FRELP PROJECT LIFE12 ENV/IT/000904

Full Recovery End of Life Photovoltaic

A process for the recovery of all useful materials from photovoltaic panels at their end of life

PRESS RELEASE

Sasil S.p.A., Stazione Sperimentale del Vetro and PV Cycle are working on a 4 years project to test and demonstrate the application of innovative technologies for integral recycling of end-of-life PV panels, mono and poly-crystalline, in an economically and viable way.

Four solutions have been proposed with low environmental impact for the recovery of the following components:

- Automated recovery of aluminum profiles;
- Recovery of high quality extra clear glass, to be employed in hollow and flat glass industry, implying very significant energy and CO_2 emission saving in the glass melting process;
- Recovery of (metallic) silicon, to be employed as ferrosilicon in iron silicon alloys, thus saving important energy cost and CO_2 emission for the production of primary silicon;
- Recovery of silver by electrolysis.

The partnership wished to share with stakeholders the first important milestone achieved: having found the technological solutions for every step of the treatment process and translated into a technically and economically feasible industrial process design.

To this end, on the 25th of September, a conference took place at the visitors centre of Laghetto Gabella in Curino (Biella, Italy), in the past a feldspar mine transformed in a prestigious natural area.

During the conference, the actual situation concerning the collection of end-of-life PV panels has been illustrated by PV Cycle's Olmina della Monica. It appears that the conferment of such panels saw a significant drawback since 2012 when incentives in Europe for the substitution of old panels were strongly reduced. This drawback is expected to imply a delay in the need for technologies for their disposal with several years.

Gian Andrea Blengini of the JRC - Institute for Environment and Sustainability presented the life cycle assessment performed on the FRELP process, showing the important improvements that can be achieved with respect to actually available technologies. He highlighted as well the important contribution the project can offer to the EU Draft Ecodesign Working Plan 2016, identifying the constraints that actual product design imply for the full recovery of the panels and that could be improved by producers. As such, in particular the use of fluorine content in the panel's back-sheet should be abandoned to permit an environmentally and economically optimal recovery process.

Vico Ramon, project manager of FRELP, then illustrated the objectives of the project and the 4 phases of the treatment process that will be piloted next year. He extensively revealed the environmental achievements that are expected, as well as the employment opportunities that would derive from exploitation of the treatment process.

At this point, and before presenting more in detail the main technologies to be experimented, Sandro **Hreglich** of the Stazione Sperimentale del Vetro explained in detail how PV panels are constituted, underlining the high variability of the materials involved and their respective amounts. The explanation made clear which materials can be recovered (glass, silver, alumina, silicon) and what are the main difficulties to do so.

After the coffee break Sasil consultant Piero Ercole explained in detail the various technologies studied, simulated and trialed to separate the glass from the polymer-based adhesive encapsulation layer (called EVA) and showed the identified best technology translated into a pre-prototype that offered excellent results. He proceeded with an exposure of the further treatment of this EVA, originally foreseen to be submitted to pyrolysis, but, due to environmental constraints, at last transformed in ashes by means of controlled combustion. This process was trialed by the Stazione Sperimentale del Combustibile.

Lastly, Stefano Ceola explained the audience how from these ashes metals will be recovered.

Next step of the project regards the realisation of prototype equipment to trial the findings on a significant scale (1 ton PV panels per hour). The construction is expected to be performed during 2016 after obtainment of the needed authorisations, while pilot operation is foreseen in 2017.

For further information:

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