Understanding the Carbon Footprint of Satellites: From Launch to Pixel

Company: Callala Ltd (https://www.callala.co.uk/)

Project open to: Masters students

Application closing date: 31st May 2022

Expected duration of project: 4 months

Latest start date: October 2022

Application link: https://forms.gle/U8Gpj16NeTY68qKJA

Organisation description

Callala is inspired by a sense of urgency, supporting business transformation with technology-led innovation and delivering sustainable outcomes. Our partners are inspired to create impactful decarbonisation and resilience systems.

Callala is a climate-positive consultancy, delivering zero and low carbon technology and innovation support, stepping up to the ambitious net zero challenge. Through our space and geospatial technology partners, we underpin commercial efforts to deliver impactful sustainability, resilience and climate adaptation strategies through technology and innovation.

We partner with these organisations to drive commercial engagement and market-related activities to enhance and strengthen the technology offering of our partners in the areas of:

1. Market and Product Analysis
2. Business Development
3. Innovation Funding
4. Innovation Market Development

Project description

The research project aims to understand which information is available to support carbon footprint calculations and estimation of space launches over the life of satellites, specifically in carbon to hydrogen for launch propulsion.

Begin to understand information availability *and gaps* across multiple vectors to support and guide UK space sector research:

1. What is the CO2e -> H2 per launch?
    a. Transition story for % renewables in H2 generation in launches beyond 2030.
    b. Timing of launches and % CO2e in the H2 mix through time.

2. What is the CO2e -> H2 per satellite?
    a. Analyse CubeSats (shorter lifespan; high number per launch) vs Traditional Satellites (longer lifespan; low number per launch)
3. What is the CO2e -> H2 per pixel?
    a. Analyse consumption of Open data (used lots so CO2e per scene is relatively low) vs Commercial data (less well used so CO2e per scene is relatively high)
    b. Analyse difference between low resolution satellites in regional analysis vs high resolution in targeted Critical National Infrastructure (CNI) analysis

The applicant shall:

a) Develop and execute a research plan; utilising a matrix approach to reporting based on information publicly available and gap analysis.
b) Execute engagement plan for gap fill; who should be contacted from satellite companies with their own spacecraft or those who conduct launches.
c) Report of findings (.xlsx and .pptx); illustrate information available and residual information gaps following completion of (a.) and (b.).
d) Conclusions and recommendations (.pptx) to illustrate one or more areas of key future intervention for the UK Space Community.

The key deliverable will be the development of an influential, data-driven set of industry information points and information gaps which shall translate to important and urgent areas of work for the wider UK space sector.

Person Specification

Callala aims to appoint a single Masters level student with both strong space sector skills, a passion for sustainability and who is able to utilise and develop the soft skills needed to elicit conversations and discussions with space companies in relation to their own ESG credentials and reporting.

Callala is looking for someone that has a diverse background of work and educational experiences and can demonstrate that they are an effective communicator both at interview and in their influence across previous non-space settings.

The project shall require:

1. wide-angle plan development.
2. highly targeted and forensic independent research.
3. collaborative reviews of outcomes, step-by-step.
4. development of agile in-project actions based on project outcomes and findings.
5. analysis, development of conclusions and high-level recommendations.

The successful applicant will both require a commercial awareness and shall further develop their soft skills in both securing virtual meetings and translating these into impactful insights that can be reported and more widely relied upon.

Mentoring and guidance shall be provided to the successful applicant by highly experienced Callala staff.