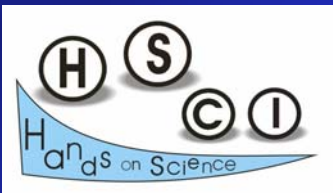


Renewable Energies

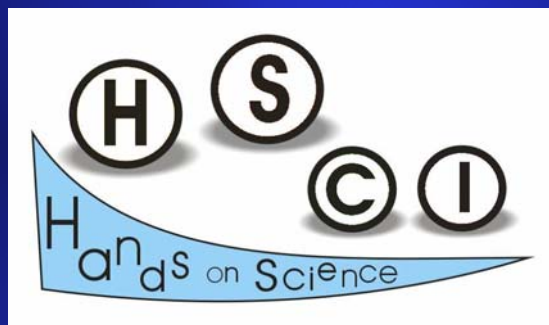
Solutions for the Future

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Hands-on Science



www.hsci.info

The United Nations declared 2005 - 2014
the decade of the
Education for a Sustainable Development



ENERGY

... pollution ...

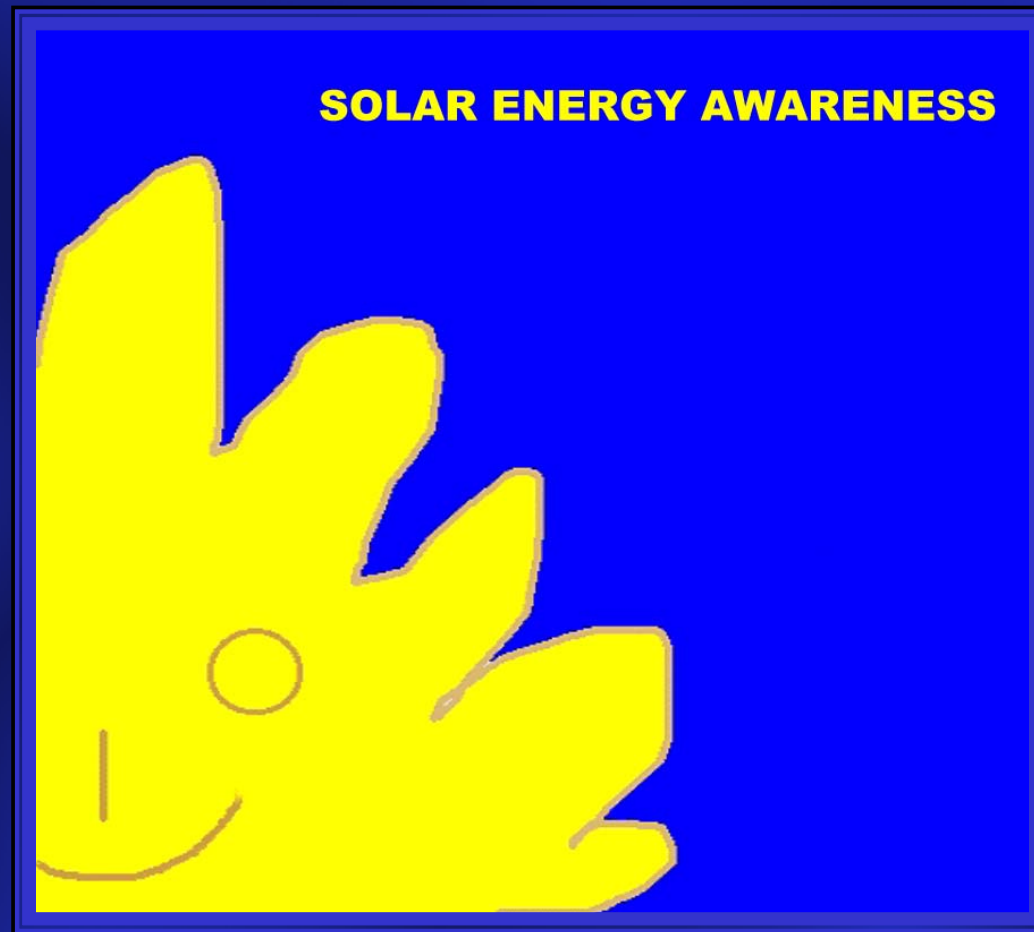
degradation of our quality of life

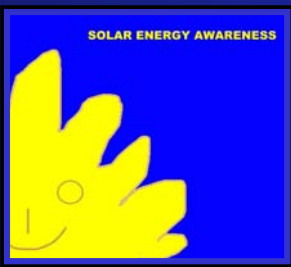
Sources of energy in Earth

Tides

Geothermal

Solar





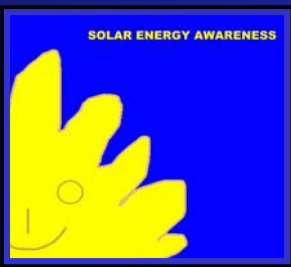
Wave Energy

Hidroelectrical EnergyEnergia (water cycle)

Bio-energy (biomass - photosintesis)

Fossil Fuel

transformation of biomass during million years



31.500.000.000 W/m²
~ 32 TW/m²

**... but only between 1,4 and 21,4% of
that energy reaches the Earth ...**

**However that amount of energy its enough cover
10000 times the energy needs in all the world
(~12TW)**

SUN relatively low efficiency ... but ...

WIND increased use

RIVERS AND WATER FALLS 2200 TWh in
2002 (theoretical maximum of 50000 TWh)

SEA WAVES >100 MW in Denmark

TIDES in 1967 in France (La Rance) a pioneer station produce 240 MW

GEO THERMAL 1998 8,000 MW

HYDROGEN CELLS a great hope

BIOMASS

NUCLEAR

Fossil Fuel

A 50 CV car only needs 100 ml of gas to drive 1,5km spending 66kW, but...

Industrial Revolution
Oil crisis – on the 70' and 2008/2009/...

In England only the energy needs raised to 8 GW but with peaks of over 40 GW

On last 200 years half the reserves were spend.

... the future ...



...green house effect, deforestation, lack of drinking water, atmospheric pollution,...

... sustainable development...

better use of the energy and our natural resources

... in harmony with nature ...

... discovering, profiting, creating, inventing ...

RENEWABLE ENERGIES

Obrigado

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