

Final report

1.1 Project details

Project title	Deltagelse i IEA Bioenergy Task 39 og 42 2016-2018
Project identification (program abbrev. and file)	64015-0610
Name of the programme which has funded the project	EUDPII-2015
Project managing company/institution (name and address)	Københavns Universitet – Institut for Geovidenskab og Naturressourceforvaltning Rolighedsvej 23, 1871 Frederiksberg
Project partners	Københavns Universitet, Institut for Geovidenskab og Naturressourceforvaltning Københavns Universitet, Institut for Plante- og Miljøvidenskab Danmarks Tekniske Universitet, DTU-Biosustain,
CVR (central business register)	29 97 98 12
Date for submission	9-4-2019

1.2 Short description of project objective and results

The project is the ongoing Danish participation in the two networks IEA Bioenergy Task 39 "Commercialization of Conventional and Advanced Liquid Biofuels from Biomass" and Task 42 "Biorefining in a Circular Economy" and covers the period 2016-2018. The objective of both networks is to provide an international platform for collaboration and information exchange between industry, SMEs, GOs, NGOs, RTOs and universities concerning biofuel/biorefinery research, development, demonstration and policy analysis. The aim of the EUDP project was to ensure representation of Danish stakeholders and Danish efforts. Both networks have during the period released a number of strategic reports and analyses with Danish input. Particularly Denmark has contributed with the Task 39 report "Biofuels for the marine shipping sector", which has received much attention.

Projektet vedrører den en løbende dansk deltagelse i de to netværk IEA Bioenergy Task 39 "Commercialization of Conventional and Advanced Liquid Biofuels from Biomass" og Task 42 "Biorefining in a Circular Economy" og dækker perioden 2016-2018. Hensigten med begge netværk er at danne en international platform for samarbejde og informationsudveksling mellem industri, SMV, GO'er, NGO'er, RTO'er og universiteter vedrørende forskning inden for bioraffinaderi, udvikling, demonstration og politikanalyse. Formålet med EUDP-projektet har været at sikre repræsentation af danske interessenter og den danske indsats. Begge netværk har i løbet af perioden produceret en række strategiske rapporter og analyser med dansk in-

put. Specielt har Danmark bidraget med rapporten "Biofuels for the marine shipping sector", som har modtaget stor opmærksomhed efter udgivelse.

1.3 Executive summary

The project supports the Danish participation in the two networks IEA Bioenergy Task 39 "Commercialization of Conventional and Advanced Liquid Biofuels from Biomass" and Task 42 "Biorefining in a Circular Economy" and covers the period 2016-2018. From Denmark, the National Task Leaders have been Prof. Claus Felby (Task 39) and Associate Professor Henning Jørgensen (Task 42) from University of Copenhagen and from 2018 also Group Leader Solange I. Mussatto (Task 42) from Biosustain-DTU.

Task 39 is a network of 15 participating countries. The purpose of Task 39 is to provide participants and actors and public authorities in their countries with information that will support the development and use of biofuels in the transport sector. The tasks of the participants in Task 39 are to provide information and analyzes of political, market and implementation aspects that will help promote the commercialization of 1st and 2nd generation biofuels. In addition, work must help stimulate continued research and development work towards a cost-effective production of second generation biofuels, including bioethanol.

There are nine participating countries in Task 42. The purpose of Task 42 is to contribute to the development and implementation of sustainable biorefineries. This will be achieved by uncovering global status and potential in biorefineries and gathering information on new technologies for sustainable, integrated, energy and cost-effective production of heat, biofuels for the transport sector, bio-based products (chemicals and materials), and feed and Food acids. This information will provide the basis for national and international authorities to define strategies and policy guidelines for promoting the use of biomass for bioenergy. At the same time, industrial players will be able to utilize the information to target their R&D and provide guidelines for the most promising and sustainable value chains within the use of biomass.

Within the period 2016-2018, the Danish activities represented by the NTLs have involved:

- Participation in project meetings and events (workshops/conferences) organized by or co-organized with Task 39 and Task 42
- Preparation of status reports regarding Danish politics, legislation and RD&D activities within the area of Task 39 and Task 42
- Contributed to reports and newsletters prepared by Task 39 and Task 42
- Knowledge dissemination to Danish stakeholders, e.g. by newsletters, and collection of information from Danish stakeholders (universities, industries, partnerships, NGOs and GOs)

Particularly, Denmark has been lead on the Task 39 report "*Biofuels for the marine shipping sector*", which was published in 2017. This report has received large international interest and resulted in many contacts. The report has in addition been presented on a number of international conferences.

Other major reports published (or close to publishing) where Danish NTLs have contributed are:

- Natural Fibers and Fiber-based Materials in Biorefineries (Task 42 – 2018)

- Bioeconomy and biorefining strategies in the EU Member States and beyond (Task 42 – 2018)
- Standards and Labels related to Biobased Products (Task 42 – 2018)
- Implementation Agendas - 2018 Update: A review of key biofuel producing countries (Task 39 - 2019)
- Bio-based Chemicals report (Task 42 – 2019)

In view of the Danish activities within the area of biorefining, the participation in the two networks under IEA Bioenergy is important to strengthen the dissemination of knowledge between Denmark and Danish stakeholders and international stakeholders. Within the project period, Denmark has positioned itself strongly within the area as exemplified by R&D activities, industrial innovation as well as political-ly/strategically by the reappointment of the Bioeconomy Panel and the Advisory Board for Circular Economy. Based on this, it is clear that in coming years, there will be strong focus on biofuels and biorefinery activities. The Danish involvement in Task 39 and Task 42 will continue in the next three-years period from 2019-2021.

1.4 Project objectives

The objective of both Task 39 and Task 42 is to provide participants, actors and public authorities in their countries with information that will support the development and implementation of sustainable biorefineries. This will be achieved by gathering, analysis and dissemination of information on political, market and implementation aspects as well as technologies for sustainable, integrated, energy and cost-effective production of heat, biofuels for the transport sector, bio-based products (chemicals and materials), and feed and Food acids.

Both tasks include continuous collection of data within the area in close cooperation with NTLs and stakeholders in the participating countries. Close contact between NTLs and stakeholders covering SMEs, large companies, authorities, interest organizations and universities is therefore central.

From the Danish side, the project was divided into two work packages (WP). WP1 dealt with activities in Task 39 and WP2 dealt with activities in Task 42. The National Task Leaders was Prof. Claus Felby (Task 39) and Associate Professor Henning Jørgensen (Task 42) from University of Copenhagen and from 2018 also Group Leader Solange I. Mussatto (Task 42) from Biosustain-DTU.

The project has been running very much as anticipated. Most of the deliverables are directed by the work programs of the Tasks. In that respect Denmark has contributed as planned in the original work programs. Danish NTLs have contributed actively at meetings and with input to reports. There has been active outreach to Danish stakeholders from industry, universities, authorities and Danish partnership initiatives within the area.

As the project involves both Task 39 and Task 42, the activities have been distributed between the NTLs. Claus Felby has been main Danish NTL for Task 39 and Henning Jørgensen for Task 42. During the period, Henning Jørgensen has also represented Claus Felby at some Task 39 meetings. In 2018, Solange I. Mussatto joined the project, although with no official part of the project budget. For the final IEA Bioenergy end-of-triennium meeting, the project covered travelling expenses for Solange.

1.5 Project results and dissemination of results

The major outputs of the project and Task 39 and Task 42 are knowledge sharing and dissemination activities. During the project, the Danish NTLs have:

- Attended bi-annual Task-meetings, often co-organised with workshops/conferences (Task 39 and 42)
- Attended bi-annual progress meetings by Skype (Task 42)
- Attended conferences within the area presenting work from the Tasks/updates from Denmark (Task 39 and Task 42)
- Country reports (Task 39 and 42)
- Input for newsletters (2-3 per year) including distribution to Danish stakeholders (Task 39 and 42)
- Input for update of Task 39's demonstration database
- Contributed to reports (see list below)
- Been in active correspondence with Danish stakeholders

In the periode the following reports have been prepared by Task 39 and Task 42.

Reports Task 39:

- [Task 39, CTBE biofuels LCA comparison Final Report \(Phase 2 Part 1\)- February 2019](#)
- [Survey on Advanced Fuels for Advanced Engines- November 2018](#)
- [Biofuels in Marine Shipping \(2017\)](#) – Danish lead report
- [Bioenergy role in balancing the electricity grid and providing storage options \(A report by Task 41\)](#)
- [State of Technology Review – Algae \(2017\)](#) (A summary published in Algal Research can be accessed [here](#))
- [The Potential of biofuels in China \(2016\)](#)
- Drop-in Biofuels (2019)
- Implementation Agendas - 2018 Update: A review of key biofuel producing countries (2019)

Reports Task 42:

- [Leaflet: IEA Bioenergy Task42 Biorefining in a Future BioEconomy](#)
- [Proteins for Food, Feed and Biobased Applications: Biorefining of protein containing biomass](#) (2016)
- [Joint survey on bioeconomy policy developments in different countries.](#) (2018)
- [Standards and Labels related to Biobased Products](#) (2018)
- [Bioeconomy and biorefining strategies in the EU Member States and beyond](#) (2018)
- [Natural Fibers and Fiber-based Materials in Biorefineries Status Report 2018](#) (2018)

1.6 Utilization of project results

The project do not directly engage in activities leading to commercialization of technologies. However, the project aims at provide information and analyzes of technology, political, market and implementation aspects that will help promote the commercialization of technologies for biofuels and biorefining. From a Danish per-

spective, an important motivation for the project is to promote Danish technology and Danish stakeholders within the area. In addition, the reports prepared by the IEA Bioenergy Tasks have high credibility and are important documents supporting political and strategic decisions within industries and for authorities.

1.7 Project conclusion and perspective

The EUDP project sustains the continued participation in the two IEA Bioenergy Tasks 39 and 42, which Denmark has been member of for many years. This participation is of great value for the biorefining and bioeconomy activities in Denmark. The project serves as a platform for dissemination of knowledge between Denmark and Danish stakeholders and international stakeholders. It is an important tool to create awareness of Danish activities to a large audience. In addition, the Tasks prepare important background documents of value for Danish stakeholders. Equally important is that the participation in Task 39 and Task 42 ensures that Danish knowhow, competences and positions are communicated in these documents/reports.

Within the project period, Denmark has positioned itself strongly within the area as exemplified by many important R&D activities and industrial innovation. From a political and strategic perspective, the work of the Advisory Board for Circular Economy and the reappointed Bioeconomy Panel shows that Denmark has large potential within biorefining and circular bioeconomy. Denmark can be provider of key technologies but there is also several opportunities to build biorefineries in Denmark. The Danish involvement in Task 39 and Task 42 will continue in the next three-years period from 2019-2021.