Prioritized Technology: High-Temperature Compatible Power Systems
Summary of Batteries, Power Generation, and Solar Cells

Capability Description

- Power systems for high temperature applications such as Venus surface missions.
  - These will be required to operate at 460 deg C and at 92 bar in a corrosive environment.
  - Near term life target is 3000 hours.
  - Power requirements will be one the order of 100 watts near term rising to the kilowatt range long term.
- Battery systems, both primary and rechargeable are of interest.
  - High Temperature Low Intensity solar cells (HTLI) are also of interest
  - Mechanical power generators such as windmills or chemical combustion based systems are also candidates.

Capability Status

- Batteries – there are battery systems that exist that can operate at high temp (Li-FeS) as either primary or rechargeable. TRL-4 at the moment.
- Solar Cells – Low temperature low intensity cells exist. High temperature will require development. TRL-3 at present.
- Power generation – Wind turbines and Li combustion are under development. There is a HOTTCH award for Li combustion. Most are very low TRL for Venus.

Mission Applications

- These power sources can be used for missions on the Venus surface and lower atmosphere. Most could also be applied to Jupiter atmospheric missions.
  - For near tem Venus missions, power demands are likely to be modest and can be met with batteries and small scale generators.
  - Longer term, rechargeable batteries and either solar power or some sort of generator will be required.
- Most could also apply to Jupiter atmospheric missions
- Venus is a rosseta stone to understanding exoplanent atmospheres

Development Cost and Schedule