



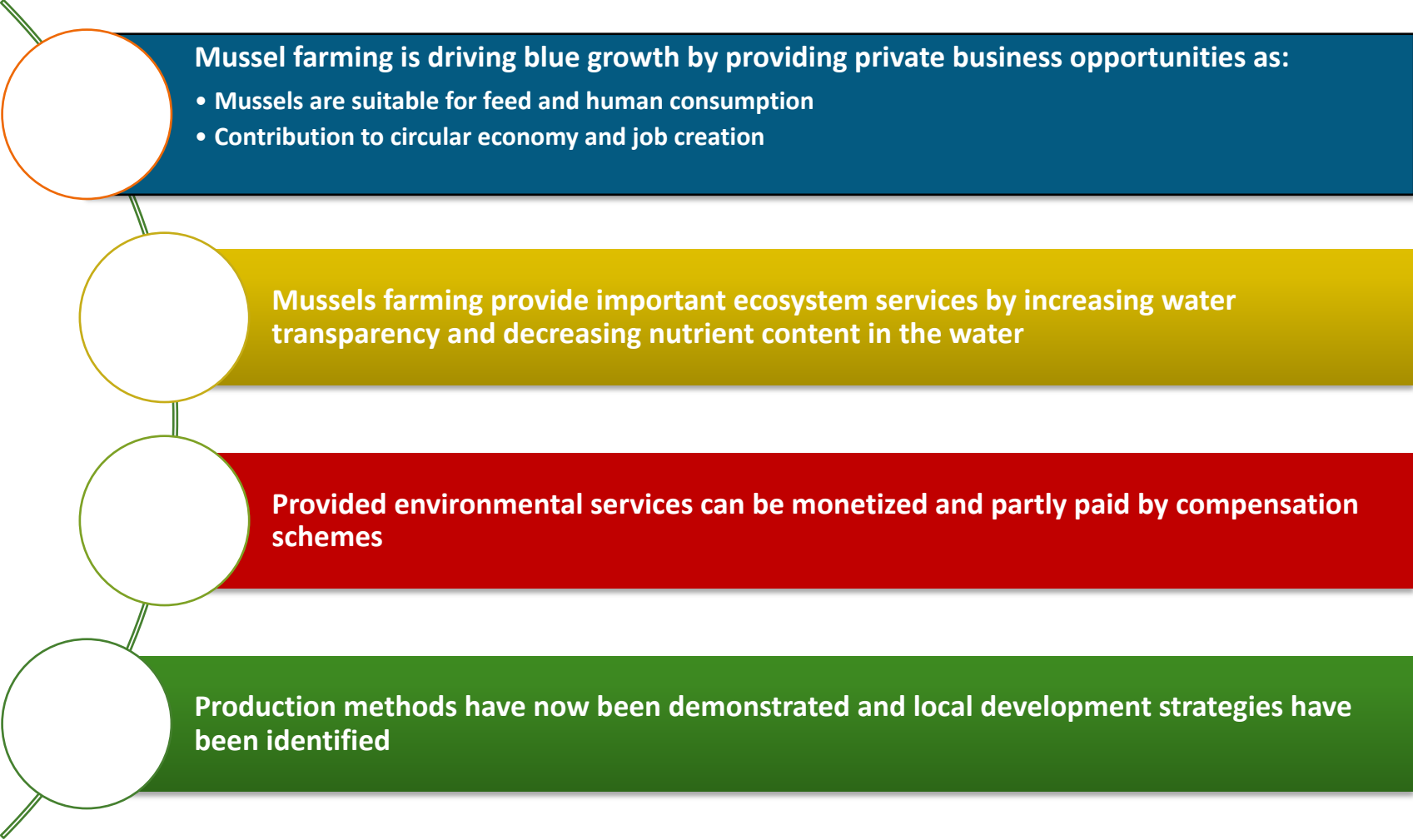
PLANS FOR LONG-TERM COMMERCIAL VIABILITY OF THE FOCUS MUSSEL FARMS

Susanna Minnhagen, Kalmar municipality

Baltic Sea mussel farming and nutrient
offset conference, Malmö

24th April 2019

This talk address:



Mussel farming is driving blue growth by providing private business opportunities as:

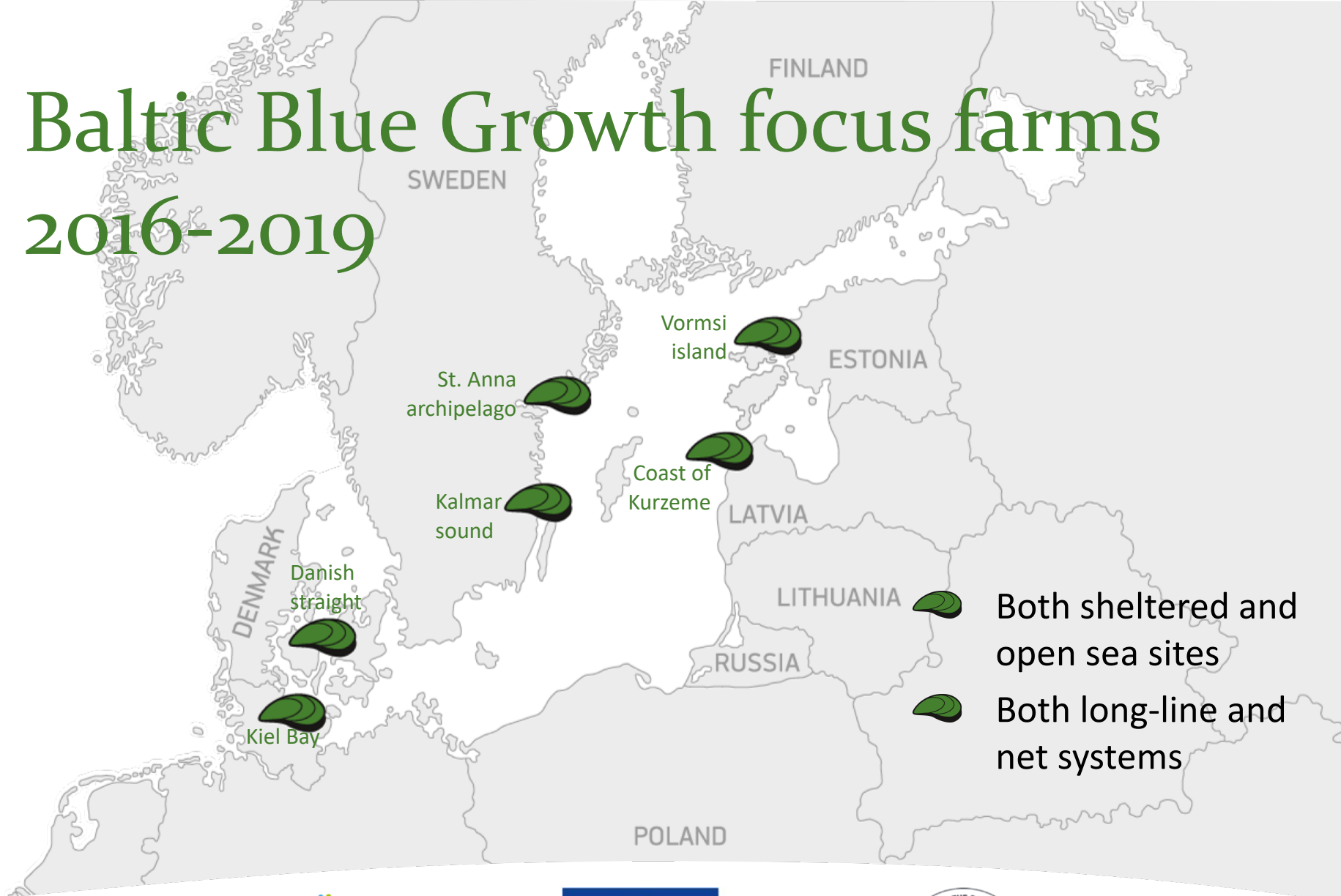
- **Mussels are suitable for feed and human consumption**
- **Contribution to circular economy and job creation**

Mussels farming provide important ecosystem services by increasing water transparency and decreasing nutrient content in the water

Provided environmental services can be monetized and partly paid by compensation schemes

Production methods have now been demonstrated and local development strategies have been identified

Baltic Blue Growth focus farms 2016-2019



Outcome from the BBG focus farms:

Production methods have now been demonstrated and local development strategies have been identified

Published reports:

- Results from Baltic Blue Growth project's mussel farms and way forward for mussel farming in the Baltic Sea
- Recruitment, growth and production of blue mussels in the Baltic Sea
- Technical evaluation of submerged mussel farms in the Baltic Sea
- Experiences from predator mitigation tool testing
- Business plans for blue mussel production in the Baltic Sea



”Business plans”...contains

- Potential products, markets and pricing strategies
- Investment costs, production efficiency and management costs based on the project farms
- Legal framework (country-specific!)
- 3 different marketing strategies for small 2-4 cm mussels

1. Mussel meal – could be a direct replacer for fish meal in various products

- Successful trial of producing mussel meal in BBG
- Pilot-scale production plants exists
- Legal in all countries
- Production guidelines are produced by East Sweden Aquaculture centre*



<http://www.vattenbrukscentrumost.se/sv/kontakt/>

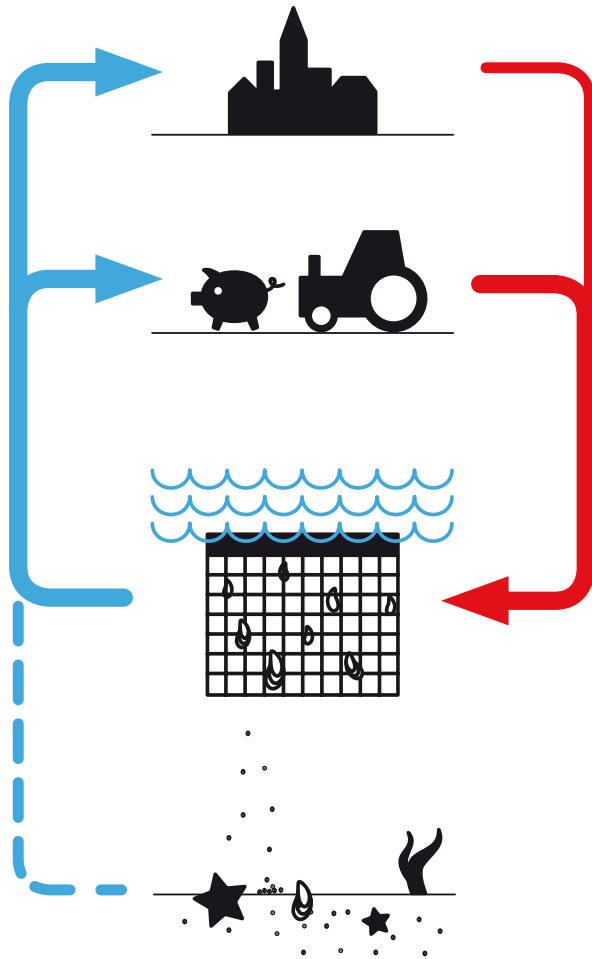
2. Mussels as part of the IMTA concept

(Integrated Multi Trophic Aquaculture)

- Mussels can serve as compensatory organisms for nutrient inputs due to fish farming
- Legal in Denmark, piloted in Germany, discussed in Estonia and autonomous Åland
- Part of the strategy for how to reach viable business at the Musholm farm and at Kiel Marine Farm



3. Mussel farming as a measure to reach internationally agreed environmental goals



- Mussel farms could be used by coastal municipalities as a “catch crop” for the management of eutrophication
- Nutrient uptake by mussel harvests could be used for nutrient trade.
- This is in line with EU’s WFD, but not approved, due to lack of guidelines and decisions on national level
- This is part of the strategy on how to reach viable business at the St. Anna farm, and in the Danish example from Mariager Fjord municipality

Road map:

Biological
conditions
for mussel
growth?

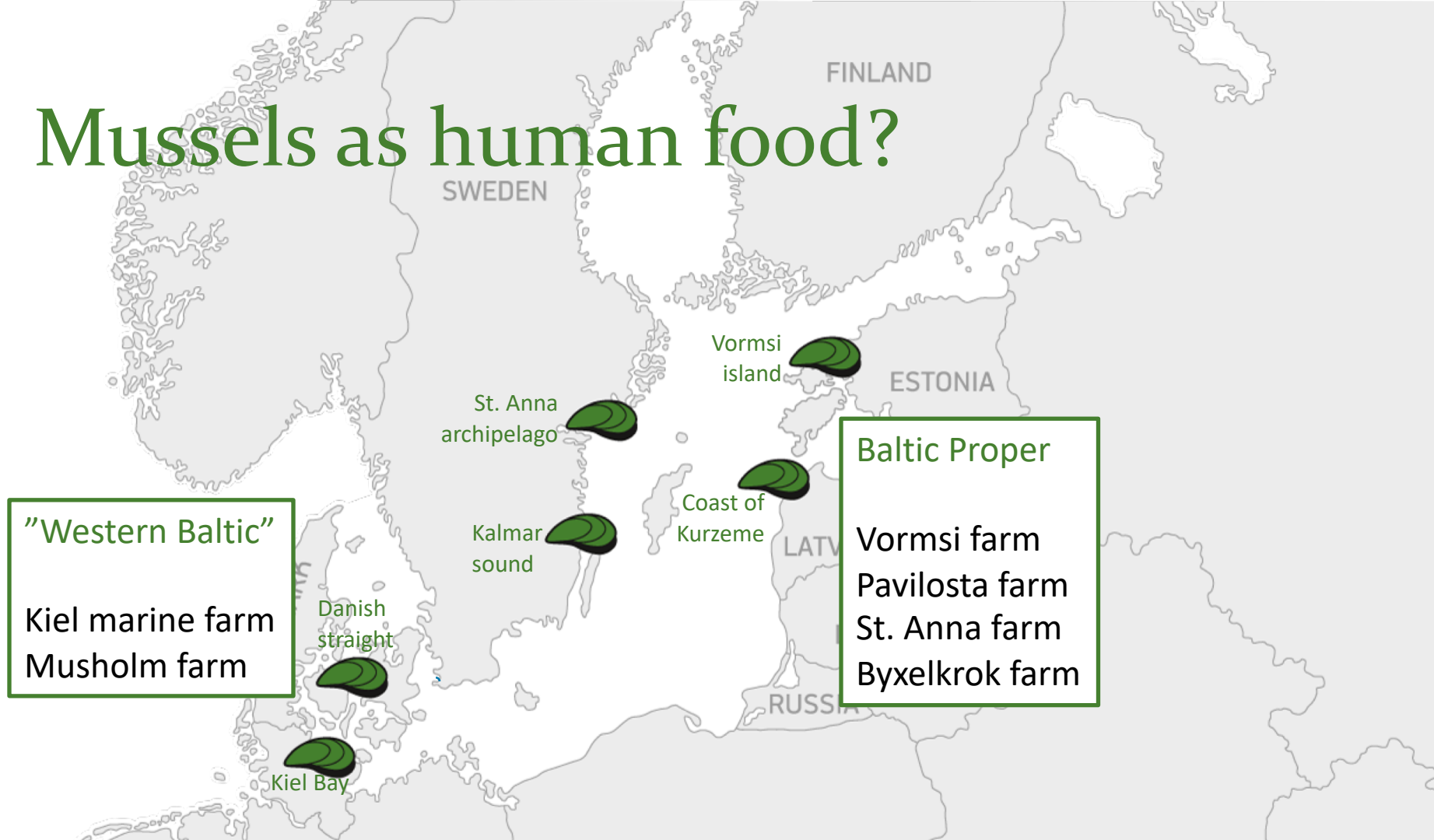
Country-
specific
legislation?

Large
volumes of
bulk
mussels to
take up
nutrients?



Fresh mussels
to the local
restaurant?

Mussels as human food?



- The plankton community (=mussel's food) in the Baltic Proper is different from plankton in the Western Baltic and other more saline areas
- Hence, present food-safety control programs are not adequate for the Baltic Proper
- As a result, *mussels from the Baltic Proper cannot be sold as human food*

Business plan "Kieler Meeresfarm"

Target:
50 tons per year

Pricing:
"High price policy"
Short dealer chain

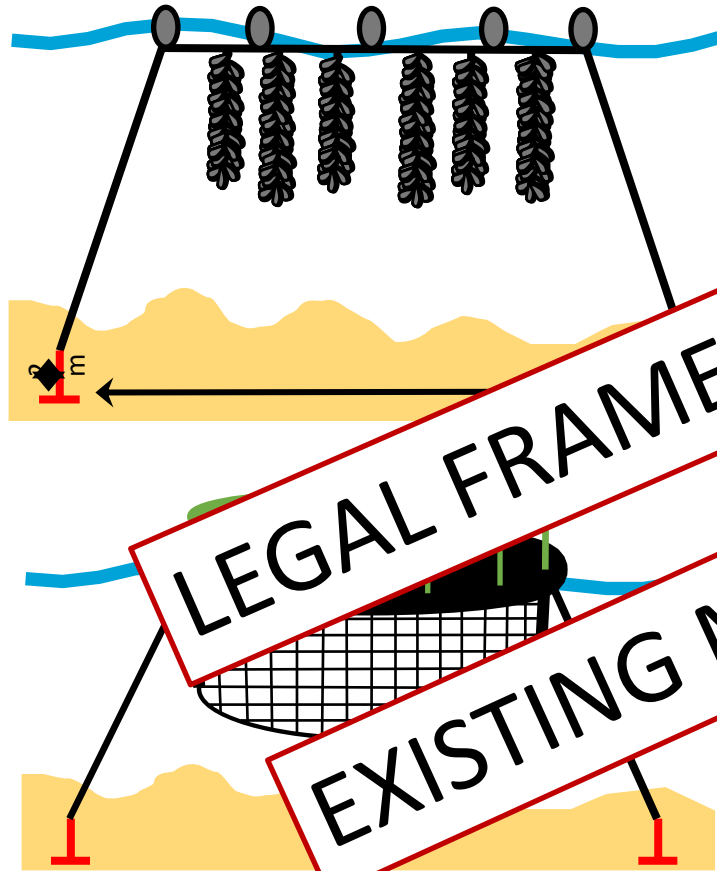


Foto: Lemcke

Products:

- Fresh food mussels (certified organic)
- Processed food-mussels
- Algae for human consumption
- Farmed fish
- Research projects *

Business plan "Kieler Meeresfarm"



Customers:

- Private customers
- Business
- ...

LEGAL FRAMEWORK IN PLACE!

EXISTING MARKET!

Investment

- ... systems
- ... cages
- ... research platforms
- Packaging center

Staff plan:

- 3 full-time employees
 - 2-3 seasonal workers
 - 1 research project manager
- +Additional if needed



Schleswig-Holstein
Ministry for Energy Transition,
Agriculture, Environment,
Nature and Digitalization

Baltic Blue Growth

**Kieler
Meeresfarm**

Examples of two Danish business plans for production of environmental mussels



1. Musholm Fish Farm – business level



Target:

400 ton

NO MARKET FOR 1 CM MUSSELS

LEGAL FRAMEWORK IN PLACE!

Great Belt:

- Rough conditions
- Low production
- Predators

High production costs => net loss

Pricing:

- At present, the 1 cm mussels are given away at a cost

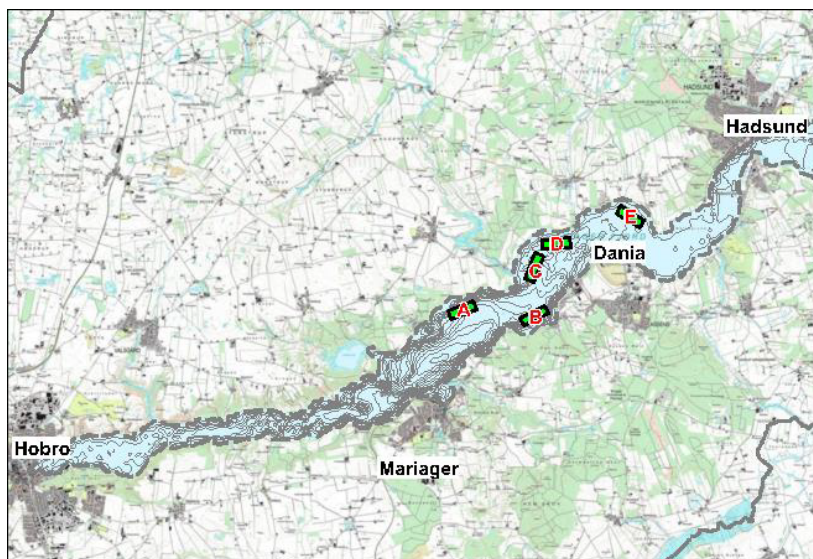
Conclusion:

Strive to legalize "general" compensation, rather than to force compensation measures in rough waters

1 cm mussels, towed to the Limfjord for outgrowth and harvest

Examples of two Danish business plans for production of environmental mussels

Mariager Fjord – governmental level



Annual deficit for the private operator:
1.9 million DKK

Needed pay for the N-removal: € 2.3/ kg N

Target:
2000-2500 ton per
year

Products:

- 112-170 ton N removal per year
- Primarily animal feed
- Smaller amount for human consumption

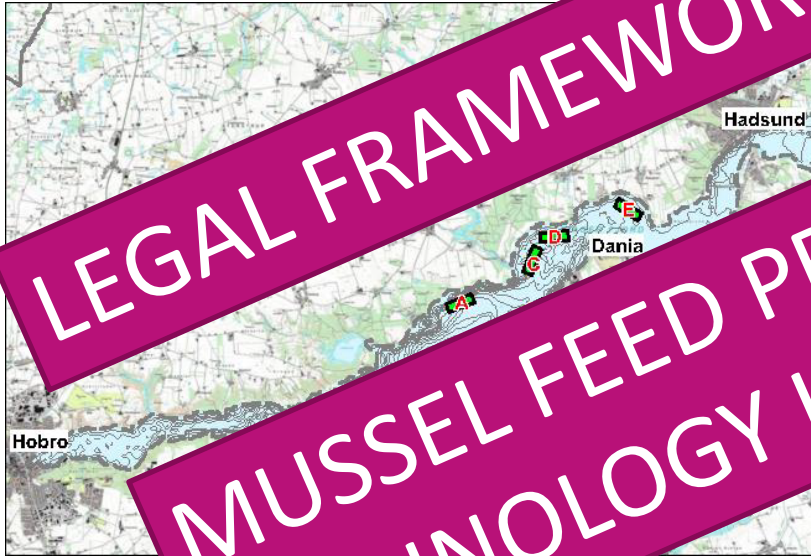
Investments:
100 Smartfarm units
€ 8 170 700

8 new full time jobs, plus
parttime jobs (transport,
processing, sales)

Examples of two Danish business plans for production of environmental mussels



Mariager Fjord – governmental



Grant-based
government

the
d

ment loan from
fund or similar

ent

There are several risks related to the marketing of mussels for this product. no market has yet been established for this product.

The goal of the project is that mussel farming achieves status as a national mitigation tool for nitrogen

Mussel farm business plan for Kalmar, Sweden



St. Anna mussel farm

Customers:

- Municipalities of Kalmar and Västervik
- load according to the local market
- Organic egg and p...

Investments:

- 48 (72*) Longline units
- Work boat and harvester

per year

Pr

removal n

kg P rem

130 000

Mussel harvest does not have the status of a national nutrient mitigation measure in Sweden

Mussels € 0,069/kg

Nitrogen uptake € 19/kg

Phosphorus uptake € 250/kg

Mussel farm business east coast Sweden

Pricing:

- Feed mussels € 0,069/kg
- Nitrogen uptake € 19/kg
- Phosphorus uptake € 250/kg

12 East Swedish municipalities could qualify as “archipelago municipalities”

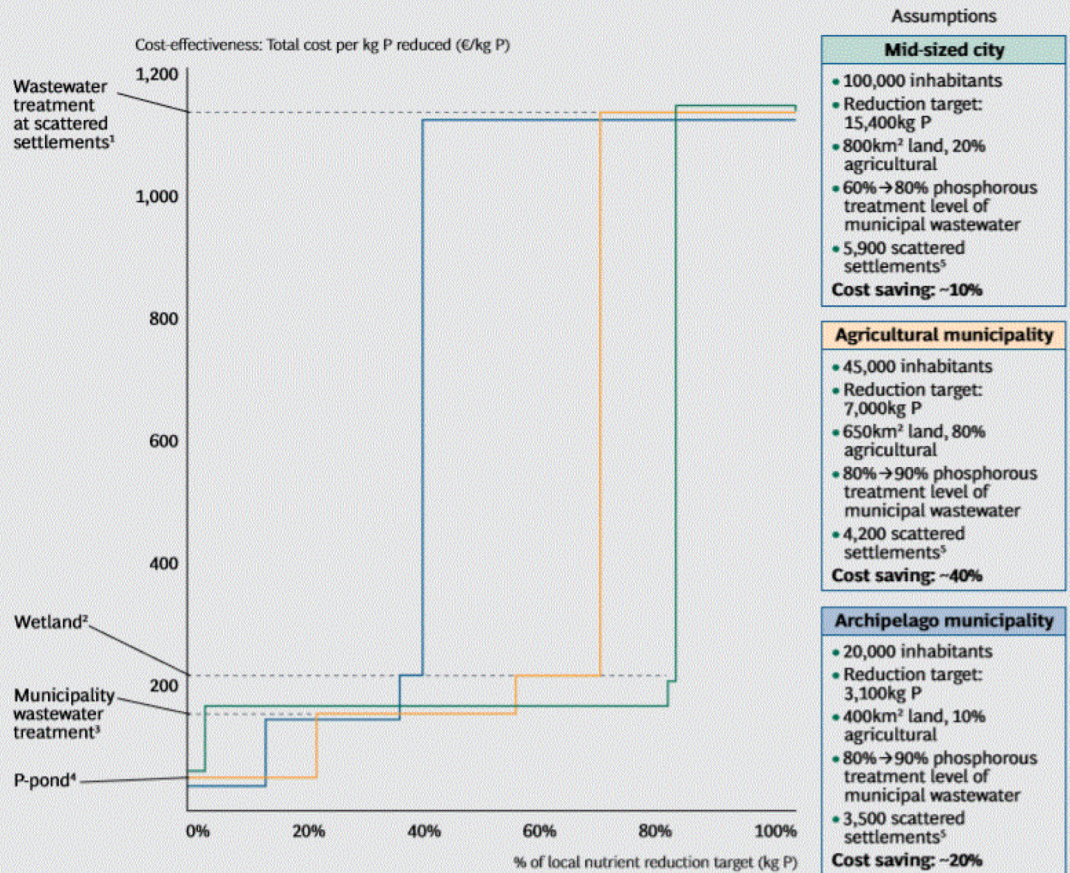
Worst symptoms of eutrophication

Highest economical gain of a better water status

Least space and highest cost for land-based measures

+ BEST potential for mussel farming!

EXHIBIT 18 | Up to 40 Percent Cost-Savings Potential by Using a Structured Approach to Find the Most Cost-Effective Local Combination of Measures



Sources: HELCOM; County administrative board in Västmanland; Swedish water authorities; BCG Analysis.

Note: Reduction targets based on HELCOM CART, 2013. Cost saving = Compared with reaching reduction targets by only leveraging measures for municipal wastewater and scattered settlements.

^{2,3,4}County administrative board of Västmanland — Lillån example, 2013.

⁵Swedish water authorities — Södra Östersjön, 2014.

¹Number of households not connected to the municipality wastewater treatment plant network and with insufficient levels of nutrient treatment of their wastewater.

Marketing aspects of Blue Mussel production in the Baltic Sea



Other potential products:

- insect meal
- soil fertilizer
- mussel shells
- pet food
- mussel fondue
- mussel farms as a tourist attraction



Next project at St. Anna

Analyze of the present situation:

Western Baltic

Long term commercial viability is possible! IF built on:

- Mussels sold as human food
- Mussel as compensatory organisms for fish farming

Things that would improve the business situation for mussel farmers:

- Build-up of mussel feed process
- Mussel farming achieves status as a national mitigation tool

Baltic Proper

Long term commercial viability is NOT possible in most countries. Because of:

- No established market
- National legislations for mussel farming as a nutrient reduction tool are not in place.

Things that would improve the business situation for mussel farmers:

- The same as for Western Baltic
- PLUS an established control program for food mussels!

Ways forward how to reach viable business:

- Mussel farms should achieve the status of national nutrient mitigation tools. Cooperate cross-border to gather knowledge and examples on how!
- Invest, support technical development, certificate labelling and marketing campaigns for mussel meal. It is difficult to compete with today's price on fish meal. But prepare for future shortage!
- Combine the EU control program for food mussels¹ with existing knowledge on cyanobacterial- and other potentially harmful algal blooms in the Baltic Proper. The Swedish guidelines for feed mussel² contain a sampling strategy. Åland already did a proper investigation on the prerequisites and requirements³

¹ EG nr 853/2004; EG nr 854/2004 and EG nr 2073/2005.

² Lindahl, O. 2019. Branschriktlinjer för primärproduktion av fodermussla

³ Linsén J. 2016. Musselodling för livsmedelsproduktion i landskapet Åland, förutsättningar och krav enligt unionslagstiftning

Thank you for your attention!

This work was supported by:

