



Energy conversion as smart as Nature's own

Nanoscience basic research and new revolutionary energy technology.

Humanity is facing enormous sustainability challenges. And research is expected to deliver solutions – fast!

Revolutionary scientific discoveries have moved our civilisation forward, but the really crucial paradigm shifts on which our well-being rests are few and far between. And they are the result of curiosity-driven, long-term research without any demands for immediate utilisation.

Fundamentally new solutions require us to investigate completely unknown territory, not only to exploit and optimise what is already established and known, although that is also important.

Today, fossil fuels are the energy source for 40% of all the electrical power generated in the EU. The benefits for the climate would be great if we could make renewable solar energy equally efficient. Solar energy has great potential to become one of our most important renewable energy sources, but our current solar cells do not convert solar energy with sufficient efficiency. This requires completely new scientific discoveries.

After many years of work, basic research in nanoscience has resulted in improvements to our current solar cells, but there are several paths of investigation to pursue. Revolutionary solutions for sustainable energy technology require an ability to think several different thoughts at once.

Chemical energy, such as carbohydrates in the form of vegetable matter, is converted very efficiently into movement in every living organism, without major energy loss. The efficiency of these biological processes is higher than in energy technology

devised by humans. Inspired by how biological molecules function in energy conversion, researchers are investigating the possibility of applying these processes to electrons and photons in solar cells to increase efficiency.

This is basic research in thermodynamics at the nanolevel. It is difficult to predict its potential outcomes and applications exactly. This is inherent to the very Nature of basic research. Patience and long-term perspectives are required as researchers study how individual electrons behave, with the aim of increasing efficiency in the conversion of solar energy to electricity.

One thing is certain, however: giving researchers in nanoscience the conditions to study Nature's own smart energy conversion is a wise investment to meet the future generations' need for sustainable energy solutions.

For this research, Nanolab Science Village is a crucial asset. Imagine this being possible thanks to you!

CONTACT

Pia Siljeklint

Head of Development Office, Lund University

E-mail: pia.siljeklint@fsi.lu.se

Phone: +46 46 222 34 39

Cell Phone: +46 70 640 48 09