



Lunar Power Architecture for Lunar Exploration

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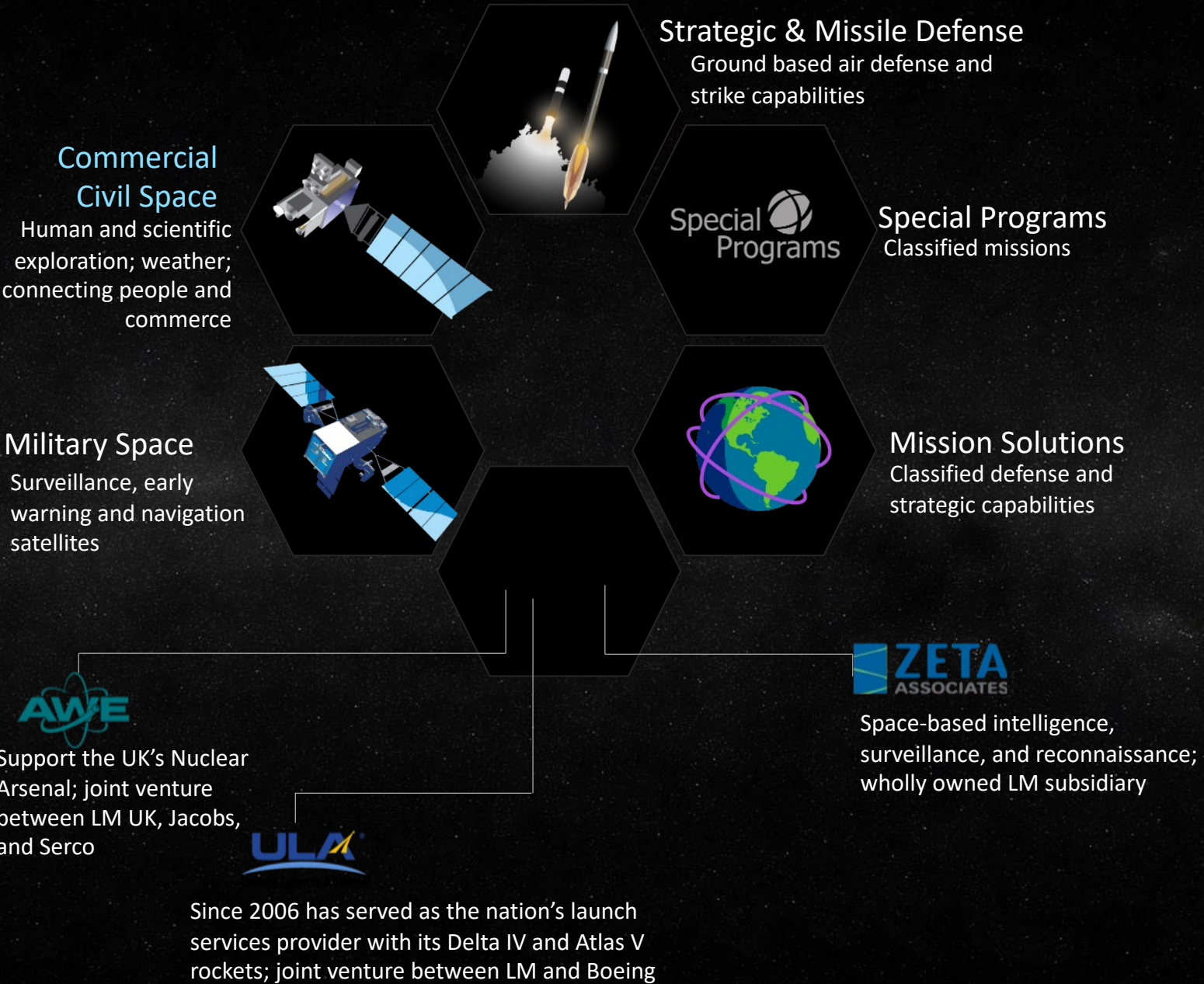


Outline

- Lockheed Martin Space Overview
- Lunar Exploration Campaign
- Lunar Power Ecosystem
- Moon-to-Mars Architecture



Lockheed Martin Space



Customers



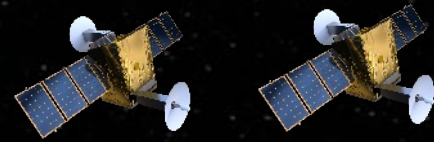
- Commercial
- U.S. Navy
- U.S. Air Force
- UK / MOD
- NASA
- NOAA
- Classified

Footprint

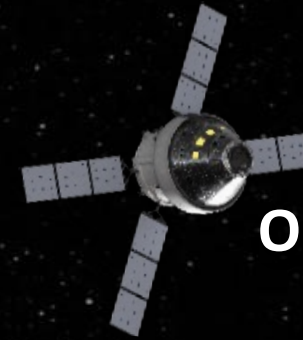
21,440+ Employees at 210 Locations



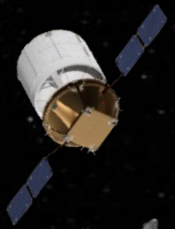
Lunar Exploration Campaigns



Parsec®



Orion



Transportation

ISRU



Mobility



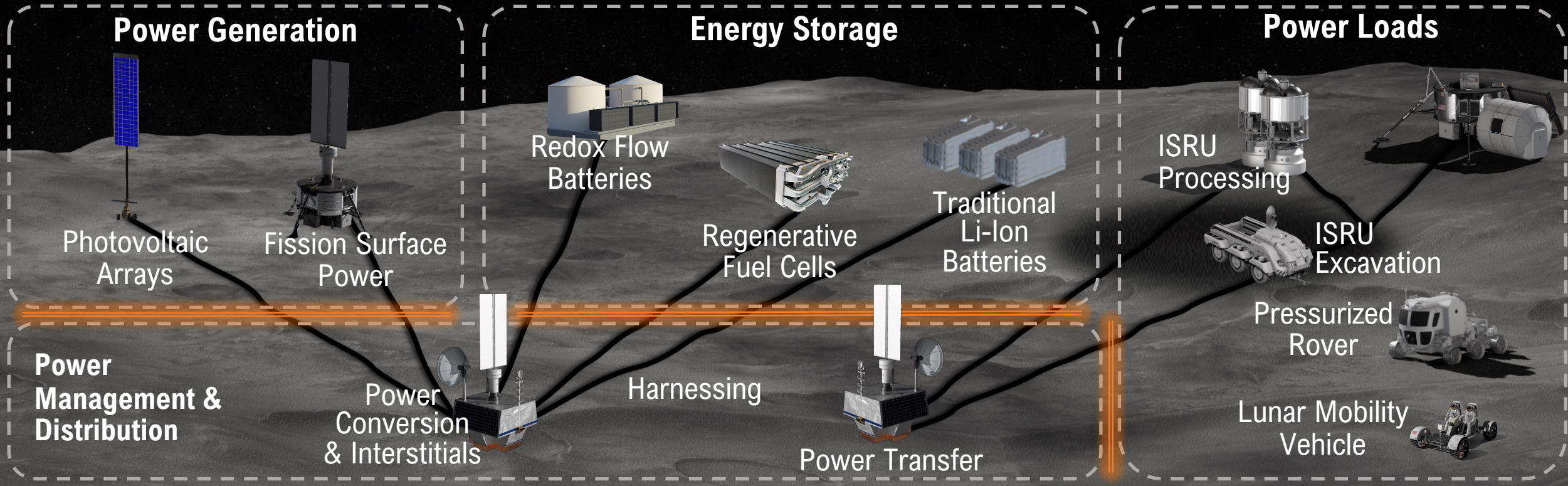
Habitation



Power



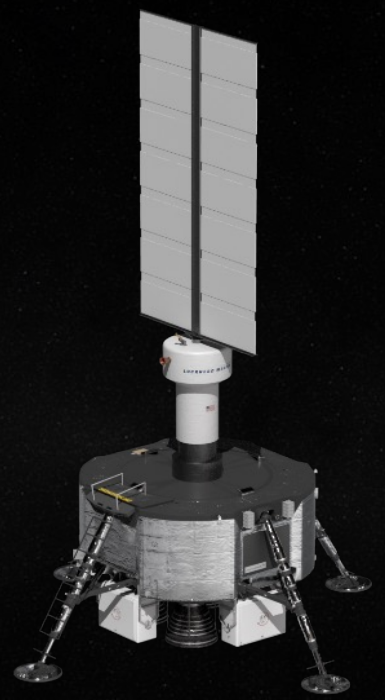
Elements of a Lunar Power Ecosystem



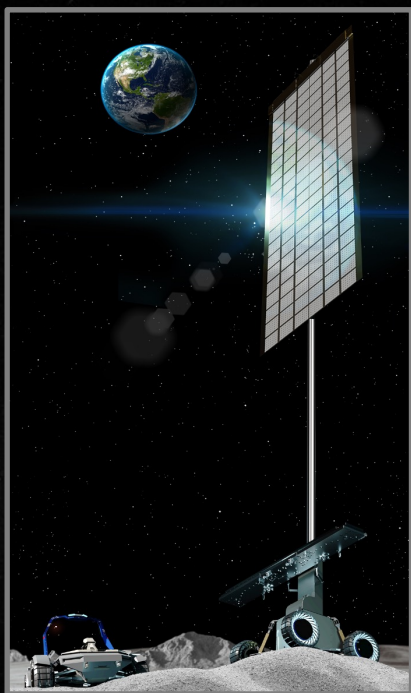
- **Power Generation:** Produce power that is consumed by the ecosystem (i.e., power source)
- **Energy Storage:** Store energy produced by the ecosystem before it is consumed
- **Power Loads:** Consume power produced and stored by the ecosystem
- **Power Management & Distribution (PMAD):** Connect all element endpoints, manage communication, execute load control, and implement fault protection

 **Key Interfaces**

Lunar Surface Power Portfolio



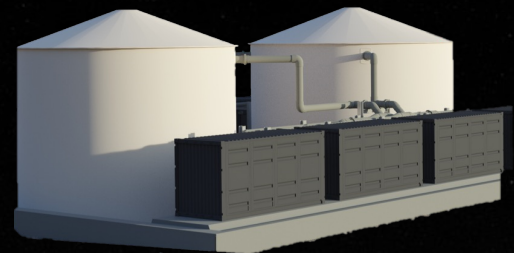
Fission Surface Power (FSP)



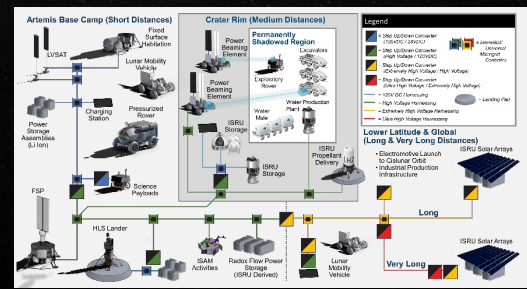
Vertical Solar Array (VSA)



Lunar Mobility Vehicle (LMV)

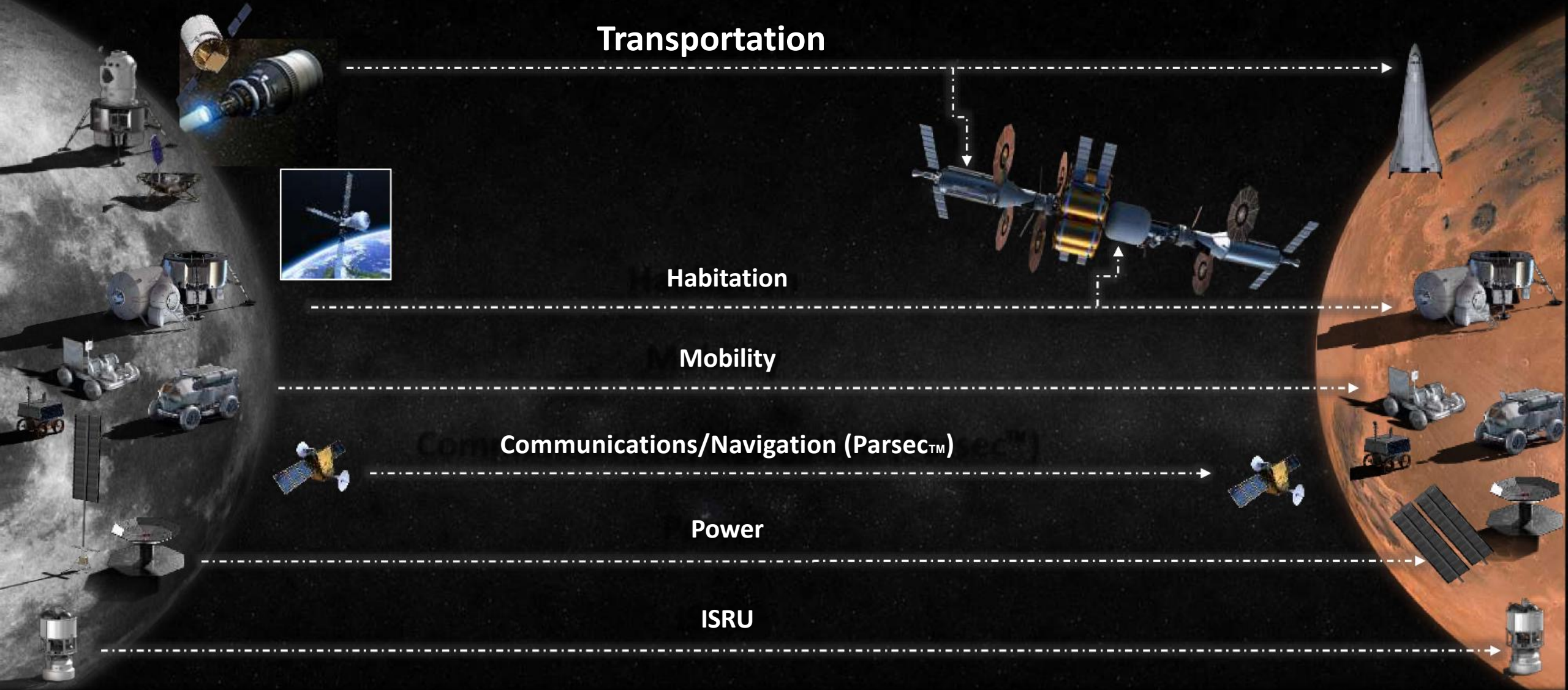


GridStar® Redox Flow Batteries



PMAD Tech. Development

Extensibility: Cislunar Systems Directly Translate to Mars



A composite image showing Mars in the background, the Moon in the middle ground, and the Earth's horizon in the foreground, all set against a starry space background. The word "Questions?" is centered over the Moon.

Questions?



LOCKHEED MARTIN