

# LCA application and challenges

The background image shows a wide, calm body of water under a heavy, grey, overcast sky. In the distance, a range of mountains is partially covered in snow. In the foreground, a large, dark, abstract sculpture with multiple curved, branch-like structures stands on a circular, paved plaza. A person is standing on the plaza to the right of the sculpture, looking towards the water. The overall atmosphere is somber and quiet.

Ólafur Ögmundarson

Associate Professor at the Faculty of Food Science and Nutrition  
and Vice-Faculty Dean

## Research focus

- Life Cycle Assessment
- Process optimization
- Circular economy
- United Nations Sustainability Goals
  
- Aquaculture research (feed and growth)
- Fisheries management
  
- Eco-Industrial parks
- Public Perception

## Broader Interest

Break down barriers and increase collaboration between industry and academia. Only by doing so we can maximize sustainability of products, processes and services.

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## Work



Associate Professor 2023 to present  
 Assistant Professor 2021- 2023  
 Adjunct Professor 2020-2021



Senior Sustainable-Innovation Manager 2019 - 2020



Project Administrator 2014 - 2016



Project Manager 2009 - 2013

## Education



PhD in 2019  
 Management Engineering  
 Technical University of Denmark



MS in 2009  
 Environment and Natural Resource Management  
 University of Iceland

# LCA fundamentals session

## 1. Introduction to LCA

- LCA and Life Cycle Thinking
- Goal and scope definition
- System boundaries and Multifunctionality (allocation)
- Life Cycle Inventory

## 2. Interpretation of results

- Hotspots/contribution analysis
- Sensitivity analysis
- Uncertainty analysis
- Application of LCA (EPD, market, etc.)

## 3. Examples of LCA in biotech



**LCA in BlueBio project:  
BIOZOOSTAIN**





Journal of Cleaner Production

Volume 343, 1 April 2022, 130880

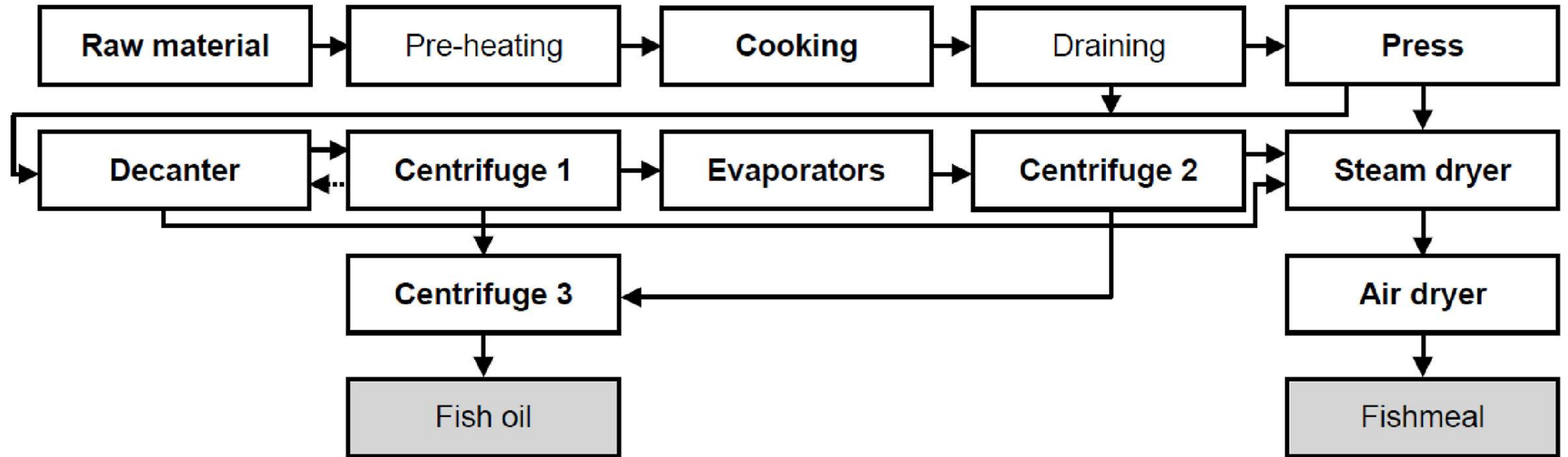


# Identification of environmental hotspots in fishmeal and fish oil production towards the optimization of energy-related processes

[Gudrun Svana Hilmarsdóttir](#)<sup>a</sup>  , [Ólafur Ögmundarson](#)<sup>a</sup>, [Sigurjón Arason](#)<sup>a b</sup>,  
[María Gudjónsdóttir](#)<sup>a b</sup>

Reference:

<https://www.sciencedirect.com/science/article/pii/S0959652622005182?via%3Dihub>



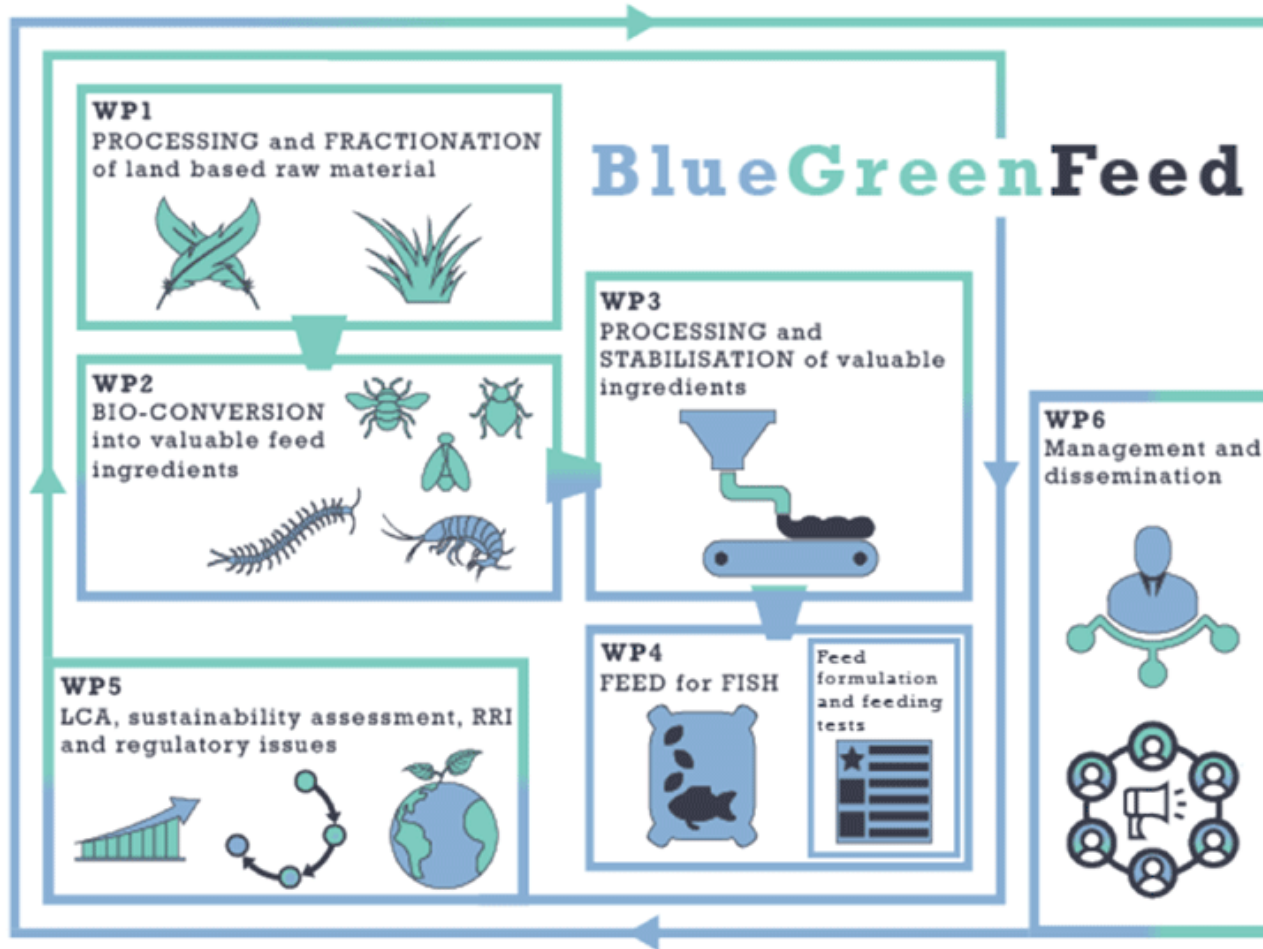
Next step is to assess the environmental impacts of a new protein plant partially developed within the BIOZOOSTAIN projects and compare the results to the conventional fishmeal plant which process is demonstrated above.

Reference:

<https://www.sciencedirect.com/science/article/pii/S0959652622005182?via%3Dihub>



LCA in BlueBio project:  
BlueGreenFeed



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Markou Mpotsari 47, GR-11742, Athens, Greece  
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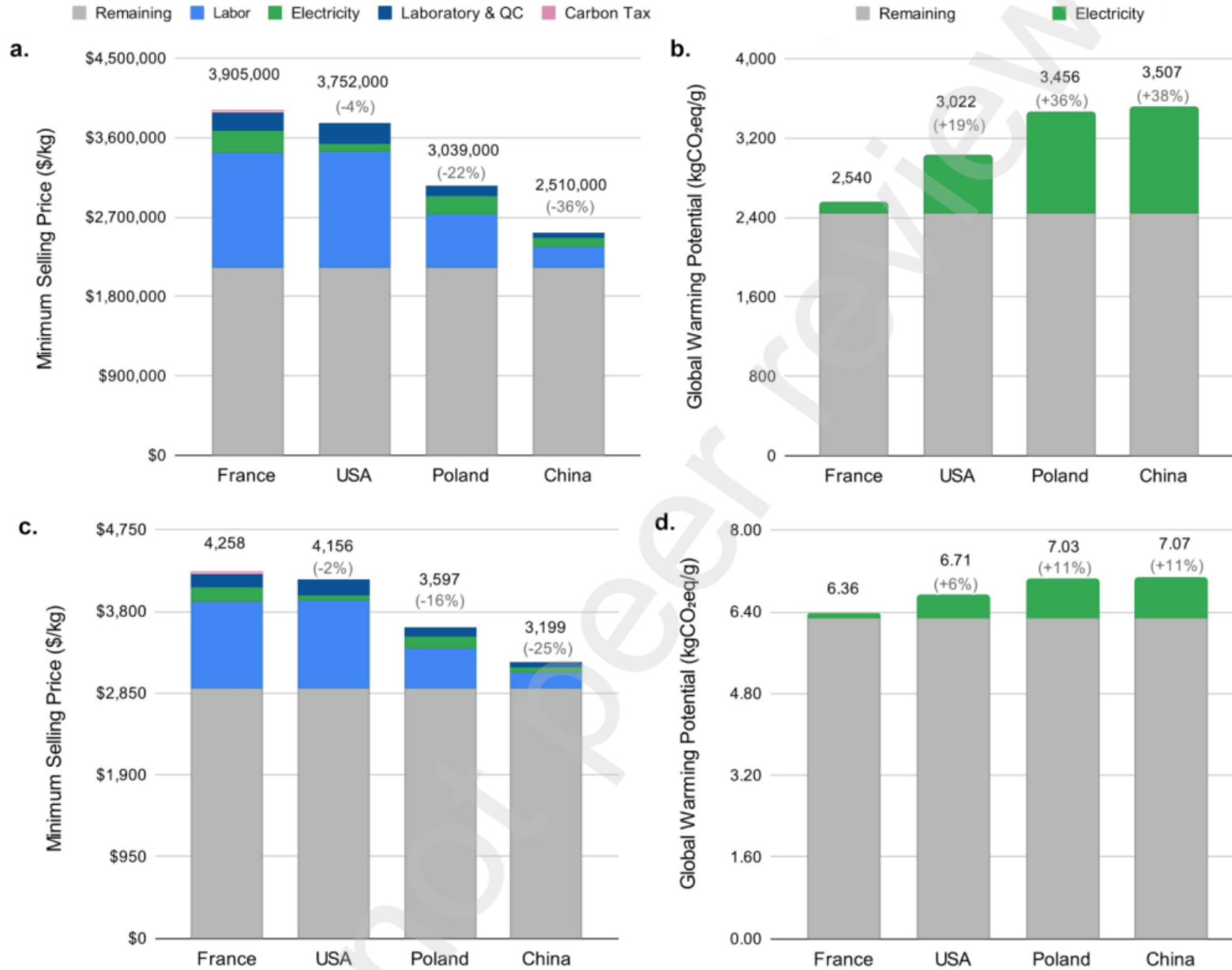
Websites:

<https://www.sintef.no/en/projects/2022/bluegreenfeed/>

<https://www.accelwater.eu/>

# Selection of geographical location of operation

Figure 3.



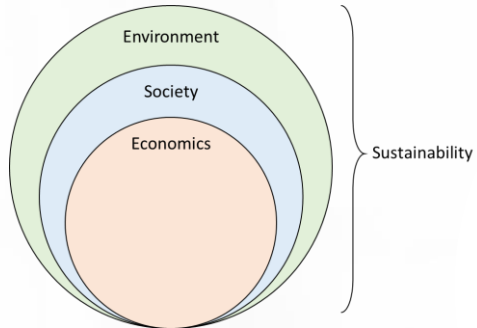
Reference:  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4596258](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4596258)

# Education & Workshop



# Education & Workshops (recurring yearly)

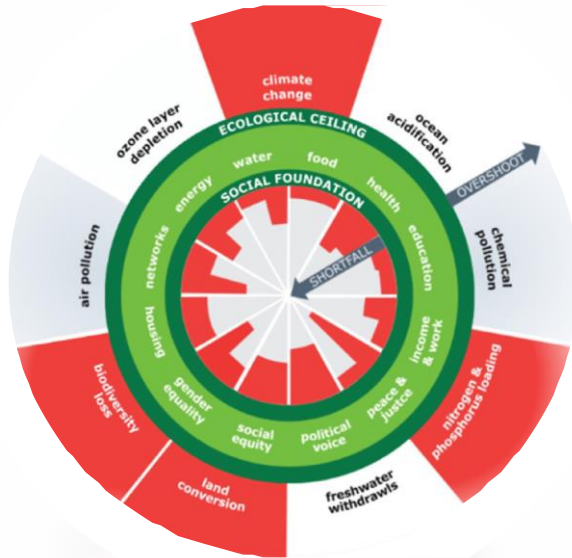
## Introduction to Sustainability



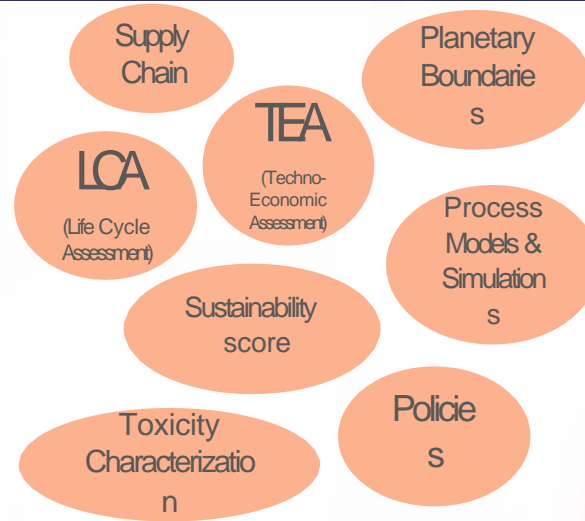
### SUSTAINABLE DEVELOPMENT GOALS



## Absolute Sustainability

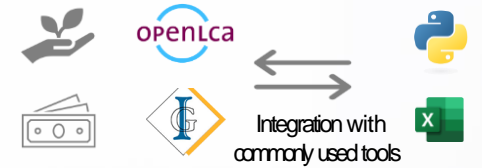
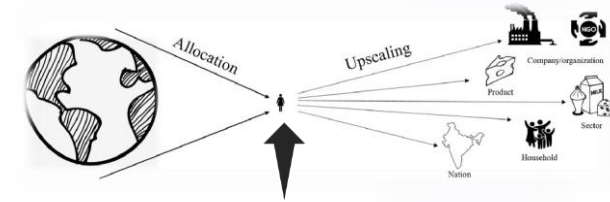


## Introduction to Tools to Quantify Sustainability



## Hands-on Workshop to Apply the Learnings

Learn how to upscale/downscale planetary impacts to a region/sector/company/individual level



Hands-on exercise to perform Techno-Economic and Life Cycle Assessments

## Speakers from Academia, Industry and Sustainability Consulting Firms



Prof. Michael Hauschild  
DIUSustain,  
Leader of Center for  
Absolute Sustainability



Prof. Peter Fantke  
DIUSustain,  
Assessment  
USEtox® Director



Giovanni Salvetti  
Assistant Manager  
Services  
KPMGItaly



Dr. Morten Ryberg  
Senior Sustainability Specialist  
SMEQDenmark



Dr. Ólafur Ögmundason  
Associate Professor  
Department of Food Science & Nutrition  
University of Iceland, Iceland



Dr. Samir Meramo  
Postdoctoral Researcher  
Sustainability Assessment  
DIUBiosustain



Eleonora Pasutto  
Techno-Economic &  
Innovation Lead  
DIUBiosustain



Dr. Suresh Sukumara (Course Responsible) Senior  
Researcher & Group Leader Sustainable  
Innovation Office  
DIUBiosustain



Thank you!

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University profile: <https://english.hi.is/staff/olafuro>