

Sustainable Aviation Test Environment (SATE)

Group of TDAs connecting Orkney and Shetland Islands for SATE UAS operations

The SATE (Sustainable Aviation Test Environment) will create the UK's first operationally based low-carbon, aviation test centre at Kirkwall Airport in the Orkney Islands.

Part funded by UK Research and Innovation (UKRI) through the Industrial Strategy Challenge Fund. The Future Flight Challenge is investing up to £125 million to develop greener ways to fly, such as all-electric aircraft and deliveries by drone, by advancing electric and autonomous flight technologies. The investment is matched by £175 million from industry.

The challenge aims to bring together technologies in electrification, aviation systems and autonomy to create new modes of air travel and capability.

The SATE will be a UK first and it is hoped will test and showcase new technology that can be adopted for island and wider use, with the aim to create social benefit and economic prosperity.

The SATE project will feature:

- Flight trials demonstrated in a real-life context
- Trials including low-carbon aircraft using electric, hydrogen and Sustainable Aviation Fuels (SAF) as well as Unmanned Autonomous Vehicles (UAV)
- Airport infrastructure improvements
- Improved regional air connections
- Local supply chain and employment impacts
- Contribute to Net-Zero aviation goal

The SATE Consortium is formed of the following 13 members, led by Highlands and Islands Airports (HIAL). Loganair, Ampaire, ZeroAvia, Windracers, Flarebright, University of the Highlands and Islands (UHI), European Marine Energy Centre (EMEC), Denchi Group, Cloudnet, Highlands and Islands Transport Partnership (HiTrans), Highlands and Islands Enterprise (HIE), and the Orkney Island Council (OIC).

As part of the SATE consortium, Windracers will demonstrate the application of ULTRA Unmanned Aircraft System (UAS) for delivering on-demand supplies to remote communities that currently suffer from mistimed or limited logistics. Preliminary engagement with key local stakeholders has confirmed the priority for medical supplies to remote health care service providers and other relevant use cases that would generate significant benefit.

Under the current regulatory and technological conditions, it is necessary to establish structures of segregated airspace that enable the intended Beyond Visual Line-of-Sight (BVLOS) operations. Therefore, this airspace change proposal aims to set up a complex of five different Temporary Danger Areas, connecting the following locations:

- Wick Airport
- Kirkwall Airport
- Eday Airport
- North Ronaldsay Airport
- Fair Isle Airport
- Tingwall Airport
- Unst Airport

These airspace structures will be activated during short periods of time, separately or in combination to allow the intended itinerary, whilst minimising the impact over other aviation activities. It is anticipated that the implementation of this ACP will last no longer than 8 weeks.

Participation of Air Traffic Services will be sought to provide the TDA complex with DAAIS during operation.

ULTRA UAS is a 10 m wingspan, 350 kg MTOW fixed wing remotely piloted aircraft that features multiple redundancy of critical subsystems, on-board electronic conspicuity (ADS-B + Mode S) and standard visual conspicuity aids (navigation and position lights).