

THE YEAR OF LIGHT 2015 – PHOTOVOLTAIC VERSUS CONCENTRATING SOLAR POWER (CSP)

John Perlin
Storico dell'energia solare, USA

Il solare termico a concentrazione (CSP), come le centrali elettriche a combustibili fossili e nucleari, utilizza il calore per produrre energia elettrica e pertanto la sua efficienza dipende dai limiti imposti dalle leggi della termodinamica. Al contrario, il fotovoltaico non è soggetto a questi limiti, dal momento che converte direttamente la luce solare in energia elettrica .
Nella pagina che segue il punto di vista di John Perlin, storico statunitense dell'energia solare, su CSP e fotovoltaico.

Gruppo per la storia dell'energia solare (GSES, www.gses.it)

Incontro dibattito presso Museo dell'Industria e del Lavoro di Brescia, Rodengo Saiano

Via del Commercio 18 - 25050 Rodengo Saiano - Brescia

“Storia e attualità del solare termodinamico con il contributo italiano”

venerdì 10 ottobre 2014

As Daryl Chapin, one of the inventors of the silicon solar cell, wrote more than a half a century ago, “It is clearly wasteful to convert solar energy first into heat and then try to reconvert it into electricity.” CSP plants, like other large-scale generators of power, face other issues as well. They require transmission lines to carry their power to distant homes. When their thermodynamically restricted efficiencies are combined with losses as their electricity they generate snakes through electrical wires, their efficiency takes a further hit, as much as fifty or more percent in most developing countries. Photovoltaics can avoid the problems inherent in transmission since the technology’s modularity allows for placement right where the demand exists and can be perfectly tailored for the electrical need at hand. Solar cells, unlike CSP, do away with all the bulk paraphernalia usually associated with electrical generation such as boilers, turbines, pipes, condensers and cooling towers. In fact, they have no moving parts. Within a few microns, photons, packets of energy from the sun, move electron-hole pairs to opposite sides and thus create electricity. Droughts and rising water temperatures due to global warming, as well as the growing scarcity of water, also adds another advantage for photovoltaics over CSP or any other power plant thermally driven. Photovoltaics also benefits from the advances in allied semiconductor research and development that currently dominate the field of material science while CSP has its own particular set of problems – its dependence to operate on full sunlight only found in deserts distant from electrical demand. For these reasons, CSP for electrical generation will always remain a niche technology. On the other hand, the only impediment to the mass use of photovoltaics has been its high cost which thanks to the Chinese has faded to the background. Now it has become unstoppable. When compared and contrasted it becomes clear that CSP represents a nineteenth-century method of generating electricity and photovoltaics offers a revolution in power generation. As Science magazine declared almost forty years ago, “If there is a dream solar technology, it is photovoltaics. A space-age electronic marvel at once the most sophisticated solar technology and the simplest, most environmentally benign source of electricity yet conceived.” (J.Perlin)

Gruppo per la storia dell’energia solare (GSES, www.gses.it)

Incontro dibattito presso Museo dell’Industria e del Lavoro di Brescia, Rodengo Saiano

Via del Commercio 18 - 25050 Rodengo Saiano - Brescia

“Storia e attualità del solare termodinamico con il contributo italiano”

venerdì 10 ottobre 2014