# Press Release

DBU Deutsche Bundesstiftung Umwelt

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# Setting new standards in photovoltaics with "the power of 500 suns"

## 2012 German Environmental Award: Individual commendations for Dr. Andreas Bett, Fraunhofer ISE, and Hansjörg Lerchenmüller, Soitec Solar GmbH

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**Freiburg. "Low material costs, efficiency records, qualified jobs: with inquiring minds and the courage to take risks, Andreas Bett and Hansjörg Lerchenmüller have taken solar power into a new generation and shown that ecology and economics are compatible with one another. Their concentrator photovoltaics is at the forefront of the global photovoltaic industry with module efficiency rates of around 30 percent and makes a great contribution to creating a climate-friendly energy supply." - This is how Dr. Fritz Brickwedde, Secretary General of the Deutsche Bundesstiftung Umwelt (DBU), today announced the presentation of the 2012 German Environmental Award of the DBU to Dr. Andreas Bett (50), deputy director of the Fraunhofer Institute for Solar Energy Systems (ISE) and head of the "Materials – Solar Cells and Technology" division, and to Hansjörg Lerchenmüller (45), CEO of Soitec Solar (both Freiburg). German President Joachim Gauck will present them with the award in Leipzig on 28 October. Their prize money: 250,000 euros.**

*Energy yield twice as large as with conventional technology*

"Bett and Lerchenmüller have made an outstanding contribution to the use of solar energy by developing a new solar technology to marketable standard," Brickwedde said. What set this concentrator photovoltaics (CPV) apart above all, he said, was its high degree of efficiency. According to Brickwedde, this meant that a relatively large proportion of the energy from sunlight could be converted into electricity, with a module efficiency of around 30 percent being achieved in practice. This made the energy yield of the concentrator technology around twice as large as that of conventional silicon technology, he said.

*Lenses concentrate light into the power of five hundred "suns"*

Brickwedde explained that the high efficiency resulted from a technical trick: the CPV systems contained so-called "stacked cells". Unlike the usual photovoltaic technology, in which solar cells are arranged in just a single layer, with stacked cells several solar cells made of different materials were arranged on top of each other, he said. "The clever mixture of materials makes it possible to use a larger proportion of the energy from sunlight than with solar cells made of only one single material," Brickwedde said. Another reason for the high effi-

ciency, he said, was the modular principle developed by the two inventors. He described how, with conventional solar cells, the sunlight entered the cell directly, while with concentrator PV modules, it was first concentrated by a lens, thus greatly increasing the intensity of the light. Researchers spoke informally of 500 "suns", Brickwedde said. The advantage, he said, was that a tiny solar cell sufficed to use the focused light, meaning that very little material was needed to produce the cell. This allowed solar engineers to use expensive cells of the highest efficiency.

*"Brilliant" researcher and "experienced business mind" get together*

Brickwedde went on to describe how the development of the concentrator technology had been significantly influenced by the Fraunhofer ISE, for which Bett, born in Furtwangen, had carried out research on solar cells since 1987. "Bett is a brilliant solar-cell developer who with his team always leads the field in the race for world records. He recognised and worked to advance the potential of CPV technology from an early stage," he said. At this time, he said, Lerchenmüller had been in charge of profitability, market and technology analyses at ISE, and had the task of assessing the chances for success of the projects on which his colleagues were working. According to Brickwedde, Lerchenmüller saw excellent prospects for CPV systems, which is why he was happy to accept a position as CEO and Senior Vice President of the start-up enterprise Concentrix – now Soitec Solar – which was founded in 2005 by the ISE. Brickewedde said that Lerchenmüller – a physicist and marketing expert from Riedlingen – was a "confident and experienced business mind" who had very skilfully led the Fraunhofer offshoot to become an industrial company with a highly automated production technology for manufacturing CPV modules.

*Successful technology transfer from science to industry*

"Lerchenmüller and Bett are living proof of the successful interaction between scientific excellence and business enterprise. Together, they have successfully travelled the long path from vision to industrial product. Despite technical obstacles and financial risks, they have never lost sight of their goal – to establish a new, innovative environmental technology on the market. Their story is a testament to how the technology transfer from research to industry can succeed and how at the same time new, qualified jobs can be created. With their achievements, they serve as an example to other scientists and businesspeople," Brickwedde said.

*Solar plants in 14 countries on four continents*

Brickwedde described how Bett and Lerchenmüller built their first pilot plant in Lorca (Spain) in 2006 with financial backing from DBU. Plants in 14 countries on four continents have followed up to now – including in the USA, Italy, France, Egypt, South Africa, China and Saudi Arabia. He said that a further production location was currently being constructed in San Diego (California) to supply the south-west of the USA. According to Brickwedde, the Concen-

trix™ technology was now seen as one of the best in the world in the field of concentrated photovoltaics and was used in solar-energy plants in many sunny regions. He said such plants were now already able to compete on several markets without receiving any subsidies, and that their costs were coming down as the price of conventional energy was going up.

*German "green-tech" on the rise across the world*

Brickwedde: "Solar energy is an important mainstay of environmentally-friendly energy production. Solar power plants produce electricity without emissions or waste and protect the finite resources of our planet. Solar power – partly in view of the energy switchover now taking place– will gain even more in importance over the next few years. That is why it is important to produce solar current at the lowest possible cost and the highest possible efficiency. With their concentrator technology, Bett and Lerchenmüller have set new standards in photovoltaics. Thanks to their scientific and entrepreneurial commitment, green-tech 'made in Germany' is on the rise across the world. They have fuelled innovations and proven that economic growth and environmental protection cross-fertilise each other."