

ENERGY INNOVATION CENTRE

Drones flying BVLOS for Energy Networks *“Above and Beyond”*

Andy Walbridge, Chief Designer Avionic Systems, Callen-Lenz

“Above and Beyond” Overview

- Project
- Team
- UK BVLOS journey so far
- Challenges
- Outputs
- Project Status
- First Stage Trials
- Take-aways so far

Project

To facilitate BVLOS drone operations for Critical Linear Infrastructure to become “Business as Usual”*



Funding: 100% by Industry, £1.36m over 2 years 5 months

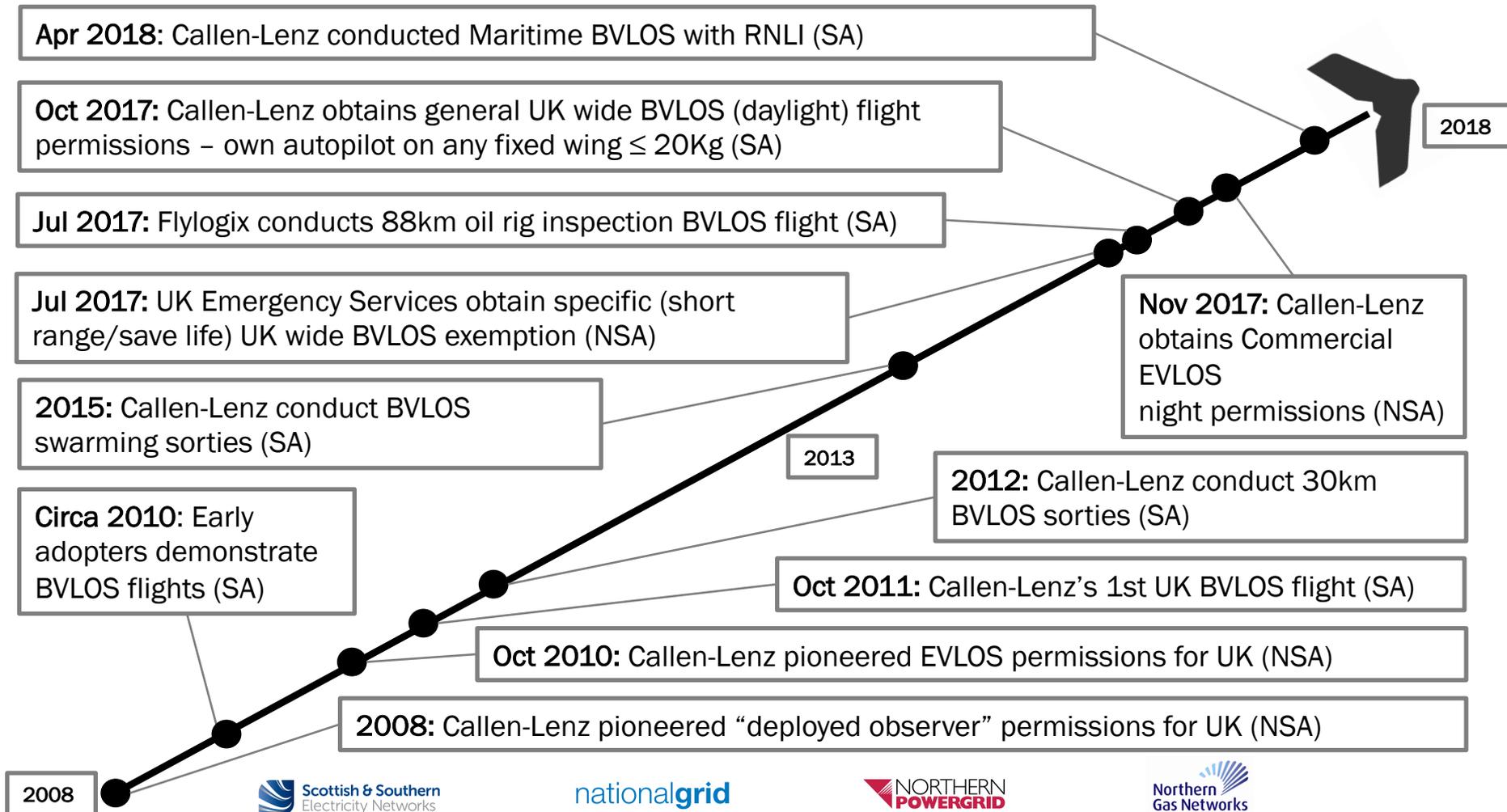
* *Beyond Visual Line Of Sight*



Team



UK BVLOS Journey So Far



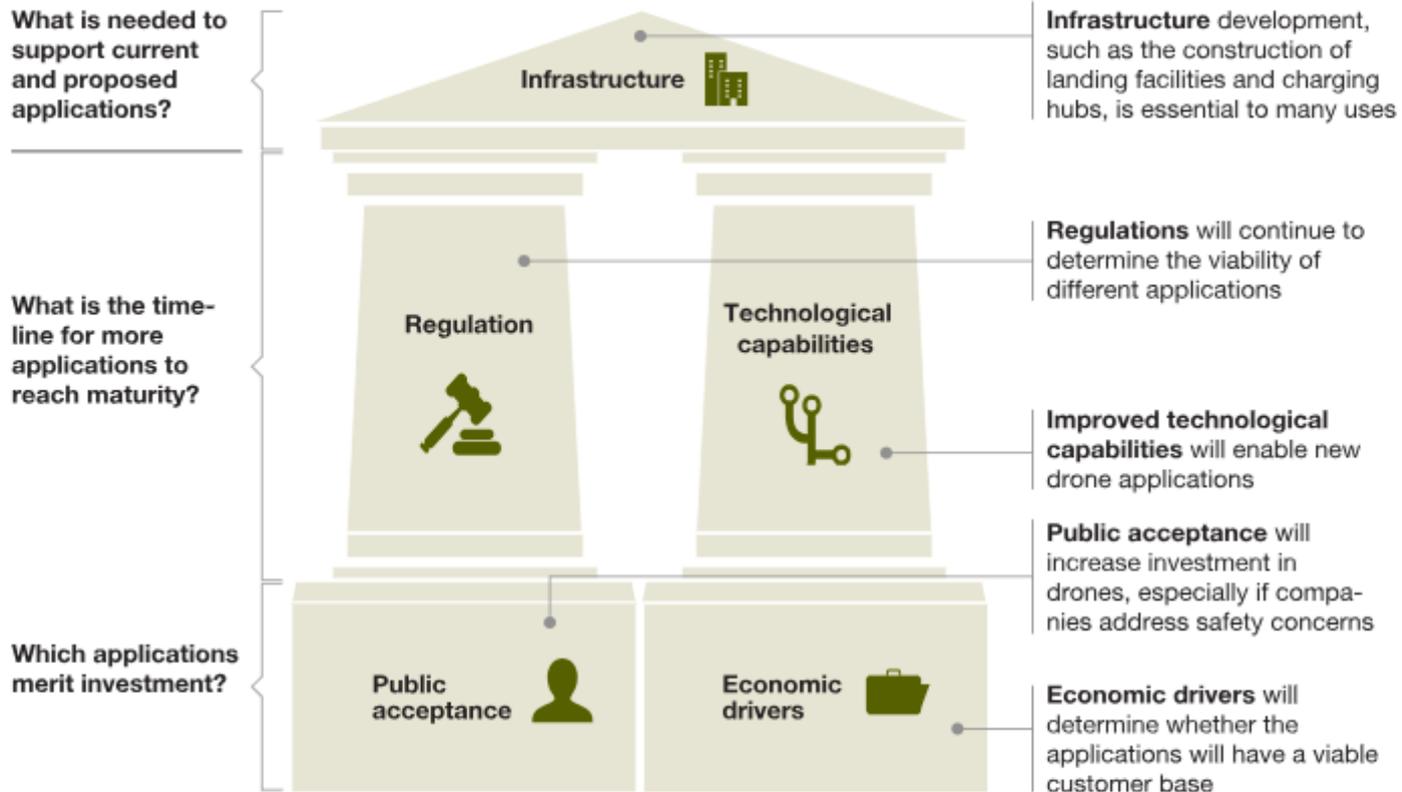
(N)SA: (Non) Segregated Airspace

Cadent
Your Gas Network

UK
Power
Networks

WALES & WEST
UTILITIES

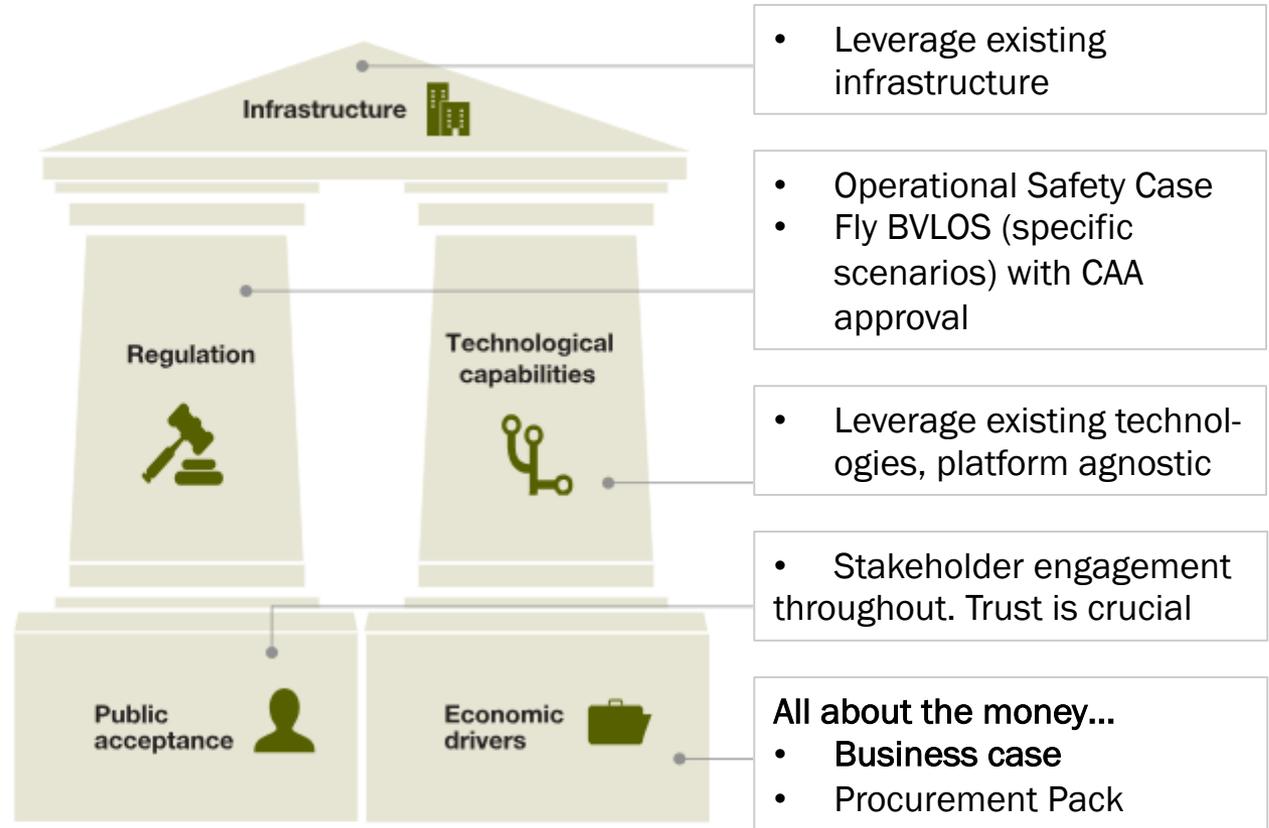
Challenges



Source: 5 Factors will influence UAS growth, McKinsey & Co



Outputs



Source: 5 Factors will influence UAS growth, McKinsey & Co



“Above and Beyond” Progress

- Technical and Cost Questionnaires completed - ✓
- Requirements development
 - CONOPS Matrix development - ✓
 - Trials objectives for TISA/TINA - ✓
 - Network Infrastructure requirements / Trials sites - ✓
- TISA planning
 - TDA (SARG – Airspace) – Submission to cover proposed scope, trials requirement and sites including consultation - **Ongoing**
 - PfCO Exemptions (Operations) - Based on OSC - ✓
- High Level Cost Model Issued - ✓

“Above and Beyond” First Stage TISA Trials

- Trials planned for January / February 2019
- Trials sites selected
 - Gas
 - Electricity
- Sensor technology review
- Platform selection

Requirements

- Initial analysis has led us to conclude that we need a single vehicle
 - Speed 22.35m/s
 - Wingspan 660mm
 - Weight 0.37kg
 - Range (no payload) up to 1800km
 - Full motion video
- Potential vehicle - Columbia Livia

Requirements

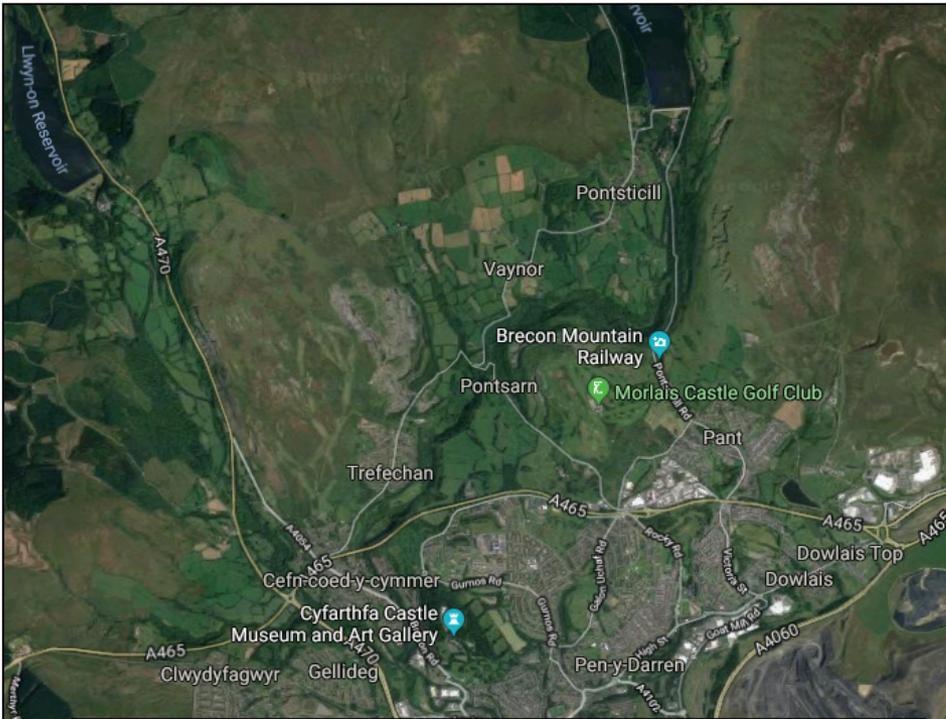


“Above and Beyond” First Stage TISA Trials

- Gas Network Trials site
- WWU Merthyr Tydfil to Cardiff
- Detailed planning with engagement from networks:
 - Operations team
 - Safety
 - Security

- Start: Dowlais Offtake

Grids: 306709, 209929

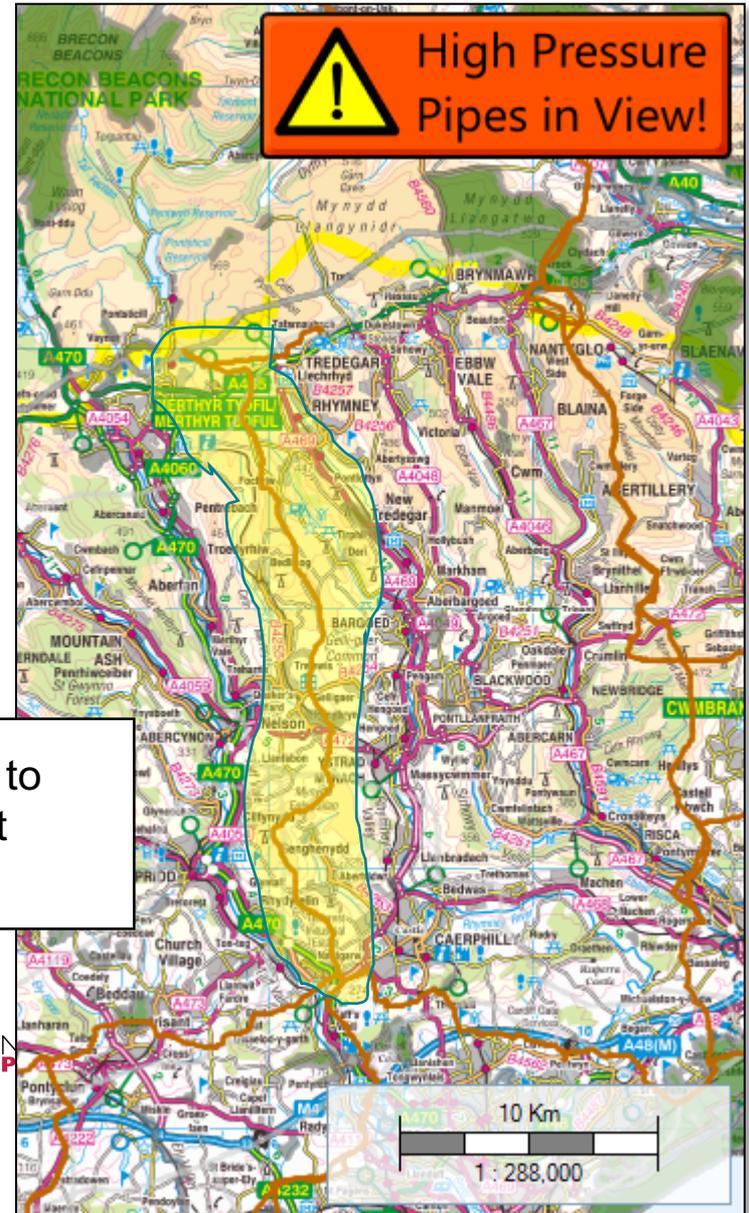


Site: > 20m x 20m, some vegetation, should be able to arrange access to immediate area, highest altitude in WWU

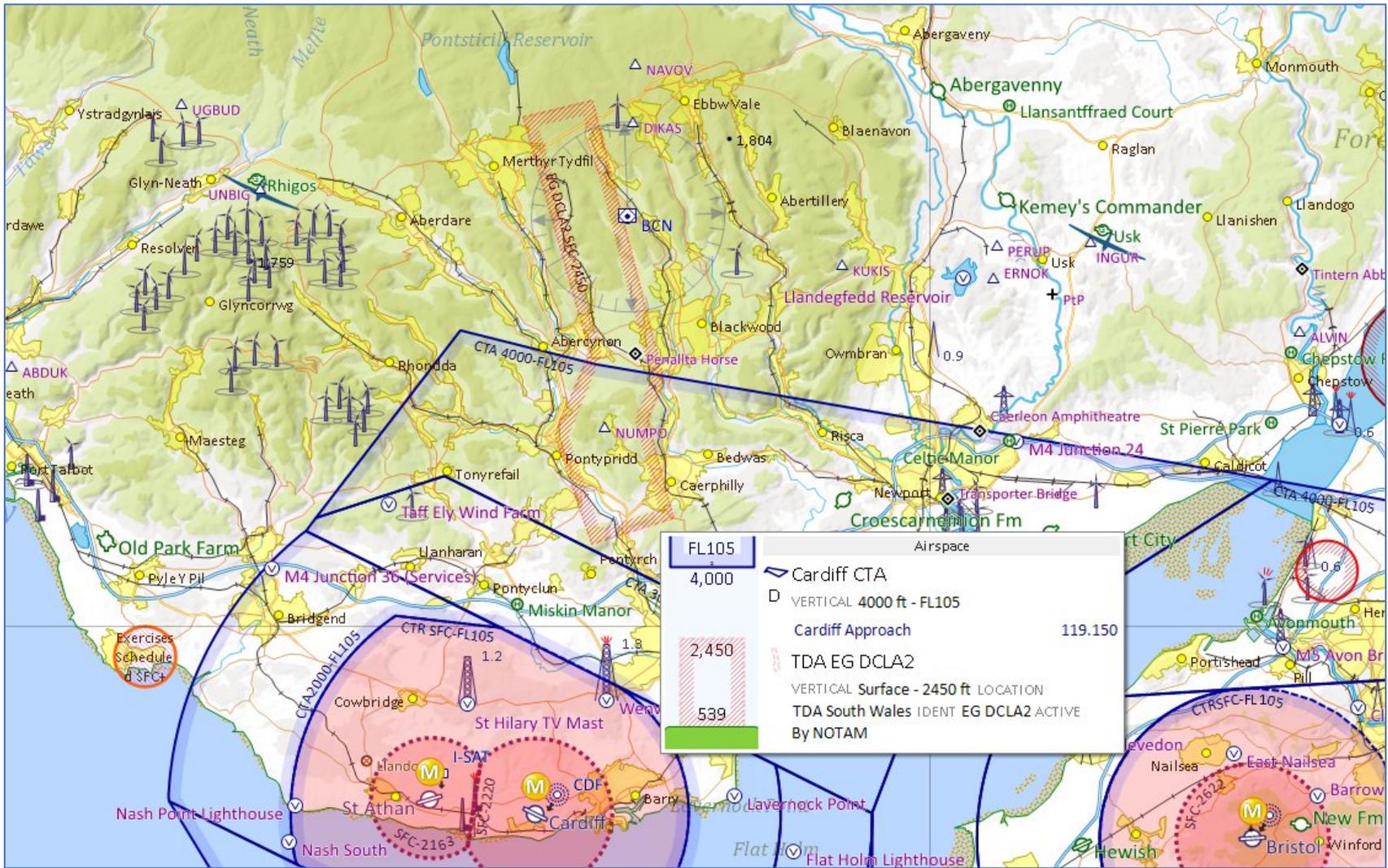


- End Location: Nantgarw 2 PRS

Grids: 312707, 185769



Route: 20-25km, winding down a valley from Merthyr to Cardiff, bends and corners, hilly terrain, previous flight information, should be able to get height data



Take-aways so far

- ***Trust in Aviation community is crucial***
 - *They are a well informed stakeholder group*
 - *They take flight safety extremely seriously*
 - *Unhelpful to safety case arguments to say civil BVLOS flying is new in the UK, when it has been deployed for over 8 years*
- ***CAA safety case resource may be a critical constraint***
 - *Turnaround times have increased over last couple of years*
 - *New team in place and learning*
 - *Demand likely to increase*
- ***For our customer group it is “all about the money”***
 - *Achieving BVLOS in Non Segregated Airspace by building robust processes that deskill operator capabilities to deliver cost-effective solutions*

- Thank you for your attention
- Questions?



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