

English Transcript

ASTUTE 2020+ collaboration with 360 Aquaculture

| Time | Audio | Video |
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| 00:00:00 | <p>ASTUTE 2020 (Advanced Sustainable Manufacturing Technologies) is a multi-university partnership of five Welsh Higher Education Institutions, part-funded by the European Regional Development Fund through the Welsh Government.</p> <p>ASTUTE 2020 is designed to stimulate growth in the manufacturing sector across Wales, by applying advanced engineering technologies to manufacturing challenges, driving cutting-edge research, development, and innovation.</p> | <p>Instrumental music in the background.</p> <p>ASTUTE 2020 (Advanced Sustainable Manufacturing Technologies) logo.</p> <p>Drone footage of Swansea University Bay Campus.</p> <p>ASTUTE 2020 Higher Education Institution Partner logos - Aberystwyth University, Cardiff University, Swansea University, University of South Wales and University of Wales Trinity Saint David.</p> <p>European Regional Development Fund logo.</p> <p>Footage of Swansea University Bay Campus and its beachfront location.</p> |

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| | | <p>Swansea University, College of Engineering building leading onto an ASTUTE 2020 Project Officer looking at a computer screen with computational modelling simulations on it.</p> <p>ASTUTE 2020 project officer looking down a microscope and a Kuka industrial robot moving about in sequence.</p> |
| 00:00:32 | <p>My name is Lee Tanner, I'm the CTO at Three-Sixty Aquaculture Limited.</p> <p>We're based down in Swansea on the Queen's Dock. We design, construct and operate land-based fish farms. Currently we're producing Whiteleg Shrimp for the UK market.</p> <p>What we've been working towards the last couple of years is demonstrating this system – that it is feasible</p> | <p>Three-Sixty Aquaculture logo shows on screen.</p> <p>Lee is sat behind a desk with two ASTUTE branded pop-up banners behind him in the background.</p> <p>Wide angle shot showing Swansea's Queen's Dock. A large body of calm water with jetties, cranes, wind turbines and warehouses lining it.</p> <p>The camera follows Lee down a corridor into the hatchery where the shrimp tanks are found.</p> |

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| | to grow King Prawns on land indoors. The next phase of this will then be to expand to a target of 1000 tonnes. | |
| 00:01:04 | <p>All of the King Prawns that come into the UK are farmed in Asia outdoors in ponds. There's roughly 23,000 tonnes that comes into the UK annually. That's all then cooked and frozen at source, shipped across and takes 45 days to get here.</p> <p>We're able to produce it fresh within a much tighter radius and that's much more sustainable than what's currently being done.</p> | <p>Close and medium shots of blue King Prawns swimming in the tank.</p> <p>Shots of Queen's Dock showing 360 Aquaculture's unit from the water. It is a large warehouse with a wind turbine to its right-hand side.</p> |
| 00:01:25 | <p>We had a design concept for farming shrimp on land. It requires computational fluid dynamics to demonstrate that the theory on paper will also work in real life.</p> <p>These systems are incredibly expensive to build and are also still considered high risk. We were moving away from that and trying to innovate more. The work</p> | <p>Lee is observing the shrimp. He is standing on a platform that enables him to see into the deep tank from above.</p> <p>Close shots show the filtration and feeding equipment that surrounds the tank. The equipment works to clean the tank's water and feed the shrimp at regular, timed</p> |

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| | we did with the ASTUTE team has allowed us to reduce the risk of building something that's out there on the innovation front. | intervals. |
| 00:01:56 | <p>We looked into the private sector to find solutions for the simulation we wanted to run, but we were unsuccessful in finding anyone. That's when we came across the ASTUTE team.</p> <p>With their access to the software and their experience in engineering. After the first meeting it was clear it was going to be a good fit.</p> | <p>Shot over Lee's shoulder showing him changing the settings and starting the filtration process from a control panel.</p> <p>ERDF plaque that is displayed at 360 Aquaculture's unit is shown in a close up shot.</p> <p>Lee is seen talking to ASTUTE project officers next to the Shrimp tanks.</p> |
| 00:02:14 | 360 provided the CAD drawings and designs and operating conditions for ASTUTE to be able to run the simulation. ASTUTE then built the CFD model to run the simulation so we could verify the operation conditions that were required in the tank like hydraulic mixing and oxygen distribution. | A computer simulation predicting how shrimp feed would flow in the tank's current can be seen on screen. The feed is shown in red and can be seen dropping into the tank and swirling through it's water. |

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| | <p>They then fed the simulation results back to us and we were able to make alterations based on the data gathered from the simulation. Throughout the process we'd meet up on zoom and ASTUTE would take us through the slide deck so we could see what variations were coming out in the simulations and we'd need to change to run the next one.</p> | <p>Shots from above the tank show the shrimp swimming in clear blue water and resting on the bottom of the tank underneath lighting units.</p> |
| 00:02:57 | <p>The collaboration with ASTUTE allowed us to safeguard jobs during the COVID pandemic. It's been fundamental in helping with our tank design and verifying that. Allowing us to then raise funds to pursue and build based on the computational fluid dynamics.</p> <p>We have a new and more efficient working system and we've been able to file a patent for a new modular system that allows independent tanks to be much larger than is currently possible.</p> <p>We'll be able to provide a stable and sustainable supply</p> | <p>Lee is shown having a discussion with an ASTUTE Project Officer on a platform next to the tank.</p> <p>We are taken through to a second room where multiple tanks are stored next to one another with blue feeding equipment above them. The tanks are empty, but show what the 360AC facility could look like at full capacity.</p> <p>Shots taken from around the facility that show pieces of equipment, feeding tubes, and nets. Lee can be seen pouring a jug of feed into a blue feeding unit that is suspended over the tank from the ceiling.</p> |

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| | of high-quality seafood to the UK market in this period of uncertainty with the pandemic and Brexit. | |
| 00:03:36 | <p>As a company we've benefitted greatly from the experience that the ASTUTE team was able to bring. Working with ASTUTE has allowed us to accelerate the R&D that we couldn't carry out in-house. We've been able to conduct more research, improved our innovation, grow as a business, raise more funds, and expand.</p> <p>That then leads on to further innovations and takes the company down a different path that we probably wouldn't have been able to do without the ASTUTE project.</p> | <p>Lee is driving a small boat out into the dock wearing an orange life jacket.</p> <p>Close up shots of swimming prawns in the aquaculture tank.</p> <p>Lee is sat in a chair with ASTUTE branded pop-up behind him. The left pop-up is written in English and the right is in Welsh.</p> |
| 00:04:05 | Instrumental music | ASTUTE 2020 partner logos – Aberystwyth University, Cardiff University, Swansea University, University of South Wales and University of Wales Trinity Saint |

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| | | <p>David.</p> <p>ASTUTE 2020 and the European Regional Development Fund Logo.</p> <p>ASTUTE 2020 website link.</p> |
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