Sahara desert project aims to power half the world by 2050

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Image credit: Diginfo TV

(PhysOrg.com) -- A joint project by universities in Algeria and Japan is planning to turn the Sahara desert, the largest desert in the world, into a breeding ground for solar power plants that could supply half the world's electrical energy requirements by 2050.

The Sahara Solar Breeder Project aims to begin by building a silicon manufacturing plant in the desert to transform silica in the sand into silicon of sufficiently high quality for use in solar panels. Solar power plants will be constructed using the solar panels, and some of the electricity generated will supply the energy needed to build more silicon plants to produce more solar panels, to produce more electricity...

Leader of the Japanese team, Hideomi Koinuma from the University of Tokyo, said while no one has tried to use desert sand as a source of high-quality silicon before, it is the obvious choice and will be of high enough quality.

The energy generated by the solar power plants will be distributed as direct current via high-temperature superconductors, a process that Koinuma said will be more efficient than using alternating current. He envisages a large network of supercooled high-voltage direct current grids capable of transporting the expected 100 GW of electricity at least 500 kilometers. Even if the grid needs to be cooled with liquid nitrogen, Koinuma said it could still be cost-competitive. (High-temperature superconductors operate at about -240°C.)

The Sahara Solar Breeder Project (dubbed the Super Apollo Project by Koinuma) is being developed as part of the International Research Project on Global Issues by the Japan Science and Technology Agency (JST) and Japan International Cooperation Agency (JICA). The team expects to have to overcome many problems, including frequent sandstorms, the need to use liquid nitrogen to cool cables and to bury them in the sand to minimize fluctuations in temperature, and so on.

The initial aims of the research will be focused on tackling the expected challenges and demonstrating the project's viability. Training engineers and scientists from Africa in the entire research and development process is also a goal of the project.

Another project aiming to harness solar power in the Sahara was launched last year. The Desertec Foundation aims to supply 15 percent of Europe's electricity requirements by 2050 using high-voltage direct current transmission lines without superconductors.