

Country Study – Denmark

1 Denmark in numbers

1.1 Economic and industrial structure

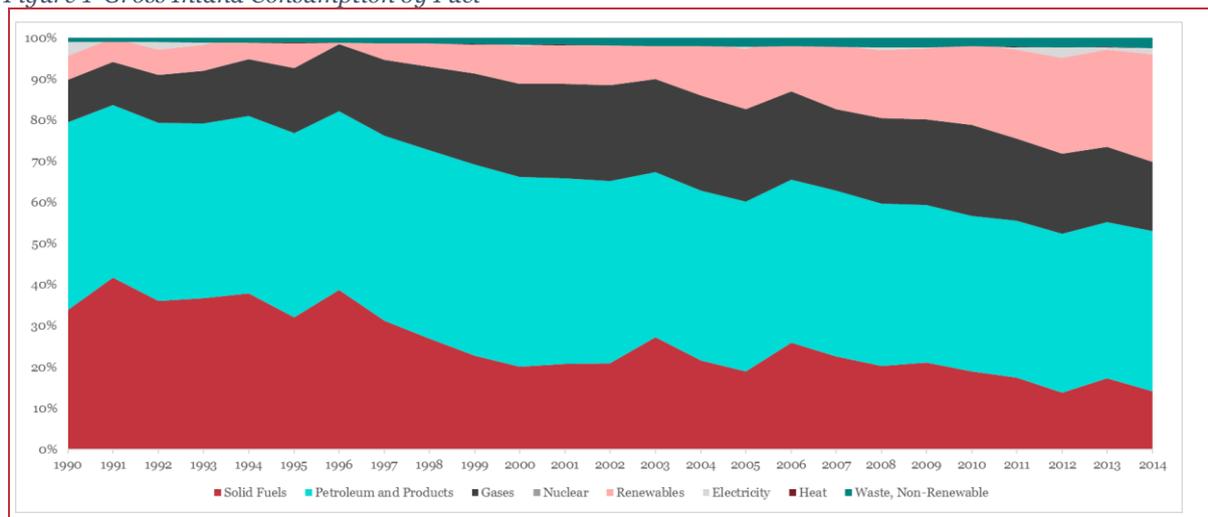
Denmark has a developed mixed economy with a traditional linking to agriculture. In fact, agriculture represents 25% of the total income from exports and the country is one of the world leading agricultural producers. Since finding oil resources in the Danish part of the Northern Sea after the oil crisis, Denmark for some time was a net-exporter of oil and natural gas and was able to supply most of the country's energy demand by these domestic resources. However, zooming out from the energy sector, Denmark has a limited supply of raw materials and natural resources and is therefore highly dependent on international trade. The greatest trading partner of Denmark nowadays is the EU, primarily United Kingdom and Germany.

Denmark's GDP amounted to €313 billion (2014), which translates to a GDP per capita of €46,383. The sectoral activity in the Danish economy has fluctuated in recent years to the advantage of the service sector that holds a share of 76.2% of GDP. The industry's share of GDP is 22.5% and the traditionally main sector of the Danish GDP, agriculture, holds a share of just 1.3% of total GDP. After suffering a substantial -5.1% downturn in the GDP between 2008 and 2009, GDP Growth Rate in Denmark averaged 0.35 percent from 1991 until 2016, and about 1.1% annually after the financial crisis of 2008/9.¹

1.2 Main indicators on energy generation and usage

Whereas in the past 25 years major changes in the energy mix have come from the reduction in the use of oil products and solid fuels and the increased use of renewables for electricity production. The change would be more visible taking the mid 70-s as a starting point for the comparison – it was the oil crisis that gave birth to the thoughts of using renewable energy sources, starting with wind energy.

Figure 1 Gross Inland Consumption by Fuel

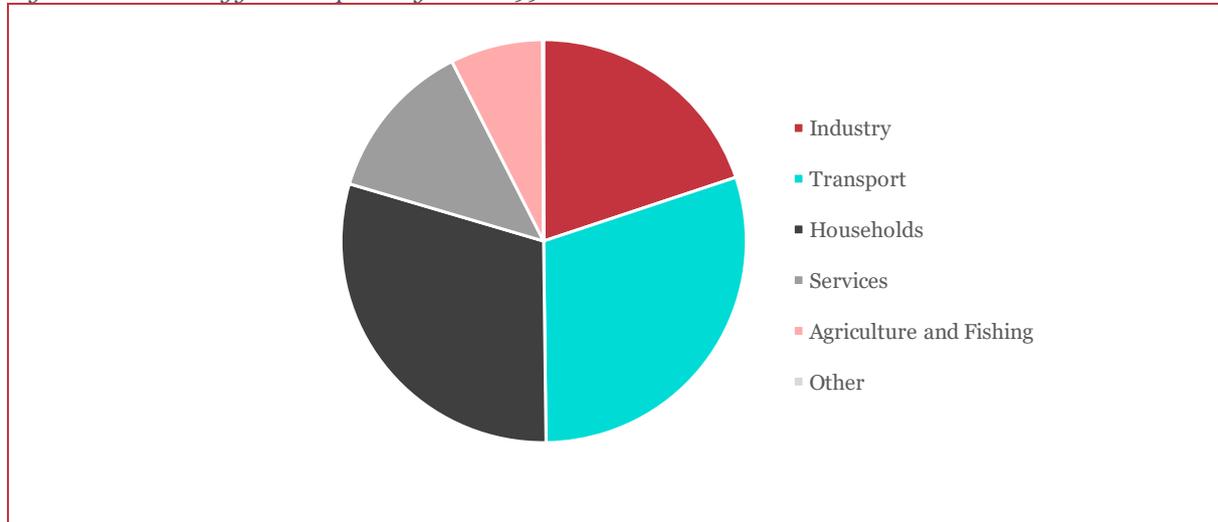


Source: Eurostat

¹ Statistics Denmark

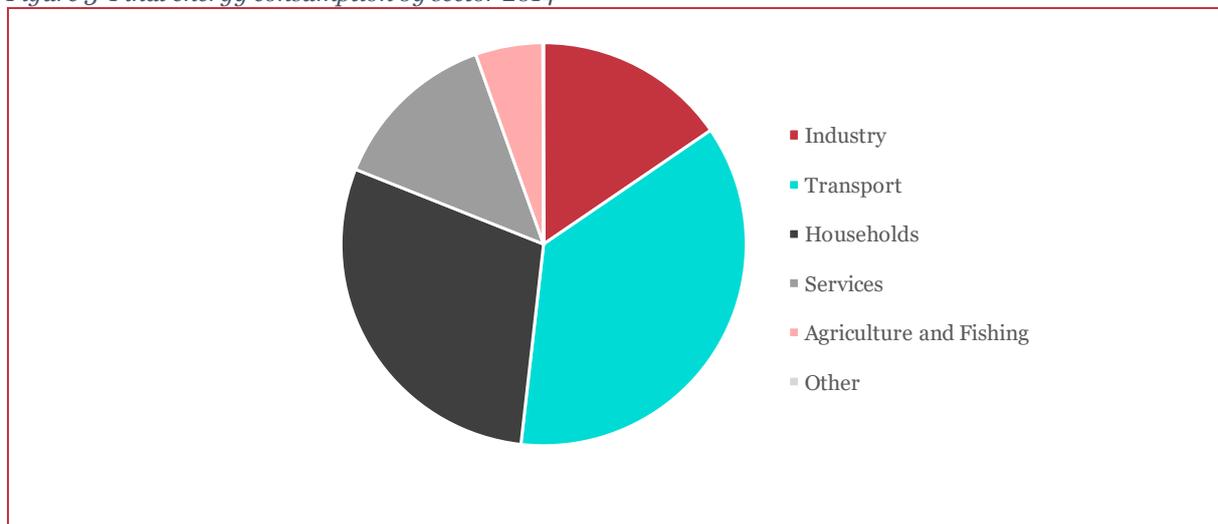
Transport is the largest energy consumer in the country, accounting for 36% of the final energy consumption. It is followed by households (29%), with industry only in the third position with a level of 15%. In the past 25 years, the energy consumption by sectors has been relatively stable, with a moderate increase in the transport sector and a moderate decrease in industry's share as the most noteworthy changes.

Figure 2 Final energy consumption by sector 1990



Source: Eurostat

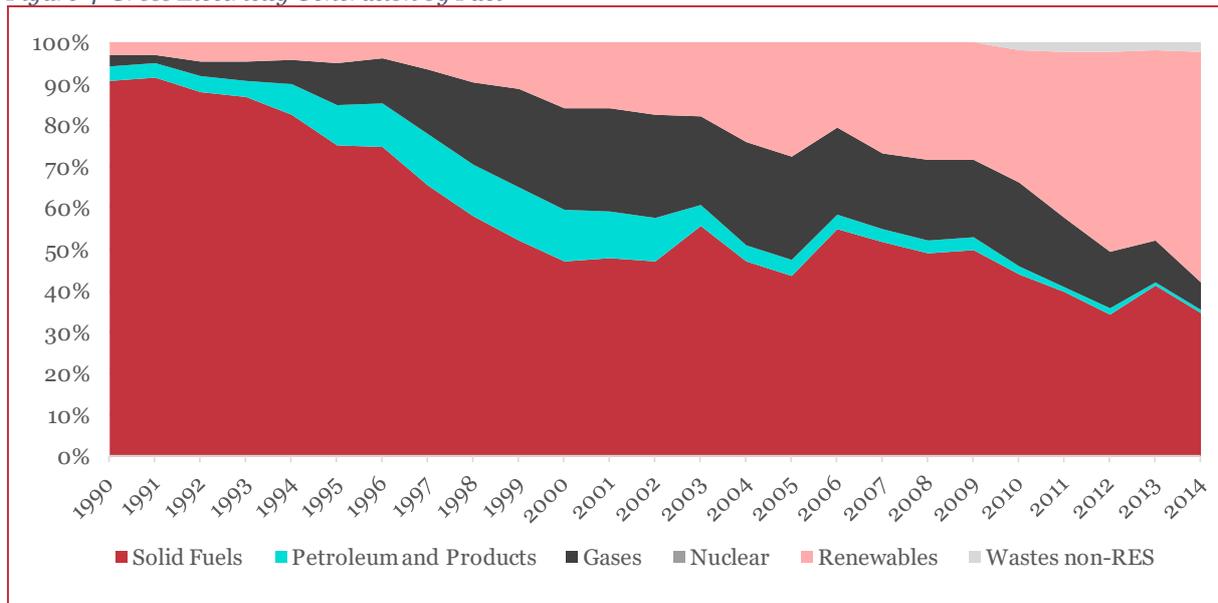
Figure 3 Final energy consumption by sector 2014



Source: Eurostat

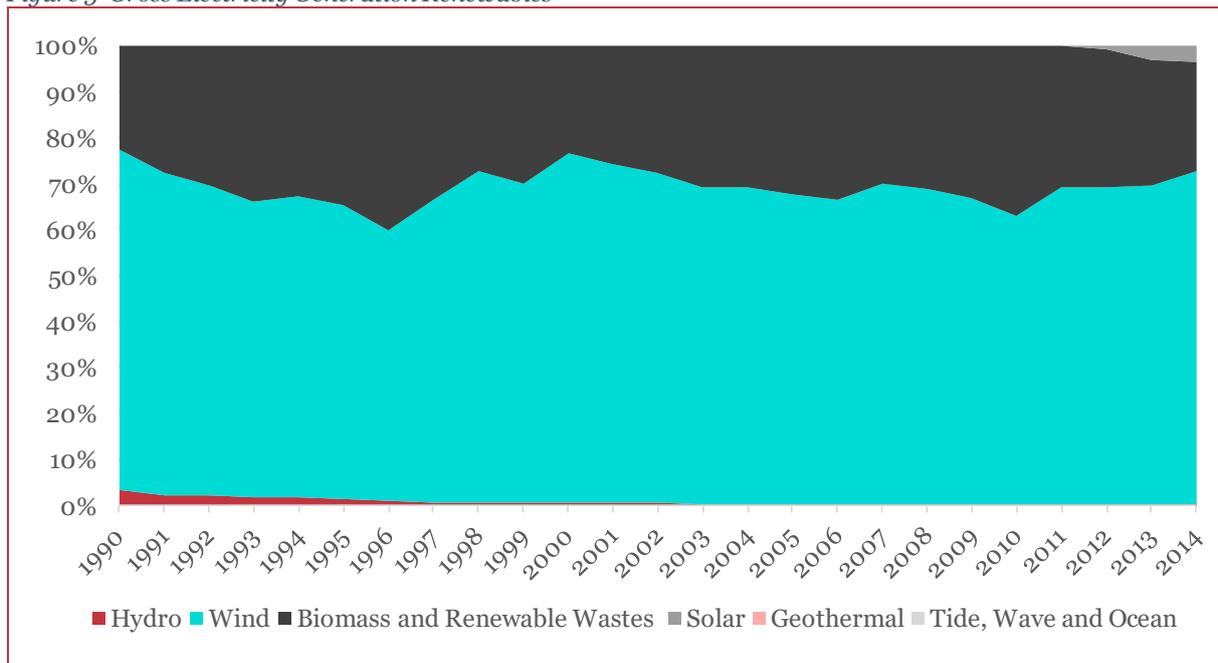
Looking at the development of electricity generation by all fuel sources, the increase in renewables is dramatic. Renewable energy sources constitute a large and increasing part of the Danish energy mix. Looking more closely at the gross electricity generation from renewables over the last few years, we notice that the Danish “wind wonder” is alive and well (partly thanks to an increasing offshore activity). Biomass and renewable waste seem to have reached its peak and to be on the downturn, whereas later generation renewable sources such as tidal wave and ocean energy are increasing their shares, albeit setting out from modest levels.

Figure 4 Gross Electricity Generation by Fuel



Source: Eurostat

Figure 5 Gross Electricity Generation Renewables



Source: Eurostat

Low electricity prices have affected the development of for instance biomass and solar energy facilities, since the electricity price from these plants becomes too high for consumers.

Each half of the country is part of a major electrical grid which depends on nuclear power for much of the base-load supply. The electricity grid of the Jutland peninsula is linked to northern Germany, and the rest of the country to connected the Nordic grid. In 1996, Norway and Sweden started the Nordic power exchange, Nord Pool. Shortly afterwards, Denmark and Finland, and later Estonia joined the cooperation. These countries' electricity networks are interconnected and electricity is sold and bought between the countries: Nord Pool is a power market and offers trading, clearing, settlement and associated services in both day-ahead and intraday markets.

2 Culture and history around energy policy

To accurately assess the Danish energy sector and the transition thereof, it is initially crucial to understand the context in which it occurs. Consequently, there is a need to describe the institutional arena in Denmark, concerning formal institutions as well as historical and social ones. Thus, the objective of this chapter is to briefly chart the institutional formation, alteration and structure in which the transition of the Danish energy sector is operating.

2.1 Policy history, informal rules and structures, events that shaped the country's energy transition

In order to properly describe the policy history and the informal rules and structures that shapes the Danish energy policymaking, the first step is to identify a formative moment. The crucial event that has shaped the country's energy transition is the oil crisis in the 1970's. The oil crisis affected all oil dependent nations in one way or the other and Denmark, that before this moment in time supplied 90% of the total energy demand by imported oil from the Middle East, was no exception. During the crisis, the oil prices increased dramatically and by the end of the decade, the prices had multiplied by six. This situation had a highly negative effect on Danish economy, on a private as well as on a national level. The Danish Parliament took initiatives to short-term energy saving measures, but it was evident that a more permanent and long-term solution had to be developed. The great impact of the oil crisis on the Danish economy and energy supply forced the country and its citizens to gain an understanding of the problematic situation of dependency on non-renewable energy resources.

Out of this grew a deep understanding throughout society that the country needed to build up a security of supply. Natural gas, coal and oil were used – but it had to be done sensibly, the municipalities were responsible for the investment of district heating systems. Denmark responded to the circumstances by shifting focus to an ultimate goal of self-sufficiency, inevitably involving enhancement of the use of other energy sources than oil. (Quartz+Co, 2015) There was a clear ambition to reduce oil consumption and to abandon coal consumption. At this time, many heating plants were coal fuelled and gradually Denmark switched to gas-fired power plants with natural gas from the North Sea.

In the shadow of the oil crisis in the 1970's, an idea paradigm of Keynesianism gained footing in the Danish energy sector – as well as in other policy sectors - and influenced an institutional revolution the next-coming decades. The idea of Governmental intervention was shed in a most positive lightning after the market failure the oil crisis constituted, and the shredding effects it had had on the Danish society. Denmark began to regulate the previously practically unregulated energy sector and in 1976, the energy sector was nationalised in order to better control the security of supply. (Fuglsang, 2011)

Another effect of the oil crisis, in parallel with developments mentioned above, was the realization that energy was not purely a matter of trade and supplying domestic needs. The oil crisis pointed to a number of critical and urgent issues that needed to be addressed. Out of this, “energy policy” became a distinct and central policy area in Denmark, and many other countries. Directing the spotlight on these issues increased the interest from the general public. Commitment grew. A strong grass-roots opposition to nuclear power plants (clearly against the Barsebäck plants that the Swedish government had authorized building by the Öresund straits, just across the waters to Copenhagen) incited the flames, and the search for alternatives.

This development created the favourable context from which the expansion of wind power in Denmark could take place. Local initiatives and organisation are a distinct feature of Danish society in general, and the growth of the wind power in the country was based on local initiatives through shared ownership and cooperative ownerships of wind turbines. The public acceptance for and strength of this movement was largely because these were bottom-up ventures and not production plants constructed and run by some large corporation. (This could also be one reason why wind energy today is less heartily embraced; large, multinational players such as Vattenfall now drive the wind energy expansion in the country.)

As mentioned above, shareholding is a strong Danish tradition. This is made very evident in the expansion of the district heating network. District heating plants are share owned with the exception of large facilities owned by municipalities. There are very few district heating plants owned by commercial companies, and Danish law makes it explicit that it is forbidden to make profit in this sector. Due to this fact, the district heating has been politically controlled. The expansion of the district heating network is often referred to as the “hidden” or “forgotten” national treasure in the energy field.

The ideas that characterised the energy politics in the final part of the 20th century and the beginning of the 21st were the growing awareness of climate change as well as neoliberalism. Unlike the Keynesian institutionalisation, the ideas of sustainable development and neoliberalism cannot be described as institutional revolutions but rather evolutions of the existing structures. The same goes for the current paradigm of Green Growth that has not completely transformed the system, but rather expanded the framework in which the system operates. When drawing up the context for these institutional evolutions, it is necessary to mention the political parties involved in institutionalising the ideas. In regards to the institutionalisation of the ideas of climate change, sustainable development and neoliberalism the green majority in Danish Parliament was one key actor. Since a majority of the political parties in Parliament were considered green parties during the timeframe 1987-2001, ideas that were less optimistic to the focus on sustainable development and renewable energy did not have much impact.

Another central actor for the institutionalisation of the ideas of sustainable development and climate regulation was Svend Auken, the social democratic politician who took over the Ministry of energy in 1994 and thus became both minister of energy and environment. This merging of minister portfolios was very indicative of the growing environmental and climate considerations that at this time influenced the energy policy. Auken managed to use tomorrow's ideas as a tool to bring about institutional change by virtue of his position (he is known as one of the most powerful ministers in that government, and built up a large ministry). Under Auken, the climate issues became institutionalised in the Danish energy sector. When Anders Fogh Rasmussen became Prime minister in 2001, this momentum slowed down for a period. Very symbolic for Rasmussen's position on the climate issue was the separation of the Ministry of Energy from the Ministry of Environment. However, by this time, the Danish society had already adapted to the ideas on regulating global warming and so the institutionalisation was a fact, which means another institutional revolution would be required in order to change the planning in opposite direction. (Fuglsang, 2011)

The goals for the Danish energy politics and policymaking have changed continuously with the institutional evolutions, but the method for reaching these goals, through regulations, has remained the same. Energy taxes, district heating and subsidies for renewable energy are examples of this. The Keynesian institutional revolution came with a primarily goal of securing energy supply, while the long-term goals of the following idea paradigms, climate change and neoliberalism, concerned securing sustainable development. The current paradigm of Green Growth has further developed the primary goals of the Danish energy politics to make investments in climate sustainability within the neoliberal framework. (Fuglsang, 2011)

The transformation of the energy system continued from 2000 and forward into alternative energy. Gas and coal heated power plants transform into or are replaced by biofuel power plants. The use of solar panels has increased both in larger, commercial scale and in single-family homes. In addition, the wind turbines have become larger and more expensive, and there is a strong offshore expansion. Large corporations drive this expansion, and, as noted above, the establishment of wind power plants does not have the same grassroots support as before. Biofuels are considered better than coal and natural gas, but biomass is not a long-term solution. There is also a discussion on waste incineration.

Considering the election system in Denmark and the tradition of reaching consensus across political borders, the authority of the Government is respected and trusted. The respect and trust is further strengthened in the energy and climate areas by the fact that the ideas behind the pursued policy is widely institutionalised in the Danish society. Accordingly, it is bound to be a minimal friction between the pursued policy and the cognitive framework of the Danish citizens. The bottom-up perspective is

perceived as typical for Denmark, and reflected in the development towards decentralisation of energy production.

As for the energy sector, the Danish Government has relied on both free market arrangements and state interventions. These are applied in one way or the other in every sector of the society. Free market arrangements are regarded as necessary to a certain extent, to create an internationally competitive market and to reduce the public expenses. To put it shortly: the Danish energy market is free in theory but still a forum for various regulations.

Denmark's social institutional framework puts heavy emphasis on public responsibility, which means that even though the Government's authority is respected, it can be trumped by the public opinion. Concerning energy and climate policies, the public view on alternative arrangements (such as voluntary agreements and social movements) is overall positive. There is a tendency that people do not simply stand by passively awaiting the Government to advance in the energy and climate politics. Instead, when the expectations among the citizens are higher than the ambitions of the Government solutions are found through social movements and/or voluntary agreements etc. (Dyck-Madsen, 2016).

3 Formal rules and instruments

3.1 Laws and regulations

There is a long tradition of Danish Governments negotiating and compromising in Parliament in order to reach consensus across political borders. This can be seen as a crucial condition for accomplishing long-term strategic planning, which has been done successfully in Denmark in the environmental area (Varga, 2015). This standard of broad political agreements, alongside the fact that the Danish environmental efforts ever since the 80's have incorporated the notions of sustainable consumption and production, have highlighted Denmark as a society with an emphasis on the economic prospects of sustainable development. In other words, the focus of the Danish Governments, irrespective of their political colour, has been on how to turn the challenges of the environmental predicament into economic opportunities for the state and its citizens.

The most prominent long-term plan in Denmark in the field of energy and climate is the Climate Change Act, passed by Parliament on 11th of July 2014. This law plays an important role in accomplishing the Government's vision of being independent of fossil fuel and have a 100% renewable energy supply by 2050: it establishes a strategic framework for the Danish climate politics in order to achieve a low-emission society by 2050. One of the main features of the law is the establishment of an independent Climate Council with experts specialising in areas highly relevant to the identified challenges of climate change. Furthermore, the law obliges the Minister of Climate, Energy and Building to propose targets for national greenhouse gas reduction. These targets are to be presented in a ten-year perspective to the Danish Parliament at least once every five years with a requirement to be ambitious enough to reach the 2050 low-emission goal. (The Danish Parliament, 2014)

The Climate Change Act is a result of *Energy Strategy 2050* and its stated objective to thoroughly review the Danish legislation with the purpose of ensuring its appropriateness in relation to the target of fossil fuel independence. This policy document defines the temporal targets concerning energy and climate. Negotiations for a broad agreement on the vision of a fossil fuel free 2050, and how to implement the Strategy's outlined energy policy in Danish legislation, are under way in Parliament (*Energy Strategy 2050: from coal, oil and gas to green energy*, 2011). Thus, we will probably see more concrete and target focused energy legislation in Denmark in the forthcoming years.

Another important law for realising the target of fossil fuel independence is the Promotion of Renewable Energy Act (1 January 2009). The RE Act primarily regulates wind turbines and has the objective to promote renewable energy sources so as to reduce dependency of fossil fuels and secure the energy supply (The Danish Parliament, 2009). Apart from this law, and the previously mentioned Climate Change Act, a common focus of the energy and climate legislation in Denmark concerns state subsidies.

There are subsidies for efforts such as energy savings, district heating, consumption of bio fuels and research on technological development in the energy area. Several EU directives and international agreements in respect to energy and climate, for instance energy labelling and regulation on quotas of CO₂-emissions, have been implemented in the Danish legislation.

Means of monitoring

Monitoring of laws and other formal regulations in Denmark is a comparably well-oiled machine, considering the institutional foundations. This means two things: the Government holds the absolute accountability for monitoring, and the framework for monitoring is regulated in legislation.

The Danish Energy Agency, under the Danish Ministry of Climate, Energy and Building, has the responsibility to oversee the legal and political framework for sustainable energy supply in Denmark. The Agency is responsible for upholding of the rules on Energy-Labeling and Ecodesign, by surveillance through internet controls, shop controls, document inspections and measurement inspections (Energistyrelsen, *Energikrav til produkter*, u.d.). Moreover, the Danish Energy Agency partakes in the EU Commission Programme “Monitoring of Energy Efficiency in Europe (ODYSSEE MURE)”, which establishes indicators to measure energy efficiency and ensure comparable data of the achievements of the member states concerning energy efficiency. The results of the programme are presented in a variety of reports, evaluating the development of energy efficiency in general as well as in regards to different sectors (Energistyrelsen, *Indikatorer for energieffektivitet*, u.d.). The latest national report on Denmark was published in January 2016 (Danish Energy Agency, 2016).

The Danish Energy Regulatory Authority (Energitilsynet) plays an important part in the monitoring of the energy area in Denmark. The agency is independent of the Government, although the Minister of Energy, Climate and Building calls the members. The Electricity, Gas and Heat Supply Act obliges the Danish Energy Regulatory Authority to monitor the markets for electricity, gas and heating in order to ensure aspects such as necessity-cost-pricing and transparency for consumers (Energitilsynet, *Om Energitilsynet: Opgaver*, u.d.). The Danish Energy Regulatory Authority submits an annual report on its activity and performance to the Minister of Energy, Climate and Building (Energitilsynet, *Om Energitilsynet: Energitilsynets forretningsorden*, u.d.).

The monitoring of CO₂-emissions is performed in accordance with EU regulation, via the Danish Energy Regulatory Authority. Monitoring of other legislation derived from EU directives and international agreements such as the Kyoto Protocol and COP21, is done in a similar manner. As an example, the Danish National Environmental Research Institute (NERI) annually reports the Danish greenhouse-gas emissions inventories to the United Nations Framework Convention on Climate Change (UNFCCC). (International Energy Agency, 2011)

Debated regulations

The public opinion in Denmark about the environmental questions is naturally fluctuating. In general, the private economic aspect of environmental engagement is of great importance for the Danish citizens when for instance, choosing the type of energy contract or whether or not to make a green effort (Olesen, 2016). Moreover, the fluctuation depends on the current surrounding environment, such as political changes or merely the latest trends in the area of energy and climate. This being said, in a recent survey of the public opinion on the current Government’s energy and climate politics by the *Opinion for fire grønne organisationer*, two out of three Danes expresses dissatisfaction with the efforts and ambition level (Ritzau, 2016). Considering Denmark is a vital democracy with a highly dynamic climate for debate, the result is not too surprising. In fact, criticism of the pursued politics of the Government are more of a rule than an exception. The dissatisfaction of the Danish people can be further described as a result of Denmark traditionally being a front-runner in the transition to a green society: with great achievements comes great expectations.

VedvarendeEnergi (VE), a national Danish NGO, is currently debating for a change in the legislation on the expansion of wind energy. The amendment is proposed to strengthen the local authority in cases of

wind turbine deployment. More specifically, VE wants a regulation that permits the locals to either allow or reject establishing wind turbine plants in their immediate surroundings. Furthermore, fees and subsidies are regularly debated among the public. For example, the fees on heat pump should be lowered, while the fees on petrol vehicles should be higher. Regarding subsidies, the debate concerns the opinion of increasing subsidies for the railroad system as well as energy saving efforts. (Olesen, 2016)

Table 1 Danish policy targets until 2050

Targets and regulations	Heat 	Industry 	Transport 	Electricity 	Multi-sectoral
Target 2020 ²	40% of demand met by renewable energy sources	Increase the energy-saving obligations of energy companies by 50% from 2013 and by 75% in 2017-2020	10% share of renewable energy	50% of electricity supply from wind power	Reduce primary energy consumption by 4-6% compared to 2006
	Reduction of energy use in new buildings by at least 75%		Reduce GHG emissions		Reduce consumption of fossil fuels by 33% compared to 2009 (excluding the transport sector)
			Increase in electric vehicles	20% of electricity supply from biomass	Increasing renewable energy's contribution to gross energy consumption to 33%
			Increased consumption of first- and second-generation biofuels		Reduce non-ETS emissions (which represent 58% of GHG emissions) by 20% compared to 2005-levels
Target 2050		100% renewable energy supply	100% renewable energy supply		Reduce non-ETS emissions by 80-90% compared to 1990-levels
			Reduce GHG emissions		Independence from coal, oil and gas – 100% renewable energy supply
Special/additional regulations or targets	100% renewable energy supply by 2035			100% renewable energy supply by 2035	Denmark are to be in the world's top three countries in terms of renewable energy penetration by 2020 and to be among the most energy-efficient OECD members by 2020

(International Energy Agency, 2011)

Denmark has a comparably extensive legislation concerning environmental issues. In addition to the legislation already mentioned, there are laws for addressing the matter of sustainable management of landscape, nature and biodiversity, more specifically the Planning Act and the Nature Protection Act. Correspondingly, highly relevant to the environmental area is the Chemical Substances and Products Act. The objective of this law is to prevent threats for health, environmental impact and environmental

² Since the short-term goals of the Danish Government primarily are set to 2020, this year is presented in Table 2 instead of 2030.

damage by regulating the handling of chemical substances and products through prohibits and restrictions of packaging, for instance (The Danish Parliament, 2014).

3.2 Energy policy and instruments

As mentioned in the previous section, the most extensive policy package formulated by the Danish Government concerning energy and climate is *Energy Strategy 2050*. The initiatives in the package promote numerous aspects of the energy area and consist of several policy instruments, including policy support, economic instruments and research, development and deployment. This reflects the Danish energy policy in general, containing several policy instruments, to manage the various aspects of the energy sector and properly deal with the challenges at hand. Economic and regulatory instruments seem to be symptomatic for the Danish energy policy, which one could argue is an effect of the traditionally social democratic political environment in Denmark and the generally Keynesian institutions. Essentially, the framework itself institutes a Government intervention, but on several parts, it leaves room for interpretation and concretisation that might actually reduce the Governmental impact in favour of other societal groups.

The fact that Denmark is a member of the EU, as well as part of international environmental agreements, means that the national policymaking is dependent on regulations on supra-national levels. These regulations are mostly frameworks for achieving an overall set of goals, leaving the specific national targets and policy instruments to each state involved in the agreement. What this means though is that there is an overseeing element to the EU, as well as to the international agreements, since they form a framework for the overall policymaking in the nations that are part of the agreements.

Denmark is a very active participant both in the EU and in forming the international environmental agreements, and commonly drive a well-motivated agenda with high standards. Since the EU as well as the UNFCCC are fora for compromises through different sets of standards and levels of ambition, the directives, regulations and agreements are often less ambitious than what Denmark put on the table. Consequently, in general, the national policies of Denmark do not only live up to the international standards and regulations, but also exceeds them by far.

The responsibility to oversee energy policy in Denmark lies with the Ministry of Climate, Energy and Building, and the Danish Energy Agency is in charge of implementing the energy policy in all sectors except transport. Further delegation of the policy execution is made to the Danish Transmission System Operator (TSO), Energinet.dk. Energinet.dk connects wind turbines and other energy sources to the electricity grid, paying subsidies for environment-friendly electricity production and the handling of system operations, securing sufficient production capacity and ensuring that the electricity infrastructure supports the increasing use of renewable energy (International Energy Agency, 2011).

The energy policies in Denmark can be divided into three categories, depending on the general type of global issue they are laid out to deal with. These categories are climate change, global renewable energy and energy efficiency. Several policies naturally covers more than one category and contains multiple policy instruments and policy targets. The *Danish Agreement for 2012-2020* is an example thereof as it establishes a broad framework for multi-sectoral policy that deals with climate change as well as energy efficiency and the transition towards renewable energy. The Agreement thus, similarly to *Energy Strategy 2050*, constitutes an instrument of policy support and strategic planning on a large scale, but additionally involves other policy types on more specific levels. Economic instruments are used in the form of financial incentives, for instance funding and targeted subsidies to promote and maintain various beneficial efforts in the energy and climate sectors. Moreover, there is a regulatory element to the Agreement, in the ban on the installation of oil-fired and natural gas boilers in all new constructions. Important to mention is also the instrument of research, development and deployment (RD&D) in the Danish Energy Agreement for 2012-2020 as it, among other things, lays down that the RD&D in energy technology should be maintained on a high level – especially concerning technology to support renewable electricity production (IEA, 2012).

The *Energy Strategy 2050* is sorted under the category of global renewable energy and is a textbook example of policy support, in the more specific form of strategic planning. The Strategy lays out a precise

framework for all future energy policymaking in Denmark for which reason it might not be considered a regulatory instrument, an instrument of information and education or others directly, but most certainly will lead to policy formation of these types. A recent example of a regulatory instrument formulated in the framework of *Energy Strategy 2050* is the Building Code, which is among the strictest in the world. This policy contains codes and standards as well as mandatory requirements concerning both new and existing buildings, with the overall objective of improving energy performance (IEA, 2013).

Policy instruments that are included in *Energy Strategy 2050*, in addition to strategic planning, are economic instruments in the form of financial incentives and taxes, as well as research programmes to ensure technology development. Taxes are introduced in the framework mainly to discourage the use of oil, gas and coal but also to reduce the total Danish energy use. The research and development programmes primarily concern solar and wave power, but also focus on increasing the wind manufacturer sector in order to reach the target of 40% of electricity supply from wind power by 2020 (IEA, 2011). Another objective in the area of research, development and deployment is funding for research regarding electric cars (International Energy Agency, 2011).

Energy research funding is largely the prerogative of the Council for Strategic Research under the Danish Agency for Science, Technology and Innovation, and the Energy Technology Development and Demonstration Programme (EUDP) under the Danish Energy Agency. These programmes are rather generic in that they do not prescribe what types of functions should be addressed. In addition, the Danish National Advanced Technology Foundation also funds energy research related to power, as does the Danish TSO, Energinet.dk.

Table 2 Overview of policy instruments per function

Instrument				
Economic			Road-use taxes Taxes on vehicle fuels and vehicle purchases	Taxes on electricity
Information, education, networks				One-in-all electricity bill, making it easier for the consumer to understand it
Policy and regulations	Building codes	Order of Environmental permitting Emission limit values for air polluting substances	Low emission zones	
Research and development			Electricity and biomass in transport	The ForskEL programme on technologies for environmentally friendly power generation and integration
Voluntary instruments				

4 Interaction and governance

There is in Denmark a long tradition of the energy policy based on consensus between the main political parties. Originally driven by social democratic governments, their political opponents also came to embrace renewables, and do this a little ahead of the rest of the world. The reasoning and understanding behind the wind energy adventure was that it was going to cost in the short term, but that in the long term it would give the country and the companies a competitive advantage.

There is also a strong history of grassroots movements, in the energy and environment areas as well as in other societal fields, and thus a clear acceptance of the importance of such movements. There have not been any major conflicts concerning the energy policy – public opinion and politicians have often been able to agree on a way forward.

There has been a strong interventionist policy during the last 40 years in the energy sector. It has been a political debate and a debate in the media, but it is still a broad consensus on these issues and it has also been broad agreements in the parliament. Energy policy and industrial policy go hand in hand. Dialogue between parts of the industry, politicians, and NGOs is an important part of this system. Industry associations and independent environmental organisations seek to be and are often represented in the energy related law and regulation formulating processes through hearings and committees, and by submitting policy papers and responses to proposals for laws. There is good cooperation between organizations in the climate and energy also when organised interests want to influence EU Directives. The discussions are pragmatic, and interested parties engage in conversations with officials rather than through lobbying. There is a culture of cooperation and finding common solutions.

One example of interaction is the initiative for a partnership in the energy field to promote cooperative relations between energy players, support the strategic energy planning in the municipalities and promoting the green conversion the Danish Energy Agency and Local Government Denmark (KL) took the initiative to and that ran from 2013 to 2015.³ The partnership, which actively involved close a hundred municipalities in projects, was open to all energy actors that wanted to help promote the green conversion in the municipalities. Activities were undertaken with the purposes to coordinate the implementation of the best possible projects for the benefit of all municipalities in their future work with strategic energy planning and to bring together different stakeholders with a view of possible future collaborations. An evaluation carried out at the end of the programme period concluded that this way of promoting partnerships and strategic energy planning in the municipalities had been a success.

Another example of public-private agreements was the one concluded in 2012 between the minister of climate, energy, and construction and network and distribution companies.⁴ The agreement meant that network and distribution companies in the field of electricity, natural gas, district heating and oil should double their efforts to save energy. The companies helped their customers – companies and private – to reduce energy use through advisory services, technical and financial assistance.

A recent development worth mentioning is the Government's Energy Commission, launched in March 2016.⁵ The Commission will analyse the new developments in the energy sector and make recommendations for Danish energy policy from 2020 to 2030. The Energy Commission consists of eight members and a chairman appointed based on their professional knowledge and expertise on the energy sector, industry conditions, digitization and financing. The Commission, whose chairman is Niels B. Christiansen, CEO of Danfoss, is expected to publish recommendations for Danish energy policy in early 2017.

³ <http://www.kl.dk/Teknik-og-miljo/Partnerskab-pa-energiomradet-id117292/>

⁴ <http://www.efkm.dk/nyheder/ny-aftale-fordobler-energibesparelserne>

⁵ <http://www.efkm.dk/en/news/the-energy-commission-must-come-up-with-the-next-intelligent-steps-forward-in-denmarks-green>

There are also examples of more ad hoc initiatives. In April 2016, the Danish Energy Agency launched a campaign to get wholesale stores to put energy renovations on the agenda. Energy use in the country's approximately 5000 product wholesale stores are unnecessarily large, because many of the wholesale stores is not energy-optimized with modern energy solutions. The campaign was completed before the summer break.

Societal movements exercise their influence through collaboration with each other and with policy makers, through information and activities directed to specific groups or the public in general. NGO's such as SustainableEnergy, the Ecological Council and Greenpeace take part in the climate policy processes and work to influence policy decisions toward more sustainable solutions.

The commitment to the 2050 goals is now such that the present minority government led by Venstre, the liberal party, is under criticism for speaking with forked tongue. In the Paris negotiations, the government says one thing, but the conversion process is slow, and by some understood as half a step back. Clear political leadership is missing, and the view is that the present minority government is not so interested. These difficulties to create consensus also applies to other policies and is not specific to the energy transition. The Danish government's stance now is that Denmark does not need to be first in the energy transition. But Denmark must improve in order to maintain its image as a green nation. Despite this, a general view seems to be that the political climate of broad agreements probably will remain.

4.1 Stakeholders (groups) that stand out because of their initiatives and intentions

An interesting case in point is the **Danish Energy Association**. This a non-commercial lobby organisation for Danish energy companies. The association takes care of its member companies' interests and thus works to improve conditions and competition among these companies. They do this by several means, and regular contacts with the government, authorities, commercial and professional organisations and other decision-makers nationally and internationally is an important part in this. Since the energy industry has become the country's most important industry sector, representing some 20 % of Denmark's exported goods, the energy industry is committed to the reduction of carbon emission. This commitment to the strategy to develop fossil-free energy goes hand in hand with economic advantages for the Danish energy industry, and the association has become one of the strongest voices in favour of the national strategy.

It is telling that the Energy Association is among the harshest critics of the present government's work towards energy transition, saying that the government is not wholehearted in their policies. The major industries with long-term investments ask for stability and long-term ground rules. Energy companies' future lie in being green, based on a clear understanding that their activities cannot continue to be based on a technology that eventually will be eliminated. The energy policy will require solutions based on solar and wind, with the use of biomass in a transitional period.

SustainableEnergy is a member based NGO with activities in Denmark and in developing countries.⁶ The organisation was created in 1975 as a protest against plans for nuclear power in Denmark under the name "Organisation for Vedvarende Energi" (OVE), and in 2010 changed name to VedvarendeEnergi (SustainableEnergy). SustainableEnergy runs Energy Service Denmark which helps citizens to make the right choices. Based in 10 regional offices around the country, all Danes are offered free and unbiased advice on energy conservation in their private households. Energy Service helps citizens change from older oil or gas furnaces to modern heating systems such as central heating, wood pellet boilers or heat pumps. Energy Service Denmark also trains craftsmen and cooperates with their associations to improve the technical knowledge of renewable energy among energy professionals, and conducts extensive outreach activities in the public schools by providing well tested teaching material and exercises for energy education. Since 2005, Energy Service Denmark has collaborated with a large part of the local governments, some 80 in total. The organisation has some good contacts with politicians both at the national and local level.

⁶ <http://sustainableenergy.dk/sustainableenergy-in-denmark>

The Ecological Council (Det Økologiske Råd) is an independent, member-based environmental organisation working for the sustainable transformation of society.⁷ It is an environmental organization, but they also act as a think tank and as consultants. Since the organization has few members and are dependent on outside aid, the consultancy work in areas such transport and energy funds the activities to a great extent. The Council's approach is both politically behind the scenes, trying to collaborate with and influence politicians in Parliament and in Brussels and decision makers in business, and providing the public with information to make sustainable choices in their daily lives. The Council participates in a variety of advisory groups and committees and collaborates with universities and researchers.

The **Danish District Heating Association** (Dansk Fjernvarme) organises more than 400 Danish district heating companies.⁸ 55 are municipally owned district heating companies, which deliver around two thirds of all district heating, and the others are predominantly consumer owned cooperatives. Members supply 63 % of Danish households (1.6 million) with district heating, covering around half the demand for space heating demand in all buildings and thus making the Association an influential voice in the Danish energy landscape. Apart from promoting the interests of the members by influencing rules and conditions of production, transmission, distribution and sales of district heating, gathering and disseminating knowledge through meetings, training courses and information activities, the association has also set up a think tank - Green energy (Grøn Energi) - that creates knowledge about sustainable energy systems, making analyses and starting innovation projects. Among other activities, the think tank works to make visible the Danish district heating industry in the political debate through agenda-setting analysis and energy policy initiatives. The interviewee from the Association believes they are an organization that politicians listen to.

Compared to the players mentioned above, the **92 Group** is perhaps slightly less influential on the national level. It is still, however, an interesting coalition of 23 Danish NGO's working on issues related to the environment and development, largely focused on global and international issues. The group was established in 1991 with the mandate of coordinating the Danish NGOs' preparations for the United Nation's Conference on Environment and Development in Rio de Janeiro, 1992. Today the Danish 92 Group is working on the follow-up of the World Summit on Sustainable Development in Johannesburg 2002, the Rio+20 UN conference on Sustainable Development in 2012 and related issues on sustainable development at both national and international level. Activities include joint actions on advocacy, lobbying and information activities coordinated in different thematic working groups. Some other organisations such as WWF and Greenpeace play a smaller role, and do not have many members and less support among the population.

Table 3 Stakeholder type mapping

	High power	Low power
High interest	<i>Utilities</i> <i>Energy technology industry</i> <i>Most political parties</i>	<i>NGOs</i> <i>municipalities</i>
Low interest	<i>Present government</i>	

⁷ <http://www.ecocouncil.dk/en/>

⁸ <http://www.danskfjernvarme.dk/sitetools/english>

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Interviews

Name	Organisation	Date
Lars Aagard	Danish Energy Association	2016-10-26
Søren Dyck-Madsen	The Ecological Council	2016-10-25
Birger Lauersen	Danish District Heating Association	2016-10-26
Gunnar Olesen	SustainableEnergy	2016-10-25
Svend Svendsen	Technical University of Denmark	2016-10-18