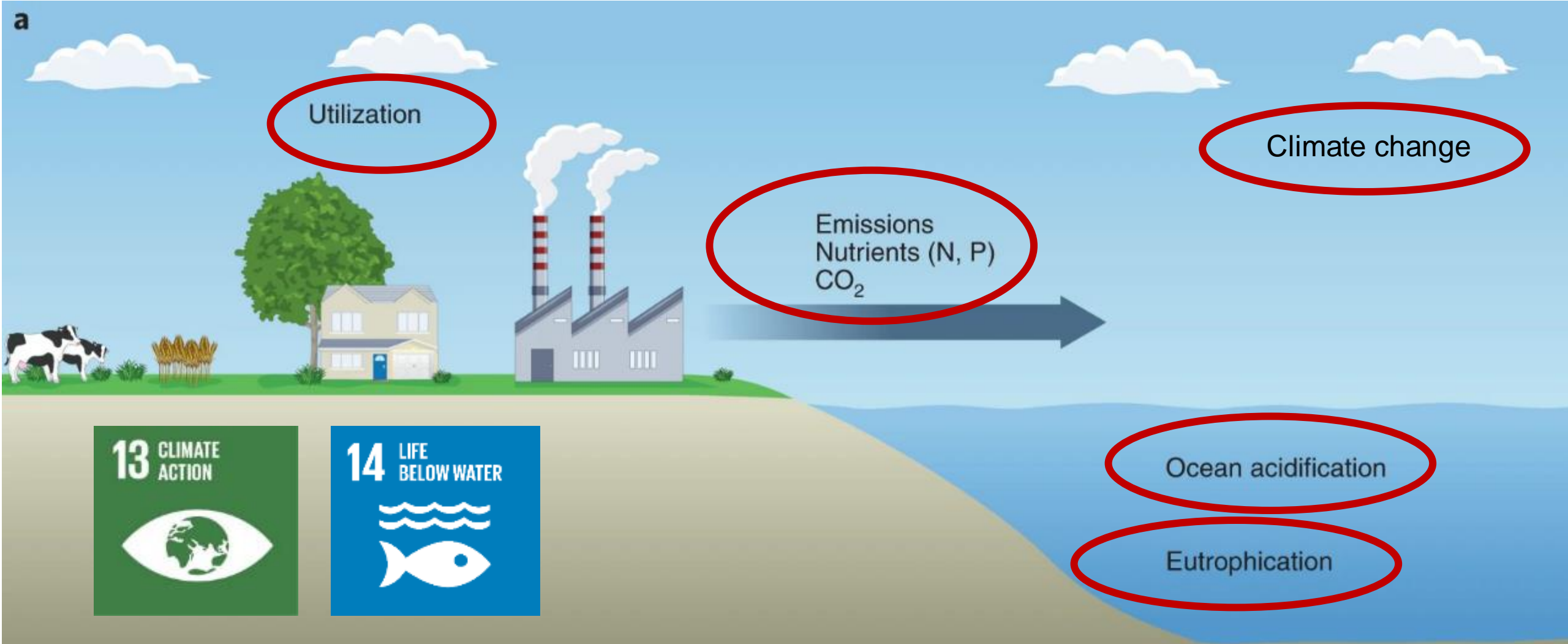


EMISSION CAPTURE & UTILISATION

THE BLUE BIOMASS IN THE CIRCULAR BIOECONOMY

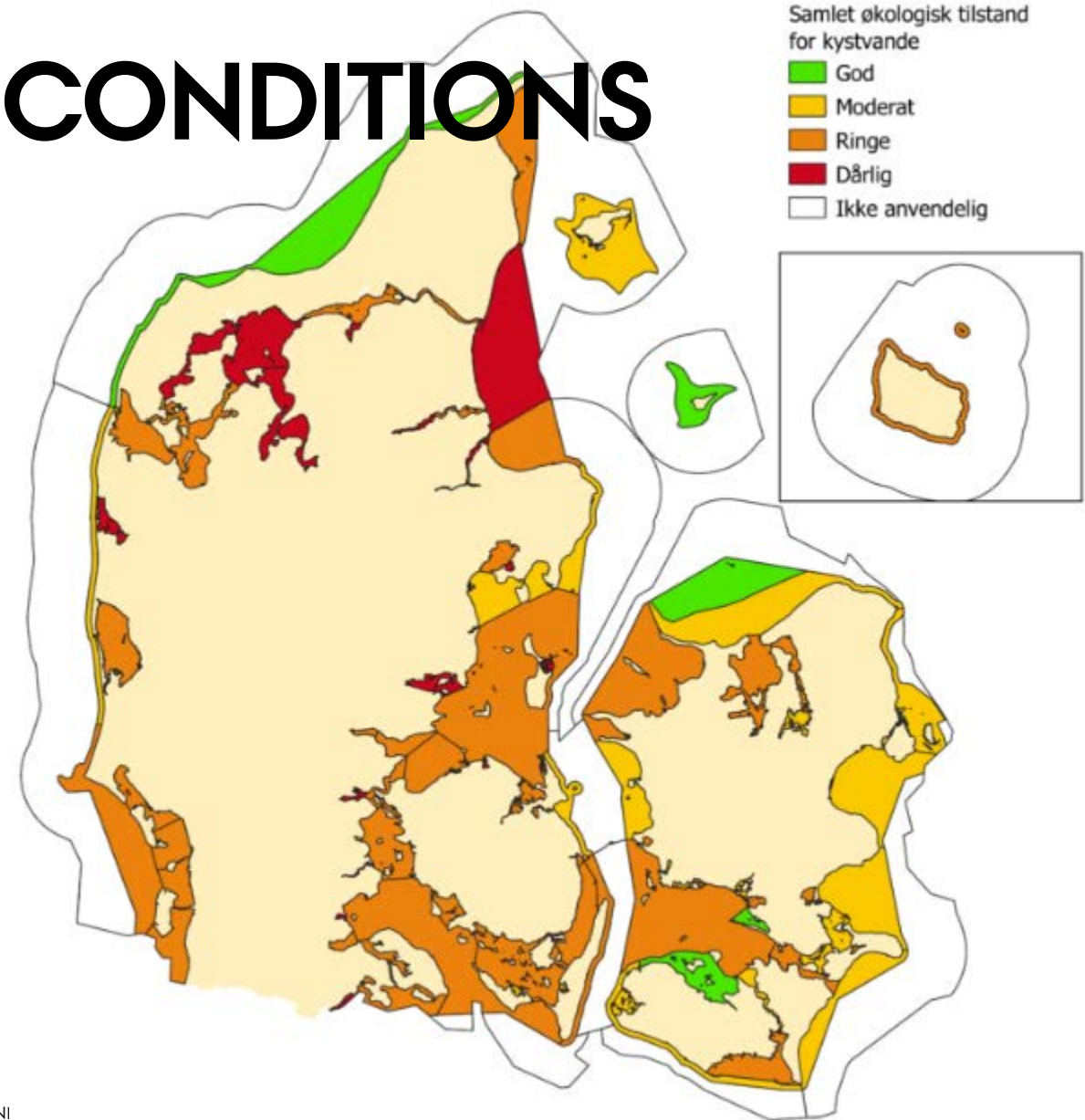
ANNETTE BRUHN, AARHUS UNIVERSITY, DEPARTMENT OF ECOSCIENCE

LINEAR RESOURCE MANAGEMENT

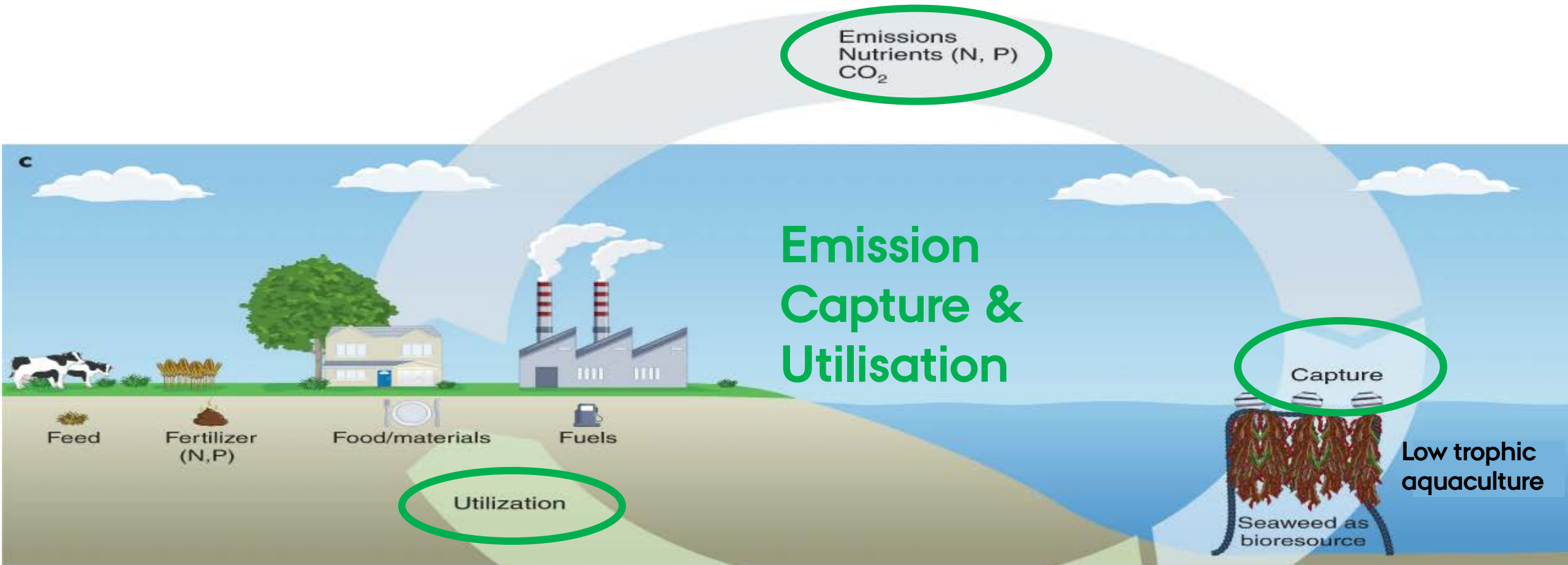


BAD COASTAL WATER CONDITIONS

- Nutrient pollution – eutrophication
- EU Water Frame Directive
- **Good Ecological Status** before 2027
- Need for reduction in nutrient emissions
- Potential for additional action?
- **Low trophic aquaculture** as an additional tool for mitigation and nature restoration



CIRCULAR RESSOURCE MANAGEMENT



2 ZERO HUNGER

13 CLIMATE ACTION

14 LIFE BELOW WATER

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

17 PARTNERSHIPS FOR THE GOALS

LOW TROPHIC AQUACULTURE

- Blue Biomass
- Non-fed species
- Bivalves i.e. blue mussels
- Seaweeds

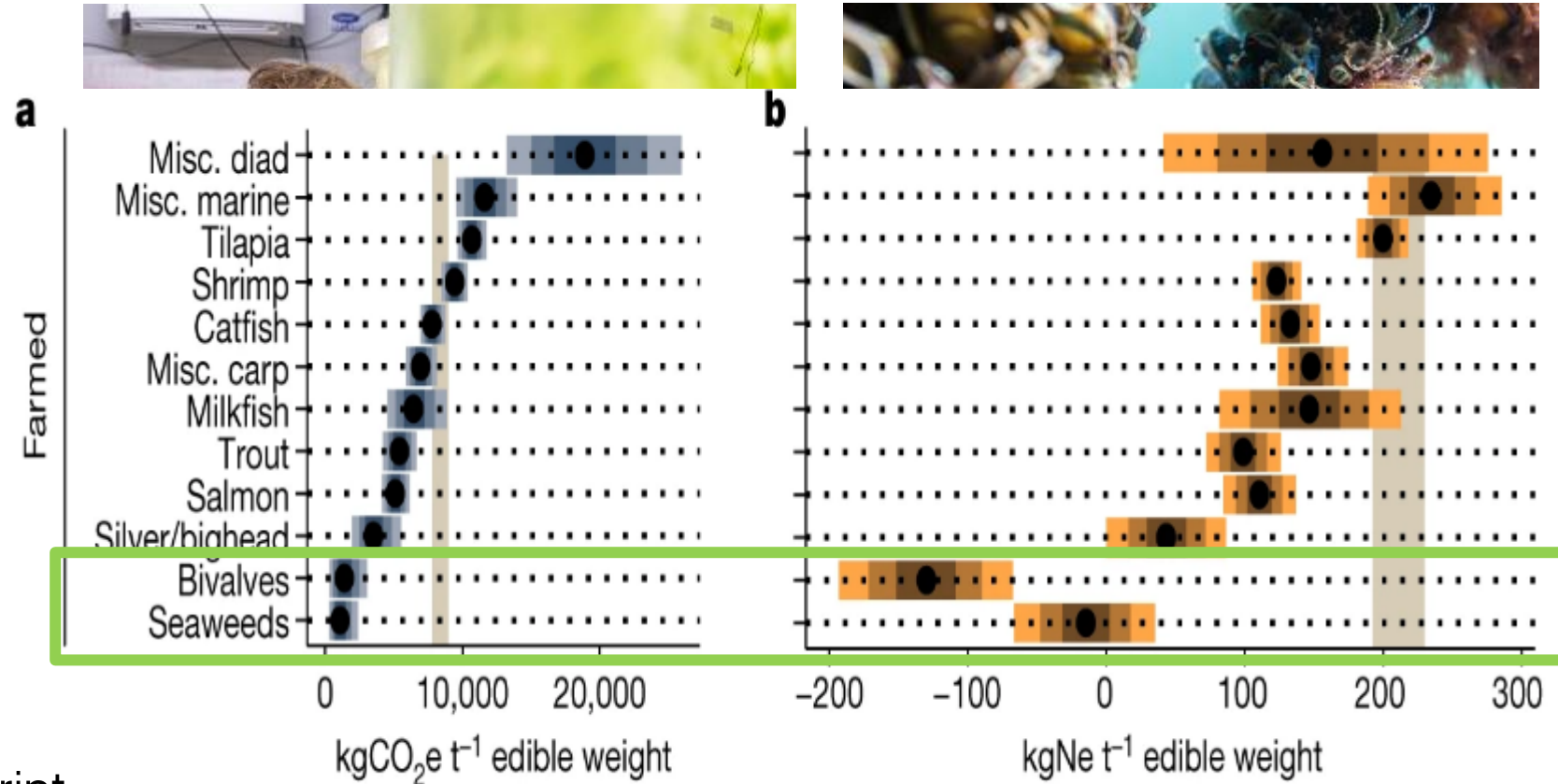
- In the sea
- Land-based systems

- Food, feed, materials
- Low environmental footprint



LOW TROPHIC AQUACULTURE

- Blue Biomass
 - Non-fed species
 - Bivalves i.e. blue mussels
 - Seaweeds
-
- In the sea
 - Land-based systems
-
- Food, feed, materials
 - Low environmental footprint



CBIO & THE BLUE BIOMASS - PAST

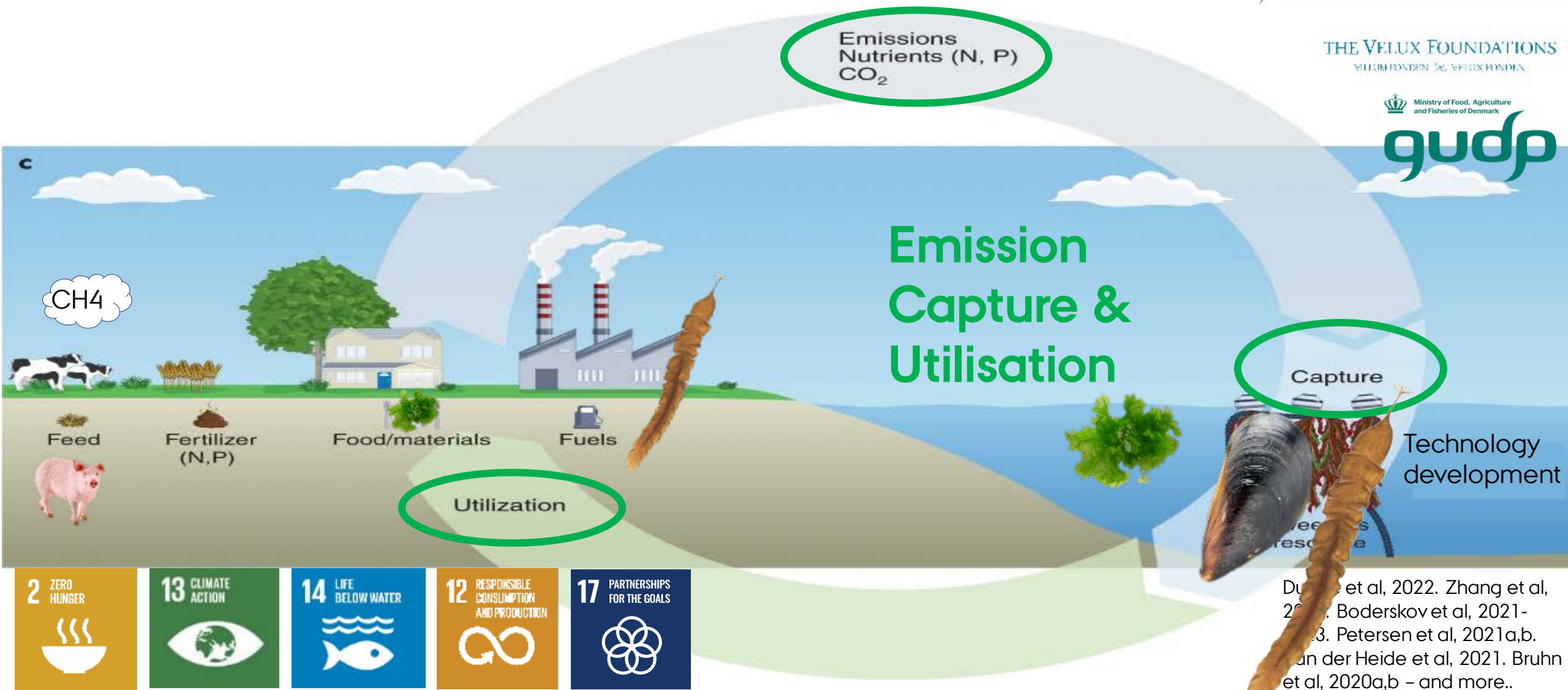


Innovation Fund Denmark

THE VELUX FOUNDATIONS

VILLUM FONDEN & VELUX FONDEN

Ministry of Food, Agriculture and Fisheries of Denmark



Technology development

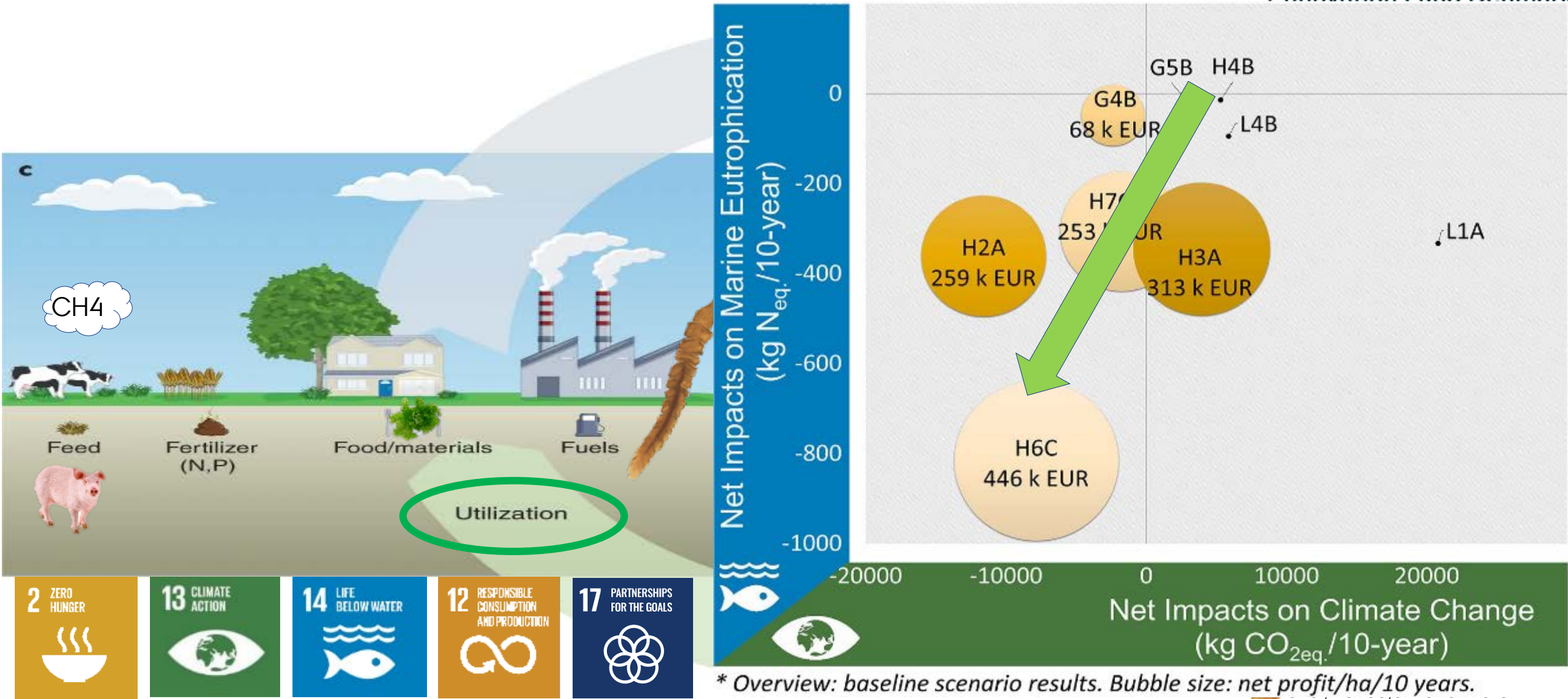
Du et al, 2022. Zhang et al, 2021. Boderskov et al, 2021-2023. Petersen et al, 2021a,b. van der Heide et al, 2021. Bruhn et al, 2020a,b - and more..





CBIO & THE BLUE BIOMASS - PAST

Innovation Fund Denmark



CBIO & THE BLUE BIOMASS - FUTURE

- **Off-shore** Wind Farms – potential for Multi-use
- **On land** – Re-circulated Aquaculture Systems (RAS)
- Emission Capture:
 - Water Restoration tool in EU WFD?
 - end-of-pipe Emission Capture at Recirculated Aquaculture Systems (RAS) – N, P, C and heat'
 - Modelling effects
- - and Utilisation
 - Processing of sugar kelp in large-scale for fermented pig feed
 - Biorefining of sea lettuce
 - Food, fish feed, nutraceuticals



THANKS!



Innovation Fund Denmark



THE VELUX FOUNDATIONS
VELUX FONDEN OG VELUX FONDEN



AlgeCenter Danmark