

Increased application of green biomass entails potential as well as challenges

September 30 2015, by Nina Hermansen

Politically, it has been decided that Denmark should be a growth centre for bio-economy. Thus, the National Bioeconomy Panel was appointed, the primary task of which is to indicate actual initiatives to encourage a sustainable, bio-based production in which resources and products are better utilized to the benefit of the environment, the climate, growth and employment. The panel recently published a series of recommendations as to how the government may encourage the utilization of green biomass.

To ensure the scientific foundation for panel discussions the Danish AgriFish Agency asked DCA - Danish Centre for Food and Agriculture to produce a memorandum presenting the essential potential and challenges encountered in connection with an increased application of green biomass in Denmark. The memorandum has been prepared in cooperation between scientists from DCE - Danish Centre for Environment and Energy, IFRO at University of Copenhagen and DCA - Danish Centre for Food and Agriculture.

Green biomass with great potential

In the memorandum the scientists summarize the production potential of green biomass. Cultivation of crops with a higher utilization of sunlight - such as e.g. grass - allows for a doubling of biomass yield per area unit when compared to cultivation of cereals.

Next, the scientists consider the possibilities of biorefinery. Denmark imports significant amounts of high-protein feed, primarily from South America, to meet the need for protein in animal production. It would be preferable if this import is replaced by protein produced in Denmark, e.g. with due consideration to both climate and environment.

Protein extracted from green biomass might be such a replacement. The examples used in the report show that it is actually possible to produce protein from green biomass of the same quality as that of soybean and to maintain the present amount of cattle feed at the same time.

In addition, the scientists will examine the production potential of high-value products as well as the environmental and employment impact in relation to increased [biomass production](#).

Price, technology and regulations

Storage and logistics, [business economics](#) and regulation barriers are among the challenges examined by the scientists. The first challenge is to extract - from the green biomass - protein of a sufficiently high quality and at a price that is competitive when compared to soya [protein](#). Next, the residual product must be converted into a product in demand.

Finally, we face a number of challenges in relation to harvest, transport, storage and processing of the green biomasses.

In the memorandum the scientists state the following:

"Protein production for feed is potentially a huge market, but also a very price-sensitive market. Thus, competitive technology will be a prerequisite for realizing the potential of green biomass in feed production."

In addition, calculations show that significant geographical differences exist as to the business economics as well as the environmental potential when converting from cereals to grass. Scientists point out that the existing regulation of nitrogen consumption is no incentive for the farmer to convert to crops with lower nitrogen leaching.

"Facing the challenges in relation to the water environment and climate goals it is of significant importance that initiatives within the bioeconomy area are merged with other politics affecting the agricultural use of land", the scientists state, and they continue:

"The analyses referred to in the memorandum indicate that major environmental goals may be achieved by an optimized cultivation of green biomass. However, the same analyses also indicate that it is of major importance to choose the proper cultivation system in order to achieve the desired effects and that there is a significant geographical variation as to environmental impact. Thus, it is very important to consider these conditions when contemplating new regulation initiatives within the area."

Provided by Aarhus University

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