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# Scottish Sea Farms

The growing demand for RAS in  
Scotland



Scottish  
Sea Farms

# Scottish Aquaculture- brief overview

- “Worth £1.86 billion every year, supporting 8,300 jobs” - Scottish government 2016
- Dominated by Atlantic salmon. Scotland is currently the largest producer in the EU and the 3rd largest globally.
- UK’s largest food export – fresh salmon is exported to over 50 countries.

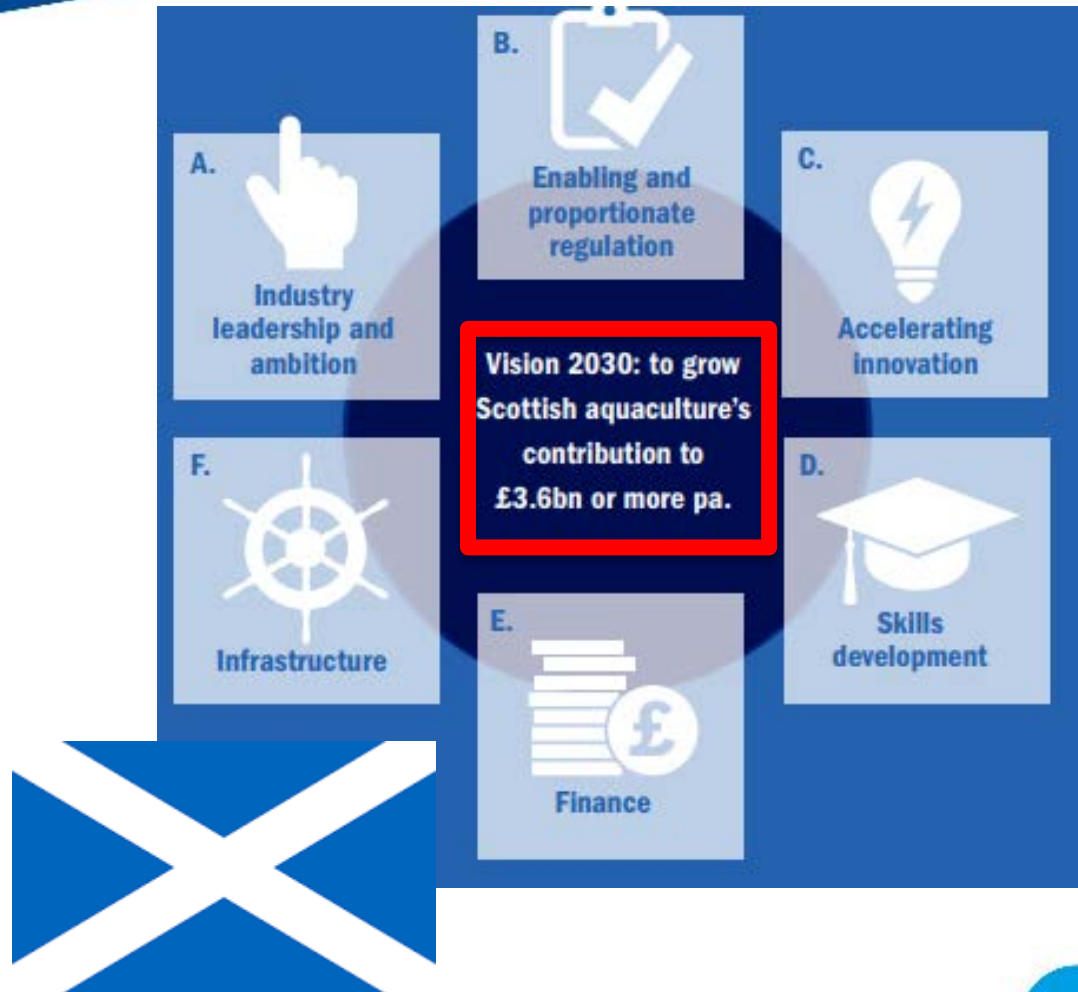
Atlantic Salmon					
Global Supply, ktonnes WFE	2014	2015	2016	2017e	2018e
Norway	1,199	1,234	1,171	1,167	1,270
Chile	583	591	504	528	554
UK	171	166	157	170	171
Canada	95	135	143	135	140
Faroes	83	77	77	84	88
Other	98	111	107	118	122
<b>Total Harvest</b>	<b>2,229</b>	<b>2,314</b>	<b>2,160</b>	<b>2,204</b>	<b>2,345</b>

- Other Finfish:
  - Rainbow trout (8,588T)
  - Brown trout (42T)
  - Halibut (56T)
  - Cod
  - Haddock
  - Cleaner fish
- Shellfish
  - blue mussels (7,732T)
  - Pacific oyster (3,534,000 shells)
  - Native oyster (201,000 shells)
  - Scallop (35,000 shells) and queen scallop (155,000 shells)
- Plus a few small-scale seaweed cultivation sites

Source:  
aquaculture.scotland.gov.uk

# Scottish Aquaculture – Vision for growth

- Ambitious target to grow from £1.8bn to £3.6bn value
- From 8,000+ jobs to 18,000+ jobs in the supply chain
- Some biological challenges to overcome first



# Opportunities and Challenges

## Challenges



Fish health in current freshwater flow-through and loch operations

- Water mould (Saprolegnia)
- ERM

## Opportunities

How RAS reared smolts will help

- Larger, more robust smolts with consistent quality = greater tolerance & less time in sea
- More confident production planning with greater certainty of TIME & SIZE of input into marine = avoid seasonal gill health challenges with stocking strategy to manage risk profile

RAS

- Biosecurity = Enhanced control reduces risk
- Advanced water treatment technology on intake

# Potential for RAS

- Post smolt
- Other salmonids and marine species with the farming techniques and equipment being adapted to meet the differing requirements of each species.
- Pilot project – table size salmon
- Shellfish – more land based hatcheries – marine RAS could be used to improve water quality, temperature control and provide more secure supply.
- R&D
- Cleaner fish!!



# Scottish Sea Farms Overview

- SSF produce 2<sup>nd</sup> highest volume of salmon in Scotland (est. 30,000T HOG 2017)
- Owned 50/50 by Lerøy Seafood Group and SalMar - two leading performers in the European Seafood Industry, both companies are listed on the Oslo stock exchange.



- 3 Farming regions
- Freshwater - 2 active hatcheries (80s RAS) and 5 lochs
- 43 active marine farms



➤ Aim to be the leading Producer through innovation and focussing on best practice

# Strategic plans for growth – New RAS smolt production site



# Barcaldine RAS – enhanced control reduces risk

## Capacity:

- Up to 10million 140g
- Flexibility to meet supply demand from Marine
- Over 15,000m<sup>2</sup>
- Production from Q4 2018

To achieve this, we knew we needed the skills and knowledge





# Barcaldine RAS – Investment in People

Barcaldine design is the product of...

- Taking global learnings and localising and modernising
    - 5 facilities benefits and issues understood
    - 3 full time SSF team members in Norway for minimum of 12 months each
    - Full time SSF team members in Norway for 3 month secondments
- = 4 out of 15 of the Barcaldine RAS team are already skilled**

# Barcaldine RAS – Investment in People

## Learning and development project – 19 months in Norway



Scottish Sea Farms makes it happen

### Leroy Midt – Belsvik

- 14million 80g smolts
- Production since 2013



Source: leroyseafood.com

### SalMar – TSS

- 15million 100g smolts
- Production since 2017



Source: overhallabetongbygg.no



# Barcaldine RAS – Investment in Technology

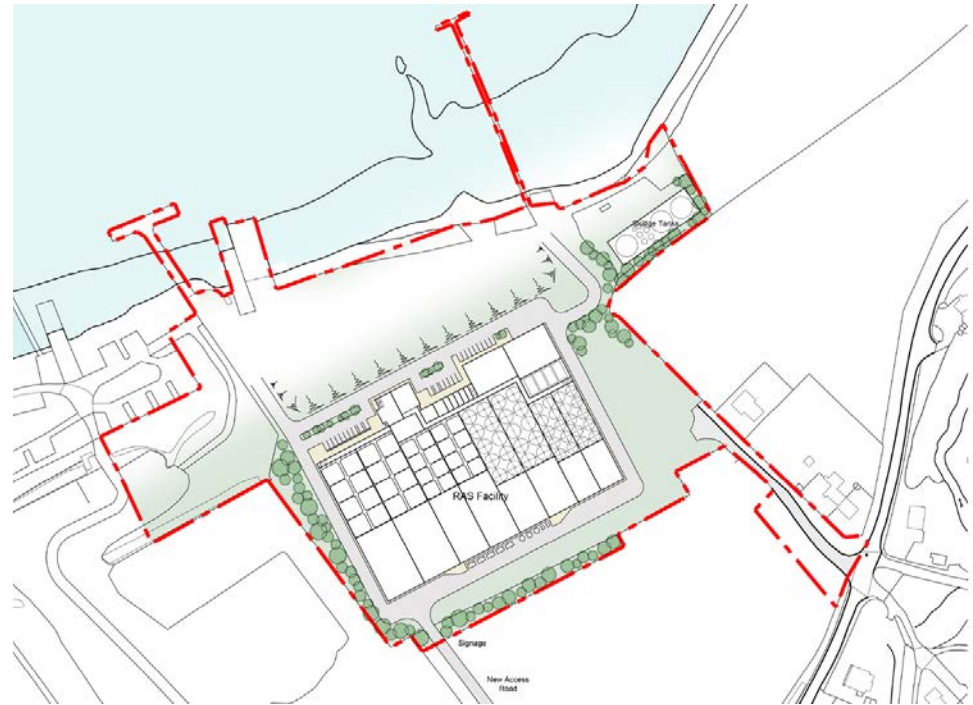
- Design - Sectioning individual departments for biosecurity
- Technology to enhance control with focus on fish health & welfare
- Adhering to strict biosecurity measures/sluse procedures
- Hygiene – uniforms
- Health & Safety



Standards set in Norway are impeccable and we will have same pride in our facility

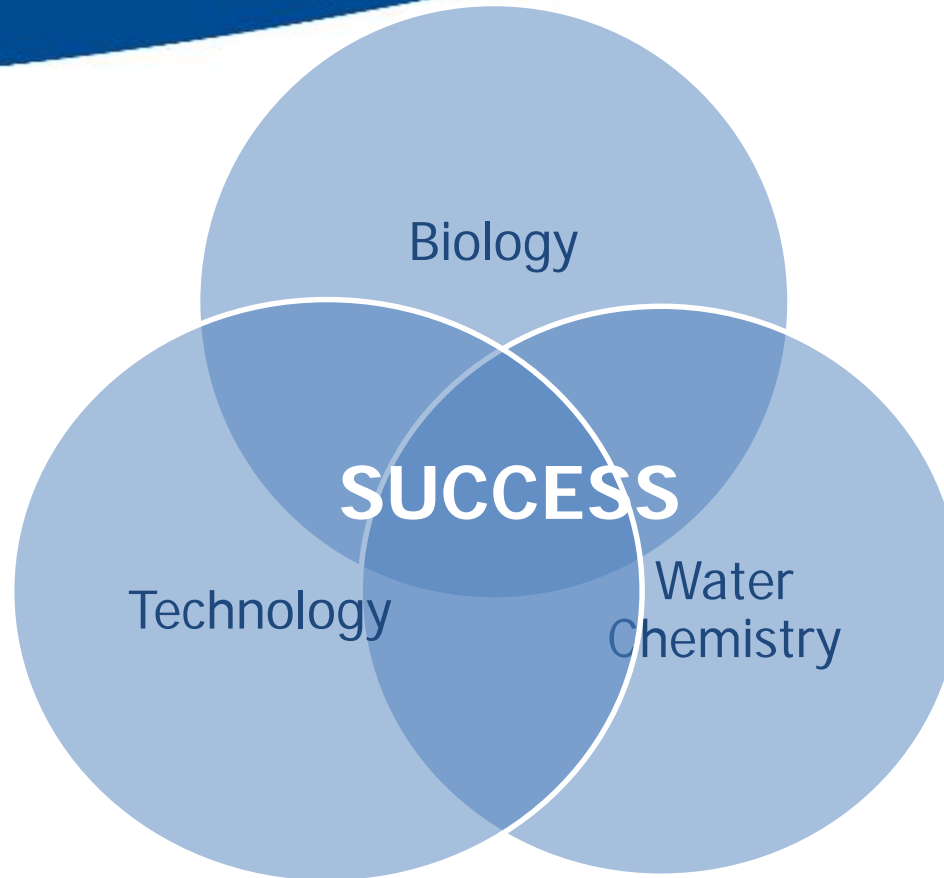
# Sustainability

- Environment
  - Reducing fresh water consumption by +90%
- Location
  - Direct to wellboat transfer
- Managing waste streams
  - Aquaponics
  - Sludge treatment research
- Energy sources
  - Water turbine
  - Wind? Solar? Biofuel?
  - Other?



- Future
  - Post smolt?

# People and knowledge



The growing demand and opportunities for RAS in Scotland and globally requires greater investment in training and skills of people.

# Thank You



Scottish Sea Farms makes it happen

