

Solar power could become cheaper, more widespread

In a paper published in *Nature Energy*, Dr Ross Hatton, Professor Richard Walton and colleagues, explain how solar cells could be produced with tin, making them more adaptable and simpler to produce than their current counterparts.

Solar cells based on a class of semiconductors known as lead perovskites are rapidly emerging as an efficient way to convert sunlight directly into electricity. However, the reliance on lead is a serious barrier to commercialisation, due to the well-known toxicity of lead.

Dr Ross Hatton and colleagues show that perovskites using tin in place of lead are much more stable than previously thought, and so could prove to be a viable alternative to lead perovskites for solar cells.

Lead-free cells could render solar power cheaper, safer and more commercially attractive -- leading to it becoming a more prevalent source of energy in everyday life.

This could lead to a more widespread use of solar power, with potential uses in products such as laptop computers, mobile phones and cars.

The team have also shown how the device structure can be greatly simplified without compromising performance, which offers the important advantage of reduced fabrication cost.

Dr Hatton comments that there is an ever-pressing need to develop renewable sources of energy:

"It is hoped that this work will help to stimulate an intensive international research effort into lead-free perovskite solar cells, like that which has resulted in the astonishingly rapid advancement of lead perovskite solar cells.

"There is now an urgent need to tackle the threat of climate change resulting from humanity's over reliance on fossil fuel, and the rapid development of new solar technologies must be part of the plan."

Perovskite solar cells are lightweight and compatible with flexible substrates, so could be applied more widely than the rigid flat plate silicon solar cells that currently dominate the photovoltaics market, particularly in consumer electronics and transportation applications.

Abstract:

A breakthrough in solar power could make it cheaper and more commercially viable, thanks to research at the University of Warwick.

Solar power- sončna energija (is the conversion of sunlight into electricity, either directly using photovoltaics (PV), or indirectly using concentrated solar power)

Solar cells- sončne celice (A solar cell, or photovoltaic cell (previously termed "solar battery"[1]), is an electrical device that converts the energy of light directly into electricity by the photovoltaic effect, which is a physical and chemical phenomenon.)

Current- tok (An electric current is a flow of electric charge. In electric circuits this charge is often carried by moving electrons in a wire. It can also be carried by ions in an electrolyte, or by both ions and electrons such as in a plasma.)

Electricity- elektrika (Is the set of physical phenomena associated with the presence and flow of electric charge.)

Laptop computer- prenosni računalnik (A laptop, often called a notebook or "notebook computer", is a small, portable personal computer with a "clamshell" form factor, an alphanumeric keyboard on the lower part of the "clamshell" and a thin LCD or LED computer screen on the upper portion, which is opened up to use the computer.)

Renewable sources of energy- obnovljivi viri energij (Renewable energy is energy that is collected from renewable resources, which are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat.)

Voltage- napetost (electromotive force or potential difference expressed in volts.)

Climate change- podnebna sprememba (Climate change is a change in the statistical distribution of weather patterns when that change lasts for an extended period of time (i.e., decades to millions of years).

Mobile phones- mobilni telefoni (A mobile phone is a portable telephone that can make and receive calls over a radio frequency link while the user is moving within a telephone service area.)

Technology- tehnologija (Is the collection of techniques, skills, methods and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation.)

Process- processing

Use- using

Great- greatly

Change- changing

Lead- leading