

Are climate budgets the new green?

A critical study of environmental discourses in Oslo's climate budget

Anne-Sofie Sejer Petersen

Master Thesis Series in Environmental Studies and Sustainability Science,
No 2020:001

A thesis submitted in partial fulfillment of the requirements of Lund University
International Master's Programme in Environmental Studies and Sustainability Science
(30hp/credits)



LUCSUS

Lund University Centre for
Sustainability Studies



LUND
UNIVERSITY

Are climate budgets the new green?

A critical study of environmental discourses in Oslo's climate budget

Anne-Sofie Sejer Petersen

A thesis submitted in partial fulfilment of the requirements of Lund University International
Master's Programme in Environmental Studies and Sustainability Science

Submitted January 2, 2020

Supervisor: Mine Islar, LUCSUS, Lund University

Empty page

Abstract

Reducing greenhouse gas emissions at the city scale continues to be of high priority. Oslo pioneered a cross-sectoral steering method 'the climate budget', effectively branding themselves as 'green leaders'. It begs the question; Are the novelty governance measures in Oslo driving tangible change towards sustainable pathways, or is it a case of political business as usual in a 'greener wrapping'? This calls for a closer look at the climate budget.

This study identified the dominant environmental discourses within Oslo's climate budgets, the discursive practises and activities included and excluded from the discourses, as well as degrowth potential. Guided by critical theory and a degrowth perspective, I used Fairclough's critical discourse analysis, Dryzek's environmental discourse categories and Van Dijk's theory on dominance to analyse the interdiscursive level, discursive practise and social practise through an iterative research process. Data included the 2018 and 2019 climate budget reports, coalition statement document, information on the political process, six municipal press releases, a motivational speech by the Finance Minister, and two public talks.

Four themes emerged; 1) a preference for a regulated capitalist market structure, 2) importance of the collective good over the individual, 3) high importance assigned to expert knowledge, technological solutions, infrastructure, and market-based incentives, and finally, 4) competing orders of discourse with national politics and mass media. This indicated strong subscriptions to administrative rationalism and ecological modernisation. Social wrongs became apparent; lack of agency assigned to citizens, disregard for local inequality, and disregard of global equity. An important discursive struggle emerged; consumption focus and recognition of ecological limits has declined steadily over the years.

Emancipation from the dominant structures could be pursued by using discourses as an active strategy, looking towards degrowth ideas, complimentary consumption-based emissions accounting, and participatory approaches. The semiotic embeddedness of current values present obstacles to such an emancipation.

Keywords: Oslo, climate budget, environmental discourses, degrowth, consumption-based emissions, city GHG mitigation

Word count (thesis): 13.995

Acknowledgements

This project was not an easy birth, and many wonderful people helped make it possible!

Thank you to my patient supervisor Mine, for your encouragement when the process did not go as planned. Your feedback and open attitude made a difference.

Growing out of sync with the rhythms of LUMES proved a tough challenge. Thank you to Amanda and Anne for the flexibility and always greeting me with positive energy when I go to LUMES.

A big thank you to tireless Anita, for your valuable feedback and always believing that I could get to the finish line – you made me believe it too. I am grateful for your support and friendship!

Andy, I cannot thank you enough for believing in me and being there through the tumbles of this epic adventure. Your love, support and acceptance is nothing short of spectacular.

Thank you to Alexandra, for celebrating ups and downs with me, and to my wonderful family for your love and for listening when I go on about emissions.

Not to forget - thank you to SU for keeping me partially fed (and Andy for the rest).

Last but not least, thank you to batch 20 and LUCSUS staff for a fun, unforgettable time together!

Table of Contents

1 Introduction	1
1.1 Backdrop.....	1
2 Context and case	2
2.1 Oslo’s emissions	2
2.2 What is the climate budget?	4
2.3 Climate discourses in Norwegian politics	5
2.4 GHG accounting.....	6
2.5 Situated within sustainability science	6
3 Ontological and Epistemological perspective	7
3.1 Critical realism	7
4 Theoretical framework	8
4.1 Critical theory.....	9
4.2 Degrowth	9
4.3 Fairclough	11
4.4 Dryzek’s political environmental discourses	11
4.4.1 <i>Limits and survival discourses</i>	11
4.4.2 <i>Problem solving discourses</i>	11
4.4.3 <i>Sustainability discourses</i>	12
4.4.4 <i>Green radicalism discourses</i>	12
5 Methodology	13
5.1 A discursive approach.....	13
5.2 Research design.....	14
5.3 Limitations and ethical reflections	16
6 Critical discourse analysis and findings	16
6.1 Interdiscursive analysis of the 2018 and 2019 climate budget reports	16
6.1.1 <i>Genres and styles</i>	17
6.1.2 <i>Legitimisation</i>	18

6.1.3 Authority and expert agency	18
6.1.4 Mobilisation and involvement	19
6.1.5 Economic growth, yes or no?	20
6.1.6 Competing discourses from Dryzek's discourse categories.....	20
6.1.7 Discourse evolvment between the 2018 and 2019 climate budget reports	21
6.2 Discursive practices	22
6.2.1 Dissonance between party statement and the climate budgets.....	22
6.2.2 Cross sectoral practice.....	22
6.2.3 Klemetsrud carbon capture and storage	23
6.3 Emerging and competing discourses	23
7 Discussion	24
7.1 Prominent environmental discourses in the climate budgets.....	24
7.1.1 Dominant discourses	25
7.1.2 Social wrongs.....	25
7.2 Contestation and discursive struggles	27
7.2.1 Consumption driven GHG's	27
7.2.2 Geographical boundaries	27
7.2.3 Question of scale in Norwegian political discourses	28
7.2.4 Discourses and growth ideology	28
7.3 Ways of righting the social wrong	29
7.3.1 Participation and active learning	29
7.3.2 Degrowth in policy and discourse	29
7.3.3 Municipal agency	31
7.4 Reflection on sustainability science and from a critical realist perspective.....	31
7.5 Limitations	32
8 Conclusion and future research.....	32
8.1 Conclusion.....	32
8.2 Future research	33

9 References	34
10 Appendices	43
Appendix A: Measures in the climate budgets	43
Appendix B: Quantitative analysis elements	46

Abbreviations

CCS = carbon capture and storage
CDA = critical discourse analysis
CO₂ = carbon dioxide
CO₂e = carbon dioxide equivalent
GDP = gross domestic product
GHG = greenhouse gasses

1 Introduction

1.1 Backdrop

Major cities within the global north continue to be heavy greenhouse gas (GHG) emitters globally (Kennedy et al., 2009), so finding ways to transform cities continue to be of high priority if the Paris agreement targets are to be met. In recent years, city councils have shown increased resolve to address carbon dioxide (CO₂) reductions at the local level (Watts et al., n.d.). This development holds great potential as the city level can induce structural changes to socio-technical systems that neither individuals nor the national level can easily impact (Sengers, Berkhout, Wieczorek & Raven, 2016). Some city councils even go so far as to brand themselves as 'green leaders', such as Oslo, the focus of this study.

There is indeed work to be done in Oslo. Norway has high per capita emissions, in fact the annual emissions per capita in Norway was approximately 9.27 metric tonnes of CO₂ in 2014 from the burning of fossil fuels (CDIAC, n.d.). Emissions could be even higher, considering that indirect and consumption related emissions are tricky to account for and often excluded (Afionis, Sakai, Scott, Barrett & Gouldson, 2017). However, if we are to stay below the 2 °C climate target, the global annual CO₂ equivalent (CO₂e) emissions per capita should approximate 2.1 tonnes by 2050 (Girod van Vuuren, & Hertwich, 2014). This clearly places Norway's per capita GHG footprint well over any equitable limit in a global context.

Oslo is a special case because the municipality is pioneering a cross-sectoral steering method; the 'climate budget' - to implement aggressive reduction targets in the city. In fact, Oslo aims to bring down the GHG emissions with 95% by 2030 compared to 1990 levels (Oslo Municipality, 2018a). Numerous cities are implementing climate work, but the new approach Oslo is taking is rare in terms of the steering process, the aggressive scope and accountability structure. As a result, Oslo was granted the European Green Capital Award 2019 (European Commission, 2019a). This presents an opportunity for a closer look at the climate budget.

Gretha Thunberg's global climate emergency activism has refuelled a sense of questioning whether political actions have real impact or whether pledges fall short of reduction targets. Such questions are highly relevant in the Norwegian context. Approximately 22% of Norway's gross domestic product (GDP) comes from the oil industry (European Commission, 2019b). As a state-owned enterprise, the economic activities associated with oil also benefits Oslo.

It begs the question; can a country be branded as a green leader in light of continued oil dependency at the hearth of its economy? Are the novelty governance measures in Oslo driving tangible change towards sustainable pathways, or is it a case of political business as usual in a 'greener wrapping'?

While Oslo municipality at first glance continues to take leadership on many aspects of sustainable urban transitioning, the framing of the climate budget can contain hidden inherent limitations. An environmental discourse analysis can shed light on such framings and unveil rhetoric, assumptions and omissions beyond scope boundaries (Dryzek, 2013). Various discourses legitimise particular actions

above others – ultimately affecting the actual GHG reduction actions and their effectiveness. In light of this, a holistic evaluation of the environmental discourses at work in the climate budget at present time is pertinent, especially as Oslo seeks to inspire other cities' green transitions in the near future.

With this study I contribute to the discourse debate within Norwegian climate governance, specifically within Oslo municipality's GHG reduction goals. My work draws on previous studies of environmental discourses in Norwegian national policies. I extend this discussion to the municipal level, by unveiling and evaluating environmental discourses at work in the climate budget.

In order to achieve the aim of this study, I pursued the following research questions:

1. What are the dominant environmental discourses within Oslo Municipality's 2018 and 2019 'climate budgets' and their relation to orders of environmental discourses within national politics, mass media and broader municipal political social practices?
2. Following the dominant discourses, which discursive practises and activities are included and omitted from the climate work, and how do the discourses frame and affect GHG emissions from a degrowth perspective?

2 Context and case

The following section will cover Oslo's emissions, the climate budget, the political context and discourses, GHG scopes and finally situate this study within sustainability science.

2.1 Oslo's emissions

In 2016, Oslo emitted 1.085.000 tonnes CO₂e, (Oslo Municipality, 2019). The sectoral emissions trends (Figure 1) include industry, energy supply, heating, heavy and light vehicles and transportation by road, sea and air, waste, and wastewater treatment.

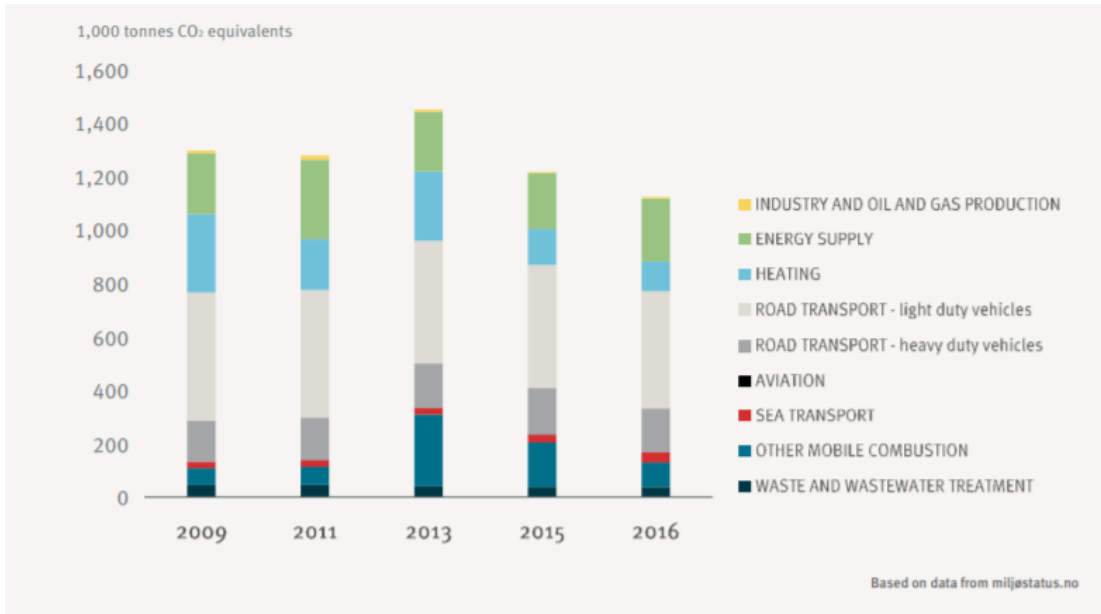


Figure 1. Oslo's GHG emissions trends (Oslo Municipality, 2019)

Figure 2 and 3 show a clearer view of reported emissions distribution in Oslo in 2015 and 2016, respectively. The overviews cannot be directly compared because of reworking of the distribution categories. The main reported emission sources stem from road traffic, incineration of waste, and construction.

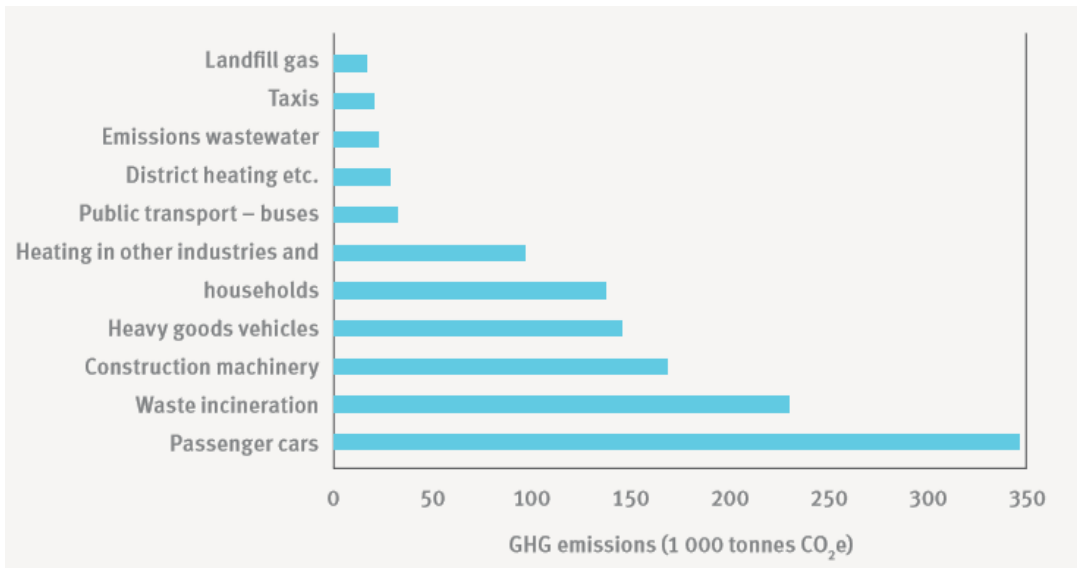


Figure 2. Oslo's emissions in 2015, by subcategory (Oslo Municipality, 2018a)

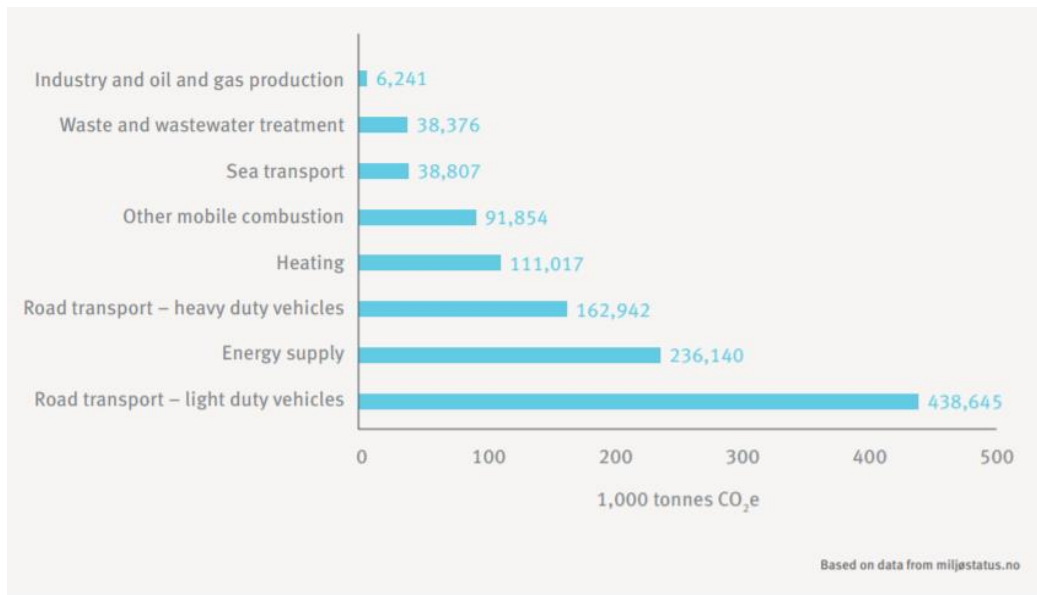


Figure 3. Oslo's 2016 emissions by sector (Oslo Municipality, 2019)

2.2 What is the climate budget?

The city of Oslo is governed by the city council (Oslo Municipality, n.d., a) and executed through eight departments (Figure 4), (Oslo Municipality, 2018a). The Green Party¹ became the third largest party in Oslo (Oslo Municipality, n.d., b) in the 2019 municipal election. This means that the green-left coalition will continue to be in power for the 2019-2023 term.

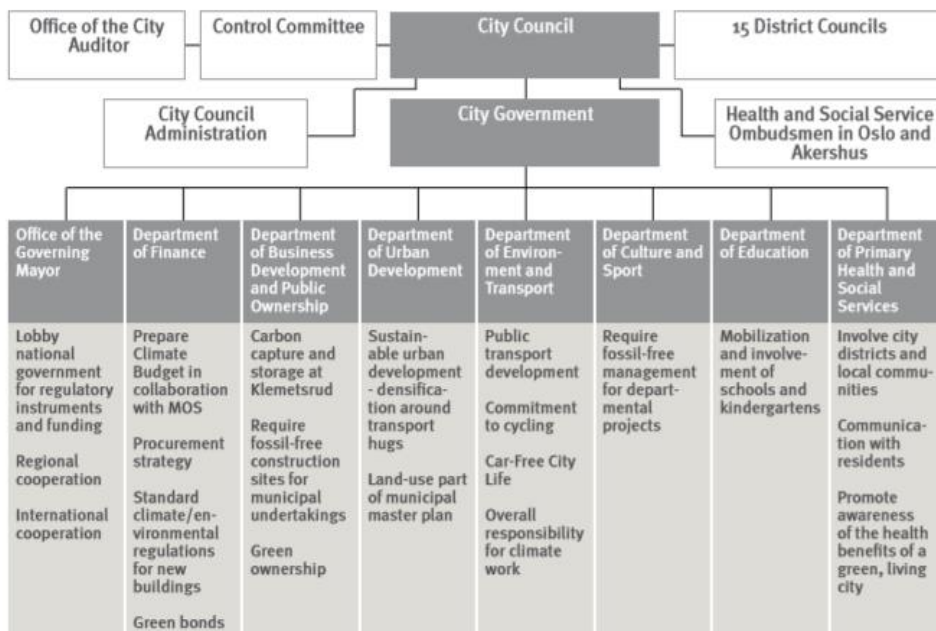


Figure 4. Organisational chart of Oslo Municipality (Oslo Municipality, 2018a)

¹ In Norwegian "Miljøpartiet de Grønne"

This coalition launched the climate budget in 2017 (Oslo Municipality, 2017). The new concept is to steer climate work as a budget through cross-sectoral governance. Instead of isolating the climate work in one branch, it became distributed across energy, infrastructure, transport etc., in a CO₂ budget form (Oslo Municipality, 2019). At the core is the idea of distributing the responsibility for climate work, to the sectors who have the agency to affect CO₂ emissions (Oslo Municipality, 2019). Cross-sectoral work has been seen before - but treating the reductions as accounting on equal terms with financial planning is novel. All activities performed by the municipality must include a CO₂ overview and sectors are responsible for reporting progress, as they would with monetary budgets (Oslo Municipality, 2019).

The CO₂ reductions pledged in the climate budget are given in absolute terms rather than relative terms (Steen, 2019). This means the municipality is working towards 95% GHG emissions reductions by 2030 compared to 1990 levels (Oslo Municipality, 2019), with the added pressure of projected population growth and related building boom for the next decade in Oslo (Statistisk Sentralbyrå, 2018).

The measures in the climate budget are divided into 'stationary' and 'mobile' sources of CO₂ emissions. They centre heavily around heating, transportation and waste. Below is a simplified overview of key measures in the climate budget (Oslo Municipality, 2019). For a detailed list, see Appendix A.

Heating. Phasing out fossil fuel-based heating in municipal and residential buildings.

Transportation. Toll rings, introducing road user payments, increasing public transport capacity and reducing delays, removing of parking spaces and introducing payment schemes, 20% biofuel blending requirement nationally by 2020, expanding cycle paths, permit requirements for taxis from 2020 towards zero-emission, targeting construction machinery, shore power stations for ferries, goal of fossil free public transport by 2020, and expanding charging infrastructure for electric cars.

Waste. Increased supply of biogas from wastewater and planning of carbon capture and storage (CCS) facility at Klemetsrud incinerator facility.

2.3 Climate discourses in Norwegian politics

Studies on climate discourses in Norwegian politics mostly exist on the national level. Firstly, Tellmann (2012) found knowledge-based discourses from 1989 until 2008, on tax, quotas, and technology, yet a lack of policy manifestations. Secondly, a discursive struggle on 'national action' versus 'thinking globally' has persisted for decades (Hovden & Lindseth, 2002). Lindseth (2006) found that the 'global' discourse can detract focus from local action. He highlights that misaligned scalar climate goals risk leaving municipal work in the shadow of lacking national commitment (Lindseth, 2006). Furthermore, competing discourses on the national level seek a reputation of green leadership while continuing oil extractions (Fløttum, 2017). For example, 'Statoil' was recently rebranded to 'Equinor', yet no substantial reductions to the oil activities are planned (Lahn, 2019). The 'global' discourse justifies Norwegian oil, arguing that it is 'cleaner' than international alternatives (Lindseth, 2006). In sum, studies on political environmental discourses in Norway focus on the national level; the polarising

question of scale, a gap between discourses and action, and using expert knowledge as a legitimising tool. There is a lack of studies at the municipal level, yet city scale emissions and solutions are important since cities are major CO₂ emitters (Sudmant, Gouldson, Millward-Hopkins, Scott & Barrett, 2018) and affect structures not easily reached nationally.

2.4 GHG accounting

Following the GHG protocol (Greenhouse Gas Protocol, n.d.; World Resources Institute, n.d.) there are three scopes of GHG accounting. Scope 1 accounts for direct GHG emissions, Scope 2 includes purchased electricity, and Scope 3 takes into consideration consumption-based GHG emissions for example by applying production life-cycle accounting and including other indirect emissions (Larsen & Hertwich, 2009). The GHG accounting in Oslo follows scope 1; production-based accounting from direct emissions. They employ the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (Oslo Municipality, 2018a).

However, there are drawbacks to Scope 1. Production-based GHG accounting disregards complex supply chains related to high consumption lifestyles (Dodman, 2009). Studies show that Annex-1 countries have increased consumption-based emissions at a faster rate than they have decreased production-based emissions (Fischer, 2011). Bows and Barrett (2010) found a 10% increase in GHG emissions from Annex-1 countries between 1992 and 2006 when adapting the consumption-based approach on cumulative emissions scenarios. The consumption-based outputs are sensitive to GDP (Karstensen, Peters, & Andrew, 2018). Most developed countries have higher emissions when using consumption-based GHG accounting (Peters, Minx, Weber, & Edenhofer, 2011). Therefore, consumption-based accounting has potential to affect global GHG emissions through local policies (Bows & Barrett, 2010). Bows and Barrett (2010) recommend that policies in Annex-1 countries include consumption of imported goods when establishing GHG targets and policies. Cities often adopt Scope 1 or Scope 2, yet have not begun to analyse and incorporate Scope 3 in policies (Sudmant et al., 2018).

2.5 Situated within sustainability science

Sustainability science can be characterised through the choices of; research purpose, approach, scope, and process. This study is of normative nature, ultimately exploring boundaries of the existing, as an opportunity to highlight alternatives, which partly defines sustainability science according to Spangenberg (2011). Jerneck et al. (2011) broadly divides sustainability science into problem solving and critical theory. This study departs from the Marxist and later the school of Frankfurt critique of capitalism and emancipation theory (Agger, 1991). For example, the focus of this study is *not* targeted optimisation of existing measures, but rather questioning the measures themselves, the assumptions behind them and bringing into question the political processes and alternative orders. Having said that, the normative element inherently indicates a problem, to which alternative discourses may offer different solutions.

There is a reflexive element to both aim and process. A reflexive approach can be defined as problem-solving, yet questioning unsustainable root causes through a reframing of the problem (Jerneck &

Olsson, 2008). This study contributes in this way by reframing the GHG reduction challenge in Oslo through discourse analysis. Furthermore, it links various scientific fields and policy. In fact, Fairclough (2013a) argues that critical discourse analysis (CDA) is a transdisciplinary form of analysis. Through CDA this study integrates theory and research from different fields. Finally, sustainability science deals with complex socio-natural systems (Kates et al., 2001) and explores transition pathways to sustainable lifestyles and socio-ecological interaction (Kates, 2011). The climate budget operates with various system boundaries, such as political, physical, geographic, economic, temporal, and integration (or lack thereof) with ecological components. I argue that disregarding essential aspects of the complex dynamics that come about from human-environmental interactions can lead to ineffective or biased solutions.

When 'sustainability' is mentioned throughout this paper, it refers to 'environmental sustainability', as Morelli (2011) clearly operationalised it;

Meeting the resource and services needs of current and future generations without compromising the health of the ecosystems that provide them, ...and more specifically, as a condition of balance, resilience, and interconnectedness that allows human society to satisfy its needs while neither exceeding the capacity of its supporting ecosystems to continue to regenerate the services necessary to meet those needs nor by our actions diminishing biological diversity (Morelli, 2011, p. 6).

3 Ontological and Epistemological perspective

3.1 Critical realism

On an ontological level this thesis is aligned with critical realism, which allows for a separate world with independent structures, but refers to social facts as being constructed. Our understandings of the structures are limited by mode of inquiry, experience, and exposure (Bhaskar, 2013). Bhaskar operates with three levels; the empirical, the actual and the real (Figure 5). The empirical are observable phenomenon, the actual are independent events and the real are the underlying mechanisms and structures causing the other levels (Bhaskar, 2013). This distinction is present in my work. In my analysis, I address the empirical level through the texts of the climate budgets and the political statement document. I address the actual level, through discursive and social practises in terms of how the political process and climate actions manifest. Striving towards the real is represented by the presence or absence of discourses that shape dominant values and world views.

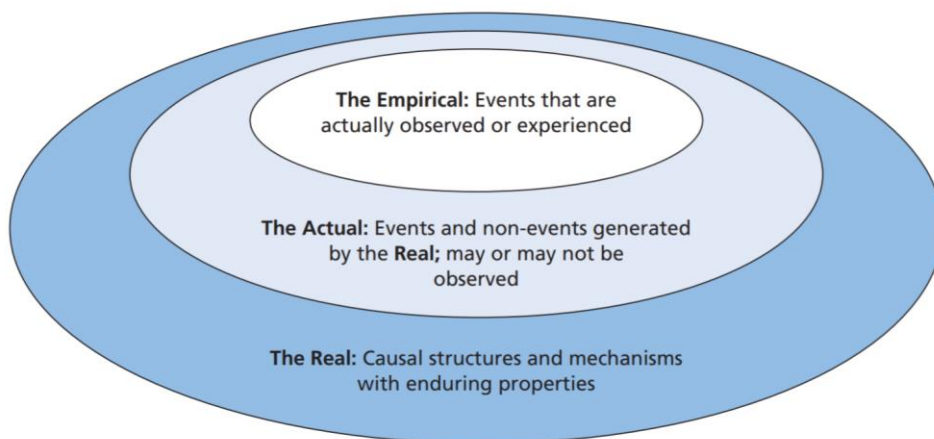


Figure 5. Developed from Bhaskar's strata of the empirical, actual, and real (Saunders, Lewis, & Thornhill, 2009)

The epistemological perspective of moderate social constructivism within realism is applied in this thesis. This suggests that what can be known about the *social* world is constructed. In other words, social sciences produce social facts (Kukla, 2013). This does not imply strong constructivism on a metaphysical level (which regards all ascertainable facts about the world we live in as socially constructed). In contrast, the starting point in this work is that climate change is physically real, caused by anthropocentric GHG emissions; planetary boundaries exist; and carrying capacities are relevant on a global scale and down to local ecosystems. Rather, in this work, in line with Bhaskar's (2013) ontology, it means that no scientific social knowledge is complete; we can strive towards understanding the 'real', but will always be limited through our lens of theory and of our way of understanding the world.

CDA often follows the ideas of critical realism by integrating discursive and material elements (Fairclough, 2013b), as opposed to a poststructuralist focus on discourse alone. In this sense, Fairclough describes CDA as "moderate constructivism" within realism per Sayer's definition (as cited in Fairclough, 2013b, p. 185), acknowledging that;

Many objects are not socially produced... since what can be constructed depends on the properties of the 'materials' (including people, institutions and ideas) used in the construction, there is still a sense in which performativity depends on practical adequacy (Sayer, 1999, p. 44).

The kind of knowledge production emerging from critical discourse analysis is value driven and can show how "particular social forms on the one hand enhance well-being, on the other hand place systemic limits, and to identify possible and feasible forms which can mitigate or overcome those limits." (Fairclough, 2013a, p. 21).

4 Theoretical framework

The theoretical section covers relevant theoretical grounds for the study; critical theory and degrowth as a criticism to capitalism as well as Dryzek's categorization of environmental discourses.

4.1 Critical theory

The climate budget is presented through a strong combination of logical conviction and extensive data, and at a glance appears progressive and necessary. Since this study explores discursive framing from a normative starting point, a theoretical basis that enables deeper, critical analysis is called for. Critical theory offers a standpoint for critiquing society as it exists with the underlying assumption that there is a need for change, as opposed to more traditional social theory that seeks to explore or explain society. In this sense, critical work will always take a normative form to a greater or lesser extent. It can explore and expose any domination that may hide under the surface. Critical theory originated from the Frankfurt School of thought, drawing on Marx' critique of political economy amongst others (Dahms, 2011). At its heart, it seeks to explore the underlying assumptions that form our current understanding of the world, with the intent to emancipate from the oppression of the dominant system (Dahms, 2011). Originally, this was a critique of capitalism (Dahms, 2011), but later included diverse fields (Weber, 2002). The emancipatory aspirations that run through critical theorists' work, such as Horkheimer, Habermas, and Adorno, bring into question agency and actions that can bring about change (Alway, 1995), so agency is explored in the analysis.

While CDA according to Fairclough's (2013b) own definition draws on Marx' critique of political economy, I extend my critical theoretical base to degrowth theory. The emancipatory intent behind critical theory, especially that of degrowth, can challenge the fabric of the climate budget and liberate towards alternative pathways.

4.2 Degrowth

Degrowth is an ambiguous term and often coloured by field specific understandings (D'Alisa, Demaria, & Kallis, 2014). Yet overall, it is a broad framework which offers critique of the continuous material growth and mass consumption of capitalism, capitalist systemic lock-ins and associated natural degradation, ecosystem collapses and resource depletion (D'Alisa et al., 2014).

Degrowth proponents suggest we reduce our environmental impacts, implement equitable redistribution of wealth and move from materialistic towards convivial and participatory lifestyles (Cosme, Santos, & O'Neill, 2017). This implies production and consumption reduction, hence a GDP decline, and a shift of metrics towards measuring equality, biophysical and social welfare (Kallis, Kerschner, & Martinez-Alier, 2012).

It becomes a question of global equity. Economic degrowth presents the idea of living within sustainable boundaries through increased sharing and reduced consumption in the privileged 'West' or industrialised societies, as opposed to overconsuming at the expense of developing countries and poorer nations (D'Alisa et al., 2014). If the wealthy societies continue to overconsume, there are not enough resources and 'ecological budget' for sustainable development in poorer nations. Recessions are linked to reduced CO₂ emissions (Kallis et al., 2012), a sign that degrowth has the potential to affect CO₂ emissions at large scales. Thus, one of the main facets of degrowth is to go beyond simply *changing* consumption patterns, towards drastically reducing consumption. In this sense, degrowth

goes beyond other critiques of capitalism, such as steady state, a-growth and post-growth (D'Alisa et al., 2014).

Opponents of degrowth question whether social welfare and employment can function in a degrowth context. However, degrowth challenges the idea that growth leads to increased well-being. Beyond basic needs, happiness does not increase with national income (Kallis et al., 2012). Secondly, degrowth can be viewed as a potentially unstable transition period to a 'new normal' with a steady state economy, rather than a permanent decline (Kallis et al., 2012). This allows for a stabilisation of employment and demand at lower consumption levels. Lorek and Fuchs (2013) argue that degrowth depends on strong sustainable consumption, meaning that people are aware of the social embeddedness of consumption choices. In recent years, degrowth discussions have explored tangible pathways to move beyond capitalism with policies such as CO₂ caps (Douthwaite, 2012 as cited in Kallis et al., 2012, p. 175), reduced working hours, consumption and resource taxes and ethical banking (Jackson, 2009; Korten 2008; Latouche, 2009; Speth, 2012 as cited in Kallis et al., 2012, p. 175) and restructured property rights (Griethuysen, 2012; as cited in Kallis et al., 2012, p. 176).

Cosme et al. (2017) conducted an extensive literature review of suggested policy initiatives within degrowth, which I have summarised (Table 1), as they are relevant for the discussion;

Table 1. Degrowth Policies. Condensed from Cosme et al. (2017, pp. 328-330)

Reduction and trade	reduce consumption, reduce energy and material consumption, waste reduction, reduce production, promote local production-consumption, reduce commerce and trade, decrease trade distance, decrease household goods
Tax	tax environmental externalities, tax consumption, tax international capital movement, tax resource use
Caps	caps on political campaigns, CO ₂ caps, salary caps, cap resource use and extraction
Regulations	regulate tourism, regulate advertising, ban harmful technologies, avoid monopolies
Equity and social initiatives	create basic income, decrease unemployment, reduce working hours, equal access to goods and services, equitable redistribution of income and capital assets, deepen democratic institutions strengthen common possessions, promote shared living, promote frugal lifestyles, promote voluntary work and value, strengthen local communities, job-sharing, educate in sustainability
Ownership, monetary systems and investment	non-monetary exchange, eliminate debt-based money, promote new ownership patterns, decentralise or publicise banking system, increase green investment, divest in car-based transportation, promote small local businesses
Efficiency	increase eco-efficiency, increase water efficiency, compact city living
Ecology	ecological conservation, promote organic farming,

Economic degrowth is ecologically desirable (Kallis et al., 2012). Avoiding global warming, ecosystem degradation, and resource depletion is indeed high on political agendas. Yet, degrowth is often avoided in political and wider debates. According to Sekulova, Kallis, Rodríguez-Labajos and Schneider (2013), it is a taboo people are reluctant to discuss or consider as a serious pathway to sustainability.

Despite this reluctance, it is clear that we need to pursue new ways to stay within the planetary boundaries and safe operating space for global ecosystems (Rockström et al., 2009). Degrowth at its

core, is a critique of capitalism with transformative social aspirations, and as such is in line with broader notions from critical theory. It forms the normative stance of this thesis, as a natural extension of Fairclough's original intent with CDA which feeds on a Marxist' critique of capitalism (Fairclough, 2013b).

4.3 Fairclough

Fairclough's critical discourse analysis both serves as a theoretical framework and methodological guide, and is covered in the methodology section.

4.4 Dryzek's political environmental discourses

Dryzek grouped environmental discourses into various categories (Dryzek, 2013). His work relies on other scholars' work on discourses. It is worth noting that Dryzek himself is not a critical theorist. Thus, the normative, critical theory applied here is not necessarily in line with Dryzek's philosophy. Dryzek's categories are used to provide a basis against which to understand the emerging elements of the critical discourse analysis. They are extensive and enrich the findings of the CDA.

Dryzek (2013) has identified four categories of political environmental discourses, each with several discourses within; limits and survival, problem solving, sustainability, and green radicalism. The summaries below are paraphrased from Dryzek (2013).

4.4.1 Limits and survival discourses

The first category includes 'limits and survival' and the 'promethean argument'. The limits and survival discourse build on the arguments of planetary boundaries with an authoritarian, global outlook, and apocalyptic imagery. It recognises finite resources and carrying capacities of ecosystems. Populations are controlled and monitored through policies and statistics.

The promethean discourse on the other hand, sits well with capitalist ideologies and climate denial movements, by viewing natural resources as infinite and disregarding ecosystems. The discourse focuses on growth, scarcity, competition, prices, energy, and technology.

4.4.2 Problem solving discourses

The second category includes 'administrative rationalism', 'democratic pragmatism', and 'economic rationalism'. These problem-solving discourses view environmental issues as a myriad of challenges that can be dealt with within industrialism and liberal capitalism, through markets, democracy, and bureaucracy.

Administrative rationalism is centred around top-down power and knowledge with a unified, clear public interest defined by experts. The agency structure is hierarchical and mostly non-participatory, relying on policy mechanisms, bureaucracy, legislation, expert assessments, and regulatory instruments such as price incentives.

Democratic pragmatism promotes networks and informal interactions rather than hierarchy. Agency is expanded to public officials, activists, citizens, journalists, NGO's etc. It provides space for public addresses, legal disputes, hearings, and media investigations. Some tools used are; voluntary targets (such as certification schemes) and Ostrom's framework on cooperative management.

Economic rationalism promotes 'free market environmentalism' and disregards complex socio-ecological systems. Agents are seen as selfish economic consumers. The discourse relies on markets, prices, privatisation, market incentives, property right, 'homo economicus', and governments. Policy examples are privatisation of water and air, cap and trade of pollution rights, emissions trade and offset, trade quotas, carbon tax, green tax, and eco-labelling.

4.4.3 Sustainability discourses

The third category pursues sustainability, and includes the 'sustainable development discourse' and 'ecological modernisation'.

The sustainable development discourse pursues global goals of inclusive, green economic growth, environmental conservation, poverty reduction, and social justice through international collaboration and networked governance. The discourse highlights nested social and biological systems and local ecological constraints yet ignores limits to growth. Ideas include valuation of ecosystem services and technological advancement.

Ecological modernisation occurs in strong, weak and reflexive variations (Hajer, 1995) and focus on a decoupling of economic growth and environmental stresses. Limits to growth is diluted by the decoupling argument and technological advancements to fix environmental issues. 'Green growth' is promoted, for example through export of green technologies and through energy and resource efficiency. Ecological modernisation is also linked with the idea of social progress, yet inequality gaps between nations and social justice is omitted. The discourse functions through partnerships between strong states, scientists, businesses, and moderate environmental groups.

4.4.4 Green radicalism discourses

Finally, the fourth category 'green radicalism' encompasses a variety of movements, all rejecting the industrialisation discourse, critiquing an anthropocentric world view, and seeking alternatives. Green consciousness builds on a critique of instrumental rationality and includes movements such as deep ecology, ecofeminism, bioregionalism, lifestyle greens, and ecotheology. Important themes are changed consciousness, egalitarianism and harmony, sensibilities, and limits to economic growth. Agency is extended to species and ecosystems. Green politics place necessity in structural change and political action. This category includes various green parties, social ecology, transition towns, eco-Marxism, the environmental justice movement, antiglobalisation, global justice, and radical activist groups. Complex interconnectedness of natural and social systems is recognised, and social learning is seen as an opportunity to change.

5 Methodology

The methodology section below covers Fairclough's CDA as a framework, the research design, including data collection and analysis stages, and finally limitations and ethical reflections.

5.1 A discursive approach

In order to analyse Oslo's climate budget, a critical discourse analysis was carried out. Discourses can broadly be described as systematised ways of viewing the world, with underlying assumptions and judgements; they construct meaning, condition values and perceptions, and legitimise knowledge (Fairclough, 2013a). This thesis more specifically follows Fairclough's definition of a discourse - language use conceived as a social practice. Operationalising a discourse can mean new ways of acting, being and new physical materialisations (Fairclough, 2013a). In other words, discourses hold power, in that they can shape understandings, sway actions, and manifest physically. Various political environmental discourses have the power to promote competing actions which ultimately manifest physically on the planet. Those physical results depend upon and are constrained by the chosen lens. Critical discourse analysis is an analysis of dialectical relations between discourses and other objects, connecting discourse theory and political theory (Fairclough, 2013b).

I chose a critical discourse approach rather than a discourse analysis for the following reasons. A discourse analysis is focused on the dissemination and consumption of meanings, showing meaning of texts as constitutive of reality in some way (Herrera & Braumoeller, 2004). A CDA takes it one step further. The CDA approach allows for understanding the discourses as part of a dialectical relationship with the broader social structures and practices. Thus, CDA goes beyond discourses by including the surrounding institutions as part of the analysis. According to Van Dijk (1993), CDA requires the researcher to take a social stand which enables the understanding of social issues and challenges social wrongs. What sets apart the CDA from a discourse analysis is the importance given to power, ideologies, legitimacy, and hegemony (Fairclough, 2013a). Power and dominance are often ideological and maintained semantically through for example institutions and media (Van Dijk, 1993). 'Critical' refers to a normative stance in social life, meaning that it is a value-based quest to identify what is wrong and how the wrongs might be 'righted'. CDA has the advantage of including the context and dialectic relations beyond the textual focus of a discourse analysis. This aided the identification of dominant environmental discourses in the climate budget and how they related to social structures. Or put in Bhaskar's (2013) terminology, how the empirical reflect the actual.

In this way, CDA opens up for analysis on how social wrongs and rights are reproduced through discourses. This allows for analysing how texts represent certain world views and ideologies. For example, Dryzek's discourse categories are ripe with such inherent ideologies (Dryzek, 2013). By applying the critical discourse framework, I could analyse if and how these discourses are reproduced in the local Norwegian context; for example, through identifying if certain values were asserted as universal, which can be a manifestation of power. This assumes a coherent set of values to form base for the critique, and in this study - these stem from degrowth.

5.2 Research design

The CDA took starting point in Fairclough's three levels of analysis (interdiscursive, discursive practises and social practises) and Dryzek's categorisation of environmental discourses. Finally, Van Dijk's theory (1993), was included to aid the analysis and is further explained below.

Data selection

Data gathering consisted of technical reports, speeches, public talks and websites. The sources were selected based on three principles; 1) topic relevance for the climate budget work, 2) recent time frame 2018 and 2019, besides the statement document, and 3) language used by authoritative people, since according to Wodak (2001a) language gains power when used by powerful people.

The main documents for the interdiscursive analysis were the 2018 and 2019 technical climate budget reports in English. To analyse discursive practises, such as context and consumption of the climate budgets, I included the following; municipal website for additional information on the political process, a policy statement document of intent from the newly elected coalition in 2015 which represent authoritative politicians, and thus use of power through language. Raymond et al. (2015) pioneered the climate budget, and the policy statement document was included to compare the original intent of the climate budgets with the actual climate budgets. I also included sectoral practice and initiatives from the climate budgets.

Finally, to analyse the relation within a wider context, I selected six municipal press releases based on their relevance to the climate budget, a motivational speech on the climate budget as part of an initiation of the new term, delivered by the Finance Minister Robert Steen, who is a powerful and influential figure. Furthermore, I attended two public talks; the first was an evaluation of the climate budget by the municipality, delivered by Robert Steen, the second was a discussion on climate discourses in Norwegian media with representatives from CICERO and The Norwegian Broadcasting Corporation. This data contributes to the understanding of relations between orders of environmental discourses from national politics, mass media and broader municipal political social practices, for example to see if the discourses from the climate budgets were represented in similar ways throughout media internally to the municipality and externally, or if competing discourses occurred. For a complete list of the texts and talks included in this analysis, see Table 2;

Table 2. Sources included in the critical discourse analysis (Own illustration, 2019)

Source Type	Description	Pages	Reference
Policy Document	Climate budget 2018 (Technical report)	75 pages	(Oslo Municipality, 2018a)
Policy Document	Climate budget 2019 (Technical report)	118 pages	(Oslo Municipality, 2019a)
Policy Document	Policy statement document of intent. Cooperation between the Labour Party, the Green Party and the Socialist Left Party, Oslo	44 pages	(Raymond et al., 2015)
Speech	Motivational speech delivered by the Finance Minister Robert Steen	9 pages	(Steen, 2018)
Municipal Website	Additional information on the political process	2 pages	(Oslo Municipality, n.d., a)
Municipal Website	Best practises, Oslo climate strategy and climate budget	2 pages	(Oslo Municipality, n.d., c)
Press release	Klimabudsjettet 2019: Nye tiltak styrker Oslos grønne skifte	2 pages	(Oslo Municipality, 2018 b)
Press release	En grønnere, varmere og mer skapende by med plass til alle	6 pages	(Oslo Municipality, 2018 c)
Press release	Bedre kollektivtilbud, en renere by og mer til friluftsliv	3 pages	(Oslo Municipality, 2018 d)
Press release	Grønn og inkluderende byutvikling	3 pages	(Oslo Municipality, 2018 e)
Press release	Byrådetts forslag til revidert budsjett for Oslo kommune 2018 På vei til grønnere, varmere og skapende by med plass til alle	3 pages	(Oslo Municipality, 2018 f)
Press release	«Vår by, vår framtid»	2 pages	(Oslo Municipality, 2018 g)
Public talk	An evaluation of the climate budget, delivered by Robert Steen	-	(Steen, 2019)
Public talk	Discussion on climate discourses in Norwegian media with representatives from CICERO and NRK	-	(Samset, 2019, June7; Støstad, 2019, June 7)
News articles	International news related to the climate budget	13 pages	(Doyle, 2016; Peters, 2018; City of Oslo, 2019; Watts, 2018)

To favour transparency, it is custom as part of the CDA process to reflect on the researcher's own position (Fairclough, 2013a). I lived in Oslo for a year and while this informal immersion is not included as data, it left impressions and thus should be disclosed for ethical and reflexive purposes; I discussed climate and policy with citizens on the streets, I followed the municipal election in media in autumn 2019, I experienced the implemented infrastructure and other initiatives first hand.

Analysis iterations

Wodak (2001b) suggests including topics, discursive strategies, and linguistic means in CDA, which I followed. Topics were investigated as themes through the use of Dryzek's categorisation. To inform the analysis of discursive strategies, Van Dijk's theory on dominance was incorporated. Justification and legitimisations are strategies used to establish dominance through discourses, for example by establishing claims and arguments as; 'just', 'natural' and 'necessary', or by adopting a denial of any inequality and dominance (Van Dijk, 1993). Linguistic means took into account rhetoric, buzz-words, slogans and the like.

The analysis was carried out in NVivo 12 Plus; identifying nodes in relation to Dryzek's categories and identifying recurring discursive themes beyond by looking at genres (the rhetorical and argumentative structures), styles (particular ways of using language), discourses and their interconnection (Fairclough, 2012). This resulted in 63 nodes and 402 references. These were grouped into themes and overlaps eliminated. Descriptions and interpretations were separated in order to improve transparency and retroductive properties (Wodak, 2014). The interpretive elements were further elaborated upon in the discussion in connection with theory to enrich the understanding of the findings.

The analysis consisted of a mixed methods approach. I integrated a quantitative aspect of NVivo word and phrase frequencies; deductive from Dryzek's discourse categories of what constitutes certain discourses, as well as inductive from frequent use of certain expressions and linguistic imagery, 'buzz words', and values from the reports. For a full enclosure of quantitative elements, see

Appendix B. I looked at the context and meaning in which the words appeared as well as gaining a sense of importance of a few particularly frequent articulations.

The next stages of the analysis focused on the discursive and social practices, looking at competing orders of discourses to compare and contrast with the climate budget documents, as well as manifestations of the climate work.

5.3 Limitations and ethical reflections

Firstly, this analysis draws on Dryzek's categories of environmental discourses. According to Bhaskar's (2013) notion of stratified reality, the empirical is observable phenomena, but will always be interpreted through a lens. This lens can be a theoretical understanding. While Dryzek (2013) includes a wide range of discourses, choosing this lens may undervalue or overlook other discourses.

Secondly, an ethical reflection is that there might be a bias through using a coherent set of values as a starting point for a normative analysis, such as is custom for CDA (Wodak, 2014). In my case, degrowth entails a critique of how environmental discourses in the global north maintain inequities in global power relations, at the face of climate change, through continuous promotion of economic growth and ignoring the role of consumption in sustainability work.

Thirdly, some elements had to be omitted due to limitations of space and resources. Visual images and photographs were excluded, as was the 2017 climate report. Extending the analysis to visual imagery could have enriched the semiotic findings. Face-to-face interviews with prominent politicians could potentially have deepened meanings and elaborated on presence of some - and invisibility of other - discourses.

Finally, the speech from the Finance Minister and press releases were in Norwegian. Any quotes used from the speech or press releases were subjected to translation, which can present a limitation of capturing the meaning. Norwegian is not my native language. However, having lived in Norway, and Norwegian being very close to my native language (Danish), any unintended linguistic bias would be limited.

6 Critical discourse analysis and findings

The analysis and findings are presented below, structured into three sections of the interdiscursive level, discursive practises and social practises. The interdiscursive level analyses the 2018 and 2019 climate budgets. The discursive practises centre on the political process, communication, and policy manifestation. Finally, the social practises draw in broader societal discourses.

6.1 Interdiscursive analysis of the 2018 and 2019 climate budget reports

Four themes emerged from the critical discourse analysis of the climate budget reports; a preference for a regulated capitalist market structure; importance of the collective good over the individual; high

importance assigned to expert knowledge, technological solutions, infrastructure, and market-based incentives and finally; competing orders of discourse with national politics and mass media.

6.1.1 Genres and styles

The assumed natural relationship in the climate reports is anthropocentric. An anthropocentric view value human benefits from nature in contrast to an ecocentric perspective of nature's intrinsic value (Thompson & Barton, 1994). The climate reports emphasise benefits such as clean air and clean water, and frames green spaces as recreational (Oslo Municipality, 2019). In the 2019 report, neither 'species' nor 'biodiversity' is mentioned at all. Nature is only mentioned once as "easy access to nature", so as a human benefit (Oslo Municipality, 2019, p.6).

The climate reports acknowledge complex systems, but emphasise social and economic dimensions and omit natural elements and ecosystems in the definition. It is also clearly assumed that climate change is caused by humans;

Greenhouse gas emissions in Oslo result from the behaviour of hundreds of thousands of people and thousands of businesses. This is a complex and dynamic system that is influenced by many factors, including population growth, economic growth, changes in the behaviour of people and businesses, technological development and municipal- and central-government measures (Oslo Municipality, 2018a, p. 41).

Styles used as linguistic devices, such as slogans, metaphors, and buzzwords are plentiful. The 'greening' trend has well and truly rooted itself in the report as a prominent style. A lot of these are market-based metaphors, examples include; "green value creation" (p.12), "green bonds" (p.27), "green shift" (p. 68), "green transition" (p. 22), "green mobility" (p. 6), and "green economy" (p. 12) (Oslo Municipality, 2018a). Another market-based formulation is the frequent use of the word 'boosting'; for example, "boosting demand for biogas" (Oslo Municipality, 2018a, p. 23). The examples below are in line with economic rationalism and ecological modernisation:

"trigger new markets for climate-friendly technologies" (Oslo Municipality, 2018a, p. 58)

"create new markets for the implementation of climate friendly solutions" (Oslo Municipality, 2018a, p. 60)

Note the word 'friendly' from the above quote, it is a consistent framing choice, for example "climate friendly" (p.33), "environmentally friendly" (p.33) and its new cousin, "climate smart" (p.17) (Oslo Municipality, 2018a). Finally, "zero-emission" and "fossil free" deserve a mention. These two concepts are used almost a hundred times throughout the 2018 report. The report is vague on their definition and liberal in their application, but in one place they define "zero-emission" fuels as electricity and hydrogen or alternatively, biofuels (Oslo Municipality, 2018a, p. 60-61). Elsewhere, they interestingly recognise that it is not emission free to produce "zero-emission" biofuels (Oslo Municipality, 2018a, p. 54). As such, the term appears as a social construal to serve as part of the legitimisation strategy.

6.1.2 Legitimation

Legitimation, such as authorisation and rationalisation, are examples of semiotic articulations of political strategies (Van Dijk, 1993). There is a heavy reliance on statistics, analysis, and indicators. For instance, throughout the reports the work assumes validity through using forecasting, baseline calculations, segregating Statistics Norway's outputs into more specific categories and conducting technological analysis of the carbon capture and storage facility at Klemetrud's. The following quote illustrates the expert authorisation approach well;

"According to the Institute of Transport Economics, removing workplace parking is a powerful instrument for reducing traffic." (Oslo Municipality, 2018a, p. 61)

An authoritative approach is present through legislative work. For example, businesses are imposed restrictions; taxis are required to be fossil free from 2022 and strict emissions and environmental requirements are put in place on construction sites, including sourcing and life cycle analysis requirements (Oslo Municipality, 2018a). The climate budgets contain market-based economic rationalisations, hinging on the notion of homo economicus, the economic assumption of self-interest (Dryzek, 2013) and thus that price incentives steer people and businesses. A few examples are;

"...position biogas as a climate-friendly alternative in the competition with other biofuels. ...to boost demand for biogas... discounts should apply to biogas-fuelled vehicles passing through the toll ring" (Oslo Municipality, 2018a, p. 68)

"importance of stronger economic incentives to boost demand for zero-emission construction machinery." (Oslo Municipality, 2019, p. 101)

There is a focus on unification rather than pluralism; both in terms of the political landscape, but also for interest organisations and citizens. The municipality expresses to know best what is 'good' for citizens, and seeks to modify behavioural patterns. For example, there are no mentions of opposition, minorities, marginalised groups, and poverty. The only notion of socio-economic concerns, was a request for a study in 2018 on socio-economic consequences related to the transport changes (Oslo Municipality, 2018a, p. 61), however the study is not elaborated on in the 2019 report.

International attention is used as a legitimation strategy as well. Oslo municipality aim to be a green leader, and positive international attention on the climate budget (City of Oslo, 2019; Doyle, 2016; Peters, 2018; Watts, 2018) is retold in the climate reports, supporting the local sense of importance and authorising the work.

6.1.3 Authority and expert agency

The agency in the climate budget is placed with a strong authority (municipality), scientists and to a lesser extent, 85 businesses through collaboration (Oslo Municipality, 2018a, p. 68). The national government is also an agent, important to the CCS plant and biofuel blending requirements. Overall, the municipality and experts are presented as the 'responsible' ones;

“Oslo’s Climate Budget is a means of showing where emissions must be reduced and who is responsible for doing so” (Oslo Municipality, 2018a, p. 6).

There is a recognition of general climate work being carried out by the municipality, businesses, organisations, and residents (see example of responsibility distribution in Appendix A). Oslo municipality, however, does not express explicit importance to grassroots movements or the global scale; this is implicit through omission of these ideas.

Some of the established experts are the Climate Agency, Statistics Norway, Norwegian Institute for Air Research, Rambøll, and other externals (Oslo Municipality, 2018a). The climate agency is an important agent, evident through the many active verbs attached to their activities, such as; “assessing” (p. 36), “projecting” (p. 74), “developing indicators” (p.27), “calculating” (p.30), “obtaining statistics” (p.37), and “categorising emissions” (p.36) (Oslo Municipality, 2018a). The verbs also show an attachment to a mechanical and knowledge-centred approach to the climate work.

Little agency is placed with individuals. The focus lies on steering people to make “climate friendly choices” (Oslo Municipality, 2018a, p. 6). Examples are frequent formulations of encouraging “behavioural change” (Oslo Municipality, 2019, p.28). In that sense the focus lies overwhelmingly on political tools for top-down steering such as “measures” (p.30), “packages” (p.66), “initiatives” (p.68), “instruments” (p. 68), and market mechanisms (Oslo Municipality, 2019). But where economic rationalism operates with *consumers* self-interest, the climate report most often operates with “people” (p. 22) and “residents” (p. 59) (Oslo Municipality, 2018a). ‘Citizens’ is a value laden concept connected to citizenship which suggests a status of rights and a practise of political participation (Lister, 1998). ‘Citizens’ is only mentioned once in the 2018 report (p. 6) and not at all in the 2019 report (Oslo Municipality, 2018a; Oslo Municipality, 2019).

6.1.4 Mobilisation and involvement

Little space in the reports is dedicated to involvement. By using the term ‘mobilise’ (Oslo Municipality, 2019) there is already an inherent assumption that something (municipality) has the agency to mobilise, or induce action upon another entity, here the people. This reinforces the assumption that the agency lies with the authority. The initiatives are few and appear top-down focused and mechanistic of nature. The ‘involvement’ mostly relies on pushing information to encourage behaviour change, for example via www.klimaoslo.no⁴, (so there is an inherent assumption that knowledge leads to action). They also rely on market-based mechanics, rather than participatory approaches. There is curiously no mention in the reports of the events throughout 2019 that take place in connection with Oslo as Green European Capital.

⁴ A website for people with descriptions and information regarding Oslo’s climate work

6.1.5 Economic growth, yes or no?

On the notion of economic growth, the budgets are somewhat ambiguous. “Economic growth” (p. 41) is mentioned several times in the 2018 report whereas ‘steady state’, ‘organic growth’ and ‘degrowth’ are not mentioned at all, and “circular economy” (p. 60) is mentioned once in the 2018 report and not at all in the 2019 report (Oslo Municipality, 2018a; Oslo Municipality, 2019). Green growth is not directly mentioned but is practised through creative alternative styles such as “green economy” (p. 12), “green value creation” (p. 12) and “green bonds” (p.27), (Oslo Municipality, 2018a).

There is a recognition that economic growth is correlated with CO₂ emissions, but the concept of relative decoupling is brought into play within the same breath, yet absolute decoupling is recognised as impossible. Decoupling is not mentioned in the 2019 report.

An absolute decoupling would mean that GHG emissions were completely unrelated to economic growth. We lack sufficient evidence to calculate a specific factor linking economic growth and GHG emissions, and accordingly have omitted the effect of economic growth from the baseline (Oslo Municipality, 2018a, p. 44).

In the 2018 report, the municipality encouraged reductions of energy consumption because of the harmful environmental effects, but this was removed in the 2019 scope. In another section, growth was indirectly promoted by advocating more commerce in the city centre; “There will be more commerce, outdoor café seating...” (Oslo Municipality, 2018a, p. 7). From the above examples, it is fair to assess that the report takes a position of an altered capitalist political economy, albeit somewhat convoluted.

6.1.6 Competing discourses from Dryzek’s discourse categories

Ecological modernisation

There are strong subscriptions to ecological modernisation discourses within the climate reports. Ecological modernisation occurs in various forms, some stronger than others (Warner, 2010). Refusal of absolute decoupling suggests a stronger variation. Reducing the number of cars by affecting consumer preferences through market mechanisms is also in line with strong ecological modernisation (Berger, Flynn, Hines, & Johns, 2001). However, weak ecological modernisation focuses on technological fixes, of which there are plenty; the carbon capture and storage plant, researching Intelligent Transport System sensor technology, advanced biofuels and vague “climate friendly technologies” (Oslo Municipality, 2018a, p. 58).

Administrative rationalism

There is a strong subscription present to the administrative rationalism discourse; the 2018 report relies heavily on policy mechanisms, institutions, bureaucracy, and methodologies. To illustrate this, “measures” is mentioned an overwhelming 358 times and “packages” 44 times (Oslo Municipality, 2018a). Secondly, there is resonance with top-down power and expert knowledge. As mentioned, agency is placed with the municipality, control agencies, and expert assessors. An example of imposed behavioural steering on the population is that 25.000 parking spaces will not remain cost free for non-

residents, and 1.100 parking spaces by public transport hubs are removed (Oslo Municipality, 2018a). The goal of reducing the GHG emissions is presented as a unified fact that takes priority over other areas.

6.1.7 Discourse evolution between the 2018 and 2019 climate budget reports

To unveil competing discourses over time, the main changes – actual, rhetorical, and of construal order – will be shown in the below section.

Indirect versus direct GHG emissions

Firstly, the 2019 report is clearer about direct and indirect GHG emissions, in that it explicitly adopts a complete omission of indirect GHG emissions;

We have based the assessments in this Technical Report on, and have attempted to limit them to, direct GHG emissions from Oslo as a geographical unit, defined as “Scope 1”. In other words, the emissions accounting and Climate Budget only include emissions from manufacturing and other activities within Oslo’s city limits. Emissions from the use of electricity, defined as “Scope 2”), and other emissions released indirectly by Oslo (defined as “Scope 3”) are excluded from the emissions accounting and the Climate Budget (Oslo Municipality, 2019, p. 43).

As a consequence, the food waste reduction and energy efficiency that was part of the budget initiatives in 2017 and 2018 were removed (Oslo Municipality, 2019, p. 44), and any room for including new consumption reduction initiatives has effectively been excluded from the dialogue, apart from single plastic use reduction within the municipality, and material recycling of commercial waste. The strategy is legitimised through conceptual boundary setting of ‘Scope 1’.

Arbitrary boundary exclusion of direct GHG emissions

Another change is that statistics are now available on air travels from Oslo’s airport Gardermoen in Ullensaker Municipality. Despite the renewed 2019 focus on direct emissions, the 251.840 tonnes CO₂e emissions from air travel are omitted (Oslo Municipality, 2019). Although not all the airport emissions can be attributed to Oslo’s activities, Oslo’s businesses, tourism, and citizens’ share is likely substantial. The strategy is legitimised through the boundary setting, here geographical.

Agency construal

Another important shift is occurring; acknowledging that the agency to some extent needs to be shared; “No single measure or single actor can achieve all the emission reductions required” (Oslo Municipality, 2019, p. 12). The municipality calls for feedback from unions and business on how to make people switch to fossil free transport modes within the private-sector (Oslo Municipality, 2019). There is also an increased focus on education. Yet, agency still lies implicit with authorities, with a focus on steering the population. Finally, a brief note on the actual manifestations of the climate work. The CO₂ reductions are expected to fall short of the 2020 goal by 95.815 tonnes CO₂e (Oslo Municipality, 2019) which is almost a third of the aimed absolute reduction by 2020.

6.2 Discursive practices

6.2.1 *Dissonance between party statement and the climate budgets*

The political coalition from 2015-2019 (The Labour Party⁵, The Green Party and The Socialist Left Party⁶) initiated the climate budget format. The coalition issued a policy statement document from 2015, prior to the climate budget (Raymond et al., 2015). The coalition statement acknowledge the ecological footprint, limitations and inequality (Raymond et al., 2015). These concepts are not reproduced in the climate budgets. This is clear from the different representation of consumption-based initiatives in the policy statement document;

Reduced consumption is one of the most important measures recommended for rich countries by the UN Intergovernmental Panel on Climate Change. Reduced material consumption will reduce Oslo's global ecological footprint and greenhouse gas emissions. The City Government's vision is for 100% materials recovery in Oslo and we will thus facilitate ever more recycling, re-use, and sharing (Raymond et al., 2015, p. 17).

Consumption reduction and recognition of global impacts of ecological footprints are essential aspects of the degrowth discourse, an ideology which is not explicitly mentioned. Later however, the expressed view on economy is that Oslo must be "an engine for economic growth" (Raymond et al., 2015, p. 23), which is not problematised in relation to the previously stated need for consumption reduction. This suggests a landscape of competing discourses within the policy statement, as consumption reduction does not mix well with economic growth. According to Fairclough, discourses are ideological when they uphold power and dominion (Fairclough, 2013a). In this sense, the total exclusion of consumption initiatives from the 2019 climate budget report is an example of exercise of power and dominion. It is a Gramscian expression of 'ideological hegemony' (Forgacs 1988, as cited in Fairclough 2013a, pp.27-28), i.e. of an ideological discourse that favours continuation of growth from capitalism and in doing so, represses the idea of degrowth.

6.2.2 *Cross sectoral practice*

The climate budget is a steering tool within and beyond the municipality, in the sense that emission caps are used when negotiating the municipal budgets (Oslo Municipality, n.d., c). In this respect the budget holds power as it is implemented with equal importance to monetary distribution. The department for environment and transport takes ownership of the climate work (Oslo Municipality, 2018a, p. 27). Businesses, the national government and other stakeholders are responsible for reporting progress on their areas. The below quote shows how important the climate budget is in the political process;

⁵ In Norwegian "Arbeiderpartiet"

⁶ In Norwegian: "Socialistisk Venstreparti"

"The City Council can only adopt budget plans that will provide climate cuts in accordance with the climate strategy. In this way, climate measures are highly prioritised in budget negotiations." (Oslo Municipality, n.d., c)

Jessop (2012) theorised 'restructuring' as a tendency within capitalism, where economic fields 'colonise' non-economic domains of life. Both linguistically and structurally, by the very act of subscribing budget terminology and process to sustainability initiatives, this discursive practise could be said to take place within the climate budget and related social events.

6.2.3 Klemetsrud carbon capture and storage

The carbon capture and storage plant is a discursive practise example of how the ecological modernisation discourse is operationalised. At an estimated 165.000 tonnes CO₂ reduction, the CCS plant is the largest single measure of GHG reductions in the climate budget, and is equivalent of 25 percent of the CO_{2e} necessary to halve Oslo's GHG emissions by 2020 (Oslo Municipality, 2018a). So far, the project has been delayed because of a dependence on financing from national level politics (Oslo Municipality, 2019). These political, financial, and technological uncertainties put Oslo's future GHG reduction plans at considerable risk, given the large attribution of GHG reductions assigned to this single measure.

6.3 Emerging and competing discourses

Municipal press releases were included in the analysis, because they are part of the order of discourses and part of the social practise network. Through them, elements from the climate budget are repeated, but also represented by different genres and styles through the emphasised slogans, tone, and values.

The motto that "the climate budget works" (Oslo Municipality, 2018b, p.2), is present in the Finance Minister's speech. Other examples of repetitions are; Oslo as a "green and inclusive city", "greener, warmer and creating city with room for everyone" and "European green capital" (Oslo Municipality, 2018c; Oslo Municipality, 2018e; Oslo Municipality, 2018f; Oslo Municipality, 2018g) and "Clean water, clean streets, safe city" (Oslo Municipality, 2018c). They diverge on other articulations; work is framed as 'fighting poverty and inequality' (Oslo Municipality, 2018d). There is focus on "decreasing social differences across the city" and "keeping the property price increase down" (Oslo Municipality, 2018g). All in all, the press releases are more value laden than the climate budget, particularly in relation to equality, inclusiveness, and social equity, and they focus on framing the politics as a 'right' and 'service' to the residents.

As part of the social practises that produce and reinforce cultural values, I included a speech by the Finance Minister on the climate budget. The values are presented as "equal opportunities for all", "a city with room for everybody", "feeling safe", "belief in the freedom of the individual", "limitless

solidarity”, “proactivity”, “just cozy”⁷, “brave choices” and “strong economy” (Steen, 2018, pp.1-2, 8-9). Threats to the values are presented as; growing inequality and undermining of individual freedom. Top-down governance is legitimised through the slogan “politics work” (Steen, 2018, p. 2). The use of fear rhetoric is applied; a work model “under attack”; a need to fight the forces who wish to tear down what “we have built up”; “what we have can be destroyed terrifyingly quickly” and “if we do not act, we will all suffer” (Steen, 2018, p. 1). The last quote exemplifies how the *common good* takes precedence over the individual. Finally, the Minister emphasises “It’s not cheap, but it’s worth it” (Steen, 2018, p. 9). Consumption levels are not mentioned.

Competing orders of discourse exists in the relation between mass media and the political institutions and is relevant for the socio-cultural context. Climate discourses from mass media compete with the discourses from the climate budget. There are discourses adopting ‘scare’ strategies and others that adopt a ‘solution oriented’ strategy (Samset, 2019, June 7). A local outlook, something that feels ‘close’, is one of the current framing trends to gain credibility and relevance for climate stories in Norway; this can create social media spikes that reflect pro climate urgency to act and hatred from climate deniers (Støstad, 2019, June 7). There is a tension between the left-green municipal politics, and the right-wing national politics in Norway - which includes climate deniers (Steen, 2019). Poignant, political discussions at national level are portrayed in media and polarise people on the topics of wind power, meat production, biofuels, emissions statistics and nuclear power (Samset, 2019, June 7). This is not an exhaustive list of media portrayals, but it reflects the polarised and diverse order of discourses.

7 Discussion

The purpose of this study was to identify dominant discourses in the climate budgets and their relation to orders of environmental discourses within the municipality, in national politics and mass media, as well as their implications for discursive practises, activities and framings of the climate work from a degrowth perspective.

7.1 Prominent environmental discourses in the climate budgets

Green leadership is one of the discourses; through discursive practise, Oslo municipality seeks to position Oslo as a green leader in Europe, in order to inspire other cities. While it is refreshing to see a serious citywide effort on direct GHG emissions reductions, the present discourses leave out some important areas in terms of GHG emissions, which the discussion will take a closer look at.

⁷ “just cozy” loosely translates to “bare hyggelig”

7.1.1 Dominant discourses

The dominant discourses from Dryzek's categorisation in the 2018 and 2019 climate budget reports, were established in the analysis; a mix between ecological modernisation and administrative rationalism with generous application of market-based tools.

A prime example of the high reliance on technology, in line with ecological modernisation (Warner, 2010), is the carbon capture and storage plant at Klemetsrud. The carbon capture and storage plant is the largest single measure in the climate budget, equivalent to 25% of the 2020 goals (Oslo Municipality, 2018a). This technological reliance grows starker in light of the largely abandoned consumption reduction goals, which could have reduced the amount of waste to be incinerated in the first place. It is a problematic development that a fourth of the 2020 reductions rely on an untested technology, while at the same cutting out the scope that deals with the root of the problem.

7.1.2 Social wrongs

Global equity

I argue that it is a social wrong when the very definition of the problem and scope - and subsequently the actions, structures and systems put in place as solutions - continue the tradition of global inequity and perpetuate the consumption and production cycles of growth, a cycle which causes global warming and destruction of ecosystems and species (D'Alisa et al., 2014).

Firstly, the scope disregards global equity in terms of CO₂e limits per capita. The whole scope is designed around GHG emissions against 1990 levels in Oslo (Oslo Municipality, 2018a). It is not reflected upon in the climate work what kind of state that leads to. How much CO₂e per capita does that amount to? Is that globally just? If we aim to prevent global warming above 2 °C climate target, the annual CO₂e emissions globally per capita by 2050 should approximate 2.1 tonnes (Girod et al., 2014). That may indicate a greater need for behavioural change. Categorically excluding indirect GHG and consumption-based emissions is thus problematic. Duus-Otterström and Hjorthen (2019) argue that consumption-based accounting is more distributive just, than production-based accounting.

Secondly, the use of technological framing, efficiency, and responsibility with authorities may stifle or undermine a need for behavioural change that addresses consumption levels. Murtagh, Gatersleben, Cowen, and Uzzell (2015) found that reliance on technology can indeed undermine personal responsibility for climate action.

Thirdly, with a high focus on experts, indicators, statistics, and prognoses, such as is the case of administrative rationalism, there is a risk that the climate work becomes a narrow bureaucratic balancing act to meet the budget. One example is the 'zero-emission' fuel. The 'zero-emissions' biofuels alternative becomes a substantial proportion of the estimated car and heavy vehicle reductions because of the 20% blend requirement (Oslo Municipality, 2018a). Yet, the politicians recognise that it is not emission free to produce 'zero-emission' alternative of biofuels (Oslo Municipality, 2018a). Biofuels come in many types, some add environmental stresses through the sourcing and add stresses in the food-energy-water nexus, when agricultural soil could have been

used for food production (Rulli, Bellomi, Cazzoli, Carolis & D'Odorico, 2016). The supply chain questions however, are not specifically addressed, besides the vague umbrella term of "sustainable" sources (Oslo Municipality, 2018a, p. 61). So, while the municipality may calculate local emission reductions to Oslo, understanding accurate emissions reductions in a global context requires full supply chain considerations. Additionally, non GHG considerations are disregarded. A holistic, systems perspective, that considers ecological and social impacts, is relevant for global environmental sustainability (Morelli, 2011; Kates, 2011). Seen in this light, while 'zero-emissions' sounds promising, the framing is a value laden social construct and part of a discursive strategy to legitimise the climate work.

Ecological wrongs

Fairclough focuses on social wrongs (Wodak, 2014), but ecological wrongs should also be considered, and are relevant to climate discourses with an ecocentric focus. There is a lack of connection with the natural and social aspect of sustainability in the climate budget discourses, especially in a global context, as the biofuel initiative exemplified. Environmental sustainability as presented by Demaria, Schneider, Sekulova, and Martinez-Alier (2013) is absent from the climate budget discourses and related social practises in Oslo;

"Democratic redistributive downscaling of production and consumption in industrialized countries as a means to achieve environmental sustainability, social justice and well-being" (p. 209)

The above quote fits within Dryzek's (2013) green radicalism discourses, here referring to 'green consciousness' or 'green politics'. In here lies a large contrast to the climate budget. 'Green radicalism' critiques industrialism and encourage limits to economic growth. As such, alternative ideas include de-growth, a-growth or steady state economy; none of which are present in the climate budget discourses.

Local inequality

The critique of administrative rationalism, that citizens agency is disregarded (Dryzek, 2013) is somewhat merited in the case of the climate budgets, due to the lack of recognition of diversity, poverty and the unification strategy. In Oslo, the climate discourses translate into policies that affect citizens differently. Especially fees; Some can afford to pay the premium, but the financial incentives do not affect all groups equally. The lower income groups are more vulnerable, as are the geographically dispersed outside city boundaries.

For example, the toll introductions and continuous removing of free parking spaces within Oslo make car travel a more expensive choice. Switching to electric cars can have high entry costs. It can cause population groups to simply not afford car travels any longer. The municipality legitimise vehicle GHG reductions through the arguments of 'the right to' improved air quality (Oslo Municipality, 2018a). In this way 'clean air' and 'clean transport' is legitimised as a right and a positive common. It leaves the impression of the legitimisation strategy of *denial* (Van Dijk, 1993), which upholds the impressions that all citizens are of equal opportunity. This contrasts the values of 'inclusivity', 'fighting poverty and inequality' that are highlighted in the policy statement document (Raymond et al., 2015) and press releases (Oslo Municipality, 2018d).

“It’s not cheap, but it’s worth it”, is one of the Finance Minister’s slogans (Steen, 2018, p. 9). Raised property taxes help fill the financial gap (Steen, 2018). It begs the question, at what social costs are the solutions pursued? According to Fairclough (2013a), “the semiotic dimension, deeply embedded within the new structure, is part of the obstacle to addressing the social wrong” (p. 244). The slogans that the ‘climate budget works’ and ‘politics work’ justify the top-down steering and continuation of the current social practices, and present semiotic obstacles to challenging the dominating discourses.

7.2 Contestation and discursive struggles

7.2.1 Consumption driven GHG’s

Indirect GHG emissions and emissions related to lifestyles (apart from transportation choice within the city) continue to largely be omitted from the scope. The only mention of consumption reduction was encouragement of reductions of energy consumption because of harmful environmental effects (Oslo Municipality, 2018a), and as mentioned, this was removed from the 2019 scope. The municipal report does not justify or comment on why they decided to only focus on direct GHG emissions. It is merely stated as a matter-of-fact in the report.

This omission is problematic, as it has substantial repercussions for the scope and effects of the climate work. It is faulty to completely disregard consumption-based GHG emissions, such as meat consumption, household consumables and electronics, food waste and other indirect consumption and lifestyle related emissions, like the air travel from Gardermoen. According to the Global Footprint Network (2019), it takes nature one year and nine months to regenerate the global human demand consumed from one year, which calls attention to overshoot. The degrowth movement recognises human demand, manifested through production and consumption, as a driver for greenhouse gas emissions (D’Alisa et al., 2014).

Even the politicians in Oslo municipality formally acknowledged this necessity for consumption reduction in the political statement report from 2015 (Raymond et al., 2015). This reflects an important discursive struggle between the 2015 intent document, the 2018 and 2019 climate budget report, as it seems a consumption focus has indeed declined steadily over the years. However, if the budget work *were* to integrate consumption-based emissions, there is a need to live with higher degrees of uncertainties and unmeasurable goals, a philosophy that goes against the current dominant discourses within the climate budget work.

7.2.2 Geographical boundaries

The 251,840 tonnes CO₂e from air travel from Gardermoen (Oslo Municipality, 2019), is a stark example of emissions deemed outside scope, from the legitimisation strategy of geographical boundaries. However, one of the main tenants and communicated strengths of the climate budget is the cross sectoral discursive practise of distributing the responsibilities to whom can affect that emissions source (Oslo Municipality, 2018a). Following this logic, Oslo’s air travel should be assigned to Oslo, *not* Ullensaker Municipality, which has little agency to influence those emissions. In contrast,

the collaboration between businesses in Oslo and Oslo municipality could for example make campaigns to promote reductions of air travel and similar initiatives.

This is an oversight in the climate work, both relating to the geographical boundary setting and the assignment of agency. It is curious that a policy designed so intently to target direct emissions from transportation would go against its internal logic of distribution of responsibility and omit such a large post. It begs the question of what end the means from the climate budget reports are working towards; currently, the climate work seems to be operationalised as an isolated bubble of Oslo, rather than perceived in a global context, with social and environmental interconnections.

7.2.3 Question of scale in Norwegian political discourses

Political discourses in Norway have been influenced by an either/or approach rather than a multiscale perspective to environmental politics (Hovden & Lindseth, 2002). This disconnect is visible in the climate work, (lacking supply chains, global implications from local actions, hard municipal boundaries). A multiscale perspective to environmental politics, could spur profound structural changes that cannot be enforced by Oslo municipality alone; taking into account global perspectives, strengthening collaboration with national level, but also collaborating across the current 'hard' municipal geographical boundaries.

However, a challenge to this development persists in national political discourses; one of the competing discourses is the promethean discourse of climate deniers. A study found that climate change denial is present in Norway and is often occurring in relation to right-wing nationalism amongst conservative white males (Kränge, Kaltenborn, & Hultman, 2019). According to the Finance Minister Steen (2019), climate deniers in national politics put a limit on the coordinated efforts across scales for Oslo's municipal work, yet unsurprisingly such notions are left out of the climate budget itself. Cooperation with national level politics remains important, especially for the aforementioned Klemetsrud carbon capture and storage facility.

7.2.4 Discourses and growth ideology

The authors of the climate report recognise a correlation between economic growth and GHG emissions;

"Greenhouse gas emissions in Oslo result from... many factors, including population growth, economic growth, changes in the behaviour of people and businesses, technological development..." (Oslo Municipality, 2018a, p. 41)

However, this point is diluted as none of the solutions seek to curb economic growth in any capacity. As mentioned, the 2019 report handles this dilemma by consequently excluding indirect emissions, and explicitly stating only direct fossil fuel is to be targeted. In its own way, this corresponds with ecological modernisation where economic and environmental values are married.

"We lack sufficient evidence to calculate a specific factor linking economic growth and GHG emissions" (Oslo Municipality, 2018a, p.44).

This reason stated above (for omitting economic growth), seems weak considering in general the heavy focus from administrative rationalism on funding research and obtaining statistics, using proxies etc. It points towards a lack of will to challenge the growth paradigm, not a lack of capacity. According to Fairclough (2013a), discourses become ideological when they sustain power and dominion, which I argue is the case here. The active discourses maintain these perspectives, semantically and discursively.

7.3 Ways of righting the social wrong

7.3.1 Participation and active learning

As mentioned in the analysis there is an inherent assumption in the climate budgets that knowledge leads to action. This goes to show through the investment in education and distributing information, among others, on the climate website. However, there is contention as to whether knowledge does indeed lead to action. According to Thøgersen (2005), there is a notable gap between available information and the real action and subsequent impact when it comes to consumer choices). This may partly play out on a discursive level, as citizens can experience discursive confusion partly due to contradictory information (Markkula & Moisander, 2012), particularly in light of the competing discourses with national politics and the local media in general. But even within the local municipal politics there are signs that knowledge does not necessarily lead to action. The politicians behind the climate budget acknowledge the ecological footprint and the advice to cut consumption (Raymond et al.), yet this knowledge is not translated into action in the policy on a discursive level. Thus, it does not manifest on a societal level. If the politicians do not put knowledge into action, how can they expect citizens to do so?

Studies indicate that moving beyond simply informing citizens will be more effective in terms of behavioural change and impact. In order to create effective behaviour change, Csutora (2012) argues that top-down structural and contextual changes are necessary, rather than relying on voluntary behavioural changes alone. The climate budget work *does* indeed seek to change peoples' behaviours by more means than sharing knowledge. An intrinsic motivation, such as saving money, is a common strategy used in the climate budget when it comes to altering behaviour. But designing interventions that move beyond rational choice may prove an untapped potential, not in lieu of, but in addition to, the regulatory strategies. For example, participatory strategies can increase relatability; one example is *active* learning strategies (Osbaldiston & Schott, 2012), which can entail face-to-face time, increasing the feeling of participation, increased interaction and voluntary self-expressed commitment. Active learning strategies are part of Dryzek's (2013) category of green radicalism that also favours limits to growth - an indication that such strategies can work well together.

7.3.2 Degrowth in policy and discourse

There is a potential to challenge the dominant discourses by looking to degrowth. Hardy, Palmer and Phillips (2000) suggest that discourses can be used actively as a strategy, in this case for example to promote consideration of supply chains and to reassess the overall goals of the climate work. The below policies (Table 3) are suggestions from a wide range of degrowth papers, condensed in Kallis et

al., (2012, p. 175-176) and Cosme et al. (2017, p. 328-330). I have sorted them according to the case of Oslo, given the current climate discourses at work.

Table 3. Degrowth policies, separated into current, new and radical for Oslo’s climate work (Cosme et al., 2017; Kallis et al., 2012)

New - Fit well with Oslo’s current types of policy	commerce free zones; consumption and resource taxes; CO ₂ caps; resource caps; tax environmental externalities; regulate advertising
New - Fit well with the values of equality	equal access to goods and services; decrease unemployment; equitable redistribution of income and capital assets; universal income; strengthen local communities; strengthen common possessions; salary caps; caps on political campaigns
Current - Already (partially) in place	sharing of cars; urban food gardens; divest in car-based transportation; (reintroduce) waste reduction; (reintroduce) energy consumption reduction; compact city living; educate in sustainability; increase green investment; promote small local businesses; ban harmful technologies
Radical - novel ideas	non-debt money and ethical banking; tax international capital movement; new property ownership structure; promote new ownership patterns; promote local production-consumption; reduce commerce and trade; reduce material consumption; reduce production; regulate tourism; ban harmful technologies; reduced work hours and work sharing; support of ‘innovative local living’; promote frugal lifestyles; promote voluntary work and value; ecological conservation; promote shared living; promote organic farming

The policies listed above should be subject to evaluation, and would in some cases create problems of their own, or necessitate strong national collaboration. Furthermore, economic changes, such as implementation of degrowth ideals or consumption reduction would mean less means to achieve the current goals and thus require strategic and incremental implementation (Kallis et al., 2012).

Finally, consumption-based accounting could be a useful tool in a degrowth strategy. Advantages to consumption-based accounting are increased emissions coverage, encouragement of cleaner supply chain, equity, and justice (Afionis et al., 2017). There are varying degrees of roll-out of consumption-based accounting. Peters et al., (2011) recommend using consumption-based accounting as a *complementary* indicator for policy formulation rather than full replacement of production-based accounting. If used complementary, it would not reverse the bias and omit production-based

emissions from Oslo. Double accounting should be watched out for of course, but it is curious that a city branding itself as *best practise* and *green leader* fails to consider consumption-based emissions.

Some obstacles to implementing this approach are related to effectiveness, the practical feasibility and political incompatibility (Afionis et al., 2017). Moreover, the Intergovernmental Panel on Climate Change and international standards for city GHG accounting play a role in the discourse mix and discursive practise. When consumption-based emissions are omitted in the standardised accounting from international context, it is harder to argue for such integration in a local setting. Both in terms of validation and also practically because a by-product is limited data for assessment work.

7.3.3 Municipal agency

It is relevant to consider what practically and naturally lies within the power of the municipality; their legislative and regulatory tools are amongst those, which is perhaps why solutions are heavily based on these. The mode of transportation for commuters is indeed changing based on the structural strategies implemented by the municipality. Regulatory and physical work is carried out; of removing parking spaces; changing the zones for heavy vehicles and deliveries etc. As such, the tools are put into practice in Oslo in a very present and firm way. Here the notion that the 'administrative mind steers society' does indeed spring to mind. However, the GHG accounting system, boundary setting, citywide approach, participation strategies *can also* be influenced.

7.4 Reflection on sustainability science and from a critical realist perspective

Cash et al (2003) argue findings within sustainability science should work to increase credibility, legitimacy and saliency. I worked on credibility by incorporating a sound basis of data and a coherent analysis framework, salience in terms of providing a reframed perspective to policy makers at a crucial point of the beginning of a new term and legitimacy through a reflexive research process with an openly stated normative starting point and declared personal role as a researcher.

With regards to critical realism, this study is conducted with the terminology of CDA, however, CDA and critical realism have many commonalities (Fairclough, Jessop, & Sayer, 2002), so below follows a short reflection from a critical realist perspective. I investigated the transitive dimension, i.e. discourses used to understand the world (Edgley, Stickley, Timmons, & Meal, 2016). Transitive dimensions, such as discourses, are relevant to study because they can influence our behaviour (Sayer, 1999). The discourses, discursive elements, and social events from this analysis stem from the dimensions of the empirical and the actual. The actual, such as political debates, may change the nature of objects, such as political institutions (Fairclough et al., 2002). Studies of the empirical and actual are relevant to approximate understandings of the structures from the domain of the real. In this case, the empirical and actual pointed towards power structures and assumptions about the world, that guide the climate work. Finally, critical realism is concerned with replacing unwanted structures with wanted structures, or in other words, emancipation (Corson, 1997). Here, degrowth ideas are suggested as an alternative to the dominant structures.

7.5 Limitations

Firstly, in critical realism, the 'truth' we learn about the world is considered to be conditional rather than absolute (Pratt, 1995). This means, what can be known is never complete – science is always limited by its lenses, as is also the case for this study. Secondly, there is a risk of misunderstanding when using quotes, as they echo a positivist representation, so it is useful to specify that any examples of text and quotes is representative in a causal rather than in a statistical sense (Pratt, 1995). Finally, the findings are relevant to the local case, and are not meant as scalable or transferable to other settings, as they are contextual.

8 Conclusion and future research

8.1 Conclusion

This study set out to identify dominant discourses in Oslo's climate budgets and their relation to orders of environmental discourses within the municipality, in national politics and mass media, as well as their implications for discursive practises, activities and framings of the climate work from a degrowth perspective. Data included the 2018 and 2019 technical climate budget reports, coalition statement document from 2015, information on the political process, six municipal press releases, a motivational speech by the Finance Minister, and two public talks.

The critical discourse analysis took into account the interdiscursive level, discursive practise and social practise through an iterative research process. Four themes emerged; 1) a preference for a regulated capitalist market structure, 2) importance of the collective good over the individual, 3) high importance assigned to expert knowledge, technological solutions, infrastructure, and market-based incentives and finally, 4) competing orders of discourse with national politics and mass media.

Legitimation strategies were deployed through rationalisation and authorisation, and involved unification rather than pluralism; retelling of international attention, green leadership, expert assessments, and heavy reliance on statistics, analysis, and indicators. The focus lied on top-down steering of people to make 'climate friendly choices' through the use of policy mechanisms, incentives, institutions, and bureaucracy. Linguistic devices such as 'green value creation', 'green economy', 'boosting', and 'zero-emission' were used (Oslo Municipality, 2018a). Some social practises include the CCS plant and cross sectoral governance.

There is a lack of agency assigned to citizens and the financial incentives do not affect all groups equally, which is not recognised. Secondly, the climate work disregards global equity. Currently, the climate work seems to be operationalised as an isolated bubble of Oslo, rather than perceived in a global context, with considerations of social and environmental interconnections.

All this indicate strong subscriptions to administrative rationalism and a mix of stronger and weak ecological modernisation discourses (Dryzek, 2013) that refuses a possibility of absolute decoupling, yet rely on technological fixes, such as the carbon capture and storage plant. The administrative rationalism approach poses the risk that climate work becomes a bureaucratic balancing act to meet

the budget. An important discursive struggle emerged; consumption focus and recognition of ecological limits has declined steadily over the years. The 2019 climate budget cut out 'scope 2 and 3' emissions of consumption and indirect emissions as well as airport GHG's. This was legitimised through conceptual and geographical boundary setting.

Righting the social wrongs through emancipation from the dominant structures (Dahms, 2011), could be pursued by using discourses as an active strategy (Hardy et al., 2000), looking towards degrowth ideas, multiscale perspective to environmental policy and agency through participation and social learning. Some degrowth policies are already part of the discourse and social practises; others present an opportunity. Introducing consumption-based GHG accounting as a complementary social practise could increase emissions coverage, encourage a cleaner supply chain, global equity, and justice (Afionis et al., 2017) and support degrowth ideals.

Yet there are obstacles to such an emancipation. The authors of the climate reports recognise a correlation between economic growth and GHG emissions, but there is a lack of will to challenge the growth paradigm. Consumption-based emissions would also challenge standardised internationally dominant social practises of production-based GHG accounting (Peters et al., 2011). According to Fairclough (2013a), discourses become ideological when they sustain power and dominion, as is the case here; in the name of green leadership, the discourses favour the continuation of growth, and execute a total exclusion of consumption initiatives, and in doing so, repress the idea of degrowth. Finally, competing orders of discourses present obstacles. For example, framing the politics as a 'right' and 'service' to the residents, using fear rhetoric's (Steen, 2018), and polarisation in the media and at national level politics, including climate denial (Krange et al., 2019; Samset, 2019, June 7; Støstad, 2019, June 7,). The semiotic embeddedness of "It's not cheap, but it's worth it", the "climate budget works" and "politics work" (Steen, 2018), "green economy", "boosting" (Oslo Municipality, 2018a) and portrayal of Oslo as "an engine for economic growth" (Raymond et al., 2015) justifies and maintains the top-down steering and continuation of the current social practices.

8.2 Future research

Future research could conduct and investigate barriers to consumption-based GHG accounting at the city level. An integrative approach that allows for a holistic understanding of CO₂ emissions in Oslo, for example by including indirect emissions from consumption, supply chains related to imported goods and a boundary setting that reflects actual living trends of citizens. This is not to suggest a discarding of the hard measures taken to address direct emissions within the city limit, but to supplement the understanding of human impact by providing emissions overviews from sources that are, at this point, excluded from the political debate. Finally, future research could take up the challenge of how discourses could be actively deployed as a strategy to overcome some of the discussed shortcomings and shape the climate work to include novel activities as solutions, such as degrowth ideals.

9 References

- Afionis, S., Sakai, M., Scott, K., Barrett, J., & Gouldson, A. (2017). Consumption-based carbon accounting: does it have a future?. *Wiley Interdisciplinary Reviews: Climate Change*, 8(1), e438.
- Agger, B. (1991). Critical theory, poststructuralism, postmodernism: Their sociological relevance. *Annual review of sociology*, 17(1), 105-131.
- Alway, J. (1995). *Critical theory and political possibilities: Conceptions of emancipatory politics in the works of Horkheimer, Adorno, Marcuse, and Habermas* (No. 111). Greenwood Publishing Group
- Berger, G., Flynn, A., Hines, F., & Johns, R. (2001). Ecological modernization as a basis for environmental policy: Current environmental discourse and policy and the implications on environmental supply chain management. *Innovation: The European Journal of Social Science Research*, 14(1), 55-72.
- Bhaskar, R. (2013). *A realist theory of science*. Routledge.
- Bows, A., & Barrett, J. (2010). Cumulative emission scenarios using a consumption-based approach: a glimmer of hope?. *Carbon management*, 1(1), 161-175.
- Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., ... & Mitchell, R. B. (2003). Knowledge systems for sustainable development. *Proceedings of the national academy of sciences*, 100(14), 8086-8091.
- CDIAC. (n.d). CO₂ emissions (tonnes per person). In Carbon Dioxide Information Analysis Center. Retrieved 2019, from <https://cdiac.ess-dive.lbl.gov/> via Gapminder <https://www.gapminder.org/data/>
- City of Oslo (2019, January). Oslo's Climate Budget 2019. *C40 Knowledge*. Retrieved from <https://www.c40knowledgehub.org>
- Corson, D. (1997). Critical realism: An emancipatory philosophy for applied linguistics?. *Applied linguistics*, 18(2), 166-188.

- Cosme, I., Santos, R., & O'Neill, D. W. (2017). Assessing the degrowth discourse: A review and analysis of academic degrowth policy proposals. *Journal of Cleaner Production*, 149, 321-334.
- Csutora, M. (2012). One more awareness gap? The behaviour–impact gap problem. *Journal of consumer policy*, 35(1), 145-163.
- Dahms, H. F. (2011). Chapter 1 The Early Frankfurt School Critique of Capitalism: Critical Theory between Pollock's "State Capitalism" and the Critique of Instrumental Reason. In *The Vitality Of Critical Theory* (pp. 3-44). Emerald Group Publishing Limited.
- D'Alisa, G., Demaria, F., & Kallis, G. (2014). *Degrowth: a vocabulary for a new era*. Routledge.
- Demaria, F., Schneider, F., Sekulova, F., & Martinez-Alier, J. (2013). What is degrowth? From an activist slogan to a social movement. *Environmental Values*, 22(2), 191-215.
- Dodman, D. (2009). Blaming cities for climate change? An analysis of urban greenhouse gas emissions inventories. *Environment and urbanization*, 21(1), 185-201.
- Doyle, A. (2016, September 28). Oslo's radical 'climate budget' aims to halve carbon emissions in four years. *Reuters*. Retrieved from <https://www.reuters.com>
- Dryzek, J. (2013). *The politics of the earth – Environmental discourses* (3rd ed.). Oxford, England: Oxford University Press
- Duus-Otterström, G., & Hjorthen, F. D. (2019). Consumption-based emissions accounting: the normative debate. *Environmental Politics*, 28(5), 866-885.
- Edgley, A., Stickley, T., Timmons, S., & Meal, A. (2016). Critical realist review: Exploring the real, beyond the empirical. *Journal of Further and Higher Education*, 40(3), 316-330.
- European Commission. (2019a, February 5.). European green capital 2019 - Oslo. Retrieved from <https://ec.europa.eu/environment/europeangreencapital/winning-cities/2019-oslo/>
- European Commission. (2019b, November 1). Norway, trade picture. Retrieved from <https://ec.europa.eu/trade/policy/countries-and-regions/countries/norway/>
- Fairclough, N. (2013a). *Critical discourse analysis: The critical study of language*. Routledge.

- Fairclough, N. (2013b). Critical discourse analysis and critical policy studies. *Critical Policy Studies*, 7(2), 177-197.
- Fairclough, N. (2012). Critical discourse analysis. *International scientific researcher*, 7, 452 – 487. ISSN: 2305-8285. Retrieved from <http://scholarism.net/FullText/2012071.pdf>
- Fairclough, N., Jessop, B., & Sayer, A. (2002). Critical realism and semiosis. *Alethia*, 5(1), 2-10.
- Fischer, C. (2011). Policy: Trade's growing footprint. *Nature Climate Change*, 1(3), 146.
- Fløttum, K. (2017). Klimanarrativer i ulike sjangrer. *Sakprosa*, 9(1).
- Girod, B., van Vuuren, D. P., & Hertwich, E. G. (2014). Climate policy through changing consumption choices: Options and obstacles for reducing greenhouse gas emissions. *Global Environmental Change*, 25, 5-15.
- Global footprint network (2019). Earth overshoot day 2019 is July 29th, the earliest ever. Retrieved September 2019, from <https://www.footprintnetwork.org/2019/06/26/press-release-june-2019-earth-overshoot-day/>
- Greenhouse Gas Protocol. (n.d.). Retrieved November 5, 2019, from <https://ghgprotocol.org/guidance-0>
- Hajer, M. A. (1995). *The politics of environmental discourse: ecological modernization and the policy process*. Oxford: Clarendon Press.
- Hardy, C., Palmer, I., & Phillips, N. (2000). Discourse as a strategic resource. *Human relations*, 53(9), 1227-1248.
- Herrera, M. Y., & Braumoeller, F. B. (2004). Introduction to the Symposium: Discourse and Content Analysis. *Qualitative Methods Newsletter of the American Political Science Association: Organized Section on Qualitative Methods*, 2(1), 15-19.
- Hovden, E., & Lindseth, G. (2002). Norwegian climate policy 1989–2002. *Realizing Rio in Norway: Evaluative studies of sustainable development*, 143-68.
- Jerneck, A., Olsson, L., Ness, B., Anderberg, S., Baier, M., Clark, E., ... & Persson, J. (2011). Structuring sustainability science. *Sustainability science*, 6(1), 69-82.

- Jerneck, A., & Olsson, L. (2008). Adaptation and the poor: development, resilience and transition. *Climate Policy*, 8(2), 170-182.
- Jessop, B. (2012). Understanding the 'economization' of social formations. In Uwe Schimank & Ute Volkmann (Eds.), *The marketization of society: Economizing the non-economic* (pp. 5-37). Germany, Bremen: Welfare Societies Conference Paper.
- Kallis, G., Kerschner, C., & Martinez-Alier, J. (2012). The economics of degrowth. *Ecological Economics* 84, 172-180
- Karstensen, J., Peters, G. P., & Andrew, R. M. (2018). Trends of the EU's territorial and consumption-based emissions from 1990 to 2016. *Climatic change*, 151(2), 131-142.
- Kates, R. W. (2011). What kind of a science is sustainability science?. *Proceedings of the National Academy of Sciences*, 108(49), 19449-19450.
- Kates, R. W., Clark, W. C., Corell, R., Hall, J. M., Jaeger, C. C., Lowe, I., ... & Faucheux, S. (2001). Sustainability science. *Science*, 292(5517), 641-642.
- Kennedy, C., Steinberger, J., Gasson, B., Hansen, Y., Hillman, T., Havránek, M., Pataki, D., Phdungsilp, A., Ramaswami, A. and Mendez, G. (2009). Greenhouse Gas Emissions from Global Cities. *Environmental Science & Technology*, 43(19), pp.7297-7302.
- Krange, O., Kaltenborn, B. P., & Hultman, M. (2019). Cool dudes in Norway: climate change denial among conservative Norwegian men. *Environmental Sociology*, 5(1), 1-11.
- Kukla, A. (2013). *Social constructivism and the philosophy of science*. Routledge.
- Lahn, B. (2019). *Norwegian petroleum policy in a changing climate* (2019:10). CICERO, Center for International Climate Research. Retrieved from <https://cicero.oslo.no/no/publications/external/6194>
- Larsen, H. N., & Hertwich, E. G. (2009). The case for consumption-based accounting of greenhouse gas emissions to promote local climate action. *Environmental Science & Policy*, 12(7), 791-798.
- Lindseth, G. (2006). Political discourse and climate change: the challenge of reconciling scale of impact with level of governance.

Lister, R. (1998). Citizen in action: citizenship and community development in a Northern Ireland context. *Community Development Journal*, 33(3), 226-235.

Lorek, S., & Fuchs, D. (2013). Strong sustainable consumption governance—precondition for a degrowth path?. *Journal of cleaner production*, 38, 36-43.

Markkula, A., & Moisander, J. (2012). Discursive confusion over sustainable consumption: A discursive perspective on the perplexity of marketplace knowledge. *Journal of Consumer Policy*, 35(1), 105-125.

Morelli, J. (2011). Environmental sustainability: A definition for environmental professionals. *Journal of environmental sustainability*, 1(1), 2.

Murtagh, N., Gatersleben, B., Cowen, L., & Uzzell, D. (2015). Does perception of automation undermine pro-environmental behaviour? Findings from three everyday settings. *Journal of Environmental Psychology*, 42, 139-148.

Osbaldiston, R., & Schott, J. P. (2012). Environmental sustainability and behavioral science Meta-analysis of proenvironmental behavior experiments. *Environment and Behavior*, 44(2), 257-299.

Oslo Municipality. (2019). *Climate budget 2019* (Technical report). Retrieved from <https://www.klimaoslo.no/wp-content/uploads/sites/88/2019/03/Climate-Budget-2019.pdf>

Oslo Municipality. (2018a). *Climate budget 2018* (Technical report). Retrieved from <https://www.klimaoslo.no/wp-content/uploads/sites/88/2018/02/Climate-Budget-English.pdf>

Oslo Municipality. (2018b). *Klimabudsjettet 2019: Nye tiltak styrker Oslos grønne skifte [Presse Melding]*. Retrieved from <https://www.oslo.kommune.no/getfile.php/13295843/Innhold/Politikk%20og%20administrasjon/Politikk/Byr%C3%A5det/For%20pressen/Pressemeldinger%20budsjett%202018/Klimabudsjettet%20-%20nye%20tiltak%20styrker%20Oslos%20gr%C3%B8nne%20skifte.PDF>

Oslo Municipality. (2018c). *Bedre kollektivtilbud, en renere by og mer til friluftsliv [Presse Melding]*. Retrieved from <https://www.oslo.kommune.no/getfile.php/13295810/Innhold/Politikk%20og%20administrasjon/Politikk/Byr%C3%A5det/For%20pressen/Pressemeldinger%20budsjett%202018/Bedre%20kollektivtilbud%20en%20renere%20by%20og%20mer%20til%20friluftsliv.PDF>

Oslo Municipality. (2018d). *En grønnere, varmere og mer skapende by med plass til alle [Presse Melding]*. Retrieved from

<https://www.oslo.kommune.no/getfile.php/13295816/Innhold/Politikk%20og%20administrasjon/Politikk/Byr%C3%A5det/For%20pressen/Pressemeldinger%20budsjett%202018/Hovedpressemelding%20-%20En%20gr%C3%B8nnere%2C%20varmere%20og%20mer%20skapende%20by%20med%20plass%20til%20alle.pdf>

Oslo Municipality. (2018e). *Byrådets forslag til revidert budsjett for Oslo kommune 2018 På vei til grønnere, varmere og skapende by med plass til alle [Presse Melding]*. Retrieved from

https://www.oslo.kommune.no/getfile.php/13281737/Innhold/Politikk%20og%20administrasjon/Politikk/Byr%C3%A5det/For%20pressen/Pressemeldinger/Byr%C3%A5dets%20forslag%20til%20revidert%20budsjett%20for%20Oslo%20kommune%202018_P%C3%A5%20vei%20til%20gr%C3%B8nnere%2C%20varmere%20og%20skapende%20by%20med%20plass%20til%20alle.pdf

Oslo Municipality. (2018f). *Grønn og inkluderende byutvikling [Presse Melding]*. Retrieved from

<https://www.oslo.kommune.no/getfile.php/13295828/Innhold/Politikk%20og%20administrasjon/Politikk/Byr%C3%A5det/For%20pressen/Pressemeldinger%20budsjett%202018/Gr%C3%B8nn%20og%20inkluderende%20byutvikling.PDF>

Oslo Municipality. (2018g). «*Vår by, vår framtid*» - *byrådets forslag til ny kommuneplan for Oslo mot 2040 [Presse Melding]*. Retrieved from

<https://www.oslo.kommune.no/getfile.php/13285434/Innhold/Politikk%20og%20administrasjon/Politikk/Byr%C3%A5det/For%20pressen/Pressemeldinger/PM%2021062018%20Byr%C3%A5dets%20forslag%20til%20kommuneplan%20for%20Oslo%20mot%202040.pdf>

Oslo Municipality. (2017). *Millø- og klimarapport 2017*. Retrieved from

<https://www.klimaoslo.no/wp-content/uploads/sites/88/2018/06/Miljo-og-klimarapporten-2017.pdf>

Oslo Municipality. (n.d., a). City Governance. Retrieved October 10 from

<https://www.oslo.kommune.no/politics-and-administration/politics/city-governance/>

Oslo Municipality. (n.d., b). Resultater for kommunestyrevalget i Oslo 2019. Retrieved October 28

from <https://www.oslo.kommune.no/politikk-og-administrasjon/politikk/valg/resultater-for-kommunestyrevalget/>

Oslo Municipality. (n.d., c). *Best practices, Oslo's climate strategy and climate budget*. Retrieved 2019 from <https://www.oslo.kommune.no/politics-and-administration/green-oslo/best-practices/oslo-s-climate-strategy-and-climate-budget/>

Peters, G. (2018, September 27). Oslo's climate budget – leading the way? *Cicero*. Retrieved from <https://cicero.oslo.no>

Peters, G. P., Minx, J. C., Weber, C. L., & Edenhofer, O. (2011). Growth in emission transfers via international trade from 1990 to 2008. *Proceedings of the national academy of sciences*, *108*(21), 8903-8908.

Pratt, A. C. (1995). Putting critical realism to work: the practical implications for geographical research. *Progress in Human Geography*, *19*(1), 61-74.

Raymond, J., Nguyen Berg, L., Borgen, M., Bøhler, J., Vederhus, T., Larsen, B., Dahl, T., Nissen, H., Eidsvoll, S., Staalesen, S., Marcussen, H. & Østvold, P. (2015). *Platform for City Government cooperation between the Labour Party, the Green Party and the Socialist Left Party in Oslo 2015-2019*. Retrieved from <https://www.oslo.kommune.no/getfile.php/13166803-1483540739/Content/English/Politics%20and%20administration/Green%20Oslo/Plans%20and%20programmes/Platform%20for%20City%20Government%20Cooperation.pdf>

Rockström, J., Steffen, W. L., Noone, K., Persson, Å., Chapin III, F. S., Lambin, E., ... & Nykvist, B. (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and society*.

Rulli, M. C., Bellomi, D., Cazzoli, A., De Carolis, G., & D'Odorico, P. (2016). The water-land-food nexus of first-generation biofuels. *Scientific reports*, *6*, 22521.

Samset, B. (June 7, 2019). *Klima som clickbait?* [Public debate, Representative from CICERO]. Tekna, Ingienørenes hus, Oslo. Retrieved from <https://energi.tekna.no/klima-som-clickbait/>

Saunders, M., Lewis, P., & Thornhill, A. (2009). Understanding research philosophies and approaches. *Research methods for business students*, *4*(1), 106-135.

Sayer, A. (1999). *Realism and social science*. Sage.

Sekulova, F., Kallis, G., Rodríguez-Labajos, B., & Schneider, F. (2013). Degrowth: from theory to practice. *Journal of cleaner Production*, *38*, 1-6.

- Sengers, F., Berkhout, F., Wieczorek, A. J., & Raven, R. (2016). Experimenting in the city: Unpacking notions of experimentation for sustainability. In *The experimental city* (pp. 15-31). Routledge.
- Spangenberg, J. H. (2011). Sustainability science: a review, an analysis and some empirical lessons. *Environmental Conservation*, 38(3), 275-287.
- Statistisk Sentralbyrå. (2018). *Population projections*. Retrieved from <https://www.ssb.no/en/folkfram/>
- Steen, R. (May 29, 2019). *Klimaregnskap – Oslo*. [Public debate]. Tekna, Ingeniørenes hus, Oslo. Retrieved from <https://energi.tekna.no/klimaregnskap-oslo/>
- Steen, R. (2018). *Finanstale 2019, Oslo Municipality*. Retrieved from <https://www.oslo.kommune.no/getfile.php/13296158/Innhold/Politikk%20og%20administrasjon/Budsjett%2C%20regnskap%20og%20rapportering/Finanstale%202019%2C%20holdt%20av%20finansbyr%C3%A5d%20Robert%20Steen%2026.09.2018.pdf>
- Støstad, M. (June 7, 2019). *Klima som clickbait?* [Public debate, Representative from NRK]. Tekna, Ingeniørenes hus, Oslo. Retrieved from <https://energi.tekna.no/klima-som-clickbait/>
- Sudmant, A., Gouldson, A., Millward-Hopkins, J., Scott, K., & Barrett, J. (2018). Producer cities and consumer cities: Using production-and consumption-based carbon accounts to guide climate action in China, the UK, and the US. *Journal of cleaner production*, 176, 654-662.
- Tellmann, S. M. (2012). The constrained influence of discourses: the case of Norwegian climate policy. *Environmental Politics*, 21(5), 734-752.
- Thompson, S. C. G., & Barton, M. A. (1994). Ecocentric and anthropocentric attitudes toward the environment. *Journal of environmental Psychology*, 14(2), 149-157.
- Thøgersen, J. (2005). How may consumer policy empower consumers for sustainable lifestyles?. *Journal of consumer policy*, 28(2), 143-177.
- Van Dijk, T. A. (1993). Principles of critical discourse analysis. *Discourse & society*, 4(2), 249-283.
- Warner, R. (2010). Ecological modernisation theory: towards a critical ecopolitics of change?. *Environmental Politics*, 19(4), 538-556.

Watts, M. (2018, September 27). From outstanding Oslo to the Norwegian Normal. How Oslo's Climate and Energy strategy can inspire the boldest possible climate action worldwide. *C40*. Retrieved from <https://www.c40.org/blog>

Watts, M., Schultz, S., Bailey, T., Beech, A., Russel, B., Morris, E., Vines, K., Lawrence, S., Sprigings, Z., Cepeda-Marqiez, R., Parik, G. and Tofias, Z. (n.d). Deadline 2020, how cities will get the job done, C40 cities. Retrieved from <https://www.c40.org/research>

Weber, M. (2002). Engaging globalization: Critical theory and global political change. *Alternatives*, 27(3), 301-325.

Wodak, R. (2014). Chapter 20, Critical Discourse Analysis. In Piazza, R. & Wodak, R (Eds.), *Critical Discourse Analysis* (pp. 302-316). Retrieved from https://www.researchgate.net/publication/238105100_DCA_-_Critical_Discourse_Analysis

Wodak, R. (2001a). What CDA is about—a summary of its history, important concepts and its developments. In Wodak, R., Meyer, M., Jäger, S., Van Dijk, T., Fairclough, N. & Scollon, R. (Eds.), *Methods of critical discourse analysis*, (pp.1-13). UK, London: Sage publications

Wodak, R. (2001b). The discourse- historical approach. In Wodak, R., Meyer, M., Jäger, S., Van Dijk, T., Fairclough, N. & Scollon, R. (Eds.), *Methods of critical discourse analysis*, (pp.63-95). UK, London: Sage publications

World Resources Institute. (n.d.). Retrieved November 5, 2019, from <https://www.wri.org/publication/greenhouse-gas-protocol-us-public-sector>

10 Appendices

Appendix A: Measures in the climate budgets

A detailed list of measures in the climate budget 2018 (with estimated effects).

MEASURES	Responsibility for implementation (Responsibility for reporting in parentheses)	Estimated effect of measure, 2015-2020 (tonnes CO ₂ e)
Phase out the use of heating oil in municipal buildings and undertakings	Undertakings that use heating oil (KLI)	121 450
Phase out the use of fossil fuel in privately owned buildings by 2020 through a combination of bans and subsidies (Climate and Energy Fund and Enova)	KLI	
Reduced emissions of landfill gas from Grønmo and Rommen	EGE and EBY	6 900
Phase out the use of fossil fuel and gas in district heating (peak load)	NOE	5 600
Increase material recycling of household waste and boost re-use	REN	4 300
Conclude documentation of nitrous oxide volumes in wastewater, with the aim of correcting figures supplied by Statistics Norway*	VAV	20 500
Introduce a new toll-ring payment system, including new toll stations, in 2019. Note that the effect assumes the implementation of the measures listed below in italics:	MOS	93 300
<i>Installation of new charging stations for passenger and commercial vehicles, including a pilot project for car-sharing schemes</i>	BYM	
<i>Increase public transport capacity to cope with population growth and reduction in private vehicle traffic</i>	Ruter	
Better provision for cyclists	BYM	3 400
National requirement for 20% blended biofuel to be implemented by 2020	National government	53 900
Fossil-free public transport by 2020	Ruter	29 500
Introduce new licensing rules for taxis with requirement for zero-emission taxis by 2022. Note that the effect assumes the implementation of the measure listed below in italics:	BYM	13 400
<i>Install new charging stations for taxis</i>	BYM	
Switch to zero-emission vehicles in the City of Oslo's own vehicle fleet, possibly using sustainable biofuels	All (UKE)	4 100
Establish a low-emission zone for heavy goods vehicles in Oslo	BYM	2 800
TOTAL REDUCTION IN 2020		360 000

(Source: Oslo Municipality, 2018a, p. 19)

A detailed list of measures in the climate budget 2018 (without estimated effects).

MEASURES	Responsibility for implementation (Responsibility for reporting in parentheses)	Unallocated reduction (CO ₂ e)
Increased supply of biogas for use as a fuel from water/wastewater (VEAS)	VEAS	
Increased supply of biogas for use as a fuel from Bekkelaget Wastewater Treatment Plant and Romerike Biogas Plant	VAV and EGE	
Improve parking and traffic management by continuing work on the development of Intelligent Transport Systems (ITS), including sensor technology	BYM	
Continue work on package of 100 initiatives to reduce delays on public transport	BYM	
Better provision for pedestrians	BYM	
Car-Free City Life within Ring 1, including establishment of loading/unloading spaces for commercial vehicles	[BYM/Car-Free City Life]	
Car parking measures (e.g. roll-out of residents' parking zones)	BYM	
Climate-friendly urban development including densification around transport hubs	BYM, EBY, PBE	
Increase material recycling of commercial waste	REN-næring	
Implementation of fossil-free/zero-emission construction site programme at new municipal buildings and construction sites.	Municipal construction undertakings (UBF/KID/OBY/Boligbygg) and other municipal developers.	100 000
Continue existing, and introduce new, subsidy schemes, from the Climate and Energy Fund to reduce GHG emissions.	KLI	
Acquire sites for municipal climate measures (incl. energy stations)	EBY	
Establish energy stations supplying at least two renewable fuels for passenger cars and light and heavy commercial vehicles (incl. Alnabru)	KLI	
Mandatory requirement for zero-emission (or fossil-free) solutions when procuring transport services	All procurement officers (UKE)	
Upgraded and new shore power facilities for international ferries	Oslo Harbour	
Reports on packages of measures to increase the certainty of goal attainment: <ul style="list-style-type: none"> • Encourage climate-friendly travel to and from work • Gradual transition to a fossil-free city centre within Ring 3 by 2024 through the implementation of low-emission zones • More efficient and climate-friendly commercial transport • Increased proportion of low- and zero-emission vehicles and machines on construction 	MOS	

(Source: Oslo Municipality, 2018a, p. 21)

A detailed list of measures in the climate budget 2019.

Emissions sector	Emissions source	No.	Measures and instruments	Responsibility for implementation (reporting responsibility for joint measures in parentheses)	Effect* 2016-2020 (tonnes CO ₂ e)
Heating	Municipal buildings	1	Phase-out of oil-fired heating - <i>National ban from 1 Jan. 2020</i>	All (KLI)	500
	Residences and business premises	2	Phase-out of oil-fired heating - <i>National ban from 1 Jan. 2020</i> - <i>Information about state subsidies schemes (ENOVA)</i>	MOS National govt. KLI	69,000
Energy supply	District heating, excluding waste incineration	3	Phase-out of the use of fossil oil and gas for district heating during peak-load periods - <i>Target set by Fortum Oslo Varme AS</i>	NOE	4,000
Road traffic	Light and heavy duty vehicles	4	Road-user payment system at the toll ring, assuming the implementation of prior measures: - <i>Installation of adequate charging infrastructure for passenger cars</i> - <i>Continued implementation of local and regional instruments to promote the use of zero-emission cars.</i> - <i>Continued implementation of national instruments to promote the use of zero-emission cars.</i> - <i>Increase in public transport capacity to cope with population growth and reduced use of private cars.</i> - <i>Package of 100 initiatives to reduce delays on public transport.</i>	MOS BYM/KLI MOS National govt. Ruter BYM	36,000
		5	Implementation of national 20 percent biofuel blending requirement in 2020	National govt.	30,500
	Light vehicles	6	Better provision for cyclists - <i>The Cycling Project</i> - <i>Subsidy schemes</i>	MOS BYM KLI	1,500
		7	New permit regulations for taxis. Zero-emission by 2022 - <i>Charging infrastructure</i> - <i>Subsidy schemes</i>	MOS BYM KLI	7,000
		8	Use of zero-emission vehicles/sustainable biofuels in the municipal light-vehicle fleet	All (UKE)	1,000
		9	Package of measures to encourage climate-friendly transport of goods <i>Utility transport</i> - <i>Dedicated parking spaces for zero-emission goods/utility vehicles</i> - <i>Charging infrastructure</i> - <i>Setting requirements within the municipality</i> - <i>Subsidy schemes</i> <i>National subsidy scheme: exchange of fossil-fuelled goods vehicles for electric goods vehicles</i>	MOS FIN BYM BYM UKE KLI National govt.	17,500
	Heavy duty vehicles	10	Fossil-free public transport by 2020	MOS Ruter	27,500
		11	Use of zero-emission vehicles/sustainable biofuels in the municipal fleet of heavy duty vehicles	All (UKE)	1,000
Other mobile combustion	Diesel-powered motorized equipment	12	Package of measures to encourage the use of zero-emission construction machinery <i>Machinery fleet</i> - <i>Standardized municipal procurement requirements</i> - <i>Subsidy schemes</i> - <i>Voluntary agreements with businesses in the sector</i>	FIN NOE UKE KLI KLI	26,000
		13	Municipal construction machinery to be zero-emission or use sustainable biofuels	All (UKE)	1,500
TOTAL estimated emissions reductions within sectors included in Oslo's climate goals for 2020					223,000
Maritime sector	Maritime traffic	14	Shore power facilities - <i>Shore power for international ferries</i> - <i>Shore power at Sydhavna</i>	NOE HAV HAV	2,300
		15	Zero-emission public transport - <i>Nesodden ferries</i>	MOS Ruter	4,200
TOTAL maritime					6,500

* Here, the assessments of effects are rounded to the nearest 500 tonnes CO₂e. Accordingly, in some cases there are discrepancies with the more precise assessments of effects shown in the Climate Agency's Technical Report for Oslo's Climate Budget 2019.

(Source: Oslo Municipality, 2019, p. 22-23)

Appendix B: Quantitative analysis elements

- such as 'buzz words' and value laden words from particular discourses.

Full list of quantitative elements used for word count searches and frequencies. (Own Illustration, 2019)

Climate budget report	Word count	Dryzek's Environmental Discourses	Word count (same meaning)
"zero emission"	57	Cooperation Partnership	6 (within municipal: 2) (Regional:1) (International:1) (Business: 2)
"fossil-free"	42	Justice	0
"air quality"	13	Human progress	0
"supply"	19 (mostly related to biofuels)	Development Sustainable discourse context	31 (area, or urban, or of measures or technology) Business development 0
"promote"	12	Privatize /privatization ownership property	0 4 (but none in the context of private property rights) 0
"uncertainty"	9	certification	0
Establish, encourage, trigger, generate or create new "markets"	8	Natural capital	0
"boost/Boosting"	29 (5 times in connection demand of with biofuels)	Planetary boundaries	0
"re-use"	4	Carrying capacity	0
Climate or environmentally "friendly"	31 Often used construct	Ecosystems ecology	0 6 (all in connection to the Bikuben project)
"competitive"	5	Global	2 (global warming, and global compliance with GHG accounting "Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC)"
"Green mobility"	2 (used as a headline)	Green growth	0
"green economy" and growth in "green value creation"	3		

“green bonds”			
“Circular economy”	1		
“green shift” or “green transition”	5		
“measures”	358	Decouple	5
“Packages”	44	(of growth and GHG emissions)	(mentioned 3 times as a relative decoupling. Mentioned twice that absolute decoupling would not be possible, aka as not sustainable in the long run)
“initiative”	14		
“instrument(s)”	6		
“offset”	5	Freedom	0
“efficiency”	20	Change	16 Most prominent: Behavioral change: 8 Market related: 2
“projection(s)”	28		
“trend”	21		
“Climate smart”	4 City or market	Social learning	0 (2 mentions as in ‘everyone who wants to learn’ in connection with Bykuben project.) The closest thing to the social learning concept in the budget
		navigate	0
		steer	0
		Precaution	0
		Participatory /participate	0 3 (2 in connection with Bikuben project. “lean about and/or participate in ecological work...” (1 in connection with ‘private sector participants, to give them a bigger role in the expansion of charging stations)
		Incentive	3
		Networked governance	0
		Network(s)	8 (Mentioned only in connection with infrastructure, not collaboration)
		“governance”	3 (2 city governance, 1 climate smart city governance)
		Organic growth	0
		Economic growth	7
		Steady state	0
		Degrowth	0
		Circular economy	1