Solar cell, blanket component and advanced solar array technology with high operating efficiency (>30%), low mass (>200W/kg), and low stowed volume;

- PV technology capable of long-term, reliable of planetary surface operation under dust, temperature extreme (high and low), radiation, and other space environmental conditions;

- Advanced concepts for array packaging, autonomous deployment, retraction and redeployment;

- Modular, high power (10s to 100s kWe) concepts with lifetimes greater than 10 years;

- High voltage (>200 Volts) array designs capable of reliable operation under space environmental conditions.

Research should be conducted to demonstrate technical feasibility during Phase I and show a path toward a Phase II hardware demonstration, and when possible, deliver a demonstration unit for functional and environmental testing at the completion of the Phase II contract. A major focus will be on the demonstration of dual-use technologies for clean and renewable energy for terrestrial applications.