

## PA #13 The Danish Bioeconomy and supporting knowledge on the transition to a local circular bioeconomy

The Danish Bioeconomy sector encompasses the food and agriculture sector, forestry, water, bioenergy, and biomaterials sector employing 166,300 people and an added value of €17.4 billion. The main bioeconomy sector in Denmark in terms of added value is the arena bio-based chemicals, pharmaceuticals, plastic, and rubber (excl. biofuels), - a total added value of €6.1 billion. In terms of employment, the agriculture and food sector accounting for the majority, around 72% of the people employed within bioeconomy, thus agriculture employing 60 thousand and food industry employing 59 thousand people. The bio-based chemicals, pharmaceuticals etc. accounting for 12% of the employed people corresponding to employing 20 thousand people<sup>1</sup>.

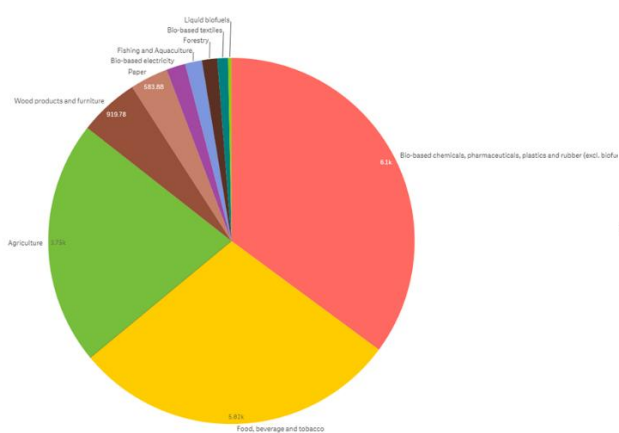


Figure 1: Employment by Sector | Denmark

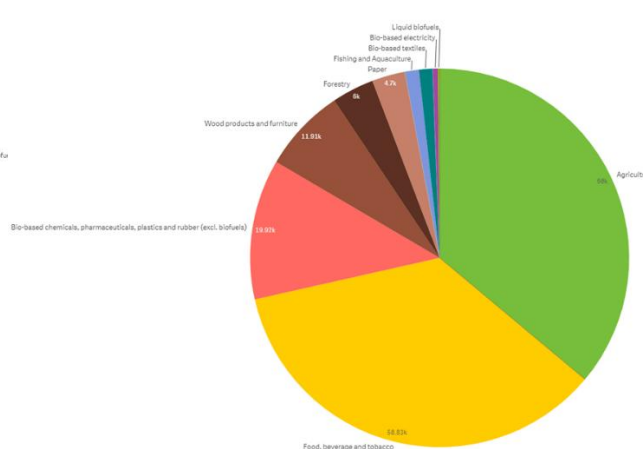


Figure 2: Value Added by Sector | Denmark

Source: JRC Joint Research Centre Data Catalogue (<https://datam.jrc.ec.europa.eu/datam/mashup/BIOECONOMICS/index.html>)

The Danish bioeconomy is still largely dependent on linear production systems though increasing focus and efforts are being made towards circular sustainable production systems and transitions towards low-carbon economy. For the agriculture and food sectors, it has, among other things, meant that there is a focus on reducing the import of feed and ingredients produced under environmentally harmful conditions abroad, and instead increasing the production of local alternative feed and goods that can replace the unwanted import.

<sup>1</sup> JRC Joint Research Centre Data Catalogue (<https://datam.jrc.ec.europa.eu/datam/mashup/BIOECONOMICS/index.html>)



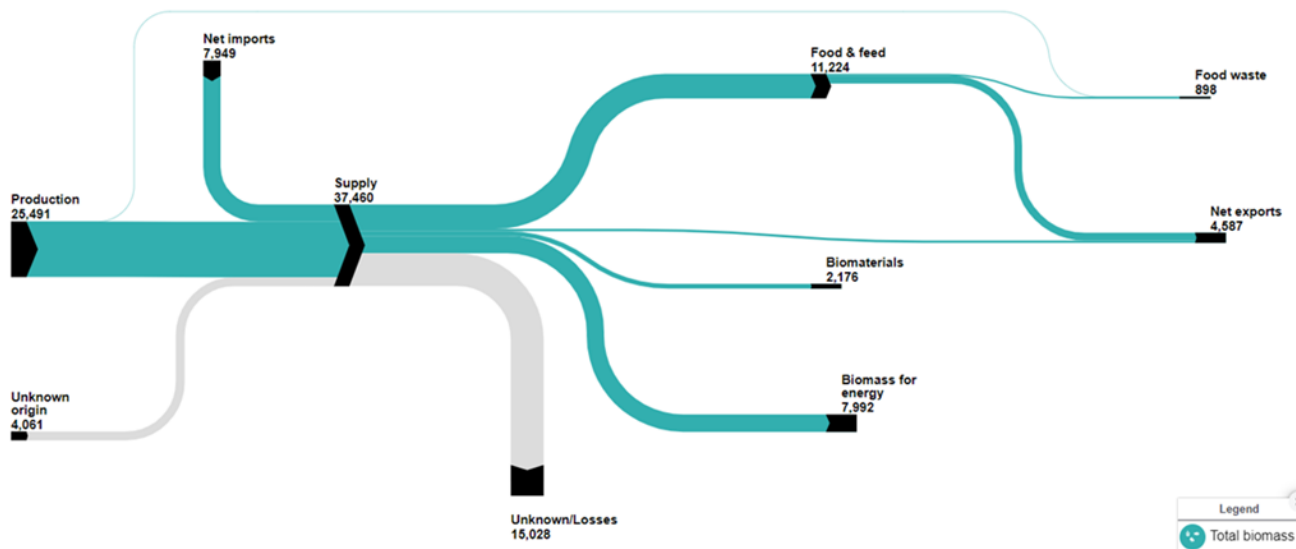


Figure 3: Biomass Flows | Denmark (Latest available data)

Source: [https://datam.jrc.ec.europa.eu/datam/mashup/BIOMASS\\_FLOWS/](https://datam.jrc.ec.europa.eu/datam/mashup/BIOMASS_FLOWS/). Data from the BIOMASS project, European Commission – Joint Research Centre. The data point "Latest available data" corresponds to the latest data available from each sector: 2020 for agriculture, 2016 for fisheries and aquaculture and 2017 for forestry

Historically, Denmark have had a very large agricultural production and a significant export of food and agricultural goods. In recent years, the pharmaceutical sector has grown significant and become a large and very important part of the Danish economy.

Examples of bio-based solutions from Denmark:

- [CBIO Aarhus University Centre for Circular Bioeconomy](#): Centre for Circular Bioeconomy (CBIO) researches and develops bioeconomic production systems and concepts for recycling, bio refining methods, production and management of agricultural biomasses etc.
- [Green protein to replace soy in feed](#): Full-scale biorefining plant on the Danish farm Ausumgaard produces green protein, which is used to replace soy in feed for monogastric animals such as pigs and poultry. Green protein is a protein extracted from clover grass by biorefining with the aim of using it as a feed ingredient.
- [Danish Marine Protein](#): Produce local and sustainable high-quality proteins for Danish agriculture in the form of starfish protein powder, which is extracted from starfish from the Danish Limfjord.
- [EcoCocon straw panels](#): The EcoCocon innovative wall system is made of straw panels that are made of 98% natural and renewable material. The system ensures healthy, comfortable, and energy-efficient living at the same time.
- [Sound barriers made from sustainable wood](#): The noise screen is produced from Willow. The natural screens have a 67% lower climate footprint than conventional noise screens and they require minimal or no maintenance. The screen's frames are constructed on the basis of steel and acacia in a sandwich construction.
- [Willow compost](#): Organic growth medium from willow chips mixed with clover grass and herbs. The compost can be used in the garden, outdoors, in growing beds, in greenhouses and in pots.



For more information, please consult the [BioRural toolkit](#).



*Figure 4: Fields in Horsens, Denmark.*

*Source: Photo by Igor Meghega (<https://www.pexels.com/photo/a-lutheran-church-in-the-middle-of-a-green-field-in-denmark-14547045/>)*



Funded by  
the European Union

© BioRural Consortium, 2022

