# Germany, Denmark and the United Kingdom: lessons to be learnt for the Netherlands?

## Report on a seminar for the SER negotiations on the Netherlands' National Energy Agreement

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# Foreword

On 17 April 2013 – at the invitation of the Social and Economic Council (SER) – the European Climate Foundation (ECF), PBL Netherlands Environmental Assessment Agency (PBL), and Clingendael International Energy Programme (CIEP) organised a seminar on *Energy Transitions in North-western Europe*.

The results of the seminar provide insight in the developments in Denmark, Germany and the United Kingdom. The lessons presented in this paper will be used by the SER as input for the negotiations on the *National Energy Agreement for Sustainable Growth*.

As the negotiations on the *National Energy Agreement for Sustainable Growth* are moving into a critical stage it is important to remind ourselves that the national agreement in the Netherlands is inherently part of a wider policy development in Europe and our neighbouring countries in particular.

The Netherlands has a very open economy and its energy system is heavily integrated with our neighbouring countries. Our economy benefits in many ways from this interconnectedness. It allows us to optimise our gas resources, fully develop the role of the Rotterdam harbour, and develop our offshore resources and employ our expertise.

The interconnectedness of the Netherlands energy system also means the Dutch approach to decarbonisation should relate to developments and policy decisions in other countries. Relevant lessons can be learned on the technical, societal, political and policy challenges of decarbonisation.

A critical part of a successful negotiation outcome lies in the ability of the stakeholders involved to create trust in the long-term robustness and policy stability of the negotiated agreement. Our neighbouring countries have each in their own way managed to create broad support amongst policy makers and in society at large for decarbonisation policies and have ensured investor confidence in the longevity of the policy direction. Permanent institutions are pivotal to ensure continued consensus building amongst stakeholders, translation of the vision in into medium term strategies and monitoring of progress.

We are very grateful to the organising organisations – European Climate Foundation, PBL Netherlands' Environmental Assessment Agency, and Clingendal International Energy Programme – for their research, support and facilitation.

A special thanks goes out to the speakers of the day – Rainer Baake (German Agora Energiewende), Peter Bach (Danish Energy Agency) and Michael Grubb (UK Climate Change Committee), the panellists – Coby van der Linde (CIEP), Bert Stuij (NL Agency) and Jan Willem Velthuijsen (PwC) –

and moderators Pieter Boot (PBL) and Bert Metz (ECF). Special thanks are also due to Fieke Geurts (Ecofys) who expertly conducted this paper.

Wiebe Draijer
President Social and Economic Council

# Executive Summary

This report synthesises the outcomes of the seminar on the *Energy Transitions in North-western Europe,* held on 17 April 2013 in The Hague. The aim of the seminar was to feed lessons learnt from Germany, Denmark and the United Kingdom into the negotiations for a National Energy Agreement in the Netherlands.

The seminar was facilitated by the Social Economic Council (SER) and organised by the European Climate Foundation (ECF), PBL Netherlands Environmental Assessment Agency (PBL), and Clingendael International Energy Programme (CIEP).

While realising that the Dutch Energy Agreement cannot be a copycat version of foreign examples, there is much to learn from the experiences in our neighbouring countries. Specifically, the seminar sought to explore how Denmark, Germany and the United Kingdom have institutionally managed and embedded the transition to a low-carbon energy system over the past decades in policy.

Five key messages emerged from the different presentations and the panel discussions on lessons from low-carbon energy policy experience in three neighbouring countries.

1. **Sketch a long-term energy and climate vision.** The experiences in Germany, Denmark and the United Kingdom show the clear value of having a long-term vision. Each of these three countries have agreed on ambitious energy and climate targets for 2050. This has created certainty, consistency and stability in tackling a long-term problem. It is remarkable that in all three countries the targets for 2050 were agreed with broad support from society and parties from all parts of the political spectrum.

   Our neighbours' practices demonstrate that a solid long-term vision combines multiple objectives. Although the focus is on energy and climate, it should include perspectives on economic growth, investment climate, security of supply and environment. Concrete and flexible measures would need to support the vision and pave the way to achieving the results. The vision is best enshrined in legislation to ensure government commitment and long-term stability. A successful long-term vision has a clear set of characteristics:
   - ✓ A vision should appeal to a sense of pride, based on our Dutch strengths. The Dutch economy has much to gain from the energy transition and should make explicit choices.
   - ✓ It should be tangible, self-evident and realistic. Radical transformations of society are rare and usually lack broad support from society. Broad support requires realism and ambition and the recognition that transformation will take place over a longer period of time.
   - ✓ Robustness should go together with flexibility. Robustness on the long-term vision creates clarity on the long-term direction. Flexibility on the measures to achieve the

vision allows for incorporation of new elements and adaptation to technological, economic and social developments.

2. **Preserve permanent institutions for continued consensus building among stakeholders, translation of the vision into medium term execution plans and monitoring of progress.** Continuity in policy is one of the key success factors for effective energy policy. Permanent institutions are pivotal to ensure continued consensus building amongst stakeholders, translation of the vision into medium term execution plans and monitoring of progress. A legal basis for these institutions can provide long-term security and stability. Germany, Denmark and the United Kingdom have experienced this continuity over the past decades.

   Translating this experience to the Netherlands, it is important to realise what we already have achieved in the past and to build on that. We should not start a new organisation for every new initiative. And although many things in the SER process might feel new, many elements might not be that new. We should capitalise on the results that came out of former processes such as the Clean and Efficient program and the Top Sector policies.

3. **Create (local) ownership in society of the transition to a low carbon energy system.** The experiences in Germany, Denmark and the United Kingdom all share that ownership by different groups in the society supported political consensus. Ensuring this public support would be a crucial factor for stability of policy over the timeframe of several governments. Creating ownership for consumers, farmers and local companies in renewable energy and energy efficiency projects is an effective way to ensure visibility of the transition and support in society.

4. **Good policies come in packages.** Best practise examples of Denmark and the UK show the clear benefit of organising policy instruments in packages. Their experience teaches us that we should not look for single policies, because different players have different needs and should be addressed by different measures. Different policy target groups face different implementation barriers, have access to different information (information asymmetries), and respond to different incentives. Good policy packages combine both carrots and sticks.

5. **Address the energy transition together with other countries.** The energy transition inherently will result in a future energy system very different from the present system. We can expect new challenges for the electricity grid, balancing of production and consumption, new business and cost remuneration models. The future energy system will also require higher levels of system interconnection, both from a technical perspective and to minimize total system cost. Successful decarbonisation of the European economy depends on successful international cooperation and agreements. In particular, the power system will likely need other incentives to trigger new investments in (renewable) capacity or demand reduction.

# Samenvatting

Op 17 april 2013 faciliteerde de Sociaal Economische Raad (SER) een seminar onder de titel *Energy Transitions in North-western Europe*. Het doel van het seminar was om ervaringen en lessen uit Duitsland, Denemarken en het Verenigd Koninkrijk in te brengen in de discussies over het Nationale Energie Akkoord. De organisatie van het seminar was in handen van de European Climate Foundation (ECF), het Planbureau voor de Leefomgeving (PBL) en het Clingendael International Energy Programme (CIEP).

Hoewel het duidelijk is dat het Nederlandse Energie Akkoord geen kopie kan en mag zijn van buitenlandse voorbeelden, kan er veel worden geleerd van de ervaringen uit onze buurlanden. De specifieke vraag van dit seminar was hoe Denemarken, Duitsland en het Verenigd Koninkrijk de transitie naar een duurzame energiehuishouding institutioneel en beleidstechnisch inrichten en op lange termijn waarborgen.

Uit de presentaties en (panel)discussies kwamen vijf belangrijke lessen uit de ons omringende landen naar voren.

1. **Schets een lange termijn visie op het gebied van energie en klimaat.** Ervaringen in Duitsland, Denemarken en het Verenigd Koninkrijk laten de waarde zien van het formuleren van lange termijn visie. Elk van deze landen heeft ambitieuze energie- en klimaatdoelstellingen voor 2050. Dit heeft geleid tot zekerheid, consistentie en stabiliteit van beleid. Het is opmerkelijk dat in alle drie de landen deze ambitieuze doelstellingen konden en kunnen rekenen op een brede maatschappelijke én politiek steun vanuit het hele politieke spectrum.

   De praktijk in onze buurlanden laat zien dat een lange termijn visie meerdere doelen combineert. Naast energie en klimaat worden ook economische groei, investeringsklimaat, leveringszekerheid en milieu meegenomen. Zo'n robuuste visie wordt ondersteund door concrete en flexibele maatregelen. Verankering van de visie in wet- en regelgeving versterkt de stabiliteit van het onderliggende beleid op lange termijn en verhoogt de stabiliteit.

   Uit de discussies kwamen de volgende essentiële eigenschappen voor een lange termijn visie naar voren:
   - ✓ Een visie moet appelleren aan een gevoel van trots en voortbouwen op waar we in Nederland sterk in zijn. Nederland heeft te winnen bij de energietransitie en moet expliciete keuzes maken.
   - ✓ De doelstelling moet tastbaar, vanzelfsprekend en realistisch zijn. Radicale transformaties van de samenleving zijn zeldzaam en worden zelden gedragen door de maatschappij. Brede steun voor de transitie vergt realisme, ambitie en de erkenning dat de transitie over een lange periode zal plaatsvinden.

- ✓ De visie moet zowel robuust als flexibel zijn. Een concrete, robuuste visie creëert duidelijkheid over de richting. Flexibiliteit in ondersteunende maatregelen zorgen dat nieuwe elementen kunnen worden toegevoegd en dat ingespeeld kan worden op technologische, economische en sociale ontwikkelingen.

2. **Bouw verder op bestaande initiatieven om continuïteit te behouden.** Een van de lessen uit het seminar is dat continuïteit in beleid een van de belangrijkste succesfactoren is van een effectief energiebeleid. Het voortbouwen op bestaande initiatieven en structuren en geeft continuïteit en stabiliteit. Dit maakt consensusvorming met belanghebbenden makkelijker.

   Als we deze lessen vertalen naar de Nederlandse situatie, dan is het belangrijk dat we datgene wat we al bereikt hebben behouden en als uitgangspunt nemen om op voort te bouwen. We moeten dus *niet* een nieuwe organisatie oprichten voor elk nieuw initiatief. Hoewel veel onderdelen van het SER proces nieuw lijken, is het goed om ons te realiseren dat de meeste onderdelen niet zo nieuw zijn. Het is essentieel om voort te bouwen op de resultaten van eerdere processen zoals Schoon en Zuinig en het Topsectoren Beleid.

3. **Maak de samenleving onderdeel van de transitie naar een koolstofarm energiesysteem.** We zien dat in zowel Duitsland, Denemarken als het Verenigd Koninkrijk het betrekken van verschillende groepen uit de samenleving heeft geleid tot politieke overeenstemming. Tijdens het seminar werd geconcludeerd dat het vormen van brede publieke steun ook in Nederland een cruciale factor kan zijn om stabiliteit van beleid te creëren voorbij de levensduur van één enkele regering. Zorg voor beleid dat consumenten, boeren en lokale bedrijven betrekt bij de uitvoering van duurzame energie en energie efficiëntie projecten. Het is een effectieve manier om de zichtbaarheid van de energie transitie te vergroten en maatschappelijke steun te krijgen.

4. **Goed beleid bestaat uit pakketten.** Aansprekende voorbeelden uit Denemarken en het Verenigd Koninkrijk laten duidelijk zien dat het belangrijk is om beleid in pakketten vorm te geven. We moeten niet kijken naar op zichzelf staande beleidsoplossingen, omdat verschillende spelers verschillende behoeften hebben en dus ook verschillende beleidsinstrumenten. Industrie, midden- en kleinbedrijf en consumenten hebben elk te maken met verschillende implementatie barrières, hebben toegang tot verschillende informatie (informatie asymmetrie) en reageren op verschillende prikkels. Goede beleidspakketten combineren de 'wortel' met de 'stok'.

5. **Kies een gezamenlijke aanpak in de energietransitie.** Recente ontwikkelingen in vooral Duitsland en het Verenigd Koninkrijk laten duidelijke zien dat het toekomstige Nederlandse energiesysteem volledig anders zal zijn dan het huidige. Om nieuwe investeringen in (duurzame) capaciteit of reductie van elektriciteitsvraag te bewerkstelligen zal het energiesysteem andere marktprikkels nodig hebben. Er zullen nieuwe uitdagingen zijn in het elektriciteitsnetwerk, zoals het balanceren van productie capaciteit. De verdeelsleutel voor het vastrecht zal wellicht anders gedefinieerd moeten worden. De mate waarin elektriciteits- en energiemarkten tussen landen voordelig met elkaar kunnen samenwerken, hangt daarbij af van succesvolle internationale samenwerking en overeenstemming over marktregels.

Verschillende deelnemers van het seminar benadrukten dat de EU altijd een onderdeel zal zijn in een energie transitie. Een helder EU beleid richting 2030  op het gebied van energie en klimaat zou hierbij zeker helpen, vooral in een land als Nederland met haar open economie. Hoewel EU beleid efficiënt zou kunnen zijn, is er op de korte termijn niet echt zicht op een gecoördineerde aanpak. We moeten er echter voor waken terug te grijpen naar nationale oplossingen, simpelweg omdat deze duurder zullen uitvallen. Multilaterale oplossingen zijn realistisch en er zijn sterke argumenten om samen te werken met buurlanden, bijvoorbeeld met Belgie, Duitsland, Oostenrijk, Scandinavië en het Verenigd Koninkrijk.

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# Introduction

This memo reports the outcomes of the seminar in support of the SER Energy Agreement process on the *Energy Transitions in North-western Europe: lessons from Germany, Denmark and the United Kingdom,* held 13:00 – 18:00 on 17 April 2013 in The Hague.

## Objective: learn from Germany, Denmark and the United Kingdom

The objective of the seminar was to identify critical drivers, obstacles and solutions in the realisation of a transition towards a low-carbon and efficient energy system in key countries in North-western Europe and the institutional embedding of energy agreements to provide input into the discussions on an Energy Agreement in the Netherlands.

While realising that the Dutch Energy Agreement cannot be a copycat version of foreign examples, there is much to learn from the experiences in our neighbouring countries.

The seminar particularly sought to share experiences from the German, Danish and United Kingdom's policy practise with regards to the following questions:

1. How to assure continuity in energy policy in a parliamentary democracy?
2. How to manage the decarbonisation of the power system?
3. What conditions were created for key stakeholder groups?
4. How to reach political consensus and manage public acceptance?

The seminar was held under Chatham House rules, with around 40 participants representing government, employers' organisations, labour unions and environmental groups.

## Background: the National Energy Agreement negotiations

The seminar should be seen as background of the current process to negotiate a National Energy Agreement in the Netherlands, facilitated by the Social Economic Council (SER). In four 'topical tables' representatives from government, employers' organisations, labour unions and environmental groups are discussing policy instruments that would lead to the Netherlands meeting its climate and energy objectives for 2020 and beyond. The process has full support from the relevant Ministers, i.e. Economic Affairs, Infrastructure and the Environment, Interior and Kingdom Relations.

To optimally build on experiences abroad, the SER have asked the European Climate Foundation (ECF), PBL Netherlands Environmental Assessment Agency (PBL), and Clingendael International Energy Programme (CIEP) to organise a seminar on the international context. As the Dutch economy is an open economy and our energy system is heavily integrated with our neighbouring countries, the Dutch approach to decarbonisation needs to relate to the developments and policy decisions in other

countries. Relevant lessons can be learned on the technical, societal, political and policy challenges of decarbonisation.

At the time of this seminar the SER process is in the phase where all tables are trying to find the common ground for measures: who takes responsibility to which part of the equation, how will we make it work and how can things stick over a long period of time?

## Conclusions: five take away messages

From the seminar, five key messages emerged from the different presentations and the panel discussions on lessons from low-carbon energy policy experience in three of our neighbouring countries.

- ✓ **Sketch a long-term energy and climate vision for the Netherlands**
- ✓ **Preserve permanent institutions for continued involvement and consensus**
- ✓ **Create ownership in society to the transition to a low carbon energy system**
- ✓ **Good policies come in packages**
- ✓ **Address the energy transition together with other countries**

The experiences, critical drivers, obstacles, solutions from Germany, Denmark and the United Kingdom with each of these lessons are presented in the following sections.

# 1 A long-term energy and climate vision

The experiences in Germany, Denmark and the United Kingdom show the clear value of having a long-term vision for the Netherlands. These three countries have agreed on ambitious energy targets for 2050 and this has created certainty, consistency and stability in tackling structural problems in the long-term. All have also committed to this vision and made explicit choices in low-carbon development of (parts of) their economy. It is remarkable that in all three countries the targets for 2050 were agreed upon with broad support from society and parties from all parts of the political spectrum and that despite changes in instruments they have created firm belief in the long-term direction of policy.

Our neighbour's practice demonstrates that a long-term vision would have multiple objectives. Besides energy it should include perspectives on economic growth, investment, security of supply and environment. Concrete and flexible measures would need to support the vision and pave the way to achieving the results. The vision is best enshrined in legislation to ensure government commitment and long-term stability. A successful long-term vision has a clear set of characteristics:

- ✓ A vision should appeal to a sense of pride, based our Dutch strengths;
- ✓ It should be tangible, self-evident and realistic;
- ✓ Robustness should go together with flexibility. A transition can only be robust to some extent. There should be a focus on robust elements, but also the flexibility to incorporate other elements in later stages.

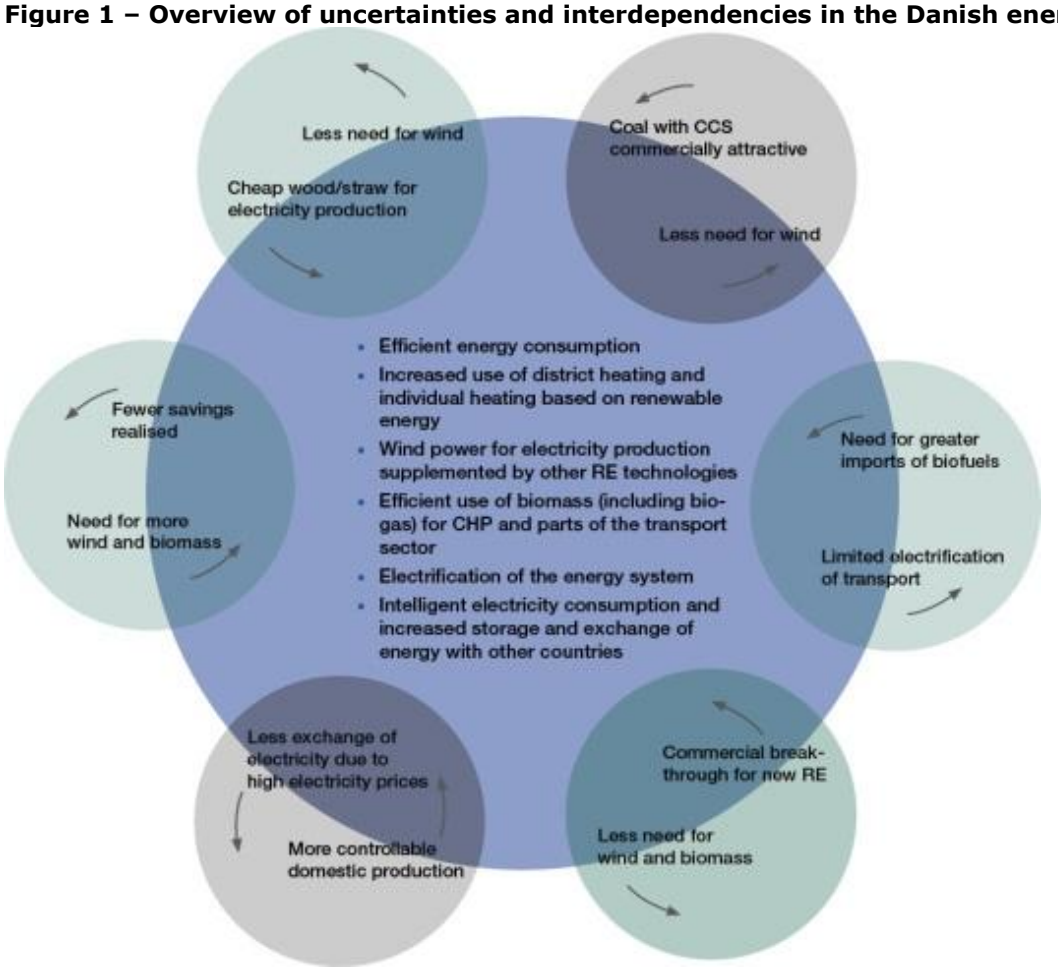
In November 2011 Denmark adopted the goal of converting to an energy and transport system based 100% on renewable energy by 2050.

The Danish energy policy can be traced back to the first oil crisis in 1973. Denmark, as a country reliant on imported oil, was impacted particularly heavily. This roused much public discussion to diversify the energy mix, including a long discussion on nuclear. This public debate resulted in a ban on nuclear from 1986 onwards.

The current Danish strategy builds on a sound scientific basis. In 2010 a Climate Commission concluded that it was technically and economically feasible for Denmark to become 100% independent of fossil fuels. Based on these outcomes two consecutive governments adopted a strategy for 2050.

The long-term goal is supported with an action plan that focusses on the next ten years. The vast majority of Danish parties agreed to this action plan and parties meet with the Danish Minister on Climate, Energy and Buildings on a monthly basis to follow up on this political agreement.

**Figure 1 – Overview of uncertainties and interdependencies in the Danish energy system**




An important aspect of the Danish short-term action plan is that it contains both a robust core of no-regret options and is flexible towards future developments (like Carbon Capture and Storage) that are not yet certain. See the figure 1.

In June 2011 Germany adopted its strategy, which is commonly referred to as the *Energiewende:* reduce $CO_2$ emissions 80-95% compared to 1990 by 2050 and phase out nuclear energy on the short term.

It is a common misperception that the German *Energiewende* is the result of the 2011 Fukushima accident. The *Energiewende* can be traced back to 2000, when it was first decided to phase out nuclear and the feed-in tariffs for renewable energy were agreed. The decision to extend nuclear production until 2040, which was made end of 2010, only lasted a couple of months. After the Fukushima accident in March 2011, plans were changed back to their original form. The decision to adopt the *Energiewende* strategy was historic in the sense that there was a broad political consensus: both ruling parties and opposition embraced the legislation.

The political support for the *Energiewende* has changed gradually since 2000, when a small political majority adopted the first energy act. Since then, public support for renewables has steadily grew and conservatives, liberals and left now have consensus on the long-term goals, despite differences of opinion on the policy instruments and levels of support currently reported in the German media.

In the UK the Climate Change Act of 2008 sets a target of -80% of greenhouse gas emissions in 2050 (compared to 1990 levels) and is legally binding. The government is obliged to set carbon budgets for 5 year periods, 15 years ahead to give industry investment security.

The UK has a long-term background of broad consensus that originated in the 1980s when Margaret Thatcher very firmly put climate change on the political agenda as one of the first political leaders. The effect was that this diffused the political debate: it was no longer a typical left-wing issue. It was also important that the UK led the IPCC Science Working Group.

Since then, there has broadly been continuity. During the period of 'New Labour' (1997-2010) there was a growing emphasis on energy efficiency. The desire for a *Strategic framework* led to the Climate Change Act in 2008. The Act was passed by parliament with an overwhelming majority.

The new Coalition government (starting 2010) has continued with implementing policies in support of the Climate Change Act. It has most notably picked up the Energy Market Reform agenda to address investment. Attempts to unravel the Climate Change Act as post credit-crunch and post-Copenhagen backlash were rebuffed. An important aspect was that the Confederation of British Industry has made a strong call for continuity of policy to preserve a stable investment climate.

# 2 Preserve permanent institutions

From the seminar we learn that continuity in policy is one of the key success factors for effective energy policy. Permanent institutions are pivotal to ensure continued consensus building amongst stakeholders, translation of the vision into medium term strategies and monitoring of progress. A legal basis for these institutions can provide long-term security and stability. Germany, Denmark and the United Kingdom have experienced this continuity over the past decades.

If we translate this experience to the Netherlands, it is important to realise what we already have achieved in the past and to build on that. We should *not* start a new organisation for every new initiative. And although many things in the SER process might feel new, many elements might not be that new. We should capitalise on the results that came out of former processes such as the Clean and Efficient program and the Top Sector Policy.

The UK's Climate Change Act was adopted as a way to give more certainty, consistency and stability in tackling a long-term problem. This certainty applies both to industry and government. The first aspect of the Act was to set legally binding long-term targets. The second aspect of the Climate Change Act is that it established the Climate Change Committee.

The legal nature of the Climate Change Act makes a considerable difference in ensuring continuity of policy especially because the British system is more legal based than consensus focused. The legal structure is both flexible and robust. There is robustness since the Acts commits the government to long-term targets in 2020 and 2050. There is also flexibility because the longer-term targets are translated into medium-term execution plans by setting 5 yearly carbon budgets. These carbon budgets should be determined 15 years ahead to give industry investment security.

The mandate of the Climate Change Committee is to advise on the level of targets and carbon budgets, to track progress and report annually to Parliament and – if needed – advice on additional measures to reach targets and meet budgets.

The Climate Change Committee has helped to establish long-term institutional structures that can guide national efforts based on best scientific and economic analysis. The establishment of the Climate Change Committee has also helped to create a process of policy due diligence.

Through the architecture of the Climate Change Committee, with its combined role in monitoring and advising, the Committee has become quite influential. The yearly monitoring cycle gives a strong incentive to the government to stay on track with regards to their carbon budgets to avoid the Committee advising on additional measures and policies.

Energy and climate has had a strong institutional embedding in Denmark, both in the form of dedicated Ministers and through the Danish Energy Agency.

Since 1979 Denmark has had a ministry of energy – and after some merges and detachments with transport, trade and environment, Denmark currently has a ministry of Climate, Energy and Buildings.

The Danish Energy Agency has been responsible for the Danish energy policy since its establishment in 1976. It is an agency under the Ministry of Climate, Energy and Building, employing about 250 people. The agency is responsible for the entire chain of tasks linked to energy production and supply, transportation and consumption, including energy efficiency and savings as well as Danish national $CO_2$ targets and initiatives to limit emissions of greenhouse gasses.

# 3 Create ownership to build support

The experiences in Germany, Denmark and the United Kingdom all share that ownership by different groups in the society generated political consensus. At the seminar, it was concluded that also in the Netherlands, building this pubic support would be a crucial factor for stability of policy over the timeframe of several governments. Creating ownership of consumers, farmers and local companies in renewable energy and energy efficiency projects is a very effective way to ensure visibility of the transition and support in society.

In Germany, ownership of renewable energy by the people is a pivotal element in the continuity of the Germany energy policy over the last decade. When the German feed-in system of renewable energy started, it was largely individuals and farmers who started to invest - not the utilities. This means that at present around 50% of the renewable power capacity is in the hands of either private people or farmers. This ownership by different groups in the society broad and continuing public support forced political parties to change their positions toward energy and climate policy. At present Germany has a broad political consensus on the overall objective of the *Energiewende.*

In the UK, it is noteworthy that the Confederation of British Industry CBI, UK's top business lobbying organisation, has had a constructive contribution to the UK's energy policy ever since Mrs. Thatcher put climate change on the agenda in the 1980s. In 2007 the CBI published *Climate Change: Everyone's Business*. In a response to the double-dip recession, the UK's business response is "definitive and emphatic: green is not just complementary to growth, but is a vital driver of it. And not just for companies traditionally defined as 'green'."[1]

Attempts to unravel the Climate Change Act as post credit-crunch and post-Copenhagen backlash, were rebuffed. An important aspect was that the CBI has made a strong call for continuity of policy to preserve a stable investment climate.

In Denmark there is strong support for the conversion to a green society. Three ingredients that help build this support are the attention of the Danish government to awareness campaigns, the extensive coverage of the energy debate in the general media and the acknowledgement that the renewable energy sector is an important economic sector for the Danish economy.

Public awareness of the greening of society is seen as a priority to reach the Danish targets. Awareness campaigns and sharing of best practices on municipal level have always been part of the mandate of the Danish Energy Agency.

[1] Source: cbi.org.uk

The acknowledgement that economic and green growth go together, traces back to the fact that Danish companies have become important export products. An example is Vestas, which was originally producing agricultural equipment. The roots of the company can be traced to the fact that Danish farmers took ownership to generate renewable energy decentrally in the 1980s. Communities set up testing centres and this was supported with simple rules on how to connect to the grid.

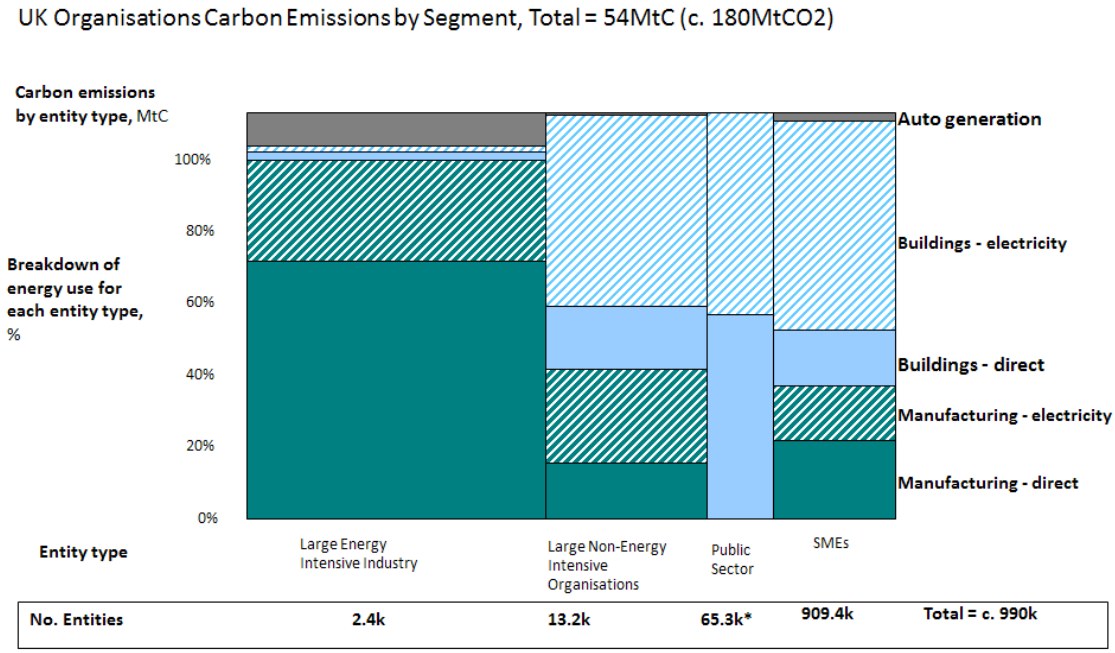
# 4 Good policies come in packages

Best practise examples show that policy instruments need to be organised in packages. We should not look for single policies, because different players have different needs and should be addressed by different measures. Different policy target groups face different implementation barriers, have access to different information (information asymmetries), and respond to different incentives. Good policy packages combine both carrots and sticks.

The UK uses different policy instruments for large energy intensive industry, Small and Medium Enterprises and the residential sector.

Efficiency in the energy intensive industry, for example, is incentivised with the Climate Change Levy which works as a package with the - voluntary - Climate Change Agreements. The Climate Change Levy provides an incentive for the sectors to enter in the Climate Change Agreements. Companies participating in the agreements are granted a 65% tax rebate on the Climate Change Levy provided that they meet specific targets.

**Figure 2: The UK carbon budgets**




In contrast with the energy intensive industry, the commercial and public sectors face a different set of implementation barriers for energy efficiency. They are, for example, experiencing a lack of awareness on energy consumption and energy management systems. These barriers are not appropriately addressed with purely economic incentives such as the Climate Change Levy. In order to tackle these, the UK implemented the Carbon Reduction Commitment – encouraging organisations

to develop energy management strategies that promote a better understanding of energy usage. See also Figure 2 above.

Past successes with energy efficiency policies in Denmark have as common denominator: the use of combinations of policy instruments, including taxes, regulations, subsidies as well as information programmes, working as a whole.

As a matter of example, greenhouse gas emissions in the Danish industry are penalised with the Green Tax Package, which provides a strong incentive for companies to invest in energy efficiency measures. However, companies are also given the choice of joining the Voluntary Energy Efficiency Agreements. Companies that join the voluntary agreements are eligible to receive a rebate on the Green Taxes.

# 5 Address the energy transition together

The recent developments in most notably Germany and the UK make a strong case that also the Dutch future power system will be considerably different from the present one. The power system will probably need other incentives to ascertain new investments in (renewable) capacity or demand reduction. We can expect new challenges on the electricity grid, balancing of production capacity and consumption, and cost remuneration models. The increasingly interconnected nature of power and energy markets will depend on successful international cooperation and agreements.

Multiple participants of the seminar stressed that the EU will always be part of the answer to the energy transition. A strong set of EU energy and climate goals for 2030 would surely help, especially in the Netherlands with its open economy. Although EU policy would be efficient, EU consensus takes time and will not lead to a coordinated approach in the short-term. Still, we should not go back to national solutions, simply because together solutions will be cheaper. Therefore, bilateral or multilateral solutions might be more realistic and there are strong arguments to coordinate with neighbouring countries – for example Belgium, Germany, Austria, Scandinavia, Netherlands, the UK.

In the German *Energiewende*, one of the insights is that the energy transition will happen primarily on the basis of solar and wind. These two technologies are the clear winners of the technological race over the past decade. This fast increase in solar and wind capacity, means that there is a need to rethink the German energy system, because:

1. Solar and wind don't produce based on demand, but on weather conditions;
2. They are not consistent during the day;
3. They do not have (considerable) operational costs, only investment costs;

With a high share of variable input into the electricity grid, the residual production has to adjust on two leads: both on demand and also on supply from wind and solar. The core question is on synchronisation: how to align solar and wind with demand. The solution has three prerequisites:

- ✓ Back-up capacity;
- ✓ Demand side flexibility;
- ✓ Grid system.

The current German market structure is not capable of delivering these three perquisites. At present there is an electricity only market – and this market is not guaranteeing anymore than investment costs can be earned back.

The current market model was developed in the 1990s, when the electricity markets were liberalised: first in the US, then in the EU and the power exchange was created. The power exchange functions on the basis of marginal costs – not on the investment costs. Nuclear, brown coal and gas: all have different marginal costs to produce one kWh of electricity. Together they form the merit order. This electricity only market functions on the basis that the marginal cost of the last generator that is

needed is determining the market price. Investment costs are recouped from the difference between the marginal and market price.

However, there is an issue with energy security when the price difference between marginal and market price is not large enough to guarantee enough investments in new capacity. At present this is a genuine problem in Germany. High shares of renewables are pushing the market price down, because they have near-zero marginal costs.

The effect is that traditional energy suppliers are not investing anymore or are even taking generators out of the market. Germany now has a policy ordinance that generators are not allowed to shut down. This is a clear signal that there is a need for a new market design.

Germany considers a capacity, or rather capability, market additional to the energy-only market. In a capacity market there is a financial remuneration that guarantees sufficient capacity and triggers flexible demand response for to secure supply.

From the German perspective, this electricity market reform should be undertaken in coordination with neighbouring countries. The increasingly interconnected nature of power and energy markets will depend on successful international cooperation and agreements. Although EU policy would be efficient, The EU consensus will take time and will not lead to a coordinated approach in the short term. Bilateral and multilateral solutions might be more realistic and there are strong arguments to coordinate with neighbouring countries – Germany, Austria, Scandinavia, Netherlands, the UK.

Also the UK has concluded that the existing market structure is unfit for purposes of decarbonisation. Even though their liberalised market has helped to cut energy prices, the focus on short term shareholder value also resulted in a collapse of R&D, limited investment and focus on gas for new power generation and a growing concern whether the market will deliver either security or sustainability. These concerns resulted in an increasingly complex mix of instruments to 'fix' this, including a Renewables Obligation.

At the start of this decade, Ofgem's (UK's energy market regulator) 'Project Discovery' project concluded that future security of supply cannot be delivered by the existing market arrangements over the coming decade. They identified that there are inadequate price signals for security of supply, uncertain about long-term price signals for decarbonisation, increased risks in gas market and finally they analysed that some consumers may not be able to afford adequate energy.

To bring forward low-carbon capacity at lowest cost, the Government adopted a set of reforms to the UK electricity market in 2012. The Electricity Market Reform (EMR) will bring about a significant transformation of the UK's electricity sector through two new market mechanisms: a Feed-in Tariff with Contract for Difference (FiT CfD) for projects over 5 MW and a Capacity Market. The two mechanisms will be supported by a Carbon Price Floor (a tax to underpin the carbon price in the EU Emission Trading Scheme) and an Emissions Performance Standard (EPS) as a back-stop to limit emissions from unabated power stations.

The Contracts for Differences, CfDs, are long-term contracts that provide stable long-term revenues for investors in low-carbon technologies at a fixed level, known as a strike price. It is a pivotal element of this mechanism that will help developers to secure upfront the large amounts of capital investment that are required. It will also help lower the cost of capital.

# References

This section contains references to the official government publications and internet sites that were referred to during the seminar.

## UK

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|---|---|
| **Climate Change Act** | http://www.legislation.gov.uk/ukpga/2008/27/contents |
| **Climate Change Committee** | http://www.parliament.uk/ecc |
| **EMR – Electricity Market Reform** | https://www.gov.uk/government/policies/maintaining-uk-energy-security--2/supporting-pages/electricity-market-reform |
| **The Energy Bill** | https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/energy-bill |
| **Contracts for Difference Feed in Tariffs (CfD-FiTs)** | https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/66554/7077-electricity-market-reform-annex-a.pdf |
| **Confederation of British Industry** | www. cbi.org.uk |

## Denmark

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| **Danish Energy Agency** | www.ens.dk |
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## Germany

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| **Energiewende (in German)** | http://www.bmu.de/themen/klima-energie/energiewende/ |
| **Feed-in tariff** | http://www.erneuerbare-energien.de/en/unser-service/mediathek/downloads/detailview/artikel/renewable-energy-sources-act-eeg-2012/ |
| **Germany's 2011 decision on 2050 strategy** | http://www.bmwi.de/English/Redaktion/Pdf/germanys-new-energy-policy |