**Solar photovoltaic energy: today’s crisis and tomorrow’s technologies**

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After recalling some general principles of solar energy, we will present the technologies to transform solar energy into electricity. Their potential developments will be described with particular emphasis on new photovoltaic technologies that are changing rapidly. The differences between the photovoltaic technologies of the first, second and third generations will be described with emphasis on the technical issues from the perspective of industrial development. We will highlight how basic science will support this evolution. We will present an economic comparison of different technologies using solar energy prospects in comparison to other energy sources. This will draw some conclusions about the medium and long term that will help to better understand the issues in the current debate on energy transition.