

Establishing solar power generation on the moon

How many kW does a lunar power system need?

Evolution of Lunar Power Systems
oInitial Lunar Power Needs (~1 - 5 kW) - Exploration and lunar science (robotics, rovers, etc.) - Sources: solar arrays, primary fuel cells, and batteries
oInitial Demonstrations (~10 - 20 kW)

Can solar energy be used in the Moon?

The conversion and application of solar energy would be the most important in situ energy acquirement scheme for future Moon exploration missions. On the lunar surface, one of the reported silicon production processes is to heat the lunar regolith in the presence of reductants such as fluorine.

What is the energy source on the Moon?

The main energy source will be solar, supplemented by batteries. Unlike on Earth, there is no cloud shading on the moon, which means the lunar surface receives more direct sunlight. Darbali-Zamora sees it as an advantage in some ways, but they will have to account for lunar nights, which are approximately two Earth weeks long.

What are the main sources of energy in the lunar system?

Lunar habitat, full scale ISRU, exploration, and lunar science - Sources: solar arrays, primary fuel cells, fission surface power, regenerative fuel cells and batteries
oLunar Expansion / Globalization (~1 MW - 100s MW)

How will solar power affect the lunar surface?

The amount of electric power consumed on the lunar surface increases with the arrival of the lunar habitat and ISRU systems, which will bring their own power generation (solar arrays) and energy storage devices (batteries or fuel cells).

Is photovoltaic power generation possible on the Moon?

Girish T, Aranya S. Photovoltaic power generation on the moon: problems and prospects. In: Badescu V (ed) Moon. Berlin, Heidelberg: Springer Publishers, 2012. 29. Wadia C, Alivisatos AP, Kammen DM. Materials availability expands the opportunity for large-scale photovoltaics deployment.

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