

An Overview of the UK activities on Space Based Solar Power

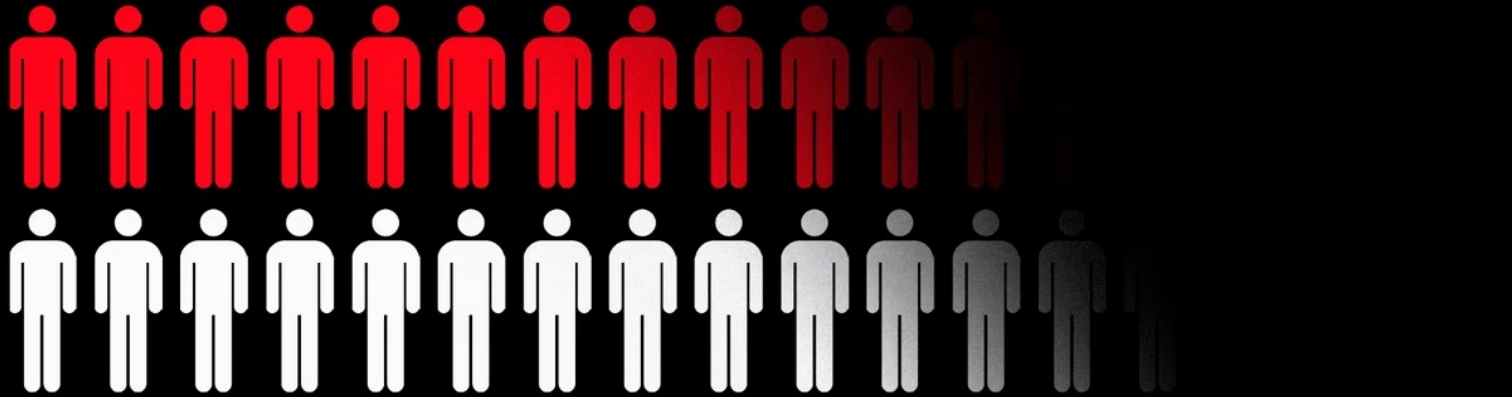
Dr Mamatha Maheshwarappa
UK Space Agency



Increasing World Population

2018

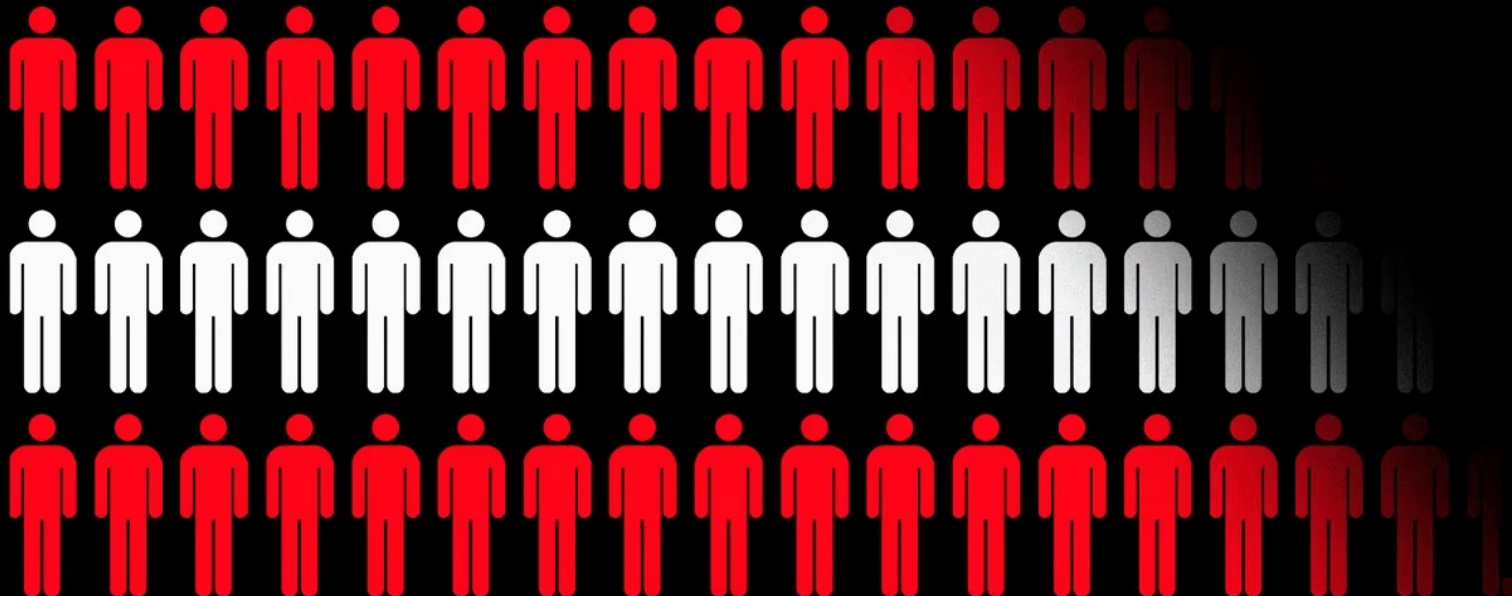
7 Billion
2B no access to
electricity



20 Billion MWhr

2050

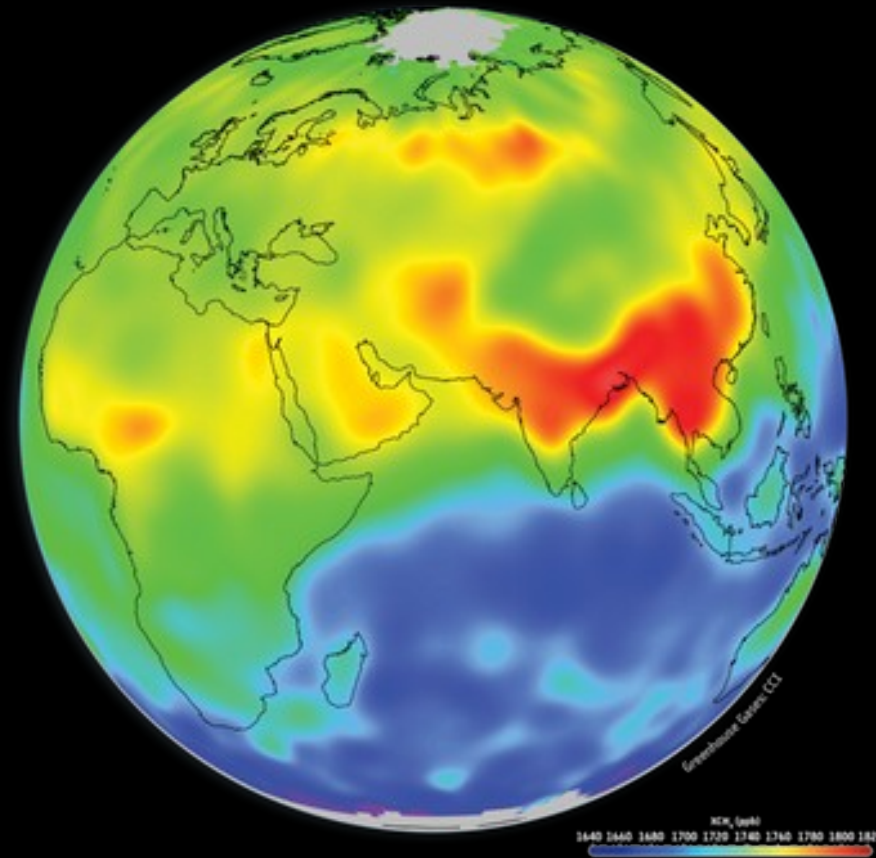
9 Billion



50 Billion MWhr



Need for renewable energy

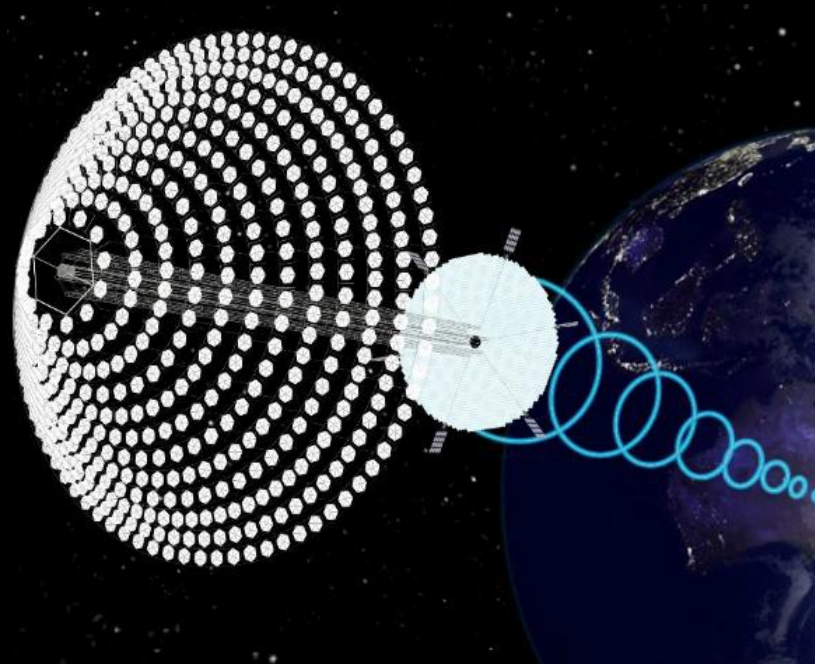




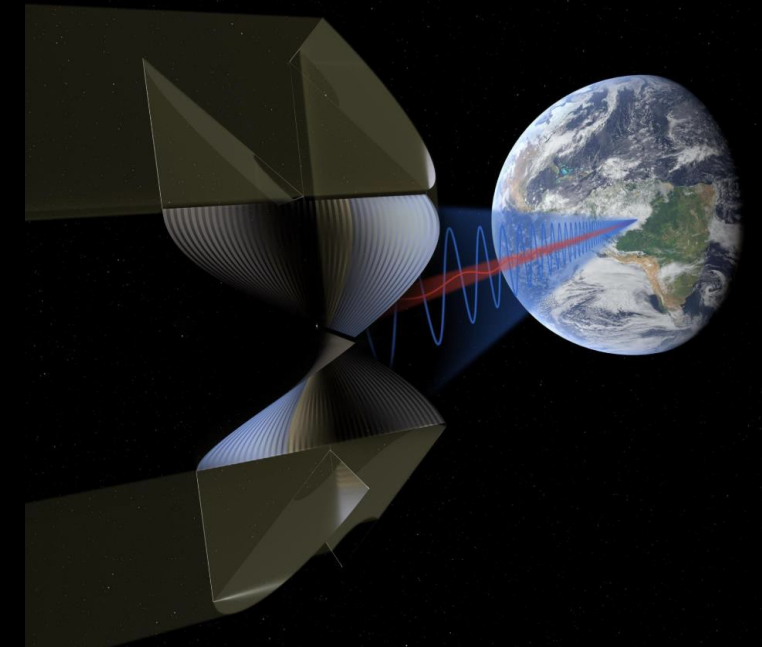
Different SBSP Architectures



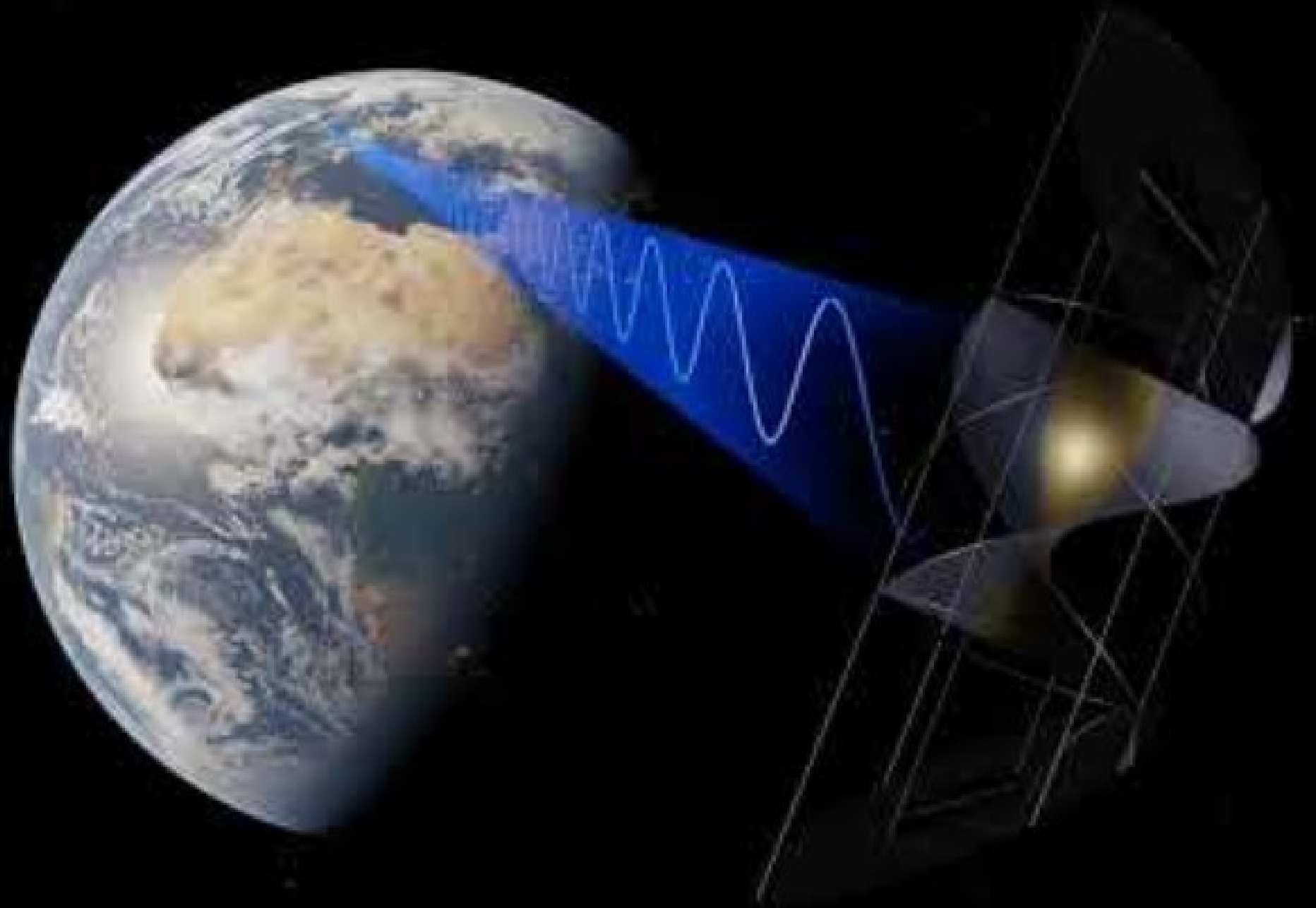
MR-SPS, China
(Xinbin, et al., 2016)



SPS-ALPHA, USA
(Mankins, 2007)



CASSIOPeiA, UK
(Cash, 2019)



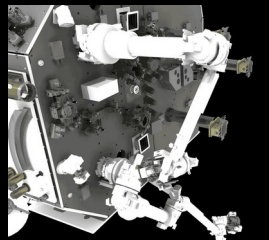


Why now?



\$60K/kg

\$2.3K/kg

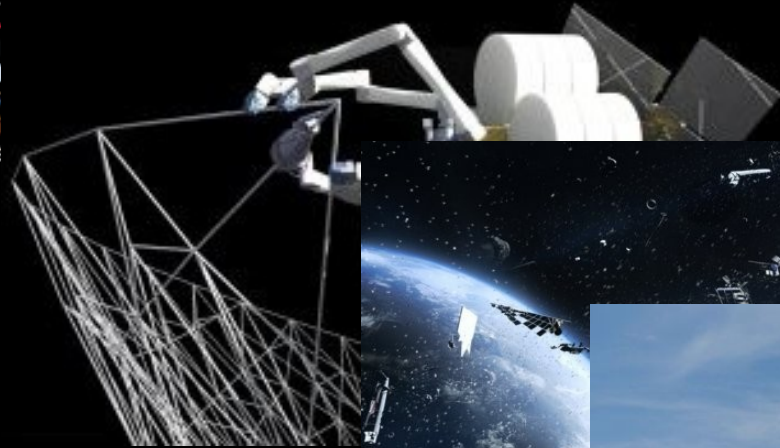
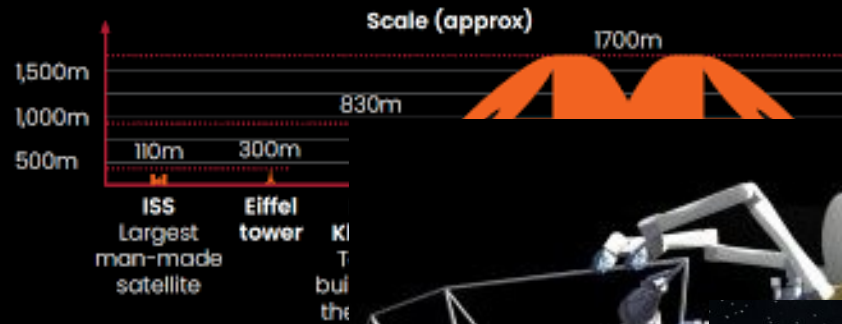


1970s

2020s



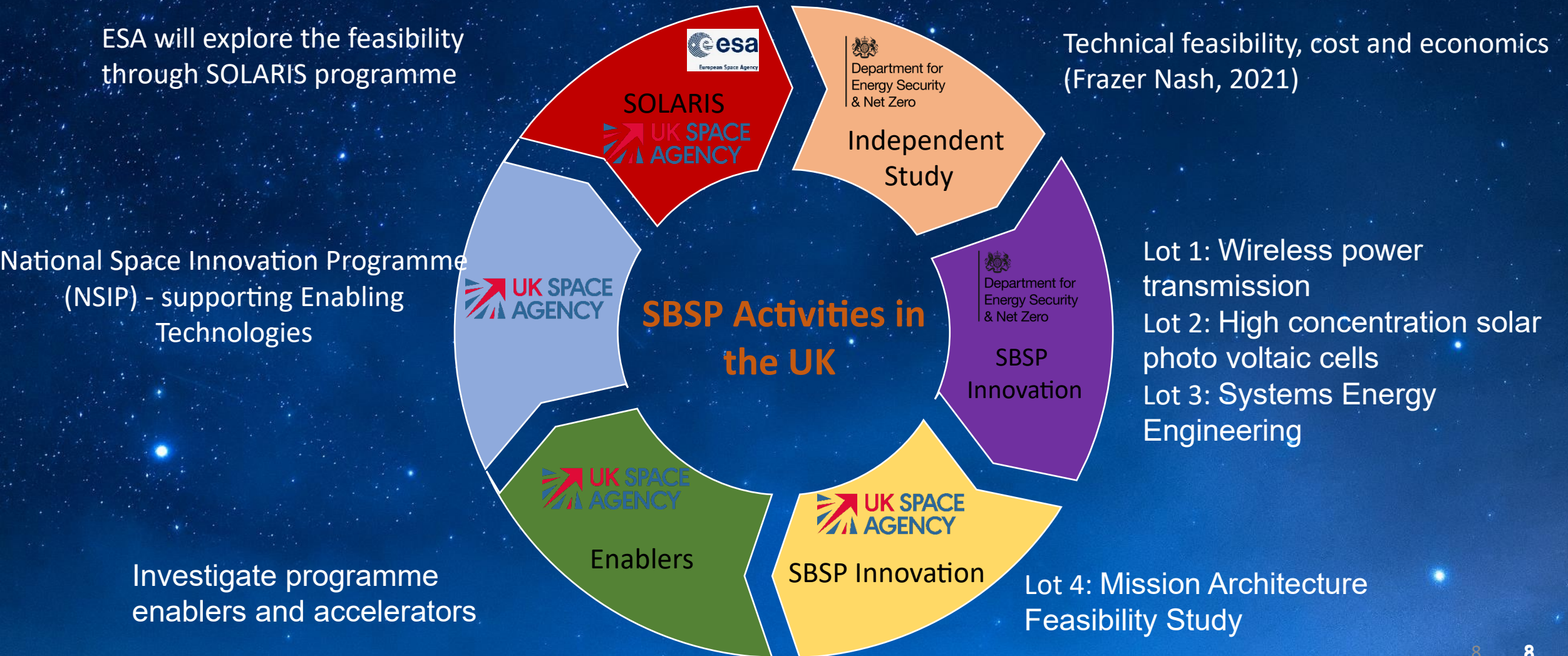
Challenges



S P E C T R U M



SBSP Activities in the UK

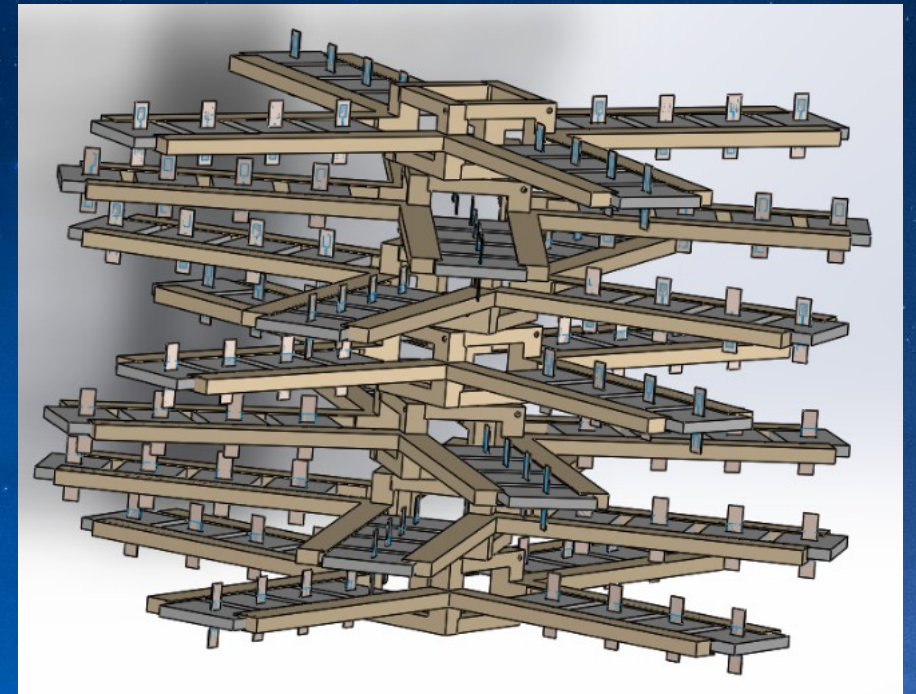
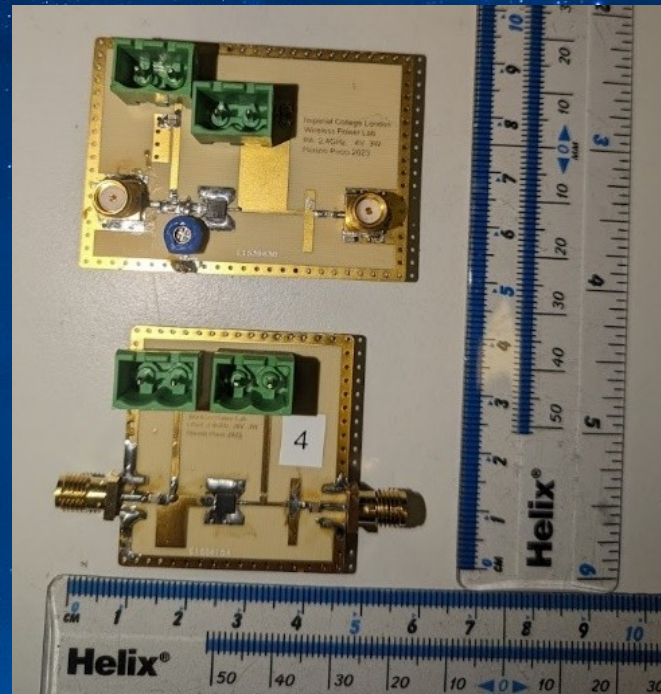
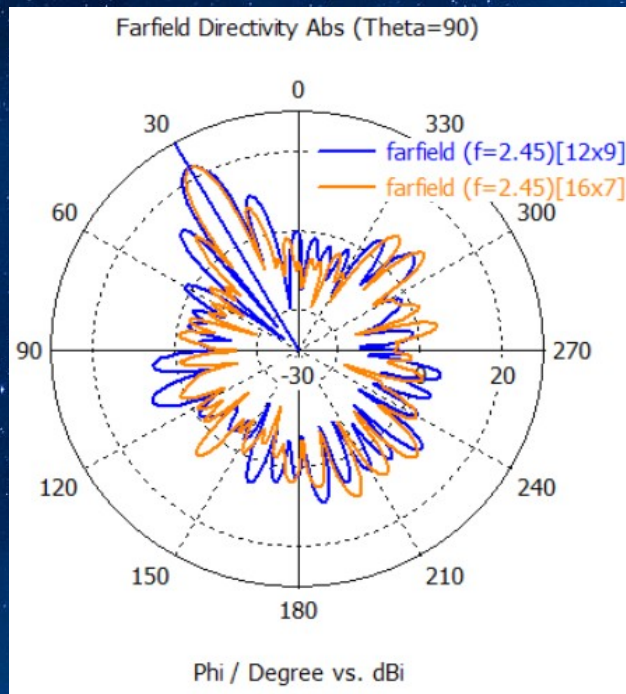




Lot 1- CASSIOPeiA Antenna with Steering Scaled Indoor Experiment (CASSIE)

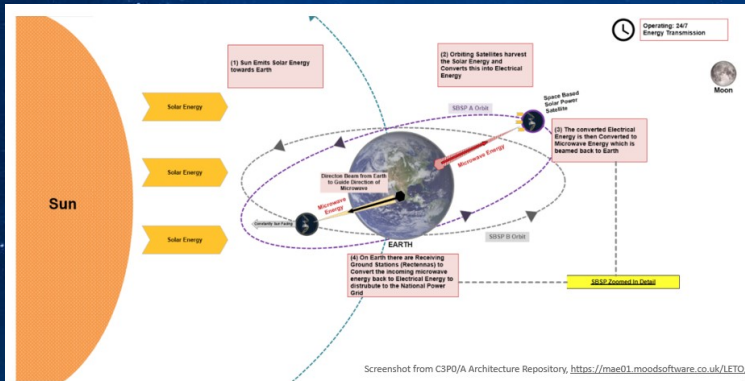
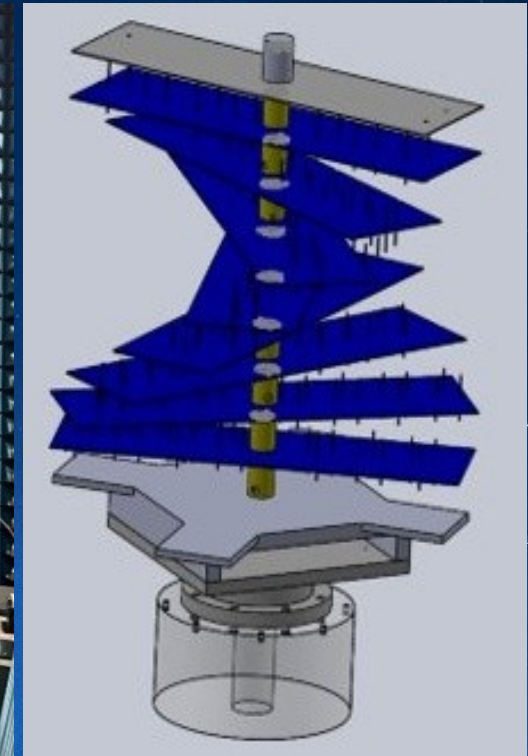
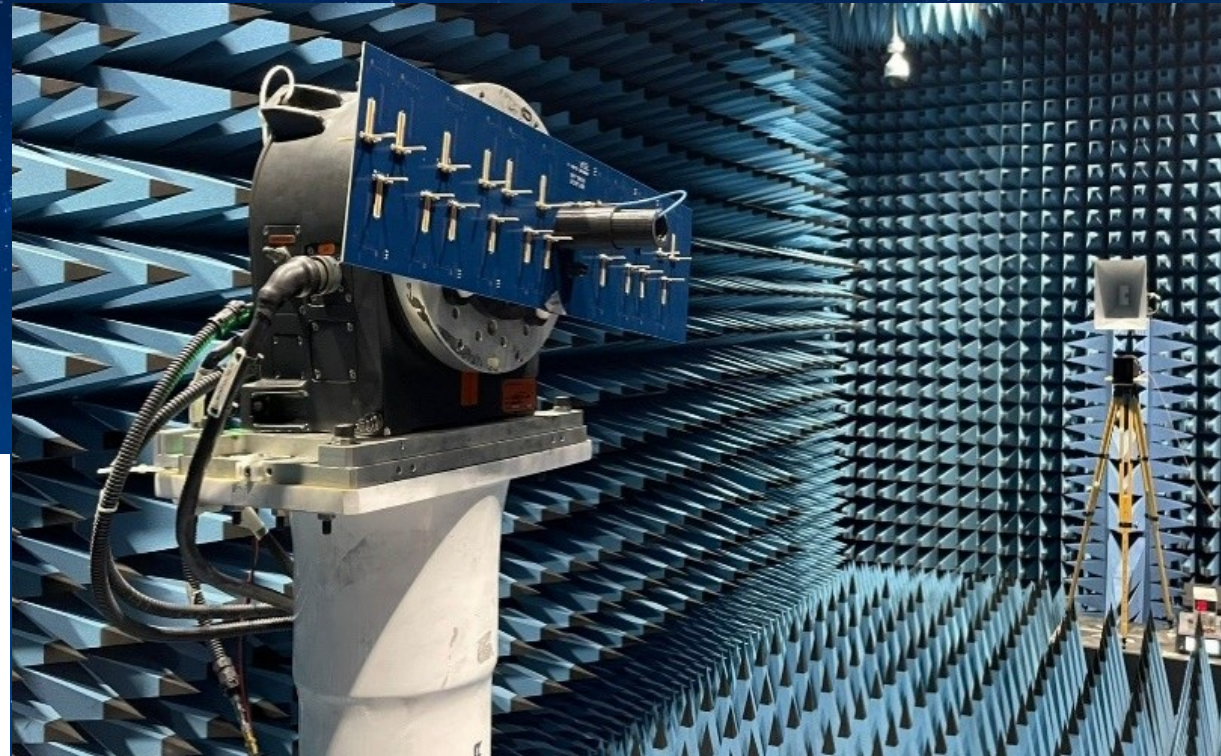
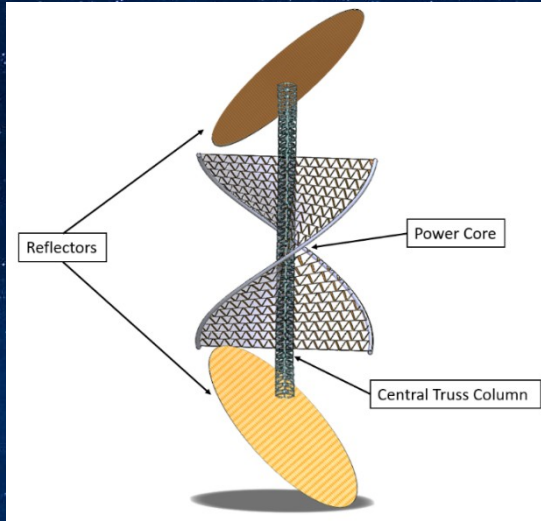
Objective:

Validate the electrical steering and beam quality of the CASSIOPeiA phased array design at power densities relevant to SBSP ($>100\text{W}/\text{m}^2$)





Lot 4- CASSIOPeiA Commercial and Concept Phase 0/A (C3P0/A)



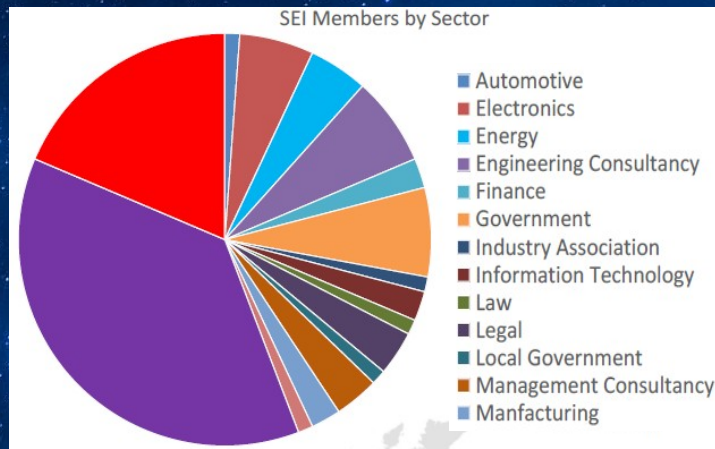
Horizontal Array for Receiving Radio Energy Retrodirectly (HARRIER)



Other Initiatives in the UK



Space Energy Initiative



International Conference on Energy from Space
17-19 April 2024, London, UK
Towards unlocking the potential of clean, abundant, affordable and secure energy delivered from space to Earth

Department for Energy Security & Net Zero | ROYAL AERONAUTICAL SOCIETY | UK SPACE AGENCY | esa

with the support of the
Space Energy Initiative



Thank you!