

Kristine van het Erve Grunnet

Biomass in the international Context – how to safeguard Sustainability

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Denmark has, as one of the only countries in Europe, a long term objective for the independence of fossil fuels by 2050. This goal is supported by 90 % of the Danish Parliament. The objective was set in a comprehensive, broad political energy agreement from 2012 which contained a wide range of initiatives for the time period from 2012 to 2020.

The agreement especially provided incentives for large investments in renewable energy: biomass as well as onshore- and offshore wind energy. Furthermore the agreement supports the phasing-out of oil-fired boilers in existing buildings by:

- banning the installation of oil-fired boilers and natural gas boilers in new buildings from 2013 onwards
- banning the installation of new oil-fired boilers in existing buildings in areas

where district heating or natural gas is available from 2016 onwards

- committing 5.5 million € to fund the conversion from oil-fired boilers and natural gas boilers in existing buildings to renewable energy.

As a result Renewable Energy Sources (RES) are expected to account for about 80 % in the power and heat sector by 2020 (Fig. 1).

Biomass district heating for Copenhagen and other cities

Denmark's ten major cities have city-wide district heating schemes where most of the heat (95 % to 98 %) used to be produced in large coal- or gas-fired CHP plants and waste incineration CHP plants. Most of these plants are currently changing production from fossil fuels to sustainable bio-



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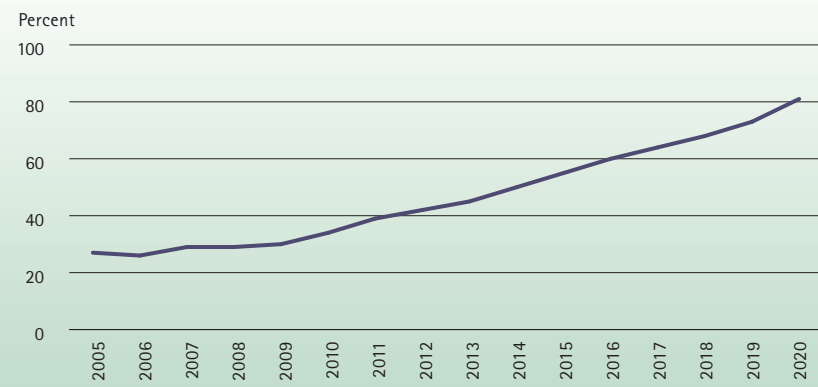
Port of Copenhagen – the Danish capital has set a goal for 100 % renewable energy by 2025, hereby biomass district heating plays an important role.

mass. Copenhagen is one of these cities and the change to biomass is the most important initiative in reaching the goal of being independent from fossil fuels in 2025.

One of the main reasons for this development is that the Energy Agreement made it more attractive to convert from coal to biomass at large-scale CHP plants.

This was made possible by allowing producers and consumers to make price agreements. In this way the tax benefit of biomass could be split – and local consumer's demand for green and climate friendly heat could be satisfied. In addition subsidy schemes have also supported the development of the transition.

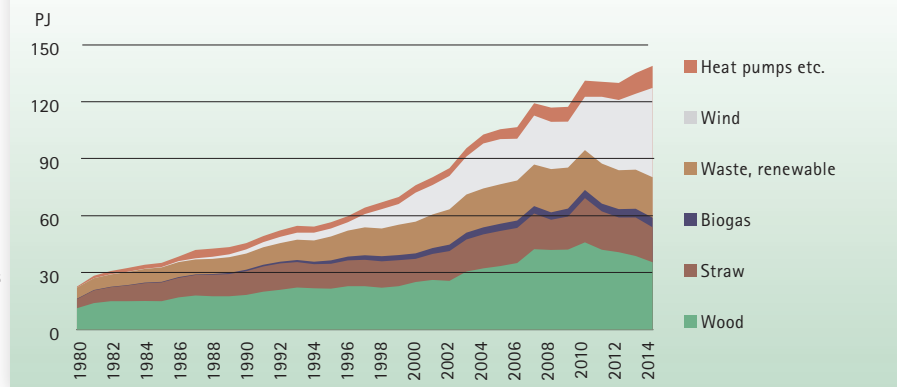
Share of Renewable Energy Sources in the Danish power and heat sector



Source: Danish Energy Association

Fig. 1: The Renewable Energy Sources are expected to account for about 80 % in the Danish power and heat sector by the year 2020.

Production of renewable energies in Denmark by type 1980 to 2014



Source: Danish Energy Association

Fig. 2: The production of renewable energies, especially biomass and wind power, has experienced a steep rise in Denmark during the last 35 years.



© Danish Energy Association

The conclusion of the Danish Industry Agreement to document sustainability was well received by the industry.

In 2014 approximately 26 % of final energy consumption came from renewable energy sources whereof bioenergy is the most important source.

The consumption of solid biomass for electricity and district heating is expected to rise from less than 58 Petajoule in 2014 to 113 Petajoule in 2025. All in all Denmark expects an increase in the consumption of solid biomass of 50 % over the period from 2012 to 2025. This is accompanied by an expected decline in the consumption of coal and gas for CHP plants

Imports of pellets and wood chips

Denmark will import most of the solid biomass used for CHP production. Today 95 % of the wood-pellets and 33 % of the wood-chips are imported. With the expected increase in solid biomass the political parties behind the Energy Agreement requested more information on the use of bioenergy in Denmark.

The government therefore carried out a comprehensive analysis of the use of biomass. The analysis concluded that the move by combined heat and power (CHP) plants to wood pellets and wood chips is good for the

climate, when using sustainable biomass. Furthermore the analysis concluded that Denmark will be able to source wood pellets and wood chips sustainably in the short and medium term. But the analysis also pointed to an increasing risk in the longer term perspective / after 2020. Expecting that global and regional demands for wood will rise in the long term, this could pose a threat to the sustainability regarding Danish biomass use. Given the limited, short-term supply of wood from thinning and residual wood products, customers may be „pushed“ in the direction of buying wood products that are not sustainably produced.

Voluntary industry agreement instead of regulations

As a result, the former energy minister requested the industry to enter into a voluntary agreement to purchase only sustainably produced biomass. The alternative being that the government would move to ensure sustainability through regulation. To the members of the District Heating Association and the Danish Energy Association the issue of sustainability was not a new thing. Members have strived to source biomass sustainably for years.

However, there was a general understanding of the need to document sustainability. Thus the industry accepted the challenge from the former Minister. In December 2014 the Danish Energy Association and the Danish District Heating Association made their agreement regarding sustainable biomass public. The agreement was well received across policy makers, NGOs and industry.

An industry agreement is not the most common approach but very much in line with Danish traditions. The Netherlands, the United Kingdom and Belgium have opted for regulations to document the sustainable use of biomass. However, the voluntary agreement will provide the same guarantee of securing sustainable biomass as regulation, but in a flexible and less bureaucratic manner. The agreement is based on existing regulation and guidelines on sustainable forests management. The agreement reflects

- 1) the contents of the Danish Ministry of Environment's guidelines on securing sustainable timber in public procurements of goods and services and
- 2) Forest Europe's criteria for sustainable forest management.

Share of renewable energy in total energy consumption in Denmark

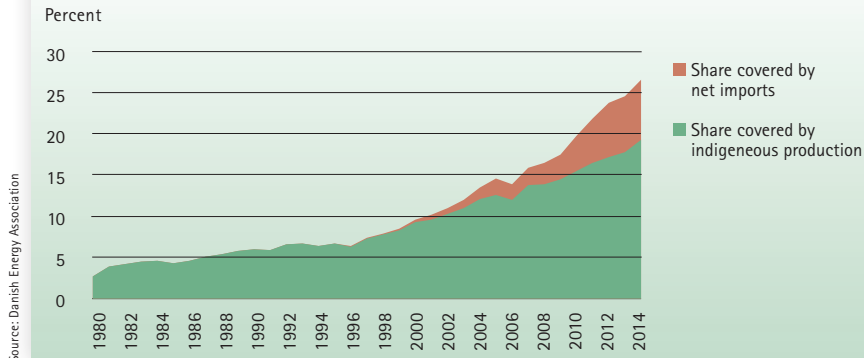


Fig. 3: The consumption of renewable energy has risen to a share of around 26 % in the last years.

Danish imports of pellets by country of origin

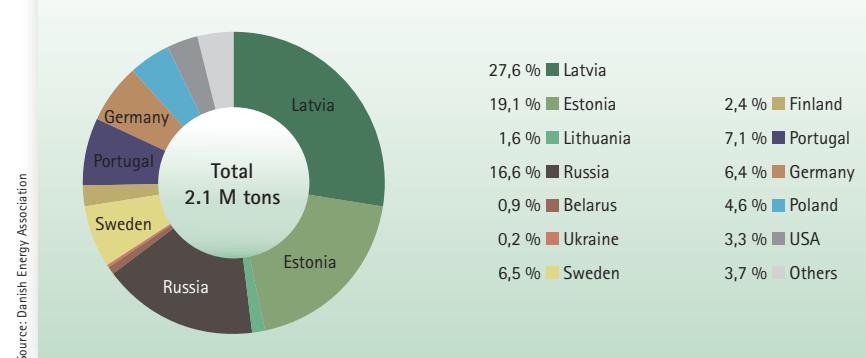


Fig. 4: Most of the pellet imports to Denmark are delivered by countries from Eastern Europe.



As ambitious as most stringent legislations

The agreement is as ambitious as the most stringent legislation in place. It matches the UK regulation, both regarding the elements included and the level of ambition. Furthermore a voluntary agreement can be implemented without a large administrative set-up. If European regulation on biomass sustainability becomes a reality, the agreement will be easily replaced by it. The agreement is based on the experience of the industry and has been made with input, help and support of its members.

Eight criteria for sustainable biomass

The agreement basically consist of eight criteria that all solid biomass used by the CHP plants must meet (Tab.1). The first six criteria concern the management of sustainable forestry and correspond to a great extent with Forest Europe's criteria for sustainable forest management. The seventh criterion focuses on the reduction of CO₂ (based on the whole value chain). The eighth and last criterion deals with indirect effects such as carbon debt and cascading. The first seven criteria are binding whereas the eighth is a recommendation.

The CHP plants are responsible for complying with the agreement and for documenting compliance through an annual report. Three certification schemes can be

used to show compliance. The three systems are SBP (Sustainable Biomass Partnership), FSC and PEFC.

Certification systems with third party verification

The report must be either developed or verified by an independent third party that is either accredited to undertake FSC or PEFC forest certification, SBP certification or by an organization that is EU-approved as an EUTR monitoring organization. After publication the reports will be available on the two associations' websites.

The Danish Industry Agreement ensures the sustainable use of solid biomass in CHP plants (wood pellets and wood chips) in Denmark. The same can be said for regulation in Holland, the UK and Belgium.

The problem is that the sustainable use of biomass is close to but not exactly the same in the four countries. And some countries have no schemes at all to ensure sustainability. This leads to uncertainties in the market, lack of transparency and an uneven playing field. Denmark therefore urges the EU to work for binding European sustainability criteria for the use of solid biomass. ■

Kristine van het Erve Grunnet
Senior Advisor,
Dansk Energi/Danish Energy Association,
keg@danskenergi.dk

Tab. 1: The criteria of the Danish Industry Agreement

1. Legality	Legality of forest management and utilisation is safeguarded.
2. Ecosystems	Protection of forest ecosystems
3. Carbon cycle	Forests productivity and ability to contribute to the global carbon circle must be maintained.
4. Condition of forests	The forests must be healthy and well-functioning.
5. Biodiversity	Protection of biodiversity, sensitive areas and areas worthy of preservation
6. Rights	Social and work-related rights must be respected.
7. CO ₂ -Limits	CO ₂ -emissions from the biomass value chain
8. Carbon cycle	Forest carbon stock, iluc, iwuc

Source: Dansk Energi, Dansk Fjernvarme

