# Welcome to Capital Markets Day

November 24, 2020 at 13.00 (CET)



AKVA GROUP

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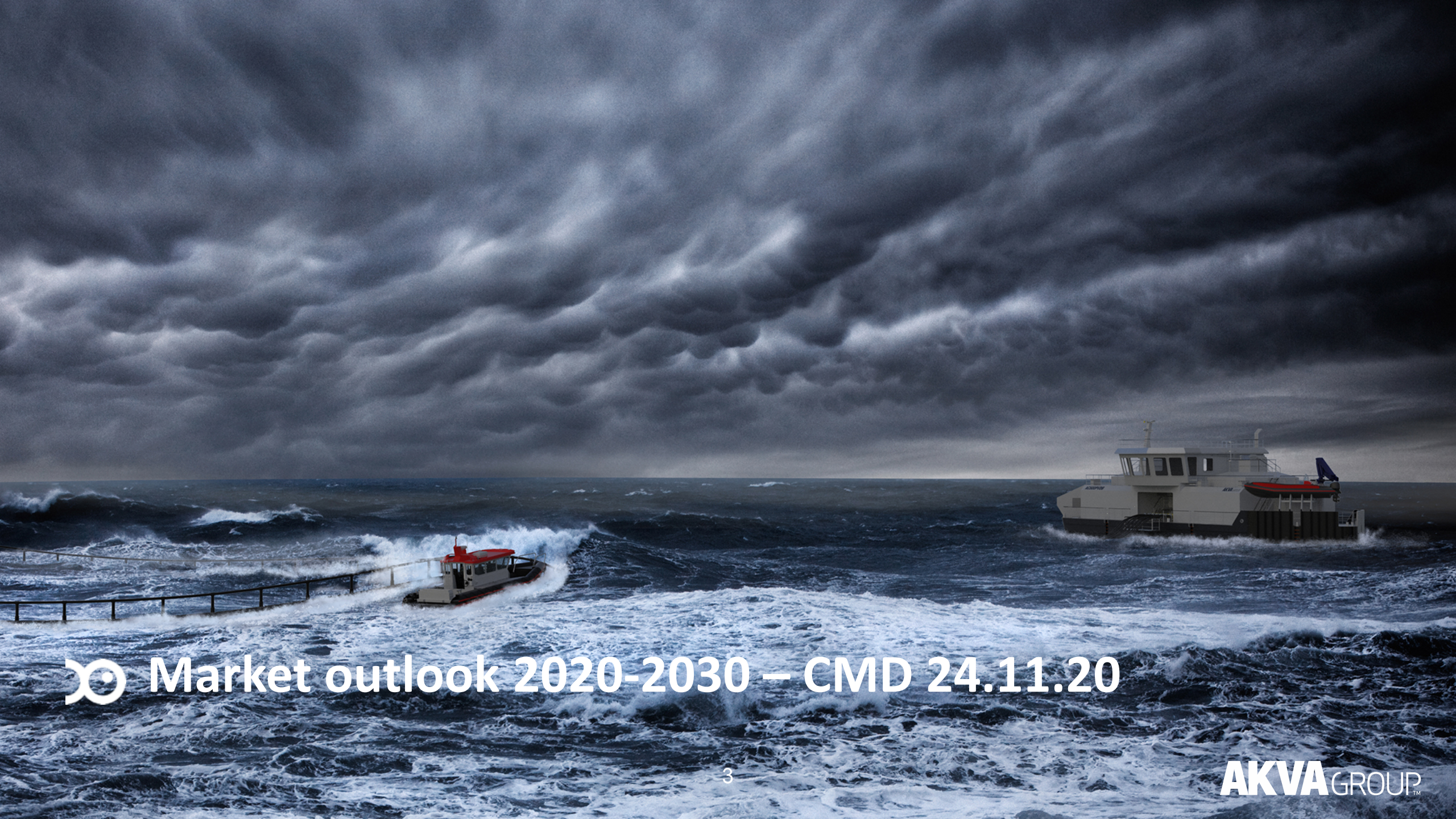
# Content

| TOPIC | Presented by |
| --- | --- |
| 1. AKVA group introduction (short video) | |
| 2. Macro perspectives and Overall strategy | Knut Nesse, CEO |
| 3. Financial perspective | Ronny Meinkøhn, CFO |
| 4. Innovation agenda | Espen Fredrik Staubo, CIO |
| 5. Cage based | Erlend Sødal, COO Cage based Nordic |
| 6. Land based | Johan Fredrik Gjesdal, COO Land based |
| 7. International sales | Per Andreas Hjetland, CCO Cage based |
| 8. Digital (presentation + video) | Andrew Campbell, COO Cage based International |
| 9. Q&A | |
| 10. Closing | |



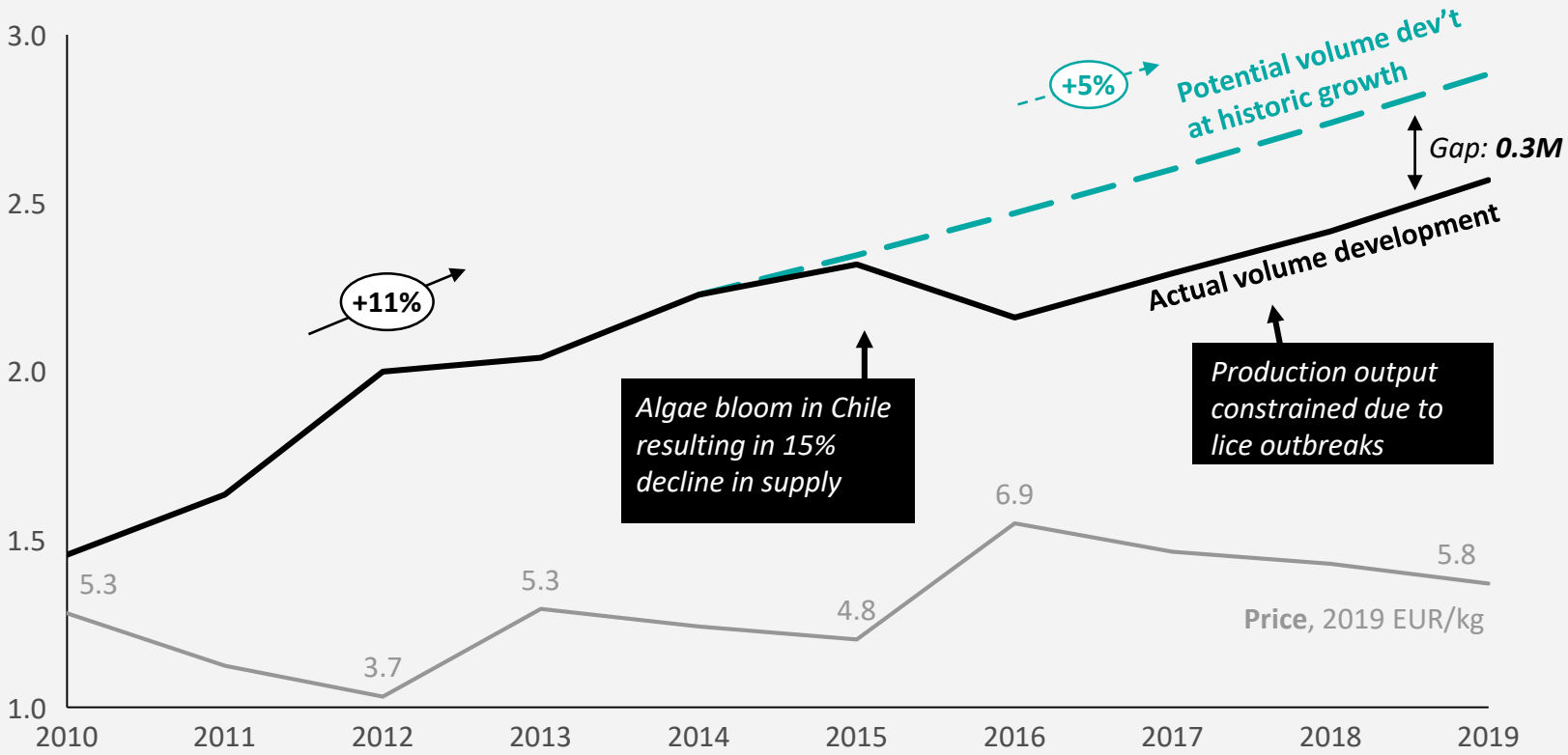
# Market outlook 2020-2030 – CMD 24.11.20



AKVA GROUP

# Historical strong volume development despite recent supply constraints – ~12% estimated underlying untapped demand potential

**Global demand and price development for salmon 2010-2019**
Consumption of salmon and trout WFE in mill. tons



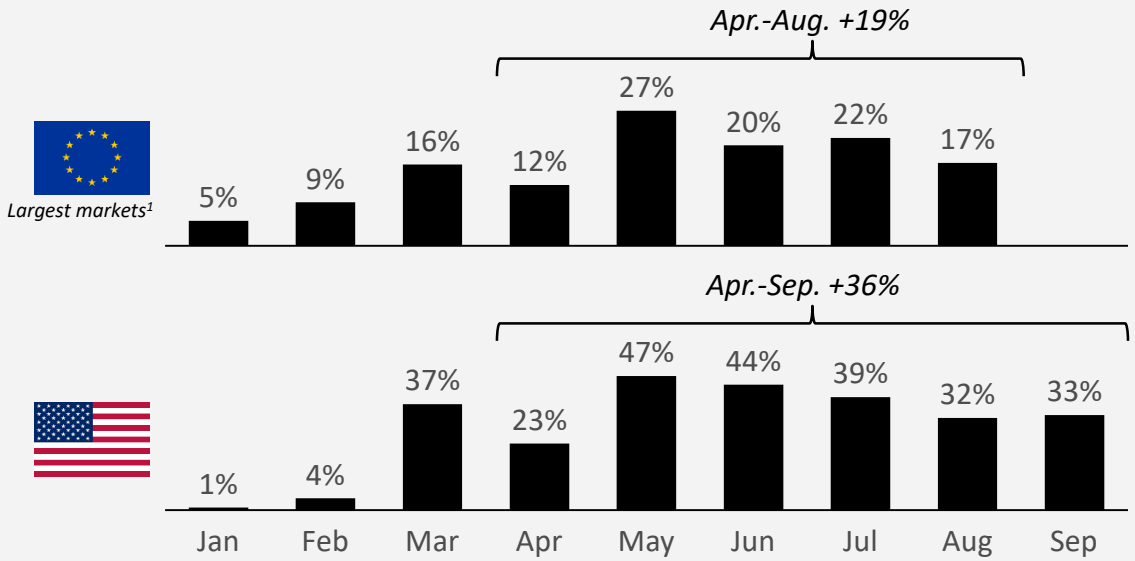

Source: Kontali, NASDAQ, Cardo Partners analysis

**Key demand drivers**

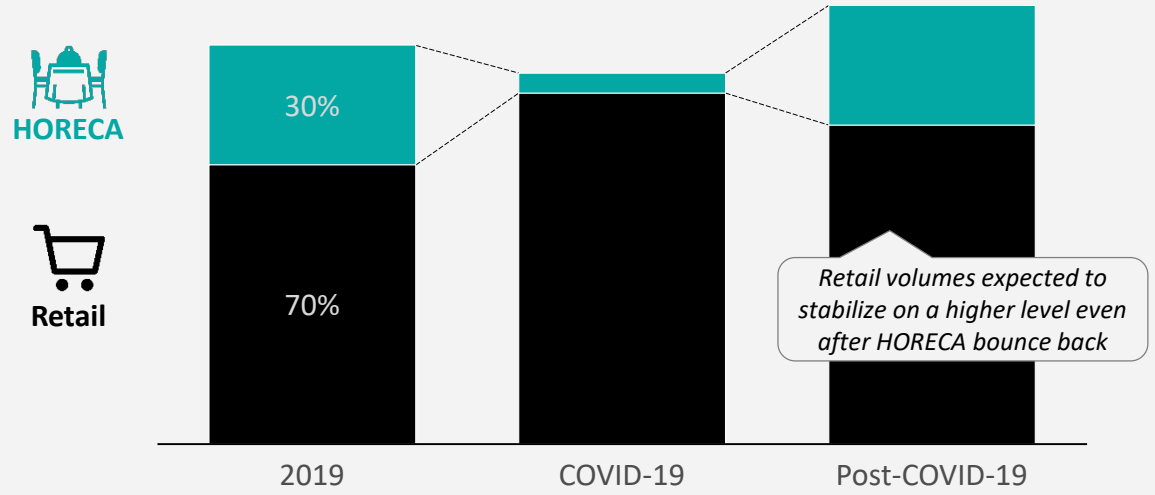
- **Focus on environment and health** increasing demand for more environmentally friendly and healthy sources of protein
- **Salmon among favored species** for consumption in developed and emerging seafood markets
- **Distribution to new markets** fueling demand, ~45% of total volume growth 2015-2019
- **Product developments** (e.g. smoked, marinated, sushi) resulting in salmon gaining market share
- **Modified Atmosphere Packaging (MAP)** has prolonged shelf life and enabled grocery retailer distribution

# …especially impressive transition of HORECA volumes to retail during COVID pandemic – retail volumes expected to remain strong due to changes in preferences

**EU and US retail volumes significantly up in 2020**
Year-on-year change in in-home consumption volumes for salmon, %




**Indications of change in consumers preferences, resulting in salmon capturing a larger share of the dinner table**
Illustration of retail vs. HORECA in EU, % of total Salmon consumption




**COVID lockdown resulted in HORECA volumes being diverged into retail**

- Volume supported by increased in-home consumption and 8% decrease in spot price[2]
- Increased consumer experience and confidence in preparing seafood meals, e.g. +~40% "salmon recipe" searches on Google

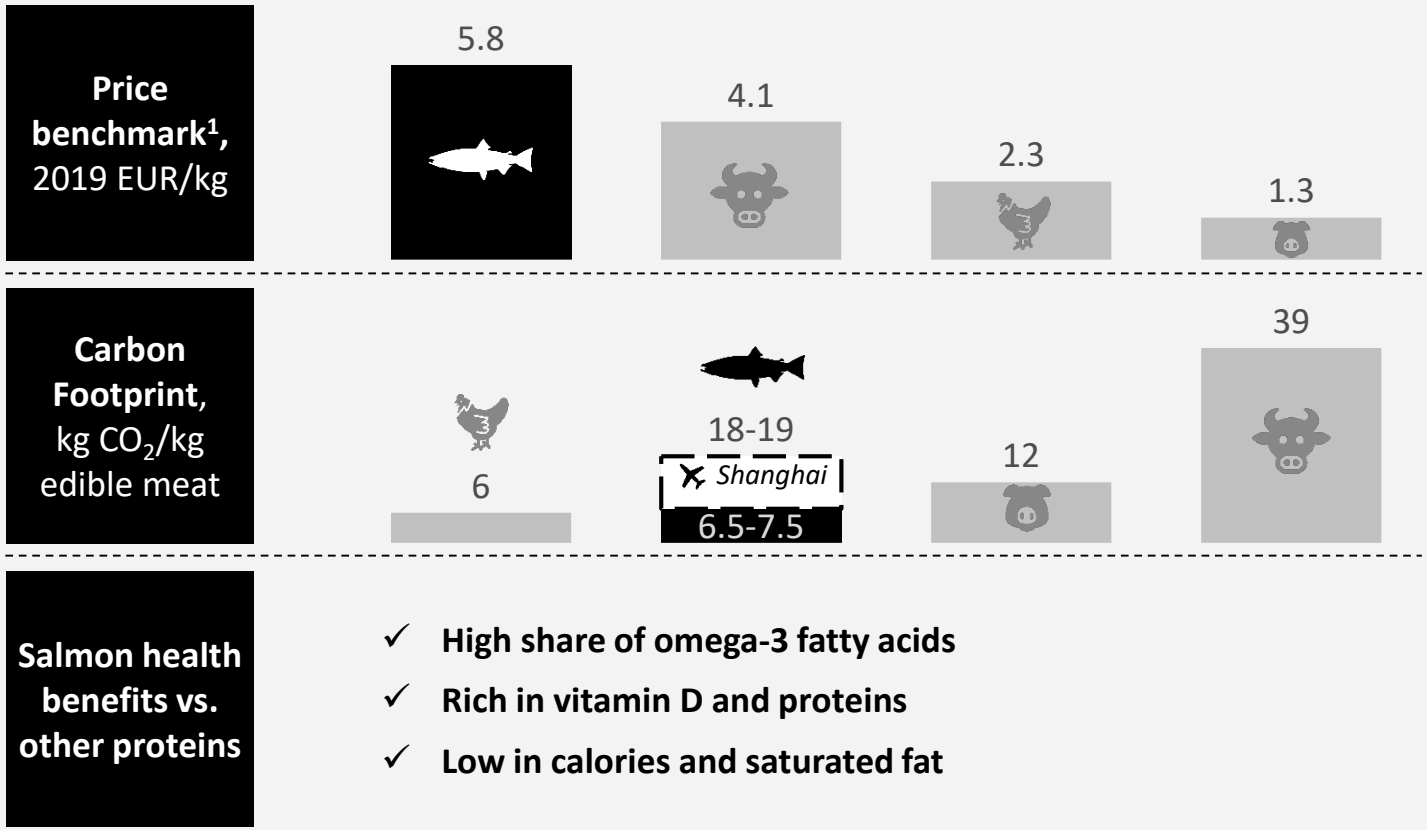
**Changes in consumer preferences could result in retail stabilizing at a higher level**

- 1H 2020 lockdown resulted in HORECA volumes almost disappearing
- Recovery of HORECA expected post-COVID, but potential higher retail level driven by change in customer behavior during pandemic

1) Including France, Italy, Germany, Spain, UK
2) Weeks 12–36 in 2020 vs. 2019
Source: Kantar/Gfk, Nielsen, SB1M, Cardo Partners analysis

# Consumers willing to pay a premium for salmon vs. other proteins

**Salmon versus other protein sources**

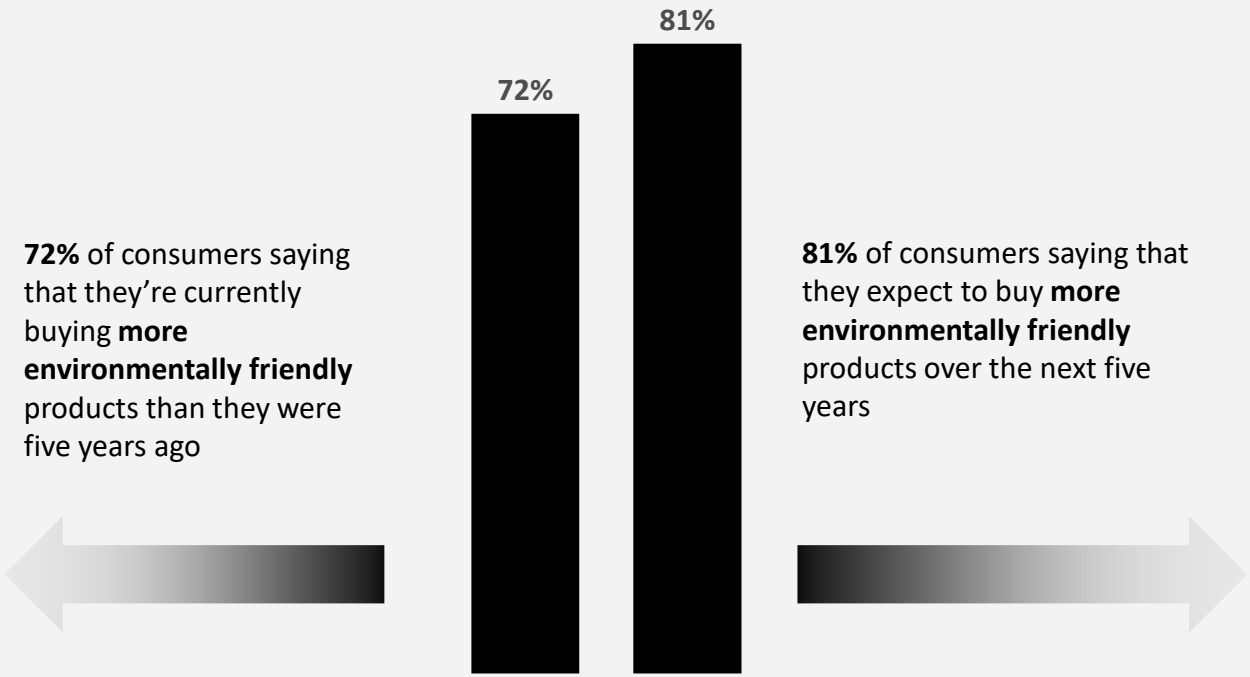



- Current price level shows that consumers are willing to pay premium prices for salmon vs. other proteins, likely due to health benefits and superior taste
- Airborne salmon challenging in terms of sustainability given ~3x CO2e/kg emissions compared to locally produced salmon

1) Salmon: Norwegian salmon export price; Beef: Australian and New Zealand 85% lean fores, CIF US import; Chicken: Whole bird spot price, whole iced, Georgia docks; Pork: 51-52% lean hogs, US price
Source: SINTEF (Carbon footprint), IMF (Price benchmark)

# Increasing customer awareness on sustainable products – trend expected to accelerate over the next decade

**Recent survey shows high consumer focus on sustainable products**
N = 6 000 across 11 countries, conducted by Accenture for ACC in 2019




**Possible megatrends likely to further increase environmental focus**

*Selected examples*

**Climate change** among top challenges – likely to continue changing consumer behavior

- **Carbon footprint** ($CO_2$)
- **Water scarcity**

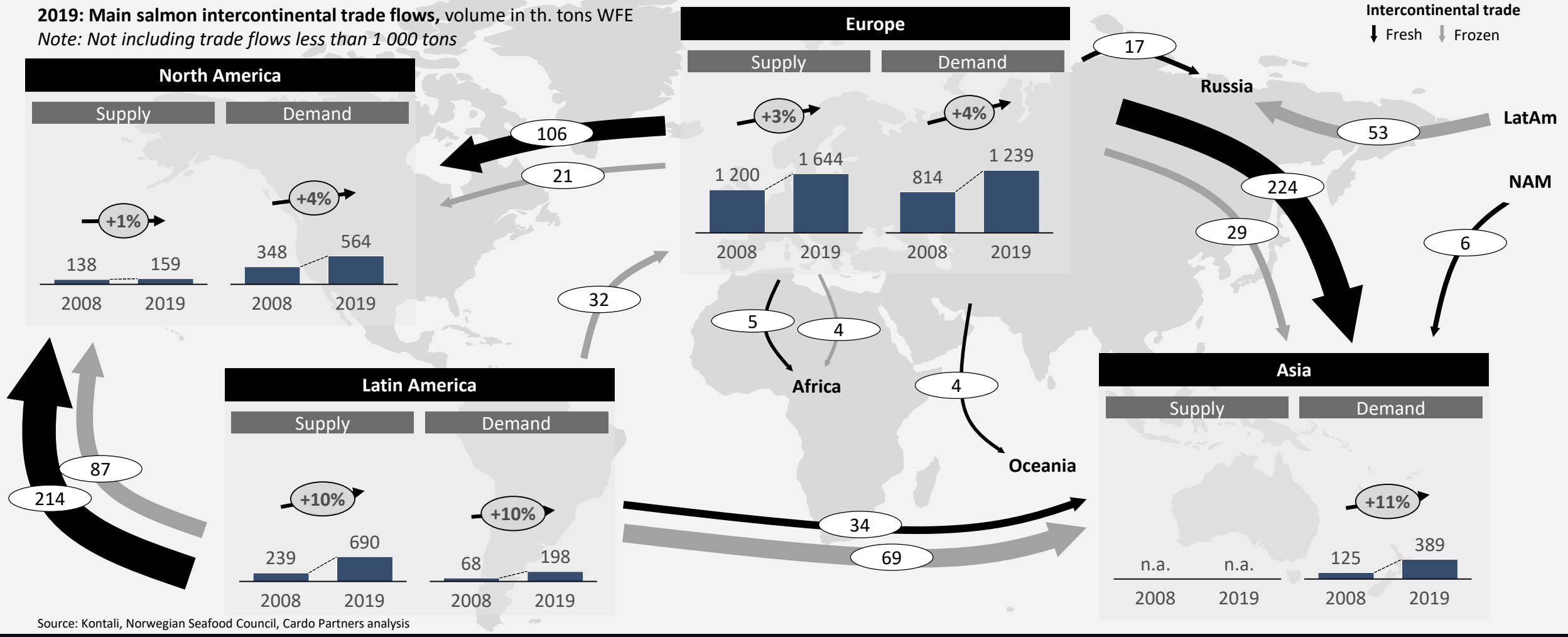
**Locally produced food in high demand,** both due to need for freshness and carbon footprint challenges

**Security of food supply** becoming increasingly important due to population growth, more extreme weather and fragile supply networks

Source: Accenture, AKVA Group perspectives

# The North American and Asian markets have historically been dependent on (and limited by) import from Norway and Chile

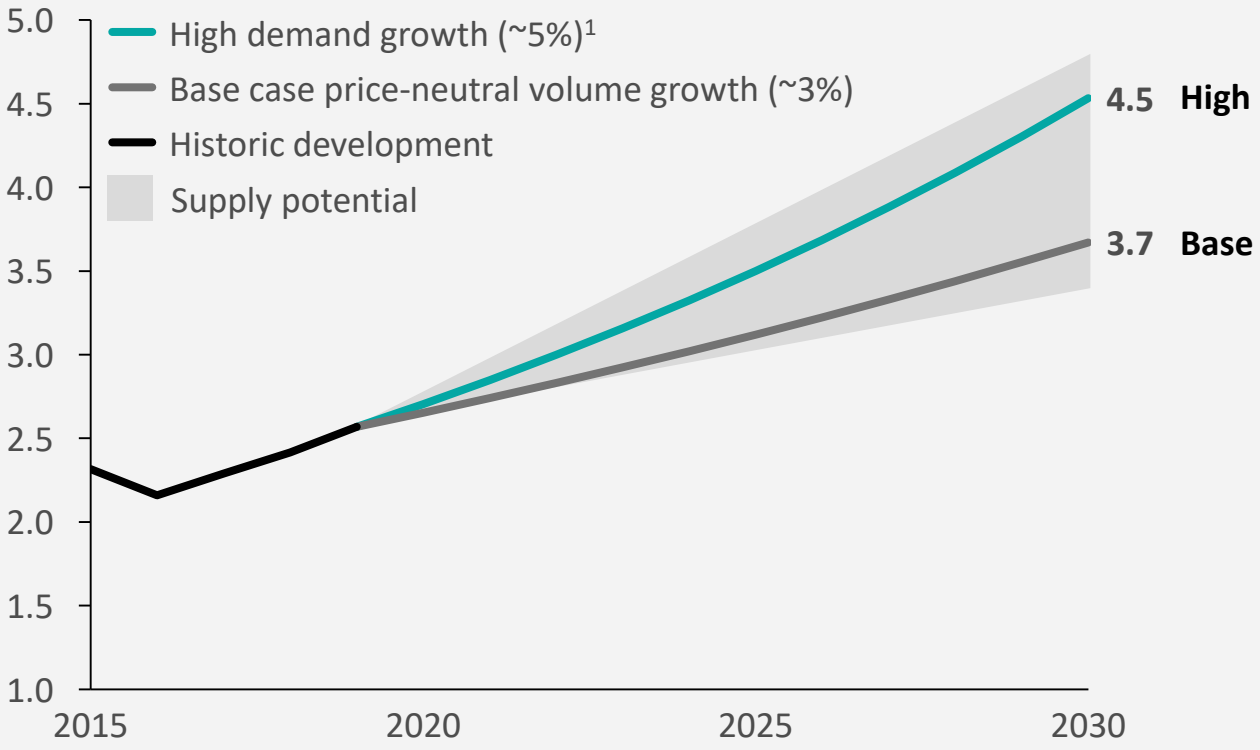
**2019: Main salmon intercontinental trade flows,** volume in th. tons WFE
*Note: Not including trade flows less than 1 000 tons*




Source: Kontali, Norwegian Seafood Council, Cardo Partners analysis

# Underlying demand growth implies 1–2 million ton volume increase by 2030

**Extrapolation of underlying demand growth for salmon 2015-2030**
Consumption of salmon WFE in mill. tons




**"What you need to believe in" in 2030**

| | | |
|---|---|---|
| **High** (+2M tons) | '15-'19 **2%** '19-'30 **4%** | Doubling in volume growth for **Europe** and **North America** (CAGR) |
| | 2019 **0.1** 2030 **0.3** | 3x **Chinese** consumption (kg/capita) CAGR of 10,5% |
| | '15-'19 **4%** '19-'30 **7%** | 7% volume growth **other regions** (CAGR) |
| | *Note: Will require additional funding of marketing activities* | |
| **Base case** (+1.1M tons) | Extrapolation of historical ~3% price-neutral volume growth rate[2] | |

1) +2 percentage point increased price-neutral volume growth compared to base case
2) Extrapolation based on ~3% real-term value growth in salmon market 2016-2019 measured in Euro and adjusted for inflation
Source: Kontali, Cardo Partners analysis

# Traditional growth and new emerging technologies have the potential to cover underlying demand

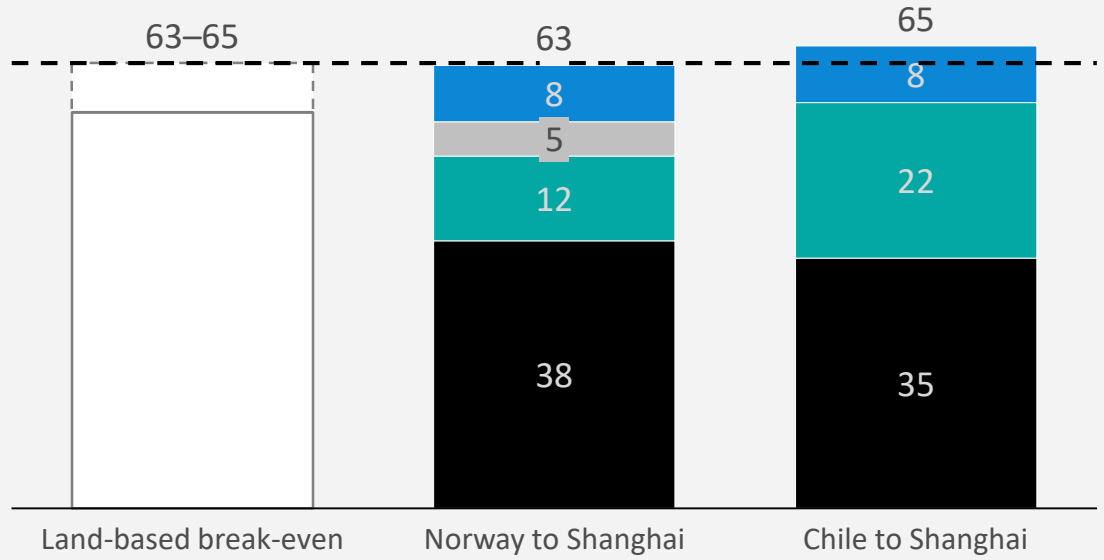
| Supply sources/ drivers | | | Indicative supply potential 2030, mill. tons | Volume 2019, tons | What to believe in? |
|---|---|---|---|---|---|
| Conventional | Traditional growth |  | 0.3–0.6 | 2.5M | • 1-2% supply growth driven by increased capacity and utilization<br>• Currently challenging supply outlook in Chile and Canada (conv.)<br>• Innovation required to maintain and grow existing volume |
| | Post-smolt |  | 0.12–0.25 | | • 5-10% increase in conventional production driven by shorter production cycles and lower mortality due to time in sea |
| | Effective lice prevention/ treatment |  | 0.1–0.4 | | • Improved solutions for lice treatment/prevention can lead to maximal biomass allocations in Norwegian “traffic light” system and reduced mortality rates |
| Un-conventional | Landbased |  | 0.2–0.8 | 7K | • Land-based has a role to play, either as “niche” production or as preferred growth area (dependent on cost competitiveness) |
| | Offshore/ open sea |  | 0.1–0.2 | ~0 | • Current development licenses in Norway<br>• Significant potential if applicable in new regions |
| | | | **Total: 0.9–2.3** | | |

Low High

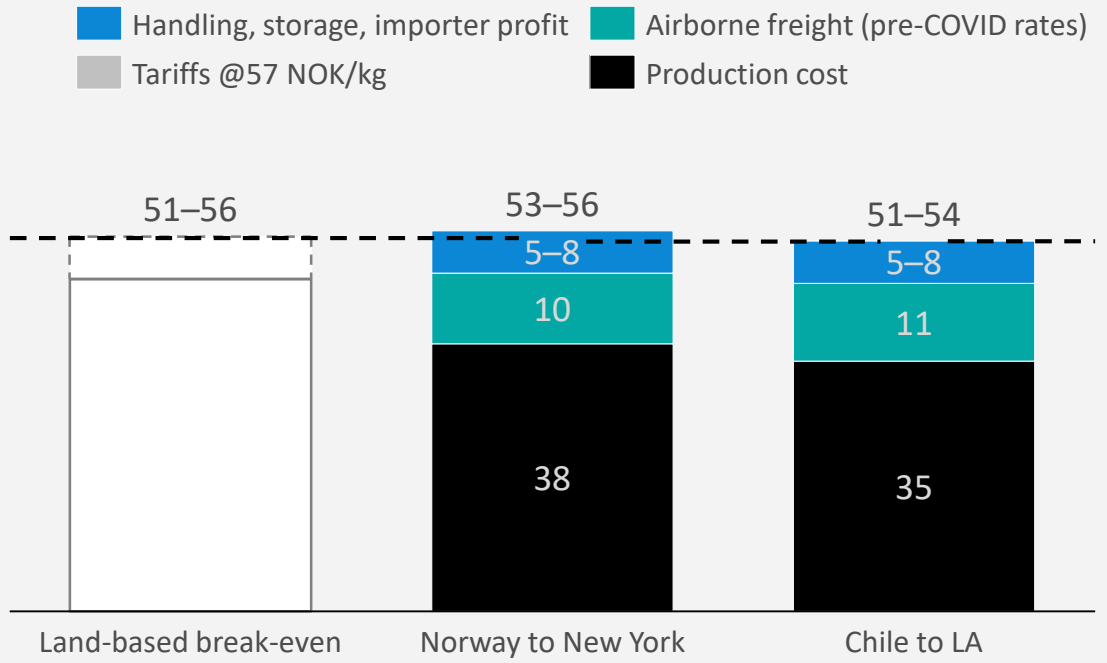
Source: AKVA Group and Cardo Partners analysis

# Freight, tariffs and distribution increase the competitiveness of land-based – 51-65 NOK/kg required to be competitive dependent on region

**Asia: Competitiveness land-based,** NOK/kg HOG (fresh)



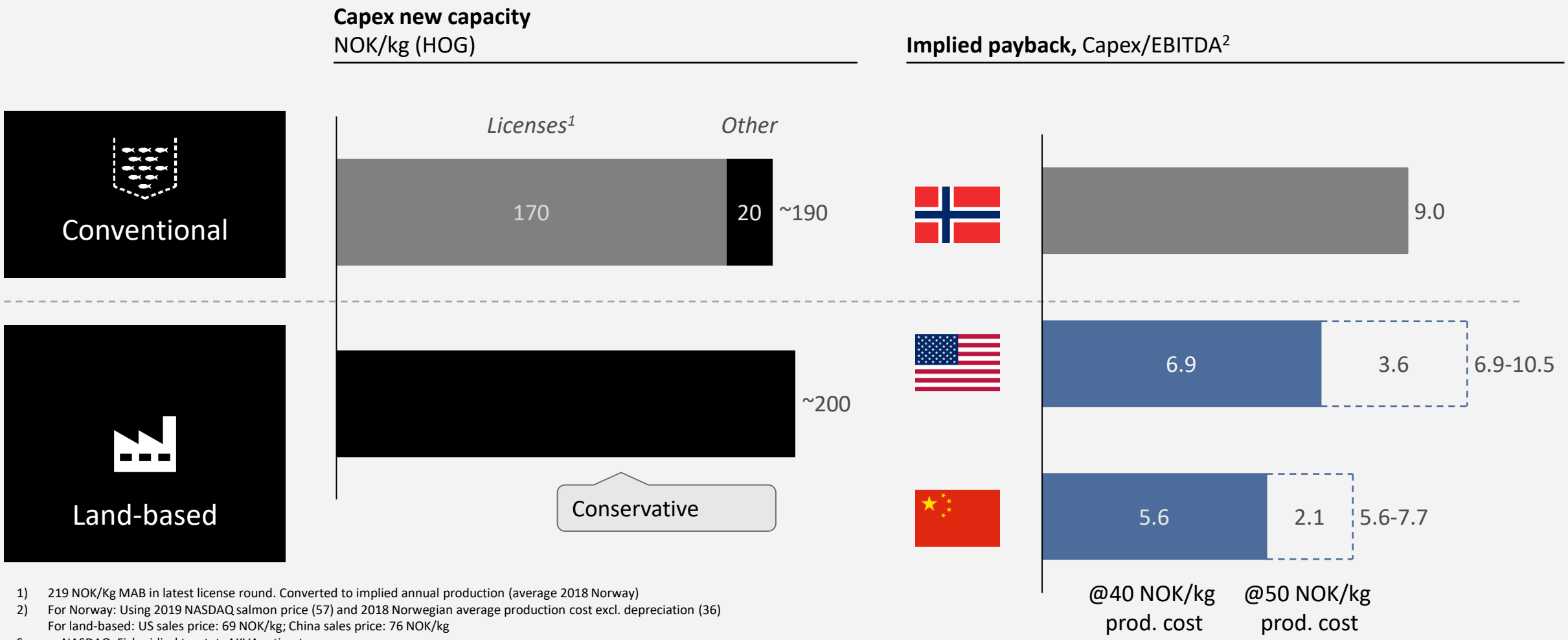

**North America: Competitiveness land-based,** NOK/kg HOG (fresh)




Norway-China free trade agreement talks in final stages – likely to remove Chinese tariffs on Norwegian salmon
Current 2x air freight rates vs. pre-COVID levels – high uncertainty regarding development over next 10 years

Source: Fiskeridirektoratet, NOFIMA 2018 numbers on production costs, Nordea, NAP, World Trade Organization, Seaborn

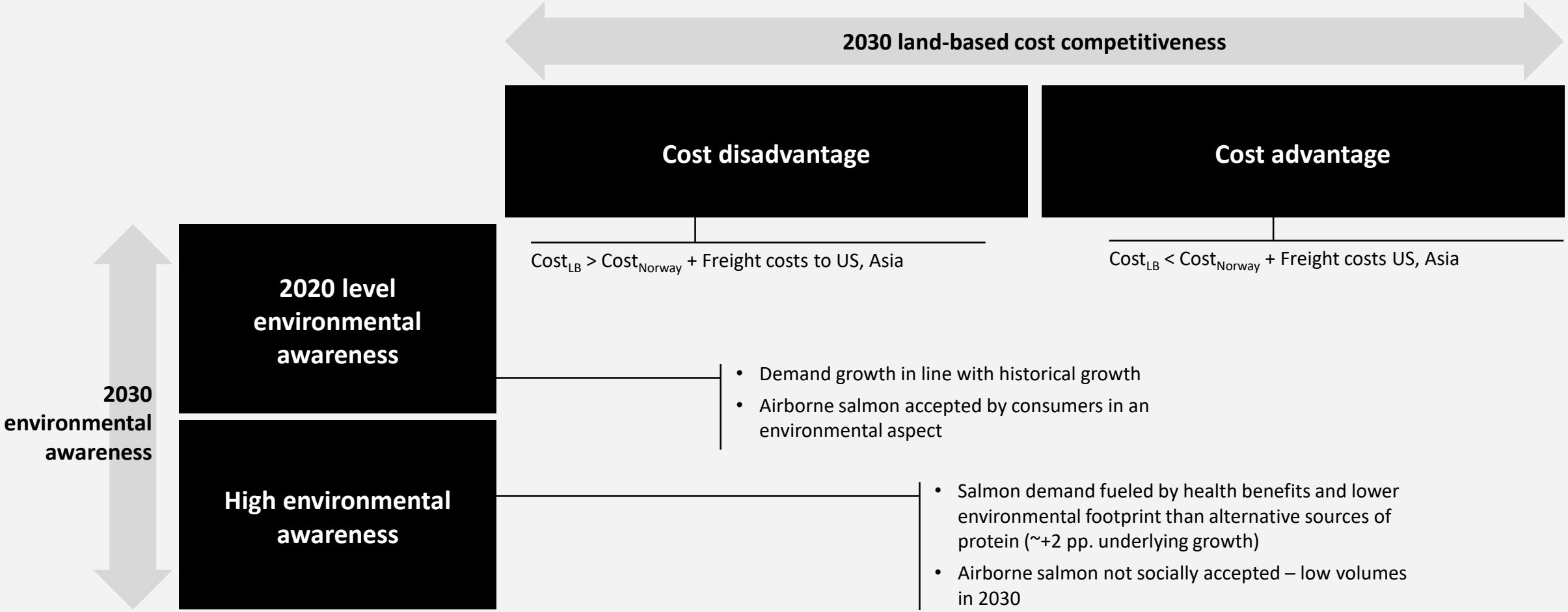
# Land-based production achieves favorable payback if 40-50 NOK/kg production costs




1) 219 NOK/Kg MAB in latest license round. Converted to implied annual production (average 2018 Norway)
2) For Norway: Using 2019 NASDAQ salmon price (57) and 2018 Norwegian average production cost excl. depreciation (36)
For land-based: US sales price: 69 NOK/kg; China sales price: 76 NOK/kg

Source: NASDAQ, Fiskeridirektoratet, AKVA estimates

# 2030 high-level market scenarios driven by land-based cost position and consumers' environmental awareness

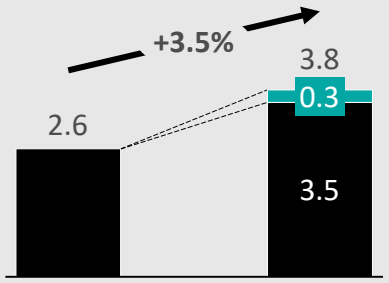
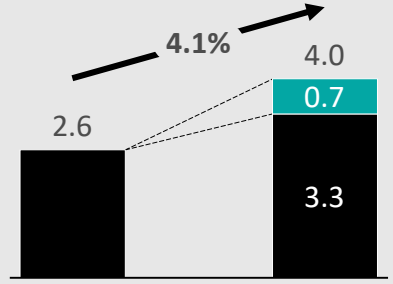
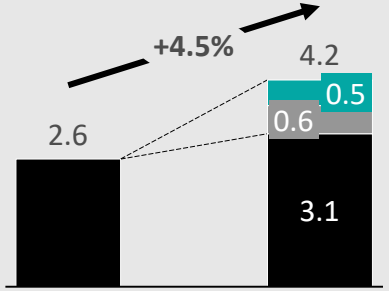
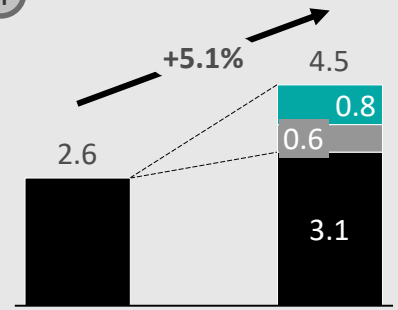


# All four scenarios involve significant land-based volumes, but also sustained conventional growth

**2030 supply/demand scenarios**
Volumes in mill. tons WFE

**2030 land-based cost competitiveness**

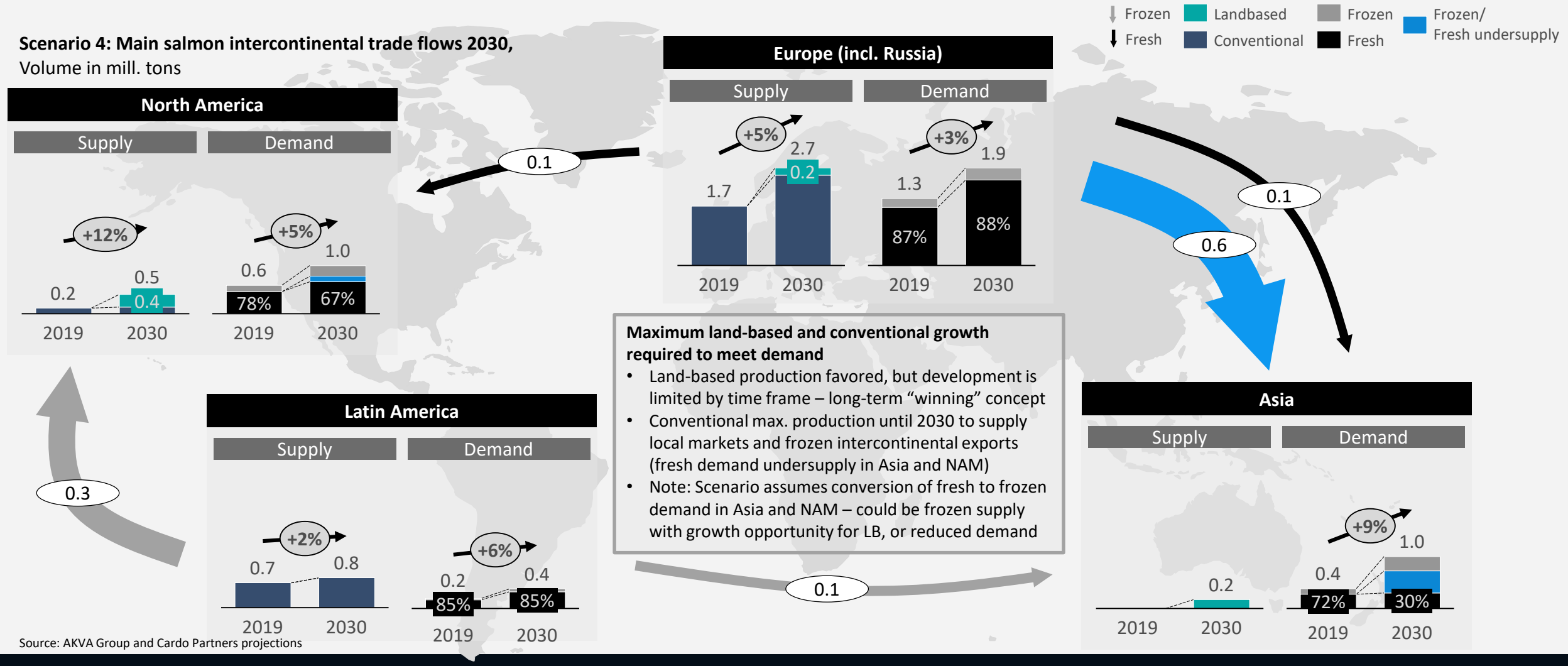
Land-based supply
Fresh undersupply
Conventional

| 2030 environmental awareness | Cost disadvantage | Cost advantage |
|---|---|---|
| **2020 level**<br>*Extrapolation of historical demand growth*<br>*Airborne OK* | ①  <br>**Conventional and selective land-based projects largely balance demand**<br>• Underlying demand in line with 2015+<br>• ~2.5% (historical)[1] conventional growth in Chile and Norway<br>• Sanctioned + selective new LB projects where cost disadvantage is the lowest<br>• ~2x airborne supply | ②  <br>**Land-based captures growth and develops new markets**<br>• LB favored, but limited by time frame<br>• Higher demand growth in LB regions<br>• ~2.0% conventional growth due to less fresh demand<br>• +50% airborne fresh supply |
| **High environ. focus**<br>*Salmon demand fueled by health/ environmental concerns*<br>*End of airborne* | ③  <br>**Undersupply: "Super profit" for conventional and emerging LB**<br>• +~2 p.p. price-neutral volume growth<br>• ~3% conventional growth (~maximum)<br>• Emerging LB even with cost disadvantage as prices increase and local fresh supply is limited<br>• Selective fresh intercontinental supply | ④  <br>**Maximum land-based and conventional growth required to meet demand**<br>• LB favored, but limited by time frame<br>• Conventional supplies local regions, and selective fresh/residual frozen intercontinental trade<br>• LB gradually capturing non-conventional regions in the long term |
| | 2019 2030 | 2019 2030 |

1. 2015-2019 period
All scenarios imply a 60+ NOK/kg salmon price in 2030
Source: AKVA Group and Cardo Partners projections

# Scenario 4: Land-based driver of supply growth in long-term, but limited by time frame until 2030

**Scenario 4: Main salmon intercontinental trade flows 2030,**
Volume in mill. tons



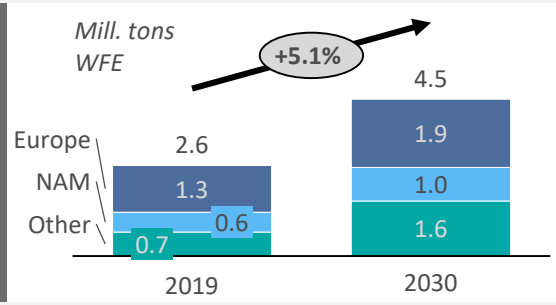

**Maximum land-based and conventional growth required to meet demand**

- Land-based production favored, but development is limited by time frame – long-term "winning" concept
- Conventional max. production until 2030 to supply local markets and frozen intercontinental exports (fresh demand undersupply in Asia and NAM)
- Note: Scenario assumes conversion of fresh to frozen demand in Asia and NAM – could be frozen supply with growth opportunity for LB, or reduced demand

Source: AKVA Group and Cardo Partners projections

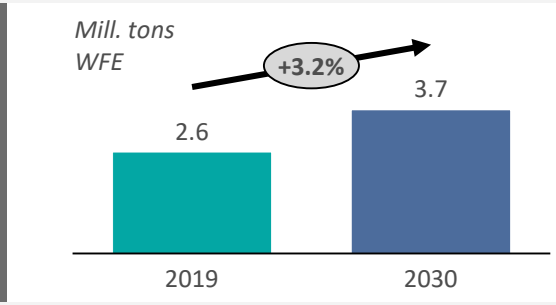
# Scenario 4: The paradigm shift of land-based farming will require major capex investments until 2030 and beyond

**Demand**



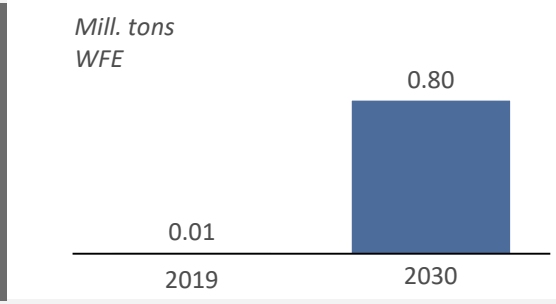

- Restricted fresh supply requires market effort to convert demand from fresh to frozen
- Asian markets critical for growth – required to increase and broaden marketing efforts

**Conventional production**




- Innovation critical to achieve growth
- New freezing technologies required to secure increased quality for frozen intercontinental exports
- Growth capex >20 bln NOK and additional maintenance capex
- Expectations 2030+ may limit investments/production

**Land-based/ other unconventional**




- ~160 bln NOK[1] in CAPEX investments needed to reach land-based capacity of 800 th. tons by 2030
- RAS suppliers critical to achieve growth

**AKVA Group implications:**

- Strong Cage Farming segment
- Exponential growth in Land Based revenue
- Likely high margins within Land Based technology given potential shortage of RAS supplier capacity

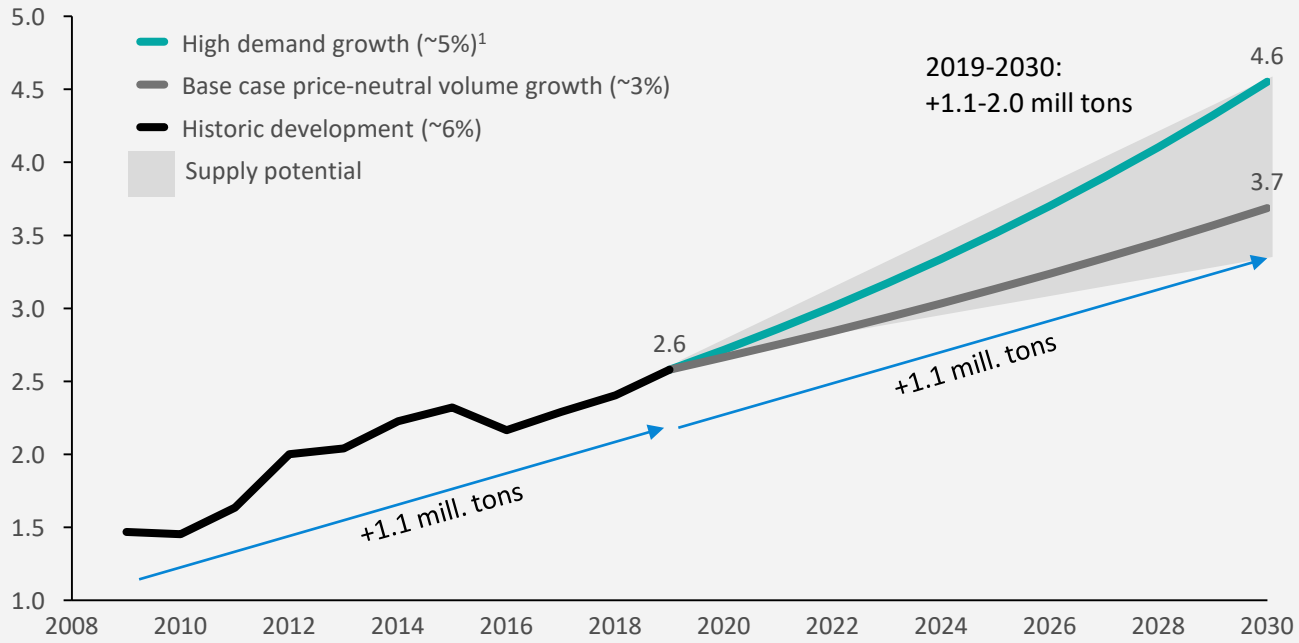
1. Estimated 200 NOK/kg capex investment for land-based and 20 NOK/kg for conventional production

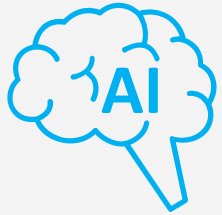
# AKVA Overall Strategy

# Underlying demand growth implies 1–2 million ton volume increase by 2030

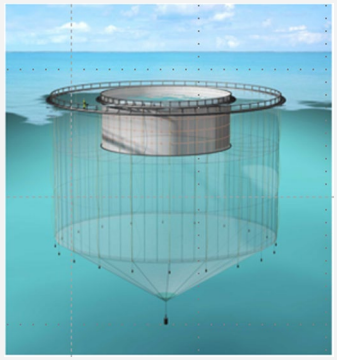
Salmon demand has increased by 1.1 mill tons from 2009-2019. “Base case” assumes similar demand growth till 2030

Consumption of salmon WFE in mill. tons




Step change Innovation and new Digital solutions required to enable salmon farmers to leverage on expected demand growth and increase Cage based and Land based production.

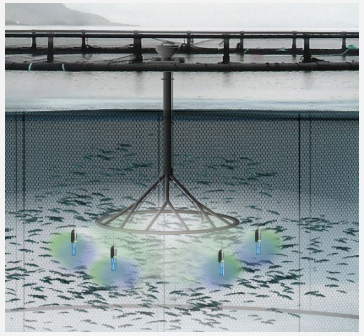


# Overall strategy for Cage Based Salmon Farming: Continue in the forefront offering Solutions and services to improve fish health and productivity and increase production

**Strong ramp up of Innovation and R&D capabilities:**

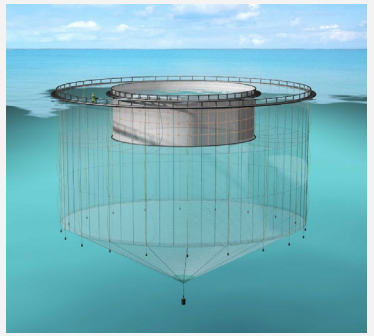
1. **Innovation resources/spending from 2021: + 50%** to support Organic growth ambitions.
2. **Centralize Innovation facilities.** One Centre of Excellence.
3. **Further develop Existing Core Products and Solutions.**
4. **Step change innovation:** Dedicated resources.
5. **Combining traditional** farming **technologies** with **digital** opportunities.

**AKVA subfeeder and lights**



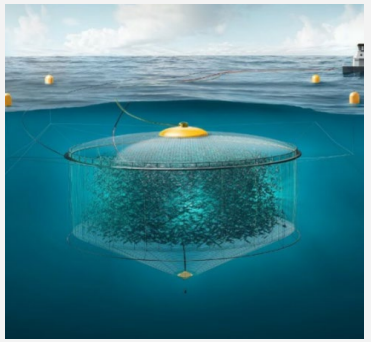
The fish voluntarily seek deeper water from light and feeding

**Tubenet™**



The fish has less access to surface and surface flow of water is barred from swimming area

**Atlantis subsea farming**



Completely submerged cage. The fish is offered only sub sea areas

**AKVA Observe**

AI assisted feeding operation and management

**Hybrid feeding barge**

An AC600 Feed barge with AKVA Hybrid battery package and water borne feeding

# AKVA's Overall strategy for Land Based Salmon Farming

1. Market leading Zero Water Concept RAS enabling sustainable and cost-effective production
2. Delivering complete scope of fish farming technology (e.g. feeding, fish tanks, fish handling, camera, lights, sensors, control system)
3. Data driven insight and intelligent farming systems enabling consistent and optimized production - "Precision Farming"
4. Production Advisory Services – RAS production competence group helping customers maximizing output and reducing cost

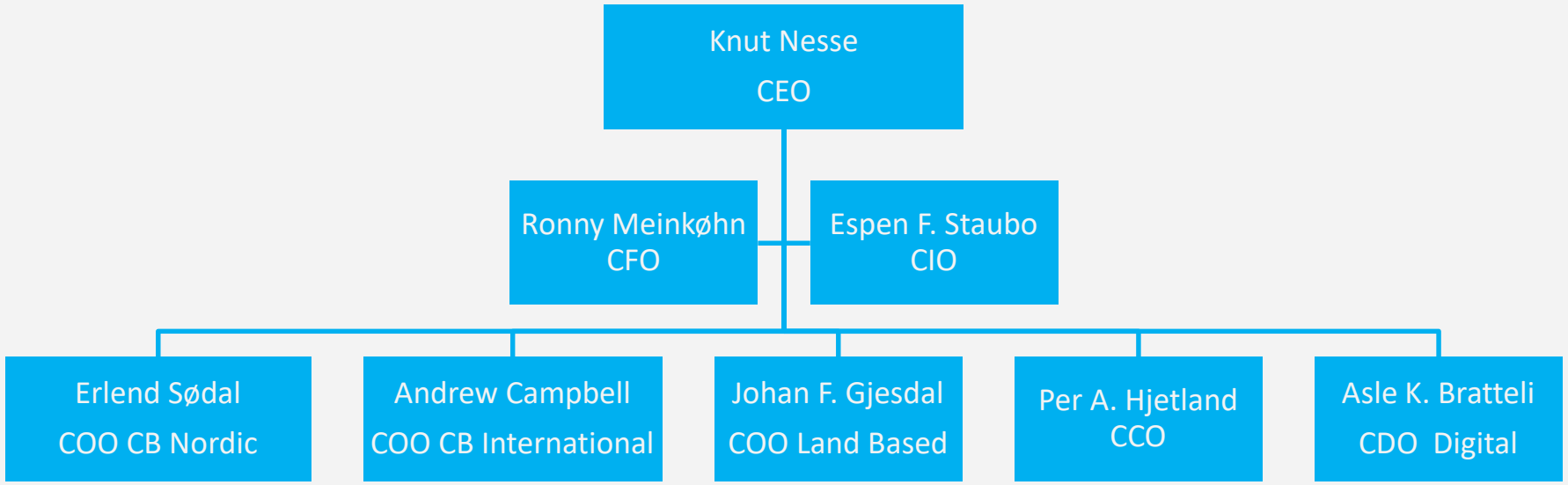
Standard 5,000 tonnes modules

Build up LB organization in Norway

AKVA group Innovation agenda – Centre of Excellence

# Strengthened Management Team

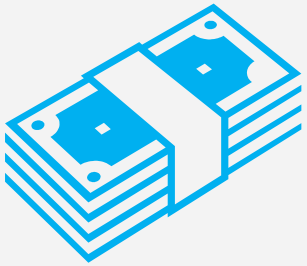
## -with a total of 125 years of aquaculture experience



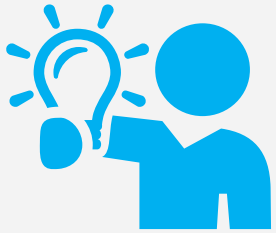
# Strategic guidance

Organic topline growth.

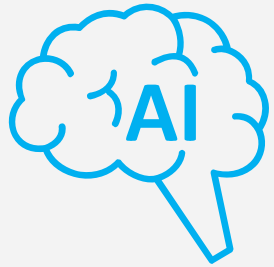
Operational excellence



- Deliver min. 25% EBIT-increase Y-o-Y
- Step by step improve ROACE to min. 15% by 2023.



Min. 50% increase in Innovation spending to support new Product development and Organic growth




3 Digital platforms: AKVAconnect, AKVA Observe and Fishtalk.

# ESG focus

- Good Environmental, Social and Governance principles (ESG) are key to AKVA group global activities.
- Our business is inherently dependent on a healthy environment. Farm raised salmon benefits human health, and AKVA supports the salmon industry producing in a sustainable way.
- Our Corporate Governance principles has for years been available for all stakeholders at our web-pages.
- This presentation gives a broader picture of how ESG-focus permeates our daily business focus from R&D to sourcing and delivery of solutions and services.
- We have started an internal processes to make our ESG-focus more visible and measurable and to prioritize actions by their importance.

## Solutions improving sustainability – product examples:

1. Tube net: Reduced lice infestations, less discharge of lice medication, improve health of salmon and cleaner fish.
2. Water feeding ➔ less energy, reduced $CO^2$ emissions and less micro plastic.
3. Hybrid barges ➔ less energy use and $CO^2$ emissions and better environment for the employees.
4. Net and Copper recycling and waste management at our net cleaning stations.
5. Land based RAS solution with zero-water exchange concept




# AKVA Business profile

**Solutions & Products:**
Supported by R&D and result of continuous investment in Innovation.

**Business Model:**
Primarily “Asset light”.

**Service & After sales (S&AS):**
May be more capital intensive and provides higher return.

**Larger projects:**
Strive to be “cash-positive”.

**International scalability.**


# Technology for Sustainable Biology

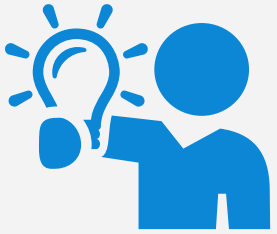

# Financial Outlook – by CFO Ronny Meinkøhn

# High focus on organic growth

*…supported by strong innovation agenda and further development and improvement of digital solutions*

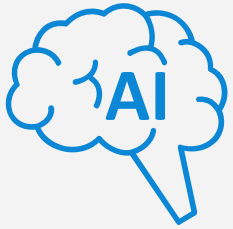
**Topline growth:**

- ✓ Mainly organic
- ✓ Leverage on strong product base and global presence
- ✓ Low M&A focus but financial capacity available



**Innovation Agenda:**

- ✓ Significant ramp up of activities and organization
- ✓ Increased focus on Land Based technology
- ✓ 2021 spending up 50%



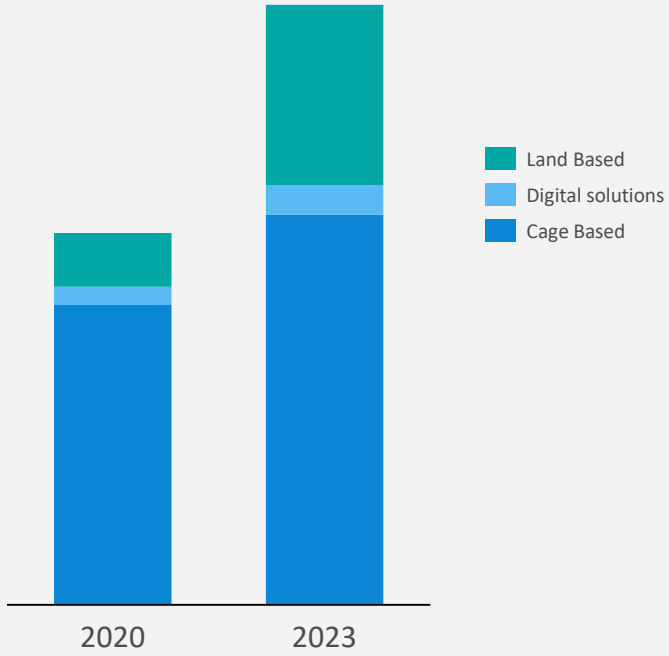

**Digital solutions:**

- ✓ Step change in development and improvement of digital solutions
- ✓ Spending up 25% in 2021

# Strong topline growth in all business segments

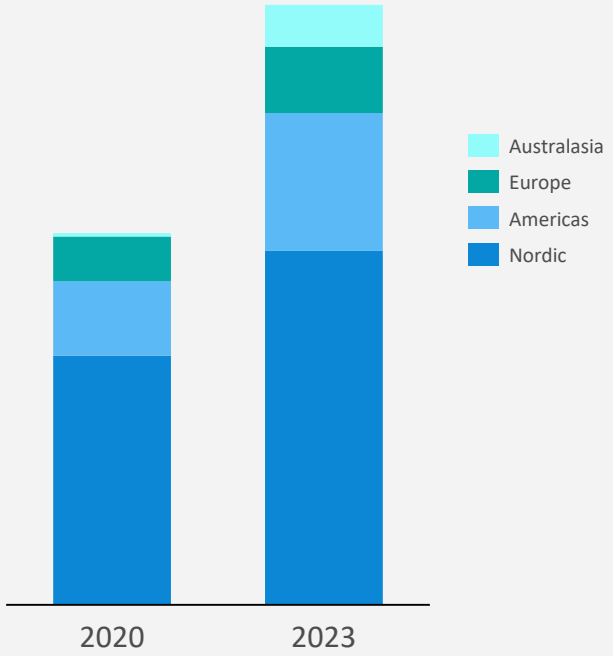
*…and paradigm shift on Land-based farming combined with strengthened international footprint*

## Segment




* For illustration purposes only

## Geography

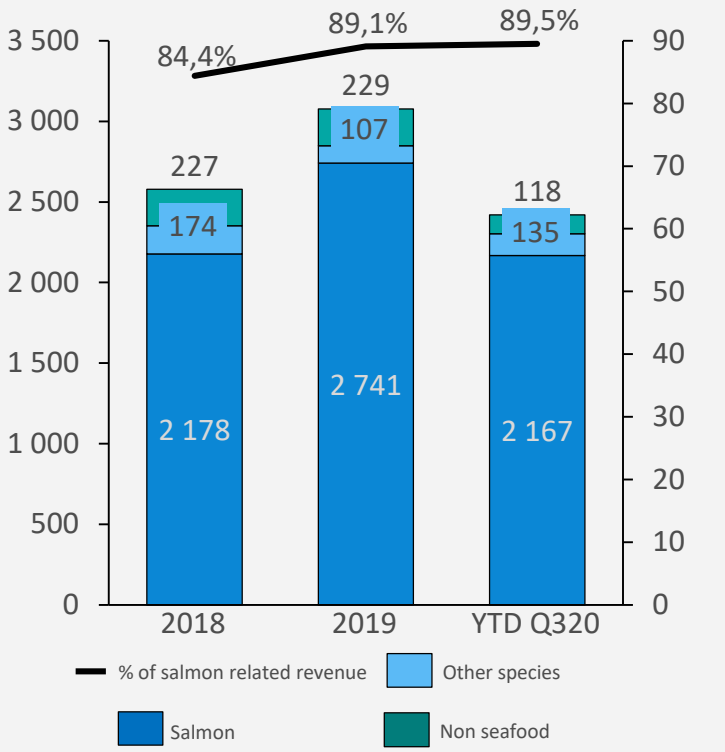



* For illustration purposes only

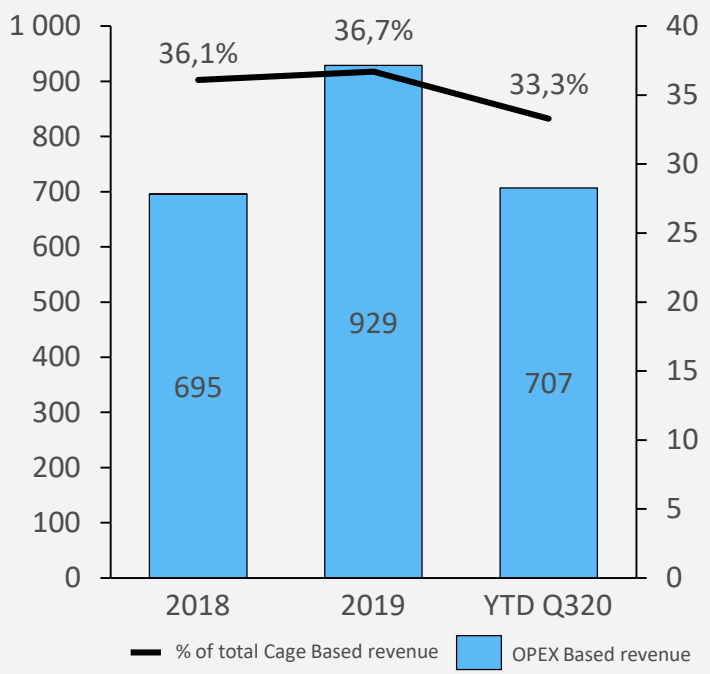
# Salmon to remain key focus area

*…and preparing to increase OPEX based revenue through our asset light service model*

## Species




## OPEX based revenue




**Two new service stations in Norway**

**Increased net cleaning services in Chile**

# Increased focus on operational excellence

1

**«The AKVA way» - our operational excellence program**

- ✓ Strengthening of the performance culture
- ✓ Simplifying work methods and organizational set-up
- ✓ Increase efficiency to reduce overall costs on projects and products while increasing customer satisfaction

2

**Implement group ERP system**

- ✓ Standardize business processes and increase visibility
- ✓ Improve supply chain management and project execution

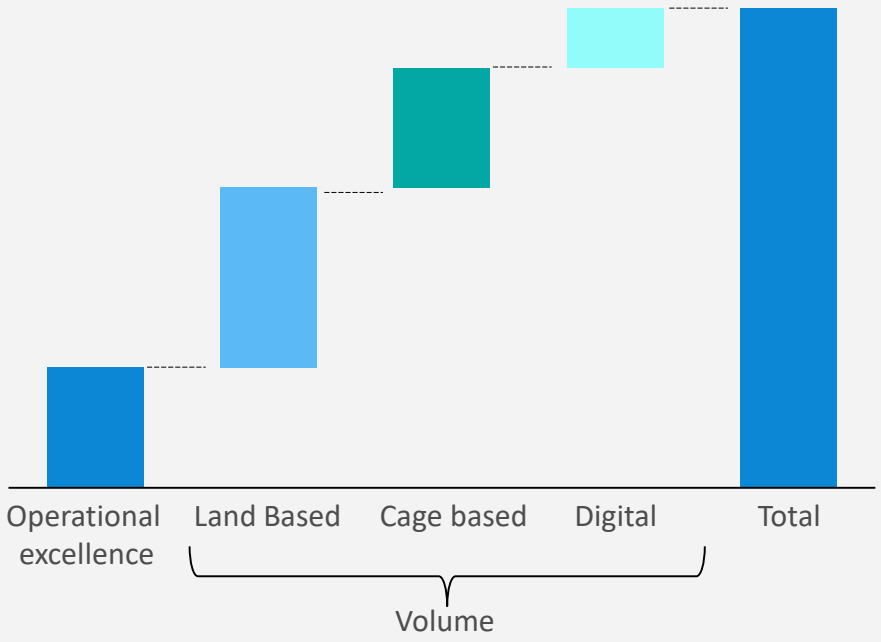
3

**Strengthening of project- and business controlling capabilities**

- ✓ Monitoring of performance and development of KPIs integrated in business reviews
- ✓ Transparent and consistent reporting at all levels

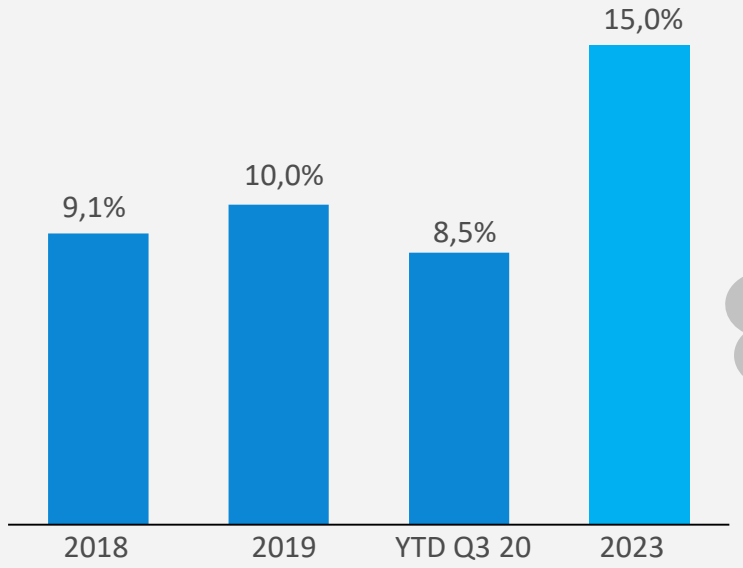
# Ambitious financial targets

**Minimum 25% increase in EBIT year-on-year 2021-23**




* For illustration purposes only

**Minimum 15% return on average capital employed (ROACE) in 2023**

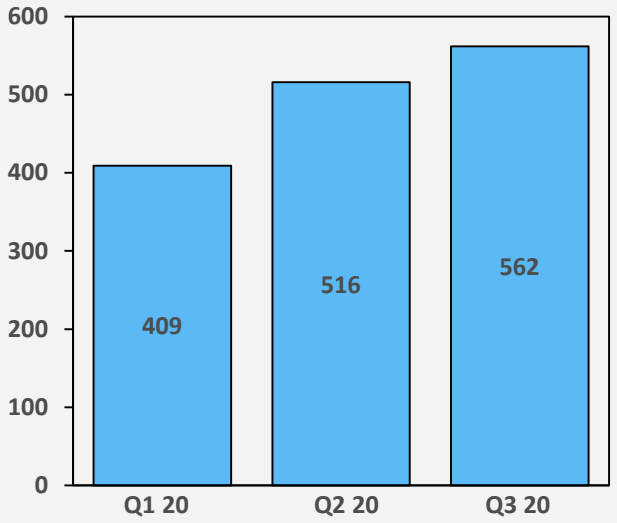



**Increased dividend capacity**

- ROACE is calculated ex balance sheet items of IFRS 16
- Adjusted for exceptional items in Q4 2019

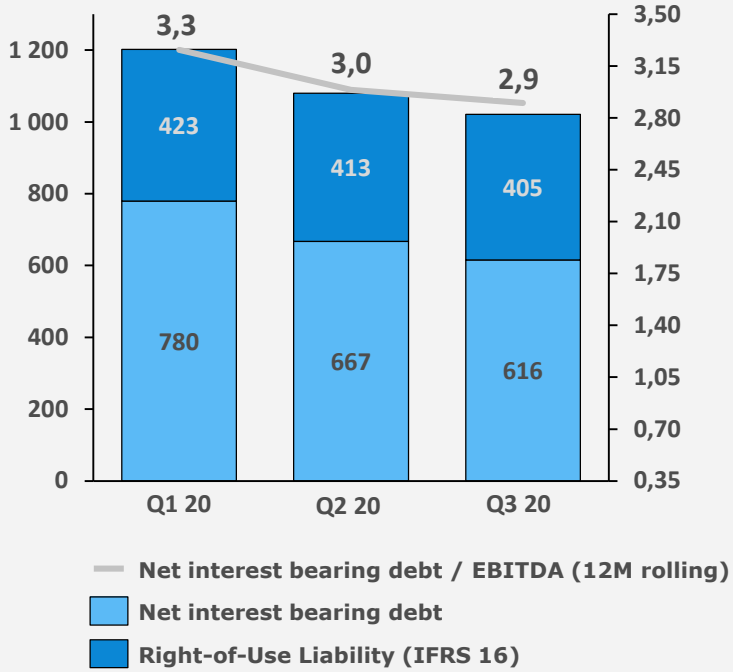
# Financed to execute organic growth strategy

## Available cash

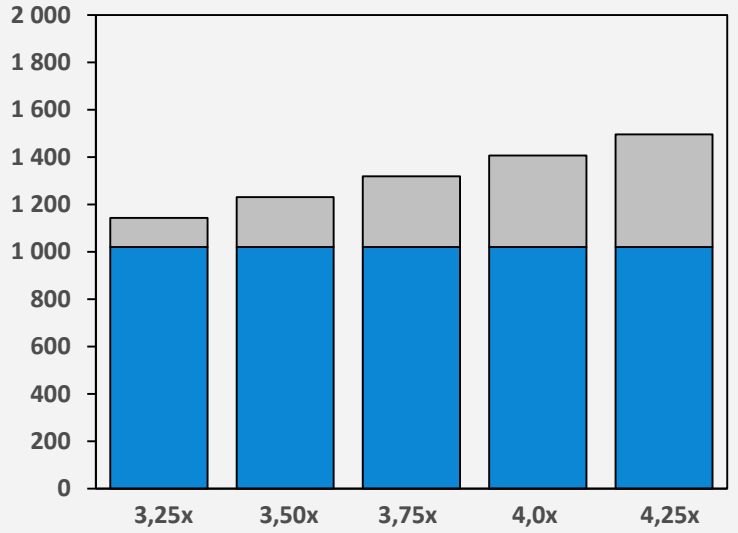



- Including 300 MNOK unused credit facility Danske Bank end of Q3 2020

## NIBD / EBITDA




## Debt capacity




- Current NIBD/EBITDA covenant threshold of 4,25

# Divestment of AKVA Marine Services

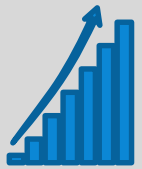
- Decided to initiate sales process and Danske Bank has been engaged as financial advisor
- Focus to create a robust process to take care of shareholder values

# Financial outlook - summary

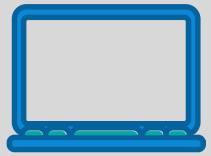
**Strong organic growth**

**EBIT growth ≥ 25% year-on-year**

**Operational excellence**



**Financial robustness**

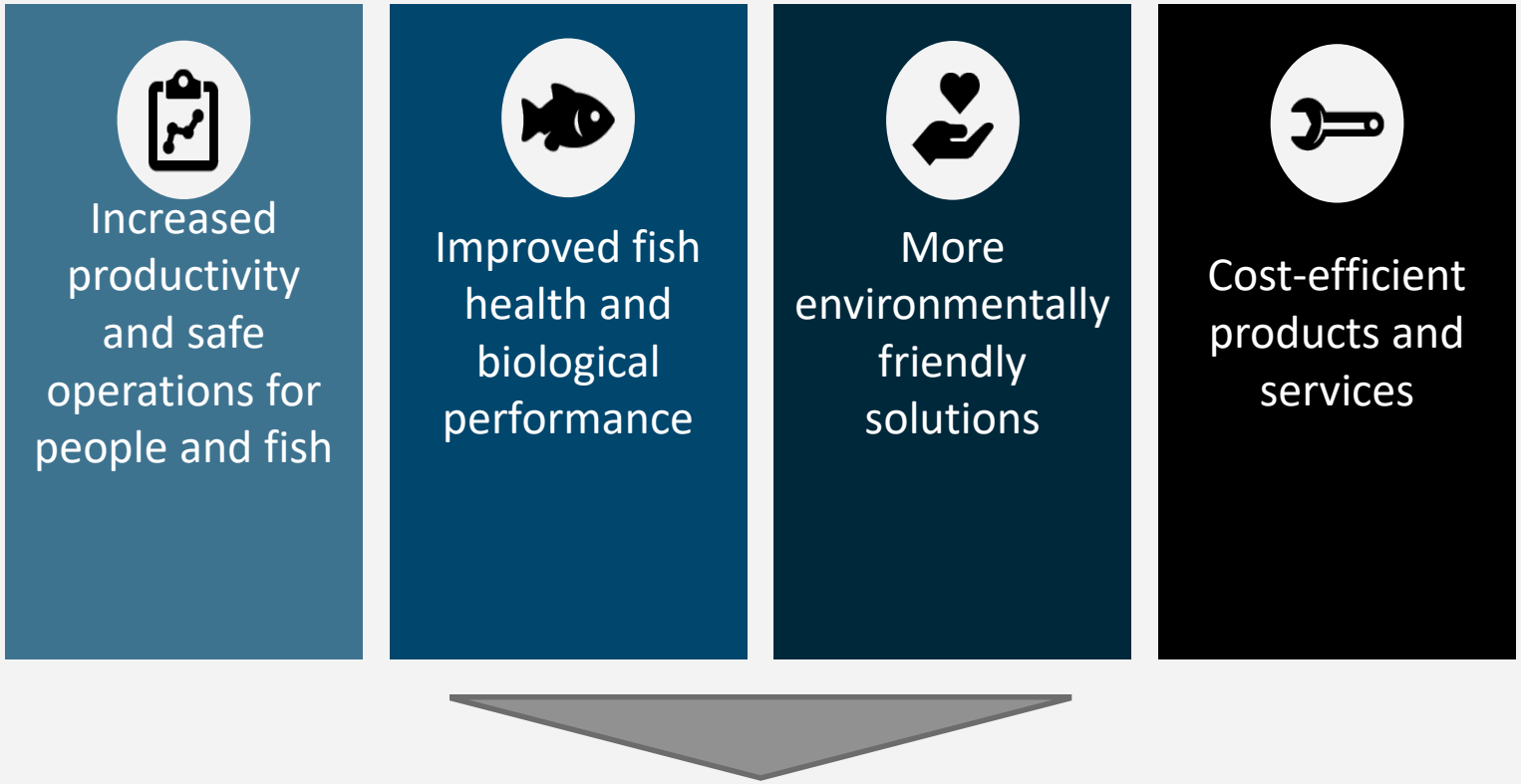


**ROACE ≥ 15% in 2023**

**Increased dividend capacity**

# Innovation Agenda – presentation for CMD 24.11.20

# Starting point: Innovation to enable Salmon farming industry to exploit the Untapped Demand Potential with sustainable growth




AKVA group mission: Innovation for the **industry** to successfully achieve the **growth potential**

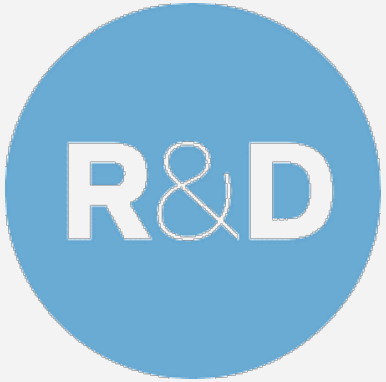
- Sustain and develop conventional sea-based salmon production
- Build a sound complimentary land-based RAS industry

# World class R&D to secure Long term success for AKVA group…

**… by matching *Customer* needs with *latest Sciences and Technologies* to deliver tomorrow's successful sustainable Industry Solutions**

**Customer and commercially** oriented

The best **people**




Continuously **updated** on competing solutions, relevant start-ups / ideas and science and technology

**Balancing** the need for **short** term product development with the **long-term** development

**Efficient** development processes and project management

Persistently **discover and develop** step change products/ services/ solutions

# AKVA group is already in the forefront with Innovative and sustainable solutions offering fundamental improvements for the industry…

## Subsea farming:

- Secure **fish health and preventive lice solutions**
- Farming on more **exposed sites**
- Stable and **controlled production** environment

## AKVA Observe - Digital AI assisted feeding solutions:

- Precision feeding, real-time AI and computer vision assisted farming
- AI assisted feeding management and analysis tool

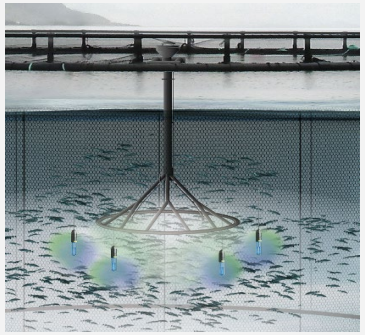
## Hybrid feeding barge and waterborne feeding

- Reduce energy need up to 90%
- Reduce local environmental impact, noise and microplastics

## Zero Water Change RAS technology

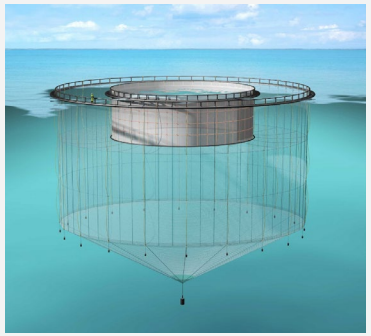
- Recirculating 99,9% of water and reduce water in final sludge
- Remove phosphorus and nitrogen and allow for re-circulation of phosphorus

### AKVA subfeeder and lights



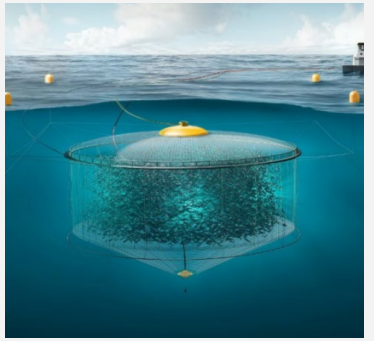
The fish voluntarily seek deeper water from light and feeding

### Tubenet™



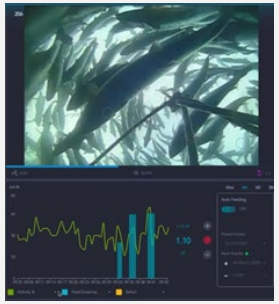
The fish have less access to surface and surface flow of water is barred from swimming area

### Atlantis subsea farming



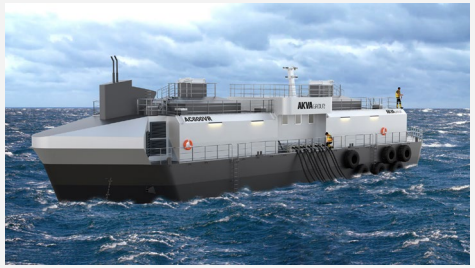
Completely submerged cage. The fish are offered only sub sea areas

### AKVA Observe



AI assisted feeding operation and management

### Hybrid feeding barge



An AC600 Feed barge with AKVA Hybrid battery package and water borne feeding

# …but with industry growth prospects, we further strengthen Innovation - key enabler for AKVA group strategy of Organic growth

**Strong ramp up of Innovation and R&D capabilities:**

- **Innovation resources/spending from 2021: + 50%**. Organic growth.
- **Centralize Innovation facilities. Efficiency**. Future opportunities. Cross-functional solutions.
- **Existing Core Products and Solutions**: Support incremental improvements.
- **Step change innovation:** Dedicated resources.
- **New RAS Innovation department**
- Exploit **synergies** and competencies **sea-based** ⟷ **land-based** RAS
- Build further capabilities and competencies **merging traditional** farming **technologies** with **digital** opportunities – "Fish Farming Industry 4.0"

**Realizing AKVA group's full potential as an Industry leader in both Sea Based and Land Based**


## Successful implementation requires balancing short- and long-term development:

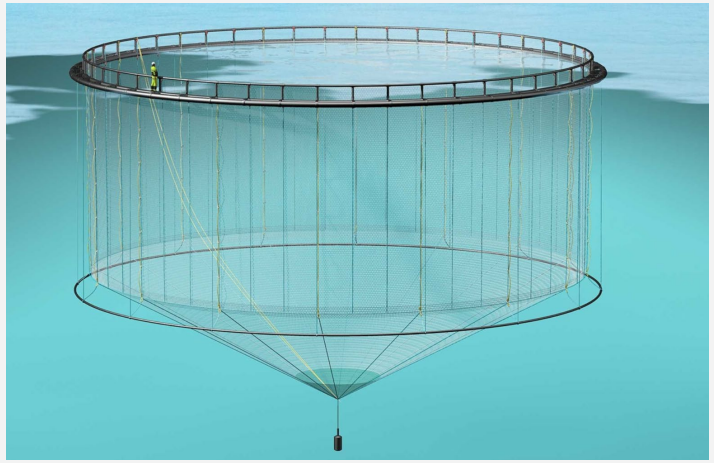
# «Sustain development» and «Step change innovation»

### Sustain position on core products

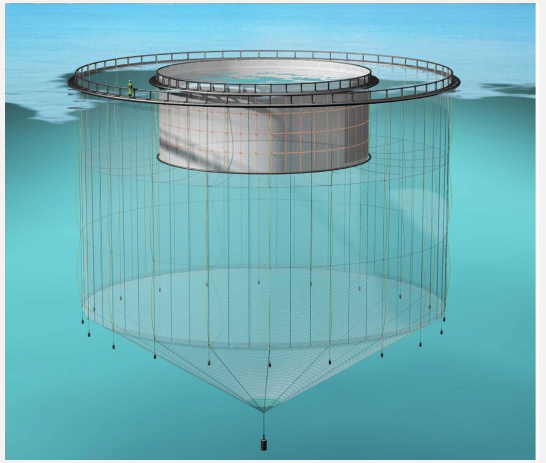
- **Incremental** development
- Structured **regular input** from customers, sales, service, production
- **Surveillance of competitor** products
- **Next generation** larger projects **– product road maps**
- Critical for retaining **sound EBIT**
- **Organic** growth

### Step change solutions

- Based on **insights** and trends to generate ideas
- **Ideation** process
- **Substantial growth** potential
- Higher **risk**
- Require **dedicated** investments



**We must do both!**



# Our ambition: To release at least one new step change solution per year. Requires a changed approach.

Dedicated AKVA group Team, investments and processes to facilitate Step Change innovations.

**Major industry challenges offer opportunities for new Innovative solutions**

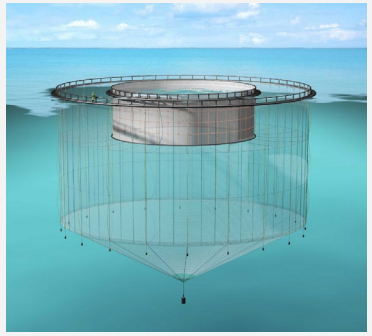
- Local and global Environmental concerns and Consumer Health focus
- Fish health
- Cost efficient production for further consumer demand
- Inherent process risk
- Limited new farming areas available in sea
- Salmon farming closer to main markets

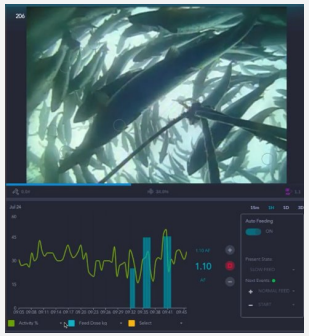
Develop the **optimal grow-out RAS factory** for the future

New **digital** technologies

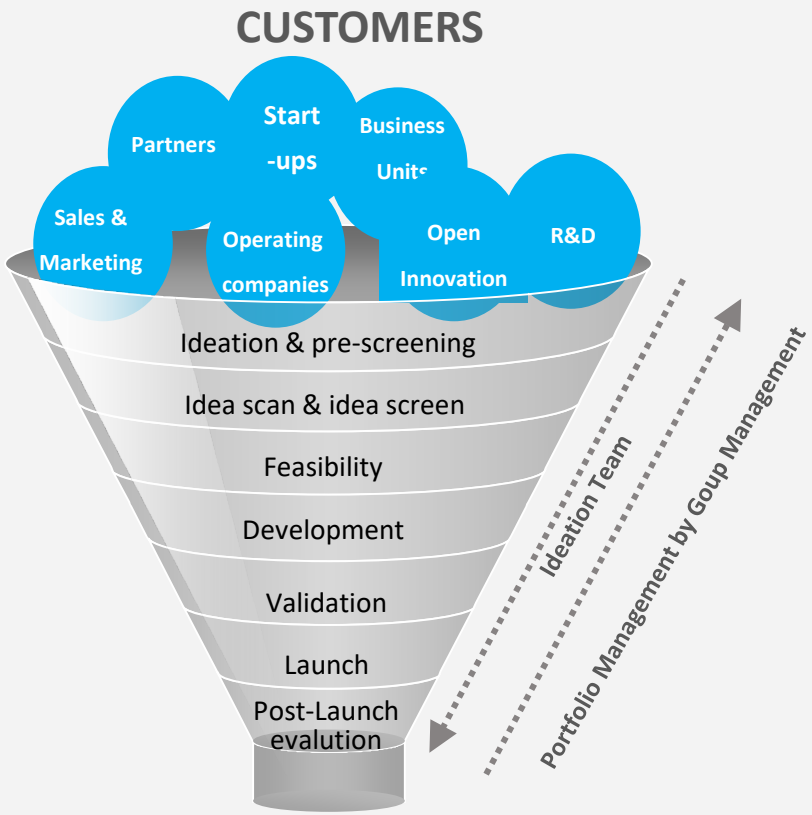
**AKVA group examples of step change innovations**

- **Tubenet™ -** regular, next generation, HDPE based, Steel cages
- **AKVA Observe** - Advanced feeding assistant – computer vision and machine learning
- **Further Machine assistant decision support** from all sensors of data for both sea-based farming and land based
- **Atlantis s**ubsea farming





# ….reflecting the demanding task to combine creativity with structure




## Generating ideas from insights

- **Truly Innovative** products demand a creative process combining **insights** with **idea generation**
- Differs from **incremental** product development and improvements on existing products
- Today's **Industry and technology trends** open for **opportunities** in many different areas

## **Systematic exposure of ideas from a multitude of Industry contact points** (other than normal market interaction)**:**

- **Customer development projects** (Examples: Atlantis with SinkabergHansen, joint R&D licenses (CAC) with Mowi and Skretting, Fiddler (NRF funded) with Mowi and Norce)
- **Start-up companies, networks and clusters** (Stiim Aqua Cluster, NCE Aquatech Cluster, Blue Planet)
- **Trade organizations** (Sjømat Norge)
- **Research** projects with **customers and universities** (Examples: DIGIRAS – EU funded three year program for RAS)

# Closing comments:
# AKVA group's Innovation program covers the major capacity growth areas

| Supply sources/ drivers | | | Indicative supply potential 2030, mill. tons | Volume 2019, tons | AKVA group present position and growth prospects |
|---|---|---|---|---|---|
| Conventional | Traditional growth |  | | 2.5M | • World leading supplier of a full range of products<br>• Spear heading new technologies targeting major growth concerns (preventive lice technology, more exposed sites, energy and environmental impact) |
| | Post-smolt |  | 0.12–0.25 | | • Major supplier of RAS systems today, strong build up of innovation capacity<br>• Synergy of both land-based and sea-based technologies<br>• Combining digital and traditional technologies |
| | Effective lice prevention/ treatment |  | 0.1–0.4 | | • Sub sea farming; Tubenet™, Atlantis |
| Un-conventional | Land Based |  | 0.2–0.8 | 7K | • Major supplier of RAS systems today, strong build up of innovation capacity<br>• Synergy of both land-based and sea-based technologies<br>• Combining digital and traditional technologies |
| | Offshore/ open sea |  | 0.1–0.2 | ~0 | • Involved in several development license projects today |

Low High

**Total: 0.9–2.3**

Source: AKVA Group and Cardo Partners analysis

# Cage Based – presentation at CMD 24.11.2020



AKVA GROUP

How international salmon farmers know us for decades:

# AKVA group – offering “everything needed” for sustainable salmon farming…

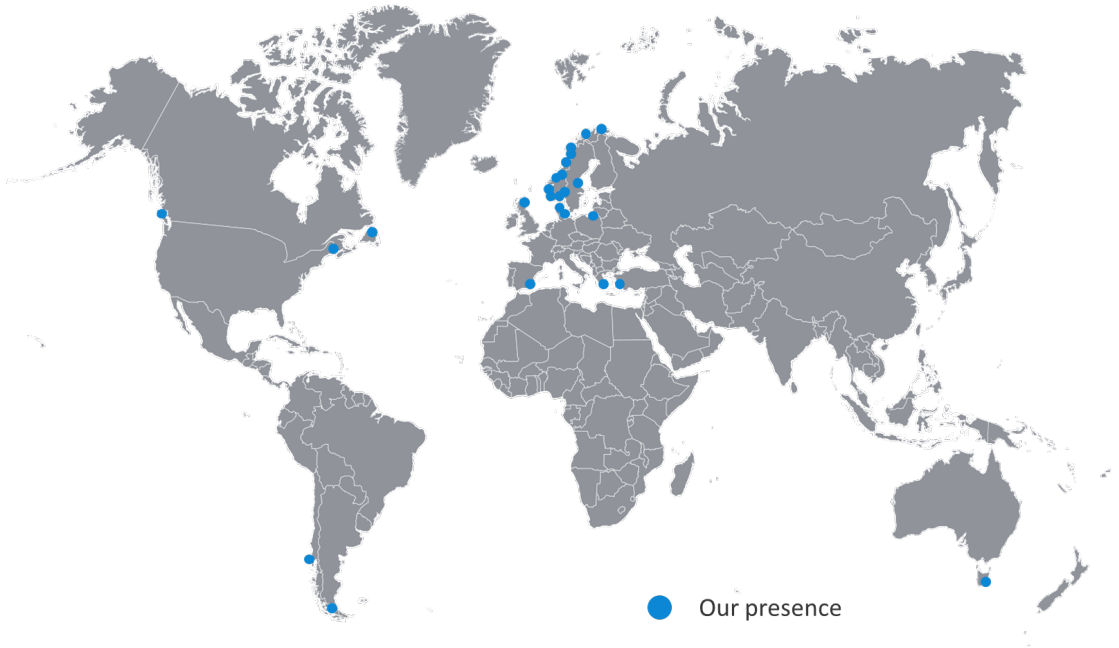
## From single components to complete solutions…

### Cage Based Technology

### Digital

AKVA groups Digital solutions are becoming more and more advanced to support high productivity in salmon production

## Extensive presence to serve the Global industry



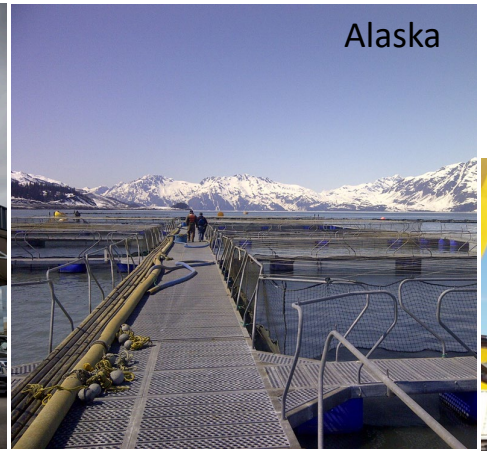
# Global supplier. Local presence in key markets.
# Pictures of AKVA people and some supplier or customer sites

For the Global salmon industry it is attractive to have a solid and trusted global supplier with local presence in all the markets they have operations.

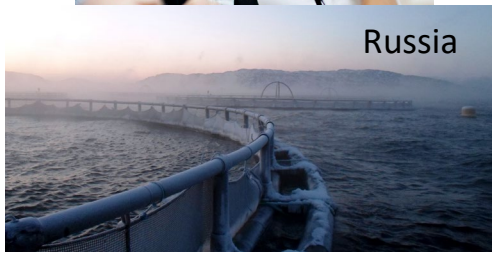




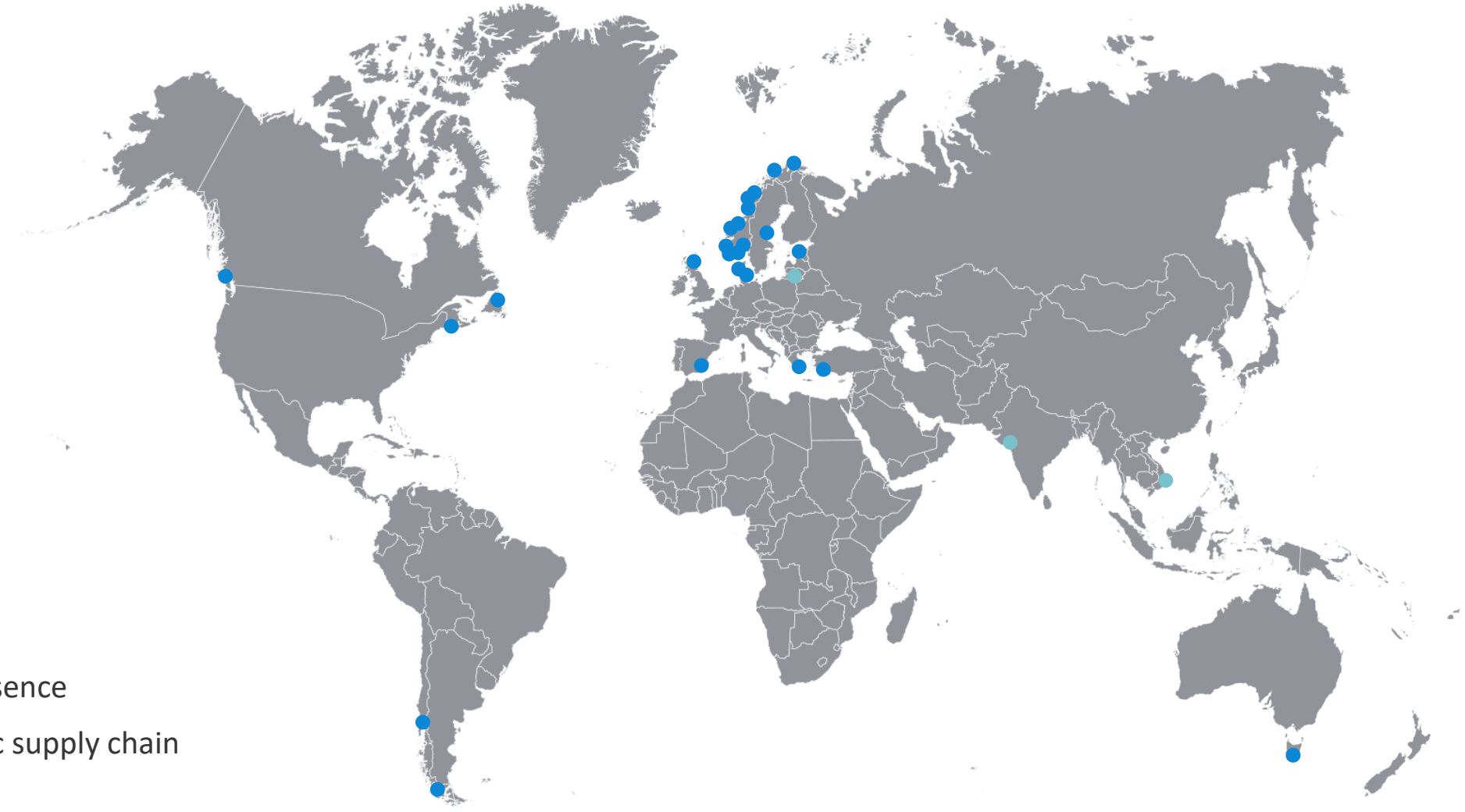







# AKVA group’s global presence

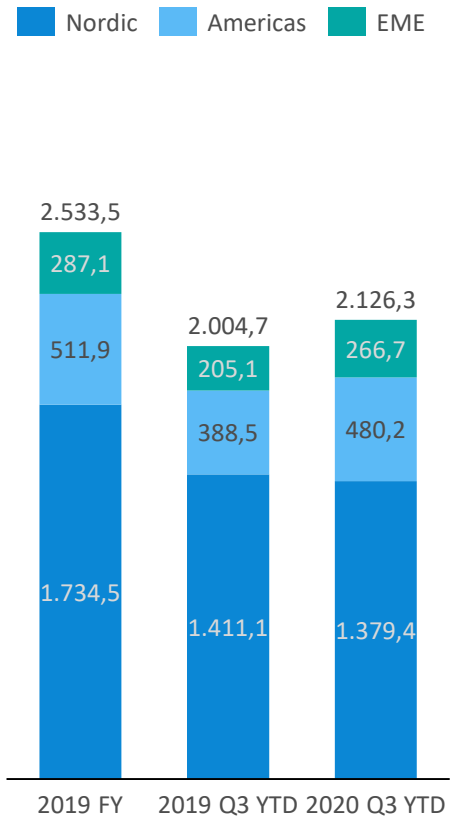


Our presence

Strategic supply chain partners

# 1/3 of Cage Based revenues comes from International salmon business Chile No. 1. Remaining from Canada, UK & Ireland and other

CB Revenue split MNOK



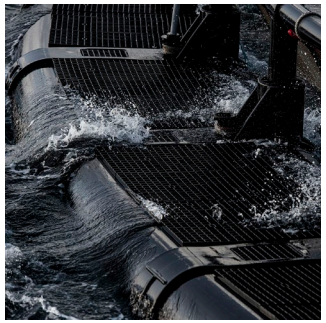

International success requires balancing proven solutions with understanding of local differences. Some examples:

- Plastic cages
- ~No Seals and Sea Lions
- All equipment regulated NS 9415
- Internet connection, the norm
- Low current, clear water

- Metal cages
- Seals and Sea Lions
- Equipment regulations in process.
- Internet connection, the exception
- High current, high algae load

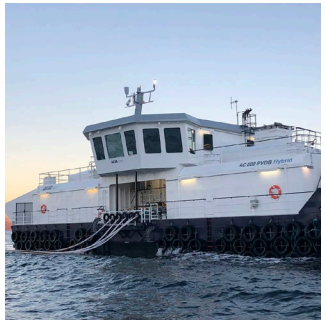
Well-proven and innovative solutions and services from AKVA group attractive to the industry in both countries: Nets, feed barges, Digital solutions, sensors, cameras, ROV technology, net cleaning etc

# A broad range of solutions offered

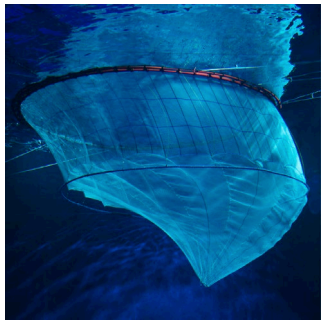


Plastic pens

Steel pens



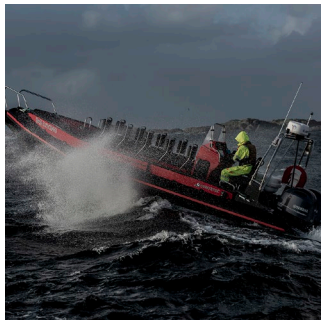
Feed Barges



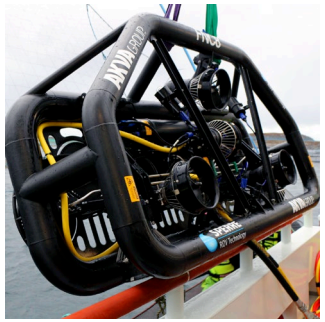
Nets

Feeding Systems

Lights

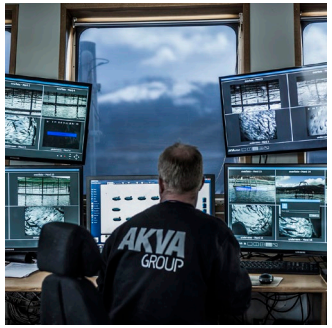


Work Boats



ROV/Net cleaning

Battery packs



Digital

Cameras

Sensors

## Farming in the deep:

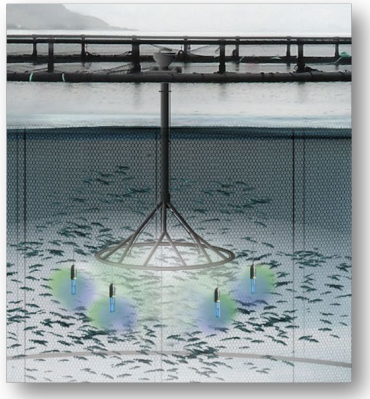
# Innovative solutions to improve fish health farming economy

### Benefits from Deep sea farming:

- Avoid or reduce unwanted surface influences like lice, algae, currents, high temperatures.
- Better fish health and reduced mortality
- Improved fish welfare and reduced frequency and cost of reactive lice treatments
- Facilitate salmon farming at more exposed sites
- Knowledge-based development in cooperation with Institute of Marine Research, SINTEF Ocean etc.
- Reduced lice infestations is needed to sustain production growth (Norwegian Traffic Light system)
- Help farmers sustain fish health, reduce risk and increase profits.

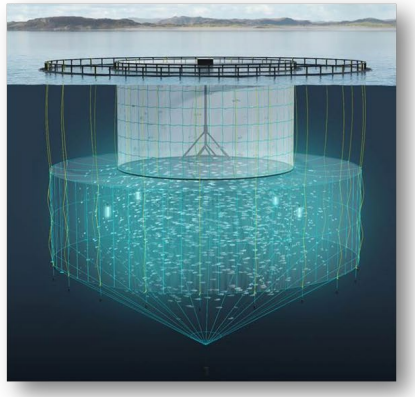
### AKVA commercial solutions in operation

**AKVA SUBFEEDER and Aurora SUBLed**



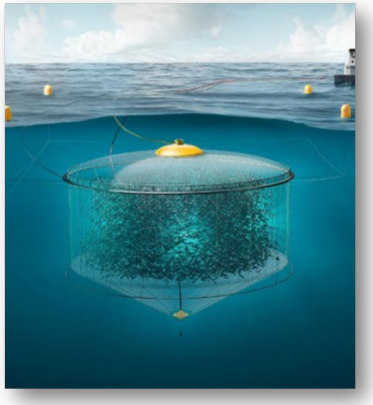
1. Fish is kept voluntarily in the deep

**TUBENET™**



2. Access to air through a smaller surface

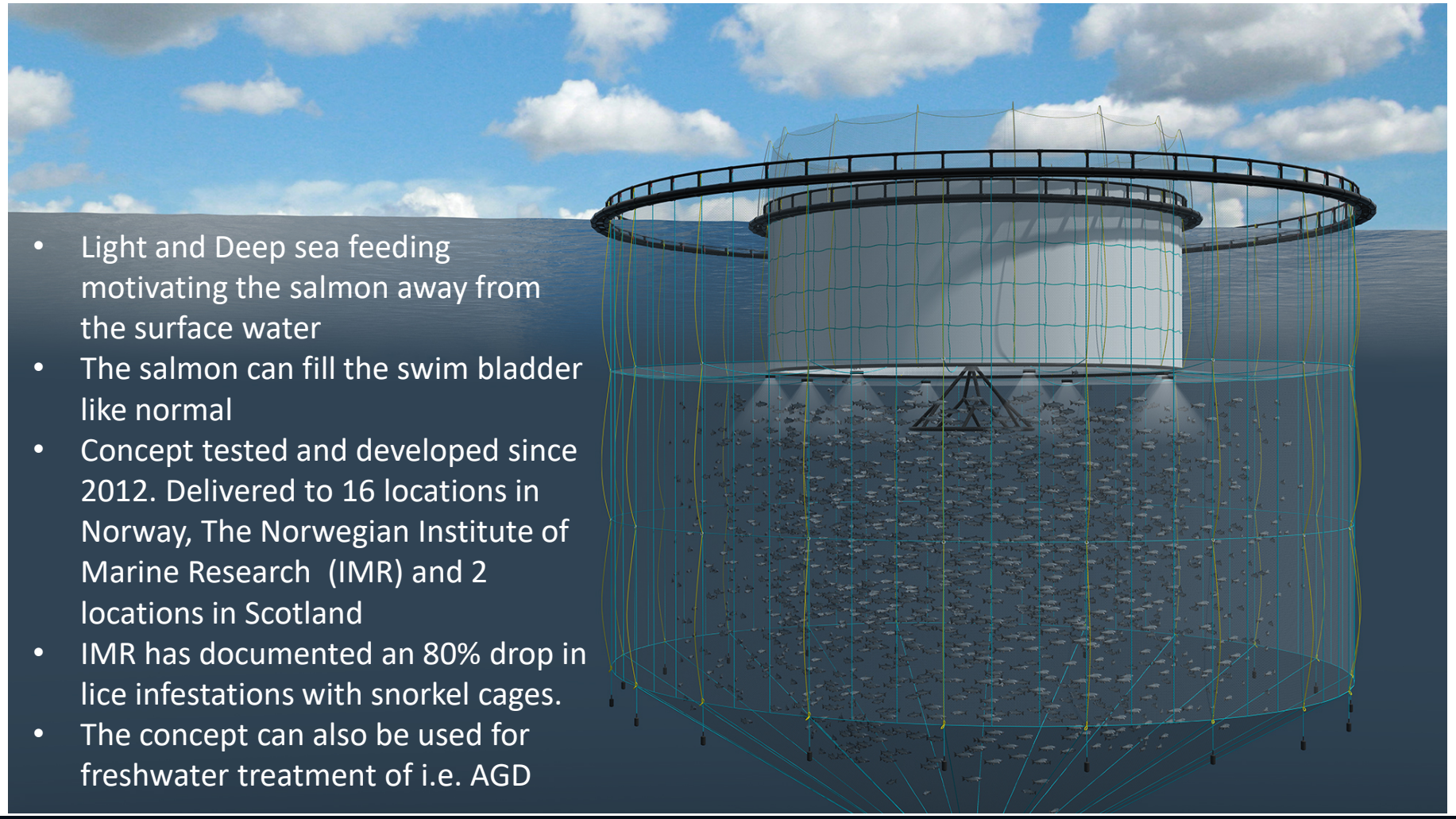
**ATLANTIS SUBSEA FARMING**



3. Access to air in the deep

AKVA group also offers several solution to reinforce Tubenet™ and the other Deep sea farming concepts: Subfeeder and light; Waterborne feeding solutions, Camera, sensors and AI solutions for optimal feeding control; solutions to mix water & oxygen.

# Tubenet™ our patented concept to reduce lice infestations without touching the fish

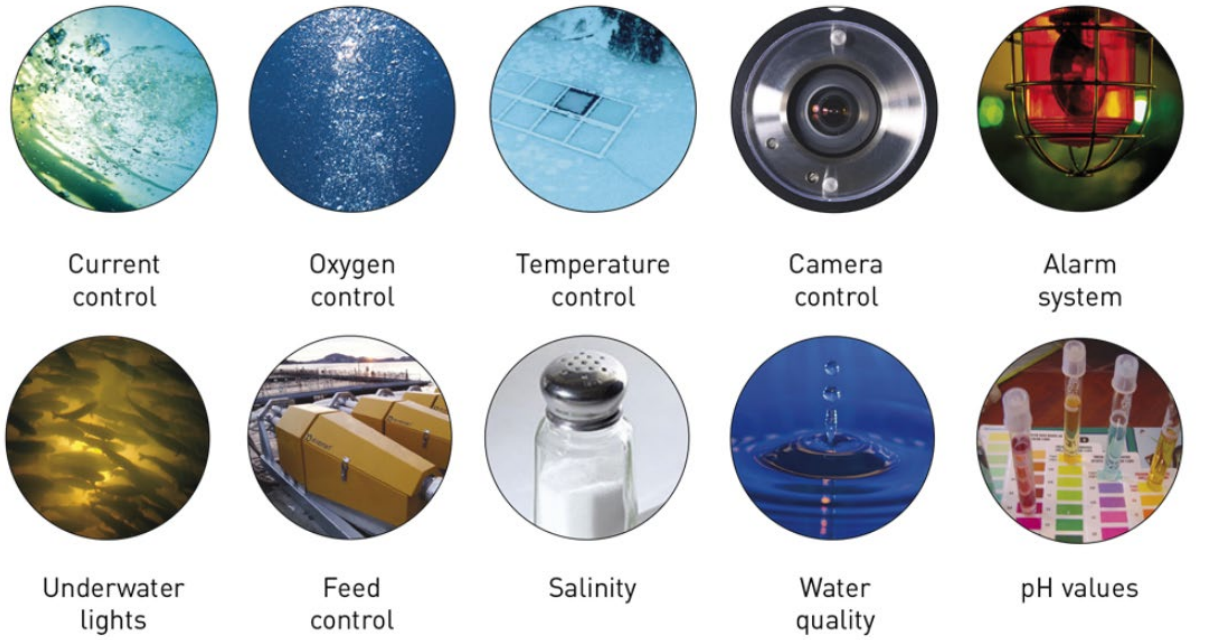


- Light and Deep sea feeding motivating the salmon away from the surface water
- The salmon can fill the swim bladder like normal
- Concept tested and developed since 2012. Delivered to 16 locations in Norway, The Norwegian Institute of Marine Research (IMR) and 2 locations in Scotland
- IMR has documented an 80% drop in lice infestations with snorkel cages.
- The concept can also be used for freshwater treatment of i.e. AGD

"AKVA group is the proud supplier of Tubenet™ to several commercial locations. We are eager to follow and benchmark the fish growth in these"

**«One de-licing less per salmon generation is sufficient to defend the additional CAPEX of Tubenet™»**

# Industrialized sustainable fish farming: Biology, nature forces and high-tech solutions AKVA group is providing advanced technology tools for Monitoring, control and optimizations of daily farm operations under harsh conditions




AI-based feeding and decision making, combining real time condition monitoring and historical documented experiences. Self learning solutions (AI).

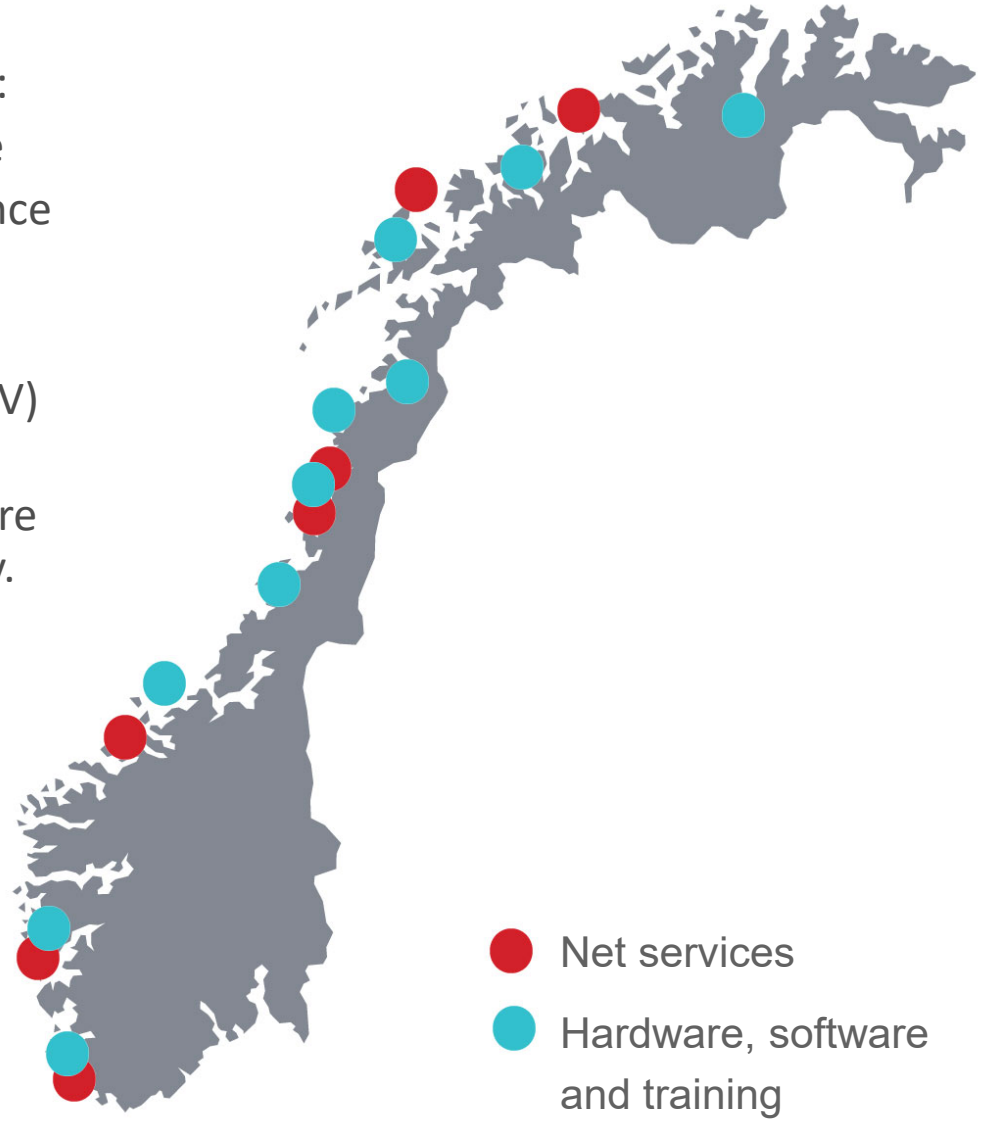
AKVACONNECT | FISHTALK CONTROL | FISHTALK EQUIPMENT | AKVA OBSERVE | PHOTOFISH

# Extensive Service and After sales to serve our customers…..

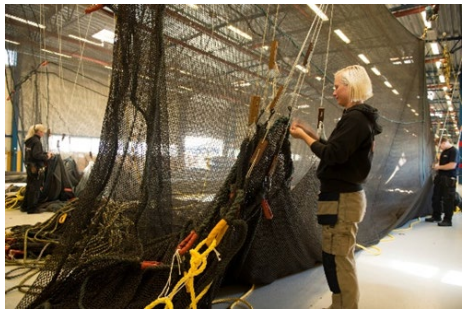
AKVA deliver broad range of services related to:

- Nets & Moorings inspection & maintenance
- Sensors/Cameras inspection and maintenance
- Feeding systems maintenance
- Net cleaning services
- Remote Underwater Operated Vehicles (ROV) services

Annual revenues from Service and After sales are about 800 MNOK, whereof ~ 75-80% in Norway.

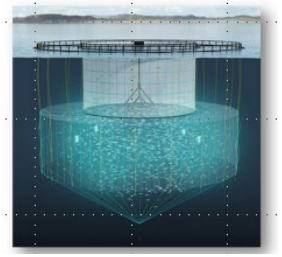



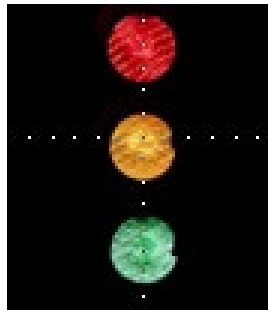




# Support salmon industry to increase productivity, reduce footprint and negative environmental impact. (We believe in footprint reduction through profitability)

## Improving fish health, productivity and profitability

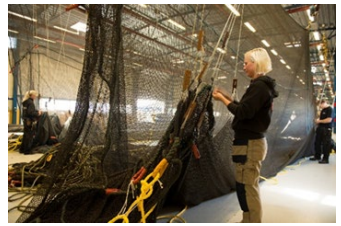


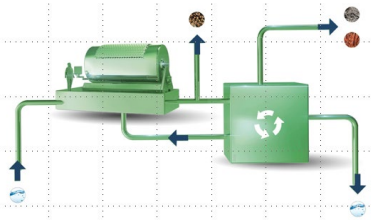



1. Tubenet™ to reduce lice infestations ➔
   - Better fish health, reduced mortality, reduced reactive handling of fish.
   - Saving labor and costs of de-licing
   - May increase volume 6-12% (Traffic light system Norway)
2. AKVA Observe. Artificial intelligence/Machine learning. Optimizing feeding
3. ROV/FNC, products and services for underwater inspection, maintenance and net-cleaning ➔ better environment and better growth
4. Waterborne feeding and hybrid solutions➔ significant (90%) reduction of energy costs

## Reducing negative environmental impact

1. Tubenet™ ➔
   - Reduced emission from lice handling
   - Less fish mortality and reduced risk of escape
2. AKVA Observe/AI: Reducing feed waste
3. Re-cycling of nets.
4. Waterborne feeding and hybrid fuel solutions➔ significantly reduced CO2 emissions (90%), reduced microplastic, improved working conditions with reduced noise and smoke
5. Landbased RAS solution with Zero-water exchange concept



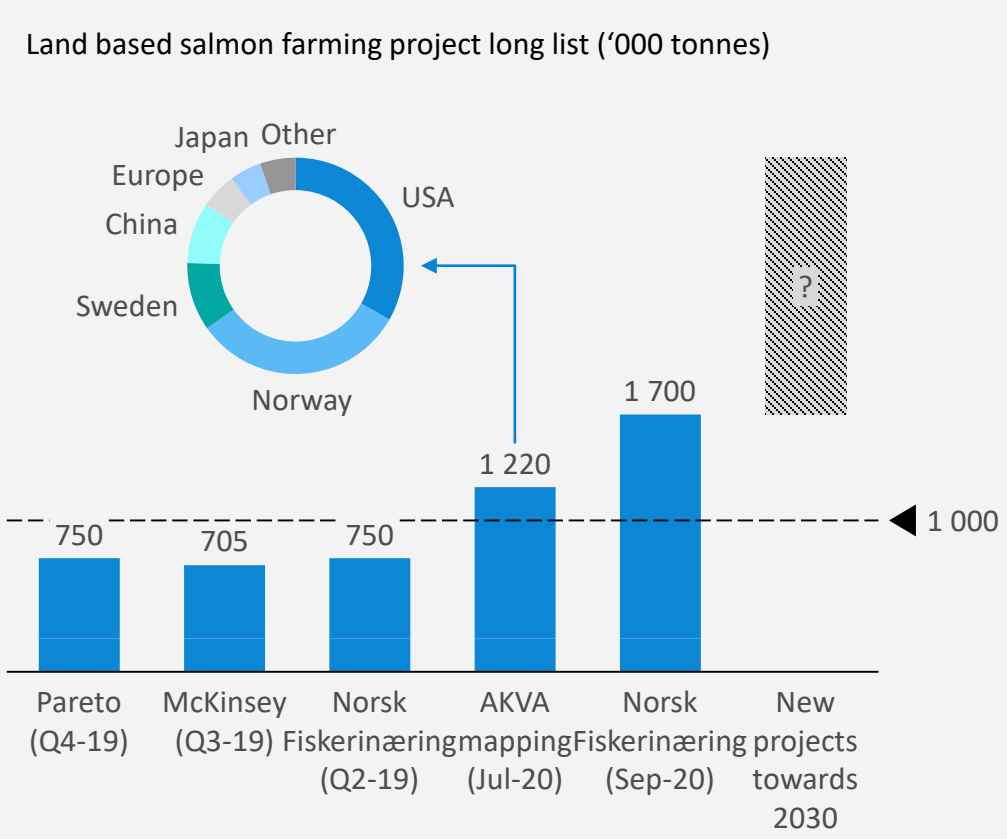


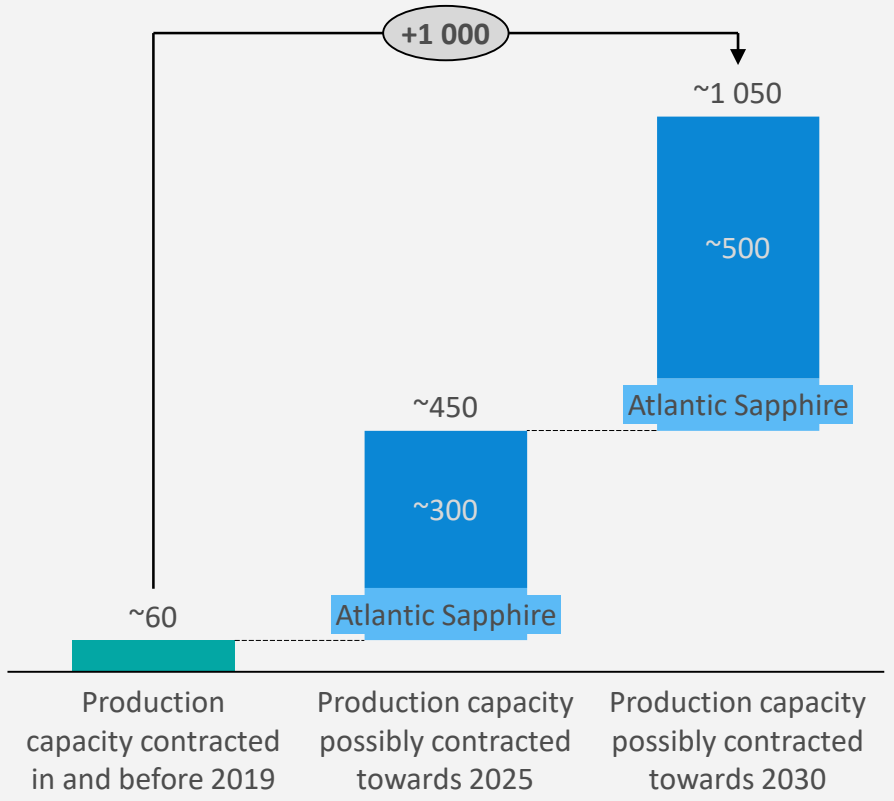
# Land Based – presentation at CMD 24.11.20



AKVA GROUP

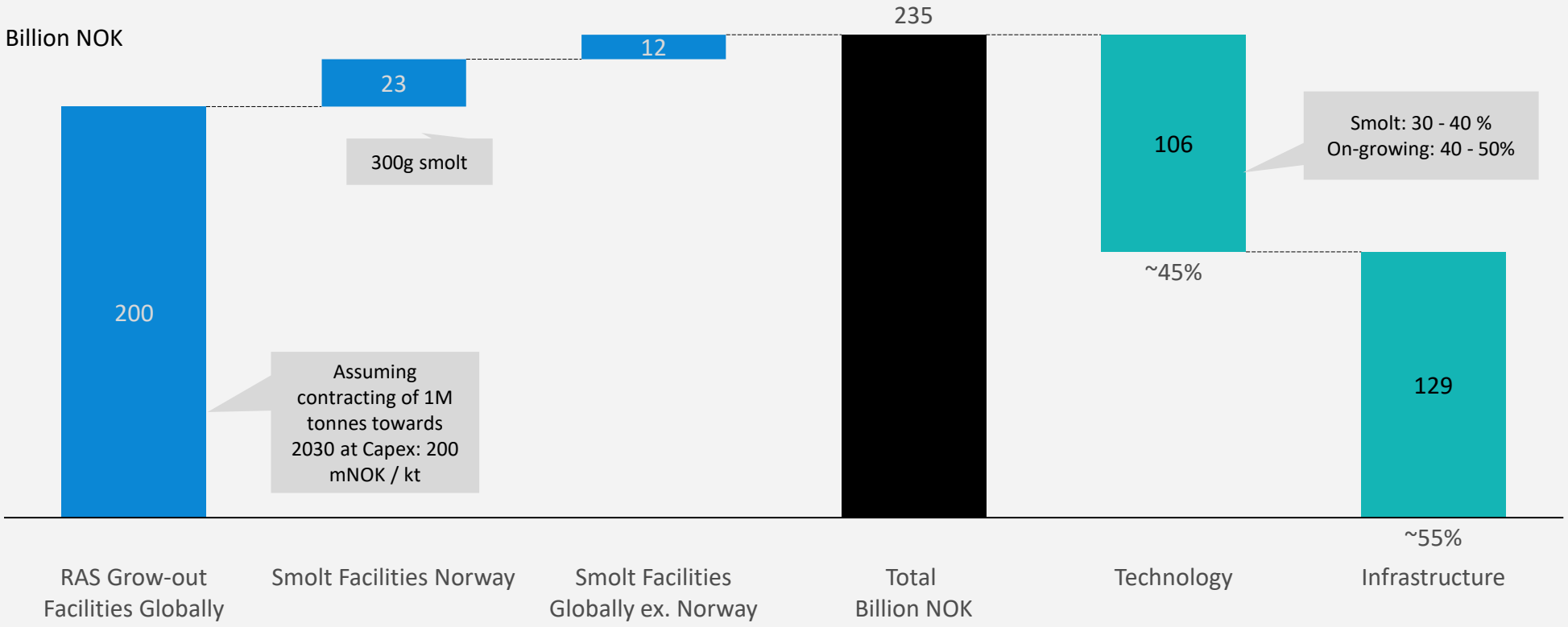
# Long-list for land based salmon farming projects keeps growing – contracting of up to 1M tonnes towards 2030 seems more likely than ever



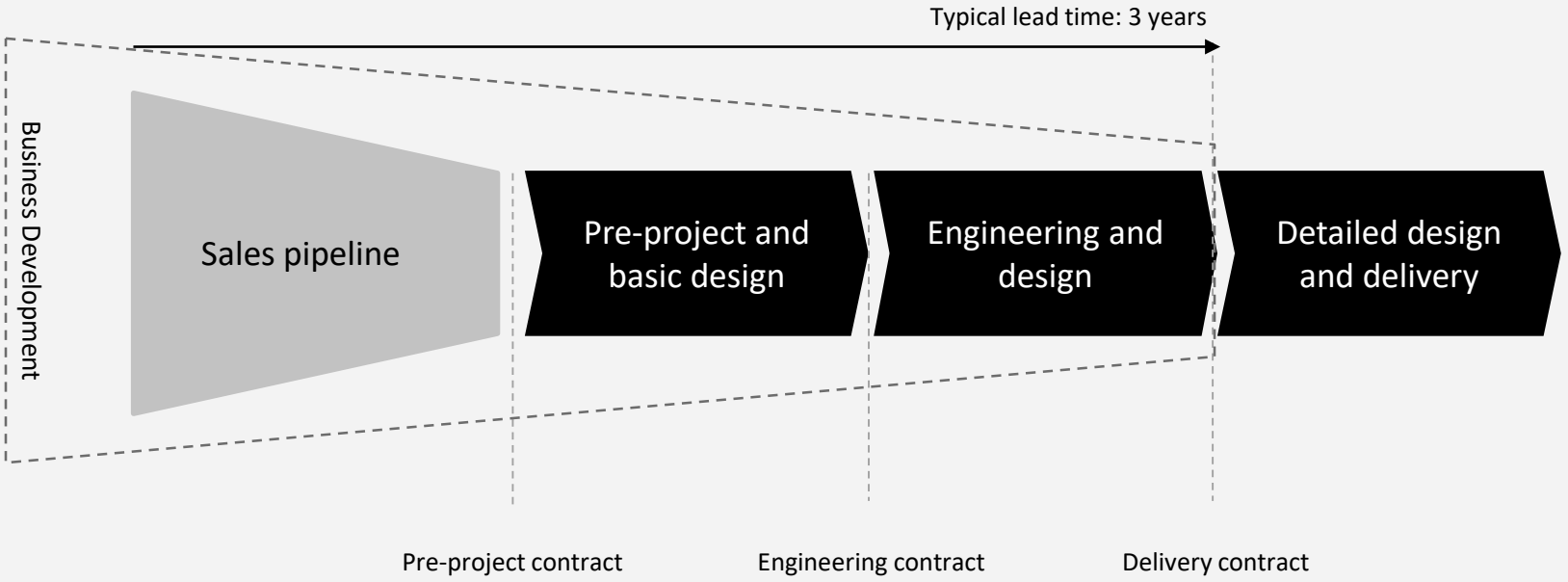

Source: AKVA group analysis and project mapping Aug 2020

# Significant investments in both full grow-out and smolt production facilities towards 2030




Source: AKVA group analysis and Mckinsey analysis (smolt)

# AKVA with a phased business development process to ensure the most attractive opportunities being converted into delivery projects



# AKVA´s overall strategy for land based salmon farming

1. Market leading Zero Water Concept RAS enabling sustainable and cost-effective production
2. Delivering complete scope of fish farming technology (e.g. feeding, fish tanks, fish handling, camera, lights, sensors, control system)
3. Data driven insight and intelligent farming systems enabling consistent and optimized production - “Precision Farming”
4. Production Advisory Services – RAS production competence group helping customers maximizing output and reducing cost

Standard 5,000 tonnes modules

Build up LB organization in Norway

AKVA group Innovation agenda – Centre of Excellence

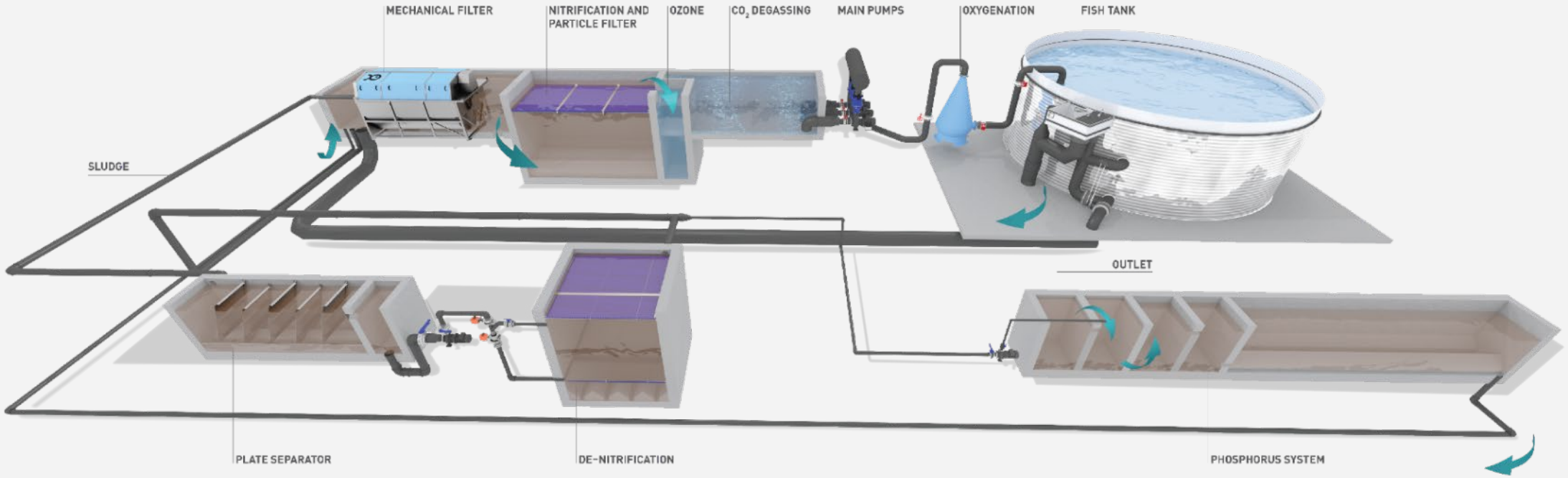
# AKVA's Zero Water Concept RAS is the most sustainable production technology for land based salmon farming

| | Flow-through (0% re-use) | Re-use (60% re-use) | RAS – standard (96% - 99%) re-use) | RAS – Zero Water Concept (99,9% re-use) |
|---|---|---|---|---|
| | *New water constantly flowing into and through the system, filtering of waste water flowing out (1:1)* | *Flow-through with re-use of water including mechanical filtration and $CO_2$ degassing* | *Full recirculation of water with mechanical filtration, biological filtration and $CO_2$ degassing* | *RAS technology including removal of dissolved nutrients by phosphor precipitation and de-nitrification* |
| **Water usage**, Liters per kg feed per day | *30.000* | *12.000* | *300 – 500* | *30 - 50* |
| **Energy usage**, kWh per kg fish produced | Aeration and oxygenation *1 – 2* | Degassing, oxygenation, desalination and intake pumping *4 - 6* | RAS part 3-4 kWh Cooling 1-4 kWh *4 - 8* | RAS/ZWC 3-4 kWh Cooling 1-4 kWh *4 - 8* |
| **Removal of nutrients,** % removal | *N: 25%* *P: 50%* *SS: 60%* | Nitrogen, Phosphorus and Suspended Solids *N: 25%* *P: 50%* *SS: 60%* | *N: 40%* *P: 90%* *SS: 95%* | *N: 70% - 90%* *P: 93% - 98%* *SS: 99%* |

Source: AKVA group

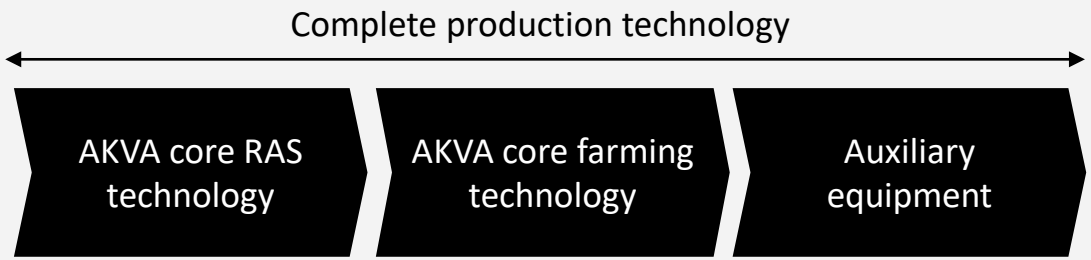
# AKVA with differentiating Zero Water Concept RAS

| | | | | |
|---|---|---|---|---|
| 0.1% of total system water volume added to the system per hour | 0,1 % of system volume going out per hour | Min. 100% of system water recycled per hour | Complete system water exchanged every 40 days | 40 liters of new water used per kg feed per day |




Using only 10% of the water of basic RAS

# AKVA's delivery scope to be standardized around core technology products



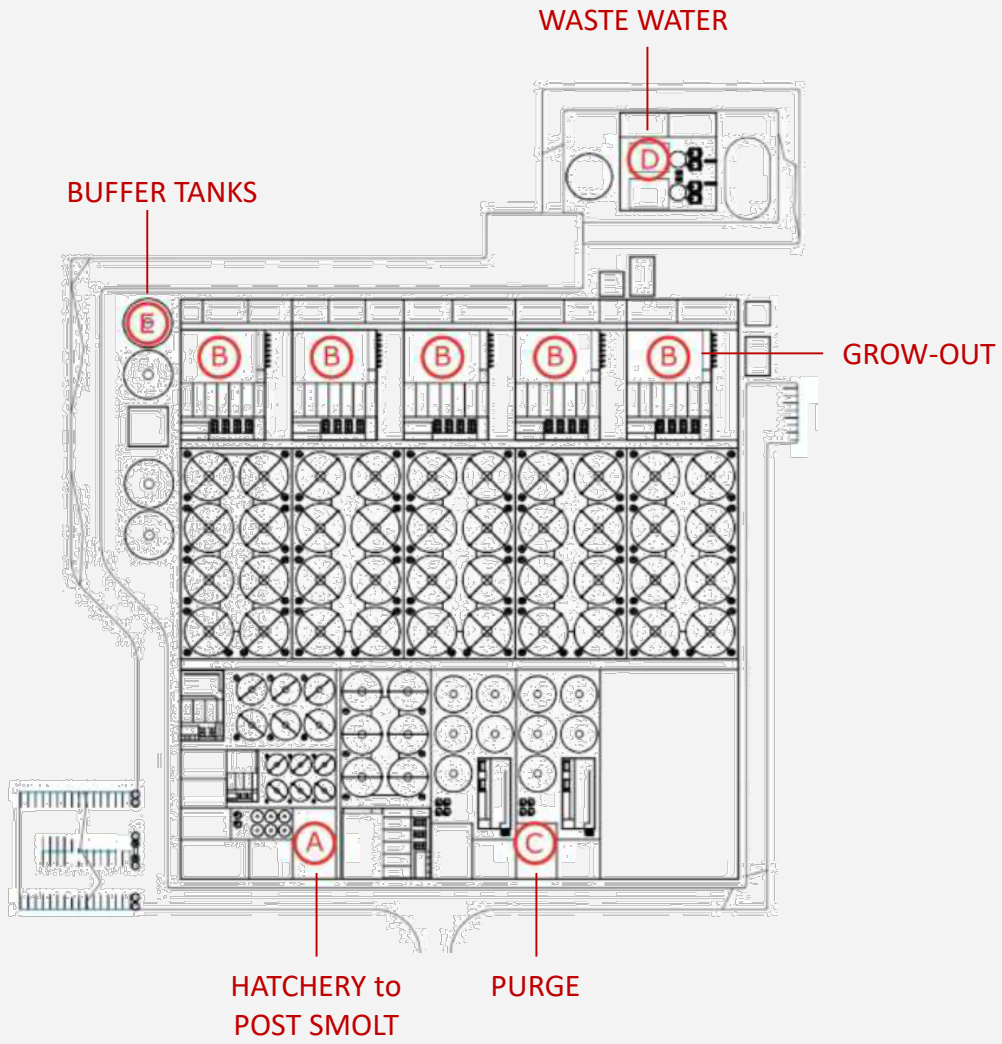

- Complete RAS modules incl. ZWC
- Water pumps, mechanical and biological filter systems, degassing systems, UV disinfection, process and emergency oxygenation system etc.

- Feeding system
- Fish tanks
- Fish handling and grading systems
- Camera and sensors
- Lights
- Control system

- Water intake/ treatment
- Waste water/ sludge handling
- Heating and cooling
- Walkways
- Mortality handling system
- Emergency generators
- Etc.

# AKVA with a standardised 5000 tonnes module for grow-out

- Output of 5,000 tonnes live Atlantic salmon per year
- Can be expanded to 10,000 tonnes by adding five more grow-outs
- The 5,000 tonnes layout takes up 35,000 $m^2$, but with flexibility to arrange sub-modules to fit logistics or property needs
- The standardized module will allow for more efficient project delivery by AKVA and hence reducing time from engineering to first harvest of fish
- Continuous improvement and optimization of standard module



# Precision Farming: Digitizing land based salmon farming to reduce risk and optimize production

## Operations

State of the art monitoring and control systems

- Efficient and consistent operations: auxiliary system integration, real time recommendations, automation
- Optimal and safe production: smart water quality and RAS performance management utilising cutting edge sensors and AI
- Reduced risk: intelligent alarms, anomaly detection and predictive models

## Farm management

Data driven decision making across the production cycle

- AI augmented intelligent feeding and optimised feeding strategies
- AI enabled, automated biomass measurements and growth predictions
- Cost / production optimization

## Cloud ecosystem

Fully cloud native portfolio

- Cloud native data portfolio enabling scalability, development agility and opportunity
- Open APIs empowering our customers and 3rd party ecosystem
- Machine learning across all data sources and customers

# Production Advisory Services will be a key offering to make sure customers achieve consistent output with the highest productivity

- Establishment of a land based RAS production competence group with cross functional competence
  - Water treatment
  - Biology and fish health
  - Technical
  - Feeding
  - Farming operations and production protocols

- Advisory services on planning, production protocols and technical / operational perspectives to ensure a production of 4 - 5 kg fish with the desired quality, at a consistent level with the lowest possible cost

- Offered as a payed service in relation to start-up and first production cycle, but also sold as a service to projects at a later stage

# International Sales – CMD 24.11.20



AKVA GROUP

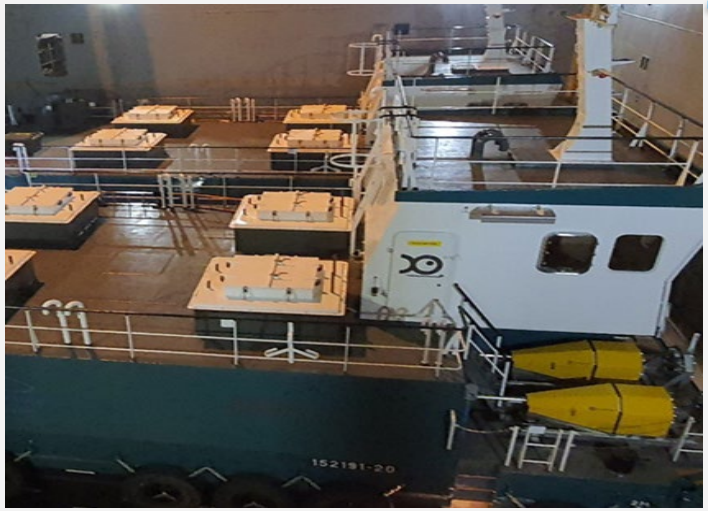
# AKVA group Feed and service barges Turned into an international success story

- AKVA group has the last 15 years delivered 276 Feed barges.
- 85% delivered to Norway (market share 35–45%).
- In 2017 AKVA group established a dedicated sales force to boost the international sales.
- This has resulted in a steady increase outside Norway. A total of 29 barges are sold to 14 other countries, including US, Chile, Russia, Canada, Scotland, Ireland, Iceland, Australia, New Zealand, Mediterranean and Middle East.

# International sales to Scotland in 2017/18

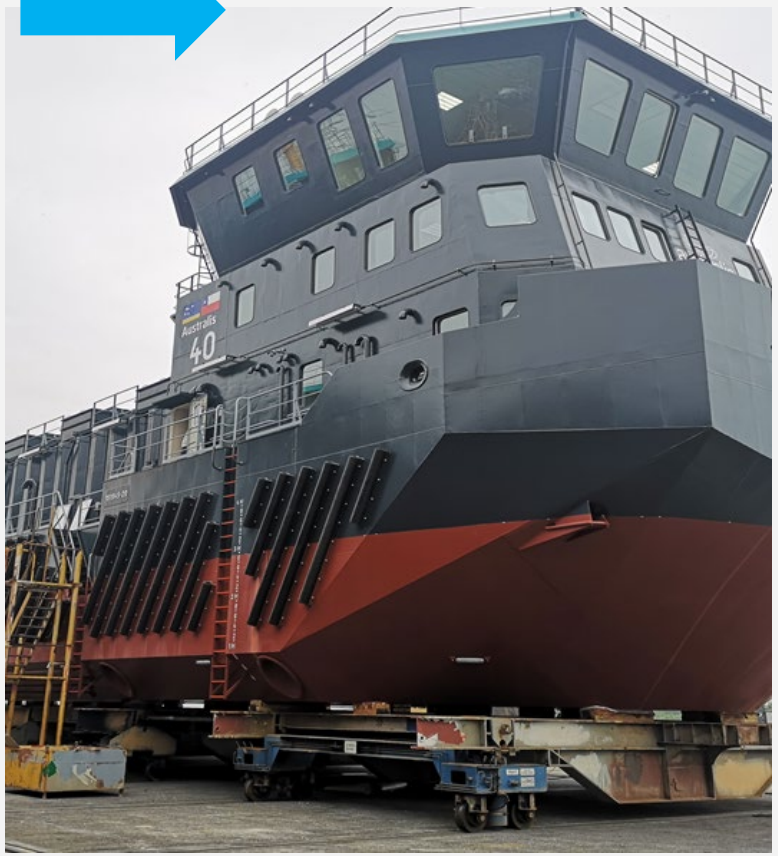
- Customer: 2 of the biggest production sites in Scotland
- 3 barges with 450 – 650-tonnes feed capacity
- The barges has endured rough weather and proven AKVA's barge quality
- These deliveries were combined with AKVA group cage & infrastructure installations

# First International sales to Chile and US -2019/20



**AKVA group – Chile** was in Q4 2019 awarded a contract of four AM 600-ton Barges to a customer in Chile. These barges have accommodation for 20 people and are equipped so they can live on the barge for several weeks.

**AKVA group – North America** was early 2020 awarded a contract of two AJ 96- ton Barges equipped with AKVA group feeding systems, for delivery into USA.



# “A Feed barge” much more than Feed storage & distribution: Advanced control center, veterinary lab and living quarters

- Our new Feed barges with V-shaped hull, gives a unique, softer and more controlled behavior in exposed sites with rough sea. 16 such barges have been delivered and are in daily operation.
- AKVA group has developed a new series of barges, 400 – 600 – 800 tonnes of feed capacity.
- The barges are standardized but allowing for a certain customization according to customer needs and preferences.
- Depending on country, location and type of AKVA feed barge, 2 -20 people may live there for shifts of 1-4 weeks, with “facilities almost like home”

**A UNIQUE FEEDING SYSTEM**

All Wavemaster feed barges have built-in Akvasmart CCS Feed Systems. The largest models are available with up to 16 parallel feed lines.

**JUST LIKE HOME**

Feed barges has become a modern work place proper equipped to meet the needs of the employees, with meeting facilities, living areas and entertainment centers.

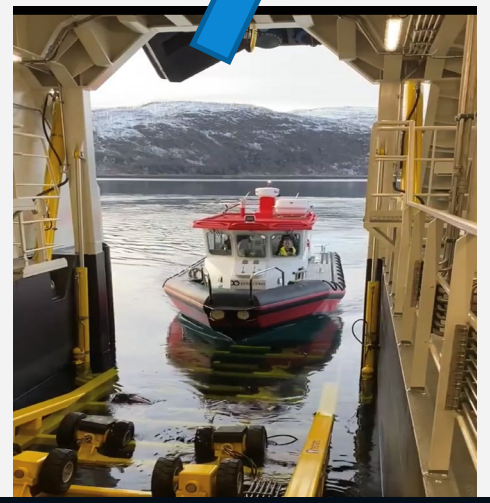
**October 2020:**

# “The toughest Feed and Service Barge ever” delivered to Norway Royal Salmon’s Artic Offshore Farming (AOF) west of Tromsø…”

Purpose :

“Service base” for Norway Royal Salmon’s Artic Offshore Farming (AOF) where 2 semi-submersible steel structures will be placed, west of Tromsø, to operate their new “Development license”

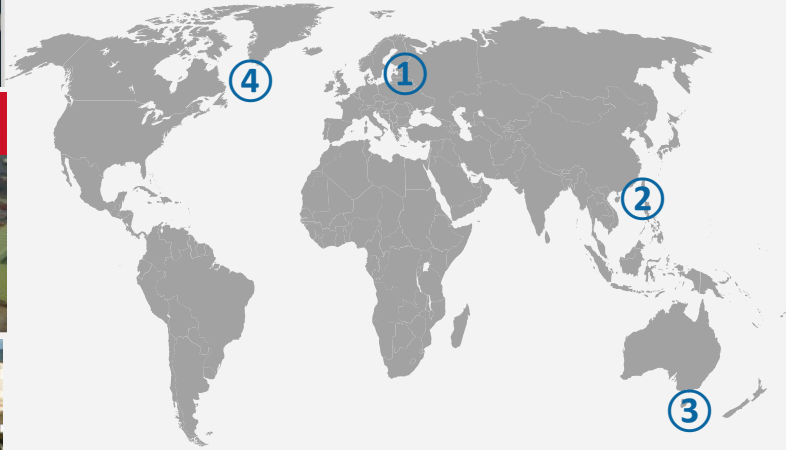
- New AKVA group feeding technology: waterborne feeding.
- 64 x 12 meters; V-shaped hull with Ballast system. Certified for 6.5 meters significant wave height
- Living quarters “like a hotel”. Own freshwater production and Sewage treatment system.
- Control room and digital systems enabling full remote control
- Integrated boat garage, enabling the boat crew to embark and disembark with the boat into the barge.



# New international Barge sourcing strategy, to secure global delivery capacity and reducing lead times, in the years to come.

- Last 15 years, about 60% of AKVA group barges have been built at shipyards in Estonia or Poland.
- Following the new sourcing strategy, AKVA group entered in 2019 into an agreement with a shipyard in Vietnam. 13 barges are contracted from there so far.
- For barge deliveries to Australia and Canada, AKVA group have chosen to build at local shipyards.
- During next 3-5 years AKVA group expect global demand of 100 -150 new Feed barges, and our target is to deliver 25-35% of these.
- All AKVA barges are designed and built according to NS9415 / DNV-GL.
- Specialized, multi-disiplinary teams follow up on each site during the building process.

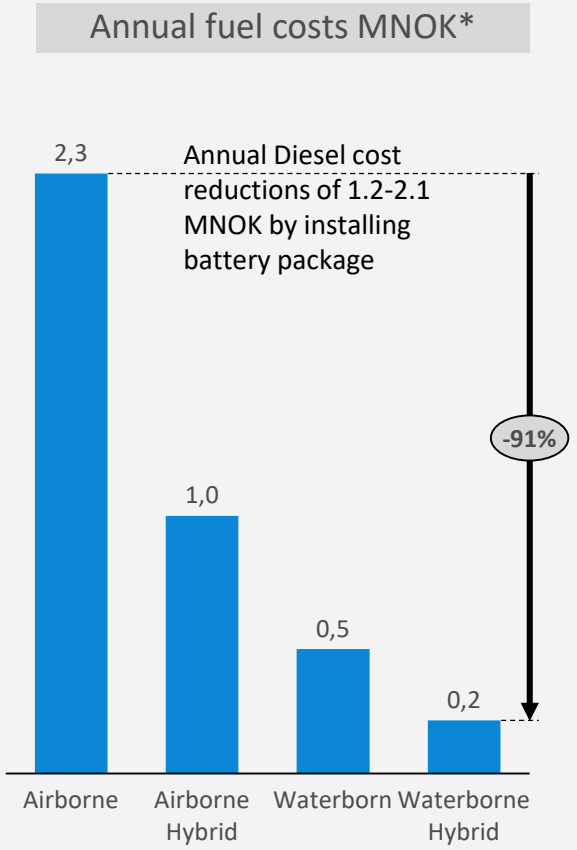

AKVA group Shipyard partners

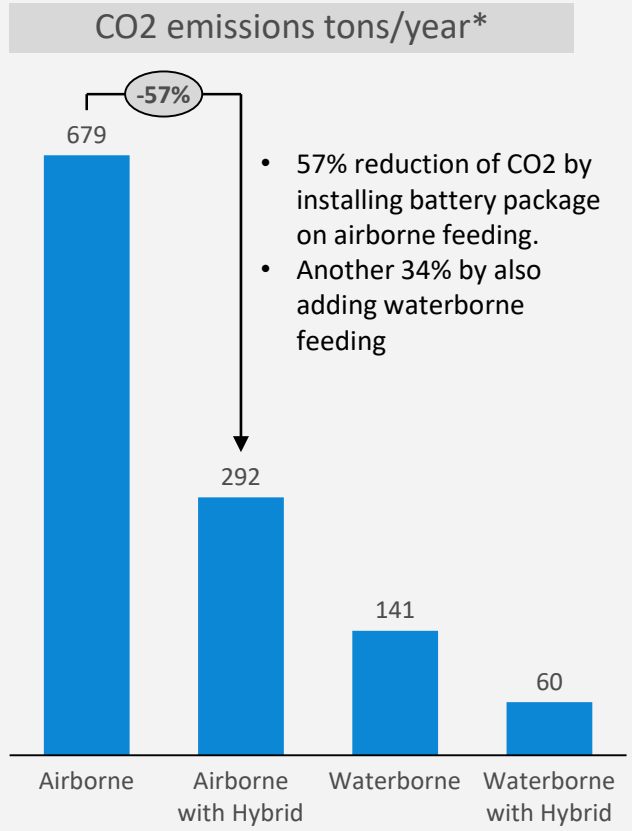



1. **Estonia**
2. **Vietnam**
3. **Australia**
4. **Newfoundland**

# Major reduction of Costs and $CO^2$ emissions with AKVA group Waterborne feeding systems and battery package

- AKVA Hybrid Battery package (CAPEX of 2.0-2.5 MNOK) has a payback time of 1-2 years (reduced fuel costs)
- Waterborne feeding and Hybrid solutions ➔ Generator capacity may be reduced.
- AKVA group Waterborne feeding important impact, less microplastic realised into the environment.
- Significant reduction in operation time for generators ➔ increased lifetime and reduced maintenance and service costs
- Annual fuel costs and $CO^2$ emission may be reduced 90%, according to tests.
- Better environment for workers (10 – 15 hours daily with no generator noise or emissions).




*)Calculations based on 8 feeding lines and average of 8 hours feeding/day

# AKVA Digital – CMD 24.11.2020

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Crop
Soil
Technology
Water
Data
Weather
Graphic Provided by Raj Khosla

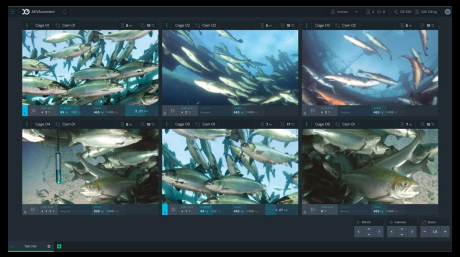

760 WORK

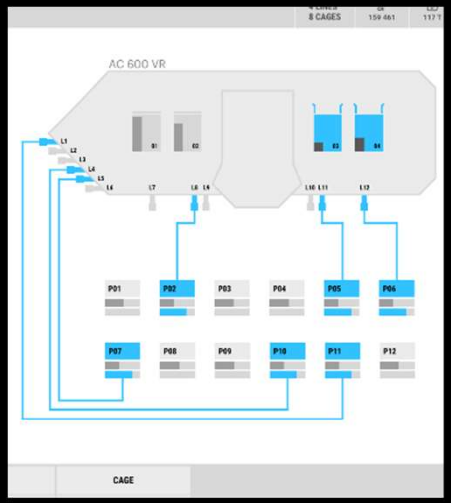
Technology for sustainable biology

AKVA GROUP

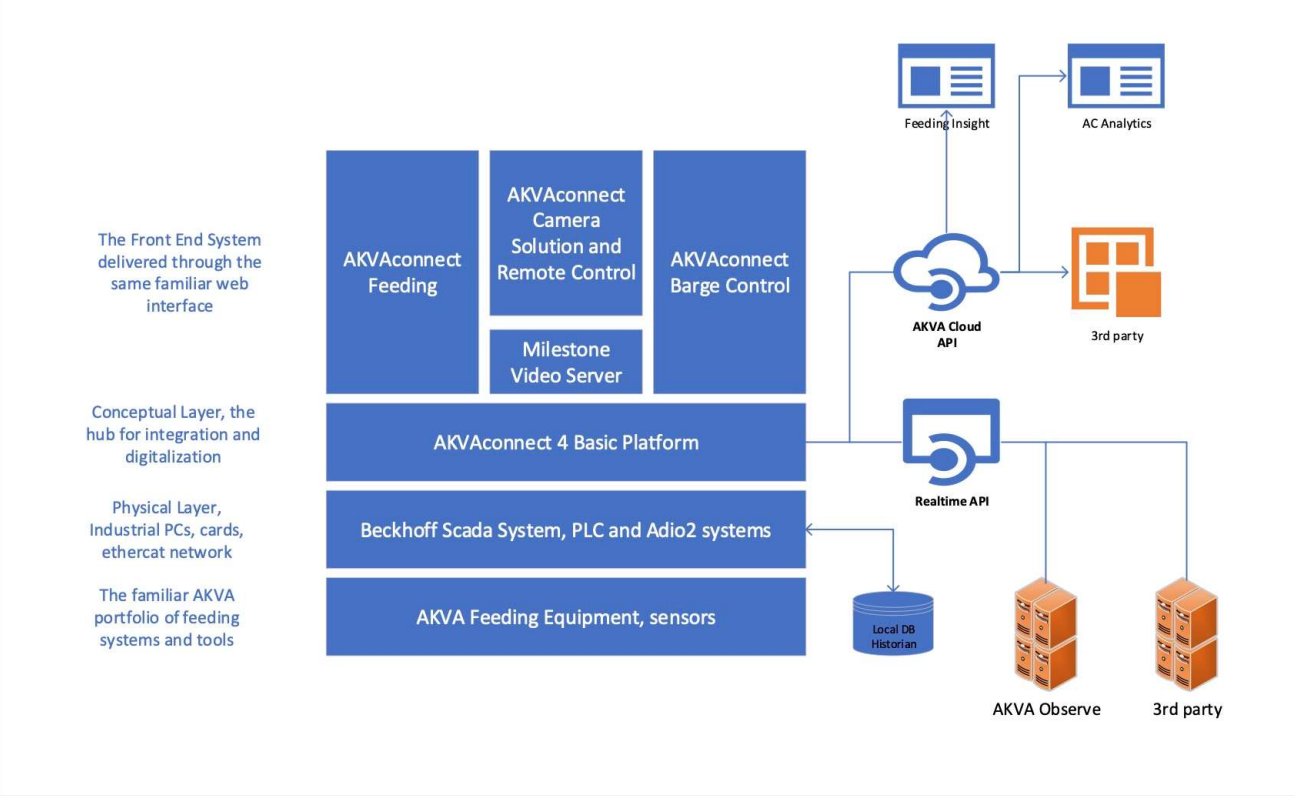

AKVAconnect
Fishtalk
AKVA Observe
Technology for sustainable biology
AKVA GROUP

# AKVAconnect – digitalization & control





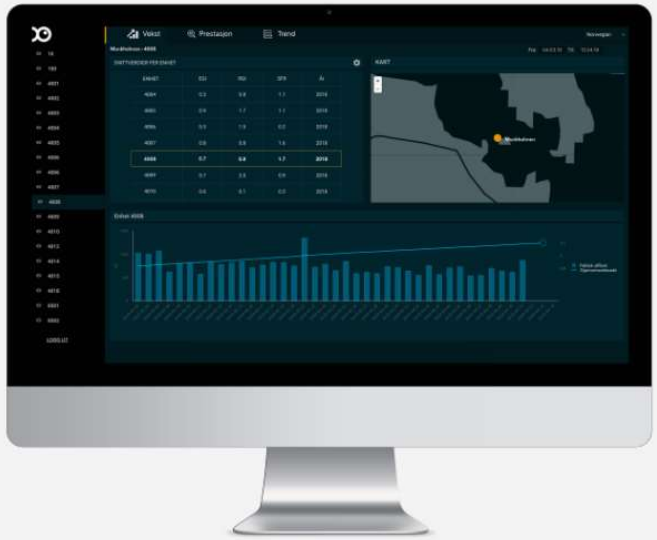

# AKVAconnect – Open Architecture

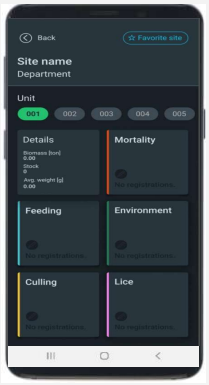



- Real time control
- Open architecture
- API's to support 3rd party integrations
- Connect to Artificial Intelligence solutions such as AKVA Observe
- Connection to cloud services

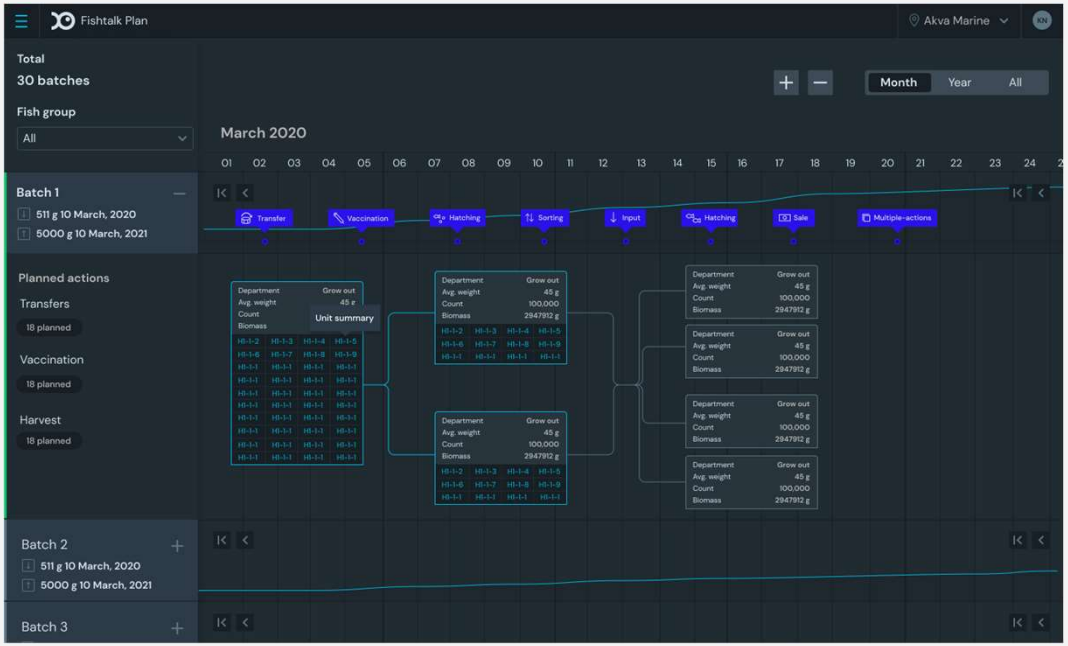
# Fishtalk

- Biological status from brood stock to harvest
- Large global installation base
- Many users with new functionality and integration requests
- Key priority in the step wise development program






# Fishtalk Plan



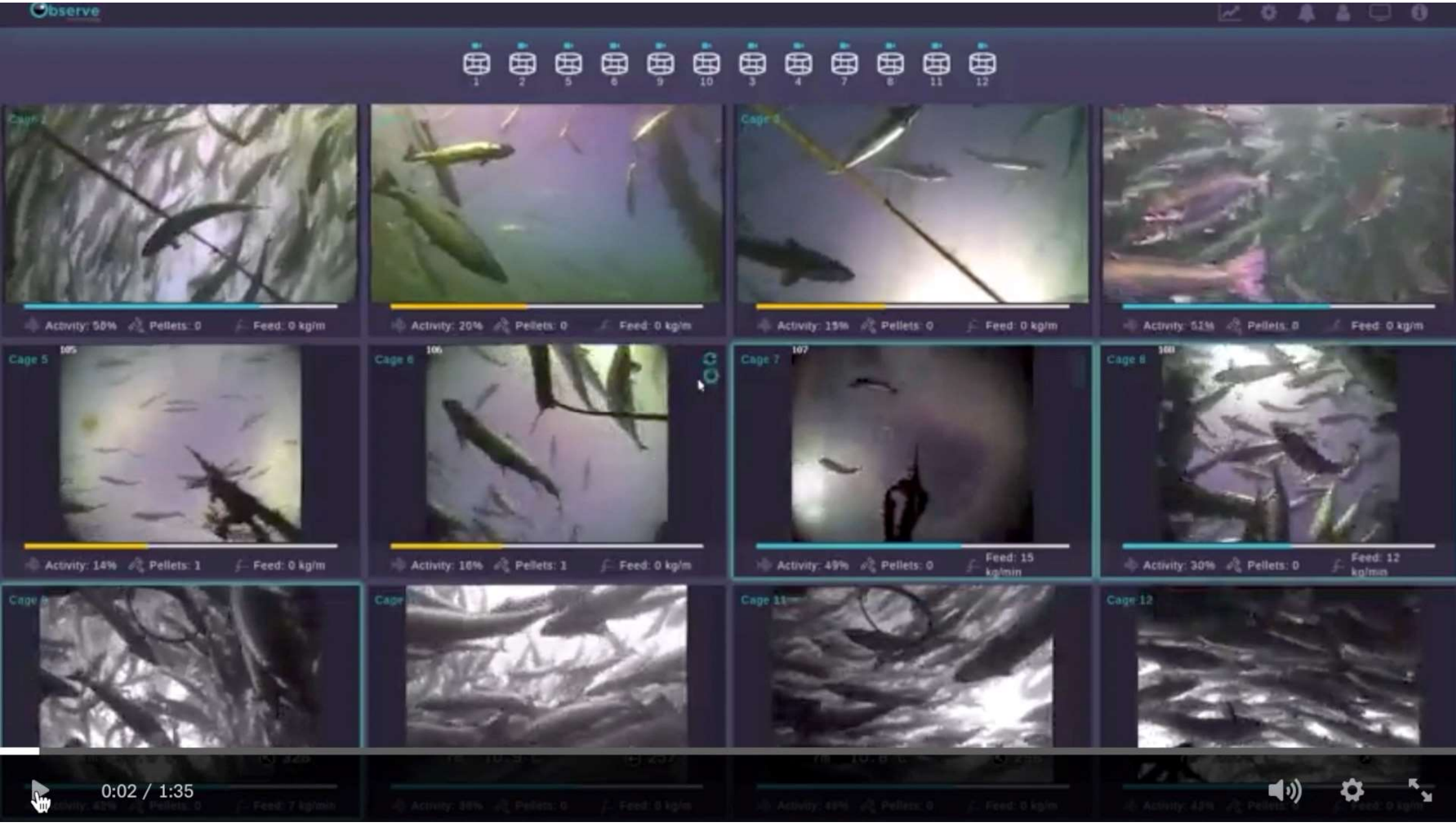


Data driven decisions
overflate - Merd 6
overflate - Merd 5
overflate - Merd 4
undervann - Merd 6
undervann - Merd 5
undervann - Merd 4
overflate - Merd 3
overflate - Merd 2
undervann - Merd 3
undervann - Merd 2
overflate - Merd 17
overflate - Merd 16
undervann - Merd 17
overflate - Merd 15
overflate - Merd 14
overflate - Merd 13
undervann - Merd 15
undervann - Merd 14
undervann - Merd 13
AKVA GROUP
SAMSUNG

# AKVA Observe – Precision Feeding

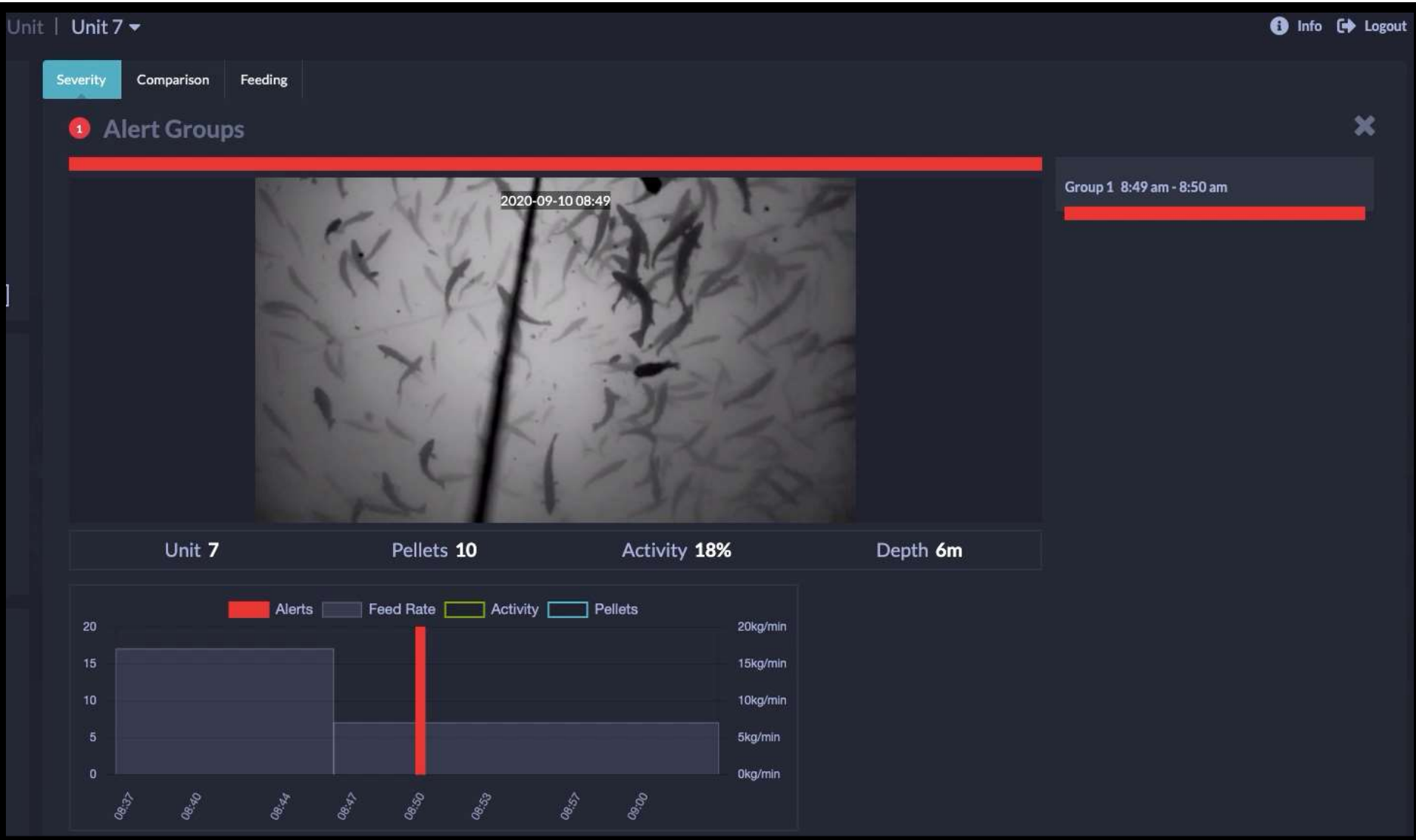
AKVA GROUP™


2018-10-16 15:11:19 TUE


Observe
1 2 5 6 9 10 3 4 7 8 11 12
Activity: 50% Pellets: 0 Feed: 0 kg/m
Activity: 20% Pellets: 0 Feed: 0 kg/m
Activity: 15% Pellets: 0 Feed: 0 kg/m
Activity: 51% Pellets: 0 Feed: 0 kg/m
Cage 5
Activity: 14% Pellets: 1 Feed: 0 kg/m
Cage 6
Activity: 18% Pellets: 1 Feed: 0 kg/m
Cage 7
Activity: 49% Pellets: 0 Feed: 15 kg/min
Cage 8
Activity: 30% Pellets: 0 Feed: 12 kg/min
Cage 12
0:02 / 1:35


Alert Breakdown
0%
25%
50%
75%
100%
75 Alerts
Farmer Alerts
No Farmers on ROTA for the selected date range
Statistics
Severity
Comparison
09/06/2020
09/12/2020
1D
3D
1W
1M
Alerts
Last updated 1 day ago
Depth
Alerts
Feed Rate
Activity
Pellets
80
60
40
20
0
20kg/min
15kg/min
10kg/min
5kg/min
0kg/min
Sep 6
Sep 7
Sep 8
Sep 9
Sep 10
Sep 11
Sep 12
Copyright © 2020 Observe Technologies.


Severity
Comparison
Feeding
09/10/2020
09/10/2020
1D
3D
1W
1M
Alerts
Last updated today
Unit 7
Depth
Feed Rate
Activity
Pellets
Alerts
100
50
0
30kg/min
20kg/min
10kg/min
0kg/min
07:00
08:00
09:00
10:00


Unit | Unit 7
Info
Logout
Severity
Comparison
Feeding
Alert Groups
Group 1 8:49 am - 8:50 am
2020-09-10 08:49
Unit 7
Pellets 10
Activity 18%
Depth 6m
Alerts
Feed Rate
Activity
Pellets
20
15
10
5
0
20kg/min
15kg/min
10kg/min
5kg/min
0kg/min
08:37
08:40
08:44
08:47
08:50
08:53
08:57
09:00

# Integration with feeding system

Data Available to Farmers

Fish behaviour & feeding practices

Integrate into:

- Sensor systems (4 major suppliers)
- Reporting tools (Fishtalk)
- Feed systems (ScaleAQ and AKVA feeding systems)
- Cameras (8+ suppliers globally)

Decision AIs

Observe technologies

Action

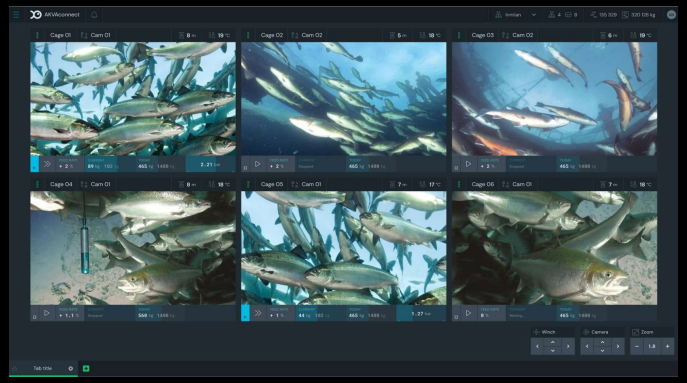
Automatic systems to:

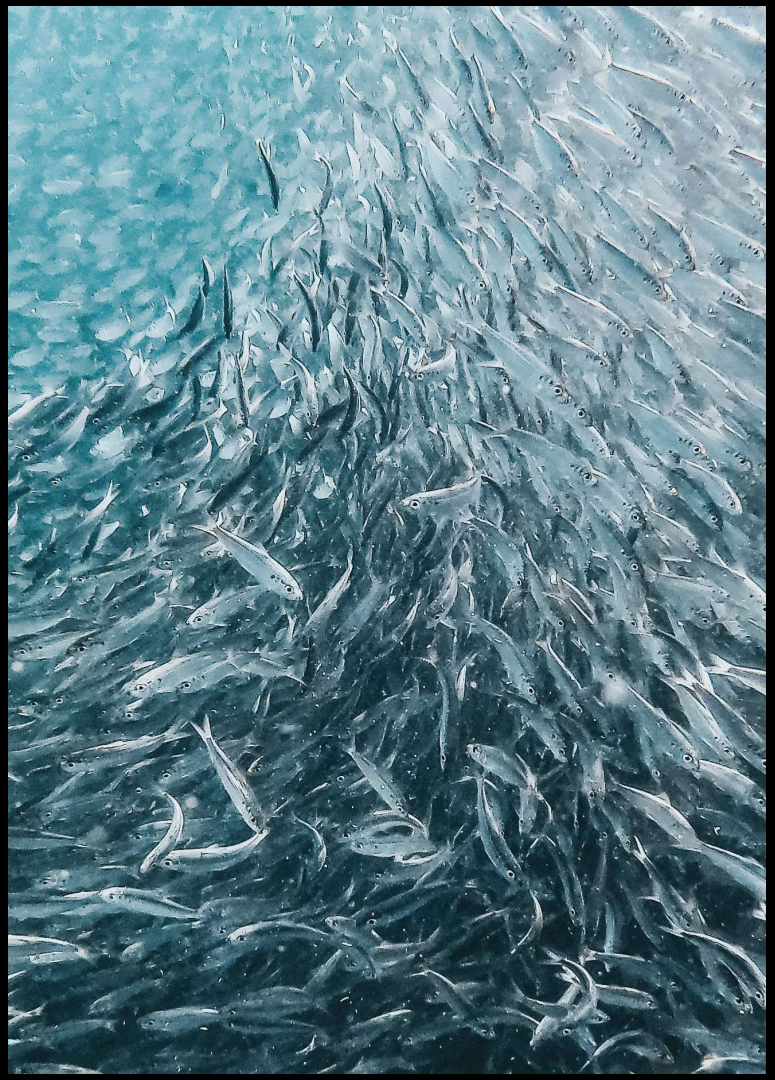
- Fully integrated control for farmers
- Perform complex automatic feed strategies

*In development:*

- *Optimally place feed cameras*
- *Sample biomass for cages*


Observe
No video
109
SLOW FEED 3
D: 8 T:14.1 V:10.9 H:316
auto
10.0#
47.0%
5.9Kg/min
Air Speed
0.70 m/s
Silo
42 %
Visits
1/2 #
Visit
45639 g
Run
Dosing
Aug 13
15m
1H
3H
1D
12
9
6
3
0
14:36 14:37 14:38 14:39 14:40 14:41 14:42 14:43 14:44 14:45 14:46 14:47 14:48 14:49 14:50
0.70 AF
0.70
AF
Feeding
Observe Feeding
Present State:
SLOW FEED 3
Next Events:
SLOW FEED 2
STOP
Activity %
Feed Rate kg/min
Select



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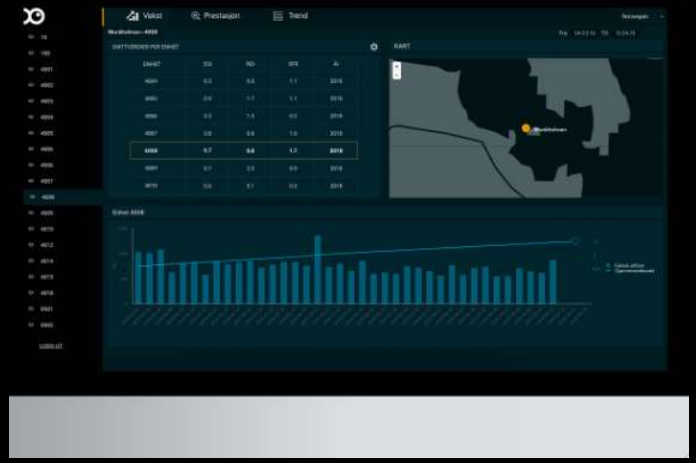


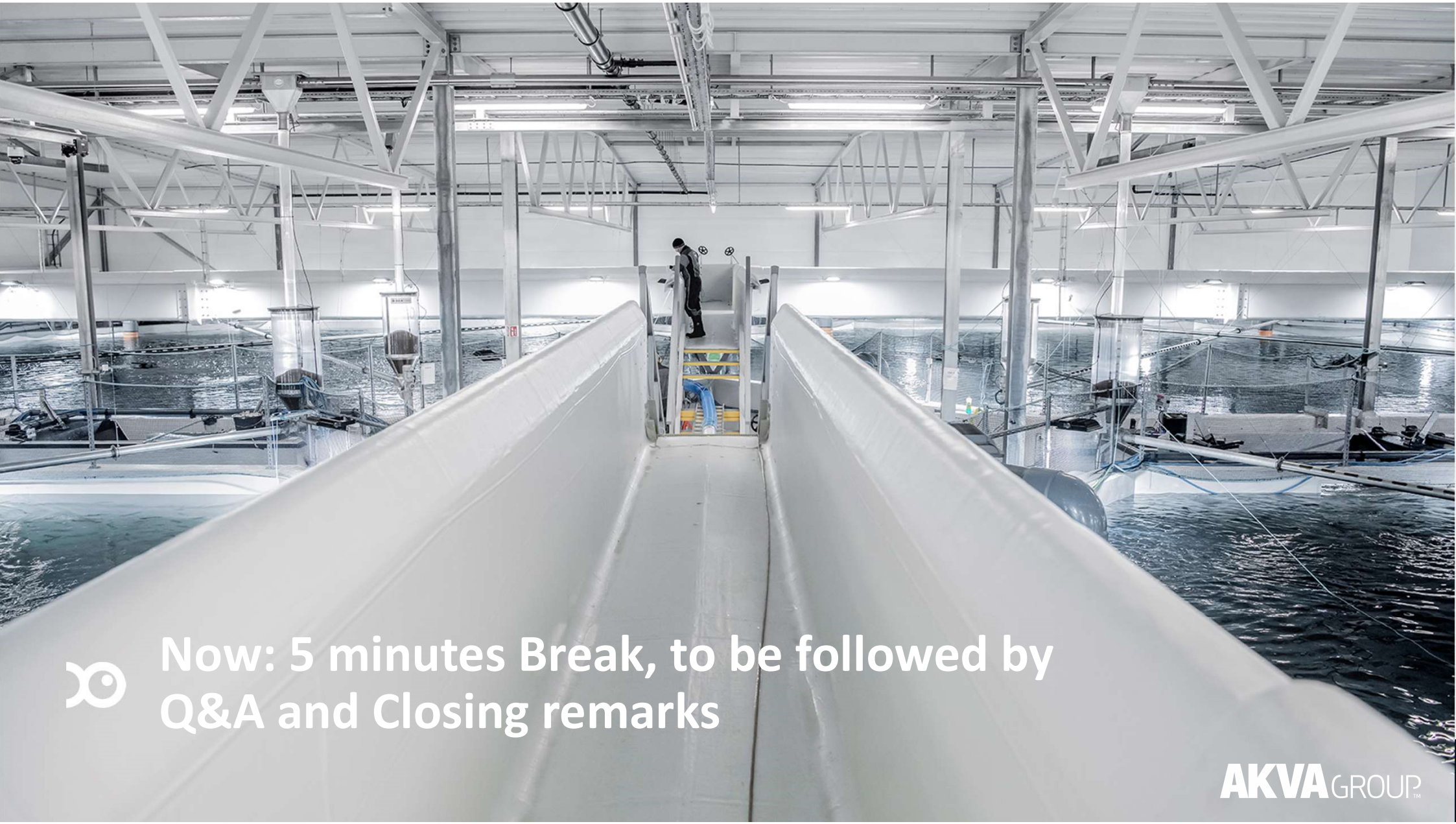

Alert Breakdown
Farmer Alerts
Statistics
Alerts


AKVA GROUP
Technology for sustainable biology
AKVA GROUP

Observe technologies

## Aquaculture powered by Artificial Intelligence

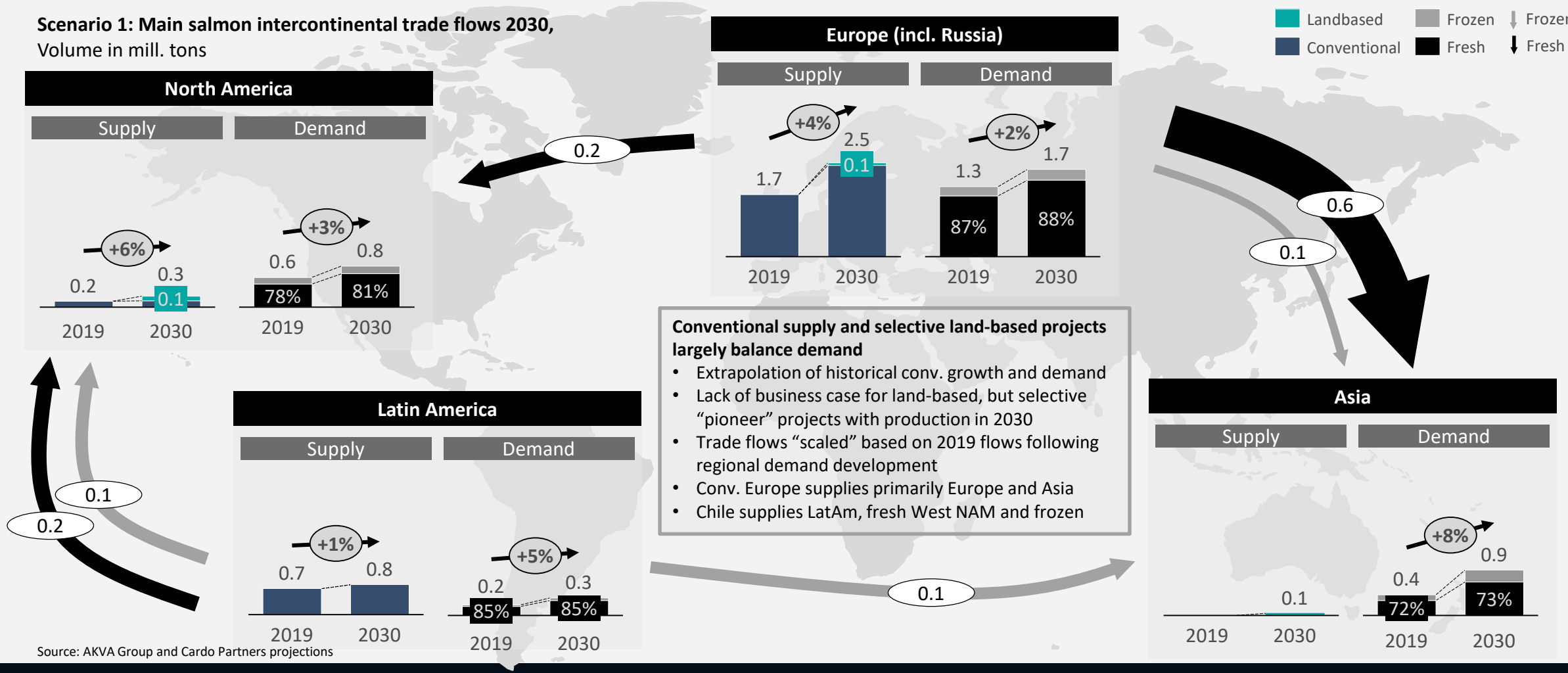
CEO: Hemang Rishi (h.r.rishi@observe.tech) CTO: Pieter Fabry (pieterfabry@observe.tech)


Now: 5 minutes Break, to be followed by
Q&A and Closing remarks
AKVA GROUP

# Appendix

# Scenario 1: Europe will be key supplier of fresh salmon to North American and Asian markets

**Scenario 1: Main salmon intercontinental trade flows 2030,**
Volume in mill. tons



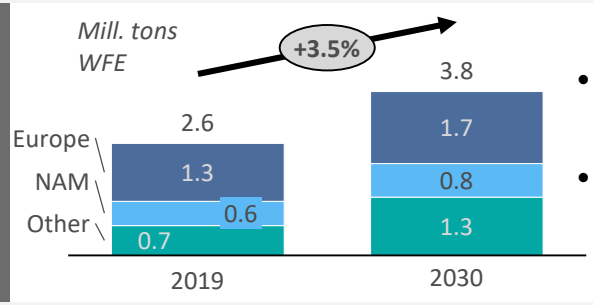

**Conventional supply and selective land-based projects largely balance demand**

- Extrapolation of historical conv. growth and demand
- Lack of business case for land-based, but selective "pioneer" projects with production in 2030
- Trade flows "scaled" based on 2019 flows following regional demand development
- Conv. Europe supplies primarily Europe and Asia
- Chile supplies LatAm, fresh West NAM and frozen

Source: AKVA Group and Cardo Partners projections

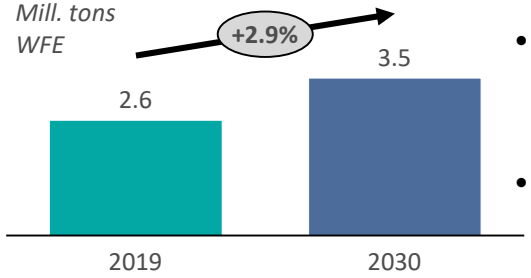
# Scenario 1: Conventional pen farming to grow at full capacity to alleviate the world's growing demand for Salmon

**Demand**



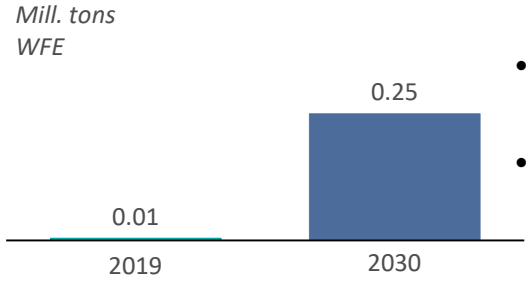

- Continued marketing effort required to sustain demand growth
- Especially important to develop markets in Asia and other emerging markets

**Conventional production**




- Innovation critical to achieve growth given current short-term growth outlook in Chile, Canada and Norway
- Growth capex >20 bln NOK (excl. licenses[1]) and additional maintenance capex

**Land-based/ other unconventional**




- Continued technology development to make RAS cost competitive
- ~50 bln NOK in total land-based capex spend on land-based in 2020s

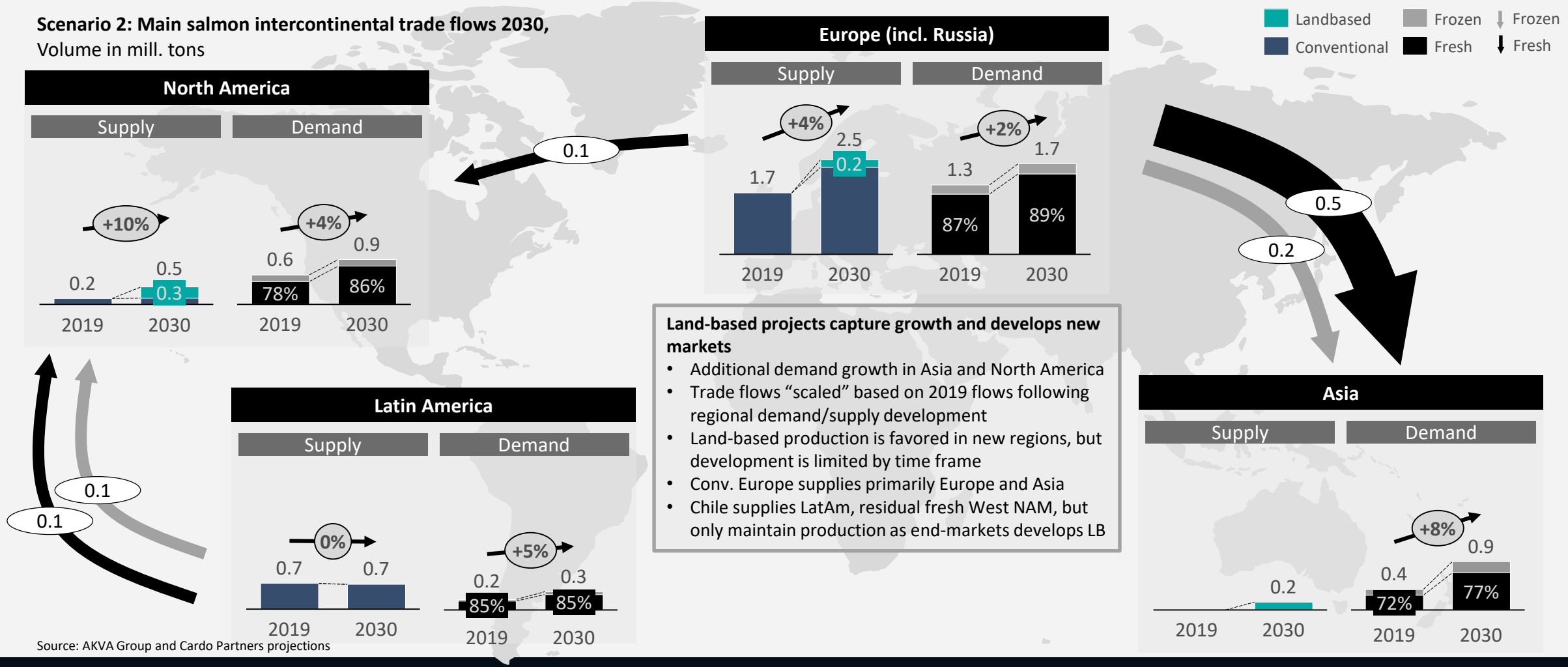
**AKVA Group implications:**

- Strong Cage Farming segment with increased demand for innovative solutions
- Significant revenue for land-based even in the conservative case

1. Estimated 200 NOK/kg capex investment for land-based and 20 NOK/kg for conventional production

# Scenario 2: Asia supplied locally and from Europe – Chile with a challenging long-term market condition

**Scenario 2: Main salmon intercontinental trade flows 2030,**
Volume in mill. tons



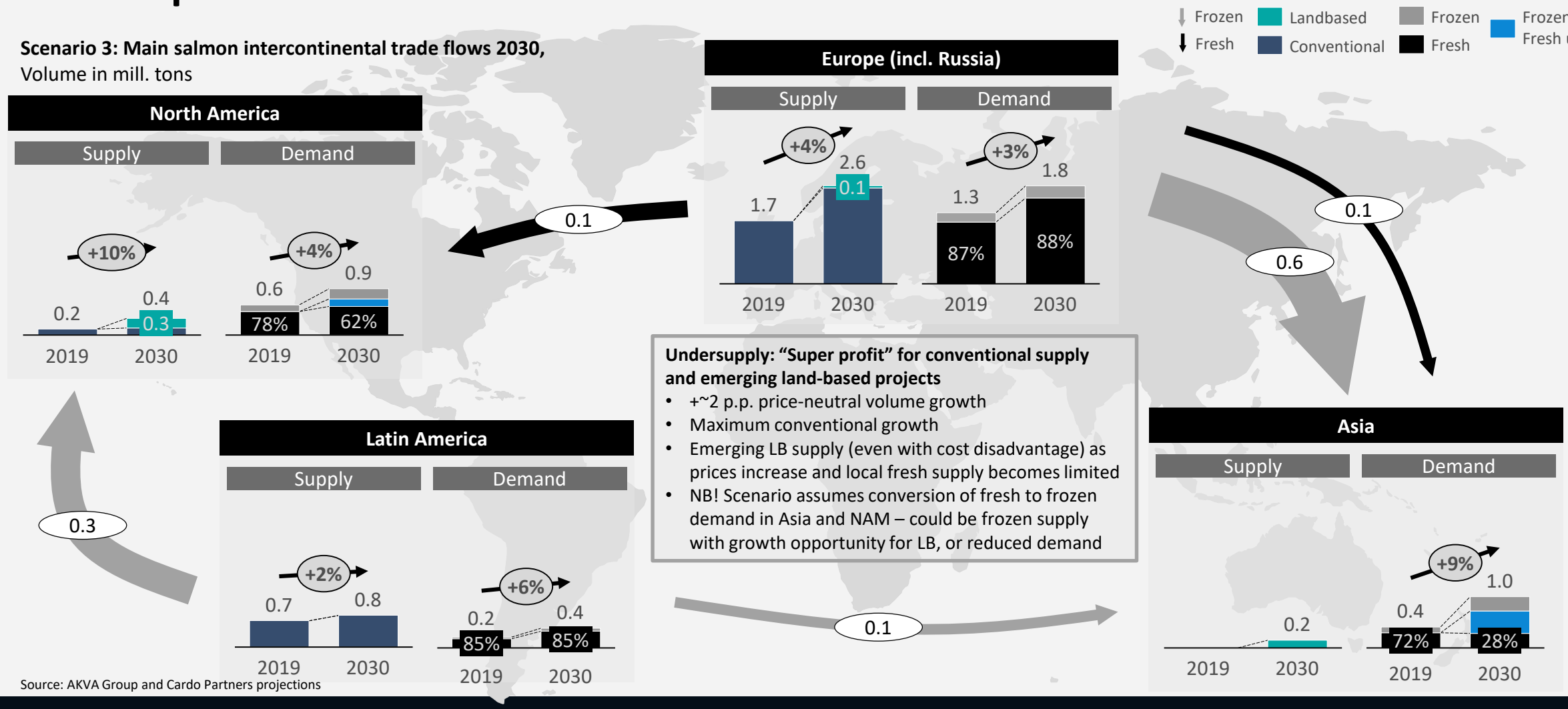

**Land-based projects capture growth and develops new markets**

- Additional demand growth in Asia and North America
- Trade flows "scaled" based on 2019 flows following regional demand/supply development
- Land-based production is favored in new regions, but development is limited by time frame
- Conv. Europe supplies primarily Europe and Asia
- Chile supplies LatAm, residual fresh West NAM, but only maintain production as end-markets develops LB

Source: AKVA Group and Cardo Partners projections

# Scenario 3: Lack of airborne freight resulting in significant drop in fresh consumption in NaM and Asia

**Scenario 3: Main salmon intercontinental trade flows 2030,**
Volume in mill. tons




**Undersupply: "Super profit" for conventional supply and emerging land-based projects**

- +~2 p.p. price-neutral volume growth
- Maximum conventional growth
- Emerging LB supply (even with cost disadvantage) as prices increase and local fresh supply becomes limited
- NB! Scenario assumes conversion of fresh to frozen demand in Asia and NAM – could be frozen supply with growth opportunity for LB, or reduced demand

Source: AKVA Group and Cardo Partners projections


**Aquaculture powered by Artificial Intelligence**

**CEO: Hemang Rishi (h.r.rishi@observe.tech) CTO: Pieter Fabry (pieterfabry@observe.tech)**

**2017** **Observe founded through Entrepreneur First**

**First deployment on Chilean site**

www.observe.tech

## Underleveraged Data

- Cameras
- Fish weights
- Feeding
- $O_2$ Sensors
- Reports

## The Art of Feeding

## Unclear Feeding Strategy

## Data Available to Farmers

- Cameras
- Fish weights
- Feeding
- $O_2$ Sensors
- Reports

## Artificial Intelligence


*No extra cage equipment*

## Maximise Stock Value

- ▲ Productivity
- ▲ Sustainability
- ▼ Costs

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**2017** Observe founded through Entrepreneur First

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**2018** **Patents developed**

**Commercial deployments in Chile & Scotland**

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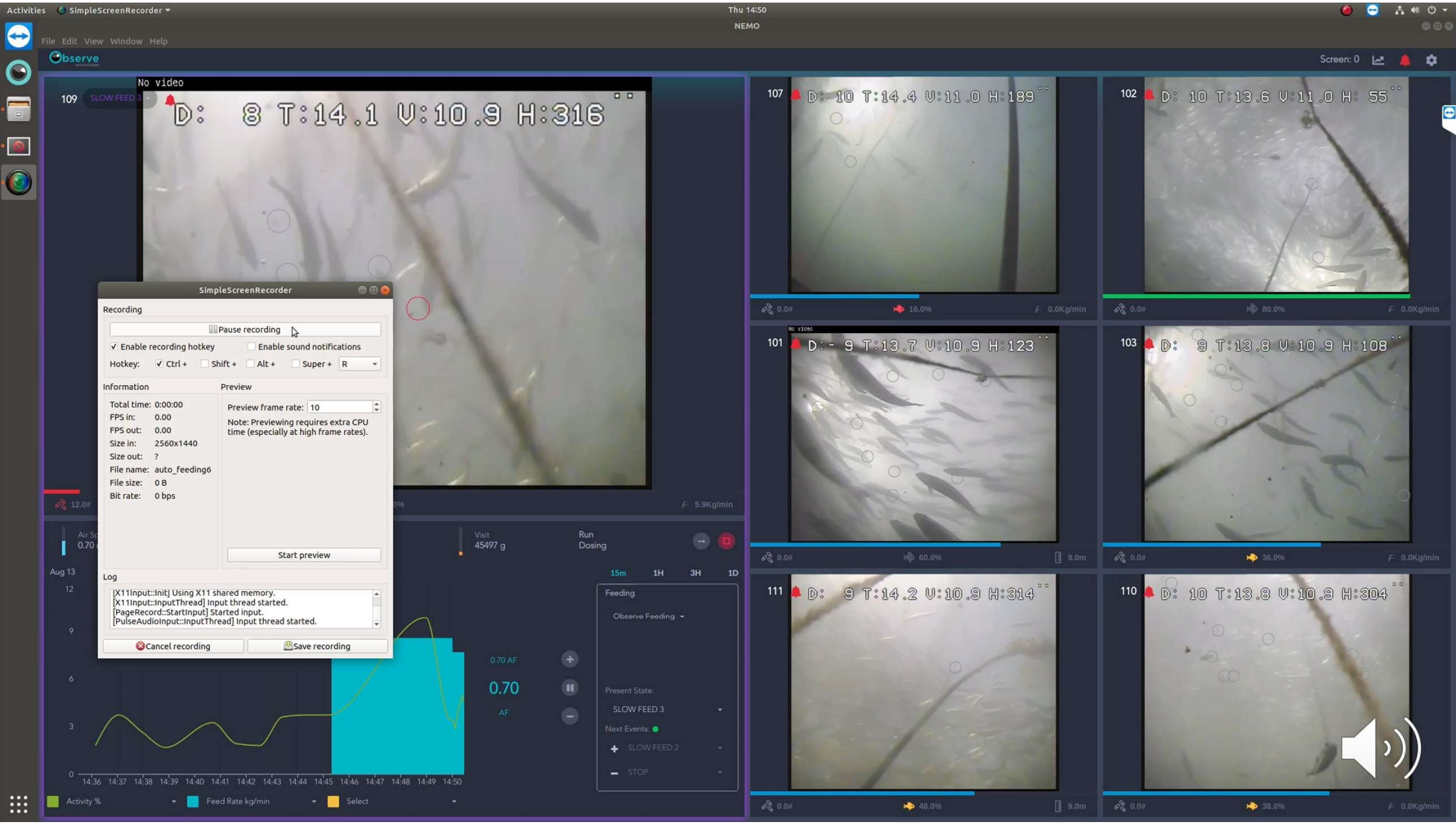
Activities
SimpleScreenRecorder
Thu 14:50
NEMO
File Edit View Window Help
Observe
Screen: 0
No video
109
SLOW FEED 3
D: 8 T:14.1 V:10.9 H:316
107
D: 10 T:14.4 V:11.0 H:189
102
D: 10 T:13.6 V:11.0 H: 55
101
D: - 9 T:13.7 V:10.9 H:123
103
D: 9 T:13.8 V:10.9 H:108
111
D: 9 T:14.2 V:10.9 H:314
110
D: 10 T:13.8 V:10.9 H:304
SimpleScreenRecorder
Recording
Pause recording
Enable recording hotkey
Enable sound notifications
Hotkey: Ctrl + Shift + Alt + Super + R
Information
Total time: 0:00:00
FPS in: 0.00
FPS out: 0.00
Size in: 2560x1440
Size out: ?
File name: auto_feeding6
File size: 0 B
Bit rate: 0 bps
Preview
Preview frame rate: 10
Note: Previewing requires extra CPU time (especially at high frame rates).
Start preview
Log
[X11Input::Init] Using X11 shared memory.
[X11Input::InputThread] Input thread started.
[PageRecord::StartInput] Started input.
[PulseAudioInput::InputThread] Input thread started.
Cancel recording
Save recording
Visit
45497 g
Run
Dosing
15m 1H 3H 1D
Feeding
Observe Feeding
Present State:
SLOW FEED 3
Next Events:
SLOW FEED 2
STOP
0.70 AF
0.70
AF
Aug 13
14:36 14:37 14:38 14:39 14:40 14:41 14:42 14:43 14:44 14:45 14:46 14:47 14:48 14:49 14:50
Activity %
Feed Rate kg/min
Select

**2017** Observe founded through Entrepreneur First

First deployment on Chilean site

**2018** Patents developed

Commercial deployments in Chile & Scotland

**2019** **AKVA distributorship deal**

**Scaled to major geographies**

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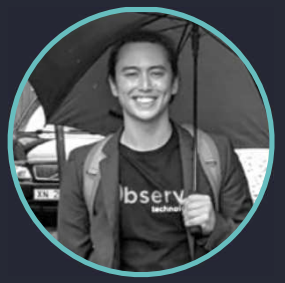
*Select team members*











**2 Patents**

**5 Observe Awards**

**15+ Academic Papers**

**3 PhDs**

**3 Mengs**

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**2020** **Our future…**

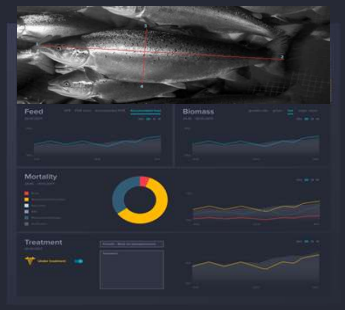
# Full Suite of Products

**Recommendation Engine**

**Cloud-Based Data Analysis**


**Automation**

**Biomass + Land-Based**

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Thank you