Interreg Co-funded by the European Union
South Baltic

"Strengthening Circular Economy and Valorisation of side-streams in RAS Aquaculture"

AQUALOOP International Conference

Challenges and constraints of implementing circular economy into commercial aquaculture production

Bremerhaven, Germany | 25 February 2026

Prof. Dr. Harry W. Palm & Adrian Bischoff-Lang
University of Rostock

@AquaLoop
@AquaLoop Interreg SB

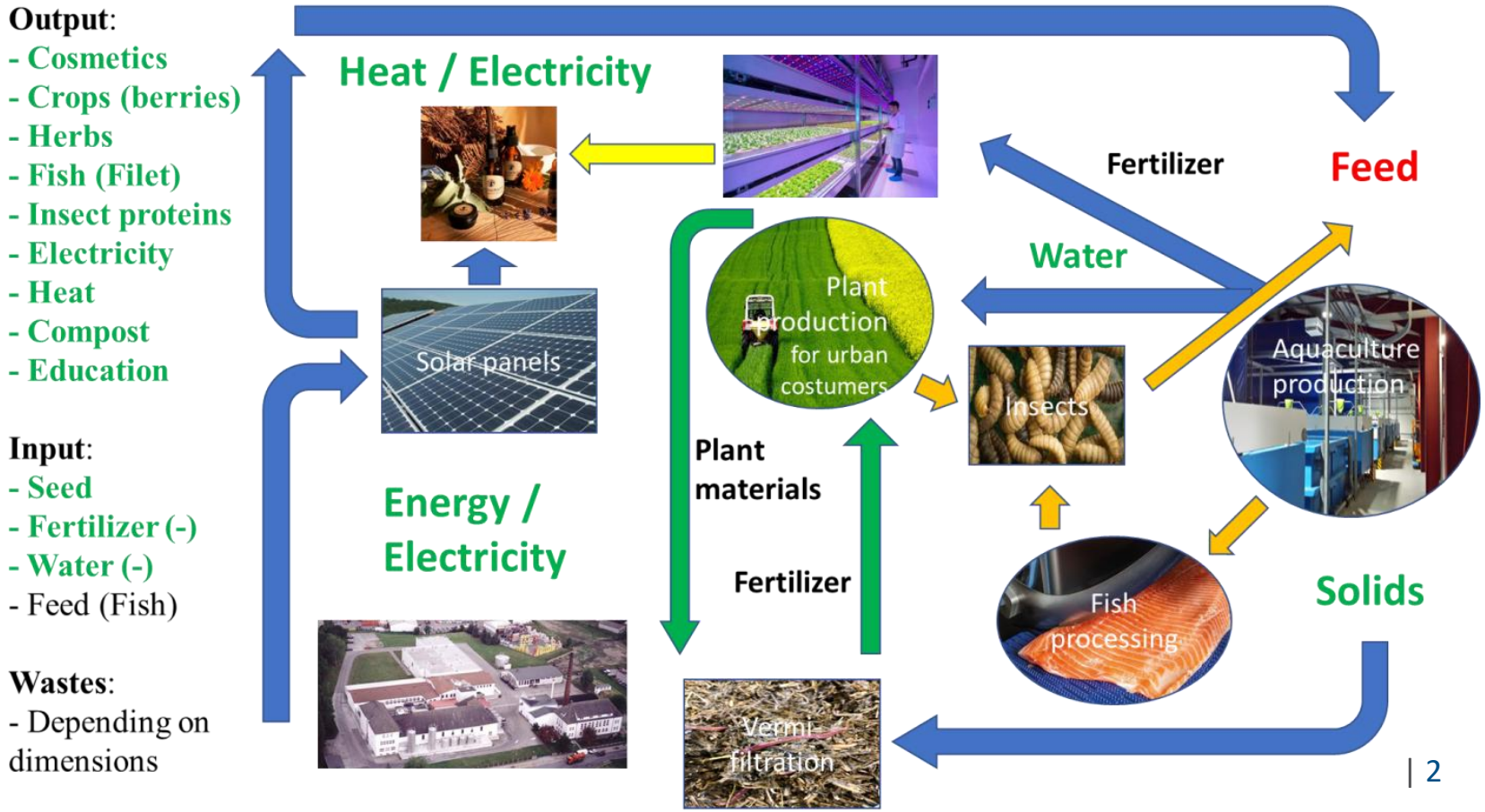
aqualoop.edu.pl

Challenges and constraints of implementing circular economy into commercial aquaculture production

Circular economy including urban Aquaculture - combination of different farming practices diversifies products and reduces energy, waste and transport costs (in theory)

Fish processing

- → reduces carbon energy sources
- → reduces feed input
- → increases margins



Interreg South Baltic
Co-funded by the European Union

Challenges and constraints of implementing circular economy into commercial aquaculture production

Circular economy in urban Aquaculture - challenges during practical implementation

Energy (electricity & heat):

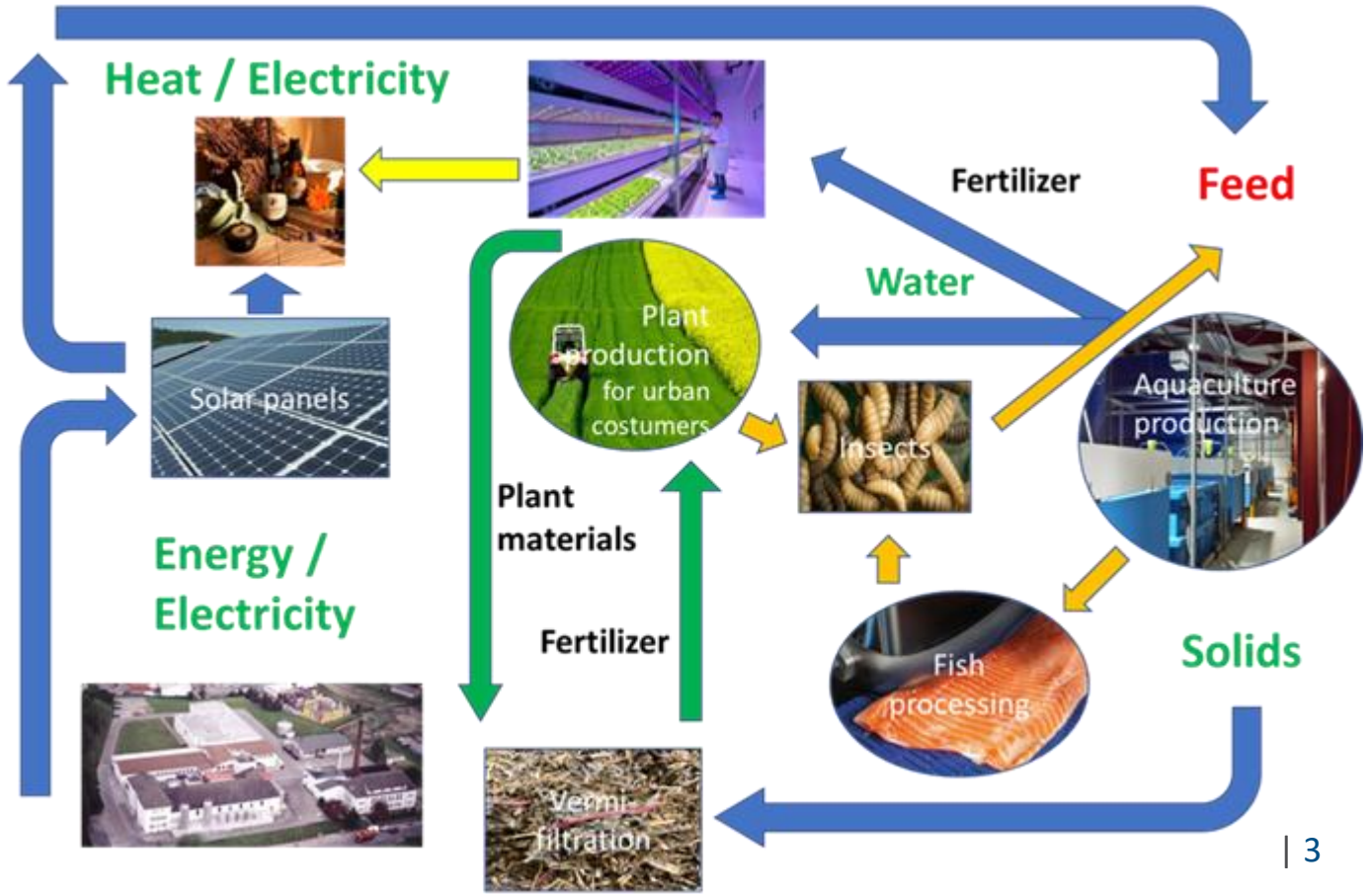
- photovoltaic system instead of biogas (agriculture)
- combined heat and power source (Blockheizkraftwerk)

Problems

→ energy companies (power connection, procedure and approval

→ qualified staff in house

→ costs



Interreg Co-funded by the European Union
South Baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

Circular economy in urban Aquaculture - challenges in practical implementation

Water (supply):

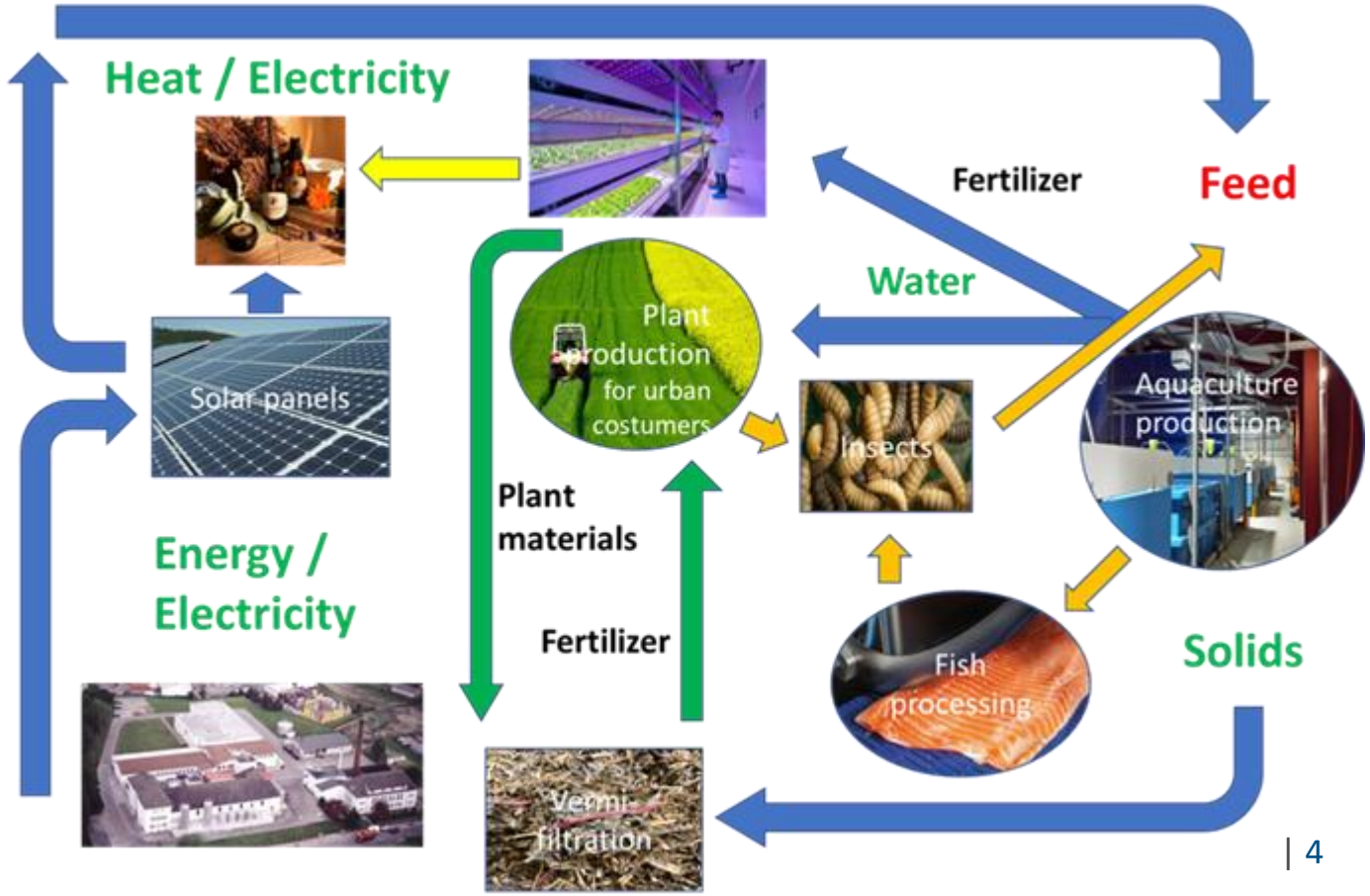
- groundwater (wells)
- surface water
- tap water

Problems

→ water rights and approval

→ no surface water from natural sources for new systems

→ costs



Interreg Co-funded by the European Union
South Baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

Circular economy in urban Aquaculture - challenges in practical implementation

Process water (disposal):

- municipal sewage treatment
- aquaponics farming

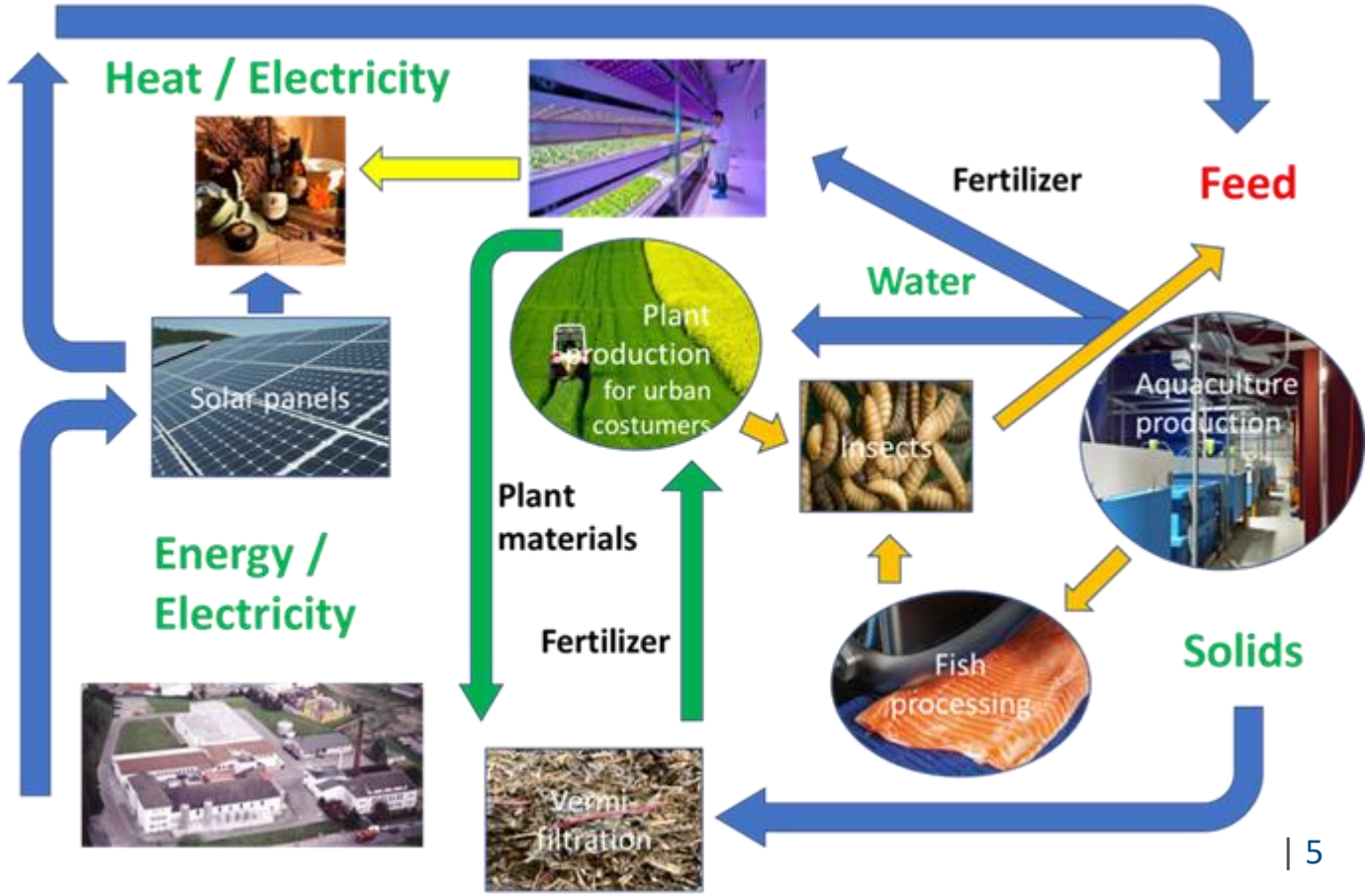
Problems

→ stocking density (nutrient loads and water volumes)

→ aquaculture species (salinity)

→ hydroponics

→ admission procedure and approval



Interreg Co-funded by the European Union
South Baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

Circular economy in urban Aquaculture - challenges in practical implementation

Solids (further use):

- insect production
- agricultural fertilizer
- biogas

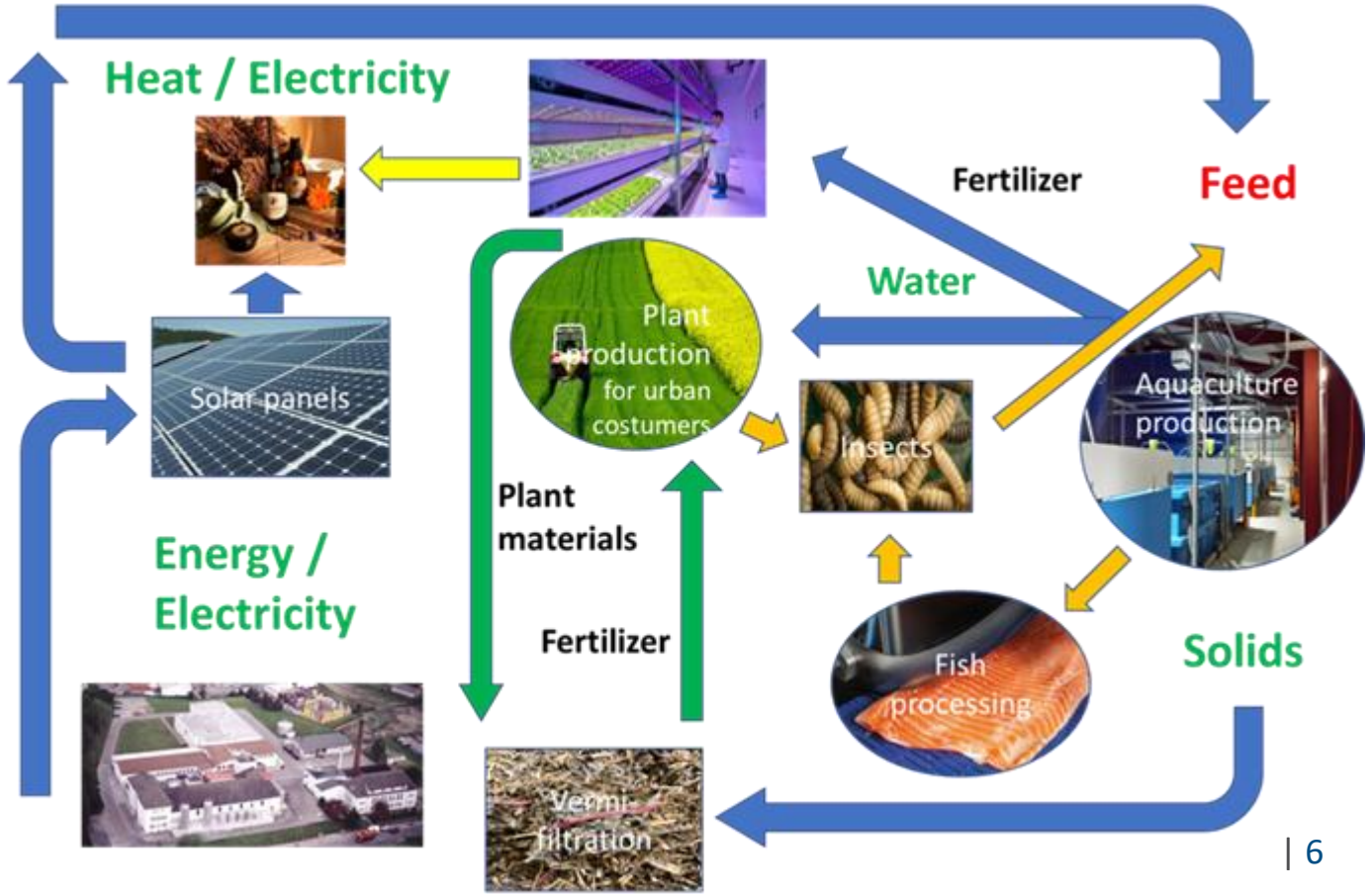
Problems

→ no agricultural land

→ stakeholder conflicts

→ suspended solids

→ admission procedure and approval



Interreg Co-funded by the European Union
South Baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

Circular economy in urban Aquaculture - challenges in practical implementation

Fish, insect and plant products:

- marketing on site
- human and pet products

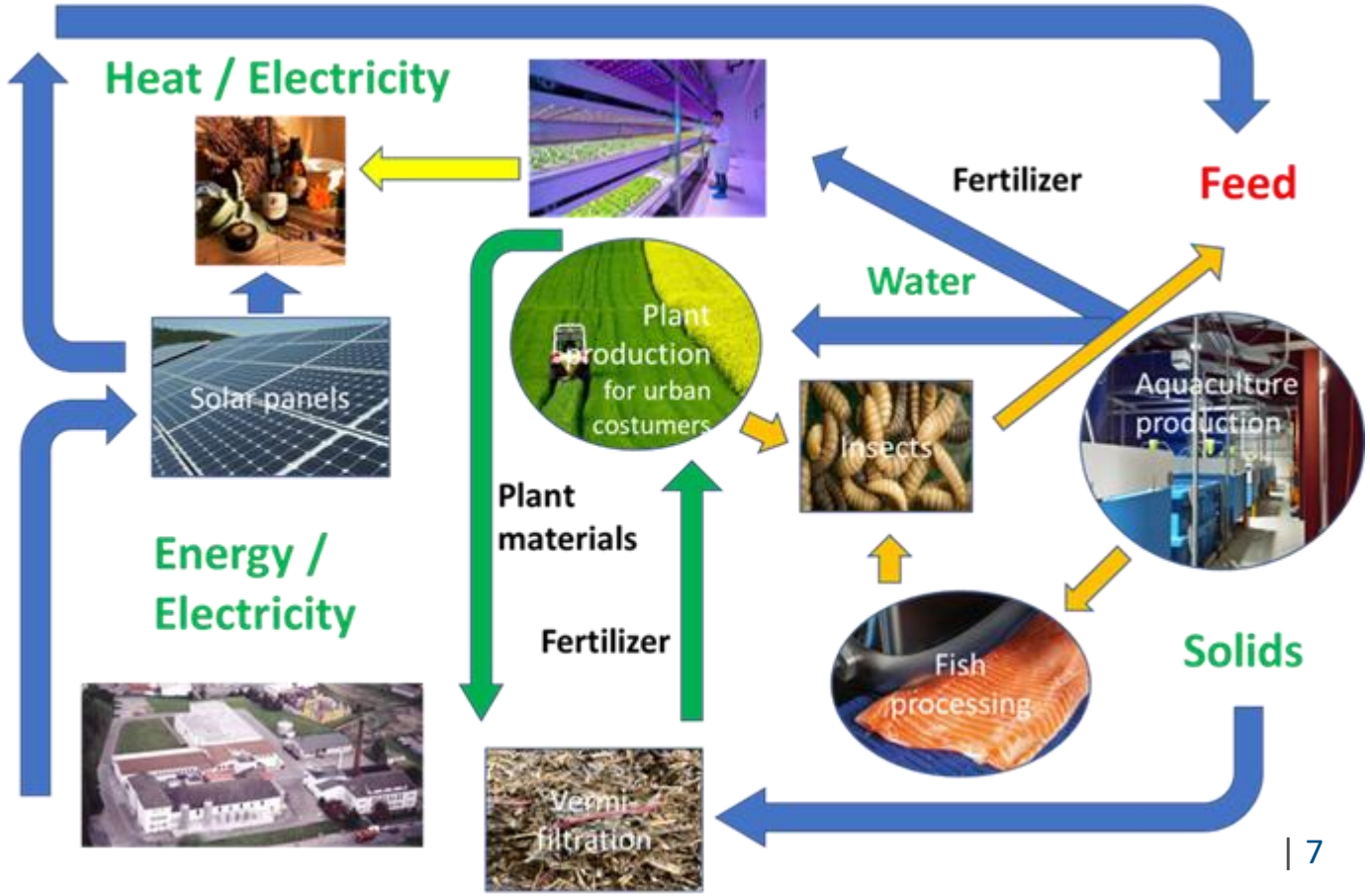
Problems

→ production capacity

→ local brand and outlet

→ optimal location

→ admission procedure and approval



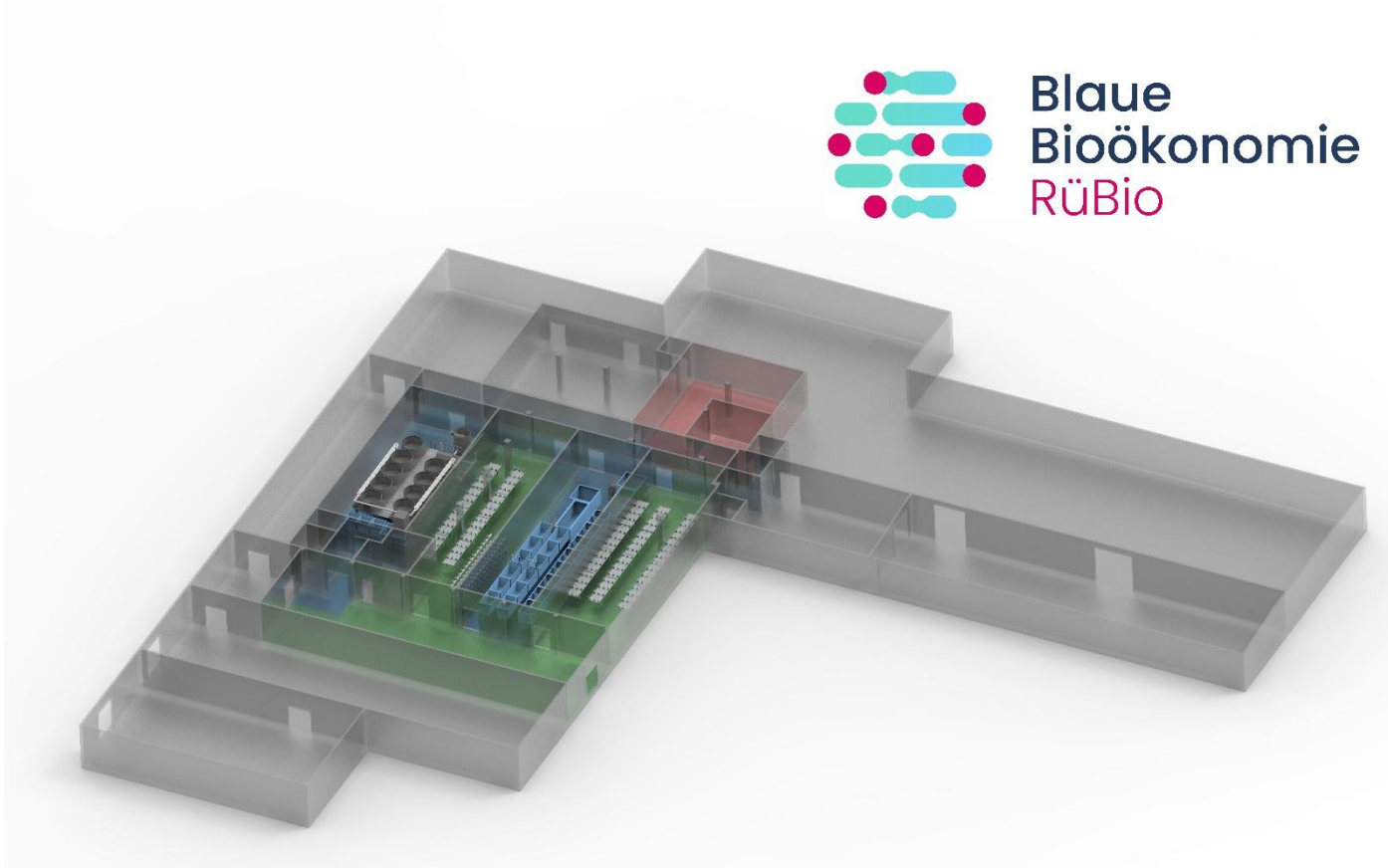
Interreg South Baltic
Co-funded by the European Union

Challenges and constraints of implementing circular economy into commercial aquaculture production

RüBio: A model location of the bioeconomy innovation space at marine sites

„Too complex for Germany “:

- old industrial complex (diary)
- tourist access
- own dwell and existing licence to produce food
- agricultural land closeby
- space for restaurant, shop and workshops available
- company trading with solar panels

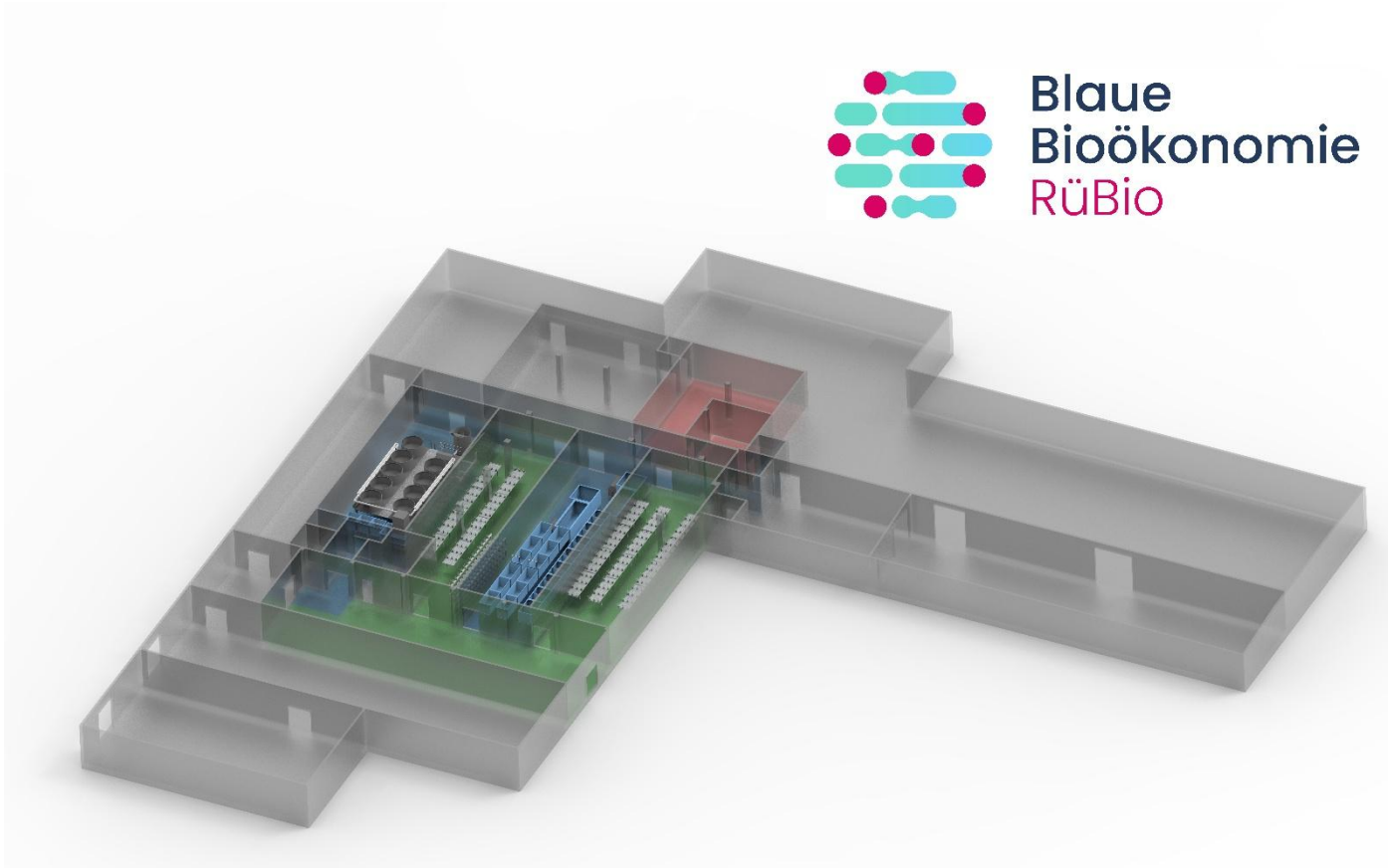


Challenges and constraints of implementing circular economy into commercial aquaculture production

RüBio: A model location of the bioeconomy innovation space at marine sites

„ Too complex for Germany“:

- building right
- water access right
- connection of solar and combined heat and power plant to local energy provider
- constant temperature
- local qualified staff for fish and plants / insects
- local market
- timing



Interreg
Co-funded by the European Union
South Baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

Circular economy in Aquaculture - challenges in practical implementation

Enhance economic efficiency through side-streams/by-products:

- production output?
- ingredients?
- possible products?
- marketing and market access?

→ AQUA LOOP

→ **Even increasing complexity**

Challenges and constraints of implementing circular economy into commercial aquaculture production

Large scale becomes small scale:

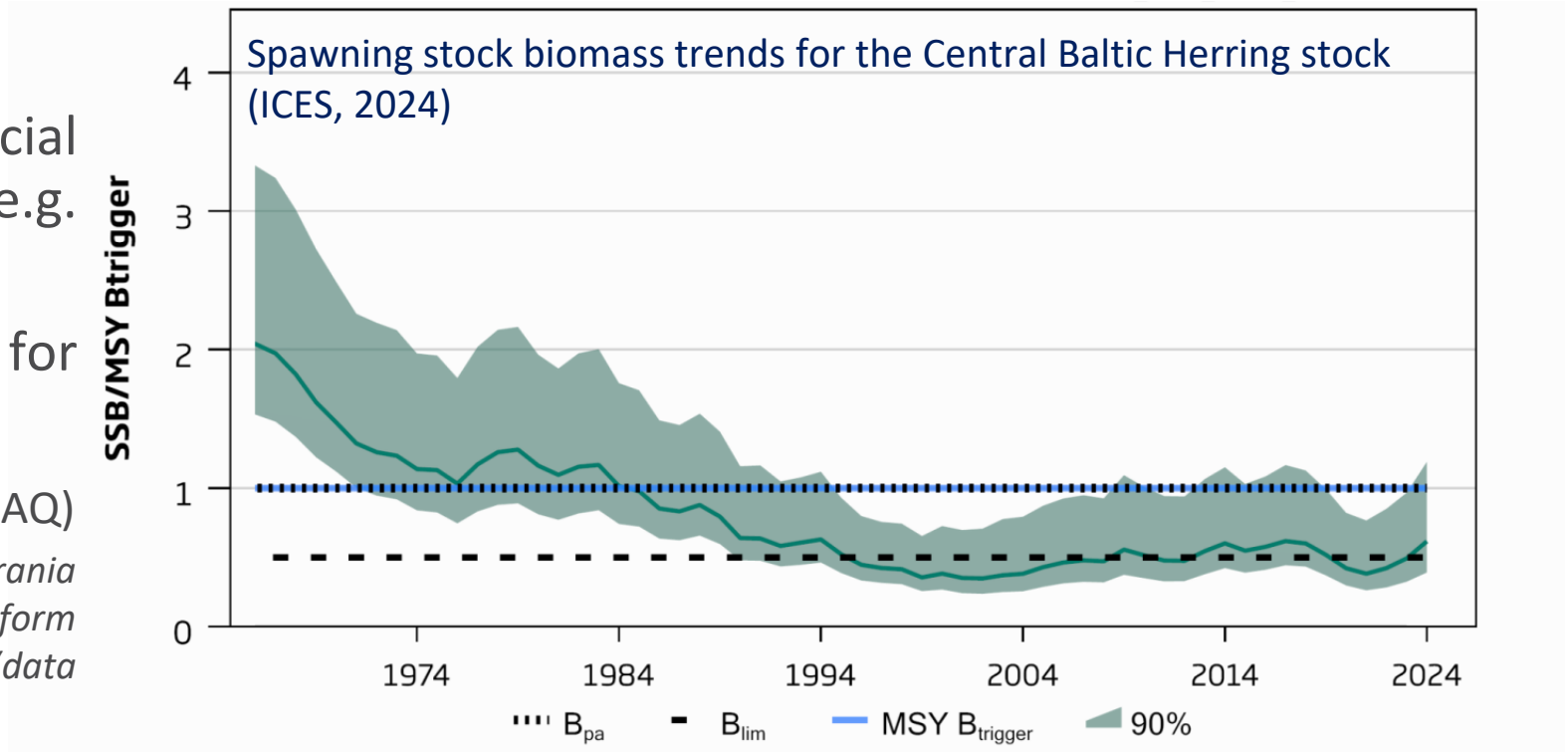
→ Small scale African catfish farms as an alternative income for Baltic Sea fishermen

Background:

- Decline of important commercial fish stocks in the Baltic Sea, e.g. Herring and Cod
- Retraining/skill enhancement for existing Baltic Sea fishermen

→ Sea-Ranger Programme (including AQ)

"Sea Rangers in Mecklenburg-Western Pomerania are specially trained coastal fishermen who perform tasks in marine conservation, research (data collection) and tourism in addition to fishing."



https://www.su.se/english/divisions/stockholm-university-baltic-sea-centre/news/articles/2024-08-30-european-commission-double-the-herring-catches-in-the-central-baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

Small scale African catfish farms as an alternative income for Baltic Sea fishermen

Acticity 3.6: TrainingLoop for professionals

- Training on the routine of a recirculation aquaculture system for intensive production of African catfish
- Support with the administrative approval of the regulatory authority as an aquaculture production facility

Interreg Co-funded by the European Union
South Baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

Small scale African catfish farms as an alternative income for Baltic Sea fishermen

Construction & operation of the RAS

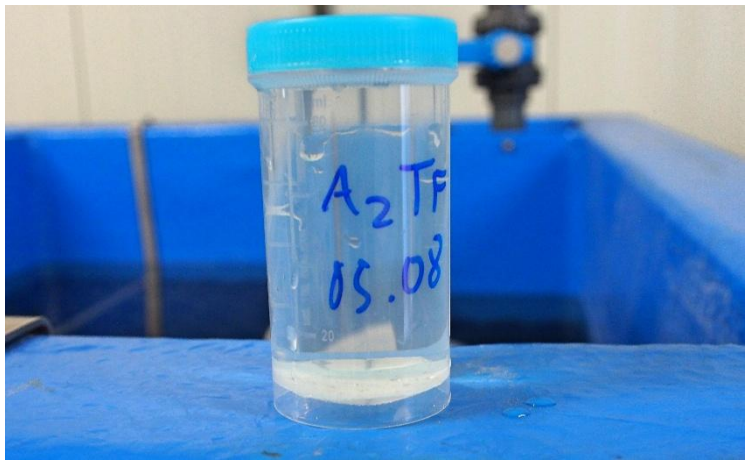
- planning of a modern small scale African catfish farm in site (Steinbeis/University of Rostock)
- main construction work on the premises done by the fisherman
- setup & commissioning of the RAS (establishment of biofilters)
- start of catfish production in summer 2025
- Seed from University of Rostock

Challenges and constraints of implementing circular economy into commercial aquaculture production

Small scale African catfish farms as an alternative income for Baltic Sea fishermen

Subject-specific support from the University of Rostock

- biotic & abiotic parameters
    - oxygen concentration, pH, concentration of N-compounds, stocking densities, feeding rates, FCR, weight gain, etc.
- health status & welfare of the fish
- further development (increased production and aquaponics)



Interreg Co-funded by the European Union
South Baltic

Challenges and constraints of implementing circular economy into commercial aquaculture production

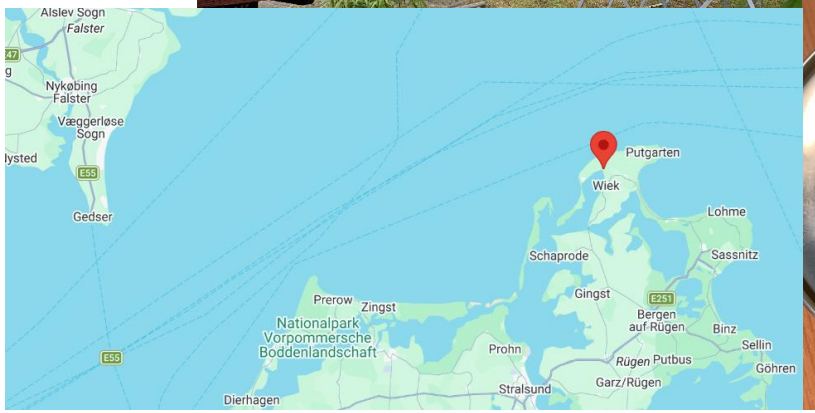
Small scale African catfish farms as an alternative income for Baltic Sea fishermen

New product development & on site sales at the restaurant

- development and adaptation of new recipes that suit the region, the ambiance, and the clientele (locals and tourists)

→ e.g. catfish schnitzel or steamed catfish with vegetables

→ give it a try…



We seek for more positive examples in future!!!

Interreg Co-funded by the European Union
South Baltic

Interreg

Co-funded by the European Union

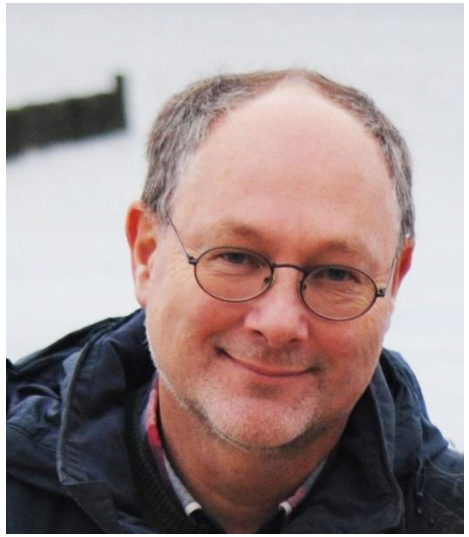
South Baltic

aqua loop

Contacts

Prof. Dr. Harry W. Palm
Professorship Aquaculture & Sea-Ranching
University of Rostock
Germany

harry.palm@uni-rostock.de
T +49 (0) 381 498 3730
F +49 (0) 381 498 3732



@AquaLoop
@AquaLoop Interreg SB

aqualoop.edu.pl