

ASX RELEASE

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ASX: NVU

Nanoveu's ECS-DoT Delivers Up to 27.8% Drone Energy Efficiency Gains Using ECS-DoT AI Optimisation

First Live Trials Demonstrated Real-World Flight Optimisation with Negligible Power Consumption and No Hardware Modifications Powered by the ECS-DoT

Highlights

- EMASS has successfully completed its first live drone flight trials with ECS-DoT, demonstrating that the **energy-efficiency improvements previously observed in simulation can also be achieved under real-world flight conditions.**
- **Up to 27.8% Improvement in Cruise Energy Efficiency:** Initial live-flight testing recorded cruise-efficiency improvements of up to 27.8% at 4 m/s and 26.7% at 6 m/s, averaging 27.2% in metres travelled per watt-hour consumed. These results were achieved without any modifications to the drone's battery, airframe or propulsion system on an open-sourced software platform.
- **Mechanism Behind the Gains:** ECS-DoT does not slow the drone to save energy; it holds cruise speed tightly around the aerodynamic optimum, cutting the speed variance that wastes energy under standard autopilot control. The tighter the cluster, the greater the efficiency gain.
- **Proven with a controlled, four-phase empirical method:** Fixed waypoints and speeds; a baseline run under the PX4 autopilot control; an identical run with ECS-DoT active; then a like-for-like flight-log comparison, isolating ECS-DoT as the only variable.
- **High-Performance Edge AI with Minimal Power Consumption:** ECS-DoT executes continuous real-time flight optimisation while consuming less than 10 mW of total system power, enabling meaningful flight-efficiency improvements without requiring additional battery capacity or hardware modifications.
- **Advancing Integration with Third-Party Flight Controllers:** In parallel, EMASS is working with a U.S.-based drone partner to integrate ECS-DoT alongside proprietary flight-control systems and assess opportunities for improved flight efficiency and endurance.
- **Early-stage results treated as a lower bound:** The Company expects gains to scale as the AI models mature, as testing extends to heavier and more complex drone classes, and through multi-chip deployment that compounds both endurance and onboard AI capability.
- **Establishing disruptive technology Moat:** Nanoveu is in the final stages of its first major IP filings covering the proprietary AI flight optimisation framework, speed-based endurance modelling, and ECS-DoT UAV integration architecture, establishing the foundation for long-term defensibility and global licensing.

Nanoveu Limited (ASX: NVU, OTCQB: NNVUF) ("Nanoveu" or the "Company"), a technology company specialising in advanced semiconductor, visualisation and materials sciences, is pleased to announce highly successful early-stage results from its live drone evaluation program. These initial live flights confirm that the ECS-DoT chip can deliver material flight endurance gains in real-world conditions, establishing a strong foundation for a highly disruptive, scalable Edge-AI avionics technology.

Taking the ECS-DoT to the Sky: Strategy and Overview



Figure 1: Pictures of the EMASS Trial Drone in Flight During Live ECS-DoT Testing

Having validated ECS-DoT's performance across hundreds of simulation campaigns¹, EMASS moved to the next stage of its development program: live drone flight trials. The objective was to confirm that the endurance gains demonstrated in simulation are replicable in real-world conditions, and to establish a repeatable, empirically sound methodology that can be scaled across different drone platforms and operating environments.

The live trial program was structured in four sequential phases, each designed to isolate and measure the precise contribution of ECS-DoT to flight endurance. By holding all other variables constant across phases, the team was able to produce clean, directly comparable results. The sections below walk through each phase in turn.

Phase 1: Waypoint and Speed Selection



Figure 2: Mission Paths - 6 m/s (Left) and 4 m/s (Right, Three-Column) with Pink Waypoint Markers

¹ Refer to ASX Announcement Dated 2nd September 2025.

The first phase established the parameters for all subsequent trial runs. The team defined a set of waypoints to create a fixed, repeatable flight path, and selected a range of target speeds at which the drone would be tested. These waypoints and speeds were programmed into the drone's in-flight controller and autopilot. This approach is platform-agnostic and applicable to any standard in-flight controller, without dependency on a specific autopilot stack.

Speed selection was a deliberate part of the experimental design. Every drone has an aerodynamically optimal speed determined by its airframe geometry, rotor configuration, and payload weight. By testing across a range of speeds, the team was able to observe how endurance gains scale as the drone approaches this optimum, a finding discussed in detail in the results section below.

The table below summarises the trial configuration used across all flight runs.

Trial Parameter	Value
Total Airborne Mass (including battery and payload)	2.8kg (inclusive of 1.3kg battery mass)
Altitude	3.5m
Battery Type and Capacity	Li-Polymer 6S (6-Cell), with a 12400 mAH capacity
Battery Condition	Normal to Full Charge

Phase 2: Control Flight



Figure 3: Pictures of the EMASS Trial Drone without the ECS-DoT Onboard

With waypoints and speeds defined, the drone was flown along the predetermined flight path under the sole control of its PX4 Autopilot. This control flight established the performance baseline.

Battery discharge was empirically measured across the full run, capturing the energy consumed by the drone operating under standard, unassisted autopilot control. All flight path and speed parameters were held exactly as defined in Phase 1.

Phase 3: Loading and Flying with ECS-DoT



Figure 4: The EMASS Trial Team Configuring ECS-DoT in the Field (Left) and the Drone with ECS-DoT Mid-Flight (Right)

ECS-DoT was loaded onto the drone and its proprietary onboard AI configured to work alongside the PX4 Autopilot. The chip communicated with the PX4 Autopilot and took over control at defined points during the flight to apply real-time speed and flight path optimisation. ECS-DoT's AI analyses telemetry data and adjusts the drone's speed to maintain peak aerodynamic efficiency for the given flight conditions, all within a sub-milliwatt power envelope that preserves virtually all battery capacity for propulsion.

The identical flight path and speed profile from Phase 2 was then flown with ECS-DoT active. Battery discharge was empirically measured under the same conditions, producing a directly comparable data set.

Phase 4: Apples-to-Apples Comparison and Analysis

With both the control flight and the ECS-DoT flight completed under identical conditions, the team conducted a direct empirical comparison of the flight log data. Battery discharge across both runs was compared with flight path and distance held equal, isolating battery savings as the sole variable of interest.

The results were mapped as GPS flight path efficiency overlays, plotting ECS-DoT's per-segment energy performance against the baseline across the full mission. Darker green segments indicate where ECS-DoT achieved the highest efficiency gains; lighter green and yellow segments indicate moderate gains. The colour intensity corresponds to the magnitude of the gain at each point along the route. Across both test speeds, ECS-DoT recorded positive efficiency gains throughout the entire flight path with no segments showing a loss against the baseline.



Figure 5: GPS Flight Path Efficiency Overlay at 4 m/s - Baseline (White, Left) vs ECS-DoT Efficiency Gain (Colour-Coded, Right)

At 4 m/s, the darkest green is concentrated at the waypoint turns and corners, the segments where a conventional autopilot is least efficient due to the energy demands of deceleration, direction change, and reacceleration. This is where ECS-DoT delivers its highest per-segment gains, actively optimising through each transition in real time. The straight cruise legs show lighter green and yellow, reflecting consistent but more moderate gains along the sustained portions of the flight.



Figure 6: GPS Flight Path Efficiency Overlay at 6 m/s - Baseline (White, Left) vs ECS-DoT Efficiency Gain (Colour-Coded, Right)

At 6 m/s, the same pattern holds, with the deepest green again concentrated at the turns and waypoint transitions. The gains at these points are consistent with the 4 m/s run, confirming that ECS-DoT's optimisation through transitions is reliable across different cruise speeds. The straight legs again show lighter but positive gains throughout.

Taken together, the two maps confirm that ECS-DoT's most significant efficiency gains occur precisely at the transitions that conventional autopilots handle least efficiently, with positive gains distributed across the full flight path at both speeds.

The Mechanism Behind the Gains: Adaptive and Optimal Speed Control with ECS-DoT

The cruise speed distribution charts below compare the speed profiles of the baseline autopilot and ECS-DoT across both test speeds.

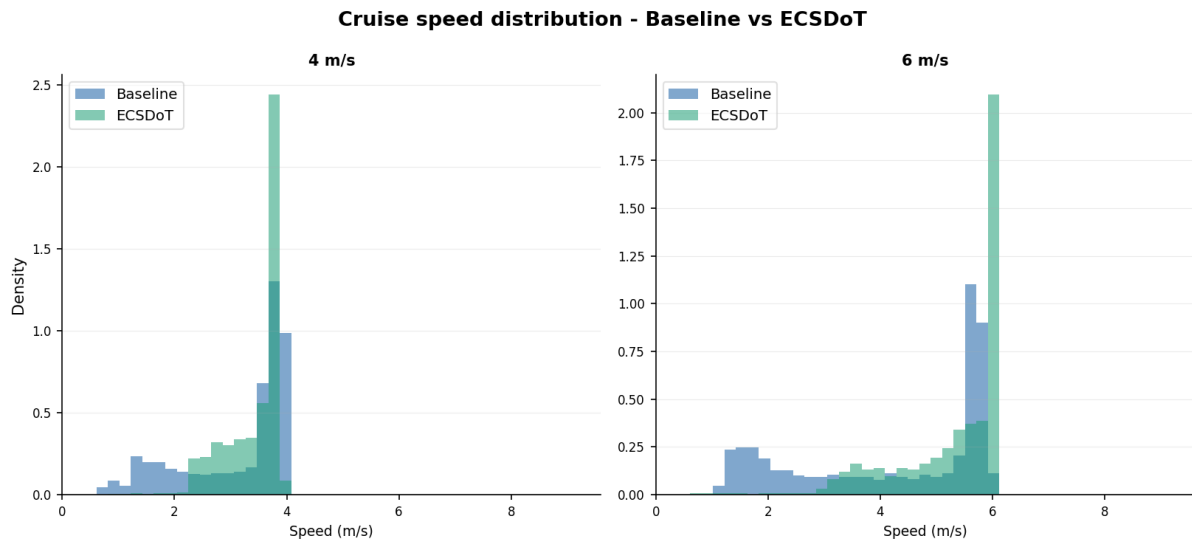


Figure 7: Cruise Speed Distribution at 4 m/s and 6 m/s - ECS-DoT (Green) Flies Longer at the Target Speed vs the Broader Baseline (Blue) Distribution

What this means:

The chart compares how tightly each system holds the drone to its target speed during cruise. A tall, narrow peak means the drone is consistently flying at the right speed. A wider, flatter spread means the drone is drifting above and below the target, wasting energy.

Key Metric	Baseline (Blue)	ECS-DoT (Green)
Speed consistency	Wider spread around target speed	Tighter cluster at target speed
Energy implication	More speed variance, higher energy use	Less variance, lower energy use
How it is achieved	Standard autopilot control	Real-time speed optimisation

ECS-DoT does not simply slow the drone down to save energy. It holds the drone precisely at the most efficient speed for the current flight conditions, all within a sub-milliwatt power envelope that preserves virtually all battery capacity for propulsion.

Up to 27.8% Endurance Gains Across Live Flight Conditions

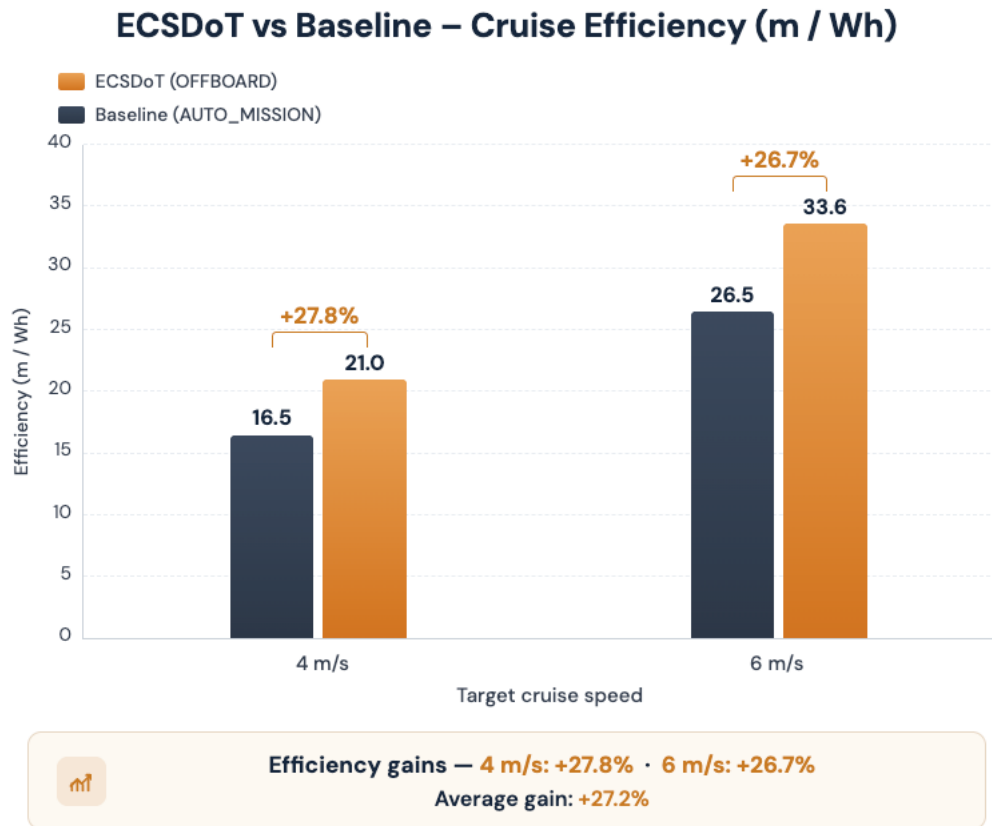


Figure 8: ECS-DoT vs Baseline Cruise Efficiency (m/Wh) at +27.8% at 4 m/s and +26.7% at 6 m/s

Flight log analysis from the four-phase trial program recorded up to a 27.8% improvement in flight efficiency, achieved without any modification to the drone's battery, airframe, or propulsion hardware. All gains were delivered through ECS-DoT's onboard AI optimising drone speed and flight path in real time.

The headline result is captured in the cruise efficiency comparison below. Measured in metres travelled per watt-hour consumed, ECS-DoT achieved the following against the baseline autopilot:

Drone Target Speed	Baseline Efficiency	ECS-DoT Efficiency	Gains
4m/s	16.69m/Wh	21.33m/Wh	+27.8%
6m/s	26.62m/Wh	33.72m/Wh	+26.7%
Average			27.2%

The consistency of gains across both speeds is a notable result. At 4 m/s the drone operates at a lower cruise speed with more frequent waypoint transitions, while at 6 m/s it flies longer straight-line legs closer to its aerodynamic optimum. Comparable efficiency improvements in both conditions confirm that ECS-DoT's AI adapts across different flight regimes rather than being calibrated for a single operating point.

The accumulated energy curves below show how the efficiency gap between ECS-DoT and the baseline builds over distance throughout the mission.

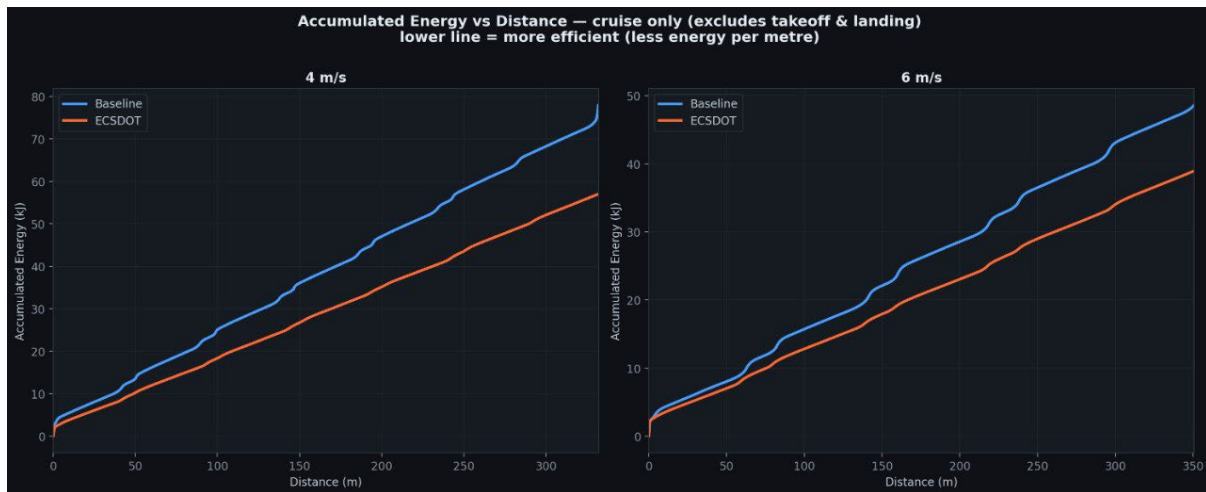


Figure 9: Accumulated Energy vs Distance (Cruise Only) - ECS-DoT (Orange) Consistently Below Baseline (Blue) at Both 4 m/s and 6 m/s, with the Gap Widening Over Distance

At both speeds, ECS-DoT (orange) consistently consumed less energy per metre flown than the baseline autopilot (blue), with the gap widening progressively across the full length of the mission. This compounding behaviour reflects the continuous nature of ECS-DoT's real-time speed optimisation: every metre of cruise flight is an opportunity for the AI to reduce energy consumption, and those savings accumulate over the duration of the mission. These early-stage results represent the lower bound of what the technology is expected to deliver. As AI models are further refined and tested across a wider range of speeds and airframes, the Company expects gains to scale materially.

0.0002% of Drone's Power Consumed, 27.2% Efficiency Gained: Made Possible By ECS-DoT

In a 120-second cruise flight, ECS-DoT's total system power including continuous telemetry transmission stays below 10 mW, less than 0.0002% of the drone's total cruise energy, while delivering efficiency gains of up to 27.8% through real-time speed optimisation.

- **Sub-10 milliwatt AI inference:** ECS-DoT's onboard AI runs at less than 1 mW, with total system power including continuous telemetry transmission remaining under 10 mW. The chip consumes negligible energy relative to what it saves, preserving virtually all battery capacity for propulsion.
- **Real-time closed-loop control:** Control decisions execute at 64 Hz, adjusting drone speed every 15 milliseconds, enabling continuous cycle-by-cycle energy optimisation throughout each flight run.
- **Onboard surrogate power model:** A trained AI model predicts energy consumption for the drone's current speed, heading, and flight conditions, allowing ECS-DoT to identify and hold the aerodynamic optimum for each specific flight path without cloud reliance or external computation.

Energy Savings Across Every Component of Flight Circuit

The energy breakdown by flight region below compares absolute cruise energy consumption between the baseline and ECS-DoT across three distinct segment types.

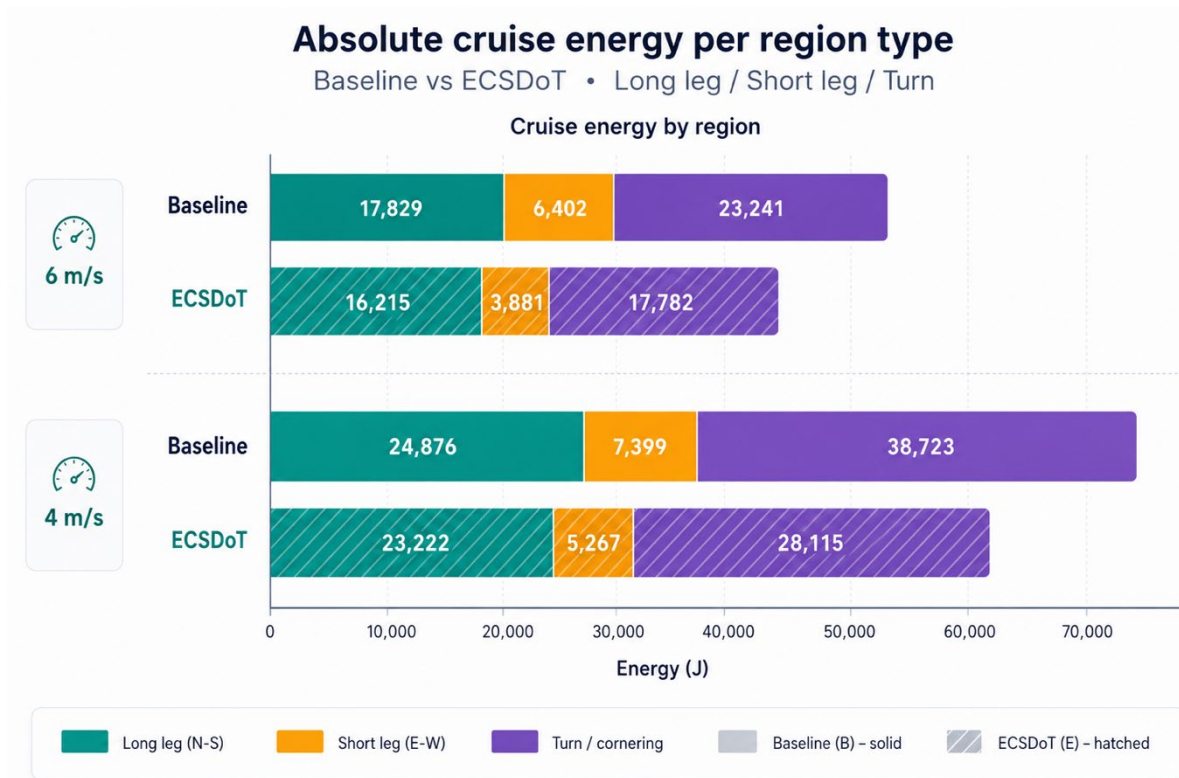


Figure 10: Cruise Energy Consumption by Flight Region — Baseline vs ECS-DoT at 4 m/s and 6 m/s

Region	4 m/s Gain	6 m/s Gain
Long Leg	+6.6%	+9.1%
Short Leg	+28.8%	+39.4%
Turn / Cornering	+27.4%	+23.5%

The gains on short legs and turns are particularly notable. These are the segments where a conventional autopilot is least efficient, decelerating, reaccelerating, and transitioning between waypoints. ECS-DoT's real-time speed control reduces the energy cost of these transitions, which in commercial operations translates directly into more mission coverage per charge, lower battery cycle consumption, and reduced operating cost across any application where drones fly structured, multi-segment routes.

Developing a Plug-and-Play Solution



Figure 11: Quadcopter in Flight With ECS-DoT Onboard

In parallel with its internal flight program, EMASS is working with a U.S.-based drone partner to develop ECS-DoT's ability to interface with proprietary in-flight controllers through telemetry input alone. Some commercial and defence drone platforms operate closed, proprietary flight-control architectures that cannot be modified or accessed by third parties. ECS-DoT is being developed to work alongside these systems from the outside, receiving telemetry data and applying real-time AI speed optimisation without requiring access to the controller's internal parameters.

Protecting the Technology: IP Filings at an Advanced Stage

Nanoveu has completed the bulk of the work required for its first major intellectual property filings and is in the final stages of compilation ahead of submission. These filings cover the proprietary AI-driven flight path optimisation framework, the speed-based endurance modelling approach, and the ECS-DoT chip's integration architecture for UAV control systems. The IP program is designed to establish long-term defensibility across the drone sector and create the foundation for a global licensing strategy as the technology scales.

Translating Results into Commercial Drone Use-cases

The EMASS ECS-DoT solution is most applicable during tight turns, acceleration, and deceleration, which are the most energy-intensive and most common phases of modern commercial drone operations. The table below outlines how this translates across key use cases.

Drone Use Case	Typical Baseline Flight Time	Why Flight Efficiency Is Critical	Commercial Value Add
Urban Reconnaissance and Surveillance	20-30 min	Tight turning radii, constant acceleration and deceleration, and variable speeds in confined airspace create high energy variance	More coverage per charge in dense environments; viable in communications-denied or contested urban settings
Precision Agriculture - Crop Spraying	10-15 min per tank	Lawnmower patterns with repeated short legs and turns; battery swaps interrupt operations across large paddocks	Fewer battery swaps per session, lower cost per hectare, reduced labour downtime
Precision Agriculture - Multispectral Surveying	25-40 min	Fixed lawnmower survey patterns at defined speeds; larger areas require more passes and more battery changes	Larger areas completed in a single flight; fewer multi-pass stitching operations

Drone Use Case	Typical Baseline Flight Time	Why Flight Efficiency Is Critical	Commercial Value Add
Defence - Perimeter Surveillance	30-45 min	Repetitive boundary-trace routes at consistent speeds; battery swaps create vulnerability windows	More perimeter coverage per charge; fewer and shorter vulnerability windows
Last-Mile Delivery	20-35 min	Fixed point-to-point routes at defined cruise speeds; range per charge determines the serviceable delivery radius	Wider delivery radius, improved unit economics, no additional hardware capex

With live flight validation now secured, Nanoveu is advancing on two parallel tracks.

- **Further Optimisation:** Nanoveu will continue to cover more stringent operating environments, additional speed profiles, varied payload configurations, and more complex drone classes. The objective is to stress-test the AI models across a broader range of real-world conditions and build the dataset required to support commercial deployment at scale.
- **Commercial Development:** With empirically validated results now in hand, the Company is positioning ECS-DoT for engagement with drone OEMs and avionics integrators across logistics, agriculture, defence, and infrastructure inspection as the trial program matures.

Dr. Mohamed M. Sabry Aly, Director and Founder of EMASS, commented: *"Taking ECS-DoT from simulation into live flight and seeing the data hold up is a significant validation. What these results demonstrate is that meaningful endurance gains do not require hardware changes. They require better control. ECS-DoT runs a full AI optimisation loop at under ten milliwatts, holds the drone tighter to its aerodynamic optimum than a conventional autopilot, and does so continuously across every metre of the mission. These are early-stage results and we expect them to grow as the models mature and we expand across more platforms and speeds."*

Dr Tan Chee How, CEO of Spinoff Robotics and Ph.D in Aerial Robotics also commented: *"Flight endurance has been the binding constraint on commercial drone adoption for years. The approaches that have moved the needle so far have all required hardware changes: bigger batteries, lighter frames, more efficient motors. What ECS-DoT demonstrates here is that meaningful gains are achievable through software and AI control alone, at a negligible power cost using ECS-DoT. That changes the economics of the problem entirely."*

This announcement has been authorised for release by the Board of Directors.

-ENDS-

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About Nanoveu Limited

Further details on the Company can be found at <https://nanoveu.com/>.

EMASS is a pioneering technology company specialising in the design and development of advanced systems-on-chip (SoC) solutions. These SoCs enable ultra-low-power, AI-driven processing for smart devices, IoT applications, and 3D content transformation. With its industry-leading technology, EMASS will enhance Nanoveu's portfolio, empowering a wide range of industries with efficient, scalable AI capabilities, further positioning Nanoveu as a key player in the rapidly growing 3D content, AI and edge computing markets.

EyeFly3D™ is a comprehensive platform solution for delivering glasses-free 3D experiences across a range of devices and industries. At its core, EyeFly3D™ combines advanced screen technology, sophisticated software for content processing, and now, with the integration of EMASS's ultra-low-power SoC, powerful hardware.

Nanoshield™ is a self-disinfecting film that uses a patented polymer of embedded Cuprous nanoparticles to provide antiviral and antimicrobial protection for a range of applications, from mobile covers to industrial surfaces. Applications include Nanoshield™ Marine, which prevents the growth of aquatic organisms on submerged surfaces like ship hulls, and Nanoshield™ Solar, designed to prevent surface debris on solar panels, thereby maintaining optimal power output.

Forward Looking Statements This announcement contains 'forward-looking information' that is based on the Company's expectations, estimates and projections as of the date on which the statements were made. This forward-looking information includes, among other things, statements with respect to the Company's business strategy, plans, development, objectives, performance, outlook, growth, cash flow, projections, targets and expectations and related expenses. Generally, this forward-looking information can be identified by the use of forward-looking terminology such as 'outlook', 'ambition', 'anticipate', 'project', 'target', 'potential', 'likely', 'believe', 'estimate', 'expect', 'intend', 'may', 'mission', 'would', 'could', 'should', 'scheduled', 'will', 'plan', 'forecast', 'evolve' and similar expressions. Persons reading this announcement are cautioned that such statements are only predictions, and that the Company's actual future results or performance may be materially different. Forward-looking information is subject to known and unknown risks, uncertainties and other factors that may cause the Company's actual results, level of activity, performance, or achievements to be materially different from those expressed or implied by such forward looking information.