marineharvest

GLOBAL R&D AND TECHNICAL

Salmon farming: the opportunity and challenges from a carbon footprint perspective

05th June 2014, Trondheim, Norway

Catarina Martins, Group Manager Environment & Sustainability



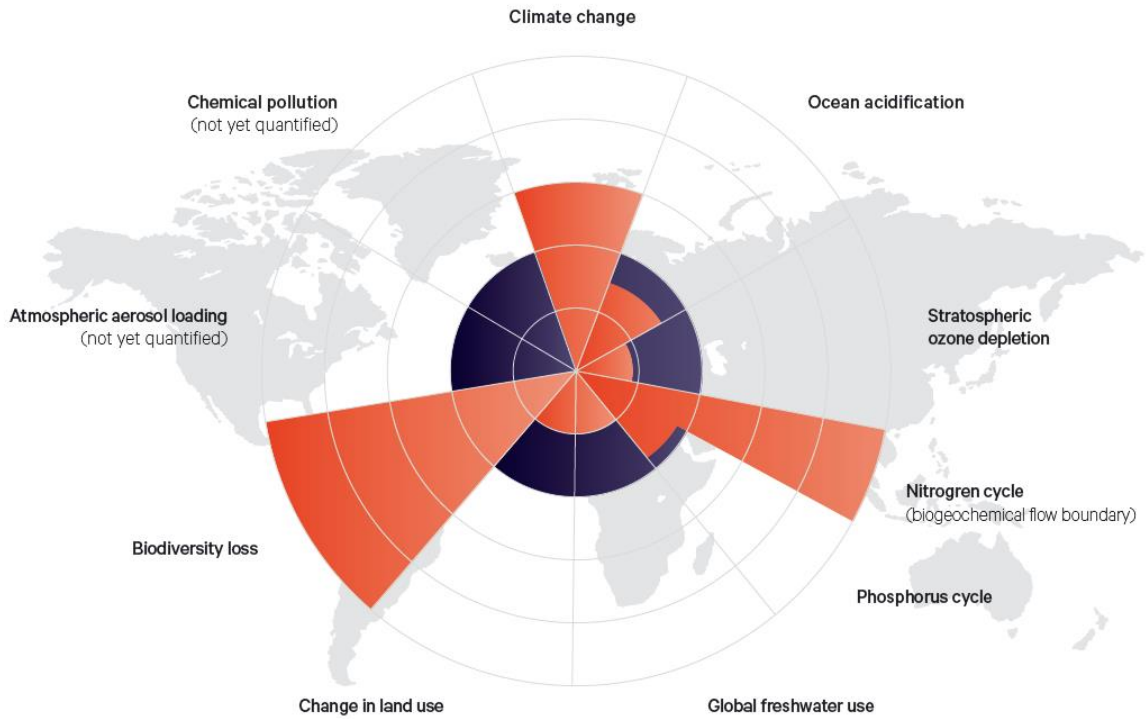
3 leading questions:



1. Why is Climate Change important for Marine Harvest?
2. What is Marine Harvest's Carbon Footprint?
3. What are Marine Harvest's efforts to reduce its Carbon Footprint?

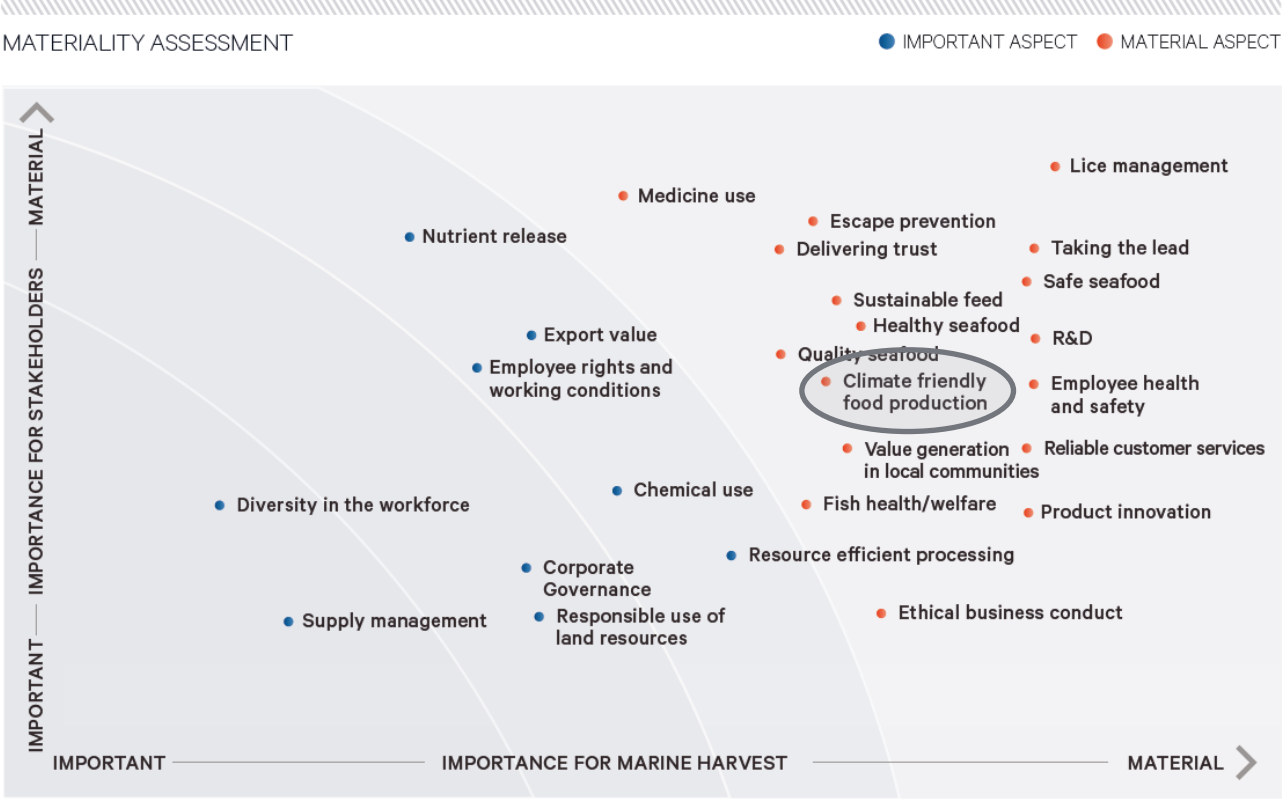
Why addressing climate change?

"BUSINESS AS USUAL" IS NO LONGER AN OPTION



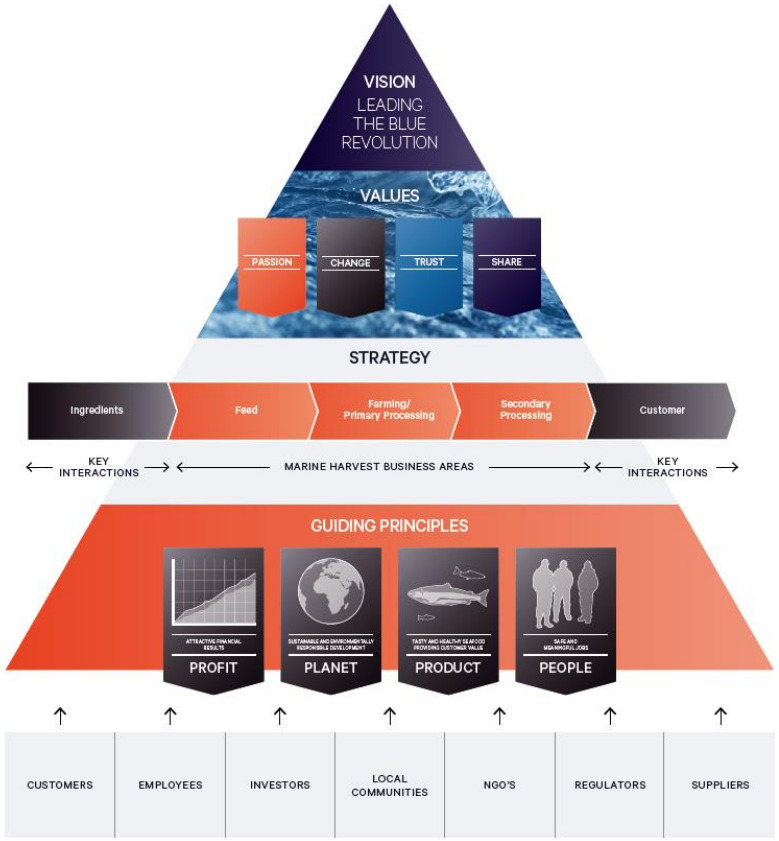
Source: Rockström et al. Nature (2009): A safe operating space for humanity.
Blue indicates the line for crossing a sustainable development and red indicates areas where we as a planet have crossed our planetary boundaries.

Why addressing climate change?



Assessment of material issues in accordance with the Global Reporting Initiative G4 guidelines. All aspects in the matrix are elements of importance to us and/or our stakeholder, but aspects placed higher and to the right in the matrix are considered to be more material from a reporting point of view. The material aspects are marked with red dots in the chart. The assessment is not science based.

Why addressing climate change?

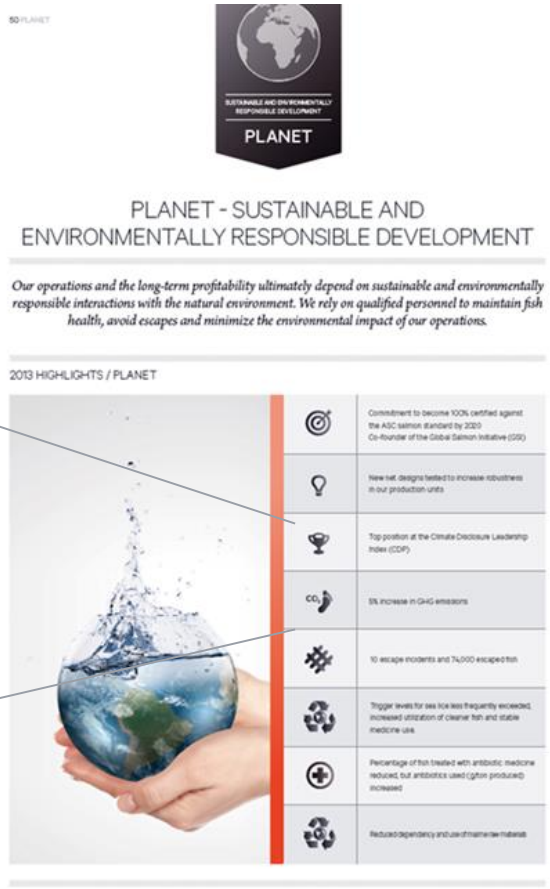




Environmental responsibility is part of leading the blue revolution

Why addressing climate change?

	Top position at the Climate Disclosure Leadership Index (CDP)
CO_2	5% increase in GHG emissions



PLANET

PLANET - SUSTAINABLE AND ENVIRONMENTALLY RESPONSIBLE DEVELOPMENT

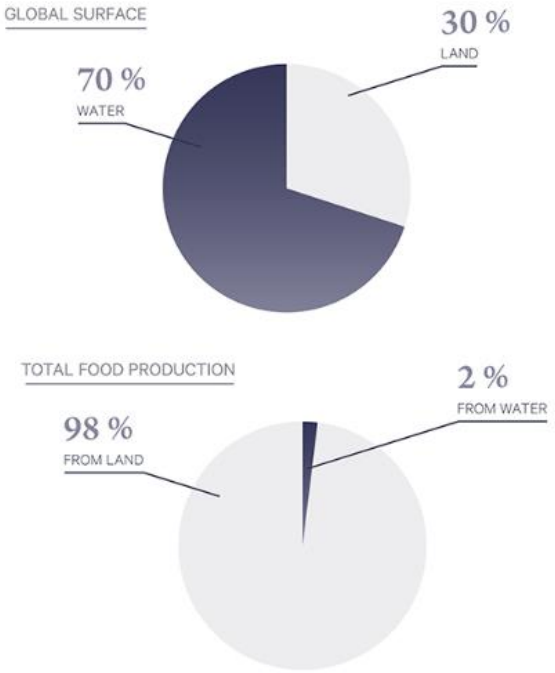
Our operations and the long-term profitability ultimately depend on sustainable and environmentally responsible interactions with the natural environment. We rely on qualified personnel to maintain fish health, avoid escapes and minimize the environmental impact of our operations.

2013 HIGHLIGHTS / PLANET

Environmental responsibility is part of leading the blue revolution

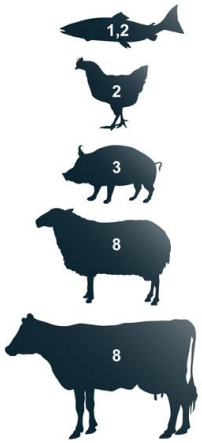
Fish Farming: the opportunity



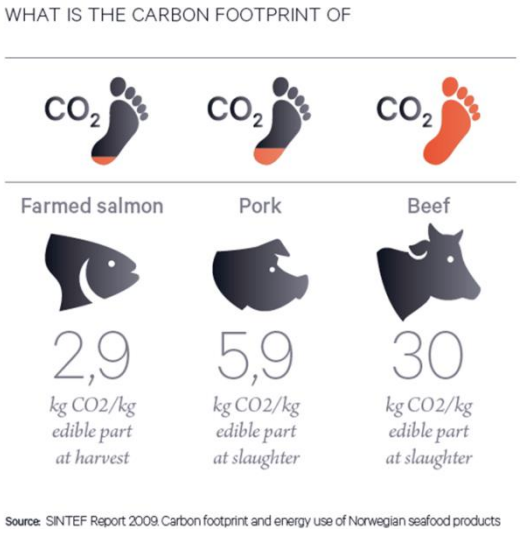


Our planet is 70 % water and yet only 2% of food production comes from the ocean

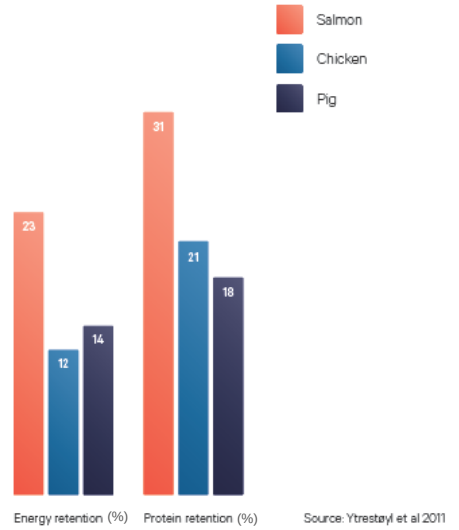
Our starting point (fish) is unique



Uniquely low FCRs



Uniquely low carbon footprint



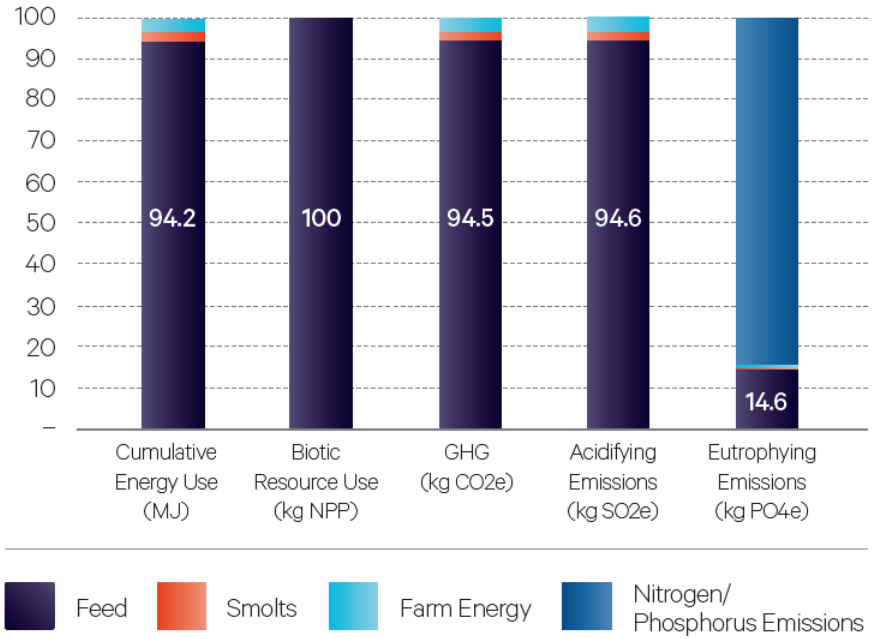
Uniquely high energy and protein retention in edible product

Both energy- and protein utilisation (feed to edible meat) significantly higher in salmon than in agriculture meat production

Salmon Farming: the challenges



HOW MUCH DOES FEED CONTRIBUTE TO?



Source: Pelletier et al. (2009). Not all salmon are created equally: Life Cycle Assessment of (LCA) of global salmon farming systems. Marine Harvest contributed with data to this study.
Feed includes production, processing and transport of all feed inputs.

✓ **In salmon farming operations, feed contributes to more than 90% of our GHG emissions, as well as to energy use, biotic resource use and acidification potential**

Marine Harvest's Carbon Footprint



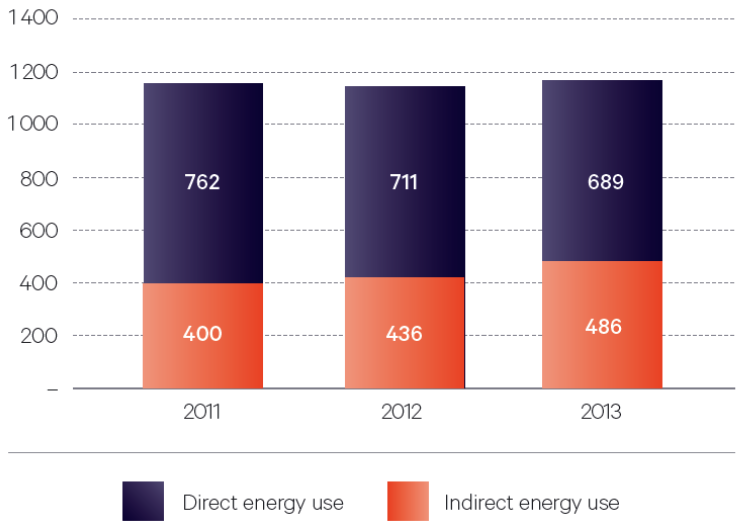
DIRECT/INDIRECT ENERGY	ENERGY SOURCE	UNIT	ENERGY USE (TJ)	%
Indirect (scope 2)	Electricity	kWh	486	41.4%
Direct (scope 1)	Diesel	liter	344	29.2%
	Fuel oil	liter	192	16.3%
	Gasoline/petrol	liter	41	3.5%
	Heating oil	liter	17	1.4%
	Natural Gas	kg	41	3.5%
		m^3	2	0.2%
	Propane/LPG	kg	11	0.9%
		liter	43	3.6%

- Energy use is a KPI reported every quarter & annually
- Includes data from farming and processing plants
- Overall improvement to the quality of reports from our business units
- Electricity represents 41% of Group's energy use
- Significant use of diesel and fuel oil (engines/machinery)

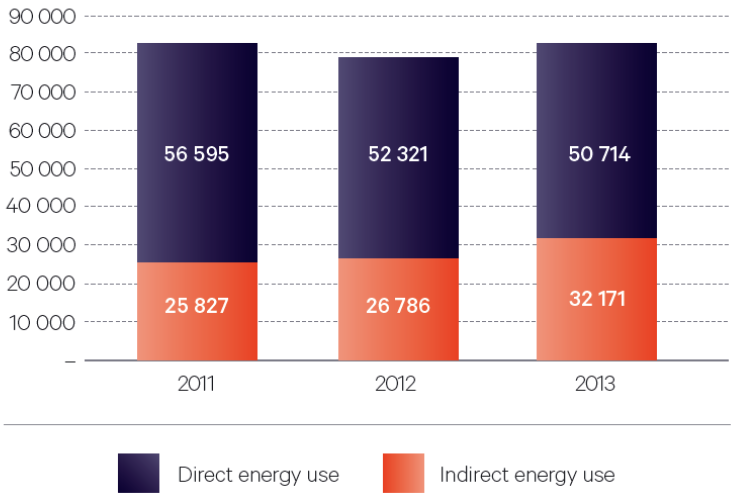
Sources: Annual Report 2013

Marine Harvest's carbon footprint

TOTAL ENERGY USE (TJ)



ANNUAL EMISSIONS (TON CO2e)

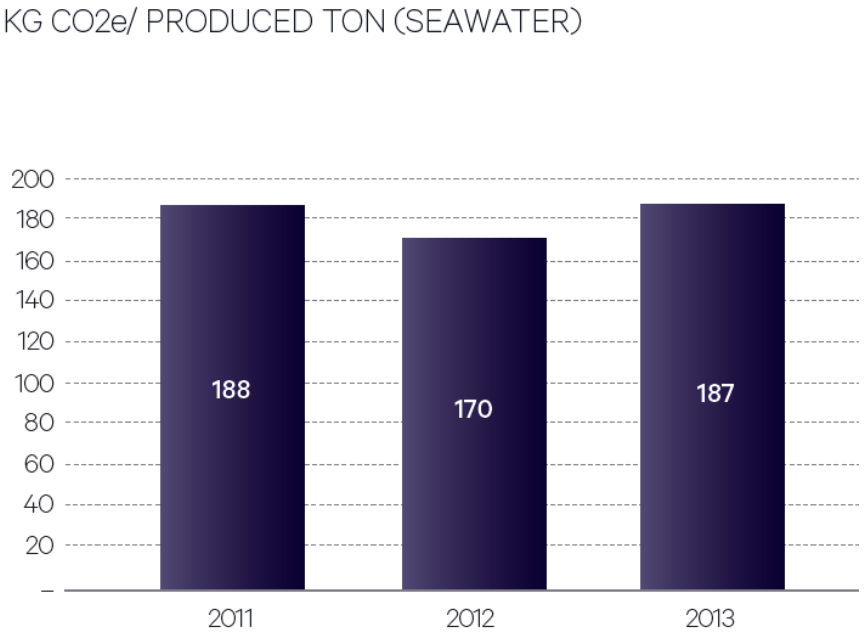


- Most of the emissions reduction was achieved from direct fossil energy consumption, while most of the business units had an increase in electricity consumption in 2013

Sources: Annual Report 2013

Marine Harvest's carbon footprint

- Intensity of GHG emissions
- 5% increase as compared to 2012
- The business units in Scotland and Norway comprise half of the GHG emissions in the Group
- All our farming units, except Scotland, have achieved an overall emissions reduction, while Scotland has increased their emissions due to a new recirculation unit



Annual Report 2013

Marine Harvest: our efforts

1. Improving data collection &Transparency



CDP
DRIVING SUSTAINABLE ECONOMIES

Marine Harvest: our efforts

2. Endorsing Global Sustainable Initiatives & Recognition

Marine Harvest: our efforts

3. Energy Reduction Initiatives

E.g. 1 Marine Harvest Canada:

Towards more energy efficient staff transportation

- In 2013, we initiated a program using rental vans to transport farm staff to crew boat pick up points. This change has reduced personnel travel by more than 3,300 km per week
- Coordinated staff transport into the Klemtu area on scheduled passenger flights allowed us to discontinue our use of > 100 aircraft charters







- ✓ Reduced energy use
- ✓ Reduced safety risk
- ✓ Reduced cost (fuel, repairs, driver)

Marine Harvest: our efforts

3. Energy Reduction Initiatives

E.g. 2 Marine Harvest Canada:

Replacement of metal halide lights with energy saving LED units

- Previous metal halide cage lighting:
- LED cage lighting:

→

- ✓ **Reduced energy use**
- ✓ **Reduced cost**



Marine Harvest: our efforts

3. Energy Reduction Initiatives:

E.g. 3 Marine Harvest Chile:

Energy Efficiency project for the Río Blanco Hatchery

- Aim was to:
    1. Develop a base line that specifies the annual consumption of energy;
    2. Propose improvements than can reduce the energy consumption at least 5% per year

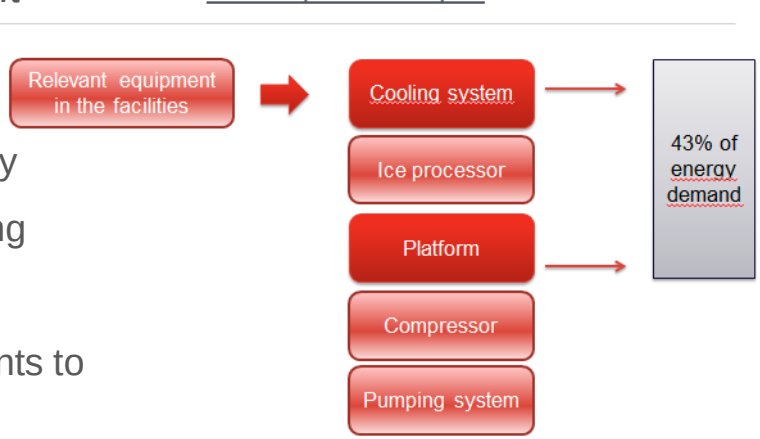
Marine Harvest: our efforts

3. Energy Reduction Initiatives:

E.g. 3 Marine Harvest Chile:

Energy Efficiency project for the Caicaen processing Plant

- Aim was to:
  1. Identify improvements, with previous baseline, in energy consumption assuming a new scenario in the processing facility;
  2. Identify and develop the best cost-efficient measurements to apply in the facility in a short-term stage.



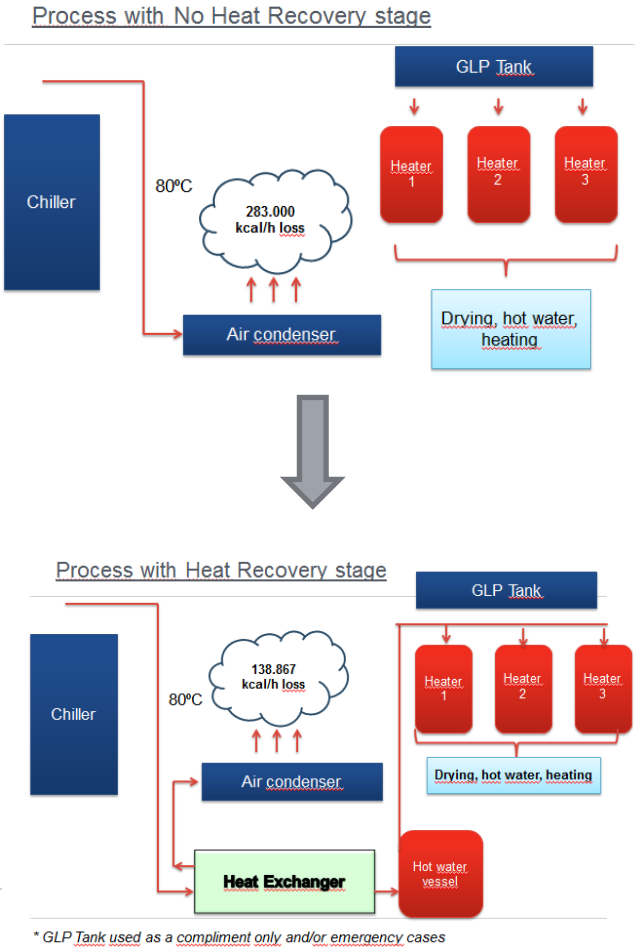
Marine Harvest: our efforts

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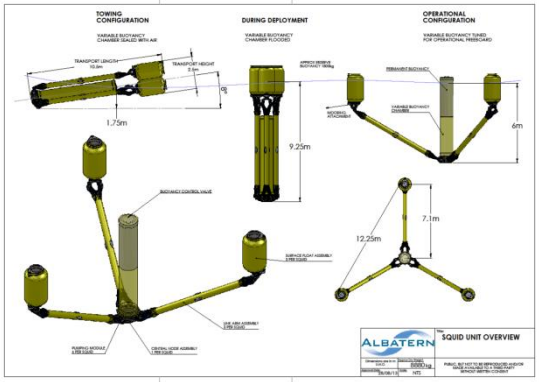
Marine Harvest: our efforts

4. Research Projects

E.g. 1 Marine Harvest Scotland:

Seeking solutions for the generation of power in remote locations

- AlbaTERN Squids
- Trial to start in MH Scotland in the fall of 2014
- Preliminary testing of hybrid diesel – wave energy solution indicate up to 40% energy saving





Marine Harvest: our efforts

4. Research Projects

E.g. 2 Marine Harvest Ireland:

- Partnership with the Coatal & Marine Research Centre (CMRC) of the University College Cork (UCC) and Marine Renewable Energy Ireland (MaREI)
- Goals:

1. Investigate the potential implementation of power and energy requirements for present and future aquaculture installations
2. Assess the availability of marine renewable energy resources at typical fish farm sites
3. Examine the applicability of using scaled energy conversion devices to improve production

Coastal & Marine Research Centre
Ionad Taighde Cósta is Mara
CMRC

UCC
Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland

MaREI
Marine Renewable Energy Ireland

Looking ahead



1. Continue to optimize data collection and quality;
2. Continue to report on energy use and GHG;
3. New feed division will also start reporting on energy use and GHG emissions;
4. Transparency will remain a key element;
5. Continue to support energy-saving initiatives;
6. To follow up closely projects on the use of renewable energies

Tusen Takk!

