An Overview of the UK activities on Space Based Solar Power

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Increasing World Population

2018
7 Billion
2B no access to electricity

2050
9 Billion

20 Billion MWhr

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

1970s

$2.3K/kg

2020s
Challenges
SBSP Activities in the UK

National Space Innovation Programme (NSIP) - supporting Enabling Technologies

Investigate programme enablers and accelerators

ESA will explore the feasibility through SOLARIS programme

Technical feasibility, cost and economics (Frazer Nash, 2021)

Lot 1: Wireless power transmission
Lot 2: High concentration solar photo voltaic cells
Lot 3: Systems Energy Engineering
Lot 4: Mission Architecture Feasibility Study
Lot 1 - CASSIOPeiA Antenna with Steering Scaled Indoor Experiment (CASSIE)

Objective:
Validate the electronical steering and beam quality of the CASSIOPeiA phased array design at power densities relevant to SBSP (>100W/m²)

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

Horizontal Array for Receiving Radio Energy Retrodirectively (HARRIER)

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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
Thank you!