CBIO ADVISORY BOARD MEETING JULY 2020

AARHUS UNIVERSITY CENTRE FOR CIRCULAR BIOECONOMY

AARHUS UNIVERSITY

25 JUNE 2019

CBIO
AARHUS UNIVERSITETS CENTER FOR CIRKULÆR BIOØKONOMI

Agenda CBIO AB meeting

I. Welcome (9.30)

II. Agenda approval and approval of notes from last CBIO Advisory Board meeting – Annex 1 (9.40-9.50)

III. Short update on CBIO Activities – Annex 2 (9.50-10.20)

IV. Centre achievements within 3 main areas (Green biorefinery, Blue biomass, Circular bioeconomy sustainability evaluation) (10.20-11.10)

V. Evaluation of CBIO strategy – Annex 3 (11.10 -11.30)

VI. How can CBIO collaborate more nationally and internationally at an institutional level? (11.30-11.50)

VII. Any other business (11.50-11.55)

VIII. Next meeting - time, focus and site (11.55-12.00)

IX. End of meeting (12.00)

ADVISORY BOARD RECOMMENDATIONS

- The strategic CBIO focus on green and blue biomass for biorefining works well √
- However, biogas should not be underestimated! There is still a lot to do – to create value for the farmers √
- Indicate economic and environmental numbers of what you do in CBIO on the web-page
- Let the strategy drive the applications! Not the other way around (√)
- CBIO need better PR and communication! Communicate the vision on how agriculture should look in 20 years
- CBIO should work on getting onto the EU agenda - The food industry is missing in BBI √

III: SHORT UPDATE ON CBIO ACTIVITIES – ANNEX 2

Circular Bioeconomy Research at Aarhus University

Join CBIO Webinar 1st July 2020, 9-12
– open to all

Aarhus University Centre for Circular Bioeconomy, CBIO, was established in 2017 to support the transition from the fossil-based economy to a circular and biobased economy.

With eight research platforms, it embraces most areas of the bioeconomy, and a suite of projects supporting the green transition is now running under CBIO.

Aarhus University would like to invite all with an interest in further developing the bioeconomy to this interesting webinar, where PhD students and Postdocs from Aarhus University will give short pitch presentations on their work in areas such as:

- Biorefining green biomass for feed and food
- Value added products from side streams
- Cropping systems and management
- Seaweed in the circular bioeconomy

Centre director Uffe Jørgensen will open the webinar with a presentation of CBIO, and Claus Felby from Novo Nordisk Foundation will conclude the webinar with his presentation: "Beyond 70% GHG reduction - what should be the research & development priorities?"

After each presentation, it will be possible to ask questions.

The webinar is free of charge, but we need your registration at: **https://events.au.dk/cbiowebinar**

A few days before the webinar, you will receive an e-mail with a link to the meeting platform.

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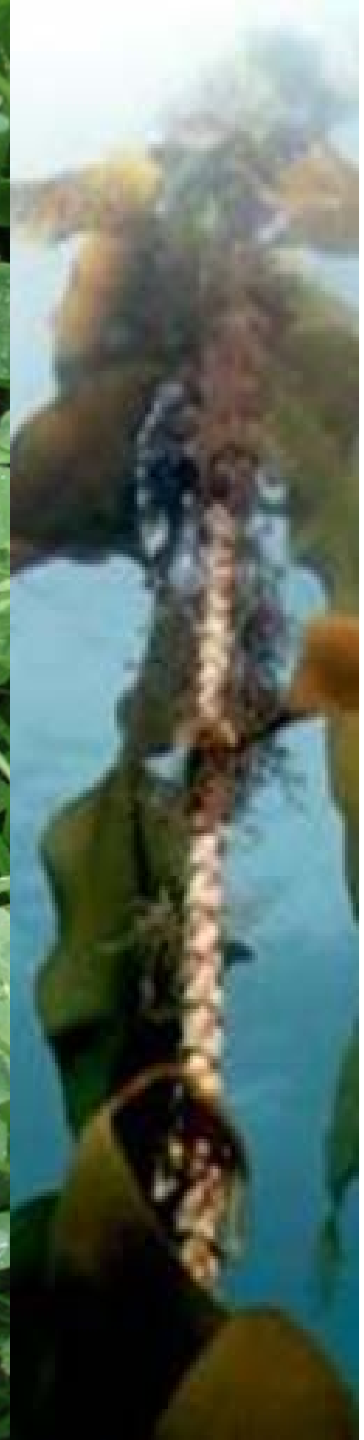


CBIO VISION

CBIO's Vision is to provide excellent interdisciplinary research on circular bioeconomy, and sustainable solutions to our grand challenges regarding food, materials, energy, climate and the environment.

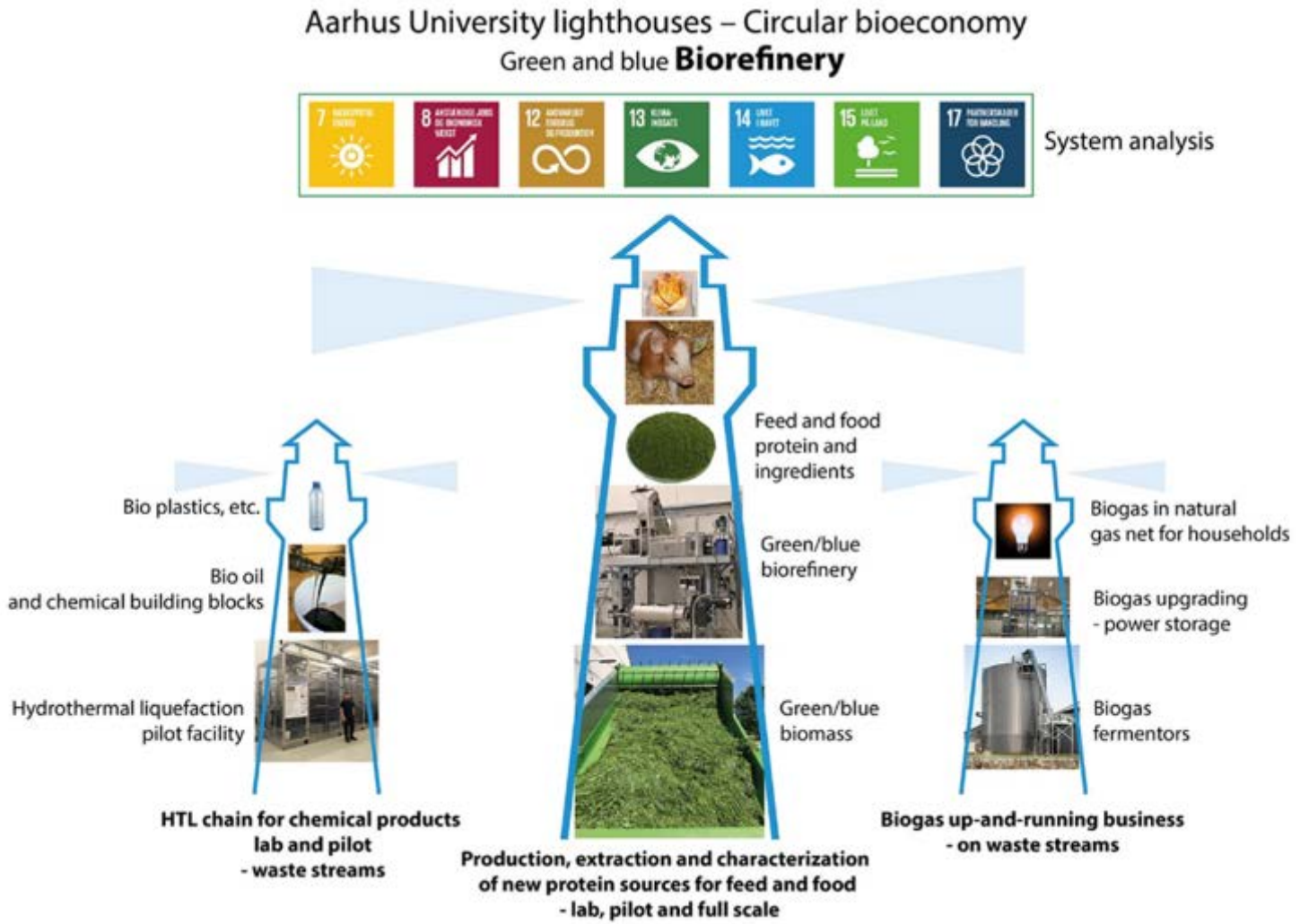
OUR OBJECTIVES ARE TO

- Build on current AU positions of strengths in order to **bring the most promising research into sustainable solutions**:
  - ➢Production, extraction and characterization of **new protein sources** from green and blue biomass for feed and food – lab, pilot and full scale
  - ➢**HTL chain** – lab and pilot scale
  - ➢**Biogas chain** – pilot and full scale
- Support inter-disciplinary inspiration and **collaboration within AU**
- Become a **hub for circular bioeconomy research** and outreach
- Increase **cooperation with industry and society**
- Attract **more external R&D funding**.

OUR STRATEGY IS TO

- **Deploy our analytical competencies** along the whole product circle from field or sea via conversion to final products and their recycling
- **Strategically develop our current lighthouses** towards funding bodies, industries, key academic partners and the political level
- **Employ the best talent** within prioritized areas (Professors, Tenure Tracks, PhDs)
- Develop **further R&D initiatives** (cooperation – funding application)
- **Increase outreach** internally and externally (centre webpage, seminars, key lectures, key papers, guests, student challenges).

CBIO LIGHTHOUSES ARE THE FOCUS FOR OWN RESOURCES



SHORT UPDATE ON ACTIVITIES

January 2019 status since last ST centre coordination meeting September 2019

General activities

- Oct19: Denmark/CBIO participated with one team at the European final of the "Biobased Innovation Student Challenge". In 2020 we will integrate the Challenge preparation in several courses with the aim of preparing more participants.
- Oct19: a CBIO team had an intensive "tour de offices" in Brussels arranged by the AU Brussel office. Very fruitful visits, which have created a number of spin-offs. One is a half-day seminar on green biorefinery at the EU Parliament on April 28th.
- CBIO participates in "Partnerskab for Bæredygtig Bioraffinering", which arranges regular meetings and position papers on bioeconomy.
- CBIO has a seat in the National Bioeconomy Panel, which gave recommendations for sustainable biopolymers in December: https://mfvm.dk/miljoe/det-nationale-biooekonomipanel/fremtidens-baeredygtige-byggeklodser/anbefalinger-fra-det-nationale-biooekonomipanel/
- An internal CBIO meeting including the Advisory Board is planned for early June.

Presentations and meetings (selection of most important)

- Sep19: the annual "Dansk Bioøkonomikonference" was arranged in Sakskøbing with several presentations from CBIO.

Applications and funding (of a certain size or importance)

- Dec19: three GUDP projects on "Grass Biochar", "Seaweed for Food" and "Green Protein" granted.
- Dec19: two Danida projects on biorefinery of seaweed and on the recycling of residues from cocoa production granted.

Employments

- A potential CBIO professor for employment at ENG was interviewed but did not have the necessary strength to enhance the biorefinery research. We approached the dean on employing a very strong young chemical engineering candidate in a tenure-track in-stead but did not succeed to have a go before the end of year.
- Two PhD's will be applied for in February.

CBIO HAS INCREASED FROM 76 TO 99 AFFILIATES IN 2019
5 JUNIOR VIP FROM THE CENTRE GRANT DURING 2019

	2017	2018	2019	2020	2021	2022
Professor	13	15	14			
Assoc. prof./Senior researcher	43	37	52			
Ten tr assist prof/ Ten tr researcher	4	6	4			
Total senior VIP's	**60**	**58**	**70**			
Postdocs	5	9	12			
PhD students	5	9	17			
Total junior VIP's	**10**	**18**	**29**			

EXTERNAL CBIO FUNDING (MDKK)

	2017	2018	2019	2020	2021	2022
Granted funding	9,73	30,34	38,09	0,35		
Granted overhead	2,21	5,06	8,11	0,00		
Total granted funding	**11,94**	**35,40**	**46,20**	**0,35**		
Applied funding	370,60	433,06	396,11	29,65		
Applied overhead	73,84	99,74	76,39	4,86		
Total applied funding	**444,44**	**532,80**	**472,50**	**34,51**		
% success		**2,7**	**6,6**	**9,8**		

CBIO PROJECT PORTFOLIO

Project start 2020

- Det cirkulære jordbrug: Systemanalyse af grøn biomasse til fødevarer, foder og energi (2020-2022)
- Climate-Smart Cocoa Agroforestry Research in Ghana (2020-2024)
- PALUDI-FIBER Bæredygtige fibre fra biomasse produceret på kulstofrige og våde jorde (2020-2021)
- FOODRUS - An Innovative Collaborative Circular Food System to Reduce Food Waste and Losses in the Agri-Food Chain
- SeaSusProtein - Bioraffineret tang – Bæredygtig proteinkilde til funktionelle fødevarer (2020-2023)

Project start 2019

- AlfaMaxBioraf - Maksimering af bioraffineret grøn protein udbytte fra lucerne (2019-2022)
- BioSubstrate - Biobaserede vækstsubstrater til planteproduktion (2019-2021)
- ClimateFeed (2019-2023)
- GoGrass - Grass-based circular business models for rural agri-food value chains (2019-2023)
- Green VALLeys - Gröna bioraffinaderier för hållbar produktion av bioenergi från jordbruket (2019-2021)
- GreenPork - Økologisk svinekød produceret med græs-protein (2019)
- Opskalering og validering af processer for separering af restsaft fra produktionen af græsprotein (2019)

Project start 2018

- ABBEE (2018-2021)
- FutureCow (2018-2021)
- Production of high quality fish feed from enchytraeid biomass (2018-2021)
- Økotang - Økologisk sukkertang - Industriel produktion af ny dansk bioressource (2018-2020)
- GrassBot2 (2018-2019)
- Græsprotein-fabrik-fase 1 (2018-2019)
- Fødevareingredienser fra grøn bioraffinering (2018-2019)

Project start 2017

- BIOCAS - Circular BIOmass CAScade to 100% (2017-2021)
- HyFlexFuel (2017-2021)
- NOWAGG - New Nordic Ways to Green Growth (2017-2021)
- CLARIUS Smart Agriculture and Bioresource Management (BSUIII KNUST) (2017-2020)
- CSR.Pork 4.0 - Dokumenteret bæredygtighed og ressourceoptimering i hele svinekødets værdikæde (2017-2020)
- GreenEgg - Greening of Organic Egg Production (2017-2020)

MANY VISITS & REQUESTS FOR CBIO PRESENTATIONS

	2017	2018	2019	2020	2021	2022
Electronic media	5	4	7			
Press	3	2	10			
Other	43	40	60			

INAUGURATION OF THE GREEN BIOREFINERY EXP. PLATFORM

WITH 2 SEATS IN THE NATIONAL BIOECONOMY PANEL WE HAD INFLUENCE ON THE BIOPOLYMER RECOMMENDATIONS

CBIO CO-ARRANGED THE 3RD ”DANSK BIOØKONOMIKONFERENCE”, SAKSKØBING, THE 9TH ”NORDIC SEAWEED CONFERENCE”, GRENÅ, AND A SESSION AT THE 10TH “GLOBAL ECOSYSTEM SERVICES PARTNERSHIP CONFERENCE” IN HANNOVER

BRUSSEL SEMINAR NOW POSTPONED TO NOVEMBER 17

INVITATION

Seminar and Exhibition
European Parliament

28 April 2020, 17.00 – 20.30

Green biorefinery – **a Green Deal for agriculture** – producing sustainable soy protein alternatives and biobased products

Europe is under a dual pressure for fulfilling environmental demands and maintaining a productive agricultural sector, which can meet future demands for genuinely sustainable food supply. Further challenges are the use of fossil fuels and fossil-based products, which pose a serious threat to the climate. Likewise, the comprehensive European import of soy protein have major environmentally and climatically consequences on vulnerable areas of the world. On this backdrop and in full alignment with a Green Deal for Europe, new, innovative solutions are needed.

Research in the production and quality assessment of protein extracted from grass and clover crops has shown a disruptive potential. These crops have very positive effects on the environment and climate and are at the same time highly productive. Further research and innovation will make it possible for Europe to produce its own sustainable protein and new biobased products.

Now, SME's as well as cooperatives and larger companies are showing their interest and have initiated the first businesses. These new solutions and businesses are in accordance with the European Green Deal and the EU Protein Strategy. Furthermore, they are well placed to contribute to the EU framework including the Common Agricultural Policy and Horizon Europe Programme.

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European Parliament

BIOBASED INNOVATION STUDENT CHALLENGE, EUROPE (WWW.BISC-E.EU)

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DEMO-PLANT FOR GREEN BIOREFINERY NOW WORKING –
WITH SUPPORT FROM NATIONAL AND EU FUNDING

New feed trial 2020

Svineafgiftsfonden

Grass protein for organic pork production
Grant: ICROFS (DK)
2017 - 2019

Animal feed

Green-Eggs
Greening of Organic Egg Production

Grass protein for organic egg production
Grant: GUDP (DK)
2017 - 2020

Alfa Max Bioraf

Optimizing protein yield and qu… from …
…22

Cellulose textile from non-wood biomass (fiber pulp)
Grant: INBIOM (DK)
2019

Fibre utilization

GRØNBIORAF
DEMONSTRATION SCALE TECHNOLOGY PLATFORM
RESEARCH AND DEVELOPMENT IN GREEN BIOREFINING

Demonstration sc… R&D pla…
Grant: …
…DK)

Process optimering og process modellering

Pyrolysis of fibres & biochar for feed/tech applications
Grant: GUDP (DK)
2020-2023

Græs Prof

Grass breeding, Harvest & transport, Maceration & juicing, Search for tannins
Grant: GUDP (DK)
2020-2024

Interreg
Öresund-Kattegat-Skagerrak
European Regional Development Fund
EUROPEAN UNION
Green Valleys

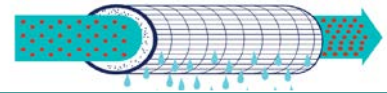
Development with SE and focus on energy utilization/production
Grant: Interreg (EU)
2018 - 2021

GO GRASS
Grass-based circular business models for rural agri-food value chains

Demo-case comparison of utilizing grass
Grant: H2020 (EU)
2020 - 2024

Brown juice utilization

Promilleafgiftsfonden for landbrug
Brown juice filtration



Concentrating brown juice with nanofiltration
Grant: PAF (DK)
2018 - 2021

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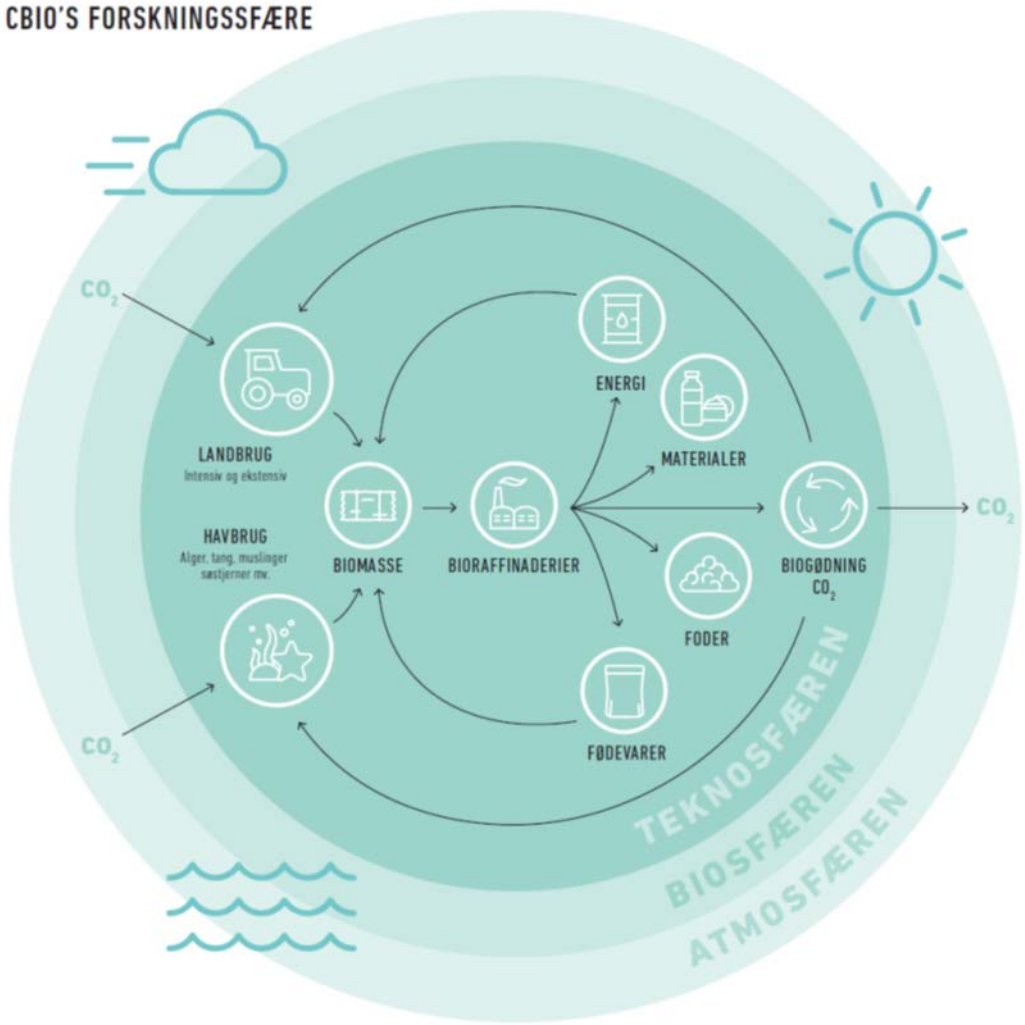
CBT
CENTER FOR BIOREFINING TECHNOLOGIES

2E. THE CURRENT PLANS FOR MAKING THE CENTER "SUSTAINABLE" AFTER 2022

- Circular Bioeconomy is in the centre of action on green transition – so there is reason to continue
- A longer-term CBIO Centre core funding needs to be constructed with a.e. a Centre secretariat
  - Present the current portfolio of research, public outreach, industrial cooperation etc. to some of the private foundations
  - Link up with similar Centres across the EU to create a pan-European Bioeconomy Centre-Network. However, is there funding for such a construction?

CBIO PROPOSAL FOR A 100 MIO DKK PROJECT

Centre for Green Biorefinery



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