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HOW DO MEMBER STATES IMPLEMENT EUROPEAN ENVIRONMENTAL POLICIES?

A comparative look at Denmark and the Netherlands' implementation of the 20/20/20 objectives.

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Executive Summary.

The following study deals with the manner in which, Denmark and the Netherlands have implemented three European environmental objectives set out in the 2020 strategy. Additionally, it aims to provide an insight into the reasons for a successful achievement of the three objectives. These objectives concern emissions, energy efficiency and renewable energy. The first objective concerns the reduction of emissions by 20% in Denmark and 16% in the Netherlands, this objective is divided between national efforts, and a European Emission Trading System (ETS). Secondly, renewable energy should provide 30% of the energy in Denmark and 14.5% in the Netherlands. Finally, Energy efficiency must be increased by 1.5% every year until 2020.

A framework was created allowing the classification of the national policies used for the implementation of the climate change objectives. Furthermore, the national progresses will be reviewed in order to understand what affects the national implementation of these targets and the results of the implementation up to 2014. Denmark and the Netherlands have been chosen because they share many national similarities (economic, geographic, and political), and both rely on wind as a source of renewable energy.

The ETS is explored separately from national implementation as is it a carbon trading system at the European level using tradeable emission allowances. However, the allocation of allowances has been too lenient, and the carbon market prices collapsed. Accordingly, the system did not have the intended impact and has been reformed. However, the new reform is deemed too weak by some, and stricter measure should be used.

There are similarities in the way in which these three targets are implemented in Denmark and the Netherlands. The main one being the use of large cross-cutting agreement to reach energy targets. Furthermore, most of the requirements set by the EU framework for 2020 have been translated into the national frameworks. To continue, there are also some differences in the implementation of the 20/20/20 targets in the two countries, the Netherlands tends to rely on fiscal means, and the use of flexibility mechanisms. On the other hand, Denmark has a balanced mix of different policy types. When it comes to impact of implementation, the major difference come from the performances on the share of renewable energy, the Netherlands is not expected to meet its target in time. Otherwise, the two countries are expected to reach their emission and efficiency targets. The reason behind the inconsistent energy performance in the Netherlands does not come from a non-implementation of EU legislation. There seem to be two major factors impeding Dutch renewable performances, first the high population density makes renewable energy project conflict with local interests. Secondly, the national political scene has been creating uncertainties in the measure put in place. Nonetheless, the Netherlands now has the required policies, and will deliver its renewable energy performances in the coming years, but will probably not meet the 2020 deadline. The climate change performances are also affected by the recent economic crisis and the warm weather of the past years, which have reduced consumption and economic activities. As such, emission reduction and energy efficiency performances are not only the results of national implementation but the context in which they are implemented.

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List of Acronyms

- ACF: Advocacy Coalition Framework
- AEAs: Annual Emissions Allowances
- BPM: Dutch tax on vehicles
- COP: Conference of the Parties
- EAP: Environmental Action Program
- EC: European Commission
- EEA: European Environmental Agency
- EIA: Energy Investment Allowance scheme
- ERUs / CERs: Emission Reduction Unit / Certified Emission Reduction
- ESD: Effort sharing decision (on emission reduction)
- ETS: European Emission Trading Scheme
- EU: European Union
- EUA: ETS tradeable commodity
- EUA: European Emission Allowance (used in the ETS)
- GDP: Gross Domestic Product
- GHG: Green House Gases
- HFCs: Hydrofluorocarbon (GHG)
- LTA: Long Term Agreements (series of Dutch national policies)
- MS: Member States
- MW: Mega Watt
- NETS: Non-ETS emissions (emissions not under the current ETS)
- NGO: Non-governmental Organizations

- NRP: National Reform Programs (Part of EU implementation assesment)
- OECD: Organization for Economic Cooperation and Development
- PBL: Netherlands Environmental Assesment Agency
- PFCs: Perfluorocarbon (GHG)
- PJ: Penta Joules
- R&D: Research and Development
- RE: Renewable Energy
- RES: Renewable Energy Share
- RVO: Netherlands Enterprise Agency
- SDE+: Stands for “Stimulering Duurzame Energieproductie”
- SER: Dutch Energy Agreement of 2013
- SME: Small and Medium Enterprises

Introduction

Climate change has now become a core issue of national and international policies. In the past years, the issue has taken an important place in the public's opinion and also comprises a core issue of nowadays society. Most Europeans consider the environment to be an important aspect that needs to be protected (European Commission, 2007, A).

In the second half 2015, the Dutch Government was subject to a very uncommon judicial case, which is formally forcing the Netherlands to comply with its national and international commitments to the environment. The case brought the attention to the issue of global warming, and the judicial aspect of climate change in regard to international law (Deutsch & MacSwan, 2015). The EU also imposes an environmental framework Member States should implement, hence the following question:

How do Member States implement European environmental policies?

The Environmental policy of the EU is very complex and broad, so the focus will remain on what is referred as the 20/20/20 objectives, which comprise the emission reduction, the energy efficiency, and the renewable energy share objectives of the European 2020 Strategy.

Furthermore, there are numerous Member States implementing the 2020 objectives justifying a two-state comparison of the national objectives for 20/20/20 targets and the means of achieving them. The two states chosen are Denmark and The Netherlands. They have been selected as Denmark is very successful in the area of climate change mitigation, and the comparison could explain why the Netherlands might not be able to achieve all of its commitments by 2020.

To begin with, the framework provided by the 20/20/20 objectives will be studied in order to understand what exactly the Member States' commitments are. Once these commitments have been explored the actual implementation profile of each country will be examined in order to answer the main topic of this paper.

Finally, the results and findings will address the main differences and resemblances in implementation between Denmark and The Netherlands. Additionally, the recent judicial case implies a lack of commitment from the Netherlands in the area of climate change mitigation, the reasons for the inconsistency of the Dutch commitments will also be explored.

Literature review

Policies can be studied from different angles, the decision-making process, for instance, is often analyzed. However, policy implementation has not been a dominant subject amongst academics, thus, a certain mix of different systems will be required to conduct the research and classify the policies used. The following paragraphs will deal with some of the most influential theories and the frameworks used to conduct policy implementation studies.

Top-Bottom and Bottom-Up Framework

To begin with, top-bottom and bottom-top are often seen as the traditional approaches employed to study policies, but it is also used in many other areas of research. Subsequently, the two methods have been used and studied by many academics. M. Hill and P. Hupe (2002) provide an overview of the literature revolving around policy implementation and what they view as the prominent contributors to these two systems.

According to Hill & Hupe (2002), top-bottom theory was founded in 1973 by Jeffrey Pressman and Aaron Wildavsky, but was later developed by numerous academics (p. 44). Top-bottom approach breaks down processes or systems to gain insight into the way they function.

In the mid-70s Donald Van Meter and Carl Van Horn studied the process of policy implementation and more specifically the changes required to implement a policy, which is described as “system building” (Hill & Hupe, 2002, p. 45). Their assumption is that the more change is required the less successful the implementation will be, this assessment is realized with a set of variables such as resources or context.

In the late 80s, Paul Sabatier and Mazmanian also studied the process of implementation in a similar way to Donald Van Meter and Carl Horn’s “system building”. But unlike V. Meter and Horn, they also looked at the results of the policy implementation using a series of questions regarding the consistency of results, which they aim to answer throughout their research in order to provide insightful analysis (Hill & Hupe, 2002, p. 49).

Now that some general theories of top-bottomers have been studied, the principle of bottom-top systems will be described in the following paragraph. Arguably this framework can be quite challenging to realize broad policy studies.

Michael Lipsky is sometimes referred as one of the first bottom-upper because unlike others before in the 70s, he started looking at the street level of bureaucracy (Hill & Hupe, 2002, p. 51), which is where policy is effectively being implemented by individuals. More precisely, the reaction and decision process of these

front liners are put in perspective by Lipsky as they ultimately shape how the policy is carried, which directly impacts implementation of a policy. In other words, individuals (much like the Member State) have targets to meet, but are free to a certain extent on the way they carry out policy implementation.

Both top-bottom and bottom-up systems have their respective critics. Matland (1995), reviews the systems and addresses the recurrent issues noted by academics on the two models.

Top-bottom according to Matland (1995, p. 147), forgets to consider important aspects of policies. The first aspect is that top-bottomers often exclude previous policies preceding the present policy they are studying, thus forgetting an important aspect shaping the decision-making process. The exclusion of the political factor is also a problem addressed by Matland (1995, p. 149), politics involves conflicting groups, and the decision-making may become ambiguous as a result. Ultimately bottom-uppers try to address what could be seen as the biggest flaw in the top-bottom framework by looking at front liners and bureaucracy to understand how policy is carried out in its final stage.

Bottom-uppers are often accused of not being able to provide a broad picture of policy processes and tend to focus on the point of view of the community on policies. Additionally, policy making is in most cases done following a top-bottom approach. The nature of the policies can also raise some problems, front liners do not answer to the society like a government does (Matland, 1995, p. 150).

Since both systems have their specific advantages and disadvantages some academics have been working on marrying both systems in order to come with a consistent and broad framework to analyses policies. Paul Sabatier is a prominent academic and worked heavily on what is called the Advocacy Coalition Framework (ACF). ACF is useful for studying policies and the conflict arising from their process, it assumes that policy is created in a political Sub-system where Coalitions (groups) are conflicting accordingly to their interests and resources (Sabatier, 2006, p. 191). This sub-system also works in a certain context, there are some relatively stable parameters such as resource distribution affecting it, but there are also external events changing the context of policy making such as an economic crisis (Sabatier, 2006, p. 191).

Rational Choice Theory

According to Levin & Milgrom (2004, p. 1), Choice or Rational Choice Theory is centered on individual decision-making. Quite logically, choice theorists tell us to look at the available options to choose from when realizing policies or implementing them, this process is often used in microeconomics in order to assess the best options for policy implementation. As such, the economist David Ricardo uses this approach with his theory of comparative advantage (Ricardo, 1817). This “best option” is often referred as “utility function” or “utility maximization”, which can also be found within utilitarian philosophy, an

inherent problem of the theory is that individual decisions are not always rational and the outcome of the decision-making will not follow the utility maximization principle (Levin & Milgrom, 2004, pp. 1-2). The nature of this theory implies a broad scope of study, it can be used on anything involving a decision-making process, but the real challenge comes from the individual's preference and the ability to predict them. When it comes to European implementation, the preferences of the governments and the concerned parties (organizations, individuals, companies etc.) are difficult to unravel with so many individual preferences in a context that keeps changing, which is why behavioral studies bring one of the biggest critic to the theory. However, rational choice theory can sometimes be used to study environmental policy implementation as it can explain what other possible choices were also available to implement the 20/20/20 objectives, and/or why certain decisions have been made over others.

Policy Interaction

Policy Interaction theories could be used to study European implementation, for instance, the ETS is a European wide system and enters into some complex relations with the Member States and the national implementation of other climate change related policies. Sorrell et al. (2003), study the relation of national climate change policies with the ETS system using a straightforward framework that can be used to gain insight into the complex mechanisms created by the different policies. These interactions are:

Direct/Indirect (between environmental policies/between different types of policies), Operational (policies operating together where targets can move from one to another), Sequencing (where one policy affecting a group is followed by a second policy), and Trading (of commodities such as emission allowance over different policies) (Sorrell, et al., 2003, p. 7). According to Sorrell et al. (2003, pp. 8-9) each of these interactions are subject to a series of different possible assumption, which in term helped him underline recurrent issues such as double regulations (two policies are doing the same, inherently one is useless), or double counting (of allowances or other commodities used).

Policy Type

The 20/20/20 objective resulted in a myriad of different and interrelated policies, it can be useful to study the types of policies adopted by each country. In order to do so, policies will be classified using the four types of climate change policies provided by Oikonomou and Jepma (2007, pp. 3-4).

- Financial Measures (taxes, financial incentives, subsidies etc.)
- Legal/Regulatory Measures
- Organizational Measures (such as agreements between private and public organizations)
- Certificates/Tradable Commodities (such as the EU ETS allowances)

In addition to the framework given by Oikonomou and Jempa (2007), another type of measure is going to be used, many policies consist of informative campaigns in order to improve behavior of the citizen and make them more environmental in their daily lives. As such, “Informative” policies will also be listed under the policy types.

Determinants of Change

Furthermore, the work of Per Nielsen (2013) on policy implementation will be relied upon heavily to describe policies used by the Member States. In his comparative study between policy implementation research and policy implementation science, Per Nielsen (2013) refers to several determinants of changes that can affect the results of the policy implementation. These determinants are listed as follows:

- Implementation object: the object of implementation are divided into two subcategories: Characteristics of the implementation and the objectives
- Implementers: Implementers are numerous (national government, local government, private organization etc.), and each has a different role and nature which in term affects how policy are implemented
- Targets: Who is affected and in what way? Targets can range from big polluters to individuals.
- Context: The context can be very important and directly affects policy implementation
- Strategies to facilitate implementation: This determinant will, however, not be used as Per Nielsen (2013) uses it mainly for policy implementation science since strategies for facilitating implementation of environmental commitments are almost always policies too.
- Implementation impact: The impact is studied on two levels, first looking at the implementers then the impact on the targets laid out previously.

General Assumptions

To add onto the theoretical framework of change, some simple and useful assumption on policy implementation by some academics.

To begin with Toshkov (2015, p. 7) lays out the assumption that the more change is required to successfully implement a policy, the less the policy will be effective, this assumption can sometimes be relevant on the use of alternative options for policy implementation as it generally requires more resources.

Secondly Sabatier and Mazmanian, have described what they consider to be the two critical aspects of policy implementation: Result consistency (with the policy decision and over time) and the Timeframe of implementation (Hill & Hupe, 2002, p. 49).

In short the framework provided by Per Nielsen (2013) will be employed to study the manner in which Denmark and the Netherlands have implemented the 20/20/20 objectives. This framework alone is, however, not sufficient and allows an overview of what can influence implementation and in what way, thus an additional system will be used, the policies will be classed using the four types of environmental policies provided by Oikonomou and Jepma (2007). The effectiveness of the overall policies can also be achieved using Sabatier and Mazmanian's framework and Toshkov's assumption that the degree of change needed directly affects the effectiveness of implementation.

Asides from the theoretical frameworks detailed above, there are other very important theories and concept that should be kept in mind. One of them is the Multilevel Governance theory have become highly relevant in order to explore how the European Union functions. Multilevel Governance (MLG) theory has been studied in an extensive way by two academics. Hooghe and Marks (2003), first started studying European Integration using the MLG approach in 1996, and have consequently laid out solid background on the framework (p. 3). The main assumption of MLG revolves around the basis that the decision-making process is moving from the national level to a higher level (in this case the supra-national European Union), creating new relationships between actors and institutions at different levels (Hooghe & Marks, 2003, pp. 1-3). MLG brings a relevant framework to study policy decision-making in the European Union, but the implementation of different EU policies in two countries is very demanding to achieve using the MLG system as a vast array of public, but also private actors need to be researched.

Methodology

Following the previous discussion on the literature of policy implementation, two different frameworks will be used in order to class and assess the important characteristics shaping policy implementation, the first one is provided by Per Nielsen (2013) with the Determinants of Change. Secondly, Policy Types will allow the classification of the policies.

To continue the Top-bottom approach will be used to explore European Environmental policy implementation. As such, the first part will focus on the European level of policies and the framework of the 20/20/20 objectives. This is necessary in order to understand what is expected of the countries involved. European legislation is very specific, the focus will remain on the main demands and requirements of the directives and other binding texts creating the framework for the 20/20/20 objectives.

Furthermore, the emission objective of the 20/20/20 targets is divided into two categories. First, the European Emission Trading System (ETS) initiated in 2005 is a European wide measure covering about half of the emissions of the EU (European Commission, 2013). Secondly, in 2009, a binding decision often referred to as the Effort Sharing Decision or ESD (European Commission, 2009, A) constrains Member State to reduce their Non-ETS (NETS) emissions to achieve their respective national targets. The ETS itself is implemented differently than the other measures and policies studied. However, it is necessary to explore it and understand its impact in order to get a very important insight into the context of emission reduction in which the Netherlands and Denmark are working with.

On the same note, the national context of Denmark and the Netherlands will be outlined. Like the ETS the national factors are important to understand the resources available but also the amount of work required to implement the 20/20/20 requirements successfully.

Once the ETS and the context in which Denmark and the Netherlands are implementing EU legislation has been explained, the national implementation and the specific policies employed will be explored. First, the Danish implementation of the 20/20/20 objectives will be studied, which will then be followed by the study of the Dutch implementation.

Finally, the last part will focus on the remarks and the findings of the study based on the policies reported to the European Environmental Agency (EEA). The EEA provides a public database of the national policies to mitigate climate change. However, the impact of each policy is often lacking, thus, the overall progress of each country will be used to determine the implementation impact.

Concerning research methods, both, field and desk research have been realized.

European Institution unfortunately never answered, but local agencies in the Netherlands have been helpful and provided some information about the Dutch implementation of the 20/20/20 objectives. The Netherlands Environmental Assessment agency was helpful and introduced me an academic employed by the agency willing to answer some questions. Furthermore, the Dutch National Emission authority has called following an electronic request and confirmed what the most important policies were in place to answer the ESD.

Most of the desk research realized often involve qualitative and quantitative data from official governments (European and national) or international organizations and academic institutions. However, some consistency issue can arise as different units can be used to measure a single policy impact, and sometimes data also conflicts depending on the source.

The time framework of this dissertation will be 2005-2014. The reason for this is that the ETS started in 2005 and preceded the energy efficiency and the renewable energy share directive. Furthermore, the implementation period is ongoing and the information for the year of 2015 is not always available, and projections are almost always subject to uncertainties. When data is missing for the year of 2014, the most recently available numbers will be used instead.

Denmark and The Netherlands have been chosen because they share many resemblances. The study will detail the situation in both countries. Simply put, both countries share a similar repartition in term of economic activities (about 70% in the service sector), their climate is similar due to their geographical situation (which also allows both to create offshore windfarms), their political systems are also similar, and both are producers of oil. The major difference between the two countries regards the geodemographic aspect as The Netherlands is more populated and has a higher density of population. When it comes to the 2020 objective, the dissertation will show that Denmark is ahead and over achieving its commitments while the Netherlands is barely meeting interim targets. As such, if the implementation is similar, then the context of implementation will be a major factor of successful implementation and Member State should work on starting implementation with a good basis. Furthermore, if the implementation means differ, policy formulation would be the source of the unsuccessful implementation coming from the Netherlands.

The framework employed prompts the use of the Implementation Impact as a characteristic of implementation. However, this assessment can be hard to realize, a lot of policies studied are ongoing and the final impact is, therefore, impossible to describe without projections (which can be subject to uncertainties), and sometimes the data is simply not available. As a result the implementation impact

cannot be provided for every single one of the policies used for implementation, however, the general development of each country's performances regarding the 20/20/20 objectives will be used. Furthermore, the 20/20/20 objectives are relatively new and there are often numerous national policies in place before the directives' entry into force that contribute directly or indirectly to the 20/20/20 objectives, thus the implementation will not only focus on the measures that directly answer the directives but also previous national instruments contributing to the 20/20/20 targets.

The European Environmental Framework

The following paragraphs will start by introducing the general environmental approach of the EU with its environmental programs and supra national commitments which will be followed by the specific texts laying out the 20/20/20 framework studied. Finally, important contextual information will be outlined since they directly impact the assessment of policy implementation

Brief Introduction to the European Environmental Programs

The Environmental Action programs

In 1973, the first Environmental Action Program (EAP) was created, and the succeeding EAPs have now become the main guideline for environmental policy in the EU (Baker, 1997, pp. 91-107). As mentioned, several action programs were created over the years, and the environmental aspect has been incorporated as a core characteristic of law making at the European level (European Commission, 2007, B). We are currently in the 7th action program. Action programs in themselves act as the guideline for the EU to draft their policies, thus it suggests objectives and certain measures and approaches.

In 1973 the first program laid out the founding bricks of environmental protection at the European level and introduced the idea of preventing pollution while being compatible with economic and social development (Baker, 1997, pp. 91-107). The programs notably added the sustainability principle to the Maastricht Treaty. However, according to Baker, (1997, pp. 91-107), the incremental programs and policy changes faced an inconsistency problem. Additionally the EAPs are not fully binding and merely serve as a guiding tool.

International Factors

Tackling climate change is a global issue and it affects anyone. Since it cannot be attained alone it requires the European Union to take part in international endeavors to create a sustainable future. Some mechanisms are in place at the European and international level to deal with climate change at the supra-national level within and outside the EU.

European emission reduction targets can be subject to international flexibility mechanisms, Member State can use CERs (Certified Emission Reduction) and ERUs (Emission Reduction Unit) credits within the framework provided by the EU and other international agreements.

These emission credits are part of a European and international system in which states can execute emission reduction projects outside their country and use the resulting emission abatements for their respective national target (European Commission, 2009, B). Credits can also be exchanged as a tradeable commodity.

Furthermore, some targets included in the European environmental policy reflect international agreements. The most known agreement has been the Kyoto protocol, which became effective in 2005 (United Nations, 1998). The European members committed to the Kyoto protocol have achieved their objectives so far (Eurostat, 2013). The EU has been part of long-term negotiations and agreements over the years, recently the COP21 in Paris took place with a new partially binding agreement (United Nation Framework Convention on Climate Change, 2015). It is still too early to assess whether the new agreement is satisfying for reducing climate change.

The recent EAPs and the 2020 commitments

The 6th EAP occurred in the period from 2002 to 2012. Like all EAPs it provides additional guidance for the European Environmental policies. Besides providing additional strategies it also stresses the need for the 2020 goals of a 20% reduction in GHG emissions, to do so it suggests the EU to focus on energy and transport (European Commission, 2001). Having set certain objectives it also proposed the creation of the Emission Trading System which will be explained further.

In addition to climate change, the EAPs also approach most topics concerning sustainable growth such as waste management, or nature and biodiversity. Furthermore, it recommends increased communication across public and private parties as well as individuals and basing environmental decisions on a scientific basis. Overall the action has spawned the creation of several directives detailed later in which recommendation from the EAPs are clearly reflected, these directives will become core elements in the way MS reach environmental goals.

The most recent EAP reports that the EU is lacking in some areas of its environmental policies, according to the 7th EAP four main areas defined in the 6th EAP are concerned. These areas are; climate change; nature and biodiversity; environment and health and quality of life; and natural resources and wastes (European Commission, 2013, A). This study concerns itself mainly with climate change, but the other areas of environmental policy are also intertwined and in a way complement each other's. For example, producing wind turbines in order to augment the share of renewable energy, would be more advantageous if it were manufactured in the most efficient way using less materials, and a superior technology in order to offset maintenance cost in the future.

The irregular trends in the EU are partly appropriated to the lack of implementation by Member State according to the 6th EAP. It shows a need for Member States' compliance and full commitment.

Asides additional framework and assessment for the current objectives, the EAP also paves the road for longer term environmental policy for 2050.

Europe 2020: Framework for a sustainable Growth Strategy

The 2020 Strategy was initially a proposition from the European commission in 2010 and integrates the EAPs guidelines of reducing emission by 20% in 2020 in addition to other objectives for a broad and complete strategy. In total, there are five main areas with different targets for each Member State. The targets studied constitute the Climate change aspect of the Strategy. They are referred as 20/20/20 because the goals are: 20% reduction in emission, 20% increase in energy efficiency and a renewable energy share of 20% at the European level (European Commission, 2015, C).

The four other areas of the 2020 strategy are; Employment, Education, Research and Development and Poverty/Social Exclusion, (European Commission, 2015, C). It should be noted that all these areas are meant to be implemented as a mix to create a sustainable growth in the long-term as they interact in many ways. For instance, employment needs to be maintained (or/and increase) through the possible changes environmental policies will bring to some industries.

The following paragraphs will detail the main pieces of legislation creating the framework of the 20/20/20 objectives. Their important features will be explained in order to understand the national targets of Denmark and The Netherlands and in which way these targets are supposed to be achieved.

Emission Reduction

The European Emission Trading System

Directive 2003/87/EC of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC OJ L275/32 and the Directive 2009/29/EC amending Directive 2003/87/EC for the third phase of the ETS OJ L140/65.

The directive mentioned above is the main piece of legislation setting the framework in which the European Emission Trading Scheme (ETS) operates. Further analysis of the system enabling the trade of emissions under the form of allowances is required to understand the context of emission reduction.

In short the ETS covers a big part of the European emissions and is an EU-wide system to reduce them. It does not require implementation under the form of national policies, but directly influences national performances in the matter (European Commission, 2003).

The Effort Sharing Decision

Decision No 406/2009/EC On the efforts to reduce their emission to meet the Community's greenhouse gases commitment up to 2020 OJ L 140/136.

This decision, as its names enunciates, gives details on how member states share responsibility for reducing the emission of the community to reach an overall reduction of 20% (European Commission, 2009, A). Article 3 of the Effort Sharing Decision (ESD) provides requirements from states to reduce their national emissions to attain their national 2020 objectives, these national targets can be found in Annex II of the Decision No 406/2009/EC. As specified in Annex II of the ESD, the targets for Denmark and the Netherlands are – 20% for the former, and – 16% for the latter, these reduction are based on 2005 levels. This directive is in direct link with the ETS in place in Europe, for instance the allocation in article 7(1) of the ESD refers to the allocation of the ETS.

In order to reach their objectives, MS are given Annual Emission Allocations (AEAs) limiting their national emissions. These AEAs are tradeable much like the ETS allowances, except, only governments and the European Commission can hold and trade them (Kollmuss, 2014, p. 7). This is part of a flexibility mechanism for MS to find cost-effective ways to attain their objectives, but it has a cap at 5% of the national emissions. Annual emissions are calculated so that the community objective of a 20% reduction in emission is secured, thus, every year the AEAs logically decrease. Additionally, the Decision 406/2009/EC permits Member States to use their climate mitigation efforts outside the EU. As such, projects resulting in the reduction of emissions in developing countries can be incorporated in their own national accounts.

Article 6 of the Decision 406/2009/EC requires a report every two year from member states, which is then assessed by the Commission. The report should contain national emission data and the national efforts to reduce emissions. If the report outlines higher emissions in the national reports, then certain measures can be taken, which are provided in article 7 of the ESD.

Energy Efficiency Directive

Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC OJ L315/1

The Article 7 on energy efficiency obligation scheme is probably the most important article of this directive. It provides the targets for Member States from 2014 to 2020, which requires involved parties to realize energy saving gains of 1.5% every year, the percentage is based on the annual energy sales to end consumers (European Commission, 2012). Measures should include the transports sector, a framework for buildings renovation and more importantly, it should include most if not all energy producers and distributors.

In line with building efficiency, the Directive 2012/27/EC requires the creation of energy audits carried out independently and by experts to all final users of energy in Article 8, it also requires better energy management systems which are also regulated by the directives on smart meters (Directive 2009/72/EC and 2009/73/EC). Energy audits would allow homeowners, Small and Medium Enterprises (SMEs) etc. to decide on the best ways to be more energy efficient.

The implementation of a financial system to support and facilitate energy efficiency shall be worked on by MS under Article 20. Revenues from the ETS auctions can be used for this matter (European Commission, 2012). Additionally, member states should provide information and training programs in accord with article 17 of the Directive 2012/27/EU. This is meant to ensure that everyone has an easy and cost-effective mean to improve energy efficiency by providing a transparent and clear framework.

This Directive 2012/27/EU is also connected with different EU laws in order to implement energy efficient in specific areas such as the Directive 2010/31/EC on the energy performance of buildings or the Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles. The Directive 2012/27/EC does ask for a building renovation plan, and requires public bodies to renovate their infrastructure and purchase only highly efficient services and products in Article 5 to 6.

Member states are to submit their respective action plan for energy efficiency by 30 April 2014 according to Article 24 (European Commission, 2012).

In the end, the Directive 2012/27/EU contains numerous legal provisions as to how certain measures should be implemented. These legal provisions are rather complex and concern very detailed aspect of the

overall implementation such as calculations and criteria for the creation and the accreditation of auditors, but they all work in conjunction towards a 1.5% yearly energy efficiency gain.

Share of Renewable Energy Directive

DIRECTIVE 2009/28/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC OJ L 140/16

In short the Directive 2009/28/EC allows MS two main ways with which they can reach their national RE targets by 2020. Firstly, they can set up national support schemes, and secondly they can use measures of cooperation between countries (European Commission, 2009, B). These two means are not exclusive and offer a certain flexibility.

Articles 5 to 11 of the RES Directive contain the framework for transfer of RE share amongst Member States and other countries outside the EU. The framework is similar to the ERUs and CERs credits system for emission reductions mentioned previously. Meaning that Member States may contribute to a foreign RE project and use the consequent RE share for its national target to a limited extent.

The Article 15 of the Directive 2009/28/EC aims to insure the integrity of RE energy reports, it imposes a guarantee of origin to producers of RE and provides the conditions for the issuance and usage of the guarantees of origin.

The following paragraph concerns energy grids, Article 16 requires Energy grid improvements to favor and ease the access for RE producers (European Commission, 2009, B). This is realized by transparency improvement and positive discrimination towards renewable energy. Like the previous Directive studied, Member states must provide the commission with their national action plan by the end of June 2010 according to the Article 4 of the Directive 2009/28/EC. The reports from Denmark and the Netherlands will be explored later.

Table 1 Features of the main European legislation for 20/20/20

POLICY	IMPLEMENTATION OBJECT	IMPLEMENTERS	TARGETS	CONTEXT	STRATEGIES TO FACILITATE IMPLEMENTATION	IMPLEMENTATION IMPACT	TYPE OF POLICY
ETS	Emission Trading system with reducing maximum capacities of allowance in order to reduce emissions. Concerns more than 11000 installations and almost half of EU emissions	European Institutions, Member states,	Most "big" polluters across Europe (More than 11000 installation concerned)	Context varies across countries (about 400 installations in Denmark and 600 in the Netherlands)	Works in Phase, Allows amendments of the systems based on the previous ones	Limited on both implementers and society in general. However very beneficial to the implementation targets due to windfall profits	Regulatory, Marketable commodity
Effort Sharing Decision	Reducing non ETS emission to meet the respective national targets. Targets: -20% for Denmark and -16% for the Netherlands (2005 lvl)	Member States	Members States	The decision does not provide a framework but a guideline with binding targets. The implementation of the decision is aimed towards the emission reduction targets that should be achieved in harmony with the ETS	NA	So far Emission targets are expected to be met ahead of the deadline. This however may partly be due to the economic crisis and the warm weather.	Regulatory, marketable commodity

Energy Efficiency Directive	Improving energy efficiency. Usually calculated with final energy consumption of the MS. Targets: 17.8 Mtoe for Denmark and 60.7Mtoe in final energy consumption. Usually 1.5% yearly improvement in efficiency is expected from the MS	Member States	Members States	Warm weather is a major actor in energy efficiency results in recent years. Context varies across members.	Related to other EU legislation concerning buildings, energy taxes etc. making the incorporation rather complex. The main objects to implement are: Obligation scheme for the 1.5% / Energy Audits / Financial system	Between 2005 and 2014 both Denmark and The Netherlands have seen their inland consumption decrease. The decrease however can partially be attributed to the economic crisis and the war weather conditions	Regulatory
Share of Renewable Energy	Increasing the share of renewable energy in the energy mix of the EU. Targets are 14.5% for the Netherlands and 30% for Denmark. Use of tradable commodities, and use of credits from project to reach objective.	Member States	Members States	Geographical context can be very important as it can restrict options for implementing the directive.	Tradable commodities, Flexibility mechanism, use of credits from projects	In Denmark renewable energy is growing rapidly and the country is on the path to phase oil base energy by 2050. The Netherlands in the other hand is behind and achieving the national target is prone to uncertainties and doubts	Regulatory

Contextual determinants of policy implementation

In addition to the framework provided by the European legislation, the implementation process is also affected by numerous factors which ultimately impact the implementation impact of the 20/20/20 objectives in Denmark and the Netherlands. As explained before Per Nielsen, (2013) argues that the context of a policy is one of the important factors shaping implementation. Therefore, the following paragraphs will examine the National context of the MS studied and the impact of the recent economic crisis and the abnormal warm weather. As stated before, the context of the policy is important, if for instance a country has already made generous progress towards 20/20/20 targets prior to the directives, it is very likely that less is needed to achieve successful policy implementation. In the later parts concerning Danish and Dutch implementation, the context below will be used in addition to the specific context surrounding policy implementation.

Socio-economic context

GDP and GDP per capita.

Detailing national GDPs between Denmark and The Netherlands can be confusing since Denmark is not using the Euro as a currency. As such, the World Bank's data in current US dollars will be used.

Table 2: National GDP in US dollars

	GDP (US dollar)		
	2005	2010	2014
Denmark	264,559,522,420	319,810,991,981	20,038,215,158
Netherlands	678,533,764,457	836,439,735,099	879,319,321,495

(World Bank, 2015, A)

Table 3: National GDP per capita in US dollars

	GDP per capita (US dollar)		
	2005	2010	2014
Denmark	48,816.80	57,647.70	60,707.20
Netherlands	41,577.20	50,341.30	52,172.20

(World Bank, 2015, A)

As the tables above show, the Dutch national GDP is very high compared to Denmark, but the Danish GDP per capita is higher than its counterpart. However, according to Eurostat data, they are both higher than the average European GDP per capita (Eurostat 2015)

Economic structure

The economic structures of Denmark and The Netherlands are very similar. According to the World Fact Book (2015), both countries have about 75% of their economy in the service sector with 76.2% in Denmark and 74.8% in the Netherlands. The Industrial sector shares the same features, with 22.3% in the Netherlands and 22.5% in Denmark.

Population

Population is a major difference between Denmark and the Netherlands. There is simply more people in the Netherlands and a higher population density than in Denmark.

According to the CIA World Fact Book, the Danish population in 2015 was around 6 million with a growth rate of 0.22%, while the Netherlands are nearing the 17 million people with a growth rate of 0.41% (Central Intelligence Agency, 2015). When it comes to population density, Eurostat indicates 130.08 inhabitants per km² in Denmark and 498.4 inhabitants per km² in 2013 (Eurostat, 2015, B). Over the years, the population density does not change dramatically in the two countries, but follows a slow and constant increase, in 2005 the Dutch population density was at 483.1 and the Danish population density was at 125.7 person per km² (Eurostat, 2015, B)

Political context

Denmark and The Netherlands have a similar political system. There is a hereditary monarchy in place in both countries and as a result both operate within the conditions of a Parliamentary Constitutional Monarchy (European Commission, 2016). Effectively, this means that the policy making process is relatively similar in both countries.

The SER agreement of 2015, which is detailed further in the dissertation, notes that the political scene in the Netherlands has been very inconsistent in recent years. The World Bank has worked on providing an indicator to estimate the effectiveness of different governments, this index works on a scale of -2.5 to 2.5 with 2.5 being strong national performances, the Dutch and Danish performances can be found in the table below. This index is based on several factors such as the quality of public services, the quality of policy formulation, the credibility of the government's commitments etc. (World Bank, 2015, B).

Table 4: National Government Effectiveness Estimate

	Government Effectiveness estimate									
Country/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Denmark	2.1	2.3	2.4	2.2	2.2	2.1	2.1	2	2	1.8
Netherlands	1.9	1.8	1.7	1.7	1.7	1.7	1.7	1.8	1.8	1.8

(World Bank, 2015, B)

Overall the Netherlands seems to be less effective than Denmark, there is however a small drop in the year of 2013 for Denmark and both were equally effective according to the World Bank Index. The political situation in the Netherlands and Denmark is relatively hard to describe. The index used cannot accurately represent the effectiveness of each countries' governments, but still offers a general view on the political scene of each country.

National situation on the 20/20/20 objectives

Emissions reduction

Table 5: National Emission

	GHG Emissions in CO2 equivalent (thousands of tons)									
Country/Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Denmark	69815	65477	73316	68602	65012	62139	62440	57397	52598	54,583
The Netherlands	219228	213229	209246	207970	207471	202271	213791	200048	196267	195,807

(Eurostat, 2015, C)

There is a clear difference in the volume of emissions each country has to deal with, the Netherlands has a higher GDP and population so it is only logical for the emissions to be significantly higher.

To continue, both countries have seen their emission reducing every year since 2005. Between 2005 and 2014 Denmark has reduced its emissions by 15232 thousands of tons, and the Netherlands by 23421 thousands of tons. Effectively, the reason behind the reduction of emission in European Member States is subject to a lot of discussions, first the recent economic crisis and abnormally warm weather have contributed heavily to curbing CO2 emissions, and secondly the ETS has been victim to market failures

resulting in a limited impact on emissions. Thus, it is hard to assess how impactful national policy implementation is.

Energy Efficiency

Table 6: National Energy savings

	Energy Savings									
Country/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Denmark	99.1	100	101.1	101.4	100.2	95.5	100.7	96	92.7	91.6
Netherlands	102.3	100	98.7	101.5	103.7	97.4	104.4	98.2	99	99

(Eurostat, 2015, A)

The table above represents the energy saving performances of both countries from 2004 to 2013 (2014 data is missing) using an index, usually energy efficiency performance are viewed using the gross or final energy consumption, but the index (based on final energy consumption) provided by Eurostat is much easier to understand. In order to provide more contextual information, the table below shows the final inland consumption of each country.

Table 7: National Energy Consumption

	Final Energy Consumption (million tons of oil equivalent)									
Country/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Denmark	15.4	15.5	15.7	15.7	15.5	14.8	15.6	14.9	14.4	14.2
Netherlands	52.9	51.7	51	52.4	53.6	50.3	53.9	50.7	51.1	51.2

(Eurostat, 2015, A)

Like most contextual factors affecting policy implementation, The Netherlands has a higher energy consumption and needs to deal with more changes in order to reduce energy use. Additionally, there is a matching trend in energy consumption between the two countries. It is hard to assess the impact of the implementation of the Energy Efficiency Directive since its entry into force dates back to 2012, but it is safe to assume that the recent crisis and the warm weather has directly impacted energy consumption, some studies indicates that the economic crisis is the main reason behind the emission and energy consumption drop of 2009 (Eurostat, 2015).

Share of Renewable Energy

Table 8: National Share of Renewable Energy

	Renewable energy share in percentage of gross final energy consumption									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Denmark	14.5	15.6	15.9	17.8	18.6	20.0	22.0	23.4	25.6	27.2
Netherlands	1.9	2.3	2.6	3.1	3.4	4.1	3.7	4.3	4.5	4.5

(Eurostat, 2015, A)

As the table above indicates, there is a clear difference when it comes to the share of renewable energy in Denmark and The Netherlands. As such, in 2005 Denmark had a RES of 14.5%, which corresponds to the Dutch national target for 2020. In 2009, 20% of Danish gross final energy consumption was supplied by RE. Meanwhile, the Netherlands has less than 5% of their energy issued by renewable means in 2005, and have progressed only slightly every year to reach 4.5% in 2013. In the end both countries have made increase since 2005, but Denmark has a major head start and is achieving more than the Netherlands every year. This data support the assumptions developed by Toshkov and other scholars. The Netherlands have more to change in order to implement the RES commitment, while Denmark is able to pursue higher targets than its European commitment with his national acquis.

Renewable energy requires the major development of infrastructures and techniques in order to increase the national production. Technology also plays a central role to renewable energy as an enabler but also as a cost determining factor since costs tend to be reduced over time. Infrastructure wise, RES is highly demanding, Member States and energy companies have to work together to create better/new energy grid and energy producing infrastructures such as wind farms, which requires time and resources.

Additionally, recent projects for the creation of wind turbines are running into local-regional conflicts in the Netherlands, (The Economist, 2015). The Economist article also underlines a certain problem, according to the author offshore wind farms need about five years to be operational and could cause problems regarding the 2020 deadline. Additionally, the high population density may be the reason behind the local-regional conflicts against Dutch wind power projects.

Recent economic crisis and weather

Most studies, and assessments regarding the environmental progress of the EU and Member States mention that a large part of the emission reductions has been heavily influenced by the economic crisis and the recent warm weather. This is important to the study as a large part of emission reduction is in fact not attributed to the state, but to the declining economic situation. Between 2008 and 2009 the biggest drop in emission was recorded since the 1990s with a decline of 7.3%, most of this decline is attributed to the economic crisis (Eurostat, 2015, A). There is a direct and simple link between emissions and Gross Domestic Product of the European Union, as the market consumes less and produces less, emissions drop.

The 2015 Eurostat study also indicates that recent years have been warmer, having non-negligible impact on energy efficiency targets by reducing the use of energy for heating and cooling. This may seem like a silver lining as the warm weather combined with the economic crisis makes reaching the 20/20/20 goals easier, but ultimately it means that under normal conditions, some Member State will not be able to achieve their goals and that national implementation should be more effective.

Conclusions and remarks.

To put it shortly, the contextual background of the Netherlands makes the implementation of the 20/20/20 objectives more complex. Denmark on the other hand has a well-developed environmental acquis in 2005, this allows Denmark to realize better performance at the national level, but it is also the reason for the higher goals set at the European level for 2020. Arguably the resources of the Netherlands are higher and should match the higher scope and complexity of implementation, but time is also a resource that transcends most barriers.

The reason for choosing these countries is also evident in the data outlined. It would not make much sense to compare The Netherlands to a large country like Germany, but Denmark and the Netherlands share a lot for resemblance in their political and economical structure. Additionally, both would most certainly use offshore wind farms to produce renewable energy due to their coastal situation.

The economic crisis and the warm weather make it hard to assess and process the data on the Danish and Dutch performances, and also raises doubts on the overall effectiveness of the measures employed by national governments

The European Emission Trading System

Overview of the ETS

A very large system of Emission trading at the European level

In order to study European environmental policy, exploring the ETS is needed to understand how the emission target is to be achieved by the Member States. According to the official website of the European Commission concerning the ETS, the program covers 45% of total European emission, which represents about 11000 installations such as energy production facilities, and various other organizations (European Commission, 2013, B). Since it covers such a large part of the total emissions of the European Union and, in a broad sense comprises all big polluters, the EU ETS is a major measure implemented to reach the 2020 emission reduction goals and the further 2050 goals, it also works in conjunction with the other two main aspects of the 2020 environmental goals concerning energy efficiency and the share of renewable energy.

The ETS system started in 2005 and according to the European Commission (2013, B), it is currently the biggest system of its genre, representing almost half of the European Union's emission, and including most power stations and manufacturing plants. It offers a market-based system for emission trading with, what is called an Emission Allowance as a tradeable commodity. In addition to the EU member states, Norway, Iceland, and, the Liechtenstein are also taking part in the scheme. The ETS works in periods of varying length. The first one being 2005 – 2007 and the second ending in 2012, the EU is currently in the third period of the program.

Emission Allowances are subject to the “cap-and-trade” principle. The Factsheet on the ETS from the Commission explains that once the “cap” (the allowances setting a maximum capacity parties can emit) is set, trade under free-market rules can be made in order to provide an incentive for reducing emissions. Companies emitting less than their maximum capacity will be able to sell their remaining allowances to other companies who may need it. Additionally, having extra allowances not only allows them to profit from their sales, but also means that a greater efficiency in producing Services and Goods was achieved by the concerned organization (unless it is caused by another external factor such as the economic crisis). This “cap-n-trade” measure aims to stabilize prices, but also to create a greater incentive for achieving emissions reduction projects. The number of allowances is set to diminish over the time by a factor of 1.74% per year, which is outlined in the Directive 2003/87/EC Article 9 and 9a. Companies are expected to be increasingly enticed to shift to a more environmental decision-making, and invest in innovations in terms of efficiency and emission reduction.

Allowances: One allowance equals to 1 tone of CO₂ (or equivalent greenhouse gases), excessive emission can result in a fine for every extra tone emitted (European Commission, 2013, B).

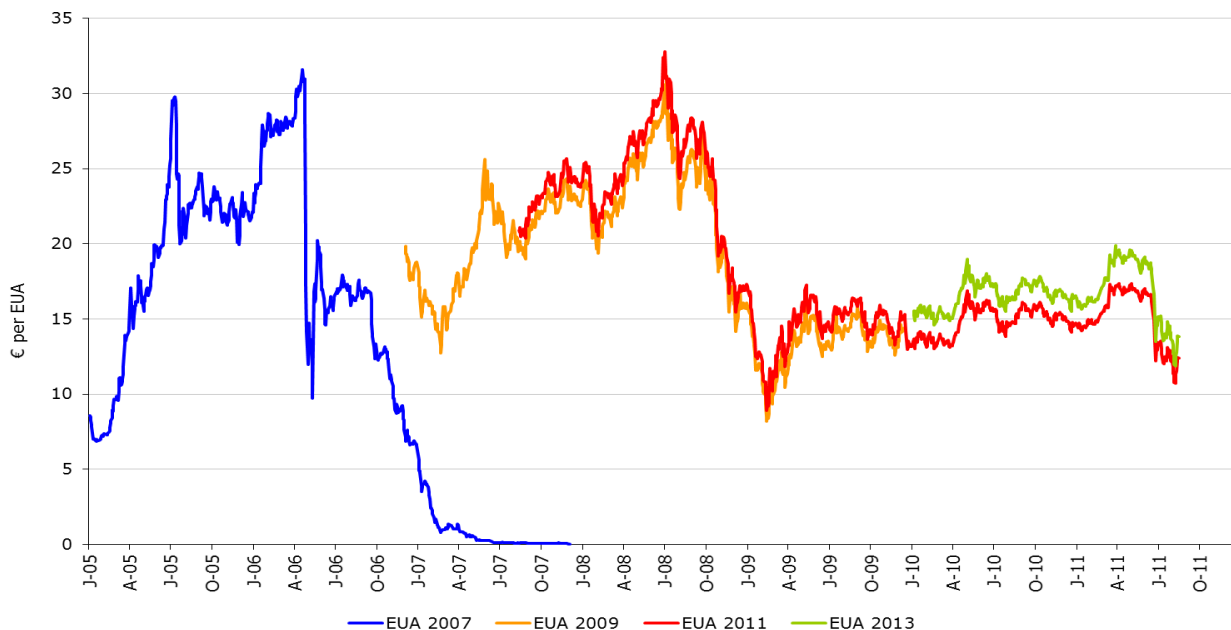
The First and Second phase of ETS

Although the principle of the ETS is rather thorough, the first two phases of the ETS were heavily criticized. According to a study assessing the effectiveness of the ETS, the phases between 2005 and 2012 resulted in a price crash allowing major windfall profits towards big emitter of CO₂ (Laing, Sato, Grubb, & Comberti, 2013, p. 3).

Price crash and Windfall profits

The Directive 2003/87/EC lays down the framework for the ETS, article 9 and 10 detail the allowance allocation process for Member States. Annual Allocations are to be calculated by the national governments according to their allocation estimation at the beginning of every year. According to the article 10, in the first phase, 95% of the allocation are allocated free of charge, and 90% in the following period. This has led to an over-allocation of emission allowances and resulted in a very low prices of allowances (Laing, Sato, Grubb, & Comberti, 2013, p. 4), which in turn transformed into large windfall profits. Over the time, the price crash of EUA (European Emission Allowance) drastically reduced the incentive the ETS was supposed to provide by pricing emissions. This problem has been outlined by both the Danish and Dutch governments. The European Environment Agency provides data on the prices of EUAs.

Graph 1. EUAs prices in euros during the period between 2005 and 2011.



(European Environment Agency, 2011)

The graph above clearly outlines the price of EUAs and the sharp decline after the first year of the implementation of the ETS, which happens at the same time as the yearly report from member states notifying the over allocation that took place in 2005.

In the case of the ETS, the problem revolving around windfall profits due to the over-allocation of allowances, has had a very negative impact on how the ETS is viewed. Having as previously mentioned, numerous ETS parties in possession of excess allowances and notably large polluters ended up benefiting from these allowances as they have a value and can be traded in a market, and goes straightly against the polluter should pay principle. As a result, in 2011, 77% percent of ETS covered organizations were holding surplus allocations. Laing, Sato, Grubb , & Comberti, (2013, p. 21) reports that in 2011 the ten “top companies” held a surplus of 240 million EUAs, representing 4.1 billion euros and 241 MtCO₂ which is more than Netherlands’ total emissions in 2010.

Additionally, the economic crisis’ impact on emission reduction also works in favor of the over-allocation dilemma. The reduced growth meant that companies were emitting less emissions than pre-crisis periods simply because they were producing less, thus using less allowances, which then resulted in windfall profits (Laing, Sato, Grubb , & Comberti, 2013, p. 9).

The ETS relation with costs and prices

The way companies pass on costs is crucial to the ETS long-term objectives (Laing, Sato, Grubb , & Comberti, 2013, p. 16), carbon price is now a new production cost that companies have to deal with. Ideally, companies would choose to improve efficiency to return to the original cost or even reduce former costs before the implementation of a carbon price, this nonetheless requires long-term planning and investments. However, studies show that most of the time the rising cost emerging from the ETS is usually passed on to the customer, especially in the energy sector where subsidies tend to come and go (Laing, Sato, Grubb , & Comberti, 2013, pp. 20-21). This means that a lot of ETS covered companies were able to make unexpected profits not only by having too many allowances, but also by passing the cost of cutting emissions to customers through price.

Finally, there has been some cases of fraud and the concern still persists nowadays (Crisp, 2015), the fraud issue does not only concern the ETS but also other areas of the European Union. This problem is rather hard to address, but an oversight system at the EU level could provide regular independent reports on the EUAs traded and maybe address the problem.

Positive impact of the ETS between 2005 and 2013

Although the first phases unearthed a lot of ineffectiveness from the ETS system, the scheme still had some positive impacts. Assessing the positive impact is complicated and different approaches often yield different results.

Concerning the reduction of emission, which is the main goal of the ETS, the range of findings from different study vary greatly. Overall with 2008 as a base year, the ETS brought an abatement of about 2% to 4% of the total emission reduced in the same year (Laing, Sato, Grubb , & Comberti, 2013, p. 8).

To put it simply, the ETS had limited results despite the scope of the program, which represents almost half of the total EU emissions.

One of the objectives of the ETS is also to induce investment and innovation by companies to reduce their environmental impact. However, the reach of the scheme has proven to be rather limited, investment requires long-term planning, and the ETS system should give a greater incentive for investing in innovative solutions. The program did bring the issue of emission reduction in the decision process of big polluters. However, it appears that it does not weight enough to make a concrete change in the final decisions taken (Laing, Sato, Grubb , & Comberti, 2013, p. 12).

In conclusion, the ETS has had a limited impact during the first two periods, in perspective the recent economic crisis has reduced emissions by a larger percentage. As a result, the third period has been revised to address the ETS ineffectiveness.

The third phase beginning in 2013

The problem of over-allocation of allowances being obvious, the third phase of ETS is introducing a progressive diminution of free allowances and relies on the principle of auctioning. The piece of legislation setting the framework for the third phase is the DIRECTIVE 2009/29/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community OJ L140/65.

Article 9 of the Directive 2009/29/EC, redefines the linear factor of 1.74% by which the allowances are set to be reduced. In other words, there will be 1.74% fewer allowances distributed each year.

Amendments to Article 10 redefine the allocation framework for European member states. Firstly, every allowance not allocated freely has to be auctioned. Secondly, the auctioned EUAs have to be used in a certain manner according to the Directive 2009/29/EC (2009).

- 88%, the major part, is to be distributed among all EU members
- 10% is to be distributed to specific member states for solidarity, allowing them to have more EUAs
- 2% is to be distributed to specific member states which are 20% below their Kyoto base year emissions in 2005

(European Commission, 2009, C)

Since the states are now auctioning a certain part of the EUAs, it creates a public revenue, Directive 2009/29/EC also provides obligations on how these funds are to be used. To put it simply, half of these revenues have to be used to attain environmental objectives while the Member States have freedom over the other 50%.

Article 10a, states that electricity production facilities may not receive free allocation anymore unless they enter certain exception criteria. However, there are still a large sum of EUAs given out for free. Article 10a, in combination with article 10b provides possible measures MS can employ to limit the risk of carbon leakage, such as financial subsidies.

Furthermore, the industry sector received 80% percent of their allowances for free in 2013, this number is rather high (phase one and two gave 95% and 90% respectively). However, this number is set to diminish every year to 30% in 2020 (European Commission, 2015, A). This would mean that about 7.14% less allowances every year, which, hopefully, will create the incentive the ETS needs. However, the quantities of free allowances remains rather high in the first years, which could undermine the program in a similar way as it did during the first periods.

According to the directive 2009/29/EC every year 300 million allowances (5% according to the directive amending 2003/87/EC) should be set aside for new entrants. This means that potential businesses eligible for the ETS program can join the program, and allows the EU to keep the market open allowing companies to invest in Europe.

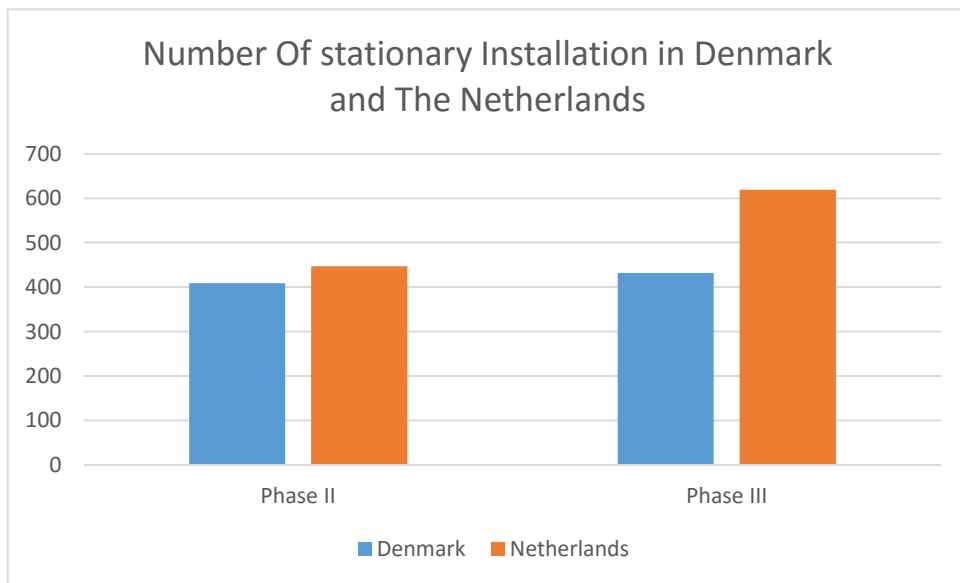
The ETS in Denmark and the Netherlands

The state of the ETS in Denmark and the Netherlands

The ETS is essential to understand how the EU intends to reduce overall emissions. However, as explained before the impact has been very limited. The following paragraphs outline the state of national emissions and the ETS in Denmark and the Netherlands. National governments have limited impact on the ETS. However, the impact of the system needs to be analyzed in order to compare both Danish and Dutch progress in their respective emission objectives.

During the second phase, the ETS system in Denmark and the Netherlands covered 856 stationary installations and now covers 1051 stationary installations in the third phase. Graph 2 shows the respective amount of installations per country.

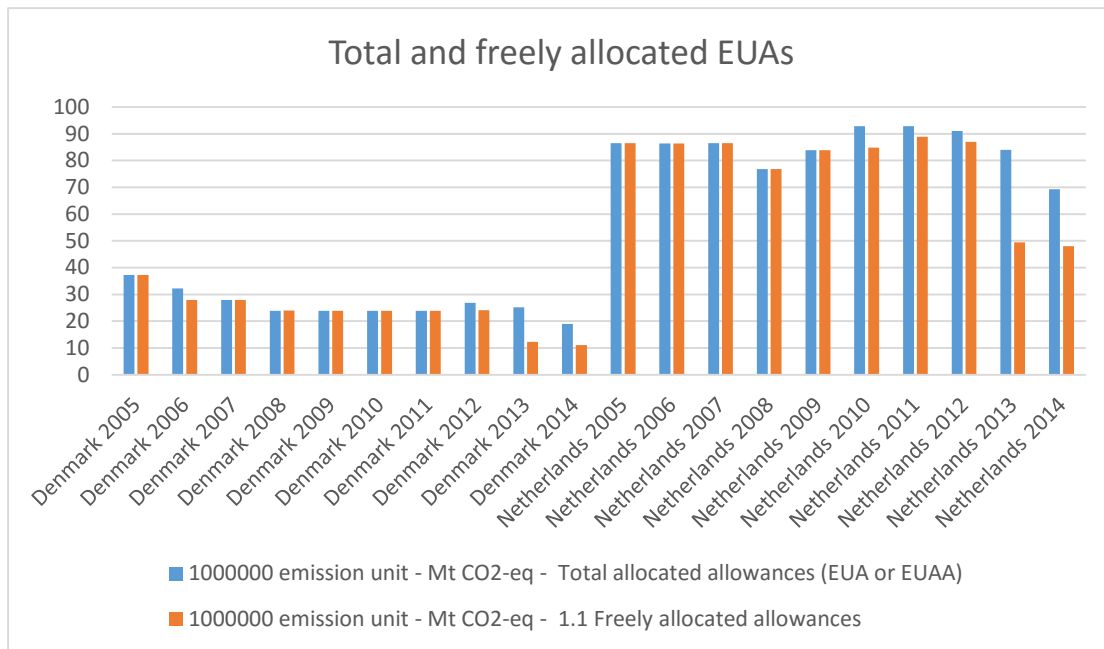
Graph 2. On the Number of Stationary Installation in Denmark and the Netherlands



(European Commission, 2015, A)

The third phase brings a notable difference in the number of installations between the two countries, which was only small in the first phase. The graph also reflects Dutch emissions progression being rather stagnant during the period 2005-2010.

Graph 3. Total allowance allocated by each country since 2005 up to 2014.



(European Environmental Agency, 2015)

According to graph 3, there is a rather big gap as the Netherlands has more than twice as many allowances as Denmark. It is also possible to assume that Dutch installations tend to produce more emissions considering there were no big difference in the numbers of installations in the first phase. This may be due to the nature or the efficiency of the installations. In addition, the free allocations are slowly being reduced in both countries, reflecting the new framework for the third phase.

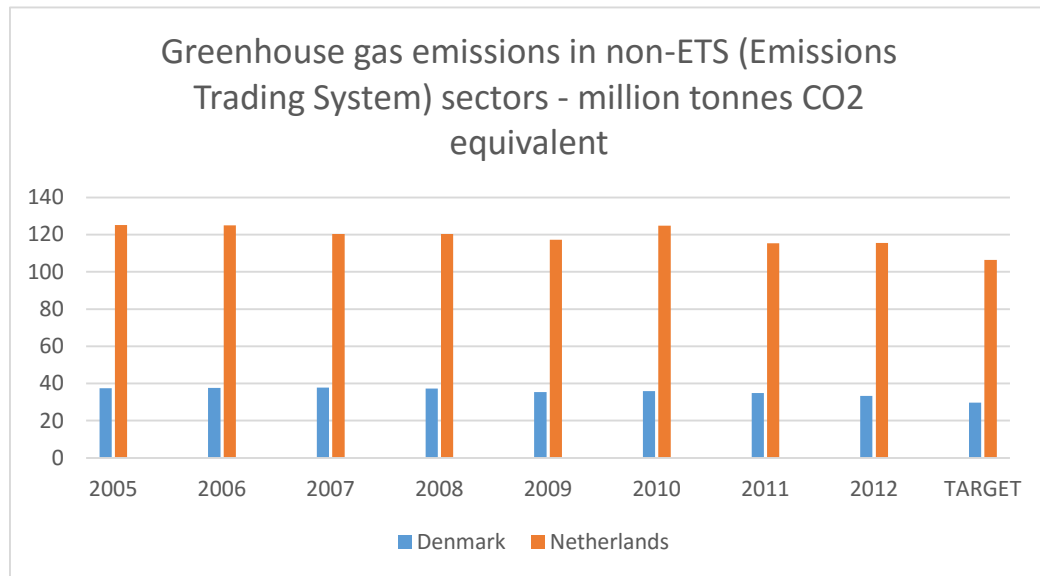
Table 9. Total emission reduction progression for Denmark and the Netherlands.

Total Emission reduction (million tonnes of CO₂ equivalents)	1990	1995	2000	2005	2010	2013	Emission contribution
Europe	5 749.7	5 408.5	5 293.1	5 355.5	4 918.2	4 611.0	100.00%
Denmark	71.0	79.0	72.1	68.0	64.9	57.1	1.24%
Netherlands	224.1	238.3	228.9	224.2	224.1	206.3	4.47%

(Eurostat, 2015, C)

The table above shows how emissions have been reduced. Additionally, it supports the assumption that Dutch installations are emitting more per unit than Denmark's.

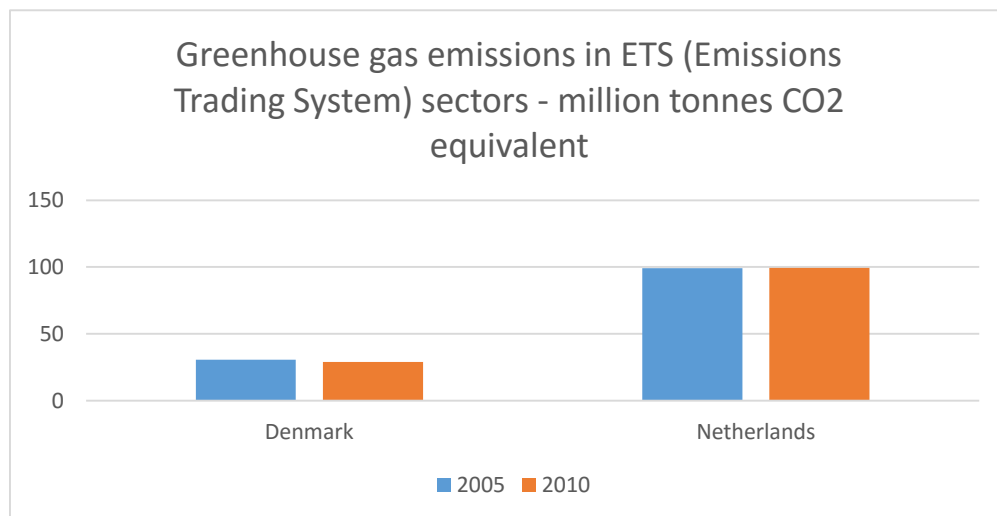
Graph 4. The Non-ETS emission data in Denmark and the Netherlands



(European Environmental Agency, 2015, D)

Data on specific emission per country is not always easy to obtain. The numbers described below outline the ETS emissions of each country based on the total emission minus the non-ETS emissions data provided by Eurostat, (2015, C). In 2012, the Netherlands emitted 115.52million tonnes of CO₂ equivalent, and 33.32 million tonnes of CO₂ equivalent was emitted in Denmark.

Graph 5. The ETS emissions status in 2005 and 2010.



(European Environmental Agency, 2015, D)

There is no big emission reduction coming from both countries when it comes to the ETS sector. Denmark has a slightly better performance, but ultimately the data do reflect the ineffectiveness of the first two phases of the ETS. The third reformed phase brings some promising changes. However, the results over the long-term remain to be observed.

Conclusion and remarks

In conclusion, the ETS has had a limited impact on the European emission reductions between 2005 and 2013. It was victim to an over-allocation of allowances, which turned into windfall profits for big polluters. The ETS incentive being low in those periods, companies under the system did not concretely invest in reducing emissions in the long-term and usually pass the costs on to customers. As of 2013, the third phase of the ETS has made changes which aim to address the issues encountered in the first phases, the impact of these changes remains to be seen in the next years.

As a result, the ETS performances of Denmark and The Netherlands can be described as stagnant. However, Denmark has a slight decrease of emissions in the ETS sector, while The Netherlands sees a very small increase, this could, however, be due to the big increase in the number of installations under the ETS in The Netherlands. In graph 3. a clear impact of the reformed ETS can be seen where the number of free Allowances is greatly reduced, future emission reports will decide on the effectiveness of the new phase in the two countries.

National implementation of the 20/20/20 objectives.

The following paragraphs will focus on the implementation of the 20/20/20 objectives in Denmark and The Netherlands. To begin with, the National Reform Programs (NRP) will be employed to analyze the differences in the implementation impact coming from the two countries. To continue, the action plans related to energy targets and other climate change policies related to the 20/20/20 objectives will be studied. Emission specific measures are not numerous, and most policies eventually result in less emission by increasing the share of renewable energy and reducing the amount of energy consumed. The European Environmental Agency provides a database of the national climate change policies of MS and their relation with EU legislation. This database will be used in conjunction with the national action plans and agreements to describe the policies used in both countries. An overview of these policies can be found in Annex 1 and 2.

The National Reform Programs

Every year the European Commission and Member States publish a document entitled The National Reform Program in which an assessment of the Member State's progress on certain topics is addressed. One of this topic is the 2020 strategy, the NRPs provide comments from the European Commission, and thus focuses on the implementation of the country. Accordingly, both states seemed to have made the changes needed to function under the directives and the decision around the 20/20/20 commitments. The content of the different programs is relevant since it reflects the state of implementation of the country for specific goals.

Unsurprisingly, Denmark is on track to meet all of its 20/20/20 commitments and has already met its efficiency and emission targets for 2020 as of 2015 (European Commission, 2015, F). Renewable energy is also on the right track to meet the national target according to the Danish NRP of 2015. In the meantime the Dutch NRP of the same year reports that the Netherlands has not met any of its goals as of 2015. Emission wise the Netherlands is short of one point to meet its objective, and according to the Dutch Government, the country should be able to achieve its target. However, the report notes that the Netherlands is behind when it comes to renewable energy, the SDE+ is mentioned as having a limited impact since it just started, and that the Netherlands really ought to do something to meet the RES objective. The 2015 NRP also reports that the Dutch government should step up its effort to reduce energy consumption (for the energy efficiency target) since it is also behind the national annual target (1.2% against 1.5%). In response to the comments on RE, the Netherlands mentions that a strong will is necessary for the country to implement RE measures (European Commission, 2015, E).

Danish specific comments

Asides from the progress realized on the 20/20/20 strategy, the NRPs also report on the main national policies on climate change and the future measures to be used at the national level. The Danish NRP thus details the three following measures.

First, the March 2012 Energy Agreement's targets are mentioned (which are often above EU requirements). Secondly, the Danish Climate Bill passed in 2014 is described in the NRP as a framework for climate change policies and requires full transparency on the matter and the creation of an independent climate council advising the government on policy making. Additionally, the bill requires yearly reports from the ministries of climate, energy and buildings in addition to targets set by the Minister of Climate and energy at least every five years (with a 10 year vision). Thirdly, the Growth Package was passed in 2014 in relation with the 2012 agreement, it includes several measures concerning bio covers, soil, the creation of an energy secretariat and the allocation of additional funds for future measures (European Commission, 2015, F).

Dutch Specific comments

A number of future measures are listed in the Dutch NRP of 2015. The SDE+ scheme is going to open itself to a wider number of projects (with smaller requirements), and will even comprise projects outside the Netherlands under the cooperation mechanism of the RES directive, and the Netherlands is currently looking for such partners in the EU (European Commission, 2015, E). Additionally, a number of national funds have been assigned to energy efficiency. The Planning Vision for onshore Wind power (March 2014) is also a new policy reported in the Dutch NRP, it aims to designate places for onshore wind projects across the country. Like the SDE+ scheme, the renewable energy capacity resulting from these policies depends on the finalization of the projects initiated.

The Dutch National Reform Program (European Commission, 2015, E), also lists the most important measure employed for the 20/20/20 commitments:

Emission reduction:

Less polluting vehicles, Energy efficiency in the built environment, More renewable energy generation in horticulture

Energy Efficiency:

Implementation of measures from the Energy Agreement, among others the rental sector energy performance stimulus scheme, European emissions standards and national stimulus for low-pollution vehicles have a positive impact on the transport sector 'traffic and transport', Intended policy measures in the service sector will lead to an increase in energy savings

Renewable Energy:

Annual budget available for renewable energy projects in the SDE+ scheme, Preparation for offshore wind power (roadmap and legislative framework), Reduced rate in the energy tax system for local Renewable energy generation, Agreements with provinces for achieving 6,000 MW onshore wind

(European Commission, 2015, E)

Conclusion and remarks

In conclusion the NRPs show that Denmark is ahead, the country has already completed two of its commitments and is on track to meet its renewable energy target. Consequently, the Danish NRP focuses on the recent measures put in place and on further objectives for the country regarding climate change. The Dutch NRP in the other hand, shows that the country is on track regarding its emissions reduction goal and should be able to meet the energy efficiency targets, new measures have been created in order to address the lack of renewable energy development. However, results from these measures may take some time to come.

Ultimately the overall implementation impact coming from the Dutch government seems doubtful, as explained the recent economic crisis and the warm weather have had a big impact on the reduction of emission and energy consumption, increasing the doubts on the effectiveness of the Dutch national implementation.

National policies for the implementation of the 20/20/20 objectives**Danish Implementation.*****March 2012 Agreement.***

The Danish Energy Agreement of March 2012 is a long-term organizational measure employed to reach a 100% renewable energy supply by 2050. The agreement comprises Electricity, Heating, Industries and Transports (Danish Ministry of Climate, Energy and Building, 2012). The agreement contains both RE and efficiency targets, but also contributes to the reduction of emissions.

Concerning the share of renewable energy the targets are higher than what the EU framework requires (30%). Below the two main targets for 2020 of the agreement concerning energy are outlined.

- 35% of Renewables in energy capacities (2006 levels), and 50% of electricity from RE
- 12% reduction of gross energy consumption (2006 levels) or 7% compared to 2010

(Danish Ministry of Climate, Energy and Building, 2012)

These targets are to be implemented by the parties, and their progress is monitored regularly. The agreement in itself does not specify who the different parties are, but its scopes seems wide enough to insure that the measures they took have the impact they desire. Grid operators, private companies and energy producers, as well as distributors are mentioned throughout the text. Energy companies are subject to an obligation to up their efforts by 75% by the end of 2014 and by 100% in 2020 compared to 2010 levels (Danish Ministry of Climate, Energy and Building, 2012).

The agreement also lays the framework for improving the energy grid with smart grids and providing the remaining energy consumers with smart and remote electric meters. According to the Danish government, the smart meters have been provided to almost half of the end users in the country, the meters are in line with the Energy Efficiency Directive's requirements.

The directives' requirements for energy in the built environment (buildings) are also addressed by the Agreement. The government plans the creation of new criteria concerning heating and the allocation of large funds to stop the use of oil boilers to switch to a renewable energy source for heating and cooling. There is a direct link between the renewable energy target the Agreement sets since in the long-term Denmark wishes to phase fossil fuel out and to have a RES of 100% in 2050.

The area of transports is also approached in the Agreement, and the main measure concerns the amelioration of the framework for using renewable energy in transports such as biogas.

Throughout the March 2012 Agreement, there are numerous funds being allocated to different areas in

order to compensate the costs of the commitments and ease the overall process, but the 2012 Agreement also contains obligations for the parties involved and the consumers. Effectively, the benefits made by companies from efficiency gains must be used to further improve the sustainability of the energy sector. The costs of the rising share of RE in the other hand will likely result in higher prices for end users. The March 2012 agreement is the main measure used to implement the energy directives' requirements, but also contributes to the emission reduction target.

Share of Renewable Energy

Action Plan

The Danish Action Plan bolsters some very ambitious targets. In essence, the country wishes to phase out fossil fuel in the long-term by increasing the share of renewable energy (Climate and Energy Ministry of Denmark, 2010).

The renewable energy action plan's indicates national projections of RES that are higher than the Directive 2009/28/EC's requirement every single year, in 2010 (the year the action plan was published) Denmark already reached a share of RE exceeding interim targets set at the European level, leaving less than 10% left to reach the 2020 target of 30%. The Danish government seems confident in their national performances and tends to lobby towards additional initiatives at the European level. This lobbying can be reflected in this action plan with the proposition for a greater cooperation in order to avoid inappropriate support competition in the energy networks spanning across member states (Climate and Energy Ministry of Denmark, 2010).

The national action plan follows the template of the European Commission and provides an overview of all measures contributing to the RE targets under the 20/20/20 framework. In total, according to Table 5a p 26 to 28 (Climate and Energy ministry of Denmark, 2014, pp. 26-28), there are 29 different measures to implement the directive, some of the measures listed also concern energy efficiency target, the focus will remain on the policies directly involved with RES targets.

Overall the Danish Actions Plan covers the directive's requirement in an extensive way, many existing laws required by the European legislation are also contributing to the implementation of the directive according to the action plan.

Denmark defined their measures using different categories. The main categories are similar to the ones used in this dissertation. In the end there are an array of Economic/fiscal and regulative measures put in

place. As such, 14 of the measures mentioned in the table have an economical aspect and 12 of them are of regulative nature.

Regulatory measures concerning energy are rather straightforward. The government has formally given renewable energy the priority on the grid network since 1999. Energy operators are in charge of the actual implementation. The biomass agreement measure is also regulatory in nature and regulates the use of biomass by power stations since 1993. As of January 2010, a certain amount of biofuel is to be integrated into the fuel mix for vehicles, which is required by EU legislation. Parties involved in the production and distribution of fuel have to respect the regulations criteria.

Economic measures often take the form of a tax or a subsidy. As such, there is a tax exemption for electric cars, a tax is also in place to provide an incentive for buying vehicles emitting and consuming less (European Environmental Agency, 2015, A).

Green Growth and Green Growth 2.0 are a group of policies used to increase the use of alternative fuel in power plants (mostly biomass), they involve the energy producers and the agricultural sector.

There are several national Acts aimed at increasing the RES of Danish Energy mix. “For example, The Promotion of Renewable Energy Act and the Electric Supply Act” provide national targets supplemented by regulatory instruments and schemes (European Environmental Agency, 2015, A). These acts are very broad and involve a wide number of participants and targets.

Agreements (organizational measures) also form an important part of the measures used to achieve climate change goals. In 2008, an agreement was reached with a renewable energy share target of 20% by 2020. In later years more agreements were realized like the 2012 Agreement on Energy to improve the efforts of the country and setting new targets (Climate and Energy Ministry of Denmark, 2010).

Other policies working towards a higher share of renewable energy

The “Biogas Plant” policy dates back to 1987, and consists of subsidies for the use of biogas in the energy grid and power plants in order to put an incentive on the use of biogas and raise the share of renewable energy, the implementers are the energy installations and the national government (European Environmental Agency, 2015, A).

The measure entitled “Tenders for offshore wind turbines” was initiated in 2013 by the Danish Energy Agency (European Environmental Agency, 2015, A). The measure permits the agency to choose the best candidate to allocate projects to. For the period of 2013 to 2015, two projects will be allocated and should be accumulating up to a 1000 MW of wind energy. The tendering for such projects has been ongoing since 2008 and now works in coordination with the March 2012 Agreement.

The measure called “Renewables for the Industry” allocates about 502 million euros to help businesses to convert to renewable energy and/or district heating. Ultimately the measure also concerns the energy efficiency target. The policy was introduced in 2013 and is implemented by the Danish Energy Agency and the concerned parties (European Environmental Agency, 2015, A).

The Danish Energy Agency and local governments are in charge of the “Scrapping scheme for old wind turbines” policy initiated in 2008 (European Environmental Agency, 2015, A). The measure answers the geographical problems of some turbines and allows more flexibility to the different wind projects.

The measure “Price supplement and subsidies for renewable energy production” is an economic policy implemented since 2008 by the Danish Energy Agency and energy producers. The policy provides a financial aid to reduce the economic strain on energy providers and consumers (European Environmental Agency, 2015, A).

Energy Efficiency

Action plan

The national target for energy efficiency reported in the action plan corresponds to a reduction of 12.6 % in primary energy consumption in 2020 compared with 2006 (or a final energy consumption of 615.5 PJ in 2020).

Efficiency obligations are in place since 2006 according to the action plan, and the 2012 agreement provides the framework for further obligations up to 2020 (Danish Government and Ministry of Climate, Energy , 2014). As such grid operators and distributor are obliged to realize yearly savings of 3% as of 2015 (2.6% between 2013 and 2014). Additionally, low energy efficient buildings are to be 50% more energy efficient by 2015 (2006 levels).

The requirements of Article 7 are met using a national framework for energy efficiency, which is revised periodically with the most recent one starting in 2015, and the oldest one being in 2006 (Danish Government and Ministry of Climate, Energy , 2014). The action plan indicates that organizations participating in the ETS are not excluded from efficiency obligations.

Article 8 concerning Energy Audit and energy management is answered by a regulatory policy, concerned entities (good/services producers and other large enterprises) have the choice between carrying energy audits every four years or having an integrated energy management system (Danish Government and Ministry of Climate, Energy , 2014). An alternative for SMEs, is also being developed and independent experts are in charge of carrying out the audits.

Furthermore, Denmark reports that smart meters have already been provided to almost half of the population at the time the action plan was finalized, billing regulations are also provided and do not conflict with European framework (Danish Government and Ministry of Climate, Energy , 2014).

Further changes are needed concerning energy efficiency in the government's built environment. The future measures plan on reporting the progress realized under an alternative means by using the energy savings realized by public buildings in MWh (Mega Watt hours), additionally there needs to be amendments in the public procurement of Danish institutions to fulfill the directive's requirements. The action plan is rather recent, (2014) therefore it is hard to confirm whether or not this has been done by the Danish Government.

Additional Measure workings towards energy efficiency

In 2014 the Danish Energy Agency implemented the “Strategy for energy renovation of buildings”, consisting of 21 initiatives to improve efficiency in the built environment. The strategy involves regulatory and informative policies in a coherent mix to boost energy efficiency.

“Better homes” is a measure working in coordination with the 2012 Agreement, it is targeting private homes and provides a single, simple framework for improving energy efficiency, and it does so by providing a package for realizing energy efficiency projects (European Environmental Agency, 2015, A). It was implemented in 2014 and it is supervised by the Danish Energy Agency.

The policy “Savings activities by elec. grid, gas, oil and district heating companies (consump. of final energy excl. Transp.)” is carried out by energy companies and supervised by the Danish Energy Agency under the form of an informative campaign (European Environmental Agency, 2015, A). The measure is expected to save up to 2.95 PJ/year, and the cost of the campaign is supported by end users through higher energy prices.

The “Center for Energy Savings in Enterprises” was created by a political agreement in 2014, allocated funds until 2017 have been made by the government. The Center plays a supporting role for the other policies concerning energy savings in Denmark and is implemented by the Danish Energy Agency (European Environmental Agency, 2015, A).

The measure “Energy labelling of small and large buildings (incl. public sector and business)” was initiated in 1997 by the Danish Energy Agency, and has for a long period provided people with efficiency labels for houses and other buildings. Since 1980 energy consumption has been reduced by 27% per square meter (European Environmental Agency, 2015, A).

The “Circular on energy efficiency in State institutions” aims to improve energy efficiency in state-owned buildings and the service sector. The Danish Energy Agency is in charge of the circular itself while the concerned institutions are in charge of the actual implementation of the measure (European Environmental Agency, 2015, A). The circular makes reports on energy efficiency public, and directly increases transparency.

Additional measures working towards the 20/20/20 commitments

Transport

The “Establishment of intermodal installations” policy was introduced in 2014 and promotes the use of intermodal transport installations, it is implemented by Ministry of Transport and Energy, municipalities, and the Danish State Railways (European Environmental Agency, 2015, A). An example of intermodal transport route can be the use of bicycle to catch a tram.

The “Information campaign on fuel consumption of new cars” Is carried out by Denmark’s Road Safety and Transport Agency since 2000, it is funded by the government and informs citizens on the efficiency and the labeling system of new cars. The campaign informs citizen on the incentive that is created for efficient cars by national and European policies.

The policy “EU requirements regarding biofuels” answers EU requirements for the fuel to include a certain amount of biofuel since 2012, the Biofuel Directive 2003/30/EC is the main piece of legislation behind the criteria of the fuel mix. The Danish Energy Agency is in charge of the implementation of the directive with fuel related enterprises, such as oil refiners.

The “Energy Correct driving technique” is a policy aimed towards the behavior of Danish citizens (European Environmental Agency, 2015, A). It consists of an informative campaign with dedicated funds and is implemented by the Ministry of Justice. According to Danish experience, drivers are usually able to save between 5% and 15% more fuel by having a more efficient driving technique.

The measure “Promotion of environmentally friendly goods transport” is mainly informative in nature and like the Energy correct driving, aims to change the behavior of the Danish citizens. The information campaign was initiated in 2014 by the Danish Environmental Protection Agency and Haulage contractors, the measure is also funded by the government (European Environmental Agency, 2015, A).

The policy “Transport infrastructure projects in the fields of electric vehicles, gas and hydrogen” is implemented by the Ministry of Transport since 2014, and provides funds for the improvement of the infrastructure for electric, gas and hydrogen vehicles (European Environmental Agency, 2015, A). The

measure is also related to the Energy Agreement. New electric cars rely on an infrastructure that is not always available, this policy addresses the issue.

The policy “Reduced travel times for public transport” is implemented by the Ministry of Transport and Energy and Danish State Railways (European Environmental Agency, 2015, A). It aims to reduce times spent by commuters thus reducing fuel and energy consumption while contributing to the reduction of emissions. The project for the railways is supposed to end in 2025 contributing to a reduction of about 100,000 tons of CO₂. Funds have been allocated by the government, in order to realize those projects.

The Danish Government plans on the electrification of parts of the rail infrastructure is thus related to the previous policy (European Environmental Agency, 2015, A). The Danish citizens do not use the train as much as the Dutch citizen, the ministry of transport has accredited a budget to different projects, electrifying the rail infrastructure while raising the share of renewable would create a highly sustainable rail network.

In 2014 two other transport related measures of the same kind have been implemented by investing in a tunnel under the Femern Belt and in new metro and bicycle lanes.

Finally Denmark is also subject to requirements from the European Union about the cars on the market, according to EU legislation cars must respect certain levels of GHG gases, several regulations provide the details countries and car manufacturer must oblige.

Agriculture

The “Ban on burning straw on fields” was introduced in 1989 and follows international agreements to reduce emissions from the agricultural sector by prohibiting open field burning (European Environmental Agency, 2015, A).

The consecutive “Action Plan for the Aquatic Environment I+II” and “Action Plan for Sustainable Agriculture, Action Plan for the Aquatic Environment III” have since 1987 regulated manure and the use of fertilizers in the agricultural sector, it is implemented by local and national government (European Environmental Agency, 2015, A).

The “Reduced emissions of ammonia” policy, aims to reduce the amount methane contributing to GHG emissions. This is to be achieved by the agricultural sector by regulating the use of manure and fertilizers in order to reduce the environmental damages. It has been active since 2011 and follows the European Nitrate directive, the implementers are the Danish government and local governments (European Environmental Agency, 2015, A).

The policy “Environmental Approval Act for Livestock Holdings” is very similar to the previous policy, it also aims to reduce the use of manure and fertilizer in the agricultural sector by imposing regulations on the concerned enterprises. The requirements are also implemented by the Danish government and local authorities.

Waste

“The waste tax” was introduced in 1987 and is implemented by the Ministry of Taxation, it covers landfills and the incineration of waste, and makes landfills heavily taxed (European Environmental Agency, 2015, A). This tax main objective is to reduce the methane resulting from landfills, and increase the use of biomass.

In a similar way the “Weight-and-volume-based packaging taxes” was introduced in 2014 by the Ministry of taxation, and aims to reduce waste by improving the packages of goods. As its title suggests, packages are taxed based on their weight, thus reducing the amount of packaging and the resulting waste (European Environmental Agency, 2015, A).

The Danish Environmental Protection Agency created a Subsidy programme for bio covers on landfills in 2015 promoting a more environmental method using compost in landfills in order to reduce the methane emitted from the waste. The subsidies are supposed to run until 2017 (European Environmental Agency, 2015, A).

Another Subsidy programme “Enterprise Scheme (special scheme for businesses)” started in 2004 and is implemented by the Ministry of Environment (European Environmental Agency, 2015, A), it follows European regulation on waste management and replaced the “Programme for Cleaner Products”.

The policy “Increased recycling of waste plastic packaging” was created in 1994 and is regulated by the Danish Environmental Protection Agency. It aims to reduce waste by meeting the requirements of the European Packaging Directive (European Environmental Agency, 2015, A).

Since 1996 Denmark has implemented a regulation on landfills through a “ban of landfills of combustible waste” (European Environmental Agency, 2015, A), this ban requires municipalities to dispose of combustible waste by incineration and not landfills, this method creates energy and reduces waste at the same time. Europe has created a framework for waste throughout the years which resulted in a rectification of the policy in 1999 to meet European criteria.

Others

The “Regulation of use of HFCs, PFCs and SF6” follows international and European framework by phasing out these substances (European Environmental Agency, 2015, A).

The “Spatial planning” measure is regulatory in nature and requires municipalities to realize infrastructure project in a way that minimizes energy uses since 2000 (European Environmental Agency, 2015, A).

The Danish Energy Agency is also in charge of the “Energy development and demonstration” policy implemented in 2008 (European Environmental Agency, 2015, A). The policy concerns research and development in environmental energy technologies. Numerous funds are allocated in order to reduce the costs of climate change measures in the long-term through R&D.

The policy entitled “Substitution of individual oil-based furnaces” used to be economic in nature and used to allocate funds to help the substitution of oil-based furnaces, but has now become an informative policy (European Environmental Agency, 2015, A). The measure was implemented in 2010 by the Danish Energy Agency, funds were allocated for a period of two years before the policy became purely informative.

Denmark has numerous environmental taxes in place. It is one of the few countries to have a national tax on carbon emissions, according to the World Bank, this tax was fixed at 31 US dollars in 2014, and it excludes some enterprises and ETS installations. This effectively makes polluting a cost for everyone. In addition, there is an electricity tax in place since 1977 which is implemented by the Ministry of taxation like most taxes in Denmark. Other environmental taxes target waste, packages, power plant and the fuel they use, energy and appliances (European Environmental Agency, 2015, A).

Dutch Implementation

SER: Energy Agreement for sustainable growth

SER 2013

The SER agreement is the Dutch version of the Danish 2012 agreement. It is a voluntary deal between the government, NGOs, and the private sector and is necessary to understand how the Netherlands wants to meet EU environmental policy.

Overall the targets of the agreement are the same that the ones set out at the EU level (Energy Agreement for Sustainable Growth, 2013).

A share of 14.5% coming from renewable energy in 2020 and 16% by 2023

Energy savings of 1.5% per year at the national level.

The agreement revolves around 10 components, as the agreement also works towards non-energy targets (such as employment) the following paragraph will focus on the relevant components of the SER.

To begin with, energy saving and renewable energy development are working in coordination with another important scheme: The SDE+ (stimulation of sustainable energy production). The scheme will be explained later as it is an important aspect of the Dutch implementation of the 20/20/20 targets. For its part the SER provides energy labeling instruments for the built environment, milestones are also set for consistent implementation, in 2016 at least 35% should be done, and by 2018, 85%. These milestones allow possible revision and induce immediate actions from the parties. The Labelling of buildings is done in line with the Energy efficiency directive Article 18 encouraging energy labeling in a broad sense.

In order to further energy savings and develop more RE capacities, decentralization scheme will be put in place in order to improve personal initiatives for realizing energy related projects.

The agreement recognizes that the Netherlands will continue to rely on fossil fuel in the future. However, Energy from coal will progressively disappear. The agreement also provides a solution for limiting the employment losses from closing coal power stations. As such, the agreement is supposed to create 15000 full-time positions.

Concerning emission reduction, the Agreement talks about a reduction of emissions from coal and fossil fuel in the range of 80% to 95% in 2050. Since coal will be phased out this objective is well within the realm of reality, but the concern is that since the SER also recognizes future reliance on fossil fuel, emission reductions will result from energy savings (less energy is produced) and other non-direct means to reduce GHG such as CSS (carbon capture and storage). Consequently, it seems the manner in which energy will be generated will not drastically change, but will become more sustainable. In other words, the Netherlands seems to rely on “clean energy” as well as renewable energy.

There are numerous financial measures the agreement outlines. Funding programs will be created for big and smaller scale projects, these programs will be made with financing bodies and the national government.

In 2015, an agreement on the SER was realized, to following paragraph deals with the recent changes it brings.

2015 Agreement on the SER

The new agreement on the SER in 2015 actually recognizes that the Netherlands have been inconsistent with its efforts to mitigate climate change. It also reports no real advances in the RE sector over the past years. However, the main reason according to the agreement, seems to revolve around the instability of the national political scene (Energy Agreement for Sustainable Growth, 2015).

The goals of this Agreement are the same as the previous agreement which are consistent with the 2020 goals set by the European Union (14% of RE, and 1.5% more energy efficient every year). The report notes that it has been 15 years since a government ended its term under normal conditions. The way this affects the implementation and results of policy is difficult to assess. However, performances detailed later support the claim. The SER 2015 also reports the successful creation of a standing committee for monitoring the parties' commitments with an independent chairman.

Asides from reporting an insufficient implementation of EU policy, the agreement does not provide a solution that can be supplied by the parties involved

Share of Renewable Energy **Action Plan**

The Dutch National Renewable Energy Action Plan 2010

According to the Dutch action plan, the country is addressing the topic of RE using three main approaches (Dutch Ministry of foreign affairs, 2010). The first element consists of making the energy cleaner in coordination with energy efficiency improvements and CO₂ recapture. Secondly, a better energy market is to be designed around the customers creating a free and smooth running energy market. Finally, the third element is to create a better framework for investments and financial incentives.

The plan gives projections of end and interim targets in comparison with the RES directive. In 2020, national expectation are 0.5% higher than directive's requirements at 14.5% (Dutch Ministry of foreign affairs, 2010). The interim targets for 2013-2014 is at 5.9% from the Directive, and 7.2% from the national projections. For 2017-2019 9.9% is asked by the directive and 11.5% is supposed to be met according to national projections.

The plan lists five main elements for the Dutch implementation of the directive.

The first one being the SDE + scheme mentioned previously. This scheme is the most important measure in place to achieve greater energy generation from renewable sources.

The Sustainable Energy Incentive (SDE+) scheme, is a financial tool creating an incentive or negating the price of switching to RE depending on the way you approach it. In other words, the scheme pays the difference between “grey energy” and RE. Parties concerned are covered during a certain period of time depending on the technology used to create RE (Netherlands Enterprise Agency, 2015). The SDE+ does not provide financial help to the government and targets companies and organizations. It spans across five different sources of RE, Biomass, Geothermal, Hydraulic, Wind and Solar energy. The SDE+ as mentioned attributes subsidies based on the prices of the energy produced, and the difference of the energy price and a correction sum (established on the yield of fossil energy). Effectively, this means that when energy prices are high the SDE+ gives less financial aid, and logically when the prices are low, the SDE+ will give more.

The SDE+ is also related to the “Offshore wind energy green deal” launched in 2011 and supervised by the Ministry of Economic Affairs, Agriculture and Innovation. The green deals are expected to contribute to the increase of wind power as a source of renewable energy (Dutch Ministry of foreign affairs, 2010).

Furthermore, there is a Biofuel obligation requiring a certain share of Biofuels used in the fuel mix by the Transport sector, which is regulatory in nature and follows European legislation (Dutch Ministry of foreign affairs, 2010). This obligation increases the share of renewable fuel in the transport sector of the country.

To continue there are two major elements to ease licensing processes, the “Government Coordination Scheme” and another regulatory measure concerning the general provisions of the Environment Act. This Act incorporates almost all environmental laws of the Netherlands (Government of the Netherlands, 2015). The government coordination scheme targets large scale projects and reduces the administrative strain needed to initialize procedures, the measure is part of the Spatial Planning Act, which is implemented by all levels of government in the Netherlands (Dutch Ministry of foreign affairs, 2010).

Finally, the last central instrument gives the priority to RE in the network when congested, which means that RE is prioritized over other sources, effectively this does not mean that the energy from non-RE is not created.

Following the directive’s template for the National Action plans, the Netherlands provides a list of all the measures contributing to the share of renewable energy under the directive 2009/28/EC. In total, according to Table 5a p 26 to 29, there are 23 different measures to implement the directive (Dutch Ministry of foreign affairs, 2010).

Overall Economic/Fiscal measures are employed the most in order to increase the share of RE with 12 measures of this type, including the SDE+ scheme energy producers work under.

The “Energy Investment Deduction” is implemented by the Netherlands Enterprise Agency and provides a fiscal deduction based on the contribution to renewable energy and energy efficiency targets (Dutch Ministry of foreign affairs, 2010).

An additional policy contributing to the renewable energy target, “The Coal Covenant” is a negotiated agreement between the Dutch Government and the owners of coal-fired power plants (Dutch Ministry of foreign affairs, 2010). The main objective of the covenant is to increase the use of biomass by these Power Plants in order to reduce emissions. The agreement has expired in 2012 after 10 years of implementation, and the country plans on phasing out fossil fuel as mentioned in the SER agreement.

In 2010, when the action plan was submitted, the Netherlands could not ensure that all the relevant facilities needed to meet the RE objectives would be finalized. The action plan reports that in order to attain their target of RE share in 2020, there must not be any delays for the concerned infrastructures and that since the government was in transition, the projections could not be made until the end of 2011 after the SDE+ was initiated (Dutch Ministry of foreign affairs, 2010).

Energy Efficiency

Action plan

Dutch National Energy Efficiency Action Plan

The directive requires national government to realize consistent improvements in the built environment belonging to the state. According to the National action plan the Netherlands does not require further implementation as the national policies in place already yield higher results than the yearly 3% improvement required by the Efficiency Directive (Minister of Economic Affairs and Minister of Interior and Kingdom Relations, 2014). Additionally, the central government has been purchasing in a fully sustainable way before the directive’s redaction, and local municipalities are to reach a sustainability rate of 75% in their purchases since 2010.

The Directive’s article 4 requirements on energy efficiency in the rest of the built environment is addressed by the SER agreement with energy labels and audits being implemented. Audits under the LTA3 (Long-term Agreement on energy efficiency) concern ETS enterprises and other organization with high electricity consumption and obliges them to have an Energy audit carried every four years by an independent expert, as well as the obligation to integrate an energy management system within three years of participation in the LTA (Minister of Economic Affairs and Minister of Interior and Kingdom Relations, 2014).

Concerns about the credibility of accreditation scheme is also addressed in the action plan and the government ensure that there is no lack of reliable energy advisors in the Netherlands.

The “Covenant More With Less” is a measure in place since 2008, its end target is a total of 2.4 million buildings renovated by 2020 (Minister of Economic Affairs and Minister of Interior and Kingdom Relations, 2014). This covenant consists of a comprehensive mix of policies, it targets existing buildings and involves several organizations in different sectors revolving around building renovation. The progress is monitored by a board.

The “Block-by-Block” scheme is rather similar, but targets homeowners, and aims to encourage them to realize energy saving projects in residential buildings, in its first year (2011) the scheme was involved in 13 projects across the Netherlands (Minister of Economic Affairs and Minister of Interior and Kingdom Relations, 2014).

Furthermore, smart meter will be implemented through a decree which would limit the impact of implementation on the end consumer. Billing is also addressed and falls under European framework.

The targets for energy savings specified in the article 7 are to be met with the SER agreement where parties have agreed to implement the directive’s objective. Furthermore, the government plans on creating “green deals” to increase energy efficiency (and renewable energy), green deals are used to remove obstacles and ease the realization of energy-related projects on a broad scale (Minister of Economic Affairs and Minister of Interior and Kingdom Relations, 2014).

The Ecodesign Directive, 2003/66/EC directive on eco designs, is a European legislation, it requires greater efficiency from appliances by improved their designs. The directive was translated into national policy and also follows additional European framework on labels. The Ministry of Economic affairs is the implementer of this regulation (Minister of Economic Affairs and Minister of Interior and Kingdom Relations, 2014).

Additional measures working towards the 20/20/20 commitments

Transport

“The Efficient Driving Campaign and Trucks for the Future” is the name given to a group of two policies. The first one concerning efficiency dates from 1999 while Trucks for the Future was implemented in 2011 (European Environmental Agency, 2015, A). These two policies work towards the reduction of fuel consumption in the transport sector, they are both implemented by the Netherlands Enterprise Agency, and

target transport-related enterprises. Reducing fuel consumption reduces emissions by increasing efficiency in the transport sector.

There are two fiscal measures on cars, the first one being on the car, and the second one on their efficiency (BPM). These measures are implemented by the Ministry of Finance, they provide an incentive for purchasing vehicles emitting less emissions and consuming less energy (European Environmental Agency, 2015, A).

The “EU CO₂ emission standards for cars” is the result of European framework on vehicle emissions, the EU has set criteria, which must be respected by member states and car companies. The measure was implemented in 2011 by the Ministry of Infrastructure and the Environment (European Environmental Agency, 2015, A).

The “Decision Biofuels as renewable energy for transport”, is a policy related to the Biofuels directive 2003/30/EC, and was implemented in 2011 and is supervised by the Dutch Emission Authority (European Environmental Agency, 2015, A). The main objective is the reduction of CO₂ emitted by the transport sector.

Agricultural sector

The “Covenant Clean & Efficient Agro-sectors” was implemented in 2008, and consists of a voluntary (organizational) agreement with the agricultural sector and more precisely in the horticulture and cattle breeding sectors (European Environmental Agency, 2015, A). The target of the measure is to achieve emission reductions and gain energy efficiency by using a mix of innovations and the covenant itself. The measure’s objective make it very broad; achieve efficiency improvement of 2% on a yearly basis, the reduction of emissions (up to 10 Mt of CO₂ equivalent) and 150 PJ of renewable energy by the year 2020. The policy thus made agreements on cattle management, the reduction of fertilizer and manure as well as energy agreements to be met (European Environmental Agency, 2015, A).

The “Ammonia and manure policy” main objective is to reduce the use of Manure and fertilizers in the agricultural sector, this effectively reduces Nitrous Oxide emissions. This policy was implemented in 1990 and is now tied to the covenant explored in the previous paragraph (European Environmental Agency, 2015, A).

The next measure is the “Sectoral emission trading system in horticulture”. As its names suggest its target is emission reduction, and to do so the measure works in a similar way to the ETS, but within the horticulture sector, which is a relatively important part of Dutch activities. Large installations already

under the ETS program also participate in the scheme. The measure is implemented and monitored by the Netherlands Enterprise Agency (European Environmental Agency, 2015, A).

The “Size of cattle stock and manure management policy” is a regulatory policy setting criteria for the reduction of emissions from cattle and the management of waste from the cattle industry. It is implemented by the Netherlands Enterprise Agency (European Environmental Agency, 2015, A).

Waste management

The Dutch Legislation on landfill and waste was implemented in 1999, landfills are regulated since 1999 by the European Union through a directive (1999/31/EC of 26 April 1999 on the landfill of waste). The regulatory policy requires waste management organizations to increase recycling and manage the methane created by the landfill process in a way that renders it useful or reduces it. The Ministry of Infrastructure and the Environment is in charge of the implementation of this regulation with waste processing/management entities (European Environmental Agency, 2015, A).

Other

The “Energy Investment Allowance scheme (EIA), Green Funds Scheme and Green Projects” is a group of policies working towards the promotion of investments in energy efficiency technologies. The measures are mainly economic and provide a deduction scheme to investors. The group of measures is supervised by the Netherlands Enterprise Agency (European Environmental Agency, 2015, A).

The “Environmental Investment Allowance schemes” was implemented in 2000, and the Netherlands Enterprise Agency is the body responsible for its implementation (European Environmental Agency, 2015, A). The policy is a fiscal one, making investments in environmental technologies more appealing, every year a list of the technologies that can partake in the scheme is published.

The “Reduction Program for non-CO₂ greenhouse gases (ROB)” dates back to 1998, it has now become a cross-sectoral policy aimed at informing society but it also creates deals and promotes research. It is implemented by the Netherlands Enterprise Agency and aims to reduce emissions by 8 to 10 Mt of CO₂ equivalent by 2020 (European Environmental Agency, 2015, A).

The National Energy Saving Fund, is a measure in place since 2014, it targets energy efficiency in buildings and is of economic nature. It is implemented by the Stimuleringsfonds Volkshuisvesting in coordination with financial bodies (European Environmental Agency, 2015, A). The funds allocated by this policy are transformed into loans to finance energy efficiency projects in residential housings (European Environmental Agency, 2015, A). Additionally, this economic measure is tied to the SER agreement and the Green deal policy.

The Netherlands has a national tax on Energy, called “Energy Tax”, the economic measure dates back to 1996, but has since been reformed in 2004, further reforms are expected (Vollebergh, 2014, pp 10-12). As such the tax is in a grey area for the moment. Before the reform, the tax was creating a financial incentive for energy efficiency and the use of renewables from small enterprises and households, renewables was completely free of tax.

Finding and Remarks.**Policy Type**

The main resemblance in the way the 2020 objectives are achieved in the countries studied, is that both Denmark and the Netherlands have used one or more large organizational measures to answer their commitments. Energy is being focused by the use of these agreements. As such, the March 2012 Agreement and the SER are similar in many aspects aside from their respective targets.

There are major differences when comparing the types of policy used between Denmark and the Netherlands.

First of all, Denmark has a considerably higher number of policies addressing climate change reported to the European Environmental agency. It is possible that some measures have not been reported by the Netherlands, yet the action plans do report on the policies used to achieve specific objectives. However, this does not mean that the Netherlands has yet to translate the directive's framework into its national policies, and the policies reported in the action plans and the EEA show that it has. Therefore, the Netherlands does confirm that the country has integrated the European policies' framework to attain the commitment it has made for 2020. As such, RE is prioritized on the grid, Energy Audits are being carried according to the Directive on energy efficiency etc.

This, however, would mean that the policies put in place at the national level in the Netherlands are/were not working as intended. And the recent performances on the share of renewable energy tends to confirm that there is a problem at the national level impeding the policies from working efficiently and limiting their impact.

To continue, the Netherlands uses economic policies to a big extend compared to other types of policies while Denmark has an almost balanced mix of regulatory and economic measures. Economic measures also often accompany informative policies and some regulatory measures in order to finance them.

A logic conclusion would be that regulatory measures seem to be more impactful than economic means of implementing European environmental policies. However, there is no conclusive studies sustaining the assumption.

Furthermore, the Organization for Economic Co-operation and Development has developed an indicator assessing the stringency of environmental policies at the national level. Interestingly Denmark and the Netherlands have the strictest policies in the OECD countries for environmental policies in the energy sector in 2012 according to the OECD indicator. But in the same year the OECD also reports that the

Netherlands is not as stringent with Market based policies that it is with non-market based policies, however the performance is not in any case bad as it is still above the OECD average (Botta & Koźluk, 2014).

Thus, non-implementation and/or lenient policies do not seem to be the cause of the lack of performances by the Netherlands, and the national context seems to be a more appropriate approach to study the Dutch inconsistent implementation results.

Determinants of Change

Implementation objects in the two countries are the same, they follow European framework, and concern energy and emission reduction. Implementation targets are different between the two countries.

First of all, the targets set at the European level with the 2020 commitments are different in both countries. Emission reduction in Denmark is at -20% and at -16% in the Netherlands. Energy efficiency is the same for all Member States (1.5% energy savings every year). On the other hand, renewable energy targets feature a big difference with 30% in Denmark and 14.5% in the Netherlands (2005 level). The main criteria used to define specific MS targets are national and gives Denmark higher goals because of their economic/social situation and their environmental acquis.

Despite having national targets set by the EU there is an additional difference in the national targets of Denmark and the Netherlands. In the Netherlands national targets tend to follow targets set at the European level. As such, the SER's objective fall in line with the energy directives. Danish national targets in the meantime are often higher than what is asked by the European Union's legislation. For instance the framework for 2050 and beyond is still in the making. However, Denmark has committed itself to phase out fossil fuel as a source of energy and is on track to meet a renewable energy share 5% higher than required in 2020.

In the two countries, there are some recurrent implementers, naturally the implementation rests on the national government and other local government in most cases.

The main ministries in charge of implementing the European requirements in Denmark are: The Danish Ministry of the Environment, The Ministry of Taxation, and The Ministry of Energy

The two most important agencies for the implementation of the 20/20/20 objectives in Denmark are: The Danish Energy Agency, and The Danish Environmental Protection Agency

The main ministries involved in the implementation of the 20/20/20 objectives in the Netherlands are: The Ministry of Infrastructure and the Environment, The Ministry of the Interior and Kingdom relation, and the Ministry of Economic Affairs

The Netherlands Enterprise Agency (RVO), is another important institution for the Dutch implementation, it is the most important agency to achieve energy targets and is in charge of most subsidies for energy-related policies, the SDE+ scheme, for instance, is implemented by the RVO

Furthermore, the “front liners” of the implementation usually consist of the different governmental agencies and the parties concerned in the different policies such as NGOs and private companies. Agencies provide a platform for the public and private sector to realize environmental measures. Private organizations are important and needed for energy policies to function correctly. Organizational policies also create a commitment from private parties, which they must respect. The Administration of various ministries also participate with the agencies, NGOs and other concerned parties.

Overall the targets of the policies used to implement the 20/20/20 policies are the same in both countries, which are the end consumers and private enterprises. Private enterprises consume energy, and generate emissions through their activities, while end consumers do so by consuming. An important feature of these targets is that the private enterprises usually pass on the cost of climate change policies through rising prices, meaning that the end consumers are likely to endorse the full price of the measures. Private organizations involved in the energy sector (creation, distribution, grid operators etc.) are the prime target of most energy policies, and especially the renewable energy share measures, their role is crucial and validates the use of a large organizational agreement in both countries. Transport and waste are also important and widely covered by European legislation, which both states have followed according to the measures reported to the European Environmental agency.

The specific implementation impact of the policies is hard to quantify and detail, thus the overall implementation impact will be addressed using the progress of the two countries on their 20/20/20 commitments. As previously mentioned the economic crisis and the recent warm weather make it hard to assess how impactful the national measures have been in the energy efficiency and emission reduction targets. The share of renewable energy, however, is not drastically affected by these contextual factors since it involves the creation of physical installations with specific energy outputs.

Emission reduction data in both countries is within the range required to achieve national targets by 2020 according to the national NRPs of 2015. However, some studies tend to discredit countries efforts to reduce emission and state the warm weather and the economic situation as the most important factors of the recent emission reductions.

Table 10 Energy Saving target for Denmark and The Netherlands

	Energy Saving targets under the 20/20/20 framework	
	Yearly energy savings	final energy consumption in 2020
Denmark	1.5%	17.8 Mtoe
The Netherlands	1.5%	60.7 Mtoe

(Eurostat, 2015)

Table 11 Energy Saving performances in Denmark and the Netherlands.

	Final Energy Consumption in Million tonnes of Oil equivalent (Mtoe)									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Denmark	15.4	15.5	15.9	15.7	15.5	14.8	15.6	14.9	14.4	14.2
The Netherlands	52.9	51.7	51.0	52.4	53.6	50.3	53.9	50.7	51.1	51.2

(Eurostat, 2015)

Energy efficiency targets in the two countries seem to have been reached already as the two previous tables outline. The rise in energy consumption is, however, not impossible in the future, and the two countries should maintain their efforts to reduce energy consumption.

Energy efficiency gains are also subject to the same critic as the emission reduction. Effectively, the impact of implementation may be different under a more favorable economic condition since the resources available (of the government and the consumers) would be greater. Alternatively, a scenario where winters were harsher would have definitely changed the performances of both countries.

Table 12. The Share of Renewable Energy in Denmark and the Netherlands

	Share of Renewable Energy In final Energy Consumption (in percentage)									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Denmark	14.5	15.6	15.9	17.8	18.6	20.0	22.0	23.4	25.6	27.20
Netherlands	1.9	2.3	2.6	3.1	3.4	4.1	3.7	4.3	4.5	4.50

(European Commission, 2015)

The table above shows that Denmark is short of its national target by only three percent, and has been consistent with its efforts to increase the national share of renewable energy. On the other hand, the Netherlands' performances could be described as "poor", with a rise of only 2% in almost a decade. Additionally, the RES directive was introduced in 2009 and has not significantly increased the Dutch

performances. The approach used by both countries is quite similar when it comes down to renewable energy, one country is using what they call a “tender” and the other one a “bidder”, in essence, they are both the same, and they follow rational choice theories, in order to maximize profits. These processes are supplemented by funds and subsidies.

Remarks

To begin with, a strong will to become sustainable is seen from the Danish government, while the Netherlands was tried in justice recently for not doing enough to mitigate climate change. Renewable energy performances in Denmark are high, national ambitions will apparently make the country fossil fuel free by 2050, and interim performances show that the targets are within grasps for Denmark. On the other hand, achieving renewable energy commitments for the Netherlands seems problematic and their success is doubtful since little progress has been made, and wind projects usually take some time before being active and having an actual impact.

The yearly progress shows inconsistency in the results from the implementation coming from the Netherlands despite having translated the European framework into national policy. According to the 2015 agreement on the SER, the reason for the lack of results comes from uncertain political elements in the country in the past years. In 2012 for instance, the government stepped down due to a political conflict and budget decision leading to early elections (British Broadcasting Corporation (BBC), 2012). Ultimately studying the political context of the two countries and their roles in the implementation of European legislation could yield very interesting results from an institutional approach. Furthermore, Dr. Robert Koelemeijer, agrees that the national instruments were unstable prior to the introduction of the SDE+. On the same note, the Netherlands should not change its approach to renewable energy, changing the current system (SDE+) would be inappropriate and would only create more confusion and complications for the energy market.

The feasibility of reaching the 14.5% of RES target in 2020 is doubtful for the Netherlands, according to Dr. Robert Koelemeijer, and the PBL the Netherlands is not expected to meet its renewable energy target by 2020. Projections stand at 12% in 2020 and 16% in 2023. In addition, the Dutch National action plan for renewable energy answering the Directive 2009/28/EC warns that any delays in the delivery of renewable energy measures would make it very hard for the Netherlands to attain their end target of 14.5% in 2020. Additionally, the data collected does not correspond to the national projections included in the Dutch Action plan for renewable energy. With less than five years remaining, it is possible that the Netherlands will not meet its national target. Consequences of failing one of the 2020 targets are not

explicit, there are mechanisms in place to ensure consistent implementation, followed by recommendation by the European Commission.

Prior to the RES and the Energy Efficiency directive Denmark already had a high environmental acquis and the country offers a somewhat better context to implement the 2020 strategy effectively, and it is reflected in the Danish commitments and advancements in climate change mitigation efforts.

Additionally, it seems that Toshkov's assumption stands true as the Netherlands has more changes to realize in order to successfully attain the 2020 commitments and needs to input more resources and efforts in order to successfully translate the implementation into results.

Moreover, reducing emission is often attained via other areas, trading schemes, and carbon pricing measures are not numerous at the national level. Instead, emission seems to be reduced by increasing renewable energy and decreasing consumption in almost if not all sectors. As such, the guideline of the EAP recommends focusing on the energy and transport sector which is reflected through the study. Transport was not heavily mentioned in the directives setting the 20/20/20 objectives. However, the EU has set an extensive framework regulating small vehicles emissions.

The average amount of energy produced from renewable energy can be calculated using table 7 and 8, which provide data on the RE targets and the national final consumption in million tons of oil equivalent. A base consumption of 51 million tons of oil equivalent for the Netherlands and 14.5 million tons of oil equivalent for Denmark has been used. Accordingly, the Netherlands would have to create about 7.4 million tons of oil equivalent from RE in 2020 to meet its 2020 target. On the other hand the Danish equivalent would be 4.35 million tons of oil equivalent, corresponding to the 30% of 14.5 million tons of oil equivalent being consumed on average every year.

According to the Netherlands Enterprise Agency, there are five projects to be constructed between 2015 and 2019, if the country is able to finalize them, it could be able to answer its renewable energy commitments. Furthermore, the Netherlands seems to be subject to a very specific problem concerning the use of wind as a source of renewable energy, the local population, despite agreeing on the use of wind, does not like wind turbines, the problem may come from the high population density, and a lot of projects encounter local oppositions. As an example, a project was withdrawn due to the local government of The Hague opposing it because it would be within sight of the beach and would damage the area visually and economically (The Economist, 2015). The Netherlands has a very high population density, it is the second highest of all member states behind Malta (Central Intelligence Agency (CIA), 2014), the only European states with a higher density than Malta are the Vatican and Monaco.

An Urgenda study reports that the Netherlands could, in theory, transform its energy supply in order to be 100% renewable by 2030 (Urgenda, 2014). Furthermore, the organization reports that the Netherlands does not lack the resources to do so, but the “will”. Additional targets the agenda presented in the study include 50% energy savings and 150 thousand new jobs.

Electricity price is amongst the highest in Europe for Danish citizen (Eurostat, 2014)., effectively the burden of climate change mitigation is distributed amongst all citizen and organization through a mix of measures, rising prices in the Netherlands and across Europe would be unsurprising in the future years as the costs of climate change is often redirect from company losses to higher price for consumers. Future projects in the energy sector in the Netherlands will not surprisingly create a rise in prices in the country too.

On the same note, the end consumer being the one endorsing most of the cost of these policies should be in a position that allows him to do so. Thus, the economic and social context of the two countries are important in the implementation process of the environmental policies. A high rate of employment and a high GDP/capita should be prerequisite to the two countries, it demonstrates how the national acquis of Denmark has helped them with the implementation. Another great contextual advantage is that the population in Denmark is not very dense.

Finally, the third and somewhat different ETS phase is quite recent and the changes it will bring cannot yet be assessed. However, Dr. Robert Koelemeijer does not think that the measures decided upon are appropriate and won't be able to stabilize the price of allowances. Less allowances or a price limit would in his opinion be a more appropriate.

Conclusion and recommendations

Conclusion

The current European framework for the environment is the result of many years of development since the first Environmental Action program. The 2020 strategy consists of a broad range of targets at the European and National levels, the strategy includes three climate change related targets: emission reduction, energy efficiency, and renewable energy. The European-wide targets are all at 20%, hence the name 20/20/20. At the National level the Emission and Renewable energy target differs from country to country, in the Netherlands emissions have to be reduced by 16% and Renewable energy should compose 14.5% of the energy consumed compared to 2005 levels, in Denmark the targets consists of a reduction of 20% in emissions and a share of renewable energy corresponding to 30% of the national energy consumption. Energy savings targets are set a 1.5% every year for all Member States. In total, there are four main European legislation creating the framework for achieving the 20/20/20 commitments, energy efficiency, and renewable energy share have their own directive, while the emission target is implemented through the ETS directives and scheme, and the Effort Sharing Decision (ESD). As a result, emissions targets are divided into two specific targets.

There is a clear contextual difference in the environmental acquis and the population density between Denmark and the Netherlands. The high population density in the Netherlands has generated some opposition to wind turbines installations across the country. Otherwise, the two countries are relatively similar with a comparable GDP/capita, weather, and geographical situation (necessary for offshore wind farms), economic structure and government type.

Emission Reduction is pursued using the ETS for about 45% of the EU's emissions, the rest is approached used by measures addressed towards the transport and the energy sectors across the EU under the ESD. As a result, emission specific measures are not numerous. The ETS system has proven to have a limited impact on the European emissions, and admittedly a big part of the emission reductions in the past decade can be attributed to the economic crisis and warm weather. To continue, the ETS did not have the intended impact due to the over-allocation of free allowances, and windfall profits for big polluters participating in the scheme. Unsurprisingly this prompted a change for the third period of the system with a new allocation framework revolving around the auctioning of allowances, the increased diminution of yearly allowances, and the "cap and trade" principle.

As to how these countries implement the 20/20/20 objectives, Denmark, and the Netherlands show a similar approach to the energy targets. As such, both have made a large cross-cutting organizational

agreements involving energy companies and setting targets at the national level for the parties involved. Furthermore, economic policies (taxes and subsidies) are widely used in both Denmark and the Netherlands, however, the Netherlands uses economic policies the most while Denmark has a balanced mix of regulatory and economic measures. In both countries, the main areas affected by regulatory and economic policies are the transport sector, the industry sector and the energy sector.

The progress made in Denmark towards its goals is consistent, achieving all of the 20/20/20 goals within the four remaining years should not be an issue for the country. On the other hand, the Netherlands has achieved good results in terms of emission reduction and energy consumption and is on the correct path to meet the 2020 requirements in these two areas. The renewable energy share however, is a problem for the Netherlands. National projections from the PBL indicate a RE share of 12% in 2020, which is short of its target for the 2020 Strategy. The reasons behind the difficulties in increasing the RE share seem to come from the instabilities of the measures put in place, but also the high population density creating some conflicts as to where should the wind turbine installations be. Political instability is also a cause of the poor renewable performances according to the 2015 agreement on the SER.

Recommendations

Policy-wise, some recommendation have been made by Dr. Koelemeijer on the ETS and the renewable energy policies in the Netherlands. The current SDE+ system should be able to increase the RE share in the long-term, and creating another measure would result in additional instabilities. The ETS on the contrary has to change in order to create a strong and reliable price of carbon allowances. Additionally, both countries have a strong bicycle culture and should strive to maintain it.

Furthermore, the European Commission is advocating for an “Energy Union” (European Commission, 2015), the implications of such a framework could bring some great benefits across Europe according to the European Commission. However, the creation of such a Union necessitates tremendous efforts in order to harmonize and connect the different energy networks in Europe, and the EU and Member States should make sure to establish sound precondition for the creation of an Energy Union in order to avoid inconsistencies in the network. The current Union proposal is still in the works and has yet to be decided upon.

Further research into the specific institutions involved in the implementation of the energy directives could bring an interesting insight on the way energy projects are handled at the national level. The Danish Energy Agency, and the Netherlands Enterprise Agency for instance, share similar tasks providing a platform for energy-related tasks and projects at the national level. Their approach and the context in which they implement their national targets would allow further understanding as to why Denmark is performing really well compared to the Netherlands.

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Annexes

Annex 1. Table on the policies contributing to the 20/20/20 targets in Denmark

POLICY AREA	POLICY	IMPLEMENTATION OBJECT	IMPLEMENTERS	TARGETS	CONTEXT	STRATEGIES TO FACILITATE IMPLEMENTATION	IMPLEMENTATION IMPACT	POLICY TYPE
	March 2012 Agreement	Multitude of targets and parties are involved in this broad agreement. The main objective concerns energy supply and efficiency. Targets are more than 35% in RE share, 50% of electricity from wind, 34% less emissions and 7.6% less energy consumed (2010 lvl) in 2020	Government, Ministry of Climate, Energy and Building and parties involved	Energy suppliers and users				Organizational
ESD	Circular on energy efficiency in State institutions (2005)	Improve energy efficiency thus decreasing emission from State institutions (infrastructures and services)	Danish energy Agency and individual institutions of the State	Danish state institutions	Danish government has to revised its public buildings performances	Public reports		Regulatory
	Promotion of environmentally friendly goods transport (2014)	continues the national effort of promoting environmental friendly means of transports	Danish Environmental Protection Agency, Haulage contractors	Drivers	European regulation 2009/595/EC	Funds for the campaigns		Informative
	Group of taxes	There are numerous environmental taxes in	"Relevant governmental	Polluters, as it follows the	Energy Taxation		Taxes effectively incentivize	Economic

		Denmark. Carbon tax, electricity tax, mineral oil. CO2 tax on energy products. Denmark is one of the few country to put a tax on carbon at the national level	Usually Ministry of taxation and the environmental and energy agency	principle of "polluter pays"	Directive 2003/96/EC		reducing emission and also allows revenues for the government which are used to fight climate change	
	Establishment of intermodal installations (2014)	Aims to create a shift to public transportation and non-motorized transportation	Ministry of Transport and Energy, municipalities, Danish State Railways (DSB)	Transport sector and citizens	Regulation Euro VI for heavy duty vehicles 2009/595/EC		Already high usage of intermodal transportation (bicycle and public transports)	Economic information
	Campaigns and promotion of efficient appliances (including elec. heating, conversion and efficient appliances in households)	Campaign with a dedicated budget to raise awareness of appliances consumption	the Minister for Climate and Energy and The Danish Energy Authority	Society in general	Expired in 2012 (started in 1997)			Informative
	Information campaign on fuel consumption of new cars (2000)	Raising the awareness concerning the new energy labels for cars, behavioral approach	Road Safety and Transport Agency	Vehicle buyers	Several European legislation create a framework for car emissions.	Funds are allocated to the campaign		Informative

	Ban on burning straw on fields (1989)	Regulates the way straw is discarded. Bans burning.	Government and local municipalities	Agricultural sector, waste management and energy production installation (use of straw to create energy)	United nation provides a certain framework since 2013		Reduced CO2 emissions and other GHG from the burning process	Regulatory
	EU requirements regarding biofuels	Implement the average of 5.75% of biofuels in the petrol and diesel sold	Danish Energy Agency	Drivers, fuel industry	Biofuels directive 2003/30/EC		Following the requirement increases the share of RE in transport	Regulatory
	Energy Correct driving technique (2000)	Informative campaign on driving more efficiently in order to save energy and reducing transport related emissions and energy consumption.	Government and ministry of justice	Drivers	Transport plays a big part in emissions and energy consumption	Funding's from the government	5 to 15% fuel savings can usually be realized with efficient driving according to Danish experience.	Informative
	Subsidy programme – Enterprise Scheme (special scheme for businesses) 2004	Concerns waste reduction and a refund on carbon taxes by reducing the emissions coming from waste.	Government and ministry of environment	enterprises	replaced the cleaner product policy aimed at reducing waste	EU framework on Landfills and waste management	Has significantly reduce methane emissions in the range of 79 to 93 percent reduction in methane emissions	Regulatory, Economic
	Transport infrastructure projects in the fields of electric vehicles, gas and	Funds have been unlocked for infrastructural project for electric drive vehicles in order to diminish the emissions from transports (70 million DKK).	Government and ministry of transport	Vehicle users,	Energy agreement, future funds in the coming years	The policy is a scheme to promote electric drive vehicle by providing the necessary infrastructure		Economic

	hydrogen (2014)							
	Energy labelling of electric appliances (1992)	Plan on covering 85 product types by 2020, 46 product types as of 2013. Mainly towards consumer items, but plan on expending towards the products used in enterprises. Provides energy labels to promote a more sustainable buying pattern	National government and European Union with labelling framework and the Energy star label	Producers of concerned products and their consumers	Labelling of product	Common labelling system (energy star), EU legislation, eco-design directive and labelling directive	Significant reduction to energy consumption according to the Danish Energy Agency (5% less of 2011 energy consumption excluding transports	Regulatory
	Reduced emissions of ammonia (2001)	Concerns the agricultural sector's use of fertilizer and their management of animal waste	National and local governments	Agricultural sector	Agriculture is a small part of Danish economy, European common agricultural policy	EU Nitrate Directive 1991/676/EC	Effectively reduced ammonia used and emitted by manure and other agricultural methods	Regulatory
	Subsidy for conversion of arable land on organic soils to nature (2015)	Reducing the use of manure and fertilizer in the agricultural sector, and appropriate land usage	Government	Agricultural sector	LULUCF - part of the UNFCCC UN framework convention on climate change			Economic

	Increased recycling of waste plastic packaging (1994)	Main objective is to increase recycling by providing people and companies with simple choice for sorting their trash in order to improve recycling	Government and Danish environmental protection agency, local governments	waste management enterprises and other concerned parties	European regulations on packaging and waste		increase of 22.5% in plastic collection for recycling	Regulatory
	Electrification of parts of the rail infrastructure (2014)	Project is attributed with a tender. Plans on electrifying a large part of the railway. Co funded by the European Union. Ultimately electrification of the railways would increase the share of renewable in the transport sector.	Banedanmark, the company in charge of the train services in Denmark. National government, party chosen for the project	users of the rail network in Denmark	Progressive electrification. Denmark isn't relying on train as much as the Netherlands	Tender for the project, European and national funds. Carbon tax revenues are used for this project	Faster, more efficient train transportation.	Economic, organizational
	Environmental Approval Act for Livestock Holdings (2007)	Reduce the impact of the agricultural sector. Reduce manure use, and improve livestock management. Puts in place a set of regulation for private agricultures such as buffer zones for ammonia	Government and local municipalities	Agriculture	Common agricultural policy			Regulatory
	A ban of landfill of combustible waste. (1997)	Has banned using landfills for combustible waste, it must be used as a source of energy	Local municipalities	waste management enterprises and local communities	European waste regulations		Less landfills and more recycling	Regulatory
	Reduced travel times for public transport (2014)	Transport sector. Aim to reduce travel time thus reducing energy consumption by the sector. Includes the railway system	Government, Ministry of Transport and Energy and Danish State Railways (DSB)	Drivers and commuters	The railway system is not used to the same		reduce energy consumption and emissions from the transport sector	Economic, Regulatory

					extend as it is in the Netherlands.			
	Investments in a new metro line and bicycle transport facilities. (2014)	Funds for improving the cycling aspect of the country and the creation of a metro in Copenhagen. Project was initiated in 2014. Improve the infrastructure.	Government	Commuters, users of bicycle as a mean of transport	Like the Netherlands Denmark is also referred to as a cycling country		Project is recent and started in 2014.	Economic
	Regulation of use of HFCs, PFCs and SF6 (phasing out most of the uses) 2006	Reduction from emissions resulting from specific industrial processes (fluorinated gases). Ultimately forbids certain uses of certain chemicals	Government and Danish Environmental Protection Agency.	industries	The EU and the international community has taken steps to phasing out this particular gas		Progressive phasing out of the fluorinated gases.	regulatory
	Biogas Plant (1987)	Increase the use of RE, reduce animal waste impact, reduce emissions. Funds and subsidies for enterprises connecting biogas to the energy grid	Government	Agricultural sector and energy supply	Part of the 2012 agreements			Economic
	EU demands on vehicle manufacturers to deliver fuel efficient cars and vans (2000)	Vehicles sold in Europe fall under certain regulation on their emissions from the European union in order to decrease the impact of transportation on energy	European Commission, national governments and car manufacturer.	Vehicle producers	European wide regulation 2009/443/EC and no. 510/2011			Regulatory

		consumption and emissions.						
	2010 Agreement on Green Growth	Various implementation objects, concerns water quality, pesticides, nature and biodiversity and emission reduction in the agricultural sector.	Danish Government	Agricultural sector			Emission reduction target is 800 000 tonnes every year.	Organizational
	The waste tax 1987	National Government (1987 tax) / fixed tax on landfills and burning of waste. Reduce landfills and the improve waste management to reduce its environmental impact	Ministry of Environment and Energy, Danish environmental protection agency	Waste	There is several waste management laws at the European level			Economic
	Subsidy programme for bio covers on landfills (2015 – 2017)	Provide a financial incentive for people using the best alternative to cover landfills	Government and Danish Environmental Protection Agency	waste management enterprises and local communities			Reduces the methane emissions of landfills	Economic
	Spatial planning (2000)	Reducing transport use at the regional level by including sustainability in the development of transport infrastructure	Local government and municipalities	Broad, public and private transport sector	Urbanization and freight transport is increasing in Denmark			Regulatory, Economic

	Investment in a tunnel under the Femern Belt (2014)	Reducing transport use by shortening the distance with the creation of new infrastructures	Danish government and the Ministry of Transport	Road users			Reducing the amount of time people travel will directly reduce their energy consumptions	Organization, financial (project costs)
	Action Plan for the Aquatic Environment I+II and Action Plan for Sustainable Agriculture, Action Plan for the Aquatic Environment III	Reduce the use of manure and fertilizer. First plan started in 1987	Government and local municipalities	Agricultural sector	4 action plans so far since 1985	Actions plans are renewed and allows amendments as progress goes.		Organizational and regulatory
	Weight-and-volume-based packaging taxes (2014)	Taxes are in place based on the amount of packaging, effectively creating a financial incentive for less materials and lighter packages.	Government and ministry of taxation	Private sector	Most products we use today come in a package.		Effectively reduce resources used in packaging and the resulting waste	Regulatory
Energy Efficiency	Better Homes (2014)	Energy efficiency of dwellings by creating a single framework for refitting private homes at a reasonable cost. The policy is not regulatory and the decision remains in the hand of the home owners	Danish Energy Agency and private companies	Home owners		The policy itself aims to facilitate home renovation to increase efficiency		Organizational

	Mandatory Energy Audit for large Enterprises (2014)	Conduct energy audits following the criteria of the Efficiency directive for 2020 (every four years)	Government and persons responsible for carrying out these Audits	Large enterprises	Required by the Energy efficiency directive		Audits gives enterprises an overview of their energy consumptions and recommendations for energy efficiency measures,	Regulatory,
	Strategy for Energy renovation of buildings (2014)	Building regulation working towards a very small energy consumption per building as well as refitting existing buildings, 21 initiatives to promote and insure efficiency measure are applied. 35% reduction in heating and hot water in 2050 compared to 2016.	Broad Network of Stakeholders	Very broad, private, public and individuals all use buildings	Large part of energy consumption comes from building. Related to "Better Homes"			Regulatory
	Savings activities by elec. grid, gas, oil and district heating companies (consump. of final energy excl. Transp.) 2006	Energy companies are obligated to realize two things. Annual energy savings of 2.95 PJ and an informative campaign for their customers of energy efficiency. Effectively the cost of these measures is carried out by the consumer through higher prices	Danish Energy Agency and energy companies	energy consumers		Consumer endorse the costs of the measure	if respected, the measure allows for stable yearly energy savings	Informative
	Agreements on energy efficiency with business	Agreement in connection with the CO2 tax for energy intensive industries, providing them with an economical relief	Government and involved companies	energy intensive industry	Started in 1993 and has expired since then in 2009			Economic Organizational

	The center for energy savings in enterprises (2014-2017)	Knowledge center with governmental funding. Aims to choose a tender to facilitate efficiency projects and creates the network in order to improve communication and information to private parties on energy efficiency	Danish Energy Agency and private companies through a tender system	Private companies		call for a tender to run the center at the European wide level (ultimately given to a consortium of institutes and scholar organizations)		Informative
	Energy labelling of small and large buildings (incl. public sector and business) 1997	Works on the principle of EIA(environmental impact assessment), providing the profile of energy consumption and the best ways to reduce energy consumption by providing labels to homeowners	Danish government, and Energy Agency, Consultants	Home and business owners	Energy efficiency directive	The target of the policy have to pay for the labelling process		Regulatory
Share of Renewable Energy	Tenders for offshore wind turbines (2013)	Make Renewable Energy projects low risk by providing a framework to facilitate new wind farm projects. Planned projects would increase Wind power to 1950 MW and a big contributor to Danish additional targets for 2050. Gives an alternative to the regular procedure for creating offshore windfarms	Danish government and relevant ministry, Energinet (non profit org owned by the Ministry of Energy)	Suppliers, private companies, ultimately end consumers with rising prices. Denmark will choose the best option out of the tenders for the different projects offered.	Danish Environmental acquis is high. Shared Technologies and knowledge	The implementers do organize information sessions and a simpler procedure for projects to be realized.	Higher prices for energy consumers /significant raise in Renewable energy share from large scale projects, Impact may vary with climate conditions	Organizational Financial
	Renewables for the Industry (2013)	Aims to increase the renewable energy supplied and consumed by industries. Directly impacts enterprises and indirectly	Government:- Danish Energy Agency (plus other governmental	Enterprises access to funds for converting to RE. Supports the use of RE and	Part of the national plan to phase out	Fund has been created to support companies		Economic

		society in general as it may influence prices	organizations) and enterprises	district heating in Enterprises and the investment from enterprises	fossil fuel directly contribute to the RES directive			
	Scrapping scheme for old wind turbines (2008)	Facilitate the removal of wind turbines due to their age or emplacement. Effectively affect the energy supply towards higher share of RE	Danish Ministry of Energy and local governments	Old Wind turbines operator, renewing installation to create more efficient solutions	New and better turbines have been created. Onshore turbines can create conflict with locals			Economic
	Price supplement and subsidies for renewable energy production (2008)	Financial support for raising the share of RE and the technological advancement needed	Government:- Danish Energy Agency and entities responsible for energy production	Energy suppliers				Economic
	Substitution of individual oil-based furnaces (2010)	As of 2013 all new boilers installed cannot use oil or natural gas. As of 2016 no new boilers shall be installed if the area has district heating or natural gas supply. 5.6 million Fund over the 2013-2015 period.	Government and Danish Energy Agency	Private buildings. House owners, users, consultants, women, finance and insurance institutions are eligible for the fund	New objectives decided in the energy agreement of 2012	Funds		Economic
	Biomass Agreement (energy production) 1993	Agreement with the electricity producer to use more biomass in 1993, since the measure is still active and has been revised	Government and electricity producers	electricity producers	Related to waste management	Objectives are adjusted over time	increase the share of renewable energy in the national mix	Organizational

(European Environmental Agency, 2015)

Annex 2. Table on the policies contributing to the 20/20/20 targets in the Netherlands

POLICY AREA	POLICY	IMPLEMENTATION OBJECT	IMPLEMENTERS	TARGETS	CONTEXT	STRATEGIES TO FACILITATE IMPLEMENT.	IMPLEMENTATION IMPACT	POLICY TYPE
SER	SER 2013 and 2015 agreement on the SER	The object of implementation follow the requirements of the Directives in order to set its goals. Energy efficiency saving of 1.5% per year, 14% share renewable energy in total consumption by 2020 (16% by 2023) and the creation of 15000 jobs. Includes more than 250 different measures.	Government , Ministry of Economic Affairs, Ministry of Infrastructure and the Environment, Ministry of the Interior and Kingdom relation, Private companies, NGOs. Local government IPO (provincial authorities)	enterprises, energy consumers	Concerns all aspects of the 20/20/20 objectives	Recent changes has prompted the creation of a standing committee with an independent chair to supervise the implementation of the agreements in the 2015 agreement on the SER	Relatively limited according to the 2015 agreement, which Mentions uncertainties and limited impact, mentions political instability as a reason for inconsistent performances	Organizational.
ESD - NETS Emissions reduction	Efficient Driving Campaign (1999) and Trucks for future (2011)	Group of two policies. One to improve the efficiency of vehicles and the other to induce a more efficient driving behavior	Netherlands Enterprise Agency (RVO), Government , Companies involved	Companies	Further measures are to be decided on	Funds to help enterprise find efficient solutions for the transport related activities		Economic and informative

	Covenant Clean & Efficient Agro-sectors (2008)	Reduce the use of manure and fertilizer in the agricultural sector through a negotiated agreement. Targets concern emissions, efficiency and RE in the agricultural sector. Target: 3.5 to 4.5 Mt of CO ₂ in 2020 compared to 1990 and 2% yearly efficiency gains	Government and parties involved in the agreement	Agricultural sector	Based on previous covenants on efficiency		200 kt of CO ₂ equivalent expected in 2020	Organizational
	Legislation on landfill and waste (1999)	Regulates the management of waste to improve recycling and the methane resulting from landfilling	Ministry of Infrastructure and the Environment	Waste management companies	European Legislation around landfills		200 kt of CO ₂ equivalent expected in 2020	Regulatory
	Ecodesign Directive (2005)	Improve the efficiency of appliances by improving the design setting standards	Government	Private and public sector	2003/66/EC directive on eco designs			Regulatory
	CH ₄ gas engines	Energy Consumption of gas engine. Reduce gas loss (CH ₄ is methane)	Government	improve methane engine efficiency, Methane gas engine are used by industries				Regulatory

	Green Deals (2015)	Remove Obstacles to small scale projects for green growth. Make simpler procedures requiring less time etc.	Dutch Government	Citizen, stakeholder organizations, local councils, SME	Broad measure aimed at the energy consumption and supply (efficiency and RE)			Organizational
	Sectoral emission trading system in horticulture (2011)	Creation of an emission trading scheme in the horticulture business	Government	Horticulture industry	The Netherlands is a prime producer of horticulture product			Economic
	Energy Investment Allowance scheme (EIA) 1997	Provides a fiscal incentive for investing in green projects. Yearly lists of possible projects are made	Netherlands Enterprise Agency (RVO) and Investerings regelingen en Willekeurige Afschrijving	Investors, companies	Technologies available and criteria provided by the yearly list			Economic
	Green Funds Scheme (1995)	Scheme providing a tax incentive to companies investing into green projects. Combines interest rates and tax to create the incentive	Government , Financial organization , the Netherlands enterprise Agency	Investors, companies				Economic
	Fiscal policy on car efficiency (BPM) 1992	Better fiscal environment for buying cars that are below the European regulation requirements	Ministry of Finance	Anyone buying a car for passenger, or a delivery van (tax based on CO2 gr/km	European emission regulation on vehicles			Economic

	Size of cattle stock and manure management (2008)	Improve the waste management of manure and reduce the emissions of CH4 from cattle	Netherlands Enterprise Agency	Agricultural sector				Regulatory
	EU CO2 emission standards for cars (443/2009)	The EU has set regulations on car emissions which must be respected			European Regulation on car emissions			Regulatory
	Reduction Programm for non-CO2 greenhouse gases (ROB) 1998	Mix of information measures and subsidy scheme, since 2009 the policy focuses on the cooperation with private companies and R&D and dropped the subsidies	Netherlands Enterprise Agency	Non CO2 emissions in the Netherlands. Private sector				Economic, informative
	Energy Tax (1996)	Tax incentive for energy efficiency since 1996. Numerous categories with different tax levels, aims to induce behavioral change in the way people consume electricity	Ministry of Finance	Industries, public society via the tax on their energy consumption (lower than for industries)	1996 policy became the energy tax in 2004.	Policy was revised over the years		Economic
	Environmental Investment Allowance	Fiscal deduction schemes to increase investment in	Netherlands Enterprise Agency	List for eligible tech and specific criteria dictates the targets				Economic

	schemes (2000)	environmental technologies						
	Ammonia and manure policy (1990)	Reducing the use of fertilizer and manure in the agricultural sector	Ministry of Economic affairs	Agricultural sector				Regulatory
	Decision Biofuels as renewable energy for transport (2011)	The objective of the measure is to curb emissions coming from the transport sector	Dutch Emissions Authority	Transport sector				Regulatory
Energy Efficiency	Energy label for housing and buildings to promote energy efficient (2014)	Encourage labels for people selling or renting their house and apartments	Ministry of the Interior and Kingdom Relations	Homeowners' selling or renting their house. Real estate industry				Regulatory, informative
	National Energy Saving Fund (2014)	Funds and loans for the creation of energy saving project in the building sector. Government and financial organizations (banks) cooperation for the creation of starting funds and loans needed for projects.	Stimuleringsfonds Volkshuisvesting - local authority	buildings (home owners, industries)	Works in coordination with the Energy Agreement and the green deals			Economic

	Covenant 'More with less' [Framework covenant] 2008 -2020	Agreement to realize energy savings in buildings (existing buildings, rental sector and new buildings) while promoting economic activity where energy saving installations are put in place. a total of 2,4 million existing buildings have to be made more efficient in 2020	Government , Ministry of the Interior and Kingdom Relations, Companies involved	Broad and selective			400 kt of CO2 equivalent expected in 2020	Organizational
	Block-by-block scheme (2011)	Energy efficiency/consumption of buildings. Testing of a programs in 2001 tying up energy saving services and financial models. If successful the project will move to more areas under the form of green deals or projects.	Government , Ministry of the Interior and Kingdom Relations, Companies involved	Energy providers and producers, end consumers	Can work in conjunction with the green deal policy			Economic

	Long-Term Agreements (MEE) on Energy Efficiency with industrial enterprises that have to participate in the EU ETS scheme (LTAs) 2009	Agreements to improve energy efficiency and enhance the use of renewable energy in energy intensive sectors of the industry. 4 year energy efficiency plans, realization and reporting of measures and developing the longer term measures needed	Netherlands Enterprise Agency.	Energy intensive sector, some transport related companies (railways). It is one for the main measure for the audit requirement	pre 2020 directive on efficiency and RE	Agreements are revised and work in phases, current phase is the third one. In order to fill the gaps of the directive A decree will be made to make audits an obligations for enterprises not in the LTAs		Organizational
Share of Renewable Energy	SDE+ Subsidy scheme for renewable energy production (Stimulation of Sustainable Energy Production) 2008	The SDE scheme consists of a subsidy which effectively pays back energy companies the price between the renewable energy and the oil equivalent, making renewable energy cost the same as other means of prod.	Netherlands Enterprise Agency.	Renewable energy projects		Recent changes have been made (NRP of 2015), more projects are eligible	Main measure in place for increasing the RES of the Netherlands, 12% RES expected in 2020	Economic
	Coal Covenant (2002)	Increase the share of Renewable energy by passing an agreement with companies. Use of biogas in their	Companies and government	Various electricity producers, Ministry of economic affairs	The measure has expired		As seen before the RES in the Netherlands poses some uncertainties	Organizational

		electricity production facilities						
	Government Coordination Scheme	Aims to simplify procedures in the context of the Spatial planning act			Part of the Spatial Planning Act			Regulatory

(European Environmental Agency, 2015)

Annex 3. Feedback from the PBL (Netherlands Environmental Assessment Agency) with Dr. Robert Koelemeijer.

Question 1:

Could you quickly describe your professional background and the organization you work for, the PBL (Netherlands Environmental Assessment Agency)?

Dr. Robert Koelemeijer:

I have been working for PBL since 2002. Since 2011, I have been working in the field of climate and energy policy at PBL. A description of PBL is given at our website:

Mission

PBL Netherlands Environmental Assessment Agency is the national institute for strategic policy analysis in the fields of the environment, nature and spatial planning. We contribute to improving the quality of political and administrative decision-making by conducting outlook studies, analyses and evaluations in which an integrated approach is considered paramount. Policy relevance is the prime concern in all our studies. We conduct solicited and unsolicited research that is always independent and scientifically sound.

Independent

PBL is an autonomous research institute in the fields of the environment, nature and spatial planning. It is part of the Dutch Government organisation; more specifically, the Ministry of Infrastructure and the Environment. Other government departments – in particular the Ministry of Economic Affairs, the Ministry of the Interior and Kingdom Relations (Housing and Government Services) and the Ministry of Foreign Affairs – may also ask PBL to conduct research into issues related to the environment, nature and spatial planning. The independence of PBL and its partner agencies CPB Netherlands Bureau for Economic Policy Analysis and the Netherlands Institute for Social Research (SCP) is safeguarded in the Protocol for the Policy Assessment Agencies (Aanwijzingen voor de Planbureaus), Staatscourant (government gazette) 3200, 21 February 2012.

Professor Hans Mommaas is the Director-General of PBL Netherlands Environmental Assessment Agency.

Core tasks

The core tasks of PBL are:

to investigate and document current environmental, ecological and spatial quality and to evaluate policy;

to explore future social trends that influence environmental, ecological and spatial quality and to evaluate possible policy options;

to identify social issues of importance to environmental, ecological and spatial quality and raise them for discussion;

to identify possible strategic options for achieving government objectives in the fields of the environment, nature and spatial planning.

History

PBL Netherlands Environmental Assessment Agency was established in May 2008 when the Netherlands Institute for Spatial Research (RPB) merged with the Netherlands Environmental Assessment Agency (MNP). The merger came about as part of the Government Reform (Vernieuwing van de Rijksdienst) programme, which resulted in the activities of RPB and MNP being transferred to PBL.

Question 2:

The SER (energy agreement) of 2015 recognizes the countries' poor performances towards its energy commitments, and according to the agreement, the national instabilities of the different governments during the past years would be the main reason.

Would you agree with the SER, and say that the unstable political scene is the main reason for the poor performances of the country? If not, what is/are the reason(s) for the lack of good results in the area of renewable energy?

Dr. Robert Koelemeijer:

The SER energy agreement (SEA) has been signed in 2013. I agree with the SER that several changes in the policy support for renewables until 2010 have contributed to a slow growth. After 2010, policy support for renewables have become much more predictable with the SDE+-subsidy system. Other factors for slow progress are problems related to agreeing on locations of windfarms on land. There has been a lot of debate between the stakeholders, local communities, provincial government and central government on where new windfarms could be realized.

Question 3:

Do you believe that the Netherlands will reach its renewable energy share targets by 2020? If not, what would be the consequences for non-implementation?

Dr. Robert Koelemeijer:

The expectation of PBL and ECN is that the Netherlands will reach about 12% renewable energy in 2020 and 16% in 2023 through domestic production. See the publication: Nationale energieverkenning 2015, page 11. However, it is thinkable that the gap between the target of 14% (2020) and our expectation (12% in 2020) is closed by collaboration with other EU-member states. The Renewable energy directive has several mechanisms for international co-operation (Articles 6-11 in the directive 2009/28/EC).

Question 4:

The Netherlands has a very high population density, which is creating some problems with the installation of Wind turbines, The Hague for instance rejected a project offshore of Scheveningen because it would hurt the community economically and visually. According to the national action plan and the different policies the Netherlands seem to bet on Wind for its renewable energy gains.

First of all would you agree with the previous statements? Then is there a less problematic alternative to wind power for the country's development of renewable energy? If not should the government try to change the behavior of citizens towards the Wind turbine projects?

Dr. Robert Koelemeijer:

Wind power, both onshore and offshore, is expected to play an important role in the production of renewable energy in the Netherlands. There are no substitutes to windpower that do not have their own disadvantages; importing biomass for example may lead to problems with sustainability, and domestic potential for additional growth until 2020 of other renewable options is limited. It is correct that in many project for onshore wind, there has been lot of local opposition which is hampering projects being developed. Also, there has been opposition to offshore windfarms by local authorities and stakeholders, because they are worried about the visual and economic consequences. To my knowledge, permission to build offshore windfarms is given by the central government, however, and not by local authorities. The central government has made agreements with provinces recently on how much area and where they should reserve for new onshore windfarms. Whether or not the government should try to influence the public opinion is up to the government.

Question 5:

If you are familiar with the European Emission Trading System (ETS), do you believe that the amended third period will fix the issues of over allocation and windfall profits?

Dr. Robert Koelemeijer:

I assume that you refer to the change regarding the market stability reserve (MSR). The MSR will not change the total amount of emission credits, hence it cannot be expected to have a large impact on the price of CO₂-credits. To realize a higher price in the ETS, the emission ceiling needs to be tightened, or a minimum price could be introduced.

Question 6:

The Netherlands uses a lot of economic measures to implement European environmental policy, should these measure be reviewed in order to increase their effectiveness? (broad vs specific taxes, higher incentives from subsidies etc.)

Dr. Robert Koelemeijer:

This is a very broad question (environment policy in general). I think regarding renewables, another approach would be an obligation for energy produces. However, studies show that the disadvantage is that an obligation system is economically less efficient than the current SDE⁺-system for the Netherlands. Moreover, I expect that keeping the system as it is will provide stability for the market and that changing the support system would hamper progress towards meeting renewable energy targets (see also the SER-conclusion in question 2).

(Minister of Economic Affairs and Minister of Interior and Kingdom Relations, 2014)