Solar Energy on Deserts and FSC technology

The solar energy arriving on the earth's surface is approximately ~1.2•10^{9} TWh/year or ~ 4.2•10^{6} Quads/year (1 Quad=10^{15} BTU).

http://en.wikipedia.org:80/wiki/World_energy_resources_and_consumption

The surface area of the sun-belt deserts is approximately 36 million Km^{2}. Each m^{2} of these desert areas is receiving in average 2000 KWh/year of solar irradiation, thus the whole desert area of our planet is receiving not less than 7.2•10^{7} TWh/year or ~ 2.5•10^{5} Quads/year (~ 6% of the overall solar energy arriving on earth).

The primary (thermal energy) consumption for 2009 is estimated to 500 Quads while the electricity demand will be less than 28000 TWh or ~100 Quads (~20% of primary consumption). It is estimated that this figure most probably could be doubled in the next 30-40 years partly because that transportation fuels could be replaced by electricity or Hydrogen made by electrolysis of clean electricity.

Let us assume that Floating Solar Chimney technology is used in desert or semi-desert areas, with an efficiency of ~1%. In order to cover 40-50% of the future electricity demand i.e. 80-100 Quads or ~22,000-28,000 TWh, we should use a desert area of 1.1-1.4 million Km^{2} . This is ~3% of desert or semi-desert areas of our planet.

Desert or semi-desert areas of high solar irradiation exist in all continents and close to the big carbon emission producers.

Europe can cover its 40-50 % of its electricity demand by FSC technology application in North Africa and Middle East desert and semi desert areas. An area of (300 Km X 300 Km) is sufficient.

Appropriate areas for the Floating Solar Chimney Technology application can be found in South West States of USA (Arizona, California, New Mexico, Nevada etc.) where the high solar irradiation is combined with mild winds. A 6% of the areas of Arizona, New Mexico and Nevada can cover USA 40-50% electricity demand.

Taklamakan desert areas in East China can be used in order to cover China's 30-40% of China's present and future electricity demand.

In India, Australia, South and Central America and Africa there are more than enough desert or semi- desert areas for a large scale of FSC technology application to cover any demand of clean electricity in these areas.

In certain areas the Floating Solar Chimney Technology can be combined to special greenhouse agriculture beneath the protected area of their Solar Collectors.

Thus useful agriculture lands will not be lost by Floating Solar Chimney Technology application however they will be even promoted.