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On A Sustainable Development Path?

A comparative case study of Norway and Sweden's
national sustainable development strategies and indicators

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FOREWORD

Sustainable development may seem like an intangible concept, but if we fail to plan for it, our future generations could be left with severe consequences. Planning is something many people see as a dull and tedious process meant for politicians. Plans often end up in thick volumes that don't reach or are not read by the public and might be sitting on bureaucratic bookshelves gathering dust. Besides, people are resistant to a transition that could possibly alter their way of living.

The starting point for this master's thesis is my curiosity of the topic of sustainable development. I wanted to explore the nature of national sustainable development strategies and how they have been translated to goals and indicators for sustainable development. It further sparked my curiosity when I learnt that Norway is only taking two-thirds of the greenhouse gas emission reductions nationally. Therefore, I chose to study such plans for Norway and Sweden and how these two countries are faring in relation to greenhouse gas emission reductions.

Sustainable development is not just an intangible concept, but also an area with a myriad of discourses and documents. It is easy to lose oneself into these countless articles and debates. Through this thesis I will explore the national strategies of Norway and Sweden, their discourses, goals and indicators. To translate an intangible concept and measure sustainable development is part of the political and democratic process. In a democracy, the best way to ensure participation is to show engagement. My engagement will be to examine what these governments and politicians are actually doing to stay on a sustainable development path.

During the work with this thesis, I have received valuable insights and suggestions from my advisor Oluf Langhelle at the University of Stavanger. I want to thank him for his engagement and support. I also want to thank the informants from the Finance Department of Norway, Statistics Norway, the Riksdag in Sweden and the Environmental Protection Agency of Sweden. Finally, I would like to thank my family, fellow students and friends for the understanding and support during the time of writing this thesis.

ABSTRACT

This thesis explores the phenomenon of national sustainable development strategies by comparing such strategies for Norway and Sweden. Based on the operationalization of their strategies into goals and indicators, it is possible to reflect upon whether Norway and Sweden are on a sustainable development path. The background for the thesis is the threat of climate change on the planet and its boundaries that may cause irreversible damages to future generations. The starting point is the concept of sustainable development by the World Commission on Environment and Development (WCED) in 1987 (p. 8). The Rio-Initiative in 1992 addressed the climate threat among other sustainable development issues in Agenda 21 by asking nations to develop national sustainable development strategies (UNCED, 1992). Such strategies and processes were studied by Dalal-Clayton (1996) in *Getting to Grips with Green Plans*. His framework of key lessons and guiding principles is the foundation for this thesis. The first Norwegian and Swedish plans are part of his study. His findings produced a basis, which are useful for the exploration of the most recent strategies.

Three research questions are defined, and the thesis is divided into corresponding parts. The research questions are seen in the light of two broad paradigms, weak sustainability and strong sustainability (Neumayer, 2013). The research strategy for the thesis is exploratory and abductive with a qualitative approach using mostly secondary data on the two strategies and statistics on the indicators studied. The methods used are discourse and document analysis. The primary data from a few key informants provide background information and verify some of the findings. The first part finds that the Norwegian and Swedish strategies primarily have a weak understanding of sustainability.

The second part explores the operationalization of strategies into goals and indicators for the two main themes of the thesis, namely climate change and intergenerational justice. The framework of Organization for Economic Co-operation and Development (OECD) and the Stiglitz commission form the basis for the discussion of indicator approaches chosen by Norway and Sweden. Norway has chosen a capital approach with sub-themes to account for the economic, social and environmental dimensions of sustainable development. The main indicator for intergenerational justice in the Norwegian strategy is national wealth and non-declining welfare

over time (St.prp. nr. 1 (2007-2008), 2007). On the other hand, the Swedish strategy has chosen an overall environmental goal for sustainable development where 16 environmental quality objectives represent intergenerational justice (Comm. 2005/06:126, 2005). The statistical data on the indicators show that Norway and Sweden will probably not meet their targets for climate mitigation by 2020. It may be questioned whether they are taking their burden of climate mitigation and are sustainable in the long run.

The third part of the thesis discusses the data for climate change and intergenerational justice using two paradigms, weak and strong, as an analytical tool. It is demonstrated that it matters whether one uses weak sustainability or strong sustainability to determine how Norway and Sweden are contributing to global and national sustainability. The implications of applying weak sustainability may hinder Norway and Sweden in being on a sustainable development path towards 2020 and 2050. If applying the strong sustainability paradigm, neither Norway nor Sweden appears to be on a sustainable development path. Granted that there are uncertainties about the future, the likelihood of becoming carbon natural by 2050 may also be jeopardized.

CHAPTER 1: INTRODUCTION

1.1 Background and choice of topic

"Sustainable development is the pathway to the future we want for all. It offers a framework to generate economic growth, achieve social justice, exercise environmental stewardship and strengthen governance."

> Ban Ki-moon, UN Secretary-General remarks at a G20 working dinner on "Sustainable Development for All", St. Petersburg, Russian Federation (United Nations, 2013).

The remarks made by Ban Ki-moon refer to a sustainable development path, and the question becomes what the desired development path should be. This thesis will explore and compare whether Norway and Sweden can be said to be on a sustainable development path by studying their current national sustainable development strategies and the way they are operationalized through sustainable development indicators. The scope of this research project will be limited to two dominating themes of sustainable development; namely climate change and intergenerational justice.

Many scientists argue that we are already overshoot where human activity is beyond the carrying capacity of the Earth's eco-systems (Goodland & Daly, 1996; Wackernagel & Rees, 1996). Other scientists warn that we are in danger of reaching planetary boundaries and tipping points and need to define a safe operating space for humanity (T. Nordhaus, Shellenberger, & Blomqvist, 2012; Rockström et al., 2009). One of these agreed upon planetary boundaries is climate change, and the political limit of global warming has been set to 2°C by the global community.

The present United Nations Assembly President Sam Kutesa has said that the new sustainability agenda "must harmonize humanity's relationship with the planet" (United Nations, 2015a). The development path the world has taken has imposed a heavy cost on our planet. He further underscored that "it is now widely accepted that our way of life, especially the production and consumption patterns, is no longer sustainable".

Accordingly, reconciling the needs of the planet's people with the goal of sustainable development is a vital global issue facing the world's nations today and in the future. The Stockholm Conference in 1972 under the direction of United Nations (UN) is considered the first global attempt at addressing what was later to become sustainable development (Mebratu, 1998; United Nations, 1972). The conference resulted in the UN initiative named the United Nations Environment Programme (UNEP). The next major milestone occurred when the then Secretary-General of the UN proposed establishing an independent committee in 1983. The committee was named the World Commission on Environment and Development (WCED), and their task was to formulate "A Global Agenda for Change".

1.2 World Commission on Environment and Development (WCED) and Rio 1992

The WCED were to propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond. The message of the WCED was clear stating that: "the world must quickly design strategies that will allow nations to move from their present, often destructive processes of growth and development onto sustainable development paths" (WCED, 1987, p. 49). The report of WCED in 1987, *Our Common Future*, called for an active follow-up by suggesting institutional and legal changes. The commission suggested that the report should be transformed into the UN Programme of Action on Sustainable Development. This UN program was followed by Agenda 21 at the 1992 UN Conference of Environment and Development, called the Rio-Initiative and demanded national strategies for sustainable development. During the 1990's, many countries developed national sustainable development strategies (NSDSs) in response to the Rio agreement (Dalal-Clayton, 1996). Since the 1990's these countries' national sustainable development strategies have been expanded and revised.

1.3 Sustainable development as a guiding principle

Since the Rio-Initiative the concept of sustainable development has been institutionalized in the national strategies of many countries. Global sustainable development is dependent on the commitment and cooperation of nations towards common goals. Lafferty (1996) refers to

sustainable development as a guiding principle to steer global development. Moreover, he talks about how global concerns must be translated into regional, national and local settings. He is honored as one of the first scholars to insist on examining exactly what national and local governments are actually doing when it comes to sustainable development (Meadowcroft, Langhelle, & Ruud, 2012). Naturally, this examination is a true challenge in that the concept of sustainable development is disputed, and relationship between strategies and actual policies are hard to track.

1.4 Translation and discourse

The translational problems arise when sustainable development is conceptualized into policies and measures. Langhelle and Ruud (2012, p. 172) reiterate that there is no common definition and "there is no agreement on how to measure global sustainable development". Some of the problems are related to what the focuses and priorities of sustainable development should be. Other problems are related to how sustainable development should be measured. These problems demonstrate that sustainable development is a value-driven concept as "indicators arise from values (we measure what we care about), and they create values (we care about what we measure)", (Meadows, 1998, p. 2). The various priorities and values have established competing discourses of sustainable development (Dryzek, 2005). The different discourses consisting of narratives or storylines make up the basis for policy-making and measures of sustainable development. Thus, the preferred discursive understanding of sustainable development will have implications on how a national sustainable development strategy is constructed and what is being measured.

1.5 Research problem and research questions

As stated in the first paragraph, the intention of this research project is to explore the content and practices of national sustainable development strategies of Norway and Sweden. Dalal-Clayton (1996) conducted a study of 12 countries including Norway and Sweden and 20 national sustainable development strategies (NSDSs) in total. In his book *Getting to Grips with Green Plans* he described the content of these plans and how they were delivered. In his study, some

key lessons and guiding principles were developed. He evaluated the 12 countries and their NSDSs according to these guiding principles. No follow-up study has been conducted for the 12 countries in order to observe the lasting effects and outcomes of designing strategies for sustainable development. The majority of the research after Dalal-Clayton´s study has focused on the operationalization of these strategies through sustainable development indicators. As well as categorizing the first national sustainable development strategies, Dalal-Clayton also questioned whether or not national sustainable development strategies would have a lasting influence on the development and implementation of policy. The central part of this master's thesis will be to answer Dalal-Clayton's question posed more than 20 years ago as well as exploring if there has been improvements to these strategies.

The recent Norwegian and Swedish strategies cover several themes. However, the focus of this study of the strategies will concentrate on climate change and intergenerational justice. As stated in section 1.1, climate change is defined as one of the planetary boundaries (T. Nordhaus et al., 2012; Rockström et al., 2009) and may be characterized as an "ultimate limit" as referred to in *Our Common Future*. Global climate change threatens the common fate of humankind in the present and in the future (Baker, 2012). Thus, climate has a unique position when it comes to global sustainable development. Accordingly, there are immense volumes of literature about sustainable development dealing with climate change and how it affects us on a global, national and local scale in the present and in the future. Global climate change and concerns for future generations seem to be part of the major sustainable development discourses as well as national sustainable development strategies.

As stated in the first paragraph of the introduction, this thesis will explore whether Norway and Sweden are on a sustainable development path. By studying Norway and Sweden's current national sustainable development strategies and sustainable development indicators it may be possible to make some reasonable inferences.

The research questions are:

1. How is the concept of sustainable development understood in the national sustainable development strategies of Norway and Sweden?

2. How is sustainable development operationalized through sustainable development indicators (SDIs) in Norway and Sweden?

3. What do national sustainable development indicators measure in terms of global climate change and intergenerational justice? Do these indicators show if Norway and Sweden are on a sustainable development path?

1.6 Norway and Sweden as a comparative case study

As stated in the research questions above, this project will explore the phenomena of national sustainable development strategies and sustainable development indicators in Norway and Sweden. These two cases are comparable since they have similar political systems. Both countries responded early to the Rio-initiative and developed national strategies for sustainable development. The study *Getting to Grips with Green Plans* by Dalal-Clayton (1996) included both Norway and Sweden. Moreover, they are considered important actors in the global discourse on sustainable development. Both countries are also ranked among the highest in the survey of Human Sustainable Development (United Nations, 2014b). One difference between the two countries is that Sweden is a full member of the European Union while Norway is associated with the Union through the European Economic Area (EEA). Another apparent difference is that Norway is an oil- and gas producer whereas Sweden is not.

More specifically, Norway and Sweden´s national sustainable development strategies and sustainable developments indicators will be discussed in light of UN´s Sustainable Development Goals (SDG). The main focus of the case study will be on the new SDG goal number 13 dealing with climate change (United Nations, 2015b). Before the UN Post-2015 agenda, it has been millennium development goal (MDG) number 7 that has captured environmental sustainability including climate change.

As a starting point the definition of sustainable development of the WCED from 1987 will be used: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987, p. 8). Then, in chapter 2 the concept of sustainable development will be further defined and discussed.

1.7 Outline of the thesis

In the following, the two most recent national strategies of Norway and Sweden will be described and compared by answering the three research questions above. First, the discourse of the strategies will be presented. Second, the content of the strategies will be summarized with an emphasis on climate and intergenerational justice. Third, the sustainable development indicators sets will highlight the framework and approach chosen and elaborate on the indicators for climate and the generational goals. Finally, the aim will be to discuss whether Norway and Sweden are on a sustainable development path. My contribution will be to examine some of the available data in order to make interpretations and reflections on what Norway and Sweden is actually doing in the name of sustainable development. To answer the research questions above and be able to make reasonable inferences, I will use an explorative, abductive research strategy. Below is an illustration of the research process:

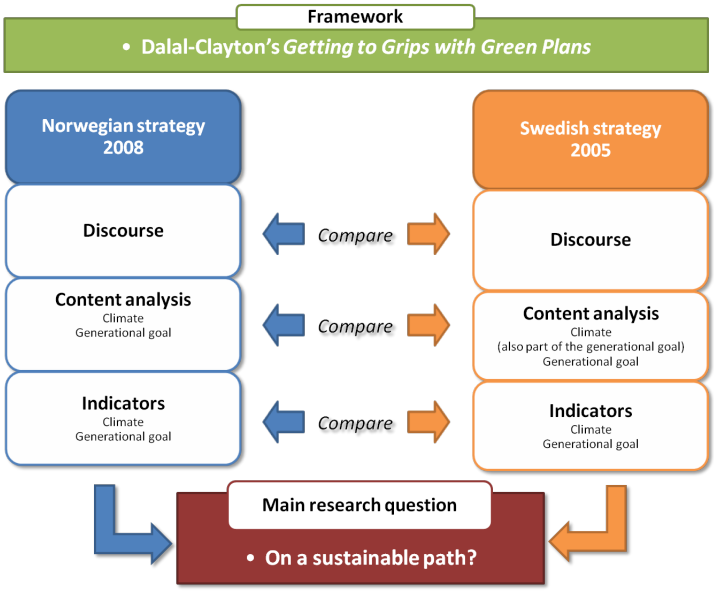

Figure 1.1. Outline of the thesis and research process. Source: Hilde Optjernsberget

1.8 The research process

The framework: Getting to Grips with Green Plans

The foundation of the thesis will be the framework of Dalal-Clayton in *Getting to Grips with Green Plans (1996)*. His findings of the Norwegian and Swedish national sustainable development strategies (NSDS) will be described and compared (Chapter 4). Some key lessons and guiding principles will be identified for the analysis of the most recent national sustainable development strategies, Norway of 2008 and Sweden of 2005.

First research question

The discourse analysis will reveal the understanding of sustainable development in Norway and Sweden (Chapter 5). Thereafter, the content analysis will give a brief summary as well as the goals for climate change and intergenerational justice of each strategy (Chapter 6). Before the second research question can be examined, the discourse and theory on indicators will be presented (Chapter 7). The point of departure for indicators will be United Nations' work on indicators and the sustainable development goals. Due to the enormous material available on indicators, the scope of this thesis will concentrate on the work done by the Organization for Economic Co-operation and Development (OECD) and the Stiglitz commission. This will entail discussions of the capital, the dashboard and the theme-based approaches.

Second research question

Based on discourses and indicators found from the first research question, an analysis of the operationalization of the goals of the Norwegian and Swedish strategies will follow (Chapter 8). The emphasis of the analysis and discussion will be on the indicators for climate change and the generational goal.

Third research question

The indicators for climate change and intergenerational justice and how these indicators are measured will be the basis for the discussion. The two broad paradigms of weak sustainability and strong sustainability will be used in the ensuing argument of whether Norway and Sweden are on a sustainable development path.

CHAPTER 2: DEFINING THE CONCEPT

2.1 The origins of sustainable development

Before delving into the topic of sustainable development in relation to national sustainable development strategies and sustainable development indicators, the origins and the usages of the term sustainable development need to be presented. The World Commission of Environment and Development (WCED) introduced the concept of sustainable development in 1987. Before 1987 it had been used in the 1980 World Conservation Strategy. However, a working group within the World Council of Churches brought up similar issues related to sustainable development in 1976 (Langhelle, 2000, p. 298). In their language, they referred to the twin issues of justice and ecology upon which the world's future should be built. The working group of the World Council of Churches stated "humanity now has the responsibility to make a deliberate transition to a just and sustainable world" (Langhelle, 2000, p. 298). The issue of justice is related to the concept of sustainable development through social justice for present and future generations.

2.2 Interpretations and the WCED's definition

Ever since WCED's report, the concept of sustainable development has been widely contested and debated (Jacobs, 1999). Many have searched for a common definition and understanding with better terms, concepts, analytical methods and policy-making principles (Lélé, 1991). According to Jacobs, this search for a common and precise meaning rests on a misunderstanding of the nature and purpose of political concepts. Political concepts are called contestable precisely because they are complex and normative. Since sustainable development is considered a political concept, the debates about the inherent complexities of the concept will continue to arise around its interpretations.

Dixon and Fallon (1989) defines three usages for the term sustainability; firstly, as a purely physical concept for a single resource, secondly, as a physical concept for a group of resources and eco-systems and thirdly, as a socio-economic-physical concept. The third and last usage of

sustainability as a socio-economic-physical concept was the meaning developed in *Our Common Future* (Langhelle, 1999).

In the WCED report, sustainable development is defined as "development that meets the needs of the present without the compromising the ability of future generations to meet their own needs". The two key concepts of this definition are:

- The concept of "needs", in particular the essential needs of the world's poor to which overriding priority should be given; and
- The idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs (WCED, 1987, p. 43).

These two key concepts are often left out when the citation is used (Langhelle, 1999). It is easy to accept the definition without realizing the implications of these key concepts. Discussions will result in conflicts around different interests, goals and priorities. Further, the WCED report states that the goals of economic and social development must be defined in terms of "sustainability in all countries" (WCED, 1987, p. 43). This implies that sustainable development is a global effort that must be shared between all nations. The commission recognized that interpretations of sustainable development would vary, but the goal would be to follow a sustainable path balancing economy and society with physical sustainability.

Also, the report defines the major objective of development as "the satisfaction of human needs and aspirations" (WCED, 1987, p. 43). However, there is a constraint on this goal of development of "need satisfaction" where each generation is permitted to pursue its interests only in ways that do not undermine the ability of future generations to meet their own needs. Malnes (1990 cited in Langhelle 2000: p. 299) has called this the *proviso of sustainability* since the constraint imposed by sustainability is a necessary condition for future "need satisfaction", and thus defining the interdependence of development and sustainability. The constraint imposed by sustainability in *Our Common Future* is a minimum standard: "sustainable development must not endanger the natural systems that support life on Earth: the atmosphere, the waters, the soils and

the living beings" (WCED, p. 45). This statement implies that there are limits referred to as "ultimate limits" in the WCED report.

2.3 Three pillars of sustainable development

Sustainable development can also be defined and understood as consisting of three dimensions or pillars. The three dimensions or pillars of sustainable development are the economic, the social and the ecological as shown in Figure 2.1 below.

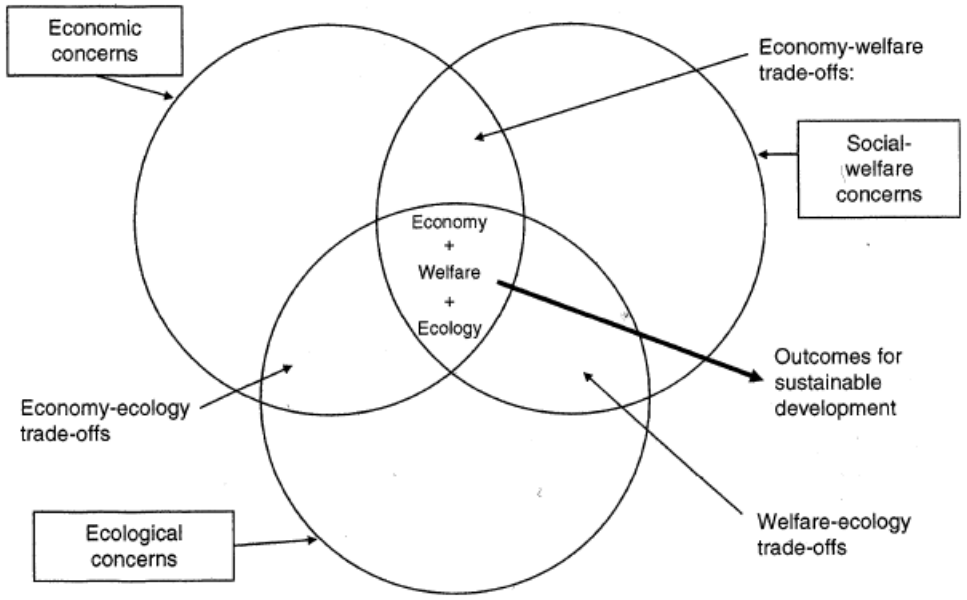

Figure 2.1. The three dimensions or pillars of sustainable development. Source: Barbier, 1987.

As demonstrated by the analytical tool of the three dimensions above, the relationships between the three dimensions are interdependent and interconnected. Each dimension represents different concerns of sustainable development that may be balanced and weighed against the other two dimensions named as trade-off in Figure 2.1. For instance, economic concerns must be balanced with both ecological concerns and social-welfare concerns. Ecological concerns have to be weighed against social welfare. The intersection between the three circles will indicate a "perfect" balance between the trade-offs of the three dimensions. In reality, trade-offs between

these three dimensions is the background for the continuous discussions around the meaning and implications of sustainable development. In sustainable development, the key task becomes to balance and resolve the trade-offs between these three dimensions (Edward B Barbier, 1987; Langhelle & Ruud, 2012). This analytical tool is often used to build national strategies and develop indicators and these three dimensions encapsulate priorities of strategies and indicators.

2.4 Weak versus strong sustainability

The way sustainable development is framed in terms of weak sustainability or strong sustainability has implications for how strategies are constructed and sustainable development translated. Sustainability can also be understood within two paradigms: weak sustainability and strong sustainability. The two paradigms suggest different rules and priorities along the three dimensions in Figure 2.1 and are essentially based on an economic approach to sustainability. Dietz and Neumayer (2007, p. 618) argues that "economic approaches to sustainability frame the issue in terms of human well-being (utility)". This has led to the capital approach and the simple intergenerational rule that development is sustainable "if it does not decrease the capacity to provide non-declining welfare for infinity" (Neumayer, 2013). The weak sustainability paradigm originated in the 1970's through the Hartwick-Solow models as part of neoclassical theory of economic growth to account for non-renewable natural resources as a factor in production (Dietz & Neumayer, 2007).

Since then weak sustainability and strong sustainability have been adopted by economists in the continuing disputes over the implications for sustainable development. The central and simplified arguments in these disputes are over the rule and possibilities for substitution between different types of capital. In the weak sustainability paradigm, natural capital can be substituted with human capital or other capital (Beckerman, 1994). On the other hand, in the strong sustainability paradigm, natural capital and human capitals are considered complements (Daly, 1995). Barbier (2014) argues that economic indicators have to account for depreciation of natural capital. Furthermore, natural capital is undervalued as well as difficult to measure.

In his book *Weak versus Strong Sustainability*, Neumayer (2013) explores the limits of the two opposing paradigms, weak sustainability and strong sustainability. In his analysis, he concentrates on the anthropocentric view of sustainable development by ruling out deep ecology. A fundamental difference related to the substitutability of natural capital is pointed out in his analysis. Weak sustainability calls for "maintaining natural capital in value terms" whereas strong sustainability calls for "preserving the physical stock of natural capital" (Neumayer, 2013, p. 191). Certain forms of natural capital are non-substitutable because they serve basic life-support functions such as the global climate and our eco-systems. Neumayer uses climate change as a case study to illustrate the difference between the two paradigms. According to Neumayer, the conflict in climate change rests on the issue of substitutability. When it comes to green house gas emissions, he claims that the issue of substitutability rather than the discount rate is the central point of argument. As long as substitutability of natural capital is assumed, strict greenhouse gas reductions are not justified and natural capital is not seen as an ultimate limit.

2.5 Climate – an ultimate limit

The minimum requirement for sustainable development set by *Our Common Future* of not endangering the natural systems that supports life on Earth, mentioned the atmosphere as one of these natural systems. Climate concerns would also be part of the ecological dimension of the three-pillar model in Figure 2.1. Climate change is considered one of the global megatrends by United Nations, governments and society at large (Blowfield & Murray, 2011; United Nations, 2009). Megatrends are characterized as global changes since they overarch and impact on everything else (Rasmussen, 2012). Such powerful trends have the potential to transform society on all levels and change our ways of living. The term "wicked problem" may also be applied to climate change since there are no definite answers and solutions (Rittel & Webber, 1973). In recent years, the debate of limits has revolved around global limits as planetary boundaries. Rockström et al. (2009) define nine such boundaries: 1) climate change; 2) ocean acidification; 3) stratospheric ozone; 4) nitrogen cycle; 5) global freshwater use; 6) land system change; 7) biological diversity; 8) chemical pollution; and 9) aerosol loading. Many of these boundaries are however contested. Nordhaus et al. operate with three possible global boundaries: climate change, ocean acidification and stratospheric ozone depletion (T. Nordhaus et al., 2012).

Meteorologists first alerted the global community to potential man-made changes in the climate (Blowfield & Murray, 2011). In 1987, United Nations published an environmental report and a framework to operationalize the WCED findings. This led to the UN Framework Convention on Climate Change (UNFCCC), which was adopted in 1992 and ratified by 189 states since then. The original document contained a precautionary statement "in the absence of scientific certainty" to address skepticism. In fact, skepticism is still alive today among climate researchers, politicians and citizens. At the same time, the original statement opens up for continued research, more knowledge and understanding of climate change.

IPCC - 2°C target

The Intergovernmental Panel on Climate Change (IPCC), (established by the World Meteorological Organization (WMO) and United Nations Environment Programme (UNEP) in 1988), is the leading international body for the assessment of climate change (IPPC, 2015). So far, the IPCC has delivered five reports on climate change. The consistent conclusion of these reports, particularly prevalent in the fourth and fifth report, is that "human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history" (IPCC, 2014). Climate changes have already impacted on human and natural systems, and the effects are likely to cause severe and irreversible impacts for people and ecosystems in the future. The key driver of climate change is the continued emissions of greenhouse gases, mainly CO2 from the burning of fossil fuels, into the atmosphere. The warming trend has resulted in an increase of about 0.85°C or 1°C over the period from 1880 to 2012, and the majority of the increase has happened in the last 30-50 years. The cumulative emissions of CO2 will affect the global mean temperature by the late 21st century and beyond. Climatic concerns and the IPCC reports have resulted in the aspirational and political goal of limiting global warming to 2°C. Figure 2.2 on the next page shows hundreds of different scenarios and some possible desired pathways.

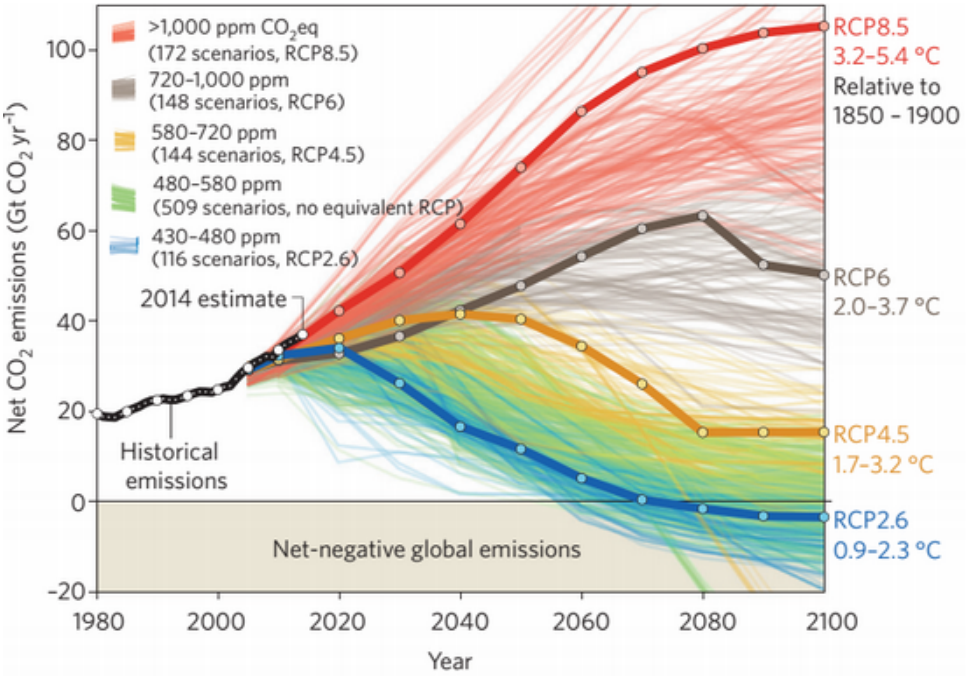

Figure 2.2. Carbon dioxide emission pathways until 2100. Source IPCC.

The blue line is the desired pathway of 2°C whereas the red line is the baseline and most likely pathways without climate adaption and mitigation. The color scheme to the left represents the concentration of CO2 in parts per million (ppm) in the atmosphere at a given temperature scenario. To stay within the blue line scenario of 2°C, the maximum concentration of CO2 in the atmosphere should stay between 480-580 ppm. The global indicator of monitoring greenhouse gas emissions is CO2 or CO2 equivalents. In accordance with the UN Framework Convention on Climate Change (UNFCCC), concentrations of greenhouse gases in the atmosphere must be stabilized at a level that will prevent dangerous anthropogenic interference with the climate system. This implies that global greenhouse gas emissions must be halved by 2050 and must be close to zero by the end of the century.

Millennium Development Goals and Sustainable Development Goals

The United Nations (UN) established the Millennium Development Goals (MDGs) in 2000 to deal with issues related to sustainable development. One of the eight MDGs is goal number 7 related to the environment: "to ensure environmental stability" where CO2 emissions total and CO2 emissions per capita were two of the indicators (United Nations, 2000b). In the 17 new

Sustainable Development Goals (SDGs) of the Post-2015 Agenda, climate change has been strengthened in goal number 13: "take urgent action to combat climate change" (United Nations, 2015c).

2.6 A sustainable development path

In the foreword of *Our Common Future,* Gro Harlem Brundtland appealed to citizen's groups, to non-governmental organizations, to educational institutions and to the scientific community to play a role in putting the world onto sustainable development paths. The commission saw that "a new development path was required, one that sustain human progress not just in a few pieces for a few years, but for the entire planet into the distant future" (WCED, 1987, p. 4). And, sustainable development must rest on political will (WCED, 1987, p. 9). In addition, one of the policy objectives suggested in order to move onto sustainable development paths, were "changing the quality of growth" (WCED, 1987, p. 49). "Changing the quality of growth" would require a change in the content of growth in order to "make it less material- and energy-intensive and more equitable in its impact" (WCED, 1987, p. 52). The possibility of reaching sustainable development and move onto sustainable development paths depends on political goals and political action. Political goals and strategies should be set according to some local, national or global targets. The assessment of the targets of goals and strategies through sustainable development indicators should show whether there is a "sustainability gap" (Fischer et al., 2007) and if a society is on a sustainable development path (Garnåsjordet, Aslaksen, Giampietro, Funtowicz, & Ericson, 2012).

CHAPTER 3: RESEARCH DESIGN AND METHOD

3.1 The research design model

National strategies are operationalized through indicators. Thus, it would be difficult to study indicators without linking them to strategies and the politics of sustainable development. The data studied will be used to analyze how these institutionalized practices may influence sustainable development and determine whether Norway and Sweden is on a sustainable path.

To explore these phenomena, a research process was designed as in Figure 3.1 to "link the research questions, empirical data and the research conclusion" (Blaikie, 2010, p. 39). The phenomena will be studied through a comparative case study by collecting available data and documents from Norway and Sweden. Below the research questions, the case study and the methods will be presented. This model describes the outline and process of the thesis:

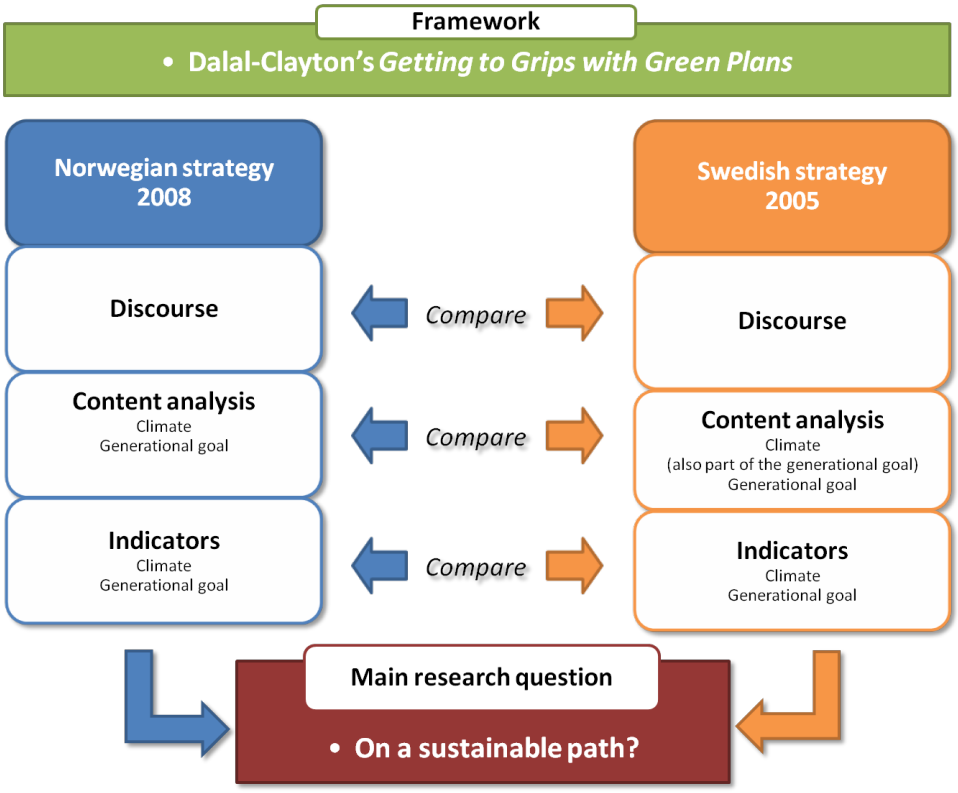

Figure 3.1. Outline of the thesis and research process. Source: Hilde Optjernsberget

3.2 Research questions

This master's thesis will concentrate on the recent national strategies and the recent sustainable development indicators of Norway and Sweden from different perspectives on sustainable development.

The research questions are:

1. How is the concept of sustainable development understood in the national sustainable development strategies of Norway and Sweden?

2. How is sustainable development operationalized through sustainable development indicators (SDIs) in Norway and Sweden?

3. What do national sustainable development indicators measure in terms of global climate change and intergenerational justice? Do these indicators show if Norway and Sweden are on a sustainable development path?

3.3 A comparative case study

To address these research questions, national strategies and indicators, a comparative case study of Norway and Sweden has been chosen. The case study is preferred "when examining contemporary events and when the relevant behaviors cannot be manipulated" (Yin, 2014, p. 12). The reasons for choosing Norway and Sweden were explained and accounted for in the introduction. To sum up, both countries are recognized for their work on sustainable development. Their systems of government are similar in that they are democratic and transparent. Consequently, the strategies and indicators are published in the public domain, and the performance on sustainable development is monitored. Thus, it makes sense to compare and contrast their approaches to sustainable development. The ultimate question from a sustainable development perspective is to what extent these practices put Norway and Sweden on a sustainable development path.

3.4 Discourse analysis

As stated in the research questions above, the two major focuses will be to analyze and explore these strategies and indicators in terms of global climate change and the needs of future generations. These questions are complex and have a multitude of answers depending on the context and the persons or institutions you ask. Thus, discourse analysis will be performed on the recent national sustainable development strategies of Norway and Sweden using Dalal-Clayton's framework as a foundation.

A discourse is "a shared way of apprehending the world" (Dryzek, 2005, p. 9). He further explains that constructing a discourse enables those who subscribe to this particular discourse a way "to interpret bits of information and put them together into coherent stories of accounts" (Dryzek, 2005, p. 9). These coherent accounts are often called storylines or narratives. The narrative or the storyline constructs meaning by defining "what is considered common sense and legitimate knowledge" (Dryzek, 2005, p. 9). Furthermore, they build relationships between people, groups, organizations and institutions that subscribe to the same discourse.

Dryzek contends that, "language matters because the way we construct, interpret, discuss and analyze sustainable development has all kinds of consequences" (2005, p. 9). In reference to sustainable development, language here represents the hidden meaning in key metaphors, assumptions, concepts and motives of the agents. According to Dryzek (2005), shared meaning and building of relationships through discourses is a prerequisite for problem-solving in the area of sustainable development. Sustainable development consists of competing discourses. Through the discourse analysis of Norway and Sweden's strategies it may be possible to interpret the language of these strategies and answer the question relating to the way sustainable development is understood.

Since sustainable development is a political concept, Hajer's (1995) discursive approach towards political processes is useful. Hajer sees discourse as an argumentative approach where the focus is on political arguments and struggles. Moreover, he calls this a "discursive practice" where "specific ensemble of ideas, concepts, and categorization are produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and

social realities" (Hajer, 1995, p. 44). The practices of national sustainable development strategies and sustainable development indicators are based on the way sustainable development is understood and will have consequences for the Norwegian and Swedish approaches (Dryzek, 2005, p. 19).

3.5 Research strategy and methods

The nature of the research topic of sustainable development and the two phenomena (strategies and indicators) studied directs the project towards an abductive strategy. The task in abductive research is to re-contextualize and discuss the strategies and indicators from the theoretical perspectives introduced in chapter 2. There is definitely no straightforward answer to the research questions, especially the last and main question of whether Norway and Sweden is on a sustainable development path. There may be data, indications and signals making it possible to make reasonable inferences.

Therefore, an abductive, explorative strategy will be applied to the project. Two research methods will be used. Danermark's view on abduction is relevant for this research project. Danermark (1997) argues that the central idea of abduction is to make new inferences by recontextualizing or redescribing a phenomenon. By re-interpreting a structure or a situation in terms of a theoretical frame of reference or pattern it is possible to make inferences. These inferences may expand the view or deepen the understanding about this structure or situation. Thus, the intention is to recontextualize national sustainable development strategies and indicators to the current national and global contexts by utilizing Dalal-Clayton framework from 1996 as a contextual reference point and different discourses on what constitutes sustainable development.

First, a discourse analysis will be performed to discover the way sustainable development is understood in the two different strategies. Secondly, a content analysis of the strategies will reveal the goals for sustainable development in terms of climate change and intergenerational justice. Thirdly, the goals will lead to the comparative content analysis of the indicators, which will reveal how the indicators on climate and intergenerational justice are measured in Norway

and Sweden respectively. Lastly, the question of whether Norway and Sweden are on sustainable development path will be discussed, from different and competing discourses on sustainable development.

3.6 Data collection - qualitative method

In this research project the starting point was an extensive literature review of sustainable development in general and the previous and current national strategies and indicator sets of Norway and Sweden. In addition, I have followed the discourses of sustainable development through the Internet and the media during the entire research project.

The foundation for the study of national sustainable development strategies is the book *Getting to Grips with Green Plans* by Dalal-Clayton (1996). The framework used in his study of 12 countries, including Norway and Sweden, was categorized in terms of the key lessons and guiding principles. These principles were used as a basis for doing a document analysis of the current national sustainable development strategies of Norway and Sweden. During the document analysis however, I discovered new categories and guiding principles expanding the original framework of Dalal-Clayton.

As far as sustainable development indicators, an extensive literature review of indicators and indicator work from the United Nations (UN), the Organization for Economic Co-operation and Development (OECD), the World Bank, the European Union (EU), Statistics Norway and the Swedish Environmental Protection Agency as well as the Stiglitz commission has been conducted to find a reasonable approach and framework for the study of the most current Norwegian and Swedish indicator sets.

The data collection was based on mainly secondary data from the strategy documents themselves, the statistics of the indicators, reports and white papers. The empirical data was supported by primary data from telephone interviews and e-mail interviews with informants from the government and governmental agencies: the Finance department of Norway, Statistics Norway, the Riksdag in Sweden and the Swedish Environmental Protection Agency. Beforehand, a web

site (Appendix 1) with a description of the project and a separate interview guide were sent to the informants in Norway and Sweden (Appendix 2). Most of the questions for both interview guides were similar except for the questions relating to the organization of sustainable development in each country. With the help and the knowledge of a few of the informants, I was able to ask questions and validate inferences and interpretations of documents, strategies and indicators. Throughout the thesis, I will attempt to answer and reflect upon the questions from the interview guides, which basically reflects the outline and research questions of the thesis and Figure 3.1.

3.7 Data reduction and analysis

Scientific research is designed to make descriptive or explanatory inferences on the basis of empirical information about the world (G. King, Keohane, & Verba, 1994). From the secondary and primary data from strategies and indicators, the analysis of the thesis was narrowed down to two core issues of sustainable development, namely climate change and intergenerational justice.

The document analysis was conducted using a combination of a directed content analysis and a summative content analysis (Hsieh & Shannon, 2005). The recent strategies were analyzed systematically looking and searching for key concepts and guidelines from the framework of Dalal-Clayton with the intention of expanding his framework. To answer the research questions, a similar strategy was used by identifying key concepts and themes to uncover their latent, discursive and contextual meanings in the strategies: sustainable development; climate; climate change; intergenerational justice; generational goal; global limits; weak sustainability; strong sustainability as well as metaphors and rhetorical devices used. No formal coding software was used for the search, but rather the document search function. The indicators were evaluated against the indicator approach taken by OECD and the indicator study conducted by the Stiglitz commission. The conceptual glasses and interpretive tool applied to answer the research questions were the two broad paradigms: weak sustainability and strong sustainability. The implications of these two paradigms may be relevant with regards to goals and indicators and the final discussion of whether Norway and Sweden are on a sustainable path.

3.8 Validity and reliability

The main challenge for the validity of this research project is to be mindful of the various political discourses of sustainable development depending on the actors and the contexts. This will have implications for the type of inference and interpretations that may be drawn. The original list of the informants included other stakeholders besides government officials. The other stakeholders would have been politicians and environmental organizations. The discourses of politicians and environmental organizations have come from the organizations' Internet sites and the media. Even though Norway and Sweden is constitutes the comparative case study, it may be possible to make analytical generalizations beyond the case study with regard to the important key principles of strategies of an NSDS process and developing of indicators. The research question of whether Norway and Sweden are on a sustainable development path, is however only applicable to this case study. Nonetheless, some of the points of the discussion may be relevant for other countries as well.

The test of reliability is to ensure that if the *same* case study, namely the case study of Norway and Sweden's strategies and indicators, were to be replicated by a later researcher, this later researcher would arrive at the same findings and conclusions (Yin, 2014). The different discourses and paradigms of sustainable development have been quite consistent, but more knowledge about climate concerns might change the goals and indicators in the future. Moreover, the same indicators studied in this research project would be possible to follow in the future provided that these indicators are not changed or revised. In conclusion, the scope of a research project on sustainable development by the researcher will vary, and thus this specific research project may be difficult to replicate.

3.9 Reflections on the research process

> *No strategy is without faults or limits. Because of their deficiencies, researchers need to adopt a pragmatic attitude towards them* (Blaikie, 2010, p. 25).

It is possible to delve and dig so deep into the literature so that you will not ever come out of the library. This was my experience in working with this thesis since my research library grew ever larger with a couple of hundred articles. The complex and extensive literature available in the field of sustainable development makes the task of deciding the focus of the research difficult. In the end, the thesis was narrowed down to looking at two aspects: climate change and intergenerational justice. The strategies were studied to determine the discourse behind each indicator in order to be able to evaluate the indicators themselves and the progress on these indicators.

Given the comparable case study design and the list of informants I originally wanted to interview, getting access to the policy makers and stakeholders were seen as a major challenge of the research design from the beginning. Political advisers in the Riksdag (the Swedish parliament) and the communication director of the Ministry of Climate and Environment[1] advised me to read the statistical reports of the indicators to monitor progress. One political adviser in the Riksdag commented that politicians don't have enough detailed knowledge on sustainable development in order to answer the questions posed by the interview guide.[2] Thus, this may be a weakness of the reliability of the inferences that are made. Most of the inferences are based on secondary data and analyzed according to the frameworks and research methods chosen. The inferences and interpretations are confirmed by primary data from some informants of government offices. In the end, I also realized that the performance and progress of the indicators studied were the most important aspects of sustainable development for this thesis.

[1] Personal communication, Ministry of Climate and the Environment, April 9th, 2015.
[2] Personal communication, Political Advisor, Swedish Riksdag for Moderaterna, April 7th 2015.

CHAPTER 4: STRATEGIES

4.1 Rio-Initiative – the political driver

Before the Rio Earth Summit in 1992 developed countries have had a long history of overall planning(Dalal-Clayton, 1996). The first responses towards dealing with environmental problems resulted in green plans. The term was formally introduced in 1989 in Canada when preparing a *Green Plan* for Canada. "Green planning" refers to plans primary focused on issues related to environmental problems (Dalal-Clayton, 1996, p. 3). The wider issue of sustainable development requires the balancing of environmental, social and economic concerns as in the three-pillar model in Figure 2.1. The process of making these strategies involves these three dimensions: the social, the economic and the ecologic. Thus, the concept of sustainable development incorporates all areas of a society and engages most disciplines. A study conducted in 1994 recommended that scientists and social scientists should collaborate and provide information on these three dimensions of sustainability (Dalal-Clayton et al., 1994).

4.2 Key lessons and guidelines

The intricate relationship between the three dimensions of sustainable development makes it difficult to harmonize the various sectoral economic, social and environmental policies and plans that are operating in the country (UNCED, 1992, p. 64). At first, there were no guidelines provided on how to prepare national sustainable development strategies (NSDSs), but the International Institute for Environment and Development (IIED) and International Union for the Conservation of Nature (IUCN) came out with a *Handbook on Strategy Preparation and Implementation in 1994* (Dalal-Clayton, 1994). Based on the work presented in the handbook some of the likely challenges and dilemmas of developing a NSDS were identified:

- The political context: structural constraints and inequalities in power structures
- Setting the objective(s): different groups are likely to want to achieve different things
- Building strategic capacity: interdisciplinary and integrated approach
- The scope of the strategy: balance between local, national and international issues
- Consultation versus participation: who are the stakeholders
- Choosing approaches and methodologies

From these dilemmas (Dalal-Clayton et al., 1994) came up with some key lessons and guiding principles for national sustainable development strategies (Table 4.1 below). At the same time, it is widely accepted that a blueprint for national strategies neither is possible nor desirable (Dalal-Clayton, 1996).

Key Lessons and Guiding Principles for National Sustainable Development Strategies
• National sustainable development strategies are *cyclical* processes of planning and action in which the emphasis is on managing progress towards sustainability goals rather than producing a "plan" or end product.
• They must be genuinely *multi-sectoral and integrative*, aimed at engaging relevant interests and overcoming institutional and policy fragmentation.
• It is crucial to focus *on priority issues*, and identify key objectives, targets and means of dealing with them.
• *"Widest possible participation"* means sharing responsibility and building partnerships among all concerned – business, community and interest groups, as well as governments – but only where the partners feel it is appropriate.
• The approach taken must be *adaptive and flexible*, recognizing that problems are characterized by *complexity and uncertainty*, and policy responses and technological capability change over time.
• *Monitoring, evaluation and learning* from experience are keys to a successful strategy, and must be an integral part of the process.
• The preparation of an NSDS is an exercise in *capacity-building*, and should be organized to enhance institutional arrangements, sharpen concepts and tools, foster professional skills and competence, and *improve public awareness*.

Table 4.1. Key lessons and guiding principles *(author's italics)*. Source: Dalal-Clayton et al. 1994.

4.3 The study *Getting to Grips with Green Plans*

The key lessons and guiding principles above represented the framework when the study *Getting to Grips with Green Plans* was conducted. In the study, 20 national strategies of 12 countries addressed the dilemmas listed in Table 4.1. Dalal-Clayton and two other researchers conducted structured interviews of key players in the period between December 1994 and February 1996. The aim of the study was examine the objectives that drove the strategies and the processes adopted. Every country in the study was devoted a separate chapter of the book. For the purposes of this case study, the main points of the initial strategies of Norway and Sweden will be highlighted.

The topics of the questions of the structured interviews covered the following issues: time perspectives; participation; key factors; problems; issues; links to national planning and decision-

making; the "ecological footprint"[3] and greening lifestyles. At the time of the study, the only indicators mentioned were the "ecological footprint" and CO2 emissions. The two next paragraphs will present Dalal-Clayton's findings of Norway and Sweden in the study *Getting to Grips with Green Plans* (1996).

4.4 Dalal-Clayton's findings of Norway

The two strategies for Norway studied are listed below in Table 4.2. The first attempt of producing a NSDS was after the report *Our Common Future* whereas the other was a response to UNCED 1992. According to Dalal-Clayton, Report No 46 was environmental, but other aims included development aid and establishing a practice of using sectoral policies to achieve the goals of the WCED commission. Report No 13 on UNCED was an interpretation of Agenda 21 and outlined what had been done to date and identified what remained to be achieved.

Document	Proponent
Reports to Parliament (Storting) on WCED follow-up (No 46: 1988-1989)	Ministry of the Environment
On UNCED (No 13: 1992-1993)	Ministry of the Environment

Table 4.2. Norwegian documents studied by Dalal-Clayton. Source: Dalal-Clayton 1996.

After WCED, Prime Minister Gro Harlem Brundtland initiated the work of Report No 46 by sending a letter to all the ministries. However, Report No 46 lacked a time perspective as well as a vision for the future of Norwegian society on such issues. The reason for this lack of vision was explained that such "visioning work" is carried out by the Department of Finance every fourth year (Dalal-Clayton, 1996). On the other hand, Report No 13 after UNCED was designed to review the existing polices in the light of Agenda 21. The main focus of Report No 13 was environmental, but no time frame was assigned to this strategy either.

[3] Ecological Footprint (EF): Coined by William Reese. It represents the land area necessary to sustain the current level of resource consumption and waste discharge by that population (Wackernagel & Rees 1996). The carbon component of the Ecological Footprint takes a slightly differing approach, translating the amount of carbon dioxide into the amount of productive land and sea area required to sequester carbon dioxide emissions. This tells us the demand on the planet that results from burning fossil fuels.

In preparation for Report No 46, the WCED report was sent to all 434 local authorities in Norway. In addition, 1000 copies were sent to various non-governmental organizations (NGOs) with a request for comments on the report's implications for Norway. The subsequent discussions revealed that NGOs were critical of Report No 13. They criticized its growth-oriented focus and asserted that it would not balance the fundamental environmental issues related to sustainability. By comparison, the Parliament remained positive to the report and wanted to strengthen the aims.

Some key factors helped the effort on both Report No 46 and Report No 13. First of all, there was already public pressure on the environment. Secondly, the Ministry of Environment had already worked on a preliminary green plan in the period 1985-1988. Lastly, Prime Minister Gro Harlem Brundtland's commitment to the WCED report played a significant role. However, one of the most difficult issues to handle was climate change, particularly the question regarding stabilizing the CO2 emissions at 1989 levels by 2000. The difficulties arose because of two different approaches; namely the "economist tradition" and the "administrative" or the "engineering" tradition. The "economist" tradition avoided numerical aims in favor of general economic measures to be adjusted as the need arose. On the other hand, the "administrative" or the "engineering" tradition preferred technical standards and specific emissions permits (Dalal-Clayton, 1996, p. 167).

Report No 46 was a single policy document including problems and policies related to the environment, and the report was directly linked to the budgetary process. The policy document detailed the responsibilities of individual sectors. The document emphasized cost-effective and economic measures to reach the aims. This economic focus was due to uneasiness in relation to the costs of environmental measures. This led to a tight coupling between pollution control measures of Report No 46 and the budgetary process. Therefore, the long-term plan conducted every fourth year by the Ministry of Finance would include a chapter on the environment by the Ministry of Environment. However, after Report No 46 had been written, there was "no organized follow-up of the actual report" (Dalal-Clayton, 1996, p. 172).

Report No 46 discussed primarily environmental issues while the concept of "ecological footprints" was dealt with indirectly in Report No 13 through discussions about production and consumption. The "ecological footprint" index was the only sustainable development indicator at

the time of the study. Neither of the two reports led to any *extra* greening of the political, business or consumer mainstreams. At the same time, Norway was already considered relatively green. The climate change issue was controversial and reluctantly resolved politically to the minimum commitment possible. The main new political commitments "were to stabilize CO2 emissions by the year 2000 at the 1989 level" (Dalal-Clayton, 1996, p. 167). The funding for the commitment was 0.1 percent of the general national income (GNI) with the provision that other countries followed suit. The reason for Norway's reluctance in adopting this commitment to stabilize CO2 was the fear that it would affect Norway's competiveness negatively. In the end, the main decision to adopt the CO2 aim was a political choice. On another note, the Norwegian key players answered that Report No 46 had led to institutional changes. In conclusion, the early attempts of producing a NSDS in Norway overlooked the time perspective of such strategies. This fact may be understood as a lack of an intergenerational focus on environmental issues or the overstated emphasis on cost-effective environmental solutions. In addition, it may explain Norway's later motivation of the economic dimension as an important factor in intergenerational justice.

4.5 Dalal-Clayton's findings of Sweden

The two strategies for Sweden that were examined are shown in Table 4.3 below. The government bill "Towards Sustainable Development in Sweden" was a response to UNCED and introduced the general rule of integration of environmental impact assessments into political processes. The action programme "Enviro 93" included most of the goals, objectives and targets set by Swedish commitments under international and regional conventions and agreements.

Document	Proponent
Towards Sustainable Development in Sweden. Government bill (adopted '94)	Ministry of the Environment
An Environmentally Adapted Society: Action Programme: Enviro '93 (1993)	Swedish Environmental Protection Agency

Table 4.3. Swedish documents studied by Dalal-Clayton. Source: Dalal-Clayton 1996.

"Towards Sustainable Development in Sweden" was the Swedish response to UNCED and was initiated by the Ministry of Environment. The focus on this government bill was mostly on domestic issues. At the same time, there was also one chapter devoted to Sweden's global cooperation. This government bill had a time perspective and was a preparation for action by 1997. On the other hand, Enviro '93 was initiated by the Swedish Environmental Protection Agency. The time frame for Enviro '93 was towards year 2000, and the main focuses were on trends in the state of the environment as well as the environmental impacts of different sectors of the environment.

The motivation of "Towards Sustainable Development in Sweden" was to translate the intentions of Agenda 21 into policies and action. The focus was on the overall agenda of sustainable development and the document was arranged according to goals, priorities and measures. On the other hand, the aim of Enviro '93 was to show how individual sectors would need to respond by developing sectoral environmental action plans and programmes. Agenda 21 and the Rio-convention were translated into Swedish and distributed to 300 organizations for review and comments. In addition, 25.000 copies were distributed nationally to the public at large. The Ministry of Environment analyzed the public responses and prepared a draft outline for the bill. It was circulated to the ministries for further review and comments, and many rounds of negotiations followed. The bill covered the period up to 1997 as well as further promises about commitments to long-term sustainable development (Dalal-Clayton, 1996, p. 183).

The Minister of Environment at the time had attended UNCED and was particularly committed to the bill. At the same time, the decisions that had to be made were difficult since Sweden already had environmental policies in place. It was argued that the issues covered in Agenda 21 presented few new aspects for Swedish environmental policy. Instead, the discussions revolved around various themes and approaches such as the "polluter pays" and "pre-cautionary" principles. Some of the political conflicts were resolved by introducing separate governmental bills. The bill "Towards Sustainable Development in Sweden" provided guidelines, but it didn't force legislation and lacked funding. Thus, the bill wasn't linked to the budget and a new financial bill had to be introduced (Dalal-Clayton, 1996, p. 186).

Neither of the Swedish plans explicitly mentioned "ecological footprint". The important discussions dealt with production and consumption patterns in conjunction with trade and environmental issues. Instead, Enviro '93 among other national initiatives contributed to making Sweden green. It strengthened already existing ideas and concepts. Sweden had already initiated environmental initiatives dealing with an "ecocycle" society, climate questions, biological diversity and forestry policies. Moreover, the government intended to institute concepts like environmental impact assessments, the environment code and the environmental debt. As a result, the Swedish government placed importance on a long-term sustainable development. Even though the environment policies lacked a direct link to financial planning, the environmental initiatives such as environmental debt owed to future generations suggested an intergenerational perspective.

4.6 A comparison of the early "strategies"

Already from the start, there were some key differences between the "strategies" and the processes in Norway and Sweden. A major difference was that Norway's strategy was linked to the National Budget whereas Sweden's strategy was based on establishing and integrating international guidelines into already existing policies. Moreover, Sweden's strategy focused mostly on domestic issues related to sustainable development, but they included climate questions as part of these environmental initiatives. As part of the Norwegian NSDS process, climate questions were controversial issues due to fear of the cost involved and the threat to Norway's competitive ability. Eventually, Norway made a political choice to commit to stabilize CO2 emission levels by the year 2000 at the 1989 level and funding of 0.1 percent of gross national income (GNI). In contrast, Sweden had adopted environmental principles as part of Enviro 93, and the Swedish Environmental Protection Agency was involved from the start. The idea of a long-term environmental perspective had been born earlier. As far as having a time perspective, Sweden was also more specific when it came to goals and targets. The idea of environmental debt owed to future generations were embraced as a principle to account for natural resource depletion and degradation. So as far as integrating the principle of international justice, Sweden implemented better principles in the infancy of the NSDS process. In sum, these

strategies may have been mere plans and not full-fledged NSDSs employing all of the key principles and guidelines of Dalal-Clayton in Table 4.1.

4.7 Useful criteria

Dalal-Clayton (1996) wondered whether these strategies would remain on the bureaucratic bookshelves or actually be used as important steering documents. In the following we will look at the current national sustainable development strategies of Norway and Sweden. Even though the current strategies have been expanded, there may be signs of path dependency between the older and the newer strategies. Some of these key lessons and guiding principles may still be important criteria for the more recent strategies. These criteria will be used as a foundation and framework in the case study of Norway and Sweden. In the next chapter, the analysis will be looking for possible signs and tendencies in the current Norwegian and Swedish strategies of the following from Dalal-Clayton's framework:

- Adaptability and flexibility
- Focus on priority issues by identifying key objectives, targets and means of dealing with them
- Links to national planning and decision-making
- Public awareness
- Time perspective
- Widest possible participation

Throughout the thesis this framework will be complemented with more recent data, frameworks and studies, and discussed from different discourses on sustainable development. Climate change and intergenerational justice will be the issues highlighted in the analysis of the current strategies.

CHAPTER 5: DISCOURSE ANALYSIS

5.1 The Norwegian discourse

The Norwegian strategy for sustainable development was published in autumn 2007 as a part of the White paper National Budget 2008. The strategy focuses on how Norway may contribute to sustainable development globally and nationally. In 2011, the strategy was revised, but the main goals remained unchanged (Statistics Norway, 2012a). In this strategy, the government increased the national focus on the social dimension of sustainable development compared to the previous strategies. The global dimension of the strategy focuses on the UN Millennium Development Goals (MDGs), especially the economic and social dimension. The 8 MDGs are thoroughly discussed point by point with a special reference to MDG 7: to ensure environmental sustainability that includes climate concerns (United Nations, 2000a). Several chapters are devoted to climate and poverty in the strategy.

The National Budget is the Norwegian government's most important planning document, and every year the national strategy of sustainable development has been followed up as part of the budgetary process. Then, the appropriate departments are responsible for carrying out their part of the strategy. In addition, an indicator set was developed in 2005 titled *Simple Signals in a Complex Word (NOU 2005: 05)*. Norwegian Statistics gives a yearly update on the progress on the indicators[4]. These statistics would then be reported in the National Budget in the chapter on sustainable development.

As of 2015, the chapter on sustainable development has been omitted from the National Budget (Aslaksen & Garnåsjordet, 2014). Instead, some of the indicators are reported in other chapters of the National Budget whereas other indicators are not reported at all. The Finance department sees this as an editorial change, and not a change of policy on sustainable development.[5]

[4] The indicator set will be discussed in chapter 8 with an emphasis on climate and intergenerational justice.
[5] Personal communication, Finance Department, May 12th, 2015.

In 2007, the government requested an evaluation of the strategy from outside the political system. An expert group with five representatives from Sweden and one representative for Uganda reviewed the Norwegian strategy. The expert group commended the fact that the Finance Department coordinates sustainable development. Despite this fact, the expert group pointed to possible improvements to the strategy, especially in integrating sustainable development better in overall governmental decision-making (Danielson et al., 2007).

Understanding of sustainable development

The Norwegian strategy is based on the intention that Norway should become a global forerunner in terms of sustainable development (St.prp. nr. 1 (2007-2008), p. 7). Norway recognizes that sustainable development is first and foremost a global target based on solidarity, both between generations and the present generation. Moreover, Norway highlights their ambitious climate policy in the strategy. As a point of reference, the climate report of 2007 is mentioned with some of its climate policy commitments and targets listed. The main vision is that Norway should be an environmentally friendly energy nation and be a leader in developing environmentally sound energy solutions. Norway's rhetoric in international climate policy is that Norway is contributing to large global climate emission reductions, cost-effective solutions and sharing of the burden (St.prp. nr. 1 (2007-2008), p. 88). In subsequent policy statements, Norway supports and will contribute to preventing that the global temperature rises above the 2°C limit.

The Norwegian strategy's starting point is the WCED definition of sustainable development. The strategy restates the committee's focus on human needs and solidarity globally and between generations. The strategy refers to the WCED commission and the texts from the Rio- and Johannesburg-conferences when referring to human wealth as an indicator for sustainable development. Real capital as defined in human capital, natural capital and environmental capital per capita should be non-declining over time (St.prp. nr. 1 (2007-2008), p. 13). This implies an understanding of sustainable development in accordance with weak sustainability, since it maintains that natural capital and human capital is substitutable. Simultaneously, the strategy affirms that the degradation of natural and environmental capital may not always be substituted with other capital (St.prp. nr. 1 (2007-2008), p. 14). Norway's politics on sustainable development will be based on operating within the thresholds of nature. This statement expresses a view and understanding in accordance with strong sustainability. To summarize, Norway's

strategy communicates both a weak and a strong understanding of sustainability, but seems to be more in line with weak sustainability.

5.2 The Swedish discourse

The Swedish strategy for sustainable development *Strategic Challenges – A Further Elaboration of the Swedish Strategy on Sustainable Development* was submitted in 2005. The strategy covers all three dimensions or pillars of sustainable development: economic, social and environmental. The strategy adopts a long-term vision of sustainable development. Moreover, international sustainable development initiatives including the United Nations (UN) and the European Union (EU) are built into the strategy. The Millennium Development Goals (MDGs) are seen as ways of strengthening the effort to advance the cause of welfare and build relationships between the rich and the poor countries. However, there is no review of the eight MDGs like in the Norwegian strategy.

Sweden's broad-based sustainable development efforts extend across all policy areas. The strategy includes 99 national and global measures to be followed-up. The themes of the strategy are divided into objectives and specific measures to meet each particular objective. Furthermore, the Swedish environmental policy is based on 16 environmental quality objectives, and these objectives are measured by the Swedish Environmental Protection Agency[6]. The Council of Sustainable Development publishes an annual report to foresee any hindrances in implementing the proposed measures of the strategy. In addition, the council's mandate is to consult with various parts of the community: focus groups of young people, agencies, private organizations, colleges and universities.

Understanding of sustainable development

Sustainable development is an overall objective of Government policy. International collaboration from EU and UN has been a major source of inspiration to the Swedish sustainable development effort. Sweden plays an active role in many international arenas on sustainable

[6] The 16 environmental quality objectives will be reviewed in chapter 8 on indicators.

development and "is proactive when it comes to EU sustainable development effort" (Comm. 2005/06:126, p. 16).

However, Sweden has also built upon its own traditions of the welfare state. From the beginning, the concept of the welfare state inherently considered social justice and quality as both compatible and a stimulant to economic growth. This indicates a weak sustainability of sustainability where natural capital is not mentioned as a constraint. Sweden considers itself a leading country in terms of being a sustainable society. The idea is that Sweden can contribute to greater solidarity and more equitable allocation of the world's resources. Moreover, environmental policy was introduced early in Sweden. The green welfare state was seen as the integration of three dimensions of sustainable development.

Sweden mentions the Brundtland-report and the Rio-Initiative without making references to any definition of sustainable development. The vision of the strategy is a sustainable society where there is solidarity and justice in every country, among countries and among generations. The basic assumption is that "one generation should not conduct their lives in a way that prevents their children and future generations from enjoying a decent standard of living" (Comm. 2005/06:126, p. 9). To a large extent, this understanding of sustainable development illuminates the WCED definition. As far as recognizing any limit, the Swedish strategy recognizes that climate change represents one of the great challenges of our time. However, a specific climate goal or a *limit* is not mentioned in the strategy. Hence, the majority of the strategy demonstrates a weak understanding of sustainability. However, some of 16 environmental quality objectives have goals reflect a strong understanding of sustainability. These goals aim to preserve certain natural resources and bio-diversity since they are non-substitutable.

5.3 Comparison of discourses

"A discursive practice accounts for most aspects of an issue or a problem and writes them into the narrative" (Hajer, 1995, p. 63). A common, convincing and simplified storyline of a complex issue or problem is being told in a narrative. Discursive practice can be seen as the way the issue of sustainable development is framed in Norway and Sweden.

From the previous presentation of the two strategies and their discourse, the understanding of sustainable development in the Norwegian and Swedish strategies seems to be quite similar. References are made to the WCED definition and the recommendations and reflections made by the commission. On the whole, both national discourses of sustainable development are primarily expressions of weak sustainability. Weak sustainability is defined as sustained development where utility is non-declining over time (Pezzey, 1997). This view is especially true of the Norwegian strategy that explicitly states this goal of sustainable development. Beckerman (1994) also supports the idea that sustainable development is to maximize welfare over time. This means that natural capital can be substituted with other capital as long as the aggregated capital stock is maintained. In contrast, strong sustainability states that the economy and nature are both to be sustained over time since they are complementary (Daly, 1995, p. 56). Dryzek (2005) refers to *Our Common Future* and the commission's definition of sustainable development as an example of weak sustainability.

On the other hand, Langhelle (2000) contends that there are references to limits within the commission report that accounts for a more radical interpretation of sustainable development. There are some references made to limits in both strategies where the interest of humans is not to have overriding priorities over the interests of nature. Therefore, both the Norwegian and the Swedish policy show signs toward strong sustainability when they recognize that there are limits. For example, the Norwegian strategy states that often it is not possible to substitute the depletion of environmental capital with other capital (St.prp. nr. 1 (2007-2008), p. 14). Similarly, the Swedish strategy respects "the limits of the planet's resources and ensure a high level of protection and improvement of the quality of the environment" (Comm. 2005/06:126, p. 94).

On a whole, it is fair to say that Western societies such as Norway and Sweden are influenced by capitalism's neoclassical principle of rational choice (Nilsen, 2010). Both discourses are based on a capitalist economy and the focus on economic growth. The focus is on maximizing the utility for human beings. The strategies are built on an anthropocentric view of nature where the intrinsic value of nature is not weighed explicitly into the equation. Mostly, nature is looked upon as natural resource that can be substituted with other capital. Thus, the narrative becomes that sustainable development is possible within the boundaries and limits of the environment. One of

the metaphors being used in Sweden is a "green welfare state" where economic growth is part of the distribution of wealth. Moreover, the strategy states "Sweden has always been environmental". Similarly, the Norwegian strategy highlights the Nordic welfare model as a solution to meet the challenges of globalization and threats to the environment.

Establishing a common language can easily mask incompatible world-views of a particular narrative (Fischer et al., 2007). These two recent strategies interpreted as narratives support the scientist, the environmentalist, and the politician and their views. The different views are incorporated into a common and convincing storyline. Moreover, the Norwegian and Swedish governments and the various actors are seen as authoritative on the issue as well as being the problem solvers. It is important to consider that these documents are political and serve the purpose of presenting a responsive and responsible solution to the problem of sustainable development. It should be noted that these strategies were written about 10 years ago. Since then, the Intergovernmental Panel on Climate Change (IPCC) has published two assessments reports, one in 2007[7] and another in 2014. The reports pronounce that "human influence on the climate system is clear, and recent climate changes have had widespread impacts on human and natural systems" (IPCC, 2014, p. 2). In addition, the fifth and last report states that recent anthropogenic emissions of greenhouse gases are the highest in history. Thus, both countries have given more attention towards stronger climate mitigation efforts since these strategies were published.

5.4 Norway and Sweden as "leaders"

Both Norway and Sweden want to be seen as "leaders" in sustainable development on the international arena. At least, Norway's role of being a leading actor of sustainable development is self-imposed (Langhelle, 2000). Moreover, the statement is reiterated in the most recent strategy (St.prp. nr. 1 (2007-2008), p. 7). Sweden's evidence of being a key player can also be found in the document itself: "Sweden plays an active role in many international arenas and advocates values that touch upon sustainable development" (Comm. 2005/06:126, p. 14). Fundamental values of the Swedish government are mentioned such as democracy, equal opportunity and equal rights and receptiveness to the perspectives of poor people toward development issues.

[7] The Norwegian strategy made references to Working Group I of the 4th IPCC report.

In fact, their rankings are high on most statistics regarding social progress and sustainable development. The social progress index (SPI) measures many aspects of progress including a variable called “ecosystems sustainability”. Even though this is only one of the factors of the index, it demonstrates that Norway and Sweden rank on the top. In the Yale environmental performance index (EPI), Norway and Sweden are positioned among the top ten countries. However, being ranked high on such indices is no guarantee or evidence whether a society is on a sustainable path. One should be aware of aggregated indices when it comes to variables and the way they are weighed (Moe, 2007). Aggregated indices often show a trend or are designed to create public awareness, but they may not always succeed in addressing important sustainable development issues in a particular local or national context. By studying the content of the two strategies in the next chapter, the positions and goals for climate change and intergenerational justice will be revealed.

CHAPTER 6: DOCUMENT ANALYSIS

6.1 Categories and themes

Document analysis requires that data can be examined and interpreted in order to produce meaning, gain understanding and develop empirical knowledge (Corbin & Strauss, 2008). The procedure followed in analyzing the two strategies of Norway and Sweden were to look for evidence of the key lessons and guiding principles of Dalal-Clayton.[8] Dalal-Clayton had the privilege of following the whole process through structured interviews of key players, whereas evidence of these principles in the recent strategies must be interpreted from the documents. *Priority issues*, *links to national planning and decision-making*, *participation*, and *time perspective* are important guiding principles of a NSDS process. Other key lessons may be more difficult to comment on such as if the strategies follow *cyclical* processes whilst being *adaptive* and *flexible*. And most importantly, the keys to a successful strategy are based on *monitoring*, *evaluation* and *learning*[9]. Thereafter, the document analysis will concentrate on climate change and intergenerational justice and the related key issues[10].

6.2 The Norwegian strategy

The themes of the Norwegian Strategy	
1.	International cooperation for sustainable development and combating poverty
2.	Climate, the ozone layer and long-range air pollution
3.	Biodiversity and culture heritage
4.	Natural resources
5.	Hazardous chemicals
6.	Sustainable economic and social development
7.	Sami perspective in environment- and resource management[11]

Table 6.1. Themes of the Norwegian Strategy for Sustainable Development 2008

[8] See table 4.1 for key guidelines and principles for NSDS process.
[9] Authors italics on key guidelines and principles.
[10] See chapter 3.7 Data reduction and analysis for a complete list of concepts studied.
[11] Sami perspective is not part of the indicator set. Source: Statistics Norway.

The strategy of the 2008 National Budget is organized according to 7 themes that can be interpreted as priority issues according to Dalal-Clayton's (1996) guiding principles. The 7 themes are listed in Table 6.1 on the previous page. As far as national planning and policy-making, sustainable development has been integrated into the National Budget every year since 2008. The principle about participation was an important principle in the process of making a national strategy. Thus, a thorough hearing was conducted with Norwegian organizations and research communities on this strategy. In addition, the Government distributed copies of the strategy in order to create public awareness. As far as adaptability and flexibility, it may not be possible to comment on these principles, but the strategy was revised in 2011. However, an evaluation of the most recent strategy was conducted by a review committee as part of the process of making the strategy. As far as monitoring, sustainable development indicators are followed up by Statistics Norway.

Climate and intergenerational justice

The background on the issue of the climate challenge is based on the IPCC 4th report from Working Group I available at the time of the strategy process. The Norwegian government is currently committed to the goal of limiting global warming to 2°C compared to pre-industrial time.

The measures to reach the climate goal are covered in White Paper Report No. 21 (Meld.St.21 (2011-2012)):

- Should be carbon neutral in 2050
- Reduce the global climate emission equal to 30 per cent of Norway's emission in 1990 by the year 2020.
- Strengthening the Kyoto protocol by 10 percentage points, which corresponds to cutting emissions to 9 % below the 1990 level
- Work towards a more ambitious global climate agreement
- Develop carbon capture and storage (CCS) technology

Some of the specific measures are: establishing a new climate and energy fund, raising the CO2 tax rate for the offshore industry and improving public transport (Meld.St.21 (2011-2012)). In the event progress shows that these goals will not be attained, the Government will consider further measures. Norway commits to taking 100 percent of the responsibility of its climate emissions by 2050 through a combination of national reductions and the flexible mechanisms under the Kyoto protocol abroad (St.prp. nr. 1 (2007-2008), p. 50).

The Government will look after the national wealth by handing over natural resources and other resource capital in equal or in better standing than when we took charge of it. Some of the measures for the generational goal are to:

- Ensure that the petroleum fund will be shared with future generations
- Provide socially just health policies
- Provide higher level of education to the majority of the population
- Secure sound practice with moderate risks in administering the petroleum fund
- Oversee that ethical guidelines are being met by the companies in the petroleum fund

The document states: "it is our ethical obligation to ensure that future generations may share the prosperity of the petroleum's fund" (St.prp. nr. 1 (2007-2008), p. 70). The most important measurement for the generational account is to secure the current welfare system and to ensure that the national wealth is non-declining over time. The indicators for climate and intergenerational justice will be discussed in chapter 8.

6.3 The Swedish strategy

The themes of the Swedish Strategy
1. Health
2. Sustainable consumption and production patterns
3. Economic Development
4. Social Cohesion
5. Environment and climate
6. Global development

Table 6.2. Themes of the Swedish Strategy for Sustainable Development 2005

Strategic Challenges – A Further Elaboration of the Swedish Strategy on Sustainable Development of 2005 covers the three pillars of sustainable development in six areas shown in Table 6.2 on the previous page. Sustainable development is an overall and integrated goal of Government policy (Comm. 2005/06:126, p. 3). To ensure that this goal will reflect the principles of national planning and decision-making, the Ministry of Sustainable Development was established in 2005. Furthermore, Sweden conducted a thorough process, and the local municipalities of Sweden participated in the development of the strategy. Similarly to the Norwegian strategy, it will not be possible to suggest if one particular strategy is *cyclical*, *adaptive* and *flexible*. As far as monitoring and evaluation, sustainable development indicators are followed up by Statistics Sweden and the Swedish Environmental Protection Agency.

Climate and intergenerational justice

At the time of the Swedish strategy, the IPCC 4th report had not been published yet. Thus, there are no references to IPCC in the strategy or a specific climate target. References are made to greenhouse gas emission (GHG). The need for further reductions is mentioned in order to meet Sweden's long-term climate objective. The strategy acknowledges that Sweden and other countries must reduce GHG emissions in order to avoid dangerous cumulative impacts on the global climate system. In addition, the goal is to reduce Sweden's dependence on oil by 2020. Today, Sweden has adopted the 2°C as a target for the climate policy. The Swedish Parliament has adopted a vision of zero net emissions of greenhouse gases to the atmosphere in Sweden by 2050.

In line with the weak sustainability narrative, this climate adaptation holds promises for growth in the private sector. At the same time, economic instruments such as a carbon dioxide tax and energy taxation are mentioned as the cornerstones of Sweden's climate policy. An essence of the strategy is to promote a long-term effort for intergenerational allocation and solidarity. Moreover, a key policy is to decouple economic growth and environmental degradation while at the same time promoting social welfare and cohesion.

6.4 Comparison of the strategies

Even though the understanding of sustainable development is comparable, the most recent strategies of Norway and Sweden highlight different priorities. The Swedish strategy has a strong focus on health and national environmental concerns of Sweden whereas the Norwegian strategy talks more of global concerns such as poverty and climate. The emphasis of Sweden's discussion on the international concern of poverty and climate focuses on the Swedish contribution in EU and UN. Sweden also places a strong focus on becoming less dependent on oil and to increase the amount of renewable energy. By contrast, Norway is an oil-producing country and has hydroelectric power as a main energy source. Thus, the Norwegian strategy calls for higher energy efficiency as well as carbon capture storage (CCS) to compensate for the offshore industry's emissions.

Another main difference is the way sustainable development is administrated. In Norway, the Finance Department coordinates the policy-making and the departments when it comes to sustainable development. In Sweden, the work on sustainable development is done in the Environment and Energy Department with the coordination and oversight being done by the Commission on Sustainable Development. Thus, sustainable development is organized the same way as in the infancy of making such strategies about 20 years ago. Consequently, there is path dependency in the way the two countries deal with national strategies today. In the next chapter, the implications of these differences will be discussed when the progress on indicators for climate and generational goals are discussed.

6.5 Dalal-Clayton's framework revisited

It is important to keep in mind that these strategies are political documents with a particular discourse and framing of sustainable development. Both strategies have mentioned the Millennium Development Goals (MDGs) and recognizing that sustainable development is a global issue. The early strategies of Norway and Sweden set the ideals for the recent strategies. At the same time, the first strategies may be characterized merely as plans rather than strategies with specific goals and measures. However, the groundwork started 20 years ago has institutionalized the practice of developing national strategies in Norway and Sweden. The

guidelines of Dalal-Clayton have been followed in the most recent and expanded strategies. Dalal-Clayton's question about the continuation of such plans has been answered: the strategies serve the purpose of defining goals and measures. More importantly, the strategies' goals and measures have provided the foundation for developing indicators. Based on the goals and measures of the strategies, Norway and Sweden have developed indicator sets for monitoring and evaluation. By looking at the indicators for climate and intergenerational justice it will be possible to assess how these strategies have been operationalized.

6.6 Expanding Dalal-Clayton's framework

After conducting the study in 1996, Dalal-Clayton feared that these strategies would end up on bureaucratic bookshelves. His fear was somewhat warranted since some of his key lessons and guiding principles of national strategies are less prevalent than they ought to be according to the intentions of the Rio-Initiative. National strategies have not created the *wider participation* and *public awareness* encouraged as major success factors of NSDS processes. Nonetheless, they have resulted in operationalization through indicator fulfilling the principle of *monitoring*. However, some researches of Statistics Norway have questioned the key guiding principles of *evaluation* and *learning* since it is difficult to determine the link between indicator statistics and policy-making (Garnåsjordet et al., 2012). In Sweden, the main focus seems to be its overall environmental policy rather than the national strategy as a steering document: "sustainable development is an overall objective of Government Policy" (Comm. 2005/06:126, 2005, p. 3).

Nevertheless, more research has been conducted on the developing of national strategies. Some of these key lessons and guiding principles have been implemented in more recent OECD and UN documents. Furthermore, Dalal-Clayton has contributed to more research and work on the issues of strategies. In a report prepared for OECD in 2006, Dalal-Clayton and Bass (2006) expanded on the key lessons and guidelines from the study *Getting to Grips with Green Plans*. The same guidelines were elaborated and made clearer in the book *Sustainability Appraisal* (Dalal-Clayton & Sadler, 2014). A section of the book is dedicated to national strategies with instructions and guidelines on the process. Besides, strategies were intended by UNCED to be accompanied by indicators, but it took some time before this work showed results. Today,

indicator sets have been developed by a whole indicator industry as referred to earlier. In the report for OECD in 2006 (Dalal-Clayton & Bass, p. 21), Norway was mentioned as a good example of developing indicators as part of a NSDS process.

Norway and Sweden have followed up the original guidelines of Dalal-Clayton in the most recent strategies. The recent strategies are enhanced with respect to goals as compared to the earlier strategies. Even though climate was an issue about 20 years ago, none of the earlier strategies made clear and specific commitments to reductions in greenhouse gas emissions. In addition, they have developed indicator sets to establish a way to monitor and evaluate the progress of sustainable development. It can be argued that the phenomenon of strategies is here to stay. Already in 2007, Meadowcroft (p. 162) called it an "emergent phenomenon". The potential of developing national strategies lies in "focusing debate, building consensus, examining trade-off and make choices" (Meadowcroft, 2007, p. 157). Both Meadowcroft (2007) and Garnåsjordet et al. (2012) agrees that both strategies and indicators provide reference points for assessments and future learning. The only question that remains unanswered is in which way they are and could be cyclical processes being adaptive and flexible. At the same time, strategies are meant to cover long-term goals and policies. However, with the proposed SDGs of the Post-2015 agenda it may be necessary to revise the goals of the strategies and indicators.[12]

[12] Personal communication, Statistics Norway, May 8th 2015.

CHAPTER 7: INDICATORS

7.1 An indicator industry

The Rio-initiative prescribed the development of sustainable development indicators (SDIs) to complement the national sustainable development strategies stating that: "countries at the national and international governmental and non-governmental organizational level should develop the concept of indicators of sustainable development in order to identify such indicators"(UNCED, 1992). For this reason, there has been produced an abundance of indicator sets by various organizations such as United Nations (UN), Organization for Economic Co-operation and Development (OECD), the World Bank and European Union (EU) in the two past decades. The *Compendium of Sustainable Development Indicator Initiative* lists over 800 efforts devoted to develop indicators for of sustainable development (IIED, 2015).

The abundance of SDI initiatives and metrics is called an "indicator industry" (Hezri & Hasan, 2004; C. King, Gunton, Freebairn, Coutts, & Webb, 2000; Parris & Kates, 2003). In academic circles, there has been written countless articles about the topic of sustainable development indicators. Thus, it won't be possible to present a complete and comprehensive summary of the all the different indicator approaches here. First, the UN and its Sustainable Development Goals (SDGs) will be presented followed by a shorter presentation of OECD as well as the recommendations of the Stiglitz Commission. Secondly, some of the different approaches and frameworks of sustainable development indicators will be described.

7.2 What are sustainable development indicators (SDIs)

> *"Indicators must be simultaneously meaningful in two different domains: that of science and that of policy".*
>
> Wouter Biesiot (Meadows, 1998, p. 17)

The title of Bell and Morse's (1999) book *Sustainability Indicators: Measuring the Immeasurable* captures the overwhelming and "impossible" task of measuring the progress of

sustainable development. As stated in the introduction, it involves hard discussion and priorities. The process of constructing indicators involves pressures, agendas and biases (Bell & Morse, 1999). Sustainable development indicators (SDIs) function as operationalization of the goals and measures of the strategies. It is important to keep in mind that the strategies represent the political agenda and discourse whereas the indicators show performance in relation to certain goals. However, the construction of sustainable development indicators is also part of the political process, and actors from various arenas can participate in the development of indicators. Governments want to portray themselves in the best possible lights, and indicators may be chosen on the basis of a political agenda.

"Indicators are simple measures, most often quantitative that represent a state of economic, social and environmental development in a defined region – often at the national level" (Ness, Urbel-Piirsalu, Anderberg, & Olsson, 2007, p. 499). At first indicators were used by biologists to monitor ecosystem health (Bell & Morse, 1999). Although some articles and institutions call for standardized sustainable development indicators, they are context-specific and "there is no size fits all." Since the Rio-Initiative such indicators have been seen as the core element and tool of operationalizing sustainable development. Article 40 of Agenda 21 demanded "reliable, easy-to-use and up-to-date information for improvement of decision-making related to sustainable development" (UNCED, 1992). To come up with such indicators as first described by Agenda 21, there are at least four critical questions that need to be answered:

- What is to be sustained
- What is to be developed
- The link between environment and development
- For how long a time

> (U.S. National Research Council: Board of Sustainable Development, 1999, p. 22)

The fourth question "for how long a time" refers to the time-horizon of goal achievements and accounts for the intergenerational component. In addition to these four questions, another important feature is how to develop adequate measures that will be able to quantify the priorities

made. Essentially, the question becomes whether each indicator enables to capture what it is supposed to measure. First and foremost, the indicators should track long-term trends and point out future challenges. At the same time, they should also capture changes from one year to another. Consequently, a complete set of indicators should be able to cover significant areas of sustainable development (Statistics Norway, 2012a). At the same time, the main intention of the indicator set should be to tell if governments, nations and the global community are on a sustainable development path.

7.3 The United Nations (UN) - Sustainable Development Goals (SDGs)

An appropriate starting point for indicators would be the United Nations and their continued work on sustainable development, especially since the Rio-Initiative. There will be a short recap from the last two decades ending with the most recent work on Sustainable Development Goals (SDGs). UN Commissions on Sustainable Development (CSD) indicators serve as a reference for countries when it comes to developing or revising national indicators for sustainable development. The first set of indicators emerged in 1995 and was finalized in 1996 with 134 indicators (Spangenberg, Pfahl, & Deller, 2002). In the next set in 2007, indicators were no longer categorized into pillars. Instead the concept of themes and sub-themes were adopted. The UN CSD indicators are consistent with the Millennium Development Goals (MDGs):

Millennium Development Goals (MDGs) 2000-2015
1. Eradicate extreme poverty
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership

Table 7.1. Millennium Development Goals. Source: United Nations.

The Millennium Development Goals (MDGs) will be succeed by a new set of Sustainable Development Goals (SDGs). The 17 new SDGs are listed in the report *The Future We Want* (United Nations, 2012):

Sustainable Development Goals (SDGs) 2015-2030	
Goal 1.	End poverty in all its forms everywhere
Goal 2.	Eradicate extreme poverty
Goal 3.	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
Goal 4.	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
Goal 5.	Achieve gender quality and empower all women and girls
Goal 6.	Ensure availability and sustainable management of water and sanitation for all
Goal 7.	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8.	Promote sustained, inclusive and sustainable economic growth, full and productive and decent work for all
Goal 9.	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
Goal 10.	Reduce inequality within and among countries
Goal 11.	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12.	Ensure sustainable consumption and production patterns
Goal 13.	Take urgent action to combat climate change and its impacts *
Goal 14.	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15.	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16.	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17.	Strengthen the means of implementation and revitalize the global partnership for sustainable development

*[Goal 13.] Acknowledging that the United Nations Framework Convention on Climate Change is the primary international, intergovernmental forum for negotiating the global responses to climate change.

Table 7.2. Sustainable Development Goals. Source: United Nations.

When comparing the MDGs and the SDGs, the focus on climate change has been strengthened through SDG goal 13 above: "take urgent action to combat climate change and its impacts". MDGs were successful in making progress in reducing poverty, but they were less successful when it came to climate change and the environment (United Nations, 2014a). Another outcome of the Rio+20 conference were that SDGs should be: action-oriented; concise; easy to communicate; limited in number; aspirational and global in nature (United Nations, 2012). The resolution further states that SDGs should be "universally applicable to all countries, while taking into account different national realities, capacities and levels of development and respecting

national policies and priorities" (United Nations, 2012, p. 47). As mentioned in the introduction, SDG 13 dealing with climate change will apply to the focus on climate. Unquestionably, SDG goal 13 is also relevant for intergenerational justice.

7.4 The Organization for Economic Co-operation and Development (OECD)

"The mission of the Organization for Economic Co-operation and Development (OECD) is to promote policies that will improve economic and social well-being of people around the world " and re-establish healthy public finances as a basis for future sustainable economic growth" (OECD, 2015). The OECD developed the first international sets of core environmental indicators in 2001. The OECD identified a shortlist of ten key indicators based on their prior work and experience. OECD Environment Ministers had endorsed these indicators before they were released. Many countries had asked for a reduced number of indicators selected from existing larger sets. In turn, these limited core indicators would improve the wider communication with the public (OECD, 2001). The OECD Core indicators were selected on basis of their policy relevance with respect to the major global challenges as well as their measurability. The key environmental indicators are divided into five pollution issues and five natural resources and assets in Table 7.3 below:

OECD set of key environmental indicators	
Pollution issues	**Available indicators**
Climate change	1. CO2 emission intensities: Index of greenhouse gas emission
Ozone Layer	2. Indices of apparent consumption of ozone depleting substances (ODS)
Air Quality	3. Sox and NOx emission intensities
Waste generation	4. Municipal waste generation intensities
Freshwater quality	5. Waste water treatment connection rates
Natural resources & assets	
Freshwater resources	6. Intensity of use of water resources
Forest resources	7. Intensity of use of forest resources
Fish resources	8. Intensity of use of fish resources
Energy resources	9. Intensity of energy use
Biodiversity	10. Threatened species

Table 7.3. OECD core set of key environmental indicators

For these ten key environmental indicators, data are available for a majority of OECD countries. In addition, OECD Environmental Performance Reviews (EPRs) are performed regularly. The latest EPR for Norway was in 2011 and for Sweden in 2014, and these reviews will be used as data background.

7.5 Stiglitz Commission

In 2008, then President of the French Republic appointed the Stiglitz commission to identify the limits of the Gross Domestic Product (GDP) as an indicator of economic performance and social progress. To organize its work, the Commission organized itself into three working groups, focusing respectively on: Classical GDP issues, Quality of life and Sustainability. The commission was asked to consider what additional information would be necessary in order to produce more relevant indicators of social progress and alternative measurement tools. The final motivation was to discuss how to present statistical information in an appropriate way (Stiglitz, Sen, & Fitoussi, 2009). The report was for a wide audience of policy-makers, academic community, statisticians, users of statistics and civil society organization.

After looking into the technical world of sustainability indicators, the commission came up with three messages and four recommendations. The three messages of the commission demonstrate how they felt measuring sustainability is different to standard statistical activity:

- We need projections, not only observations
- We need prior responses to normative questions
- We need to consider each country and its contribution to global sustainability or unsustainability

On the other hand, the four recommendations by the commission dealt with the issue of sustainability assessment. A sustainability assessment should distinguish between current well-being and sustainability and whether both aspects can last over time. Whether these levels of well-being can be sustained over time depends on whether stocks of capital that matter for our lives (natural, physical, human, social) are passed on to future generations (Stiglitz et al., 2009, p.

11). The commission suggested one monetary index for sustainability and a sub-dashboard separately for non-monetary dimensions of well-being. Moreover, they advocated using a "stock-based" or "capital-based" or "wealth-based" approach to sustainability (Stiglitz et al., 2009, p. 265). Their main argument was that this approach would show how much wealth we leave for future generations. The messages and the recommendations of the Stiglitz commission will be compared with the sustainable development indicators of Norway and Sweden.

7.6 OECD Pressure-State-Response (PSR)

Each indicator in the Pressure-State-Response (PRS) framework is classified as a pressure, a state or a response factor in Table 7.4. However, the pressure factor is labeled driving forces in the UN's Driving forces-State-Response (DSR) framework. "Pressures" describe processes and activities that have a positive or negative impact on sustainable development. "State" indicators describe the current state of the issues at hand concerning for instance the environment and resources as in the example and Table 7.4 below. The actions dealing with the state indicators or the current state would be the "responses" aimed at moving towards sustainable development.

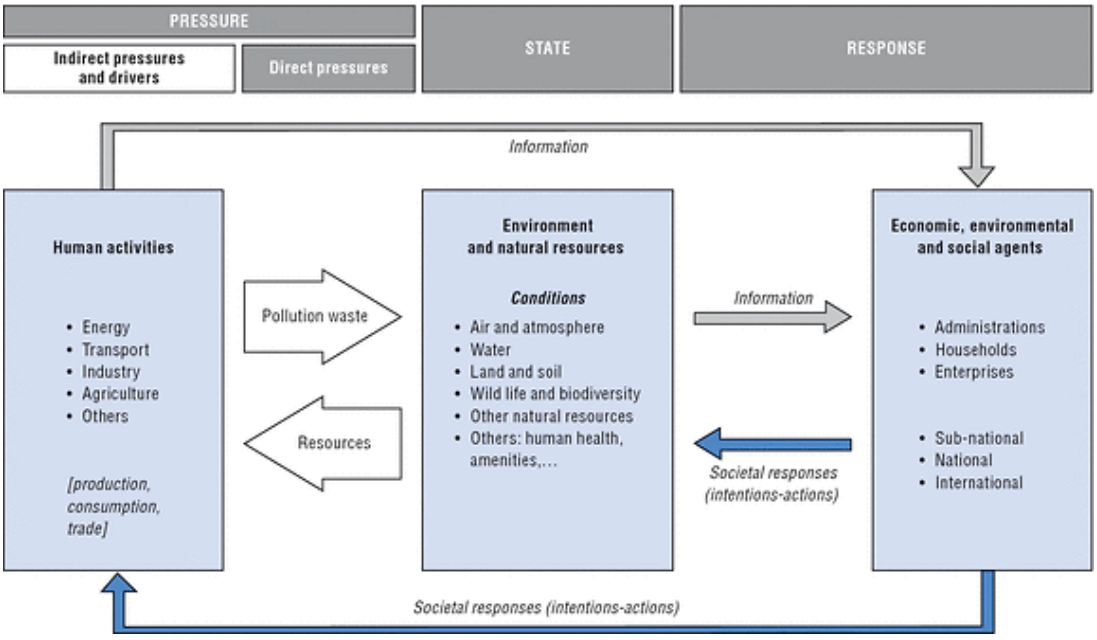

Figure 7.1. The OECD Pressure-State-Response model. Source: OECD.

7.7 The capital framework

The capital framework calculates national wealth among different kinds of capital: financial capital, produced goods, natural, human, social and institutional capital (United Nations, 2007). All types of capital must be expressed with the same measurement, usually in monetary terms. In general, the capital approach to sustainable development identifies the resources available today, and the aim will be to maintain or develop the resource base over time. The approach is further complicated by the idea of substitutability between different types of capital. Economists disagree on the issue of substitutability between different types of capital, especially the relationship between manmade capital and natural capital. For instance, Beckerman (1994, p. 195) maintain that "some natural resources can be run down as long as adequate compensation is provided by increases in other resources, perhaps even in the form of manmade capital". On the contrary, Daly (Daly, 1995) contends that manmade and natural capitals are basically complements, not substitutes. The argument is that certain aspects of our eco-system are fundamental. Certain aspects of our eco-systems and natural resources are often considered critical natural capital. For instance, no substitution is possible for a stable climate, biological diversity or a beautiful landscape. The use of monetary terms and disagreement about substitutability remains the main challenge within the capital approach.

7.8 Issue- or theme-based framework

The issue- or theme-based frameworks are the most widely used type of framework (United Nations, 2007). It is often used in conjunction with a capital approach. The issue- or theme-based approach is often used in official national indicators due to their flexibility. The various issues and themes related to sustainable development are grouped and related to priorities and policy targets stated in national sustainable development strategies. The theme-based framework also makes it easier to communicate these issues to the public.

7.9 The dashboard approach

The dashboard approach to sustainability uses a mathematical tool and software enabling a comparison between different indicators and countries (Scipioni, Mazzi, Mason, & Manzardo,

2009). The dashboard tool is adopted internationally to enable a graphical representation according to themes and their corresponding indicators. The themes are then graded according to a color scheme and scale in order to determine performance. This allows for a visual representation of the status of the different themes of sustainable development. In turn, this may be a powerful communication tool for awareness and decision-making. However, there may be a danger of oversimplification when different indicators are aggregated to complement the dashboard scheme.

"When indicators are aggregated in some manner, the resulting measure is an index" (Ness et al., 2007, p. 499). Aggregated indicators combine multiple conceptually related themes and variables to a common index. The common index or indices make it easier to convey the results to politicians and the public. At the same time, the synthesis of complex information may be the weakness of aggregated indicators. It may lead to incorrect and hasty conclusions about policy matters and priorities. As Meadows (1998, p. 4) stated, "if too many things are lumped together, their combined message may be indecipherable." Thus, decision-makers should be aware of how the indices are constructed in order to make informed decisions. Costanza (2000, p. 342) warned that users of aggregated indicators must be aware of "where the number came from, how they were aggregated, the uncertainties, weights and assumptions involved".

7. 11 Criteria for Indicator Analysis

This chapter has presented an overview over various approaches and frameworks towards sustainable development and sustainable development indicators. The main intention of indicators is to show whether things are getting better or worse in terms of sustainable development or to determine if there is a "sustainability gap" between the targets and the present state (Fischer et al., 2007). Based on the overview of different frameworks for sustainable development indicators, there seems to be no standard criteria or a blueprint approach to the process. When comparing Norway and Sweden's approaches to sustainable development and corresponding indicators, the analysis will use the framework of OECD and the work of the Stiglitz commission to explore what these indicators measure in terms of weak or strong sustainability on the issues of climate change and intergenerational justice.

CHAPTER 8: INDICATOR ANALYSIS

National sustainable development strategies define goals, which are translated to and measured by indicators. The current sets of sustainable development indicators (SDIs) for Norway and Sweden are explored in this chapter. The indicators for climate change and intergenerational justice have been selected for analysis. As far as intergenerational justice, the scope will be narrowed to the generational targets set by Norway and Sweden. Naturally, climate change is also relevant to future generations. Norway and Sweden have definite goals when it comes to climate and future generations. The Norwegian and Swedish indicators will be interpreted using the OECD indicators and the Stiglitz commission as foundations.

8.1 The Norwegian indicators

The most recent indicator set for Norway is based on the official Norwegian report NOU 2005:5 *Simple Signals in a Complex World*. Statistics Norway has measured these indicators since then. In the 2008 National Budget, 17 indicators were presented, and these are from the 2014 set:

Topics	Indicators for Norway
Economic capital	1. Net national income per capita by sources of income
	2. Generational accounts: Need to tighten public sector finances as a share of GDP
Human- and social capital	3. Trends in income distribution
	4. Population by highest level of educational attainment
	5. Disability pensioners and long-term unemployed persons as a percentage of the population
	6. Life expectancy at birth
Environmental capital	7. Norwegian emissions of greenhouse gases compared with the Kyoto Protocol target
	8. Emissions of NOx, NH_3, SO_2 and NMVOCs
Biodiversity and cultural heritage	9. Proportion of inland water bodies classified as "clearly not at risk"
	10. Proportion of coastal waters classified as "clearly not at risk"
	11. Trend in standards of maintenance of protected buildings
Natural resources	12. Energy use per unit of GDP
	13. Size of spawning stock of Northeast Arctic cod and Norwegian spring-spawning herring, compared with the precautionary reference points
	14. Irreversible losses of biologically productive areas
Hazardous chemicals	15. Potential exposure to hazardous substances
International cooperation for sustainable development and combating poverty	16. Norwegian official development assistance, in NOK and as percentage of gross national income
	17. Imports from least developed countries and from all developing countries

Table 8.1. The set of 17 indicators for sustainable development from Statistics Norway 2014.

These 17 indicators show a more complete picture of Norway nationally. The expert commission, which prepared the report *Simple Signals in a Complex World*, based their work on a capital approach (NOU 2005: 05). Many of the 17 indicators of Norway are quantifiable measures such as economic, social and human capital. Many indicators for resources and natural capital are measured in quantifiable measures whereas others are measured using an aggregated index. On a global level, one of the most prevalent sustainable development problems is climate change. Emissions of greenhouse gases are measured in tons and in reference to a baseline year of 1990. The indicator "generational accounts" related to the intergenerational justice nationally. The generational goal calculates the percentage of the budget that may need to be tightened in order for national wealth to be non-declining over time. Many of these indicators are measured in terms of a timeline, and the graphic presentation in Figure 8.1 below gives a more comprehensible picture.

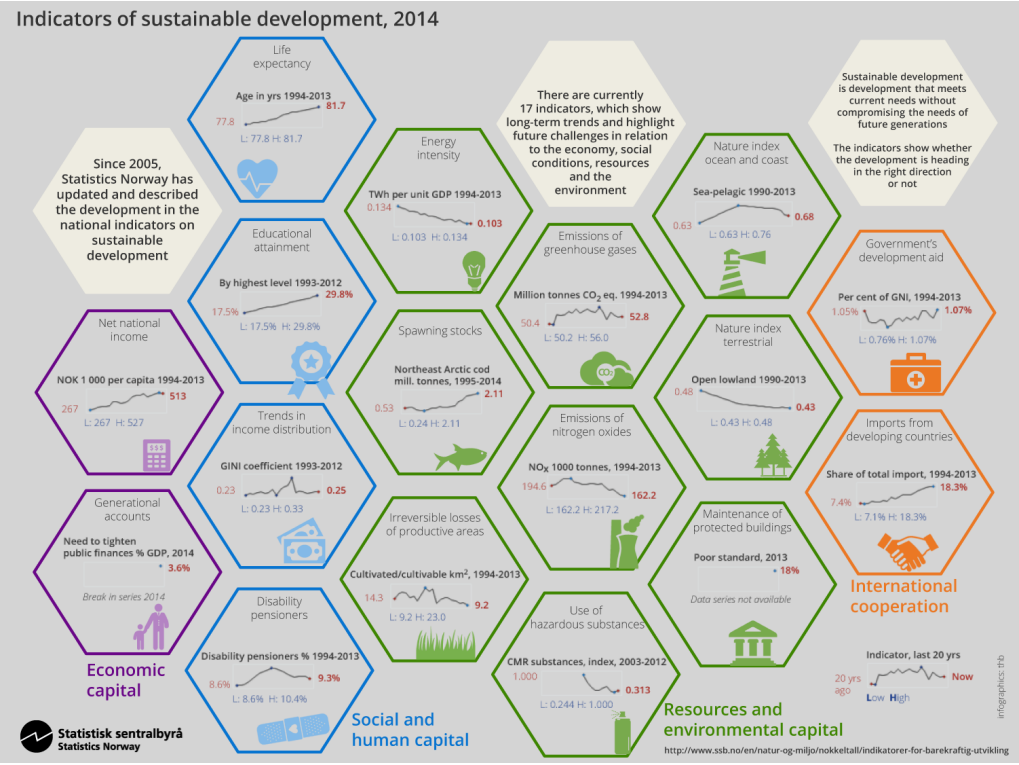

Figure 8.1. Indicators for sustainable development in Norway 2014. Source: Statistics Norway

The above illustration of the indicators shows that the indicators follow the framework of the three pillars: economic pillar in purple, social pillar in blue, environmental pillar in green and the

international cooperation in orange which could be called the international or institutional pillar. The Norwegian set of indicators is a combination of a capital approach and a sub-set with themes according to a dashboard approach (Langhelle & Ruud, 2012). Many of the OECD core environmental indicators from the short list of 2001 can be found among the Norwegian indicators. The key indicators adopted from the OECD core set would be climate change, ozone layer, air quality, fish resources, biodiversity and intensity of energy use. In line with the Stiglitz commission, Norway is using a combination of a monetary approach and a dashboard-theme approach to sustainable development.

Climate change

The important factor for climate change is measured in CO2 equivalents with year 1990 as the reference year. Figure 8.2 shows Norwegian greenhouse gas emissions from 1990 until 2014.

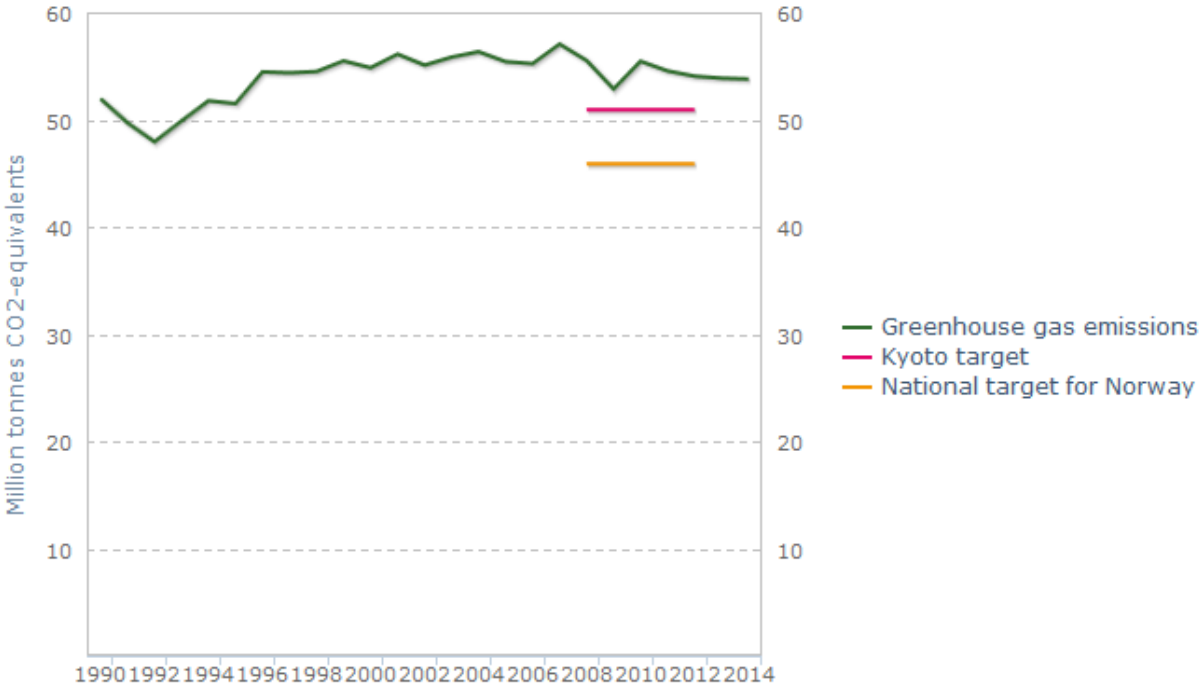

Figure 8.2. Greenhouse gas emissions for Norway. Source: Statistics Norway.

In the graph, the green curve shows the Norwegian greenhouse gas emissions in millions of tons CO2 equivalents. According to Statistics Norway, the red line is the Kyoto target and the yellow

line represents the additional 10 percent reduction commitment that was promised in the 2008 national strategy. The gap between the actual emissions and the national target is meant to be covered by flexible mechanisms through emissions trading. The discussion in Norway has been revolving around balancing national and global reductions (Hovden & Lindseth, 2004; Langhelle & Ruud, 2012). The broad consensus in Norway is that it is more economically feasible to use flexible mechanisms compared to taking the full reduction nationally (Hovden & Lindseth, 2004, p. 63). Currently, Norway is dependent on flexible emission mechanisms. However, in the national strategy the goal is to take *responsibility* (author's italics) for 100 percent of the reductions by 2050 in order to become carbon neutral. However, to take 100 percent of the responsibility for reductions by 2050 is not the same as taking the full reductions nationally. The goal of taking 100 percent of the responsibility for Norway's greenhouse gas emission and be carbon neutral in 2050, will probably not be possible to reach without flexible mechanisms as stated in the strategy (St.prp. nr. 1 (2007-2008), p. 50).

According to Statistics Norway, the emissions for 2013 were 53.9 million tons CO2 equivalents. The latest and preliminary statistics for greenhouse gas emissions were released in May this year showing 53.8 million tons CO2 equivalents for 2014 (Statistics Norway, 2015b). The two latest years show a stable trend of emissions of CO2 equivalents. In the reference year of 1990, the Norwegian emissions were 51.9 million tons. It is worth noting that this is inconsistent with the numbers reported by Miljødirektoratet (Directorate of Climate and Pollution)[13]. Between 1990 and 2014, this represents an increase of 3.5 percent. Thus, the longer trend shows that Norway is not reducing its CO2 emissions according to the national target. This means that Norway is behind compared to the Kyoto-II target of 2020 as seen Figure 8.2 above. As Norway's long-term strategy is to be carbon neutral by 2050, this calls for the transition to a low-carbon society.

Intergenerational justice

The generational goal for Norway is related to the National Budget. Since Norway adopted a national wealth perspective when the indicators were developed in 2005, the generational goal is related to government finances. Indicator number 2 measures the need to tighten public finances

[13] 49,8 million tons CO2 equivalents were emitted in the reference year 1990 (Directorate of Climate and Pollution, 2013).

in relation to the Gross Domestic Product (GDP) in order to secure the current welfare state for future generations. This indicator shows the percentage that must be reduced in order to secure the future of the welfare system with the current policies in place.

Statistics Norway has reported this statistic since 2002, and the annual percentage has been anywhere from 2 percent to 10 percent. A new indicator called S2 based on such calculation in EU was introduced in 2013. The S2 model projected that the percentage for 2014 was 3.6 percent. This model is more accurate than the calculations between 2002 and 2012. The Norwegian understanding of sustainable development is based on a policy that national wealth should be non-declining over time. This indicator factors in the justice for future generations by maintaining the national wealth. The national wealth in Norway counts economic capital, social capital, resources and natural capital to make up the total national wealth. The generational account indicates whether the current welfare system will be sustainable in the long-term for future generations (Statistics Norway, 2012b).

According to Statistics Norway, the government finances are solid compared to other countries. However, long-term calculations show that the continuation of current policies combined with economic predictions will not be sustainable in the future. In a government document called "Perspektivmeldingen 2013" (the Perspective Report 2013, author's translation), the reference path of the welfare system will be 6 percent of the GDP towards 2060 due to an ageing population. Hence, the income of the public sector must be increased or costs must be reduced by 6 percent in order to maintain the most important social benefits. At the same time, the report underscores that these projections are uncertain.

8.2 The Swedish indicators

Sustainable Development Indicators for Sweden – a first set 2001 had 30 indicators broken into four themes: efficiency, contribution and equality, adaptability and values and resources of the coming generations. Within these themes, the indicators encompass economic, environmental and social dimensions. The fourth and last theme "values and resources of the coming generations" emphasized the economic, ecological and human resources we pass on to future generations. It

was a rather pragmatic approach, but the attitude was that much of the work would remain and would be on-going. Moreover, the emission of carbon dioxide was recognized as the most pressing issue with regard to future generations.

This first set was expanded in the 2005 strategy to 12 headline indicators and 87 indicators based on the EU indicator system (EU, 2013). In 2012, Statistics Sweden reported these indicators to the EU:

Topics	Headline indicators for Sweden
Socioeconomic development	1. Growth of gross domestic product
Sustainable consumption and production	2. Resource productivity
Social integration	3. Risk of poverty
Demographic changes	4. Employment rate of older workers (55-64)
Health	5. Expected number of healthy years after birth 6. Life expectancy at birth
Climate change and energy	7. Emission of greenhouse gases 8. Renewable energy sources
Sustainable transports	9. Energy use for transport relative to GDP
Natural resources	10. The presence of common bird species in agricultural landscapes 11. Conservation of fish stock
Global citizenship	12. Official development support
Good governance	Infringement case (difficult to assess)

Table 8.2. The set of 12 headline indicators for sustainable development 2012 based on European SDI database. Source: Eurostat.

It can be argued that many of these indicators also follow some of the themes of the OECD Core Environmental indicators even though Sweden uses the themes of the EU SDIs. OECD core environmental indicators include climate change, fish resources, biodiversity and intensity of energy use. Moreover, other significant environmental indicators are covered by the 16 environmental quality objectives. The 16 environmental quality objectives are the foundation of the government's environmental policy and is the common platform for all the stakeholders of Swedish environmental efforts (Comm. 2005/06:126, 2005). In this way, Sweden's approach demonstrates a policy approach towards sustainable development. In the following the focus is on the 16 environmental quality objectives since it incorporates both climate change and the generational goal for Sweden as shown in Figure 8.3:

Figure 8.3. The 16 objectives for environmental quality in Sweden. Source: Swedish Environmental Protection Agency.

Climate change

In Figure 8.3 above, the 16 objectives for environmental quality are presented with an icon and each goal has sub-indicators and sub-themes by the Swedish Environmental Protection Agency (Swedish EPA). Many of the objectives are accompanied by a qualifying adjective describing the quality to be maintained. Even though these adjectives are subjective and normative in nature, it demonstrates that Sweden emphasizes the environment's intrinsic value. To a certain extent, some of these objectives show signs of strong sustainability such as the objectives of maintaining non-substitutable natural capital such preserving thriving wetlands and protecting a magnificent mountain landscape. Some examples of sub-indicators for these two are: preserving different varieties of marsh, breeding sites for birds and protecting mountain species of wolverine and polar fox (Swedish EPA, 2015c).

The majority of the environmental objectives are quantifiable measures with a time series in order to monitor the trend of various indicators. The first environmental qualitative objective is climate: reduced climate impact. There are several sub-indicators under reduced climate impact: energy use, greenhouse gas emissions, number of kilometers driven by car per capita, number of

mountain fox cubs, community temperature index and growth season (Swedish EPA, 2015a). The most relevant indicator for the comparison with Norway is greenhouse gas emissions in million tons of CO2 equivalents using the baseline year of 1990:

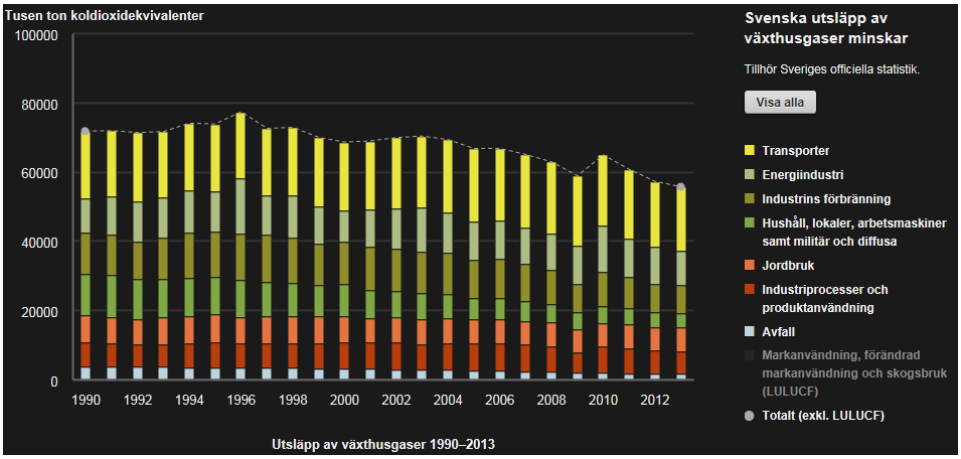

Figure 8.4. Total greenhouse gas emissions in Sweden 1990-2013. Source: Swedish Environmental Protection Agency.

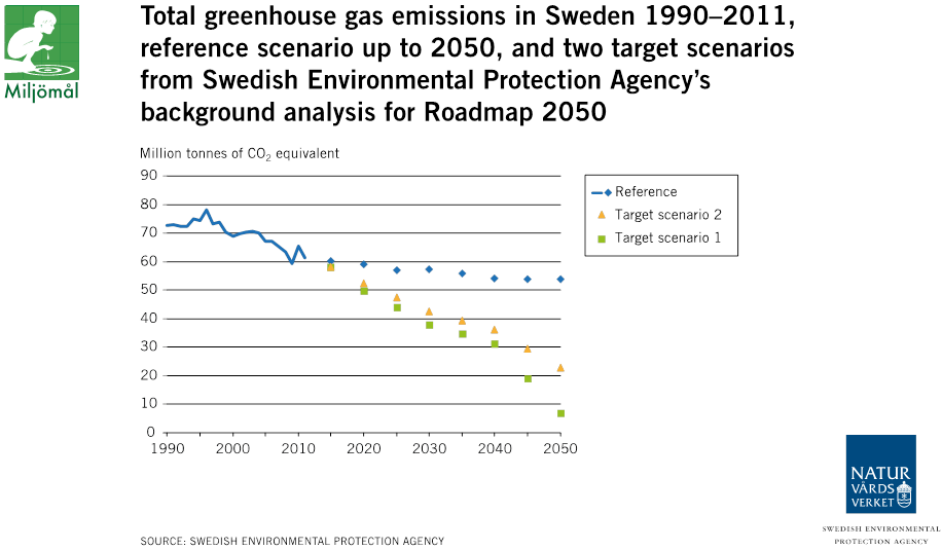

Figure 8.5. Total greenhouse gas emissions in Sweden 1990-2011 and scenario up to 2050. Source: Swedish Environmental Protection Agency.

According to Swedish Environmental Protection Agency (Swedish EPA), Sweden emitted 55.8 million tons CO2 equivalents in 2013 (Figure 8.4). That was a 2.7 percent reduction compared to 2012 (Swedish EPA, 2015b). Recent statistics for 2014 show a reduction by another 3 percent

compared to 2013 to 53.9 million tons CO2 equivalents. Both the statistics of 2103 and 2014 will be below the 60 million tons in Figure 8.5 above and thus following the blue reference line. In Sweden, there has been a downward trend in greenhouse gas emissions, and the reduction has been 25 percent between 1990 (reference value 71.8 million tons) and 2014. By 2020, the goal is to reduce the emissions of greenhouse gases in Sweden by 40 percent compared to 1990. This decrease is planned to be achieved by emission reductions in Sweden, investments in other EU member states as well as flexible mechanisms such as the Kyoto protocol.

The latest Swedish Climate policy states that Sweden will contribute to reducing global emission by becoming carbon neutral by 2050 (cite the last climate policy). Swedish greenhouse gas emissions are projected to fall, but considerably less than projected by the target scenarios proposed in the Swedish Environmental Protection Agency's analysis of Roadmap 2050. The Roadmap 2050 project is an initiative of the European Climate Foundation (ECF) and "provides analysis of pathways to achieve low-carbon economy in Europe based on the energy security, environmental and economic goals of the European Union" (web page of roadmap 2050). The pathways suggested for Sweden and by the Swedish Environmental Protection Agency are the yellow line and the green line. These emissions scenarios are the ones that will be difficult to meet by 2050 on the basis of policy instruments already decided on or planned (Swedish EPA, 2015c).

Intergenerational justice

The overall goal of Swedish environmental policy is the generational goal: "to be able to pass on to the next generation a society in which the major environmental problems have been solved" (Swedish EPA, 2013). This means that the direction of the changes in the society needs to occur within one generation. The generational goal implies that the 16 environmental quality objectives must be met by 2020 with the exception of "reduced climate impact" (to be met by 2050). With that as a starting point, the generational goal is intended to guide environmental action on every level of society. The progresses of four of the 16 environmental quality objectives are positive for the environment. Every year these objectives are monitored, and every four years there is an in-depth evaluation. This year the in-depth evaluation concluded that only two of the 16 objectives would be met by 2020. Despite the positive trend, only two of the objectives will be met: a

protective ozone layer and a safe radiation environment (Swedish EPA, 2015c). The report points to the major reason for the "sustainability gap" being that environmental concerns don't weigh enough against other interests, especially economic ones.

In the 2005 strategy, it is affirmed that Gross Domestic Product (GDP) primarily reflects economic growth and cannot be translated to human welfare. Thus, economic and social indicators have to be supplied with the environmental quality indicators to track natural capital. In Sweden, these 16 environmental quality objectives have been chosen as the generational goal in order to hand over to the next generation a society in which the major environmental problems have been solved. Needless to say, this ambitious goal shall not increase environmental and health problems outside Sweden's borders.

8.3 OECD analysis

The Organization for Economic Co-operation and Development (OECD) developed a core set of environmental indicators in 2001 in Table 7.3. The two key categories are pollution issues and natural resources and assets, and there are five indicators under each category. Many of the indicators in Norway and Sweden are built on these ten indicators: climate change, ozone layer, air quality, waste generation, freshwater quality, freshwater resources, forest resources, fish resources, energy resources and biodiversity. The OECD report from the Rome conference (OECD, 2000, p. 189) lists the Swedish environmental quality objectives as an example of using the Driving forces-Pressures and State-Impact-Response (DPSIR) framework. The DPSIR framework is an expanded version of the Driving forces-State-Response (DSR) framework.

Norway is also mentioned in the OECD report (OECD, 2000, p. 317) as having had a less systematic approach towards indicators and policy-making at first. However, many of the Norwegian indicators are also chosen based on the Driving forces-State-Response (DSR) or Driving forces-Pressure-Response (DPR) framework. In addition, Norway adopted another approach to complement the DSR framework called National Accounting Matrix including Environmental Accounts (NAMEA). The NAMEA system connects national economic data with environmental data, and thus is a tool for linking environmental impact to economic activities. Consequently, this is one of the reasons for Norway's selection of indicators. Norway has a

combination of a capital approach and a sub-set of themes according to a dashboard approach. In the strategy, national wealth was seen as basis for welfare, and it can be named a policy-oriented capital approach (Moe, 2007). Based on the OECD core set of indicators, OECD performs reviews regularly of every OECD-country. The most recent report was performed in 2011 for Norway and in 2014 for Sweden.

OECD Environmental Performance Review: Norway 2011

The previous Environmental Performance Review (EPR) had been conducted in 2001 before the indicator set of 2005 was in place. Thus, in this review, OECD commented on the unique approach of integrating economic and environmental indicators of the national strategy of 2008. The approach to national wealth ensures that the depletion of oil and gas reserves contributes to increasing other types of capital. The high economic growth and the oil and gas industry have contributed to higher emission of greenhouse gas (GHG). The CO2 emissions from offshore oil and gas extraction increased by 79.8 percent between 1990 and 2009. Along with Sweden, Norway was among the first countries to introduce a carbon tax. Norway is struggling to meet its Kyoto commitments, and it joined the EU Emissions Trading System (EU-ETS) in 2008.

The OECD recommends several mitigation efforts to Norway. The most important recommendation is instituting "clear, realistic and cost-effective domestic targets for mitigating GHG emissions by 2020 and 2050, and strengthen the policies to meet these targets" (OECD, 2011, p. 3). Despite this strong recommendation, OECD seems to consider Norway as a leader in mitigating climate change. The bottom line for the OECD-report of 2011 is that "further efforts are needed to achieve ambitious climate targets" (OECD, 2011, p. 15). The previous climate discussion showed clearly that Norway has not managed to reduce GHG emissions since the reference year of 1990. In fact, the green line in Figure 8.2 shows that GHG emissions have risen, and there is a significant emission gap to be closed by 2020. So, this can definitely be called a "sustainability gap" between the target set and the current state of emissions in Norway.

OECD Environmental Performance Review: Sweden 2014

According to OECD, Sweden's environmental quality is generally very good. The 2014 report confirms the Swedish claim of 20 years ago that it has a long history in environmental policy. The previous OECD report for Sweden was conducted 10 year ago, in 2004. In the meantime, the Swedish environmental policy has shown results. The carbon intensity of the economy is the second lowest among OECD member states. Renewable and nuclear energy covers 2/3 of Sweden's energy needs. Taxes and charges are pricing instruments used since the early 1990s. However, the OECD recommends that it would be timely to consider further use of pricing mechanisms as well as discontinue use of other measures such as generous tax breaks of company cars and commuter allowances. Since 2000, GHG emissions have declined by 16 percent by using a successful climate policy mix of market-based approaches. The carbon tax, the Kyoto protocol and the EU emissions trading system have been used. The warning from OECD is that some of the GHG emission reductions have been too costly, and to maintain public support Sweden has to establish more cost-effective solutions. In conclusion, "Sweden aims to maintain its leadership role in addressing climate change" (OECD, 2014a, p. 14). That may bode well for the generational goal of Sweden in addressing the environmental problems within one generation.

Norway and Sweden are both adhering to the three objectives behind indicators intended by OECD. According to OECD, there should be a common framework with technical measures such as physical, monetary and spatial scales. These technical measures should the monitored and evaluated for the purpose of policy analysis. Core indicators should highlight key aspects of sustainable development and allow for comparisons, evaluation and reviews. These key aspects and statistics draw attention to fundamental issues and the ability to follow trends over time (OECD, 2005). These three OECD objectives and design of core indicators seem to be within the recommendations of the Stiglitz commission.

8.4 Analysis versus Stiglitz commission

To reiterate, the Stiglitz commission reviewed available indicators in three working groups: Classical GDP issues, Quality of Life and Sustainability. This may also be interpreted to constitute the three pillars and dimension of sustainable development: the economic, the social

and the environmental. The commission placed importance on human well-being as being interdependent on both economic and non-economic values. Non-economic values for people are "what they do and what they can do, how they feel and the natural environment they live in" (Stiglitz et al., 2009, p. 11). These are among some of the needs mentioned in *Our Common Future* as well. The dual use of economic and non-economic indicators reflects the choices of the welfare states of Norway and Sweden even though Sweden places a stronger emphasis on the environmental dimensions through the 16 environmental quality objectives and in its overall goal. The Norwegian capital approach follows the concept of non-declining welfare over time and the generational account in combination with indicators to monitor the natural capital and resources. In comparison, the Swedish strategy uses the generational goal related to the environmental quality objectives as a key policy of sustainable development. At the same time, Sweden keeps track of other headline indicators with the EU indicator set. Both approaches support the conclusion of the Stiglitz commission on how to choose relevant indicators that matters in measuring sustainability.

Sustainability relies on whether human well-being can last over time and be passed on to future generations. Therefore, indicators should account for both monetary and non-monetary facets. In accordance with the Stiglitz commission, we must be able to measure all of these aspects in quantifiable terms: the economic, the natural, the physical, human and the social. In conclusion, many of the commission's main conclusions support the indicator approaches taken in Norway and Sweden.

8.5 Comparison of indicators

The discourse analysis made the claim that Norway and Sweden have a similar understanding of sustainable development, namely weak sustainability. They both underscore the Nordic welfare model, and its focus on human wealth and well-being. Many indices rank Norway and Sweden among the top countries to live in. For instance, the human development index (HDI) of UN measures development by combining indicators of life expectancy, education attainment, and income, so this index represents the social dimension of sustainable development. On the human development index, Norway is ranked number one and Sweden is ranked number 12, and they are both in the category "very high development". In the human development report for 2014, the

percentage of fossil fuels is measured: the percentage for Sweden was 31.7 percent and for Norway 57.3 percent. Even though renewable energy is not part of the scope of the thesis, it may be noted that Sweden scored considerably higher than Norway.

On the quality of life index (QLI), Sweden is ranked number 2 and Norway is ranked as number 12. Currently, the quality of life index puts the highest weight on pollution. The argument is that "if the environment is polluted too much, the economy and safety cannot fulfill it" (NUMBEO, 2015). Consequently, Sweden has a lower score on the pollution index than Norway as well as lower price on housing measured by "property price to income ration". However, the most significant factor is the pollution index since it weighs the most. These indices are aggregated indicators, and they measure and weigh different variables and dimensions of development respectively. However, they do show that countries with a great emphasis placed on human wealth and well-being score the highest. These indices are more "nice to know facts" and do not in themselves contribute to policy-making on sustainable development. However, such indices explain somewhat the image Norway and Sweden has as "leaders" of sustainable development. The most important indication will be on the actual policies in place and goal achievement. The strategies show that they have great ambitions and specific goals and targets. The indicators measure how these goals and target are progressing. How are they are actually doing?

Climate change

The climate indicator measured in greenhouse gas emissions shown both in the figures and by the numbers affirms that neither Norway nor Sweden is following their preferred scenarios. These scenarios are the needed pathways that will lead to a sustainable path consistent with the goals and target of 2°C and the aspiration of being carbon neutral in 2050.

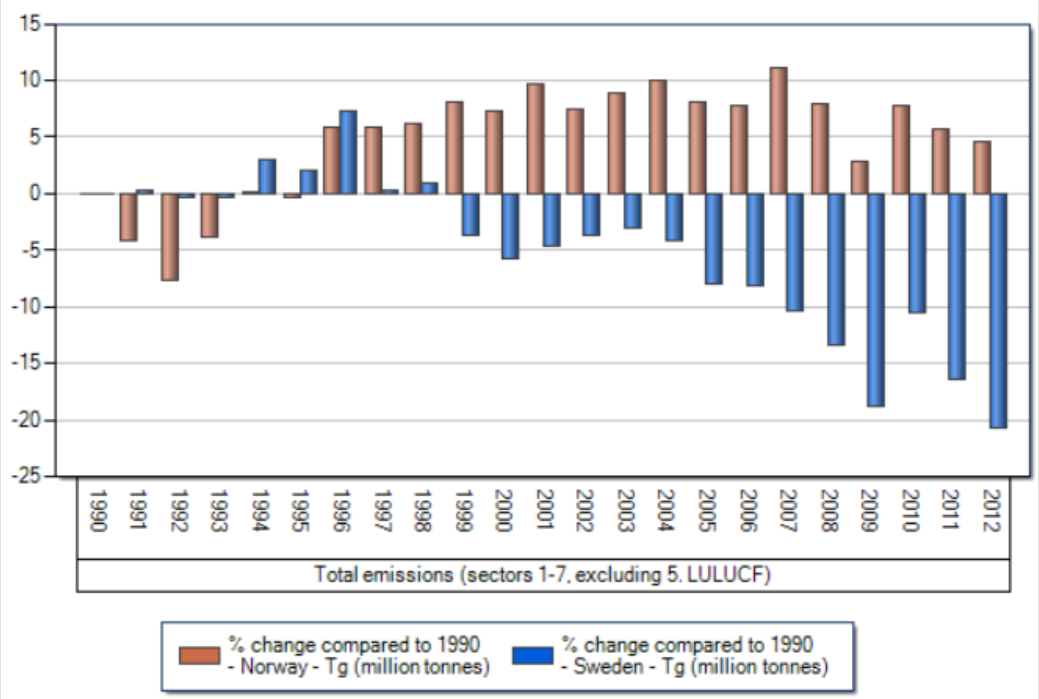

Figure 8.6. Percentage change in total greenhouse gas emissions for Norway and Sweden (1990-2012). Source: EEA.

Figure 8.6 shows a comparison between Norway and Sweden. Norwegian GHG emissions show is a clear rise. In contrast, Sweden shows a reduction of about 22 percent in GHG emissions. However, this reduction is not sufficient to meet the ambition of set by the Swedish Government. Both countries measure GHG emissions within the various sectors. One of the main reasons why Norway is lagging behind is the increase of emissions in the oil- and gas sector (Statistics Norway, 2015a).

As seen in the Figure 8.7 below, Sweden has been able to decouple growth and the rise in GHG emissions shown as "absolute decoupling". Decoupling occurs when the growth rate such as GHG emissions is less than that of its driving force as in Gross Domestic Product (GDP) (Moldan, Janouskova, & Hak, 2012). The GDP growth in Sweden between 1990-2011 has been about 23 percent while the reduction in GHG emissions has been about 17 percent in the same time period (IEA, 2012). In Norway there have been minor signs of decoupling shown as "not absolute decoupling". There has been about 8 percent rise in greenhouse gas emissions while the growth rate has been around 18 percent. In conclusion, Sweden has been successful in the goal set forth in the strategy of decoupling growth and emissions.

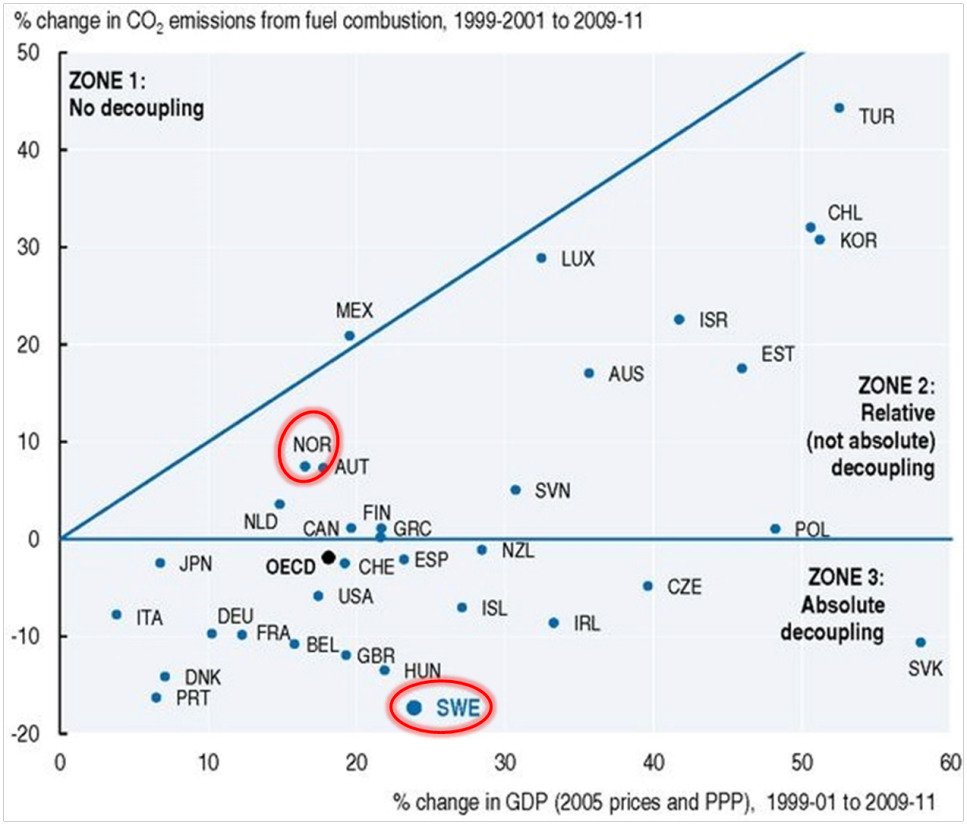

Figure 8.7. Decoupling CO2 emissions from economic growth in 1999-2011. Source: IEA (2013), IEA CO2 emissions from fuel combustion database.

At the time of Dalal-Clayton's study, indicators of sustainable development were in its infancy. The only indicator referred to in the study was the ecological footprint (Dalal-Clayton, 1996). The issue of climate change was on the agenda back then, but no significant goals or commitments on climate mitigation were made by either Norway or Sweden. The measurement of CO2 equivalents has emerged as a common global indicator on climate change. Another possible indicator to compare by is the carbon footprint or CO2 emissions per capita. Figure 8.8 below shows that the Norwegian emissions per capita are slightly reduced in 2012 (10.6 tons) compared to the reference year of 1990 (11.9 tons). On the other hand, Sweden, starting from a significantly lower level than Norway in 1990 (8.5 tons), has a significant reduction in 2012 (6 tons).

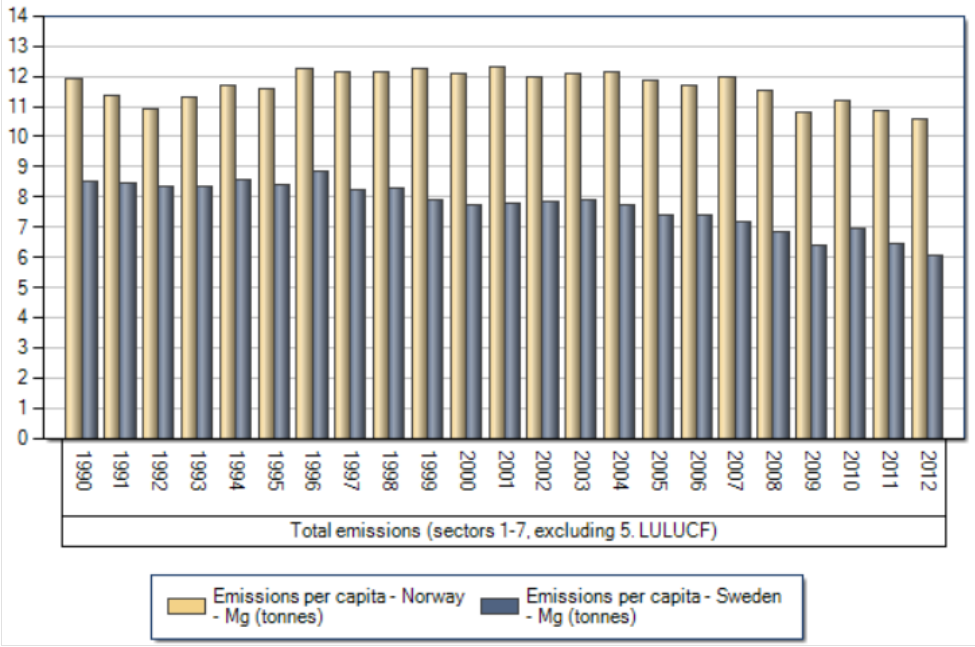

Figure 8.8. Greenhouse gas emissions per capita for Norway and Sweden EEA (1990-2012). Data sources: EEA.

Intergenerational goal

As far as the generational goal, Norway and Sweden have different approaches in order to measure how they are accounting for intergenerational justice. The strategies analyzed showed that Sweden has placed a strong emphasis on environmental quality objectives to future generation. Of course, Sweden has other indicators from the EU indicator set that measures national wealth. As far as Sweden's commitment to future generations, the goal is to leave a society to the next generation in which the major environmental problems have been solved (Swedish EPA, 2013). On the other hand, Norway's generational account is to maintain the national wealth by sustaining the current welfare system. Notwithstanding, Norway has a few similar environmental theme-based indicators like Sweden to measure the pressures on the environment such as the nature index for ocean and coast. However, comparing Sweden's 16 environmental quality objectives in Figure 8.3 with Norway's environmental pillars in Figure 8.1, the claim can be made that Sweden has other strong sustainability components than Norway in the environmental dimension.

The analysis and comparison of the one main indicator on climate of Norway and Sweden demonstrate that their goals in 2020 may not be met. Moreover, the generational goal of Sweden

by 2020 is showing that so far only two of the 16 goals are on target. As far as the projections for 2050, their analysis of both countries show that the scenarios envisioned may not be achieved without new policies and strong measures taken within the next 15 years. Even though Norway and Sweden may not reach their respective goals, they continue to strive towards meeting them. Thus, may it be fair to claim that Norway and Sweden's work on sustainable development has made them "leaders? Consequently, can they be said to be on a sustainable development path?

CHAPTER 9: ON A SUSTAINABLE DEVELOPMENT PATH?

9.1 The indicators and sustainable development

The preceding chapters of data and analysis of the national sustainable development strategies have focused on the discourses, the document content and the indicators. The analysis ended by questioning whether it may be fair to say that Norway and Sweden are taking "leading" roles in the work on sustainable development. The goals set for climate mitigation and the generational goals were reviewed together with results of the corresponding indicators. Norway has chosen a capital approach and a generational account in dealing with national intergenerational justice whereas Sweden has decided on an environmental approach including climate change as the national generational goal. Altogether, both the Norwegian and Swedish strategies and indicators portray weak sustainability.

The climate goal for both Norway and Sweden is to be carbon neutral by 2050. The scenario graphs projecting the necessary paths to be taken showed that Norway and Sweden are not following the desired sustainable development path with regard to climate mitigation. The indicator of greenhouse gas emissions in CO2 equivalents showed that Norway and Sweden are not contributing sufficiently on a global scale to climate mitigation. However, Sweden has been able to cut their emissions more than Norway since they have been able to achieve total decoupling. With regard to generational justice in Norway, Statistics Norway and *Perspektivmeldingen 2013 (The Perspective Report 2013, author's translation)* (St.meld. nr. 9 (2008-2009)) show that it will also be a challenge to maintain the national wealth as non-declining over time. Sweden's generational goal towards 2020 of meeting the 16 environmental quality objectives is not on target. One of these objectives is "reduced climate impact". As we have seen, only two of the 16 goals are being achieved, and "reduced climate impact" is not one of them. Norway and Sweden's weak understanding of sustainability makes it difficult to stay on sustainable development path.

9.2 Economic growth – an "unsustainable" global discourse?

According to Dryzek, developed societies must reduce the excessive stress their past economic growth has imposed upon the earth (Dryzek, 2005). Even though we know more about the effects of climate change, there is lack of adequate political measures as well as progress on these measures. Some raise the question whether international efforts "to promote environmental protection and sustainable development have reached an impasse" (Langhelle & Ruud, 2012; Meadowcroft et al., 2012). Overall, the rhetoric of governments in national strategies supports the concept of sustainable development. At the same time, path dependency of the political system and neo-liberalism of Western economies make it difficult to facilitate the necessary action needed in sustainable development issues (Kambites, 2014). Some argue that neo-liberalism is a global discourse of economic globalization and the dominating force of global politics. Thus, it is also the driving force for economic development globally.

Kambites (2014) critical discourse analysis of the UK national strategies and concluded that the British government has taken advantage of the normative nature of sustainable development. Through discursive techniques and adaptation of the sustainable development concept, the demands of a neo-liberal economy superseded the social and environmental dimension of sustainable development. As it turns out, the political discourse of sustainable development argues that we must make economic growth compatible with environmental protection. One of the reasons is that national economic interests override global sustainable development concerns. Consequently, in this narrative there is no apparent conflict between development and environmental protection. This weak sustainability version of sustainable development will lead to "business-as-usual" policies and maintaining of the status quo. As a result, sustainable development has lead to unsustainable policies and lack of action in the UK according to Kambites. This "unsustainable" political discourse and lack of consistent policies leads to the sustainability gap between the targets set and the actual goals being achieved as shown in Figure 9.1 below. Sustainable development calls for a focus on long-term foundational issues rather than short-term pragmatism. In addition, shorter-term policy actions are needed to provide incentives and regulations to encourage consistent sustainable behavior (Fischer et al., 2007).

This “unsustainable” political discourse and narrative is not unique to UK, but to other developed and for many developing countries as well. The national strategies for Norway and Sweden also portray apparent paradoxes between economic growth and environmental commitments. Since Norway is an oil-producing country, the dual task is to balance the discourse to support the oil industry as well as the goal of becoming carbon neutral. In Sweden, the recent in-depth report of the 16 environmental quality goals concluded that economic interests drew the longest straw in most cases (Swedish EPA, 2015c).

9.3 The sustainability gap

The indicator for climate change measured in CO2 equivalents shows a “sustainability gap” for Norway and Sweden. A “sustainability gap” represents the discrepancy between the targets set and the progress made. This is illustrated in Figure 9.1. Climate change has a unique position as a planetary boundary and an ultimate limit. An ultimate limit is linked to the minimum requirement for sustainable development as described in *Our Common Future* of not endangering the natural systems that supports life on Earth (WCED, 1987, p. 45). Thus, climate change is both a global and a national issue. By monitoring just this global indicator on a national scale, it may be possible to answer whether Norway or Sweden is on a sustainable development path.

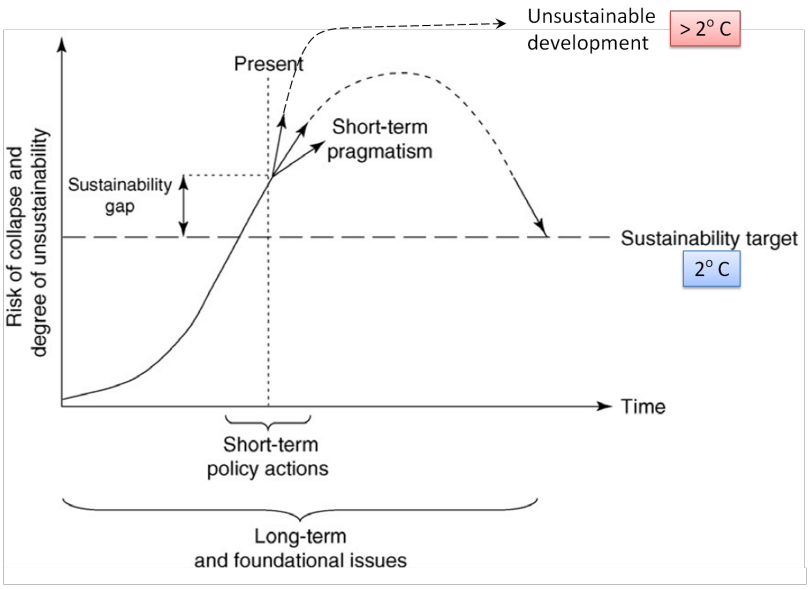

Figure 9.1. Conceptual framework of sustainability challenges (expanded version from the original by the author of this thesis). Source: Fischer et al., 2007.

Let's assume that the horizontal dashed line in the Figure 9.1 is the 2°C target. The two curved lines represent one sustainable path and one unsustainable path. The first curved line represents the sustainable path leading towards the sustainability target with *sufficient* climate adaption or climate mitigation. The second curved line above represents the unsustainable path with *insufficient* climate adaption or climate mitigation. According to Lancker and Nijkamp (2000, p. 4), side 114"a given indicator does not say anything about sustainability unless reference point value such as a thresholds is given to it". The indicators CO2 or CO2 equivalents are used to measure greenhouse gas emissions to track global warming. Pure CO2 and CO2 equivalents are the driving forces for global warming. The 2°C target may be seen as a critical threshold value and exceeding this threshold may cause irreversible damage to the environment. The Stiglitz commission saw the carbon footprint, CO2 emissions per capita, as an indicator capable of sending a strong message about "over-utilization of the planet's capacity for absorption" (Stiglitz et al., 2009, p. 71). Moreover, the commission concluded that the carbon footprint could be disaggregated at any level. In this way, carbon footprint is a powerful indicator for monitoring and comparing individual countries. As shown in Figure 9.1, climate change is a long-term foundational issue, and the target of 2°C would represent a threshold. Thus, climate change would require both short-term and long-term policy-action.

The most important indicator analyzed in this case study was greenhouse gas emission in Norway and Sweden. The progress on the indicator on climate demonstrated that Norway (Figure 8.2) and Sweden (Figure 8.4) are not following their projected sustainable paths in order to meet their respective targets for national and global climate mitigation by 2020 and 2050. Both countries are using flexible mechanisms for climate mitigation. Norway has chosen to use these flexible mechanisms to a larger extent than Sweden. In this way, Norway is only taking two-thirds of the emission reductions nationally. Therefore, Norway would not be able to "remain" on a sustainable development path without the Kyoto mechanisms and the EU trading scheme. Even with these flexible mechanisms in place, Norway has not been able to reduce its national emissions and has a "sustainability gap" to close by 2020 and even larger towards 2050. By looking at the goal for 2020, Norway is not on a sustainable path neither globally nor nationally.

Despite Sweden's stronger focus on decoupling and renewable energy sources, the ambitious goals set by Swedish government will not be met by 2020 without new measures. Therefore, Sweden is also not on a sustainable development path since "reduced climate impact" is a part of its generational goal. The in-depth evaluation of Sweden's 16 environmental quality objectives concluded that economic concerns had overriding priority over environmental concerns. This year however, Sweden has further strengthened its environmental focus by establishing an environmental advisory council called "Miljömålsrådet" to be a watchdog over the government and the 16 environmental quality objectives. Time will show whether Norway and Sweden will be able to close their "sustainability gaps" by 2020 and institute stronger climate mitigation efforts in the years to come until 2050. From a global perspective and with regard to ultimate limits, their climate mitigation efforts have not been adequate so far.

9.4 Climate change and weak versus strong sustainability

Weak versus strong sustainability is the title of Neumayer's book (2013). The debate about climate change is one of the themes in this book. Neumayer's analysis of the two paradigms is confined to an "economic methodology since both paradigms are essentially economic" (Neumayer, 2013, p. 191). The central difference between the two opposing paradigms is on the issue of substitutability. In weak sustainability, natural capital can be substituted with other forms of capital whereas in strong sustainability natural capital may not be substituted. The purpose of using these two broad paradigms is to see what their implications are on climate change, intergenerational justice and sustainable development paths. Furthermore, how do these two paradigms relate to an indicator for greenhouse gas (GHG) emissions in particular?

Depending on which paradigm one subscribes to or chooses there will be implications for how the issue of climate change is viewed. As a general rule, most political discourses of sustainable development seem to fall into the weak sustainability paradigm. At the same time, the 2°C limit is seen as a planetary boundary and may qualify for the strong sustainability paradigm (Pezzey & Burke, 2014). In this way, the political discourse of sustainable development seems to "accept" both paradigms simultaneously. This may be the reason why the Stiglitz commission recommended indicators from different paradigms, both monetary and non-monetary (Stiglitz et

al., 2009). This further complicates the political discourse of sustainable development because these two paradigms prescribe two opposing views of substitutability of natural capital.

Climate change as an indicator was analyzed in this thesis because of its major impact and long-term consequences for future generations. In Neumayer's opinion, climate change is an ideal object to study regarding the question of substitutability (Neumayer, 2013). The major impacts of climate change may not be felt to the full extent for some decades or even longer (IPCC, 2014). This means that future generations may suffer more severe consequences than the current generation. The costs of climate mitigation will be borne mostly by the current generation whereas the benefits of these mitigation efforts will be "appreciated" by the future generations (Neumayer, 2013).

Weak sustainability could be interpreted as an extension to neoclassical economics. If unsubstitutable natural capital has a unique position, neoclassical economic efficiency will not suffice for sustainability (Harris, 2001). For instance, Daly (1995, p. 46) demanded a drastic change in "the basic framework of our thinking" towards a vision of the macroeconomy as a subsystem of the finite ecosystem. In one recent article of Nordhaus et al. (2012), three planetary boundaries including climate change are acknowledged. In other articles, Nordhaus has used cost-benefit analysis to account for the optimal cost-efficient policy to reduce emissions. His analysis is based on the assumption of substitutability in the weak sustainability paradigm. Weak sustainability is regarded as traditional neoclassical welfare economics where human welfare is non-declining over time. In the weak sustainability paradigm, the amount of GHG emissions should only be what is needed to maintain the capacity to provide non-declining welfare over time (Neumayer, 2013).

As long as the substitutability of natural capital is taken for granted in the weak sustainability paradigm, large-scale reductions of GHG emissions may be less likely. The implication will be that government policies may only protect the natural capital stock "if it is inferior to investments in other forms of capital" (Neumayer, 2013, p. 192). In Norway, this view has been part of government policy and administered by the Finance Department of Norway.[14] In Norway, the

[14] Personal communication, Finance Department, May 12th, 2015.

capital approach is the basic foundation of the sustainable indicator set. This implies that Norway's generational goal is non-declining welfare over time, which is consistent with the weak sustainability paradigm. The Swedish generational goal is represented by the 16 environmental quality objectives including "reduced climate impact". This may be interpreted as moving in a direction of strong sustainability and intergenerational justice.

Demanding aggressive reductions in GHG emissions can only be justified if natural capital is regarded as non-substitutable as in the strong sustainability paradigm. Moe argues that "strong sustainability assumes that substitution is limited, and there is a minimum requirement for maintenance of critical levels of natural capital" (Moe, 2007). In the strong sustainability paradigm, certain forms of natural capital are non-substitutable because it serves basic life-support functions such as the global climate (Neumayer, 2013). A stable climate would be looked upon as critical natural capital (CNC). To limit global warming to 2°C may be regarded as a strong sustainability constraint (Pezzey & Burke, 2014). Using the strong sustainability paradigm as the basis for comparing Norway and Sweden, neither of the two countries is on a sustainable development path. Both countries need to introduce even stronger climate mitigation. Sweden appears to be closer to strong sustainability acknowledging, "reduced climate impact" as part of its generational goal.

The strong sustainability paradigm will account for justice to future generations better than would discounting (Daly, 1995). The discussions among economists and in Nordhaus'(2011) cost-benefit analysis revolve around discount rates (Beckerman, 1994). Discount rates measures the rate at which society would be willing to trade present for future consumption. In the case of climate change, the question would be how much it is worth today to avoid climate disruption later this century. Neumayer (2013) argues that the issue of substitutability should be the proper point of discussion between those who demand strict emission reductions and those who call for lower emission reductions, not the discussion about the "correct" discount rate.

To sum up, at the heart of the climate and intergenerational justice discussion are the ramifications of climate changes and which one of the two paradigms one belongs to. Whether natural capital is looked upon as substitutable or non-substitutable has major consequences for

climate change. If natural capital is substitutable, there is not enough justification for strong GHG emission reductions. On the other hand, if natural capital is non-substitutable, this calls for stricter GHG emission reductions.

9.5 Towards a sustainable society?

Several decades ago, some scientists argued that sustainable use of ecosystems would require a paradigm shift towards a stronger understanding of sustainability" (Cairns, 1997). The insight about planetary boundaries and our ecosystems being finite are not new. The term "ultimate limits" was mentioned in *Our Common Future(WCED, 1987, p. 45)*. The WCED commission recognized that sustainable development requires a change "in the content of growth to make it less material and energy-intensive in its impact" (WCED, 1987, p. 52). This may be interpreted to encapsulate a politics of limits and a paradigm shift. Meadowcroft (2012, p. 289) suggests a politics of limits, which would place "self-limitations at the center of political argument". As stated in the section about weak and strong sustainability, the 2°C target is considered an upper limit within strong sustainability.

Many governments are talking about the green shift as a paradigm shift. Norway talks about moving toward a low carbon society whereas Sweden talks specifically about a sustainable society in their strategy. The more recent OECD Green Shift discourse has brought forth a new OECD Green Growth policy and green indicators in the quest for a low carbon society. Green growth entails a transition to a low carbon economy. OECD's definition of green growth means, "promoting economic growth while reducing pollution and greenhouse gas emissions, minimizing waste and inefficient use of natural resources, and maintaining biodiversity" (OECD, 2014b). OECD has developed indicators for green growth with six headline-indicators: carbon and material productivity, environmentally adjusted multifactor productivity, a natural resource index, changes in land use and cover, and population exposure to air pollution. Norway is in the process of developing "green indicators", and the finance minister has requested the construction of such indicators (Finansdepartmentet). Sweden, on the other hand, has focused on sustainable production and consumption in line with the EU strategy.

The rhetoric of the Norwegian government is that "climate + growth = true", and green growth represents a "new economy" with new possibilities. Apparently, there is no conflict between climate concern and economic growth. Likewise, the prime minister of Sweden advocated sustainable prosperity over fossil shortsightedness (Löfven, 2015). In the speech, he stated that: "if you cannot deliver growth and jobs, you will soon be out of office". This statement illustrates one of the key elements of a political discourse; namely that actors of the discourse define the content and common meaning of a concept. In particular, political actors are prone to display a narrative that will appeal to the public.

The aim of the green shift and green growth is "to develop a new political framework to deal with the economy and the society, so as to enable technological progress and product innovation" (Brand, 2012, p. 6). Brand links green economy to the concept of "green capitalism" since there seems to be no necessary structural transformation of society and its actors. The socio-ecological transition presented by OECD and other institutions suggests that "the overuse of resources and endangered eco-systems are to be reduced by appropriate societal measures such as resource efficiency, recycling and reduced consumption" (Brand, 2012, p. 5). He argues that the view of the relationship between society and nature is masked by such terms as "problems", "megatrends" or "humankind". Nature is first and foremost viewed as a resource, and the idea of "growth of limits" or planetary boundaries are not part of the political discourse of green growth.

CHAPTER 10: CONCLUDING REMARKS

Many political discourses of sustainable development have continued to make economic growth compatible with environmental protection. This may be wishful thinking and unsustainable in the long-term. Present government structures and national strategies may prevent necessary actions on the global, national and local level. These discourses may also lead to sustainability gaps where it will be difficult to reach a goal and stay on a sustainable development path as in the cases of Norway and Sweden. One of the key principles of Dalal-Clayton's framework was to monitor, evaluate and learn from experiences, and since his study, indicators have become an integrated part of national strategies. The important issue becomes how these indicators can serve as tools for policy-making (Garnåsjordet et al., 2012). Stiglitz also pointed out that indicators are more than mere statistics, and we need projections about the future regardless of its uncertainty and the complexity of models (Stiglitz et al., 2009).

Even though a single indicator such as climate change doesn't reveal the complete picture of sustainability for Norway and Sweden, the indicator on green house gas emissions alone is able to show that these countries are not on a sustainable development path. The UN Post-2015 agenda and its 17 sustainable development goals will soon be in place. The Millennium Development Goal 7 on the environment including climate has been reinforced through Sustainable Development Goal 13: "to take urgent action to combat climate change and its impacts" (United Nations, 2015c). A section of sustainable development goal 13 emphasizes one of Dalal-Claytons guiding principles of raising public awareness about climate change mitigation. The UN Post-2015 agenda may result in new indicators both nationally and globally, and Norway and Sweden may need to adapt and revise their recent strategies, goals and indicators.

Furthermore, it remains to be seen if the most recent OECD's indicators on Green Growth will lead to a transition toward stronger sustainability. The question becomes whether green indicators and ecosystem service accounting indicators will advance the efforts of sustainable development, especially in terms of climate change as well as other environmental concerns. In the future, it may be necessary to develop monetary indicators to account for the intrinsic value and qualities of nature such as a stable climate. This illustrates that the work on developing adequate and good

indicators to monitor and evaluate sustainable development may need to continue. Concurrently, an indicator set should not be overly extensive, but rather point to important trends and warning signals (Aslaksen & Garnåsjordet, 2014). It is important to choose both monetary and non-monetary indicators that will count and will emphasize the fundamental issues of sustainable development at any given time (Stiglitz et al., 2009). The ultimate goal of operationalizing indicators will be to change our political discourses and our current fossil fuel dependent economies into low carbon economies while at the same time demonstrating global solidarity with present and future generations and staying within planetary boundaries.

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APPENDIX 1 – WEB SITE

A web site was established to present the research project. It included interview guides, lists of informants and links to relevant public web sites.

This is the welcome page, including a description of the research project:

Here is the personal presentation:

APPENDIX 2 – INTERVIEW GUIDE NORWAY

Interview Guide Norway

Norway´s national sustainable development strategy

1. How do you understand the concept of sustainable development in the Norwegian strategy?

2. What, in your view, is the relevance of the Norwegian sustainable development strategy on policy-making?

Sustainable development indicators (SDIs)

3. How are the SDIs of the Norwegian strategy used in policy-making?

4. How are the SDI numbers and trends communicated to politicians?

The Finance Department of Norway

5. How does the Finance Department coordinate sustainable development policies?

6. When it comes to policy-making for sustainable development, what is the role of the Finance Department?

Climate change

7. What are Norway´s most important commitments towards mitigating global climate change?

Norway´s focus on future generations

8. What is Norway doing to maintain their focus on the needs of future generations?

9. Which qualities (economic, environmental and social) should be sustained in order to meet the needs of future generations?

Norway and the EU

10. Norway is not a member of the EU – How does this fact influence Norway´s policies on sustainable development?

Final question

11. What indicates whether Norway is on a sustainable path or not?

APPENDIX 3 – INTERVIEW GUIDE SWEDEN

Interview Guide Sweden

Sweden´s national sustainable development strategy

1. How do you understand the concept of sustainable development in the Swedish strategy?

2. What, in your view, is the relevance of the Swedish sustainable development strategy on policy-making?

Sustainable development indicators (SDIs)

3. How are the SDIs of the Swedish strategy used in policy-making?

4. How are the SDI numbers and trends communicated to politicians?

The sustainable development council in Sweden

5. How does the sustainable development council work?

6. When it comes to policy-making, what is the mandate of the sustainable development council?

Climate change

7. What are Sweden´s most important commitments towards mitigating global climate change?

Sweden´s generational goal

8. What is Sweden doing to maintain their focus on the generational goal?

9. Which qualities (economic, environmental and social) should be sustained in order to meet the needs of future generations?

Sweden and the EU

10. Sweden has been a member of the EU since 1996 - How important is Sweden´s EU membership in terms of sustainable development?

Final question

11. What indicates whether Sweden is on a sustainable path or not?