

Aiming for the sweet spot

Proserv CEO Davis Larssen and VP, Digital Innovation Stuart Harvey tell OGV Energy's Dan Hyland how the controls technology leader is innovating radical real-time optimisation solutions for offshore wind.

Hywind Scotland floating wind farm (image: ©Equinor)

When a company establishes a work group to accelerate its digital push into offshore wind which is headed by its CEO, supported by its CTO and driven by its global VPs in digital innovation and renewables, it is safe to say this is a vital growth initiative for that business.

It also stands as a litmus test for how the energy industry is geared up for change in the coming years as sustainable sources, propelled by the latest technologies, must become an ever-louder voice in the conversation around provision and supply.

The fact the company in question is Proserv comes as no surprise. The global controls technology outfit has retained a laser-like focus on its pivot and realignment to the transition for a while.

A year ago, Proserv had won a landmark deal for its ECG™ holistic subsea cable monitoring system on the mega Dogger Bank Wind Farm, but fast forward 12 months and that same solution is set to be deployed on Equinor's Hywind Scotland, the world's first commercial floating wind asset. Meanwhile, its CEO Davis Larssen now sits on the Board of two of its closest technology partners, Synaptec and Intelligent Plant, while further alliances have been cemented with other disrupters, including real-time optimisation (RTO) start-up Ortomation.

Entrepreneurial spirit

A prime focus for Proserv is innovating independent, holistic asset-wide control and monitoring systems to deliver insights across an entire wind farm. This is R&D at the frontier and Larssen suggests Proserv is channelling all its qualities:

"One of our core values is fostering an entrepreneurial spirit. This outlook has been as important to our innovation as harnessing our heritage and reputation around control systems and harsh offshore environments. As we push further into renewables, yes, we are trusting in what we know, but equally using our natural enterprising flair to identify openings."

To drive this, Proserv has engaged the power of partnership to fuse capabilities and expertise. Its real-time predictive data analytics SaaS offering has emerged from its work with software engineering firm Intelligent Plant and was nurtured in the familiar environment of subsea oil and gas in the waters of the Gulf of Mexico. The company has harnessed these foundations, alongside its other close collaborators

like Synaptec, Ortomation and BPP Cable Solutions, to direct an ambitious package into offshore wind.

Stuart Harvey, Proserv's VP, Digital Innovation, says collaboration offers multiple gains, "Partnership is not just about moving into new areas of innovation, it also helps to generate best-in-class technologies whatever the specific domain. We are leveraging our agility to out manoeuvre others in the market."

"We see significant advantages in not owning all technologies and Proserv has the cultural maturity not to be held back by a 'but it's not built here' bias which has led to the demise of many technology companies. The main winner with this strategy is the customer who prospers from industry-leading solutions."



One of Proserv's global facilities



Davis Larssen

very inefficient and leaves significant potential yield gains on the table.

"Our RTO solution is a self-learning application which, using live data, autonomously calculates the optimum turbine set points, essentially the sweet spot, to achieve maximum power yield across the whole field while minimising structural stress and fatigue."

The sweet spot

Proserv's Digital Innovation VP details how the technology can not only improve base line performance, but can also be used dynamically to support an operator's strategic objectives:

"Most operators get nervous when you discuss optimisation with them and we fully understand why. What is unique with our philosophy is how dynamic it can be, enabling an operator to enhance power yield while monitoring remaining residual life, thus providing a safeguard, and allowing the sweet spot to be tuned further according to strategic objectives."

"If an operator chooses to maximise power yield for whatever reason during a window of opportunity, they can shift the optimiser to do exactly that and positive results will be generated in minutes. Traditional optimisation methods could never achieve that. Conversely, should an operator strategically choose to optimise their turbines more conservatively for a time, they can do that as well."

Harvey also describes a powerful, and lucrative, benefit of asset-wide engagement:

"By implementing RTO to optimise the power yield of multiple turbines across a wind farm, an operator could effectively gain the equivalent of a free turbine for every 16 based on our initial tests. That is a new additional turbine that has no purchase, installation or operational costs."

"In my opinion, making our energy industry green and committing to sustainability means not only installing more turbines in the future, but optimising what we already have and enabling new and old turbines alike to be as efficient and as long-lasting as possible."

Harvey stresses a collaborative culture must be prioritised between designers and suppliers to avoid the "unnecessary decommissioning of turbines if they have been controlled sub-optimally, when a technology actually exists to prevent that".

Larssen comments that the evolving application is underpinned by Proserv's established value proposition from its simplicity and scalability, either across specific systems or holistically over an entire asset, through to its independent OEM agnostic integration into existing architecture:

"The goal is for this RTO solution to optimise processes on multiple levels. So, we are engaging human factors engineering to simplify how key data is visualised for busy control room operatives. We are reimagining how this

A specialist disrupter

Harvey's words fit with Proserv's playbook where its unique and disruptive subsea controls offerings, built on best-in-class reliability, rapid bandwidths and OEM agnostic coexistence, have seen it earn a global reputation as "the industry's controls specialist".

Identifying opportunity has been the cornerstone of Proserv's narrative, innovating creative solutions either to remedy major industry challenges or to develop new propositions, and it is employing the same template in offshore wind. Larssen explains:

"Our attention is on actually 'sustaining' sustainable energy. While many OEMs are focused on building the world's biggest turbine, what we are looking at is the real-time optimisation of performance so that wind farms with a 25-year design life can effectively extend their operational function by another ten or fifteen years. The impacts on future power generation and ROI would be immense."

"Currently, wind farms tend to be built following the same traditional models as installations in oil and gas always have been, where lowest up-front cost wins, but that leads to siloed, disconnected infrastructure making future optimisation so much harder. We are challenging that way of thinking."

Harvey describes what Proserv is presently innovating alongside RTO expert Ortomation as a potential "leapfrog technology":

"Optimising wind turbines is a really interesting and significant challenge for the industry. They are constantly chasing a moving target – the variable direction and speed of the wind. As a result, achieving optimisation by currently known and established modelling techniques is

information is relayed via HMIs, using multiple data points on a flat 3D plateau, so that we can also optimise human performance day-to-day."

Like-minded partner

The likely next step for Proserv is to establish another of its innovative partnerships – but this time with an operator, asset owner or major OEM to accelerate the technology's route to market. Larssen knows the type of collaborator wanted:

"We need a partner that buys into our philosophy around doing things differently. So, holistic asset-wide connectivity in the design phase of the next generation of wind farms, recognising the importance of life extension to expand the market and how real-time optimisation can be an enabler to doing that and to maximising revenues for the operator."

Larssen sees the industry at a nexus right now as uncertainties involving energy security, policy and climate change interconnect with big ticket opportunities to propel innovation and local UK content.

"Offshore wind is just getting started really. Hundreds of billions of dollars are to be spent on its rollout in the next decade as the transition accelerates. That is an exciting place to be for innovators. There are challenges ahead but the UK, through projects like ScotWind, can lead the way in technology evolution, new skills and expertise development, and can transfer that know-how around the world."

"Our on-going work in RTO is equally pioneering and comes from recognising industry issues ahead of time. We have the capabilities, alongside those of our technology partners, to engineer the answers to these key questions. We are reinventing how assets will be controlled in the future."



Stuart Harvey

