy. The government had made its ambitions to become a pioneer of a green, circular economy clear, but how to achieve this goal, was yet unknown to the public. Moreover, the strategy was delayed in a situation where Scandinavian, European, and UK countries had already launched and started to implement – with varying intensity – their strategies in their pursuit to become circular economy pioneers themselves.<sup>3</sup>

Still, the road ahead for the Norwegian Government and its subnational authorities of counties and municipalities towards a circular economy and a low-emission society is

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<sup>1</sup> This governmental constellation called 'Granavolden' comprised the political parties Høyre (The Conservative Party), Venstre (The Liberal Party), Kristelig folkeparti (The Christian Democratic Party), and Fremskrittspartiet (The Progress Party).

<sup>2</sup> While Norway is not a full EU member, it is, in fact a European Economic Area (EEA) and European Free Trade Association (EFTA) member; as such, EU politics highly influences Norwegian politics (European Union, n.d.; Ministry of Foreign Affairs, 2021; Stortinget, 2021; Jones, 2021). EEA EFTA members can participate in EU's internal market which ensures the free movement of goods, services, capital, and citizens. However, this membership does not include the right to participate in EU decision-making processes, but EEA EFTA members can offer input during the preparatory phases of decision-making (Ministry of Foreign Affairs, 2021).

<sup>3</sup> For example, Denmark launched its strategy in 2018 (Ministry of Environment Denmark, 2018), Sweden in 2020 (Visit: <https://www.samverkanhanobukten.org/cirkular-ekonomi-nu-har-sverige-en-nationell-strategi/> (accessed 29.10.2022), and the United Kingdom also in 2020 (UK Government, 2020).

long and uncertain, especially considering that estimates suggest that Norway's 'circularity rate' is at a mere 2.4 % and that the global average is at 8.6 % (Circularity Gap Report, 2020).<sup>4</sup> There is no lack of ambition: Following the EU Commission's waste targets, Norway aims to increase its material recovery of household and municipal waste to 55 % by 2025 and 60 % by 2030 (European Environmental Agency, 2021). Moreover, the current government constellation's (the Labour Party and the Centre Party) overarching climate goals are to reduce Norwegian emissions by 55 % towards 2030 compared with 1990 and net zero emissions in 2050, and prioritising and redeveloping existing circular economy strategies will be necessary to achieve these targets (Office of the Prime Minister, 2021). Hence, this thesis explores the recent and ongoing efforts at curbing the Norwegian economy of production and consumption at national, regional, and local levels towards one that aims to implement circular-economic principles. First, before expanding upon the background of these focus areas in the coming chapters, this chapter will continue to outline some of the issues and contextual factors underpinning Norway's endeavours to become more 'circular' before presenting the research questions and thesis structure.

## **1.1 Norway's Sustainability Ambivalence**

Norway is an intriguing case when concerned with the current transition to sustainability, of which the circular economy is a key part (Klimakur 2030, 2020; IPCC, 2022; European Commission, 2019). There are two central reasons for this: first, in the decades after World War II, Norway underwent a social democratic modernisation process (Lange, 2020). This process, characterised by increased prosperity, changes in household technologies and goods, and new consumption patterns, saw Norway grow into a high-consumption society (Myrvang, 2009). After 1969, this modernisation process was accelerated when the oil company *Phillips Company Norway* discovered oil on the Norwegian continental shelf. Since this discovery, prudent management of the ample profits from oil and natural gas exploitation has fuelled the Norwegian welfare state and protected the flourishing Norwegian middle class from repercussions from domestic and

---

<sup>4</sup> Compared to other countries subjected to the same study, Austria's circularity rate is estimated at 9.7 % and the Netherlands at 24.5 %. A more detailed overview of the methodology for identifying the circularity rate can be found here: <https://www.circularity-gap.world/methodology> (Accessed 16.08.2022).



international economic crises. This was consequential for Norway's growing consumerism, and since its discovery, it has commonly been referred to in Norway as *oljeeventyret* ('the oil fairy-tale'), referring to the *Askeladden* fairy tale in which the poorest brother of three, in the end, becomes the king. Second, the economic dependence on the export of fossil fuels does not prevent that Norway has long prided itself on being a global sustainability pioneer (Anker, 2020). It has continuously represented itself to the world as an eco-conscious nation, where arguments such as its pristine nature and political effort to help others in need, politicians would envision Norway as an "ecological standard for the world to admire" (ibid., p. 11). Its carbon footprint and consumption levels, however, suggest an ambivalence to this image of a self-proclaimed sustainability pioneer, which now aims to become yet another pioneer: for the circular economy.

To offer some numbers to describe this ambivalence, in 2021, Norway's emissions were 49.1 million metric tonnes of CO<sub>2</sub>-equivalents (Statistisk Sentralbyrå, 2022), which puts Norway's per-capita emissions slightly below the average of high-income countries. However, this number does not include the emissions related to the production of goods and services imported to Norway nor the consumption of exported fossil fuels and gas abroad; thus, Norway's *true* total emissions remain unknown. If we included the emissions of oil and gas consumption abroad in the national statistics, the emissions would rise to over a staggering 500 million tonnes of CO<sub>2</sub>-equivalents and rank Norway in 16<sup>th</sup> place among global emitters (Topdahl et al., 2021). Regarding the consumption of imported goods and services, there are, as of now, no available statistics connected to the national CO<sub>2</sub> emissions. However, there exist numbers for the volume index of personal consumption.<sup>5</sup> In 2020, Norway ranked second highest in private consumption in Europe, 26 % above the EU average, beaten only by Luxembourg (Statistisk Sentralbyrå, 2020). A study from 2020 estimated that Norway consumed 235 million tonnes of materials, including fossil fuels, minerals, metals, and biomass, and 97.6 % of these materials are never cycled back into the economy (Circularity Gap Report, 2020).

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<sup>5</sup> The volume index refers to the number of goods and services that citizens consume in a country compared to another.

This brief contextualisation indicates a need to address private consumption and the overall consumption of resources in Norway. As described above, currently Norway is a laggard with respect to central measures of circularity while there is at the same time a prevalent ambition to become a circular-economic pioneer, which draws attention to what kind of expectations and visions not only the national strategy and other stakeholders have for Norwegian production and consumption, but indeed what kind of societal implications such visions have on everyday life enactments and the overarching transition to sustainability, too. Therefore, this doctoral dissertation investigates the introduction, understanding, and implementation of the circular economy concept in the Norwegian contexts of the state, regional, and local governance; as well as the domestic sphere of households. The following research questions guide this work:

- I. How did the circular economy become a political priority for a more sustainable production and consumption system in Norway?
- II. How do actors envision the circular economy concept, and how do they enact them?
- III. What are the implications of these visions and enactments for the Norwegian transition to a circular economy?<sup>6</sup>

This article-based thesis consists of three interconnected parts: the introduction (Part One), the articles (Part Two), and the cross-cutting analysis and conclusion (Part Three). The thesis investigates the circular-economy concept and its role in different scalar levels of Norwegian society by building on and mobilising sociotechnical perspectives from Science and Technology Studies (STS). In what follows, the remainder of chapter one and chapter two outline the necessary background information to understand the specific context of the circular economy concept in Norwegian policy and society today. Chapter three presents the existing literature on the circular economy that is relevant to the thesis' outlined themes, while chapter four introduces and contextualises the theoretical resources and perspectives that I mobilise to understand the circular economy. I conclude Part One in the fifth chapter by describing the methods for the data collection and analysis.

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<sup>6</sup> Like Parag & Janda (2014) accentuate, the word «transition» is not intended to invoke transitions theory per se but rather connotatively to describe a series of changes.

Part Two consists of four research articles, which are the main results of the data collection and analysis and serve as the thesis' empirical foundation. The articles may be read as stand-alone pieces, but for this thesis, they are used as connected depictions of the circular economy in the Norwegian context to describe the development of visions and enactments; therefore, they should be read as interlinked stories.

In the third and final part of the thesis, a cross-cutting analysis is presented in which I discuss and analyse the articles' results against the topics addressed in Part One before I end with concluding reflections on the status and role of the circular economy in the Norwegian transition to a circular economy, as well as proposing suggestions to actors in this transition. But before arriving there, I will in the following continue to expand upon the Norwegian context, with particular emphasis on historical lines in the development of environmental awareness and political action concerning environmental issues until today.

## **1.2 A Brief History of Environmentalism and Environmental Politics in Norway**

This section aims to outline some of the main characteristics of Norwegian environmentalism and political development. As I will show, Norway's ambivalence regarding sustainability can be traced back to the 1970s. Norway had one of the earliest consumerism-critical social movements, Norwegian philosophers have influenced ecological thought worldwide, Norway had one of the first ministries of environment, and Norwegians have been prominently involved in all major milestones of global environmental research and politics. At the same time, not only is Norwegian society becoming increasingly dependent on the influx of profits from fossil energy export, but it is also heavily invested in a growth-based development model.

Thinking about the climate and environmental crises that are unfolding, not just in terms of how production and consumption are organised but also in terms of the underlying growth logic of this (e.g., Hickel, 2020; Hickel & Kallis, 2020; Jackson, 2017), is particularly relevant for this thesis. It is pertinent because it touches upon the core features and principles that characterise the concept of the circular economy, which I return to, and which its propagators contrast the current linear economy with (e.g., Ellen

MacArthur Foundation, 2013).<sup>7</sup> Considering these two factors in tandem offers a way to think about Norway's post-war development, which is relevant to understanding the circular economy ambitions of the Norwegian Government today.

The discovery of Norwegian oil and gas in 1969 came at a time when consumerism was already increasing. According to *Statistisk Sentralbyrå* (SSB) ('Statistics Norway'), in 1969, Norway's population was 3.8 million and the GDP per capita in 1970 was 23 616 NOK, while today, in 2022, the population is 5.4 million and the GDP per capita for 2021 was 765 835 NOK (SSB).<sup>8</sup> Although the advent of the oil era was not the sole contributor to this, it would deeply influence the country's overall consumption of resources. In the following years, Norway became the third largest oil exporter and a central deliverer of gas to Europe (Hanson et al., 2011), and since its discovery, there has been a broad political consensus that the Norwegian state-owned petroleum industry should benefit Norwegian society (Hanisch & Nerheim, 1992). The Norwegian state was and still is heavily reliant on the high income from this sector to finance the welfare state, characterised by universal welfare rights such as healthcare and education.<sup>9</sup> While this thesis is not about oil; it is relevant to the emergence of Norwegian environmental-political efforts in the decades during the ambivalent 'oil fairy-tale' because it ties into how Norwegians not only perceive their immediate surroundings and conditions but also what horizons of opportunity exist within an expansive and growth-based mindset.

In addition to a steadily growing fossil fuel export, many factors together ensured the booming consumerism in Norway, and the Norwegian state was central to this (Hammer, 2018). Among these were strong labour unions, a strong focus on market

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<sup>7</sup> The idea of the 'linear economy' has been popularised by the Ellen MacArthur Foundation (2013) and is frequently used as a term to describe how the current economic system is organised, often in a simplified manner by emphasising a set of phases: extraction, production, use, and discarding – a linear flow of throughput of resources in which products are produced, used by people (consumers) and the discarded as waste in which nothing or little returns to the economy.

<sup>8</sup> The Norwegian currency: NOK= Norwegian Crowns.

<sup>9</sup> The income generated by the petroleum industry in Norway is transferred to the Norwegian Government Pension Fund Global and is evaluated at ca. 12 208 Billion NOK (as of 10.11.2022). The goal of the Fund is to ensure responsible and long-term management of the oil and gas income. More can be read here: <https://www.nbim.no/en/the-fund/about-the-fund/> (accessed 17.08.2022). In addition, since 2001, there exists a "rule of action" (handlingsregel), which restricts use of the fund's money in regular government budgets to three percent of the fund's worth. Since the fund has grown more or less continuously since 2001, this amounts to increased use of the income of oil and gas from government to government.

solutions since the 1980s, the willingness to invest in future income, and heavy investments in domestic infrastructure. Provoked by increasing private consumption and expansive modernisation projects such as the oil and gas ventures, a cultural and social critique of material consumption's role in society gained momentum already in the 1970s (Dammann, 1972; Lange, 2020).<sup>10</sup> This critical stance was represented by Norwegian environmental activists (Jørgensen, 2019a), eco-philosophical thought such as in the Deep Ecology movement (Næss, 1973), and the environmental organisation *Framtiden i våre hender* ('the Future in our Hands') (Dammann, 1972). These movements were highly influenced by the Club of Rome's *Limits to Growth* in 1972 (Meadows et al., 1972), which counts one Norwegian as its co-authors (Jørgen Randers).

In 1972, the same year as the release of *Limits to Growth*, the Ministry of the Environment was established as one of the first internationally. The 1970s saw environmentalism take new steps to raise awareness of growth-based development's environmental consequences. Still, the critique of industrialisation, technology, and science did not achieve definition power over the new political direction in the following decades. According to Asdal (2011), during the 1980s, the Ministry of Finance won the battle against the Ministry of the Environment to become responsible for society's resource management. As background for this 'battle' of responsibility, Norwegian sociologist Hammer (2018, p. 86), describes that the economists had foregrounded in economic analyses that nature had 'self-cleansing capabilities', which would undermine the then-new scientific knowledge about planetary boundaries and capacities. This meant that environmental issues and realities were reduced to and fit into an economic logic where cost-efficient solutions were the driving force for mitigating environmental harm. Andrew Jamison (1996), in an analysis of Norwegian environmental movements, states that many influential groups waned and ceased to exist during the 1980s, especially in the wake of a controversy around a hydropower development project in Alta, Finnmark, in northern Norway, when the Supreme Court ruled against indigenous Sápmi and environmental conservation interests in 1982. The movement dispersed and lost

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<sup>10</sup> Schmelzer et al. (2022) note that critiques of industrialisation, growth, and consumption cultures were not new phenomena in the 1950s and onwards but appeared at the beginning of the industrialisation of the late 18<sup>th</sup> century.

momentum, but environmental issues were still part of political and scientific discourse (ibid.).

The next milestone in the history of environmental politics of relevance for Norway, was the Brundtland Commission's *Our Common Future* of 1987 (World Commission of Environment and Development, 1987). The World Commission of Environment and Development, which was led by the former Norwegian Prime Minister Gro Harlem Brundtland, was tasked with presenting a long-term environmental strategy and facilitate cooperation that considered the interconnections between resources, people, and the environment and development. As part of a growing focus on the environment, *sustainable development* was defined there as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission of Environment and Development, 1987, p. 41). The term 'sustainability' comprised social and economic, as well as environmental sustainability.

While the Commission acknowledged that there were environmental limits to human development, increased levels of consumption were described as positive for the global south, while presenting claims about technology's ability to stabilise or even reduce resource consumption sustaining high consumption levels (World Commission of Environment and Development, 1987: p. 55). As opposed to the Club of Rome's *Limits to Growth* message, *Our Common Future* emphasised that economic development with technological progress was the answer to environmental and poverty issues; the overarching conviction was that economic growth, social responsibility, and ecological consideration could be harmonised, and this view came to dominate politics (Lidskog & Sundqvist, 2013). Anker (2020) points out that the Brundtland Commission report would shift the environmental debate away from ecology and towards climatology and climate change. This would come to shape climate policy in the coming decades. The UN Rio conference of 1992 saw the climate issue be framed in cost-benefit terms; after all, as Anker (2020) reflects, there was the sentiment after the Cold War that capitalism had championed communism, and during the 1997 Kyoto conference, soon-to-be Norwegian Prime Minister Jens Stoltenberg, educated as an economist, was one of the main

advocates for carbon emission trading<sup>11</sup>, which completely shifted the focus away from consumption.

During the previous decade, carbon emission trading has prevailed, but the concept of ‘green growth’ has taken centre stage also framing the EU Commission’s circular economy efforts (European Commission, n.d.). The reader of political economy Gareth Dale (2021) holds that ‘green growth’, in fact, has ushered in a new phase in reconstructing political discourse concerning ecological challenges and environmental movements. Norwegian politics have adopted the concept of ‘green growth’ as central part of what is called ‘det grønne skiftet’ (‘the green shift’). A search for “green growth” in the Norwegian Government’s “find document” webpage gives 108 results. When sorted after year, the first document dates to 2010 in a white paper regarding the national budget (Meld. St. 1. (2010-2011)). Herein, the term is mentioned in relation to the Organisation for Economic Co-operation and Development’s (OECD) work with strategies to manage and ensure that economic growth can be steered towards sustainability in the wake of the financial crisis in 2008. The Norwegian white paper from 2010 does not explicitly show the Norwegian Government’s adoption of this term but emphasises sustainable development. However, a document affiliated with the white paper said that Norway contributed to the OECD’s green growth strategies (Prop. 1 S (2010-2011)). Dale (2021) points out that the increasing market and financial logic framing environmental issues, especially since the Brundtland Commission’s sustainable development concept in the 1980s, has taken over ecological approaches such that by the 2000s, the concept became synonymous with sustained economic growth.

In Norway, there has been an increasing focus in the previous decade on green growth through pushing competitiveness, quotas, taxation, regulations, and other price mechanisms that promote technology development to establish a bigger market for environmentally friendly products and services (Office of the Prime Minister, 2019; Meld. St. 11, 2021-2022). However, green growth is not defined explicitly in these political documents but is used in connection to promoting aspects of development that include, but are not limited to, value creation, emission reductions, and technology

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<sup>11</sup> Carbon emission trading means buying and selling credits which permit a company or other entity to emit a certain amount of CO<sub>2</sub> or greenhouse gases in which the goal is to reduce emissions. <https://www.investopedia.com/terms/c/carbontrade.asp> (Accessed 30.08.2022).

development. Given the rise of primarily academic, but also social movements' green growth critiques, this lack of definition raises concerns about the taken-for-granted nature of (economic) growth in political spheres. In continuation of this 'greening' process, Norway, like many other nations, added to their focus the circular economy that will be central in unleashing green growth (EU Commission, 2015; 2020).

This chapter has highlighted the exchanges and connections between Norwegian and international environmental policies and politics. The early critiques of the deep ecology philosophers and consumerism-critical social movements have since the 1980s lost influence. The welfare state's commitment to increasing standards of living for all its citizens is echoed in Norwegian politicians' contributions to the international environmental agenda, for example in the propagation of the term sustainable development and of carbon tax schemes. Norwegian politics has contributed to and followed the international shift towards an increased focus on continued economic growth. As we shall see in the next chapter, this is also the background on which the Norwegian circular economy story unfolds.



## Chapter Two: The Circular Economy in Norway

As we learned in the previous chapter, a range of voices raised concerns about the environmental issues of increased economic growth and development during the 1970s. As in other countries, in Norway, precursors of what today is called circular economy were not related to these critiques but rather to the conceptualisation of waste as a resource and waste management.

The spendthrift society that gradually emerged in the aftermath of World War II meant that most people could not afford to be wasteful out of virtue of necessity; as such, things were repaired and cared for (Carstens, 2018). Increased consumption led to more disposable consumer goods entering the market and homes on a mass scale, leading to what is now known as *municipal solid waste* (O'Neill, 2019). I would like to briefly illustrate waste management in Norway as a precursor to what I describe as the *recycling dream*: a politically and industrially strong emphasis on technological development to deal with overconsumption while eluding direct engagement with contemporary consumer culture.

The technology that would become a symbol for Norwegian everyday environmentalism was born out of a technological innovation that made capitalist production and distribution more efficient: the reverse vending machine, a technology for the return of empty bottles and cans located in supermarkets, has since its conception become a staple, a seamless part of Norwegian consumer culture (Jørgensen, 2007).<sup>1</sup> According to the market leader in reverse vending machines worldwide, Norwegian company Tomra, “Norway’s deposit return scheme is the world’s recycling role model” (Tomra, 2022). Return rates for plastic bottles and cans in Norway are estimated to be above 95 %, enabled by the combined political effort of a strategic environmental tax on packaging and citizens’ diligent return of used bottles and cans (Infinitum AS, n.d.). Still, there is an ambiguity about this symbol of Norway’s environmental virtue: disappearing in the machine, waste flows seamlessly ‘out of sight’ through a complex system built around the reverse vending machine, which has become culturally embedded (Jørgensen,

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<sup>1</sup> The Norwegian company Tomra Systems, founded in 1972, produces the most reverse vending machines on the world market today. More information about the company can be found here: <https://www.tomra.com/en/about-tomra> (accessed 16.08.2022).

2019a). The also in other respects highly efficient Norwegian waste management system can be regarded as an important reason consumption culture is rarely politically addressed in Norway because the signs of consumption, i.e., waste, disappear somewhere, thus freeing up space for more consumption, which Inge Torstenson (2006) described as nothing less than ‘a form of happiness’. The connection between the reverse vending machine and the circular economy today is relevant here not just because this technology is so culturally embedded, but the companies handling the collection of bottles and cans use its success to propel claims about how resource efficient the whole Norwegian waste management system is.

In 2013, the Ministry of Climate and Environment introduced their waste strategy ‘*Fra avfall til ressurs*’ (‘From waste to resource’), which proposed a new direction for dealing with waste. This report conceptualises waste as an economic commodity of value, although waste had been a political priority before this. The report states that “the goal of limiting the growth of waste density in relation to the growth of the economy has not been reached, and it will be a challenge to reduce waste levels in the future.” (Ministry of Climate and Environment, 2013, p. 8). This concern continues in the more recent white paper *Waste as a resource – waste politics and circular economy*: “It is estimated that waste volumes will develop in pace with economic developments unless new measures and instruments are introduced. [...] The Government has few policy instruments aimed directly at preventing waste from occurring.” (Meld. St. 45 (2016-2017), p. 25, my translation). Thus, the attention towards technical improvements and efficiency follows an eco-modernist approach to resource-related issues (Genovese & Pansera, 2021). Since waste in recent times is considered a vital resource to be collected, managed, and invested in new products, the Norwegian Government found that technology development will be an important priority in the coming years (Meld. St. 45 (2016-2017)). As will be shown in the next subsection, this framing informs the current national circular economy strategy, which was published by the government in 2021.

## **2.1 The National Circular Economy Strategy**

As the introduction’s opening vignette showed, the Norwegian Government launched the national circular economy strategy in June of 2021. To achieve the goals put forth by the

UN and the domestic environment and climate targets, the plan states that a circular economy is not a goal in itself, but a means to attain green economic growth, innovation, value creation, and, ultimately, a low-emission society in 2050 (Ministry of Climate and Environment, 2021), and that Norway aims to be a front-runner nation in developing a green circular economy.

The text of the published circular economy strategy focuses on innovation, value creation, and jobs in Norway. Following the EU's circular economy work closely, the Norwegian strategy rates business and industry sectors as those with the most significant opportunity for utilising the potential for value creation. Economic incentives and financial restructuring mechanisms are central in the strategy to gear investments into sustainable activities. In line with the EU's Green Deal (European Commission, 2019), Norway's strategy formulates the ambition to enable climate neutrality by 2050, where economic growth happens without increased use of resources. The government's view is that the transition towards a sustainable, low-emission society presents an opportunity for new green growth, which means, in practice, establishing new markets and products for better resource utilisation, innovation, and technology development. Moreover, the determined emphasis on value creation through new ways of organising production and consumption systems with new business models seems to follow a historical, political trend of incremental and symptomatic treatment of climatic and environmental crises: where the "greening" of the economy has become a favoured, political goal (Stoknes, 2021).

The foundation of the strategy was based on a (digital) public hearing process that collected 50 inputs from industries, waste management, interest organisations, trade organisations, research institutions and networks, and other actors. The Ministries also met with industry and commerce actors about their concerns and priorities. Among the measures suggested were changing the tax system, establishing a circular economy tax commission, including the Ministry of Finance and other economic institutions; anchoring the national strategy in the Ministries of Finance, Ministry of Trade, Industry and Fisheries, and the Ministry of Climate and Environment; to mobilise industry and commerce in the development of a national strategy (Haugsvær, 2018). These suggestions are based on a strong belief that a circular economy will contribute to green growth by

utilising resources better, and new business models can contribute to the stimulation of repairing instead of buying new (ibid.).

A second important foundation for the strategy was the consultant agency *Deloitte's* (2020) three-part fact sheet, which the Ministry of Climate and Environment ordered. In this fact sheet, knowledge and cultural barriers were identified: such as lack of knowledge and awareness of the environmental footprint of products leading to confusion about what good circular options are; confusion surrounding concepts like circular economy, green growth, and sustainability; and that established attitudes and habits of consumers and businesses ensure that better or 'circular' products are not requested or prioritised (ibid., p. 8). Another relevant barrier identified focused on the lack of political objectives and coordination in public administration.

The national strategy outlines seven prioritised value chains: electric and electronic products; batteries and vehicles; packaging; textiles; plastics; buildings and construction materials; and food and nutrients. These areas form the basis of action for the strategy and it emphasises that industry and commerce actors are central in the development of solutions to reduce the wasting of resources. Like the EU's circular economy plans, the Norwegian strategy emphasises product development, waste management, and creating toxic-free cycles, with the focus being on industry and the business sector because of their capacity to create value. Consumer concerns are present, but they are addressed indirectly or passively: preoccupied with new ways of offering products and services, for example, initiatives around eco-labels with product information to steer consumption towards something more sustainable.

Like in all Norwegian national strategy documents, county and municipal administrations are described as important actors (Ministry of Climate and Environment, 2021). The special role of regional governments in the Norwegian political system and culture is described in the next subchapter.

## **2.2 The Role of Subnational Authorities**

“In their roles as society developers, large owners, service deliverers, and purchasers, the county municipality and municipality can use the circular economy to realise climate- and environmental goals and create the

potential for value creation and employment” (Ministry of Climate and Environment, 2021, p. 139, my translation).

The Norwegian population has, through long periods of its past, been governed from the capitals of other countries; first under the Danish king as part of Denmark-Norway (1523-1814), then by the Swedish king in a union with Sweden (1814-1905). During these almost four centuries, various forms of acting and often unpopular regional authorities have existed, which carried out the will of remote kings and governments. An echo of this past still exists in the form of the powerful political party “Senterpartiet” (‘the Centre Party’), which has as its main issue regional independence and is part of the government together with “Arbeiderpartiet” (‘the Labour Party’) since 2021. At the same time, like in all social democratic Scandinavian welfare states, the post-war period saw a wave of centralisation in the name of effective (welfare-)administration, which still continues. The result of this past is a moderately centralised federalist state with three independent administrative levels (state, county, and municipality). These levels have their own elected representatives that must operate within the political scope of the state (Ministry of Local Government and Modernisation, 2020). The county authority oversees education at the secondary school level, dental services, transport and maintenance of county roads, and cultural services like the county library. The municipality manages kindergartens, elementary schools, comprehensive schools, healthcare services, local infrastructures such as roads, water and sewage, waste collection and management, environmental protection, and cultural services like the local libraries.

The national circular-economic strategy emphasises that counties and municipalities are society developers, owners, service providers, and procurers. They can be drivers, connecting links, and facilitators of circular measures in cities and regions. However, the territorialisation of circular economy policies must consider the institutional, administrative, and cultural contexts where such policies are adopted. Silvestri et al. (2020) note that research on the regional adoption of a circular economy in the EU is not well developed. Regional authorities are important in launching and accelerating a circular economy transition, but the geographical context creates different needs and opportunities (Bacova et al., 2016). To ensure a proper transition, the EU Commission calls for a broader commitment from “all levels of government, in the

Member States, regions and cities and all stakeholders concerned will also be necessary” (EU Commission, 2015, p. 21).

The national strategy follows this argument and aims to help local governing bodies further develop their respective circular economy efforts and places emphasis on the planning systems such as: coordinating state, regional, and local tasks; considering the use and protection of resources; considering responsibilities to and for local society; and the system of land planning, which connects to the construction and building sector. Furthermore, the counties and municipalities can connect actors and facilitate work towards specific goals.

Cities and rural settlements, where administrative centres in most Norwegian counties and municipalities are localised, play increasingly recognised roles in climate change mitigation responses as administrative hubs and change laboratories (Kronsell & Mukhtar-Landgren, 2018; Sareen & Waagsaether, 2022) and important planners for sustainable urban development (Palm et al., 2019)—as such, understanding the role of subnational authorities in the transition to sustainability is highly relevant as they are responsible for many crucial citizen services, both rurally and centrally. Therefore, they are also important because they affect the overall organisation of local communities and give direction to what type of society we live in.

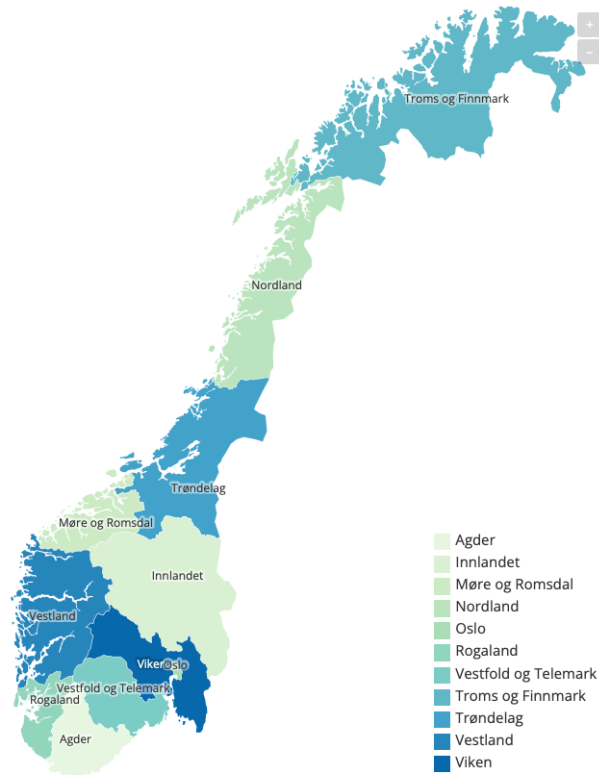
The regional climate and environmental strategies for the counties in Norway, documents outlining how counties will transition to sustainability, show that operationalisation of the circular economy into county activities and responsibilities is in the early stage, but there have been some achievements. Efforts at this level reveal particularly ambitions related to waste management. Viken County (See: Figure 1 below), for instance, wants to be at the forefront of circular economy development, but also while securing economic growth and value creation within planetary boundaries and the creation of welfare for its citizens (Viken County, 2020). In Western Norway, Rogaland County believes that a circular economy means the better utilisation of resources: with as much reuse and as little waste as possible (Rogaland County, 2020). In Northern Norway, Nordland County wants municipalities, businesses, regional authorities, and voluntary organisations to think and act ‘in a circular manner’, but its success is measured in how much material is recovered from the county’s household waste (Nordland County, 2021).

In Trøndelag, a central region for the studies undertaken in this thesis, the county's *Innovation and Value Creation Strategy* of 2017, and the related action plans state that “[t]he global challenges related to the climate and the environment require a readjustment to a society in which growth and development take place within nature’s sustainability limits. Society must go through a green shift.” (Trøndelag County, 2019, p. 2).<sup>2</sup> At the same time, Trøndelag aims to develop a circular economy that increases its regional value creation based on the intelligent use of resources and the minimisation of waste from production and consumption. New business models for production and consumption, further exploitation of residual raw materials, and replacing fossil-based products with bio-based ones. “The goal of the circular economy is to keep the resources in the economy for as long as possible by means of reduced consumption of raw materials, waste, emissions and energy.” (ibid., p. 4).

The biggest city in Trøndelag is Trondheim, Norway’s fourth largest city, with 211 106 inhabitants (Statistisk Sentralbyrå, 2022). Trondheim municipality, which proclaims itself as the technology capital of Norway, holds that it has a particular opportunity to be a forerunner in the green shift. The municipality’s energy and climate plans support the Paris Agreement and the UN’s SDGs, and the goal to realise emission reductions is through interaction between public actors, industry and commerce, organisations, and its citizens (Trondheim Municipality, 2022a). Concerning the circular economy, the municipality frames it in alignment with the waste management goals of the EU Commission of increasing material recovery by 60 % within 2025. In 2017, this recovery rate was 32 % of household waste (Trondheim Municipality, 2019; Trondheim Municipality, 2019). The municipality writes in its municipal sector plan that they expect that in a ten-year perspective, eco-design and leasing services will have begun to close the loops in the circular economy. Additionally, it emphasises that the municipality can support the work for better producer responsibility and take more responsibility in its public procurement and its organisation. In turn, it aims to make it easy for its citizens to make environmentally friendly choices in their everyday life in 2030 (Trondheim Municipality, 2022b).

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<sup>2</sup> In 2020, Trøndelag County emitted 2 896 187 tonnes of CO<sub>2</sub> equivalents (Norwegian Environment Agency, 2020).



**Figure 1.:** Map of Norway (excluding Svalbard) with the current overview of its counties. Trøndelag is situated in the middle (in light blue). Source: Ministry of Local Governance and Modernisation (2019b).

The roles of these subnational authorities are primarily to offer and secure well-functioning services for their citizens. On the other hand, they must simultaneously adapt to societal and global developments, such as the climate crisis and overconsumption of resources. These authorities translate national and transnational policies and visions to suit their mandates. They create their own visions and enactments in which there is the element of political independence that allows them to find local solutions to more extensive and minor issues. Thus, subnational authorities are relevant for understanding how the circular-economy concept is contextualised and implemented.



### 2.3 Beyond Waste: Addressing Consumption

“A circular economy is not really a recent invention. It's rather an old tradition. My grandparents knew how to save resources and reuse them. Single-use items didn't exist. Broken things were mended, and clothes were repaired. This was a virtue of necessity.” (Rotevatn, 2020)

This reference to a distant past is a speech excerpt from the 4<sup>th</sup> Norwegian Circular Economy Conference by the former Minister of Climate and Environment, Sveinung Rotevatn. It can be seen as an attempt to mobilise not only businesses, industry, and policymakers, but the broader public, too. It is a way to legitimise the circular economy by evoking reflections from the past that people can relate to, and such a rhetorical manoeuvre is not uncommon among politicians to strengthen a political message (Tanner, 2021). In this quote, Rotevatn says that the circular economy is a long-standing tradition, something that past generations used to enact. As such, the Minister frames reusing, repairing, and saving resources as circular-economic ideals and practices. Before the booming consumer culture in the post-war era, household waste generation was also much lower (Carstens, 2018). Thus, this added framing of the dominant waste as resource discourse is part of a larger ongoing process of opening new avenues for transitioning to sustainability and addressing other aspects of production and consumption that non-governmental organisations engage with. One of these is the environmental non-governmental and solidarity organisation called the *Future in our Hands* (henceforth FIOH).

Previously, I briefly mentioned FIOH as one of several actors criticising the emerging growth-based consumer culture in the 1970s. I return to this particular organisation because it has not only been a powerful grassroots movement through 50 years, but also because it has recently adopted the ideas promoted internationally as circular economy. FIOH, which according to its own website has more than 40 000 members (FIOH, n.d.), is today publishing reports about resource consumption connected to textiles, transport, food, plastics, and environmental toxins, and they are actively and effectively communicating their position towards politicians and the Norwegian public. To offer some background, FIOH was founded in 1972 and led by the Norwegian

environmentalist Erik Dammann, who argued that Earth's resources ought to be shared by all and that everyone has an equal right to them; instead of the continuous and headless extraction of raw materials for the pleasures of consumerism, one should resist such forces and not blindly follow them. As such, from the beginning, it was an environmental and solidarity organisation (Unander, 2019) and a consumption-critical movement: one that questions growth in the consumption society of the West (Hansen, 2007). Stearns (2006) writes that movements directing radical critiques toward consumption society had been rare in the West, which makes FIOH a unique case.

Early on, FIOH's philosophy was inspired by the founder of deep ecology Arne Næss, who appealed to one's 'egenverdi', their 'intrinsic goodness', to inspire participation in FIOH. He claimed Westerners had lost sight of their self-worth and had instead let themselves be controlled and made unhappy by growing materialism (Hansen, 2007). Næss believed appeals to egoism would be more effective than idealism to mobilise a more significant part of the population. He believed that FIOH should invoke action at the individual level, not collectively. Physicist Jørgen Randers, co-author of *Limits to Growth* (1972), was another prominent figure in FIOH. While there is still a belief in individual action within FIOH, what we can see in more recent times is a shift towards more collaboration to implement their ideology (See: Article Three).

FIOH saw the emergence of the circular economy concept as an opportunity to revisit its early consumption critique by appealing to past imagery of a more sufficiency-oriented mindset as Rotevatn did a year later. FIOH's circular economy report *Circular Future – about the transition from linear to circular economy* (Boye, 2019) showed this. Herein, it criticises the former Conservative Government's vision of a Norwegian circular economy as being just about improving systems of recycling and incineration and thus only representing the periphery of what can be called a circular economy (ibid., p. 3). According to FIOH, the circular economy in Norway should address consumer culture and the design and use of, and care for extracted resources. In the report, they call for consumption reduction, repairing one's possessions, and the distribution of resources through various sharing platforms. FIOH's old and new visions are beginning to manifest in specific local areas in Norway, which Part Two addresses. FIOH seeks to realise projects concerned with repair, reuse, and sharing. A further topic promoted by FIOH

focuses on extended producer responsibility schemes. Another example that FIOH addresses in their report are their call for revising legislation.

One example for this legislation is the support of the former Conservative Government's initiative in 2019 to repeal the 'law of second-hand sale' (Brukthandellova, 1999, §1-7). Currently, this law intends to prevent stolen property and goods transactions, but due to Norway's recent focus on the circular economy, the law is being reinterpreted as it conflicts with actors wishing to establish reuse businesses. The law aims at providing the police with an extra tool for criminal investigation to prevent unlawful transactions of goods. The law came into force in 1999 when transactions and businesses mostly took place in physical stores. However, to a greater extent, contemporary consumption patterns are happening on digital platforms. Because many physical businesses have digital platforms, 'Brukthandellova' acts, according to the government, as a hindrance to new business models, which conflicts with Norway's previously mentioned ambition to transition to a green, circular economy (Office of the Prime Minister, 2019). In the Granavolden Platform, all parties ratified that it would remove or change laws and regulations hindering technological development and business models in the public and private sectors. The law states that a license is needed to operate a reuse business, and according to the government, 'Brukthandellova' may impede opportunities for implementing circular business models.<sup>3</sup>

In this chapter, I have taken a closer look at some of the political efforts regarding the circular economy in Norway. The development towards prioritising the circular economy is rooted in a longer historical process of growth-centred development and environmentalism and consumer culture critiques since World War II. What is yet missing is a deeper explication of what the circular economy is and where it comes from, and this chapter has sketched out some historical development trends that show the emergence of the concept. However, in the next chapter, this will be outlined further together with other relevant, previous scholarship on the circular economy.

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<sup>3</sup> The law seems to still be in effect at the time of writing the thesis as there have been no indication of repealing.



## **Chapter Three: Previous Circular Economy Scholarship**

The circular economy is gaining momentum globally as a desired economic system of production, provision, consumption, and waste management, both in achieving resource efficiency and a competitive economy. I organise this chapter, which reviews the parts of this literature that are relevant for the questions asked in this thesis, by the following overarching themes: concept origins, definitions, and critiques; the circular economy, policy, and governance; and consumption and citizen perspectives. The aim of this chapter is to build upon the previous chapters and to elevate our understanding of the circular economy in discussion with different topics to identify knowledge gaps and relevant and necessary points of inquiry.

### **3.1 The Circular Economy Concept's Roots, Interpretations, and Critiques**

An important element of circular economy concepts is the acknowledgement of the finitude of Earth and its resources. A relevant point of departure is the Science and Technology Studies (STS) scholar Sheila Jasanoff's (2001) reflection on the iconic image of Earth from the Moon's vicinity in 1966, highlighting its spherical character. It is useful because it contrasts the ideal of the closed loop of the circular economy with the linear aspect of production and consumption:

“[The image] catches the spirit of contemporary environmentalism, one of late modernity's signature social movements. The picture of the earth hanging in space not only renders visible and immediate the object of environmentalists' concern, but it resonates with the themes of finiteness and fragility, and of human dependence on the biosphere, that have provided growing impetus for environmental mobilization since the 1960s” (Jasanoff, 2001, p. 310).



**Figure 2.:** Earth from the Moon's vicinity taken by the Lunar Orbiter in 1966. Credit: NASA.

Jasanoff (2001) depicts how a single photo of the fragile Earth acts as a resource for global environmental protection. The Brundtland Commission report, *Our Common Future*, also used Earth's depiction in space as a tool, which helped to crystallise a sense of the human condition: the contradiction between human development and environmental protection (Jasanoff, 2001). Jasanoff traced the effects of this image, which revealed that its path to becoming an icon of global environmentalism strengthened Earth's finitude and vulnerability themes in political discourses. In a sense, it influenced perceptions of risks from a local phenomenon to a global issue. Not only are risks constrained to space and consequential to specific groups of people, but the image also refers to the time dimension of posterity's survivability. However, this image may also "... [render] invisible the day-to-day environmental insults suffered by billions of the world's poorest citizens: dirty air, polluted waters [...] [i]ndeed, people themselves are eliminated from this image of environmentalism" (Jasanoff, 2001, p. 335).

The circular economy is one of the latest additions to the sustainability discourse. It has risen to prominence, for example, not just in Europe, but also in China through its Five-Year Plans attempting to address the severe overconsumption of Earth's resources. The European Parliament (2022) defines the circular economy as "[...] a model of production and consumption, which involves sharing, leasing, reusing, repairing,

refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended”. As visualised in the infographic below, it seeks to show how resources and products travel in a circular motion with one area of an influx of raw materials and one section which discards parts of the waste generated within the circle.



**Figure 3.:** An infographic of the EU’s visual interpretation of the circular economy. Credit: European Parliament (2022) adapted from the European Commission Communication of 2014.

By drawing on the Earth’s shape, over time, most of humanity has accustomed itself to the idea of the Earth as spherical instead of an endless plain. Nevertheless, coming to terms with Earth as a planet of finite resources seemed to be difficult to comprehend, according to Boulding (1966, p. 2), who writes that: “economists in particular, for the most part, have failed to come to grips with the ultimate consequences of the transition from the open to the closed earth [sic]”. Boulding describes this ‘open Earth’ economy with the metaphor of the ‘cowboy’, drawing associations with reckless and exploitative behaviour.

On the other hand, ‘closed Earth’ refers to an Earth with limited resources for extraction and sinks for pollution. This type of economy is represented with the image of a ‘spaceman’ economy, where humanity finds itself in a “cyclical ecological system which is capable of [a] continuous reproduction of material form” (ibid., p. 8). The

difference between these economies centres on how consumption and production are understood. In the ‘cowboy’, or ‘open earth’ economy, consumption and production are considered positive. The throughput of resources determines the economy’s success through capital, now commonly known as the gross domestic product (GDP). In the ‘spaceman’ economy, throughput is not only disregarded as a requirement for a healthy economy but should be minimised.

Greyson (2007) held that Boulding (1966) was the originator of the circular economy concept with his notion of the cyclical ecological system and metaphor of the spaceship economy, but was not used in Western literature before the 1980s, which operationalised the economy as a closed-loop system by means of recycling and renewable resources, and avoiding extraction of new resources while requiring more energy to transform materials (Pearce & Turner, 1990). The circular economy is not an original concept (Cecchin et al., 2021), nor a uniform one, but draws upon preceding images and schools of thought such as industrial ecology (Frosch & Gallopoulos, 1989), biomimicry (Benyus, 2002), cradle-to-cradle (Braungart & McDonough, 2002; 2019), eco-efficiency (Schaltegger & Sturm, 1989), industrial symbiosis (Ayres & Simonis, 1994), and waste-as-food (Babbage, 1835), the performance economy (Stahel, 2010), and the blue economy (Pauli, 2010). Common for all these concepts is their inspiration from nature’s biological cycles in which waste becomes nutrition for all its processes; just as a leaf on the ground becomes food for microorganisms and fungi, excess heat in a chemical production process may power another process. The general idea is that by-products and resources are reused somehow, and that waste is revalued through better resource management (Pomponi & Moncaster, 2017). Kraaijenhagen et al. (2016, p. 11) call the circular economy “a market-driven solution to balance the use of finite resources on our planet” by emphasising that it is about value creation through waste as food in industrial systems.

Scholars ascribe many characteristics to the concept itself. Some describe it as an ‘umbrella term’ to replace the older buzzword ‘sustainable development’ (Genovese & Pansera, 2021; Homrich et al., 2018), while others describe it as an “empty signifier” sheltering different meanings (Rip & Voß, 2019). Bonciu (2014) claims that the circular economy should replace “sustainable development” and “low-carbon economy”, as the latter terms do not sufficiently account for the limits of planet Earth. Gregson et al. (2015)



echo this and write that it is both an “idea and ideal” for encountering Earth’s finitude and depletion of natural resources and that it enables cyclical thinking (Wübbecke & Heroth, 2014). Korhonen et al. (2018) hold that the flexibility of this concept may produce competing ideological agendas, which is the case regarding pathways towards sustainability. As it has piqued the interest of practitioners and academics (Ghisellini et al., 2016; Murray et al., 2017), and is represented in different realms and by various stakeholders, the concept’s meaning may become blurred and diffused (Gladek, 2017; Kirchherr et al., 2017), which also is supported in reviews of the idea (for example in Blomsma & Brennan, 2017; Lieder & Rashid, 2016).

Since its emergence and popular reception (Korhonen et al., 2018), there have been several literature reviews covering different topics of the circular economy. One of them is the much-cited review of Kirchherr et al. (2017), with its review of 114 definitions, which indicates that the circular economy is dynamic and interpretatively flexible. Its vocabulary includes an even more diverse set of terms suggesting that resources should circulate rather than be wasted. Kirchherr et al.’s (2017) review, then, shows that the circular economy is mostly understood in relation to the aspects of reducing, reusing, and recycling activities or a combination of these. Furthermore, the circular economy seems to be diverging from the sustainable development concept, as there were few linkages between the two in this review. They propose their definition based on their review of the 114 definitions:

“an economic system that replaces the ‘end-of-life’ concept with reducing, alternatively reusing, recycling and recovering materials in production/distribution and consumption processes. It operates at the micro level (products, companies, consumers), meso level (eco-industrial parks) and macro level (city, region, nation and beyond), with the aim to accomplish sustainable development, thus simultaneously creating environmental quality, economic prosperity and social equity, to the benefit of current and future generations” (ibid., p. 229).

A broadly defined concept like this may crumble or continue in a deadlock due to conceptual contention (Bocken et al., 2017), making it retain its blurriness (Loiseau et al., 2016). Skene (2017) reflects further on these concerns and describes the circular economy concept as misleading because economists continue to use outdated theories to explain the planet’s constructs. Skene calls the closed-loop idea, with a perfect balance or

equilibrium between the elements, the ‘Garden of Eden’ fantasy; an economists’ paradise of closed loops, waste-free and growing perpetually was and still is desirable. However, as Skene continues, equilibrium cannot be achieved even if warranted. Nature is dynamic and emergent; it requires continuous throughflow of energy in various forms and thus, cannot be closed.

While it perhaps is unsurprising that sectors ascribe their own definition and meaning to the circular economy, it would be unfruitful to think that each respective sector operates independently or that their understanding of the circular economy is a natural outcome. Sectors are deeply intertwined and work alongside consumers, businesses, policy spheres, and infrastructures. If everyone solely focuses on their narrow understanding, it could be problematic to achieve cross-sectoral collaborations and implementation of the circular economy throughout society. On the other hand, a weakly defined concept might create interest and a sense of belonging to a community working towards specified and unspecified goals. Although the circular economy is a young field (Murray et al., 2017), it is already and often presented as a panacea to the ills created by a globalised economy through over-exploitation of natural resources, pollution, and climate change (Temesgen et al., 2019). Various “R-frameworks” have helped to popularise the concept giving it the aura of a recipe for action. For instance, Potting et al.’s (2017) 9R framework consists of nine strategies ordered in their degree of circularity: (0) refuse, (1) rethink, (2) reduce, (3) reuse, (4) repair, (5) refurbish, (6) remanufacture, (7) repurpose, (8) recycle, and (9) recover. While practitioners of policymaking, industries, and businesses appreciate this apparent practical usability of the circular economy, there are voices that scrutinise the concept. In the following, I present some of the more prominent critiques.

Summarising critiques of the circular economy, Corvellec et al. (2021) find a wide spectrum of critical approaches. They take issue with the aforementioned openness of the concept, which is seen as leading to arbitrary labelling of initiatives as ‘circular’ even if they only represent business as usual. Second, they present a type of critique which argues against the claim of practical applicability referring to hard structural obstacles. The third group of critiques presented by Corvellec et al. (2021) sees a technological and economic bias in the literature on and application of circular economy, which systematically depoliticises sustainability efforts. A common thread binding these critiques together is

the claim that to be meaningful, the concept would have to lead to more fundamental changes, based on a more stringent conceptual basis, an acknowledgement of structural barriers and overcoming its biases.

A good example for this type of more fundamental critique is the study of Temesgen et al. (2019) who contrast the mainstream neoclassic economic paradigm, where the goal is how to increase the effectiveness of resource extraction and utilisation to maintain growth, with ecological economics, where the aim is achieving a higher quality of life. The authors question whether the circular economy challenges the fundamental aspects of neoclassical economics or if it creates a so-called 'protective belt' around it. They find that if the circular economy fails to critically scrutinise and challenge the foundational basis of limitless economic growth, it operates within a mechanistic worldview where nature is an instrument for growth and thus forms a protective belt. A circular economy that works within an organic worldview recognises that the economy should serve society and nature, not the other way around. In such a view, a circular economy could play a part in identifying solutions that are not restricted or confined to the economic growth paradigm. As Hickel (2020, p. 159) writes, "[...] the growth imperative makes this dream (of a circular economy) unnecessarily difficult to achieve. It would be much easier to improve circularity in a post-growth economy".

Along these lines, Hobson (2016) raises concerns about how the circular economy may become another instance of neoliberal environmental governance of ecological modernisation, the promotion of individualised recycling actions, and product labelling. Vittersø & Strandbakken (2016) reflect this concern in what they call strategies of product substitution, which derives from the idea that resource use and consumption can be reduced under a paradigm of green growth and efficiency measures. Returning to Hobson's (2016) concern, the critique is that the circular economy falls short in challenging existing, unsustainable modes of governance and consumption behaviour, which are deeply complex (Camacho-Otero, 2020). Similarly, Valenzuela & Böhm (2017) write that the circular economy reproduces the capitalist logic and does not sufficiently address the current organisation of production and consumption nor the consumer's identity.

These criticisms of the shortcoming of the circular economy in challenging the current capitalist logic also derive from arguments from ecological economics, which

takes inspiration from Georgescu-Roegen (1971). From this line of inquiry, the circular economy is misleading due to the theoretical impossibility of perfect circularity (Haas et al., 2015).

Corvellec et al. (2021) conclude instead in their review of the circular economy critiques with a call for a path to circularity which is:

“modest, not a panacea but an actual solution to actual problems; concrete, in the sense of being clear about which kind of circularity it sets up and the goal conflicts that it entails; inclusive, in that it takes energy, people, and waste on a global scale into consideration; and transparent, in the sense of being accountable for its achievements and shortcomings, not the least when it comes to economic, social, and environmental changes” (Corvellec et al., 2021, p. 429).

Such a ‘modest’ approach will have to be based on empirical work regarding the visions and enactments of circular economy in specific spatio-temporal settings and their impacts on society and ecology.

The main finding from this part of the literature review is the concept’s rootedness in older ecological thinking and its open nature, which has contributed to its attractiveness, but which also, according to its critics, threatens to turn it into a weak instrument of sustainable societal change if it is not – to use Corvellec et al.’s (2021) terms – modest, concrete, inclusive, and transparent.

### **3.2 The Circular Economy in Policy and Governance**

Despite the circular economy concept’s rich and contested nature, it has seen wide political adoption and has become a central part of the EU’s sustainability strategies, including its member states. In studies of circular economy policy and governance and their national, regional and local implementation, we find a rich body of literature, which looks at visions and enactments of the circular economy.

First, it is worthwhile to acknowledge that the EU is not the sole promoter of circular economy policies or trajectories. China shares much of the conceptual basis in the strive towards enhanced resource efficiency, but they differ as Chinese circular economy policies take a broader approach, including pollution, waste management, and resource concerns, while the EU has a narrower approach focusing on waste as a resource

and opportunities for business (McDowall et al., 2017) to ensure their global competitiveness. That said, the focus is on the EEA member Norway; thus, the European context is most relevant here. Since the circular economy is a contested concept and an assembly of different ideas (Kovacic et al., 2021), it is relevant to consider how governments across nations adopt and implement it.

The circular economy as a desired sustainability paradigm has become a guiding effort behind both environmental and economic policies of the EU and particularly the Juncker commission (Friant et al., 2021). Although heralded by European policymakers, Farmer (2020) critically addresses the circularity of materials in the economy, which is an important aim, but it does not deal with the aspect of overconsumption in the EU. This ties into the need for cooperation to deliver a circular economy, which addresses consumption by citizens. According to Domenech & Bahn-Walkowiak (2019), the EU's circular economy policy push in recent years shows that it challenges the EU roadmap and diverges from this as the circular economy policy package is limited in scope and has weak objectives outside of waste management, such as taxation schemes. The authors advise interlocking circular economy and resource efficiency policies and clarify any differences and identify similarities to avoid diluting the already weakly defined concepts and encouragement of the approach of the path of least resistance. Fidélis et al. (2021) look at narratives within the EU on water and land use (spatial planning) and argue that these should be better integrated into circular economy policy to overcome potential barriers and foster more eco-centred and inclusive approaches. However, the territorialisation of circular economy policies must consider the institutional, administrative, and cultural contexts where such policies are adopted.

The study of Leipold (2021) shows that the circular economy narrative was established to transform EU policy discourse from within, but instead, the ecological modernisation discourse was perpetuated through concealing conflict, the strengthening of incumbents, and the exclusion of external voices. The formation of alternative visions needs strategic practices that address contemporary and future issues and provide renewed agency to so-called change agents, but also transition strategies for powerful actors.

Since the launch and implementation of the 2015 circular economy action plan in the EU region, it has facilitated a number of circular initiatives across industries because

of government regulations and policies (Mhatre et al., 2021). The ecological modernisation discourse is evident here as the most used circular strategy is about waste management and recycling. In their literature review of circular economy initiatives in the EU, Mhatre et al. (2021) find additionally that macro-level initiatives by various levels of government and regional administrative bodies dominate the circular economy implementation. They hold that a further transition to a circular economy can be achieved by cross-sectoral and governmental collaboration through policies, awareness, and technological availability. As hinted at by Silvestri et al. (2020), regional implementation of the circular economy is not well covered, and regional authorities are important in accelerating the circular economy (Bacova et al., 2016) and called upon by the EU Commission (2015).

In a case study, Johansson & Henriksson (2020) analyse and compare two concepts of circularity from two policy reports in Sweden: circular economy and eco-cycle. Their discourse analysis of these concepts identifies two interpretations of circularity, weak and strong, respectively. In the weak version, recycled materials complement, rather than substitute, existing resource extraction, and it reinforces existing power relations and excludes social responsibility. A strong circularity, on the other hand, is one where the state and producers are responsible for creating a closed material loop limited in space and size based on the fair distribution principle. This version of circularity balances tensions between economic, social, and ecological priorities. As they acknowledge, they base their findings on the analysis of two reports only. How the identified discourses are connected to practices is left open and is therefore presented as an important avenue of study, as well as how various actors like consumers, companies, industries, governments, and local contexts relate to such discourses. The authors welcome alternative directions of circularity as the dominant understanding of the circular economy, like the one promoted by the Ellen MacArthur Foundation, is not a given and does not need to aim for perpetual economic growth.

There is a growing body of literature dealing with the role of governments and governmental efforts engaging with the circular economy concept. First, local governments have been noted to be important in implementing EU policies (Borghetto & Franchino, 2010). The circular economy literature also recognises the role of subnational authorities (Dagiliené et al., 2021), who hold that national and international policies are

important for the transition to a circular economy, local interventions by local governments are necessary for realising a circular economy (Levoso et al., 2020). However, the success of circular economy implementation requires that such governmental actors understand their position as important dissemination agents of policies as well as regulating and creating strategies for action (Termeer & Metze, 2019). Bolger & Doyon (2019) posit that local governments inherit transformative capacities that can encourage and enable the establishment of circular economy practices. Not only must local governments abide by their initial mandate of providing well-functioning citizen services, but their institutional conditions make it possible to engage in and promote cooperative and democratic participation in economic activities (Bolger & Doyon, 2019; Moreau et al., 2017). The studies of Dagiliené et al. (2021) and Nogueira et al. (2020), for example, highlight the facilitating capacities of local governments in coordinating and creating spaces for cooperation between local stakeholders in new ways by utilising existing infrastructures (Palm & Bocken, 2021). Palm et al. (2019) consider this latter dimension by reflecting on the local governments' accessibility to local resources and knowledge that ought to be utilised, but the authors raise a slight caution by pointing to the fact that the local government should be reflexive about their position as an influential actor. Dagiliené et al. (2021) write that implementing a circular economy from a local governance viewpoint is fragmented and that local governments ought to be more proactive and strengthen the networks between local businesses and across different value chains.

As such, these studies, with a normative flavour, reflect high expectations towards subnational authorities to play a key role in this transition, and they are specific in what the focus of such governments should be. There is a call in the literature pointing out that only some studies emphasise what it takes and how local governments can implement circular economy principles (Vedvik, 2022). As Vedvik (2022) found, in a case study of Ålesund in Norway and Sofia in Bulgaria, these municipalities saw their role in the circular economy transition by adhering mostly to traditional waste management strategies to attain the waste directives set by the EU (see also Lacey et al., 2020). However, the author points out that the focus of the municipalities should be moved higher up in the waste hierarchy by pointing to the R-framework, as sketched out by Potting et al. (2017). As such, the municipalities should focus more on the aspects that

place before recycling and material recovery, according to Vedvik (2022). Still, the municipalities recognise their role as facilitators to shift from the traditional waste management focus to other circular principles, but empirical studies of how this happens are needed (ibid.).

In a case study, Prendeville et al. (2018) studied the concept of the circular city and found that political leadership, building adaptable (future) visions, and applying experimental approaches such as living labs in which contextual knowledge about resource use with a diverse group of actors are important. This work is relevant as it points to some of the key aspects in this thesis, which have to do with cross-sectoral arrangements of action based on local knowledge and access to resources. The authors state that the study was not intended to be exhaustive, but it offers valuable insights into how six European cities engage with the circular economy. In the study conducted here, it was found that policymakers relied on business stakeholders to lead the implementation of circular initiatives and principles.

Summarising these studies, the multi-level nature of the political implementation of circular policies stands out. Moving from international commitments on the EU level through national legislation to regions and cities, the circular economy changes and is adapted to specific contexts. Regions make different plans when they want to become more circular, referring to different approaches and implementing their plans differently. A lacuna in this literature is that the largest part of these studies only approaches specific levels, often claiming their paramount but underestimated importance, and need to be clearer on the connections between the international, regional and local.

### **3.3 Consumption and Citizen Perspectives in the Circular Economy**

While the literature presented so far emphasises that the involvement of different stakeholders is important, Prendeville et al. (2018) highlight that the inclusion of citizens seems to be lacking in establishing circular cities and major urban stakeholders become powerful in the implementation and deciding the direction of circularity. Therefore, it is relevant to visit previous scholarship that addresses citizen perspectives and consumption.

In the circular economy literature, there is a tendency in which much of the dialogue about the move from a linear to a circular economy focuses on the production side, which reinforces technological and innovation narratives about a future circular



economy (Lofthouse & Prendeville, 2017). Thus, consequently, in policy circles, environmental issues are framed as opportunities with a stark emphasis on innovation and techno-optimistic scenarios (Kovacic et al., 2021; Genovese & Pansera, 2021), despite that most definitions of the circular economy recognise that both production and consumption need to transform (Geissdoerfer et al., 2017). Milios (2022) argues that most research has focused on business solutions and policy approaches to enable them and that such approaches over-prioritise technologically mediated forms of engagement (Hobson & Lynch, 2016). Lofthouse & Prendeville (2017) argue that moving beyond the technology-centred narratives to a focus on the user/consumer's needs and values would ensure a more considerate and inclusive field. At the same time, the authors argue that increasing the insights into these aspects would lead to better opportunities to address societal issues of consumerism. And indeed, there are similar calls for more perspectives and insights into the consumption side of the circular economy (Camacho-Otero et al., 2018).

A relevant finding from Kirchherr et al. (2017) is the lack of consumer representation in the 114 definitions, of which one out of five definitions outlines consumers as enablers of the circular economy, thus supporting literature that consumers in circular economy contexts represent a research gap (see Camacho-Otero et al., 2019; 2020; Mylan et al., 2016). In the mapping of social dimensions of the circular economy, Mies & Gold (2021) highlight the problem of fragmented coverage of social issues, while Casson & Welch (2021) write about how the circular economy as an imagined future plays an important part in the role of consumption and, in turn, consumers in this future. They write further that the EU's circular economy framing of consumers is based on assumptions of rational economic behaviour. In the EU vision of circularity, consumption is reduced to the acts of buying and recycling; thus, the critiques of the concept and its application seem warranted, considering that the political emphasis is eco-modernistic (Genovese & Pansera, 2021).

Yet consumers play a vital role in the circular economy through their roles as buyers, users, and dischargers of products, but expectations of them in circular economy policies and objectives are expressed normatively: they are expected to make purchasing decisions and be well-informed (Maitre-Ekern & Dalhammar, 2019). In moving beyond such a framing, the authors present a consumption behaviour hierarchy, which aims to

constrain product-related policymaking and contribute to achieving a circular economy. At the top, aspects such as avoidance, maintaining and repairing, and sharing are most preferred to achieve circularity, and buying second-hand, buying quality, and engaging with waste sorting at the bottom are less important. The hierarchy is similar to the waste management hierarchy and Potting et al.'s (2017) 9R strategies. The idea is to avoid buying low-quality products and products in the first place to ensure that higher-quality materials can be recirculated. However, according to Sanne (2002), consumers who are motivated to consume more sustainably often find themselves locked in by circumstances and thus unable to partake in sustainable consumption practices even if they want to. Structural, systemic, or circumstantial issues are addressed in circular economy policies concerning consumers (Maitre-Ekern & Dalhammar, 2019). They identify four policy trends: (1) information campaigns aimed at product labelling and signage in stores; (2) economic incentives to promote particular behaviour through taxation and price adjustment schemes; (3) reinforced rights-to-complain and repair; and (4) enabling new modes of consumption that are non-ownership based on the consumption behaviour hierarchy could reduce circumstantial lock-in.

Hobson & Lynch (2016) call for more empirical studies focusing on consumption in a circular economy context by addressing the role, place, and potential of the citizen, considering that the circular economy appears to be one of the large political-economic projects. The issue of the normative flavour of consumer expectations in circular economy policies, as found by Maitre-Ekern & Dalhammar (2019), is raised, for example, in the study of Milios (2022). Here, Milios calls for transcending the passive consumer role which such policies promote. As hinted at elsewhere, such as in Camacho-Otero et al. (2018), there is still little knowledge about the role of citizens in the circular economy. Milios' (2022) study argues for expanding the methodological arena by integrating socio-cultural theories such as consumption work (e.g., Wheeler & Glucksmann, 2015) to complement existing perspectives on consumer/citizen behaviours that can better explicate the complexities of everyday life. Thus, consequently, one of the units of analysis becomes the domestic and how the circular economy plays out within it. While it is important to focus on these dimensions of the circular economy, Dalhammar et al. (2022) accentuate that moving beyond wasteful consumption patterns does require strong policy measures. Karagouni et al. (2020) find there is a pressing need to nuance the role

of the citizen-consumer by not just focusing on behaviours but their embeddedness in society.

Thus, as a final remark, these studies highlight the missing concerns about sustainability and social transformation. As such, Jaeger-Erben et al. (2021) reflect upon the term ‘circular society’ as an alternative to growth, technology, and market-based solutions to the circular economy, where they consider that a circular economy transition is not possible without the inclusion of all societal actors. The authors highlight that the road to a ‘circular society’ includes, for example: (1) the revival of the roots of circular economy, meaning a re-evaluation of human labour, the role and conditions for work, service provision, and do-it-yourself (DIY) activities, which are lacking in mainstream circular economy debates. Another goal here is to foster care, connectivity, and cooperation at the expense of competitive approaches; (2) challenge and transform capitalist value definitions from economic and technological to more socio-ecological terms; (3) negotiate and strengthen sufficiency strategies. Current debates emphasise efficiency strategies, but a circular society approach highlights the importance of sufficiency in systems of provision to consume less by refusing (avoiding) and reducing consumption; and (4) foster agency instead of passivity, pointing to the normative approach policies has towards consumers and users within the circular economy. Moving beyond such simplistic accounts of citizens, the circular society approach acknowledges people as deeply embedded in complex systems. Jaeger-Erben et al. (2021) highlight that people should be enabled to form communities of collaborative consumption and co-designing activities and social innovation processes characterised by DIY, repair, and care. Departing from these studies’ insights, it is clear that more research that improves our understanding of the role of citizens and their consumption and society-policy relations is required.

The overview of the literature thus far has shown that the literature on circular economy has moved into a reflexive phase, reflecting on the shortcomings of its definitions, conceptual foundations, and the motivations and effects of its political implementation. The specific context in Norway, laid out in the first two chapters, is characterised by Norway being a laggard in the implementation of a circular economy but that there are high political ambitions on all political levels, ranging from the national to local governments. Moreover, I showed that it is particularly the high level of private

consumption which poses challenges to the realisation of these ambitions. In light of the literature reviewed here, both the translation of political programs between scalar levels and the circular economy's consumption side appear underdeveloped. This thesis sets out to focus on policy and consumer strategies in transforming a circular economy by considering these academic recommendations. In the next chapter, I present the theoretical background of the thesis' articles needed to study the visions and enactments of the circular economy.

## Chapter Four: An STS Approach to the Circular Economy

As we have seen in the preceding chapters, since the circular economy idea is contested (Corvellec et al., 2020), housing contradictory claims (Kovacic et al., 2021), and rooms a vast number of definitions (Kirchherr et al., 2017), it is relevant to understand how various actors envision and enact the circular economy, which is the dissertation's goal. To study this, I will present a set of theoretical resources, primarily from the field of Science & Technology Studies (STS), that I mobilise in the thesis' four research articles (See: Table 1 below).

In general terms, STS is about the relationship between science, technology, and society and criticises deterministic accounts of technological and societal development. At its core, STS begins with the assumption that science and technology are social activities and active processes – pointing to how actors within scientific and technological communities *construct* knowledge and technological artefacts (Sismondo, 2010). Here, the contexts in which these processes occur are not pre-defined but are outcomes of many factors that mutually shape each other. The processual and action-oriented nature of STS follows the role of actors – which do not have to be human – in shaping the technical and social, i.e., the sociotechnical (Latour, 1987). Hence, this approach is about a sociotechnical and not just a social construction.

Central to this, and consequently for this thesis, is how expectations about the future connect with and are influenced by enactments of the present and vice versa. As the circular economy remains an anticipated future rather than a present reality, the subsequent theories function first to identify the actors' interpretations of the circular economy and second to study how actors enact them. Each article in this dissertation draws upon different but complementary theoretical resources for studying the circular economy's introduction, vision, and enactment. In what follows, I will present these theoretical resources and discuss their use-value when studying the circular economy.

Article One	Discourse coalitions (Hajer, 2005)
Article Two	Domestication (Alasuutari, 2009; 2015; Sørensen, 2006)
Article Three	Sociotechnical vanguard (Hilgartner, 2015)
Article Four	Consumption work (Wheeler & Glucksmann, 2015)

**Table 1.:** Overview of the respective articles' main theoretical concepts.

#### 4.1 Sociotechnical Imaginaries, Vanguards, and Discourse Coalitions

There is great enthusiasm for the circular economy concept as a political departing point for a more sustainable production and consumption system, and this enthusiasm can be seen through its adoption among nation-states and subnational authorities across EU countries and affiliated member states. Some have already raised the circular economy to the status of a *sociotechnical imaginary* in Finland and Flanders (Frattini et al., 2019; Bocken et al., 2019). Sociotechnical imaginaries are “[...] collectively held, institutionally stabilized, and publicly performed visions of desirable futures” (Jasanoff & Kim, 2009, p. 120). Sociotechnical imaginaries draw on earlier works dealing with imagination as a cultural power (Sarewitz, 1996), imagination as helping produce systems of meaning enabling collective diagnoses of social reality (Castoriadis, 1987), and for example that these, in turn, may form the basis for a shared sense of belonging to a political community (Anderson, 1991). Thus, imagination can be seen as an organised field of social practices (Appadurai, 1996). Sociotechnical imaginaries are not, however, policy agendas, which can be rather specific in their language, more abstract, less issue-specific, goal-oriented, not as accountable as a policy, and nor are they as instrumental (Kingdon, 1995). They are neither frames, which are ways of organising society that structure someone’s perception of reality (e.g., Goffman, 1974). Imaginaries are, to a greater extent than these concepts, embedded in norms and discourses and cultural meanings and symbols, and they project visions of what is good, attainable, and desirable (Harvard STS, n.d.).

Although the circular economy has been analysed as a fully developed sociotechnical imaginary in some countries, Norway’s status as a laggard makes such a designation impossible. Although the Norwegian Government has a circular economy strategy and aims to implement circularity, and there is an elevated interest among a broad

spectrum of actors, the implementation and work with the concept are fragmented and not institutionalised. The linear characteristics of Norwegian consumer culture are deeply rooted in an ideal of private ownership (e.g., more than 80 % of Norwegians own their home), which is part of what constitutes the good life in a modern welfare state. However, as shown in the first two chapters, emerging trends build on circular-economic principles of sharing, reusing, and repairing that challenge the ideals of ownership and high-consumption lifestyles. For these reasons, I propose to think of the circular economy as a sociotechnical imaginary in the making. There are both clear political investments in institutionalising the circular economy as a desirable future, and citizens and industrial and business actors are increasingly focused on making a circular future reality.

If we consider the circular economy in Norway as a potential future sociotechnical imaginary, the question arises how do we get from the present situation to a future in which the circular economy is a collectively held, institutionally stabilised, and publicly performed desirable vision of the future? In order to study how this may happen, Stephen Hilgartner (2015) offers a relevant perspective with the concept of *sociotechnical vanguards*, denoting “[...] relatively small collectives that formulate and act intentionally to realize particular sociotechnical visions of the future that have yet to be accepted by wider collectives, such as the nation” (Hilgartner, 2015, p. 34). This original formulation takes place within the case of synthetic biology development in the United States. Here, the emerging synthetic biology imaginary is situated within a larger imaginary of the US as a technological powerhouse, and more specifically, the vanguards of synthetic biology derive from the imaginary of ‘America the innovator’ (ibid., p. 36). Vanguards may mobilise and seek to drive change, often in direct competition with others and in more peripheral areas of influence. Sociotechnical vanguards strive to make desirable futures, but this cannot be done freely or created under self-defined circumstances. Making futures entails using existing vocabularies and practices transmitted from the past, and a sociotechnical vanguard is always retrospectively identified in the sense that looking for vanguards in the present has to remain speculative.

Hilgartner (2015) writes that sociotechnical revolutions, in his synthetic biology example, are difficult to achieve because it means a significant change in how societal organisation, technological systems, cultural and social factors, and views of nature and its resources are conceived of. Visions of such revolutions are shaped through dynamic

processes between actors with different goals, and the process takes place in existing systems with their logic and collective aspirations (Jasanoff, 2015). If we now think back to the Norwegian historical development of consumption and environmentalism described in the first two chapters, we can see that there are specific collectives of actors who seek to replace a vision of a desirable consumerist future with alternatives to economic (green) growth. They reacted in the 1970s to a sociotechnical revolution of Norway rapidly becoming a high consumption welfare state fuelled by fossil fuel export. With the shock of climate change – in Norway predominantly received as the threat of climate refugees and the end of the national pastime of winter-time skiing – the sociotechnical imaginaries from the 1970s are revived as the circular economy.

These vanguards share with the niche actors described by the multi-level-perspective on sustainability transitions (Geels, 2002) that they develop common visions and engage in learning by doing (Schot & Geels, 2008). To direct the attention towards sociotechnical imaginaries and their vanguards instead of sociotechnical regimes and their niches, allows us to analyse the circular economy as a shared vision of a desirable future, which may never be achieved, instead of a possible future sociotechnical regime. Despite similarities between both approaches, I have chosen sociotechnical vanguards as it seeks to explain how a potentially radical idea and vision such as the transformation from linear economies into circular ones can become a central organising principle of a society.

To complement this sociotechnical vanguard perspective and to understand the relative position of the described potential vanguard in a larger discourse field, I use the framework of *discourse coalitions* (Hajer, 1993; 1995; 2005). The analysis of alliances that gather around different notions of which desirable future the circular economy represents allows us to identify how the circular economy is interpreted in Norway. Maarten Hajer (2005, p. 302) defines a discourse coalition as “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”. The term ‘storyline’, how events unfold over time, adds to the future oriented imaginaries the temporal dimension of the past. How the desirable circular future is constructed does not happen in a historical vacuum but are instead part of “[...] contexts of historical discourses which contain knowledge of how similar phenomena were dealt with in the past” (Hajer, 1993, p. 45). Hajer (ibid.) defines



a discourse as “[...] an ensemble of ideas, concepts, and categories through which meaning is given to phenomena”. Hajer’s focus on discourses and their relevance for analyses of policies emerged as a response to the linguistic turn, pointing to the shift from the positivist view of language as a neutral system of signs one could describe the world with and the argumentative turn of the increasing relevance of argumentation, language, and deliberation in policymaking (Hajer, 1993).

The term “discourse coalition” does not describe the interactions between actors or their networks. Instead, it analyses metaphors and storylines to explain how actors think, argue and imagine the world together. The storyline dimension looks into contested and emerging phenomena, in our case the circular economy, and how negotiations and contestations manifest in independent storylines. Using this framework, it is possible to identify adopted and rejected discourse storylines and metaphors to reconstruct underlying ideologies. Thus, one can show the shared or diverging belief systems that are not explicit in discursive statements (Van Dijk, 2006).

Vanguards and discourse coalitions formulate expectations, which are essential in guiding technological and sustainability transitions (Eames et al., 2006; Borup et al., 2006), and are comprised of circulating statements in texts or other materials about the future (Van Lente, 2012). The advent of the circular economy as a political goal is manifested predominantly in written texts such as policy documents, but also through images and figures visualising core principles of how a future circular economy should be organised (e.g., Figure 3 on p. 27). Expectations of technological or innovative advancements inspire imaginative innovation, which has positive performative functions (e.g., Pfothenhauer & Jasanoff, 2017). Circular economy expectations traverse and are adopted across transnational and political realms. For this thesis, which explores the circular economy’s introduction in Norway, it is relevant to draw on insights not just in policymaking and governance but among a range of different actors from various sectors of society as it offers the opportunity to see how momentum for action is being created (Lazarevic & Valve, 2017).

In moving forward, the vanguards’ imaginaries about desirable futures can become shared by larger groups receiving broad and communal acceptance. While vanguard visions inform the practices of a small group only, which commits to norms and rules that are in line with the imaginary, when imaginaries are elevated to larger social

entities, they become embedded in policy and legislation and, at least equally important in forming expectations about the future among regular individuals. In the case of a Norwegian circular economy, an important context is European policy and international discourses about circular futures, which have great influence on the enactment of circular ideas in Norway. To capture how visions are enacted and how circular-economic policies traverse geopolitical borders and are adopted, I do so with a practice-oriented outlook to see whether there are emerging enactments of particular circular-economic visions that can be traced in Norway.<sup>1</sup>

## 4.2 Domestication

Milios (2022) has called for broader sociological approaches to the study of the circular economy. In many ways this thesis answers this call. The analysis of policy is one answer to this, in which policy can be seen as “moving” between national and regional contexts. The literature on policy diffusion and policy transfer agrees that transfer/diffusion is important in policy change (Marsh & Sharman, 2009). In the case of the circular economy, using the terminology presented in the previous sub-section, the question is how desirable futures are embedded in the context of nation-states, such as when EU circular-economic policies enter Norwegian political contexts. The idea that policies and their appurtenant imaginaries influence each other is immediately plausible. The question, however, is how this transfer should be conceived. Pertti Alasuutari (2009) argues against simplistic diffusion and transfer models by suggesting that *domestication* is useful when focusing on the impact of exogenous policies. For him, the locus of domestication is the meeting between, or the exposure to, a political concept and idea traversing geopolitical boundaries. As such, Alasuutari (2009) considers that nations and subnational authorities may be understood as local places that produce contexts for people’s activities, and considering that national and subnational authorities are central in shaping visions and enactments through policies, this approach offers a way to understand the process in which different levels of governance domesticate imaginaries about desirable circular futures that were developed elsewhere.

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<sup>1</sup> Here, I do not mean practices as in the *Practice Theory* sense, but rather practices related to the use or application of an idea, vision, or way of doing something more generally.

Moreover, domestication adds to this by highlighting the mutual sociotechnical change that happens through the domestication process. According to Alasuutari (2015), the concept of diffusion conveys that, for example, exogenous policies give the impression of ‘flying around’ and ‘sticking to organisations’. He argues that it is more useful to think of a translation process in which actors are active but are simultaneously influenced by existing systems. Alasuutari (ibid, p. 172) explicates this further:

“While there is a plethora of concepts which capture the transformation of the original when an idea or policy is introduced to a local context, the concept of domestication pays attention to a local field battle as a condition of its acceptability. When an idea, concept, model or a comparison to other entities becomes part of local politics, local actors and spectators to the political drama retain their sense of agency, and the eventual policy changes do not seem to be a mere imitation of what has been done elsewhere.”

Considering this, domestication emphasises that actors indeed are active in shaping policies and are not passive receivers of a given structure and policy.

In its original sense, domestication entails the process of taming wild animals for purposes of human use. Within media studies and STS, domestication is an approach to study practices of technology adoption (e.g., Lie & Sørensen, 1996; Sørensen, 2006). The domestication process is one of bringing something home (Aune, 2007), and in essence, domestication is the juxtaposition of the outside and inside and the relational aspects between them. It is the process of how something becomes one’s own (Lie & Sørensen, 1996).

The contribution of the domestication approach to the topic of the thesis, is that it provides theoretical tools that allow us to analyse circular economy as an entity that travels between different contexts. As we have learned in the literature review, despite weak definitions and doubts concerning its practical application, the concept has received wide adoption in a broad variety of contexts, involving among others, China’s top-down policies, EU sustainability strategies, regional governments’ environmental plans and environmental movements. We miss considerable exogenous influences when we only look at the emergence of desirable circular futures as a home-grown phenomenon – driven by governmental policies and civil society organisations.

Domestication developed from the critique of the understanding of how new ideas or technologies spread and are adopted in society as a linear and *a priori* process. The critique of the diffusion of innovation that Everett Rogers (1962) stood for is especially central to this development. Rogers described the diffusion of innovation as a five-step process, visualised through an S-curved graph, of the rate at which innovators, early adopters, early majority, late majority, and laggards adopted an innovation. One of the underlying problems here is the linear characteristic of diffusion. It is problematic on the one hand because it suggests that the adopters of an innovation are limited in their ability to change the innovation; connected to this, on the other hand, it also implies that the innovator controls the direction of the innovation; thus, indicating determinist undertones. The domestication approach aims to move beyond this understanding of the dynamics of technology development and use by acknowledging the agency of the new objects introduced while avoiding deterministic and simplistic understandings of what these objects do to the receiving end of the diffusion.

Originally, domestication focused on the introduction of media technologies in the domestic sphere (Silverstone et al., 1992), in which a four-phased domestication process of appropriation, the transfer of an artefact from the market to the user; objectification, denoting that the user ascribes the artefact in question a physical place in the household but also becomes part of the symbolic and cognitive reality of its users; incorporation is about the use of the artefact and becomes integrated into everyday-life practices, routines, and habits; and finally, the conversion phase in which the artefact is made someone's own that the user can showcase beyond the household. The unit of analysis of domestication has been expanded to incorporate other scalar levels, such as knowledge appropriation of human-induced climate change (Ryghaug et al., 2010), car and electrical-vehicle mobility (Østby, 1995; Anfinson et al., 2018), video games and the everyday life of gamer parents (Ask, 2016; Ask et al., 2021; De Schutter et al., 2014), the built environment (Korsnes et al., 2018; Berker, 2011), and more recently, and automated milking systems on farms (Finstad et al., 2021). Domestication itself has been reinterpreted, redeveloped, and synthesised since its conception.

An influential synthesis is Knut Sørensen's (2006) reinterpretation of Silverstone et al.'s. (1992) domestication process, where these phases are described as three dimensions: practical, cognitive, and symbolic processes, which occur when an object

(both material and conceptual) is attempted to be incorporated into a social context, and not just the household. As domestication is a process, it does not imply that the practical, symbolic, and cognitive dimensions of the relation to a technological artefact or, indeed, a sustainability concept like the circular economy end up in a state of stable closure or are black-boxed. Rather, these inter-connected dimensions may break and lead to a change (Lie & Sørensen, 1996).<sup>2</sup>

The circular economy concept as shared desirable imaginary of the future manifests in policy documents and plans that reproduce widely shared examples, diagrams, numbers, and storylines. These manifestations travel between international, national, regional and local contexts. A domestication approach to the analysis of this travel offers a non-linear approach to studying how the circular economy concept traverses geopolitical boundaries and how it gets incorporated into local practices and contexts. We can thus view domestication as a versatile heuristic that has evolved from studies of the home to be useful in studies of larger contexts, which constantly attends to the mutual shaping developed in the early formulations of the theory.

The circular economy does not just include the political aspect of policy implementation, but domestic consumption has received attention as an important point of inquiry and is, as I have argued above, particularly relevant in the Norwegian context. In the following, an additional answer to the call for broader sociological analyses is presented, which connects domestic work in the context of the circular economy to the sociological analysis of production and consumption. This section outlines the theoretical foundation of the thesis' focus on domestic consumption in the circular economy.

### **4.3 Consumption Work**

The field of STS borders and overlaps with other disciplines that investigate the complexities and constructions of societies and the production and consumption of

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<sup>2</sup> The processual feature of domestication implies that when an artefact is introduced and integrated into a context, the artefact may at some point be subjected to change. Since its conception, domestication has itself been synthesised and nuanced (Hartmann, 2020) to include additional descriptions of processes that artefacts may undergo. For example, Hebrok (2010) rethinks domestication by conceptualising dis-domestication, indicating a heterogeneous process of disposal. Karlsen & Syvertsen (2016) discuss reverse domestication as an example of reducing media use instead of establishing new routines, the aim is to disconnect existing patterns of use.

artefacts. The field of the sociology of consumption has grappled with questions of production and (sustainable) consumption since its beginnings (Evans, 2019). This field has been critical of the studies of sustainable consumption within disciplines like behavioural economics, marketing, and psychology, which narrowly focused on behaviours, attitudes, and individual choices; leading to thinking of the consumer as a rational decisionmaker and overlooking other societal factors that may shape actions (Shove, 2010). STS also shares this critique, emphasising the active role and ongoing construction processes of a wide variety of actors in shaping and building societies (Bijker & Law, 1992). As part of this critique, instead of focusing on individuals as the unit of analysis, there is a wave of scholars using practices as the primary focus of inquiry (e.g., Shove et al., 2012).

Leonidas Milios' (2022) call for a broader sociological approach to understanding the role of citizens in a circular economy that is not just about practices or individuals. Everyday life entails complex activities and networks between people, technologies, knowledge, and different sociotechnical systems. Domestic spheres are no different, as organisation and negotiation between these elements frequently occur. Overcoming the traditional division between the home as a sphere of reproduction and production being situated outside the home, studies of domestic consumption have lately sought to acknowledge the work going into the act of consuming. In the context of a circular economy, how consumption is organised raises questions and concerns about how people can shift to a more sustainable consumption model; central European and Norwegian governments have placed great expectations on the ability of individuals to accommodate these changes (e.g., European Commission, 2015; Ministry of Climate and Environment, 2021).

Some scholars (e.g., Welch et al., 2019; Hobson et al., 2021), including Milios (2022), have, of late, proposed that the study of the circular economy would benefit from a research agenda for *consumption work* that emphasises that the economic and the social are inextricably intertwined. Consumption work means “all work necessary for the purchase, use, re-use, and disposal of consumption goods and services” (Glucksmann, 2016, p. 881); thus, consumption work is to be understood as “[...] distinct from consumption itself in the sense of using or using up goods or services” (Glucksmann, 2013, p. 10). Consumption work challenges the idea of production and consumption as

watertight realms, thus sharing fundamental theoretical similarities with the early domestication literature in which the goal was to empirically show that acquisition and appropriation are active processes (Lie & Sørensen, 1996). To analyse consumption work instead of cognitive, practical, and symbolic appropriation in the context of this thesis has the two advantages that it first connects household practices with larger systems of production and second that it has been developed with a specific focus on the circular economy.

Wieser (2019) and Hobson et al. (2021) focused on the implications of new *systems of provision*: such as sharing, repairing, and the (re)use of products and services. While the EU expects individual consumption to remain unchanged in their sustainability models, research into consumption work needed to perform circular practices disagrees. The framework looks at circular-economic visions through the division of labour and the amount of work required by consumers to change and then perform their consumption practices.

Considering that consumption-oriented EU policies thus far are mostly about economic incentives and information campaigns based on the idea of a rational decision-making public, it is an important intervention to draw attention to how exactly consumption in everyday life is performed, and to insist on that consumption is not unproductive, involving work that is important for economic processes. With other words, consumption work is relevant to the study of domestic consumption by showing that consumers are active, not passive, actors in a sociotechnical system.

To summarise this chapter, on the most general level, the presented theoretical resources share one important commonality: they are concerned with the dynamic and changing nature of the sociotechnical. The combination of these theoretical approaches (as used in the articles) shows how different actors in different contexts perform the circular economy, as emerging shared imaginary of a desirable future, as diverging storylines in discourse coalitions, as exogenous policies that are embedded in national and regional contexts, and as household members performing consumption work. To see how the circular economy has become an emerging sociotechnical imaginary in Norway, and to propose future directions in this process, the outlined theoretical resources focus on different aspects, but together they allow us to draw an image that ranges from EU

policies to households in a medium-sized town in Norway. The next chapter describes the methods used in the study of the circular economy in Norway.



## **Chapter Five: Methods**

This article-based dissertation seeks to understand how the circular economy has become the desired path in Norway for the achievement of a more sustainable organisation of production and consumption. This dissertation is comprised of four research articles, which have a foundational base in the two empirical studies, which I outline in this chapter.

### **5.1 Studying the Circular Economy in Norway**

Circular visions and practices are distributed across different stakeholders within policy, governance, industry, business, and the public. The empirical scope of the thesis and the subsequent studies were primarily located in the region called Trøndelag and its main city Trondheim, which is situated in the middle of the country. Choosing this region and city derives from two main reasons: first, of late, there has been a rise in interest among and small-and-medium sized businesses concerning reuse, repairs, redesign, sharing, and the concept of the circular economy that houses these aspects, which can be seen in increasingly more stores and events around the city. Second, which pertains to the type of city and aspects of demographics and size, the city of Trondheim is a post-industrial city and fourth largest in Norway, and coupled with the region's and city's ambitious environmental goals and interest in the circular economy, they are relevant sites for studying the emergent circular economy concept. In addition, the closeness of the studied site to the work place where this thesis was written enabled focused access over a longer period. This allowed me to build trustful relations with informants and gave me a more complete picture of the phenomena that are relevant for this thesis.

My approach to research design was social constructivism, meaning that it focuses on the situatedness and the co-creation of knowledge between the researcher and the study participants (Rapley, 2007). The foundation of the research articles is a combination of two overarching methods, which I characterise as a dual-method study. The specific methods used in each article are explained in detail in their respective methodological

chapters, but this chapter further reflects on the underlying choices and consequences of the research design. My methodological decisions are rooted in the overarching research questions, but also in decisions based on results and reflections from the extant literature. The following two studies, and their methods, focus on mapping and identifying visions of the circular economy and the enactments of these visions. I also included stakeholders outside this region who were relevant because they offered broader insights into the circular economy transition in Norway.

The methods reflect the goal to investigate the circular economy in Norwegian contexts of governance, in the private sector, among industry actors, in not-for-profit organisations, and finally, in the domestic sphere and everyday life of citizens. The studies are qualitative, and I draw on two main methods in the semi-structured interviews and an action-research design for capturing the visions and enactments of the circular economy in the outlined Norwegian contexts. The representation below details the methods and empirical material underpinnings of each study and research article of the thesis.

<i>The Studies</i>	<i>Articles</i>	<i>Main methods and data sources</i>	<i>n=</i>	<i>Collection period</i>
<b>Study one</b>	Article one	Semi-structured interviews	26	2019-2020
		Documents	4	
	Article two	Semi-structured interviews	7	2019
E-mail correspondence	1			
	Documents	7		
Article three	Semi-structured interview	Participatory observation	1	2019
		Documents	2	
		Documents	5	
<b>Study two</b>	Article four	Action-research design		2020
		Semi-structured interviews	14	
		Written reflections/diaries	2	
		Photographs	34	
		Interviewed Households	7	

**Table 2.:** Overview of methods and data material underpinning the thesis' articles.

## 5.2 The First Study: Mapping the Circular Economy in Norway

I acquired the first data sources through semi-structured interviews with a broad range of stakeholders involved in transitions to a circular economy (for an overview: see Article One); 22 of 26 interviews were undertaken with a fellow PhD candidate in design, Isaac Arturo Ortega Alvarado (See: Table 3). Most interviewees were affiliated with circular economy transitions through their work situation: either politically, through industries and businesses; or were people engaging with core tenets of the circular economy, like reuse and redesign as side jobs. With the circular economy being a contextually new phenomenon in the region and elsewhere, the stakeholders' relation to the circular economy was unclear, and they had not devoted much time to the topic. We were presented early on with an opportunity to speak with a representative from the Trøndelag county council, someone who had worked on this subject, and possessed an overview of circular economy activities and stakeholders: this person became a *key informant* (Wadel, 1991). After meeting this key informant, it was decided that we would employ a

*snowballing method*. Kowald & Axhausen (2012) write that this method is used within sociological fields to collect information on hard-to-reach stakeholders where it can be used to show how these relate to each other.

The snowballing method showed and contextualised which names, cases, or stakeholders are of importance to the regional transition to the circular economy. The interviews my colleague and I did together were in English, while the ones I did alone were done in Norwegian. In the interviews, we asked whom the subjects would recommend we speak to next, thus, the snowballing continued. Our method also employed what Berg (2001) calls a *convenience sample*: selecting people based on their willingness to participate in the study. Because the key informant influenced our sampling of interviewees, there was a particular bias underpinning the sample. I found that several interviewees, primarily those residing in the Trøndelag region, referred back to the county representative and the county itself as stakeholders with an excellent overview and command of the circular economy in the region and important for themselves in their daily business. However, when the snowballing resulted in the repetition of the key informant and the county, we did additional desk research to find out if there were any further relevant people to enrol in the sample to minimise the bias of the sample (Thagaard, 2013). I am confident that this bias was adequately tackled as the suggested informants that were proposed reinforced the relevance of the stakeholders we spoke to. Additionally, if we had not had access to this key informant, there is the possibility that we have would have lost our direction, as the circular economy is so contextually new.

<b>Role</b>	<b>Present in article</b>	<b>Joint interviews marked with the interviewer(s) initials</b>
Cluster leader	A1	TES, IAOA
Advisor	A1	TES
HMSK-leader	A1	TES, IAOA
Advisor	A1, A2	TES, IAOA
Climate coordinator	A1, A2	TES, IAOA
Senior advisor	A2	TES
Volunteer	A1	TES, IAOA
Consultant	A1	TES, IAOA
Head of development	A1	TES, IAOA
Advisor eco-design	A1	TES, IAOA

Co-founder	A1	TES, IAOA
Director	A1	TES, IAOA
Advisor	A2	TES
Organisational consultant	A1	TES, IAOA
Project leader (biology)	A1	IAOA
Professor	A1	TES, IAOA
Employee/owner	A1	IAOA
Founder	A1	TES, IAOA
Co-founder	A1	TES, IAOA
Employee, digitalisation and Project leader	A1	TES, IAOA
Founder	A1	TES, IAOA
Coordinator	A1	TES, IAOA
Librarian	A2, A3	TES, IAOA
Climate advisor	A1, A2	TES, IAOA
Climate advisor	A1, A2	TES, IAOA
Municipal engineer (retired)	A1, A2	TES, IAOA
Owner	A1	TES
Operations manager	A1, A2	TES, IAOA

**Table 3.:** Overview of informants, relation to the articles, and who conducted the interviews (See Table 2 in Article One for a more detailed description about their affiliation).

We employed a semi-structured approach to the interview because it enabled us to capture and give information about how people experience and interpret their environments (Thagaard, 2013). Our questions were constructed to increase our understanding of how the interviewees perceived the circular economy concept, and how their interpretation affected their practices. My colleague and I had differing focuses on some topics, where his focus was related to design, but our approaches enabled us to pose questions that were flexible enough to cover a broad list of topics; it also allowed us to let the informants talk about what they found most relevant about the circular economy. Ahead of each interview, in addition to our interview guide, we developed interviewee-relevant questions (Kvale & Brinkmann, 2009). We enquired about the informants' relationship to the circular economy concept: how they came to know about the term, how they enact circular-economic visions, and how they relate to the relevant aspects of the circular economy in their work. We structured the interview guide and the interviews themselves to be flexible enough to ensure that we could follow the story or topics raised by the informants: an approach referred to as responsive interviewing by Rubin & Rubin (2012)

and further described by Gudmundsdottir (1996) as a form of interview comprised of a conversation between the researcher and the interviewed person (Rapley, 2007). Holstein & Gubrium (1995) write that all interviews are interpretatively active, implicating meaning-making practices for both researcher and informant, meaning that interviews are unavoidably collaborative (Alasuutari, 1995). As such, the conversations with the informants, and the data we produced, helped to shape the focus of the studies. Since the circular economy is contextually new, it was important to consider the informants' understanding of the topic; this led to our finding that our interviewees' specific reflections on the growth paradigm, as it relates to the circular economy idea, were well-aligned with either for or against positions as discussed in the previous chapters.

An analysis begins by identifying the research questions and the structure of the interview guide; the researcher then brings intuitive ideas and biases into this process based on the research interests. In my case, I was concerned with the introduction of the circular economy concept into various Norwegian contexts and the roles of the people and actors in this transition that I interviewed. These considerations shaped my analytical focus when I read through the transcribed interviews. I could not let my initial interest limit the scope of the analysis, however. The analysis process continued in the subsequent interviews, in dialogue with those in the *convenience sample* (Berg, 2001). Sometimes, the answers were unclear or difficult to understand, which triggered follow-up questions. The interviews themselves constituted the first stage of data analysis: the dialogue, the note-taking during, and the memo-writing after the interview were all part of this first stage. The transcription of the interviews was the next step, where I simultaneously listened attentively and typed up the recorded material. This dual process was an important step in familiarising myself with the material.

I drew inspiration from grounded theory for my data analysis, in particular, what Corbin & Strauss (2008) call *open coding*. Using this strategy, I identified patterns and themes which were interesting and relevant to my inquiry and research questions. This identification of patterns and themes was done with every interview transcription, and here, I could compare and extract meaning from the interview excerpts into the thematic

codes. Such topic-centred approaches, or *cross-sectional analysis* (Mason, 2002), require the researcher to analyse the information as it relates to each topic of study across all the data material. Such analyses have been criticised (Thagaard, 2013) because text excerpts become disconnected from their original context. To avoid this, I did a closer coding where I turned my attention to specific utterances and sentences. The difference between *open coding* and *cross-sectional analysis* – a more closed form of coding – is in their levels of abstraction. The former identifies themes and occasional reflections from the researcher, whereas the latter, which I did after open coding, is of a lower abstraction level. In the cross-sectional analysis, I focused on capturing the informants’ actions, their methods, and their views, as they relate to the circular economy.

I collected empirical data from more than interviews: documents relating to different levels of governance were determined to be central in understanding state and subnational political goals, trajectories, and processes: such as white papers, municipality and county strategic documents, and European action plans and strategies. The documents acted as contextualising devices and were support materials for the interviews. They were used pragmatically to help me identify topics and passages relevant to the focus of my studies, and were not subjected to formal or rigorous document analysis.

<b>Document name</b>	<b>Document type</b>	<b>Source</b>	<b>Used in Article</b>
Waste as resource – waste politics and circular economy (2016-2017)	White paper	National Government	A1, A2, A4
Political platform Granavolden	Political platform statement	National Government	A2, A3, A4
(The Norwegian) National Strategy for a green circular economy (2021)	Strategy	National Government	A4
Strategy for innovation and value creation in Trøndelag (2017)	Strategy	Trøndelag County	A1, A2, A3
Action programme 2018-2019 to the innovation and value creation strategy	Action programme	Trøndelag County	A2
Action programme 2020-2021 to the innovation and value creation strategy	Action programme	Trøndelag County	A2, A3
Climate Strategy for	Strategy	Trøndelag County	A1

the County (Trøndelag County, 2020)			
County Commissioner Report – reduced consumption through increased reuse, repairs and redesign (2020)	Report	Trøndelag County	A3
Waste management plan for Trondheim municipality 2018-2030	Plan	Trondheim Municipality	A1, A2, A4
Energy and climate plan for Trondheim municipality 2017-2030)	Plan	Trondheim Municipality	A1, A2, A4
Future in our Hands. (2020). Reduced consumption through increased reuse, repairs and redesign.	Application	Future in our Hands	A3
Sirkulær framtid – om skiftet fra lineær til sirkulær økonomi	Report	Future in our Hands	A3
Closing the Loop – An EU action plan for the Circular Economy (2015)	Action Plan	European Commission	A1, A2, A4
A new Circular Economy Action Plan. For a cleaner and more competitive Europe (2020)	Action Plan	European Commission	A2
Circularity Gap Report (2020)	Report	Circle Economy	A1, A4

**Table 4.:** Overview of the documents used in the articles.

### 5.3 The Second Study: An Action-Research Experiment

In the second study, I chose to focus on the perspective of citizens' everyday life and their consumption. Understanding the role of individuals is expected to be important in the transition to a circular economy (European Commission, 2015), and there are a limited number of studies investigating consumption in a circular economy context and, more specifically, the identified need for understanding peoples' opportunities to participate in circular economy transitions (Camacho-Otero et al., 2018; Mylan et al., 2016). With this second study, I investigated how the circular economy is understood in Norway through the examination of households.



In studying transitions to circularity among domestic dwellers, an opportunity presented itself when a master's student, Markus Halvorsen Karijord, investigated circular food practices in Trondheim. Our empirical focuses differed as he was concerned with circular food practices and I with reuse, repair, sharing, and other circular-economic activities, but both can be placed under the umbrella concept of a circular economy. We decided that it would be mutually beneficial to conduct an experiment together, and my work became a pilot project or pre-study, in the sense that I used it as an opportunity to identify the future research agenda for my second study. For Karijord, his work became the empirical foundation of his master's thesis.<sup>1</sup>

The design of my pilot project merits some explanation, as it was central to the approach I took in outlining the main study for the fourth article in this thesis. *Action research* inspired our approach, and it was originally derived from work on the democratic governance of companies as a tool for achieving increased efficiency (Adelman, 1993). The scope of action research has since widened to include research in which participants play active roles in the establishment and implementation of change in their everyday life in dialogue with researchers (Rowell et al., 2015). Our research design was a combination of two types of action research: *diagnostic action research*, where the researcher(s) provide an action plan for the participants (a list of services and suggestions); and *participative action research*, in which the participants are actively involved in the research process from the very beginning (see: Marrow in Adelman, 1993). Karijord (2020) studied circular food practices, while additional circular activities such as repairing, sharing, reusing, and refurbishing were my focus. Our shared focus was to study changes over a span of two weeks, and our work was divided into three phases: (1) designing the experiment and conducting the pre-interviews; (2) the testing phase; and (3) post-interviews and analysis. We interviewed four households in the city of Trondheim with a pre-and post-interview scheme (See: Table 5). We recruited the households through our personal connections. A key part of our approach was in how we

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<sup>1</sup> A complete methodological account of the design of the pilot can be found in Karijord (2020) in Norwegian.

translated various sources, such as an overview of local services and offerings, into a document that the participants used to decide what they wanted to test out during the experiment. The next step was to build upon the pilot, and since the aim was still to capture the dynamics of change in households implementing circular activities, I kept and re-developed the document showcasing services and offerings. I reused the essence and fundamental dimensions of the pilot in my subsequent case study.

In the next step, I kept my original research focus from the pilot, but included more participants from mainly Trondheim, but I also recruited an informant from the rural town of Røros in the same region. The research design of the study resulting in the fourth article emphasised collaborative and participatory action research. The process of redesigning the pilot for my second study was mainly about developing the document describing existing circular services and offerings in Trondheim and Røros, which I refer to as a “cultural probe” or “handbook” in my study (See: Appendix Three). The handbook is a collection of tasks, which was used to provoke and elicit responses from the participants (Gaver et al., 1999; Gaver et al., 2004). The cultural probe contributed to the action research process as it entailed participation and collaboration between the researcher and the participants to create new knowledge. In general terms, a probe is participatory, exploratory, and disruptive: it may redefine the investigator-participant role (Graham et al., 2007).

Pilot Study	Main Study
4 households: 1–2-week commitment. One student, a family of four, and two couples	7 households: 1-month commitment. One pensioner, one family of five, three families of three, and two families of two

**Table 5.:** Brief overview of the households in the pilot and main study. See Article Four for a more detailed overview of the main study participants.

The development of the handbook’s contents took inspiration from the work of Vittersø & Strandbakken (2016), who proposed three strategies for the green shift (transition). These were (1) product substitution, relying on technology development and efficiency

strategies in which people choose the most environmental option; (2) reorganising consumption, which is about sharing, renting, and lending instead of ownership – activities that contribute to prolonging a product’s lifetime; and (3) consumption reduction, where the aim is to reduce the actual consumption of goods and resources such as reducing meat consumption, shorter showers, and reducing or avoiding the purchase of new clothes, and so forth. These strategies were relevant when considering the historical development of the circular economy in which both eco-modernist and consumption reduction positions are present. These strategies were then adapted to the format of the handbook, and during the first phase of the experiment, I explained and discussed the strategies with the participants.

To capture the intricate details of people’s everyday life and consumption, I needed to draw on the participants’ expertise to describe how they perceive their reality. Probes humanise and capture personal engagement accounts with the material world around us, so I was attentive to the context and histories that informed people’s decisions. My experiment consisted of three main phases: (1) distribution of the cultural probe (the handbook), as a sensitising step for triggering reflections from the participants before the experiment began (Trischler et al., 2019), and the pre-experiment interviews in which we also discussed the different consumption strategies they wanted to test out; (2) the experiment itself, where participants tested out consumption strategies presented in the handbook; and (3) a post-experiment interview, which focused on participant experiences and their reflections on the experiment. The participants’ process of deciding what they wanted to do with the cultural probe was discussed with them where they actively reflected on how to use the handbook; they often suggested things to try out themselves. The probe was meant to be more of an inspiration for the participants than a strict to-do list. The goal was rather to trigger responses to enable a discussion in the interviews. Furthermore, Mattelmäki (2008) writes that probes are design-oriented tools based on self-reporting. The handbook suggested diary-keeping and photographing of the experiments’ activities, and as such, this was part of the handbook as strategies to collect data as the experiment happened.

For the analysis of the generated data, I employed the same approach to the data as I did with the first. In addition to the interviews themselves, some household participants delivered personal diary notes from the experiment, while many others sent me photographs of products they tested, things they repaired, vegetables and fruits from their gardens, and the way they organised their domestic waste management. To give me a better idea of how they lived and organised their consumption, I conducted the interviews in the homes of the participants. This strategy allowed for a more profound understanding that was important in analysing and discussing the data. I wrote my reflections based on the coding process, the supplemental material, and the observations (household tours): all of which were necessary for the focus of the fourth article. My reflections helped me to understand how the participants perceived their current consumption, and how they engaged with new consumption concepts during the experimental phase and beyond. Reflecting also helped me identify potentially problematic and challenging aspects when rethinking personal consumption. The close interaction with the participants was highly fruitful in identifying visions, expectations, and circular economy practices that may appear in the future.

As is common for action research, my second study focused on smaller groups of local participants. The study framework was a cycle of action, reflection, and learning over shorter time intervals (Refstie, 2018). My study considers the flaws of action research in that it can be described as ill-equipped to deal with structural change at scale, as it works primarily with symptoms instead of the underlying processes that create them (Greenwood, 2002). I argue that uncovering the details and implications of consumption patterns can affect structural aspects of systems over time. Thus, the goal of my study is to make a diagnosis based on practices, while allowing for change at the individual level. Scholars of critical action research (for example, Davis, 2008) argue that this strand of research should identify suppressive power structures and help people find ways to resist structural inequalities. Despite its drawbacks, action research tackles what McNay (2014) calls the problem of ‘social weightlessness’, wherein other approaches suffer from an abstract way of thinking about the world detached from everyday practices and dynamics;

therefore, action research is superior, in that it offers an approach for socially situated research (Reason & Bradbury, 2008). As such, my second study is actionable, as it has practical value to those involved in the project and whose insights can be elevated, as well as having implications for the mentioned structures surrounding us.

An outcome of the action-research method was that I gained very detailed descriptions, through multiple data sources, of how changing to more sustainable forms of consumption came up against structural resistance; particularly when it came to work-life balance and the general organisation of everyday life. There is little research into how the current systems allow or disallow circular economy actions at the local level. In this way, the critical-action research component of my study sought to elevate this discussion, and for these considerations to be included in existing and envisioned structures of circular production and consumption systems, as well as other structures central to everyday life organisation.

Another critical aspect taken from this research design is that the participatory role of the informants' enabled the construction of knowledge by *doing* (Dewey, 1938). The research design outlined here, and its timeframe ensured that I could be attentive to the complexities of everyday life. It enabled the research participants to participate by experimenting with visions and enactments themselves. This was important in understanding many of the struggles of implementing more sustainable and circular consumption into existing routines and habits. The multiple uses of methods through pre- and post-interviews, written participant reflections, and photos coupled with the initial cultural probe provided a wide variety of data that offered a different level of detail than I did with the semi-structured interviews from the first study. Combining these methods was necessary as the participants could decide how to learn and communicate their experiences testing out consumption strategies.

## 5.4 Combining the Two Studies

The qualitative studies in this thesis focus on how the informants and participants apply meaning to certain topics in their interaction with each other and with material sources. This focus enabled me to highlight the significance of the social realities underpinning a shift in consumer behaviour and practice, which is the focus of my second study, but also how those in the first study experience their reality when engaged with the circular economy concept. The methodological consequences of this approach highlight the significance of investigating the social realities in light of how people understand and interpret their realities (Thagaard, 2013). A central premise of symbolic interactionism is that we develop our relations to things based on our interpretations of social situations (Esterberg, 2002). Interviewing as a method is a key component in both studies that make up this thesis, and its strength as a method lies in capturing what circular visions and practices in the Norwegian context mean to the participants, and how they engage with the concept. Documentation was used as a supplemental source for the interviews, and as additional contextualising devices to help me better understand the role of the circular economy in political settings, in addition to the envisioned direction of the circular economy. The interviews conducted in the first and second studies differed because the first only had one round of interviews, but they were rich in information and often very specific, as I was asking about the informants' work with the concept. The interviews conducted in the second study had two rounds, which were necessary to capture any potential change in consumption.

Combining the first and second studies ensured that I could capture the circular economy at several levels. I have written and recorded sources describing the state of the circular economy in Norway and the region of Trøndelag. These approaches, especially the latter study, contribute to the understanding of an emerging phenomenon at its early implementation stages. Even though the circular economy enjoys media coverage and enthusiasm among many actors, little is known about how the Norwegian circular

economy transitions play out. This is what the research design allowed me to do – to study such attempts.

## **5.5 Methodological Constraints**

The goal of these methods is to understand how actors in a specific region interpret the circular economy and, more specifically for the second study, how households enact circular-economic activities in their environment. The thesis' context-specific studies' strength lies in that the research is anchored in the studied context, thus offering a level of depth that other studies cannot achieve (Flyvbjerg, 2012). Moreover, in a similar vein, they can foster a better understanding of the context and processes that actors go through, which in turn, offers a way to analyse the relationship between actors and their environments and societal organisation (Flyvbjerg, 2006). Furthermore, case studies like the ones conducted in this thesis are useful because they can elucidate the context of actors' knowledgeable and their reasons for action, to paraphrase Anthony Giddens (1984, p. 328). Hence, studies in rather small contexts with few informants can say something about the local conditions and the actors (Flyvbjerg, 2006).

The studies above aim to contribute to improving the understanding of the social dimensions within the circular economy. Regarding the studies' reliability and validity, given their qualitative nature, reproducibility and generalisation have to be qualified to apply. Under different conditions in other places, the studies would likely achieve different results because contextual factors are key to understanding how visions and enactments are constructed. These factors also influenced the second study, as it was a joint endeavour between the researcher and the seven households. A different group of households might yield different results, as the relationships and dynamics between the researcher and participants could be different, as well as the participants themselves. Seale (1999), for example, argues that such external reliability is difficult to achieve in qualitative studies. The handbook's design is highly context-specific, and the services and alternatives covered within it would differ in other places. However, in other contexts it would be easy to substitute items in the probe with other local offerings. As such, the

second study could be adapted to other Norwegian cities and even other countries: making it possible for others to conduct similar context-specific studies in the future if their local requirements and contexts are considered.

The first study would be less challenging to replicate, even though the another researcher would bring a different approach which could affect the dynamic between the participant and the researcher. Given the extensive engagement with a rather limited phenomenon – circular visions and enactments in Trondheim in the early 2020s – I am confident that the group of informants, while not being complete, still represents the most significant positions within the area under study. We used snow-balling which could lead to systematic biases, but there is no indication at all that we have systematically excluded important groups from our enquiry. Particularly because the circular economy was contextually new, we were not able to base our sampling on established scientific findings or other more systematic sources. Since our original data collection, the circular economy has gained more momentum within our target city and region, and a similar study conducted today would likely require the recruitment of additional stakeholders.

Despite the challenge of comparing data from two studies, each employing different methods, it is specifically the qualitative, contextual information of the studies that strengthen the position of this thesis. I am confident that the co-construction of knowledge, achieved through the researcher-participant dynamic, was beneficial to interpreting the data. For example, the second study used the pilot study as a departing point in which the methods of the main study were tested and made sure that they could be transferred into a different setting. Furthermore, the participants committed to a one-month experimental process with pre- and post-experimental interviews, which ensured a prolonged engagement in the experiment, ensuring confidence in the results' credibility. Flyvbjerg (2012) stresses learning as main contribution of often misunderstood case studies. Despite my closeness to the studied region, which was controlled by engagement with the literature reporting on other contexts, and Trondheim's and Trøndelag's idiosyncrasies, the gained knowledge should be general enough to at least be useful in other Norwegian and Scandinavian contexts, and hopefully also beyond. Depth of inquiry



and high contextualisation – both highly valued in qualitative research – do not have to mean that the knowledge produced only applies to the case studied. Many regions show traits of high circular ambitions, lagging implementation, and are characterised by high levels of private consumption. In these contexts, the knowledge generated here should be relevant.

In the next part of the thesis, Part Two, the articles comprise the empirical foundation, which will serve as the starting point for the cross-cutting analysis in Part Three.



## **Part Two – The Articles**



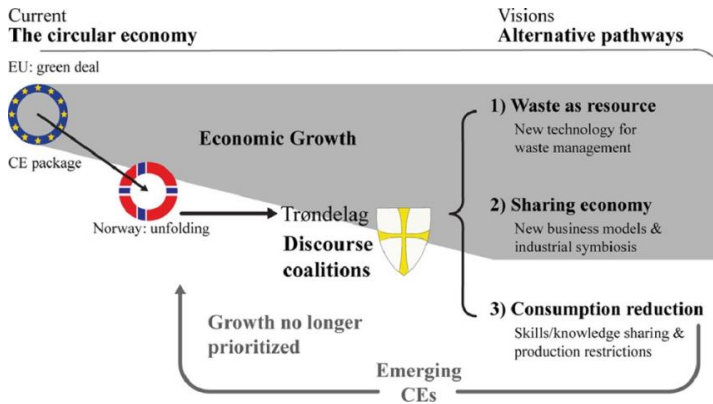
# Article One: Emerging Circular Economies: Discourse Coalitions in a Norwegian Case

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## Abstract

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. 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 kind 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.

## Graphical Abstract



### 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). 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 & Tennant, 2020; Genovese & 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., 2020; UNFCCC, 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 extent 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 & Pietrulla, 2018; Homrich et al., 2018; Korhonen et al., 2018; Kalmykova et al. 2018; Prieto-Sandoval &

Ormazaba, 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 & Tennant, 2020). These approaches to CE are circumscribed to a narrative that, in the terms used by Genovese & 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, it requires a different starting point.

The enactment and planning of CE are 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 & 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. (2019) 's 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 & 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 & 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 & 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 enhance knowledge and improve competence about new measures affecting citizens and policy areas (Schou & 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 & 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 & 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). Understanding 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<sup>1</sup> 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. Hence, why 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 & Phillips (2002, p.14) put it this way:

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<sup>1</sup> We could here also use the wording sociotechnical imaginaries of prospected futures, social orders in the terms of Jasanoff (2015).

*"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 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 & 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 & 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 (2021), who studied public discourses of waste management and CE in radio broadcasts in Russia. This author identified a poor representation of CE, which has 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 emerging from the comprehension of waste 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 & 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 & 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 semi-structured interviews conducted from April to November of 2019 in Norway (find interview guidelines and process for selection of informants in the supplementary material in the co-submitted MethodsX article).

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, 2018) 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.

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 European Union's vision and the dominant goal of economic growth (Figure 1).

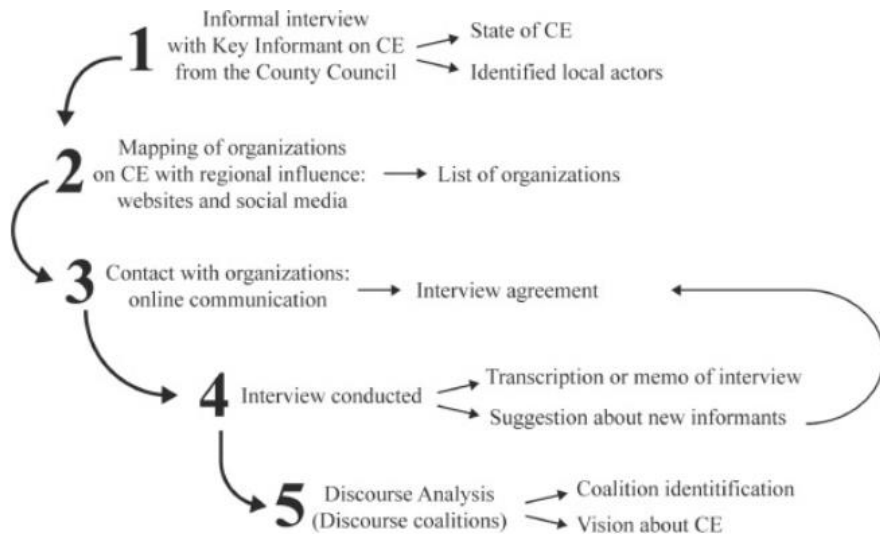


Figure 1. Steps followed for the data collection



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.

<b>Sector</b>	<b>n=</b>	<b>Subcategory</b>	<b>n=</b>
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

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

<b>Informant</b>	<b>Position</b>	<b>Sector</b>	<b>Source</b>
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-	Transcription of

		profit	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

**Table 2.** Sample of participant and sources for analysis.

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.

### *3.1 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.

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.

	<b>Coalition 1:</b> Waste as resource Techno - design - recycling	<b>Coalition 2:</b> Sharing economy Local production - Symbiosis	<b>Coalition 3:</b> Individual consumption reduction - Reduce – Reuse – Repair
<b>Discourse</b>	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).	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.	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.
<b>Metaphors (about CE)</b>	<ul style="list-style-type: none"> <li>- CE is about resource management.</li> <li>- CE's main problem is technical (recovery of materials).</li> <li>- CE is about the recovery of materials (second source materials in the market).</li> <li>- CE is measurable in tons of materials recycled/reused.</li> </ul>	<ul style="list-style-type: none"> <li>- CE is a buzzword (a frame for collaboration that is broad).</li> <li>- CE is an approach to solve environmental problems (emissions).</li> <li>- CE is a way of thinking that requires integration (Green shift).</li> <li>- CE is about industrial/sector integration (industrial symbiosis and scaling of solutions).</li> <li>- CE is the/a sharing economy.</li> </ul>	<ul style="list-style-type: none"> <li>- CE is sharing.</li> <li>- Consumption reduction is achievable through repairing and reuse of products.</li> <li>- The main barrier in consumption reduction is consumer behavior (culture and knowledge).</li> <li>- Local capacity for reusing and repairing products enables consumption reduction.</li> <li>- Overconsumption is the cause of environmental damage.</li> <li>- Value is more than profits.</li> </ul>

<b>Storylines</b>	<ul style="list-style-type: none"> <li>- Planetary limits.</li> <li>- CE is not new. It has been there for many years and now promoted under this concept (since 2015 with the EU CE package).</li> <li>- New targets from the EU for recycling are a motivation to hold on to the concept.</li> </ul>	<ul style="list-style-type: none"> <li>- Planetary limits.</li> <li>- EU CE policy package in combination with the need for local and national policy.</li> <li>- Introduction of CE, through EU projects, such as SMICE and work at the County level.</li> <li>- Climate change (CO<sub>2</sub> emissions reduction)</li> <li>- Need for indicators (assessment tools).</li> <li>- Public procurement.</li> </ul>	<ul style="list-style-type: none"> <li>- Planetary limits.</li> <li>- People/consumers have power but will do the same if there are no regulations on producers.</li> <li>- A local offer of services and Small and Medium Enterprises (SMEs)</li> <li>- Need for a political mandate on consumption.</li> </ul>
<b>Aligned informants by sector</b>	<b>Public:</b> 1 <b>Private:</b> 5 <b>Hybrid:</b> 2 <b>Non-profit:</b> 2 <b>Total:</b> 10	<b>Public :</b> 4 <b>Private:</b> 3 <b>Hybrid:</b> 0 <b>Non-profit:</b> 1 <b>Total:</b> 8	<b>Public:</b> 2 <b>Private:</b> 2 <b>Hybrid:</b> 1 <b>Non-profit:</b> 3 <b>Total:</b> 8
<b>Semi-aligned informants by sector</b>	<b>Public:</b> 2 <b>Private:</b> 0 <b>Hybrid:</b> 0 <b>Non-profit:</b> 0 <b>Total:</b> 2	<b>Public:</b> 1 <b>Private:</b> 3 <b>Hybrid:</b> 2 <b>Non-profit:</b> 1 <b>Total:</b> 7	<b>Public:</b> 4 <b>Private:</b> 2 <b>Hybrid:</b> 0 <b>Non-profit:</b> 2 <b>Total:</b> 8
<b>Enacted vision</b>	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).

**Table 3.** Summary of identified coalitions.

#### 4.1. Discourses

The following discursive patterns were identified. In the first pattern, a CE is enacted by focusing on material recovery and redesign 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 share 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.

#### *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<sub>2</sub> 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 set 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, in 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 currently. Nevertheless, motivations for acting are different according to the organization 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. As 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 has a priority on sharing economy and new businesses as 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 political mandate on recycling targets and markets for recycled materials, 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 industrial 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 cannot take on their own hands, 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' discourses relates to the repair and reuse of existing products. As with sharing, there is no political mandate about consumption reduction, as it 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 reduction 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 awareness about a need for regulations or restrictions to be imposed on manufacturers and commercial actors. We can assume that consumption approaches and debates will become relevant on CE discourses in Norway, for instance the Circularity Gap Report Norway by Circle Economy (2020) – a non-profit organization for the promotion of CE in Europe, reports that the Norwegian economy is only 2,4% circular and sets part of the blame on the high consumption patterns in the country.

At the Trøndelag County level, consumption concerns are enacted by prioritizing the sharing economy and putting it forward through the provision of support for small businesses, more specifically 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 for repairing skills and the provision of spaces for people to meet repair and reuse practices. Trondheim Municipality also promotes reuse by offering tool sharing services at local libraries and has established targets for product reuse at the local waste management company — 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 recycle from waste streams, as indicated by an informant from a local waste management enterprise: “... *we do have the goal of x kilograms per inhabitant, 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 individual 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), economic 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 economic 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 competitiveness, 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 takes place within nature's sustainability limits. Society must go through a green shift." (Trøndelag Fylkeskommune, 2019). Growth is latent in work towards a more sustainable future. At the municipal level, in Trondheim, 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 reducing climate gas emissions" (Trondheim Kommune, 2017). The plan also argues that "green workplaces within energy production and environmental 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**

Under the two dimensions put forth by Hajer (2005) and linking 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 Commission. 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 act 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 from 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.

### *5.1. Implications for a CE emerging from a different set of priorities*

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 under 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 & Henriksson (2020) and Nikitina (2021), 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 & Pansera, 2020). We reiterate that some of these aspects are already present in the discursive utterances of some of the informants, however, they are not articulated as they compete with the dominance of economic growth in support to 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.

	<b>Linear economy</b>	<b>Economic Growth CE</b>	<b>Consumption reduction CE</b>
<b>Material circulation</b>	- 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.
<b>Product life</b>	Short life, fast pace of replacement.	Long life, replacement when desired.	Long life, replacement of components when no longer functional.
<b>Production</b>	Continuous production.	Provides services for repair and recovery of materials.	Restricted and distributed.
<b>Responsibility over materials</b>	Transferred with ownership at retail point.	Manufacturer, in some cases maintaining ownership of materials.	Organized citizens or public authorities.
<b>Consumption</b>	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.
<b>Source of resources</b>	Mining from natural sources.	Material mining from waste streams.	Local available sources first and conservation.
<b>Value of resources</b>	Availability of raw materials.	Supply and demand.	Attributes given and personal attachments.
<b>Distribution</b>	Global value chains.	Local providers.	Local providers and self-production.
<b>Role of markets</b>	Central to all aspects of life	Central to all aspects of life.	A regulated space.
<b>Infrastructure for materials</b>	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.
<b>Consumer skills</b>	Capacity to pay for the acquisition of products.	Knowledge about care for product-services systems.	Assessment capacity for product repair and material quality. Knowledge about a



			local network of skilled people.
<b>Waste</b>	Externality of the economy.	Valuable resource that can be recovered and re-cycled many times.	Avoided by avoiding overconsumption.

**Table 4.** Comparative speculation of alternative emerging CEs

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 about 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 to 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 conformation 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. 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. Regarding 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 find that two coalitions prioritize economic growth as its central goal, while a

third one shifts the goal by including individual consumption, this supports our initial assumption. We see competition in the priorities emerging in relation to the goal of economic growth, which is not so evident if only the technical solutions were addressed.

We have looked at the dimensions of discourse presented by Hajer (2005), in structuration and institutionalization, and concluded that two discourse coalitions are dominant by default. The coalition centered around recycling and waste as resources prevails, as it is the only one with targets defined in policy. It does, however, not address questions related to individual consumption. It makes the coalition centered around the sharing economy and new business models a proper complement, that at the same time, functions as a bridge with the coalition centered with individual consumption.

Competition in CE discourses is found at the level of its political goals, resulting in alternative enactments. Ideas related to the reduction of individual consumption compete with those about economic growth, which could be the basis for the emergence of plausible alternative CEs. Furthermore, this competing aspect is evidence about the operation of economic growth as an ideology, in its two functions (Griffin, 2006): in maintaining or challenging 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 subjected 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.

A first limitation of this study is in relation 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 refrain and explore through research the

presence of other actors whose discourse and practices are ‘circular in nature’ but not yet recognized as such.

A second limitation is on 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 enacted based on the visions formulated. Particularly in CE, it is difficult to take a stance on competing aspects in practice, which we think we have covered to some extent by providing insight under the light of economic growth, but it could also be fruitful to realize a similar analysis connected to other aspects, for example, social justice.

Despite these limitations, 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.

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## **Article Two: Domesticating Circular Economy? An Enquiry into Norwegian Subnational Authorities' Process of Implementing Circularity**

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### **Abstract**

This article focuses on the introduction of the concept of circular economy into a Norwegian context by concentrating on two levels of subnational authorities against the backdrop of the national level. By drawing on recorded qualitative data collected in the region of Trøndelag and Oslo, we deploy the concept of domestication to analyse how the diffusion of CE as a political, future-oriented concept is appropriated, i.e., through symbolic, practical, and cognitive dimensions. Additionally, we consider the performativity of the future as a component in the adoption of the concept. Our findings suggest that the adoption of CE at these levels of governments in Norway is an ongoing process where the co-construction of the dimensions happen concurrently. Relating to the future, the national level takes a translative approach and goes after an increased interest and activity by private actors. At the first subnational level, in the case of the Trøndelag county, the public sector operates as a channel between knowledge of best practices and private actors who can mobilise action. Meanwhile, at the third subnational level, we find at the municipality of Trondheim, a public authority that proactively changes specific practices and regulates (or normalizes) the CE through their own means.

## 1. Introduction

Circular economy (CE) has become a key approach to deal with challenges of global warming, resource scarcity, and overconsumption. In Europe, the European Union's (EU) Commission is leading the development towards circularity through "Closing the Loop" (2015) and the "New Circular Economy Action Plan" (2020) which is a main pillar of The European Green Deal for sustainable growth (European Commission, 2019).

CE has since become a prominent development area within city-regional governance and scholarship on this topic has thus far been primarily concerned with commercial realisation and infrastructural change (Savini, 2019), but also with (re-)conceptualisations of CE (e.g. Kirchherr et al., 2017). Despite various conceptualisations, CE remains fragmented (Rizos et al., 2017) and acts as an 'umbrella' encapsulating variety of understandings (Marin & De Meulder, 2018). Few contributions focus on regional and local contexts of policy implementation, despite evidence suggesting that subnational authorities such as counties and municipalities are increasingly important spaces for implementation of EU regulatory policies (Borghetto & Franchino, 2010). In this paper, we set out to empirically study the diffusion of the Commission's CE policies in a Norwegian context by focusing on the subnational levels – Trøndelag county, and municipality of Trondheim – against the backdrop of the national level.

The first half of the last decade saw the Norwegian government embrace the idea of 'the green shift' to describe the road towards a low-carbon society by 2050, which the then governmental platform Sundvolden embraced (Office of the Prime Minister, 2013a, p. 60). Last decade's latter half witnessed a turn in focus towards resource scarcity and management of wastes (as resources) in both the European and Norwegian policy sphere (European Commission, 2015; 2019; Meld. St. 45, 2017). The action plan "Closing the Loop" (2015) quickly awoke interest among Norwegian business stakeholders, interest organisations, the waste management sector, and policy makers. As of 2019, the political discourse on the green shift in Norway persists, but CE is now part of the latest governmental platform of Granavolden, which aims at making Norway "a pioneer of a

green, circular economy which utilises resources better”<sup>1</sup> (Office of the Prime Minister, 2019, p. 86). Appurtenant to this is the ongoing development of a national strategy on CE which has no clear release date at the time of writing this article.

Until now, the national government has held hearings, meetings, and dialogues with stakeholders about challenges and opportunities that a CE transition brings. The government identifies particularly regulatory and legislative barriers as impairing a CE transition, thus echoing Pheifer’s (2017) point that these aspects hinder increased material circulation. However, it also seeks to improve technologies of recycling and the establishment of circular business models (Ministry of Trade, Industry and Fisheries, 2019), which De Jesus & Mendonça (2018) identify as ‘hard’ barriers. The broader waste industry aims at improving waste management technologies to reach a higher level of recycling as part of EU’s waste directive (European Parliament, 2008). This extends the Norwegian government’s tradition and wider effort of developing better systems for recycling and incineration.

In relation to the future CE has a double function, as a pathway to better resource use and as an end-goal – alternative to the current linear economy. Despite this, there is no clear indication to how a CE is to be performed as a pathway or an end-goal. Although CE is a contested concept (Skene, 2017), policy makers prescribe it as a requirement for future societies. While specific Norwegian CE policies on the national level are still emerging, subnational authorities are already implementing CE as part of their work in establishing targets and prioritizing current actions. The handling of waste in Norway – as elsewhere – is the responsibility of municipal actors, which together with high environmental ambitions codified in municipal and regional action plans, explains why CE was embraced quickly by subnational governments as central vision for the future.

From this, we outline the following research questions: *How is the concept circular economy introduced in Norwegian subnational contexts, and in what ways is it adopted?* We answer to this enquiry by drawing on *domestication* (Silverstone et al., 1992; Sørensen, 2006) to describe the dynamics of appropriation, construction of meaning, learning processes, and the enactment of CE adaptation. A future-oriented outlook complements this perspective as we analyse the performances of the subnational

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<sup>1</sup> Our translation from Norwegian.

authorities, as future expectations lead to alternative forms of governance. Bauwens et al. (2020) addressed CE governance in a study of CE scenarios by considering the roles played by public authorities and strong commercial actors in driving the CE vs. the voluntary involvement of the citizens and concluded that future CEs could be driven by either authoritarian or participatory forms of governance. Here we follow a more explorative approach analysing how subnational authorities make the vision of a circular future “their own” by adapting it to the specific context in which they act, but also by changing existing practices to become aligned with the vision.

This article aims at tracing the adoption of CE policies as a pillar of the specific Norwegian brand of sustainable transition called the “green shift”. We continue by presenting the theoretical framework and methods before we penultimately put forward the results and analysis before tying up the main findings and insights from the foregoing chapters in the conclusion.

## **2. Domestication and performativity**

Subnational authorities play increasingly important roles in EU policy and regulative implementation (Borghetto & Franchino, 2010). The EU depends on the diffusion of its policies and regulations into its member states, but the adaptations of those do not happen top-down and in a linear fashion but are locally adjusted (Alasuutari, 2009; 2015). Acharya (2015) writes that a precondition of diffusion is the establishment of congruence between the ‘foreign’ policy and local beliefs and practices. Thus, the idea of policy diffusion is according to Alasuutari (2015) insufficient as it does not fully capture what happens when the policy becomes taken up by a public authority. Local actors construct and contest the level of appropriateness of the policy, which implies a reinterpretation and transformation of the original policy (Alasuutari, 2015). The domestication framework provides tools to analyse this through how locality and cultural context play into the work with global policies (Alasuutari, 2009; Marsh & Sharman, 2009).

We take inspiration from two strands of domestication studies. First, through media studies where Silverstone et al. (1992) described the process in which technologies were ‘tamed’ into systems of routines and practices of humans in domestic spaces. The authors observed four stages of domestication: appropriation, objectification, incorporation, and conversion. Second, a synthesis of this original formulation of the

framework took shape within science and technology studies (STS) traditions, which extended the scope from media to technology and knowledge in a general sense. Sørensen (2006; see also Sørensen et al., 2000) distinguished three dimensions:

- 1) **Symbolic:** The construction of meaning of the artefact, including the role the artefact eventually could play in relation to the production of identities of the actors involved.
- 2) **Practice:** The construction of a set of practices related to an artefact. This could mean routines in using the artefact, but also the establishment and development of institutions to support and regulate this use.
- 3) **Cognitive:** Cognitive processes related to learning of practice as well as meaning. (Sørensen, 2006, p. 47).

A key aspect of domestication is that of mutuality, in which artefacts and users mutually adapt. Domestication, then, is a way to understand how artefacts and people co-produce use in a particular place (Sørensen, 2006; Sørensen et al., 2000). The specific location does not need to be the domestic spaces early domestication literature focused on (e.g., Lie & Sørensen, 1996), but can also be nation states and subnational authorities (Appadurai, 1996; Alasuutari, 2009). The framework has proven its usefulness in extensions from material artefacts to the knowledge and visions of a desirable future embedded for instance in policies (Alasuutari, 2009; Skjølsvold, 2014). In this paper, we focus on subnational domestication of CE with the national level as a backdrop. We enquire into the construction of meaning, practices, and learning enabling us in paying attention to the locality that conditions the acceptance or not of the domestication process of CE (Alasuutari, 2015).

Previous discussions of the implementation of CE policy have focused on prospects about resource efficiency in relation to product life cycles, considering product design, consumption, and end of life as the main components in a CE policy mix (Milios, 2018; Hartley et al., 2020). These three aspects are incorporated in the EU framework, based on technical solutions for waste prevention through recycling targets and product policy related to the eco-design directive (European Parliament, 2009) and the waste

directive (European Parliament, 2008). CE, as proposed by the EU, is a prospected socio-technical future that is de facto introduced in the governance attempted by the regional public sectors (Konrad & Böhle, 2019). Thus, if policies are the object of concern, this future orientation in the governance of CE should be addressed as part of the domestication process. The adoption of CE that results from the negotiation between currently held practices, symbolic, cognitive meanings, and future expectations is what drives an attempted form of governance. As noted by Konrad et al. (2017), anticipatory intervention to shape technoscience in a positive direction is achievable by examining present performances. The domestication of CE is also to be found in the proto governance<sup>2</sup> forms that are performed based on these future expectations.

The time dimension in domestication is explored by Skjølsvold (2014) in a study about a decade long implementation of advanced electricity meters in Norway. In this study, future is considered in its prospective capacity as seen from the past, with the intention of examining past performances in the governance. He draws inspiration from Brown & Michael's (2003) "sociology of expectation", by which a recollection of past futures (retrospecting prospects) was developed to identify the performances that influenced the emergence of smart grid electrical meters. The main contribution of Skjølsvold (2014) is the formulation of a typology of performative futures, which can be applied to studies of domestication. These are *translative performativity*, referring to efforts in which the interest in a certain future is transferred from one actor to another, and *transformative performativity*, which refers to efforts in which direct change is put into action, influencing the three dimensions of domestication.

Skjølsvold's (2014) typology of future performance is relevant for our study as it offers us a fourth dimension to analyse the domestication based on action (performances) taken by the public sector in the process of adopting CE. The proposed framework, then, allows us to focus on how an EU policy and concept of CE becomes part of subnational authorities' work by considering the locality, cultural context, and practices of these authorities targeting CE as path or goal for the future. In the following, our methodological considerations are presented before analysing CE in Norwegian contexts.

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<sup>2</sup> These refer to performances supporting the institutionalization of a desired prospected policy.



### **3. Methods**

From a science and technology studies (STS) perspective, science and technology and their interaction with people are social activities (Sismondo, 2010). The dominant methodological tradition within STS is qualitative research producing empirically grounded observations of socio-technical interactions. Empirically, this paper draws upon a purposive-sampled set of 27 semi-structured expert interviews, which we jointly conducted between April 2019 and February 2020. This data set represents a heterogenous group of stakeholders ranging from policy makers, industry, local businesses, waste management, and non-profit organisations involved in CE work. Of these 27, in this article we focus particularly on eight informants belonging to the national and subnational governments. The remaining 19 are important as they refer to the interactions with the eight as part of the adoption of CE in the Trøndelag region, processes that are analysed in depth in Ortega Alvarado et al. (2021).

The selection process started from an informal meeting with a special advisor on CE at the county municipality in Trøndelag. She talked about the state of CE in Trøndelag and provided names of stakeholders and people relevant to a CE transition in the region. Here, a snowball approach coupled with online searches of the mentioned stakeholders took shape to assess whether they had first-hand experience with the topic of CE in Trøndelag. Throughout the interviews further stakeholders were recommended which we later approached. This method continued until we reached thematic saturation as well as the same stakeholders kept repeating.

From this greater data set of 27 informants, this paper narrows the focus by enquiring into the subnational levels of governance with the national level as the backdrop, which ended in a total of eight people representing the national (n=1), county (n=3), and municipality (n=4) (table 1). We offered anonymisation to prevent that political or institutional concerns would prevent our informants to talk freely about their experiences with domesticating CE, which is why their names are changed here with initials indicating the level of government they are engaged in. We encountered difficulties in accessing additional national level representatives likely due to their ongoing work with the national CE strategy, but one key informant was willing to share insights into their work and national agenda. Based on our selection process which

involved interviews with altogether 27 informants, we have reason to believe that the eight informants posit important knowledge and key positions particularly in the subnational governance of CE. These were the individuals that regional actors from all sectors pointed us to when we asked about politics and policy. Thus, their utterances and descriptions of the domestication process carry weight. Table 2 showcases the documents that are relevant to the governance levels of our study.

<b>Informant(n ame)</b>	<b>Position</b>	<b>Affiliation (level)</b>	<b>Governance level</b>	<b>Method</b>
Nora	Political advisor	Ministry of Climate and Environment	National government	Skype interview (in Norwegian)
Claire	Senior advisor	Trøndelag county municipality	County municipality	Interview (in English)
Catherine	Advisor			Interview (in English)
Christian	Senior advisor			E-mail correspondenc e (in Norwegian)
Maya	Climate advisor	Trondheim municipality	Municipality	Interview (in Norwegian)
Martha	Climate advisor			Interview (in English)
Magnar	Municipal engineer (now retired)			Interview (in English)
Madeleine	Public librarian			Trondheim public library, Trondheim

		municipality		
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**Table 1:** Overview of informants.

<b>Document name</b>	<b>Document type</b>	<b>Government level</b>
Waste as resource – waste politics and circular economy (2016-2017)	White paper	National
Political platform Granavolden	Political platform statement	National
Strategy for innovation and value creation in Trøndelag (2017)	Plan	Regional, county
Action programme 2018-2019 to the innovation and value creation strategy	Action programme	Regional, county
Action programme 2020-2021 to the innovation and value creation strategy	Action programme	Regional, county
Waste management plan for Trondheim municipality 2018-2030	Plan	Local, municipality
Energy and climate plan for Trondheim municipality 2017-2030)	Plan	Local, municipality

**Table 2:** Overview of supplemental documents.

The data analysis for this article began with reading the eight interview transcripts and being mindful towards topics or patterns that are relevant for the article’s research question. From there, a second round commenced where we coded the transcripts using a deductive and concept driven approach in which the three dimensions of domestication

– practical, symbolic, and cognitive – served as the categories for our data-driven analysis. Here, we were attentive to their accounts of the things they did (practical dimension), how they constructed meaning (symbolic), and sections describing learning aspects related to CE work (cognitive). We grouped the categories (dimensions) of domestication and added relevant themes and related quotes as seen exemplified in Appendix 1. Appendix 2 shows our interview guide.

Ragin (1998, p. 105) distinguishes between ‘small-N’ and ‘large-N’ studies, where the former provides an opportunity for in-depth descriptions of one case and the latter produces broad generalizations. Based on this he proposes a framework that bridges ‘small-N’ and ‘large-N’ studies by comparing specific traits across a larger number of cases. Our study, which focuses on a specific region in Norway – Trøndelag and its largest city – belongs to the ‘small-N’ end of the spectrum described by Ragin and has in line with this the ambition to provide an in-depth analysis of the relevant actors’ domestication activities within this region and how they relate to the national level. In a next step, which is outside the scope of this article, our results could be used as one element in a more comprehensive comparative study including other regions in Norway or on the European level.

Another weakness related to our empirical work is inherent to snowballing as selection method. We cannot rule out that there are clusters of CE activities that are completely unrelated to the work of our informants. Since they are in key positions, this is unlikely, but our informants’ specific interpretations of the weakly bounded concept CE may have excluded relevant actors that do not necessarily consider themselves as driving a CE agenda per se but are working with elements of circularity. At the time of collecting this data, we are confident that we spoke to the relevant stakeholders within Trøndelag, but a future study could expand and identify additional representatives within each organisation, such as at the national level to get a firmer grasp of the processes taking place.

#### **4. Introduction of CE within subnational authorities in Trøndelag**

CE became a topic for Trøndelag county in three ways. Senior advisor Christian said that it “came as a part of the ‘public debate’ where climate issues and research and development cooperation introduced the term”, and the concept “[...] was first mentioned in 2015 in passing [...] in yearly budget documents and became explicit in 2016”. Senior advisor Claire who works with EU interregional projects saw that CE “emerged in the SMICE project” where one focus area was “efficient management of natural resources”. Another EU-project similarly addressed CE in a transnational collaboration between regions and stakeholders in Sweden and Norway. Participation in these projects was influential in the future pathway for the recent 2018 merger between the counties of “Sør-Trøndelag” and “Nord-Trøndelag” which became Trøndelag county. This administrative reform, informed by the national level, resulted in the “Innovation and Value Creation Plan” (2017) where CE is one of five pillars of regional development. This document’s appurtenant action programmes operationalise the county’s CE focus where it emphasises “increased regional value creation based on smart resource use” and “minimise waste from production and consumption” (Action Programme 2018-2019, 2018; Action Programme 2020-2021, 2019, p. 4). Claire described the introduction of CE as such: “There was this process of developing new plans and new strategic directions, and then the advisors who are involved with the international projects lifted the circular economy as one of the main areas of operationalisation of sustainability”. Thirdly, county advisor Catherine narrates that the appropriation of CE is rooted in international organisations’ work such as within the EU, the Intergovernmental Panel on Climate Change (IPCC), and the International Panel on Biodiversity in the Ecosystems (IPBES).

As for Trondheim municipality and the county’s largest city, climate advisor Maya and Martha state that the EU Commission’s CE policy package and the national government’s white paper “Waste as resource” (2017) were influential to their work. Additionally, the county’s “Innovation and Value Creation Plan” influenced them. CE appears in the “Energy and Climate Plan 2017-2030” and the “Waste Management Plan 2018-2030” in relation to consumption and recycling. Hitherto, we see that CE introduction is influenced by both national and EU work.

## **5. Analysis: Domestication of CE in three levels of authorities in Norway**

In this section, we structure the discussion of our results according to the three levels of government and their domestication process of CE. Secondly, we also discuss each level of government's future performance of CE. Even though we focus on the regional levels of Trøndelag county and Trondheim municipality it is clear how national CE domestication is an important factor in regional adaptations of the concept. Therefore, we have included an analysis of documents and an interview with an informant involved in the national work.

### ***5.1 The national government***

#### *5.1.1 Symbolic domestication*

At the time of writing this article, the Norwegian government is developing a national strategy on CE. The governmental representative Nora expressed that the “main motivation is related to that we know that we today have a global economy which is not within Earth's carrying capacity”. However, she also said that CE is close to people “because it is very much about consumer patterns”. Consumers, here, are afforded an important role. Consumption in Norway is characterised by high private consumption, ownership, comfort, and leisure. As such, she noted that “the consumer culture is very much embedded in many of us, really, but there is a counter trend now and things can happen quite quick when trends first manifest”. According to the informant, CE is introduced to this culture, the business sector, industry, and to policy makers to alter an exploitative economy to a responsible one. Thus, Nora reflects on CE's meanings in very general terms, mentioning Earth's carrying capacity and current consumer culture.

#### *5.1.2 Practical domestication*

The unfinished national CE strategy is led and conducted by a group of state secretaries from eight ministries, where the Ministry of Climate and Environment are organisers.

Dialogues through hearings and meetings with the business sector and industries shape their work in order to identify barriers and opportunities for a CE transition. They have visited and established contact with small-scale businesses and grass-root movements. Despite these small-scale activities of sharing and reuse of products and resources, it is important for the government to see if CE can be upscaled or if it functions better at smaller scale dimensions. As part of the governmental work, Nora says that it is “interesting to just gather and find out which parts of our economy now we will feature as part of the circular economy, and which are not”. This quote sums up most of the CE work that is done by the state secretary group.

Nora reports further no dialogue with subnational authorities on CE work, which is reasoned as such: “I believe the main reason to why we haven’t done that is because there might not be something they haven’t properly started working with systematically, despite that they work with elements of CE”. This indicates little collaboration between national and the subnational authority of Trøndelag.

### *5.1.3 Cognitive domestication*

Relating to the national government’s learning process, Nora stated that “[i]t is of course the IPCC that is our best source of information”. The government used IPCC’s reports as they painted a picture of the state of the world, but the political advisor says, “it can be thought that we need new knowledge about the Norwegian condition”, indicating a more local-oriented CE transition. For the informant, however, this did not mean commissioning national studies that would correspond to the work of the IPCC, but gathering information and experiences among stakeholders, which included large industries, but also the small businesses and grassroots organizations in the previous section.

### *5.1.4 Futures*

Taking on Skjølsvold’s (2014) typology of performative futures and considering that a formal policy is still missing in the governance of CE, in addition to the data from the national representative. We categorize the national efforts related to CE as a translative

performance. This way, the interest in enacting CE is transferred from the public sector to private actors, but also *vice versa* as many representatives of the business and waste management sector also advocate for a CE transition (Haugsvær, 2018).

The translative performativity at the national level is also present in the proto governance of CE, in which the normative definition of a future in policies is first made the responsibility of actors outside the public sector. We see this in the lack of integration with the subnational levels (counties and municipalities). The national government takes a role of translator of the visions of CE from the private sector to the public sector. The expectations coming from the EU vision are negotiated back and forth with the private sector before becoming policies.

## **5.2 Trøndelag county**

### *5.2.1 Symbolic domestication*

For Claire, CE was a central part of the region's development plans where it acted as a "rallying point" for sustainable change. Advisor Catherine agreed: "It's a buzzword, a very important buzzword both for the administration and for the politicians" which is sometimes "difficult to fill with meaning". Thus, different from the informant from the national level, who reflected in general terms about consumer culture, county representatives focused on the use of the concept as a mobilizing force, facilitated by its vague nature. In addition to this, Claire associated CE with meanings that relate to its systemic nature and that distinguish between degrees of actual capacity of the concept to reduce consumption:

"It is very easy to push the electrification agenda as a way of reducing emissions, but it is an excuse for keeping consumption on the same levels, so circular economy can also be done wrong very quickly in that you keep the loops too big, when they actually should be reducing, or they should be more localised"



As Nora reflects, it is important to identify if CE loops work at small or large scales, where smaller scales would be preferable. A similar point is made by advisor Catherine who discusses CE more in relation to keeping resources within the region:

“For us as a county, it's just as important to bring the circular economy idea into our industries, that there are so many resources at the moment being shipped out from the region. We have to close the loop and we have very good possibilities for that, because we have a big corn production, a big vegetable production, a big house or husbandry productions. And the links between the blue and the green sector are there. But it can definitely be exploited to a much bigger extent”

A future where materials and resources are locally managed and contained is desirable in Catherine's view. Doing this entails collaborating with the different sectors to find solutions.

In the context of a county, regional resource loops are preferable not only because of their sustainability potential but also given the county administration's task to support regional businesses. The meaning of CE, thus, as regional 'rallying point' is aligned with the interest in strengthening both Trøndelag county, but potentially all other counties – that can establish their own regional loops – as well.

### *5.2.2 Practical domestication*

As described above, the county's practices related to CE took form through involvement in interregional EU-projects. Since then, the focus has been on establishing collaboration with regional industries, businesses, the R&D sector, while also continuing work with international projects. As with the national government, much of the work entails finding CE barriers and opportunities. The main strategy used here is to look for 'best practice' that can be implemented to Trøndelag:

“I think our way of working has been to find specific examples of what happens in other places, so best practice. And see what the low-hanging fruit, or what do we see that we can do in Trøndelag. Mostly to have achievable results so people get motivated and see that this is relevant for us and doable” (Claire)

Through the lens of Alasuutari (2009; 2015), this is an example of how CE is interpreted and adjusted to the local way of working and thinking. Capacity and knowledge jointly have effects of what is possible to do and accomplish. “A lot of the implementation happens more by this road of less resistance. You do what you are able to do” and “[t]here might be something that you should be doing, but it is not possible for various reasons”, Claire says. It is important for the county to be “out there” and not sit inside and write policies.

Regarding CE implementation in the region, Claire distinguishes between plans that aim at the whole region and their realisation which necessarily happens distributed unevenly:

“it is definitely not implemented in the entire region. I think implementation happens in pockets and in very small groups. With all due respect to my colleagues and to plans, it is not like a plan is implemented in its entirety, it is a piece of paper until someone decides that they want to do something with it”

A key point here is that documents function as guiding tools for work in the region. For the county, it has meant working towards businesses and industries to find out what is

possible, i.e., which practice could be presented as best practice and be implemented throughout the county. In this sense, it is interesting that there is no closer communication between the national government and the county despite Claire's efforts: "We have tried. We have contacted [the national bodies working with CE policies], but we haven't received an invitation to engage".

### *5.2.3 Cognitive domestication*

Climate advisor Catherine, like Nora at the national level, referred to the global knowledge base provided by IPCC and IPBS. A distinct element of learning by doing, however, was introduced by Claire, who in addition stressed the importance of contributing to a scientific knowledge base:

"our approach now is twofold, so we work both on best practice stakeholders, translate to the regional context, implement which is kind of work "do-as-you-go", and then we work on the other track which is more the scientific way of first trying to develop a knowledge base and that is what we are doing with the research communities"

The research communities she mentions here refer to the presence of a large R&D community in Trøndelag, which among others hosts the main campuses of Norway's largest university. The county participated as public actor in many research projects and centres, where it typically contributed through providing test and pilot cases. In this way, the county was able to build a knowledge base that helped concretise their work, which the county's "Innovation and Value Creation Plan" emphasises.

In terms of cognitive appropriation of the CE concept, the county informants have added two new elements: First the idea of learning by doing in collaboration with local actors, which was informed by and aimed at creating best practice examples. Second, a more scientific approach followed in collaboration with local research communities.

### *5.2.4 Futures*

The expectations for the future at Trøndelag county are not only taken from the EU Commission's vision, but also the projects in which the county's senior advisor Claire

has been involved in. In a certain way, these projects were devices for the transference of interest to the county. However, this is not the only transference performed. A subsequent one is performed when the advisors take the experiences learned from projects and transfer them to local private actors, as best practices or learned lessons from abroad, with the same aim of mobilising interest.

The translative performativity of CE that is enacted within the county shares similarity in approach with what was expressed by the representative at the national level but differs in that it intends to create a local vision of CE based on imitating or adopting practices that are considered successful elsewhere. This translative performance of CE is at the same time a device to create local future expectancies. It means there is an emergent local vision of CE, and it has been adopted through the interaction and practices mobilised by the county advisors.

### ***5.3 Trondheim municipality***

#### *5.3.1 Symbolic domestication*

The municipal interpretations of CE share the view with of the national government and the county that the openness of the concept provides opportunities. However, the description of what these opportunities were differed. Because the climate work in the municipality centres strongly on CO<sub>2</sub> emissions, climate advisor Maya focused on CEs broader focus on resource use: “CE is more than reduction in emissions. It is about resources beyond climate gas emissions”. She pointed out that the municipality “wishes to make it completely natural for people to share instead of owning it themselves”. In line with this, climate advisor Martha saw the motivation for working on sustainability issues in resource scarcity:

“My personal motivation for working on the climate and environmental issue, I think the biggest driving, at the core of this, I mean CO<sub>2</sub> emissions is of course a big problem, but the biggest problem is that we don't have enough resources to consume, [...] if we continue to do things like that and consume and live, the way we live, we will need four planets [...] For me, the circular economy is really a mechanism for the effective use of resources”

Former municipal engineer Christian proposed a different interpretation of CE, who stated that “I don't think it is quite new, I think we have worked with circular economy for a lot of years, but we haven't called it circular economy”. In fact, for the municipal waste sector, which shifted its focus towards avoiding waste and recycling long before CE discourses entered Norway, much of CE was business as usual.

Both interpretations understand CE as an opportunity to focus on resources beyond a narrow focus on CO<sub>2</sub> emissions, and CE as a continuation of previous work came together in a conviction that CE would mean for the municipality to provide good infrastructures, explicated by Martha:

“I think we have to put more energy on that (creating infrastructure and services) than telling people that they have to change their behavior. I think both are important, but we as an authority, we have the higher possibility to drive the service design. Making it probably as good as today or better but using less resources”

Instead of traditional nudging and behaviour change campaigns which the European Commission is proposing, she believes that the municipality should do more infrastructural work and providing services.

### *5.3.2 Practical domestication*

Climate advisor Maya said that they had a plan to “facilitate for making it easy to make environmentally friendly choices [...] so here we are kind of “guiding” in collaboration with voluntary and other stakeholders”. Even though there was no official decision to reduce consumption in the municipality, the municipality had provided subsidy schemes for small-scale businesses aiming at establishing their circular businesses in the city. In some cases, the municipality actively supported businesses of reuse and redesign of clothes and furniture: “We support [name of business] because we see that they contribute towards buying used instead of new”, Maya said. In other cases, stakeholders, and voluntary groups such as Future in our hands (FIOH), ‘Friends of the Earth Norway’ (‘Naturvernforbundet’), and student organisations approached the municipality asking for funds to create reuse markets and clothes swapping. Collaboration with these stakeholders

resulted in concrete and permanent practices that supports consumption reduction, which is exemplified by the municipal public library that now rents out tools. Public librarian Madeleine described this:

“they (FIOH) got some money from [the municipality] to start a project. After that, I think it has mainly been the library’s project. We don’t work together with them now. It was only in the beginning. [...] We are always positive when somebody has an idea. We thought it was a good idea and we thought that it was good for the environment”

This example shows the porous boundaries of seamless collaboration between public, private, and voluntary work as they share the common goal to reduce consumption. Additionally, the municipality was looking into more circular public procurement, which entailed that it “mandated the department leaders to look for used inventory before new” when seeking to replace furniture or other goods, according to Maya.

Like the case of the county level, municipal interviewees combined CE with municipal tasks, such as the work to attract innovative businesses. Moreover, the adaptation of CE is characterised by local networks moving between the boundaries of public, private, and civil society sectors. It is reasonable to assume that the local nature of the municipality’s perspective has contributed to this form of adaptation.

### *5.3.3 Cognitive domestication*

Maya called participation in CE projects “learning arenas” with the tool-library project as example. Martha builds on this description of learning by doing, which closely resembles the perspective encountered in the county:

“There is a lot of learning by doing, and of course you have to follow-up [...] What’s going on, the news of course, it is a good channel to get updated, as also when we are revising the plan we have to go over the list of national strategies and regional plans and what’s going on in the local context, and another thing which is quite important, we have a lot of events going on in the city [...] You have to be alert of your surroundings when you are working with these kinds of issues. Yeah, so I think that is the main source, meetings, networking and also follow-up on what’s happening”

Here, Martha highlights the tension between ‘the list of national strategies’ and ‘what’s going on in the local context’. Considering the local conditions in relation to global policies are important for those constructing and implementing policies in the municipality (Alasuutari, 2009; 2015). Being alert to their surroundings and to follow national developments allowed the municipal informants to identify local opportunities.

#### *5.3.4 Futures*

Municipal expectations for the future were driven by the visions exposed by the EU Commission’s CE package. However, their proximity with Trøndelag’s county also provides another source of knowledge, gained through projects in the experiences by the county council, which in turn influences their performance. Here, the municipality also has a wider range of action, as they manage the waste from households and offer services directly to its citizens.

The performativity at the municipal level leans more towards transformative efforts, and they are exemplified in three practices: green procurement, the service for borrowing tools at the local library, and through the recovery and reuse store ‘BrukOm’ administered by the local waste management company. It does not mean that the municipality can regulate CE as part of all their activities, but that they are transforming specific practices, its symbolic and cognitive meanings even before there is a normative policy indicating how to put forward a CE. This performativity is also coupled with translative efforts by offering workshops to teach about reparation of goods and by offering support to green businesses in the repair and reuse sector.

This level of governance is the only one in which the adoption of CE is being taken directly by the public sector, although with certain restrictions imposed by current regulations. From our analysis, it is possible to say that a more proactive and transformative performance by the public sector is hindered by a lack of a political mandate indicating how the public sector can navigate its offer within a future CE.

## 6. Discussion

We established a framework inspired by studies of domestication complemented with a perspective of translative performativity and transformative performativity to engage with the future aspect of the domestication process of CE. On both regional (county) and local (municipality) level, CE was introduced through EU projects and transnational collaboration.

Our domestication analysis shows that CE is an open concept allowing the subnational levels to introduce their specific concerns. The symbolic, practical, and cognitive dimensions of domestication dynamically interlink in the way that the informants interact with private and public sector. Also, the businesses, industry, waste management, and R&D of the broader sample (see [reference deleted for peer review]) pointed to learning as a currently required element in order to implement CE policies in Norway. The domestication process of CE was characterised by a multitude of different scale stakeholders going through their own respective domestication processes of CE, which intertwines with existing practices. For the actors formulating and implementing CE policies on the subnational level, four main findings are observed.

Firstly, the national government's work appears to be weakly connected to subnational authorities. National representative Nora assumed that the county had not systematically begun working with CE, which is contrary to the observations at the county level. Our county informants even expressed the desire to enter a dialogue with the national government. Tighter collaboration between subnational authorities and the national government seems in our analysis to be potentially favourable as both are part of a larger process of domestication of the exogenous policy of CE.

Our second finding is that the level of government had direct bearing on the interpretation of the preferred scale of CEs resource loops. County advisor Catherine argued for regional loops, while the municipal perspective was confined to local waste recycling and local services provided by small businesses and public institutions. CEs openness allowed for a seamless adaption to the preferred scale of policy making. Again, however, tighter collaboration may be advisable, as one may ask whether links between local, regional, and national resource loops are neglected when each level works within their territory. We found examples of exchange between county and municipality, but the



lack of connection to the national level, which was experienced by the informants as exogenous, is problematic in this respect.

Thirdly, at the county and municipal level, we found competent accounts of learning by doing. The informants described a link between learning in collaboration with researchers and with those involved in the practical implementation of projects. The missing element, however, seemed to be a common repository in which experiences and knowledge was collected and made available. Actors involved in practical initiatives, but also researchers and not the least policy makers on the national level would have profited greatly from this knowledge base.

A fourth finding focuses on the future performativity by the actions taken at each government level in support of a CE. The national level took a translative approach and went after an increased interest and activity by private actors. Trøndelag county operated as a channel between knowledge of best practices and private actors who could mobilise action. Meanwhile, at the municipal level, we found a public authority taking a more proactive role, by changing specific practices and regulating (or normalizing) the CE through their own infrastructures and services. By looking at these three performances, we suggest that the policies coming from the national level should consider some flexibility so that subnational authorities have room to perform in a transformative way according to local concerns.

## **7. Conclusion**

The national and county authorities promoted a decentralised CE by focusing on the mobilisation of private actors while at the municipal level the adoption of CE was assumed to be a task that must be integrated in their institutional work and plans. Yet, we found that CE was adopted and performed as a promissory concept that was merged with existing meanings, practices and knowledge. It is performed to comply with the EU, while its focus and significance for the future is still pending. This represents an opportunity for local authorities to push forward on their agendas about local production and consumption as the specifics of what the policies for circularity will include is still a missing aspect.

A question that remains open is if CE is to be considered a pathway for structural changes or the end-goal. The four findings discussed in the previous section demonstrate that the domestication of CE at the subnational governance level without a strict intervention from the national level allows for the adoption of the concept as a pathway for structural changes, which are motivated by expectations for a more sustainable future based on local concerns. Particularly at the municipal level, we have demonstrated that CE was performed in a transformative way. At the same time, the range of action that the local authorities have is restricted to their municipality.

We have shown that regional activities in fact are important in shaping CE policies according to their own priorities. It is reasonable to expect that this finding also applies to other regions in Europe. How this space for action is created and how it affects the outcomes of CE policies may very well differ in relation to the intervention by national authorities and the legal context of national policies. However, supported by our theoretical frameworks – domestication and performativity of future orientations – we claim that also our more specific findings discussed in the previous section, will be able to shed light on how other regional and local settings appropriate CE. We found disconnects between national and subnational levels, as well as between different subnational entities that each employed learning by doing confined to their areas of responsibility and conceived the extent of relevant resource loops according to their geographical reach. These observations, and the finding that more radical transformative future orientations were held by actors that inhabit more local positions, address fundamentals of subnational governance, and should therefore not only help to understand and improve CE adoption in Trondheim, Trøndelag and Norway, but also elsewhere.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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## **Article Three: A Norwegian Circular Economy? Protestant Visions of an Alternative to Mass Consumerism**

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### **Summary**

Like many other successful terms, ‘circular economy’ is weakly defined and open to different interpretations. This openness, which enables adoption by a broad coalition of actors, has been dealt with in the academic literature by repeated efforts to define and categorise. Instead of adding yet another definition, in this chapter we describe the particular vision of a ‘circular economy’ which is performed in the context of the Norwegian region of Trøndelag. Drawing on two cases which are interpreted with the help of the concepts sociotechnical imaginary (Jasanoff and Kim 2009; 2015) and sociotechnical vanguard (Hilgartner 2015), we present a specific vision of a feasible and desirable alternative future which is deeply rooted in protestant ethics of individual responsibility and the absolute reduction of consumption. Because of these historical and cultural roots, we argue that despite opposing trends, this vision has good chances to become the dominant vision of a sustainable future in the Norwegian context.

## 1. Introduction

In hindsight, the visions, hopes and convictions of those driving processes of industrialisation in the 18<sup>th</sup> Century appear as destined to succeed and unavoidable. It is not easy to imagine a world in which industrial forms of production were a radical alternative and in which their protagonists were weird exceptions dreaming of very different futures than most people. Max Weber's "Protestant ethics and the spirit of capitalism" (2005 [1905]) describes these early industrialists as outsiders that clung to a new set of beliefs, which both motivated them and justified the consequences of their actions. In this chapter, following Weber's example, we trace alternative beliefs and dreams of a better future among Norwegian proponents of a circular economy. To be able to do so, we are less interested in circularity as incremental adaptations leading to more efficient and sustainable industrial production, but will focus on those descriptions that potentially are vanguard visions of an everyday life that transcends industrial production and consumption.

Many elements of these visions of a circular world are imported from the outside and will be familiar to readers that have followed the career of circular economy ideas during the previous decade. But, as we will argue, the socio-technical imaginaries present in Norwegian programmatic manifests and initiatives, are also exemplars of at least one specific aspect which we will call its reference to Northern European Protestantism.

In the next section, we will describe our approach, in which we combine the inspiration of Weber's classic text with the influential concept of sociotechnical imaginaries developed by Jasanoff and Kim (2009; 2015) and sociotechnical vanguard by Hilgartner (2015). We then move on to describe the background and context of our cases – circular initiatives connected to the influential Norwegian environmental non-governmental organisation (ENGO) "Future in our hands" (FIOH). The presentation and discussion of our cases concludes this chapter.



## **2. From ethics to visions and imaginaries**

Weber's treatise on "The protestant ethic and the spirit of capitalism" is commonly read as alternative to Marxist interpretations of the birth of capitalism and the industrial revolution. In this opposition, Marx is of course the materialist, and Weber the idealist thinker, which would render their positions as diametrical opposites. Weber seems to have foreseen this reading and ends on a cautious note calling for more research on how protestant ethics not only has made possible and formed early capitalism but also how it has been formed by "the totality of social conditions, especially economic" (Weber 2005 [1905], p. 125). Thus, Weber wants his treatise to be read as a study of how collectively held visions of a good life participate in the creation of new 'social conditions, especially economic' not as exclusive to their cause. Weber analyses Calvinist, Methodist, Pietist, and Baptist religious doctrines that according to him only differ in the degree of their "iron consistency" (ibid., p. 87) but not in their basic compatibility with principles of capitalist entrepreneurialism. Weber shows that these religious writings break with previously dominant Catholic and Lutheran ethics in ways that are more consistent with capitalist economic activity than with other forms of production and exchange.

Such affinities between collectively imagined forms of social order and large-scale societal projects have more recently been analysed using the framework of sociotechnical imaginaries developed by Jasanoff and Kim (2009; 2015). Sociotechnical imaginaries are "collectively imagined forms of social life and social order reflected in the design and fulfilment of nation-specific scientific and/or technological projects" (Jasanoff and Kim 2009, p. 120). These imaginaries can be rooted in a collective's past, but they are more than the stories an imagined community tells itself since they are directed towards an attainable and desirable future. Within this framework, the ethics that Weber found formulated and practiced by early capitalists corresponds to what Hilgartner (2015) has called vanguard visions: "the visions of single individuals or small collectives, gaining traction through blatant exercises of power or sustained acts of coalition building" (Jasanoff 2015, p. 4). In this sense, calling a collectively held vision of a plausible and desirable future a vanguard vision, will always be a label that is applied retrospectively. Only few visions will succeed to become a widely shared socio-technical imaginary.

It is plausible that in today's secularized West, neither vanguard visions nor sociotechnical imaginaries are any longer formulated in religious writings – even though they may have religious overtones. However, the common element between Weber's protestant religious beliefs and today's vanguard visions and sociotechnical imaginaries is that they contain strong ethical programs in the form of visions and prescriptions about how one should lead a good life now and in the future. In this way, vanguard visions motivate and justify change as much as the religious believers of the past.

### **3. Circular economy: an emerging sociotechnical imaginary?**

Recently, several observers have elevated circular economy in Finland and Flanders to the status of a sociotechnical imaginary (Fratini et al., 2019; Bocken et al. 2019). Indeed, circular economy is currently one of the most promising contenders to linear, industrial ways of organizing production, distribution, and consumption of goods and services. In Norway, as elsewhere, circular economy is promoted by groups that otherwise have very different visions of a better future. It is seen as a way to increase Norway's competitive advantage by parties that promote market liberal policies, it is proposed by environmental groups as the ultimate means to get to terms with climate change, and it is part of a vision of a better, simpler and more fulfilling life beyond the pleasures of consumerism.

Despite this support from a diverse set of actors and despite circular economy's recent rise to prominence in environmental policies all over the world, there is good reason to believe that the dominant sociotechnical imaginary of how to deal with climate change and other environmental challenges is the continued belief in unchanged high levels of consumption enabled by 'green growth' and technological innovation. For example, both in Norwegian and European research funding, while circular economy has entered the scene, there is still a dominant emphasis on innovation and technological development aiming at product substitution (Vittersø and Strandbakken 2016, p. 13) in which unsustainable technologies are replaced with more sustainable options.

Framed in the theoretical terms laid out in the previous section, the existence of a tension between increasing coalition building around circular alternatives and the persistent dominance of a sociotechnical imaginary that is defended by incumbent actors (Geels 2014), means that circular visions are potential vanguard visions. They are not yet (part of) a sociotechnical imaginary, but they may very well become (part of) one, which

would in hindsight justify calling them vanguard visions in Hilgartner's and Jasanoff's sense.

In what follows we discuss circular economy initiatives in the Norwegian context as vanguard vision 'to be', i.e. we ask how these initiatives and their visions could become part of a national sociotechnical imaginary that transcends linear industrial visions of continued growth.

#### **4. Background: Norway and Future in our hand's early consumption critique**

Norway's economic history follows in many ways the European example. It took part in the industrialisation processes of the last 200 years that made economic growth possible (Munthe 2014). Trade agreements and cooperation with other countries saw Norwegian society and businesses enriched by new impulses that spurred advanced economic activity. This activity, among others, resulted in a steady growth in domestic product, which enabled high investments in production equipment, education, technical, and organisational improvements in public and private sectors. Additionally, the emergence of the consumer society, which took place in the decades after the Second World War, saw the mass consumption of standardised products and services rise (Myrvang 2009). Houses got bigger, people spent less money on food, filled instead their houses with furniture, electrical appliances, clothes, and other miscellaneous products that were produced and sold. The so-called 'oil fairy tale' ('oljeeventyr') since the beginning of the 1970's is seen as a pivotal piece in how today's, Norwegian society has come to be. Where other countries saw temporal declines in economic growth, in Norway the consumer society steamed onwards, and private consumption grew threefold over the coming 50 years (Myrvang, 2009). Myrvang points out that during the 20th century, each Norwegian has become eight times richer on average. The consumer society, then, points to central characteristics of Norwegian society. Due to its oil and natural gas fuelled uninterrupted growth and low degrees of social inequality, Norway has acquired a wealthy and broad middle class which has extraordinary consumption power.

However, even though Norway can be seen as exemplary for a mass consumption society which is undisturbed by economic disruptions, in this little country in the far north, earlier than in other countries mass consumption has also been diagnosed as something profoundly wrong, in a cultural critique of the material consumption's position

and status in society. An influential proponent of this consumer critique was the Norwegian Erik Dammann, a former marketing consultant, who in 1972 published the book “Future in our hands” . It began with the thought that:

“we must consider the world as a united source of raw materials for our subsistence, and humanity as one family where everyone is born with the equal right to what Earth provides, independent of where one happens to be born.” (Dammann 1972, p. 15, our translation)

Considering this, he continues, we find a vastly different and unfair situation. Europe and North America with its third of the world population have usurped almost all power and influence over Earth’s inhabitants. The continents with the richest deposits of natural resources are those that have least access to them. Dammann rhetorically and sarcastically questions this logic and imbalance and asks if a new allocation of these resources wouldn’t be a natural solution, and a reduction in consumption to redress scarcity among the poor? Dammann (1972) writes that a more human approach is needed in which we critically ask ourselves if experts can find solutions. What happens when experts decide? Are other human needs outside of money addressed when economists design models of society? Do engineers consider the future homes of people when suburbs are built? And what happens when people loose trust in themselves to know what is best for them? It provides these experts with an open playing field. Dammann, then, concludes that it is the experts that need to be guided by the people.

Dammann’s (1972) starting point is to hold back, to not blindly follow current development in Norway and other countries. Second, he proposes that citizens should see their work, conduct of life, and acquisitions in a greater picture. For him, it is important not to lose sight of what others think either, e.g., wanting a bigger car and more comfort, but become aware and attentive to the pressure such development involves. “To become human instead of a consumer” (Dammann 1972, p. 169), he claims, means finding the ‘real’ joys of life, and his normative messages point to what everyone can do as an individual, to rely on what one believes is right, and show to others that the future, indeed, is ‘in our own hands’.

Encouraged by the enthusiastic reception of his book, in 1974, amidst booming consumerism and in a time in which Norway’s ‘oil fairy-tale’ just had begun, Dammann held the speech “the merry madness” (Dammann 1974) in a tightly packed sports hall

west of Oslo, Norway. This ‘madness’ pointed to the aforementioned unfair distribution of raw materials between the global North and South that high-industrialised countries and their market-oriented systems managed. His public talk to some 3000 attendees, would become the people’s movement known as Future in Our Hands (FIOH). FIOH, then, was established in protest towards this unjust course, against hunger, and other crises in the global South, but simultaneously addressed the problems in the global North. FIOH argued that overconsumption, too, brought about social and psychological issues by working long hours to elevate income, but moreover that people were engrossed in material values. Such a global humanism, solidarity, and a holistic critique of consumption and distribution distinguished FIOH from other development aid organisations (Hansen 2007) and – at least in the early 1970s – distinguishes this Norwegian social movement from others in other countries.

Since the 1970s, FIOH has grown to 38.000 members, which is even more impressive if one considers that Norway has only five million inhabitants. It has become an important voice and source of information and pressure pertaining to misleading and deceptive advertisement, openness in industry, and ethical guidelines for the Norwegian Government Pension Fund. FIOH has of late become an important proponent for a circular economy and released in 2019 a report which shows a heavy investment and belief in this economic paradigm. In line with FIOH’s historical roots, the report emphasises individual attitude changes to shift to circular modes of consuming. The report’s normative message sums this up: “You must accustom yourself to share, repair, take care of and most importantly – consume less” (Boye 2019, p. 52). Images mobilized are of a recent past, in which people lived without waste:

“We humans have always known how to preserve the resources around us and how to exploit waste. Many Norwegians remember how generations before us knew how to produce goods of high quality and how to care for them. We repaired, and were creative with the resources that we had at our disposal. In villages there was almost no waste. Food waste became compost, clothes were redesigned until they found a new life as cloth and rags.” (Boye 2019, p. 8, our translation)

From FIOH’s standpoint, a turn to a circular economy entails not just economy, but a deeper and structural change in society geared towards how one should live one’s life, which is something Dammann has stood for since the beginning. FIOH’s adaptation of

the circular economy to the Norwegian context is consequential not only because of the influence of this organisation on policy makers and policy but also – as we will argue after we have presented two instances of this influence – because FIOH promotes a particular version of a circular vision.

## **5. Case overview**

The cases of FIOH's circular initiatives presented here are situated in the Norwegian medium-sized city Trondheim and region Trøndelag. The cases represent few instances of public-private-ENGO collaboration on consumption reduction and a reorganization of consumption in the region. Since autumn 2019, we have participated in an observatory capacity at three FIOH events related to case nr. 1, where we have followed its development. An interview with a public librarian involved in circular initiatives is also informing case nr. 2. Hence, the selection of these cases is based on their relevance for the region's shift to a potential, future circular economy. These actors are mainly working with utilising second-hand resources in textiles, construction material, and food waste. The alternatives and the transition which local and national policies favour, can be interpreted to be at odds with a specific Norwegian comfort culture, which is deeply embedded in most Norwegian people's lives. Very high living standards, soaring levels of private consumption, and low population density produce a challenging situation for those aspects of a circular transition that restrict current ways of consumption and are based on sharing of resources, extending product lifetime, and reducing waste accumulation.

Politically, the Trøndelag region is committed to the United Nations' Sustainable Development Goal (SDG) number 12 to ensure sustainable production and consumption patterns, and especially goal 12.5 which states that “[b]y 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse” (UN SDG n.d.). Thus, because of the current high consumption culture in Norway that we described, an alternative scenario is projected to reduce private consumption in the county Trøndelag, but also to reach SDG number 12. The concept circular economy which is a way to think of production and consumption as more sustainable, is an official part of the county's value creation strategy (Trøndelag county 2017) and its appurtenant action programme (Trøndelag county 2019). They emphasise development of “business models for

resource-efficient production and consumption of resources. Increased utilisation of residual raw materials based on product innovation and business cooperation” (Trøndelag county 2017, p. 4). The following parts describe cases that project this contextually new way of imagining consumption and production. However, to be noted, is that these cases are ongoing projects and the results, especially pertaining to case nr. 1 have yet to materialise.

### **5.1 Case 1: “Reduced consumption through increased reuse, repair and redesign”**

In 2019, a pilot study on co-location of circular initiatives showed that there was a potential for value creation for stakeholders within reuse, repairs, and sharing economy in Trøndelag. It showed that circular economy is a feasible future for the region. However, according to the county commissioner’s report (2020), existing circular initiatives are small, fragmented, and in need of increased knowledge to become competitive. For a vanguard vision, this fragmentation is to be expected as well as the expressed desire to become ‘competitive’ within the existing frame of reference.

The results of the pilot study were used to argue for funding of a larger project in which FIOH assembled a network of actors interested in gathering experience with circular economy. The application centred on competence building for the network resulting in new activity within reuse, repairs, redesign, including a well-functioning network of circular business stakeholders, as well as increased demand of circular products and services (County Commissioner Report, 2020). The project received funding for two years (2020-2022). In line with FIOH’s focus on individual consumption, the goal of the project is to reduce consumption and waste from private dwellings in Trøndelag, and it is to strengthen the competitiveness of actors within reuse, repairs, and design. The project’s stakeholders gathered by FIOH are the county municipality of Trøndelag, which is facilitating the project, the waste cluster of mid-Norway, Trondheim public waste department (TRV), and Trondheim municipality.

There are three main targets for this project, 1) to increase reuse, 2) to strengthen private businesses offering repair, reuse, and redesign, and 3) to increase interest and positive attitudes towards reuse, repairs, and redesign. The targets aim at increasing levels of reuse in Trøndelag. Its complimenting activities are primarily focused on raising awareness through posts via blog forums and the news media. Secondly, it is about

mapping resources and stakeholders and identifying potential cooperation with relevant stakeholders to forward the development of a circular Trondheim. Moreover, stakeholders are mapped, developing concepts and guidelines, and establishing a network. To sustain the networks, workshops and course along with social measures are to be held and taken. Finally, activities aim at knowledge creation through concrete activities such as workshops, attitude campaigns, and lectures on consumption practices.

Recently, to facilitate this network, a digital platform has been established. Later in the project, a larger physical location in Trondheim is to host these ‘green actors’ where resources are shared to increase utilisation of used materials from TRV. This location is aimed to be an important piece in the realisation of the project’s goal of reducing consumption through more accessible resources. A challenge for many of these smaller actors is that their businesses are conducted in addition to their full-time job, which makes growing their operations difficult.

The application text itself consists mainly of references to existing plans and political programs related to sustainability, such as commitments to climate change mitigation and fulfilment of the UN SDGs. The passages in which circular economy is mentioned explicitly refer exclusively to private consumption in the context of a generational shift:

“[s]ince one-two generations ago, we have gone from a circular society to a use and discard of single-use based products. For a sustainable economy, we must return to products that are made to last and to stimulate repairs and reuse of materials” (Future in our hands 2020, 6, our translation)

Formulated as a ‘must’, circular economy is presented not only as informed by the past but also as a necessity for the future. According to the application text, circular economy activities, such as repair, are only ‘forgotten’ because of the lack of opportunity to be reminded of how easy they are:

“A new generation of young people has ‘forgotten’ the values and methods around repair, re-use and craft. Consumers that never have engaged in these activities think that it is difficult and impossible to repair their products. But repair has to be discovered! Repairing things, one often discovers that it is easy and one will most likely engage in repair activities again. Knowledge around repair, reuse and recycling increases the value



of the product for the consumer. Sustainability has to be an experience!”  
(Future in our hands 2020, p. 2, our translation)

In the context of FIOH’s history, the re-discovery of the individual’s ability to achieve repair contributes first and foremost to the desired overall reduction of consumption. The additional value contributed by the experience of repair is emphasised: one does not lose the ability to buy new and better things, instead one gains valuable experiences. Implicit here is the strong belief in individual experience resulting in more sustainable choices.

The application implicitly acknowledges that not every consumer good is as easy to repair as it is claimed in the passage quoted above and that not every consumer will be able to achieve every repair. Therefore, another part of the projects aims at supporting small commercial actors in the region in order to:

“[...] create a network for Trøndelag’s repair and redesign professionals to contribute to community building, concept development and knowledge exchange. Many feel that they are small and alone in their work.” (Future in our hands 2020, p. 2, our translation)

Again, the project targets individuals, but now in a commercial context. The networking and capacity building supported by the project is supposed to strengthen these actors that share the vision of a circular economy.

The future envisioned so far consists of consumers and networked private actors making a living from repair, redesign and recycling. A third party, the public sector is assigned the role of facilitator. A little shop offering used goods co-located with the largest public recycling centre and driven by Trondheim’s public waste disposal works is described as an ‘arena’ which makes it easier for consumers to engage in re-use and to learn about material flows in the region (Future in our hands 2020, p. 1)

## **5.2 Case 2: ‘Reimagining’ public libraries**

The project described in the previous section has a strong focus on individuals and how they can be encouraged to experience repair, to make a living from repair, redesign and recycling. Another major activity initiated by FIOH in the Trondheim region, is in many respects similar, but assigns a much bigger role to public authorities as facilitator.

Originally conceived by FIOH together with a group of students of the local university NTNU, a development project, which explored the possibility to turn public libraries into sites that offer loan of tools that are used infrequently and still bought by most Norwegian households. These libraries, which are owned and operated by the municipalities, quickly embraced this opportunity to extend their reach and today they are operating this service which was extended to also comprise electric bicycles that can be used to transport bulky goods. In addition, local libraries allow the use of more expensive equipment, such as 3D-printers and sewing machines, on their premises. According to the library statistics for 2019, the 37 different objects that are located at six different libraries were rented in 1214 instances.

This case is a second example of strong public involvement in realising consumption-oriented projects. But it also indicates a rather fluid process from idea to realisation in which the involved stakeholders willingly cooperated. By building on the libraries' principle of renting, this newly established mandate for the library has become a step towards attaining a specific, circular sustainable consumption pattern within Trondheim and Trøndelag. Reimagining libraries as sites of renting out tools comes with new roles and tasks for the librarians. Initially, the infrastructure was both digitally and physically designed to accommodate books, but the introduction of tools has brought some difficulties. Tools cannot be booked online, yet. One must either send an email, call, or meet in person. Despite initial system challenges, renting tools is planned to be as easy as books through the library systems. According to our informant, a local librarian involved in the initiative, already, the library is receiving positive feedback and reactions from people saying that they are 'glad and surprised' about the services offered.

Furthermore, when asked about the role of people in a circular transition, the informant indicated that complementary infrastructural and public involvement is needed to ensure reducing consumption:

"I think everyone has a responsibility of course, but I think that it would be naïve to think that people will do this big job for themselves, so if Trondheim municipality and the library facilitates, it would become easier for people to take responsibility." (Public librarian)

In addition to FIOHs vision of circularity, visions of the future role of public libraries were relevant in this case. Since the rise of digital access to an abundance of information, libraries have increasingly been challenged to redefine their role. Different answers exist, libraries have been cast “as a democratic instrument in a multicultural and digital context” (Audunson 2005), as instruments closing digital divides (Kinney 2010), or as supporter for local communities (Hildreth and Sullivan 2015). The plans of Trondheim’s public libraries participate in the search for a feasible and desirable future. In this context it is no coincidence that the ‘tool library’ was originally presented as part of another initiative called ‘the people’s workshop’ (Skille 2017), through which courses in crafts and ‘repair parties’ were organized at libraries.

## **6. Norwegian vanguard visions of circularity?**

Summarising both cases, they share a common vision of circularity, which is closely connected to FIOH’s programmatic goal to reduce mass consumption. The considerable support mobilized among regional and municipal actors indicates that FIOH’s vision of a circular future is seen as desirable and feasible by politicians and other officials. The activities described are rooted in the overarching policy strategies of the county and municipality, but also within a broader national agenda that aims to make Norway a pioneer of a green, circular economy (Office of the Prime Minister 2019). The national government is developing a national circular economy strategy projected to be finalized by the end of 2020. The approach taken by the government is a process of dialogue and knowledge exchange with various sectors in Norway. Both cases focus on individual awareness, values and experiences connected to reduced consumption. Individuals learn and enact reduced consumption, small commercial actors are empowered to support these processes, and public actors, finally, are assigned the role of facilitator. Coupled with the focus on individual consumption championed by FIOH, both cases are examples of how digital and physical infrastructures play important roles connecting both invested stakeholders and citizens to gear production and consumption patterns towards circularity. The public authorities are important facilitators in this transition, and without, the cases described here would be difficult to realise. These cases and the actors involved can thus serve as important examples of learning for the Norwegian government going forward with the national strategy.

At the same time, even if the projects succeed in creating awareness and networks around circularity, and if the libraries manage to extend their circular activities, there is little reason to believe that the cases show that a widely shared circular sociotechnical vision is about to immediately reduce consumption in Trondheim and Trøndelag. Rather, we propose that our observations should be read as description of a vanguard vision “in the making” that points into the direction of a possible, more profound sociotechnical change. Whether the currently dominant vision of continued high levels of consumption enabled by frictionless product substitution will be replaced by a vision of more radical transformations of production and consumption remains to be seen and will depend on a variety of factors that are difficult to predict. However, based on our observations we are now able to describe a specific sociotechnical imaginary, towards which FIOH and their allies work as vanguards.

Hilgartner, who has coined the term ‘sociotechnical vanguard’, describes the work done to create what in hindsight became the new sociotechnical imaginary of synthetic biology as skilful coalition building based on the combination of existing visions in new ways:

“Sociotechnical vanguards seek to make futures, but (to paraphrase Marx) they cannot make them simply as they please; they do not make them under self-selected circumstances, but do so using vocabularies and practices already given and transmitted from the past.” (Hilgartner 2015, p. 50)

In this sense, the vocabularies and practices employed in the successful coalition building driven by FIOH as it was presented above, are relevant indicators for the shape of the sociotechnical imaginary that is aimed at.

We do not claim that the two cases from FIOH’s work with circular initiatives that we have picked and presented here are representative for circular initiatives in Norway. But together with the strong alignment of these cases with FIOH’s consumption critique since the 1970s reveals the contours of a specific vision, in which individuals reduce consumption through the rediscovery of lost competences and knowledge from a recent past, which is facilitated by regional public actors. The vision refers to the Norwegian past in two, interrelated ways: First, it evokes the image of a better, rural and pre-industrial world, in which people lived less alienated from each other and from nature.

And second, it does so by appealing to the individual rather than arguing in social, economic or political terms. In this sense, it is first and foremost moralizing and strongly rooted in the same protestant ethics of individual responsibility and avoidance of waste and luxury that according to Weber characterized the ethics of early capitalists. This even longer line into the past, connects the specific circular economy vision promoted by FIOH with fundamental values embedded in all institutions of a protestant country like Norway. Against this backdrop, the coalition between regional public sector and the moralizing consumption critique of the FIOH flavour observed here definitely has a potential to spread further and to ultimately become a new dominant sociotechnical imaginary.

Whether and how far the vanguard vision presented here is a specific Norwegian or Northern European one, can be disputed. The reference to a more circular past and the diagnosis of lost competences that first have to be recovered to create a more sustainable future is present in many sustainability initiatives all over the world. The transition town movement, which started in the UK, for instance, explicitly referred to the more frugal production and consumption practices during the Second World War and promoted cross-generational learning about the more sustainable ways of the past. Neither are moralizing warnings against the alienation of mass consumption the invention of FIOH and have a long history reaching back to the social movements of the 1960s. In this respect, for example a close reading of Dammann's book against the backdrop of Fromm's (1976) "To have or to be" which was published two years later and influential in German speaking countries, would be instructive.

Despite these similarities and parallels we still would claim that a historically informed analysis of national (and maybe also regional) differences in how more sustainable futures are imagined can reveal specific constellations. It is no coincidence that FIOH formulated its early mass consumption critique in apolitical and moralizing terms in protestant Norway, and it is no coincidence that local circular economy initiatives in today's Norway are driven by FIOH. Whether this means that circular production and consumption will become the dominant sociotechnical imaginary in Norway's sustainability policies in the future is uncertain. But if it happens, in this chapter we have contributed to an analysis of how this could happen.

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## Article Four: Consumption Work in Household Circular Economy Activities: Findings From a Cultural Probe Experiment

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### Abstract

The widely discussed transition to a circular economy (CE) combines a large number of approaches that imply varying degrees of change and affect institutions and actor groups. Despite this variety, the basic premise of CE is that production and consumption are connected to each other in new ways. Consumers are integral to any attempt to gear the economy towards circularity. In this article, implications for consumption work in CEs are explored based on a qualitative, experimental approach using a handbook as a cultural probe. The case is Norwegian domestic dwellers enacting activities related to CE principles. The study reveals two interconnected findings that question and raise attention to broader social dimensions of circular economic activities in households. First, the participants envisioned and enacted activities of a specific CE alternative, in which a local, community-based, and self-sufficiency vision was central. Here, resources were utilised and cascaded domestically reducing the link to economic exchanges that reach beyond the household to reduce and close environmental resource loops. Second, the enactment of circular activities required more time and work, leading to discussions in which standard wage labour was presented as problematic because it did not leave enough time to engage in circular consumption work.

**Keywords:** consumption work, circular economy, domestic consumption, qualitative study, time

## 1. Introduction

With the crises of environmental degradation and resource depletion unfolding around the globe, it can be no doubt that the patterns of consumption in the global North are entangled in capitalist arrangements of economic and social organisations' relationship with the natural world (Jackson, 2006; Evans, 2019). This has triggered critiques of consumerism (Meissner, 2019), and those high levels of consumption have led to calls for domestic sustainability transitions (Davies et al., 2014), including a further critique of the economic system underpinning these realities (Hickel, 2020). Still, the remedies for consumerism's inherent ills are many and divergent. This article starts with understanding the economy as deeply embedded in societal structures and not as a disconnected, autonomous realm (Polanyi, 1944; Block, 2007). Based on the concept of consumption work (Wheeler and Glucksmann, 2015), this study reports empirically on changes introduced by a desire to move from domestic consumption in a linear economy to more circular forms of consumption. How resources and things circulate (Braun et al., 2021) becomes important for understanding this potential change.

In the literature on circular economies (CEs), the move away from so-called 'linear' production and consumption patterns and systems to those of 'circular' nature entails activities like repairing, reusing, and recycling (e.g., European Commission, 2015; 2020; Ellen MacArthur Foundation, 2013). For example, the United Nations Environment Programme (UNEP) holds that CE is key to achieving the Sustainable Development Goals (SDG) (Andersen, 2021). In a CE context, consumption is expected to be radically different from today (Ellen MacArthur Foundation, 2013; Welch et al., 2017). Fuelled by oil and gas exports, a well functioning welfare state and low social polarisation, Norway is characterised by a large middle class that is very well off. In this context, the Norwegian answer to environmental concerns is a so-called "green shift" agenda. As part of this, recently the Norwegian CE policy was outlined in a government white paper (Office of the Prime Minister, 2019; Ministry of Climate and Environment, 2020; Office of the Prime Minister, 2019; Ministry of Climate and Environment, 2021) that aims at sustaining the current paradigm of consumerism through more environmentally friendly and novel product substitution rather than shifting to different modes of consumption. Considering Norway's high levels of consumption with an annual material consumption per capita of

44,3 tons (Circularity Gap Report, 2020), such a restricted approach to circularity appears as deeply problematic.

The European Commission's (2015; 2020) efforts at transitioning to a CE say that the millions of choices made by consumers can impair or support it. Such a framing transforms consumers into policy targets (Wheeler and Glucksmann, 2015), which implies that sustainable consumption requires a comprehensive approach that includes individual, collective, and systemic dimensions. Where the Norwegian CE strategy targets mainly businesses and industry actors to steer the transition, a more extensive approach necessarily includes individual acts of consumption and how they are embedded in broader social, economic, and cultural contexts.

In those approaches to CE transitions, which go beyond simple product substitution, citizens are encouraged to lead more resource-efficient lives with an emphasis on prolonging the lifetime of products. This comes with far-reaching consequences for all economic activity as the current 'take-make-use-dispose' economy, as popularised by the Ellen MacArthur Foundation (2013), means that the consumption of goods is cheap, accessible, and easy to discard making space for new purchases. Such a CE is framed to move away from this rationale towards caring for and reducing environmental impacts through means of reuse, repairs, refurbishment, renting, and re-selling. Following the argument of the embeddedness of economic activity, this starts with the assumption that the choices of millions of consumers are never solely guided by price, information, or accessibility – as for example the EU Commission hints at in its CE action plan – but encapsulates cultural heritage, histories, social norms and values, desires, relations to others, and work-life balance. Everyday life decisions are deliberate and rational, unintentional and illogical, and they result from negotiations with individual and collectively held norms. In that way, this paper is based on the assumption that a transition to a CE can only unfold its full potential when it is about much more than sustainable innovations in the sphere of production as it transforms the very relation between consumption and production.

Switching to a different mode of consumption demands effort and persistence from the consumer, but it also requires the right economic and systemic conditions. In this article, it is asked what happens when households commit to more circular ways of consuming, what are motivations, barriers, experiences and potential effects on the larger

economy when individual acts of consumption become more circular. Wheeler and Glucksmann (2015), who studied how consumers performed what they call consumption work, i.e., unpaid domestic work related to consumption activities, when sorting waste in their homes, showed how these acts of consumption were embedded in the organisation of labour and the overall economic system. This approach allows to both invite the complexity of everyday life settings and to maintain a perspective of embeddedness in the larger economy. Extending the scope of their work, in this article, the consequences of a circular transition of household consumption are explored. In the next part, I present the theoretical lens of the paper before introducing the methods and results followed by the discussion and conclusion.

## **2. CE and consumption work**

If CE is seen as more than mere substitution of more sustainable products or services, then consumers are expected to consume differently in a CE. After a period in which business models, systems, and services were described as central to a CE transition as companies' inner business logic changes towards keeping value instead of discarding it, more recently, calls for empirical studies focusing on consumption in a CE context have become more frequent (Hobson and Lynch, 2016; Mylan et al., 2018; Camacho-Otero et al., 2018; Camacho-Otero et al., 2020). Camacho-Otero et al. (2020), for example, write that when developing circular products and systems, it is pivotal to consider the effort the use of such offerings requires for the consumer. Tunn et al. (2019) state that consumers compare the efforts required to consume and manage goods and services of standard offerings with the perceived efforts of the new, circular offerings.

Kathryn Wheeler and Miriam Glucksmann (2015) provide the analytical point of departure for this paper with the framework of 'consumption work'. This research framework brings consumers into societal understandings of the division of labour (Evans, 2017) and where consumption work means 'all work necessary for the purchase, use, re-use and disposal of consumption goods and services' (Glucksmann, 2016, p. 881). This framework resonates with a perspective in which the economy and the social are deeply embedded together. Consumption work is a precondition of use and distinct from consumption itself. Since everyday life is situated within a broader, complex

sociotechnical system that influence each other – from the politics configuring work and labour organisation to imaginaries shaping political, technological, and social trajectories, all play a role of how people consume the way they do. The consumption work framework looks to make the connection between domestic consumption work, consumption, and economic organisation clearer.

This paper takes inspiration from a research agenda for consumption work in a CE (Welch et al., 2019) in which the authors argue that CE visions and circular business models' successfulness strongly depend on reconfigurations of consumption work. As Wheeler and Glucksmann (2015) note, consumption work reframes the economic process on the assumption that consumers undertake work to consume, making it appropriate for interpreting dynamics of CE (Welch et al., 2019). Consumption work in a CE can be returning parts to manufacturers for maintenance or it can involve more intricate activities like acquiring the skills and knowledge necessary to complete repairs oneself (Wieser, 2019).

Empirical and theoretical studies of consumption argue that a large amount of work is needed to be able to consume (Glucksmann, 2009; Wheeler and Glucksmann, 2015; Glucksmann, 2016). The background for viewing consumption as a two folded process of working and consuming stems from sociological traditions studying the division of labour to understand large-scale transformations of the 19<sup>th</sup> century. A central piece within the sociology of work has, according to Glucksmann (2009), not been critically re-evaluated. However, with developments within employment and work, Glucksmann writes that the increasing complexity of supply chains and restructuring of market and non-market relations change work and reshape links between workers and non-workers, i.e., consumers. Munro (2021) discusses similarly the links between the household, the economy, and the state with emphasis on recycling in which the unwaged work of households' waste sorting advances capitalism's crisis-prone dynamic of overaccumulation as well as waste sorting is an instance of work transfer from industry to households. O'Neill (2019) writes that the rise of the global waste economy derives from economic growth and industrialisation in the 20<sup>th</sup> century, which transformed the relationship between wastes and resources in the industrialised world. But as Max Liboiron (2021) notes, resources flow from the South and into the North, where waste accumulates and is later returned, thus polluting communities of people and nature in the

South. This is according to Liboiron colonialism. This point may tie into how large resource and waste loops are thought of. Should resources and wastes be kept in local or global loops?

Bauman (1998) wrote that in the global North, there had been a shift from work as the source of identity towards greater preoccupations with consumption and lifestyles instead. In classical understandings of the division of labour, all work is completed prior to reaching the end-user, in which emphasis was on the technical skills, tasks, and competencies related to paid employment (Wheeler and Glucksmann, 2015). They exemplify this by describing that furniture was used to be produced and assembled in the production process, while the rise of 'Ikea-isation' shows that an important aspect of the production of furniture shifts across socio-economic boundaries and into the domestic to be undertaken by diligent citizens. In this way, consumption can be defined as the result of various types of consumption work.

The main point in consumption work is that work does not cease to exist despite its movement across such boundaries, but continue with different sets of skills, tasks, and competencies. As I shall argue in the coming chapters, work is also kept within the domestic and is not in all instances transferred beyond the household. The difference is that this shift of labour to the consumer is unpaid. Both of Wheeler and Glucksmann's work (2009; 2013; Wheeler and Glucksmann, 2013) aim to reconceptualise the division of labour to be able to understand recent and current transformations taking place in not just the global North, but South, too. Their framework is about acknowledging the unconscious work and taken for granted activities people do, and that these are economically crucial to the wider economic system. Glucksmann (2013) reflects that daily activities may be presumed unimportant and not experienced as work but could be classified as such when reviewing their significance for economic activity.

Connecting this to the moral economies of households, Wheeler and Glucksmann (2015) draw on a comparative, empirical case of waste sorting in Sweden and England, which follows a newer tradition of transferring tasks from producers and retailers to consumers and users. Their cases show that cutting production and labour costs is important in this regard, which affects the level of labour needed from the consumer to be able to consume. This theoretical lens offers a way to study not only how people consume, but it offers a vocabulary to analyse how consumption and consumption work

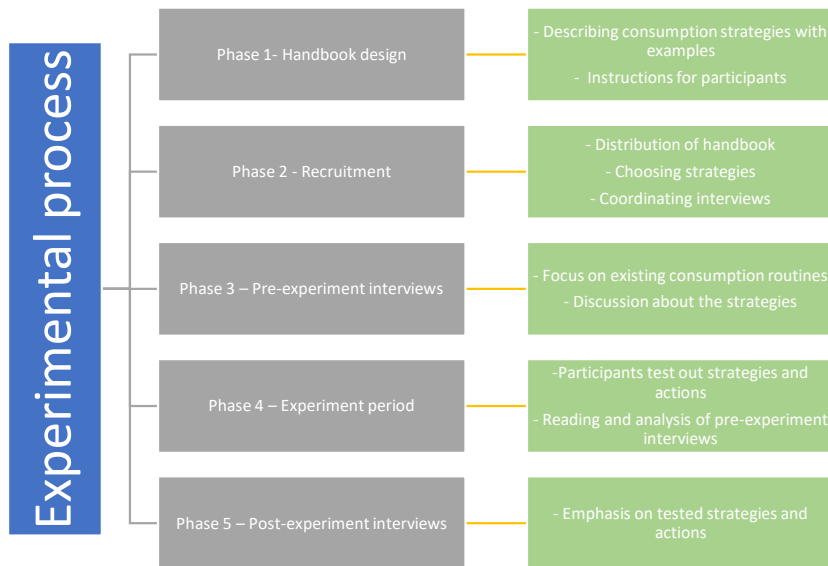
relates to a broader sociotechnical system of production, provision, use, and post-use. With this framework and study of domestic consumption transitions, the following sections outline the methods used and the results.

### **3. Methods**

With the domestic brought into focus in relation to the public, both are subjected to more frequent inquiries, experimentations, and tests (Marres and Stark, 2020). The data presented in this paper derives from an action-research oriented study in which the aim was to study three sustainable consumption strategies described by Vittersø and Strandbakken (2016) – product substitution, reorganizing consumption, and consumption reduction - and their relation to more circular forms of household consumption. The focus was to research the challenges, opportunities, and level of work needed to consume in Trøndelag’s largest city Trondheim and the rural, cultural hub of Røros. The empirical study at its core consisted of a one-month long experiment in which households tested acts of sustainable consumption. The study can be described as consisting of five phases (see figure 1). In phase one, various consumption strategies were used as a template for designing a handbook<sup>1</sup> for the participants. The handbook found inspiration from the ‘cultural probes’ of Gaver et al. (1999), which are ‘collections of evocative tasks meant to elicit inspirational responses from people – not so much comprehensive information about them, but fragmentary clues about their lives and thoughts’ (Gaver et al., 2004, p. 53). The handbook included an outline of the strategies, selected examples relating to each strategy, and a set of appendices of additional information and suggestions for actions. The participants chose freely among the strategies and in that way the handbook was used as a probe to trigger reflections about their own consumption pertaining to resource use and management.

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<sup>1</sup> Available at: <https://doi.org/10.5281/zenodo.6384495>



**Figure 1.** The experimental process.

Recruitment comprised phase two (see table 1). The handbook was distributed to colleagues who forwarded it to their networks on Facebook. Those interested contacted me by e-mail by writing about their motivation for participation and general information such as age and place. They indicated very shortly which changes they were interested in. The first round of semi-structured interviews took place in their homes. I enquired about their consumption habits and routines, and their consumption related to resource use in the production and consumption of everyday commodities. The goal was to establish a connection with the participants, gain insights into their thinking, and establish a point of reference for the final round of interviews. This first round was moreover a relaxed conversation about the handbook, what they wanted to test out, and practicalities like documenting the experiment with pictures and making notes. They were asked to reflect on the handbook's content and summarise points of what they aimed at testing out. In phase four, the participants partook in the experiment and no contact was made except for scheduling the follow-up interviews for phase five. These took place shortly after the experiment ended and was a reflective discussion of their experiences.



Household #	Participants, age	Household	Location	Experiment period
1	Astrid, 69	Lives alone	Trondheim	03.09.20-03.10.20
2	Frida, 37 Harald, 40	Three young children	Trondheim	03.09.20-03.10.20
3	Birk, 50	Daughter and son	Trondheim	11.09.20-11.10.20
4	Hilda, 33	Two young girls	Trondheim	09.09.20-09.10.20
5	Inga, 38	One young boy	Trondheim	09.09.20-09.10.20
6	Ulf, 45	One young daughter	Trondheim	13.09.20-13.10.20
7	Sigrid, 45	Husband, one young boy	Røros	03.09.20-03.10.20

**Table 1.** Participant overview.

The participants are given fictive, Norse names to ensure privacy protection. The experimental process resulted in 14 semi-structured interviews (7 pre and 7 post interviews). In analysing the transcriptions of the pre-experiment interviews, I took notes and summarised their insights by focusing closely on their descriptions of their consumption, thoughts about the environment and resource use, as well as capturing their thoughts of the probe. Furthermore, it was relevant in getting an overview of their consumption related to their every day- and work-life relations. In the second reading of the transcripts, I identified themes related to consumption, everyday life, and work, which ended in a thematic description looking at sections of interview transcriptions relating to these themes. Categories such as reuse, repairs, reduce, food, waste management, time management, work, Covid-19, organisation, leisure, environment, knowledge, learning, practices, children, family, and sharing were identified.

For the post-experiment interviews, I took a similar approach where I collected examples of what they tested out, how this was experienced, and elements relating to the feasibility of establishing CE activities as a default in the future. I grouped occurring topics in a table and linked to them the relevant quotes. I emphasised capturing descriptions of processes leading to consumption such as sorting waste fractions and acquiring knowledge to choose products and repairing things.

The overall impression was that the handbook, or probe, served more as an inspirational guide to narrow the focus of the experiment for the participants. Their choices indicated to be internally motivated by different topics they engage with on a daily basis as well as what is feasible to follow through time-wise through hectic everyday lives. With that said, in Norway and elsewhere there is a larger focus on activities of product-life extensions such as repairs, recycling, reuse, that cannot be ignored. People are more frequently exposed to such ideas of circularity and issues pertaining to global warming through the media landscape, but the actual performance of elements of CE in everyday life is rarely tested or studied. This experimental approach does this by considering the increased political push and societal awareness of CE coupled with a handbook that is operationalised based on elements of CE and types of sustainable consumption strategies. The suggestions in the handbook align partly with this increased CE focus in the media, but its specific contribution is the overview of services and suggestions that households can implement that are part of a local and national turn towards more sustainable services and activities. The experiment, then, served as a final push for the domestic dwellers to try out changes they had been contemplating about doing for a long time. Whether these activities would be undertaken without my influence is difficult to discern.

### **3.1 Limitations and COVID-19**

The experiments took place during a global and local pandemic situation. I expected from the beginning of designing the experiment that I likely would meet resistance in the recruitment phase. I had 10 respondents of which seven committed. The fear of infection may have limited participating willingness. The qualitative nature of the study and the sample size is not reflective of the population of this region. A survey study could potentially reach broader, but the detailed discussions of their consumption would be insufficient. Due to the temporal dimension of the study, it would be more difficult to coordinate the testing of the strategies through before-after surveys. Another point of consideration is that my position as a researcher is actively involved in the contents of the handbook as a cultural probe, but also through the interviews and discussions. A central tenet in action research is the co-production with the participants where ideas are

exchanged which prompt unplanned topics. In such a study, it is challenging to be a neutral observer, despite this I hold that a mutual discussion about the topics addressed here creates better knowledge than without this joint involvement.

#### **4. Results**

The following presentation and analysis of the data topically relates to Wheeler and Glucksmann's (2015) recycling and household sorting consumption work but extends it to involve so-called 'circular' activities of repairing, sharing, and creating shorter and more localised waste loops. With these circular activities is the acquisition of knowledge central. Together, the cases aim to describe the work needed to consume when engaging with sustainable consumption including reflections of the informants around this work. The participants in this study were prior to, during, and after the experiment mentally and physically involved with the idea and performance of sorting household wastes. Wheeler and Glucksmann's (2015) detailed descriptions of the significant labour of sorting waste fragments post purchase where individuals function as 'suppliers', their homes as 'warehouses', and the waste fragments are 'distributed' beyond the confines of the domestic. This is very much the case for the participants in the experiment as well. The participants could choose changes that were relevant for them. Although some chose one main strategy, all participants engaged in a broad variety of new activities.

As this study focuses on change, the pre-interviews provided a starting point for understanding how they consume. Each household shared similarities such as being interested in environmental and climate aspects of consumption, they practiced repairs, reuse, and redesign from time to time, and they sorted their waste fractions diligently. They also chose products that were time saving due to the busy schedules of daily life. They enacted predominantly what CE proponents describe as a linear management of resources in which products were acquired, used, and discarded as waste. In most cases, the discarded products were transferred out of the household. Waste is a central topic in CE literature and policy and it is especially relevant for domestic consumption (work). The findings show that even prior to the experiment, but much more during and after the experiment, there were activities of using particularly food waste for domestic use like composting and gardening. In the next section (4.1), excerpts of the participants'

experiences of changing their consumption and descriptions of how resources flow both beyond and within the domestic economy are presented. Observations regarding circular consumption activities that go beyond the focus on waste management – particularly repairs – are collected in the second part of the empirical observations (4.2).

#### **4.1 Composting and gardening as circular activities**

The participants organise their waste, as most Norwegians do, under the sink in the kitchen or in a cupboard, which they later distribute to larger rubbish bins outside the houses. Glass and metal fractions must often be brought further away to designated areas where there are collection stations. There is a great variety of how waste is organised depending on the neighbourhood, municipality, and available infrastructure. Residents pay a renovation tax which varies from where and how one lives as well as how big the waste collection bins are. The sorted household waste is then collected by the local waste management operators, which is municipally owned, and brought in for further sorting and management. The citizens of Trondheim and Røros, where the participants of this study live, are bound to sort their waste fractions according to the local, administrative regulations (Renovation regulation, 1999; 2020). Despite this official technicality, there is a long-standing tradition and culture for sorting out household waste which is not necessarily due to such regulations per se but warranted by institutionalised practices and skills transferred from generation to generation. A generally high level of trust towards public institutions coupled with the cultural embeddedness of waste sorting makes this activity a social norm. There is thus a public expectation to sort waste at the household level, but there is also a type of cultural memory informing this activity.

With regards to that food waste is not sorted separately in Trondheim municipality yet, but is since 2020 in Røros municipality, there are alternative ways of utilising this waste fraction. The households of Astrid, Birk, Ulf, and Sigrid used warm and cold composting prior to the experiment, which is placed in their gardens. Not all waste fractions were transferred out to other socio-economic processes but were kept for personal use. Astrid, for instance, was spurred by a long-standing wish for making her garden produce more succulent vegetables, took advantage of the experiment and got

herself a bokashi (fermented organic material)<sup>2</sup> set. *'I am looking forward to the spring so I can use better soil. My neighbour told me that she had used bokashi'*. She realised during a conversation with her neighbour that: *'oh dear, that is why you have such large kale. Mine were so thin'*. Her introduction of bokashi, with an economic stimulus up to 1000 NOK from the local government as a waste-reducing measure, meant however, expanding the waste system by adding two new waste containers. She throws fresh food waste in one and a second which the actual fermentation process takes place. The contents of the first bin are transferred manually to the second bin, where the former sits in a cupboard under the kitchen and the latter in the entryway, a place that is not a traditional space to store waste. For Astrid, this meant in her words *'a mental readjustment that I need to look out for every time I opened the cupboard. I am awfully close to throwing it (the food waste) in the old (residual waste) bin'*, which is how it was organised pre-experiment. As the bokashi bin ideally should not be frequently opened, she had to temporarily store the waste elsewhere.

Here, the 'warehouse' metaphor of Wheeler and Glucksmann (2015) becomes an intermediary warehouse between two processes of cooking and fermentation. Old habits collide with new in finding the ideal way to manage food waste but also to satisfy the biological aspect of the fermentation process. The result is less residual waste and more nutritious gardening soil, but it has also led her to *'become more conscious about my own consumption'*. The new process of sorting out food waste serves a very concrete purpose of being able to grow more luscious vegetables in the future, which means that she must spend more time organising food waste to become raw ingredients in another process, a CE cornerstone. Optimal fermentation does not happen on its own, but demands inputs of knowledge, effort, time, space, energy, and composting sprinkle for activating fermentation. Despite that the new system brings a certain script into play, it meets a personal preference of how to use and place it in her home. This way of organising food waste resonates with her history of farming when she was younger at her Dad's farm: *'My brother and I come from and grew up on a farm. Our parents first grew vegetables and then flowers, so we probably have it in our genes, in our fingers, to be self-sufficient'*.

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<sup>2</sup> 'Bokashi', of Japanese meaning 'fermented organic material' is a composting system for changing food waste into a soil additive.

She wishes to be self-sufficient on soil instead of buying it which later may ensure greater food independence. This example points to a personal desire to reduce the need to buy food at the store which also reduces the generation and accumulation of residual and plastic waste. Being self-sufficient is something that resonates with her.

**Astrid:** It means a lot. I think more of us must go in that direction – to grow more oneself.

**Interviewer:** Can you explain a bit further why you think being self-sufficient is important?

**Astrid:** Firstly, it is that you have more control over the products and the content. I also think that everything is uncertain going forward that it is probably smart to have a certain level of self-sufficiency.

Astrid, Frida and Harald, Birk, Hilda, Ulf, and Sigrid have all tried to grow fruits and/or vegetables with varying luck, and the idea of self-sufficiency seems to be strongly grounded in especially Birk, and Ulf’s descriptions, which also have different motivational roots. Birk describes elements of self-sufficiency in relation to personal experiences:

I have made a vegetable garden which we will begin with next summer, so there’s expectations for something. I also get some potatoes from my father [...] I could of course extend this to pick strawberries and cowberries, but it’s about time – it takes a long time.

The sustainability issue is explicated further in Birk’s following reflection:

I believe that it [allotments] must be part of the sustainable solution in countries that have space for it. Think of Norway, how many square kilometres of lawns we have, which we only mow, really, and don’t use. To put it bluntly, this [space] should be regulated by law so all must use a certain share of their lawn to cultivate, and then we could have public gardeners coming to help people get started. That would be part of a national voluntary communal work for local production of food. [...] However, it opposes this efficiency society which has been the main deal since the Second World War. [...] It demands a “slower” mindset to make things more sustainable. [...] It is an idealised thought, this, but to strive for it will do good for the future of food production. [...] The “think globally act locally” thing ... it is actually a lot of things you can do locally which actually is moved away because it is cheaper to do things in China or other countries.

Keeping labour and resources within local communities are understood as important for future sustainability where partial self-sufficiency is key. Ulf shares the interest of cultivating and producing home-grown food. He is also the one with the largest garden and greatest harvest of the participants. Warm and cold composting has become routine and the nutritious soil is laid upon the land where he reaps the rewards. Ulf, as Birk and Astrid, is likewise affected by familiar relations and histories informing current actions.

I have a home composting, so all food waste goes into a container under the sink here, and once in a while I need to empty it [...] It is a warm compost behind the garage [...] Principally, food waste goes out to the compost meaning that it creates rather small amounts of residual waste. [...] We grow potatoes ourselves [...] and I put the compost onto the soil. Then the nutrients go back into the potato. [...] Last year I harvested 25 kg potatoes. [...] My father made it (the compost) [...] He liked garden work and it gives better soil. Also, he saved parts of the renovation tax.

Here, we see an example of how Ulf acts as a distributor and manager of waste, and where the cupboard under the sink and compost areas in the garden are temporary ‘warehouses’ for the resources. When food waste and/or garden wastes are moved from the domestic warehouses like containers for fermentation or composting to the soil, are examples of how waste flows domestically are used to advance self-reliance and circular activities. The cases of Astrid and Ulf highlight especially all the work needed to complete the circle from waste to resources to food. In other words, instead of shifting these resources to external entities such as the waste management company, they are kept within the domestic economy of internal feedback loops. The activity of cultivating, growing, and harvesting means engaging in activities considered to be circular where prior knowledge coupled with learning by doing make up these activities.

#### **4.2 Repair and reflections on time and critiques of growth**

Many participants were already practising repairs, but the cultural probe made this a more central activity. The following excerpts focus on various experiences with repair activities and the time and knowledge needed to prolong product lifetime. They also tie into

temporal reflections and interpretations of contemporary society. The first example highlights a mundane dishwasher issue:

[...] the lower trail [rack of the dishwasher] has wheels, but the majority got worn out, some were falling off and the trail would not be held and will touch the bottom of the dishwasher causing it not to work properly. Also, the basket holding cutlery had big holes, the cutlery went through, and it will make the trail not be able to slide it open or close. This was a pain. It is an IKEA dishwasher, and we did not find spare parts in IKEA, so we thought we were lost here and doom to change dishwasher. We got the option to replace it by another dishwasher (a rather new one from relatives) but I thought it was stupid to change the whole dishwasher because some plastic wheels and a plastic basket with holes. The trick was to google the serial number and it happened to be an Electrolux machine, probably a brand for IKEA since it does not say Electrolux anywhere. Anyway, I bought the spare parts from Electrolux.no (they were delivered at the post office) and now everything is working perfectly. To think we were considering changing dishwasher due to a few missing parts feels a bit unnecessary, but of course it helped to find the parts. (Frida and Harald)

In retrospect, this process started with them almost giving up: ‘[...] *in the beginning we kind of gave up, because it’s an IKEA thing, and we couldn’t find the repair parts. [...] It takes a little bit more time, but it’s not any ambivalence there, I think.*’. This reflection of repairing their dishwasher contains many elements. A first point is the issue of it hindering daily cleaning chores. It shows that the possibility to use the dishwasher and undertaking relating tasks are not solely confined to the domestic but extends beyond to the technical design of the dishwasher, its manufacturer, provider, and product information, and the postal service for delivery. Thus, a complex interdependency between the domestic and external actors appears to be able to consume energy and water for completing trivial tasks in the home. The family considered despite minor component issues to substitute it, but after consideration they felt that ‘*would be so stupid*’. In repairing the dishwasher, they realised the following:

**Harald:** [...] the dishwasher has several programs. And I think, I’m not sure, but I think some people use the one that makes the dishes cleanest, and that is the one with the warmest and longer duration. And then I looked into the user manual.

**Frida:** We’ve never used that before.



**Harald:** And it actually explained how much water and energy the different programs consumes. And it happens to be the one we were using uses like 27 litres of water.

**Frida:** I think also now we think that we should do that with more things. Maybe the washing machine. We should not just press the default button.

**Harald:** Exactly. It would be interesting to see how much it's possible to save in all these things. That was very nice. [...] I think with a little bit of effort you realize you can save much more. I think that was a nice learning.

**Frida:** I find it very important to show the kids it's possible to repair.

Astrid describes a situation where she looked to outsource the repair service needed for her phone – a sound issue. She first went to a well-known telephone operator store but was told that this would be difficult to repair. Then, she went to a repair shop nearby where she recalled seeing ‘*a nerd with long hair*’ and thought to herself humorously that ‘*this is the right chap*’. He understood straight away what was wrong, and he fixed the phone in 20 minutes and it was cheap. Understanding where to go and that the process is transparent, is important for choosing repairs over buying new. For Inga, repairing something is not always a clear-cut option. She described a hesitance towards repairing electronics because of the unknown price and where to repair such items.

Harald noted further on finding time to do circular activities that ‘*I think time is where we are more pressed [...] Instead of doing it in the store, I'm doing it here, and in the end, it takes more time than I thought*’, here referring to repairs. When asked how they could organise everyday life differently to create more time, they responded with ‘*I'm sure that one option would be to actually work less, I think [...] I don't think I can take extra hours from the duties at home, because that is not something you can avoid*’. Making time for sustainable activities like repairing, they do not see it coming from the other daily chores, but from working less. Birk echoes this by describing that ‘*we have such economic freedom that you must create frameworks and demands, so to have a six-hour workday must be maximum if you are to have time*’. To be able to consume differently and with it put down more work to consume indicates a different organisation of the labour force and how it organises workers' time. Prioritising time to compost, cultivate, and repair, the participants say that such activities ought to be meaningful. If not, they would be difficult to implement.

Birk took during the post-experiment interview a position against the race for green growth, as popularised in policies and industries, where he said that ‘*I don't believe*

*much in green growth as it is a greenwashing of the same efficiency society, we've had all along, or been striving for the last 50 years'. 'That stuff is supposed to move quicker and to call it green growth [...] I don't believe this is a solution to anything'. Instead, to reach a society of circularity 'you must be very conscious about it [...] and there is also this slow mindset that you must have time to invest in what is sustainable'. Time is something other participants mentioned was lacking in being able to reduce their material intensity. Frida and Harald noted regarding repairs that 'time is where we are more pressed [...] Instead of doing it in the store, I'm doing it here, and in the end, it takes more time than I thought'. When asked how they could organise to free up more time, they responded with 'one option would be to actually work less [...] I don't think I can take extra hours from the duties at home, because that is not something you can avoid'. Finding time for circular activities like repairing, they do not see it coming from daily chores, but from working less, thus echoing Birk's statement above. Birk reflects further on the social organisation of food production and interrelated topics on contemporary developments:*

it should be regulated by law that all must allocate part of their garden for cultivation, and then public gardeners would help to get started, which would be part of a national, voluntary communal work, and also other forms of allotment gardens. [...] You can cut out much of the industrialised and imported agriculture that demands fertilisers, pesticides, and monocultures and favour local production instead. [...] However, it opposes the efficiency society [...], so it demands a different mindset to do things more sustainable. [...] This is an idealised thought, but to strive towards this would do good for the future of food production. [...] The repair and maintenance mindset to be able to produce products that last and can be repaired. Imagine, it demands that you maintain traditional professions, and this isn't romanticising. Carpenters make furniture by hand, which is quality of life in its own right, and then people get quality products which can be repaired.

## **5. Discussion**

This section fleshes out the implications of the foregoing activities performed by the households against overarching trends in sustainability and economic discourses.

## 5.1 An alternative CE

The presented cases relate thematically to the CE discourses of wastes as resources and product lifetime in the EU and Norway (EU Commission, 2015; 2020; Ministry of Climate and Environment, 2017; Trondheim municipality, 2017; 2019). Today, food waste is not separately sorted, but discarded with residual waste, which the local waste company collects and manages for further transport, recovery, and/or incineration. The division of labour related to the economic process of waste management takes on large amounts of household residual wastes, but with joint economic support from the local government and the waste management company, citizens have the non-obvious option of reducing food waste fractions in the residual waste bins, thus reducing the workload of the technical division despite food waste not being sorted out here.

The examples of food waste sorting, composting, transporting, and gardening relate to CE discourses of utilising resources better, where waste fragments shift between the domestic and external resource loops as well as the division of labour. They also require several instances of work. Here we see how food and garden waste fragments move from various storages in the form of bins and different composting and fermentation systems, which is again returned to the soil as nutrients. This process continues in loops between human, biological, and infrastructural actors. Waste fractions are redistributed for personal means with the global in mind. Where Wheeler and Glucksmann (2015) describe how waste fractions move beyond the household, in this study we see the opposite regarding food waste. Astrid, Birk, and Ulf use waste for higher quality cultivation and food production with the aim of being more self-reliant. In cascading such resource loops domestically, work shifts from the public/private management to the domestic realm undertaken by its dwellers. As Wheeler and Glucksmann (2015) reveal in their waste management cases in Sweden and England, the bokashi case highlights a similar aspect in which the local government and waste company seek to shift labour to the citizens to reach EU waste goals. It even shows that a product-substituting alternative means more work to be able to live more circular and environmentally friendlier. Organising it this way demands more space and time to do so, but it leads to fulfilling the participants' long-term goals of being more self-sufficient, which tightly links to ideas of global and local sustainability.

These insights point to that the domestic composting and food production, however small the quantity currently may be, over time reduce the purchase frequency which minimises the acquisition of plastic packaging that must be managed and distributed to external value chains that are high-energy demanding. The idea extrapolated here is to slow and narrow the resource loops and confine them as much as possible to the domestic economy. Wastes and their value shift between different socio-spatial realms in traditional waste management (O'Neill, 2019), but in the cases described here, we see that some participants want to maintain that value domestically. By retaining the value like this, the workload increases for the consumer, despite that it is not necessarily experienced as such. But in mainstream CE discourses, waste is a critical input, thus relying on continuous waste streams to feed into new products or processes could ensure that growth paradigms are upheld.

As we have seen, this move towards self-reliance is not accidental. Birk emphasises in his descriptions an idealistic future organisation of a domestic/local variant of food production to reduce the need for energy and resource intensive industrialised systems and transportation. Astrid and Ulf support this idea of localising either individually and/or in a cooperative to reduce consumption of energy and resources. Together, they perform parts of an envisioned future which is rooted in their personal past and perceptions of what sustainability is. Here, circular activities are performed in a synergy of global policies of waste reduction, personal histories, values, interests, and perceptions of future sustainability. Such envisioning reveals a reliance on past reservoirs of knowledge and experience in informing the sustainable choices in this experiment, which is also informed by how the future is perceived in relation to the environment (Korsunova et al., 2020). This also resonates with a particular vision of circularity that takes inspiration from how people consumed in the aftermath of the Second World War (Boye, 2019). Wallenborn and Wilhite (2014, p. 58) capture what several of the participants in this experiment described – that past experiences and histories inform and shape how they perceive an ideal way of living in which the body is a ‘repository of past experiences, both individual and collective, and as such, affected by social relations and cultural learning. The body is thus not only the site of action, but also of dispositions for future actions.

The food waste sorting, composting, and gardening activities are part of an envisioning and enactment of a more specific CE alternative that breaks with mainstream CE discourses like that of the performance economy (Stahel, 2010) in which activities such as extending product lifetime is outsourced and performed by services. In contrast, the ideas of a local community-based- and self-sufficient production and consumption are central values where resources are utilised and cascaded domestically rather than beyond the household to reduce and close environmental resource loops. Astrid's memory of her father's farm is in this respect informative as it points to a very different way of organising the economy. It is more self-sufficient and localised than the average household, which relies on products from external sources. Although the participants did not perform any circular activities as a group, they shared similar ideas of what sustainability is and how it can be achieved through creating a community feeling where resources are managed locally. In Wheeler and Glucksman's (2015) study, consumption work in waste sorting is performed individually, as do the participants of this study. However, their common views of circularity point to that consumption work may be shared for a collective good. This means that they envision a rather different future that breaks with green growth agendas and technology development as the main driver for change. In a way, the participants question the sincerity of such agendas and reveal scepticism towards them by envisioning their own. The next main point ties into this particular CE vision and related consumption work.

## **5.2 Time as a resource for sustainable consumption**

The alternative CE discussed above connects the amount of work needed to consume and produce in more circular ways. The cases of repair activities, where participants reflect about reducing their work hours to be able free up time to implement further circular activities, resonates with previous literature on work, time and consumption. For example, Pullinger (2014) states that under the correct circumstances, work hours reduction may play an important part in a sustainable economy. Despite that more empirical studies on the effects of work hours reduction are needed and under-researched (Rau et al., 2014), Schor (2005) raises the larger question whether a competitive market economy and scientific and technological breakthroughs are sufficient to achieve

sustainability. Already in the current market-based organisation of work, more and more service tasks are transferred to the consumer, e.g. in home-banking, thus changing the dynamics of consumption. Similarly, implementing circular activities like repairing and keeping food waste domestically requires, more time to complete, in some instances even much more time. This does not mean that this additional time is experienced as negative, it is rather welcomed by my informants. What is described, however, is that important economic parameters such as the standard amount of working hours would have to change to be able to lead a truly sustainable lifestyle.

The findings from this study reveal how the participants in many instances break with concurrent political aims of continued economic expansion through green growth and product substitution. The consumption and organisation of the economy envisioned by the participants link to a perspective in which the social and economic are more deeply embedded and where reciprocity and care are fundamental values in creating a sustainable society. Frida said that it is important to show their children that it is possible to repair. This sense of responsibility in prolonging product lifetime (e.g., Evans, 2005) shows a desire to make the younger generations care for their possessions. Responsibility is not solely in contexts of CE afforded the citizen-consumer of a service or good, but producers are increasingly mentioned in relation to producer-responsibility schemes. This follows a line of reasoning of polluter pays as well as taking responsibility of the waste generation. Offering spare parts to ensure product longevity is thus a way to share the responsibility of a product with its user. Wieser (2019) writes that such examples of provisioning require significant coordination work on the consumer part. This shows that reorganising consumption entails a compromising path where consumers put in more work to prolong product lifetime, but that it does not happen separately. The work highlighted in this case points to a sharing of responsibility between the domestic and manufacturer to ensure lifetime extension of electrical appliances.

The CW framework highlights that a prerequisite for consumption is work. In traditional waste systems, wastes are transferred beyond the household into a large market and industry. It requires coordination between domestic and external actors to make this transfer. In this study, this is also still the case, but circular activities like composting and bokashi fermentation require an internal reorganisation of practices that entails more work on the part of the citizen-consumer. Based on the findings of this study, a turn to a

more circular consumption pattern is likely to mean that the average time spent on preparing for consumption will increase. This will then happen either through increased outsourcing of services like repairs from the household or through retaining responsibility at the individual level. Either way, this increase will have further implications for the organisation of consumption and everyday life.

## **6. Conclusion**

Connected to their efforts to turn deeply ingrained consumption patterns into a more circular direction, the participants revealed that they engaged in envisioning and enacting a more specific and alternative CE that links to ideas of a local, community-based, and self-sufficient mindset that – if fully realised – represent a different way of organising labour. Building on the consumption work framework, the activities and reflections of the participants in this study link to the economy in ways that move performing work within the domestic sphere. The participants take more responsibility to manage their own waste and their appliances themselves. In this way, artefacts and particularly food waste remain for longer periods of time within the household.

The findings reveal how the abstract opposition between linear and CE is performed by the participants in this study as an opposition between dependence on (often global) flows of goods on the one side and self-reliance on the other, and between work performed outside the home to earn a living and inside the home to engage in sustainable activities—making this connection to larger systems that govern and shape consumption. In experimenting with their everyday lives, the participants show how their experiences with circular activities affect perceptions of spaces and times of production and consumption and the management of these resources. It taps into how the economy is geared – the current efficiency and science and technology-centred emphasis of the neo-liberal market economy, and how working hours play more important roles in the decisions informing consumption. The households embody and enact repositories of knowledge and histories of the past in constant negotiation with the present and the future. In these temporal connections, it becomes visible that they also link directly with international political goals of circularity, local socio-technical- and economic systems of production, provisioning, and post-use.

On the background of the discussion and the findings, it would be instructive to widen consumption debates to include how work life and working hours affect different types of consumption. This paper contributes to and extends the original scope of Wheeler and Glucksmann (2015) by including specific CE activities of repairing and the narrower focus on food waste management. In addition, the paper brings into focus that social and cultural aspects like people's histories play an important role in shaping visions of desired consumption. These aspects are for the most part missing in much of current policies towards CEs, most notably in the Norwegian national strategy for a CE where consumers not even appear as having a role in circular transitions, but also in EU policies in which still the image of rational consumers dominates. Against this background, it is advisable for practitioners and policy makers to connect environmental consumption choices with how people understand their work-life and local opportunities of action. The study shows that if time is to be made available to shift consumption, governments must consider how work is organised. If people do not have opportunities to alter their consumption, large sustainability potentials of circular transitions remain untapped. Making further connections between everyday life, work-life, and policies by focusing on time management would be an important avenue for future consumption research based on this paper's findings, particularly in the context of CE transitions.

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## **Part Three – Cross-Cutting Analysis**



## Chapter Six: Cross-cutting Analysis

In the empirical studies presented in the articles, we have met a puzzling array of actors that form discourse coalitions, potential vanguards, domesticate exogenous policies, and try to transform their households into more circular ones. Some of them saw in the circular economy concept a way to achieve economic growth, for some it meant to return to smaller and simpler lives, some claimed it was nothing new for them at all, and others struggled with the impossibility of living a circular life. In what follows, these voices are set in relation to each other.

To reiterate, the goal of this thesis is to study the introduction of the concept of circular economy and how actors envision and enact it in Norwegian contexts. The presented voices represent different answers to these questions, and this chapter aims to situate them in an overarching framework. But first, a brief recapitulation of the four articles in the preceding part is useful, and for clarity, I refer to the articles in the analysis as Article One, Article Two, Article Three, and Article Four as they appear in Part Two.<sup>1</sup> Table 6 below showcases the relevance of the research questions and which article they are relevant for. The research questions are: (1) How did the circular economy become a political priority for a more sustainable production and consumption system in Norway? (2) How do actors envision the circular economy concept, and (3) What are the implications of these visions and enactments for the Norwegian transition to a circular economy?

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<sup>1</sup> **Article One:** *Emerging Circular Economies: Discourse Coalitions in a Norwegian Case*

**Article Two:** *Domesticating Circular Economy? An Enquiry into Norwegian Subnational Authorities' Process of Implementing Circularity*

**Article Three:** *A Norwegian Circular Economy? Protestant Visions of an Alternative to Mass Consumerism*

**Article Four:** *Consumption Work in Household Circular Economy Activities: Findings From a Cultural Probe Experiment*

	Article One	Article Two	Article Three	Article Four
RQ 1		X	X	
RQ 2	X	X	X	X
RQ 3		X	X	X

**Table 6.:** The research questions' relation to the articles.

## 6.1 Summarising Discussion of the Articles' Results

In the first two chapters of Part One of this thesis, I situated the circular economy concept within the Norwegian context by focusing on historical developments and offered the necessary background information to be able to answer the first research question. Here, I answered parts of the research question by pointing to an ambivalent historical development that simultaneously focused on political and industrial ideals of economic (green) growth and where the state heralded itself as a sustainability pioneer (Anker, 2020), particularly from the 1970s onwards. Alongside this development, a cultural critique of mass consumerism existed, which informs current alternative circular economy interpretations.

Articles Two and Three build upon the contextual insights from Part One and further explicate the circular economy sensemaking across three levels of government and their domestication processes. It continues to answer the first research question in more detail about how the circular economy became a political priority for the National Government and the subnational authorities. The circular economy's introduction into Norwegian contexts follows the domestication of exogenous circular economy policies from the EU, which government professionals translate into its local contexts. For the subnational authority of Trøndelag County, the circular economy became operationalised through interregional projects financed by the EU. The domestication processes of the circular economy concept done by the National Government and subnational authorities are translative and transformative; where the former looks to create interest for and seek input from industrial and business actors for its translation into a national strategy. The latter relates to the understanding of imagined futures that happen in collaboration between the public and civil society actors. Trondheim Municipality saw the engagement with the circular economy coming from primarily waste management activities, but it



domesticated and enacted a potential vanguard vision promoted by the Future in Our Hands (FIOH).

As shown in Article Three, the circular-economic vanguard vision of FIOH materialised in two cases of close collaboration with the subnational authorities. This vanguard vision took inspiration from the early consumption critique of the 1970s, which contains characteristics of the Protestant ethics of frugality and individual responsibility that go beyond principles of economic growth.<sup>2</sup> Despite the alternative circular vision here, aligning with the third discourse coalition in Article One, holds an anti-growth position. It does not exclude ideas of development but orients its development focus towards a collective organisation through regional and local governments to preserve the individualised and sufficiency aspects present in this vision, but also to strengthen the knowledge aspects that are relevant for new circular enactments. The introduction of the vanguard vision is another way the circular economy became part of subnational authorities' practices. However, there are other visions and interpretations of the circular economy within the studied Norwegian contexts.

As the extant literature on the circular economy shows, the circular economy is interpretatively flexible, meaning that the concept allows for the inclusion of many elements whose natures sometimes contest each other (Korhonen et al., 2018; Corvellec et al., 2020). Article One analyses the different interpretations by identifying the three discourse coalitions of 'waste as a resource', 'sharing economy', and the diverging and alternative 'consumption reduction'. Where most of the studied actors' understanding of the circular economy aligns with the two former coalitions in which notions of economic (green) growth and development are central, the third discourse coalition contrasts them by questioning and diverging from the belief in continued economic growth, but additionally through the idea that change comes from sources other than technology development and economic interests. The discursive competition among these three discourse coalitions focuses on the ambivalence of having economic growth as the guiding principle for circularity.

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<sup>2</sup> Protestantism is ambivalent in this regard as it also is about growth which derives from the belief that God has faith in you if you have economic success (Hughes, 2005). But people could never be entirely sure if they did, so people continued to build, expand, and grow in an unorganised fashion. Max Weber described this as the formation of early capitalist development. However, protestant individuals were frugal themselves.

In Article Four, a potential vanguard vision promoted by FIOH is presented as guiding the householders' attempts to shift domestic consumption enactments towards more circular and local ways through consumption work (Wheeler & Glucksmann, 2015). The households examined here tended to envision and enact circular production and consumption practices with strong personal ties to their past, where one was frugal and had strong community relations. The domestic dwellers' consumption work tended to reveal tensions with the current organisation of wage labour, in which the extra time required to enact circular activities made it difficult to change their consumption in a sustainable direction further, thus being 'caged' in the linear mode of production and consumption. This finding implicates how policies can support domestic circular consumption that goes beyond linear-economic modes of production and consumption.

As we have seen thus far, a wide range of actors envisions the circular economy differently, which means varying enactments in different contexts. Article One shows this, for example, in which industry actors operate within a space suited to innovations and technology development to produce better recycling technologies, systems, or products that can increase the material recovery of waste generation in society or utilise energy and material surplus in one production process in another. Likewise, actors within trade and commerce are interested in developing eco-friendlier products and services to reduce resource use and related emissions. We learned that actors in one area create collaborations based on industrial symbiosis in which by-products are used and not wasted within a cluster of actors. Grassroots movements are socially organised and often have one or several focus areas that they work to improve. For example, FIOH is one of these actors who have long worked to reduce private consumption. Then we have the politically oriented actors such as the National Government, municipalities, and counties, which, especially Articles Two and Three, show and answer in the second research question, are important in enacting and facilitating the circular economy. Households are part of the vision work of conceptualising the circular economy and what constitutes the good life and society. As the article shows, the dwellers had thought about these things before the study.

In Article One, we identified the formation of three discourse coalitions which show us that there are two coalitions that follow the dominant vision of circularity, positioned within an economic (green) growth paradigm, and one coalition that diverges

by focusing on consumption reduction through other ideals than economic growth. With this as a starting point, Article Two narrows its focus to the processes of domestication by the National Government and the subnational authorities of Trøndelag County and Trondheim Municipality. It highlights transformative change within the city, which Article Three explicates in more detail. Here, a particular vanguard vision promoted by the Future in Our Hands (FIOH) influences the subnational authorities' work. In Article Four, it is revealed that households are highly motivated to shift to more circular consumption activities, but they experience structural resistance when doing consumption work.

A question arises from these empirical connections: How can we further understand the relations and interactions between the different levels and actors in which circular economy visions are created and the circular economy is enacted? The theoretical tools used in the studies all have in common that they draw their explanatory force from connecting traditionally divided approaches. Discourse coalitions connect politics with language, domestication traces how exogenous forces become part of domestic (literally or in terms of domestic policy), vanguards are local harbingers of changes in the way large collectives imagine their desired future, and consumption work has the explicit goal to connect households' consumption activities with the larger economy. Based on the work done with these tools, I am now able to deconstruct another powerful dichotomy, which divides approaches to socio-technical transformations: the one between bottom-up and top-down drivers of change. There are lines in the empirical material collected that fall in line with a top-down narrative, e.g., the exogenous influence of EU policies on regional policies. And conceived as a grassroots movement, FIOH and the households that explicitly or implicitly share its visions can stand for a bottom-up approach to a transition to circularity. However, Part Two also shows that the circular economy becomes, in addition, enacted at a specific level operating between the top-down and the bottom-up: the meso or middle level occupied by the subnational authorities. As I will show, this level and actors within is a particularly relevant unit of analysis because it gives attention to the dynamics between actors at different scalar levels and their visions and enactments.

In this penultimate chapter, then, I depart from the four articles in Part Two by analysing them together with a particular focus on the role and dynamics of the studied

subnational authorities. In a first step to further the insights of the articles, I begin by presenting the theoretical foundation that will serve as the guiding perspective for the cross-cutting analysis.

## **6.2 The Middle-Out, Mediation, and Socialisation**

Within Science and Technology Studies (STS), one way to understand the dynamics between the different levels and actors is to follow the actors, as Bruno Latour (1987) encouraged. Who and what acts, is, in this tradition an empirical question, explicitly refusing to assign privileged agency to specific groups or phenomena that are assumed to be powerful (Latour and Callon, 1981). Kathryn Janda's and Yael Parag's Middle-Out approach (Parag & Janda, 2010; Janda & Parag, 2013; Parag & Janda, 2014) was originally created based on them following actors in low-carbon initiatives in the built environment. There they found that between the top-down of introduction of sustainable innovations through building codes and construction industry, and the bottom-up of occupant engagement, a third option exists, which is based on the invisible work (Star & Strauss, 1999) of facilities management. Generalised, the Middle-Out approach is a way to nuance the dominant focus on the top and bottom actors as drivers of change by considering those that 'fall' in between as passive and inconsequential. Breaking down such dichotomies is a cornerstone of STS work. Instead of focusing only on those actors at the top who appears to have definition power or the more marginalised bottom actors fighting to get their message across, showing how these actors influence and shape other actors and give them meaning, we can better nuance and understand how they organise society (Skjølsvold, 2015). The Middle-Out approach recognises that those actors residing in the 'middle' are more familiar with the contextual factors shaping individuals' behaviour than actors 'at the top' and, at the same time, understand macro concerns better than those at the 'bottom' and thus are positioned to influence change upwards, sideways, and downwards (Parag & Janda, 2010).

Parag & Janda (2014) are strategically unclear about the issue of the definition of who or what constitutes a middle actor: they answer that it varies depending on the context, situation, and position of other actors. These categories are relational, both internally and regarding the specific context of study. As the authors explicitly state, local

governments can be, in one context, a top actor but a bottom or middle in another. Considering this, none of the actors within any of these levels is predefined or fixed, and one way to define where an actor belongs, according to Parag & Janda (2014), is to define the actors' relative position regarding which direction they act towards. Here, I approach the subnational authorities as middle actors in reference to implementing the circular economy based on the articles' topics and their analytical foci. The subnational authorities become important as they are close enough to the citizens and other organisations, and they have the political connection and mandate set by the state and other exogenous policies while simultaneously keeping their political autonomy to realise their projects without interference from the top or bottom.

This leads to the dimension of the 'agency' of the middle actors, meaning "the ability to take action and choose what action to take" (Cambridge Dictionary, n.d.), which is essential for a successful transition to sustainability. Agency here denotes the actors' willingness and capabilities to make choices and the capabilities to perform or enact the choices (Parag & Janda, 2014). This ability to engender change is not an essential characteristic of 'the middle'. Instead, it results from its position 'in-between'. Moreover, the agency of an actor also depends on factors such as infrastructures, laws and regulations, culture, and institutional arrangements (Parag & Janda, 2014).

### **6.2.1 Mediation and Socialisation**

The authors' discussions about the well-positioned nature of middle actors also include a discussion about what a middle actor is not. A middle actor is not an intermediary in the traditional sense of being a broker between actors in facilitating flows of knowledge (Van Lente et al., 2003), but this framing, according to Parag & Janda (2014), precludes them from having independent agency. Instead, other actors shape the priorities of such intermediaries through local conditions or influences outside the immediate context. In the same vein, Latour (2005) distinguishes between two conceptualisations of social actors: intermediaries and mediators. An intermediary is one that "[...] transports meaning or force without transformation: defining its inputs is enough to define its outputs" (ibid., p. 39), while mediators "transform, translate, distort, and modify the meaning of the elements they are supposed to carry" (ibid., p. 39). As such, my focus on

middle actors, such as the subnational authorities, assumes that they are more than intermediaries because they can shape societal norms and practices (Parag & Janda, 2014). Instead, seeing actors as mediators ties into the agency of the subnational authorities, and its role in transforming circular visions into practices.

To further understand the dynamics of the middle-out actors' agency, the concept of *socialisation* (Bijker & d'Andrea, 2009; Sørensen, 2013) provides a way to think about what the subnational authorities do when implementing circularity. The concept originates with social psychology to describe how children are raised to fit society and social expectations. From there, it was adopted to describe how technology and knowledge are incorporated into society. In this sense, it is a mirror concept of domestication (Sørensen, forthcoming). Sørensen (forthcoming) lists a number of sites where socialisation can happen: marketing, demonstration and pilot projects, newspaper articles, and science communication. Like mediation that Latour (2005) discusses, socialisation is action-oriented, focusing on the actor(s) and their incorporation activities. Socialisation shares with mediation an emphasis on efforts to give change meaning, to embed it into existing practices and foster capabilities needed to implement the change successfully.

Using this as the starting point means an empirically based analysis that accentuates how visions of circularity are produced and enacted by middle actors in a way that enables the socialisation of circular change. This, then, becomes visible as efforts of co-production that include possible modifications of what a circular economy could be in the regional context and proposals of new practices and other social changes emerging from these modifications of both the object and its meaning (Sørensen, forthcoming). Bijker & d'Andrea (2009), writing about technoscientific objects, consider local governments, such as subnational authorities, to be agents of socialisation. With respect to the circular economy, when understood as an amalgam of overlapping and sometimes competing interpretations from different areas of society, such as research, innovation, policy, think tanks, production, and consumption, socialisation is a process of designated efforts in which actor(s) incorporate the new object(s) into specific parts of society (Sørensen, forthcoming). Middle actors, defined as having a mediating function between scalar levels above and below them, translate and transform the meanings of other actors

through socialising efforts that include proposals of what a circular economy may be in practice.

In what follows, I present the relations between the various voices collected in the empirical parts of this thesis, taking the subnational authorities as starting point through the lens of the Middle-Out approach and supplemental perspectives of mediation and socialisation. This perspective responds to the call of Parag & Janda (2014) to investigate the Middle-Out activity and multi-level governance since the locus of this thesis and cross-cutting analysis engages with these dynamics. Next, I define and discuss further the positions and connections between the different actors in the articles.

### **6.3 The ‘Top’, the ‘Middle’, and the ‘Bottom’**

In a first step, I will now position the actors encountered in the articles in relation to the Middle-Out approach. A discussion of the relations between the actors follows then in the next sub-chapter.

Especially Article Two shows how the subnational authorities mediate between the National Government and the EU on the one hand and the citizens, environmental organisations, and smaller circular businesses on the other. Although the connection or space between the supranational entity that is the EU and a municipality in Norway may be far apart, they are connected in terms of the directives they set and which the local authority tries to implement them. The Norwegian Government is vital in this regard as it operationalises and domesticates the EU’s calls into its context (Alasuutari, 2009), making it possible for subnational authorities to domesticate them further. As such, it is also the case that the top actors and bottom actors influence the subnational authorities, which mutually affects them in return.

Article One shows that two discourse coalitions orient and align with the dominant EU and contested green growth-based policies aiming to decouple resource use from economic growth. Herein the focus is on better recycling and material recovery technologies and systems, innovation for new business models that can also alter consumption patterns to more circular options, which also ties into an interest in designing and producing more environmentally friendly products (European Commission, 2015; 2020; Ministry of Climate and Environment, 2021). While these strategies also give space

to consumer or citizen perspectives, they are addressed passively and with a deterministic flavour; changes in consumer culture and habits will be unleashed when technological improvements and innovations are available and when regulatory, cultural, and knowledge barriers are torn down or loosened up. The first paper finds that the ‘waste as a resource’ and ‘sharing economy’ coalitions reproduce an eco-modernist and techno-centric solutionism to overconsumption, which for example, one of the county professionals contested by reflecting that circularity would be better suited to find solutions based on low-hanging fruits or paths of least resistance to instigate change. As such, we can frame the EU and the Norwegian Government as Top-Down policy actors seeking to achieve societal change through broad translative efforts aiming at technology and business development. Since the state decides the political latitude of its subnational authorities and because each respective governmental constellation influences this through its political ideology or specific policies, it makes sense to ascribe them to the role of a top-down actor.

The Bottom-Up actors in the articles are actors on the periphery of decision-making power, such as households and NGOs such as FIOH. They are part of a diverging group that envisions an alternative direction towards sustainability than those promoting growth-centred policies. Citizens exert political influence by voting and electing their parliamentary or local representatives into office; thus, one must have some belief that their political interests are cared for by the elected, and after that, their direct influence is limited and fragmented. Organisations like FIOH, because they are organised, have more political influence than individual citizens because of their resources and mandate.

Now that the different actors are defined and positioned to each other, I will focus more explicitly on the dynamics between the top, the middle, and the bottom by discussing their agencies, mediation, and socialisation efforts.

#### **6.4 The ‘Middle’ and its Transformative Capacities**

The aspect of ‘agency’ is of empirical significance in the Middle-Out approach (Janda & Parag, 2013; Parag & Janda, 2014). One way to see it is through what has happened at the different levels, and as empirically shown, the National Government has hitherto been primarily engaged in creating a knowledge foundation for its circular economy strategy



in which they sought input through written and physical hearing processes and hiring an external consultant. Despite that, the National Government oversees and is responsible for many sectors of society, which follow their respectable directives and regulations; their primary work of implementing a circular economy has been translative, meaning that they not only translate exogenous policies into their context but also identify and translate back to the public what other actors' concerns, expectations, and suggestions are.

The subnational authorities must initially adhere to their mandates of providing well-functioning services for their citizens. Moreover, they are tasked to do so in economically responsible ways, and there are explicit and implicit expectations that they foster economic growth in their respective regions. In this latter context it is no coincidence that circular economy is part of the county administrations 'value creation strategy', mentioned side-by-side with other areas that are seen as economically important such as the exploitation of marine-based resources and tourism. Two of the three discourse coalitions identified in Article One are oriented towards these links to the 'top' to which subnational authorities have to relate.

However, given the significant political latitude set by the state, governmental professionals can engage with non-governmental actors and vice versa, as shown in Article Two and Three, and can therefore be parallel mediating practices. Subnational authorities do not operate in a political vacuum where policies are solely implemented by those who create them. As shown in Part Two, initiatives related to the circular economy took root in not just specific circular economy policies or recommendations, which there were few of, to begin with, but were driven by other goals such as cross-sectoral collaboration and supporting actors that can contribute to sustainability. As Mahon (2021) states, most of the circular economy policy measures to date have represented a limited evolution of traditional waste management policies. However, as I have demonstrated in Article Two and Three, the local government and county have shown an effective implementation of their key policy about involving other actors to achieve sustainability which traverses the singular waste management focus, although it still holds an important role in this transition to the circular economy. Lacy and colleagues (2020) write about the role of policymakers and that policies to accelerate the circular economy should begin with a clear vision, outlining what circular initiatives and activities the government would

like to see and the objectives it seeks to attain. While this might be one promising way of implementing circularity or any other policy, it is not always straightforward, as this thesis has shown.

Regarding the policy realm at the municipal level of this thesis, there are differing ideas of circularity covering distinct areas of society. For instance, one of the former waste managers in Trondheim held that it was not uncommon to think of the circular economy, understood as recycling and material recovery, as something they had been doing for a long time. Since the publication of Article Three, which initially highlighted that FIOH was involved in a pilot project about a multi-function centre for circular activities, the BrukOm pilot has become a reality where the Municipality took over the project and made sure that the waste management department runs it. Hence, it shows further that the Municipality transforms traditional waste management practices by adding an extension to its existing activities. This is enabled by their role as enabler and partner (Kronsell & Mukhtar-Landgren, 2018) in cooperation with organisations that organise society in a bottom-up way such as FIOH.

The municipal services encountered in the empirical material as involved with circular economy differ greatly in their goals and areas of engagement. When waste is collected, the goal is to sort it to the best of their abilities and ensure that the material recovery rate is high, utilised, and prepared for reuse when possible. For a librarian or the public library, the task and goal is to promote information, education, and other cultural activities through active dissemination and by making books and other media available free of charge to everyone living in the country (Folkebibliotekloven, 1985). One of the findings in Article Two is that the Municipality engages in learning by doing processes, and connected to learning, the Municipality socialises the circular economy through promoting the library activities of tool lending, repair workshops, and experimenting with ‘circular’ activities and knowledge exchanges in the public libraries, which includes NGOs and other publics, from which they learn.

The role of public libraries, which provide one of the services municipalities in Norway are tasked with by the state, is changing. The collaboration with the grassroots organisation FIOH has created a form of renewal, as identified in Article Three. Here, we see that there is a specific type of added goal that aims to contribute to the SDG goal of responsible production and consumption but offers an alternative to individual economic

exchanges through principles of renting and reusing. Hence, the public library is part of one way to reorganise consumption cultures by being a direct link between its citizen-consumers and the more top-down oriented political goals of sustainability focusing on technology development. In this way, it is an example that the Municipality as a middle actor facilitates not only its primary objectives but transforms its practices to facilitate the development of a consumption culture by utilising existing resources and infrastructures. The Municipality's agency shows that it can mediate other actors' needs and ideas from both the top and the bottom by giving meaning to the circular visions by creating new practices. This is the Municipality socialising the circular economy into existing spaces of Trondheim, making potential future changes in consumer behaviour and culture more accessible. The Municipality governs several libraries across the city, strengthening the socialisation processes and preparing society and individuals for domesticating circular economy activities.

The subnational authorities' agency to make their own choices and perform them reflect their position as in-between actors and levels (Parag & Janda, 2014). As we have seen clearly in the last example, this agency depends on the positionality between 'the top' and 'the bottom' and the established relations. The positive outcomes of the cross-sectoral collaboration have also influenced the agency of the other involved actors because not only was the FIOHs initial project legitimised through the authorities' institutionalisation, or the socialisation of them, which promoted new circular activities, but it also established a network of other actors and groups that participate in organising workshops, repair cafes, and swap events, through the library infrastructures. Thus, the Municipality and these actors continue to push the alternative circular economy vanguard vision of consumption reduction, gaining momentum, which could, over time, become a sociotechnical imaginary (Jasanoff & Kim, 2015).

## **6.5 Mediation and Socialisation from the Middle-Out**

The subnational authorities' cooperative interventions have potential as they laid a foundation in which further circular economy implementation can be broadened and upscaled. Moreover, since other municipalities have library spaces, it is probable that they can implement this vision. As such, these findings highlight that the subnational

authorities changed at least two central aspects of their institution: waste management and increased preparedness for reuse and library services. The transition to the circular economy requires such institutional changes (Domenech & Bahn-Walkowiak, 2019). One of the major foci of circular economy policies and measures is the technical realm of efficiency to close material loops within the design, production, and waste management phases (Kautto & Lazarevic, 2020), but my findings accentuate a different focus and synergy to policy implementation, which is necessary to create local circular economy visions (Jørgensen, 2019b). Not only can we see that an alternative circular economy vision is underway in Trøndelag, but it is being enacted daily by its citizens, thus legitimising the vision and the work of the subnational authorities.

The transformative change through mediation and socialisation in Trondheim is one step in the right direction to overcoming silo thinking, institutional barriers, and technological barriers in the physical infrastructure and system of handling waste (Deloitte, 2020). What happens is that the Municipality changes its institutional practices and culture from within, in its waste management department and environmental department, to affect change among the citizens. It communicates its activities on social media platforms, thus communicating that the vanguard vision is desirable not just for the Municipality but something that it believes its citizens also want. This is part of the socialisation efforts of the Municipality. It assumes the role of an agent that enacts crucial functions in the transition process (Parag & Janda, 2014) that actors like FIOH, citizens, and the state cannot. Based on the findings here, this has led to durable change within the city.

Another additional dimension was raised in Article Four about the householders who experienced systemic resistance (not time for more consumption work) when attempting to incorporate and enact circular activities. Within sociology, this would relate to the term “structure”, which could explain how actors act and which norms they extract from the culture and the structure(s) they engage in and with. However, the position that Parag & Janda (2014) take, which better reflects the articles’ findings and constructivist thought, is that agency and structure are complementary and interacting forces affecting each other. As such, it is clear from the domestic dwellers of Article Four that they inherit significant agency – a desire to change – and they succeed in consuming circularly. Still, they meet resistance in the form of standard wage labour work weeks that limit their

ability to achieve their desired potential. Individuals are more likely to change their habits when this and other structural/systemic resistances are removed, alleviated, or support desired behaviour (Parag & Janda, 2014). Middle actors like the subnational authorities have made it more accessible for people to engage in circular activities. The citizens benefit from the Municipality's successful collaboration and continuation as it shapes internal practices and infrastructures and forms consumption behaviours, as evidenced by the number of tool rentals. According to Parag & Janda (2014), physical infrastructures, in the context of energy use in buildings, influence behaviour more than social structures. However, it is likely that the physical infrastructures of the two cases also influence people's attitudes and habits. As the authors state, change is possible when the agencies of both the Municipality and its citizens are high.

While it was FIOH that proposed the tool-library project to the municipality and applied for funding to the county, which resulted in BrukOm, it was the Municipality that took over as project owners because it was within the Municipality's mandate and jurisdiction to provide the necessary infrastructure, systems, and resources to mobilise the change. In one way, the cornerstone of domestication (Lie & Sørensen, 1996) is how someone makes something one's own, and in the case of the Municipality as a middle actor, the establishment of these projects can be regarded as making aspects of the circular economy like reuse, sharing, and knowledge exchange its own – as a service to the citizens. Furthermore, establishing the tool library reduces individuals' need for personal ownership and thus limits economic exchanges when used. Regarding BrukOm, the large second-hand market organised by the municipality, there will still be economic exchanges, but it is likely that it does not increase the demand for new goods, which requires new raw materials for its production. Establishing spaces that, perhaps in the future, can compete with established businesses is important if the very fabric of consumer culture is to transform and where the consumer can escape the 'iron cage of consumerism' (Jackson, 2017). The cases of BrukOm and the tool library are not just coincidences but a consequence of the mediating and facilitating agency of the Municipality as a middle actor, which socialises an alternative circular economy vision through transformative changes within two areas of its operation.

## 6.6 Escaping Consumerism's Iron Cage Through the Middle?

In the context of this analysis, Jackson's (2017) 'iron cage' metaphor is intriguing as it points to how societal structures reflect the institutionalised characteristics of linear production and consumption systems. Hitherto, challenges of circular economy implementation have been concerned with breaking down barriers that may impede the circular transition. This chapter has shown how such a shift could happen in which a particular sociotechnical vanguard pushes its alternative circular-economic vision, which one day could become stable enough to elevate to the status of a sociotechnical imaginary that is institutionalised (socialised) and publicly performed. I will argue further that the cross-cutting analysis also offers evidence of how to begin to escape the linear logic of production and consumption in which the subnational authorities are crucial.

As such, to move beyond high levels of private consumption, we have seen a complex process unfold: first, most of the actors, as highlighted by the first two discourse coalitions, show that they try to adapt the circular economy to the dominant economic paradigm of growth, while the third coalition diverges in which vanguards push an alternative circular-economic vision. However, because this vision is marginal compared to the dominant vision of circularity, it requires the facilitation, mediation, and socialisation by a middle actor, the subnational authorities, to implement it. Second, we see here that the subnational authorities socialise this alternative vision to make it easier for its citizens to engage in circular consumption work as a reorganisation of consumption strategy. In this way, the socialisation here makes the domestication of household circular economy activities more successful, reducing the difficulty of escaping consumerism's iron cage – just as the householders indicate, they want to consume differently but are restrained by systemic barriers.

Therefore, as the analysis has shown, the role of scale is central to the transition to the circular economy in Norway. Not only is the 'middle' level here a promising site for transformative change, but scale also points to the size of the material loops of the economy. The enacted alternative vision here emphasises a shift in consumerism that reduces the need for engaging in or stimulating globalised production and consumption systems. Lending tools and reusing furniture and other goods do not require vast and complex material and social loops. Instead, they are focused, narrow, and local. As such,

by supplementing the Middle-Out approach with Latour's (2005) mediation and Sørensen's (2013; forthcoming) socialisation perspectives, we can better nuance the dynamics between scales and actors in enacting circular-economic visions. As the findings show, the infrastructures that are central to the tool library and reuse centre are provided by middle actors.

Before concluding this chapter, I want to raise some potential limitations and concerns about the role of subnational authorities as middle actors and the Middle-Out approach. First, as Parag & Janda (2010) explicate, what constitutes the 'middle' is relative and not necessarily easily defined. I hope to have clarified in which context exactly subnational authorities have become middle actors in the cases studied and how their agency is formed by their positionality between national authorities and bottom-up initiatives. Secondly, regarding the limitations of the subnational authorities as middle actors, they are obviously not in a position to change national laws and regulations that can make the transition to a circular economy easier. They must adhere to the frames set by the state and the exogenous EU directives. However, in the Norwegian context, fiscal federalism provides subnational authorities with sufficient room to prioritise initiatives and projects and, in turn, transform existing practices with other actors.

To answer the third research question about the implications of the visions and enactments of the circular economy, the Middle-Out approach here shows that the role and activities of the subnational authorities offer insights into how the 'middle' is effective and suitable for bringing about circular transformation. Considering these insights, the implications of enacting the alternative circular economy vision for the Norwegian transition to a circular economy relate to the fact that the 'middle' is well positioned as it is anchored in existing infrastructures and practices that are developed. The finding from Article Two that there was little knowledge about the county and municipal initiatives on the side of an informant from the National Government, in light of this cross-cutting analysis, it can be reinterpreted as another proof of the autonomous agency performed by subnational authorities: the subnational authorities made changes that the state could not do themselves and had no reason to involve the national level. This implies that increasing and strengthening subnational authorities' support

mechanisms for actors seeking to establish sustainable practices is crucial to creating institutionalised and durable change. This would be a potentially important next step. From these reflections, then, there are good chances that similar synergies can happen in other municipalities in Norway and in countries that have similar governance structures.



## Chapter Seven: Conclusions and Recommendations

This thesis results from a desire to understand how the circular economy concept became Norway's dominant vision for a more sustainable production and consumption system. I was curious to find out how societal stakeholders interpreted the concept and how they attempted to enact their interpretations. The circular economy concept has come to act as an umbrella term for describing divergent visions and goals among diverse sustainability transition stakeholders (Bauwens et al., 2020). My findings relate to this diversity by showing that the broadness of the concept indeed allowed stakeholders to orient their interpretations to their context. As the introduction chapter showed, the circular economy concept is part of a parallel ambivalent historical development with ambitions to achieve sustainability on the one hand and (green) economic growth on the other. The political focus on waste management and the deeply culturally embedded recycling culture in Norway was central to which the circular economy would influence and develop further.

The identified discourse coalitions are evidence of the interpretative flexible nature of the circular economy concept. From the discourses emerged diverging positions to the fundamental ideology of what should drive the circular-economic transition: economic (green) growth or consumption reduction through sufficiency ideals. The identified visions orient towards different pathways to achieve not only circularity, but sustainability too. The vision of technology development and innovation, which dominates the national circular economy strategy, drives a circular economy transition that fails to properly address the structures that influence the high-consumption cultures and which engender passivity on the part of the consumer. Compared to this, the vanguard vision of consumption reduction pays more attention to how circular-economic change can happen through the transformation of existing practices and infrastructures that are already used by citizens, which strengthens the agency of consumers to alter their consumption. In a final effort to synthesise the insights of this thesis, I want to accentuate three main findings.

The first finding relates to the role played by the subnational authorities, which has been a central theme in the cross-cutting analysis. I defined these actors as operating within what Parag & Janda (2014) call the ‘middle’. At this level, these local governments are crucial socialisation agents of the alternative circular-economic vision pushed by the vanguards of the consumption reduction discourse coalition. The process of socialisation by the subnational authorities taking place in the region of Trøndelag and the city of Trondheim happens through activities and processes of cooperation and facilitation, as exemplified through economic support mechanisms for local businesses and organisations attempting to challenge existing and traditional high-consumption cultures with one characterised by repairs, reuse, sharing, and redesign. In addition, these authorities socialise the circular economy through processes of mediation. Here, they mediate between national and exogenous policies and expectations at the ‘top’ level and the citizens and organisations at the ‘bottom’ level by domesticating them. This mediation process ties deeply into the socialisation process as the activities seek to provide the vanguard vision with meaning by showing its citizens through repair workshops and other communication activities the value of caring for our products.

Second, the agency of local governments was not just about ambitious policy goals, but they actually succeeded in transforming (some of) their practices that better can facilitate a circular-economic transition. Article Two found this type of transformative performativity that the National Government could not do. As such, this thesis adds empirical evidence to existing calls for a stronger focus on local governments as key actors in transforming ambitious national and global goals and visions into local practices (McCormick et al., 2013; Palm et al., 2019). The type of transformation we have seen in this region coincides with Palm et al.’s. (2019) point about how infrastructures need to change to facilitate sustainable consumption. This thesis’ exemplars of socialisation and mediation through the ‘middle’ are conducive to realising a circular-economic transformation.

The third finding draws attention to the role of citizens in the transition to a circular economy. Citizens are expected to consume differently through circular

activities, but how can they do that when the existing linear production and consumption systems and the structures that organise people's work-life and wage labour organisation remain unchanged or are not developed sufficiently to accommodate the necessary changes? The fourth article explicitly captures that a shift to circular consumption entails more labour for the citizen-consumer, i.e., consumption work. Not only was this labour found to be necessary for the formal and institutional organisation of labour, but its value for society and life itself is vital (Jackson, 2021). The current organisation of labour contains structures that impede rather than support engagement with circular activities. For instance, Schor (2008) finds a significant positive correlation between national ecological footprints and average working hours. Thereby, addressing formal wage labour, reducing work time, and actively including these in sustainability policies may be necessary for a notable decrease in domestic consumption. As such, this thesis contributes to widening our perspectives and knowledge about the social dimensions of the circular economy.

In sum, the thesis contributes to the growing body of knowledge about circular economy policy implementation and governance at the 'middle' level, as well as deepening the insights into the complexities of everyday life and domestic consumption. Moreover, the preceding analysis has shown how middle actors can foster citizens' engagement in circular economy activities by transforming public spaces, taking Trondheim steps further to become a circular city (Jaeger-Erben et al., 2021). The results complement the work of Ortega Alvarado et al. (2022), which shows that alternative circular-economic vanguard visions emphasise experimentation in practical engagements with repair, reuse, and knowledge sharing. As they conclude, this could leverage a circular economy that challenges consumerism, freeing citizens from the iron cage of consumerism (Jackson, 2017). The successful cooperation demonstrated in the empirical examples of this thesis will be needed in the future to create not only local circular visions but also enactments (Jørgensen, 2019b) and to establish alternative avenues for the transition to sustainability as well.

In a final reflection, returning to the Norwegian sustainability ambivalences described in Part One, they first and foremost are connected to the 'top'-level of the actor

constellation analysed here, i.e., the national level. The analyses of Part Two and Three show that this ambivalence is less pronounced at the ‘middle’ level. Its central elements – a commitment to fossil fuel export, growth and consumerism mixed with strong claims of world-leading sustainability – appear instead as aspects contained in different discourse coalitions. The ambivalence is overcome in practical engagements enabled by middle actors. In this regard, and in general, further studies adding to the growing body of literature on subnational authorities’ enactments of circular changes are needed. Framing other municipalities and counties in Norway and other countries as ‘middle’ actors would then allow us to see whether comparable results can be found to offer deeper insights into the role of ‘middle’ actors as facilitators of visions and enactments of the circular economy. Continuing down this path, an important avenue for future research would be to research how circular-economic visions and enactments move between different scalar levels and what the roles of other actors, for example, citizens, play in this dynamic.

As a final concluding step, the next section presents a set of recommendations for the main actors addressed in the articles and the cross-cutting analysis.

## **7.1 Recommendations for Actors in the Circular Economy Transition**

### **I**

The Municipality and County rethink their roles as facilitators, mediators, and supporters of circular (sustainable) socialisation in light of the Middle-Out approach. In practical terms, this will mean to utilise and/or redevelop existing services and infrastructures. They are key to fostering a consumption culture based on circular-economic principles.

### **II**

The Municipality and County should seek actively and extend their cooperation with societal actors, for example, environmental organisations that already work with specific and relevant topics connected to the consumption of resources and products, and these consequences for nature and biodiversity.

### III

National Government should strengthen the financial support of subnational authorities that is earmarked for socialising activities to increase circularity. This can be done by strengthening and increasing the financial support that subnational authorities can hand down to their citizens. For example, covering the acquisition of bokashi waste composting, covering parts of the costs of repairing clothes and electronics, and reducing the costs of public transport. Tied to this, it would be relevant for the National Government to be more observant of the initiatives happening at the local levels, which would lead to better financial incentives for environmental organisations to initiate projects with middle actors like the subnational authorities.

### IV

Globally, governments have experimented with shorter work weeks, usually connected to questions of better work life. The National Government of Norway ought to, with other relevant actors, build on existing trials to explore how non-standard wage labour organisation can support changes in consumption practices towards circular-economic principles of prolonged product lifetime.



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# Appendices

## Appendix One: Coding Framework for Article Two

<b>Informant</b>	<b>Level</b>	<b>Category</b>	<b>Theme</b>	<b>Aligned quotes</b>
Nora	National	<b>Symbolic</b>	Planetary limits, material resource use  abstract concept, consumption	<p>“As an example, world overshoot day was last Monday, which is a symbol that we are on the wrong course”</p> <p>“The main motivation is related to that we know that we today have a global economy which is not within Earth’s carrying capacity”</p> <p>“It is a bit complicated, because CE is in a way very big and a bit abstract [...] at the same time it is very close to people, because it is very much about consumer patterns”</p>
		<b>Practical</b>	Translation work  interdepartmental cooperation  mapping, identifying CE	<p>“It is important to translate it (CE) from being a floating concept to something more graspable, or that it gets a practical consequence”</p> <p>“It is a group of state secretaries in the most relevant ministries working together (on the national CE strategy)”</p> <p>“interesting to just gather and find out which parts of our economy now we will characterise as part of the circular economy, and which are not”</p>

		<b>Cognitive</b>	<p>Continuous learning, no specific CE in mind</p> <p>international knowledge</p> <p>local knowledge</p>	<p>“There is continuous learning, and when we talk to people, we still await someone say that a strategy for CE should look like this and answer these questions”</p> <p>“[i]t is of course the IPCC that is our best source of information”</p> <p>“it can be thought that we need new knowledge about the Norwegian condition”</p>
Claire, senior advisor	County	<b>Symbolic</b>	<p>International and local understanding of CE</p> <p>Scandinavian-ness</p> <p>A topic for cooperation</p>	<p>“there is no common understanding of what circular economy is, and in our understanding, it is a paradigm. It is an aim to minimise leakage out of the loops, to substitute fossils non-renewables, to minimise consumption or to shift consumption. So, it is very broad”</p> <p>«Scandinavian approaches are quite rational in the sense we would like to know that it is worth the effort to work on circular economy both in economic terms, but also in environmental, and social”</p> <p>“circular economy works as a rallying point”</p>
		<b>Practical</b>	Best practice	«I think our way of working has been to find specific examples of

			<p>Feasibility</p> <p>Local cases of implementation of CE, translational work</p>	<p>what happens in other places, so best practice. And see what the low-hanging fruit, or what do we see that we can do in Trøndelag. Mostly to have achievable results so people get motivated and see that this is relevant for us and doable”</p> <p>“A lot of the implementation happens more by this road of less resistance. You do what you are able to do”</p> <p>“it is definitely not implemented in the entire region. I think implementation happens in pockets and in very small groups. With all due respect to my colleagues and to plans, it is not like a plan is implemented in its entirety, it is a piece of paper until someone decides that they want to do something with it”</p>
		<b>Cognitive</b>	Dual approach to CE	<p>“our approach now is twofold, so we work both on best practice stakeholders, translate to the regional context, implement which is kind of work "do-as-you-go", and then we work on the other track which is more the scientific way of first trying to develop a knowledge base and that is what we are doing with the research</p>

				communities.”
Catherine, advisor	County	<b>Symbolic</b>	A rallying concept	“It’s a buzzword, a very important buzzword both for the administration and for the politicians”
		<b>Practical</b>	Closing regional loops and maintaining resources within the county	“for us as a county, it’s just as important to bring the circular economy idea into our industries, that there are so many resources at the moment being shipped out from the region. We have to close the loop and we have very good possibilities for that, because we have a big corn production, a big vegetable production, a big house or husbandry productions. And the links between the blue and the green sector are there. But it can definitely be exploited in a much bigger extent.”
		<b>Cognitive</b>	Multiple CE sources	“It comes from our knowledge base, you have clear directions from the from the EU, and the IPCC reports and IPBS. So, the International Panel on Biodiversity in the Ecosystems, and there you have a circular economy white paper. And the Research Council”
Christian, senior advisor	County	<b>Symbolic</b>	Link between research and county	“Beyond that more people can simplify the interpretation of CE, by

			interpretations	for example not to look at the waste pyramid, this way to accept energy recovery is principally an interpretation of CE which is in line with the one we find in the research communities”
		<b>Practical</b>	Mainly business development focus	“CE is included in the county’s work with business development, but there are still challenges regarding inclusion in other areas (transport, procurement, buildings)”
		<b>Cognitive</b>	CE barrier	“My interpretation is that it has been uncomplicated to integrate CE in the business department. Meanwhile, there is a general challenge that silos create further challenges regarding how other county units include CE in their work”
Maya, climate advisor	Municipality	<b>Symbolic</b>	A broadly understood concept	“CE is more than reduction in emissions. It is about resources beyond climate gas emissions”  “It is also a buzzword many people use about many things”
		<b>Practical</b>	Public support for start-ups and circular practices	“We have a subsidy scheme where we support businesses wanting to compost food waste from restaurants [...] and we have given support to those start-ups we see need help”

			Support of circular offerings  Circular procurement approach	<p>“We support [name of business] because we see that they contribute towards buying used instead of new”</p> <p>“We have added a department agreement where the department heads are ordered to find used before new. And we help them with a repair space where furniture can be repaired. There we have an internal campaign to reduce the use of inventory and furniture”</p>
		<b>Cognitive</b>	Unspecified knowledge source for CE	“We have no specific knowledge base we use”
Martha, climate advisor	Municipality	<b>Symbolic</b>	Planetary limits, CE as a concept to address resource use	<p>“My personal motivation for working on the climate and environmental issue, I think the biggest driving, at the core of this, I mean CO<sub>2</sub> emissions is of course a big problem, but the biggest problem is that we don't have enough resources to consume, [...] if we continue to do things like that and consume and live, the way we live, we will need four planets</p>

			<p>CE as infrastructural demanding</p>	<p>[...] For me, the circular economy is really a mechanism for the effective use of resources”.</p> <p>“I think we have to put more energy on that (creating infrastructure and services) than telling people that they have to change their behavior. I think both are important, but we as an authority, we have the higher possibility to drive the service design. Making it probably as good as today or better but using less resources”</p>
		<p><b>Practical</b></p>	<p>Identifying programs for funding climate actions</p>	<p>“I would say that is one of the most important thing just to figure out which kind of programs are there, which kind of funding schemes are there, and one area that we are looking closer into, probably is the climate fund, like the financial sector, climate finance, like the banks and how do they support the climate actions through investment. That is quite important</p>

			<p>Promote and make visible circular offerings</p>	<p>as well.”</p> <p>“you see that there are people trying to make the green businesses more visible in the city context. Like trying or making a green map of green services, like repair or second-hand stores and you know, mechanisms that try to lower buying new products and stuff. I think there are people working on these kinds of like, green city guide, and a green map, so this is something that, we at least, from the municipality can do to make those services more visible and available to people.”</p>
		<p><b>Cognitive</b></p>	<p>Practical approach, contact with national and regional levels of plans</p> <p>Attentiveness towards local conditions</p>	<p>“There is a lot of learning by doing, and of course you have to follow up on what’s going on, the news of course, it is a good channel to get updated. When we are revising the plan, we have to go over the list of national strategies and regional plans and what’s going on in the local context”</p> <p>“You have to be alert of your surroundings when you are working with these kinds of issues. Yeah, so I think that is the main source, meetings, networks, and also follow up on what’s happening”</p>



Magnar, municipal engineer	Municipality , waste department	<b>Symbolic</b>	Old content in new wrapping	“I don't think it is quite new, I think we had work with circular economy for a lot of years, but we haven't called it circular economy”
		<b>Practical</b>	Technical advancement  Facility for reuse and redistribution of goods	“think that a sorting plant would be a first step for more circular economy projects in the region, so, when we are sorting out plastics for instance, we can use a way to treat the plastics and to make raw materials to the plastic industries in this region, instead of sending it to Sweden and Germany”  “We have companies collecting clothes, Fretex and so on, and we also have this recycling station at Heggstadmoen where you can deliver clothes and equipments to reuse purposes.”
		<b>Cognitive</b>	Research as important for increasing material recycling	“you have to find how to get good enough quality. Yeah, research and development [...] There is a lot of research activities, but if the costs are too high or if it takes a long time to come out with new ideas, it is put away, and they produce as they have done before. So, you have to push it, to produce the guidelines to push the industry to research more.”

Madeleine, public librarian	Municipality , public library	<b>Symbolic</b>	Reference to a more knowledgeable past of fixing goods	“Let’s say 50 years ago, everyone could fix their lamp or their jacket. Everyone could do that, but now, very few people can do that. I think that we lose practical skills because we tend to buy new jackets instead of changing the zipper.”
		<b>Practical</b>	Reciprocal cooperation to establish circular offerings	«They (Future in our hands) got some money (from the municipality) to start a project (tool library). After that, I think it has mainly been the library’s project. We don’t work together with them (on this project) now. It was only in the beginning. [...] We are always positive when somebody has an idea. We thought it was a good idea and we thought that it was good for the environment”
		<b>Cognitive</b>	Physical things, skills, and knowledge is offered by the library	“we want to offer knowledge and we do that of course with books, but also when we have these tools and events that I told you about. We want to offer knowledge together with the things we that we lend out, so we have the tools, these events that help you repair your bike, so the things we lend out is seen as a part of the knowledge.”

## Appendix Two: Interview Guide for Study One

### Part 1

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#### I. The interviewee as practitioner

- 1) Can you tell me a bit about your professional background?
- 2) In which department do you work here?
- 3) From which types of activities have you gained knowledge about sustainability and/or CE?

#### II. Sustainability goals/ general goals

- 1) What are your organization's sustainability goals?
- 2) How do you plan to achieve these goals?
- 3) Do you have any existing sustainability initiatives?
  - a. What are their goals?
- 4) Do you have any indicators in relation to the goals of the initiatives?
- 5) What is the financial source of these initiatives?

#### III. Circular Economy (CE)

- 1) If the CE is an area in which you work, how do you understand the CE?
  - a. If no, is there a department which does?
- 2) What are your CE goals?
- 3) How will you reach these goals?
- 4) Are they connected to your sustainability goals?
  - a. If so, how?
  - b. And in which areas?
- 5) In relation to the CE goals, do you have any current or previous initiatives within CE-work?
  - a. Which principles of the CE are being applied?
- 6) What are the challenges you face when working with the CE?

#### IV. Collaboration with others (stakeholder relation)

- 1) Which stakeholders are important in the transition towards sustainability and/or a CE?
  - a. Could you say something about why they are important?
- 2) Which stakeholders are you working with to reach your sustainability and/or CE goals? In the following order:
  - a. Public sector
    - i. How do you work with them? What are their roles? What is your role?
    - ii. Do you share similar goals?

- iii. What are the challenges with this collaboration?
    - iv. Opportunities?
  - b. Private sector
    - i. How do you work with them? What are their roles? What is your role?
    - ii. Do you share similar goals?
    - iii. What are the challenges with this collaboration?
    - iv. Opportunities?
- 3) In your view, what else can be done to achieve your goals?

**We will now move over to more specific questions that are central to our research.**

## **Part 2**

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### **V. Vision of the future**

- 1) How does your organization envision the future of Trøndelag/Trondheim?
  - a. What the organization's long-term goals?
  - b. For the city/villages?
  - c. For commercial activities?
  - d. For the environment?
  - e. For consumers?
- 2) What is the organization doing to reach that future?
  - a. How long will it take for it to be done?
- 3) How is the organization's vision for the future connected to other projects?
  - a. At national level/scale?
  - b. At planetary/international level/scale?
- 4) How do you define which areas are important for the future?
  - a. How do you prioritize them?

### **VI. Local resources (material flows and circulation)**

- 1) What is the organization's view on waste?
- 2) What is the organization doing about resources already in this region/city?
  - a. Is there a value in material resources that are discarded?
  - b. How can/is the organization taking advantage of these resources.
- 3) Does the organization work any initiative related to product re-use/repair?
  - a. How are they implemented?
- 4) What can be done by other actors to achieve a good use of the local available resources?
  - a. Is efficiency implied or a concern?
- 5) What is necessary to avoid local depletion of resources?

Consumption value from waste/resources?

## **Part 3**

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### **VII. Citizens' role in sustainable consumption/transitions**

- 1) How do you envision the role of the consumer/user in sustainability and/or CE transitions?
- 2) Do you engage with consumers/users in your work?
  - a. If so, how?
  - b. If no, why not?
- 3) What is your organization's view on sustainable consumption?
- 4) What is your view on bottom-up initiatives attempting to create sustainable practices (e.g. reuse etc.)?
  - a. Does your organization work with such initiatives?
  - b. If so, how? What is the aim with this collaboration?
  - c. If no, why not? Is there a desire to collaborate?
- 5) Are there policies or financial support in place which aim at helping or assisting bottom-up initiatives or citizens in *doing* and choosing sustainable practices?
  - a. If so, which policies/financial support?
- 6) How could your organization better engage with consumers/users in sustainable transitions?
- 7) In your view, what can citizens concretely do to become an active stakeholder the transition towards sustainability and/or a CE?

### **VIII. Service-based living**

A direction within the circular economy is the performance economy, which is about moving away from ownership to service-based living.

- 1) What are your thoughts on the premise of the performance economy?
  - a. And the sharing economy?
- 2) Are sharing services supported as alternatives to conventional ways of performing everyday life?
- 3) Are sharing services supported as alternatives to achieve your sustainability goals?
- 4) If it is an organization that profits: What is their business model based on?
  - a. Product oriented? (sales of products)
  - b. Use oriented? (access model)
  - c. Result oriented? (Performance model)

### **Part 4: Concluding questions**

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1. Is there anything you wish to add which we haven't talked about?
2. Are there any institutions and/or people you believe we should speak to, and if so, whom?
3. Would you be open to participating in a follow-up interview if needed?

**Thank you for your time and contribution!**



## Appendix Three: Handbook (English version)

### A HANDBOOK ON THREE CONSUMPTION STRATEGIES FOR A GREEN SHIFT

#### Background and information about the project

The project's overall theme is the environment, resource use, and waste management at both systemic, political, and household levels. These are topics I am personally very concerned about and find exciting to work with. Most of us may be aware that there is a significantly greater focus on global warming and the environment in the media, among politicians, and other actors. Not least that the changes "out there" are real. But how can society be turned in an environmentally friendly direction?

The research you will now participate in is based on the overuse of things that have major implications for the environment and the opportunities for future generations to have the same level of welfare and access to resources as us. At the same time, we see an unfair distribution of the earth's resources and wealth. To reduce the burden on nature, we find in Norway three main positions among politicians, business actors, environmental interest organisations, and industry to do this: green growth, sharing and service economics, and consumption reduction. These will be discussed later.

The experiment is inspired by the book "Consumption and the Green Shift" (Vittersø, Borch, Laitala and Strandbakken, red., 2016). The goal of the experiment is not to assess or measure what is right or wrong, but primarily to capture your experiences, experiences, and challenge you to reflect on your own consumption related to the topics of environment, resource use, and waste management. An important element is to see if these strategies lead to a change in the way you consume. You're the ones I want to learn from. I want you to think extra about how things are produced, how, and with what resources. What are the implications for the environment both locally and globally?

Over the past decade, the concept of **circular economy** has become a popular term among politicians and businesses for how resources should be better utilised while reducing the environmental impact. The focus is often on new business models, waste management, and product design, but there are also measures we can implement in our own everyday lives.

To live more "circular", one can avoid buying new things that contribute to increased resource use, throwing things away, while preserving the value of things, one can instead do the following:

1. Try to get things repaired by local repairers that can help reduce resource use, in addition to extending the life of the product.
2. Use reusable solutions that extend the life of products and reduce disposal.
3. Use sharing services that reduce the need for purchasing things and ownership.

4. Rent and borrow instead of buying.

### **What are you going to do?**

I encourage you to write a diary or log of what is done during the test period. It may be to:

- Write up which services/products are being replaced and which ones they are replaced with.
- Record the number of times something is used such as road trips, washing machines, etc.
- Write down thoughts, experiences and questions related to the strategy(s).
- Take pictures of products/services used and/or made yourself.

Before and after the experiment, a qualitative interview will be conducted that is recorded on tape recorder. It is also ideal for the project, if possible, whether a follow-up interview can be conducted a month or two after the experiment has been completed to see if there have been concrete changes in consumption habits.

Participation in the experiment is anonymised and the research has been reported to the Norwegian Centre for Research Data (NSD).



## 1. STRATEGY 1 – PRODUCT SUBSTITUTION

Product substitution means integrating the most energy and resource-efficient solutions into everyday life.

This strategy is the one that is most promoted by politicians both in Norway and abroad. They don't necessarily call it product substitution, but the strategy falls below what might be called green economic growth. It is about developing a market where we as consumers can choose the most environmentally friendly options. This is related to what is known as a dematerialization of production and consumption, or doing more with fewer resources. Among other things, energy efficiency and recycling of waste (resources) are strong. The political goal of green growth should be realized through technological and scientific solutions instead of directly addressing individual consumption.

An example of this is the government's recommendation to replace a fossil-fuelled car with an electric car as it has no direct emissions that harm the local community. The focus on electric cars in Norway is largely about reducing national greenhouse gas emissions. Beyond this, we see a broader focus on electrification of the transport sector through battery technologies to reduce emissions.

Other examples include insulating houses, switching to spare showers, better energy-labelled appliances, and products that have a greater proportion of recycled or reduced materials in them.

Beyond these specific examples, we find a sea of products that are advertised as more environmentally friendly. This is where it becomes challenging to consider what is a more environmentally friendly option. Such products can be cleaning agents, various types of packaging, clothing, hygiene items, etc.

You are not expected to replace the dishwasher or car, but it is these smaller products that are perhaps most relevant to this experiment. Questions such as "what do you think makes a product more environmentally friendly?" and "how do you go about it?" are relevant here.

On the next page you will find some examples of products/recipes in different areas of everyday life that should be more environmentally friendly options.

## **1. Transport**

- a. Try to take public transport/bicycle/scooter/walking instead of driving and air travel.

## **2. Food & Drink** (See Part 1 and 2 at the back of the manual for suggestions on "circular economic food")

## **3. Health & Wellness**

- a. Homemade Shampoo: <https://www.tv2.no/a/3914233>
- b. Homemade deoderant: <https://gronarekvardag.no/oppskrifter/deodorant/>
- c. Soap: <https://gronarekvardag.no/oppskrifter/enkel-heimelaga-sape-for-miljoet/>
- d. From tampon/bandage to menstrual cup:  
<https://gronarekvardag.no/emballasjefri/menskopp/>

## **4. Housework**

- a. Housecleaning: <https://gronarekvardag.no/oppskrifter/om-husvask/>
- b. From tumbler dryer to clothes rack

## **5. Clothing**

- a. Livid Jeans in Trondheim, a more transparent clothing retailer. Also offers repair of pants. <https://www.lividjeans.com>

## **6. Other**

- a. From plastic bags to carrying nets
- b. Bivokspapir for matoppbevaring:  
[https://etikken.no/?s=bivoks&post\\_type=product](https://etikken.no/?s=bivoks&post_type=product),  
<https://etikken.no/produkt/bees-wrap-3-pack-large/>
- c. From plant soil with peat to peat-free flower soil.  
<https://www.framtiden.no/gronne-tips/fritid/jordguiden.html>

## 2. STRATEGY 2 – REORGANIZING OF CONSUMPTION

This strategy involves moving away from the idea of ownership of sharing, renting, borrowing, and switching. The strategy falls under what is known as the sharing economy. A key element in addition to the sharing aspect is extending the life of products. It can be done through, for example, reuse and repair. According to researchers, the strategy represents a middle ground between strategy 1 and 3, because it can create jobs that in turn allow welfare to be maintained. Strategy 3, which we immediately get to, is linked to reduced economic growth.

It is argued that increased product life leads to a more sustainable consumption than strategy 1, because the products are used longer through care for things and repairs that lead to reducing the amount of waste, but also the need to buy new ones.

Examples of sharing economy include using the library for both entertainment and tool loans, digital platforms such as Finn.no and other applications to sell/give away/buy used, borrow from friends and family, and to use the neighborhood. In transport, it is common to talk about car collective.

An important point to mention is that buying used, giving away, and sharing has little effect if one also buys new.

Here you will find an overview of some selected services that offer alternatives to ownership.

### 1. Transport

- a. Nabobil: <https://nabobil.no>
- b. Trondheim Bilkollektiv: <https://trondheim-bilkollektiv.no>
- c. E-scooters
- d. Bysykkel: <https://trondheimbysykkel.no>

### 2. Other

- a. Tool loan at Trondheim Public Library: <https://biblioteket.trondheim.kommune.no/innhold/om-biblioteket/tilbud/verktoybiblioteket/>
- b. Buy/sell/give away: <https://www.finn.no>, <https://tise.com>, <https://trv.no/produkter-og-tjenester/brukom/>, <https://www.facebook.com/brukombutikk/>
- c. Tool loan at Clas Ohlson: <https://www.clasohlson.com/no/utleie-av-verktoy>

### **3. STRATEGY 3 – REDUCE CONSUMPTION**

The desire for green growth and the associated strategy 1 have been criticised for not being sufficient and reduced consumption has become an alternative to this. The challenge for such a strategy from a political standpoint is that it is unpopular and moralizing to the population despite the climate crisis.

In the past, the concept of green consumption has been popular in that it ruled a belief that its own consumption choices can have a positive effect on the environment. A message was so spread to politicians that knowledge and information could help make environmentally friendly choices in the market of products. Literature has pointed out that there was little resistance to the thinking about green consumption growth because the Brundtland Commission argued that we need economic growth to tackle social and environmental challenges.

Nevertheless, such a growth mindset has been criticised because it is said to help maintain the harmful environmental impacts and that industry and business have "greenwashing" their businesses – the products are advertised as better, but it still depends on buying new ones at the same time as new products are launched.

Examples of reducing consumption may include reducing water use by using a washing and dishwasher less frequently, showering shorter, and collecting rainwater from the gutters to water in the garden. You can reduce meat consumption, the number of road trips, flights, the purchase of new things, the use of chemicals in cleaning and hygiene, electricity, and mobile/data use.

Below is an overview of some areas where you can reduce consumption.

**Transport**

Reduce the number of trips by car and plane  
Reduce the need to travel in the first place

**Food & Drink**

Reduce eating of meat (bird, cattle, pork)  
Reduce consumption of imported foods from abroad  
Reduce food waste

**Health & Wellness**

Shower shorter and/or less often  
Reduce the use of wellness products such as soaps and creams

**Housework**

Reduce the use of washing machine, dishwasher, dryer  
Reduce the use of chemicals in house washing and washing clothes

**Other**

Reduce purchase of new goods  
Reduce screen time on your phone, TV, and computer  
Reduce the purchase of single-use items  
Reduce the emission of microplastics: <https://www.framtiden.no/gronne-tips/fritid/slik-kutter-du-utslipp-av-mikroplast.html>

**IF THERE'S SOMETHING THAT'S NOT HERE THAT YOU WANT TO TRY OUT,  
DO IT!**

## **Part 1 - Information on circular food options in Trondheim**

### **Vegetable boxes**

**RÅGO:** Frosta-based company that delivers vegetables in crates at the door. They choose the content for you after the seasons, but you also have the option to choose the content yourself. A medium vegetable box costs 368kr (incl. shipping). Ordered and cancelled as you like. All the content comes from various farmers at Frosta. They also deliver other local food.

[www.rago.no](http://www.rago.no)

**Trondheim Cooperative:** Offers vegetables in bags that need to be collected in the city centre. The content is determined by the farmer. The bag costs 220kr per delivery, in addition comes annual membership fee of 250kr. The bag is available every other Thursday and must be booked Sunday in advance. The company is run voluntarily and non-profit and requires members to take part in the operation by delivering and/or packing the vegetables.

<https://trondheimkooperati.wixsite.com/trondheimkooperativ>

**REKO ring:** Facebook page where local farmers, fishermen and hunters post products they want to sell at price. Booked in advance and picked up at the stated address. REKO stands for Fair Consumption and aims to connect consumers with manufacturers without intermediaries.

<https://www.facebook.com/groups/rekoRingenTrondheim/>

<https://www.facebook.com/groups/725774517940973>

### **Communal gardens**

Kneiken Fellestage is located in Bakklandet and regularly holds courses and events. Kneiken is "a joint project for all members, where we meet, learn, share knowledge and experiences, and grow organic food together. Everything we cultivate should be distributed between the members, but membership is open to all."

Email: [post@kneiken.no](mailto:post@kneiken.no)

Facebook: <https://www.facebook.com/kneikenfellestage>

Væres Venner Fellestage is located at Vestre Be and is part of Presthus Frivillighetssentral. Seems to be less active. It may be necessary to contact them on Facebook or make a phone call to get in touch. post: [post@presthus.frivilligsentral.no](mailto:post@presthus.frivilligsentral.no)

Facebook: <https://www.facebook.com/presthus.frivilligsentral.no/>

It is also possible to start your own community cultivation project and get support from the municipality for this: <https://www.trondheim.kommune.no/aktuelt/utvalgt/andre-omrader/miljo/urban-dyrking/urbane-dyrkingsprosjekt-i-trondheim/>

### **Self-cultivation**

It is possible to take part in a local parcel garden if the garden does not extend. For a map of urban cultivation opportunities in Trondheim, see: <https://www.trondheim.kommune.no/urbandyrking/>

You can grow plants directly in water without soil. This results in less water consumption because the water is closed inside with the roots of the plants. This also allows you to give the plant exactly the nutrition it needs. In addition, they require very little care. The micro gardener in Mellomveien sells relatively inexpensive solutions, such as: <https://www.mikrogartneriet.no/products/minigarden-basic-uno>

## **Part 2 - Options for circular economic food**

To eat food without using up the resources we don't have infinitely much of we can:

- A: Eat food that hasn't travelled so far.
- B: Don't throw anything away, find a way to use it either.
- C: Eating foods that benefit from and help nature's circulation.

To eat foods that haven't travelled so far, you can:

- Order a local vegetable box from, for example, RÅGO, Trondheim Cooperative.
- Order food straight from the farmer via the REKO ring on Facebook.
- Buy local foods in the store.
- Grow vegetables in the city with others in e.g., Kneiken Felleshage or Bes Venner Felleshage.
- Grow vegetables at home in the garden, on the windowsill or in pots without soil, but only water! If you don't have a garden, there are several parcel gardens you can take part in.

In order not to throw anything away and find a way to use it, you can:

- Make compost in the garden, maybe with your neighbours? You can get free help from the municipality to get started.
- Eat the whole vegetable! Example: Eat the broccoli stalk, eat the stalk on the carrot. (NOTE: The potato plant e.g., is highly toxic. Always check thoroughly first.)
- Use the whole animal! Example: Eat liver and roe, boil soup on bones and carcasses, grind up their own bone flour as plant fertilizer.
- Eat up the food of someone you know: Has your neighbour cooked too much food? Doesn't little brother eat their food? Then residual dinners are an option.
- Eat the food the shops throws out in the Free Fridge at Trondheim Folkekjøkken, via Too Good to Go or by dumpster diving.
- Avoid throwing away food you might actually use. For example, by storing food better, using the eyes and nose rather than the shelf life date label, eating leftovers, making croutons of dry bread, freezing, pickling, etc.

To eat foods that benefit from and help nature's circulation, you can:

- Eat organic food.

- Eat less animal products by having vegetarian day(s), make smaller portions of meat, drink plant milk and eat 'cheat meat'.
- Eat wild animals we have enough of in the forest and the sea, such as mackerel, elk, deer, cod and herring.
- Eat food that needs less soil and energy. For example, grazing animals and vegetables that are not cultivated in greenhouses.
- It is possible to follow a 'Nordic diet', similar to the Mediterranean diet. It consists of: Berries, cabbage plants, fish and seafood, game and grazing animals, rapeseed oil, oats/barley/rye.

## Repair services

**Mr. Fix Trondheim AS:** <https://www.mrfixtrondheim.no>

Wide variety of repair of clothes, shoes, electronics, etc.

Price: No overview of price on the websites, Location: St. Olav's gate 1

**Bitfix:** <https://bitfix.no>

Repair, upgrade of electronics. Price from 395 kr for various services.

Price: Depends on what kind of service you want, Location: Tempevgen 23

**Nidaros Data:** <https://www.nidarosdata.no>

Possibility of repair of electronics.

Price: Depends on the service and the scope of it, Location: Fjordgata 46

**Trondheim Bike Service:** <https://www.trondheimsykkelservice.no> + facebook page

Bicycle service with repairs, parts change, and adjustments.

Price: varies according to the needs of the bike, Location: Innherredsveien 49

**Prisløs:** <http://prislos.no/info>

Priceless Redesign is a redesign concept that designs and sews about secondhand textiles into new fashion. Feel free to contact us if you want to get something sewn about or repaired something.

Price: Unknown, Location: Brattørgata 1

**Mister Minit:** <https://misterminit.no>

Location: City Syd (Østre Rosten 28-30), Trondheim Torg (Kongens gate 9)

## Sharing and mobility services

**AtB:** <https://atb.no>

Public transport in the Trondheim region which includes bus and tram.

Accessibility: AtB app, travel card (t:card)

**Nabobil:** <https://nabobil.no>

A marketplace for private individuals who want to rent out or rent cars. Free registration with BankID. Wide selection of cars in Trondheim.



## Reuse

**Fretex:** <https://www.fretex.no>

Reusable shop with everything from clothes, furniture, kitchen utensils, books, movies, music, and other household items to a cheap money.

Price: Depends on quantity and type of item.

Location: Rosenborggata 9-11, Fjordgata 40, Nardoveien 10, Heggstadmyra 2

**Prisløs:** <http://prislos.no/info>

Prisløs is a reusable collective that goes in search of good quality vintage and secondhand clothing.

Hotel Area: Brattørgata 1

**Second-hand shop Sirkulus:** <http://www.sirkulus.no>

Second-hand trade with a wide variety of things and clothes.

Hotel Area: Kjøpmannsgata 33

**Transit:** <https://transit-shop.no>

Has a collection of second-hand furniture that is being repaired and re-designed. Transit also has some clothing, music, and other household items.

Price: Some items are free, but generally slightly more expensive than, for example, Fretex.

Hotel Area: Kjøpmannsgata 63

**BrukOm:** <https://trv.no/produkter-og-tjenester/brukom/>

Billige high quality things such as furniture, bicycles, crockery, tour bags, music/dvd, books, pictures, painting, plant pots, chairs, sofas, etc. Here you can also deliver your own things one does not need.

Finn.no: <https://www.finn.no>

Website and app for the sale and purchase of all possible used things. Must create profile to use the marketplace. Sales of larger items such as car and boat cost money (max 849 kr).

**Tise:** <https://tise.com>

Tise is an app where you can sell and buy second-hand. The app is free to download. Here you decide the price of what you want to sell.

**NMS Reuse:** <https://nms.no/butikk/trondheim/>

Sommerveita 4, 7011 Trondheim

**NML Reuse:** <https://nlmgjenbruk.no/trondheim/>

Reier Saupstadsvei 12, 7078 Saupstad

## Loan and rental services

**Clas Ohlson:** <https://www.clasohlson.com/no/c/utlan-av-verktoy>

Clas Ohlson offers lending of electrical tools for 1-3 days.

Price: deposit of 200 KR

Location: Trondheim Torg, Solsiden, City Syd, City Lade

**Trondheim Public Library:** <https://biblioteket.trondheim.kommune.no>

Opportunities for lending books, music, movies, tools, electrical loading bikes (main library), language courses.

Price: Free

Location: Trondheim city centre, Saupstad, Moholt, Heimdal, Byåsen, Ranheim, Risvollan

**Here you'll find some internet sources with more information and tips about «green consumption»:**

<https://www.plusstid.no/helse-og-velvaere/helse/livsstil/10-gronne-trender>

<https://gronarekvardag.no>

<https://www.framtiden.no/gronne-tips/mat/ikke-kast-maten.html>

<https://www.sintef.no/siste-nytt/-vi-ma-framsnakke-makrellen/>

<https://www.framtiden.no/gronne-tips/mat/sjekk-hvilken-mat-som-er-best-for-miljoet.html>

<https://www.framtiden.no/gronne-tips/mat/tips-til-mer-barekraftig-kjott.html>

<https://www.kk.no/helse/derfor-bor-du-spise-skall/70010557>

<https://www.dinside.no/bolig/slik-lager-du-ditt-eget-vaskemiddel/71697791>

<https://naturvernforbundet.no/miljovennlig-tekstil/miljovennlig-klesvask-article32797-3638.html>

<https://www.framtiden.no/shoppestopp-2020.html>

<https://www.framtiden.no/gronne-tips/klar/miljobevisst-klesvask.html>

<https://tavarepadetduhar.no>

<https://naturvernforbundet.no> (under 'hva kan jeg gjøre')

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