

LAND MEETS OCEAN, SEPTEMBER 18TH 2020

Increased export values from Norwegian biobased value chains.

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(The NHO project : Roadmap to development of new industries in Norway)

Natural resources

Jared Diamond (2019). *Upheaval, Turning points for nations in crisis*.
Little, Brown and Company

Resources outside 2000 km economic zone that can be exploited by all nations:

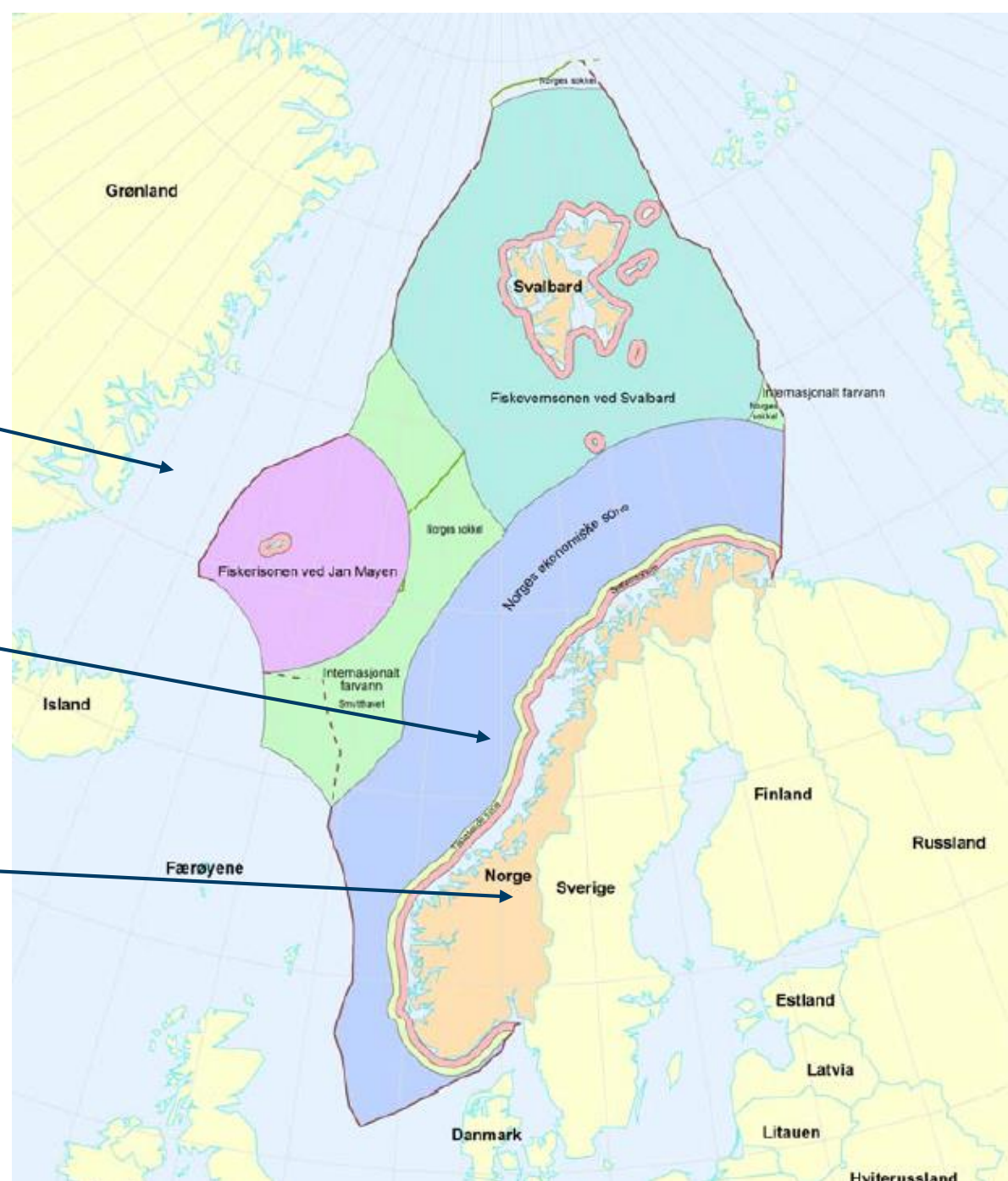
- Fish resources
- Minerals on the sea floor or in the water column
- Fresh water resources in Antarctica

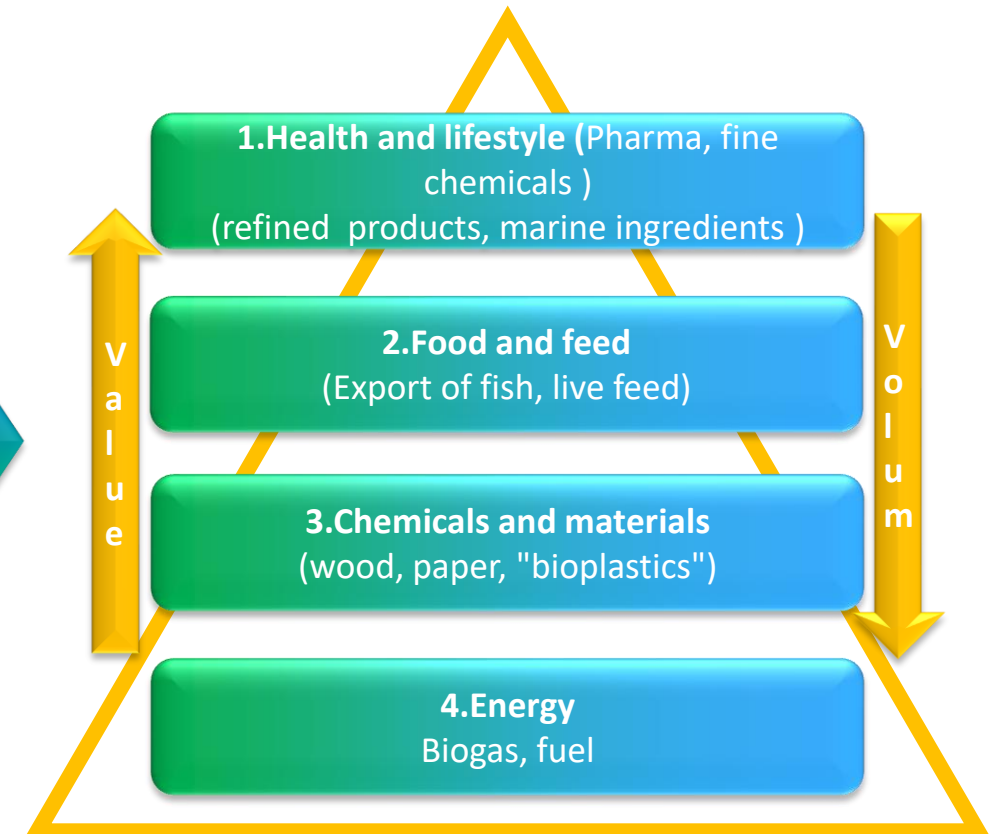
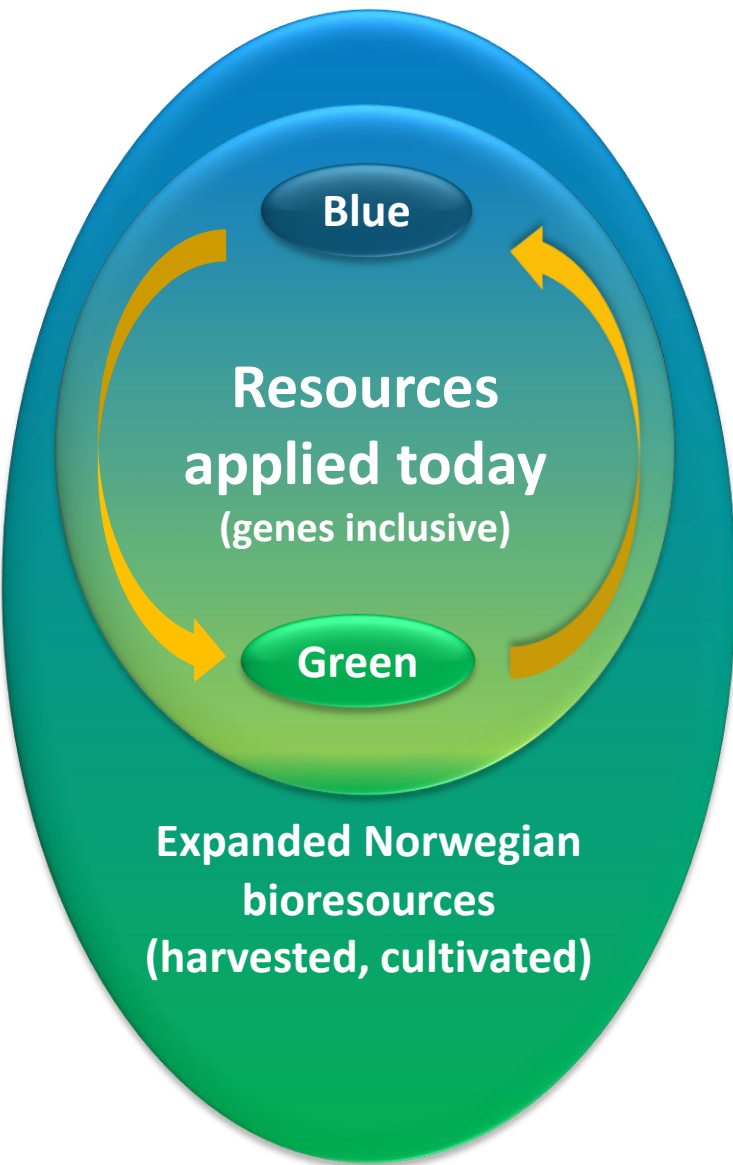
Resources that can be moved and exploited by other nations:

- Fish resources inside the 2000 km economic zone

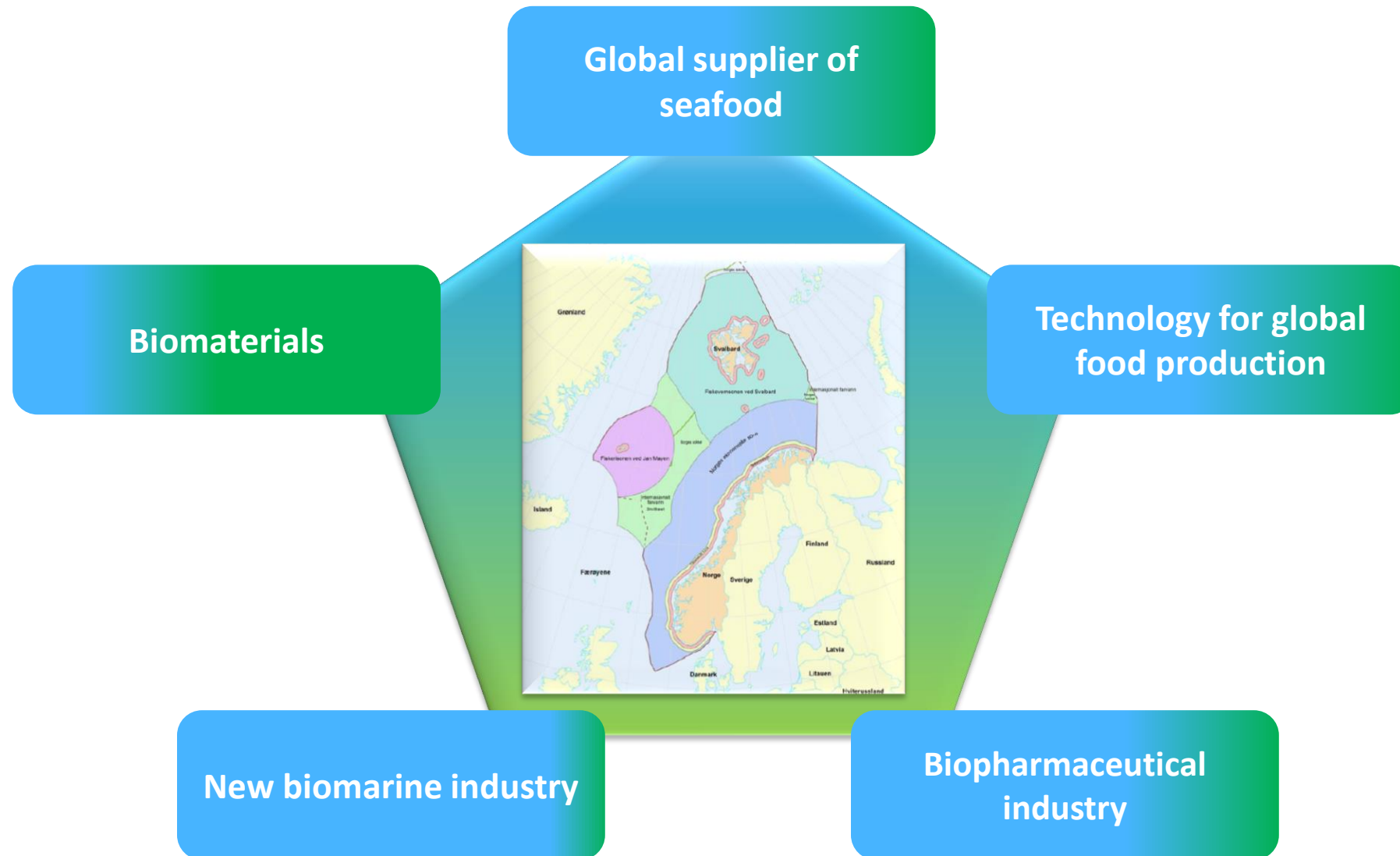
Stationary resources under national control

- Forest, agricultural areas
- Oil and gas
- Minerals
- Fresh water resources
- Aquaculture





Biobased value chains



1. Global supplier of seafood

Why increase food production from the sea?



Total bio-
production
50/50



Human
consumption
98/2

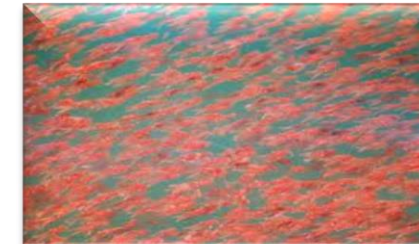
Water



Energy



Temperature

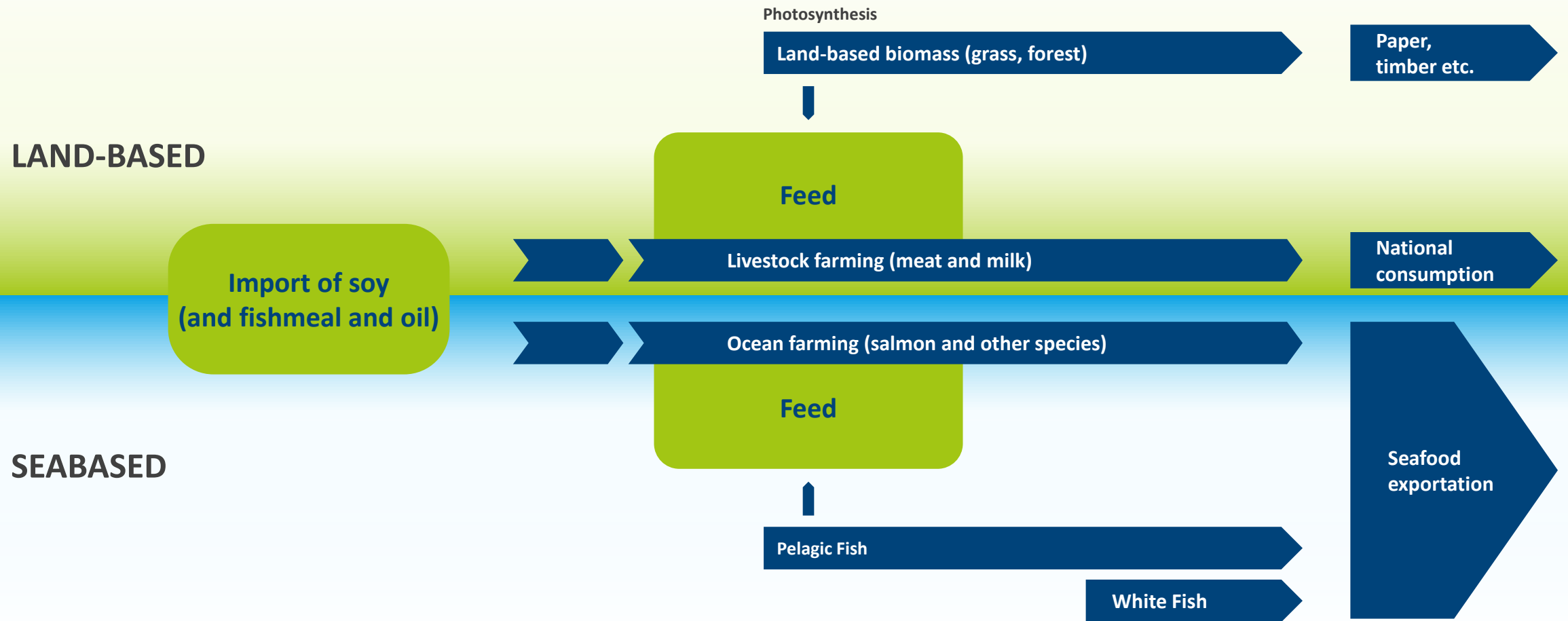


Seafood production contribution to solve the climate challenge

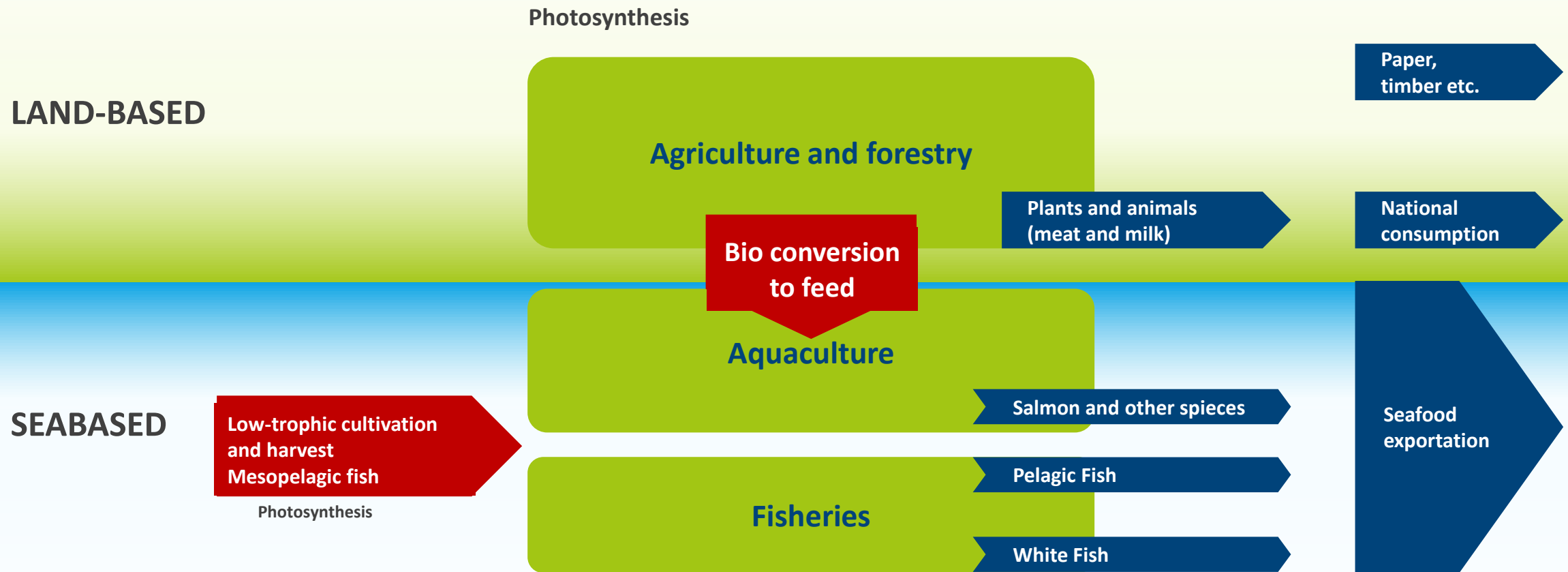


High level panel for a sustainable ocean economy (2019)

Today's Situation



Norway as Global Food Supplier



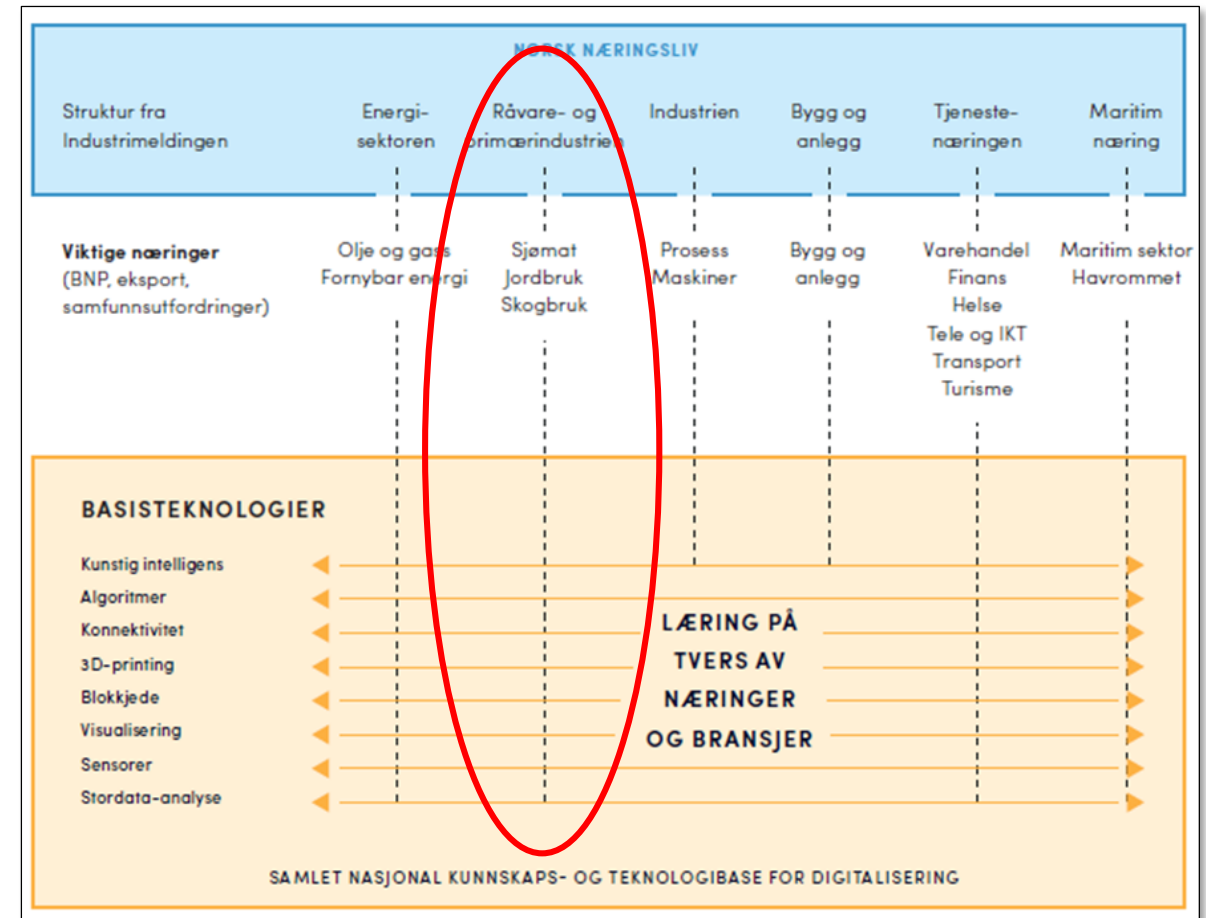


2. Biomaterials

- Forest harvest and processing
 - Increase a sustainable harvest of Norwegian forest in a sustainable way.
 - Develop today's and tomorrow's industry (downstream and biorefining)
- Polymer production
 - Cellulose, alginate, chitin, collagen

3. Supplier industry

- Suppliers to the fisheries and aquaculture industry
 - Competitive home market . "Cross-over"
 - Expanding export industry
- Suppliers to agriculture and forestry
 - Precision agriculture
 - Advanced "kupert-landskap-småskala-teknologi" agriculture.



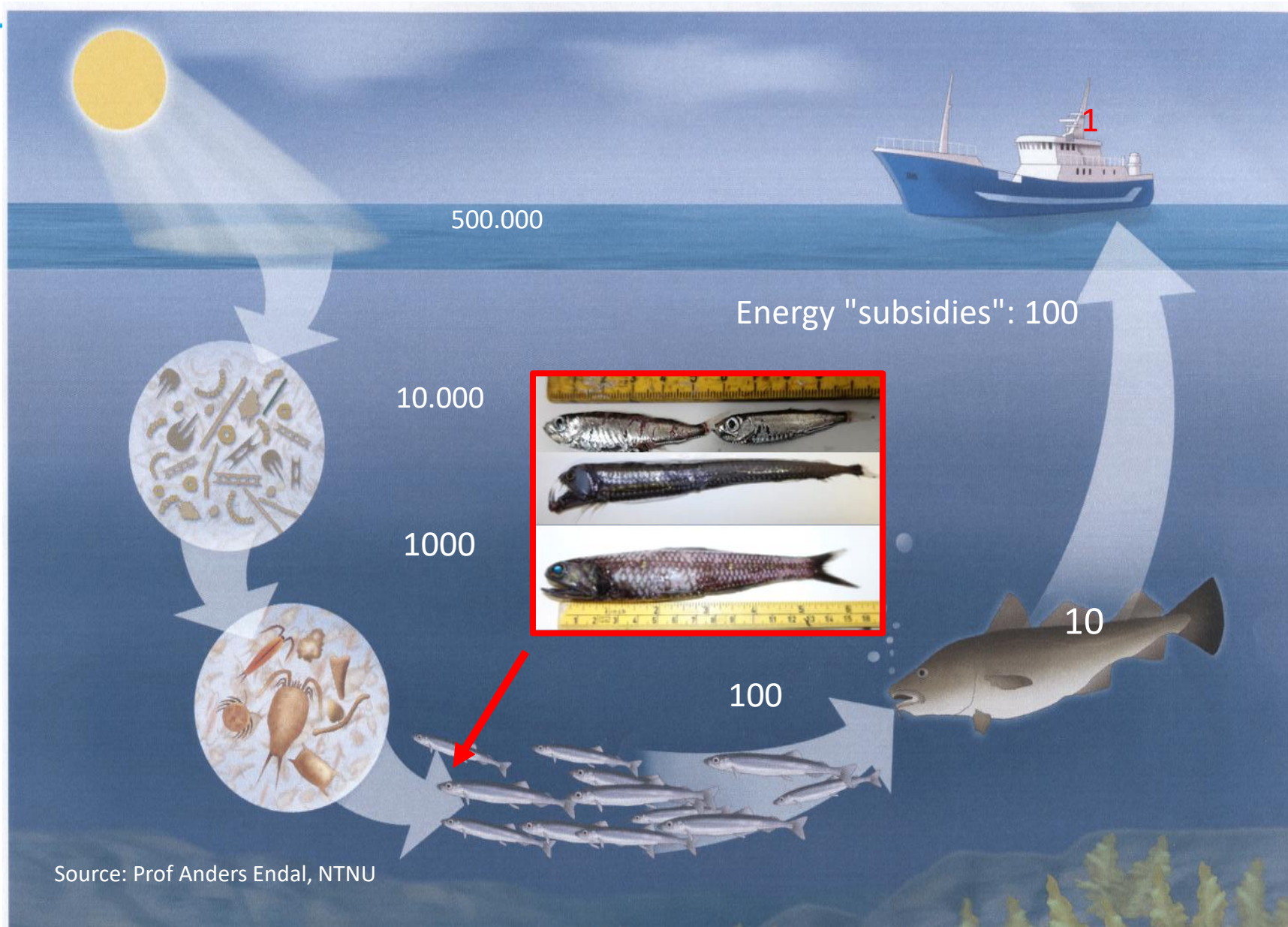
4. New biomarine industries

- Seaweed
 - Large areas
 - Fixation of CO₂
- Cultivation and harvest on lower trophical levels
 - Upwelling, intensive/exstensive production
- Mesopelagic fisheries



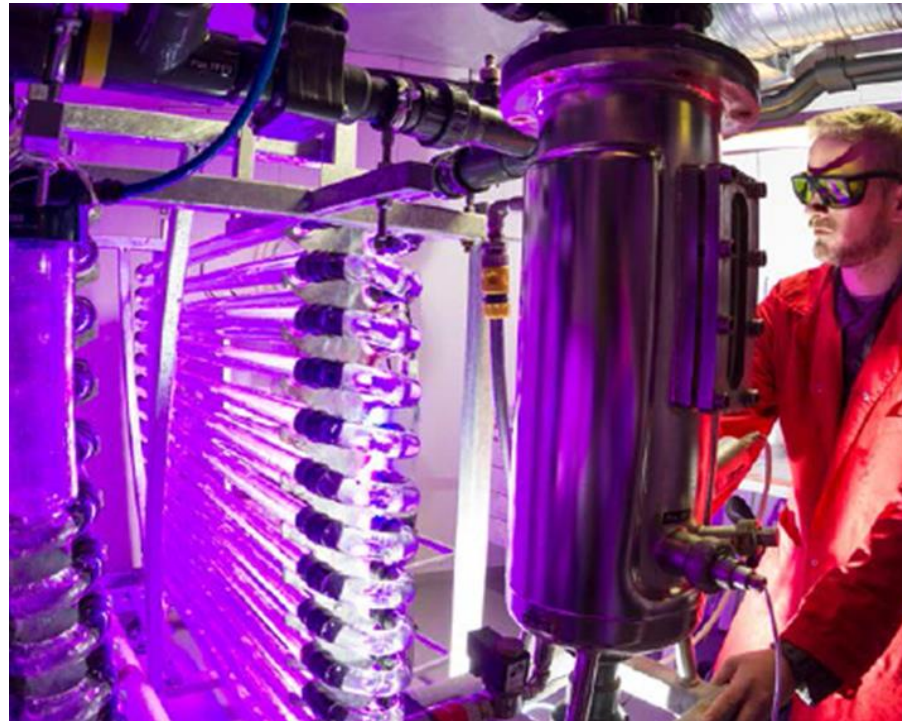
Photo: Tora Bardal, N

Energy in the food chain

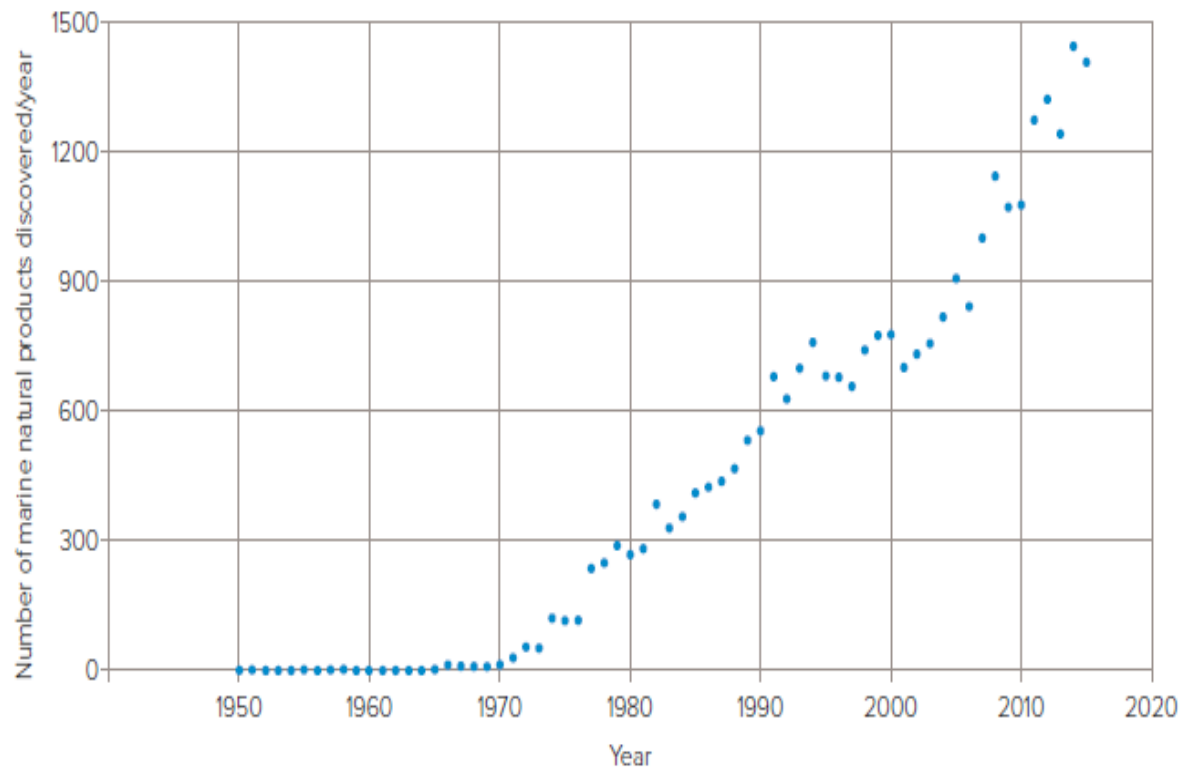


5. Biopharmaceutical industry

- Marine ingredient production.
- Application of microorganisms and enzymes in processing and value adding of bioresources in a variety of products
- Development of a Norwegian pharmaceutical industry
- Bioprospecting of marine microorganisms



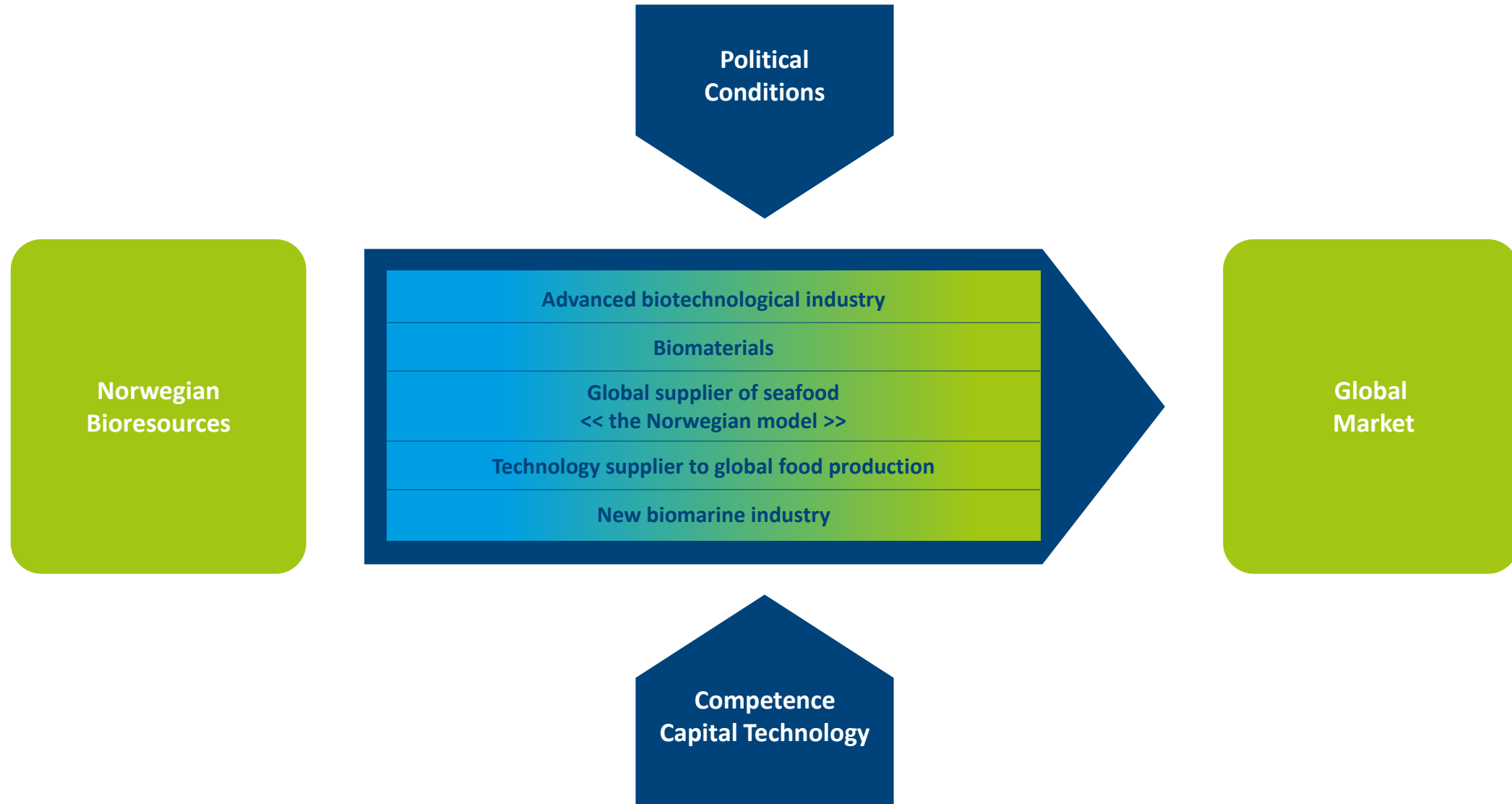
New products from marine raw materials



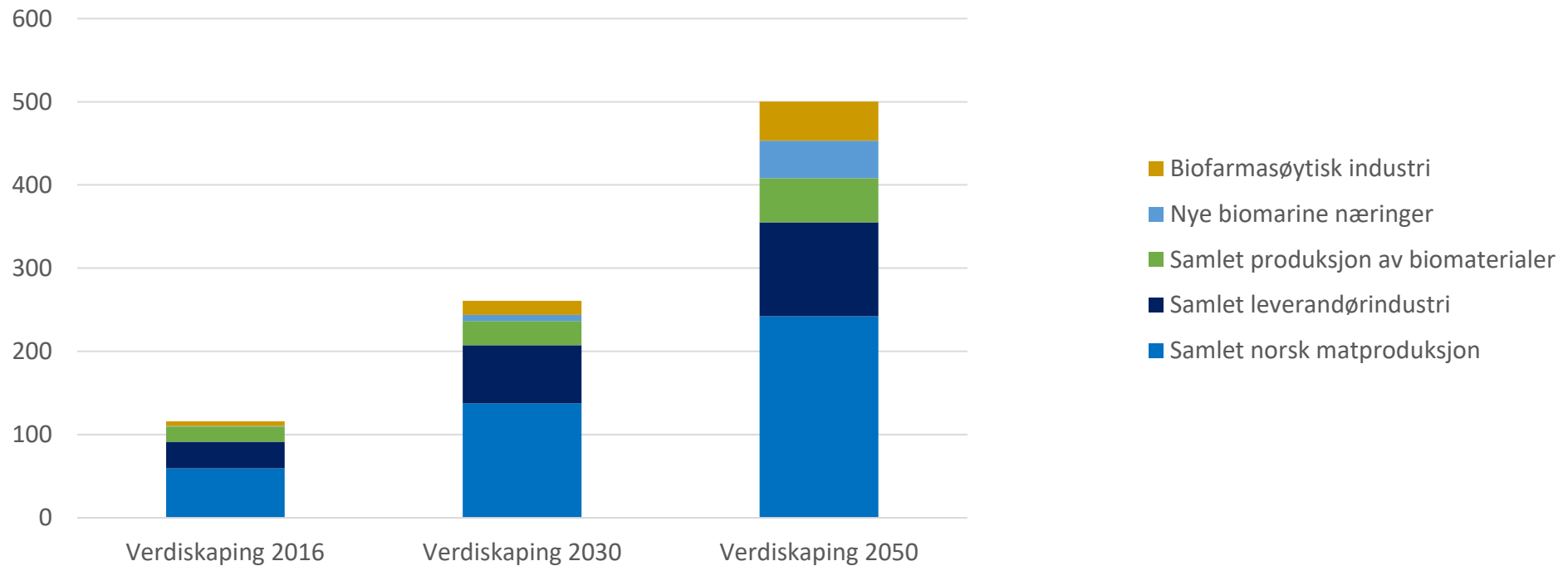
Source: RSC MarInLit database, February 2017.



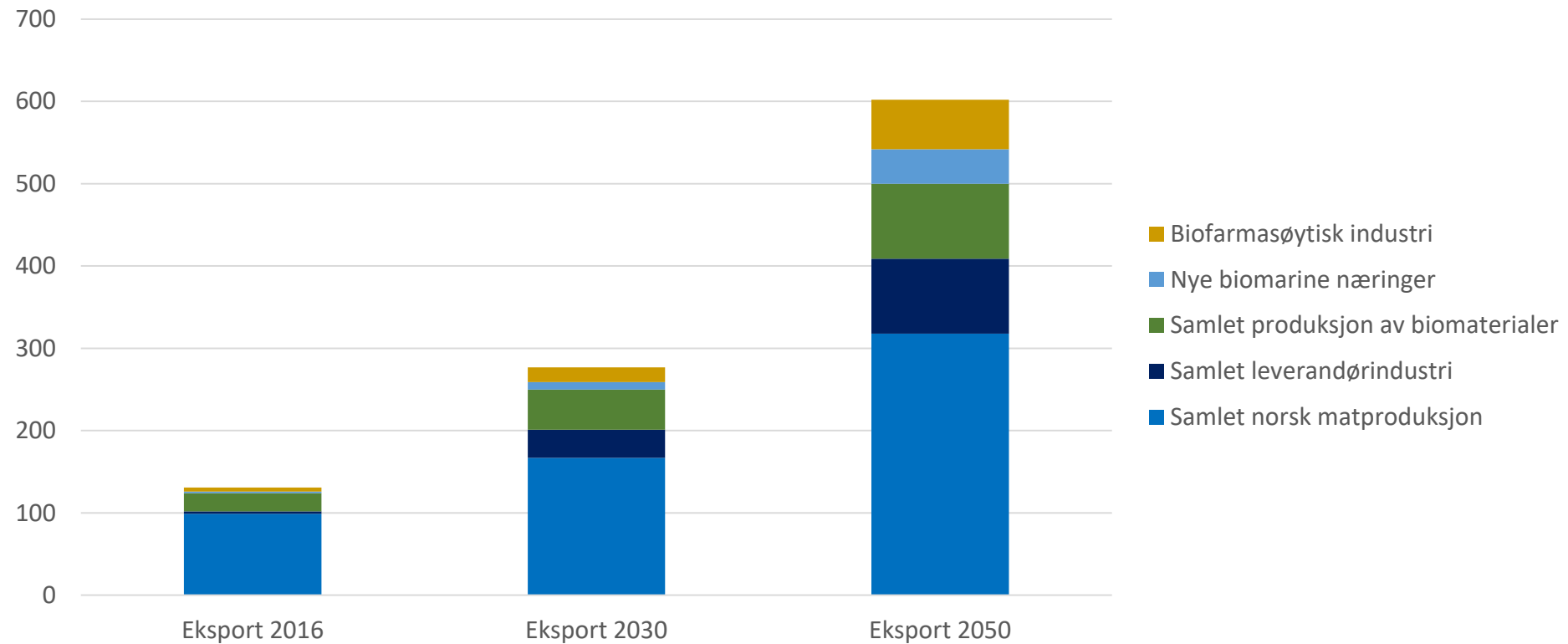
Biobased value chains



Value creation potential from biobased value chain (MRD NOK)



Export potential from biobased industries (MRD NOK)





Teknologi for et bedre samfunn