

Breakthrough welfare innovation for fish slaughter

Mike Forbes

mike@aceaquatec.com

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A large school of fish, possibly sea bream, swimming in clear blue water. The fish are densely packed, moving in a coordinated fashion. The lighting is bright, creating a vibrant blue environment. A white rectangular box with a thin black border is positioned in the upper left quadrant, containing text.

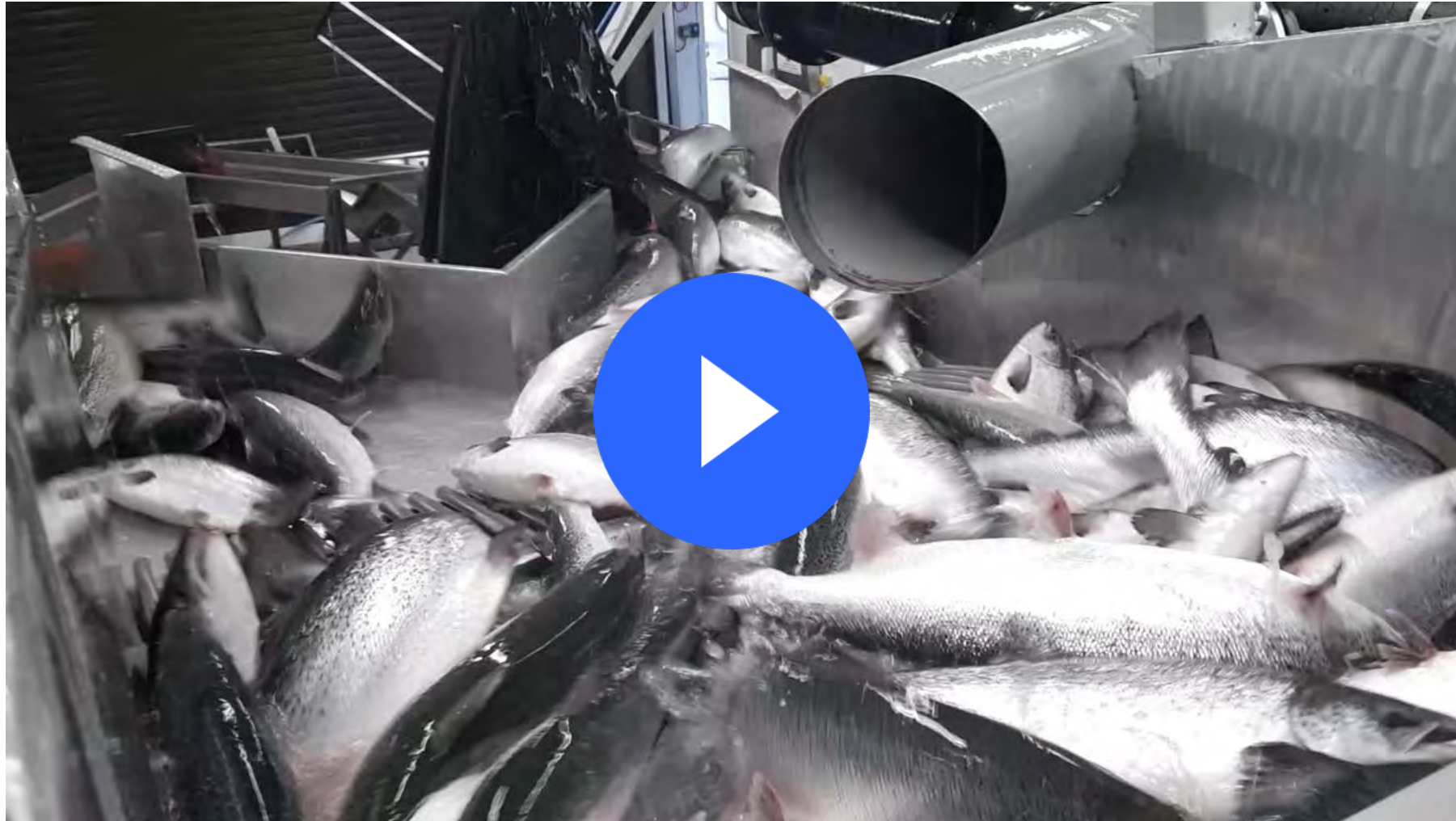
The stunning process can
be a huge stress for fish.
It doesn't need to be.

Humane Stunner Universal (HSU)

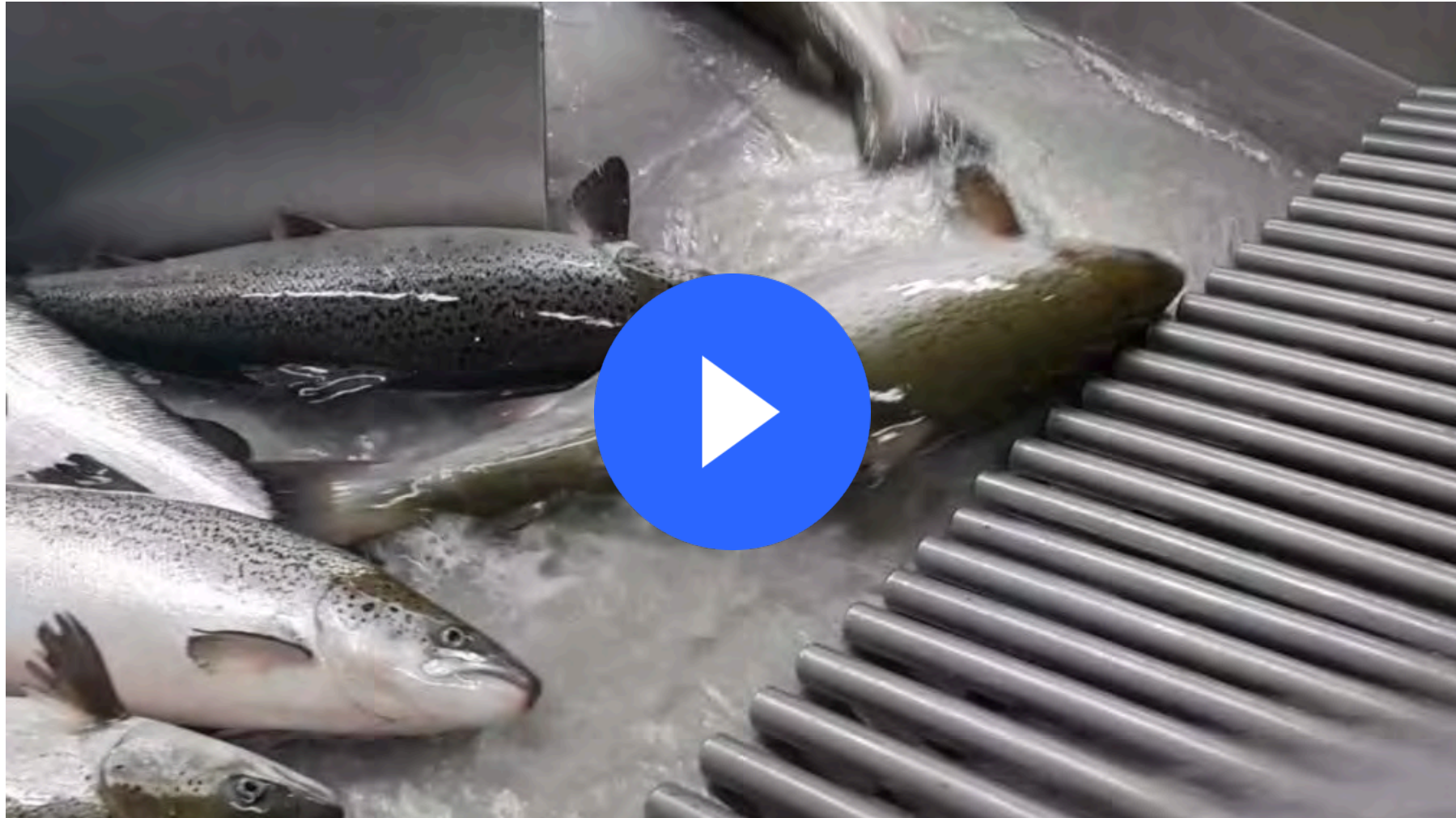


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Video - **without** our stunner



Video - **with** our stunner



Our vision is to...

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**use technology to accelerate
the adoption of responsible
marine practices.**



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**use technology to accelerate
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Key trends driving our R&D

1. Consumer demand for better welfare standards
2. Retailer pressure on suppliers to meet consumer welfare expectations
3. Regulatory changes
4. Factories increasing operational efficiency
5. Seafood producers looking to differentiate on quality

Existing stunning methods caused unnecessary stress to fish



CO²

- Inhumane
- Illegal in the EU
- Fish stress



ICE

- Inhumane
- Fish stress



PERCUSSIVE

- Expensive
- Fish stress



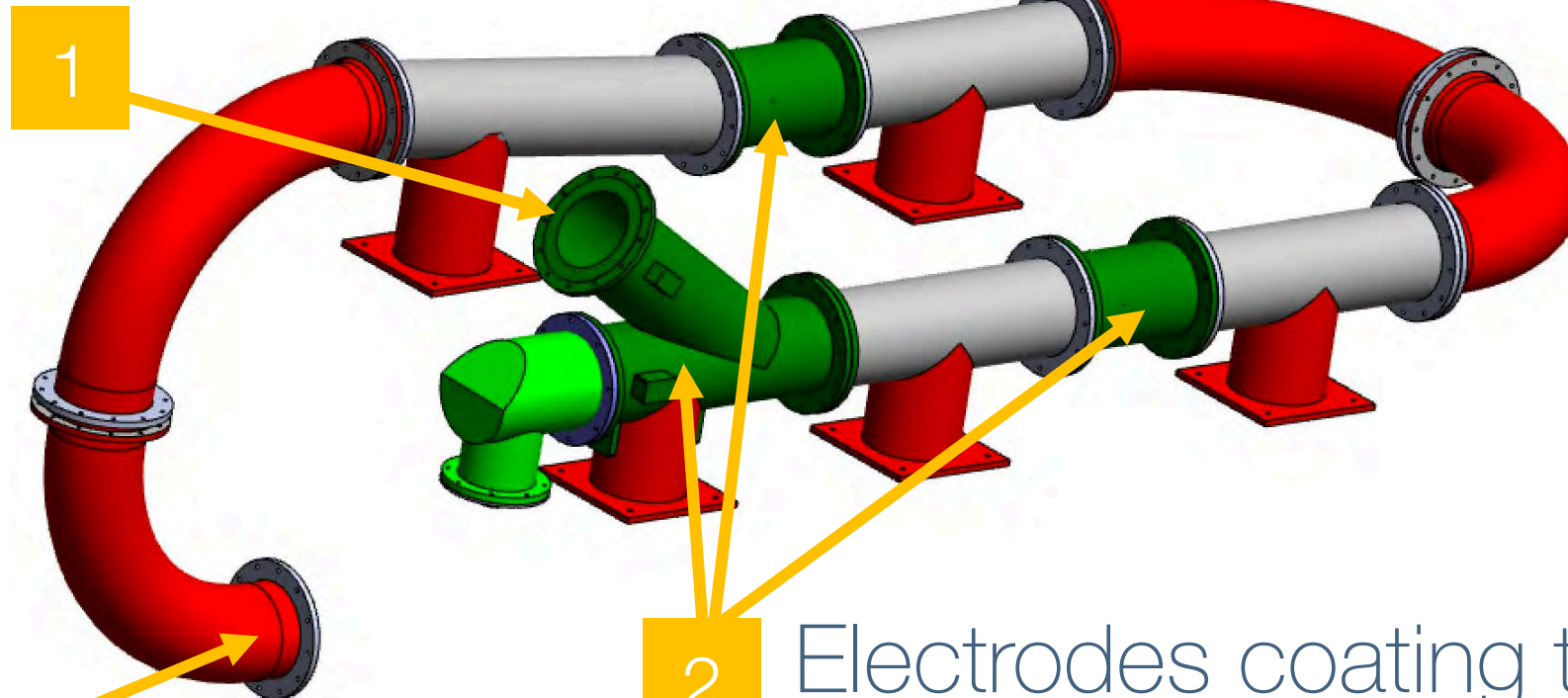
DRY ELECTRIC

- Inconsistent
- Flesh damage
- Fish stress



How in-water electric stunning works

Fish are pumped into the stunning pipeline



Fish exit to a bleeding table or ice

2

Electrodes coating the inside of the pipe electrify the water

3

Boat

Sea Trout



Factory

Atlantic Salmon



Barge

Seabass and
Sea Bream



RAS

Seabass,
Sea Bream
and Yellowtail



Six benefits of **in-water** electric stunning

1

Humane

2

100%
stun rate

3

No compromise
on quality

4

Increase
productivity

5

Any species,
any size

6

Low
maintenance

1

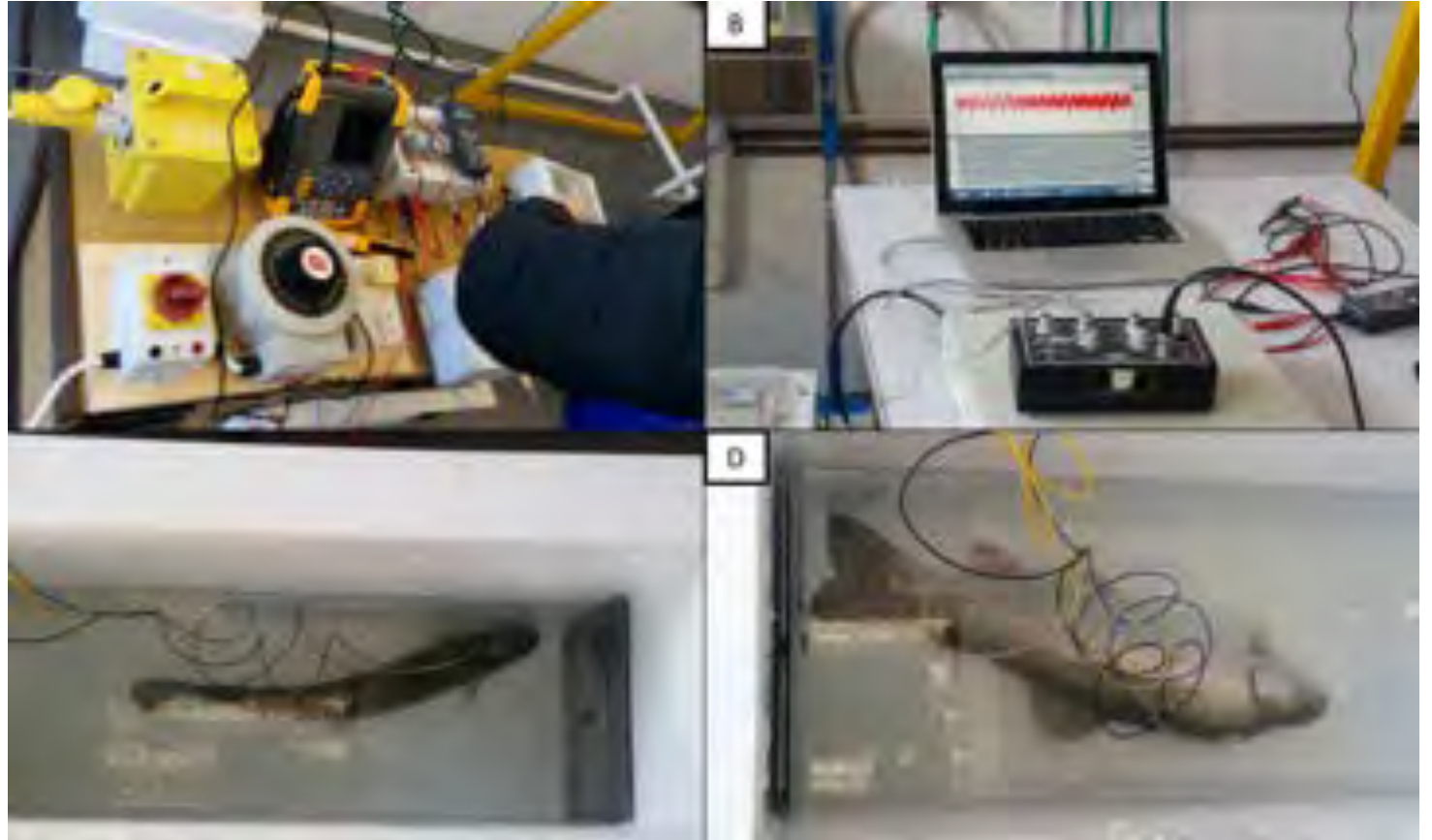
Humane



University of
BRISTOL



Scottish
Sea Farms



EEG testing in the lab and with customers

2

100% stun rate



3 No compromise on quality

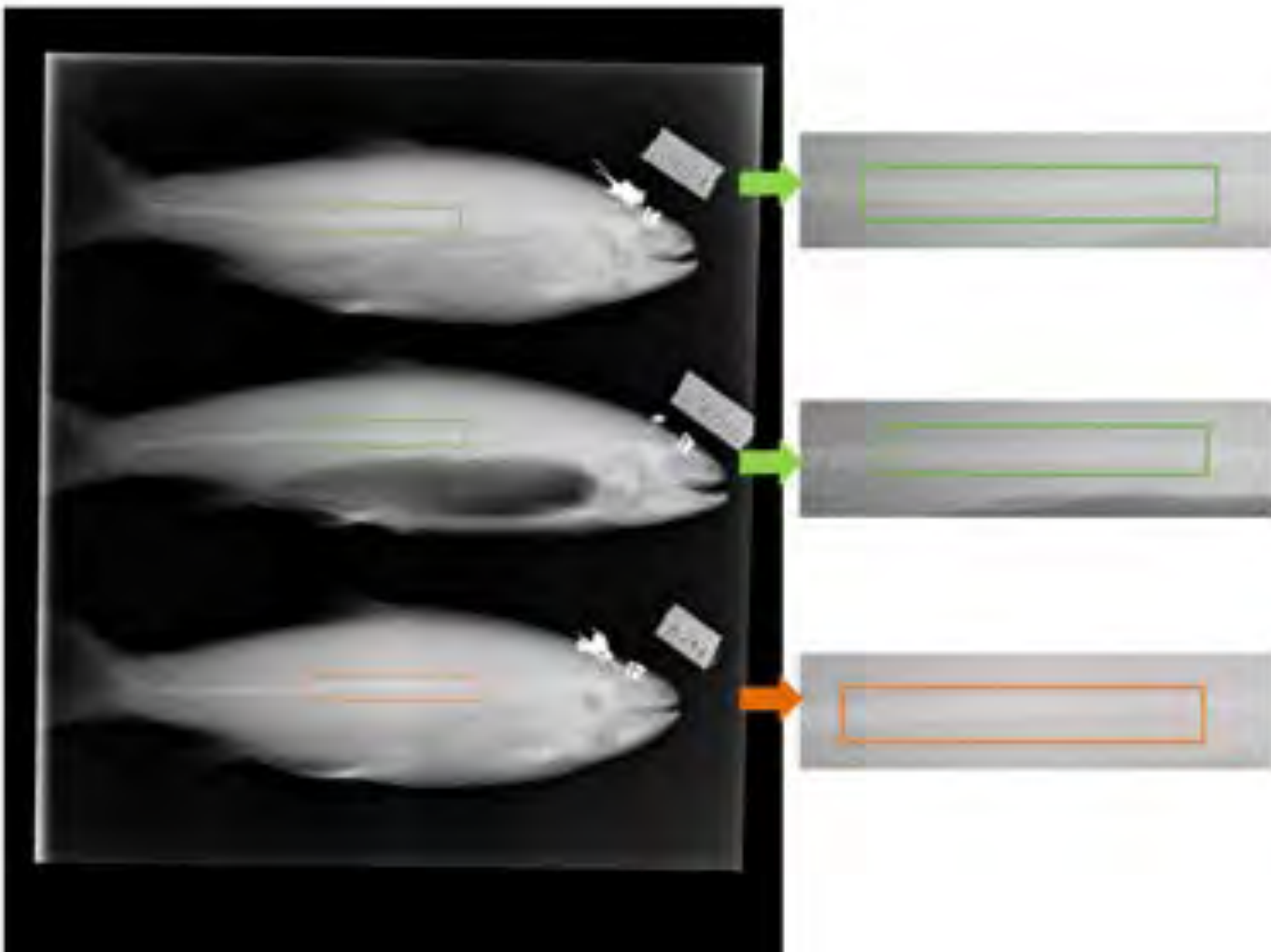


University of
BRISTOL



Scottish
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X-rays for spine
damage and
texture analysis



3 No compromise on quality



University of
BRISTOL



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X-rays for spine
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3 No compromise on quality



4

Increase productivity



**Scottish
Sea Farms**

Doubled production from
20 to 40 tonnes per hour

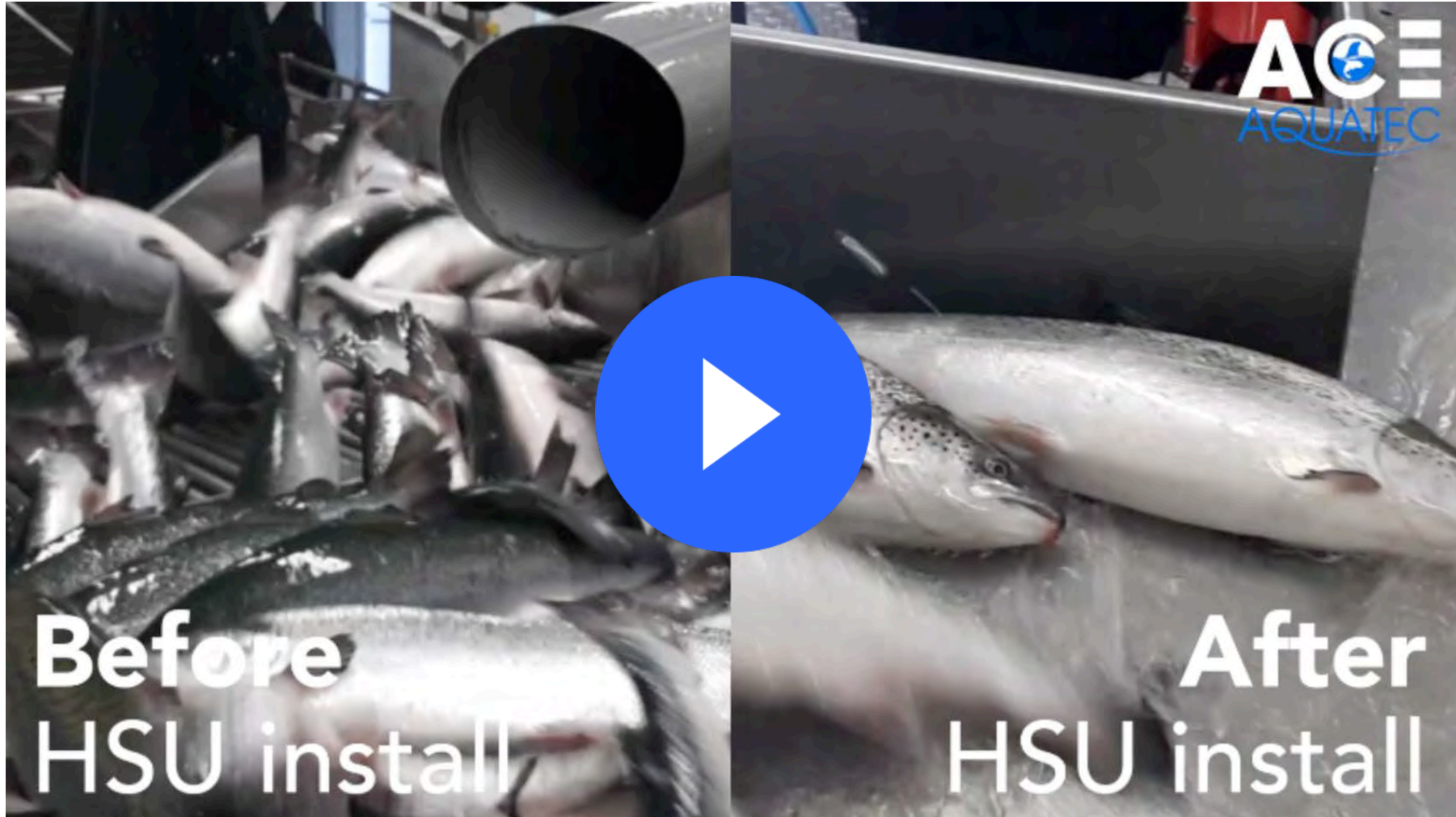


**The Scottish
Salmon Company**

Reducing headcount
from four to two people

4

Increase productivity



5

Any species, any size

Salmon



Tilapia



Bream



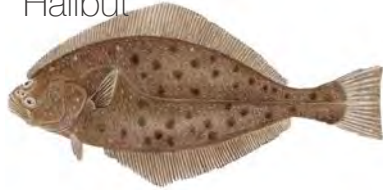
Dogfish



Sea trout



Halibut



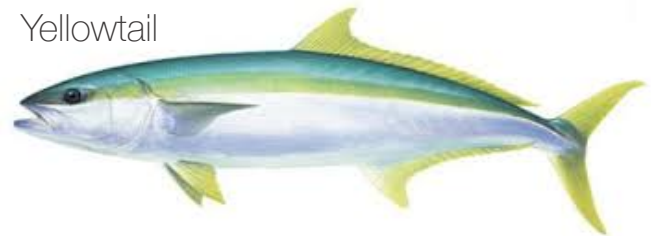
Turbot



Pangasius



Yellowtail



Cobia



Seabass



Sturgeon



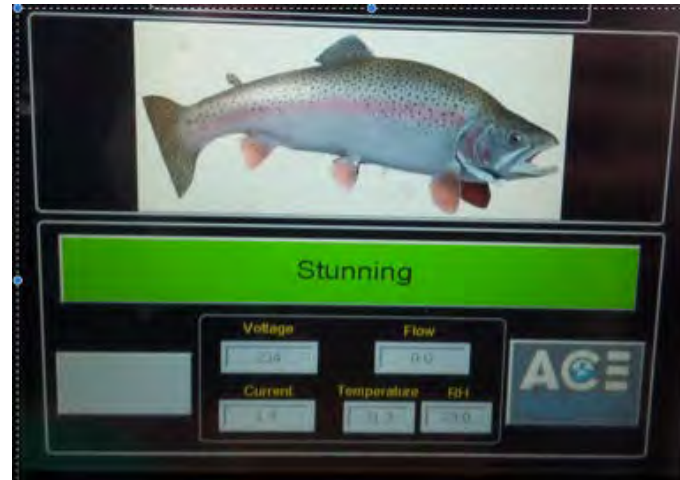
Prawn



Lobster

6 Low maintenance

- No moving parts
- IP68 waterproof
- Corrosion proof
- Remote monitoring



Unexpected secondary benefits



Zero impact
on eggs

Industry recognition

Core
Technology

Early
Adopters

Going
Global



WINNER OF
INNOVATION
AWARD 2017



QUEEN'S AWARD
FOR ENTERPRISE
INNOVATION 2019



Global
Aquaculture
Alliance

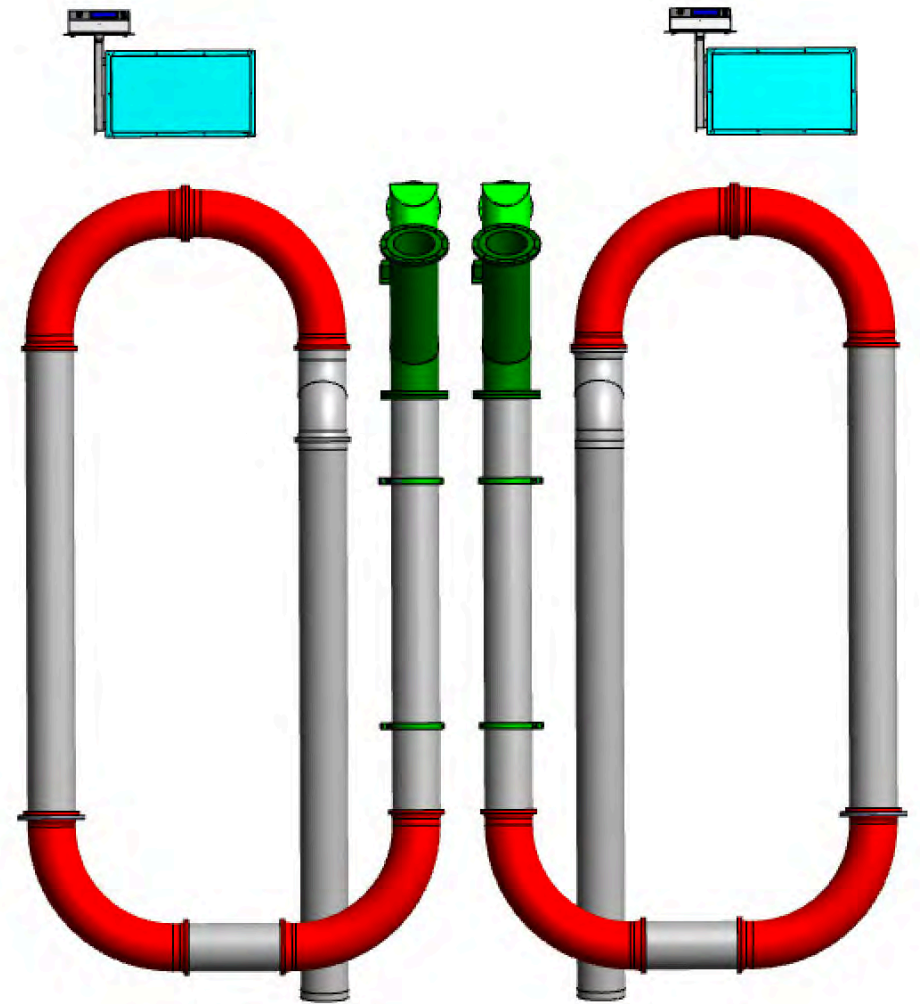
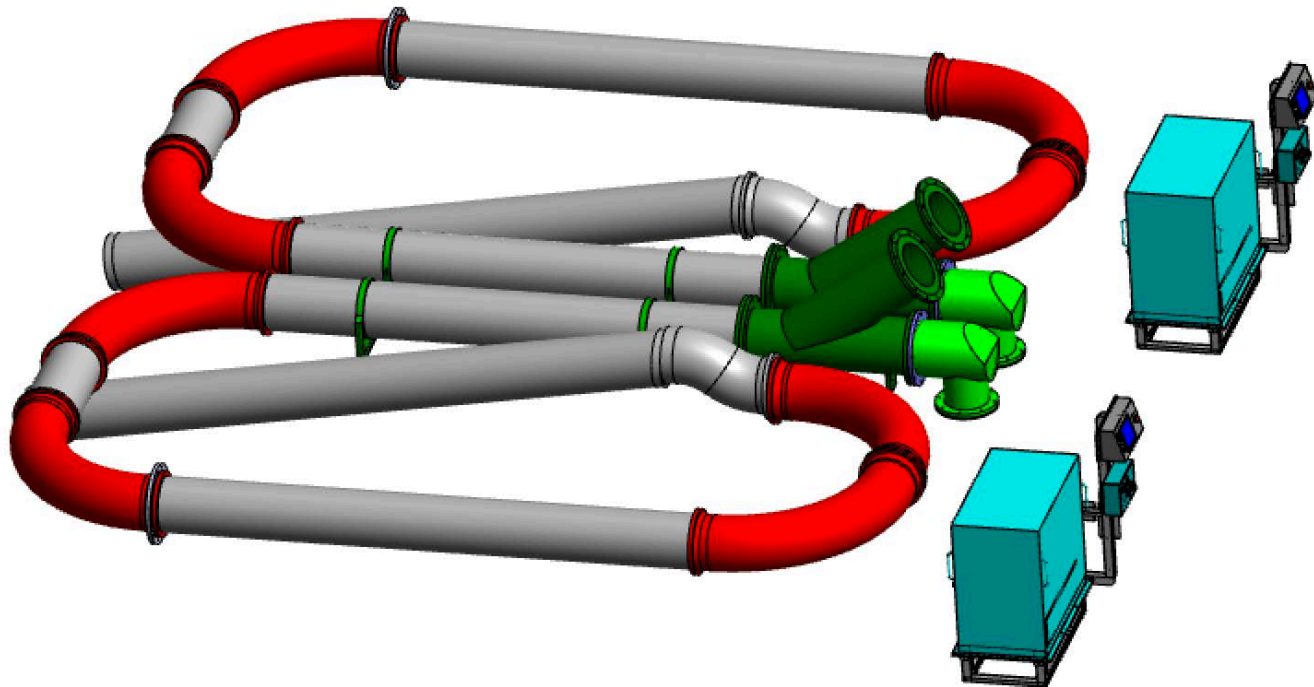
Conveyor System

Specialised design for species like prawns and lobsters that require longer emersion time.



Wild Catch

High volume design
for wild catch vessels



Vaccinations

Reduce handling stress
during vaccinations





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