Solar Energy for Use by Humans

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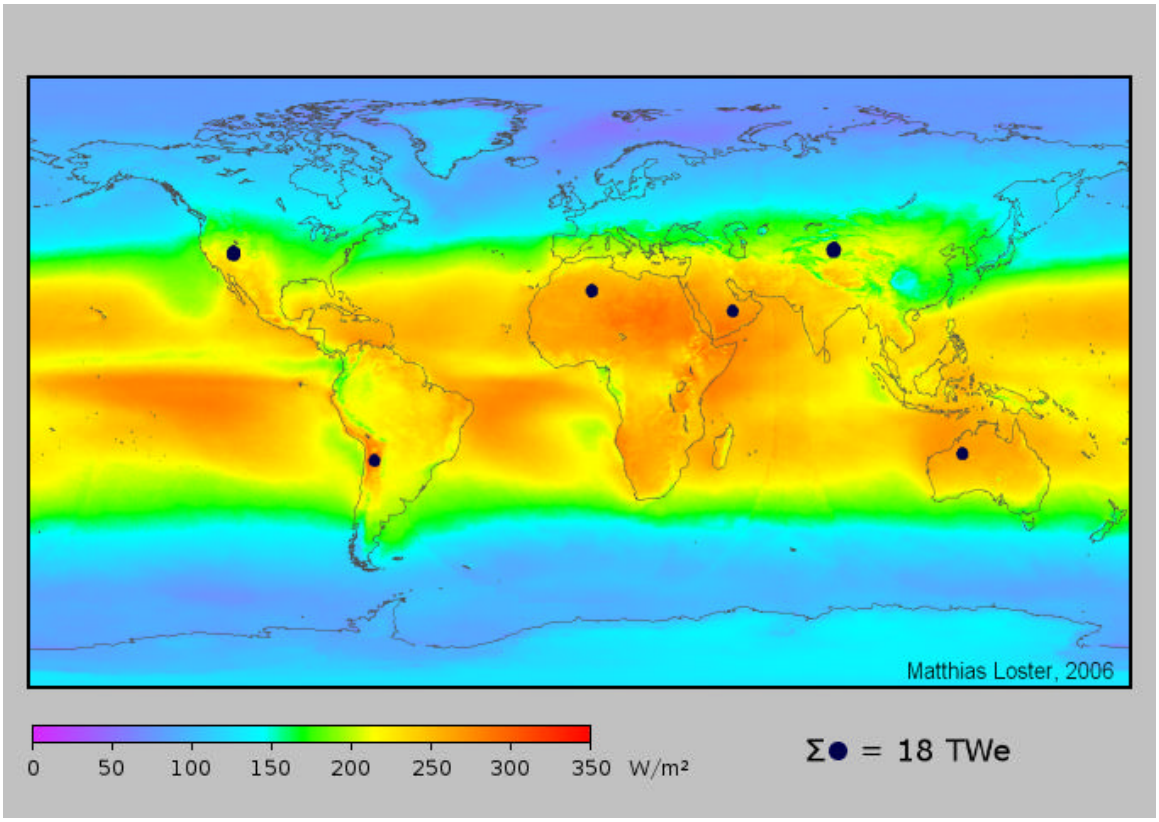
http://arts.bev.net/roperldavid
This is web page http://www.roperld.com/science/SolarEnergyHumans.pdf

The solar energy per time (power) reaching the surface of the Earth is 122 x 10^{15} watts (122 petawatts).
(http://en.wikipedia.org/wiki/Solar_energy)
The power used by humans is 13 x 10^{12} watts (terawatts).
There are about 6.6 x 10^{6} humans on the Earth.
So the average amount of power used per human is about 2 x 10^{6} watts/human.
The average amount of solar energy available per human is about 18.5 x 10^{9} watts/human.

The surface area of the Earth is 510,065,600 km² (http://en.wikipedia.org/wiki/Earth)
The land area of the Earth is 148,939,100 km² (29.2 %).
So, the solar energy that strikes the land area of the Earth is about 35.6 x 10^{15} watts, making about 5.4 x 10^{9} watts/human available to humans living on the land.

"For example, in North America the average insolation at ground level over an entire year (including nights and periods of cloudy weather) lies between 125 and 375 W/m² (3 to 9 kWh/m²/day). This represents the available power, and not the delivered power. At present, photovoltaic panels typically convert about 15% of incident sunlight into electricity; therefore, a solar panel in the contiguous United States on average delivers 19 to 56 W/m² or 0.45 to 1.35 kWh/m²/day."



"Map of global solar energy resources. The colors show the average available solar energy on the surface during 1991 to 1993. The scale is in Watts per square meter. For comparison, the dark disks represent the land area required to supply the primary energy demand in the year 2010, using currently available technology (8% efficient solar panels)." (http://en.wikipedia.org/wiki/Solar_energy)

Solar Roofing: http://www.roperld.com/science/solarroofing.htm .

Solar energy primer: http://www.solcomhouse.com/solarpower.htm :

- All the energy stored in Earth's reserves of coal, oil, and natural gas is matched by the energy from just 20 days of sunshine.
- In *40* minutes of daylight The SUN releases upon The Earth the amount of energy that is consumed by the entire population of the planet in ONE YEAR
- Each day more solar energy falls to the Earth than the total amount of energy the planet's 6 billion inhabitants would consume in 27 years.
- Currently we harness about 1% of this energy