

Denmark

Key Issues

The energy mix will change significantly due to ambitious policy targets for renewable energy (wind power set to account for up to 50% of electricity generation by 2020). To address this interconnection capacities with neighbouring countries are being developed to maintain a high level of security of supply.

Danish household customers pay one of the highest electricity prices in EU, mainly due to a very high level of energy taxes. Compared to electricity prices for industrial consumers the price for household customers is three times higher. However, the electricity price without taxes for industrial consumers is below the EU-27 average (5% in 2012).

Annual domestic gas production was reduced by approximately 10% in 2012. Denmark now partly relies on imports through Germany to balance its gas supply and demand. Denmark's security of supply is closely linked to that of Sweden due to the fact that the latter is entirely dependent on Denmark.

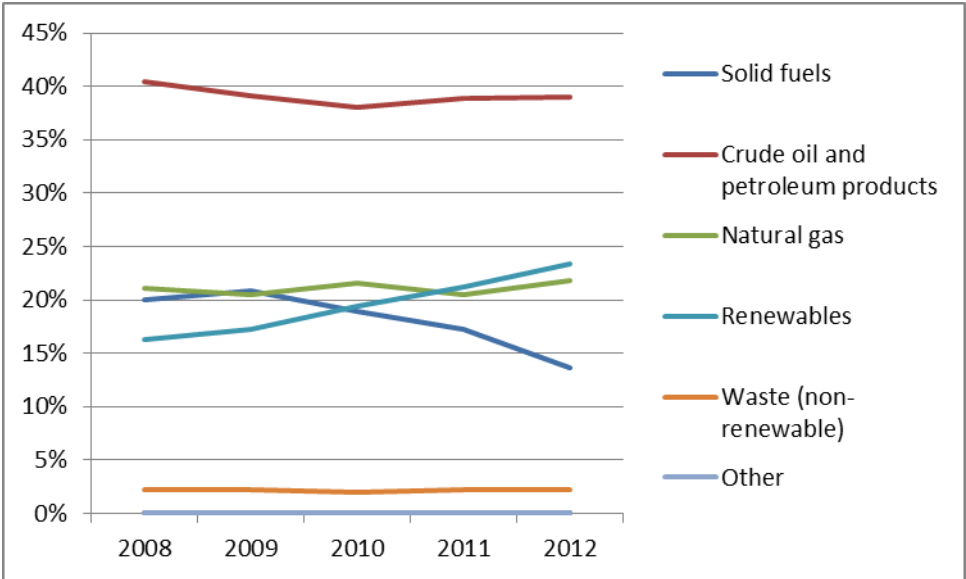
Regulated end-user prices will be phased out by October 2015 (electricity) and, based on legislation yet to be proposed, by October 2016 (gas). A bill on a supplier centric model for the electricity retail market was adopted in June 2012 and will come into force by October 2015.

General overview

Gross energy consumption has decreased from 20.2 Mtoe (2008) to 18.1 Mtoe (2012). In 2012, Denmark relied on crude oil and petroleum products (39.0%), renewable energy sources (23.3%), natural gas (21.8%) and solid fuels (13.6%)¹³².

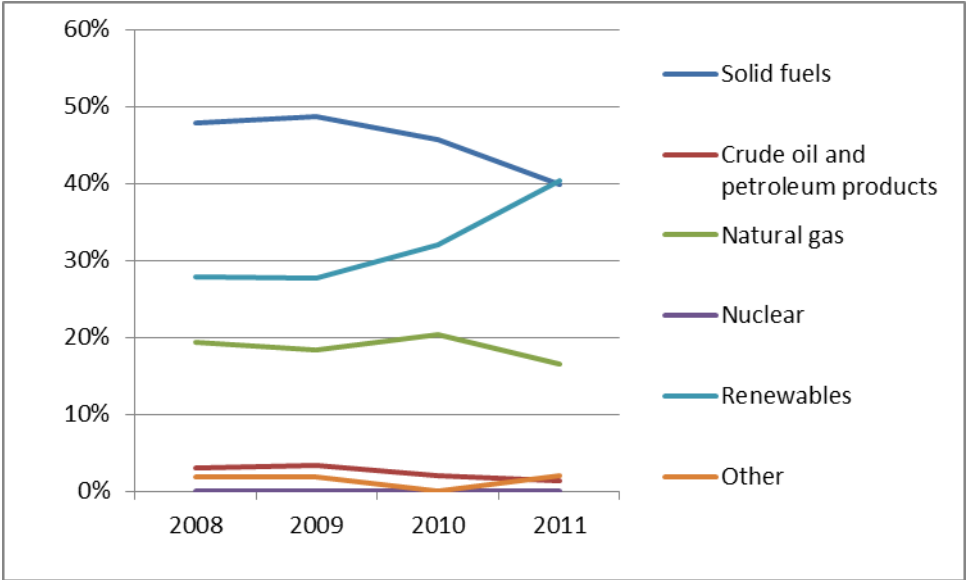
¹³² Eurostat.

Figure 1: Gross inland consumption mix 2008 – 2012 (source: Eurostat)



Total gross electricity generation in 2012 dropped to 30.7 TWh¹³³. In 2011, renewable energy sources provided the largest share for the first time (40.34%), whereas solid fuels were the second most important source (39.77%). Natural gas had a share of 16.48 % and crude oil of 1.42 %.

Figure 2: Gross electricity generation 2008 – 2011 (source: EU Energy in Figures - Pocketbook 2012 and 2013)



The RES share in gross final energy consumption in Denmark reached 26% in 2012 and is expected to rise to more than 35% by 2020. In spring 2011, the Danish government decided to raise the share of

¹³³ Eurostat.

renewable power to 50% by 2020, thus exceeding the European targets. Cogeneration¹³⁴ provided between 40.7% and 49.2% of the total energy generation between 2008 and 2011.¹³⁵

Regulatory framework

General

The Third Energy Package was implemented in national law with the adoption of Act no. 466 on 18 May 2011.¹³⁶

National energy regulator

The Danish Energy Regulatory Authority (DERA) was founded in 2000 and employs about 50 employees with a budget of about EUR 5.56 million in 2012. Compared with 2011 this is an increase by more than 10% in staff and budget.¹³⁷

Unbundling

The TSO for both gas and electricity is Energinet.dk. DERA adopted final certification decisions in February 2012 in accordance with the rules of the ownership unbundling model and making use of the provisions related to separation within the state.

Wholesale markets

Electricity

The largest electricity generators in Denmark are Dong Energy and Vattenfall who together account for about 56.7% of the total generation capacities. Denmark is part of the Nord Pool Spot, a joint energy exchange for the Scandinavian countries. More than 70% of the energy generated in the area is traded at Nord Pool Spot.

Denmark is divided into two market areas (Western Denmark DK1 and Eastern Denmark DK2). The energy is either traded day-ahead or intraday. The total volume traded day-ahead was 20.3 TWh in DK1 and 15.3 TWh in DK2 (2012), while the volume traded intraday was 0.2 TWh in DK1 and 0.2 TWh in DK2 (2012)¹³⁸. The average price (arithmetic mean) in 2012 was EUR 36.33/MWh in DK1 and EUR 37.56/MWh in DK2.

The Danish electricity wholesale market is part of the day-ahead market coupling project which began operation in February 2014.

¹³⁴The share of electricity produced in combined heat and power plants (CHP).

¹³⁵Eurostat.

¹³⁶DERA – Results and Challenges,

http://energitilsynet.dk/fileadmin/Filer/Information/Resultater_og_udfordringer/Aarsrapport2011_eng/helepubl.htm#kap07.

¹³⁷ <http://energitilsynet.dk/tool-menu/english/secretariat/>.

¹³⁸ All values based on the bought quantities.

Gas

The annual gas production for 2012 in Denmark was 5.455 mcm, production decreased by about 10% compared with 2011. The gas consumption was at 3.696 mcm while an amount of 2.830 mcm was exported. Only a very small amount was imported from Germany. The three important export countries were Sweden (37.84 %), the Netherlands (35.19 %) and Germany (26.96%).¹³⁹

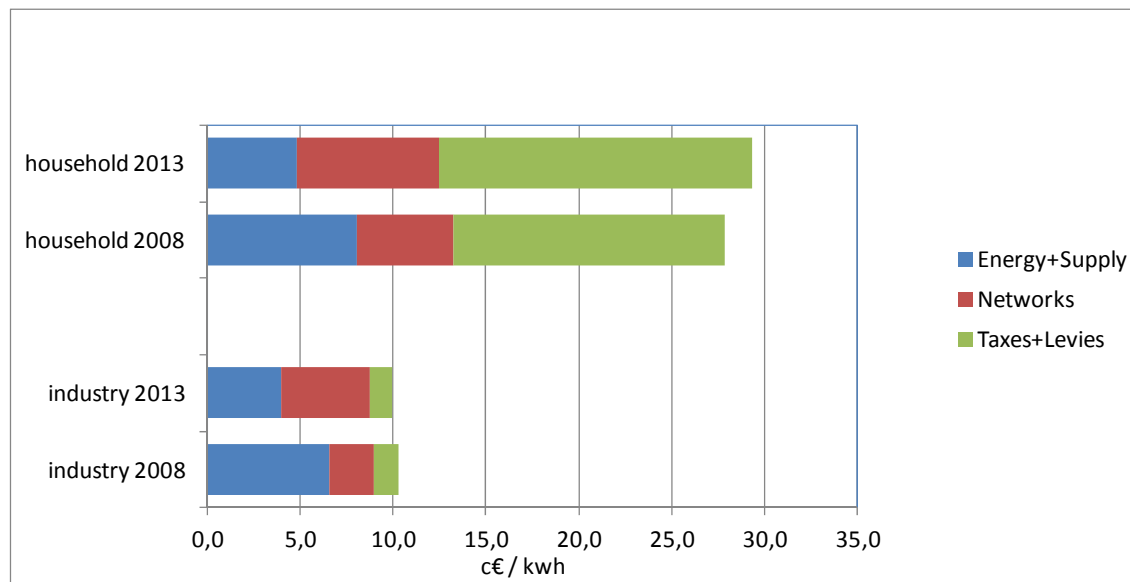
The Danish wholesale market is mostly based on bilateral trading (OTC trading), but volumes traded at the Danish gas exchange (Gas Point Nordic) have by 2014 reached 25%. It has been possible to trade gas on the gas exchange since 2008. The gas exchange was established in 2007. The average prices were EUR 27.98/MWh in 2013, EUR 25.16/MWh in 2012 and EUR 23.25/MWh in 2011.

Retail markets

Electricity

The electricity market was liberalised in 2003. There are currently 33 active suppliers in the retail market. DERA recognises that the level of competition needs to improve. In 2012, 6.7% of the end consumers switched supplier, which is an increase on 2011 levels (3.18%), but still low. Since 2003, all Danish electricity consumers are free to choose whether to join the regulated market with regulated prices or the liberalised market where prices are not regulated. Consumers above 100,000 kWh, covering about 50% of the retail market (in terms of consumption), are active in the market, whilst at least until the end of 2012, between 90 and 95% of electricity consumers had not exercised their right to change supplier and remained on default contracts with regulated prices. However, for most consumers, the regulated prices will cease by October 2015.

Figure 3: Electricity price change by component 2008 – 2013 (source: Eurostat, energy statistics)



The electricity prices for consumers are frequently updated by DERA and published on www.elspristavlen.dk where both fixed and variable prices are shown. The prices did not rise

¹³⁹ www.ens.dk/en/info/facts-figures/energy-statistics-indicators-energy-efficiency/monthly-statistics.

between the first half of 2012 and the first half of 2013, remaining constant at EUR 0.3/kWh, which is the highest electricity price within the EU and primarily caused by the highest level of taxes and levies including VAT (56.7%).¹⁴⁰

In 2013, the Danish Energy Agency issued a new regulation securing the full roll-out of smart meters in Denmark by 2020. Large scale replacement of existing meters began in 2010/2011 and currently more than 50% of consumers have smart meters. There are already 1.63 million metering points where a smart meter is installed following a voluntary roll-out led by the distribution system operators (DSOs), and the remaining 1.38 million will be also equipped following a positive cost-benefit analysis.

On 1st October 2015, the electricity retail market will change to a supplier centric system, where electricity suppliers buy grid services on a wholesale basis, and sell “delivered electricity” to consumers. By the same date, regulated prices will cease for almost all consumers. The suppliers of electricity will become the primary contact for consumers. This should make bills easier to read as there will only be one price for electricity covering both energy consumption and transmission costs. Due to this simplification consumers may be encouraged to become more active. One important initiative to boost the competitiveness of the retail market is the so-called 'datahub', a data platform developed and managed by the ownership-unbundled Danish TSO, Energinet.dk, which simplifies the extensive data traffic between the players in the Danish electricity market and makes it easier for electricity consumers to change supplier and to access their own consumption data. The datahub has been operational since March 2013.

Gas

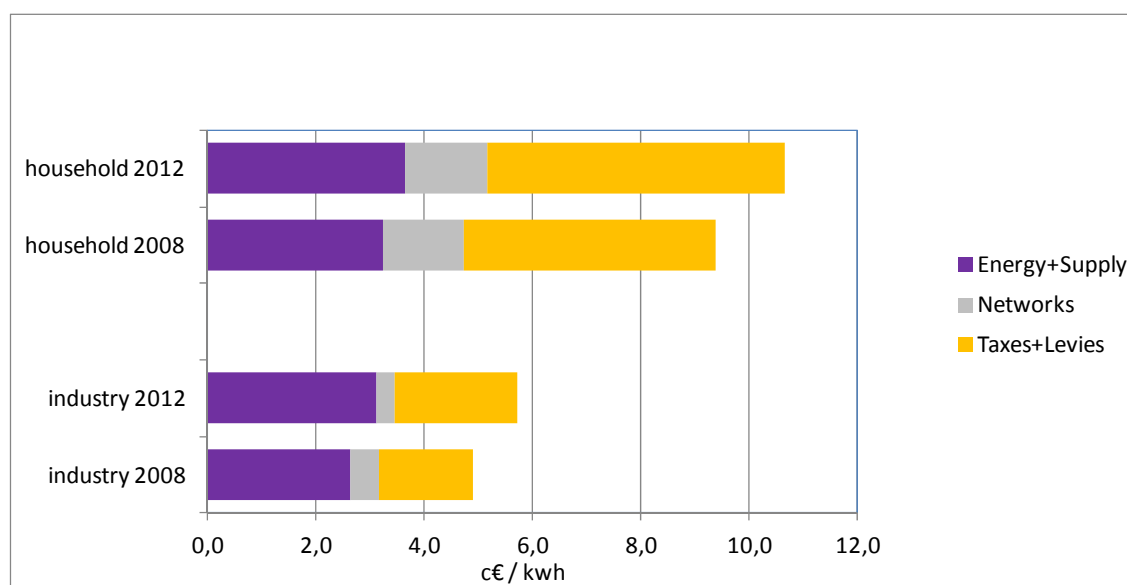
The gas market was liberalised in 2004. In 2012, a total number of 14 retail suppliers were active in the market. On average the Danish customer is able to choose between at least 12 different suppliers. In 2012, 7.7% of end-consumers switched supplier. The retail market concentration is relatively high with a Herfindahl-Hirschman Index (HHI) of 3.648 in 2013¹⁴¹. Customers are able to choose between regulated and unregulated prices. However, at least until the end of 2012, the vast majority of smaller gas consumers had not exercised their right to change supplier and remained on default contracts with regulated prices. For most consumers, regulated prices will cease by October 2016. The majority of small scale customers are not active in the unregulated market segment, whilst large scale consumers are. The prices for consumers are monitored by DERA and published on www.gasprisguiden.dk. The average natural gas price for households was EUR 13.82/GJ in 2013, decreasing constantly in the last two years (2011: EUR 16.47/GJ). The average price for industrial consumers was at EUR 10.74/GJ in 2013 which is an increase of 4.51% compared to the previous year.¹⁴²

¹⁴⁰ Eurostat.

¹⁴¹ DERA, figures for 2013 (based on volumes).

¹⁴² Eurostat.

Figure 4: Natural gas price change by component 2008 – 2012 (source: EC, EPCR metadata)



At the moment there are no plans to implement smart gas meters on a large scale.

Consumers

Danish consumers rate the performance of their retail electricity and gas market above the EU average (75.4 points compared to 72.0 and 77.0 compared to 74.1¹⁴³), corresponding to 12th and 9th place EU-wide, respectively. The gas market also ranks above the average of all domestic services markets (12th place out of 31), while the electricity market scores just below the average (17th place). The incidence of problems is the second lowest for electricity and lowest for gas in the EU. Both markets score high on trust in providers and overall satisfaction (2nd and 3rd highest in the EU in the case of gas market). On the other hand, comparability is amongst the lowest rated in the EU, (lowest for the gas market and 5th lowest for electricity)¹⁴⁴.

There are no specific provisions regarding vulnerable consumers in energy law; instead this issue is dealt with in social legislation.

Denmark is one of very few countries to protect energy consumers in remote areas¹⁴⁵.

Infrastructure

The Danish authorities should ensure a proper and timely adoption of the measures stemming from Regulation 347/2013 on the trans-European energy infrastructure, including the establishment of the one-stop-shop for Projects of Common Interest, PCIs (due by 16 November 2013), and other measures foreseen for 2014 and 2015, including the publication of the manual on the permit

¹⁴³ However the difference is not statistically significant.

¹⁴⁴ 10th Consumer Markets Scoreboard, http://ec.europa.eu/consumers/consumer_evidence/consumer_scoreboards/10_edition/index_en.htm

¹⁴⁵ The European Commission Vulnerable Consumer Working Group Guidance Document on Vulnerable Consumers, November 2013.

granting process for project promoters, and the adoption of legislative and non-legislative measures streamlining the environmental assessment procedures.

Electricity

The highly ambitious goals for the Danish energy policy to meet all energy demand by renewables by 2050 are a challenge to the electricity transmission system. Hence, Denmark is enhancing its electricity interconnections with neighbouring countries i.e. Germany and the Netherlands and strengthening or expanding existing interconnectors. Some of these projects are long-term with commissioning dates foreseen for years 2018 – 2022.

Gas

As a result of the gradual depletion of the Danish gas production in the North Sea, Denmark (and Sweden) require access to new gas resources.

The expansion of the gas infrastructure in the Southern part of Jutland was completed in October 2013. The expansion includes establishment of a new compressor station at Egtved and looping of the existing transmission pipeline from the German border to Egtved. Furthermore, the first phase of expansion of the transport capacity in the Northern part of Germany is completed and the next phase of the expansion is planned to come into operation in October 2015. The expansion of the cross-border connection will allow Denmark (and Sweden) to increase imports of gas from Germany in order to compensate for the decreasing Danish North Sea production. The bi-directional flow on this interconnection allows Denmark to export gas to Germany during the summer time and import gas from Germany during winter time, where gas consumption in Denmark (and Sweden) is high due to need for gas for heating purposes. The German part of the expansion of the gas system is part of the list of PCIs.

Security of Supply

Electricity

ENTSO-E predicts power imbalances from winter 2016, mainly caused by the ambitious targets for renewable energy. However ENTSO-E's calculations do not take into account that Germany is phasing out its nuclear power plants. Nevertheless, the Danish grid has been very reliable in the past. To maintain this high level, Energinet.dk is extending its electricity infrastructure with the surrounding countries to avoid becoming dependent on the capacity of a single country. In 2013, Energinet.dk and National Grid signed a cooperation agreement to consider the feasibility of an electricity interconnector between Denmark and the UK.

Gas

Denmark implemented the requirements of the EU Regulation 994/2010 in October 2012, including an Emergency Plan for the Danish gas transmission system. The expansion of the gas transmission system towards Germany will ensure increase in import capacity from Germany in order to supplement gas supplies from the Danish North Sea as the production is foreseen to decrease in forthcoming years. However, the new Hejre gas field is expected to come on stream in 2016/2017 and will increase the production in the North Sea.

Key indicators

Electricity		Gas	
Number of companies representing at least 95% of net power generation	~1300	Number of entities bringing natural gas into country	N/A
Number of main power-generation companies	2	Number of main gas entities	N/A
Market share of the largest power-generation company	37%	Market share of the largest entity bringing natural gas	N/A
Number of electricity retailers	55	Number of retailers selling natural gas to final customers	14
Number of main electricity retailers	N/A	Number of main natural gas retailers	N/A
Switching rates (entire electricity retail market)	6.7%	Switching rates for gas (entire retail market)	0.9%
Regulated prices for households – electricity	partly	Regulated prices for households – gas	partly
Regulated prices for non-households – electricity	partly	Regulated prices for non-households – gas	partly
HHI in power-generation market	N/A	HHI in gas supply market	N/A
HHI in electricity retail market	N/A	HHI in gas retail market	3,648 ¹⁴⁶
Electricity market value ¹⁴⁷ (bn€)	5.053	Gas market value (bn€)	1.514
Installed generation capacity (MW, 2011)	13,580		
National instantaneous peak load (MW)	6,169		
Number of smart meters installed	N/A		

¹⁴⁶ DERA, figures for 2013 (based on volumes).

¹⁴⁷ Market value is an estimation of the size of the retail electricity and gas markets. It is calculated using data on electricity and gas consumption in the household and non-household sectors (average bands) and annual average retail prices.