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# **Norwegian Carbon Budget: An Evaluation of the United Kingdom Climate Change Act's Carbon Budget and Norwegian Climate Policies**

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## Abstract

For the past decade, political discussions, briefings, and White Papers have been leading up to the possibility of drafting a Norwegian climate law in 2017. Norwegian domestic emissions have been on the rise since 1990 due mainly to the oil / gas and transport sectors. This is despite Norwegian participation in EU climate regulations, and a plethora of domestic measures including other legally binding acts. Reducing anthropogenic greenhouse gas emissions is an extremely complex challenge that calls for a varied approach in terms climate policy and governance solutions.

This analysis attempts to understand how a carbon budget similar to that of the United Kingdom Climate Change Act's carbon budget would function in the Norwegian context. Aside from using the UK carbon budget as a frame of reference, the time inconsistency problem and domestic politics problem (Kydland & Prescott, 1977) are also employed to further understand why broad support may still result in weak measures. It is the aim of this analysis to contribute to the Norwegian climate law conversation by proposing a Norwegian carbon budget.

The main findings are that existing Norwegian climate acts consist of some of the structural components of the UK carbon budget however components lacking from Norwegian climate policy has resulted in vulnerability. The currently existing acts are also providing support to the notion that additional domestic climate regulations are not necessary. Therefore attention is being redirected toward international measures to reduce emissions rather than improving domestic conditions. This, however, has the opportunity to change with the development of the Norwegian climate law.

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## List of abbreviations

CCA	Climate Change Act
EEA	European Economic Area
EIA	Environmental Impact Assessment
ESD	Effort Sharing Decision
ESR	Effort Sharing Regulation
ETS	Emissions Trading Scheme
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gas
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
MACC	Marginal Abatement Cost Curve
MS	Member State
NDC	Nationally Determined Contribution
OECD	Organization for Economic Co-operation & Development



# 1 Introduction

According to the Intergovernmental Panel on Climate Change (IPCC), annual global emissions grew from 2001 to 2010 by an average of 2.2% per year (calculated on an average 1.0 Gt carbon dioxide equivalent). This contrasts with the lower rate of emissions growth of 1.3% from 1970 to 2000 (0.4 GtCO<sub>2</sub>eq) (Intergovernmental Panel on Climate Change, 2014). The anthropogenic release of greenhouse gas emissions has a causal effect on the global environment resulting in catastrophic effects. Some effects include the melting of glacial ice and permafrost, rising water levels and altered time frames of seasons. Some of the major impacts are negative effects on the species dependent upon the original characteristics of the natural systems, the spread of disease and negative effects on agriculture. The IPCC strongly encourages a reduction in emissions to prevent the global temperature from exceeding 2 degrees Celsius (and ideally 1.5 degrees Celsius) (Intergovernmental Panel on Climate Change, 2007/2014).

Numerous approaches for reducing emissions exist including carbon trading schemes, carbon taxes, renewable energy support schemes, and actions on the municipality level. So far however, such approaches have not been sufficiently reducing global emissions. A carbon budget implemented on the national level is a fairly new political mechanism to regulate emissions. Recognizing that this idea remains controversial for some countries, this analysis will attempt to determine the effectiveness of a carbon budget as a political tool and the feasibility of implementing one in Norway. The assessment will take the form of an initial in-depth exploration of the existing United Kingdom Climate Change Act's carbon budget. The UK carbon budget has been chosen as the framework for two reasons. First, the UK was the first to implement a legally binding carbon budget on the national level therefore providing the most extensive data to date. Second, the UK has achieved the first target, and is set to outperform targets for budgetary periods ending in years 2017 and 2022. In addition, the fifth budgetary term was recently implemented despite suspension of other policies due to the referendum (Ilott et al., 2016).

This analysis will attempt to understand whether specific national plans in the form of carbon budgets can help supplement already existing regulations. While the Paris



Agreement depends on nationally specific plans (Intended Nationally Determined Contributions or INDCs), the cumulative effect of all INDCs as of now is set to result in a temperature rise above two degrees Celsius (Climate Action Tracker, 2015). The two-degree limit is the maximum amount in which the surface temperature of the earth can rise before entering a phase of climate change in which effects are suspected to be completely irreversible. The two-degree maximum was first proposed during the 1970s by William Nordhaus but wasn't fully embraced until 1996 by the EU Council of environment ministers (Carbon Brief, 2015; The Economist Newspaper Limited, 2015).

The analysis recognizes the differences between the UK and Norwegian governments and does not expect the UK version to be completely transferable to the Norwegian context. Rather, the UK carbon budget will be used as a frame of reference for the formation of a Norwegian carbon budget in terms of its institutional set up i.e. accountability, reporting, and amending. It will also provide a point of departure for the creation of a Norwegian plan addressing how emissions will be handled i.e. timeframe, measures to reduce and realistic emission reduction targets. The approach of this analysis will be strictly confined to the national level (aside from consideration of the Emissions Trading System).

The most recent Norwegian climate law proposal was released at the end of March 2017 with an expected decision to be made by the summer of 2017 (Climate and Environment Ministry, 2017). A hearing has been conducted since the release of the March 2017 proposal however it remains a bill which is under consideration by the Energy and Environment Committee. The timing of this analysis coinciding with the deliberation of a Norwegian climate law gives this analysis even more merit as the reality of a Norwegian climate law is more feasible than ever before. There are similarities between this analysis and the March 2017 proposal, including the use of the UK CCA as a frame of reference. However, this analysis attempts to offer a unique approach by analyzing previous Norwegian policies through the lens of the UK carbon budget. Knowledge of previous Norwegian policies can then help shape the formation of a Norwegian carbon budget. The March 2017 proposal states that measures are to be determined at a future time by the Norwegian government. This analysis attempts to provide a proposal at a more detailed level while considering the

Norwegian context and the desire for flexibility, which is always necessary when proposing long-term policies (Ilott et al., 2016).

While the UK carbon budget has been seen as a groundbreaking step toward climate policy progress (Lorenzoni & Benson, 2014), it is not without its opposition. For example, Member of Parliament George Osborne has been pledging to take actions which favor the Conservative Party and weaken the overall effect of the UK CCA. The pledges include the UK limiting its emission reductions to a pace which matches other EU countries as opposed to forging ahead, allowing “gas-fired power stations without carbon capture until 2045”, and strong support for gas in electricity generation (Lockwood, 2013). This has had a negative impact on potential investors who were previously interested in supporting the progress of environmental technology.

Throughout the process of implementing climate policy / law in general, there are certain junctures when the proposed policy or legislation is especially vulnerable. Matthew Lockwood states the UK CCA fell victim to weakened provisions and attributes this to a decline in support during the implementation period of the policy. Once it seems the government has a plan, the general population loses interest and this can result in watered down policy (Lockwood, 2013).

Despite the legal aspect of the Climate Change Act which provides much of its merit, it is claimed that the Act leans more toward being politically binding. A politically binding climate policy depends on societal pressure to see the target through. While contestation to setting a carbon budget has yet to happen in the UK, “under the Act the Committee’s recommendations to government for carbon budgets are not legally binding and views differ on how far the Act might be used as the basis for legal challenge if these were rejected” (Lockwood, 2013 p1343). In addition, the low price of carbon per ton does not provide enough incentive for long term development of cleaner sources of technology. Despite the shortcomings, this analysis aims to acknowledge the positive effects of implementing a carbon budget.

While Norway has been revered as an environmentally progressive country in areas such as renewable electricity production, the reduction of greenhouse gas emissions is still an ongoing challenge. Despite ambitions to reduce emissions domestically, actual emissions have been gradually rising (Statistisk Sentralbyrå, 2016). In the past, Norway has reverted to using emissions credits. These credits grant official

permission to emit a certain amount of emissions from specific sectors in a predetermined time frame, and within schemes such as the Emissions Trading System (Skjærseth & Wettestad, 2008). Norway also provides funding for mitigation projects outside of Scandinavia, due to lower implementation costs (sometimes referred to as offsetting), and avoids taking serious measures domestically (Brown & Adger, 1994).

Although Norway is not a member of the European Union, it is subject to significant climate regulations such as the Emissions Trading System (ETS), as mentioned previously. The ETS acts as a carbon budget intended to limit emissions in industrial sectors covering 40% of emissions in the EU (Skjærseth & Wettestad, 2008). Norway is currently negotiating taking part in the Effort Sharing Decision (ESD) beginning in 2020 which covers the remaining 60% of EU emissions. The Effort Sharing Decision (referred to as the Effort Sharing Regulation in the post 2020 phase) has been tailored to consider the gross domestic product per capita of each country involved (Erbach, 2016). This compromise among nations helps to alleviate tension typically associated with international climate agreements. Responsibility over how to reduce greenhouse gas emissions is designated to the national level.

EU climate regulations have, however, proven to be weak in the past due to loopholes and varying levels of ambition to reduce emissions among EU and European Economic Area (EEA) Member States (MS). The ETS uses an overarching approach, making it difficult to reduce emissions when there are variances not only among sectors but from company to company. In international agreements, one lagging country can have detrimental effects to the overall target (Skjærseth and Wettestad, 2008). In addition “the EU does not have the political and economic clout to force others to fight climate change” (Oberthür et al., 2008). Both the ETS and ESD have been heavily emphasized in the March 2017 Norwegian climate law proposal. This analysis supports Norway’s continued participation in EU climate regulations however encourages the exclusion of such regulations in the formation of a Norwegian climate law except when coordination is necessary.

It is suggested by some analysts and politicians that by creating a national, legally binding carbon budget, the cultural context, sector specific emissions, capacity to reduce among sectors and companies, GDP per capita and the history of ambition to

reduce emissions and improve energy efficiency can be considered in a top down approach (Dubash et al., 2013). Research will set out to answer the following question:

## **1.1 Research Question**

To what degree and in what ways can a national carbon budget be a political instrument that can contribute to achieving emissions reduction?

Following from the main research question posed in the analysis, the following sub-research question is posed to provide a basic understanding of the Norwegian greenhouse gas emission context. Research will also aim to answer the following question:

How has the Norwegian government handled the issue of domestic greenhouse gas emissions up until now, and to what degree could a carbon budget be more effective?

The analysis is framed as an academic exercise which depends heavily on theory to answer the research questions. Theory has shed light on policy formation challenges in the past and will be used to shed light on potential reasons for lack of progress in emissions reduction in Norway. The theory is separated into two approaches; however, the two approaches interact with each other throughout the analysis. The first approach addresses the root of the problem pertaining to climate policy implementation. The first approach is separated into two components including the time inconsistency problem which addresses cost over time and the domestic politics problem which addresses the dynamics of domestic climate policy. The second approach utilizes a set of criteria lifted from the UK carbon budget in order to ensure a standardized approach for analyzing existing Norwegian policies. The theory compared against Norwegian climate policy then prepares the ground for introducing a Norwegian carbon budget.

## 1.2 Literature Review

The most relevant Norwegian document to the analysis is the previously mentioned March 2017 climate law proposal (Climate and Environment Ministry, 2017). It has been in discussion since 2008 when it was first proposed in The Agreement on Climate Policy White Paper<sup>1</sup>. During the end of 2014 into 2015, a Norwegian proposal was presented again mentioning a legally binding Norwegian Climate Law. The proposal, supported by all political parties aside from the Progress Party, suggested using the UK Climate Change Act as a point of departure for the creation of a climate law in Norway. The proposal was in response to a Public Consultation put forward by the Environment Ministry which discussed the prospect of a climate law in Norway (Energi- og miljøkomiteen, 2014-2015).

The most recent version of the proposal which was published at the end of March 2017 on the official Norwegian government website (Regjeringen.no) provided additional detail describing how the law would function. The law maintains the Norwegian commitment to the EU of a 40% reduction in emissions by 2030 from 1990 levels. Should this target not be met, however, Norway can opt to use flexible mechanisms and ETS credits from within the EU in order to make up for the difference. The suggested baseline is 1990 with an overall target of an 80-95% reduction in greenhouse gas emissions by 2050. Despite being a national climate proposal, the intention is to take into account the effect on an international scale as well. This means considering the likelihood of carbon leakage<sup>2</sup> and other unwanted consequences (Climate and Environment Ministry, 2017).

Like the UK CCA, the law intends to review progress on a five-year basis, taking into consideration updated relevant information. Reporting details are required to be sent for review to parliament on an annual basis. It will be legally binding for parliament and is intended to guide high-level policy makers to work in conjunction with the Norwegian climate law. The proposal supports sector specific plans; however, the

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<sup>1</sup> White Paper: "White papers are drawn up when the Government wishes to present matters to the Storting that do not require a decision. White papers tend to be in the form of a report to the Storting on the work carried out in a particular field and future policy. These documents, and the subsequent discussion of them in the Storting, often form the basis of a draft resolution or bill at a later stage" (Regjeringen, n.d.).

<sup>2</sup> "Carbon leakage is the result of asymmetrical carbon policies, especially carbon pricing, and the resulting carbon cost, which affects the international competitive position of some EU industry and could displace production and/or investment, and the emissions of the activities displaced" (Marcu et al., 2013).

specific measures are left unknown to provide flexibility (Climate and Environment Ministry, 2017). A potential threat to a Norwegian climate law, however, is the fact that special interests that do not want climate policy are much stronger on the national level. The Norwegian climate law is still developing however so the influence of the special interests have not yet been revealed.

Another central piece of literature referenced throughout the analysis is the United Kingdom Climate Change Act, and more specifically chapter 27, which covers the UK carbon budget. The UK carbon budget has allowed for the creation of a set of criteria which is a central aspect to the analysis. Theory is also dependent on economic and political literature (Hovi, Sprinz, & Underdal, 2009; Kydland & Prescott, 1977). Norwegian government sites such as the Climate and Environment Ministry, the Climate and Pollution Agency, Miljødirektoratet (the Norwegian environmental agency), the Ministry of Finance, the Norwegian Petroleum Directorate, and Statistiske Sentralbyrå, provide a rich understanding into the Norwegian political landscape in reference to climate policy. The Storting's website (Norwegian parliament) provides English summaries of climate policy White Papers as well.

McKinsey & Company has been a pioneer in terms of implementing the Marginal Abatement Cost (MAC) curve on the national level and producing case studies for many countries. MAC curves are a commonly used climate policy tool in order to sort and prioritize mitigation measures. McKinsey & Company has demonstrated how specifically a MAC curve can operate as a policy tool. While the time constraint of the analysis did not allow for an in-depth application of MAC curves to the Norwegian economic sectors, MAC curves are briefly included and recommended for suggested further research.

Non-governmental organizations, independent media sources and consulting firms (the third sector) heavily influence climate policy and can often provide unbiased information and media coverage as they are not affiliated with or dependent upon government or special interests. In addition, it is often the case that "specialist organisations outside government [hold] the key technical or analytical skills that [are] vital to devising and sustaining credible, long-term approaches" (Ilott et al., 2016). Within the analysis, these sources include Carbon Brief, Climate Action Tracker and Ecofys. Matthew Lockwood's work which was referenced within the introduction

provides a perspective differing from the approach taken in the analysis. He provides factual evidence of events happening in the UK which are working against the overall target. Considering opposing opinions from prominent researchers helps to avoid a biased approach.

### **1.3 Carbon budgets as a Political Instrument**

Before delving into the specifics of a carbon budget, it is necessary to understand the meaning of a carbon budget as a political and regulatory instrument. This phrase is affiliated with “governance tool” and “governance (steering) mechanism.” A carbon budget is considered a political instrument because it is intended to guide the many facets of government in a common, pre-determined direction. A carbon budget in this context is distinguished from other political instruments since the UK CCA and proposed Norwegian carbon budget are both legally binding. Political instruments may indicate politically binding, meaning those responsible for meeting targets only feel pressure in the societal sense and do not face severe repercussions such as fines or imprisonment should the targets not be met.

#### **1.3.1 Why a Carbon Budget?**

For this analysis, research will use the Ecofys<sup>3</sup> definition of a carbon budget which defines it as “a set amount of carbon that can be emitted in a given amount of time, either by the whole economy, or a pre-selected sub-population or a set of activities” (Ecofys, 2006). Carbon budgets can take varying forms in scale (global, national, regional, local, individual), units (CO<sub>2</sub>, CO<sub>2</sub> equivalent, monetary), timeframe, whether it is binding, and who is accountable. A carbon budget operates much like an economic budget and is assigned a maximum amount of emissions. If the provided budget is exceeded, there are pre-determined repercussions. A carbon budget often enforces frequent monitoring and reporting, allowing it to influence the day to day responsibilities of government ministries. The following points are common in arguments that favor a carbon budget.

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<sup>3</sup> Ecofys is “a leading international energy and climate consultancy” (Ecofys, n.d.).

First, a global carbon budget has been established. As a result, we now roughly know how much CO<sub>2</sub> (“between 430 and 480 ppm CO<sub>2</sub>-eq<sup>4</sup>” (Intergovernmental Panel on Climate Change, 2014)) can be released into the atmosphere before we reach a point where it will be nearly impossible to reverse severe damage. Evidence is suggesting that we have already reached a point of severe damage due to increasing frequency and severity of natural disasters and climatic conditions worldwide (Giddens, 2015). However, reducing emissions now may lessen the long-term damage. The proponents for a national carbon budget acknowledge that it could follow the structure of a global carbon budget using the predetermined goal of keeping global temperatures from rising two degrees Celsius (and ideally 1.5 degrees Celsius). Carbon Brief<sup>5</sup> provided a timeline based on IPCC information outlining how much time is left with current emissions before surpassing the 1.5-degree Celsius marker. In less than five years with business-as-usual emissions the 1.5 degrees Celsius budget will be depleted (Carbon Brief, 2016).

Second, implementing a legally binding carbon budget could, as several writers suggest, force government to maintain climate change as a priority on the political agenda (Anderson et al., 2008). Implementing a legally binding carbon budget has the potential to result in frequent monitoring and reporting, and the ability to incite penalties in a suitable form when budget guidelines are disregarded. A legally binding climate change act is catching on as a climate policy norm with Australia, Denmark, Finland, Mexico, Sweden, Switzerland, the United States and potentially Norway following suit. Third, a carbon budget can encourage technological advancement. Technological advancement allows for additional options in terms of actions sectors can take to reduce emissions. Technological advancement makes for an easier and faster transition toward a low carbon society (Coninck et al., 2008).

Fourth, and as mentioned previously in the introduction, a carbon budget within certain limits is flexible and can be altered in order to better suit the scale at which the budget will be operating. In addition, an economic budget is a familiar concept to many governmental departments so the concept in itself is not too abstract. Finally, a

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<sup>4</sup> CO<sub>2</sub>-eq / carbon dioxide equivalent: “a measure used to compare the emissions from various greenhouse gases based upon their global warming potential” (OECD Directorate of Statistics, 2001).

<sup>5</sup> Carbon Brief is “a UK-based website covering the latest developments in climate science, climate policy and energy policy” (Carbon Brief, n.d.).



carbon budget allows the nation implementing the budget to set a standard and put additional pressure on countries lagging on any sort of climate policy implementation.

While the two can be independent of each other, the utilization of a Marginal Abatement Cost (MAC) curve is proposed within the Norwegian carbon budget in this analysis. The MAC Curve is intended to provide a range of actions which can be taken to reduce emissions along with correlating prices. One portion of the curve provides actions which can be taken with no financial investment necessary. These measures have the potential to result in a negative opportunity cost (i.e. are economically favorable). The feasibility for these measures is quite high since they do not typically require time consuming and intensive building of infrastructure or costly investments. Certain sectors such as shipping and buildings (heating and cooling) have high potential to reduce emissions with low expected investments. The other portion of the curve provides measures which require investments. By introducing a carbon budget with specific plans for each sector using a cost-effective approach first, the budget is more likely to gain political acceptance. A carbon budget can also be introduced within a competitive framework. By reducing costs related to carbon (and other greenhouse gas) emissions, funds could be invested elsewhere to strengthen companies (Tilburg et al., 2010). If technology allows (which is dependent upon the sector) and it is possible to provide additional emission reduction measures, companies may even have a choice amongst reduction options, allowing for company and sector inclusion in the decision-making process.

#### **1.4 Outline of the Thesis**

The thesis is comprised of eight chapters. Following the introduction, which includes the research question, background information and basic definitions necessary for the analysis, is methodologies in the second chapter. This includes the research design, data collection, and reliability and validity.

The third chapter includes the theory section which begins by explaining the root of the problem in reference to why climate change is such a complex challenge and why climate policies often do not achieve the intended targets. The actual content of the theory is then presented which consists of the time inconsistency problem, domestic

politics problem and four criteria which have been identified within the provisions of the UK CCA. Empirical data is separated into chapters four and five. The mapping of the most relevant Norwegian climate policies chapter first provides a detailed description of the three Norwegian Acts and the climate law proposals. Chapter five follows by utilizing the time inconsistency problem, the domestic politics problem and the criteria to analyze the four examples and interpret the Acts / proposal in a standardized way. Once the data is analyzed, a Norwegian carbon budget is proposed in chapter six. The carbon budget's purpose is to contribute to the discussion on climate change within the political arena by suggesting an approach which aims to avoid actions that have led to weakened policies in the past. The analysis proposes a brief section on suggested continued research in chapter seven. The closing chapter provides conclusions drawn from the research.

## **2 Methodologies**

The methodology section begins with a description of the research approach within this analysis and why it was chosen. This is followed by the type of data which was obtained for the empirical mapping chapter along with why it was chosen and the purpose it served. This chapter is concluded with limitations, a discussion on validity and reliability of data, and the potential risks associated with the analysis.

### **2.1 Case Study with Comparative Aspects**

A case study can be defined as a “study of the particularity and complexity of a single case, coming to understand its activity within important circumstances” (Stake, 1995). The Norwegian cases are the central case studies within the analysis. While this is not a comparative analysis between Norway and the UK, there are aspects of a comparative analysis involved in the discussion of existing Norwegian policies chapter (chapter five). The governments and political approaches to climate change vary in many ways between the UK and Norway. Therefore, it would have not been logical to compare the two approaches directly. Rather, by lifting to the surface the central aspects of the UK carbon budget and comparing them against the structures

of previously instated Norwegian policies, it is possible to understand how Norwegian climate policy could potentially be strengthened.

The climate law under consideration in Norway at the moment may soon be approaching the vulnerable phase of the implementation process i.e. when a topic that has garnered support begins to take shape within government and salience among the public and sometimes the third sector decreases. The next phase would involve translating ambition into actual provisions to address the challenge. The intent of the analysis is to contribute to the political discussion by investigating if a stringent, national, legally binding carbon budget would be beneficial to Norway. This will also contribute to the level of attention and therefore pressure policy-makers are receiving in an attempt to remove the opportunity to implement weakened legislation under the radar (Ilott et al., 2010; Lockwood, 2013).

## **2.2 Data Collection**

The methodologies used in this analysis include interviews and use of secondary sources including academic journals, documents produced by the Norwegian and UK governments including legislation, briefings and policy proposals, non-governmental organizations and media sources.

Three interviews were conducted with various stakeholders working with climate policy in Norway. The interviewees were individuals from the Norwegian Ministry of Climate and Environment, the Norwegian Green Party, and World Wide Fund-Norway. The individuals were chosen in order to represent Norwegian government, political parties in support of a climate law and the third sector. The individuals were chosen based on experience with and knowledge on Norwegian climate policy.

Interviews took the form of a semi-structured approach in which open ended questions were prepared ahead of time; however, the intent was to allow the conversation to take a natural direction. The interviews did not serve a major role in terms of contributing to the text. Interviews did, however, provide a way to map perspectives broadly speaking toward the idea of a climate law in Norway and provided interpretations of challenges associated with implementing climate policy.

Certain Norwegian documents have not been translated to English so interviews also helped to fill knowledge gaps.

Most data in the analysis consists of secondary sources including academic articles and journals, media sources and government documents. An in-depth desk study of previous Norwegian climate policies was conducted which resulted in the selection of three previously instated Acts and a series of proposals leading to the present-day climate law proposal. The examples provide a basis for understanding if and how Norwegian acts have fallen victim to the time inconsistency and / or domestic politics problem (explained in the theory chapter). The four examples are analyzed against the central features of the UK carbon budget which have been presented as a set of criteria in the following chapter as well.

### **2.3 Limitations**

While the interviews served a purpose throughout the research, limitations did occur. The time limitation of the analysis prevented research benefiting from a larger sample set. Another limitation had to do with individuals refusing to respond to participation requests for an interview. Since a carbon budget is still contested by certain political parties and ministries, it would not be in the best interest of certain individuals to participate. The problem however, is that a carbon budget should involve the majority of Norwegian ministries and input from said departments is therefore necessary.

In addition, a climate law is not even in the implementation phase yet. This became a constraint in terms of engaging interviewees on legislation that in a sense is hypothetical at this particular juncture. This led to hypothetical discussions which while provided insight into what various actors expected from the process, it did not provide concrete information. Nonetheless, the interview process still served as an important tool in terms of understanding the political landscape in regards to a Norwegian climate law. Finally, certain Norwegian legislation provided on ministry sites has yet to be translated to English. In most cases an English summary has been provided, however, the summaries lack the amount of detail provided by the original document therefore making this analysis vulnerable to knowledge gaps.

## **2.4 Validity and reliability of findings**

Validity can be defined as an indicator which measures a concept (Bryman, 2013) and has to do with the “ethical obligations to minimize misrepresentation and misunderstanding” especially when it comes to qualitative research (Stake, 1995). Misrepresentation and misunderstanding can be avoided by providing multiple sources of data, sometimes referred to as triangulation. By utilizing government documents, NGO briefings, media coverage, interviews and academic sources, a spectrum of perspectives are provided and limits room for biases.

It is essential to address the fact that the Norwegian Carbon Budget being proposed in this analysis is a hypothetical situation. Despite having access to information regarding previous Norwegian acts, proposals and the UK CCA, it is not possible to explain with certainty how a carbon budget would function in Norway or whether it would be effective without speculation to a degree. Relying on many sources of data, a concrete theoretical approach and a set of criteria to analyze policies in a standardized way help to provide merit despite the necessity for speculation.

Reliability refers to whether the same or similar results would be produced if the same research were to be carried out by others or in other words a measurement of precision. This is to say whether the material used, the findings, and the conclusions drawn from the information provide a logical sequence of steps taken throughout the research process. While there is a high probability for small scale variation should this research be recreated, it is highly likely that the same sources and the same or similar conclusions would be drawn from the research.

Despite the analysis acknowledging the fact that the UK carbon budget is not completely transferable to the Norwegian context, there is a risk that the analysis is still over simplifying the attempt to apply a carbon budget to Norway. Unforeseen factors may also hinder the transferability.

## 3 Theory

### 3.1 Problem Characteristic of Climate Change

Climate change is an especially complex issue. The nature of climate change is cross sectoral, cross boundary, requires collective action, and is widely thought of as a future problem. Although the existence of climate change has been confirmed by the majority of climate scientists, it is not possible to attribute one single occurrence (i.e. an extreme natural disaster) to climate change. Climate change is a global issue which is currently unfolding and requiring contribution in many different forms from many different actors. The extent of how climate change is interacting among complicated Earth systems is still being discovered. This uncertainty can be used to benefit certain actors in terms of policy formulation. This is magnified by the fact that “most people tend to react more strongly to the prospects of a certain *loss* than to the prospects of an equally large *gain*” (Underdal, 2010). Even if all available climate mitigation measures are realized, it will not result in tangible benefits for the generation(s) investing in mitigation. On top of everything, a complex governance system must be navigated to implement an effective climate policy where climate acts, proposals and policies already exist. Existing acts, proposals and policies further substantiate the notion of redirecting resources away from climate change mitigation.

Another frequent problem with climate policy and public policy planning in general is the concept that there is essentially only one chance to test a policy. In most scenarios, a trial and error approach cannot be carried out due to limited time, resources and other factors. Even if the conditions allow for trial and error capability, the previous attempts will have left traces which may affect the current implementation and affect perspectives moving forward. Policy planning has been heavily influenced by the scientific approach i.e. there is a clearly defined problem, a set of criteria which provides a clearly defined path, leading to an answer which is either correct or incorrect. Problems surrounding policy planning, on the other hand, are often convoluted which make it difficult to identify the root of the problem. Once (if) the problem is identified, there could be many plausible solutions and it is not possible to label the chosen policy as correct or incorrect. In addition, reviewing

results does not always provide clarity since many other factors impact policies and results could span over a large period of time (Rittel & Webber, 1973).

To further compound the issue of urgency, there is support for technology as the central solution for climate change which some believe results in diminished dependency on climate policy (Grubb, 2005). The problem with this thinking is twofold; it depends on technology that is not yet available and may never become available, and it allows further procrastination when the problem needs to be addressed now. To frame climate change as a problem which exists due to a lack of technology may result in an abundance of resources being directed to only one measure. This supposed solution does not address the root of the problem. Rather than reducing and transitioning to a low carbon society, future dependency on technology provides an excuse to continue business-as-usual.

### **3.2 Time Inconsistency Problem & Domestic Politics Problem**

The theory chosen for the purpose of this analysis is two-fold and known as the time inconsistency problem and domestic politics problem. Both problems originated from *Rules Rather than Discretion: The Inconsistency of Optimal Plans* (Kydland & Prescott, 1977). This theory is economic and political in origin. It states that rather than being a game against nature, it is “a game against rational economic agents.” The literature goes on to explain that “[...] a discretionary policy for which policymakers select the best action, given the current situation, will not typically result in the social objective function being maximized” (Kydland & Prescott, 1977 p473). To transfer this statement to climate governance, it could be interpreted that although a decision may seem fit given the present circumstances and because it meets current needs, it may not live up to the standards necessary to meet mitigation goals for the future (Underdal, 2010).

The time inconsistency problem can be considered as costs and benefits dispersed over time and helps to explain why a long-term policy may not be implemented in order to satisfy short term needs. This is even the case when the majority is in support of the said long-term policy. Decisions that reflect self-interest typically result in benefits which occur in the present, even if that results in challenges which must

be handled in the future. The time inconsistency problem can be described in the following way: “[...] a situation in which an actor’s best plan for some future period of time will no longer be optimal when that time actually arrives” (Underdal, 2010 p387; Kydland and Prescott, 1977).

To narrow down time inconsistency even further within the context of this research and climate change, it can be defined as follows: “For a single unitary actor (such as a benevolent “world government”) it might be tempting at any given point in time to devote fewer resources to mitigating climate change than required to meet its own long-term goal” (Hovi et al., 2009 p21). Redirecting resources in order to have immediate benefits, dependence on short term policies, and a turnover in elected officials are just a few of the reasons climate policy suffers from the time inconsistency problem.

The domestic politics problem is an extension of the time inconsistency problem on the national scale and refers to the complexities that exist within a national government. While a specific policy goal that garners public support may exist, it does not always become a priority for the government to follow through on implementation to achieve the goal. The domestic politics problem is defined in the following way: “the dynamics of political processes are such that even broad support for a certain goal may be hard to translate into approval of the specified measures required to reach that goal” (Hovi et al., 2009). It is difficult for governments to manage how a climate policy will be integrated with current government processes, how to secure funding, who to delegate responsibility and accountability to and how the structural organization will be decided, among other tasks. In addition, “[...] apparent consensus between parties over the need to address such problems can quickly turn into disagreement” in reference to how an ambition should be translated into policy (Ilott et al., 2016 p8).

Climate policy must be flexible enough to evolve with and address the ever changing information on climate change therefore there is no clear-cut approach. To further aggravate the problem, despite support from the general population, a government may choose to forego implementing such a policy if other countries are refusing to act. This stalemate among countries can be referred to as the international free-rider scenario. Climate change policies require measures that incur costs and in the



context of an international, free-rider scenario, costs would be incurred by countries choosing to participate. However, it is difficult to argue for specific incentives because the benefits of being a signatory in a ratified climate policy “are widely dispersed or indeterminate” (Hovi et al., 2009 p27). In other words, “those who are in a position to embark upon effective mitigation programmes must pay most of the costs but will reap only a small fraction of the benefits derived from the damage averted” (Underdal, 2010 p388).

Fixed length political terms also pose a problem. Often, politicians forego climate change policy due to other pressing issues that have garnered the majority of attention and support. By directing allocation of funds to a long-term issue, with essentially intangible benefits, it is possible the politician will lose support. Therefore, many forego the topic or address climate change on a shallow level. Once elected, politicians have only so many years to develop and implement climate policy before the position is taken over by another individual with a new political agenda (Ilott et al., 2010).

### **3.3 UK carbon budget criteria in relation to theory**

A carbon budget is one policy mechanism that could reduce the perils of the time inconsistency problem and domestic politics problem, for a number of reasons. This is where it is beneficial to assess the elements of the UK carbon budget and to determine what is transferable to a Norwegian carbon budget. Based on the UK carbon budget and the theory previously outlined, a set of four criteria have been lifted from the legislation to assist with the formation of a Norwegian Carbon Budget. The criteria have been categorized into measures which address the time inconsistency problem, the domestic politics problem or potentially both.

## 1) Binding

### *Time Inconsistency Problem and Domestic Politics Problem*

The need for climate policies to be long-term to effectively address climate change is a major contributing factor for ineffective or nonexistent climate policies in many countries due to the time inconsistency problem. It is one thing for a country to express an understanding of the need to reduce emissions; however, resources may continue to be redirected to seemingly more tangible and current issues. There are two main ways climate policy can be binding. The first and more common of the two is politically binding. The name in itself is an oxymoron, as reaching the target depends on societal pressure and there are no legal repercussions should the target not be met. The second form is a legally binding commitment. A legally binding commitment dictates who is held accountable for shortcomings and what the process is for addressing such shortcomings. Provisions within a legally binding act or law are much more difficult to disrupt than provisions within a politically binding policy. In the context of the UK carbon budget, legally binding refers to the following:

[...] the duties in the Bill – including the requirement to meet the targets and budgets – are stringent and legally enforceable. The statutory basis means that any failure to meet a target or budget carries the risk of judicial review, with remedies available at the discretion of the courts (Department for Environment, Food and Rural Affairs, 2007 p53).

The legally binding provisions within the UK carbon budget include measures which legally require the government to take action on a frequent and cyclical basis.

Implementing a legally binding carbon budget may help to address the domestic politics problem as well. The legally binding aspect of the UK carbon budget is intended to be a safeguard against the overturn of elected officials with varying political agendas throughout the extensive time period leading up to 2050. A legally binding carbon budget provides protection against the expected turnover of government officials and the integrity of the policy remains intact. Even if elected officials are in support of the continuation of the UK carbon budget, it may not translate to the type of measures necessary to reduce emissions at the current rate. The legally binding provisions has protected the UK carbon budget under the current

circumstances of the Secretary of State for Exiting the European Union or informally known as Brexit. Despite other policies being placed on hold due to the referendum, the fifth carbon budget was recently made legally binding. Even under such extreme circumstances, the carbon budget is still serving its intended purpose (Vaughan, 2016).

## 2) Time Accountability

### *Time Inconsistency Problem*

Budgetary periods are a response to time accountability in the context of the UK carbon budget. A budgetary term equates to five years. Each five-year period is assigned an emissions budget which must be distributed among sectors. Legal provisions outline that budgetary periods must be implemented twelve years ahead of time which ensures the extensive time frame is legally locked in. The UK carbon budget has been set up in a way which allows it to become a top priority within government every five years despite potential lulls in between. Otherwise, it may have had a high likelihood of being suspended through the referendum. This approach may also be referred to as embedding which assists with normalizing a topic within a political agenda (Ilott et al., 2010).

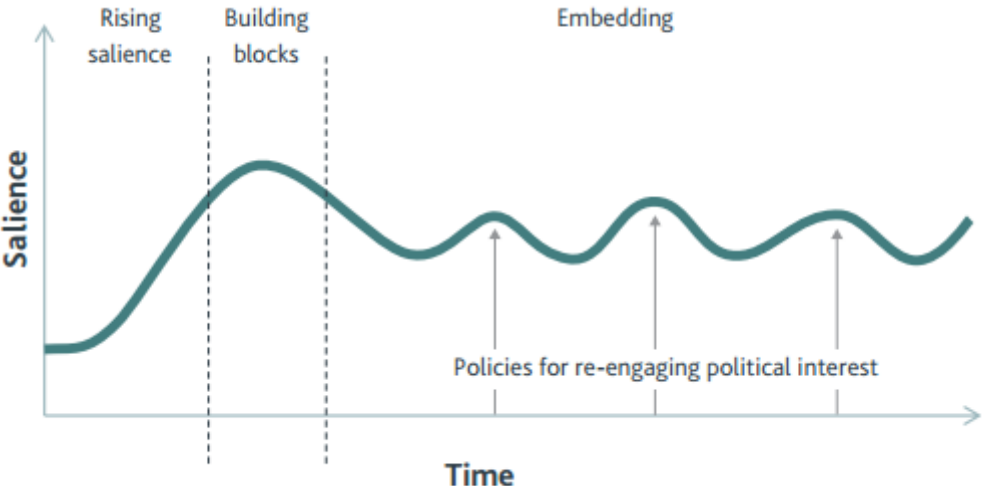


Illustration 3.1: Best Case Scenario for long-term focus.  
Source: Illott et al., 2010.

### **3) Information Accessibility / Transparency**

#### *Time Inconsistency Problem and Domestic Politics Problem*

Within each budgetary period in the UK carbon budget, each year is assigned an “annual indicative range” meaning the maximum amount of emissions for each year. This amount is then distributed accordingly. This serves as not only an annual limit which provides predictability, but it also provides additional integrity to the carbon budget by reducing in incremental amounts rather than leaving an unrealistic reduction goal for the last five years for example (UK Parliament, 2008). Annual indicative range ensures annual monitoring, reporting and transparency of emissions in terms of whether the UK is on track to meet the 2050 emission target. Similar to the budgetary term requirements, annual indicative range requires action on an annual basis which embeds the act even further. The enforcement of annual indicative range ensures attention and resources are consistently focused on emission reduction progress in light of the emission targets. Based on annual reporting, reduction targets are consistently updated. Up to date, accurate information on a consistent basis allows for the translation of ambition and information into specific measures. This ensures measures are set in a standardized way that is not dependent on the current administration.

### **4) Overall Accountability**

#### *Domestic Politics Problem*

Within the UK carbon budget, the independent body is known as the Committee on Climate Change. This is vital to the success of a climate law since responsibility and decision making is often muddled among government departments and influenced by personal agendas. Challenges associated with climate change are not confined within just one area of government and therefore, “government responses to [issues] risk losing coherence over time as the pressures during implementation weigh against maintaining co-ordination [...]” (Ilott et al., 2016). The intention is to have an unbiased group of experts with the sole purpose of monitoring, reporting and amending the contents of the climate change act as well as maintaining coordination

among ministries. This will ensure information is continuously up to date with the most recent scientific and political information which then can be translated into applicable measures. While the individuals within the independent body may change overtime, especially with an act that extends to 2050, the independent body does not change with the general election or the parliamentary terms in the UK.

<b>CRITERIA</b>	<b>UK SOLUTION</b>	<b>TIME INCONSISTENCY PROBLEM / DOMESTIC POLITICS PROBLEM</b>	
Binding	Legally binding	Time Inconsistency Problem	Legally binding equates to long term provisions as it is difficult to remove legally binding provisions. For example: budgetary term targets must be implemented 12 years in advance.
		Domestic Politics Problem	Legally binding provisions protect the Act against the overturn of elected officials which is inevitable for a successful climate policy which must be long-term.  Legally binding provisions enforce reporting which supports the translation of ambition into measures.
Time Accountability	Budgetary terms	Time Inconsistency Problem	Budgetary terms discourage implementation of short term policies through frequent reviews and requiring the independent body to propose amendments when necessary.
Information accessibility / transparency	Annual indicative range	Time Inconsistency Problem	Legally required action on an annual basis reduces the risk of resources being redirected.
		Domestic Politics Problem	Annually updated information supports translating ambition into sufficient measures.
Overall accountability	Independent body	Domestic Politics Problem	Enforcing an independent body will result in frequent monitoring therefore up to date information will be available to translate to sufficient measures.  An independent body will also reduce the likelihood of opposing opinions resulting in weakened measures.

Illustration 3.2: Criteria, time inconsistency problem, and domestic politics problem dynamic (created for analysis).

## **4 Mapping of Norwegian climate policies**

In the introduction, the following sub-research question was posed: How has the Norwegian government handled the issue of domestic greenhouse gas emissions up until now, and to what degree could a carbon budget be more effective? The purpose of this chapter is to provide an in depth understanding of a few acts central to climate policy in Norway in chronological order. The intent is to illustrate the progression of climate policy in Norway over the past few decades to provide a non-comprehensive overview. The data is secondary and has been obtained mainly through government publications as well as academic articles and media sources. As this analysis is assessing a carbon budget on the national level, the acts and proposal reviewed in this section are limited to the national level except for the EU Emissions Trading System (EU ETS) which operates on the international/national level.

The analysis initially set out to review any and all policies, acts and proposals which had to do with limiting emissions in Norway in an attempt to provide a comprehensive review. This however resulted in an excess amount of data which convoluted the aim for reviewing the data in the first place. The data was then narrowed down to four examples considered to be the most relevant in terms of mandates. Of the four examples, three Acts were chosen as they are often used to support the argument that a Norwegian climate law is unnecessary due to existing legislation. Therefore, the analysis will attempt to understand what is potentially missing from the three acts considering there has been a gradual rise in emission levels since 1990.

### **4.1 Norwegian Pollution Control Act (1981)**

Enacted in 1981, the Pollution Control Act<sup>6</sup> states its purpose is to “protect the outdoor environment against pollution and to reduce existing pollution, to reduce the quantity of waste and to promote better waste management” (Pollution Control Act, 1981). The intention of this Act is to place responsibility upon the emitter to address actions which cause high pollution levels. Within the Act, addressing pollution includes measures to prevent or limit emissions, as well as responsibility to mitigate

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<sup>6</sup> The English version of the Pollution Control Act which was used for the purpose of this analysis was last updated in 2003.

pollution which has already been released in the environment. The Act considers pollution to be anything that may alter the quality of the environment, however, this analysis will only discuss sections relating to pollution transpiring from emissions (Pollution Control Act, 1981).

The authority responsible for overseeing the day to day functions of the Act was originally referred to as the Pollution Control Authority (currently known as the Climate and Pollution Agency and herein referred to as “the agency”). The agency was established in 1974 and reports to the Norwegian Ministry of the Environment (European Network of the Heads of Environment Protection Agencies, n.d.). Responsibilities include determining what constitutes as pollution, ordering and reviewing environmental impact assessments, communication with other relevant authorities (for example The Planning Authorities), issuing investigations and whether to grant exemption from provisions within the Pollution Control Act. The agency has the power to determine the amount of emissions allowed. However, depending on the source of pollution, in many cases previously instated acts trump the Pollution Control Act (Pollution Control Act, 1981).

If the agency determines it is necessary that the operator provides an environmental impact assessment (EIA), this information is to be made public. An EIA is required if the information provided in the permit application is unclear and/or may lead to pollution beyond what is permitted in the Act. Once the EIA is provided by the operator, a public hearing is held an appropriate amount of time prior to a decision being made (Pollution Control Act, 1981).

It is within the scope of power of the agency to set limits on specific types of emissions or prohibit emissions during certain time periods, along with a procedure if these limits are exceeded. The Act operates on a case by case basis however, and the agency has not enforced a preset limit of emissions allowed in a given region or given span of time. The Act also does not explicitly state whether there is a limit to the number of operators which are approved for a given region or given amount of time. Measures intended to reduce emissions under the Act take a prescriptive and lenient approach. The Act states that measures taken to reduce pollution subsist of “[...] means of advice, guidance and information [which] seek to counteract pollution and waste problems [...]” (Pollution Control Act, 1981).



Certain chapters take a reactive approach. One section is devoted to the enforcement of a response plan should it be expected that acute pollution<sup>7</sup> will occur. Another section requires compensation for pollution to either the state or individuals who are directly affected by the pollution. While this is an incentive for polluters to reduce emissions, it does not properly address the root of the pollution.

A financial penalty may be issued for contravention of the Act. Financial penalties may motivate some operators to include the cost of fines within annual expenditures in order to avoid having to invest in preventative measures should the cost of the fines be cheaper. Therefore, financial penalties in climate policy are sometimes seen as inefficient tools within command and control measures (Jaacard et al., 2007). Regarding certain financial penalties, the operator does however have a certain amount of time to mitigate the excess emissions to revoke the fine. Aside from a financial penalty, operators may be subject to imprisonment with varying sentences dependent upon the type of contravention and/or the severity of pollution therefore making the Pollution Control Act legally binding.

The Act relies heavily on the most up to date technology measures and the costs associated with such measures are the responsibility of the operators. However, equipment with the purpose of limiting or reducing pollution must be approved by the agency prior to a sale being made. Operators with the likelihood of acute pollution events occurring must provide contingency plans and municipalities are required to provide a response plan as well.

## **4.2 C02 Tax Act (1991)**

In 1988, a conference held in Toronto focused on the issue of emissions from countries affiliated with the Organization for Economic Co-operation and Development (OECD) and proposed a 20% reduction in emissions before 2005 (Andresen & Butenschøn, 2001). Norway was a proponent of the reduction and ambition continued into 1989 when Norway was a participant of The Hague Ministerial conference with the purpose of discussing the deterioration of the ozone

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<sup>7</sup> Acute pollution: "Significant pollution that occurs suddenly and that is not permitted in accordance with provisions set out in or issued pursuant to this Act." (Pollution Control Act, 1981).

layer (International Legal Materials, 1989). This was then followed by the Bergen Conference which preceded the Rio Conference. These events and declarations of climate commitment led up to the implementation of a CO<sub>2</sub> tax in 1991.

Two types of CO<sub>2</sub> taxes were implemented in 1991. The first is called the *Act concerning sales tax* and is largely dominated by petrol imports in the transport industry. The second tax, and the one this analysis will focus on as it relates directly to domestic emissions, is the *Act relating to CO<sub>2</sub> tax in the petroleum activity on the continental shelf* (Bruvoll & Dalen, 2009).

According to the CO<sub>2</sub> Tax Act, operators “burning petroleum and releasing natural gas into the atmosphere” on the Norwegian continental shelf are subject to a tax. The tax is meant to provide incentive to reducing emissions and support an overall transition toward a carbon neutral society (Norwegian Petroleum Directorate, 2011). As made apparent through the specification of the Norwegian continental shelf, the CO<sub>2</sub> tax only applies to offshore emissions. The CO<sub>2</sub> tax covers “petrol, auto diesel oil, mineral oil and the petroleum sector” (Ministry of Finance, 2007).

The responsibility to pay the CO<sub>2</sub> tax rests solely with the emitter. The year is divided from 1 January to the 30 of June and the 1 July to 31 December. Both time periods have set deadlines for tax payment. It is not explicitly stated; however, it appears the tax deadlines were chosen in order to simplify monitoring and reporting through shorter time periods. Emitters are also responsible for monitoring (metering), calculating taxes based off of emissions and submitting this information to the Norwegian Petroleum Directorate by a specified time. The Norwegian Petroleum Directorate is responsible for settling issues pertaining to liability, metering (equipment and methods) and documentation (Norwegian Petroleum Directorate, 2011).

Should emitters fail to submit taxes by the specified deadline, interest is added to the overall amount. In serious cases seizure of property may be enforced. It is implied that the responsibility of property seizure lies with the Norwegian Petroleum Directorate however this is not explicitly stated. In extreme circumstances, emitters are liable to imprisonment of up to three months. Added interest / fines, seizure of property and imprisonment are all applicable whether the contravention was intended or through negligence (Norwegian Petroleum Directorate, 2011).

### 4.3 The Greenhouse Gas Emissions Trading Act (2004)

#### *EU Emissions Trading System*

The European Union Emissions Trading System is often referred to as the “flagship measure” of climate policy. The ETS was written into legislation in 2003 and operation began in 2005. The ETS was established to contribute to the goals set out by the Kyoto Protocol. Although the ETS is an international regulation, it operates on the installation level. This requires installations<sup>8</sup> in the private industry to trade emission credits dependent on an overall limit. The overall limit of emissions was originally set within each member state along with other logistical functions including how to handle non-compliance. In the current phase (2013-2020), an EU wide cap is being instated instead. Annual allowances have a “linear reduction factor of 1.74%” from the previous year to reduce emissions in this sector by 40% in 2030 (European Commission, 2017). The ETS is a carbon budget on the national level however it operates only in “power and heavy industry sectors” and places monitoring and reporting responsibilities on the private industry (Bogojević, 2013).

#### What does this look like in Norway?

The Greenhouse Gas Emissions Trading Act only applies to the Norwegian continental shelf and, like the mandates in the EU ETS, applies to energy and heavy industry sectors (this is subject to amendment). The Greenhouse Gas Emissions Trading Act is closely tied to the Pollution Control Act, in that any installations that fall under the jurisdiction were required to apply for a discharge permit before the 2008 phase began (Ministry of Climate and Environment, 2004).

Norway became a member of the EU ETS January 1<sup>st</sup>, 2008. The Greenhouse Gas Emission Trading Act, however, entered into force in 2005. The King was responsible for determining the total number of allowances for the phase beginning in 2008. It is then the responsibility of the agency to delegate emissions among the operators on an annual basis. Land based installations were given allocations free of charge for this first phase while other installations subject to the regulations under the act were

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<sup>8</sup> Installation: “a stationary technical unit” where activities occur which are covered by the Pollution Prevention and Control regulations (Robinson, 2007).

required to purchase allowances. A reserve of allowances however was established in the Norwegian emissions trading system allowing for the option of excess emissions (Ministry of Climate and Environment, 2004).

In addition to the establishment of the agency, the Norwegian Emissions Trading Registry was created. With guidance from the agency, the registry is responsible for managing allowances, including removing allowances when there is an excess. Should an operator fail to submit the amount of allowances which correlate with emissions for the year by the specified deadline, it must be submitted the following year along with a financial penalty. If an operator has failed to submit an emissions report, further trading of allowances is to be suspended until reporting is complete and submitted. A fine may be issued as well, however, operators are given a certain amount of time to submit a report in order to waive the fine. Operators are subject to proceedings and/or imprisonment therefore making the act legally binding.

#### **4.4 The Political Climate Settlement (2012)**

In April of 2012, the Norwegian Ministry of the Environment presented to parliament (the Storting) a White Paper outlining climate commitment, both international and domestic. The 2012 report was based on a White Paper from 2008 known as the Agreement on Climate Policy. Both reports support a sector approach ensuring specific targets and plans for each sector (Norwegian Ministry of the Environment, 2012). A handful of sectors were targeted due to high emission levels as well as for having measures with expected high feasibility. Sectors included mainland industry, petroleum, transport, construction, agriculture and forests as carbon sinks (International Law Office, 2012). Many of the targets outlined for specific sectors in the 2008 report were maintained in the 2012 report.

The previous government acknowledged that Norway should be at the frontline of climate change mitigation. As a developed, wealthy and organized country, Norway has the resources to contribute significantly. The 2012 report states that climate policy should be driven by “principles of equitable distribution, international solidarity, the precautionary principle, the polluter pays principle and the principle of a common commitment” (Norwegian Ministry of the Environment, 2012). Commitments include a

thirty percent reduction by 2020 (with a 1990 baseline) and carbon neutrality by 2050. However, should an international agreement be formed among developed countries, the government ensured preparedness to aim for carbon neutrality by 2030 (Norwegian Ministry of the Environment, 2012).

The report highlights the success Norway has had thus far in terms of reducing domestic emissions. This includes measures which were implemented in 2007 which have an expected overall reduction of five million tons of CO<sub>2</sub> equivalent by 2020. Domestic reduction measures overall, which include the uptake of emissions through the use of forests as carbon sinks, are expected to reduce over half of Norwegian domestic emissions. The previous government stressed the need to fund research which would lead to technological development to reduce emissions. Research is currently being conducted through Enova<sup>9</sup>. The report also states that sectors which are already subject to regulation such as the EU ETS will not be subject to additional regulation (Norwegian Ministry of the Environment).

Despite the strong emphasis on international agreements, the report explicitly addresses a supplementary, domestic, legally binding climate policy and states “[...] the Government will consider whether a separate climate statute is appropriate” (Norwegian Ministry of the Environment, 2012). In 2015, lawmakers voted on drafting legislation for a Norwegian climate law by 2017 with the majority supporting the notion (King, 2015). The 2012 climate policy White Paper and 2015 vote have since evolved into an actual proposal for a binding climate law in Norway. Despite the extensive support among lawmakers, political parties (aside from the Progress Party) and the general public, a Norwegian climate law remains a bill under consideration at this point without any legal authority.

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<sup>9</sup> Enova: “a Norwegian government enterprise responsible for promotion of environmentally friendly production and consumption of energy” (Enova, 2001).

## 5 Discussion of Existing Norwegian Policies in light of the theory and criteria

It is justified to say an effective climate policy is lacking in Norway since CO<sub>2</sub>-eq has risen 4.2% since 1990 with a 1.1% increase from 2014-2015 alone. This is mainly due to the oil and gas sector (Statistisk Sentralbyrå, 2016). The figure below illustrates emissions of the major greenhouse gases (CO<sub>2</sub>-eq) in Norway from 1994 until 2014.

### Utslipp av Klimagasser (CO<sub>2</sub>-ekv) (i tonn per år)

#### Totale utslipp til luft i Norge

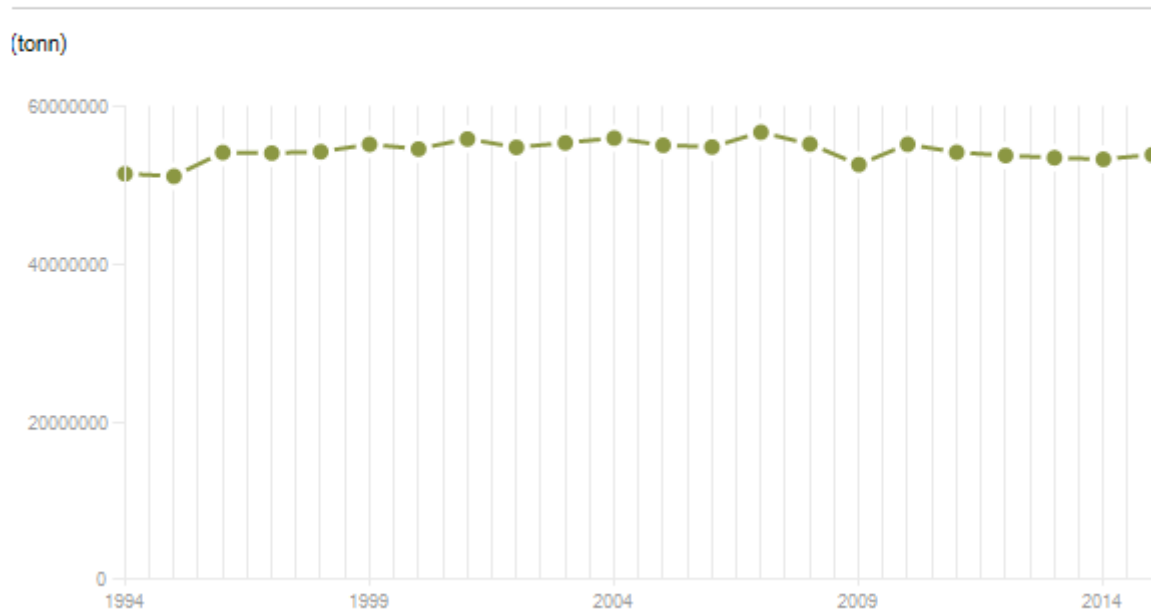


Illustration 5.1: Utslipp av Klimagasser (CO<sub>2</sub>-ekv).  
Source: Miljø-direktoratet (no date).

The theory chapter presented four criteria which provide integrity to the UK carbon budget concerning emission reductions, and will form a basis for analyzing the four Norwegian climate policy examples within this chapter. The four criteria help to address the common climate policy paradigms of the time inconsistency problem and the domestic politics problem. The intent is to analyze, based on theory, why these policies have not proven sufficient to reduce greenhouse gas emissions. Below is an

analysis using the four criteria: (legally) binding, time accountability / budgetary terms, information accessibility / annual indicative range, and overall accountability / independent body.

### **5.1 Norwegian Pollution Control Act**

The Pollution Control Act (PCA) is a legally binding Act that results in financial penalties and / or imprisonment should an operator fail to fulfill responsibilities. The PCA and the UK CCA are not directly comparable since the UK government is held legally accountable for contravention against the Act while individual emitters are held accountable under the PCA (Ministry of Climate and Environment, 1981). Despite the difference in who the legally binding provisions apply to, the act still fulfills the need to have legally binding provisions. Such provisions have allowed the act to address the time inconsistency problem since it was first implemented in 1981 and still applies today. The overall mandate and central provisions have stayed consistent since the onset as well which indicates the various government administrations over the years have not made a successful attempt to weaken the PCA measures. Had the PCA been politically binding, there is a high probability it would have been severely weakened or disregarded altogether.

Budgetary terms which enforce time accountability in the UK CCA are based on an overall target. Budgetary term enforcement is an example of a measure that helps the UK CCA address the time inconsistency problem. Rather than depending on short term policies to reduce emissions, one long-term emission reduction goal is supported by incremental progress through budgetary terms. The PCA does not enforce an overall target therefore there is no use for budgetary terms. The PCA makes decisions on a case by case basis and the measures for what constitutes as exceeding permitted pollution levels is unclear within the provisions of the Act. The Act states the purpose is to “achieve a level of environment quality that is satisfactory on the basis of an overall evaluation of human health and welfare, the natural environment, the costs associated with any measures implemented and economic considerations” (Ministry of Climate and Environment, 1981). Despite this, the term “satisfactory” remains unclear therefore the domestic politics problem was not fully addressed in terms of translating ambition into clear measures. The PCA has

succeeded in limiting business as usual emissions; however, provisions toward gradually reducing emissions overtime are not embedded in the Act.

It is worthy to emphasize however that the PCA has been in existence since 1981. While it is lacking a measure for time accountability in the form of budgetary terms, other factors have allowed for the long-term success in fulfilling what the act intended to accomplish. The factors supporting time accountability which have allowed the PCA to address the time inconsistency problem however fall outside of the lens of the UK carbon budget criteria.

Under the UK CCA, information accessibility and transparency come in the form of the annual indicative range. The annual indicative range is a more specific version of the budgetary terms which provides incremental progress. Annual indicative range also ensures transparency. Each year, the Secretary of State is required to submit a report to Parliament including the amount of emissions allowed for said year. Annual reporting must highlight whether the annual budget was exceeded the previous year and what measures will be implemented to remedy the excess. In the PCA, transparency comes in the form of an initial application for a discharge permit. The application must outline the type of pollution and the amount. In certain cases, the agency will order an environmental impact assessment which can be accompanied by a proceeding which must be made public. It is the responsibility of the operator to notify the agency should changes in emissions occur however reporting is not submitted on a regular basis (Ministry of Climate and Environment, 1981).

The information required in the discharge permit application serves a different purpose from the UK's annual indicative range. This is due to the fact that emissions are reviewed on a case by case basis via a one-time application. The information provided in the discharge permit does not provide insight into progress toward a long-term emissions goal therefore the review of discharge permit applications is done so in isolation from other emitters. Despite the Act's intent which is to protect the natural environment, the ambitions did not quite translate monitoring emissions into measures which ensure progress overtime i.e. the domestic politics problem. The time inconsistency problem may also be considered as annual indicative range further embeds legislation by requiring action on a regular basis. Once an emitter's discharge permit application has been approved, there is no requirement for



additional reporting and little incentive for further emissions reduction. As a result, there is risk of the Act becoming obsolete over time without frequently updated information.

An independent body was established for the monitoring, reporting, and amending of the UK CCA. The Secretary of State also provides extensive support and information is submitted to Parliament for review. National authorities are included on decision making however core responsibilities have been clearly designated to avoid confusion and conflict of interests (UK Parliament, 2008).

Under the PCA, the independent body is the Climate and Pollution Agency. The agency consists of relevant experts which have been appointed by the King. The agency is responsible for the core activities such as issuing discharge permits, communicating with other agencies where there may be an overlap of jurisdiction, suspending or discontinuing emissions, reviewing environmental impact assessments, participating in proceedings, issuing fines and other day to day responsibilities (Ministry of Climate and Environment, 1981). The agency fulfills the criteria of an independent body (despite the fact it has been given additional responsibilities since the implementation of the PCA) since it was established for the sole purpose of the PCA. The establishment of the agency addresses the domestic politics problem by removing the option for other elected officials with an opposing agenda to alter and / or weaken the provisions of the Act.

The PCA fulfills two of the four criteria: the binding and independent body criteria. It has been enacted since 1981. Therefore, the provisions within the act address the time inconsistency problem which typically can cause climate policy to deteriorate with the passing of time due to resources being redirected. There is clear support for the reduction of emissions in Norway however the domestic politics problem is evident in the PCA as a significant reduction target was not implemented. The intention is to prevent or limit pollution however ambitions were not translated into clearly defined emission reduction targets.

## 5.2 C02 Tax Act

Contravention, whether it is intended or due to negligence, is subject to interest on taxes, seizure of property (distrain) until taxes along with interest are paid, fines and imprisonment up to three months. Under the C02 Tax Act, the licensees are responsible for paying the C02 tax and metering / reporting “rests with the operator on behalf of all licensees” (Norwegian Petroleum Directorate, 2011). Similar to the PCA, the way legally binding provisions are enforced differ from the UK CCA. Individual operators are held legally accountable. However, due to the Act’s legally binding provisions, it has been in existence since 1991 and has been able to properly address the time inconsistency problem.

A C02 tax is a tool intended to encourage a transition toward low emissions by aiming to increase the price on activities which result in C02 emissions. As a result, other production options have a chance to be economically competitive. The Act is not working toward a specific target rather aiming to accomplish a gradual transition toward low emission production. Over time, there may be adjustments made to the tax, however, the Act does not enforce anything that resembles a budgetary term. Within the UK carbon budget, budgetary terms serve the purpose of keeping provisions relevant by including updated scientific and political information especially over extended periods of time (time accountability). Budgetary terms also ensure the act remains a priority within the government over an extended period of time. Without budgetary terms or something similar, the C02 Tax Act runs the risk of becoming obsolete with low C02 tax pricing which remains stagnant over extended periods of time. Therefore, the C02 Tax Act is, in theory, vulnerable to the time inconsistency problem. Despite implementation in 1991, the time inconsistency problem in this case refers to the weakening of provisions overtime due to a lack of budgetary terms.

Since the Act does not instate budgetary terms, it can be deduced that annual indicative range is lacking as well. The provision within the Act which comes close to resembling annual indicative range reporting is the deadline for submitting an emissions report and taxes. This occurs on a biannual basis to make reporting more manageable and allows for information to be frequently updated. Reports are submitted to ensure the correct amount of tax has been submitted and to monitor emissions. However, like the Pollution Control Act, this is done on a case by case

basis and each emitter's reporting details and taxes are reviewed in isolation (Norwegian Petroleum Directorate, 2011). Reports do not serve the purpose of providing insight toward the progress being made toward one common emissions reduction target. Despite submitting emission and tax information, the information is not used to translate into frequently updated measures therefore it cannot be considered as fulfilling the annual indicative range criteria.

The Norwegian Petroleum Directorate has been given responsibility of reviewing reports submitted by emitters which include emission and tax information. The directorate also has the responsibility of enforcing interest on taxes, distraint, fines and imprisonment under circumstances of contravention. Other than the Norwegian Petroleum Directorate, the King can amend provisions within the Act especially concerning interest. It cannot be considered, however that the C02 Tax Act has an independent body (Norwegian Petroleum Directorate, 2011). The Norwegian Petroleum Directorate first and foremost was a government department already in existence at the onset of the C02 Tax Act. In addition, considering responsibilities were granted to the Norwegian Petroleum Directorate, there is a clear conflict of interest. The purpose of an independent body is to remove agendas and allow unbiased experts to oversee and advise on the provisions and progress. The Norwegian Petroleum Directorate does not properly address the domestic politics problem for these reasons.

The C02 Tax Act fulfills one of the four criteria: the binding criteria. The C02 Tax Act has partially addressed the time inconsistency problem through the legally binding provisions. However, it is lacking provisions which ensure the measures remain adequate overtime including budgetary terms and annual indicative range. The C02 Tax Act has been vulnerable to the domestic politics problem as well due to lacking annual indicative range provisions which ensure consistently updated information. The fact that it does not have an independent body weakens the provisions further by exposing it to government departments and special interests which have conflicting agendas.

### **5.3 Greenhouse Gas Emissions Trading Act**

The Greenhouse Gas Emissions Trading Act is a legally binding Act in Norway. It holds installations accountable for reporting and submission of the correct amount of allowances which correlate with emissions. Should an installation fail to submit the correct amount of allowances, this results in a fine along with the requirement to submit allowances the following year. If an installation fails to report in time, trading of allowances is suspended until reporting is submitted. Serious contravention of the Act results in proceedings and/or imprisonment (Ministry of Climate and Environment, 2004).

The 2030 goal for the EU ETS is to reduce emissions by forty percent (and a ninety percent reduction by 2050). To do this, the amount of available allowances is reduced on an annual basis, however the current linear reduction factor will need to be increased to 2.2% each year beginning in 2021 to reach the 2030 target (European Commission, 2017). Given the ETS and GHG Emissions Trading Act do not have budgetary terms to review progress and make amendments, there is no guarantee this adjustment will be made. This results in the GHG Emissions Trading Act being vulnerable to the time inconsistency problem and therefore vulnerable to weakened emission reduction targets in the future.

At the beginning of the year, each operator is given a specific amount of emission allowances. Operators must surrender any unused allowances on an annual basis to the Emissions Trading Registry. The amount of emissions from each operator subject to the provisions within the Act is monitored and recorded therefore it will be reported if an operator exceeds the allotted allowances for the year. This provision is not explicitly called an annual indicative range. However, it serves the same purpose and therefore can be considered as fulfilling the criteria and addressing the time inconsistency and domestic politics problem (Ministry of Climate and Environment, 2004).

The responsibilities of monitoring the GHG Emissions Trading Act have been designated to the Climate and Pollution Agency. The agency is responsible for designating allowances to each operator based on the national cap. The agency has the right to adjust the required information to be included in an application submitted by an operator for a discharge permit. Should there be a suspension in operations,

operators must alert the agency. The agency must verify reports submitted by operators and has the power to enforce an investigation, charge an operator with additional administrative costs, suspend the transfer of allowances and so on. However as stated previously, the agency has other responsibilities and therefore cannot be considered an independent body for the GHG Trading Act (Ministry of Climate and Environment, 2004).

The Greenhouse Gas Emissions Trading Act fulfills two of the four criteria: the binding and annual indicative range criteria. It is not explicitly stated that the Act enforces annual indicative range however the requirements are comparable to that of the annual indicative range requirements in the UK carbon budget. The GHG Emissions Trading Act properly addresses the time inconsistency problem through legally binding provisions and required action on an annual basis which is not likely to change. The Act also addresses the domestic politics problem through legally binding provisions by protecting the Act from opposing agendas. Information is kept up to date with annual reporting which supports translating ambition into measures. Considering the provisions are set at the international level, Norwegian domestic politics may only affect the GHG Emissions Trading Act to a limited degree. Therefore, the Act properly addresses the domestic politics problem in this regard.

#### **5.4 Prop. 77L (2016-2017) Climate Law**

Following the Political Climate Settlement is the March 2017 climate law proposal. The Political Climate Settlement was included in the previous chapter to provide the background information on proposals and White Papers leading up to the most recent proposal. Since it is a proposal, the assessment is inherently different from the three previous Acts. This means, despite being approved by Erna Solberg's cabinet and receiving support from all political parties aside from the Progress Party, it is still considered a recommendation. Nonetheless, it is the most relevant proposal to the UK CCA so the March 2017 proposal will therefore will be handled in the same format as the other acts.

The Norwegian government would be held legally accountable to submit information to the Storting on an annual basis such as GHG emissions, emission projections,

legally binding targets, “sectoral emissions paths for non-quota regulated sectors”, and the current carbon budget among other information (Climate and Environment Ministry, 2017). The proposal strongly emphasizes that the climate law should only hold government accountable and it should never operate on an individual case basis or in other words hold individual citizens liable. Who specifically would be held accountable and how this would operate should contravention occur is not explicitly stated in the proposal (Climate and Environment Ministry, 2017). However, implementing a climate law with legally binding provisions which hold the government accountable would be the first of its kind in Norway and would successfully address the time inconsistency problem and the domestic politics problem.

During the open consultation held in 2016 on the topic of a climate law, the Ministry of Climate and Environment received comments from agencies and individuals alike. Comments were largely in support of a climate law with budgetary terms every four to five years with sector specific measures. To align itself with the Paris Agreement, the proposal suggests Norway should be required to submit updated climate targets to the Storting every five years beginning in 2020. This would allow for inclusion of updated scientific information, the inclusion of updated EU climate policies, and to ensure Norway stays on a path toward an eighty to ninety-five percent reduction by 2050 (Climate and Environment Ministry, 2017). Since the suggestion for budgetary terms in the Norwegian proposal matches that of the UK carbon budget, the proposal successfully addresses the time inconsistency problem.

As mentioned, the Norwegian government would be responsible for submitting relevant climate law information to the Storting on an annual basis. The Storting has also suggested the government produce an annual report providing the status of the carbon budget along with joint fulfillment climate targets with the European Union. The proposal emphasizes the need for a climate law to provide transparency to domestic emissions and to encourage public debate over emission levels and measures used to reduce emissions (Climate and Environment Ministry, 2017). The proposal suggests clearly defined measures which would require action on an annual basis and a system in place to keep information continuously up to date, therefore successfully addressing both the time inconsistency and domestic politics problem.

In early 2015, representatives of political parties in favor of a Norwegian climate law (Energy and Environment Committee) produced a recommendation. Within the recommendation, the representatives stated that implementation of an independent body which would oversee the climate law would be impractical for Norway. The committee advised that the Ministry of Climate and Environment would be equipped to absorb the responsibility (Energi- og miljøkomiteen, 2014-2015). This analysis does not doubt the ability of the Ministry of Climate and Environment to absorb the responsibilities of the climate law however it is crucial to designate an independent body to be responsible for core tasks relating to a climate law. Without an unbiased, independent body comprised of experts, the climate law is vulnerable to opposing agendas which result in weakened measures. It would also be more effective for the independent body to oversee the climate law without preexisting responsibilities. This way, there would not be a reason to postpone or suspend the frequent reporting and updating of information which is necessary to translate into adequate measures. Although the political parties oppose an independent body, the open consultation in 2016 yielded different opinions and many environmental organizations expressed support for an independent body tasked with core responsibilities relating to the climate law. Despite the benefits of an independent body, the proposal does not specifically address the idea of establishing one. The proposal is written as though the Climate and Environment Ministry will be tasked with the core responsibilities (Climate and Environment Ministry, 2017).

The Norwegian climate law proposal mirrors the UK CCA the most with three out of the four criteria being fulfilled. The climate law would be legally binding, ensure long term accountability through budgetary terms and information transparency through annual reporting. Despite details lacking in central areas (i.e. who would be legally accountable within the Norwegian government and what that would look like), the climate law proposal is a major step as it is unusual to enforce a legally binding climate law to this extent in Norway (Climate and Environment Ministry, 2017). Through the lens of the UK carbon budget, the climate law however lacks an independent body to handle core responsibilities. The independent body is important as it would be the main point of contact for ministries and the Storting and it would protect the climate law from personal agendas. A climate law lacking an independent

body may be vulnerable to the domestic politics problem due to reduced coordination and conflicting interests.

## **5.5 Summation of the Norwegian climate policies**

The three Acts have had a positive impact on emissions reduction in Norway and the March 2017 proposal has the potential to change the way climate policy is governed in Norway. The intent of this chapter is not to diminish this success. However, it is beneficial to build on such progress by evaluating the organizational structure and provisions so it is possible to isolate where there are potential vulnerabilities. The three Acts and the proposal fulfill the legally binding criteria with the three Acts holding emitters legally accountable and the proposal being the first of its kind to suggest holding the government legally accountable. Implementing a national, legally binding carbon budget has the potential of being an extremely effective climate governance tool as the national level “[...] is where the policies are ratified, implemented, and enforced, but it is also where the global epistemic communities of scientists and policymakers who work on environmental issues emerge from and continue to work” (Fisher, 2004).

It is clear from the analysis that there is not an issue with implementing climate acts which are intended to operate over an extended time period. Rather, there seems to be a trend in which government participation occurs on a one time basis (aside from the GHG Emissions Trading Act which is dictated on the international level). For example, discharge permits which require a one-time approval. This lack of consistent participation from the government results in measures which may have been progressive at the time of implementation and have since become stagnant.

Only the March 2017 proposal suggests employing budgetary terms which was borrowed from the UK carbon budget. Budgetary terms serve the purpose of locking commitments which may be a decade or more away and therefore addressing the time inconsistency problem. Although the March 2017 proposal is structurally quite different from the existing Norwegian acts, employing budgetary terms could have encouraged the development of emission limits or targets overtime to match scientific information, and updated EU and international policy targets. In addition, targets may



have encouraged the government to compete against its own previous emission targets since they “send an internal signal to the rest of government about the level of priority attached to an issue” (Ilott et al., 2016).

Despite the Pollution Control Act and CO<sub>2</sub> Tax Act leaning more toward a general, loosely enforced emissions limit, employing budgetary terms within existing acts may assist Norway with reaching carbon neutrality sooner and with less dependency on international measures. Budgetary terms also serve the purpose of allowing for the climate law to become embedded in the Norwegian government. This would ensure its resilience through the implementation phase when it is especially vulnerable to weakened provisions (Lockwood, 2013). This would also support climate law resilience through any other turbulent political situations that may occur leading up to 2050.

The GHG Emissions Trading Act and the March 2017 proposal employ the use of annual indicative range. The GHG Emissions Trading Act is governed on the international level and the “annual indicative range” is dictated on the international level as well, however, it is enforced and operates on the national level. For the March 2017 proposal, the annual indicative range has been borrowed from the UK carbon budget and will assist with embedding the climate act as well. Annual indicative range has the potential of improving emission targets for the Pollution Control Act and CO<sub>2</sub> Tax Act by increasing the frequency in which government is focusing on provisions within the acts. Consistently up to date information supports the necessity to amend provisions, allowing measures to accurately reflect relevant and ambitious goals.

The PCA is the only act to employ an independent body. However, stating the agency is an independent body is a stretch considering it has since absorbed additional responsibilities since the onset of the PCA in 1981. Additional responsibilities include the GHG Emissions Trading Act. Employing one agency to oversee two acts with similar mandates may lead to weakened provisions if for example the agency is attempting to reduce administrative tasks for emitters who must adhere to both acts. A successful, independent body should not be vulnerable to the transition to a new government administration and should not have multiple responsibilities which compete for time, funding and other resources (Ilott et al.,

2016). It is also beneficial for the public to see an independent body has been established for the sole purpose of an act / law because “well-established governments find it difficult to increase the salience [...] because the focus on the need to tackle a problem anew implicitly discredits a government’s pre-existing efforts in the same area” (Ilott et al., 2016).

In addition to the criteria, setting clear targets for climate commitments is essential, even in a government which favors flexibility. Clear targets are pertinent because they provide an “external signal of the seriousness of government intent” and avoid the risk of “ending up with targets that do not signal a serious commitment to long-term working and which therefore carry little weight and fail to change behavior” (Ilott et al., 2016).

## **6 Proposed Norwegian Carbon Budget**

While a carbon budget is a fairly new policy mechanism, it is not revolutionary in the sense that public and business sectors will already have experience with utilizing an economic budget. Despite the analysis being in support of an independent body, it is important that ministries and government departments familiarize themselves with the budget as well. Government wide inclusion is important because often climate policy is isolated from other central government departments, which prevents the implementation of a strong, economy wide target. Politically, Norway is already in a position to introduce a carbon budget with ease of implementation as there is existing “cross-party political support for climate change legislation” (Generation Zero, 2017). Having the right support for climate legislation will make the difference between stringent and weak provisions within the legislation.

In addition, policy implementation is often very dependent on the events or circumstances in the political arena. There are very limited windows in time, referred to as “policy windows” which allow for successful policy implementation (Kingdon, 2014). Policy windows often depend on a transition to a new government when it is expected to introduce new policies (Ilott et al., 2016). Since Norway has an upcoming parliamentary election in September of 2017, it is an opportune moment to implement

a carbon budget or the potential climate law. Otherwise, there is a risk that the type of attention a climate law would garner during an administration transition may not occur for another four years during the next parliamentary election. The purpose of this chapter is to propose a Norwegian carbon budget in order to contribute to the political conversation on implementing a legally binding climate law.

The UK has been successful so far in meeting emission reduction targets for the first budgetary period which began in 2008 at the onset of the Climate Change Act (each budgetary period lasts for five years in order to be aligned with parliamentary terms). The budgetary terms are organized to overlap with government administrations to ensure continuation of measures into new administrations and therefore are set up to avoid alignment with the general election (Generation Zero, 2017). Emissions for the second / current budgetary period ending in 2017 are expected to outperform the target set by the UK carbon budget and this is also the case for the third budgetary period (2018 – 2022). Trajectories predicting emission levels for the fourth and fifth budgetary periods (2023 - 2027, 2028-2032) are expected to fall short however.

Despite higher than intended predicted emissions in 2023 through 2032, a carbon budget is a functioning and effective climate policy as it has the capability of anticipating carbon emissions exceeding the budget years from now (UK Parliament, 2008). The UK government is not only required to but has the time to prepare for unintended emissions by implementing additional measures in the current budgetary term in order to curtail future emissions in the fourth and fifth terms. Additional actions now allow for a more attainable goal in 2050 (Committee on Climate Change, n.d.).

Implementing a Norwegian carbon budget at the national level will allow for climate measures to be implemented in major emitting sectors with a top down approach. Climate and energy political advisor Ragnhild Waagaard of World Wide Fund-Norway explains that there is a risk that Norway focuses too much energy on one measure. She uses the attempt to protect Lofoten from off shore drilling as an example and explains that “it doesn’t really help with overall emissions reductions because you then use all the effort on one topic but then you don’t see emissions are actually rising in other fields.” She attributes this misdirection to a lack of “a political signal from the top to prioritize climate” (R. Waagaard, 2017).

The following are the provisions suggested for a Norwegian carbon budget including the four criteria and supplementary provisions. Whenever the Norwegian context differs from the UK, this is considered and provisions are altered to better suit Norwegian climate policy.

## 6.1 Overall Target

While an overall target was insinuated through the criteria, it is important to isolate and acknowledge this as a specific provision for a carbon budget. A carbon budget must have an overall target for emissions reduction. This will allow for guidance and accountability. An overall target also provides predictability and coordination among the private sector and general public. Many countries aim for a reduction that is in line with the two-degree limit. It is now widely accepted by environment ministries, non-governmental organizations, and world leaders. Abiding by the two-degree maximum not only allows for a chance at curtailing major effects of climate change but would also align Norway with the European Union. Aligning Norway with the EU is not the priority however it sends a positive message indicating Norway is united with the EU and non-EU countries as well by abiding by this two degree rule. It may also be useful in terms of information sharing among countries.

Norway's nationally determined contribution requires a reduction of forty percent by 2030 based on 1990 levels. This commitment transpired from Norway signing and ratifying the Paris Agreement (the commitment was initially an Intended Nationally Determined Contribution<sup>10</sup> (INDC)). The Norwegian government pledged to become a "climate neutral" society by 2030 in June of 2016 as well contingent upon implementation of a stringent agreement among developed countries.

Climate Action Tracker did an analysis consisting of 31 countries based on progress toward the Paris Agreement goals. According to the analysis, Norway is not taking action which would result in emission reductions compliant with the 2-degree maximum rise in global temperature. The analysis bases this position on equity and considering Norway has been responsible for high levels of emissions (domestically

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<sup>10</sup> Prior to the Paris Agreement, participating countries provided Intended Nationally Determined Contributions (INDCs) to outline post-2020 measures. If countries did not update INDC's, they automatically became Nationally Determined Contributions (NDCs) (World Resources Institute, n.d.).

and abroad) and has the capacity to implement measures, it should take on a higher emissions reduction target (Climate Action Tracker, 2016).

Despite its pledge toward a carbon neutral society by 2030, current policies provide projections which fall short. Norway currently emits around 53 MtCO<sub>2</sub>e annually (see below for 2015 statistics). The government announced carbon neutrality would be reached through “the EU emissions trading market, international cooperation on emissions reductions, emissions trading and project-based cooperation” (Nelsen, 2016) therefore many emissions reductions revolve around international measures. This current plan will seriously undermine domestic emissions reduction and efforts to make Norway a climate neutral country (Climate Action Tracker, 2016).

Emissions and sinks of greenhouse gases. Million tonnes CO <sub>2</sub> equivalents			
	2015	Change in per cent	
		Since 1990	2014 - 2015
<b>Emissions from Norwegian territory</b>	<b>53.9</b>	<b>4.2</b>	<b>1.1</b>
Oil and gas extraction	15.1	83.3	2.5
Manufacturing industries and mining	11.9	-39.3	2.5
Energy supply	1.7	311.3	-0.6
Heating in other industries and households	1.2	-56.7	-1.2
Road traffic	10.3	32.6	0.3
Aviation, navigation, fishing, motor equip. etc.	6.4	15.3	-0.6
Agriculture	4.5	-5.3	1.0
Other	2.8	5.2	-3.2
<b>Sinks and emissions from forest and land areas in Norway <sup>1</sup></b>	<b>-25.4</b>	<b>-58.8</b>	<b>3.5</b>

<sup>1</sup> Figure for the previous year. The change in per cent shows increase in net uptake in forests since 1990.  
Source: NIBIO

The figures for forest and land areas in Norway were corrected 15 December 2016.

Illustration 6.1: Emissions and sinks of greenhouse gases. Million tonnes CO<sub>2</sub> equivalents. Source: Statistisk Sentralbyrå (no date).

The overall emissions reduction target for the Norwegian Carbon Budget proposed in this analysis is an eighty-five percent reduction in CO<sub>2</sub>eq emissions by 2050. This reduction target and target year are borrowed from the UK carbon budget. However, reductions are only considered if they remain within the borders of Norway (whereas

some international measures are considered for the UK CCA). Keeping in line with the UK's target, the baseline year will be 1990. The baseline year refers to the emissions from said year therefore there must be an eighty-five percent reduction in greenhouse gas emissions from 1990 levels. The year 1990 was chosen as a baseline for the UK to align targets with the Kyoto Protocol (Department of Energy and Climate Change, 2016).

Emissions taken up through Land Use, Land Use Change and Forestry will be included in the budget. This is a major emission sink for Norway and by including it in the carbon budget, preserving forests is further incentivized. Considering Norway is currently dependent on a plethora of international measures which would be excluded from the proposed carbon budget, it is only fair to include LULUCF because it is a domestic measure that would help Norway achieve the 2050 target.

## **6.2 Legally Binding**

Historically, Norway has implemented policies dependent upon political accountability to reach emission reduction goals. Exceptions include the Pollution Control Act, the CO2 Tax Act and the Emissions Trading System. Politically binding essentially entails societal pressure to enforce action to reach reduction goals. If targets are not met by the specified deadline, there are no legal repercussions. Legally binding provisions ensure accountability and also help to reinforce other aspects that are necessary for a successful carbon budget such as transparency and predictability. As referenced in a case study aimed at creating similar legislation for New Zealand, the UK carbon budget is comprised of three central, self-reinforcing pillars: "accountability, independent expert advice, and transparency" (Generation Zero, 2017). These pillars are solidified through legally binding provisions.

As mentioned in the March 2017 proposal, a legally binding Climate Law is an unusual piece of legislation in the Norwegian context (Climate and Environment Ministry, 2017). Some may view such a long-term, legally binding piece of legislation to be a threat to the democratic process. A law may also pose a problem in terms of locking in emission reduction targets which overtime may become obsolete. Both dilemmas however can be avoided by implementing budgetary terms and annual

indicative range to ensure frequent evaluation, reporting and updating / amending to the law.

This analysis proposes the Norwegian government be legally accountable for ensuring budgetary terms are imposed and three, four year terms must be legally instated at any given time up until 2050. The independent body must submit the required reporting by the specified deadlines. All proposals and amendments must be produced with budgetary term targets and the final target in mind. The independent body should be legally required to respond to any advice produced by the Ministry of Climate and Environment. Finally, it is suggested that pre identified emitters within the sectors included in the proposed carbon budget in this analysis are held legally accountable for submitting emission levels annually (more detail is provided in the reporting section). This analysis is in support of the March 2017 proposal in reference to excluding individual citizens from being held legally accountable under the climate law (Climate and Environment Ministry, 2017).

### **6.3 Budgetary Terms**

Once a final target year has been set, it is then natural to determine the acceptable amount of emissions for each budgetary term. Each successive term should have a smaller budget than the previous term to ensure gradual progress toward 2050. Having incremental progress woven into the regulations also ensures the economy is not suffering from implementing measures all at once. It is also a method which allows the long-term climate policy to become embedded. By doing so, it mitigates the risk that government and citizens alike will lose focus. “Cycles of further target-setting are vital for maintaining political interest, driving cross-government working and periodically rebuilding the coalition of external support that underpins long-term focus” (Ilott et al., 2016 p7). As mentioned throughout the analysis of existing Norwegian climate policies, for a long-term climate policy to be successful, there must be required action on a regular basis. Otherwise, the policy is vulnerable to the time inconsistency problem due to measures becoming less stringent over time.

The UK budgetary term lasts for five years and a five- year term has been proposed in the March 2017 proposal for Norway as well. Three budgetary terms have been

implemented at the onset of the UK CCA and the fifth one just recently, meaning carbon budgets are currently legally locked in until 2032 (with the possibility of necessary amendments). The Act requires budgetary terms are set twelve years in advance in order to “provide long-term certainty for businesses, investors, communities and public authorities alike” (Generation Zero, 2017).

To align itself with the parliamentary terms in Norway, this analysis proposes the budgetary term should be every four years with a term evaluation June 1st during the fourth year, providing three full months before the parliamentary election is held in September. The term evaluation may not contain the finalized emissions data, however, since this typically takes up to one year to produce. Instead, the purpose of the evaluation is to understand how well the institutional setup is functioning. By aligning the budgetary terms with the parliamentary term, members of parliament reaching the end of the term will have had experience working with the budget and may offer constructive feedback in terms of improving the process. New members of parliament have the opportunity to be properly briefed by previous members in order to assist with a smooth transition. This transition into a new carbon budget and new parliamentary term however should not accept amendment proposals from new members of parliament during the first year and advice should mainly come from the independent body.

Despite Norway’s existing target to achieve a 40% reduction of emissions by 2030 (or climate neutrality by 2030 contingent upon an international agreement), it is dependent on measures which would reduce emissions outside of Norway. This proposal supports a carbon budget which is dependent upon domestic emission reductions and Norway does not currently have a clear path toward carbon neutrality via domestic emission reductions. Therefore, the carbon budget will follow a plan leading up to the year 2050. A target of near carbon neutrality by 2050 depending solely on measures which would reduce domestic emissions is a more realistic target than 2030. This is because Norway depends on emissions trading credits which resulted in 5.8 million tCO<sub>2</sub>-eq/year for phase II and additional emission credits from offsetting (Environmental Defense Fund, n.d.).

Aside from having an “overall target” for 2050, there should also be a target marking a “halfway point.” In the UK, this is the year 2020 and the CCA states “for the budgetary period including the year 2020, [the target] must be such that the annual



equivalent of the carbon budget for the period is at least 26% lower than the 1990 baseline” (UK Parliament, 2008). The halfway point for the proposed Norwegian carbon budget in the analysis is from 2029-2032 with a forty percent reduction. This is intended to align the analysis with the actual Norwegian commitment to reduce emissions by forty percent by 2030.

The data below is a part of the proposed carbon budget for the analysis and outlines budgetary term emission reduction suggestions up until 2050. The reduction suggestions are based on 1990 emission levels (51.9 million tCO<sub>2e</sub>) as this year has been chosen for the baseline. The following figures would be for immediate implementation as 2017 is included within the first budgetary term.

<b>Norwegian Budgetary Terms:</b>		
<b>Term:</b>	<b>Percentage of emissions reduction from 1990:</b>	<b>Carbon Budget (tCO<sub>2</sub>eq):</b>
2017-2020	10%	46,710,000
2021-2024	20%	41,520,000
2025-2028	30%	36,330,000
2029-2032* Halfway point	40% - This target should remain the same so as to keep NO aligned with EU/Paris Agreement	31,140,000
2033-2036	50%	25,950,000
2037-2040	60%	20,760,000
2041-2044	70%	15,570,000
2045-2048	80%	10,380,000
2049-2050	85% (only a five percent increase from the previous term as it is only a two year term)	7,785,000

Illustration 6.2: Norwegian Budgetary Terms (created for analysis).

#### **6.4 Independent Body**

One major reason to designate an independent body is due to the inclusion of many Norwegian ministries. Inclusion of ministries is necessary to connect climate mitigation in Norway and the national budget for example, but may result in ownership and responsibility to be a convoluted area. Establishing a team of experts

for the sole purpose of the climate law reduces the potential for conflict of interests, it reduces the potential for overwhelming ministries with preexisting responsibilities, and it creates a clear point of contact for other government departments.

The carbon budget proposal within this analysis suggests the following responsibilities be designated to a Norwegian independent body. In the context of the UK, many of the following responsibilities are split between the Secretary of State and the Committee on Climate Change. The CCC is also responsible for providing recommendations to the Secretary of State. These two separate entities however have been merged into one suggested independent body for the Norwegian context considering an independent body has already been contested. Although the following closely mirrors responsibilities of the UK's Climate Change Committee and Secretary of State, it has been altered to fit the Norwegian context when necessary (UK Parliament, 2008).

This analysis proposes that the Norwegian independent body should be responsible for the following:

- (1) Advising the Storting on whether the final target for 2050 should be amended.
  - (a) Amendment proposals must be made public.
  - (b) Amendment proposals must be sent to all relevant Norwegian ministries, which then have two months to provide comments before amendments will be provided to the Storting.
  - (c) Comments provided by the Norwegian ministries must be considered, however, the independent body is not required to abide by suggestions but must provide reasoning for doing so.
  - (d) A Norwegian ministry may request specific information from the independent body at any time should the information not already be publicly accessible.
  - (e) Norwegian ministries may provide advice to the independent body, especially the Ministry of Climate and Environment.
- (2) Determining the carbon budget for each budgetary term and designating emission limits to each sector.

(3) Ensuring three budgetary terms are determined, agreed upon by parliament and legally instated at any given time leading up to 2050.

(a) The carbon budget for the first budgetary term must be provided no later than December 2017.

(4) Advising the Storting and targeted sectors on feasibility and expected costs associated with emission reduction measures for each sector.

(5) Monitoring emission levels for each budgetary term, each year and within the targeted sectors.

(a) This includes ensuring the necessary information is received from sectors (outlined in the following section).

(6) Reporting to parliament the annual and budgetary term emission levels along with progress within in each sector and toward the 2030 and 2050 targets.

(a) Budgetary term emission level reports must be finalized no later than one year after the end of each budgetary term. Budgetary terms end in August of the fourth year.

(7) If it is expected that the 2050 target will not be met based on the current trajectory, the independent body must provide advice to parliament in terms of supplementary policies which would realign emissions with the intended reduction target.

## **6.5 Sectors**

According to Statistisk Sentralbyrå, the main emitting sectors in Norway in order of most emissions to least based on 2015 emissions data include: oil and gas extraction, manufacturing industries and mining, road traffic, aviation/navigation/fishing, agriculture, energy supply, heating in other industries and households. This information does not necessarily represent current emissions in Norway and the next report with updated information will be published in December of 2017. These sectors however are suggested to be included in the Norwegian carbon budget (Statistisk Sentralbyrå, 2016).

This analysis supports Norway's continued collaboration with the EU, especially in regard to the Effort Sharing Regulation and the Emissions Trading System. It is important, therefore, to ensure the proposed carbon budget in this analysis and EU climate policies would complement each other. The ESR covers all non-quota regulated sectors which include agriculture, buildings, waste and transport. Each member state is responsible for determining which emission reduction measures to implement. The emission reduction targets within this analysis are aligned with the ESR target of a forty percent reduction in emissions for Norway. Considering the target includes sectors beyond those covered by the ESR, Norway's forty percent target exceeds that of the ESR (European Commission, 2017).

In terms of the Emissions Trading System, it is pertinent to ensure the emission limit enforced by the carbon budget within each sector covered by the quota scheme either matches or exceeds the limit enforced under the ETS. The ETS also has a target that is gradually reduced overtime therefore this would need to be monitored as the carbon budget and ETS progresses. The ETS covers industry and more specifically power stations and industrial plants (European Commission, 2017).

## **6.6 Amendments**

Under the UK Climate Change Act, the Secretary of State may present to the parliament an amendment for the final target if necessary. Prior to this, however, it must be discussed with the Committee on Climate Change and the national authorities. This is only permissible, however, if relevant information has been discovered rendering the original target and baseline obsolete. Other various aspects of the UK CCA may also be amended and follow a similar procedure as mentioned (UK Parliament, 2008).

This analysis suggests the independent body should have power to amend the final target, along with the baseline as is the case in the UK CCA and any other targets as seen fit. The independent body should be responsible for maintaining updated scientific and political information which could have relevance to a carbon budget in Norway and could potentially affect the integrity of the law. Proposed amendments should go to parliament for consideration and approval. Proposed amendments may

be submitted to parliament at any time leading up to 2050 and do not need to coincide with the parliamentary terms/budgetary terms or even annual indicative range. Proposed amendments should be provided to relevant Norwegian ministries for the purpose of informing ministries, not for approval. Proposed amendments should be made public as well.

## **6.7 Ministries Sharing Responsibility**

Aside from the Committee on Climate Change, the UK receives advice from the Department for Business, Energy and Industry Strategy (BEIS) and Department for Environment and Rural Affairs (Defra). This is an important aspect to the UK CCA. Climate policies are often isolated from central governmental departments, however climate change affects business, industry, and the public. and therefore should be a cross departmental responsibility (Committee on Climate Change, n.d.). This analysis proposes Norwegian ministries should have a stake in the carbon budget. Which ministries and the reasons why have been identified below. The ministries have been separated into three tiers in order to identify which ministries would coordinate the most with the independent body (the first tier indicating the most coordination).

	<b>Ministry</b>	<b>Coordination with the independent body</b>
<b>First Tier</b>	Ministry of Climate and Environment	The Ministry of Climate and Environment would work closely with the independent body to fill knowledge gaps, review measures and amendments put forward by the independent body and propose policies and amendments when necessary.
	Ministry of Finance	Parliament has agreed to designate a portion of the Government Pension Fund toward initiatives which would reduce emissions. This is a major step toward becoming a carbon neutral society. This would require monitoring of the funds in terms of whom specifically would receive funding, how it is being utilized, what are the returns on the investment in renewable energy infrastructure and so on. These areas of finance would need to be co-monitored by the Ministry of Finance and the independent body.

<b>Second Tier</b>	Ministry of Petroleum and Energy	As some of the main emitting sectors in Norway, it is important the mentioned ministries are familiar with the provisions of a carbon budget and how this will impact each sector.
	Ministry of Trade and Industry	
	Ministry of Transport and Communications	
	Ministry of Agriculture and Food	The Ministry of Agriculture and Food have two areas of concern in terms of a Norwegian climate law. First, agriculture is a major source of methane and therefore must be informed on how the proposed carbon budget would affect this sector. Second, agriculture will suffer due to the effects of climate change.



<b>Third Tier</b>	Norwegian Ministry of Education and Research	Research on climate change and dissemination of climate change information is pertinent to ensure the continuation of policies and measures which regulate emissions. Research plays a vital role as well in terms of development of technology and other potential solutions which would quicken the transition to a carbon neutral society.
	Ministry of Local Government & Regional Development	Communication between the independent body and local ministries will ensure coordination between a national carbon budget and municipality level implemented measures such as the Oslo Climate Budget.

Illustration 6.3: Ministry coordination with the independent body (created for analysis).

## 6.8 Monitoring / Reporting

Carbon dioxide accounts for the largest amount of emissions in Norway, with a total of 44.7 million tons in 2015. The remaining emissions are in the forms of methane, nitrous oxide, and fluorocarbons (HFC, PFC, and SF<sub>6</sub>). When referring to carbon dioxide equivalent within the analysis, these are the emissions that are included (Statistisk Sentralbyrå, 2016).

This analysis suggests that overall reporting should be dependent upon annual submission of emission levels to the independent body. Who is responsible for reporting emissions will be dependent upon the sector. For example, in the oil and gas extraction sector, installations where extraction occurs will be legally accountable for reporting. However, in transport, it may be more prudent to assign a member of the independent body the responsibility to obtain and manage transport emissions data in conjunction with Statistisk Sentralbyrå. Legal repercussions should be

extended to installations in the form of financial penalties and/or imprisonment in order to streamline the proposed carbon budget with the Pollution Control Act, CO<sub>2</sub> Tax Act and the Greenhouse Gas Emissions Trading Act. Reporting requirements for sectors included in the ETS would be streamlined with preexisting reporting requirements in order to avoid doubling administrative work.

The independent body would then be responsible for compiling the information across sectors to determine overall emission levels and whether the trajectory is still on a path to meet the 2030 and 2050 target. This information should be made public.

## **7 Implementation of Proposed NO Carbon Budget using Marginal Abatement Cost Curves**

Due to the time constraint of the analysis, this section mainly serves the purpose of suggested continued research by providing a basic overview of how the proposed carbon budget could be implemented using Marginal Abatement Cost (MAC) Curves. A MAC Curve is a tool used to display mitigation measures and the associated costs necessary to reduce emissions per ton of CO<sub>2</sub>-equivalent. McKinsey & Company popularized the use of this tool and defines it as “[...] a standard tool used to illustrate the supply side economics of abatement initiatives aimed at reducing emissions of pollutants such as greenhouse gases” (McKinsey & Company, n.d.).

In order to demonstrate what data would be necessary to construct a MAC Curve, road traffic has been selected as an example. Road traffic (veitrafikk) has been chosen since it is one of the top three highest emitting sectors as illustrated in figure 7.1 below. In addition, road traffic is a central focus in terms of emission reductions in Norway at the moment, and has a large amount of readily accessible data. For the purpose of constructing a MAC curve, it would be possible to obtain comprehensive data from Klima Kur 2020, Miljødirektoratet and the National Transport Plan 2018-2029 (and potentially the Oslo Climate Budget however this operates on the municipality level). The reason for using already available data and transferring it to a different format is to enhance accessibility even further, especially for high end policy makers. Despite the usefulness of a document such as the Klima Kur 2020, a 300-

page document is likely to be overlooked by the individuals with the most influence. Therefore, the intention is to provide an easily understandable graph or a snap shot of suggested emission reduction measures and associated costs.

### Utslipp av CO2 fordelt på kilde i 2015

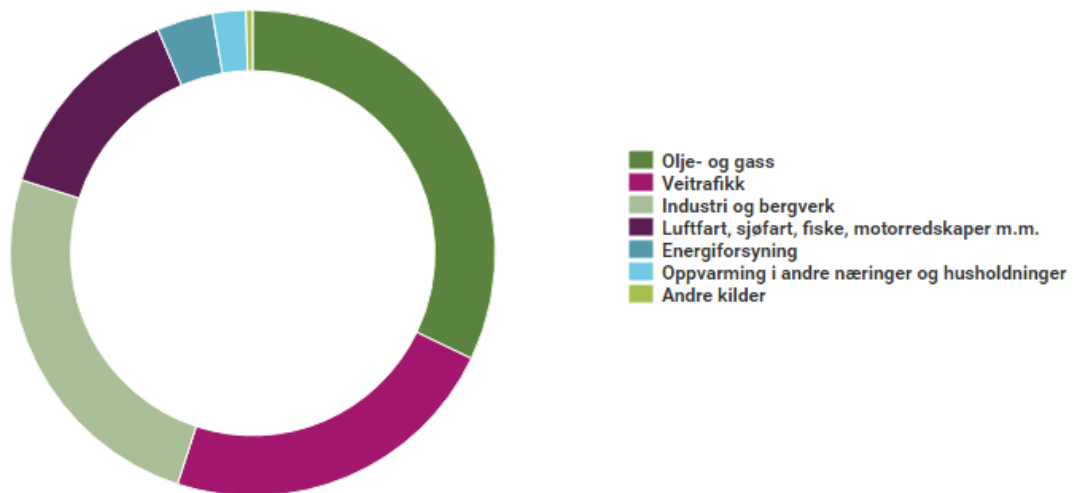


Illustration 7.1: Utslipp av CO2 fordelt på kilde I 2015.  
Source: Miljø-direktoratet, 2017.

### 7.1 How to read a MAC curve

The figure below, provided by ClimateWorks Australia, provides a simple illustration for understanding a MAC Curve. Each box represents an action or measure which would reduce emissions. The amount of emissions which could be reduced through each measure is represented along the x-axis, meaning the wider the box, the higher the reduction. The y-axis represents the costs associated with each measure. The left side of the graph begins with the measures which could provide the highest cost savings. The measures on the right hand side represent the measures which require the highest investment costs. As mentioned in the graph below, MAC Curves not only consider tons of CO<sub>2</sub> but tons of CO<sub>2</sub> equivalent (tCO<sub>2</sub>e) as well.

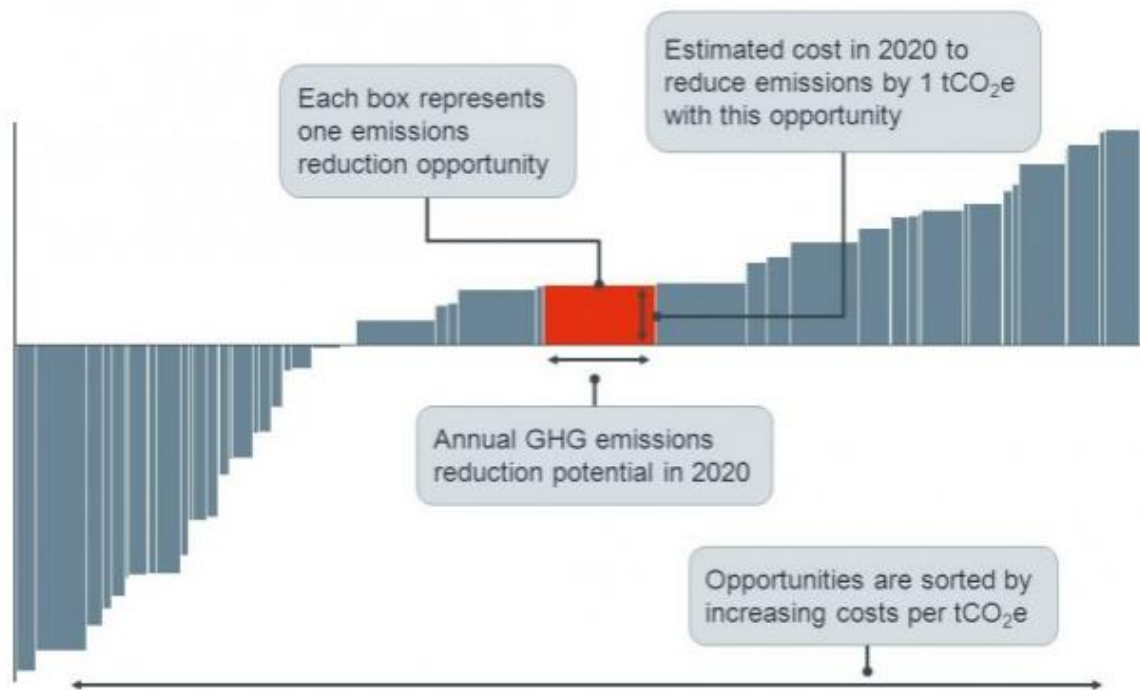


Illustration 7.2: How to read a Marginal Abatement Cost Curve.  
 Source: ClimateWorks Australia, 2013.

Depending on the sector and the range of technological options available on the market, sectors are often provided with choices. In an ideal situation, all emissions reduction measures provided in a MAC curve should be taken and in a perfect situation, all measures should be taken immediately, however this is unrealistic. Therefore, it is safe to assume that only a handful of measures will be chosen at least initially. Allowing sectors to choose which measures to implement promotes inclusivity among sectors and government as opposed to a strictly top down approach.

Often, large industries have a major influence over climate policy. However, it is possible to “sell” MAC curves in a way that makes them desirable to large industries in terms of competition. MAC curves have the potential to provide industries with cost savings which can be invested elsewhere. The cost savings can be used as an investment in further emissions reductions once reductions begin to require infrastructure. An example of shifting funds in transport would be to charge owners of diesel powered vehicles for parking at work and redirect the funds toward subsidizing the fare for public transportation. Industries which comply with a carbon budget are

able to use these actions as a reputation enhancer, claiming to support a green transition.

## 7.2 Baseline

A baseline is a trajectory of emissions created by using business-as-usual emission figures. “Starting from an estimate of baseline emissions, the costs and potential for additional abatement measures are calculated in order to construct a menu of options for abatement” (McKinsey & Company, n.d.). This cannot be exact, however, since there are typically unforeseen factors that may alter business-as-usual emissions in the future such as a fluctuating economy.

## 7.3 Road Traffic Data

Transport emissions have increased 25% since 1990 (to 2015) and half of the overall transport emissions are due to road traffic. Road traffic continues to gradually increase each year with an altogether increase of thirty three percent since 1990. Ownership and use of personal vehicles has increased drastically with an increase from 44 to 81 percent since 1960 (until 2013) (Miljødirektoratet, 2017).

### Utslipp av klimagasser fra veitrafikk

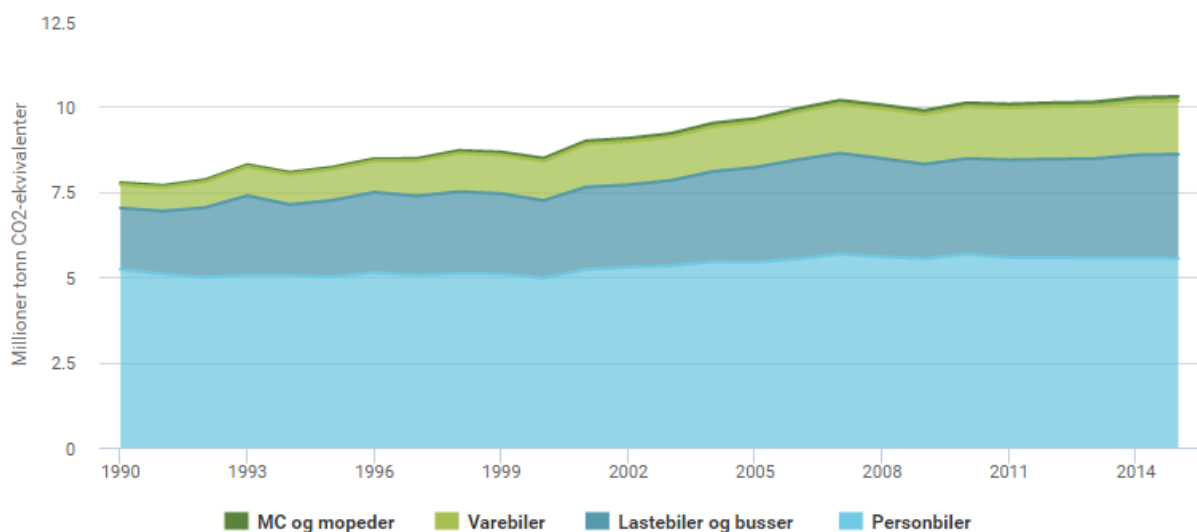


Illustration 7.3: Greenhouse gas emissions from road traffic”

Source: Miljødirektoratet, 2017.

However, Norway is taking this increase in emissions seriously and has implemented various measures to reduce the impact of road traffic. For example, ride sharing is a popular option and one of the most widely used resources is “CarpoolNorway” with 438,959 registered users as of February of 2017. The site does not merely focus on ridesharing as another option for transportation. In addition, it highlights the amount of cars that would otherwise be on the road, amount of tons of CO<sub>2</sub> which have been saved from the climate due to this resource, amount of fuel saved, and distance traveled by individual passengers saved (CarPoolWorld, n.d.).

In the 2011-2012 White Paper on Climate Policy, the Norwegian government among other claims, pledged higher priority and funding to public transport and strengthened infrastructure for cycling and walking (Norwegian Climate Policy, 2012). In addition, Norway is the first country to implement a fleet of electric vehicles on such a large scale. This will allow for further development of electric vehicles and additional subsidies in order to reduce costs for personal electric vehicle purchases. There are already 35,000 personally owned electric vehicles in Norway as of 2015 (Miljødirektoratet, 2015). Individuals who choose to purchase an electric vehicle are rewarded with incentives such as “[...] exemption from 25% VAT on purchase, no charged on toll roads or ferries, low annual road tax, free municipal parking and access to bus lanes” (Climate Action Tracker, 2016). In addition, the climate minister Vidar Helgesen proposed the discontinuation of the sale of fossil-fuel based vehicles beginning in 2025 (Darby, 2016).

While this is a progressive step for road traffic, additional measures need to be implemented now instead of waiting for the lag which will inevitably accompany a complete transition to electric vehicles. This is because the life span of a gasoline-powered vehicle is typically fourteen years and the life span of a diesel-powered vehicle is around seven years, therefore individuals who recently purchased a gasoline or diesel-powered vehicle will not consider an electric vehicle for some time if at all (Statistisk Sentralbyrå, 2015).

To construct a Marginal Abatement Cost Curve, first various measures must be chosen. Many of the measures suggested in the previously listed resources either directly or inadvertently support public transportation, cycling or walking. The measures vary in cost, infrastructure necessary, and whether it will have more of a

short term or long term effect on emissions. Once measures are chosen, the cost should be determined. This includes the capital cost, implementation cost and the cost to operate and maintain the suggested measure. Determining the cost of a measure over a specific lifespan is a complex task due to inflation rates, subsidies and taxes therefore accuracy cannot be guaranteed. However providing an estimate is necessary and may encourage investment.

Measures suggested include increasing the fuel price, increased parking restrictions, reduced public transport fares, expanding bike share programs, blending ethanol with gasoline and introducing or increasing county tolls to finance improved public transport. While data collection is possible due to the up to date and accurate information that is readily available for Norway, this is not always the case. Data collection is the most labor intensive aspect of a MAC curve and often there is no way to obtain it if emissions data has not been recorded over the years or if industries have prevented access to information. Like the cost, emission reduction potential accuracy cannot be guaranteed either. However, providing information via MAC curves allows for information accessibility for policy makers, the private industry and the general public. A MAC curve would be a policy tool embedded within the overarching policy tool of the carbon budget. The dynamic of a carbon budget and MAC curves operating together would allow for a top down approach, capable of long term enforcement while simultaneously employing specific, concrete measures to reduce emissions.

## 8 Conclusion

At the beginning of the analysis, the main research question was presented: To what degree and in what ways can a national carbon budget be a political instrument that can contribute to achieving emissions reduction? The goal of the research is to provide information which will help assess whether an adapted version of the UK's carbon budget could be an effective political tool to reduce emissions also in Norway. In addition to the main research question, the analysis sought to answer the following: How has the Norwegian government handled the issue of domestic greenhouse gas emissions up until now, and could a carbon budget be more effective?

In order to address the research questions and understand the Norwegian climate policy context in depth, the research employed two theoretical approaches; the first approach included two components known as the time inconsistency problem and the domestic politics problem. The time inconsistency problem in general terms refers to costs over time in relation to climate policy. The domestic politics problem refers to the dynamics of domestic politics which influence climate policy formation. The second theoretical approach utilized a set of criteria drawn from the UK carbon budget. In order to address both the supporting and main research questions, four Norwegian climate policy examples were chosen, presented in detail and analyzed against the theory.

Three of the examples are existing Norwegian climate related acts which have been in existence for a minimum of ten years each. It was important to choose examples that were not recently implemented in order to understand the full effects of the acts on Norwegian domestic emissions. Despite high official ambition to reduce domestic emissions in Norway, provisions within the existing acts do not reflect that same level of ambition. This is evident because while the acts may have reduced emissions which would have transpired in a business as usual scenario, present emissions have not only leveled off but have become vulnerable to the time inconsistency and domestic politics problem to the point of an emissions increase. This dynamic has provided an opportunity to understand why the acts are not effectively reducing emissions, or at least preventing an increase.



The fourth example chosen was the Norwegian climate law proposal. Analyzing the proposal has provided valuable insight in terms of how Norwegian climate policy is progressing. The proposal suggests implementation of three UK carbon budget criteria as opposed to only one or two which was the trend with the existing Norwegian climate acts. This is mainly due to the fact that the proposal was modeled based on the structure of the UK carbon budget. Despite the effort to mirror the UK's Climate Change Act, the Norwegian proposal is still missing a central component to ensure a climate law which can withstand an extended period of time with frequent updates to emission reduction targets. Therefore, the climate law proposal remains vulnerable to the domestic politics problem. Failing to establish an independent body of experts for the purpose of the climate law leaves the law vulnerable to information becoming outdated over time. If a government department instead of an independent body is assigned the responsibility of the climate law, they will have other high priority tasks as well. This may result in tasks associated with the climate law being removed as a top priority. Failing to establish an independent body also makes the law vulnerable to competing interests within the various government departments (including the department assigned the responsibility of the law) and interests within the private and business sectors.

There is a weakness within the theoretical approach however. Criteria are limited to one approach specific to the UK. There are aspects within other climate policy approaches which may have a comparable level of success to the criteria from the UK carbon budget. However, it is difficult to analyze measures which do not fall within the guidelines of the four criteria. This is the case with the Pollution Control Act addressing the time inconsistency problem despite not enforcing a measure similar to budgetary terms in order to address time accountability. This further substantiates the need to continue support for existing Norwegian climate policies and EU regulation commitments in order to have a varied approach with different strengths.

The purpose of the research is to not only propose a Norwegian carbon budget to contribute to the current conversation on the proposed Norwegian climate law but to do so based on existing climate acts. By understanding the Norwegian acts, there is an opportunity to avoid implementing similar provisions subject to the same vulnerabilities so that high levels of emissions reduction may be achieved. The main empirical findings show that there is high confidence for a carbon budget, modeled

on the UK carbon budget, effectively functioning in the Norwegian context and successfully reducing emissions to a higher degree than is currently being achieved through existing Norwegian climate policies. The main reason for drawing this conclusion is that while the criteria have been implemented through Norwegian acts previously and in various combinations, Norwegian climate policy is still lacking an instance which comprises all four criteria. The intent of implementing a carbon budget would not be to replace existing measures. Rather it would be a political tool meant to complement existing measures including the aforementioned acts and EU regulation commitments, in order to achieve the highest possible levels of greenhouse gas emissions reduction. It is likely the time inconsistency problem and domestic politics problem will continue to hinder successful climate policy implementation however the findings within the analysis hint toward possibilities to reduce these problems. The degree to which politicians are willing to adopt such measures is another question.

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