

Recycling and Reuse of Photovoltaic Panel Components

Manuel F. M. Costa

Center of Physics of the Universities of Minho and Porto, University of Minho, Portugal

Abstract

It is our days widely recognised that the use of renewable energy is crucial for the sustainability of the planet.

Photovoltaic solar energy harnessing has increased exponentially in recent years, driven by evidence that this renewable energy source can make a significant contribution in replacing fossil fuels.

However, the long-term sustainability of photovoltaic energy will depend not only on the improvement of the photovoltaic energy conversion processes and on its widespread use, but also on the recycling of photovoltaic panels and systems. Processes must to be developed or improved to proceed with the recycling and reuse of the high volume of photovoltaic panels and systems that are reaching or will reach the end of their useful life in the near future.

Recycling is a fundamental process for the reuse of valuable materials contained in photovoltaic panels and, at the same time, with this proper recycling and reuse, environment pollution by harmful elements, such as heavy metals, can be avoided or significantly reduced.

In this communication we will discuss the importance of reusing the constituents of photovoltaic panels, and a practical case of the disassembly of a photovoltaic panel will be presented in order to understand how and which materials can be reused and which materials will have to be recycled, due to the impossibility of reusing them in the construction of a new photovoltaic panels. A quantification the economic and ecological value of the process will be made. We will finally draw a critical opinion and a set of key aspects to be taken into account in the future recycling and reuse of the various constituents of photovoltaic panels.

Keywords

Photovoltaic; Photovoltaic panels; Recycling; Sustainability.

Biography

Manuel F. M. Costa hold a PhD degree in Science (Physics) from the University of Minho (Portugal) working since 1985 at its Physics Department teaching and performing applied research in optical metrology, image processing, thin films nanostructures and applications, instrumentation, and science education and literacy. Presented and published around four hundred scientific works. Chair of over thirty international conferences and editor of several book and journals. Immediate past-president of the Ibero-American Optics Network. President of the Portuguese Society for Optics and Photonics and of the Hands-on Science Network. Deputy chair of the Scientific Advisory Board of the European Optical Society. Regional representative for Europe and EXCOM member of the International Council of Associations for Science Education. Fellow of the European Optical Society.