

# Building an industry in which we can trust

One of the industry's leading module recycling companies, Loser Chemie GmbH develops and distributes future-oriented and environment-friendly products, plants and processes. It's currently focussing on getting the very most out of PV recycling, but as Dr. Wolfram Palitzsch (CTO) and Ulrich Loser (CEO) observe, there are a few obstacles that need to be negotiated along the way...

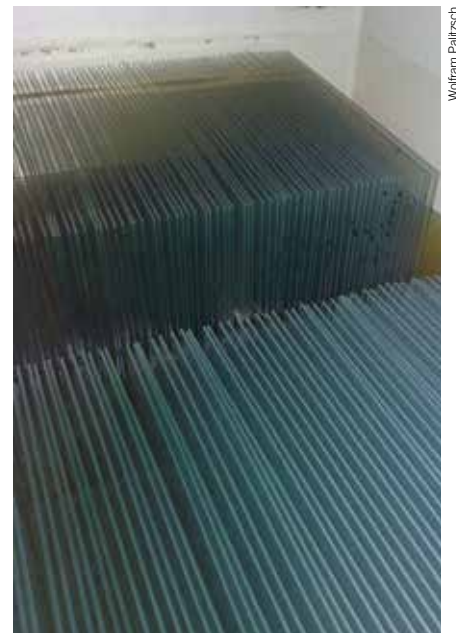
**PES:** Welcome to PES. Would you like to begin by introducing the company and explaining how you serve the PV industry?

**Wolfram Palitzsch:** The roots of Loser Chemie GmbH are closely linked with water chemistry and recycling, and for the PV industry in particular, the company has developed a range of cutting-edge, environmentally friendly recycling methods for the rare metals found in photovoltaic production scrap or end-of-life-waste, such as indium, gallium, tellurium, silver, etc.

Our technological capabilities cover the complete customer service, because our goal is to help the solar industry to reduce costs and to become green, from the beginning to the end of a module's lifecycle.

**PES:** Roughly what percentage of a module can be recycled at present? What challenges currently prevent this figure from reaching 100%?

**WP:** In our experimental system, we have recycled nearly 100% – and this is certainly possible in a large system. However, under



Wolfram Palitzsch

Pilot station, container bath for dissolving of the semiconductor layers from PV semi products



Wolfram Palitzsch

Raw material (black glass) and the possible products: clean glass, clean plastic foil flake (white, left), indium hydroxide (white powder), received from the yellow extraction solution, and last but not least, indium as metal



Wolfram Palitzsch

Useable glass after chemical treatment



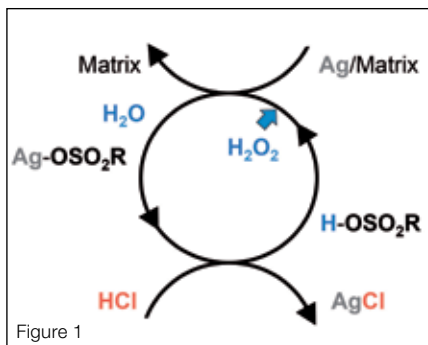
Pice (brick) as result of re-melting Si scrap after de-metallization



Scrap ready for recycling



Raw material lead after treatment to the bricks (photo before)



WEEE quotas, 100% recycling is not necessary.

When a module is, for example, 90% glass, then grinding and recycling in foam glass or fibre glass is sufficient to achieve the required rate. But the 1% of rare metals are lost. We would like it if there was a quota set for all used materials.

**PES:** Environmentally-friendly products and services seem to be no longer such a pressing issue for consumers. Is the same true for companies? Or has the media spotlight merely shifted for the time being?

**Ulrich Loser:** We do not believe that the end user is not environmentally conscious.

However, environmental awareness must also be affordable. Finally, a healthy balance between economy and ecology only lead to success.

As for the media, on the one hand it is good if education is operated. On the other, it is a major feat to convey the complexity of this problem to all equally.

**PES:** Just how competitive is your corner of the solar/PV market? Would it be fair to say that it's an area that's set to grow still further?

**UL:** This is a difficult question. If everything were normal, one could say that we are one of the few companies worldwide that recycle already active and demonstrable amounts photovoltaic waste.

But we are still dependent on input quantities. A large plant requires a critical amount of waste so that they can operate economically – and that could not be said of the last two years. And that is also the reason why Loser Chemie could not invest in this area. Currently, the market is not stable and there are too many gossips. There are many studies that predict large amounts of return – but no one can say when that will be exactly.

**PES:** Do Europe's many laws regarding greentech waste help or hinder your business?

**WP:** This is a more difficult question. The coin has two sides. From the perspective of the high-tech industry, it is necessary that the essential materials that we need to import in some quantity, are kept in the loop.

Unfortunately, we only find these important metals in low concentrations in waste. The concentration is complicated but with universal method and use of synergies feasible. But only if not because of a quota of 90% for example, the recycling of the few percents of rare metals sweep under the table.

In our opinion, the EU should reconsider the existing regulations. The laws are not yet optimal.

**PES:** Your website mentions your commitment to innovation. Would you care to give us an example of your work in this arena?

**WP:** Yes, of course. We developed several novel methods for dissolving and reclaiming rare metals from scrap of chalcopyrite (CuInS<sub>2</sub>, CuInSe<sub>2</sub> and Cu(InGa)Se<sub>2</sub>) systems, the II-VI compound semiconductor CdTe and the III-V compound semiconductor GaAs and associated photovoltaic manufacturing waste, like overspray and overlaid shields.

These chemicals can't be physically separated, but our chemical approach can. By the use of alkylsulfonic acids we can extract in every case all used metals in a very short reaction time. From this recycling process of end-of-life or semi materials we obtained the result that the clean glass pieces are useable for float glass production.

Consequently, we were able to establish with our partners that the recycling into float glass is possible with such assorted raw cullet of known provenance and very low contamination. Our chemical extraction operates at room temperature and the used alkylsulfonic acid is readily biodegradable (OECD 301 A).

The method is universal and is also used for the recycling of silver from waste silicon cell applicable. As shown in the figure 1, we use alkylsulfonic acid as a transport system, which is recovered. We can work without the formation of nitrous gases from how they normally occur with use of nitric acid in the field of silver recovering.

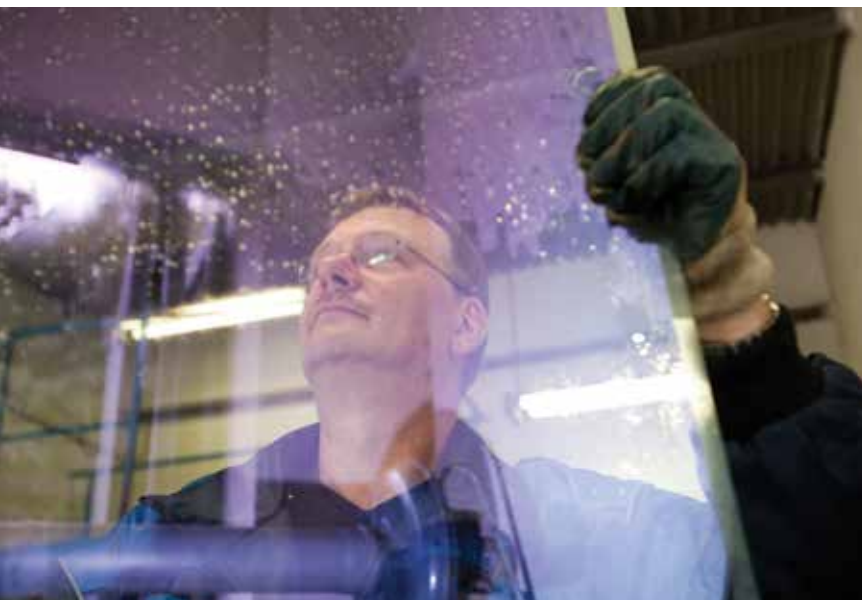
**PES:** The industry is fairly well established. Do the older modules present you with more of a challenge than what are being produced today?



Stacking production waste into the pilot system



Taking back the clean glass from the pilot system



Controlling the leaching result



Indium hydroxide from thinfilm PV recycling

**WP:** This problem is well known to us. In general, recycling is lagging behind the new developments. That is why we always get new products to test our system. So far our method has not yet failed.

**PES:** Is the PV industry serious about creating truly sustainable solutions across all stages of the product life cycle?

**WP:** We hope so. We have had very good discussions that have given us reassurance in this regard.

But the idea alone is not enough – it must be wanted by the market, especially the consumer.

**PES:** In a recent issue, we touched upon the shortage of (affordable) rare earth metals. Do you believe that this is an issue that needs to be addressed?

**UL:** Honestly, there is no real shortage of rare earths. However, the Western world is

dependent on imports – and this is the real difficulty. It comes to saving of supply. So, it is natural to pay attention to the effective use of imported materials.

It starts with the recycling of production waste and ends with the recycling of products at the end of their life cycle.

**PES:** Similarly, as the quality of PV products improves, will there be less of a market for your recycling services in future?

**WP:** Certainly there will be movement in the future. However, so far incredible amounts of products have been installed. If these all need to be recycled, it will require more than our small company to handle them.

We are also very open to all new developments. We try to develop universal technologies that can cover a broad spectrum, including a comprehensive recycling of all materials.

**PES:** How important is Europe to your operation? Are there any countries in particular that are performing well for you right now?

**WP:** Due to rising transportation costs, we will have to give decentralised solutions and Loser Chemie is much too small for disposing Europe. However, European partnerships for the implementation of the vision are very important.

**PES:** What are your thoughts about prospects for the coming year with regard to your organisation, and the solar/PV industry in general?

**UL:** This is very exciting. We are very curious to see how the amount of waste that will develop. Furthermore, we are very curious what effect the WEEE Directive has. At the end of the day, we want a stable PV industry that we can invest in. ■

[www.loserchemie.de](http://www.loserchemie.de)