

Saving energy through direct use of daylight

Background & motivation:

Even in "sunny" countries, despite the fact that an excess supply of sunlight outside, even during the day, windows are shut and artificial light is used indoors requiring a high amount of energy. Moreover, these artificial lights are used at a very low level of efficiency only. If windows were left open, too much heat would penetrate through the windows. Thus in buildings, currently, most energy used is for air conditioning!



Goal:

- * To collect direct solar light and transport this light 'WITHOUT HEAT' to rooms in the interior of buildings.
- * The non-visible portion of solar radiation may be used for further energy harvesting.

Benefits:

- **Saving of energy costs** through direct use of daylight
- **Light without heat** by splitting off infrared radiation
- Working under natural daylight improves **human performance** and contributes positively to overall **human well-being**.

Technical solution:

"Sollektor", was developed at the Georg-Simon-Ohm University of Applied Sciences, Nuremberg, Germany. Current status:

- 2 "Sollektor Euromodel" (c.f. picture right) demos have been assembled with optical concentration ("intensification") of solar radiation (light) by 280 times.
- 600 injection moulded optical concentrators channel solar light to a 1 mm diameter plastic optical fiber (POF)
- The radiated light, when coupled to a light guide (plastic tube with reflection coating inside), corresponds to about 50 halogen bulbs 100 W each, but blocks the inherent heat usually generated with it.
- Automatically steered sun tracking

