



AZ μ L- AZores Micro Launcher DEIMOS and ORBEX

**ESA Micro-Launch Services Workshop
Paris, 6 November 2018**

Introduction - Orbex Prime from the Azores



Malbusca site

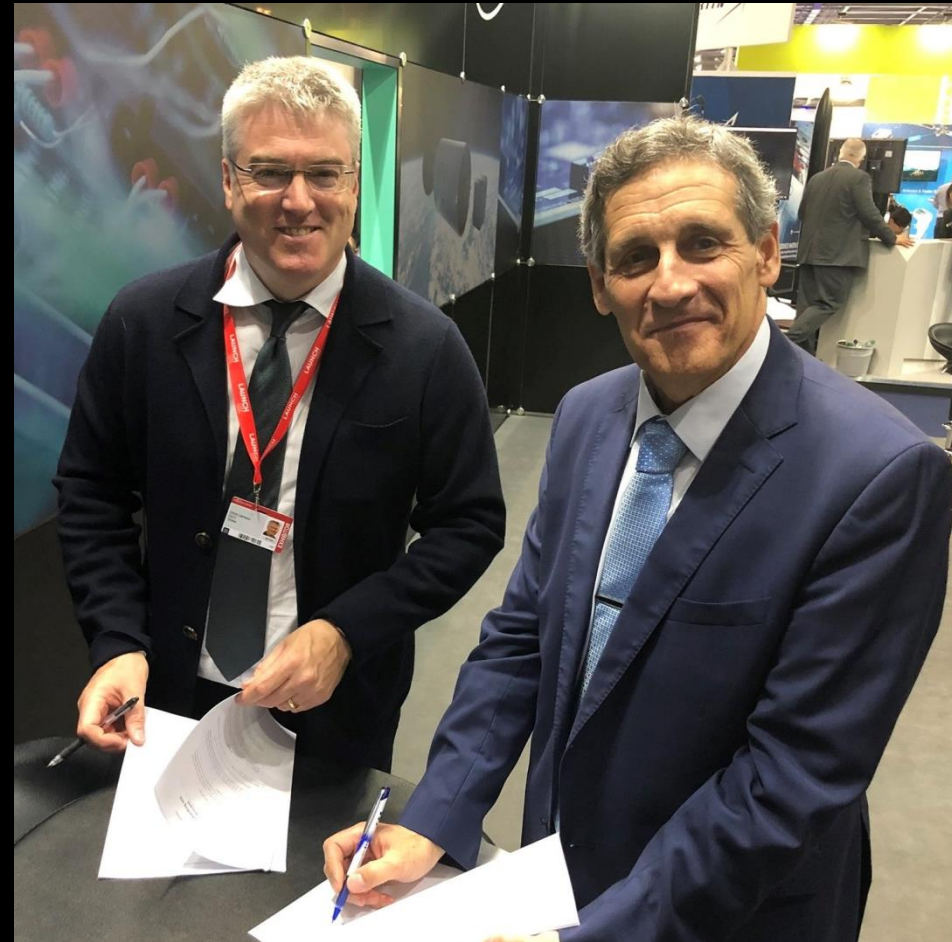
Introduction – European launcher family

Nominal 150kg to 500km SSO
Launched from Europe



Introduction – Deimos / Orbex Partnership

- **Deimos: preferred GNC & Ground System provider**
- **Orbex: preferred Launch Services Provider for Deimos satellites**



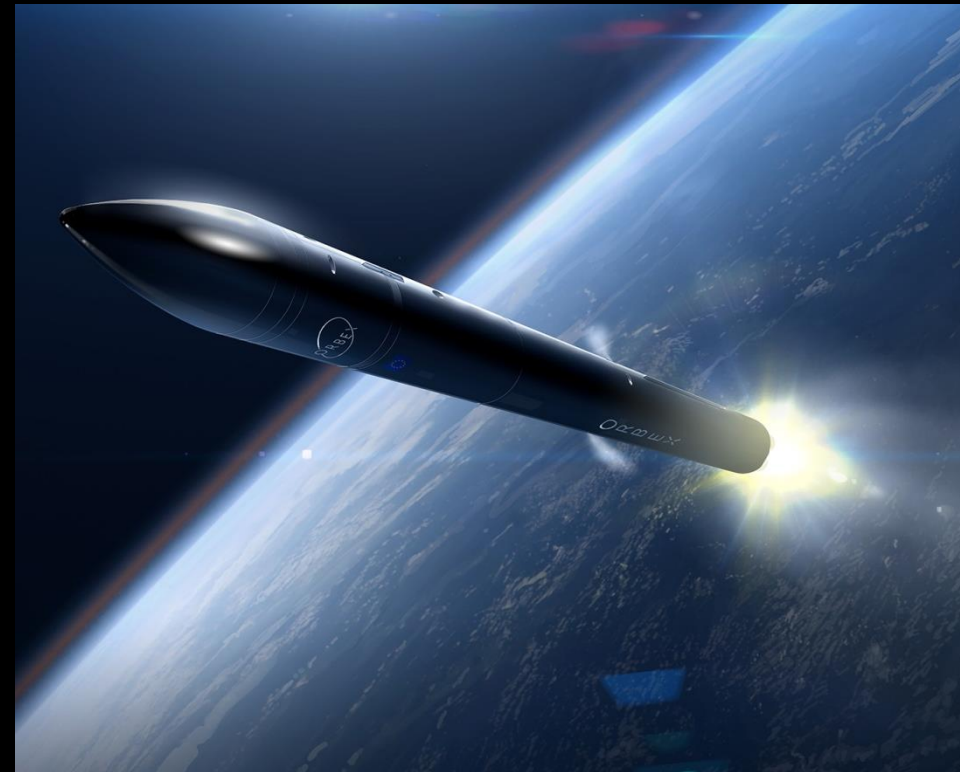
Value Proposition

- Fully European end-to-end launch service
- Two launch sites envisaged for greater flexibility and availability
- Open lean Azores spaceport with multiple launchers
- Green launcher with renewable, ultra low carbon fuel
- Highly compatible with local environment
- Optimised launcher architecture
- Easy to transport



Launch vehicle concept

| | | |
|-------------------------|---------------------|-----------|
| Diameter | 1.3 m | |
| GLOW | 18000 kg | |
| Structure | Composite | |
| No. of Stages | 2 | |
| Engine Types | Cryogenic bi-liquid | |
| Propellants | LOX/bioLPG | |
| | S1 | S2 |
| No. of Engines | 6 | 1 |
| Power Cycle | Pump | Pressure |
| Attitude Control | TVC | TVC+RCS |



Launch vehicle - innovation

- Modern low mass architecture
- 100% renewable ultra low carbon fuel
- Zero shock / zero debris separation
- Low mass recovery and re-flight system
- Smart redundant ignition system
- Scalable propulsion power density
- Class-leading 1300mm diameter
- Space tolerant, lightweight avionics

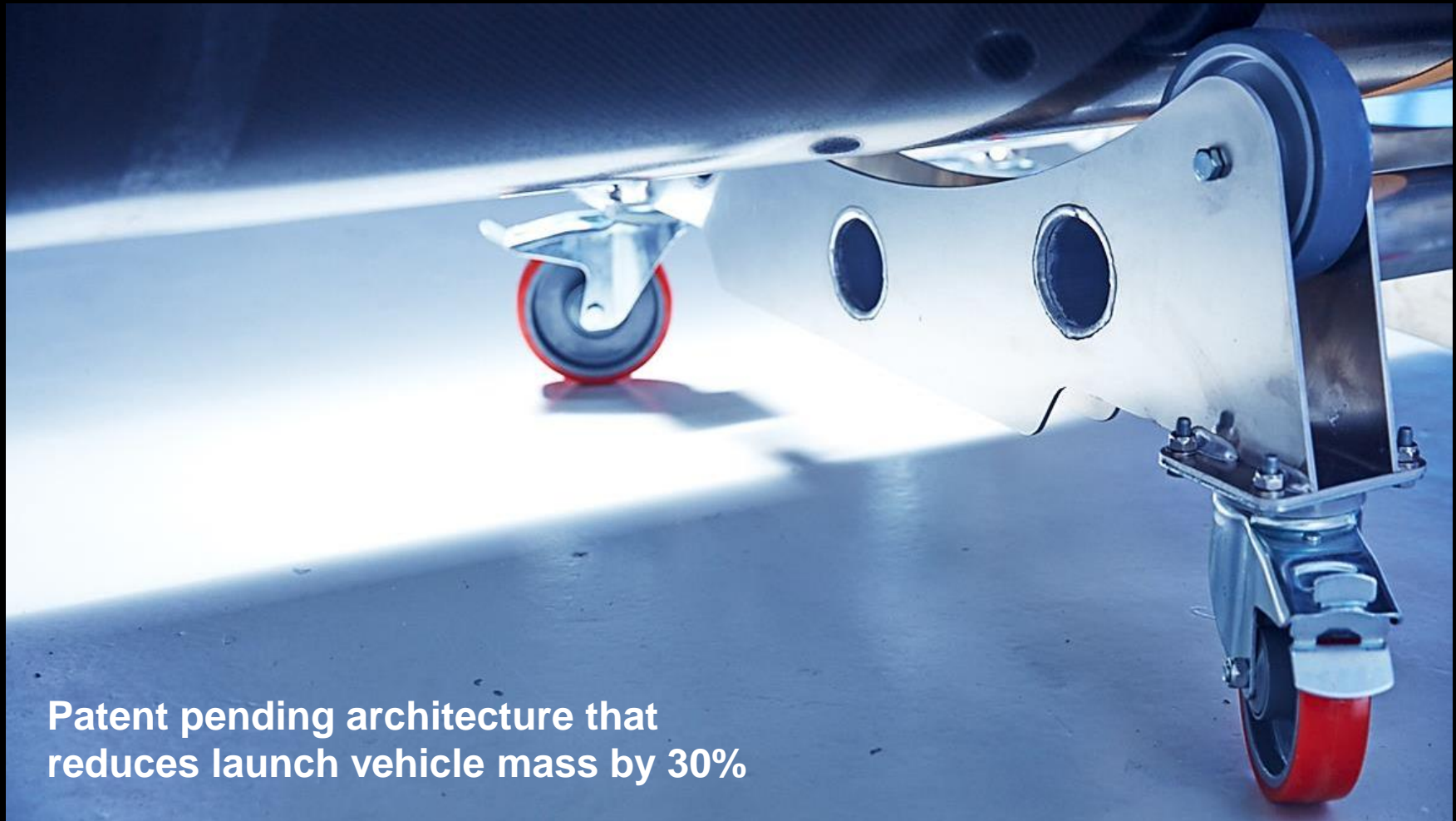


Launch vehicle progress - propulsion



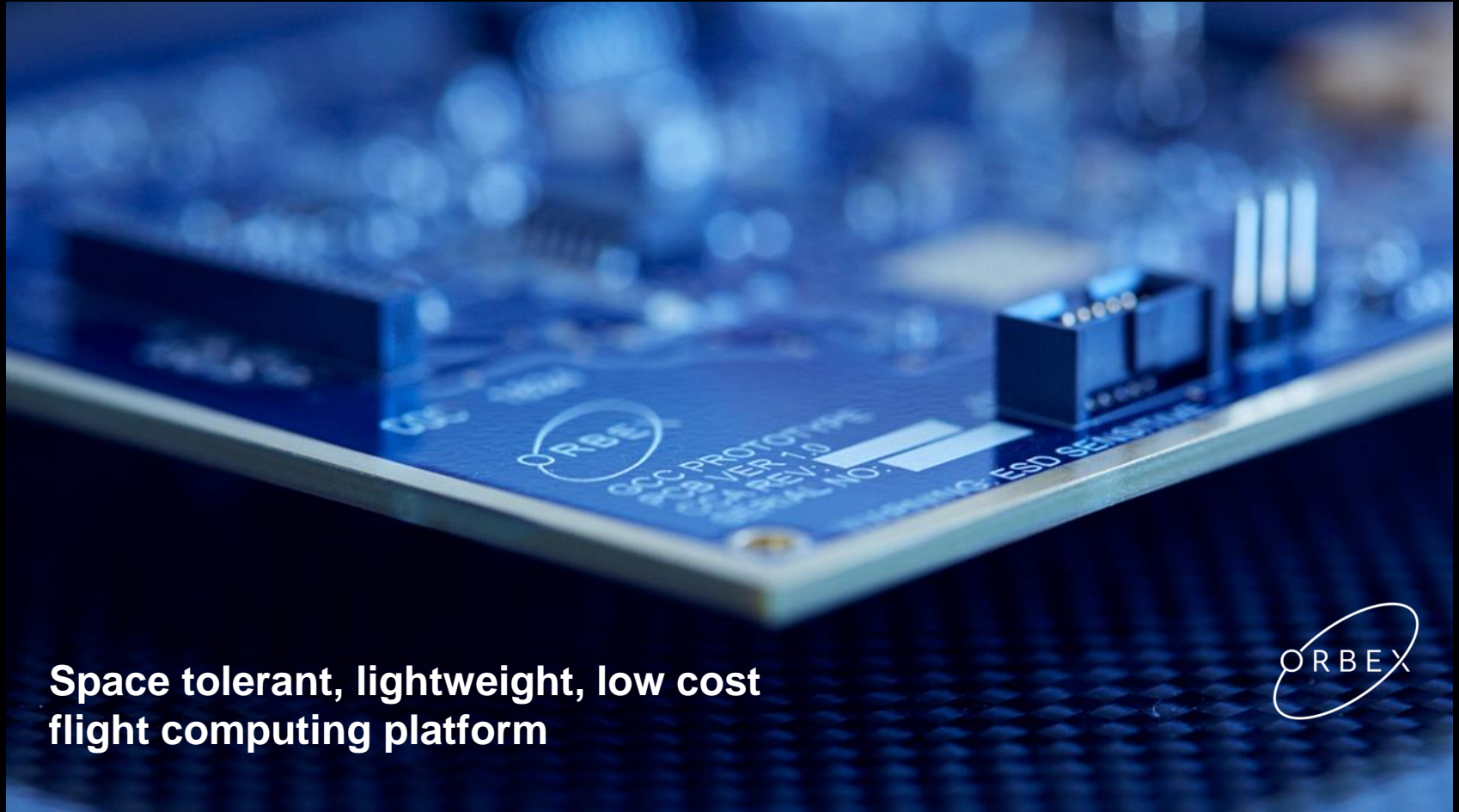
**World's 1st ignition of sub-cooled
LPG/LOX propulsion system**

Launch vehicle progress - structures



Patent pending architecture that
reduces launch vehicle mass by 30%

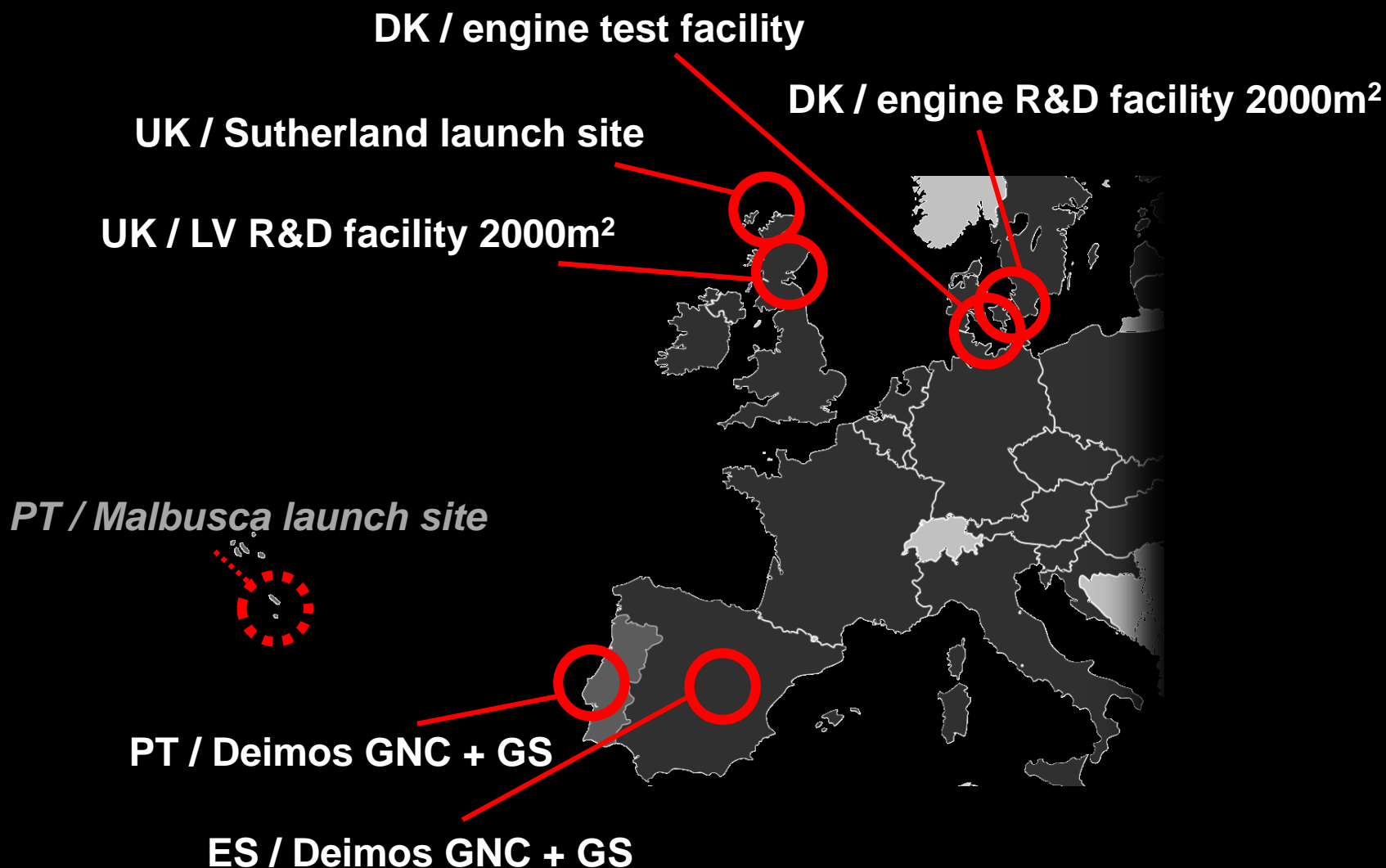
Launch vehicle progress - avionics



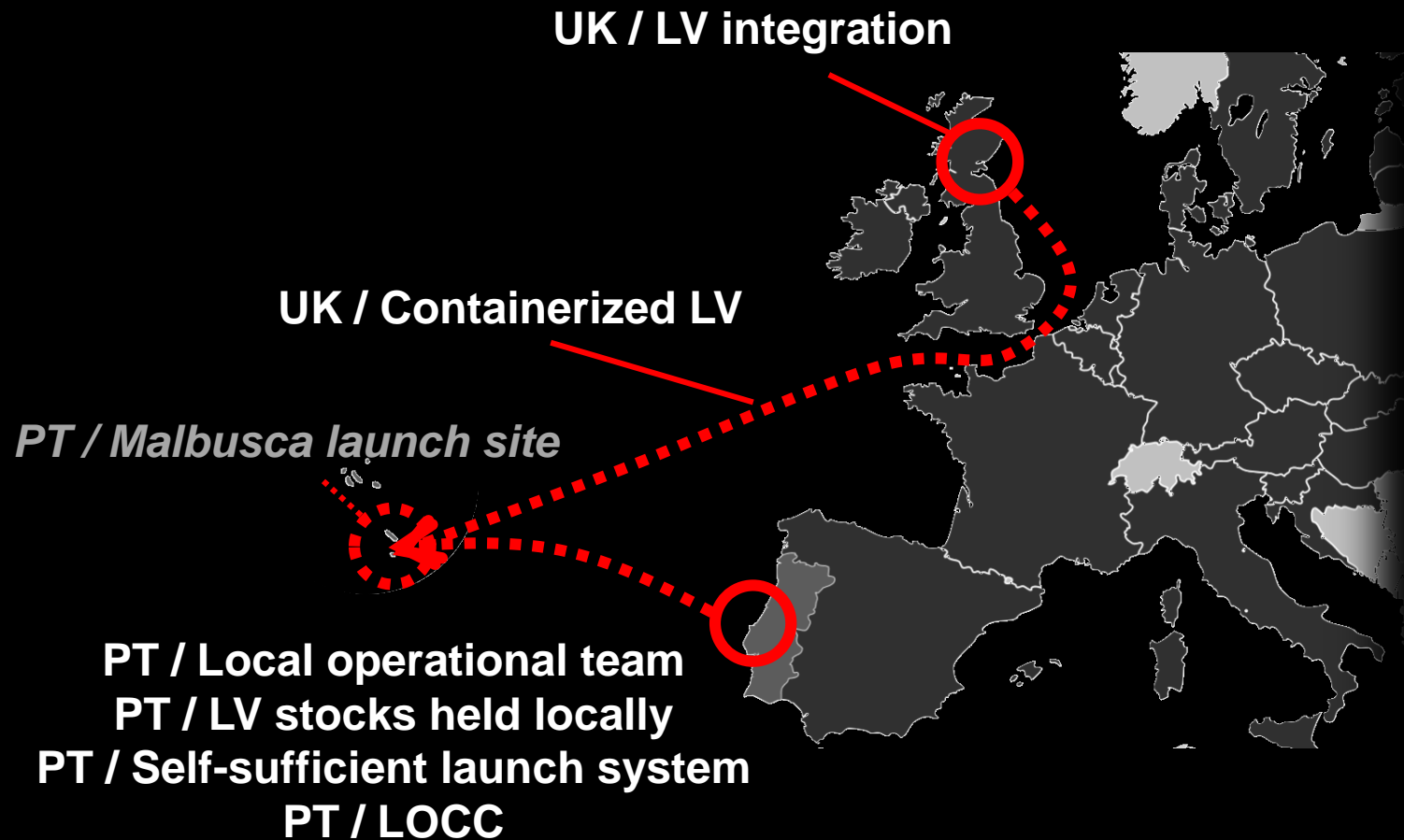
**Space tolerant, lightweight, low cost
flight computing platform**

ORBEX

Production, integration & launch supply chain

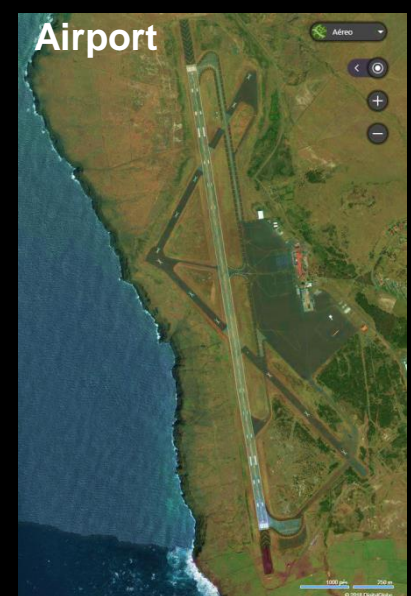
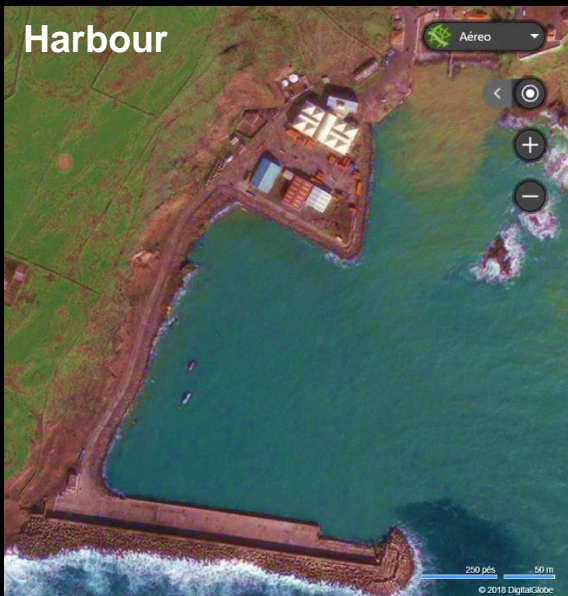


Logistics & local operations support

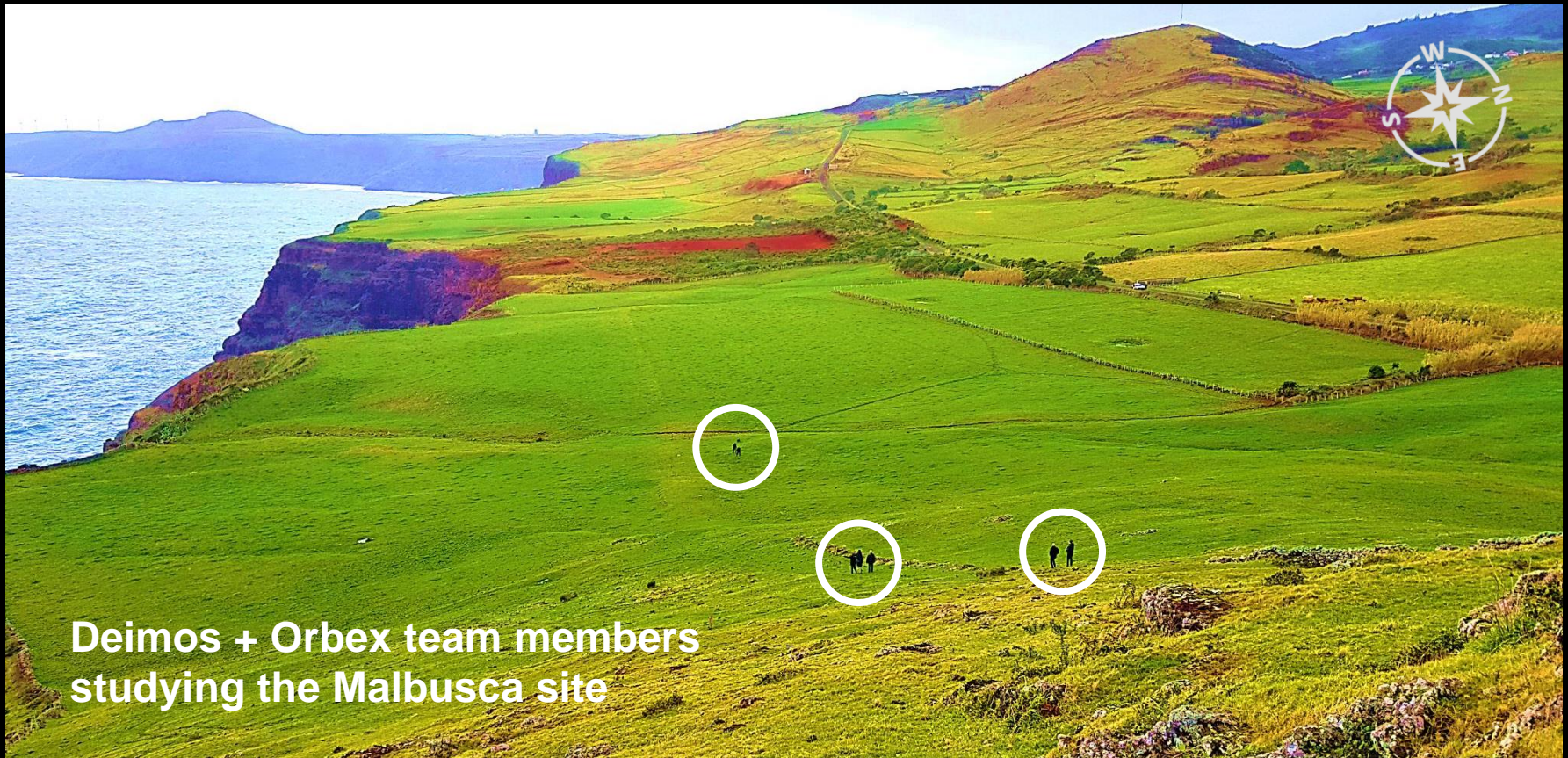


Azores Open Lean Spaceport

- Orbex + Deimos UK insight offers faster / more efficient Azores spaceport
- Concept aims at maximising existing infrastructure
- Only limited infrastructure improvement needed for Prime

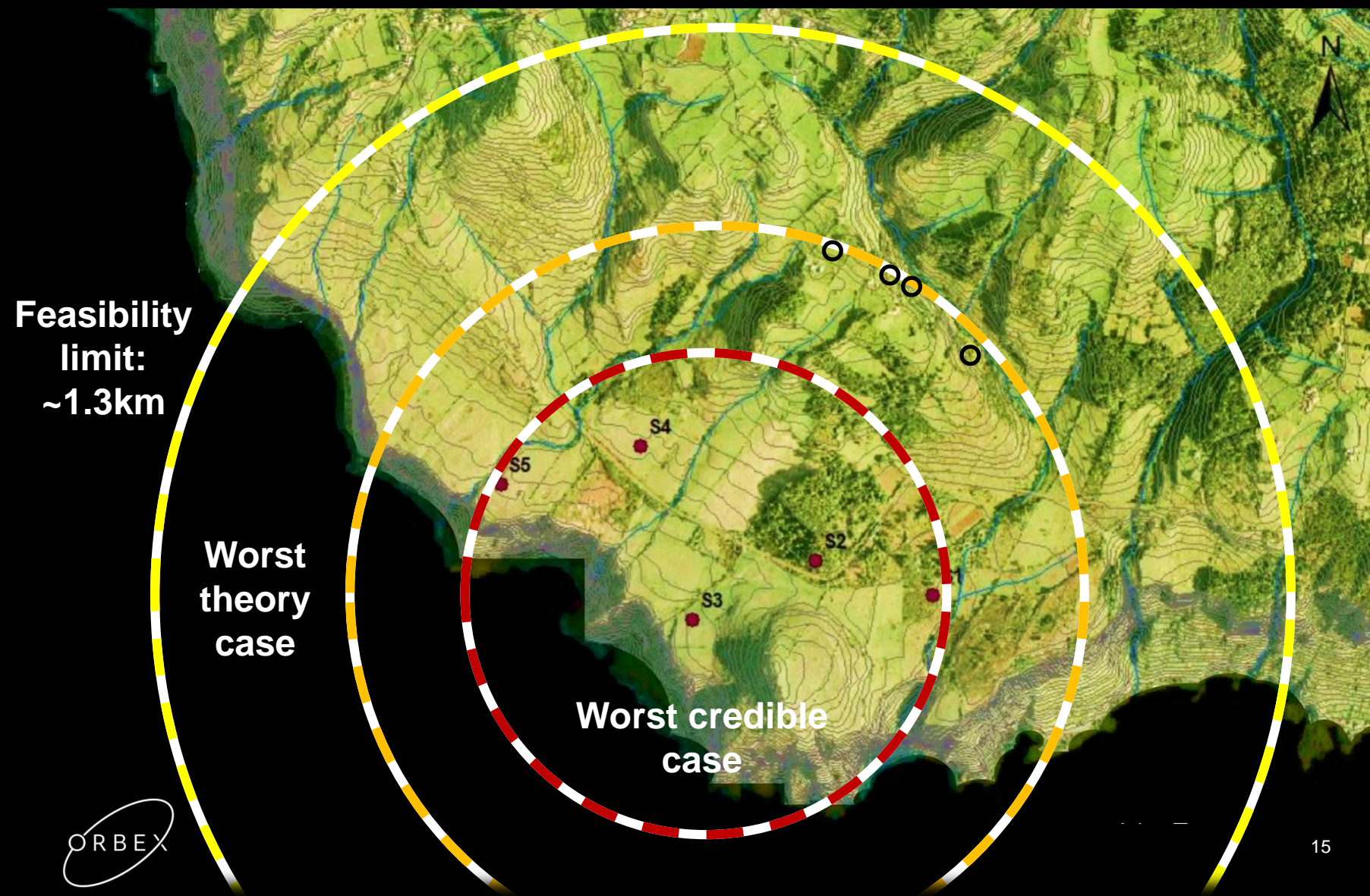


Malbusca site on Santa Maria

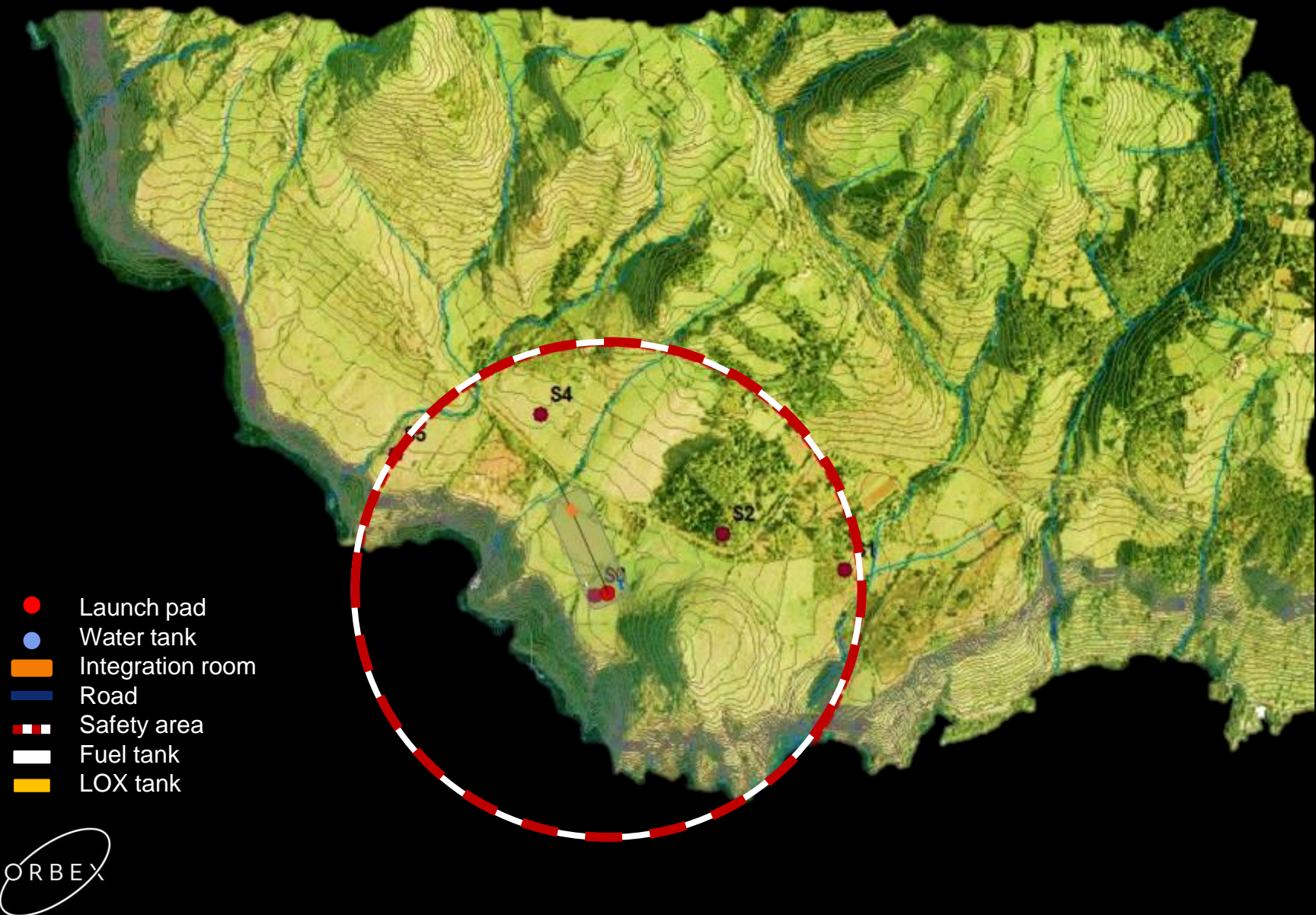


Deimos + Orbex team members
studying the Malbusca site

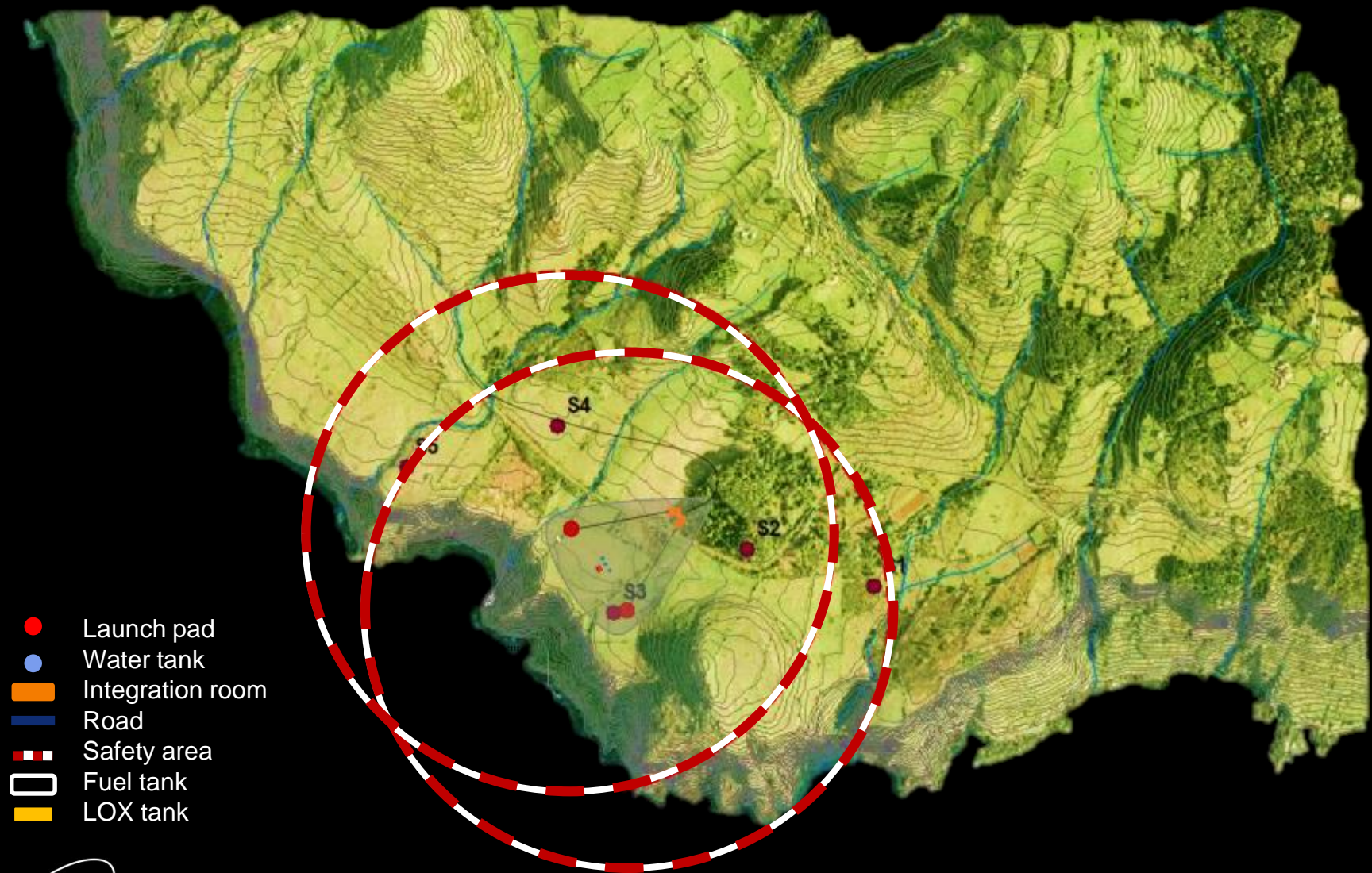
Safety and environment: Prime is a perfect fit



Azores Launch Site Concept (1 pad)

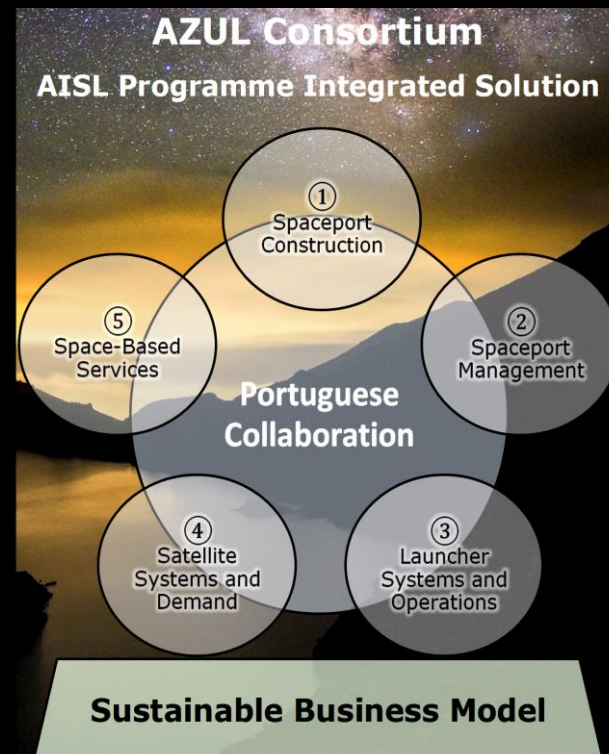


Azores Launch Site Concept (2 pads)



Next steps: AISLP consortium

- Large consortium of capabilities and synergies
- 3 founding members plus 17 other key partners
- Highly supportive of AISLP objectives
- Strong support for Azores Open Lean Spaceport concept



Conclusion

- **Good fit to site constraints**
- **Highly innovative**
- **Strong technical progress**
- **Environmentally responsible**
- **Early Portuguese involvement**
- **Advanced operational concept**
- **Clear technology roadmap**

