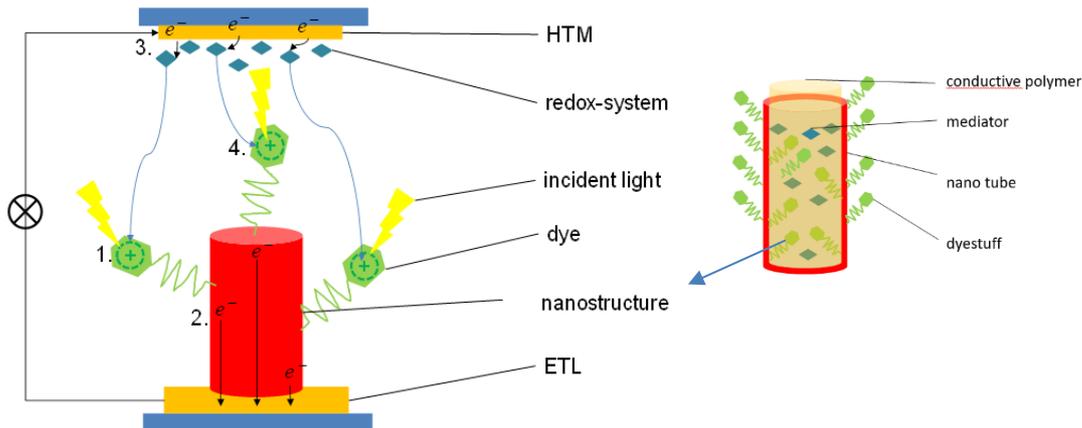


## Solar capsule

### Dye-sensitized solar cell for photovoltaic power generation

#### Invention

Solar energy is generated from solar panels or photovoltaic systems in solar farms or on house roofs. An invention by the University of Siegen based on a dye-sensitized solar cell (DSSC) now makes it possible to manufacture affordable thin-film solar cells that can be applied to any surface like paint.



Layout of a dye-sensitized solar cell and the solar capsule

The process starts by filling titanium dioxide nanotubes with a photochemically active dye and sealing them. These "solar capsules" are then applied to an electrically connected substrate on which they automatically arrange themselves through modified bonds. The last step involves applying a second contact in the form of a conductive polymer coating.

#### Commercial Opportunities

In the face of climate change, there is a need for alternative concepts for generating power. Wind turbines and photovoltaic systems have proven themselves well, although finding new locations to install them has become increasingly problematic. Thanks to the structure of these new nano solar cells, they can essentially be painted onto any surface. These self-organizing and self-arranging solar cells can make expensive coating systems obsolete, open up new surfaces to power generation and allow the necessary materials to be manufactured affordably on an industrial scale.

#### Current Status

An application for a patent has been submitted to the German Patent and Trademark Office (DPMA). Experimental proofs of concept that demonstrate basic feasibility will become available in the priority year. We are offering interested companies the opportunity to license and continue to develop this technology with the inventors at the university.

An invention of the University of Siegen.

#### Competitive Advantages

- Self-contained nanotube system
- Suitable for use on any surface
- Affordable thin-film solar cell
- Good structural reproducibility

#### Technology Readiness Level

1 2 **3** 4 5 6 7 8 9

Technology validated in relevant environment

#### Industries

- Electrical engineering
- Nanotechnology
- Semiconductors

#### Ref. No.

6360

#### Contact

Martin van Ackeren

E-Mail: [ma@provendis.info](mailto:ma@provendis.info)

Phone: +49(0)208-94105-34

