Ministry of Food, Agriculture and Fisheries of Denmark
Danish Agricultural Agency

Green biorefining

from political ambition to implementation of new subsidies in Denmark

GO-GRASS International event
24. of May 2023

I will cover…

- The political landscape
- From ambition to reality
- The stepping stones
- Creating awareness

The political landscape

The video is to be found on
https://lbst.dk/tvaergaaende/groen-bioraffinering

With the cross party agricultural agreement of October 2021, Denmark has set aside 35 million Euro to support the expansion of green biorefining.

The vision is that in the future Denmark extracts protein from green biomass in such a large scale that Danish agriculture imports much less soy for feed protein, in order for the agriculture to become more self-sufficient in feed for mono-gastric animals.

In this way, we in Denmark contribute to improve the climate, because when we buy less soy, fewer trees are felled in the rainforests.

By expanding green biorefineries, we also create an increasing demand for fore example grass, which is good for the climate and the water environment.

Green biorefining can also help create jobs locally and promote product and technology development.

Green biorefining: From ambition to real life

Two new subsidies to expand green biorefining in Denmark

Feasibility Study of a Green Biorefinery

The two subsidies are independent from each other

Establishment of a Green Biorefinery

A brief status

Feasibility Study of a Green Biorefinery
The first application round closed 26. January 2023
12 applicants applied for between 50.000 and 120.000 Euro
In total 1,3 million Euro – twice as much as expected

Establishment of Green Biorefinery
The first application round opens 1. November 2023
The legal framework is in public hearing until 30. may 2023

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In brief
Feasibility Study on a Green Biorefinery

The subsidy scheme: Feasibility Study of a Green Biorefinery

Impact
Enable the different players to investigate and asses the potential for establishing a green biorefinery.

Regulatory basis
Measure programmed in the Rural Development Program (RDP, pillar II)
Co-operation Measure (Art. 35, M 16)

The project must be
A co-operation between at least to independent players (co-operations)
At least one farmer

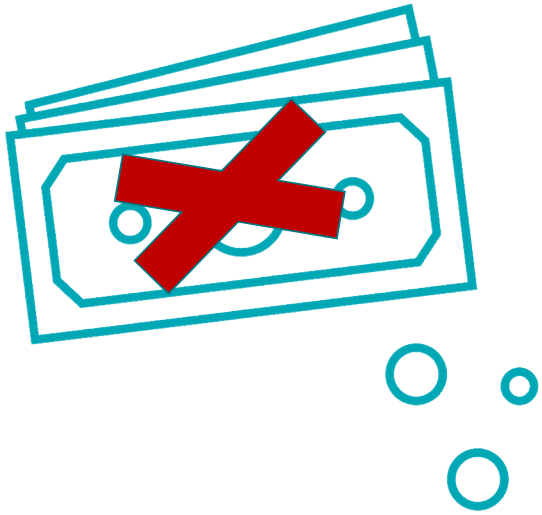
Financing
The eligible expenses are 100 pct. EU-funded
The current financial pool is 2 million Euro.

Yearly round of application
2022 - 2024

Eligible expenses

Activity	Hourly rate or maximum amount
Performed by the players in the project: Project management and technical calculations Practical and technical work Others	63 Euro 35 Euro 46 Euro (fixed hourly rate) In total max 100.700 Euro
Expenses related to external consultancy	160 Euro (max hourly rate)
Expenses related to rental of meeting space and such	In total max 3.360 Euro (max 3 activities)
Expenses related to rental and testing of process equipment incl. chemical analysis	In total max 20.140 Euro

Non- eligible expenses



Costs for:

- Lawyer
- Accountant
- Daily operation

Expenses for:

- Authority tasks, e.g. fees
- Travel, driving and accommodation
- Catering
- Single invoices for amounts below 130 Euro
- Activities from before application have been submitted

Expenses related to the establishment of the facility

Project content

- The players have 12 months to prepare a feasibility study

- The projects final conclusion:
  a) the project is viable, b) has the potential to be or c) isn't viable

The feasibility study - table of contents

- Conclusion
- Timeline for the establishment of the facility
- Ownership and location
- Supply of biomass
- Physical and technical constructions
- Production and operating conditions
- Marketing conditions
- Financing and business plan
- Need for permissions

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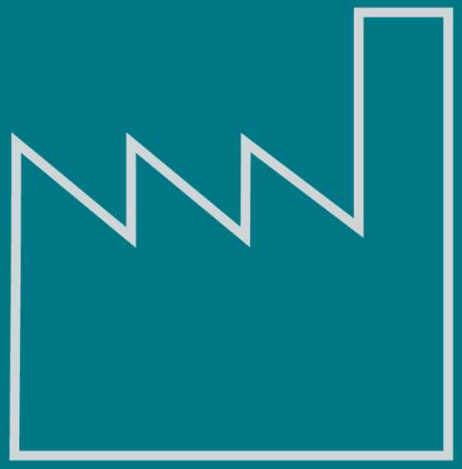


In brief
Establishment of a Green Biorefinery

The subsidy scheme: Establishment of a Green Biorefinery

Impact
To expand green biorefineries in DK so the Danish agriculture becomes more self-sufficient in protein feed, thus contributing to the green transformation

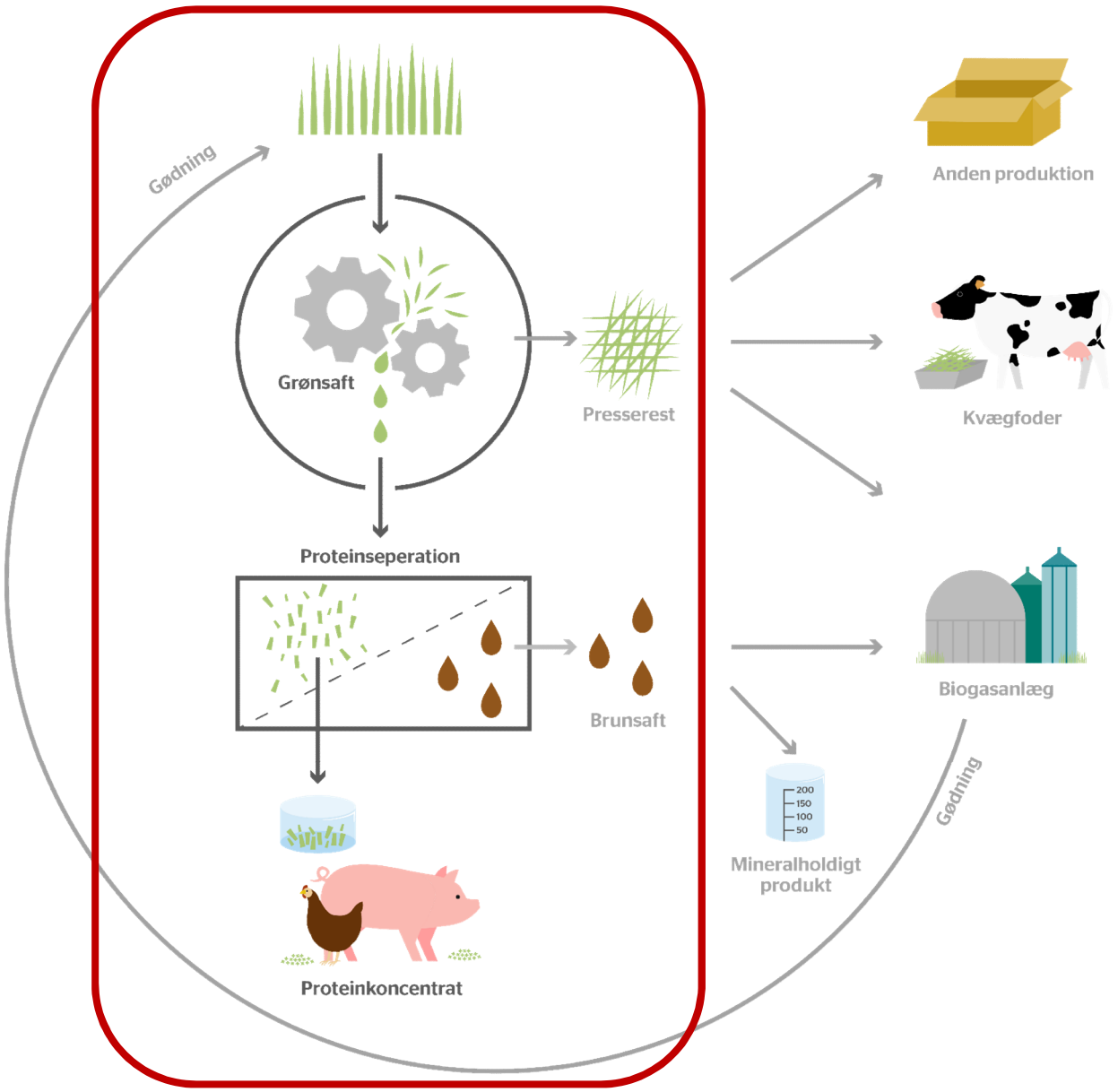
Regulatory basis
Intervention in CAP Strategic Plan (CSP, pillar II)
Investment (Art. 73)

The biorefinery must after the maximum of 24 months be able to
Refine grass, clover, alfalfa, etc. to protein concentrate for animal feed for monogastrics
The protein concentrate has to have minimum 35 pct. crude protein per dry matter content

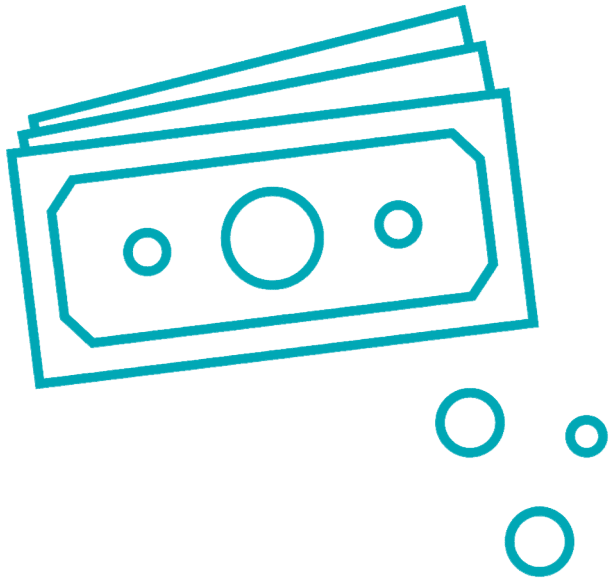
Financing
The eligible expenses are 65 pct. EU-funded
The current financial pool is 33 million Euro

Yearly round of application
2023 – 2025

The focus of the subsidy

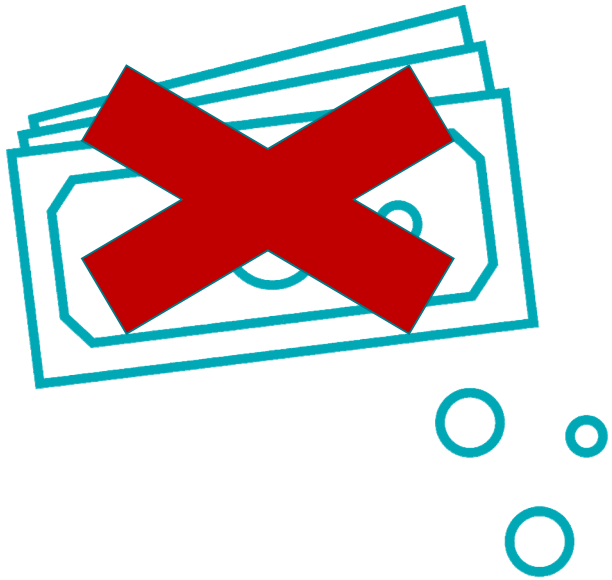


Eligible expenses



- Materials and equipment for setting up the biorefinery (including equipment for process monitoring, process control
- Equipment for the Establishment of electricity, water, heating and sewerage
- Material for establishing or renovating the building or half-roof where the facility is to be established
- Expenses for materials and equipment for storing biomass to be used at the facility, as well as storing products from main and side streams at the plant

Non – eligible expenses



- Assembly, installation, adaptation of material and equipment or other expenses related to handicraft ship when setting up the facilities to the biorefinery
- Renovation or expansion of existing facilities
- Subsequent operation of the biorefinery
- Facilities for packing and packaging products from the main stream and side streams
- Furnishing of the laboratory
- Used material and equipment
- Rental or lease of material and equipment
- Single invoices for amounts less than 670 Euro. Expenses incurred before the application is submitted

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Models for prioritizing the applicants

EU regulations states that prioritization is mandatory

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Prioritization model

Scheme: Feasibility Study on a Green Biorefinery

Foundation

We have defined six value chain links

1. Supplier of biomass, biomass producers

2. Company harvesting and transporting biomass

3. Supplier of equipment for processing

4. Buyers of protein concentrate

5. Buyers of fiber

6. Buyers of residual juice

Model of prioritization

Step 1: Point score

Projects with highest point score (PS) have first priority.

$$PS = P_{number\ of\ value\ chain\ link} + P_{number\ of\ players}$$

Step 2: Weighted point score

In case of multiple projects with equal amount of PS, the projects with the highest weighted point score(VPS) have first priority.

$$VPS = P_{number\ of\ value\ chain\ link}\ \boldsymbol{x}\ P_{number\ of\ players}$$

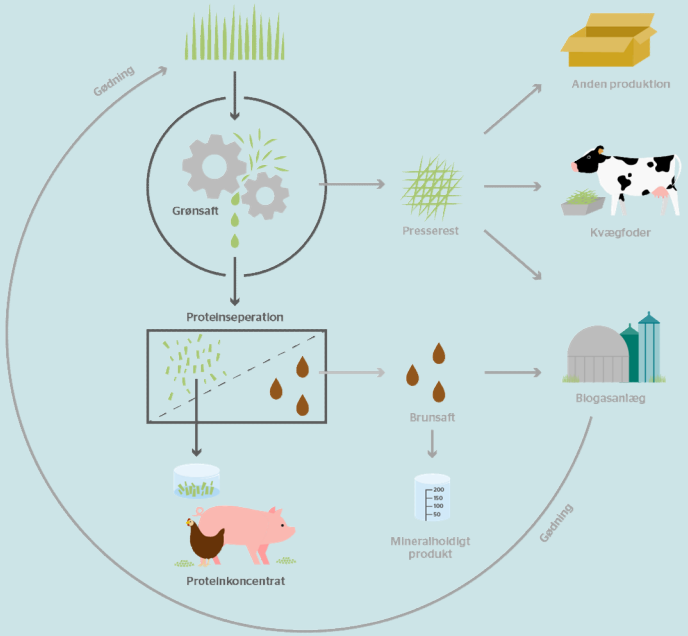
Step 3: Drawing lots

In case of equality between projects after step 2, the projects will be selected by drawing lots.

An example to illustrate the prioritization model

Following participates in the collaboration:

- 1 farmer with e.g. 30 ha of grass: Value chain link 1
- 1 farmer with e.g. 50 ha of grass: Value chain link 1
- 1 farmer with e.g. 80 ha of grass and equipment for harvesting and transport: Value chain link 1 and 2
- 1 biogas plant (common plant): Value chain links 5 and 6
- 1 consulting company: No value chain links



Pointscore (PS)

$$PS = P_{number\ of\ value\ chain\ link} + P_{number\ of\ players}$$

Step 1: Calculation of point score (PS)

1. Number of value chain links represented by players	1 value chain link	2 value chain link	3 value chain link	4 value chain link	5 value chain link	6 value chain link
Point ($P_{Number\ of\ value\ chain\ link}$)	1	2	3	4	5	6
2. Number of players	2	≥3				
Point ($P_{Number\ of\ players}$)	1	2				

Example

The number of value chain links in the project is 4: Farmers, company harvesting and transporting biomas, buyers of fiber (biogas plant) and buyers of residual juice (biogas plant)

$P_{number\ of\ value\ chain\ link} = 4$

Number of players: 5

$P_{number\ of\ players}$ ≥3 = 2 point

The point score (PS) is 4 + 2 = 6

Weighted point score (VPS)

$$VPS = P_{number\ of\ value\ chain\ link}\ x\ P_{number\ of\ players}$$

Step 2: Calculation of weighted point score

Example

The number of value chain links in the project is 4: Farmers, company harvesting and transporting biomass, buyers of fiber (biogas plant) and buyers of residual juice (biogas plant)

$P_{number\ of\ value\ chain\ link} = 4$

Number of players: 5

$P_{number\ of\ players} \geq 3 = 2$ point

The point score (PS) is 4 + 2 = 6

VPS: 4 x 4 = 16

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Prioritization model

Scheme: Establishment of a Green Biorefinery

The five prioritization criteria

1. **Financing the facility**
   The greater proportion of the obtained expenses, that you already have covered yourself, the more points you obtain

2. **Environmental approval**
   Number of points is based on whether you have applied for or obtained environmental approval

3. **Building permit**
   Number of points is based on whether you have applied for or obtained building permit

4. **Organization**
   Number of points is dependent on the number of value chain links that are represented.

5. **Green transition**
   Number of points is dependent on how the location of the facility influences the green transition. According to the map where Denmark is divided into 3 categories; weak, medium and strong influence on climate and environment.

Model of prioritization

Step 1: Point score (PS)

The point score is calculated by the total of amount of points from prioritization criteria 1-5.
Projects with highest point score have first priority.

Step 2: Point score for Green transition

In the event that applications are received for more than the allocated framework and projects have equal amount of point score after step 1; projects are prioritized according to their *Green transition* point score (prioritization criterion 5).

3. **Drawing lots**

In case of equality between projects after step 2, the remaining projects will be selected by drawing lots.

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How did we get there

The stepping stones

Establishing the knowledge base
Contributions from Aarhus University - Fall 2022

The template for the feasibility study
Online user tests with 4 players – Feb. 2022

Designing the legal framework
Written feedback and dialogue with 11 stakeholders – Jan. 2022

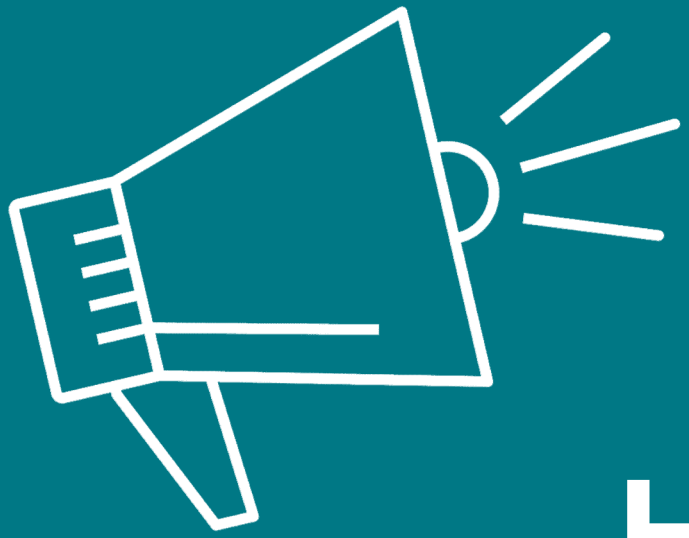
Design of models for prioritization
Written input and workshop with 3 experts Dec. 2021

Gathering knowledge
Interviews with existing players June 2021

Ministeriet for Fødevarer, Landbrug og Fiskeri

gudp

Green Development – and Demonstration Program



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How did we create awareness

Creating awareness

Key issue for our minister

Stakeholder involvement

Conference – Green Biorefining from Idea to Real Life

Key points

- To succeed, the players need to co-operate
- Immature markets calls for engagement of stakeholders
- Flexibility and simplicity needs to be balanced