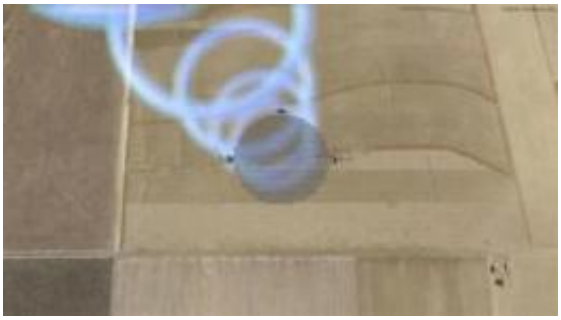
Space-Based Solar Power Coming to California in 2016

April 15 2009, by Lisa Zyga



The microwave beam is targeted at a rectifying antenna array on Earth. Designers say the beam would have about one-sixth the intensity of noon sunlight. Image credit: Mafic Studios Inc.

(PhysOrg.com) -- In the near future, a solar power satellite may be supplying electricity to 250,000 homes around Fresno County, California. Unlike ground-based solar arrays, satellites would be unaffected by cloudy weather or night, and could generate power 24 hours a day. If successful and affordable, the project could mark the beginning of space-based solar power in other locations, as well.

Solaren Corp., a solar power start-up, has convinced Pacific Gas & Electric (PG&E), California's largest utility company, to purchase 200 megawatts of electricity when its system is in place, which is expected to be 2016. According to Solaren, the system could generate 1.2 to 4.8 gigawatts of power at a price comparable to that of other renewable

energy sources.

In Solaren's proposal, solar power satellites would be positioned in stationary orbit about 22,000 miles above the equator. The satellites - whose arrays of mirrors could be several miles across - would collect the sun's rays on photoelectric cells and convert them into radio waves. The radio waves would then be beamed to a receiving station on the ground, where they would be converted into electricity and delivered to PG&E's power grid. Because the radio beam is spread out over a wide area, it would not be dangerous to people, airplanes, or wildlife.

The plan requires a large area of land to host the ground receiving station's antenna array, and several square miles of scrubland in western Fresno County could provide an ideal location. In addition to being sparsely populated, the region is also near transmission lines and a load center. While many of today's land-based solar stations are located far out in the desert, a station closer to customers could offer greater convenience and economic advantages.

Gary Spirnak, CEO of Solaren Corp. and a former aerospace engineer, noted that the project will cost more than $2 billion, mostly going toward engineering development and building of the ground station, as well as launching four or five satellites. So far, Solaren has raised an undisclosed sum from private investors.

"While a system of this scale and exact configuration has not been built, the underlying technology is very mature and is based on communications satellite technology," Spirnak said.

Solaren's project is not the only space-based solar system in the works; Japan's space agency, JAXA, has recently begun testing a space-based solar array that beams energy to Earth in the form of microwaves. If the tests are successful, the agency plans to launch an array of satellites that

would transmit power to a 1.8-mile-wide receiving station, which would generate enough electricity to power about half a million homes.

More information: Q&A with Gary Spirnak

via: MSNBC and Fresno Bee