Ongoing macroalgae projects in Norway

Algae Conference Bodø 2012

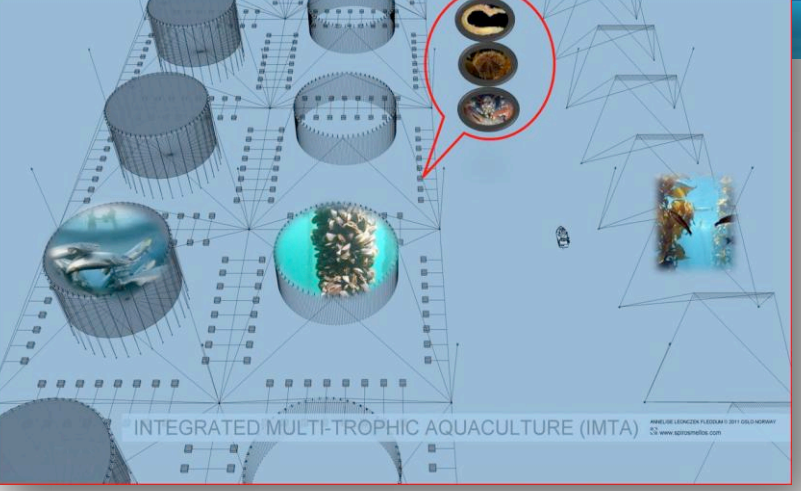
Anne Lise Leonczek
Bellona

From Pollution to Solution

Photo: Bellona

How does Bellona work?

Bellona offices and representatives



Integrated Multitrophic Aquaculture

Madagascar Algae Project

BELLONA

Ocean Forest Project

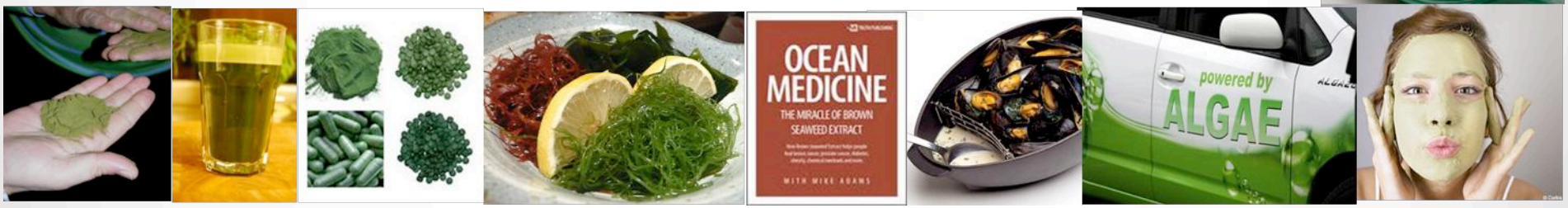
Sahara Forest Project

Why cultivate algae in Norway?

- Norway has a long coastline and good natural conditions for Aquaculture
- We already have an infrastructure for receiving, transporting and processing seaweed
- There is a large, untapped potential in marine raw materials and there are many exciting new opportunities

Large potential for raw products

- Algae has a huge potential to produce:
  - Employment
  - Food for humans and animals
  - Omega 3
  - Medicine
  - Bioenergy
  - Other products



Large product diversity!

On-going macroalgae projects in Norway

- No commercial cultivation of macro algae in Norway
- Small number of pilot projects
- Few Research projects

The ECORAIS Project 2009-2012

Cultivate: *Saccharina latissima*, *Palmaria palmata*

Hardangerfjorden

Use of results: Describe ecosystem responses to aquaculture induced stress, evaluate algae as bioindicator for waste discharges

Partners: IMR-Institute of Marine Research, NIVA-Norwegian Institute for Water Research, UniResearch

Financed by: The Research Council of Norway

Photo: Linda Skryseth , NIVA

Macroalgae Project in Solund, Sognesjøen

Cultivate: *Saccharina latissima*, *Laminaria hyperborea* and *Laminaria digitata*

Outside a fish farm in Sognesjøen

Use of results: To utilise protein

Partners: Salmon Group, Sulefisk, Hortimare and Innovasjon Norge

Photo Øyvind Kråkås

From biomass to biogas – an integrated approach towards sustainable recovery of energy and nutrients (2009-2013)

Cultivate *Saccharina latissima.* (Seaweed only small part of the project)

Frøya Taraskjæret, Frøya Hammarvik, Beijan and Storfosna

Use of results: Energy and nutrition

Partners: Norwegian University of Life Sciences (UMB), CAMBI AS, and Seaweed Energy Solution AS (SES)

Financed by: Seaweed Energy Solution AS (SES), Hafslund, Cambi AS and The Research Council of Norway

Photo SES

SEAWEEDTECH – Development of technology for large scale seaweed cultivation (2011-2013)

Cultivate *Saccharina latissima*

Frøya Taraskjæret, Frøya Hammarvik, Beijan and Storfosna

Use of results: confidential project ("BIP")

Partners: SES, Aqualine, Winds Enterprises, Stolt Sea Farm, SINTEF Fisheries and Aquaculture, NTNU- Norwegian University of Science and Technology, CIIMAR-Centre for Marine and Environmental Research (Portugal)

Financed by: SES, Aqualine, Winds Enterprises, Stolt Sea Farm, Statoil and The Research Council of Norway

Photo SES

SEABREED – Industrial seedling production for large scale offshore cultivation process" (2011-2013)

Cultivate *Saccharina latissima*

Frøya Taraskjæret, Frøya Hammarvik, Beijan and Storfosna

Use of results: Confidential project ("BIP")

Partners: SES, Winds Enterprises, Stolt Sea Farm, SINTEF Fisheries and Aquaculture, NTNU- Norwegian University of Science and Technology, CIIMAR-Centre for Marine and Environmental Research (Portugal)

Financed by SES, Winds Enterprises, Stolt Sea Farm and The Research Council of Norway

Photo SES

EUROSTARS : SEAWEED-STAR Development of offshore cultivation of seaweed (2011-2013)

Cultivate *Saccharina latissima*

Frøya Taraskjæret, Frøya Hammarvik, Beijan and Storfosna

Use of results: Confidential project to be explored by SES and business partners

Partners: SES, Aqualine, Stolt Sea Farm, Winds Enterprises, SINTEF, NTNU- Norwegian University of Science and Technology and CIIMAR-Centre for Marine and Environmental Research (Portugal)

Financed by: SES, Aqualine, Stolt Sea Farm, Winds Enterprises, Eurostars (EU finding agency)

Photo SES

The DYMALYS project 2012-2014

Cultivate *Saccharina latissima*

Måkasteinen, Bakken, Gråtnes, outside the hatchery in the Lysefjord

Partners: Lerøy, Bellona, Blue Planet, IVAR, Rogaland Forsk, Rogaland fylkeskommune, Biotec, Sylter Algenfarm, Lysefjorden Forskningsstasjon

Use of results: Biogas, human and animal food

Financed by: Lerøy, Rogaland Fylkeskommune, Ryfylkefondet

Photo Leonczek & Lerøy

Macrobiomass 2010-2012

Cultivate: *Saccharina latissima* and *Alaria esculenta*

Trøndelag, Fosna, Ørlandet and Rogaland

Partners: SINTEF Fisheries and Aquaculture, Sylter Algenfarm, Marifood, University of Oslo

Use of results: Bioetanol

Financed by: The Research Council of Norway and Natur og Næring

Photo Sintef

The EXPLOIT project 2012-2015

Cultivate: *Saccharina latissima*

Outside a fish farm in the Hardangerfjord

Partners: SINTEF Fisheries and Aquaculture, IMR-Institute of Marine Research, NTNU-Norwegian University of Science and Technology, and BELLONA

Use of results: Evaluate the full scale potential of IMTA (Integrated Multitrophic Aquaculture)

Financed by: The Research Council of Norway

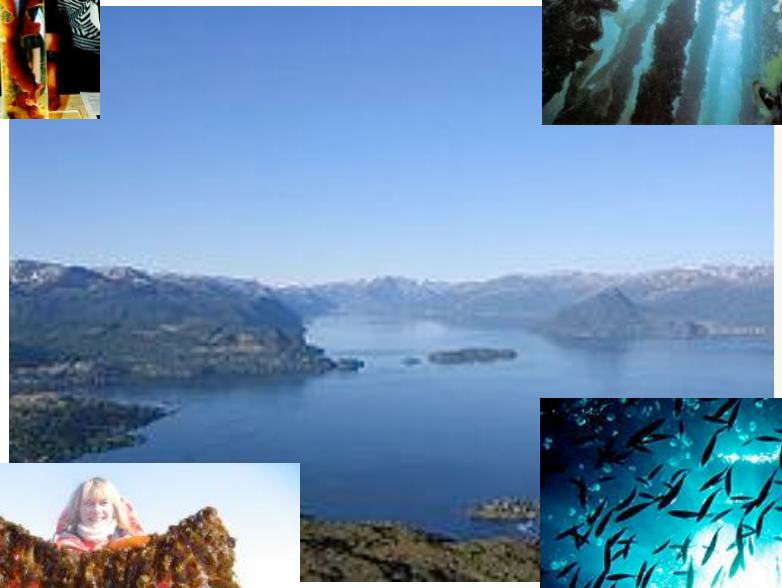


Photo Sintef

Conclusion

- Norway has a long coastline and good natural conditions for growing macroalgae
- There a few pilot projects but no commercial macroalgae production
- We have not taken advantage of our resources
- To do this, we need more collaboration between stakeholders, researchers, politicians, business and Industry