

BioSustain

BioMar Sustainability Strategy

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BioMar Norway

Åland Aquaculture Week
9-12 Oct 2012



I will be speaking about...

- ☐ **BioSustain – BioMar sustainability framework**
- ☐ Optimizing feed on sustainability
- ☐ Raw material movements
- ☐ How BioSustain can benefit your business



BioSustain pyramid



Optimised sustainability

BioSustain provides tools and methods to measure sustainability of the whole value chain, and to enable sustainability improvement through optimisation of feeds, farming, processing and transportation to market.

Hotspots

BioSustain is a dynamic approach to hot spot sustainability issues - feed raw material sourcing in particular.

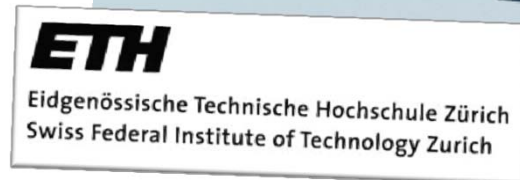
Basic

BioMar companies use certified management systems with improvement programmes and follow different guidelines; e.g. on social responsibility.

Legal compliance

All BioMar activities are founded on national, regional and international laws and regulation.

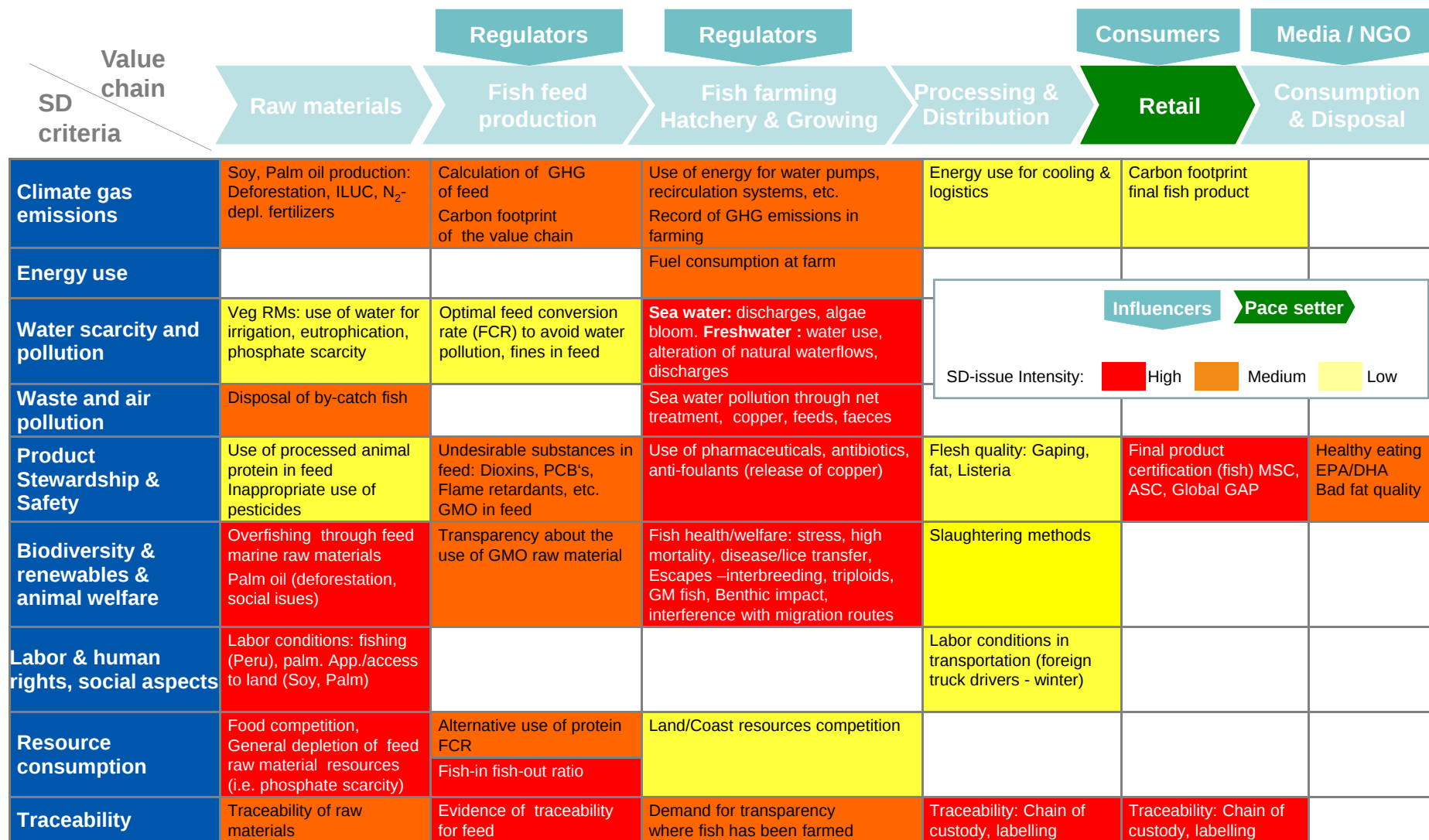
Click on a level to learn more



www.biosustain.no



SD Value Chain Map: Salmon in Europe

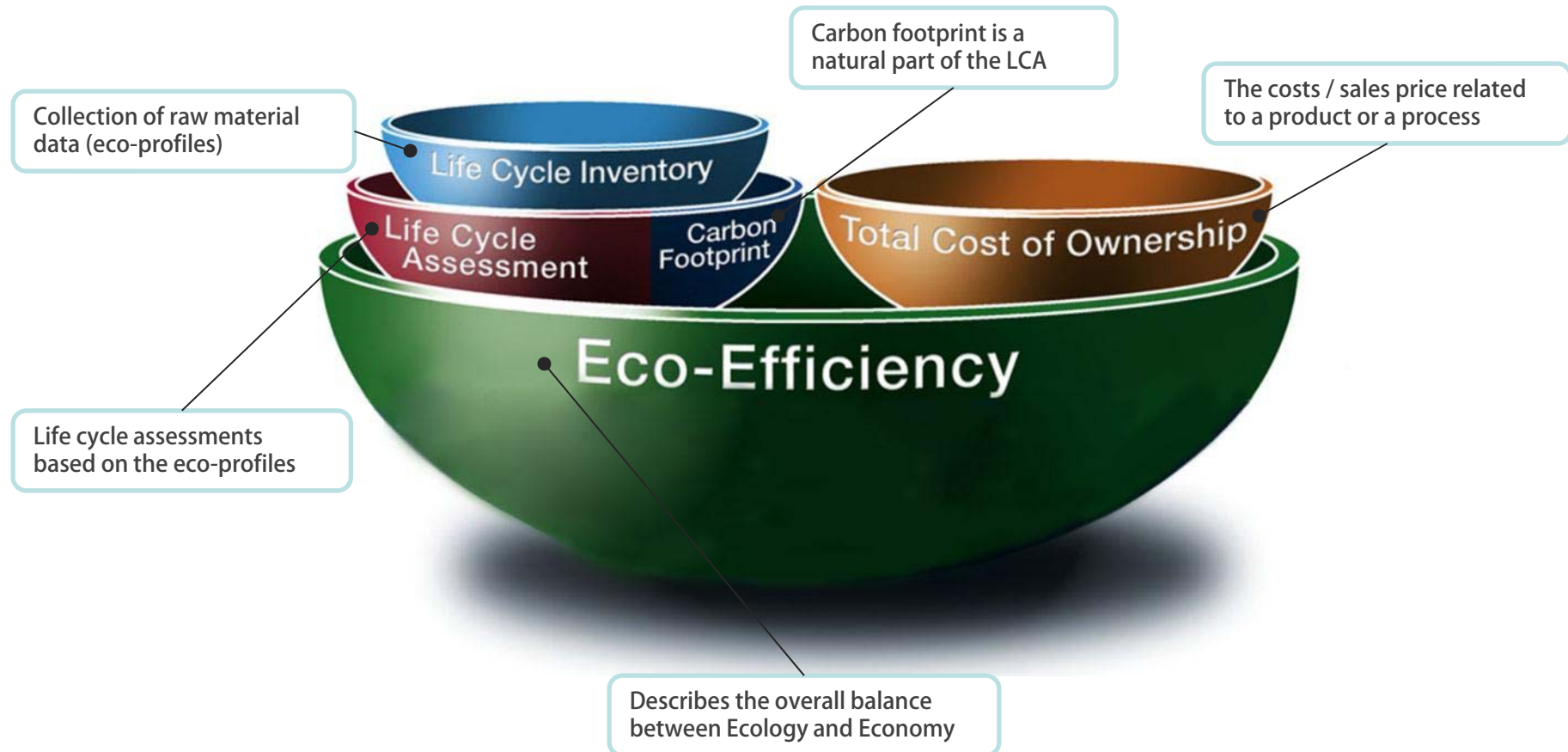


BASF methodology

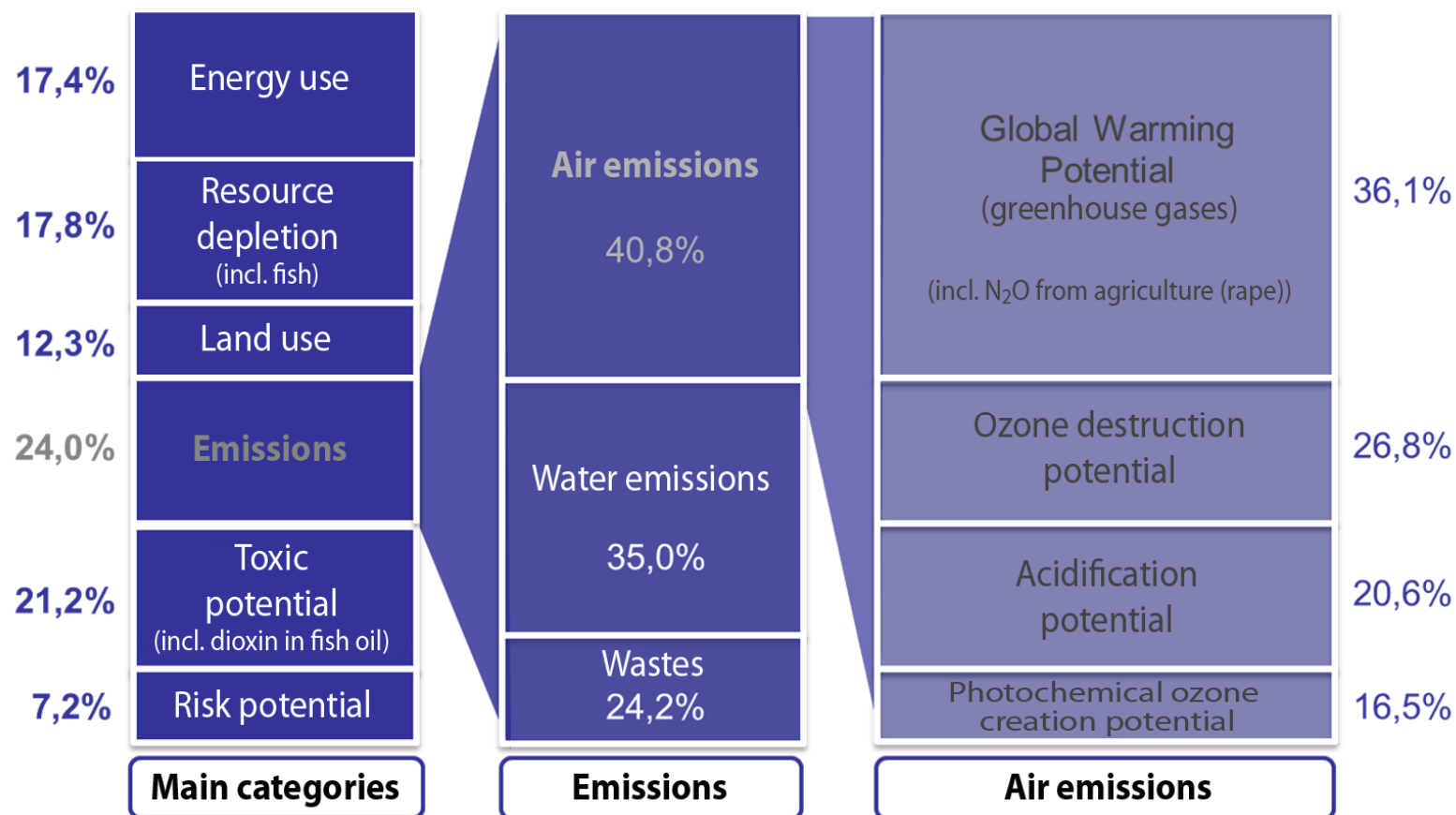
Business partner and basic model developer



Eco-Efficiency



Weighted environmental load



[TNS infratest](#) ,Germany 2009



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Eco indexes on raw materials

Raw material	Eco index	Raw material	Eco index
LT fishmeal (NA)	x,x	Corn gluten	x,x
Superprime (SA)	x,x	Pea protein	x,x
NSM Fishmeal (NA)	x,x	DDGS	x,x
Trimmings fish meal (NA)	x,x	Wheat	1,0
Standard Fish oil (NA)	x,x	Fava beans (+ organic)	x,x
Ensilage oil (NA)	x,x	Organic peas	x,x
Omega oil/health oil (SA)	x,x	Lysine	xx,x
Trimmings fish oil (NA)	x,x	Methionine	xx,x
Rapeseed oil	x,x	Threonine	xx,x
Soy protein concentrate 60%	x,x	Astaxanthin (synthetic)	x,x
High protein soy 49%	x,x	Canthaxanthin (synthetic)	xx,x
Organic soya	x,x	Astaxanthin (yeast-based)	xxx,x
Sunflower expeller	x,x	Vitamin C	xx,x
Sunflower meal	x,x	Vitamin C&E mix	x,x
Organic sunflower expeller	x,x	Vitamin E 20%	x,x
Wheat gluten	x,x	Mono calcium phosphate	x,x



BioSustain index on product recipes

CPK 2000		Regular recipe		Optimized BSi (lowest possible)	
INGREDIENTS	Ei	Cost = x,x	Recipe Ei	Cost = +0,20 NOK	Recipe Ei
NA Fishmeal	x,x				
Sunflower expeller	x,x				
SA Blend SP/STD	x,x				
Wheat	x,x				
Pea Protein	x,x				
SPC 60	x,x				
Carophyll Pink CWS 10%	x,x				
Mono - kalsiumfosfat	x,x				
DL-Metionin	xx,x				
Barox	x,x				
Std. Oil	x,x				
Omega Oil	x,x				
Rapeseed Oil	x,x				
WATER CHANGE					
Product total	BSi	100	2,3447	100	2,0000
Sum RM with Ei	BSi adj.	99,175	2,3254	99,175	1,9835



Internet-based Eco-Efficiency Analysis

Fish Feed 2011

Logged in as

[Logout](#)

Salmon20

[General](#) [Feed](#) [Salmon Production](#) [Superuser](#) [Case Studies](#)

[About](#)

case study

[create new case study](#)

Name:

Customer Benefit

fish product (end consumer)

kg 1000

Names of Alternatives

name

Alt. 1

Alt. 2

Alt. 3

Alt. 4

Alt. 5

Alt. 6

enabled

CPK

CPK Q

Power

on

on

on

off

off

off

Last Step to be Considered

salmon production

Costs or Price

Costs or price of last step considered

CPK

CPK Q

Power

Alt. 4

Alt. 5

Alt. 6

EUR/CB 4464,00

4464,00

4464,00

[results overview](#)

[export results](#)

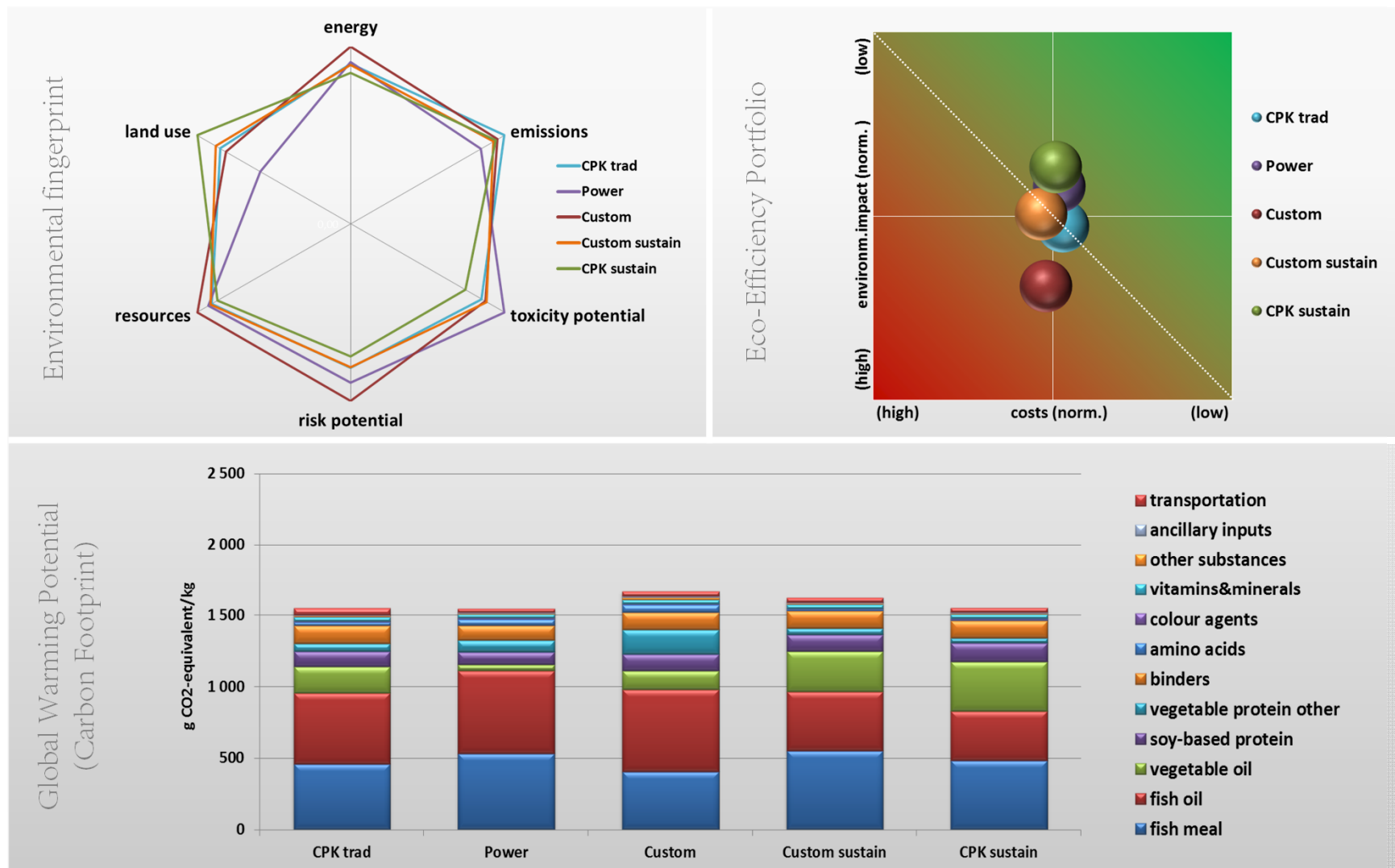
[restore default values](#)

[save](#)

[save as](#)



Eco-Efficiency Analysis test results

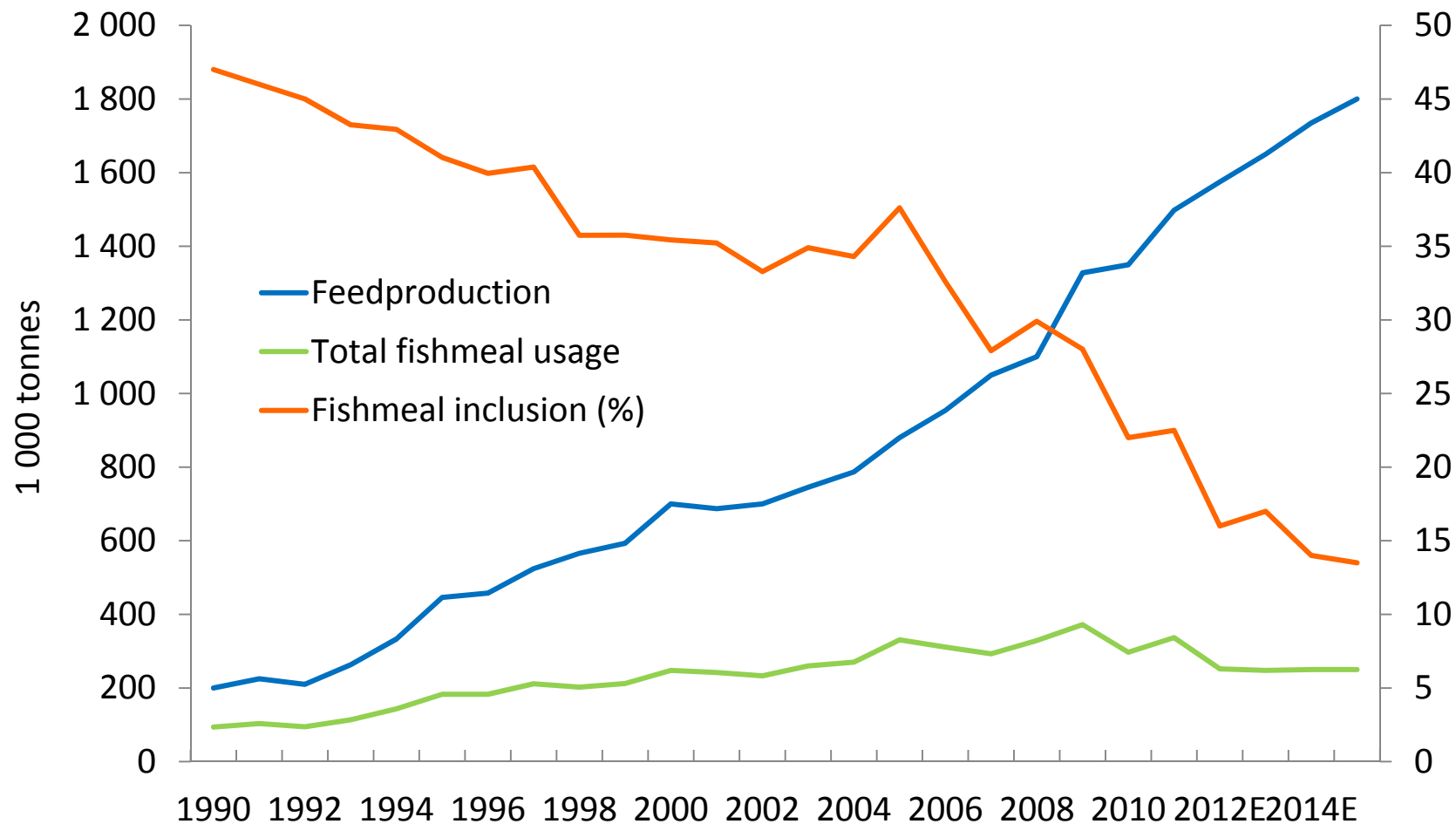


I will be speaking about...

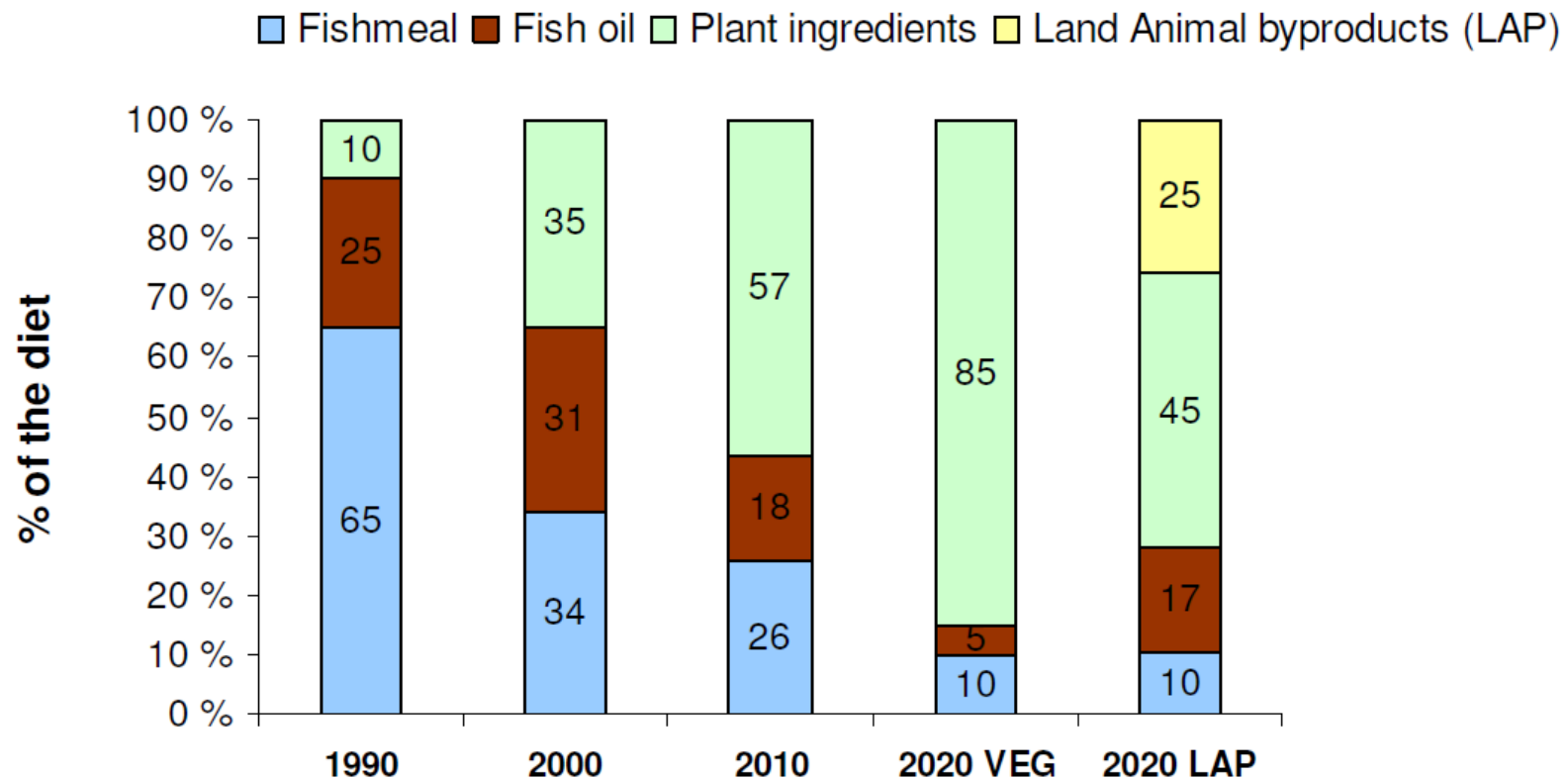
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Feed production and fish meal use

Norway 1990 - 2014



Use of fish meal and oil in salmon diets



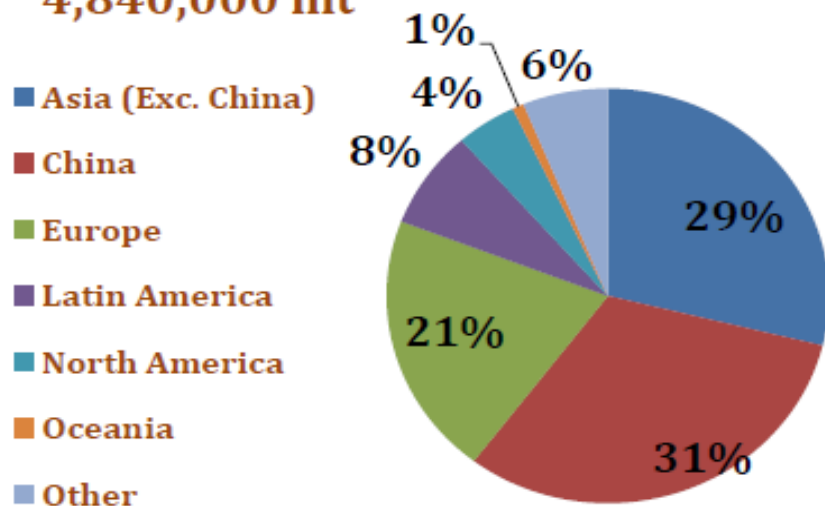
Source: Nofima report 2012



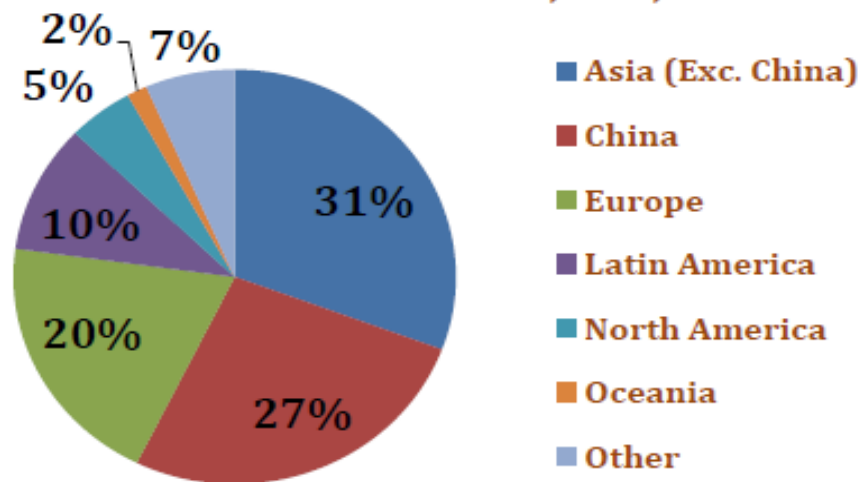
World fishmeal consumption

By region

2009:
4,840,000 mt



2010:
4,541,000 mt

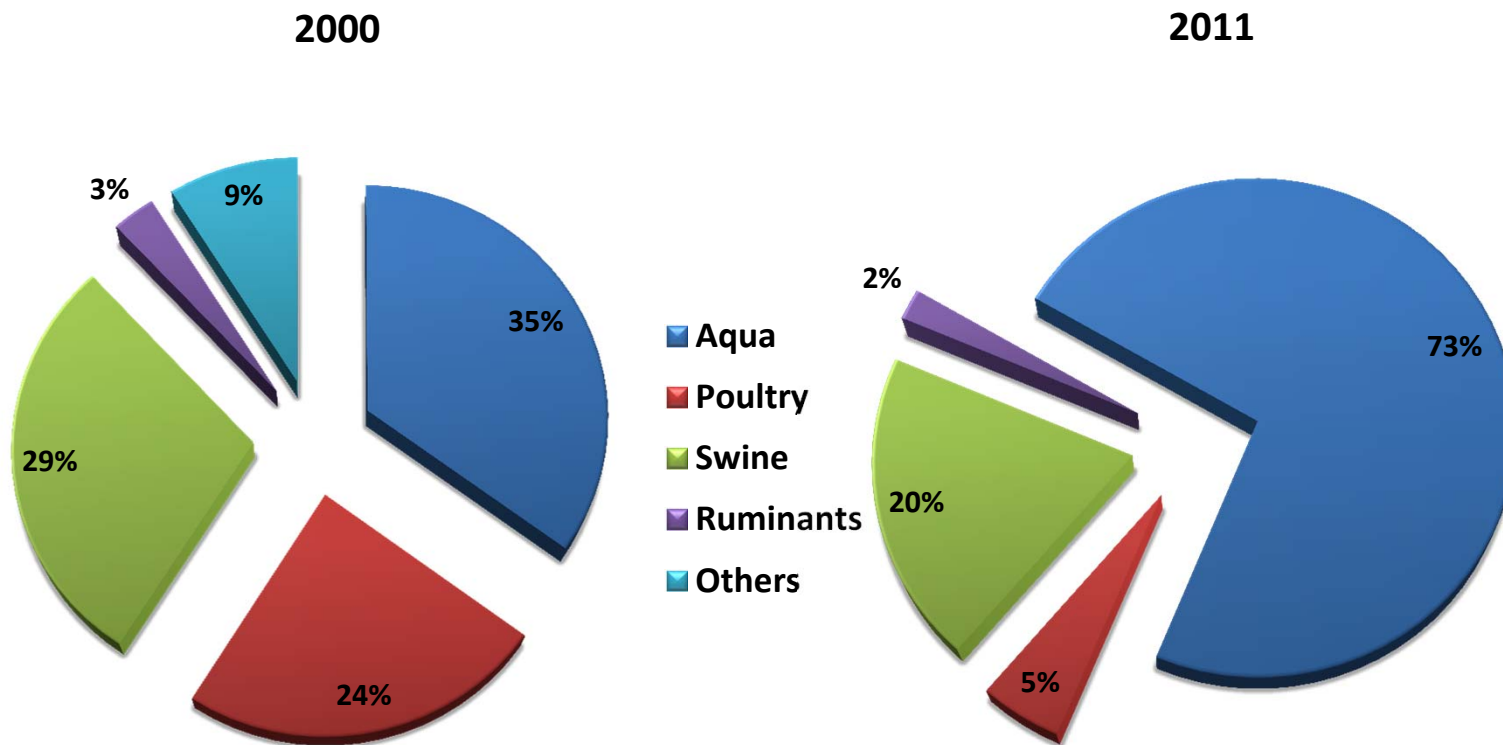


Source: IFFO



World fishmeal consumption

By industry segment

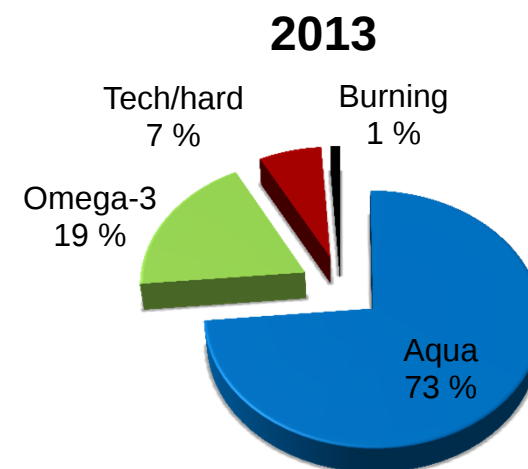
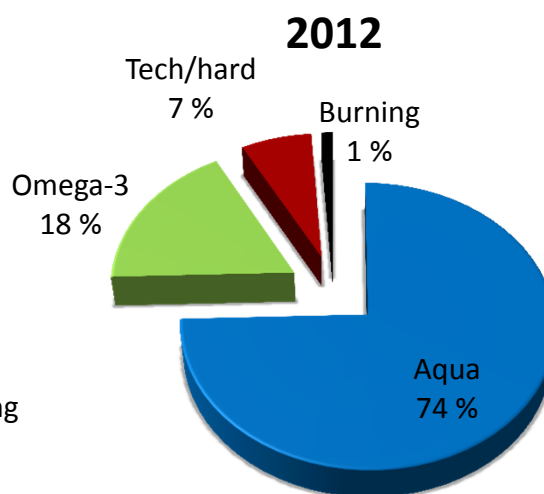
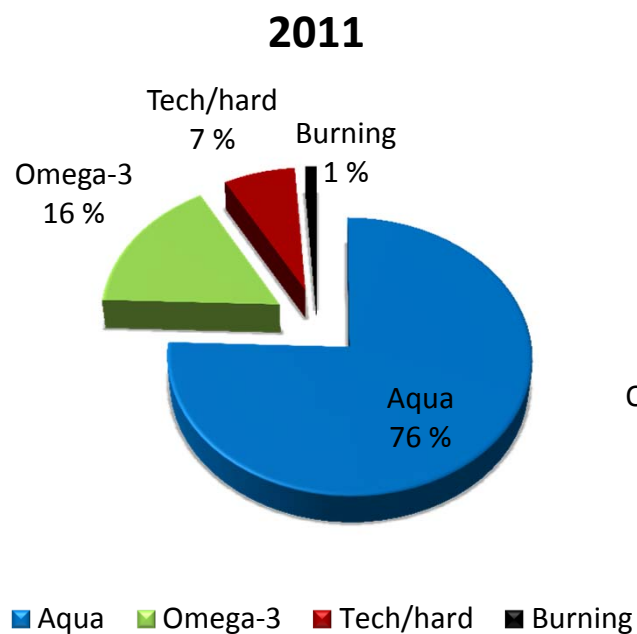


Source: IFFO



World fish oil consumption

By industry segment

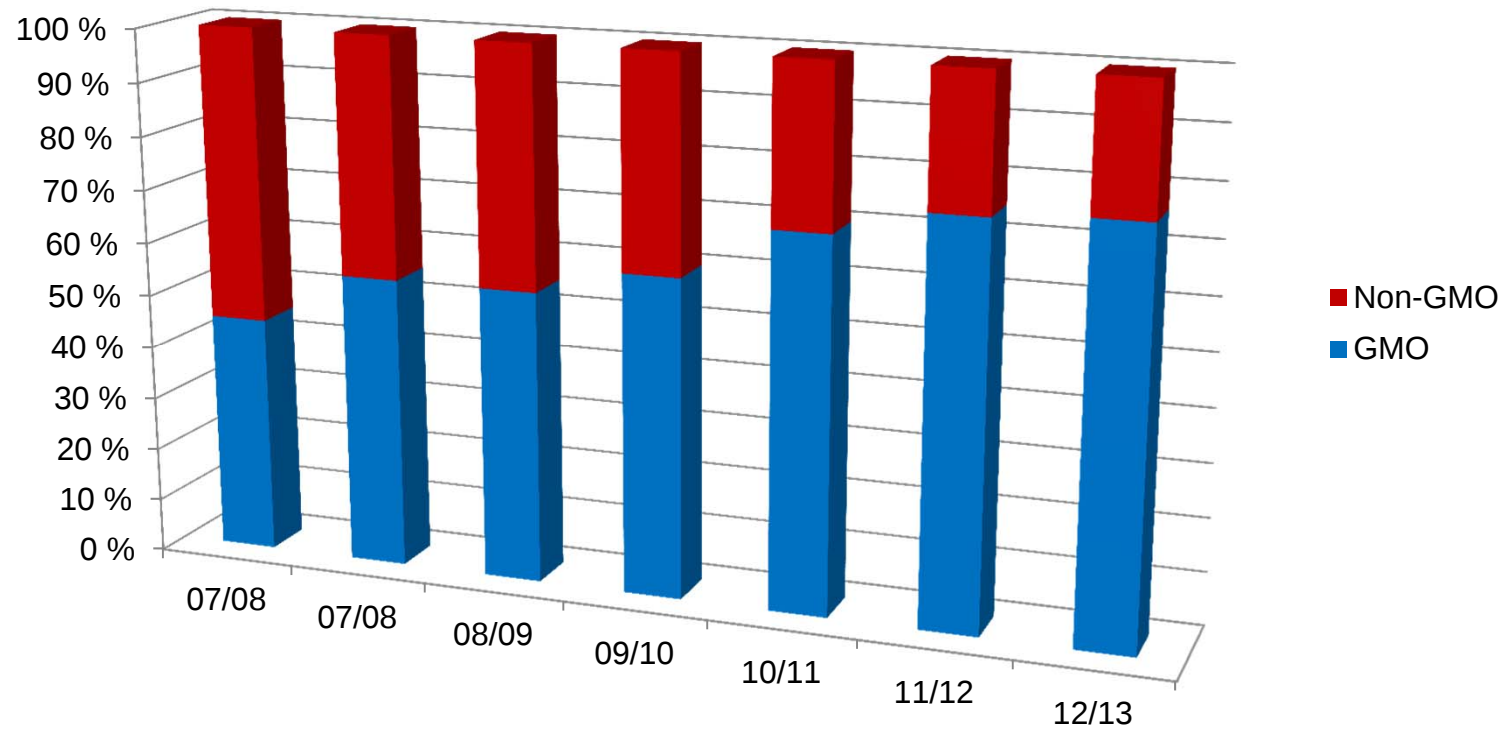


Source: IFFO



GM development

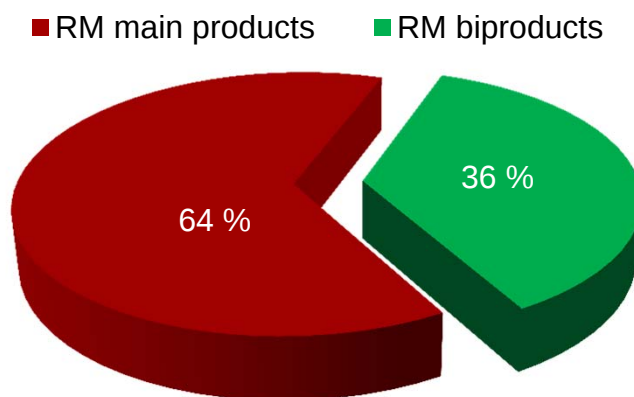
Soy Protein Concentrate (SPC)



Brazil total harvest	20 787 592 tons
Total segregated NGMO	11 725 016 tons



Main product RMs vs. by-product RMs



RM main products	MT	RM by-products	MT
Fish meal (NA+SA)	xx xxx	Fish meal trimmings	xx xxx
Fish oil (NA+SA)	xx xxx	Silage oil	x xxx
Krill	xxx	Sunflower meal	xx xxx
Rapeseed oil	xx xxx	Wheat gluten	x xxx
Wheat	xx xxx	Corn gluten	x xxx
Pea starch	xx xxx	Soy protein (SPC)	xx xxx
Beans	x xxx	Pea protein	xxx
Total	202 387		115 540

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BioSustain through the value chain

Sustainability risk reduction and branding opportunities

BioMar responsibility

Raw materials



+

RM transportation



+

Feed production

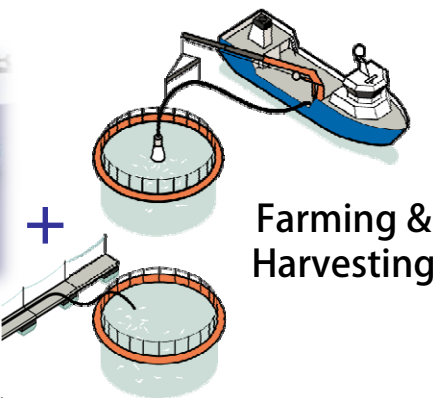


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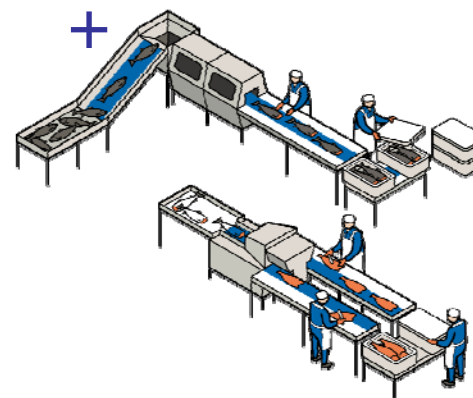
Value chain



Feed transportation



Farming & Harvesting



Slaughtering,
Processing &
Packaging

+
Retail logistics

Eco-Efficiency Analysis Report

Nova Sea



GENERAL INFORMATION

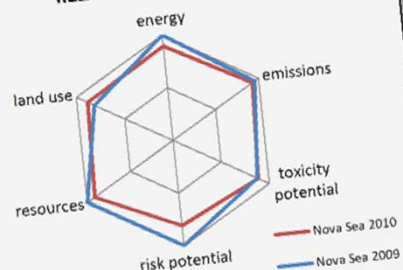
Eco-Efficiency Analysis (EEA) balance s impact of economy and ecology; i.e. the total cost and environmental load of a product.

EEA is applied to minimize resource and energy consumption in producing salmon to keep emissions as low as possible. At the same time aiming to help the value chain conserving resources and save energy.

EEA compares the life cycles of products or manufacturing processes from "cradle to grave". It includes the environmental impact of all input materials as well as process.



RELATIVE ECOLOGICAL IMPACT



ENVIRONMENTAL IMPACTS

	2010	2009	% Change
AIR EMISSIONS			
GWP (g CO2/kg)	1 618	-2,8	-3,4
Acidification potential (g SO2/kg)	15,34	-10,7	-9,1
Smog potential (g ethene/kg)	2,21	-11,5	-21,4

	2010	2009	% Change
OTHER EMISSIONS			
Water emissions (l/kg)	2 152	1,2	-10,0
Solid wastes (kg/kg)	1 078	-3,3	-29,7

REMAINING CATEGORIES

	2010	2009	% Change
Energy consumption (MJ/kg)	39,5	-0,2	-3,4
Land use (m2 areal/kg)	1,34	-0,2	-9,1
Risk potential (risk units/kg)	0,81	0,1	-21,4
Toxicity potential	1,0	0,3	-21,4
Resource depletion (g silver/kg)	0,34	0,0	-21,4

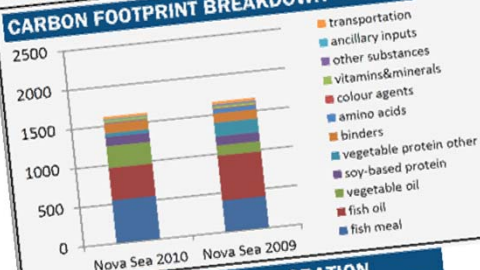
PRODUCTION DATA

	2010	2009
KEY INDEX DATA		
FCR	1,05	1,10
TGC	3,35	3,30
SGR	1,18	1,17
K-factor	1,35	1,30

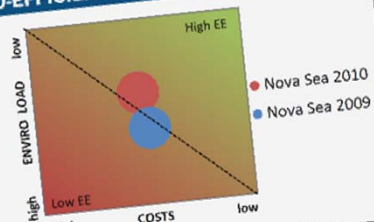
FISH STOCK

	2010	2009	2008
Tonnage	68 000	84 000	63 000
Licensed capacity	70 000	65 000	63 000
Capacity utilization rate	97 %	98 %	100 %
Pigment use (mg/kg)	25,0	30,0	28,0

CARBON FOOTPRINT BREAKDOWN



ECO-EFFICIENCY PORTFOLIO



ACCREDITATION & COLLABORATION



GLOBAL G.A.P.



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Sustainability
Certificate
with EEA report



ECO-EFFICIENCY CERTIFICATE

This is to certify that:

Customer name
address, zip code, city, Norway

Has conducted sustainability analysis in the company's use of fish feed, in fish farming, -fish processing and -packaging - in accordance with eco-efficiency methodology and standards as established in

BioSustain - BioMar Sustainable Development

This Certificate is valid for Customer name operations in:
Norway, year

Eco-efficiency analysis report is part of this Certificate

Place and date:
Trondheim, 1 september 2011
BioMar AS, Norway

Name
Management Representative



Transparency through the value chain

– a necessity for sustainable aquaculture development

