

The Sun never sets in space

Solar Power Satellites (SPSs) will collect the Sun's energy and beam it securely to a fixed point on Earth. Each SPS can generate more than three gigawatts (GW*) of electricity

SPS-ALPHA (Solar Power Satellite via Arbitrarily Large Phased Array)

1 Space launch: Requires low-cost, reusable transportation. Modular construction will allow robotic assembly once in orbit

2 Geostationary Earth Orbit: GEO is 35,786km from Earth

3 Heliostat array: Up to 6km wide. Thousands of solar reflectors control orientation of SPS with respect to Sun. Sunlight continuously reflected onto layers of solar panels in array

4 Truss structure: 13km long

5 Wireless power transmission: Solid state WPT unit converts energy from solar panels into high-frequency microwave beam

6 Microwave beam: Two GW of power – equivalent to nuclear power station – delivered to Earth

7 Rectifying antenna: "Rectenna" converts microwave beam into electricity to feed into local grid

Rectenna:
6-7km wide

***Gigawatt:** Equal to one billion watts.
†Sunlight: 1.4 kilowatts/m² in GEO – compared with average of 340 watts/m² on Earth