New, low energy solar power technologies are needed for sustainable clean power generation

Solar must provide >10% of power by 2050 and must grow faster than any other technology.

The dominant, silicon based, PV technology is limited by high embedded energy.

Solution processible organic semiconductors can be used to make ‘plastic’ (OPV) solar cells by a low energy printing process.

Life-cycle and cost analysis of organic solar cells

Model the production process in a pilot line at Danish Technical University (DTU)

LCA: Indium tin oxide (ITO) dominates embedded energy [1]

Cost: Lifetime dominates the cost effectiveness [2]

R&D Challenge: Low embedded energy electrodes

Silver nanowires are a low energy alternative to ITO

Optimising the process at Solar Press led to a fully printed 2.3% efficient solar cell.

Application Challenge: testing the lifetime of plastic solar cells

SP are now producing 4% devices in a roll-to-roll process.

We are testing the energy yield and lifetime of an organic solar PV system installed on a standalone Solar Cinema.

My Industry Fellowship has helped me to understand how my research can contribute to the global challenge of clean power generation and has taught me how to ask the right questions in our basic research.

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