



Green Toolkit for a New Space Economy

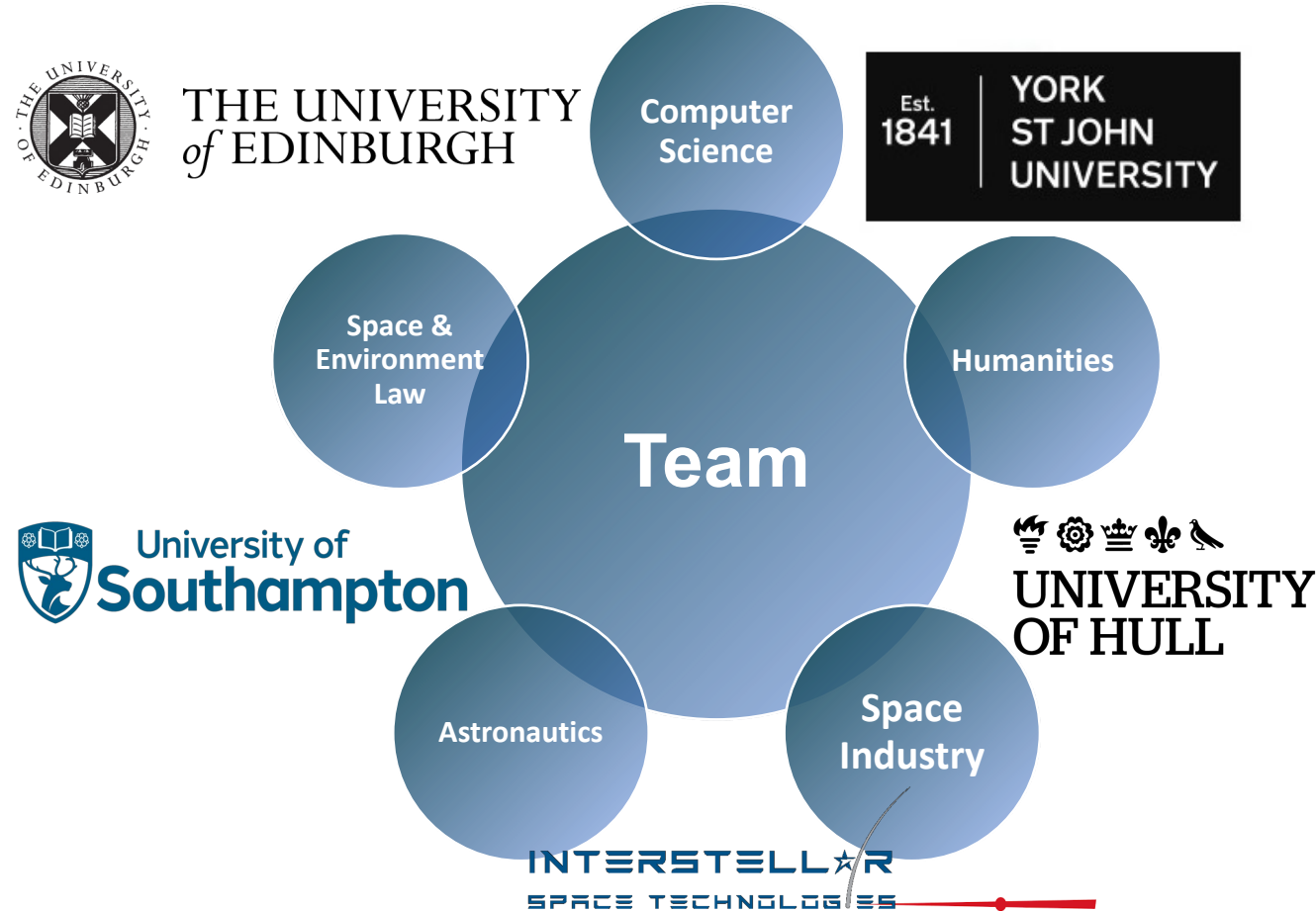
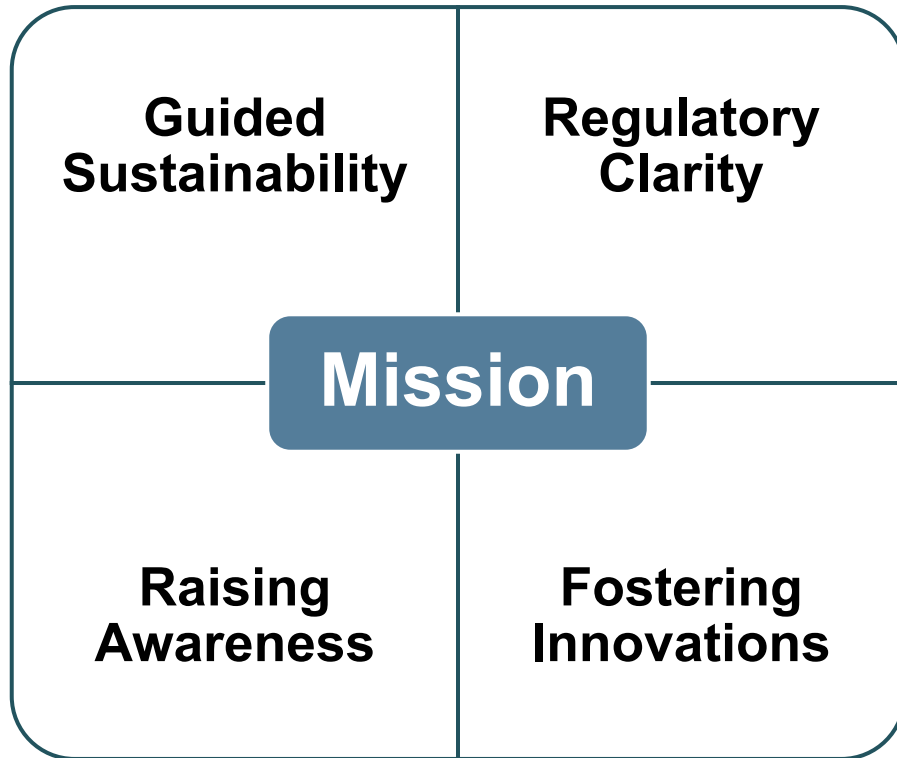
A toolkit for the space sector to
gauge our impact on the
environment and human
society

Dr Yang Lu, York St John University
UN/Austria Symposium, September 13th, 2023



Project Profile

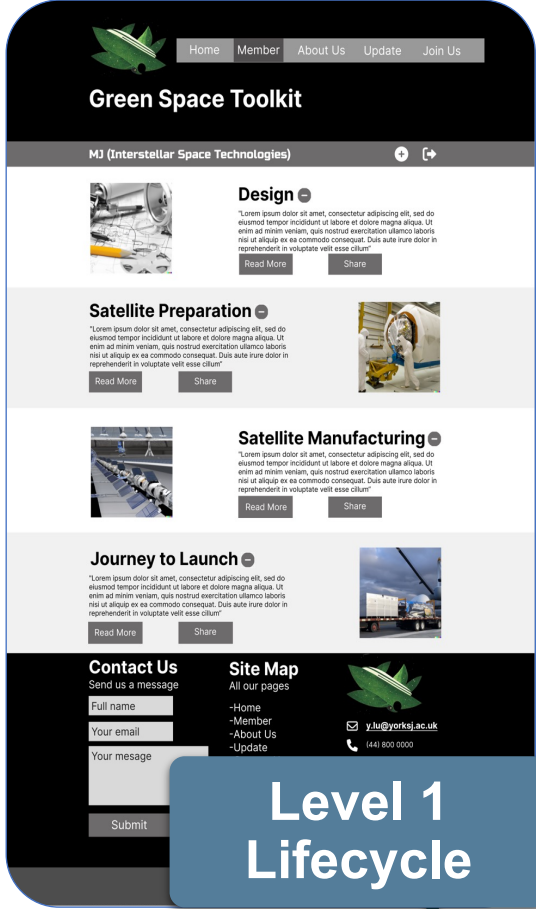
Project aim: Our project aims to help operators to navigate the complex regulatory landscape and guide companies, especially SMEs in the space industry, towards more environmentally and socially responsible choices at the earliest stages.



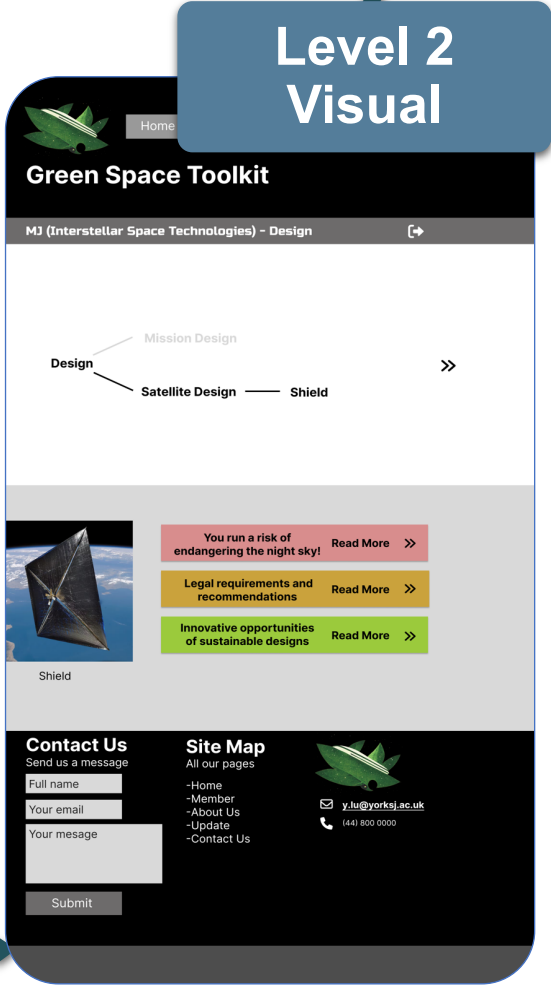
Methodology

- Stage one: Mapping the existing state of knowledge
 - Legal regulations through a comparative review of environmental legal regimes.
 - Socio-cultural-environmental impact of various stages of space activity lifecycle, including resource extraction, launch activity and re-entry.
- Stage two: Co-designing the toolkit with industry practitioners
 - User Journey, Lo-Fi/Hi-Fi prototyping.
- Stage three: Pilot testing with UK space professionals
 - July 2022: Public workshop hosted for Scottish space SMEs, in conjunction with Space Scotland's Environmental Task Force. Bayes Centre, University of Edinburgh, Edinburgh, UK.
 - June 2023: Sustainable Space: Legal & Regulatory Aspects, Higgs Centre for Innovation, Edinburgh, UK.

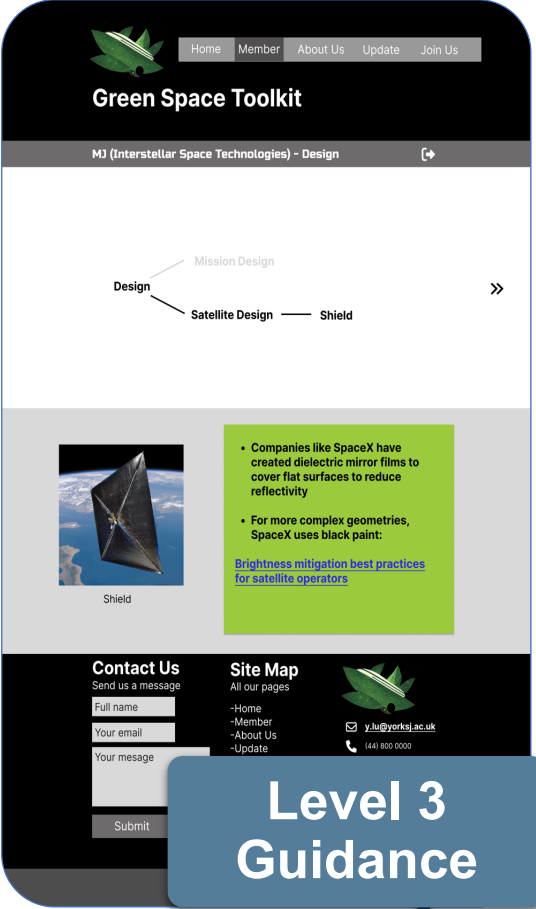
GT Interfaces



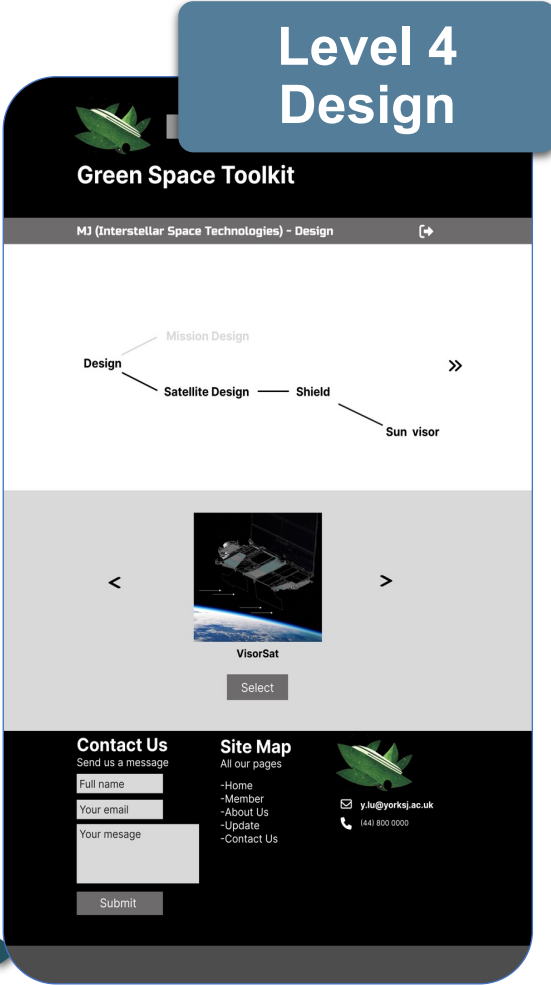
Level 1
Lifecycle



Level 2
Visual



Level 3
Guidance



Level 4
Design

Pathways to Impact



Industry Professionals

- 💡 The toolkit can help companies align their projects with sustainability goals, thereby reducing environmental/socio-cultural impact and potentially lowering costs.
- 🚀 Targeted advertising in industry publications.
- 🚀 Presence at aerospace and sustainability conferences.



Policymakers

- 💡 The toolkit can serve as a resource for policymakers (UK, Europe, and rest of world) looking to create or modify sustainability regulations for space.
- 🚀 Policy briefs and reports highlighting the toolkit's benefits.
- 🚀 Direct outreach to governmental bodies.



Educational Institutions

- 💡 Incorporating the toolkit into curricula to educate the next generation on the importance of sustainability of all kinds in space exploration.
- 🚀 Pedagogical material introducing the toolkit, its structure and its design, and the different disciplines it draws from.
- 🚀 Webinars and online courses.



Public and NGOs

- 💡 Raising awareness will lead to better informed discussions about the impact of space projects, and potentially lead to new partnerships for sustainability initiatives.
- 🚀 Social media campaigns.
- 🚀 Collaborations with environmental NGOs for joint awareness programs.

Opportunities and Next Steps

- **Ambition:** Creating an open-source, educational platform that is accessible to the public, industry professionals, and stakeholders not only in the UK but also in Europe and around the world, with the aim to enhance awareness of best practices and sustainability within the space sector.



Feedback: We invite more users to explore the toolkit and provide valuable feedback.



Research: We're looking for specialists to deepen research and identify new avenues for Space sustainability.



Collaboration: We're open to collaborations to build upon this platform and take it to new heights.



Thank you

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References & Image Credits

SpaceX (2022). *Brightness mitigation best practices for satellite operators*, viewed on 20th May 2023, <<https://api.starlink.com/public-files/BrightnessMitigationBestPracticesSatelliteOperators.pdf>>

Shield: *Artist concept of NanoSail-D in space*, viewed on 20th May 2023, <http://www.nasa.gov/mission_pages/smallsats/11-010.html>. This image is in the public domain in the United States because it was solely created by NASA. [More Info](#)

VisorSat: SpaceX's VisorSat Artist's conception of VisorSat, where a Starlink satellite will be equipped with a deployable visor that shades the antennas from sunlight. The visor will be transparent to radio frequencies, <<https://skyandtelescope.org/astronomy-news/details-spacex-starlink-visorsat/>> Credit: SpaceX.