

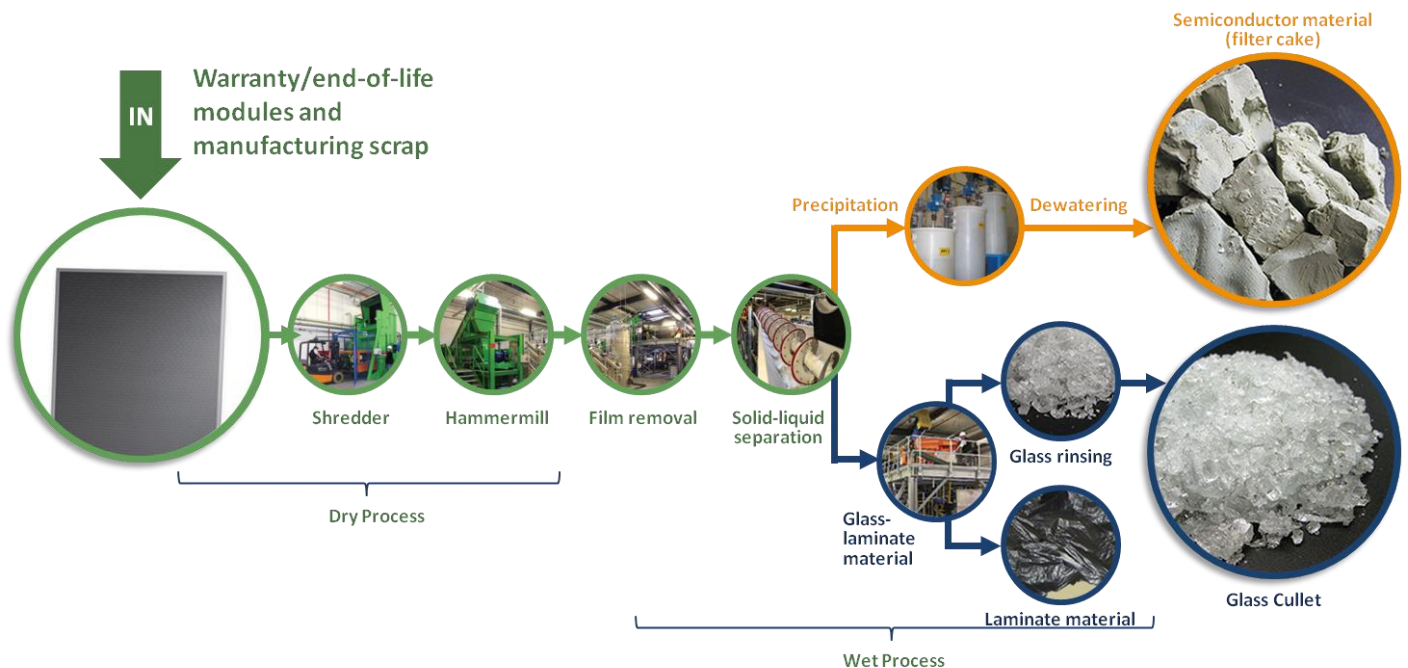
Source : First Solar

Thin Film (CdTe) recycling process – First step

First Solar has developed and implemented a prefunded module collection and recycling program. At any time anyone in possession of First Solar modules may request collection, at no charge. Funds are set aside at the time of module sale in a restricted investment account that is controlled by a trust. Under this program, First Solar manages the recycling of modules and the reuse of materials into new solar modules and new glass products. All First Solar manufacturing facilities have commercial scale recycling facilities.

The collected modules, together with the manufacturing scrap are shredded and crushed in a hammer mill after which the CdTe film is removed in a rotating, stainless steel drum. An aspiration system has been put in place to control the dust production during the initial crushing process. Afterwards, the solid and liquid content are separated from each other. The metal-rich liquids undergo a precipitation process and the resulting filter cake is sent to a third party for further processing. This filter cake contains 95% of the semiconductor material of the modules. The solid content contains glass and laminate material. The laminate is filtered out and the glass is rinsed (cleaned); 90% of the glass can then be reused in new glass products and the laminate is disposed. Each of the manufacturing facilities is equipped with a recycling facility. Until the end of 2009, over 1600 tons have been treated, including mainly manufacturing scrap, warranty returns and pre-mature end-of-life modules.

First Solar's Module Recycling Technology



Source : 5NPV

Thin Film (CdTe) recycling process – Second step

5N PV, a subsidiary of 5N Plus has been operational since 2008 and active in the recycling of PV manufacturing by-products. They deal with the recovery of valuable metals, such as cadmium (Cd), tellurium (Te), selenium (Se) from Thin Film manufacturing scrap and from concentrates resulting from etching and recycling processes.

For the recovery of tellurium (Te), a typical hydro process is used. Such a process includes treatment steps such as leaching, filtration, oxidation, reduction, precipitation of the metals and/or impurities and electrowinning of the valuable metals. For cadmium (Cd) extraction and refining, in addition, cementation and ion exchange are necessary. For the recycling of CdTe scrap, the current recovery rate is 95%. In the end, plated cadmium and tellurium can then be further purified for reuse in the manufacture of cadmium telluride.

5NPV's CdTe Recycling Process

