Grieg Seafood ASA

IntraFish Seafood Investor Forum

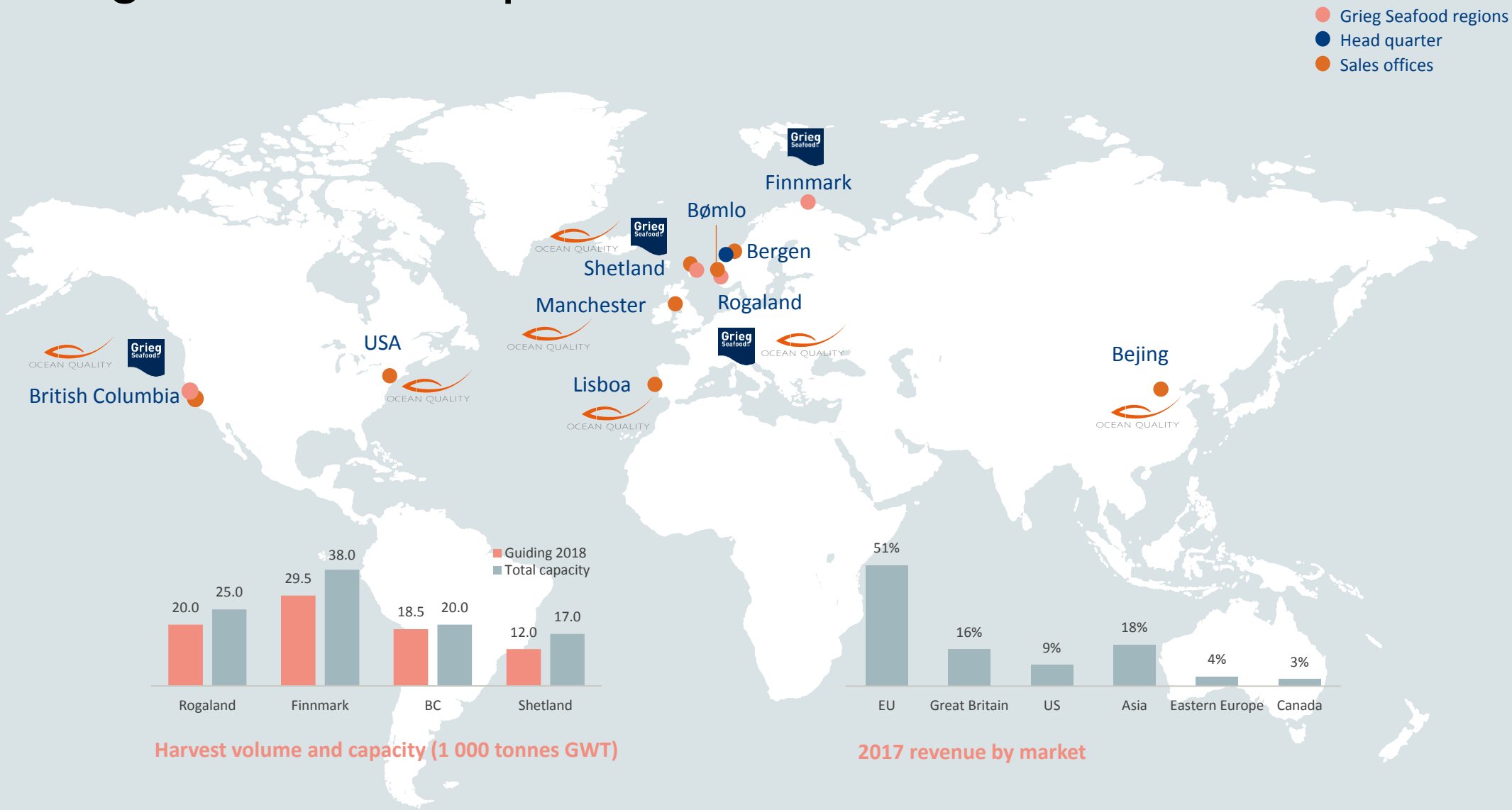
London, 13 September, 2018

Andreas Kvame, CEO

ROOTED IN NATURE

Digitalization in salmon farming

Grieg Seafood footprint



Our value chain

Grieg Seafood presence

Fish feed

Breeding and genetics

Brood activity in Erfjord in Rogaland

Smolt production

Current annual capacity of 4 500 tonnes smolt

Farming

63 grow-out sites

Primary processing

62 600 tonnes of salmon harvested in 2017

Value added processing

Sales and distribution

60% ownership in sales company Ocean Quality

Customers

900 000
meals per day worldwide

Ensuring safe and healthy food throughout the value chain

- Quality criteria for feed
- Traceability through Fishtalk

- Preventive health measures and treatment
- Traceability through Fishtalk
- GLOBALG.A.P. certification

- Preventive hygienic and quality measures
- Traceability through Fishtalk and Maritech
- GLOBALG.A.P. certification

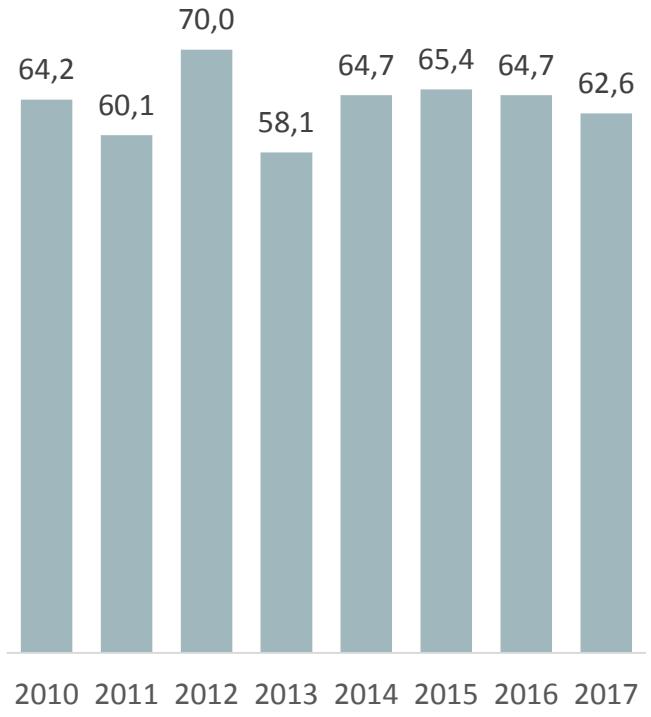
- Risk assessments and preventive measures
- Standards for transport and storage
- ASC chain and custody
- Communication about approach
- GKLOBALG.A.P. certification

- Register, follow-up and feedback
- Approved HACCP system
- Food safety authority monitors residue
- Substances in fish
- GLOBALG.A.P. certification

Operational and financial development

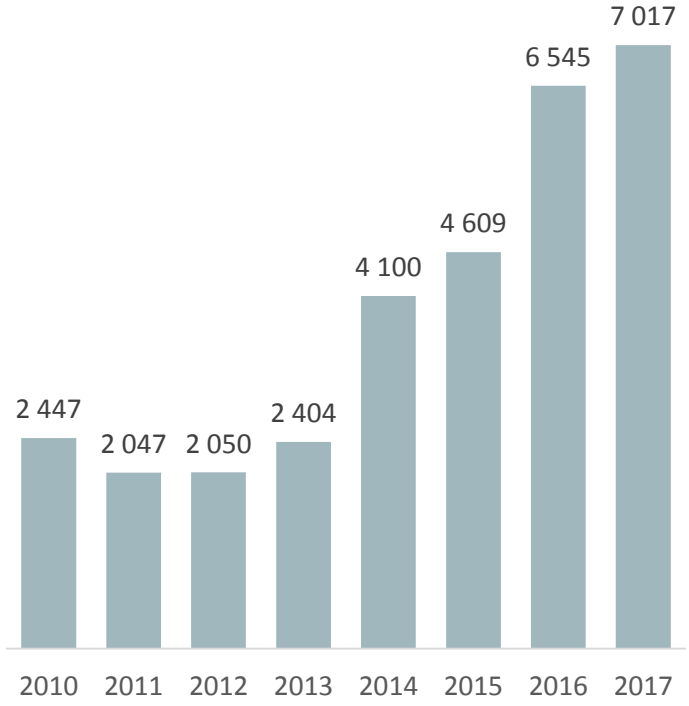
Harvest volume

(1 000 GWT)



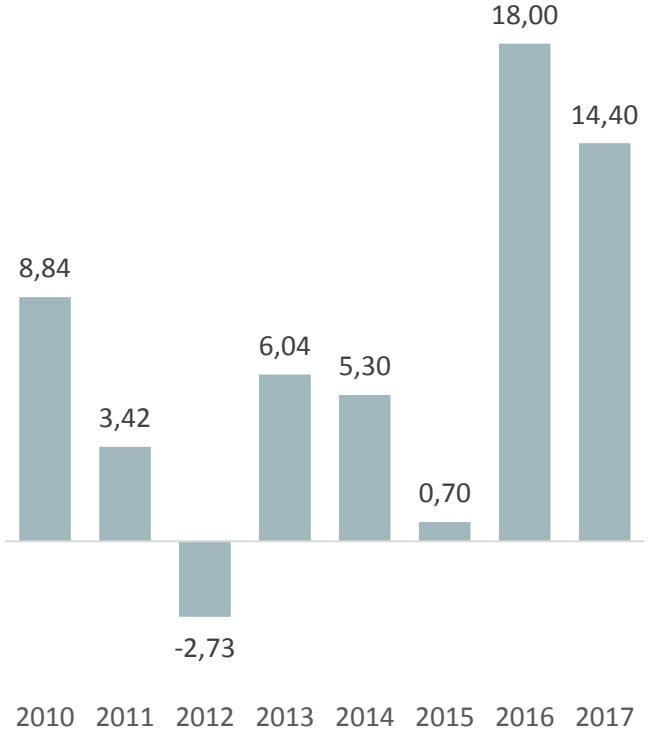
Revenues

(NOK million)



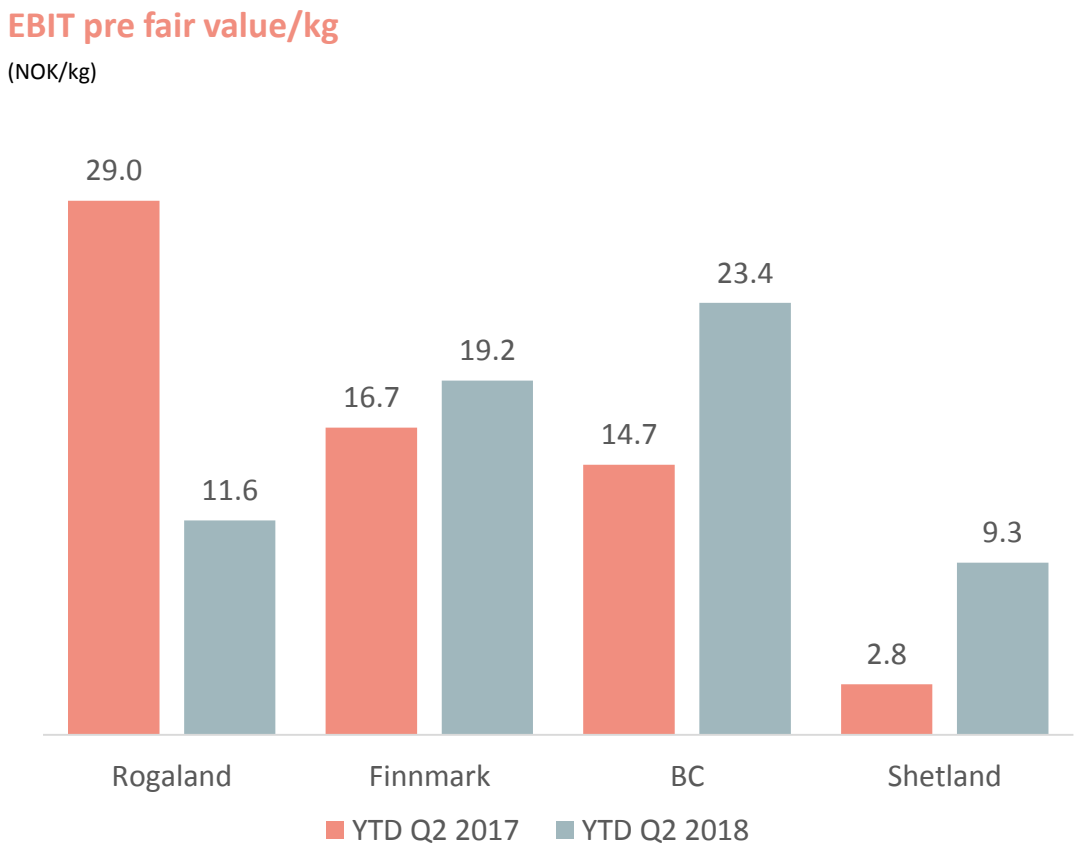
EBIT pre fair value/kg

(NOK/kg)



Financial performance H1 2018

- Record high quarterly harvest volume
- High prices driven by strong demand
- Good production in Finnmark, BC and Shetland
- Negative impact from PD in Rogaland
- Harmful algal bloom in BC
- Harvest volume of 17 100 tons Q3 2018, 75 000 for the full year
- Dividend of NOK 2.00 per share



We are on a growth journey

- Targeting 100 000 tonnes in 2020 with cost at or below industry average
- Building a platform for sustainable growth beyond 2020

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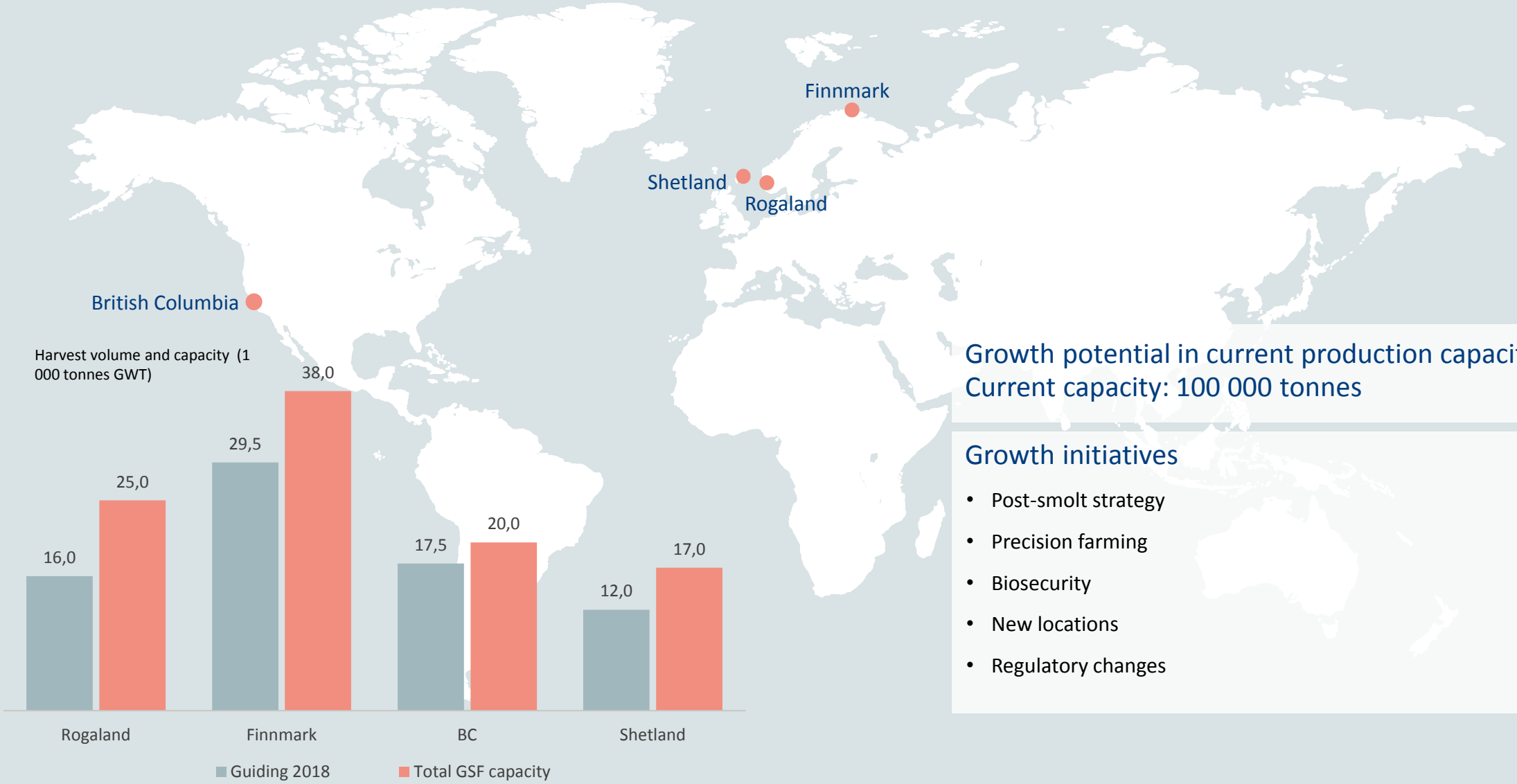
Growth through improved capacity utilization

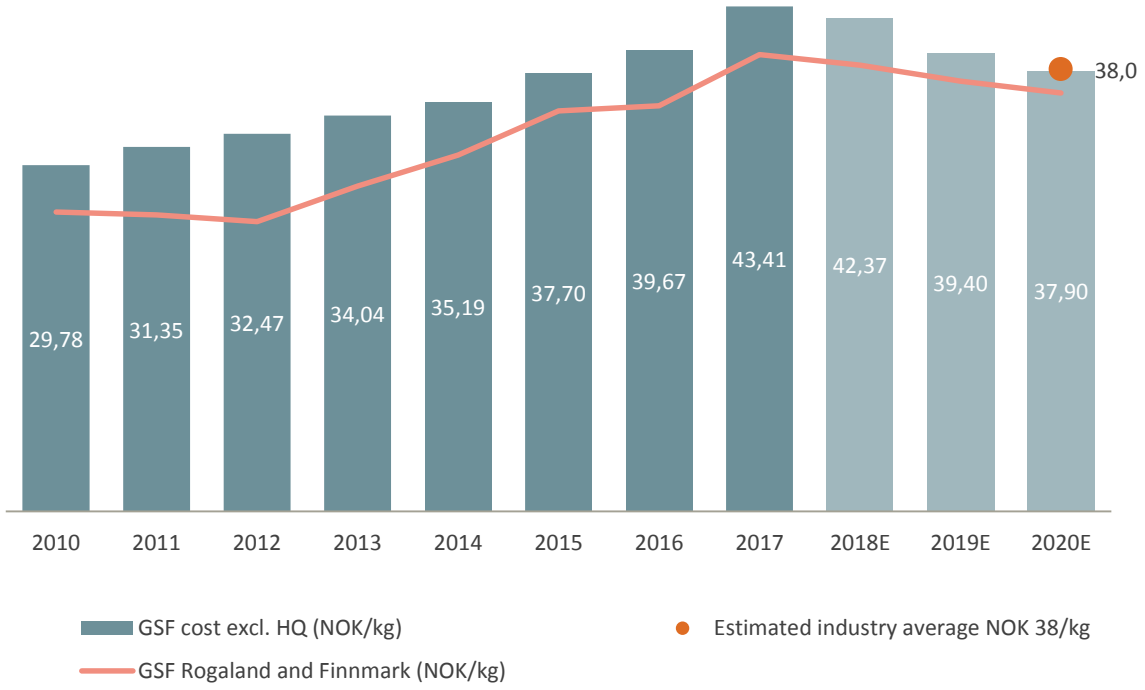


Growth potential in current production capacity
Current capacity: 100 000 tonnes

Growth initiatives

- Post-smolt strategy
- Precision farming
- Biosecurity
- New locations
- Regulatory changes

Targeting Group cost of NOK 37.90/kg in 2020



- Increased survival NOK 3/kg
  - Robust smolt
  - Reduced time in sea
  - Biosecurity
- Harvest cost NOK 1/kg
  - Increased efficiency from higher volumes
- Miscellaneous NOK 1/kg
  - Precision farming
  - Procurement
- Weighted industry average cost in of NOK 38/kg* in 2020

**based on industry and analysts forecasts*

Sustainability

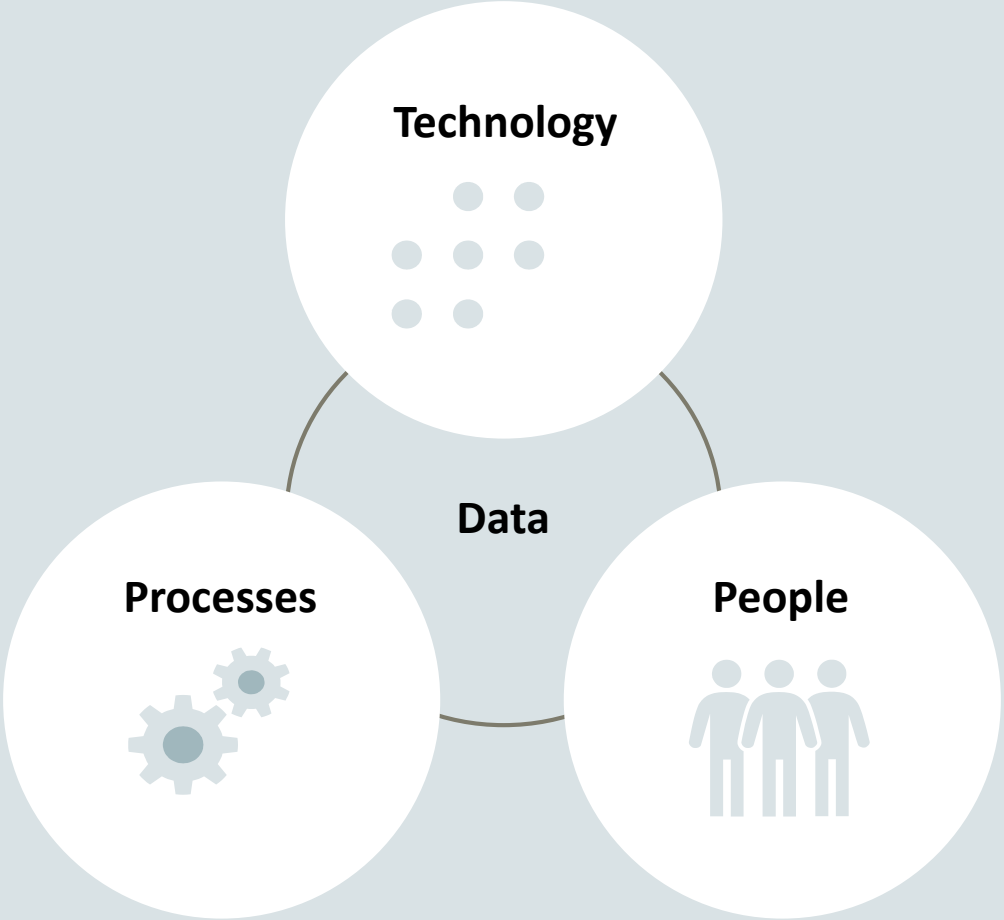
Post-smolt strategy

Digitalization in salmon farming

Biosecurity and fish welfare

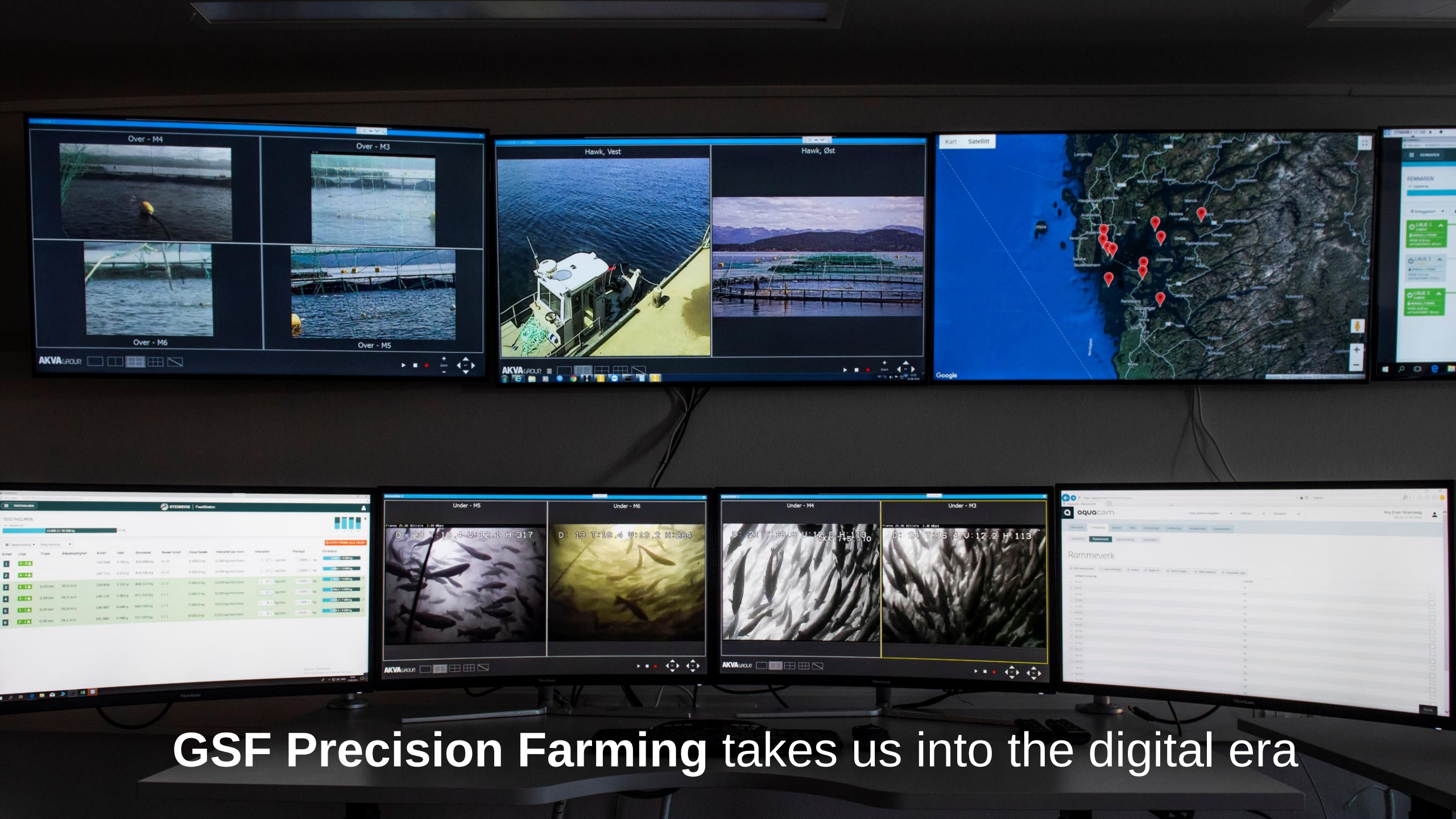
Expansion opportunites

Combining people, nature and technology



Digitalization in salmon farming

Applying advanced **sensors**, **big data**, **artificial intelligence** and **automation** in order to generate **better decisions**, thereby increasing **yield** and **resource efficiency.**



GSF Precision Farming takes us into the digital era

Technology and data are changing the way we operate

Salmon farming operations

Before

- Manually oriented
- Gut-feeling
- Experience-based
- Poor data quality
- Little focus on standardization

Historical data

Now

- Consolidation
- Simplification
- Data acquisition
- Data storage
- Data Warehouse/BI
- Master data management

Real-time data

The future

- Integration platform
- Cloud-based services
- Internet of things (IoT)/sensors
- Big data analytics
- Integrated operations
- Predictions
- Improved decision support

Data-driven predictions and simulations

Data enables GSF Precision Farming and the digital transition

Data sources

- Biological characteristics
- Biomass control
- Environmental conditions
- Operational infrastructure

Data driven actions and effects

- Data driven decision support
- Improved insight
- Better control
- Increased resource utilization
- Improved area management
- Unseen connectivity

End results

- ▲ Sustainability
- ▲ Productivity
- ▼ Costs

GSF Precision Farming is key for delivering on our sustainable growth strategy

Where we started

- Simplified and standardized infrastructure and IT portfolio management
- Developed a harmonized culture for interaction of IT and data throughout the company
- Worked closely with all regions and regional directors to recognize the importance of simplicity and standardization
- Through control of all data and systems, as well as digital confidence throughout the company, we have built the backbone for all ongoing and future digitalization projects

Where we are today

- Improving the BI solution utilizing the GSF Cloud as a source system
- Pilot for integrated operation center ready for launch in Rogaland
- Correlating satellite pictures with digital processing of water samples and environmental parameters, for optimized feeding in British Columbia
- Utilizing sensor data for real-time monitoring in cages
- Improving feed conversion ratio through big data project with IBM Watson
- Taken a lead role in industry collaboration project with NCE Seafood Innovation Cluster to predict sea lice outbreaks (AquaCloud)

Integrated full-scale operations centers for remote farming operations

Compatibility

Compatible with multiple types of feeding systems, cameras and sensors

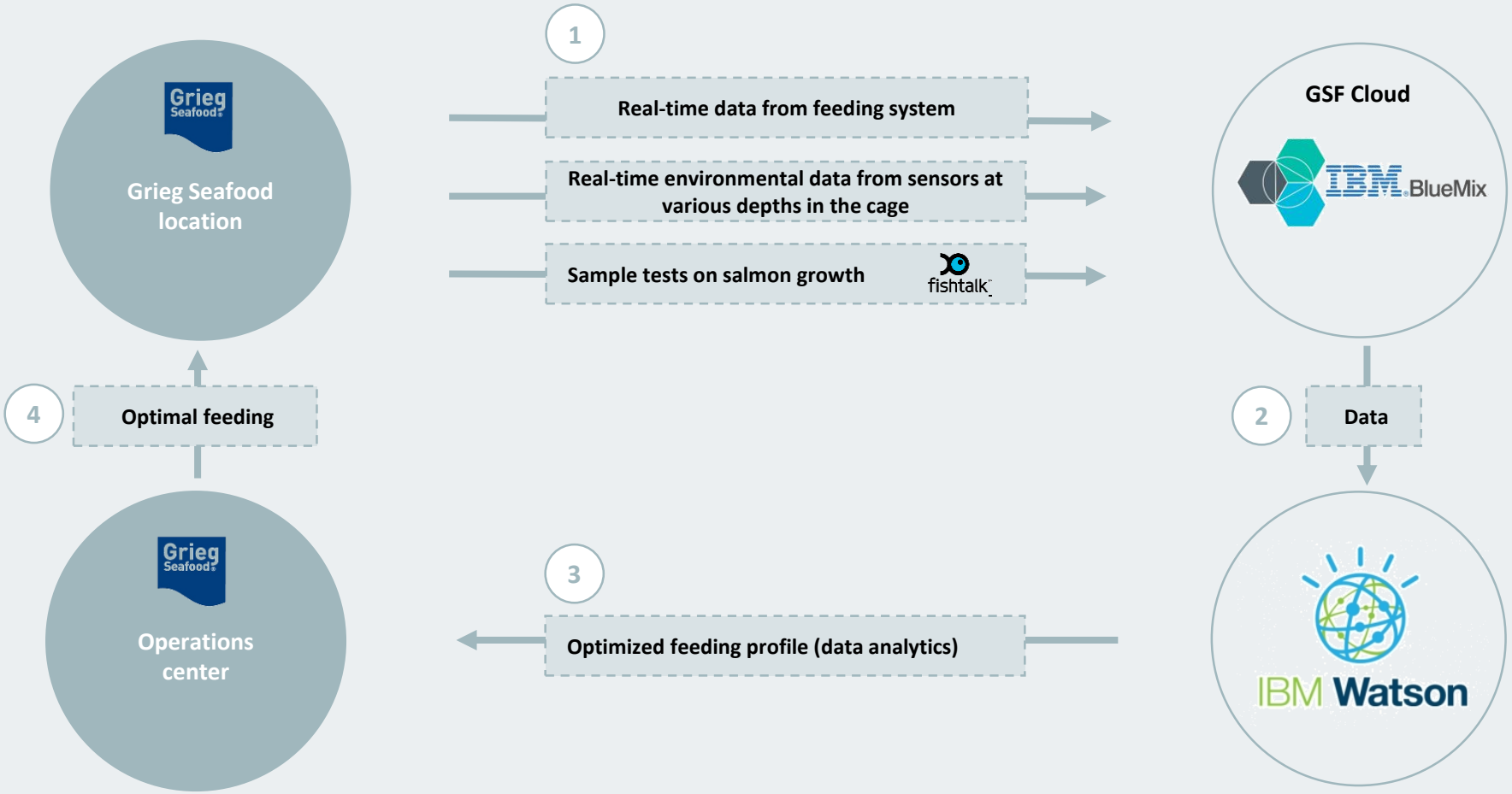
Operational and strategic decision support

- Gather and analyze new and historical data
- Support decision through continuous data analysis
- Centralize and improve feeding operations
- Overview of all technical infrastructure

Open standard

Open standard enables integration with new technologies and functionalities

Utilizing artificial intelligence in feed optimization project



Precision farming ensures efficient operations

Better feeding leads to better growth

01 Launch fall 2018 - ensure all technical aspect function correctly

02 Centralize and improve feeding operations

03 Gather and analyze new and historical data to support decision making at the growth sites

04 Free up time for employees at growth sites to focus on technical aspects, such as lice counts and cleaner fish

05 HMS - employee safety, improved surveillance of boats and employees

06 Aiming for full coverage by 2019

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Photo: Eilert Munch