



Jörg Schlaich

The Solar Chimney – Electricity from the Sun

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Current energy production from coal and oil is damaging to the environment, apart from the fact that fossil energy sources are non-renewable. Nuclear power stations are no real alternative as they are an unacceptable risk in many locations. What we need is a renewable, environment-friendly energy source that is available to all people everywhere.

Solar energy is the answer: though available mainly in sunny countries, it will benefit the whole world, as the associated environment relief has a global impact. Sunny countries can export solar energy to the northern industrial countries. This has a double positive effect: environmentally damaging energy production by the industrial nations can gradually be reduced, and explosive population growth in poor countries, which are usually sunny as well, can be checked by earnings from solar energy production, thus raising the standards of living and education.

Sensible technology for the use of solar power must be simple and reliable; it must also be accessible to the technologically less developed countries that often have limited resources of raw materials; it must not need cooling water or produce waste heat; and it must be based on environmentally sound production from renewable materials.

The solar chimney meets these conditions: Hot air is produced by the sun under a large glass roof. This flows to a chimney in the middle of the roof and is drawn upwards. The updraft drives turbines installed at the base of the chimney, and these produce electricity. The solar chimney combines three familiar techniques: the simple glass roof hot-air collector, the chimney, and wind turbines with generators. Solar chimneys can also exploit diffuse radiation when the sky is clouded over, a decided advantage for countries prone to frequent cloud cover.

A prototype in Manzanares, Spain, produced electricity for seven years, thus proving the efficiency and reliability of this kind of solar power production. Tall solar chimneys could produce 200 MW and power production costs may go down to 0.07 US \$/kWh.

Jörg Schlaich has a worldwide reputation for his innovative structures. His work ranges from cable-net and membrane roofs through bridges of a unique inventiveness to new devices for the utilization of solar energy.

See also: Alan Holgate, *Jörg Schlaich. The Art of Structural Engineering.*

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