

Klima og fremtidsrettede teknologiske løsninger
Trude Olafsen, 18.11.2015

AKVA group – uniquely positioned for further growth

- Leading technology solutions and service partner to the global aquaculture industry
- Global presence - subsidiaries in 8 countries
- 690 employees
- Listed at OSE
- Revenues of NOK 1,3bn, EBITDA of NOK 103m in 2014
- Market cap of NOK ~ 1 billion

1 Cage based



Plastic and steel cages



Infra-structure



Feed systems, sensors and cameras

2 Land based



Land based facilities



Land based equipment

4 Software



Software

3





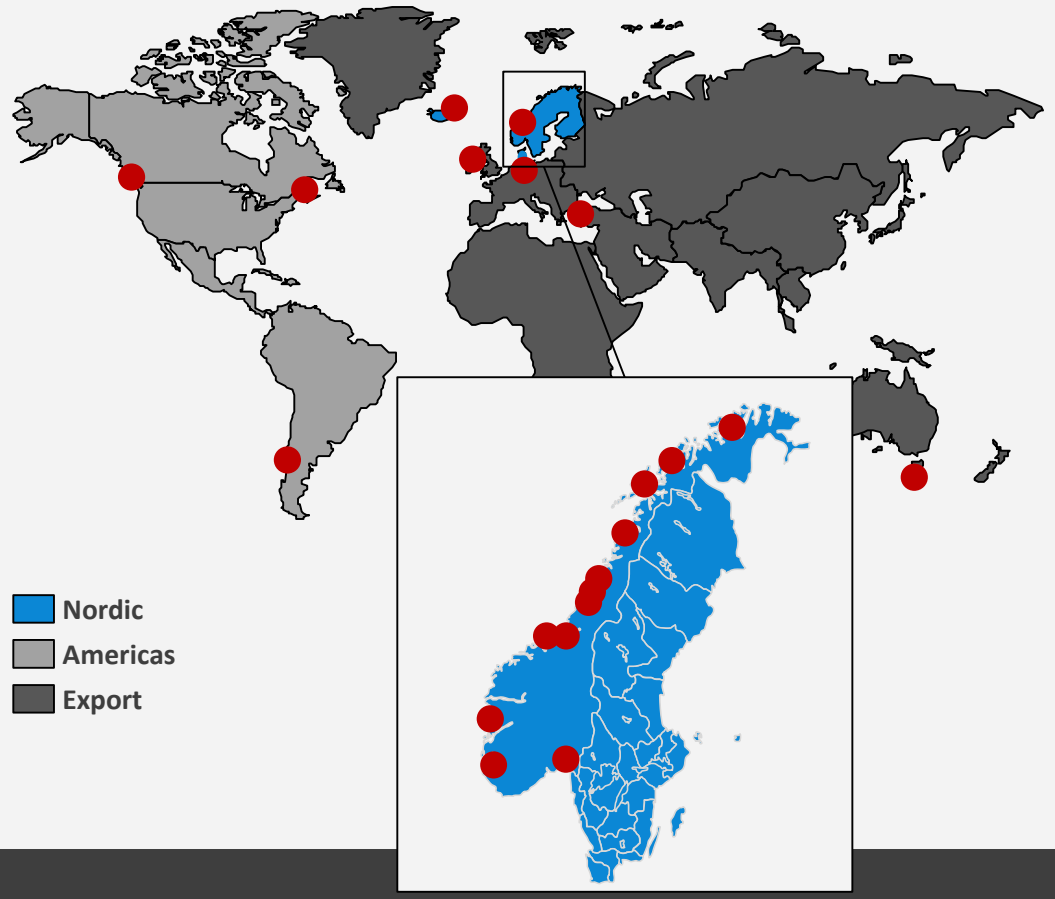




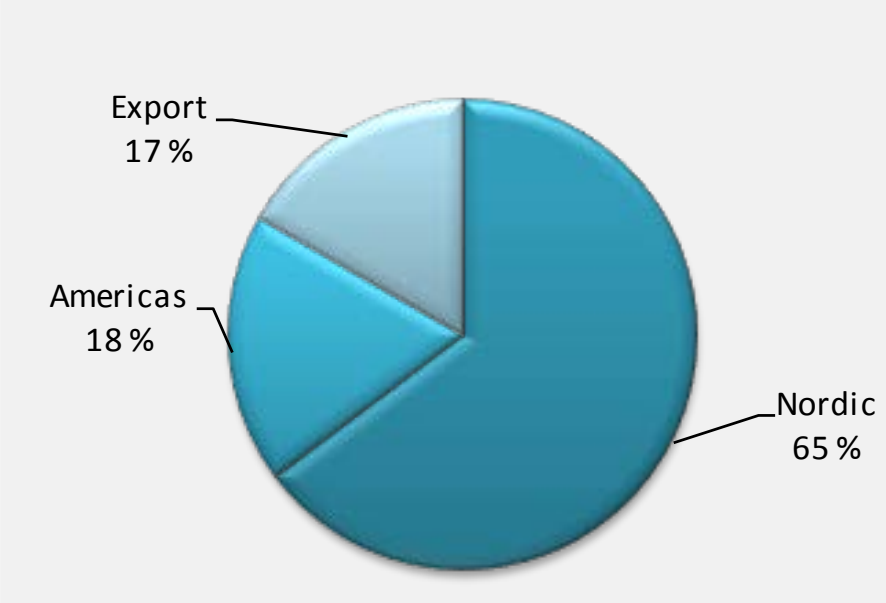
Technology and farming services

Presence in all main farming regions

Map of activities

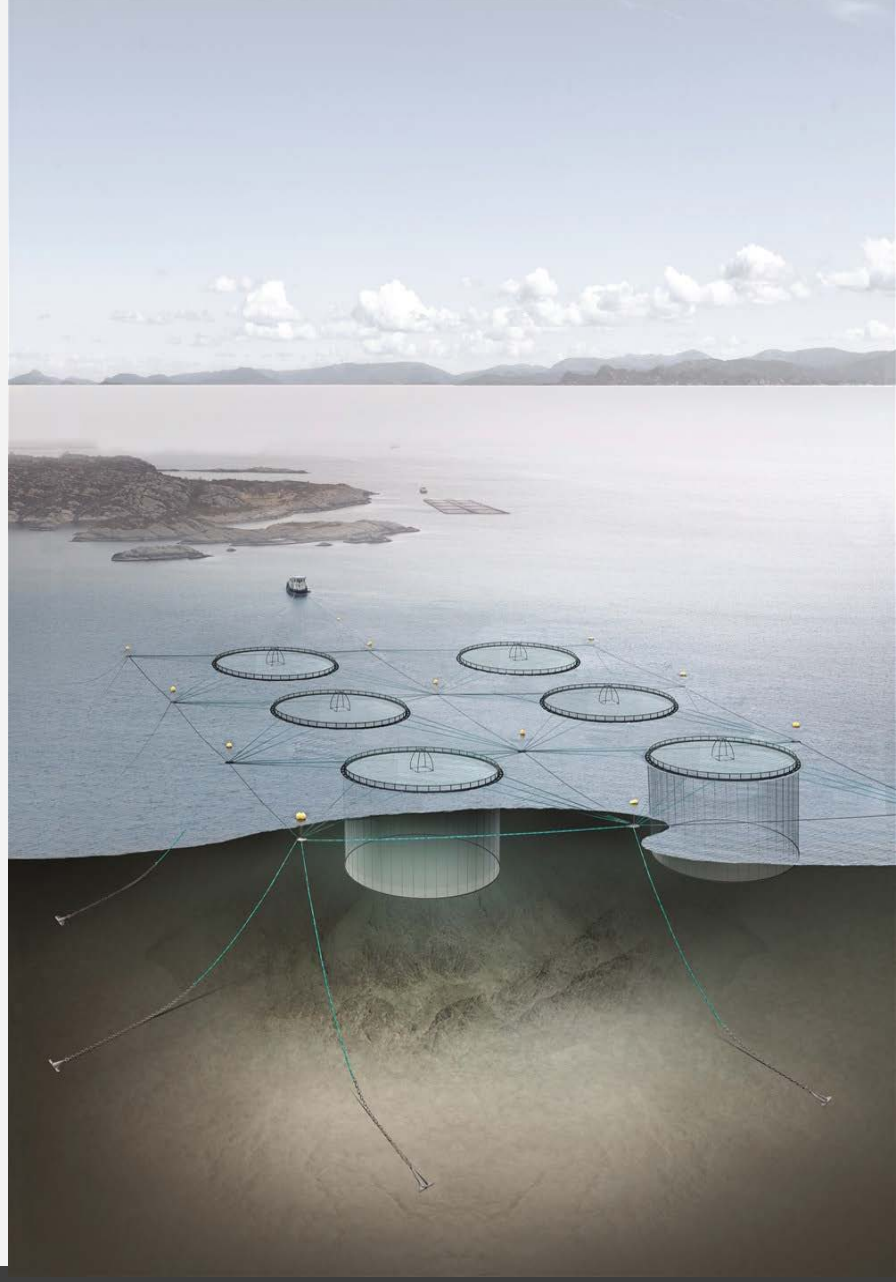


Revenue per region, Q3 2015



To tilnærminger

- Bidra til reduksjon i klimagassutslipp fra «egen» verdikjede
- Bidra til å gjøre selve oppdrettsproduksjonen mer klimavennlig



«The big picture»

LIVESTOCK: A SIGNIFICANT CONTRIBUTOR TO CLIMATE CHANGE

With emissions estimated at 7.1 gigatonnes CO_2-eq per annum, representing 14.5 percent of human-induced GHG emissions, the livestock sector plays an important role in climate change.

Beef and cattle milk production account for the majority of emissions, respectively contributing 41 and 20 percent of the sector's emissions. While pig meat and poultry meat and eggs contribute respectively 9 percent and 8 percent to the sector's emissions. The strong projected growth of this production will result in higher emission shares and volumes over time.

Kilde: FAO, 2013



NATURE | NEWS

One-third of our greenhouse gas emissions come from agriculture

Farmers advised to abandon vulnerable crops in face of climate change.

Natasha Gilbert

31 October 2012

Rights & Permissions

The global food system, from fertilizer manufacture to food storage and packaging, is responsible for up to one-third of all human-caused greenhouse-gas emissions, according to the latest figures from the Consultative Group on International Agricultural Research (CGIAR), a partnership of 15 research centres around the world.

In two reports published today[1,2], the CGIAR says that reducing agriculture's carbon footprint is

A. Sacks/Getty

Agricultural production is the main emitter of carbon dioxide in the global food system.

Kilde: Nature, 2012

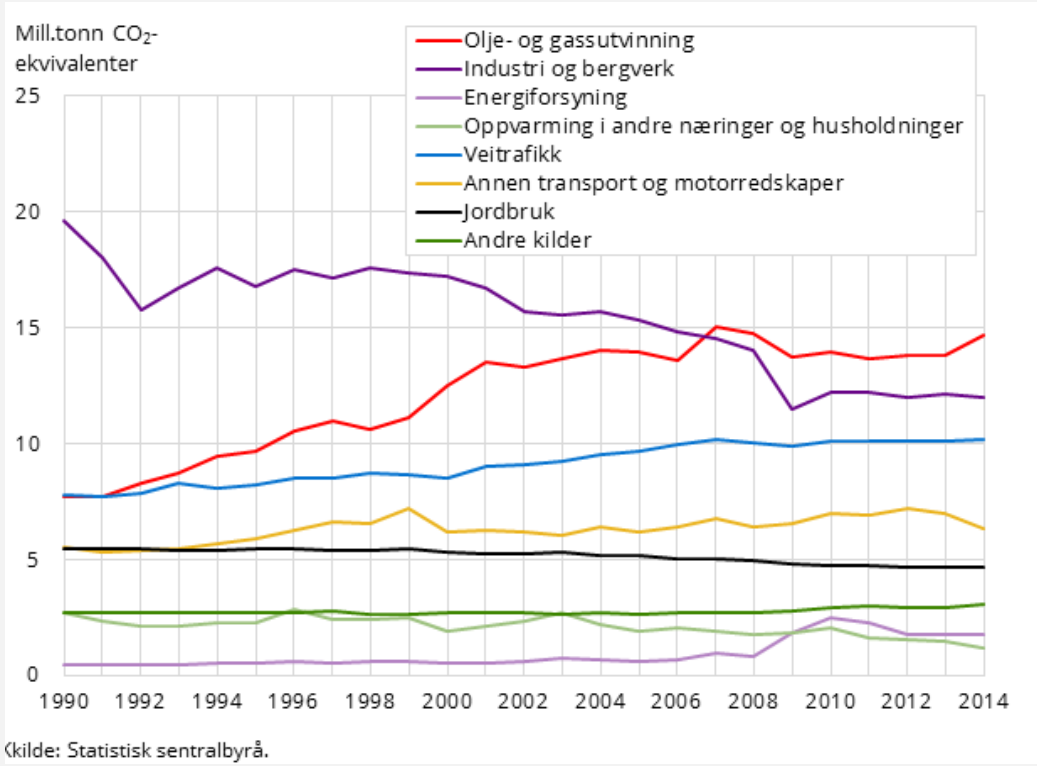




Utslipp fra egen produksjon

- Relevans for AKVA group
- Transport, industri, energi
- Hvor er leverandørenes forbedringspotensial størst?

Innenlandske utslipp av klimagasser, etter kilde



Kilde: Statistisk sentralbyrå.

Merdenes livsløp



Polyetylen produksjon

- Granulat
- Basert på naturgass
- Borealis, Stenungsund
- Togtransport til Mo i Rana



Helgeland Plast

- Heleid av AKVA group
- Merder, fôrslanger, rør, flytebrygger, båter
- ISO 14001, ISO-EN 9001: 2008, NS-EN 12201



Merder i bruk

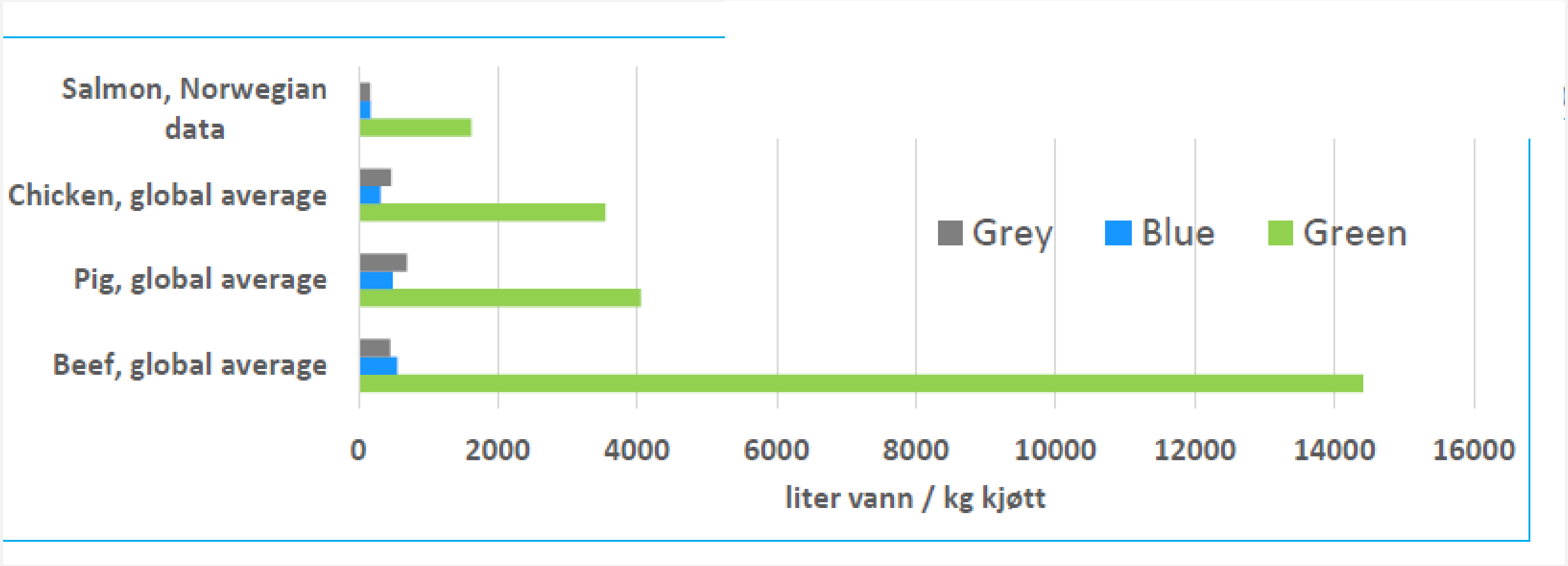
- Levetid ca 20 år?
- Vedlikehold i form av spyling, ellers lite
- Mange markeder



Gjenvinning

- Avtale Nofir/Containerservice Ottersøy
- Innsamling, oppmaling, granulering, gjenbruk
- Nye produkter, forbrenning, ikke merder

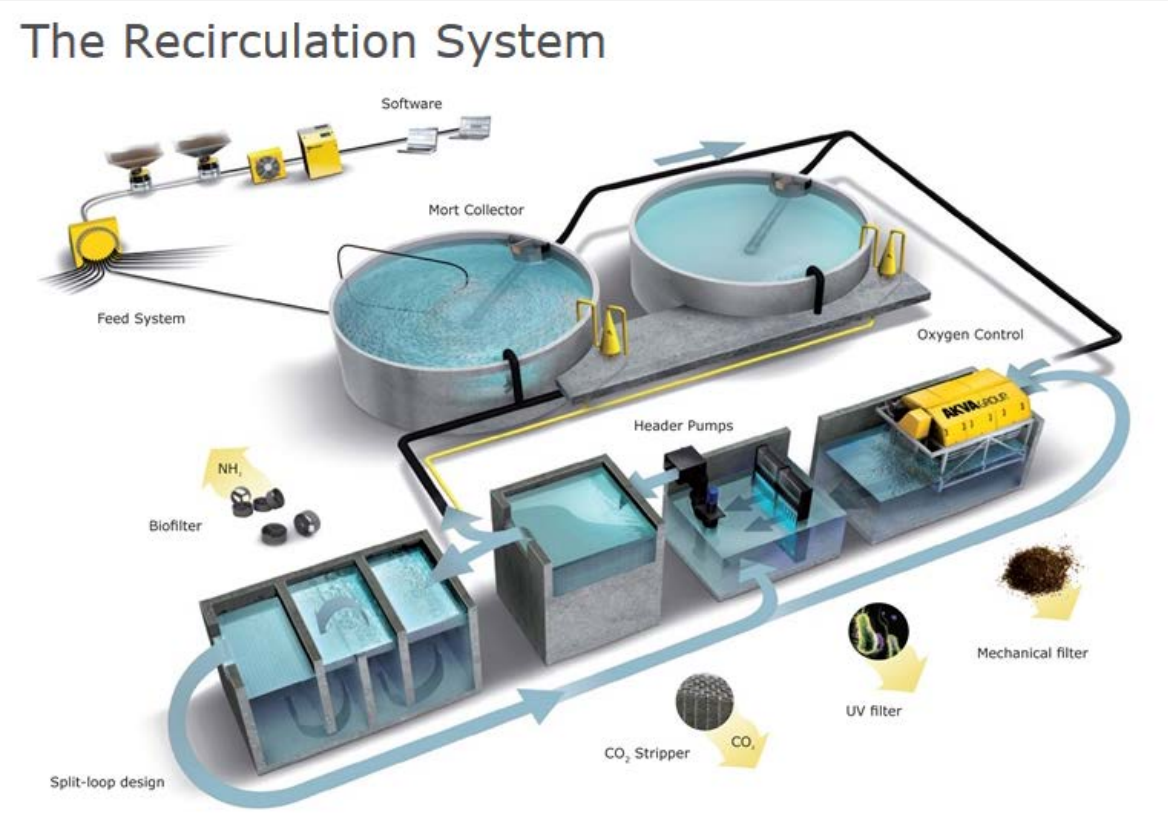
Vannforbruk



Kilde: SINTEF Fiskeri og havbruk

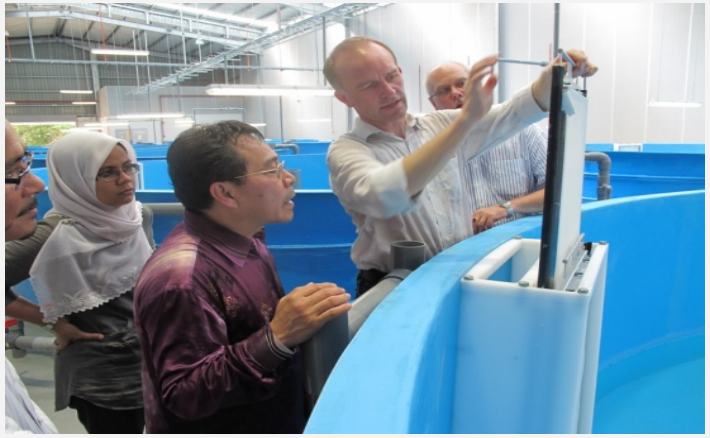
Resirkuleringsanlegg

- Over 90 % resirkulering av vannet
- Produksjon av fisk i områder uten store vannressurser
- Nærhet til store markeder
- Unngå flytransport av fersk fisk
- Kontroll på slammet
- Gjødsel, forbrenning
- Ikke god nok løsning



RAS eksempel: Rompin Marine Hatchery, Malaysia

- Department of Fisheries Malaysia - 2010
- Sikre produksjonen av nok yngel
- 5 million yngel pr år – seabass, barramundi, grouper etc.





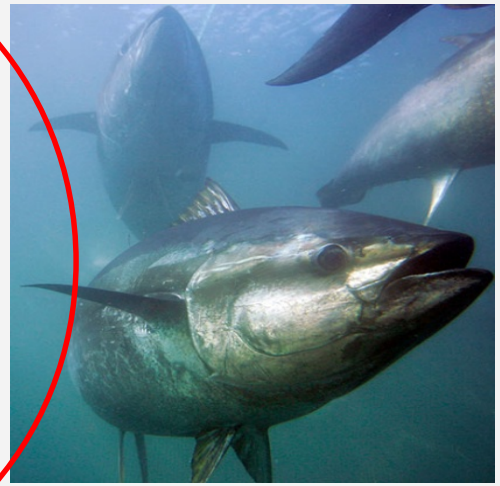


RAS eksempel 2: Clean Seas Bluefin Tuna, Australia

- The Stehr Group, Clean Seas Ltd., Australia
- Produksjon av bluefin tuna yngel





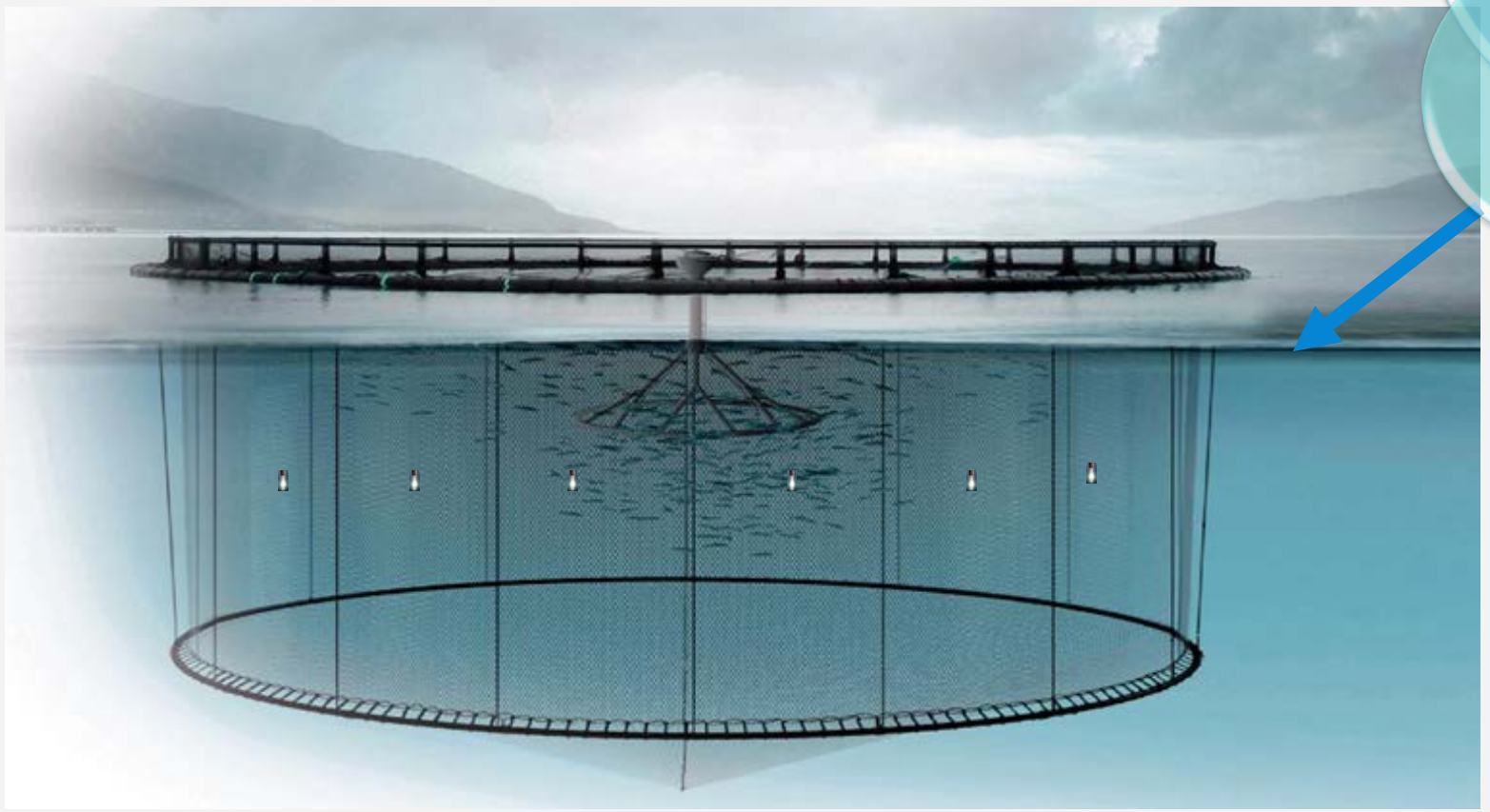


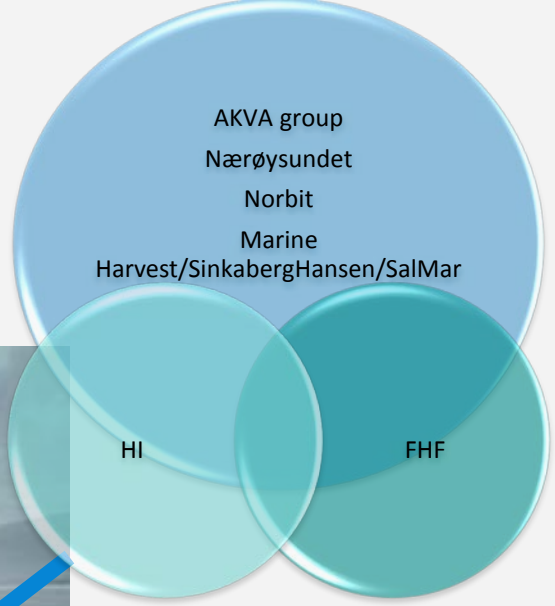


Tilpassende teknologi



Produksjon i dypet

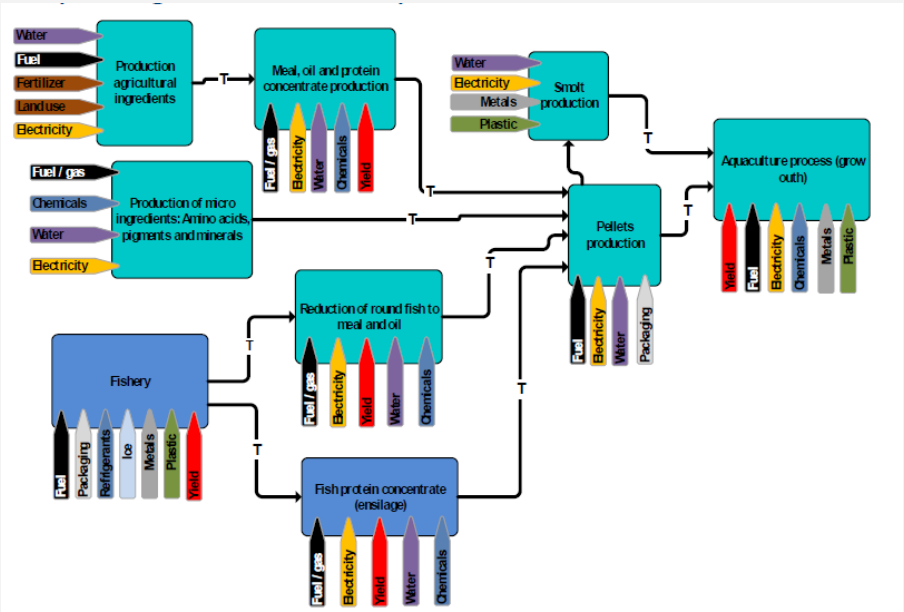






Livsløpsanalyse for leverandører?

- LCA av norsk lakseproduksjon 2010 og 2013
- **Systemgrenser**: Fra utvinning av råvarer til fôringredienser og frem til slakteklar laks – Funksjonell enhet: Resultater gitt per kilo slakteklar laks i levende vekt ved merd kant.



Kilde: SINTEF Fiskeri og havbruk

Forbedringspotensialet for leverandører?

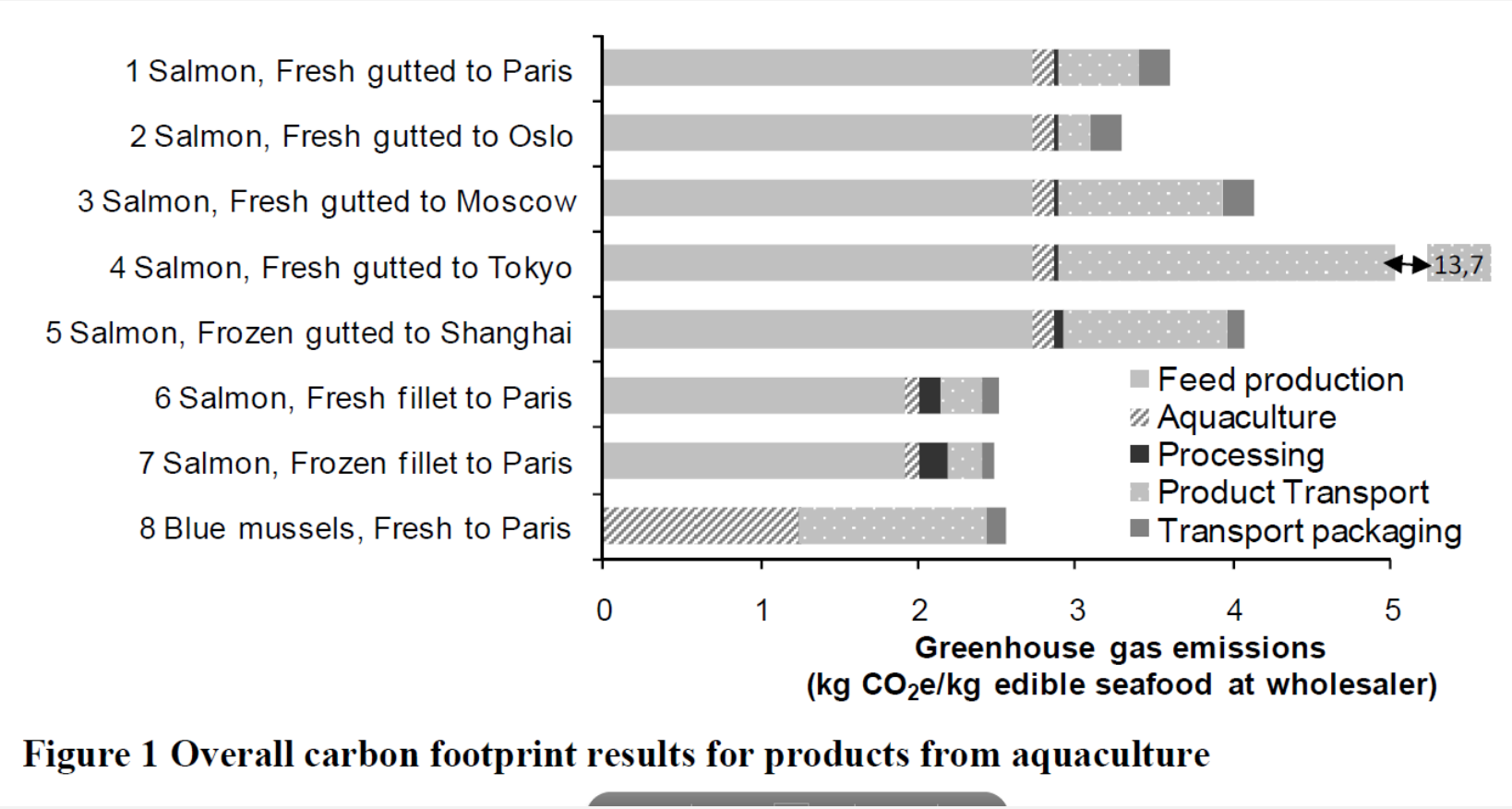


Figure 1 Overall carbon footprint results for products from aquaculture

Kilde: SINTEF Fiskeri og havbruk, 2009

Oppsummert

- Bidrag 1: Reduksjon av utslipp av klimagasser fra egen verdikjede
- Bidrag 2: Reduksjon av utslipp av klimagasser ved å gjøre selve oppdrettsproduksjonen mer klimavennlig

- Hvor er det mest å hente mht bidrag 1?
- Er det fornuftig med en egen LCA for leverandørene?

