

行政院所屬各機關因公出國人員出國報告書
(出國類別：考察)

赴德國及法國考察太陽光電模組
管理機制及後端回收處理再利用技術

服務機關：行政院環境保護署
資源回收管理基金管理會
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摘要

太陽光電模組 (Photovoltaic, 以下簡稱 PV 模組) 為綠能新趨勢, 因其種類多、結構複雜, 且所含玻璃、金屬透過適當處理仍可進行再利用。因此, 若能蒐集妥適回收處理技術, 建置回收管理機制, 將可提升再利用成效。本次至 ITRI Western Europe Office, 瞭解歐洲目前 PV 模組的發展現況、德國 aleo solar GmbH 公司, 瞭解 PV 模組綠色製程的導入概況、德國 Reiling GmbH & Co. KG 公司, 瞭解廢 PV 模組的處理技術, 包含玻璃、金屬之回收再利用等及法國 PV CYCLE France SAS 協會, 瞭解 PV 模組管理系統及後端回收處理模式, 以作為本署制定相關政策之參考。本次出國主要成果摘要如下:

一、ITRI Western Europe Office

ITRI Western Europe Office 為工研院設於歐洲柏林之辦事處, 主要工作為蒐集歐洲最新科技, 及與歐洲之研發機構建立完善合作研發管道。目前歐洲在 PV 模組發展以矽晶型為主流, 約占 80%。就德國而言, PV 模組裝設地點以北部較多, 但因主要用電工業集中於南部, 因此面臨北電南送所需之銜接電網的高成本問題。目前歐洲的 PV 模組廢棄量並不多, 但依據 bifa environmental institute 引用 CERES2013 資料指出, 2020 年預估歐洲的 PV 模組廢棄量將達 32,500 公噸。歐洲國家對 PV 模組於廢棄後回收處理規範主要依循歐盟 WEEE 修正指令(2012/19/EU), 該指令要求各國於 2018 年 8 月 14 日前針對廢棄 PV 模組的再使用及再利用率 (Reuse 及 Recycle, 屬物質回收) 需達 70%; 回收再利用率 (Recovery, 含物質回收及能源回收) 需達 80%。

二、aleo solar GmbH 公司 (以下簡稱 aleo 公司)

aleo 公司為 PV 模組組裝廠, 可因應用戶端需求開發不同 PV 模組產品。aleo 公司非常著重 PV 模組的架設安全問題, 其生產之 PV 模組的鋁框架厚度為 50 mm, 可用以承受 550 kg/m²的機械阻力(mechanical resistance)。而在綠色設計的導入方面, 則體現於材料的改良, 例如背板材質以 PET 取代杜邦™ 特能® (Tedlar®)、背板膠模層以 Polyolefin elastomer, POE 取代 Ethylene-Vinyl Acetate ,EVA, 但仍需考量成本及產品的穩定性和可靠性。aleo 公司可提供故障品維修服務, 但僅限於接線盒(junction box)或電纜線(cable)等電子零件的故

障排除，若為 PV 模組本體破損則無法維修，可提供回收點集中代收，再由合格之廢棄物處理公司定期進行清運，至於廢棄物處理公司如何處理廢棄 PV 模組，則表示暫時無相關資料。

三、Reiling GmbH & Co. KG 公司（以下簡稱 Reiling 公司）

Reiling 公司為 PV 模組處理廠，統計各類型 PV 模組市占率為：矽晶型占 92%、薄膜型 CdTe 占 5%、薄膜型 CIGS 占 2%、其他型占 1%。目前 Reiling 公司主要處理矽晶型產品，而廢薄膜型產品因種類較複雜且部分含有有毒金屬，故僅先暫存。由於 PV 模組的廢棄量有限，Reiling 公司會累積約 50 公噸再進行處理，平均每年處理 2-3 次。處理流程先以人工將鋁框、接線盒、電線拆除後，以 2 段破碎將玻璃破碎至 3mm 粒徑，接著由磁選及渦電流分選系統分離鐵及非鐵金屬，再由排氣系統分離 EVA 及 PVB，最後再以光學分選系統去除不透光的物質（如塑膠）。廢棄 PV 模組經上述處理後，轉化為 69.22%玻璃、9.16%金屬及 21.62%塑料，其中，塑料雖含部分玻璃但仍可用以製作地毯；玻璃則作為發泡玻璃或玻璃纖維。Reiling 公司可協助處理其他國家廢 PV 模組（如：瑞士），處理費依廢料狀況而定，約 80-100 歐元/公噸（不含運費）。

四、PV CYCLE France SAS 協會（以下簡稱 PV CYCLE 協會）

PV CYCLE 協會為針對 PV 模組回收處理而設立的跨國非營利組織，法國政府規定 PV 模組製造商及進口商須向 PV CYCLE 協會註冊，並依據其製造量或進口量繳交規費。當 PV 模組需報廢時，用戶可向 PV CYCLE 協會提出清運申請，若廢棄數量少於 30 組，用戶需自行送至鄰近之回收站，PV CYCLE 協會會安排後續清運事宜，若廢棄數量大於 30 組，PV CYCLE 協會則會安排專車至現場清運。目前法國 PV CYCLE 協會清運之廢棄 PV 模組統一送至位於馬賽的 Veolia 處理廠進行後續回收處理，處理方法以機械破碎方式分為玻璃、金屬和塑料等三類，其中玻璃及金屬因純度較差，僅可降階進行再利用，至於塑料則焚化供能源再生。Veolia 處理廠亦可協助處理其他國家之廢棄 PV 模組，處理費約為 360 歐元/公噸（含馬賽港到工廠之運費）。

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- 附件 1 DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF
THE COUNCIL
- 附件 2 aleo-premium solar panels manufacturer
- 附件 3 PV CYCLE, LA SOLUTION DEEE POUR PANNEAU
PHOTOVOLTAÏQUES USAGÉS

壹、前言

太陽能是一種乾淨的能源，由於具有取之不盡的優勢並可在發電之餘不至於加速地球暖化，故已成為世界各國競相發展的重點綠能產業。國內太陽光電模組(Photovoltaic，以下簡稱 PV 模組)的裝置主要分為屋頂型及地面型，目前政府規劃 PV 模組裝置容量目標於 2018 年達到 1.44GW，並於 2025 年提升至 20GW。然而，PV 模組於使用後仍會面臨廢棄問題，惟國內目前就廢棄 PV 模組之回收處理尚未有相關的管理機制及合適的去化方式。因此，本次至德國及法國考察歐洲國家於廢棄 PV 模組之管理機制及後端回收處理之再利用技術，作為本署制定相關政策之參考依據。

貳、考察目的

大部分的歐洲國家長期致力於太陽能的開發與應用，故已建立完善的 PV 模組產業鏈，並成立跨國之非營利組織 PV CYCLE France SAS 協會，以協助歐洲各國進行廢棄 PV 模組之回收及處理，其中又以德國和法國為箇中翹楚。由於 PV 模組的主要成分為玻璃和金屬，可進行回收再利用，再加上部分薄膜型 PV 模組含有有毒重金屬，並不適合以掩埋或焚化進行處理。鑑於國內缺乏廢棄 PV 模組之管理機制及回收處理技術，故本次特別規劃至德國及法國瞭解 PV 模組綠色製程技術發展、回收處理及管理機制、相關物料再利用循環等資訊。

綜合上述，本次參訪考察目的的整理如下。

- 一、拜訪 ITRI Western Europe Office，瞭解歐洲 PV 模組之發展概況。
- 二、考察德國 aleo solar GmbH 公司(以下簡稱 aleo 公司)，瞭解 PV 模組廠針對後續廢棄物減量或增加回收利用可導入之綠色設計製程技術，作為國內業者提升製程技術型態及生產綠色產品之參考。
- 三、考察德國 Reiling GmbH & Co. KG 公司(以下簡稱 Reiling 公司)，瞭解廢棄 PV 模組再利用處理設備及技術，以評估我國回收處理技術及再利用方式之參考依據。
- 四、考察法國 PV CYCLE France SAS 協會(以下簡稱 PV CYCLE 協會)，瞭解歐

洲於 PV 模組之管理機制及後續廢棄物清除處理或再利用體系等資訊，作為研議建構我國回收處理體系之參考。

參、出國行程與內容概要

日期	工作內容概要
8/21 (一)	搭機至法國 (巴黎)。
8/22 (二)	自法國 (巴黎) 轉機至德國 (柏林) 過夜。
8/23 (三)	拜訪德國柏林 ITRI Western Europe Office，瞭解歐洲 PV 模組之發展概況。
8/24 (四)	考察德國 aleo solar GmbH 公司，瞭解 PV 模組最新製程及綠色製程的導入狀況。
8/25 (五)	考察德國 Reiling GmbH & Co. KG 公司，瞭解廢棄 PV 模組玻璃及塑料之回收再利用情形。
8/26 (六)	勘查當地資源回收工作情形，整理資料。
8/27 (日)	自德國 (科隆) 搭高鐵前往法國 (巴黎)。
8/28 (一)	考察法國 PV CYCLE France SAS 協會，瞭解 PV 模組管理系統及後端回收處理方式。
8/29 (二) 至 8/30 (三)	返程

肆、考察過程

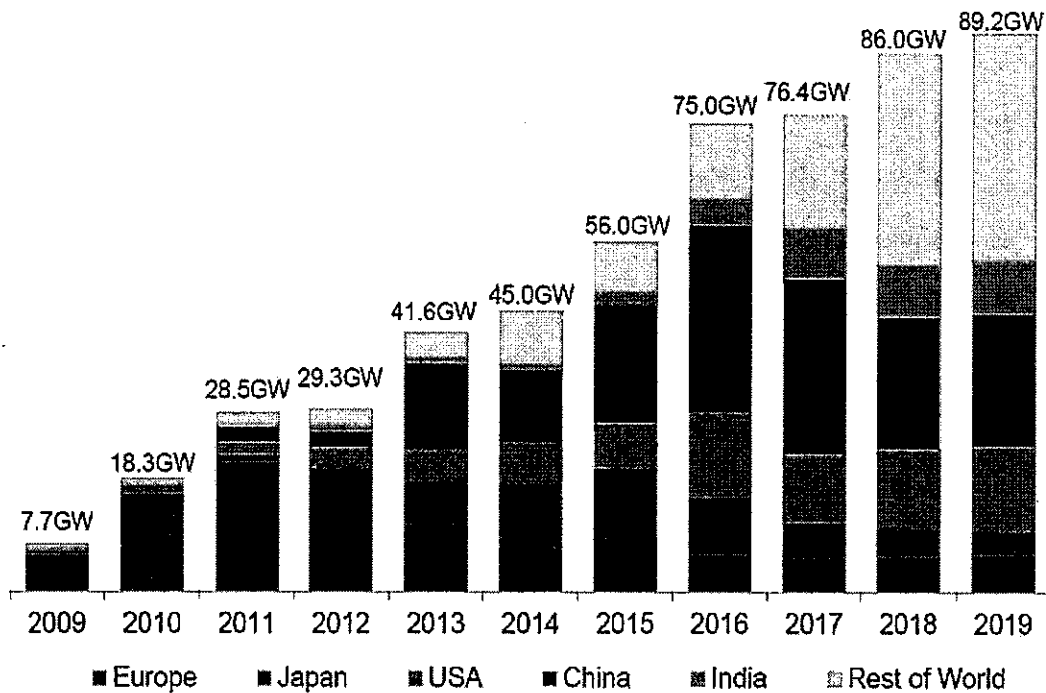
一、ITRI Western Europe Office

ITRI Western Europe Office 為工研院設於歐洲柏林之辦事處，主要工作為蒐集歐洲最新科技及與歐洲之研發機構建立完善合作研發管道。本次參訪主要就歐洲在 PV 模組之發展現況及回收處理管理機制進行交流，與該辦事處副代表 Fang-Chu Chen, Ph.D 之合影如圖一。



圖一 ITRI Western Europe Office 外觀及與代表處人員合影

PV 模組為目前世界各國發展之再生能源產業，依據 Bloomberg New Energy Finance 調查 2009~2019 年全球 PV 模組裝置量資料指出，至 2016 年全球 PV 模組裝置累積量已大於 300GW，預計 2019 年可大於 500GW，有關各國 PV 模組裝置量如圖二所示。



註：資料來源 Bloomberg New Energy Finance

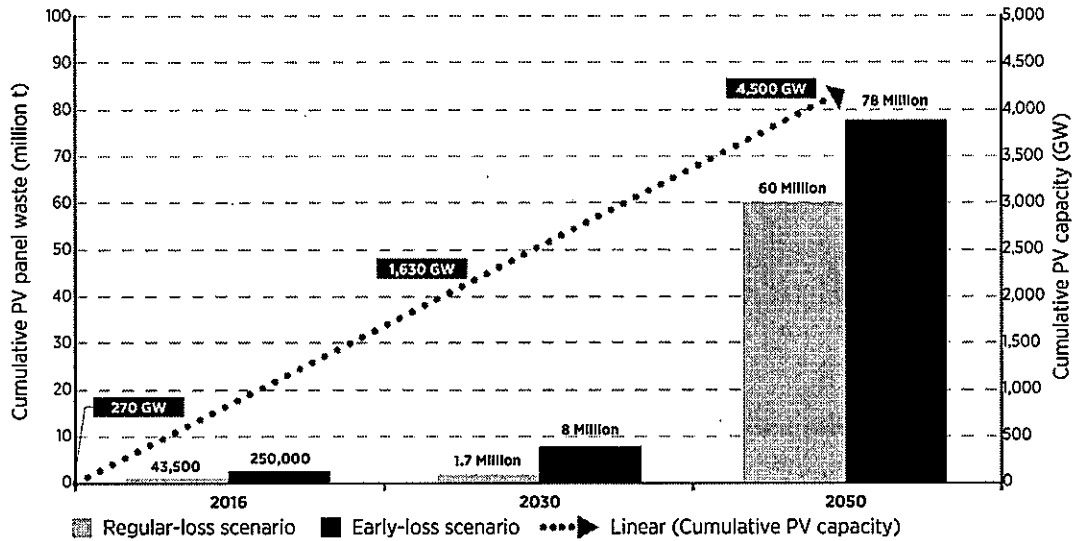
圖二 2009~2019 年全球 PV 模組裝置量

PV 模組主要可分為矽晶型(Crystalline-Silicon)及薄膜型(Thin-film)兩大類，其中以矽晶型為主流，約占 80%。儘管薄膜型單價較低，但效率不佳及含有毒重金屬如鎘(Cd)仍是關鍵問題。目前全球薄膜型 PV 模組製造商所剩不多，在美國為 First solar、日本為 Solar Frontier、中國為漢能薄膜發電集團。太陽能發電在德國的應用發展方面，大部分的 PV 模組裝設在北部，但用電量較大之工業卻集中於南部，故需建設長途輸送電網將北電南送，因而需面臨高成本之電網銜接問題，也因此目前德國政府對於 PV 模組之應用推廣已轉向補助儲能系統，而儲能系統以鋰鐵電池為主流。

PV 模組之產品生命週期約 20-30 年，故目前廢棄量仍不多。依據國際可再生能源機構(The International Renewable Energy Agency, IRENA)機構統計，2016 年全球的 PV 模組廢棄量約 293,500 公噸，且預估在 2030 年和 2050 年分別來到 970 萬公噸和 1.38 億公噸，如圖三所示。而歐洲國家對 PV 模組於廢棄後回收處理規範主要依循歐盟 2012 年 8 月 13 日所生效 WEEE 修正指令(2012/19/EU)，其中將 PV 模組新增於原第 4 類產品，而該指令規範 2018 年

8月14日前再使用及再利用率(Reuse及Recycle,屬物質回收)需達70%;回收再利用率(Recovery,含物質回收及能源回收)需達80%。由於PV模組屬生命週期較長之產品,因此在回收處理方面也希望能在符合指令規定下,儘可能使用既有的收集及回收處理系統。

Overview of global PV panel waste projections, 2016-2050



註: regular-loss: 正常報廢之 PV 模組(生命週期 30 年估算)

Early-loss: 因故提前報廢的 PV 模組

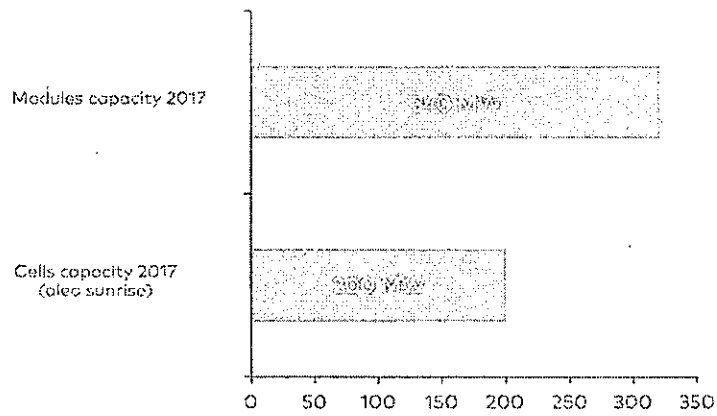
資料來源: End-of-Life Management: Solar Photovoltaic Panels, IRENA, 2016

圖三 歐洲 PV 模組廢棄量預估

二、aleo 公司

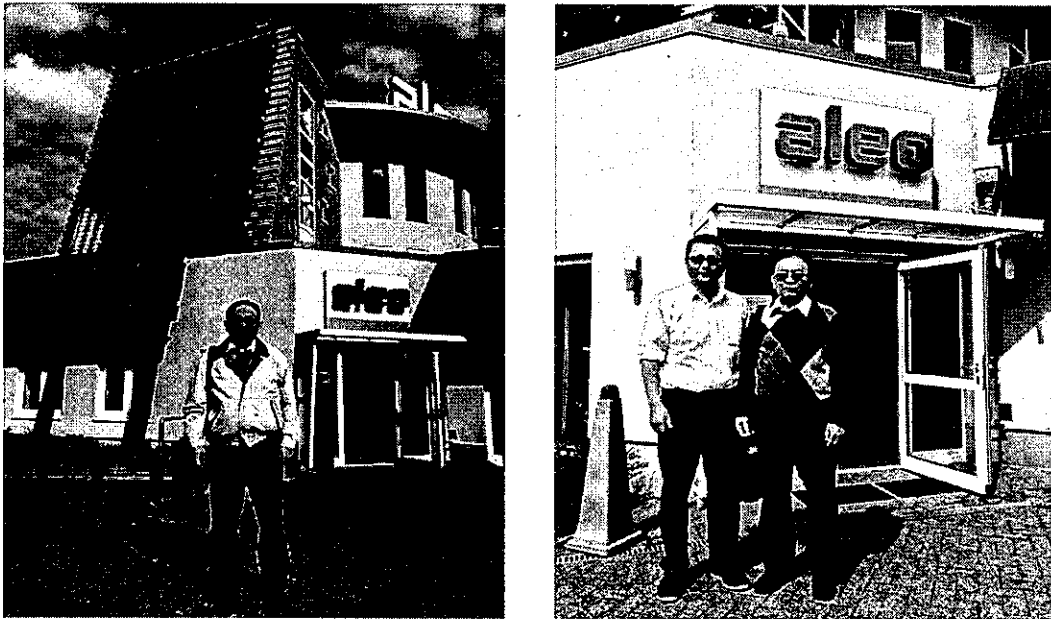
1. 工廠簡介

aleo 公司 2001 年在德國成立, 約有 330 個員工, 亦為 PV CYCLE 協會會員, 該公司致力於全球推動太陽能相關產品應用, 主要生產矽晶型(包含單晶矽和多晶矽)PV 模組, 2017 年所生產之 PV 模組發電容量可達 340MW, 而其子公司 aleo sunrise 所生產之太陽能電池發電容量可達 200MW, 如圖四所示。本次主要參訪該公司位於德國普倫茨勞之 PV 模組製造廠, 並與其總經理 William Chen 進行相關會議討論, 合影如圖五。



資料來源：aleo-premium solar panels manufacturer

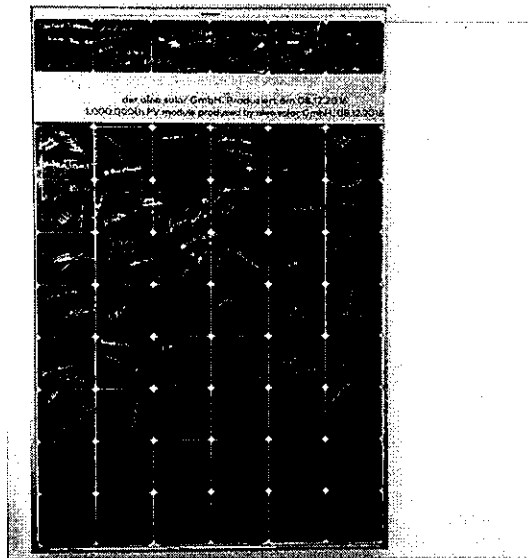
圖四 2017 年生產之 PV 模組發電容量



圖五 aleo solar GmbH 公司外觀及與公司人員合影

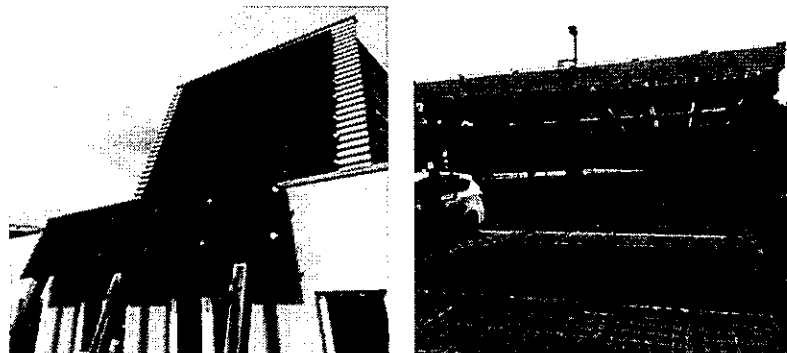
2. 生產製造

aleo 公司在綠色設計的導入方面，主要體現於材料的改良，例如背板材質以聚對苯二甲酸乙二酯(polyethylene terephthalate, PET)取代杜邦™ 特能® (Tedlar®)的聚氟乙烯(polyvinyl fluoride, PVF)、背板膠模層以聚烯烴彈性體(polyolefin elastomer, POE)取代乙烯/醋酸乙烯酯共聚物(ethylene vinyl acetate, EVA)，但仍需考量成本及產品的穩定性和可靠性，有關該公司第 100 萬片產品如圖六所示。



圖六 aleo solar GmbH 公司第 100 萬片產品

aleo 公司表示，由於全球各地氣候及地理位置條件不同，如臺灣地處颱風、地震區帶；中東屬沙塵區帶，因此針對 PV 模組規格仍需針對強化耐用、因地制宜制定相關規範，以獲得更好的性能及降低損壞故障機率。因此，aleo 公司非常著重 PV 模組的架設安全問題，其生產之 PV 模組的鋁框架厚度為 50 mm，可用以承受 550 kg/m²的機械阻力(mechanical resistance)，此外，因 PV 模組的安裝具專業性，故該公司對於安裝技術人員定期進行相關訓練。在新商品開發方面，aleo 公司也因應用戶端需求開發不同 PV 模組產品，例如：搭配屋頂配色的 PV 模組、於車庫上方設置 PV 模組(兼具遮雨遮陽功能)，以提供電動車充電，相關設置如圖七所示。



屋頂配色

車庫應用

圖七 aleo solar GmbH 公司客制化 PV 模組產品

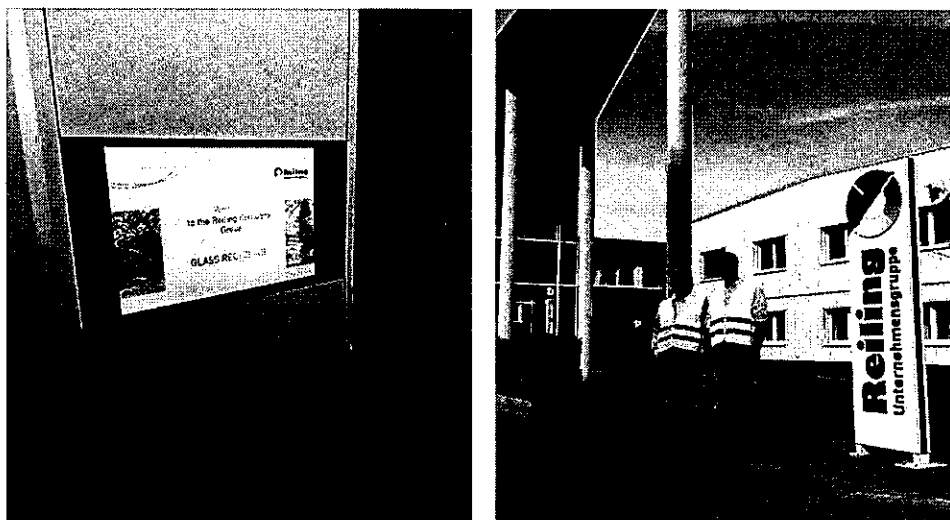
3.回收處理

aleo 公司生產的 PV 模組產品之使用年限約 25~30 年，當產品故障時，可提供維修服務，但僅限於接線盒(junction box)或電纜線(cable)等電子零件的故障排除，若為 PV 模組本體破損，則無法維修。惟該公司於公司內設置回收點集中代收廢棄 PV 模組，再由合格之廢棄物處理公司定期進行清運，至於廢棄物處理公司如何處理廢棄 PV 模組，該公司則表示由廢棄物處理公司全權負責目前廢棄 PV 模組回收，約有 85%物料可進行再利用，其中以矽晶型 PV 模組玻璃占組成成分約 70%。由於回收玻璃仍含有 EVA，大多數降階使用作為建材、隔熱材（如泡沫玻璃），尚無法回到玻璃製程再製成超白玻璃。aleo 公司表示，未來處理技術若能將 EVA 去除，則可提高製造商再使用意願。。

三、Reiling 公司

1.工廠簡介

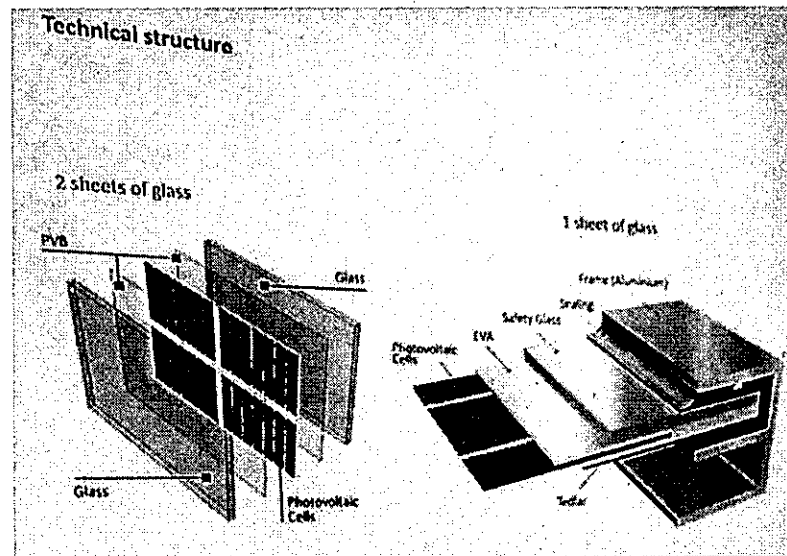
Reiling 公司從事回收再利用業務已達 100 年歷史，為達到物料有效循環目的，該公司提供綜合收集、處理、回收網絡和規劃回收方案。目前該公司可回收處理玻璃、塑膠、紙類、木材、電子廢料及其他材質廢棄物，每年總處理量約 100 萬公噸。本次主要參訪該公司位於德國哈爾賽溫克爾之回收處理廠，除了聽取該公司經理 Relf Rieke 針對廢棄 PV 模組之相關簡報外，亦實際參觀其處理線，與該公司人員之合影如圖八。



圖八 Reiling GmbH & Co. KG 公司簡報及與公司人員合影

2.處理方式

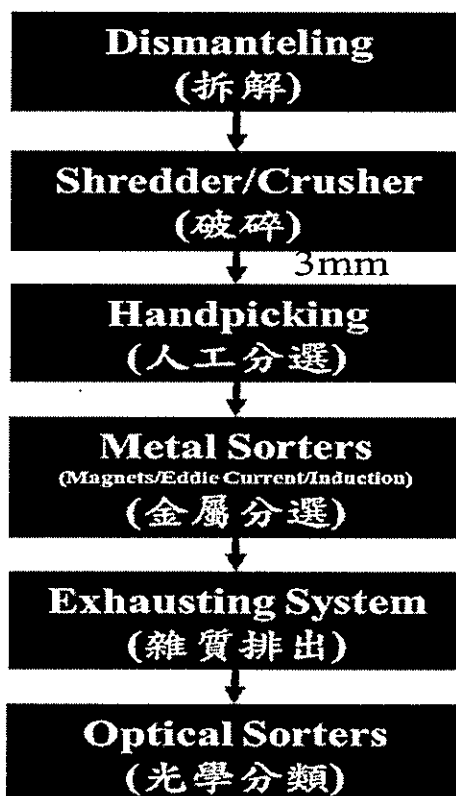
Reiling 公司統計各類型 PV 模組市占率為:矽晶型占 92%、薄膜型 CdTe (Cadmium telluride) 占 5%、薄膜型 CIGS (Copper indium gallium selenide) 占 2%、其他型占 1%。目前 Reiling 公司主要處理組成結構較單純的廢矽晶型 PV 模組產品,如圖九所示,而廢薄膜型 PV 模組產品因種類較複雜且部分含有有毒金屬,故僅先暫存。該公司進一步指出,針對廢棄 PV 模組之回收處理需克服 PV 模組重量重、需貯存空間、搬運若破損難以處理、不同種類模組(如矽晶型及薄膜型)需分別回收及運送成本高等問題。該公司表示雖然全球 PV 模組裝置持續增加,但因產品生命週期平均約 25 年,故廢棄 PV 模組數量有限,為降低營運成本,會將廢棄 PV 模組累積約 50 公噸再進行處理,平均每年處理 2-3 次,其來源包括製程、客戶退貨不良品及無法使用報廢之 PV 模組。



圖九 矽晶型 PV 模組之組成結構圖

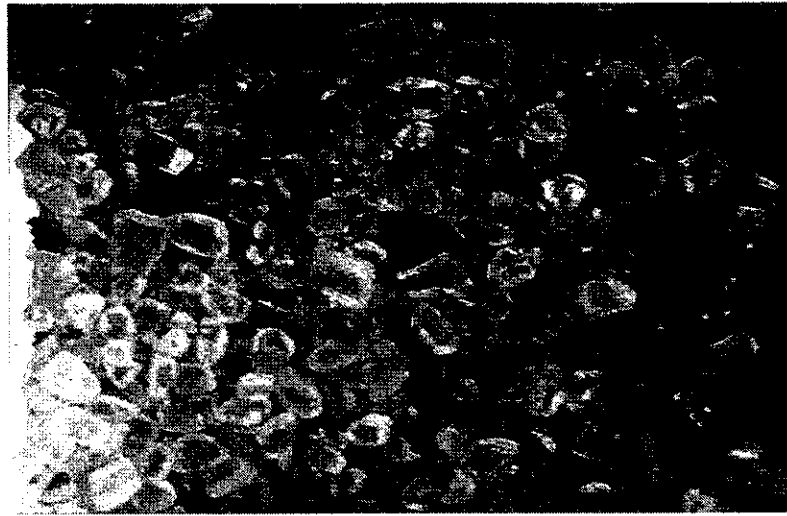
Reiling 公司針對矽晶型 PV 模組規劃完整的處理流程,先以人工將鋁框、接線盒、電線拆除後,以 2 段破碎將玻璃破碎至 3mm 粒徑,接著由磁選及渦電流分選系統分離鐵及非鐵金屬,再由排氣系統分離 EVA 及聚乙炔醇縮丁醛 (polyvinyl butyral, PVB),最後再以光學分選系統去除不透光的物質(如塑膠),如圖十所示。廢棄 PV 模組經上述處理後轉化為 69.22%玻璃、9.16%金屬和 21.62%塑料。該公司可協助處理其他國家廢棄 PV 模組(如:瑞士),

但僅提供模組的處理，故需先將外框及其他電子材料拆除，處理費依廢料狀況而定，約 80-100 歐元/公噸（不含運費）。

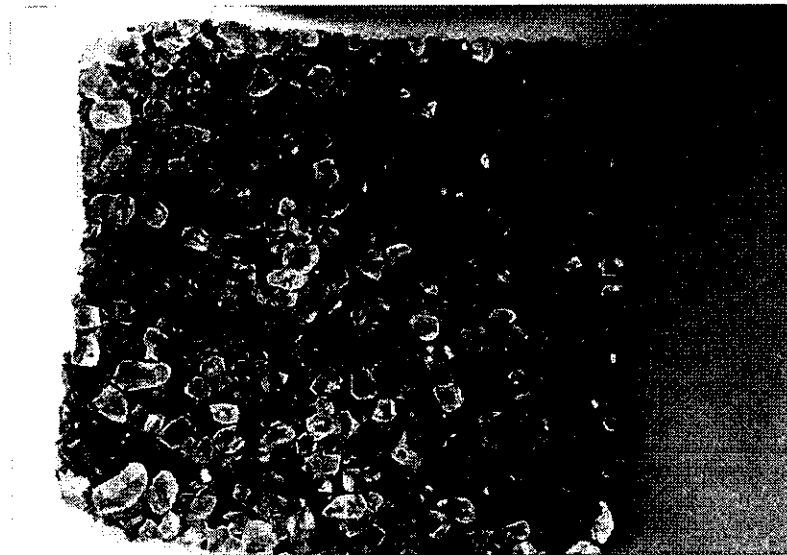


圖十 Reiling 公司矽晶型 PV 模組之處理流程

Reiling 公司對於回收玻璃之品質管理主要著重於玻璃之純度（如無陶瓷、金屬、石頭及有機物等雜質），至於玻璃顏色及粒度則依客戶之要求調整。其玻璃再利用方式，依品質劣至優依序為發泡玻璃、玻璃纖維、玻璃瓶（品質要求鐵金屬 < 2 克/公噸；非鐵金屬 < 3 克/公噸）、平板玻璃。依照上述製程處理後之 PV 模組玻璃的純度並不高，僅可作為發泡玻璃或玻璃纖維；而塑料方面雖含部分玻璃，但仍可製成地毯。有關 Reiling 公司處理後玻璃及塑料如圖十一~圖十三所示。



圖十一 Reiling 公司矽晶型 PV 模組處理後品質較佳之玻璃粒



圖十二 Reiling 公司矽晶型 PV 模組處理後品質較差之玻璃粒



圖十三 Reiling公司矽晶型PV模組處理後EVA塑料

另2016年9月Reiling公司獲德國聯邦經濟部170萬歐元補助，與Fraunhofer CSP及Tesoma公司等研究單位合作，進行廢棄PV模組處理技術之研發，研究主題包括提高玻璃品質（玻璃與塑膠之分離效率）、矽(Si)再利用途徑及提高金屬純度。

四、PV CYCLE 協會

1.協會簡介

PV CYCLE 協會為針對PV模組之回收處理而設立的跨國非營利組織，主要協助整合歐洲各國國內的回收點、清運物流和回收人員，以確保廢棄PV模組是在環保及合法的情況下進行回收處理。本次主要參訪位於法國巴黎之PV CYCLE 協會，並聽取總經理Nicolas Defrenne之相關簡報。目前該協會之會員涵蓋模組廠、回收廠及處理廠等，據統計截至2014年底，該協會已協助回收處理超過1,000公噸之廢棄PV模組。與該協會人員合影如圖十四。

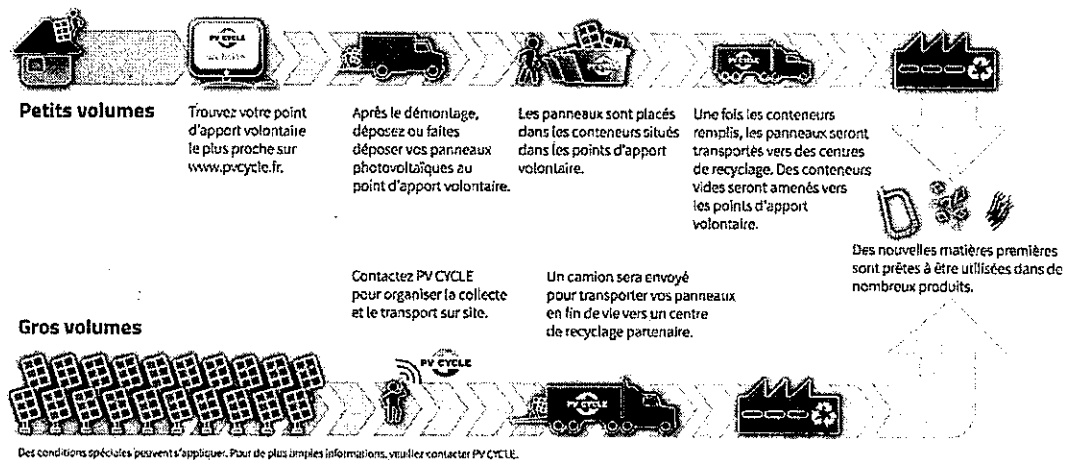


圖十四 PV CYCLE 協會外觀及公司人員合影

2.回收處理方式

法國政府依據 WEEE2014-928 指令規定在法國製造商及進口商需提供資金支援及確保其銷售和進口的 PV 模組於廢棄後可妥善地進行處理，故 PV 模組製造商及進口商須向 PV CYCLE 協會註冊，並依據其製造量或進口量繳交規費。該協會之規費主要依據未來每年市場預估之報廢數量及所需處理費用所訂定，目前為 50 歐元/公噸。

當 PV 模組需報廢時，用戶可向 PV CYCLE 協會提出清運申請，惟本體設備需為完整未經拆解且未破損。若廢棄數量少於 30 組，用戶需自行將 PV 模組拆除後送至鄰近回收站之收集箱貯存，PV CYCLE 協會會安排後續清運事宜；若廢棄數量大於 30 組，PV CYCLE 協會則會安排專車至現場清運。目前法國 PV CYCLE 協會清運之廢棄 PV 模組統一送至位於馬賽的 Veolia 處理廠進行後續回收處理，處理方法以機械破碎方式分為玻璃、金屬和塑料等三類，其中玻璃及金屬因純度較差，故僅可降階進行再利用，至於塑料則焚化供能源再生。而 Veolia 處理廠亦可協助處理其他國家之廢棄 PV 模組，處理費約為 360 歐元/公噸（含馬賽港到工廠之運費）。現階段法國之廢棄 PV 模組回收及處理流程如圖十五所示。



資料來源：PV CYCLE, LA SOLUTION DEEE POUR PANNEAU PHOTOVOLTAÏQUES USAGÉS

圖十五 法國 PV CYCLE 協會廢棄 PV 模組回收方式

伍、心得

- 一、矽晶型 PV 模組及薄膜型 PV 模組之組成成分具差異性，且部分薄膜型含有毒金屬，故在回收過程不適合混合回收處理。
- 二、PV 模組之種類繁多，唯有製造商最瞭解其產品之結構及組成成分，故為有效回收處理廢棄 PV 模組，歐洲成立之 PV CYCLE 協會涵蓋製造商、進口商及廢棄物處理業，藉此能有效分類廢棄 PV 模組，並進行妥善之回收處理。
- 三、廢棄矽晶型 PV 模組的處理關鍵在於玻璃與塑料的分離，德國及法國皆以機械破碎方式將廢棄 PV 模組分為玻璃、金屬和塑料等三類，但各類物料的分離效果並不好，因而降低物料之再利用價值，例如玻璃因含有部分塑料導致純度較差，僅可降階作為建材、隔熱材（如泡沫玻璃）進行再利用。若能提高各物料的分離率及純度，除了可提高物料的再利用價值，亦可提高業者之使用意願。
- 四、由於全球各地氣候及地理位置條件不同，除了現行針對 PV 模組本身的耐

候規格外，其裝設規格也需因地制宜，藉此提高產品之壽命並降低損壞故障之機率。

五、現階段 PV 模組之綠色設計方面著重於材料的改良，除了產品穩定性和可靠性之考量外，成本仍為主要因素。

六、為提高廢棄 PV 模組中各物料之回收再利用比率，國外處理業者仍積極與研究單位建立合作夥伴關係，針對玻璃、金屬純度提升及矽再利用途徑進行相關技術之研發，對於資源循環再利用有正面助益，並能使產業獲得更大利益。

2.廢棄 PV 模組處理關鍵在於玻璃與塑料的分離純化及金屬精煉，建議鼓勵國內研究機構開發回收處理技術，待相關技術開發成熟後，則可提供臺灣太陽光電產業協會之會員使用，在國內進行高值資源化處理。

陸、建議

一、回收處理

廢棄 PV 模組處理關鍵在於玻璃與塑料的分離純化及金屬精煉，建議鼓勵國內研究機構開發回收處理技術，待相關技術開發成熟後，則可提供臺灣太陽光電產業協會之會員使用，在國內進行高值資源化處理。

二、管理機制

臺灣太陽光電產業協會之會員涵蓋太陽能產業之上、中、下游廠商，但缺少廢棄物回收清除處理業，建議可於上述技術開發成熟後，提供該協會參考，並請其邀請相關業者入會，共同負責廢棄物回收處理問題。

柒、參考資料

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DIRECTIVE 2012/19/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 4 July 2012

on waste electrical and electronic equipment (WEEE)

(recast)

(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 192(1) thereof,

Having regard to the proposal from the European Commission,

Having regard to the opinion of the European Economic and Social Committee ⁽¹⁾,

Having regard to the opinion of the Committee of the Regions ⁽²⁾,

Acting in accordance with the ordinary legislative procedure ⁽³⁾,

Whereas:

(1) A number of substantial changes are to be made to Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) ⁽⁴⁾. In the interests of clarity, that Directive should be recast.

(2) The objectives of the Union's environment policy are, in particular, to preserve, protect and improve the quality of the environment, to protect human health and to utilise natural resources prudently and rationally. That policy is based on the precautionary principle and the principles that preventive action should be taken, that environmental damage should, as a priority, be rectified at source and that the polluter should pay.

(3) The Community programme of policy and action in relation to the environment and sustainable development (Fifth Environmental Action Programme) ⁽⁵⁾ stated that the achievement of sustainable development calls for significant changes in current patterns of development, production, consumption and behaviour and advocates,

inter alia, the reduction of wasteful consumption of natural resources and the prevention of pollution. It mentioned waste electrical and electronic equipment (WEEE) as one of the target areas to be regulated, in view of the application of the principles of prevention, recovery and safe disposal of waste.

(4) This Directive supplements the general waste management legislation of the Union, such as Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste ⁽⁶⁾. It refers to the definitions in that Directive, including the definitions of waste and general waste management operations. The definition of collection in Directive 2008/98/EC includes the preliminary sorting and preliminary storage of waste for the purposes of transport to a waste treatment facility. Directive 2009/125/EC of the European Parliament and of the Council ⁽⁷⁾ establishes a framework for setting ecodesign requirements for energy-related products and enables the adoption of specific ecodesign requirements for energy-related products which may also be covered by this Directive. Directive 2009/125/EC and the implementing measures adopted pursuant thereto are without prejudice to the waste management legislation of the Union. Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment ⁽⁸⁾ requires the substitution of banned substances in respect of all electrical and electronic equipment (EEE) within its scope.

(5) As the market continues to expand and innovation cycles become even shorter, the replacement of equipment accelerates, making EEE a fast-growing source of waste. While Directive 2002/95/EC has contributed effectively to reducing hazardous substances contained in new EEE, hazardous substances such as mercury, cadmium, lead, hexavalent chromium and polychlorinated biphenyls (PCBs) and ozone-depleting substances will still be present in WEEE for many years. The content of hazardous components in EEE is a major concern during the waste management phase, and recycling of WEEE is not undertaken to a sufficient extent. A lack of recycling results in the loss of valuable resources.

(6) The purpose of this Directive is to contribute to sustainable production and consumption by, as a first priority, the prevention of WEEE and, in addition, by the re-use, recycling and other forms of recovery of

⁽¹⁾ OJ C 306, 16.12.2009, p. 39.

⁽²⁾ OJ C 141, 29.5.2010, p. 55.

⁽³⁾ Position of the European Parliament of 3 February 2011 (not yet published in the Official Journal) and position of the Council at first reading of 19 July 2011 (not yet published in the Official Journal). Position of the European Parliament of 19 January 2012 (not yet published in the Official Journal) and decision of the Council of 7 June 2012.

⁽⁴⁾ OJ L 37, 13.2.2003, p. 24.

⁽⁵⁾ OJ C 138, 17.5.1993, p. 5.

⁽⁶⁾ OJ L 312, 22.11.2008, p. 3.

⁽⁷⁾ OJ L 285, 31.10.2009, p. 10.

⁽⁸⁾ OJ L 37, 13.2.2003, p. 19.

such wastes so as to reduce the disposal of waste and to contribute to the efficient use of resources and the retrieval of valuable secondary raw materials. It also seeks to improve the environmental performance of all operators involved in the life cycle of EEE, e.g. producers, distributors and consumers and, in particular, those operators directly involved in the collection and treatment of WEEE. In particular, different national applications of the 'producer responsibility' principle may lead to substantial disparities in the financial burden on economic operators. Having different national policies on the management of WEEE hampers the effectiveness of recycling policies. For that reason, the essential criteria should be laid down at the level of the Union and minimum standards for the treatment of WEEE should be developed.

- (7) The provisions of this Directive should apply to products and producers irrespective of selling technique, including distance and electronic selling. In this connection, the obligations of producers and distributors using distance and electronic selling channels should, as far as is practicable, take the same form, and should be enforced in the same way, as for other distribution channels, in order to avoid those other distribution channels having to bear the costs resulting from this Directive arising from WEEE for which the equipment was sold by distance or electronic selling.
- (8) In order to fulfil the obligations pursuant to this Directive in a given Member State, a producer should be established in that Member State. By exception, to reduce existing barriers to the proper functioning of the internal market and administrative burdens, Member States should allow producers that are not established on their territory, but that are established in another Member State, to appoint an authorised representative to be responsible for fulfilling the obligations of that producer under this Directive. In addition, administrative burdens should be reduced by simplifying registration and reporting procedures and by ensuring that duplicate charges are not levied for registrations within individual Member States.
- (9) This Directive should cover all EEE used by consumers and EEE intended for professional use. This Directive should apply without prejudice to Union legislation on safety and health requirements protecting all actors in contact with WEEE, as well as specific Union waste management legislation, in particular Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators⁽¹⁾, and Union product design legislation, in particular Directive 2009/125/EC. The preparing for re-use, recovery and recycling of waste cooling equipment and the substances,

mixtures or components thereof should be in accordance with the relevant legislation of the Union, in particular Regulation (EC) No 1005/2009 of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer⁽²⁾ and Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases⁽³⁾. The objectives of this Directive can be achieved without including large-scale fixed installations such as oil platforms, airport luggage transport systems or elevators within its scope. However, any equipment which is not specifically designed and installed as part of those installations, and which can fulfil its function even if it is not part of those installations, should be included in the scope of this Directive. This refers for instance to equipment such as lighting equipment or photovoltaic panels.

- (10) A number of definitions should be included in this Directive in order to specify its scope. However, in the framework of a revision of the scope, the definition of EEE should be further clarified in order to bring Member States' relevant national measures and current, applied and established practices closer together.
- (11) Ecodesign requirements facilitating the re-use, dismantling and recovery of WEEE should be laid down in the framework of measures implementing Directive 2009/125/EC. In order to optimise re-use and recovery through product design, the whole life cycle of the product should be taken into account.
- (12) The establishment, by this Directive, of producer responsibility is one of the means of encouraging design and production of EEE which take into full account and facilitate its repair, possible upgrading, re-use, disassembly and recycling.
- (13) In order to guarantee the safety and health of distributors' personnel involved in the take-back and handling of WEEE, Member States should, in accordance with national and Union legislation on safety and health requirements, determine the conditions under which take-back may be refused by distributors.
- (14) Separate collection is a precondition for ensuring specific treatment and recycling of WEEE and is necessary to achieve the chosen level of protection of human health and the environment in the Union. Consumers have to actively contribute to the success of such collection and should be encouraged to return WEEE. For this purpose,

(1) OJ L 266, 26.9.2006, p. 1.

(2) OJ L 286, 31.10.2009, p. 1.

(3) OJ L 161, 14.6.2006, p. 1.

convenient facilities should be set up for the return of WEEE, including public collection points, where private households should be able to return their waste at least free of charge. Distributors have an important role in contributing to the success of WEEE collection. Therefore, collection points set up at retail shops for very small WEEE should not be subject to the registration or permit requirements of Directive 2008/98/EC.

- (15) In order to attain the chosen level of protection and the harmonised environmental objectives of the Union, Member States should adopt appropriate measures to minimise the disposal of WEEE as unsorted municipal waste and to achieve a high level of separate collection of WEEE. In order to ensure that Member States strive to set up efficient collection schemes, they should be required to achieve a high level of collection of WEEE, particularly for cooling and freezing equipment containing ozone-depleting substances and fluorinated greenhouse gases, given their high environmental impact and in view of the obligations contained in Regulation (EC) No 842/2006 and Regulation (EC) No 1005/2009. Data included in the impact assessment carried out by the Commission in 2008 show that 65 % of the EEE placed on the market was already separately collected then, but more than half of this was potentially the object of improper treatment and illegal exports, and, even when properly treated, this was not reported. This leads to losses of valuable secondary raw materials, environmental degradation, and provision of inconsistent data. To avoid this, it is necessary to set an ambitious collection target and to ensure that WEEE collected is treated in an environmentally sound way and is correctly reported. It is appropriate to lay down minimum requirements for shipments of used EEE suspected to be WEEE, in the application of which Member States may have regard to any relevant Correspondents' Guidelines elaborated in the context of the implementation of Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste⁽¹⁾. Such minimum requirements should in any case have the purpose of avoiding unwanted shipments of non-functional EEE to developing countries.
- (16) The setting of ambitious collection targets should be based on the amount of WEEE generated where due account is taken of the differing life cycles of products in the Member States, of non-saturated markets and of EEE with a long life cycle. Therefore, a methodology for calculating collection rates based on WEEE generated should be developed in the near future. According to current estimates, a collection rate of 85 % of WEEE generated is broadly equivalent to a collection rate of 65 % of the average weight of EEE placed on the market in the three preceding years.
- (17) Specific treatment for WEEE is indispensable in order to avoid the dispersion of pollutants in recycled material or the waste stream. Such treatment is the most effective means of ensuring compliance with the chosen level of protection of the environment of the Union. Any establishment or undertaking carrying out collection, recycling and treatment operations should comply with minimum standards to prevent negative environmental impacts associated with the treatment of WEEE. The best available treatment, recovery and recycling techniques should be used, provided that they ensure human health and a high level of environmental protection. Best available treatment, recovery and recycling techniques may be further defined in accordance with the procedures of Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control⁽²⁾.
- (18) The Scientific Committee on Emerging and Newly Identified Health Risks, in its opinion on 'Risk Assessment of Products of Nanotechnology' of 19 January 2009, stated that exposure to nanomaterials that are firmly embedded in large structures, for example in electronic circuits, may occur in the waste phase and during recycling. To control possible risks to human health and the environment from the treatment of WEEE that contains nanomaterials, it is appropriate for the Commission to assess whether specific treatment may be necessary.
- (19) The collection, storage, transport, treatment and recycling of WEEE as well as its preparation for re-use shall be conducted with an approach geared to protecting the environment and human health and preserving raw materials and shall aim at recycling valuable resources contained in EEE with a view to ensuring a better supply of commodities within the Union.
- (20) Where appropriate, priority should be given to preparing for re-use of WEEE and its components, sub-assemblies and consumables. Where this is not preferable, all WEEE collected separately should be sent for recovery, in the course of which a high level of recycling and recovery should be achieved. In addition, producers should be encouraged to integrate recycled material in new equipment.
- (21) The recovery, preparation for re-use and recycling of WEEE should be counted towards the achievement of the targets laid down in this Directive only if that recovery, preparation for re-use or recycling does not conflict with other Union or national legislation applicable to the equipment. Ensuring proper preparation for re-use, recycling and recovery of WEEE is important for sound resource management and will optimise supply of resources.

⁽¹⁾ OJ L 190, 12.7.2006, p. 1.

⁽²⁾ OJ L 24, 29.1.2008, p. 8.

- (22) Basic principles with regard to the financing of WEEE management have to be set at the level of the Union, and financing schemes have to contribute to high collection rates, as well as to the implementation of the principle of producer responsibility.
- (23) Users of EEE from private households should have the possibility of returning WEEE at least free of charge. Producers should finance at least the collection from collection facilities, and the treatment, recovery and disposal of WEEE. Member States should encourage producers to take full responsibility for the WEEE collection, in particular by financing the collection of WEEE throughout the entire waste chain, including from private households, in order to avoid separately collected WEEE becoming the object of suboptimal treatment and illegal exports, to create a level playing field by harmonising producer financing across the Union and to shift payment for the collection of this waste from general tax payers to the consumers of EEE, in line with the 'polluter pays' principle. In order to give maximum effect to the concept of producer responsibility, each producer should be responsible for financing the management of the waste from his own products. The producer should be able to choose to fulfil this obligation either individually or by joining a collective scheme. Each producer should, when placing a product on the market, provide a financial guarantee to prevent costs for the management of WEEE from orphan products from falling on society or the remaining producers. The responsibility for the financing of the management of historical waste should be shared by all existing producers through collective financing schemes to which all producers that exist on the market when the costs occur contribute proportionately. Collective financing schemes should not have the effect of excluding niche and low-volume producers, importers and new entrants. Collective schemes could provide for differentiated fees based on how easily products and the valuable secondary raw materials that they contain could be recycled. In the case of products which have a long life cycle and which are now covered by this Directive, such as photovoltaic panels, the best possible use should be made of existing collection and recovery systems, provided that they meet the requirements laid down in this Directive.
- (24) Producers could be allowed to show purchasers, on a voluntary basis at the time of sale of new products, the costs of collecting, treating and disposing of WEEE in an environmentally sound way. This is in line with the Commission Communication on Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan, in particular with regard to smarter consumption and green public procurement.
- (25) Information to users about the requirement not to dispose of WEEE as unsorted municipal waste and to collect WEEE separately and about the collection systems and their role in the management of WEEE is indispensable for the success of WEEE collection. Such information necessitates the proper marking of EEE which could end up in rubbish bins or similar means of municipal waste collection.
- (26) Information on component and material identification to be provided by producers is important to facilitate the management, and in particular the treatment and recovery or recycling, of WEEE.
- (27) Member States should ensure that inspection and monitoring infrastructure enables the proper implementation of this Directive to be verified, having regard, inter alia, to Recommendation 2001/331/EC of the European Parliament and of the Council of 4 April 2001 providing for minimum criteria for environmental inspections in the Member States⁽¹⁾.
- (28) Member States should provide for effective, proportionate and dissuasive penalties to be imposed on natural and legal persons responsible for waste management, where they infringe the provisions of this Directive. Member States should also be able to take action to recover the costs of non-compliance and remedial measures, without prejudice to Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage⁽²⁾.
- (29) Information about the weight of EEE placed on the market in the Union and the rates of collection, preparation for re-use, including as far as possible preparation for re-use of whole appliances, recovery or recycling and export of WEEE collected in accordance with this Directive is necessary to monitor the achievement of the objectives of this Directive. For the purposes of calculating collection rates, a common methodology for the calculation of weight of EEE should be developed to ascertain, inter alia, whether this term includes the actual weight of the entire equipment in the form in which it is marketed, including all components, sub-assemblies, accessories and consumables but excluding packaging, batteries, instructions for use and manuals.

⁽¹⁾ OJ L 118, 27.4.2001, p. 41.

⁽²⁾ OJ L 143, 30.4.2004, p. 56.

- (30) It is appropriate to allow Member States to choose to implement certain provisions of this Directive by means of agreements between the competent authorities and the economic sectors concerned, provided that particular requirements are met.
- (31) In order to address difficulties faced by Member States in achieving the collection rates, to take into account technical and scientific progress and to supplement the provisions on fulfilment of recovery targets, the power to adopt acts in accordance with Article 290 of the Treaty on the Functioning of the European Union (TFEU) should be delegated to the Commission in respect of transitional adjustments for certain Member States, adaptation to technical and scientific progress and the adoption of detailed rules on WEEE exported out of the Union counting towards the fulfilment of recovery targets. It is of particular importance that the Commission carry out appropriate consultations during its preparatory work, including at expert level. The Commission, when preparing and drawing up delegated acts, should ensure a simultaneous, timely and appropriate transmission of relevant documents to the European Parliament and to the Council.
- (32) In order to ensure uniform conditions for the implementation of this Directive, implementing powers should be conferred on the Commission. Those powers should be exercised in accordance with Regulation (EU) No 182/2011 of the European Parliament and of the Council of 16 February 2011 laying down the rules and general principles concerning mechanisms for control by Member States of the Commission's exercise of implementing powers⁽¹⁾.
- (33) The obligation to transpose this Directive into national law should be confined to those provisions which represent a substantive change as compared with the earlier Directives. The obligation to transpose the provisions which are unchanged arises under the earlier Directives.
- (34) In accordance with the Joint Political Declaration of 28 September 2011 of Member States and the Commission on explanatory documents⁽²⁾, Member States have undertaken to accompany, in justified cases, the notification of their transposition measures with one or more documents explaining the relationship between the components of a directive and the corresponding parts of national transposition instruments. With regard to this Directive, the legislator considers the transmission of such documents to be justified.
- (35) This Directive should be without prejudice to the obligations of the Member States relating to the time limits for transposition into national law and application of the Directives set out in Annex XI, Part B.
- (36) Since the objective of this Directive cannot be sufficiently achieved by the Member States and can therefore, by reason of the scale of the problem, be better achieved at the level of the Union, the Union may adopt measures, in accordance with the principle of subsidiarity as set out in Article 5 of the Treaty on European Union. In accordance with the principle of proportionality, as set out in that Article, this Directive does not go beyond what is necessary in order to achieve that objective,

HAVE ADOPTED THIS DIRECTIVE:

Article 1

Subject matter

This Directive lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste from electrical and electronic equipment (WEEE) and by reducing overall impacts of resource use and improving the efficiency of such use in accordance with Articles 1 and 4 of Directive 2008/98/EC, thereby contributing to sustainable development.

Article 2

Scope

1. This Directive shall apply to electrical and electronic equipment (EEE) as follows:

- (a) from 13 August 2012 to 14 August 2018 (transitional period), subject to paragraph 3, to EEE falling within the categories set out in Annex I. Annex II contains an indicative list of EEE which falls within the categories set out in Annex I;
- (b) from 15 August 2018, subject to paragraphs 3 and 4, to all EEE. All EEE shall be classified within the categories set out in Annex III. Annex IV contains a non-exhaustive list of EEE which falls within the categories set out in Annex III (open scope).

2. This Directive shall apply without prejudice to the requirements of Union legislation on safety and health, on chemicals, in particular Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency⁽³⁾, as well as of specific Union waste management or product design legislation.

3. This Directive shall not apply to any of the following EEE:

- (a) equipment which is necessary for the protection of the essential interests of the security of Member States, including arms, munitions and war material intended for specifically military purposes;

⁽¹⁾ OJ L 55, 28.2.2011, p. 13.

⁽²⁾ OJ C 369, 17.12.2011, p. 14.

⁽³⁾ OJ L 396, 30.12.2006, p. 1.

(b) equipment which is specifically designed and installed as part of another type of equipment that is excluded from or does not fall within the scope of this Directive, which can fulfil its function only if it is part of that equipment;

(c) filament bulbs.

4. In addition to the equipment specified in paragraph 3, from 15 August 2018, this Directive shall not apply to the following EEE:

(a) equipment designed to be sent into space;

(b) large-scale stationary industrial tools;

(c) large-scale fixed installations, except any equipment which is not specifically designed and installed as part of those installations;

(d) means of transport for persons or goods, excluding electric two-wheel vehicles which are not type-approved;

(e) non-road mobile machinery made available exclusively for professional use;

(f) equipment specifically designed solely for the purposes of research and development that is only made available on a business-to-business basis;

(g) medical devices and in vitro diagnostic medical devices, where such devices are expected to be infective prior to end of life, and active implantable medical devices.

5. No later than 14 August 2015, the Commission shall review the scope of this Directive set out in point (b) of paragraph 1, including the parameters to distinguish between large and small equipment in Annex III, and shall present a report thereon to the European Parliament and to the Council. The report shall be accompanied by a legislative proposal, if appropriate.

Article 3

Definitions

1. For the purposes of this Directive, the following definitions shall apply:

(a) 'electrical and electronic equipment' or 'EEE' means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1 000 volts for alternating current and 1 500 volts for direct current;

(b) 'large-scale stationary industrial tools' means a large size assembly of machines, equipment, and/or components, functioning together for a specific application, permanently installed and de-installed by professionals at a given place, and used and maintained by professionals in an industrial manufacturing facility or research and development facility;

(c) 'large-scale fixed installation' means a large-size combination of several types of apparatus and, where applicable, other devices, which:

(i) are assembled, installed and de-installed by professionals;

(ii) are intended to be used permanently as part of a building or a structure at a pre-defined and dedicated location; and

(iii) can only be replaced by the same specifically designed equipment;

(d) 'non-road mobile machinery' means machinery, with on-board power source, the operation of which requires either mobility or continuous or semi-continuous movement between a succession of fixed working locations while working;

(e) 'waste electrical and electronic equipment' or 'WEEE' means electrical or electronic equipment which is waste within the meaning of Article 3(1) of Directive 2008/98/EC, including all components, sub-assemblies and consumables which are part of the product at the time of discarding;

(f) 'producer' means any natural or legal person who, irrespective of the selling technique used, including distance communication within the meaning of Directive 97/7/EC of the European Parliament and of the Council of 20 May 1997 on the protection of consumers in respect of distance contracts⁽¹⁾:

(i) is established in a Member State and manufactures EEE under his own name or trademark, or has EEE designed or manufactured and markets it under his name or trademark within the territory of that Member State;

(ii) is established in a Member State and resells within the territory of that Member State, under his own name or trademark, equipment produced by other suppliers, a reseller not being regarded as the 'producer' if the brand of the producer appears on the equipment, as provided for in point (i);

⁽¹⁾ OJ L 144, 4.6.1997, p. 19.

(iii) is established in a Member State and places on the market of that Member State, on a professional basis, EEE from a third country or from another Member State; or

(iv) sells EEE by means of distance communication directly to private households or to users other than private households in a Member State, and is established in another Member State or in a third country.

Whoever exclusively provides financing under or pursuant to any finance agreement shall not be deemed to be a 'producer' unless he also acts as a producer within the meaning of points (i) to (iv);

(g) 'distributor' means any natural or legal person in the supply chain, who makes an EEE available on the market. This definition does not prevent a distributor from being, at the same time, a producer within the meaning of point (f);

(h) 'WEEE from private households' means WEEE which comes from private households and WEEE which comes from commercial, industrial, institutional and other sources which, because of its nature and quantity, is similar to that from private households. Waste from EEE likely to be used by both private households and users other than private households shall in any event be considered to be WEEE from private households;

(i) 'finance agreement' means any loan, lease, hiring or deferred sale agreement or arrangement relating to any equipment whether or not the terms of that agreement or arrangement or any collateral agreement or arrangement provide that a transfer of ownership of that equipment will or may take place;

(j) 'making available on the market' means any supply of a product for distribution, consumption or use on the market of a Member State in the course of a commercial activity, whether in return for payment or free of charge;

(k) 'placing on the market' means the first making available of a product on the market within the territory of a Member State on a professional basis;

(l) 'removal' means manual, mechanical, chemical or metallurgical handling with the result that hazardous substances, mixtures and components are contained in an identifiable stream or are an identifiable part of a stream within the treatment process. A substance, mixture or component is identifiable if it can be monitored to verify environmentally safe treatment;

(m) 'medical device' means a medical device or accessory within the meaning of, respectively, point (a) or (b) of Article 1(2) of Council Directive 93/42/EEC of 14 June 1993 concerning medical devices ⁽¹⁾ which is EEE;

(n) 'in vitro diagnostic medical device' means an in vitro diagnostic device or accessory within the meaning of, respectively, point (b) or (c) of Article 1(2) of Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on in vitro diagnostic medical devices ⁽²⁾ which is EEE;

(o) 'active implantable medical device' means an active implantable medical device within the meaning of point (c) of Article 1(2) of Council Directive 90/385/EEC of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices ⁽³⁾ which is EEE.

2. In addition, the definitions of 'hazardous waste', 'collection', 'separate collection', 'prevention', 're-use', 'treatment', 'recovery', 'preparing for re-use', 'recycling' and 'disposal' laid down in Article 3 of Directive 2008/98/EC shall apply.

Article 4

Product design

Member States shall, without prejudice to the requirements of Union legislation on the proper functioning of the internal market and on product design, including Directive 2009/125/EC, encourage cooperation between producers and recyclers and measures to promote the design and production of EEE, notably in view of facilitating re-use, dismantling and recovery of WEEE, its components and materials. In this context, Member States shall take appropriate measures so that the ecodesign requirements facilitating re-use and treatment of WEEE established in the framework of Directive 2009/125/EC are applied and producers do not prevent, through specific design features or manufacturing processes, WEEE from being re-used, unless such specific design features or manufacturing processes present overriding advantages, for example, with regard to the protection of the environment and/or safety requirements.

Article 5

Separate collection

1. Member States shall adopt appropriate measures to minimise the disposal of WEEE in the form of unsorted municipal waste, to ensure the correct treatment of all collected WEEE and to achieve a high level of separate collection of WEEE, notably, and as a matter of priority, for temperature exchange equipment containing ozone-depleting substances and fluorinated greenhouse gases, fluorescent lamps containing mercury, photovoltaic panels and small equipment as referred to in categories 5 and 6 of Annex III.

⁽¹⁾ OJ L 169, 12.7.1993, p. 1.

⁽²⁾ OJ L 331, 7.12.1998, p. 1.

⁽³⁾ OJ L 189, 20.7.1990, p. 17.

2. For WEEE from private households, Member States shall ensure that:

- (a) systems are set up allowing final holders and distributors to return such waste at least free of charge. Member States shall ensure the availability and accessibility of the necessary collection facilities, taking into account, in particular, the population density;
- (b) when supplying a new product, distributors are responsible for ensuring that such waste can be returned to the distributor at least free of charge on a one-to-one basis as long as the equipment is of equivalent type and has fulfilled the same functions as the supplied equipment. Member States may derogate from this provision provided that they ensure that returning the WEEE is not thereby made more difficult for the final holder and that it remains free of charge for the final holder. Member States making use of this derogation shall inform the Commission thereof;
- (c) distributors provide for the collection, at retail shops with sales areas relating to EEE of at least 400 m², or in their immediate proximity, of very small WEEE (no external dimension more than 25 cm) free of charge to end-users and with no obligation to buy EEE of an equivalent type, unless an assessment shows that alternative existing collection schemes are likely to be at least as effective. Such assessments shall be available to the public. WEEE collected shall be properly treated in accordance with Article 8;
- (d) without prejudice to points (a), (b) and (c), producers are allowed to set up and to operate individual and/or collective take-back systems for WEEE from private households provided that these are in line with the objectives of this Directive;
- (e) having regard to national and Union health and safety standards, WEEE that presents a health and safety risk to personnel because of contamination may be refused for return under points (a), (b) and (c). Member States shall make specific arrangements for such WEEE.

Member States may provide for specific arrangements for the return of WEEE pursuant to points (a), (b) and (c) for cases in which the equipment does not contain its essential components or if the equipment contains waste other than WEEE.

3. Member States may designate the operators that are allowed to collect WEEE from private households as referred to in paragraph 2.

4. Member States may require that the WEEE deposited at collection facilities referred to in paragraphs 2 and 3 is handed over to producers or third parties acting on their behalf or is handed over, for purposes of preparing for re-use, to designated establishments or undertakings.

5. In the case of WEEE other than WEEE from private households, and without prejudice to Article 13, Member States shall ensure that producers or third parties acting on their behalf provide for the collection of such waste.

Article 6

Disposal and transport of collected WEEE

1. Member States shall prohibit the disposal of separately collected WEEE which has not yet undergone the treatment specified in Article 8.

2. Member States shall ensure that the collection and transport of separately collected WEEE is carried out in a way which allows optimal conditions for preparing for re-use, recycling and the confinement of hazardous substances.

In order to maximise preparing for re-use, Member States shall promote that, prior to any further transfer, collection schemes or facilities provide, where appropriate, for the separation at the collection points of WEEE that is to be prepared for re-use from other separately collected WEEE, in particular by granting access for personnel from re-use centres.

Article 7

Collection rate

1. Without prejudice to Article 5(1), each Member State shall ensure the implementation of the 'producer responsibility' principle and, on that basis, that a minimum collection rate is achieved annually. From 2016, the minimum collection rate shall be 45 % calculated on the basis of the total weight of WEEE collected in accordance with Articles 5 and 6 in a given year in the Member State concerned, expressed as a percentage of the average weight of EEE placed on the market in the three preceding years in that Member State. Member States shall ensure that the volume of WEEE collected evolves gradually during the period from 2016 to 2019, unless the collection rate laid down in the second subparagraph has already been achieved.

From 2019, the minimum collection rate to be achieved annually shall be 65 % of the average weight of EEE placed on the market in the three preceding years in the Member State concerned, or alternatively 85 % of WEEE generated on the territory of that Member State.

Until 31 December 2015, a rate of separate collection of at least 4 kilograms on average per inhabitant per year of WEEE from private households or the same amount of weight of WEEE as was collected in that Member State on average in the three preceding years, whichever is greater, shall continue to apply.

Member States may set more ambitious rates for separate collection of WEEE and shall in such a case report this to the Commission.

2. In order to establish whether the minimum collection rate has been achieved, Member States shall ensure that information concerning the WEEE that is separately collected in accordance with Article 5 is transmitted to the Member States free of charge, including at least information on WEEE that has been:

- (a) received by collection and treatment facilities;
- (b) received by distributors;
- (c) separately collected by producers or third parties acting on their behalf.

3. By way of derogation from paragraph 1, Bulgaria, the Czech Republic, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia and Slovakia may, because of their lack of the necessary infrastructure and their low level of EEE consumption, decide to:

- (a) achieve, from 14 August 2016, a collection rate that is lower than 45 % but higher than 40 % of the average weight of EEE placed on the market in the three preceding years; and
- (b) postpone the achievement of the collection rate referred to in the second subparagraph of paragraph 1 until a date of their own choice which shall not be later than 14 August 2021.

4. The Commission shall be empowered to adopt delegated acts in accordance with Article 20 laying down the necessary transitional adjustments in order to address difficulties faced by Member States in adhering to the requirements laid down in paragraph 1.

5. In order to ensure uniform conditions for the implementation of this Article, the Commission shall, by 14 August 2015, adopt implementing acts establishing a common methodology for the calculation of the weight of EEE placed on the national market and a common methodology for the calculation of the quantity of WEEE generated by weight in each Member State. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21(2).

6. The Commission shall, by 14 August 2015, present a report to the European Parliament and to the Council on the re-examination of the deadlines relating to the collection rates referred to in paragraph 1 and on possibly setting individual collection rates for one or more categories set out in Annex III, particularly for temperature exchange equipment, photovoltaic

panels, small equipment, small IT and telecommunication equipment and lamps containing mercury. The report shall, if appropriate, be accompanied by a legislative proposal.

7. If the Commission considers, on the basis of an impact study, that the collection rate based on WEEE generated requires revision, it shall submit a legislative proposal to the European Parliament and the Council.

Article 8

Proper treatment

1. Member States shall ensure that all separately collected WEEE undergoes proper treatment.

2. Proper treatment, other than preparing for re-use, and recovery or recycling operations shall, as a minimum, include the removal of all fluids and a selective treatment in accordance with Annex VII.

3. Member States shall ensure that producers or third parties acting on their behalf set up systems to provide for the recovery of WEEE using best available techniques. The systems may be set up by producers individually or collectively. Member States shall ensure that any establishment or undertaking carrying out collection or treatment operations stores and treats WEEE in compliance with the technical requirements set out in Annex VIII.

4. The Commission shall be empowered to adopt delegated acts in accordance with Article 20 concerning the amendment of Annex VII in order to introduce other treatment technologies that ensure at least the same level of protection for human health and the environment.

The Commission shall evaluate, as a matter of priority, whether the entries regarding printed circuit boards for mobile phones and liquid crystal displays need to be amended. The Commission is invited to evaluate whether amendments to Annex VII are necessary to address nanomaterials contained in EEE.

5. For the purposes of environmental protection, Member States may set up minimum quality standards for the treatment of the WEEE that has been collected.

Member States which opt for such quality standards shall inform the Commission thereof, which shall publish these standards.

The Commission shall, not later than 14 February 2013, request the European standardisation organisations to develop European standards for the treatment, including recovery, recycling and preparing for re-use, of WEEE. Those standards shall reflect the state of the art.

In order to ensure uniform conditions for the implementation of this Article, the Commission may adopt implementing acts laying down minimum quality standards based in particular on the standards developed by the European standardisation organisations. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21(2).

A reference to the standards adopted by the Commission shall be published.

6. Member States shall encourage establishments or undertakings which carry out treatment operations to introduce certified environmental management systems in accordance with Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS) ⁽¹⁾.

Article 9

Permits

1. Member States shall ensure that any establishment or undertaking carrying out treatment operations obtains a permit from the competent authorities in compliance with Article 23 of Directive 2008/98/EC.

2. Exemptions from permit requirements, conditions for exemptions and registration shall be in compliance, respectively, with Articles 24, 25 and 26 of Directive 2008/98/EC.

3. Member States shall ensure that the permit or the registration referred to in paragraphs 1 and 2 includes all the conditions that are necessary for compliance with the requirements of Article 8(2), (3) and (5) and for the achievement of the recovery targets set out in Article 11.

Article 10

Shipments of WEEE

1. The treatment operation may also be undertaken outside the respective Member State or the Union provided that the shipment of WEEE is in compliance with Regulation (EC) No 1013/2006 and Commission Regulation (EC) No 1418/2007 of 29 November 2007 concerning the export for recovery of certain waste listed in Annex III or IIIA to Regulation (EC) No 1013/2006 of the European Parliament and of the Council to certain countries to which the OECD Decision on the control of transboundary movements of wastes does not apply ⁽²⁾.

2. WEEE exported out of the Union shall only count towards the fulfilment of obligations and targets set out in Article 11 of

this Directive if, in compliance with Regulations (EC) No 1013/2006 and (EC) No 1418/2007, the exporter can prove that the treatment took place in conditions that are equivalent to the requirements of this Directive.

3. The Commission shall, not later than 14 February 2014, adopt delegated acts, in accordance with Article 20, laying down detailed rules supplementing those in paragraph 2 of this Article, in particular the criteria for the assessment of equivalent conditions.

Article 11

Recovery targets

1. Regarding all WEEE separately collected in accordance with Article 5 and sent for treatment in accordance with Articles 8, 9 and 10, Member States shall ensure that producers meet the minimum targets set out in Annex V.

2. The achievement of the targets shall be calculated, for each category, by dividing the weight of the WEEE that enters the recovery or recycling/preparing for re-use facility, after proper treatment in accordance with Article 8(2) with regard to recovery or recycling, by the weight of all separately collected WEEE for each category, expressed as a percentage.

Preliminary activities including sorting and storage prior to recovery shall not count towards the achievement of these targets.

3. In order to ensure uniform conditions for the implementation of this Article, the Commission may adopt implementing acts establishing additional rules on the calculation methods for the application of the minimum targets. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21(2).

4. Member States shall ensure that, for the purpose of calculating these targets, producers or third parties acting on their behalf keep records on the weight of WEEE, its components, materials or substances when leaving (output) the collection facility, entering (input) and leaving (output) the treatment facilities and when entering (input) the recovery or recycling/preparing for re-use facility.

Member States shall also ensure that, for the purposes of paragraph 6, records on the weight of products and materials when leaving (output) the recovery or recycling/preparing for re-use facility are kept.

5. Member States shall encourage the development of new recovery, recycling and treatment technologies.

⁽¹⁾ OJ L 342, 22.12.2009, p. 1.

⁽²⁾ OJ L 316, 4.12.2007, p. 6.

6. On the basis of a report of the Commission accompanied, if appropriate, by a legislative proposal, the European Parliament and the Council shall, by 14 August 2016, re-examine the recovery targets referred to in Annex V, Part 3, examine the possibility of setting separate targets for WEEE to be prepared for re-use and re-examine the calculation method referred to in paragraph 2 with a view to analysing the feasibility of setting targets on the basis of products and materials resulting (output) from the recovery, recycling and preparation for re-use processes.

Article 12

Financing in respect of WEEE from private households

1. Member States shall ensure that producers provide at least for the financing of the collection, treatment, recovery and environmentally sound disposal of WEEE from private households that has been deposited at collection facilities set up under Article 5(2).

2. Member States may, where appropriate, encourage producers to finance also the costs occurring for collection of WEEE from private households to collection facilities.

3. For products placed on the market later than 13 August 2005, each producer shall be responsible for financing the operations referred to in paragraph 1 relating to the waste from his own products. The producer may choose to fulfil this obligation either individually or by joining a collective scheme.

Member States shall ensure that each producer provides a guarantee when placing a product on the market showing that the management of all WEEE will be financed and shall ensure that producers clearly mark their products in accordance with Article 15(2). This guarantee shall ensure that the operations referred to in paragraph 1 relating to this product will be financed. The guarantee may take the form of participation by the producer in appropriate schemes for the financing of the management of WEEE, a recycling insurance or a blocked bank account.

4. The responsibility for the financing of the costs of the management of WEEE from products placed on the market on or before 13 August 2005 ('historical waste') shall be borne by one or more systems to which all producers existing on the market when the respective costs occur contribute proportionately, e.g. in proportion to their respective share of the market by type of equipment.

5. Member States shall take the necessary measures to ensure that appropriate mechanisms or refund procedures are developed for the reimbursement of contributions to the producers where EEE is transferred for placing on the market outside the territory of the Member State concerned. Such mechanisms or procedures may be developed by producers or third parties acting on their behalf.

6. The Commission is invited to report, by 14 August 2015, on the possibility of developing criteria to incorporate the real end-of-life costs into the financing of WEEE by producers, and to submit a legislative proposal to the European Parliament and the Council if appropriate.

Article 13

Financing in respect of WEEE from users other than private households

1. Member States shall ensure that the financing of the costs for the collection, treatment, recovery and environmentally sound disposal of WEEE from users other than private households resulting from products placed on the market after 13 August 2005 is to be provided for by producers.

For historical waste being replaced by new equivalent products or by new products fulfilling the same function, the financing of the costs shall be provided for by producers of those products when supplying them. Member States may, as an alternative, provide that users other than private households also be made, partly or totally, responsible for this financing.

For other historical waste, the financing of the costs shall be provided for by the users other than private households.

2. Producers and users other than private households may, without prejudice to this Directive, conclude agreements stipulating other financing methods.

Article 14

Information for users

1. Member States may require producers to show purchasers, at the time of sale of new products, the costs of collection, treatment and disposal in an environmentally sound way. The costs mentioned shall not exceed the best estimate of the actual costs incurred.

2. Member States shall ensure that users of EEE in private households are given the necessary information about:

- (a) the requirement not to dispose of WEEE as unsorted municipal waste and to collect such WEEE separately;
- (b) the return and collection systems available to them, encouraging the coordination of information on the available collection points irrespective of the producers or other operators which have set them up;
- (c) their role in contributing to re-use, recycling and other forms of recovery of WEEE;

(d) the potential effects on the environment and human health as a result of the presence of hazardous substances in EEE;

(e) the meaning of the symbol shown in Annex IX.

3. Member States shall adopt appropriate measures so that consumers participate in the collection of WEEE and to encourage them to facilitate the process of re-use, treatment and recovery.

4. With a view to minimising the disposal of WEEE as unsorted municipal waste and to facilitating its separate collection, Member States shall ensure that producers appropriately mark — preferably in accordance with the European standard EN 50419 ⁽¹⁾ — EEE placed on the market with the symbol shown in Annex IX. In exceptional cases, where this is necessary because of the size or the function of the product, the symbol shall be printed on the packaging, on the instructions for use and on the warranty of the EEE.

5. Member States may require that some or all of the information referred to in paragraphs 2, 3 and 4 shall be provided by producers and/or distributors, e.g. in the instructions for use, at the point of sale and through public awareness campaigns.

Article 15

Information for treatment facilities

1. In order to facilitate the preparation for re-use and the correct and environmentally sound treatment of WEEE, including maintenance, upgrade, refurbishment and recycling, Member States shall take the necessary measures to ensure that producers provide information free of charge about preparation for re-use and treatment in respect of each type of new EEE placed for the first time on the Union market within one year after the equipment is placed on the market. This information shall identify, as far as it is needed by centres which prepare for re-use and treatment and recycling facilities in order to comply with the provisions of this Directive, the different EEE components and materials, as well as the location of dangerous substances and mixtures in EEE. It shall be made available to centres which prepare for re-use and treatment and recycling facilities by producers of EEE in the form of manuals or by means of electronic media (e.g. CD-ROM, online services).

2. In order to enable the date upon which the EEE was placed on the market to be determined unequivocally, Member States shall ensure that a mark on the EEE specifies that the latter was placed on the market after 13 August 2005. Preferably, the European Standard EN 50419 shall be applied for this purpose.

⁽¹⁾ Adopted by Cenelec in March 2006.

Article 16

Registration, information and reporting

1. Member States shall, in accordance with paragraph 2, draw up a register of producers, including producers supplying EEE by means of distance communication. That register shall serve to monitor compliance with the requirements of this Directive.

Producers supplying EEE by means of distance communication as defined in Article 3(1)(f)(iv) shall be registered in the Member State that they sell to. Where such producers are not registered in the Member State that they are selling to, they shall be registered through their authorised representatives as referred to in Article 17(2).

2. Member States shall ensure that:

(a) each producer, or each authorised representative where appointed under Article 17, is registered as required and has the possibility of entering online in their national register all relevant information reflecting that producer's activities in that Member State;

(b) upon registering, each producer, or each authorised representative where appointed under Article 17, provides the information set out in Annex X, Part A, undertaking to update it as appropriate;

(c) each producer, or each authorised representative where appointed under Article 17, provides the information set out in Annex X, Part B;

(d) national registers provide links to other national registers on their website to facilitate, in all Member States, registration of producers or, where appointed under Article 17, authorised representatives.

3. In order to ensure uniform conditions for the implementation of this Article, the Commission shall adopt implementing acts establishing the format for registration and reporting and the frequency of reporting to the register. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21(2).

4. Member States shall collect information, including substantiated estimates, on an annual basis, on the quantities and categories of EEE placed on their markets, collected through all routes, prepared for re-use, recycled and recovered within the Member State, and on separately collected WEEE exported, by weight.

5. Member States shall, at three-year intervals, send a report to the Commission on the implementation of this Directive and on the information set out in paragraph 4. The implementation report shall be drawn up on the basis of a questionnaire laid down in Commission Decisions 2004/249/EC ⁽¹⁾ and 2005/369/EC ⁽²⁾. The report shall be made available to the Commission within nine months of the end of the three-year period covered by it.

The first report shall cover the period from 14 February 2014 to 31 December 2015.

The Commission shall publish a report on the implementation of this Directive within nine months after receiving the reports from the Member States.

Article 17

Authorised representative

1. Each Member State shall ensure that a producer as defined in Article 3(1)(f)(i) to (iii) established in another Member State is allowed, by way of exception to Article 3(1)(f)(i) to (iii), to appoint a legal or natural person established on its territory as the authorised representative that is responsible for fulfilling the obligations of that producer, pursuant to this Directive, on its territory.

2. Each Member State shall ensure that a producer as defined in Article 3(1)(f)(iv) and established on its territory, which sells EEE to another Member State in which it is not established, appoints an authorised representative in that Member State as the person responsible for fulfilling the obligations of that producer, pursuant to this Directive, on the territory of that Member State.

3. Appointment of an authorised representative shall be by written mandate.

Article 18

Administrative cooperation and exchange of information

Member States shall ensure that authorities responsible for implementing this Directive cooperate with each other, in particular to establish an adequate flow of information to ensure that producers comply with the provisions of this Directive and, where appropriate, provide each other and the Commission with information in order to facilitate the proper implementation of this Directive. The administrative cooperation and exchange of information, in particular between national registers, shall include electronic means of communication.

Cooperation shall include, inter alia, granting access to the relevant documents and information including the results of any inspections, subject to the provisions of the data protection law in force in the Member State of the authority which is requested to cooperate.

⁽¹⁾ OJ L 78, 16.3.2004, p. 56.

⁽²⁾ OJ L 119, 11.5.2005, p. 13.

Article 19

Adaptation to scientific and technical progress

The Commission shall be empowered to adopt delegated acts in accordance with Article 20 concerning the amendments necessary in order to adapt Article 16(5) and Annexes IV, VII, VIII and IX to scientific and technical progress. When amending Annex VII, the exemptions granted under Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment ⁽³⁾ shall be taken into consideration.

Before the Annexes are amended, the Commission shall, inter alia, consult producers of EEE, recyclers, treatment operators and environmental organisations and employees' and consumer associations.

Article 20

Exercise of the delegation

1. The power to adopt delegated acts is conferred on the Commission subject to the conditions laid down in this Article.

2. The power to adopt delegated acts referred to in Article 7(4), Article 8(4), Article 10(3) and Article 19 shall be conferred on the Commission for a period of five years from 13 August 2012. The Commission shall draw up a report in respect of the delegation of power not later than nine months before the end of the five-year period. The delegation of power shall be tacitly extended for periods of an identical duration, unless the European Parliament or the Council opposes such extension not later than three months before the end of each period.

3. The delegation of power referred to in Article 7(4), Article 8(4), Article 10(3) and Article 19 may be revoked at any time by the European Parliament or by the Council. A decision to revoke shall put an end to the delegation of the power specified in that decision. It shall take effect the day following the publication of the decision in the *Official Journal of the European Union* or at a later date specified therein. It shall not affect the validity of any delegated acts already in force.

4. As soon as it adopts a delegated act, the Commission shall notify it simultaneously to the European Parliament and to the Council.

5. A delegated act adopted pursuant to Article 7(4), Article 8(4), Article 10(3) and Article 19 shall enter into force only if no objection has been expressed either by the European Parliament or the Council within a period of two months of notification of that act to the European Parliament

⁽³⁾ OJ L 174, 1.7.2011, p. 88.

and to the Council or if, before the expiry of that period, the European Parliament and the Council have both informed the Commission that they will not object. That period shall be extended by two months at the initiative of the European Parliament or of the Council.

Article 21

Committee procedure

1. The Commission shall be assisted by the Committee established by Article 39 of Directive 2008/98/EC. That committee shall be a committee within the meaning of Regulation (EU) No 182/2011.

2. Where reference is made to this paragraph, Article 5 of Regulation (EU) No 182/2011 shall apply.

Where the committee delivers no opinion, the Commission shall not adopt the draft implementing act and the third subparagraph of Article 5(4) of Regulation (EU) No 182/2011 shall apply.

Article 22

Penalties

The Member States shall lay down the rules on penalties applicable to infringements of the national provisions adopted pursuant to this Directive and shall take all measures necessary to ensure that they are implemented. The penalties provided for must be effective, proportionate and dissuasive. The Member States shall notify those provisions to the Commission by 14 February 2014 at the latest and shall notify it without delay of any subsequent amendment affecting them.

Article 23

Inspection and monitoring

1. Member States shall carry out appropriate inspections and monitoring to verify the proper implementation of this Directive.

Those inspections shall at least cover:

- (a) information reported in the framework of the register of producers;
- (b) shipments, in particular exports of WEEE outside the Union in compliance with Regulation (EC) No 1013/2006 and Regulation (EC) No 1418/2007; and
- (c) the operations at treatment facilities in accordance with Directive 2008/98/EC and Annex VII of this Directive.

2. Member States shall ensure that shipments of used EEE suspected to be WEEE are carried out in accordance with the minimum requirements in Annex VI and shall monitor such shipments accordingly.

3. The costs of appropriate analyses and inspections, including storage costs, of used EEE suspected to be WEEE may be charged to the producers, to third parties acting on their behalf or to other persons arranging the shipment of used EEE suspected to be WEEE.

4. In order to ensure uniform conditions for the implementation of this Article and of Annex VI, the Commission may adopt implementing acts establishing additional rules on inspections and monitoring and in particular uniform conditions for the implementation of Annex VI, point 2. Those implementing acts shall be adopted in accordance with the examination procedure referred to in Article 21(2).

Article 24

Transposition

1. Member States shall bring into force the laws, regulations and administrative provisions necessary to comply with this Directive by 14 February 2014. They shall immediately communicate to the Commission the text of those provisions.

When Member States adopt those provisions, they shall contain a reference to this Directive or shall be accompanied by such reference on the occasion of their official publication. They shall also include a statement that references in existing laws, regulations and administrative provisions to the directives repealed by this Directive shall be construed as references to this Directive. Member States shall determine how such reference is to be made and how that statement is to be formulated.

2. Member States shall communicate to the Commission the text of the main provisions of national law which they adopt in the field covered by this Directive.

3. Provided that the objectives set out in this Directive are achieved, Member States may transpose the provisions set out in Article 8(6), Article 14(2) and Article 15 by means of agreements between the competent authorities and the economic sectors concerned. Such agreements shall meet the following requirements:

- (a) agreements shall be enforceable;
- (b) agreements shall specify objectives with the corresponding deadlines;
- (c) agreements shall be published in the national official journal or an official document equally accessible to the public and transmitted to the Commission;
- (d) the results achieved shall be monitored regularly, reported to the competent authorities and the Commission and made available to the public under the conditions set out in the agreement;

- (e) the competent authorities shall ensure that the progress achieved under the agreement is examined;
- (f) in the case of non-compliance with the agreement, Member States must implement the relevant provisions of this Directive by legislative, regulatory or administrative measures.

Article 25

Repeal

Directive 2002/96/EC as amended by the Directives listed in Annex XI, Part A is repealed with effect from 15 February 2014, without prejudice to the obligations of the Member States relating to the time limits for transposition into national law and application of the Directives set out in Annex XI, Part B.

References to the repealed Directives shall be construed as references to this Directive and shall be read in accordance with the correlation table in Annex XII.

Article 26

Entry into force

This Directive shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

Article 27

Addressees

This Directive is addressed to the Member States.

Done at Strasbourg, 4 July 2012.

For the European Parliament

The President

M. SCHULZ

For the Council

The President

A. D. MAVROYIANNIS

*ANNEX I***Categories of EEE covered by this Directive during the transitional period as provided for in Article 2(1)(a)**

1. Large household appliances
 2. Small household appliances
 3. IT and telecommunications equipment
 4. Consumer equipment and photovoltaic panels
 5. Lighting equipment
 6. Electrical and electronic tools (with the exception of large-scale stationary industrial tools)
 7. Toys, leisure and sports equipment
 8. Medical devices (with the exception of all implanted and infected products)
 9. Monitoring and control instruments
 10. Automatic dispensers
-

ANNEX II

Indicative list of EEE which falls within the categories of Annex I

1. LARGE HOUSEHOLD APPLIANCES

Large cooling appliances

Refrigerators

Freezers

Other large appliances used for refrigeration, conservation and storage of food

Washing machines

Clothes dryers

Dish washing machines

Cookers

Electric stoves

Electric hot plates

Microwaves

Other large appliances used for cooking and other processing of food

Electric heating appliances

Electric radiators

Other large appliances for heating rooms, beds, seating furniture

Electric fans

Air conditioner appliances

Other fanning, exhaust ventilation and conditioning equipment

2. SMALL HOUSEHOLD APPLIANCES

Vacuum cleaners

Carpet sweepers

Other appliances for cleaning

Appliances used for sewing, knitting, weaving and other processing for textiles

Irons and other appliances for ironing, mangling and other care of clothing

Toasters

Fryers

Grinders, coffee machines and equipment for opening or sealing containers or packages

Electric knives

Appliances for hair cutting, hair drying, tooth brushing, shaving, massage and other body care appliances

Clocks, watches and equipment for the purpose of measuring, indicating or registering time

Scales

3. IT AND TELECOMMUNICATIONS EQUIPMENT

Centralised data processing:

Mainframes

Minicomputers

Printer units

Personal computing:

Personal computers (CPU, mouse, screen and keyboard included)

Laptop computers (CPU, mouse, screen and keyboard included)

Notebook computers

Notepad computers

Printers

Copying equipment

Electrical and electronic typewriters

Pocket and desk calculators

and other products and equipment for the collection, storage, processing, presentation or communication of information by electronic means

User terminals and systems

Facsimile machine (fax)

Telex

Telephones

Pay telephones

Cordless telephones

Cellular telephones

Answering systems

and other products or equipment of transmitting sound, images or other information by telecommunications

4. CONSUMER EQUIPMENT AND PHOTOVOLTAIC PANELS

Radio sets

Television sets

Video cameras

Video recorders

Hi-fi recorders

Audio amplifiers

Musical instruments

and other products or equipment for the purpose of recording or reproducing sound or images, including signals or other technologies for the distribution of sound and image than by telecommunications

Photovoltaic panels

5. LIGHTING EQUIPMENT

Luminaires for fluorescent lamps with the exception of luminaires in households

Straight fluorescent lamps

Compact fluorescent lamps

High intensity discharge lamps, including pressure sodium lamps and metal halide lamps

Low pressure sodium lamps

Other lighting or equipment for the purpose of spreading or controlling light with the exception of filament bulbs

6. ELECTRICAL AND ELECTRONIC TOOLS (WITH THE EXCEPTION OF LARGE-SCALE STATIONARY INDUSTRIAL TOOLS)

Drills

Saws

Sewing machines

Equipment for turning, milling, sanding, grinding, sawing, cutting, shearing, drilling, making holes, punching, folding, bending or similar processing of wood, metal and other materials

Tools for riveting, nailing or screwing or removing rivets, nails, screws or similar uses

Tools for welding, soldering or similar use

Equipment for spraying, spreading, dispersing or other treatment of liquid or gaseous substances by other means

Tools for mowing or other gardening activities

7. TOYS, LEISURE AND SPORTS EQUIPMENT

Electric trains or car racing sets

Hand-held video game consoles

Video games

Computers for biking, diving, running, rowing, etc.

Sports equipment with electric or electronic components

Coin slot machines

8. MEDICAL DEVICES (WITH THE EXCEPTION OF ALL IMPLANTED AND INFECTED PRODUCTS)

Radiotherapy equipment

Cardiology equipment

Dialysis equipment

Pulmonary ventilators

Nuclear medicine equipment

Laboratory equipment for in vitro diagnosis

Analysers

Freezers

Fertilization tests

Other appliances for detecting, preventing, monitoring, treating, alleviating illness, injury or disability

9. MONITORING AND CONTROL INSTRUMENTS

Smoke detector

Heating regulators

Thermostats

Measuring, weighing or adjusting appliances for household or as laboratory equipment

Other monitoring and control instruments used in industrial installations (e.g. in control panels)

10. AUTOMATIC DISPENSERS

Automatic dispensers for hot drinks

Automatic dispensers for hot or cold bottles or cans

Automatic dispensers for solid products

Automatic dispensers for money

All appliances which deliver automatically all kinds of products

ANNEX III

CATEGORIES OF EEE COVERED BY THIS DIRECTIVE

1. Temperature exchange equipment
2. Screens, monitors, and equipment containing screens having a surface greater than 100 cm²
3. Lamps
4. Large equipment (any external dimension more than 50 cm) including, but not limited to:

Household appliances; IT and telecommunication equipment; consumer equipment; luminaires; equipment reproducing sound or images, musical equipment; electrical and electronic tools; toys, leisure and sports equipment; medical devices; monitoring and control instruments; automatic dispensers; equipment for the generation of electric currents. This category does not include equipment included in categories 1 to 3.

5. Small equipment (no external dimension more than 50 cm) including, but not limited to:

Household appliances; consumer equipment; luminaires; equipment reproducing sound or images, musical equipment; electrical and electronic tools; toys, leisure and sports equipment; medical devices; monitoring and control instruments; automatic dispensers; equipment for the generation of electric currents. This category does not include equipment included in categories 1 to 3 and 6.

6. Small IT and telecommunication equipment (no external dimension more than 50 cm)

ANNEX IV

Non-exhaustive list of EEE which falls within the categories listed in Annex III**1. Temperature exchange equipment**

Refrigerators, Freezers, Equipment which automatically delivers cold products, Air conditioning equipment, Dehumidifying equipment, Heat pumps, Radiators containing oil and other temperature exchange equipment using fluids other than water for the temperature exchange.

2. Screens, monitors, and equipment containing screens having a surface greater than 100 cm²

Screens, Televisions, LCD photo frames, Monitors, Laptops, Notebooks.

3. Lamps

Straight fluorescent lamps, Compact fluorescent lamps, Fluorescent lamps, High intensity discharge lamps - including pressure sodium lamps and metal halide lamps, Low pressure sodium lamps, LED.

4. Large equipment

Washing machines, Clothes dryers, Dish washing machines, Cookers, Electric stoves, Electric hot plates, Luminaires, Equipment reproducing sound or images, Musical equipment (excluding pipe organs installed in churches), Appliances for knitting and weaving, Large computer-mainframes, Large printing machines, Copying equipment, Large coin slot machines, Large medical devices, Large monitoring and control instruments, Large appliances which automatically deliver products and money, Photovoltaic panels.

5. Small equipment

Vacuum cleaners, Carpet sweepers, Appliances for sewing, Luminaires, Microwaves, Ventilation equipment, Irons, Toasters, Electric knives, Electric kettles, Clocks and Watches, Electric shavers, Scales, Appliances for hair and body care, Calculators, Radio sets, Video cameras, Video recorders, Hi-fi equipment, Musical instruments, Equipment reproducing sound or images, Electrical and electronic toys, Sports equipment, Computers for biking, diving, running, rowing, etc., Smoke detectors, Heating regulators, Thermostats, Small Electrical and electronic tools, Small medical devices, Small Monitoring and control instruments, Small Appliances which automatically deliver products, Small equipment with integrated photovoltaic panels.

6. Small IT and telecommunication equipment (no external dimension more than 50 cm)

Mobile phones, GPS, Pocket calculators, Routers, Personal computers, Printers, Telephones.

ANNEX V

MINIMUM RECOVERY TARGETS REFERRED TO IN ARTICLE 11

Part 1: Minimum targets applicable by category from 13 August 2012 until 14 August 2015 with reference to the categories listed in Annex I:

- (a) for WEEE falling within category 1 or 10 of Annex I,
 - 80 % shall be recovered, and
 - 75 % shall be recycled;
- (b) for WEEE falling within category 3 or 4 of Annex I,
 - 75 % shall be recovered, and
 - 65 % shall be recycled;
- (c) for WEEE falling within category 2, 5, 6, 7, 8 or 9 of Annex I,
 - 70 % shall be recovered, and
 - 50 % shall be recycled;
- (d) for gas discharge lamps, 80 % shall be recycled.

Part 2: Minimum targets applicable by category from 15 August 2015 until 14 August 2018 with reference to the categories listed in Annex I:

- (a) for WEEE falling within category 1 or 10 of Annex I,
 - 85 % shall be recovered, and
 - 80 % shall be prepared for re-use and recycled;
- (b) for WEEE falling within category 3 or 4 of Annex I,
 - 80 % shall be recovered, and
 - 70 % shall be prepared for re-use and recycled;
- (c) for WEEE falling within category 2, 5, 6, 7, 8 or 9 of Annex I,
 - 75 % shall be recovered, and
 - 55 % shall be prepared for re-use and recycled;
- (d) for gas discharge lamps, 80 % shall be recycled.

Part 3: Minimum targets applicable by category from 15 August 2018 with reference to the categories listed in Annex III:

- (a) for WEEE falling within category 1 or 4 of Annex III,
 - 85 % shall be recovered, and
 - 80 % shall be prepared for re-use and recycled;
- (b) for WEEE falling within category 2 of Annex III,
 - 80 % shall be recovered, and
 - 70 % shall be prepared for re-use and recycled;
- (c) for WEEE falling within category 5 or 6 of Annex III,
 - 75 % shall be recovered, and
 - 55 % shall be prepared for re-use and recycled;
- (d) for WEEE falling within category 3 of Annex III, 80 % shall be recycled.

ANNEX VI

MINIMUM REQUIREMENTS FOR SHIPMENTS

1. In order to distinguish between EEE and WEEE, where the holder of the object claims that he intends to ship or is shipping used EEE and not WEEE, Member States shall require the holder to have available the following to substantiate this claim:
 - (a) a copy of the invoice and contract relating to the sale and/or transfer of ownership of the EEE which states that the equipment is destined for direct re-use and that it is fully functional;
 - (b) evidence of evaluation or testing in the form of a copy of the records (certificate of testing, proof of functionality) on every item within the consignment and a protocol containing all record information according to point 3;
 - (c) a declaration made by the holder who arranges the transport of the EEE that none of the material or equipment within the consignment is waste as defined by Article 3(1) of Directive 2008/98/EC; and
 - (d) appropriate protection against damage during transportation, loading and unloading in particular through sufficient packaging and appropriate stacking of the load.
2. By way of derogation, point 1(a) and (b) and point 3 do not apply where it is documented by conclusive proof that the shipment is taking place in the framework of a business-to-business transfer agreement and that:
 - (a) the EEE is sent back to the producer or a third party acting on his behalf as defective for repair under warranty with the intention of re-use; or
 - (b) the used EEE for professional use is sent to the producer or a third party acting on his behalf or a third-party facility in countries to which Decision C(2001)107/Final of the OECD Council concerning the revision of Decision C(92)39/Final on control of transboundary movements of wastes destined for recovery operations applies, for refurbishment or repair under a valid contract with the intention of re-use; or
 - (c) the defective used EEE for professional use, such as medical devices or their parts, is sent to the producer or a third party acting on his behalf for root cause analysis under a valid contract, in cases where such an analysis can only be conducted by the producer or third parties acting on his behalf.
3. In order to demonstrate that the items being shipped constitute used EEE rather than WEEE, Member States shall require the following steps for testing and record keeping for used EEE to be carried out:

Step 1: Testing

 - (a) Functionality shall be tested and the presence of hazardous substances shall be evaluated. The tests to be conducted depend on the kind of EEE. For most of the used EEE a functionality test of the key functions is sufficient.
 - (b) Results of evaluation and testing shall be recorded.

Step 2: Record

 - (a) The record shall be fixed securely but not permanently on either the EEE itself (if not packed) or on the packaging so it can be read without unpacking the equipment.
 - (b) The record shall contain the following information:
 - name of item (name of the equipment if listed in Annex II or Annex IV, as appropriate, and category set out in Annex I or Annex III, as appropriate),
 - identification number of the item (type No) where applicable,
 - year of production (if available),
 - name and address of the company responsible for evidence of functionality,

- result of tests as described in step 1 (including date of the functionality test),
 - kind of tests performed.
4. In addition to the documentation requested in points 1, 2 and 3, every load (e.g. shipping container, lorry) of used EEE shall be accompanied by:
- (a) a relevant transport document, e.g. CMR or waybill;
 - (b) a declaration by the liable person on its responsibility.
5. In the absence of proof that an object is used EEE and not WEEE through the appropriate documentation required in points 1, 2, 3 and 4 and of appropriate protection against damage during transportation, loading and unloading in particular through sufficient packaging and appropriate stacking of the load, which are the obligations of the holder who arranges the transport, Member State authorities shall consider that an item is WEEE and presume that the load comprises an illegal shipment. In these circumstances the load will be dealt with in accordance with Articles 24 and 25 of Regulation (EC) No 1013/2006.
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ANNEX VII

Selective treatment for materials and components of waste electrical and electronic equipment referred to in Article 8(2)

1. As a minimum the following substances, mixtures and components have to be removed from any separately collected WEEE:

- polychlorinated biphenyls (PCB) containing capacitors in accordance with Council Directive 96/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) ⁽¹⁾,
- mercury containing components, such as switches or backlighting lamps,
- batteries,
- printed circuit boards of mobile phones generally, and of other devices if the surface of the printed circuit board is greater than 10 square centimetres,
- toner cartridges, liquid and paste, as well as colour toner,
- plastic containing brominated flame retardants,
- asbestos waste and components which contain asbestos,
- cathode ray tubes,
- chlorofluorocarbons (CFC), hydrochlorofluorocarbons (HCFC) or hydrofluorocarbons (HFC), hydrocarbons (HC),
- gas discharge lamps,
- liquid crystal displays (together with their casing where appropriate) of a surface greater than 100 square centimetres and all those back-lighted with gas discharge lamps,
- external electric cables,
- components containing refractory ceramic fibres as described in Commission Directive 97/69/EC of 5 December 1997 adapting to technical progress for the 23rd time Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances ⁽²⁾,
- components containing radioactive substances with the exception of components that are below the exemption thresholds set in Article 3 of and Annex I to Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation ⁽³⁾,
- electrolyte capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume).

These substances, mixtures and components shall be disposed of or recovered in compliance with Directive 2008/98/EC.

2. The following components of WEEE that is separately collected have to be treated as indicated:

- cathode ray tubes: the fluorescent coating has to be removed,

⁽¹⁾ OJ L 243, 24.9.1996, p. 31.

⁽²⁾ OJ L 343, 13.12.1997, p. 19.

⁽³⁾ OJ L 159, 29.6.1996, p. 1.

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- equipment containing gases that are ozone depleting or have a global warming potential (GWP) above 15, such as those contained in foams and refrigeration circuits: the gases must be properly extracted and properly treated. Ozone-depleting gases must be treated in accordance with Regulation (EC) No 1005/2009,
 - gas discharge lamps: the mercury shall be removed.
3. Taking into account environmental considerations and the desirability of preparation for re-use and recycling, points 1 and 2 shall be applied in such a way that environmentally-sound preparation for re-use and recycling of components or whole appliances is not hindered.
-

ANNEX VIII

TECHNICAL REQUIREMENTS REFERRED TO IN ARTICLE 8(3)

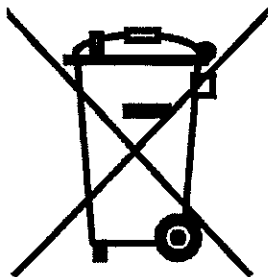
1. Sites for storage (including temporary storage) of WEEE prior to its treatment (without prejudice to the requirements of Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste⁽¹⁾):
 - impermeable surfaces for appropriate areas with the provision of spillage collection facilities and, where appropriate, decanters and cleanser-degreasers,
 - weatherproof covering for appropriate areas.
2. Sites for treatment of WEEE:
 - scales to measure the weight of the treated waste,
 - impermeable surfaces and waterproof covering for appropriate areas with the provision of spillage collection facilities and, where appropriate, decanters and cleanser-degreasers,
 - appropriate storage for disassembled spare parts,
 - appropriate containers for storage of batteries, PCBs/PCTs containing capacitors and other hazardous waste such as radioactive waste,
 - equipment for the treatment of water in compliance with health and environmental regulations.

⁽¹⁾ OJ L 182, 16.7.1999, p. 1.

ANNEX IX

SYMBOL FOR THE MARKING OF EEE

The symbol indicating separate collection for EEE consists of the crossed-out wheeled bin, as shown below. The symbol must be printed visibly, legibly and indelibly.



—

ANNEX X

INFORMATION FOR REGISTRATION AND REPORTING REFERRED TO IN ARTICLE 16

A. Information to be submitted upon registration:

1. Name and address of the producer or of the authorised representative where appointed under Article 17 (postal code and location, street name and number, country, telephone and fax number, e-mail, as well as a contact person). In the case of an authorised representative as defined in Article 17, also the contact details of the producer that is represented.
2. National identification code of the producer, including European tax number or national tax number of the producer.
3. Category of EEE set out in Annex I or III, as appropriate.
4. Type of EEE (household or other than household equipment).
5. Brand name of EEE.
6. Information on how the producer meets its responsibilities: individual or collective scheme, including information on financial guarantee.
7. Selling technique used (e.g. distance selling).
8. Declaration stating that the information provided is true.

B. Information to be submitted for reporting:

1. National identification code of the producer.
2. Reporting period.
3. Category of EEE set out in Annex I or III, as appropriate.
4. Quantity of EEE placed on the national market, by weight.
5. Quantity, by weight, of waste of EEE separately collected, recycled (including prepared for re-use), recovered and disposed of within the Member State or shipped within or outside the Union.

Note: information set out in points 4 and 5 must be given by category.

ANNEX XI

PART A

*Repealed Directive with its successive amendments**(referred to in Article 25)*

Directive 2002/96/EC on waste electrical and electronic equipment (WEEE)	(O) L 37, 13.2.2003, p. 24)
Directive 2003/108/EC of the European Parliament and of the Council	(O) L 345, 31.12.2003, p. 106)
Directive 2008/34/EC of the European Parliament and of the Council	(O) L 81, 20.3.2008, p. 65)

PART B

*List of time limits for transposition into national law**(referred to in Article 25)*

Directive	Deadline for transposition
2002/96/EC	13 August 2004
2003/108/EC	13 August 2004
2008/34/EC	—

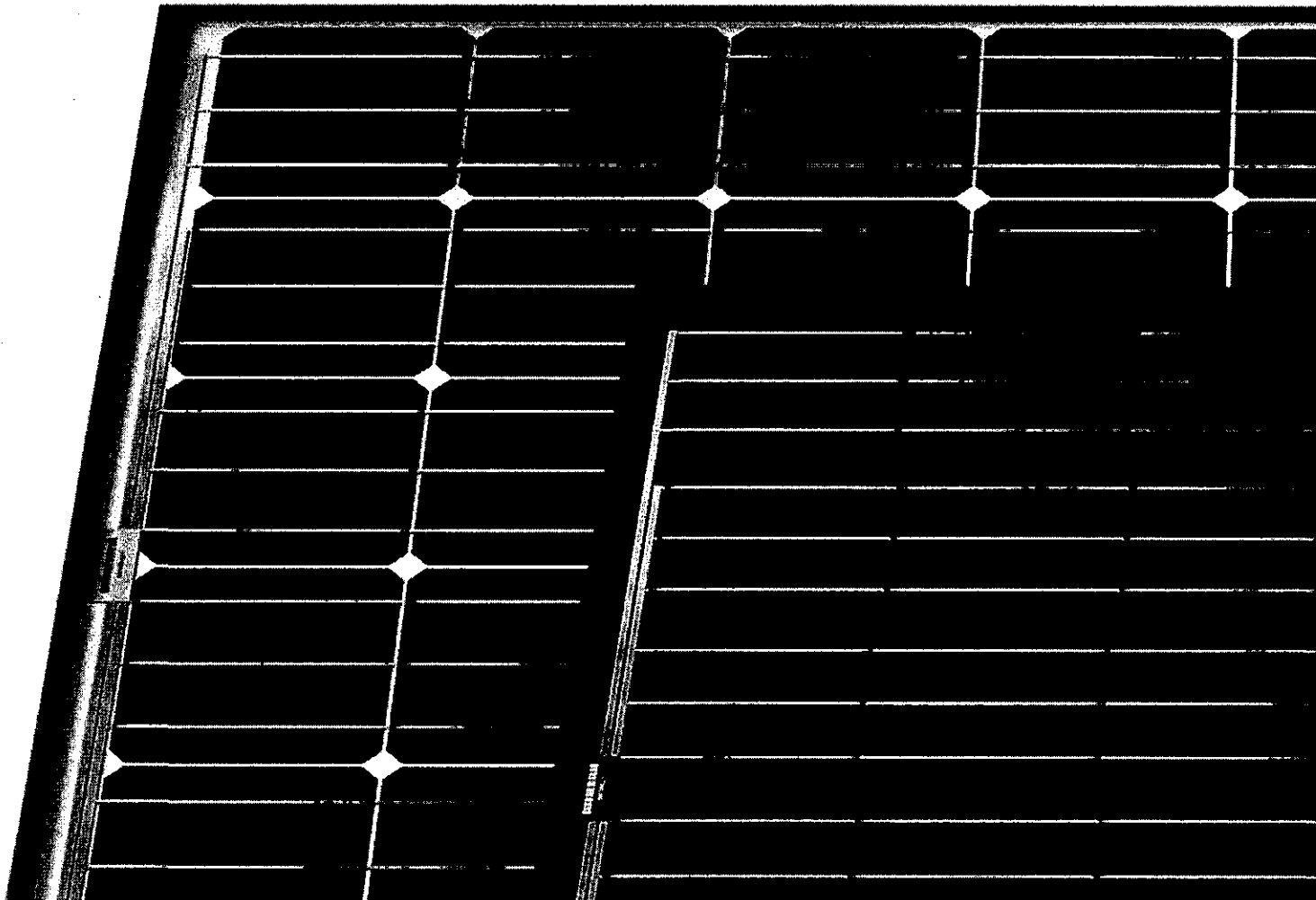
ANNEX XII

CORRELATION TABLE

Directive 2002/96/EC	This Directive
Article 1	—
—	Article 1
Article 2(1)	Article 2(1)
Article 2(2)	Article 2(2)
Article 2(3)	Article 2(3)(a)
Article 2(1) (partly)	Article 2(3)(b)
Annex IB, point 5, last item	Article 2(3)(c)
Annex IB, point 8	Article 2(4)(g)
—	Article 2(4)(a) to (f) and 2(5)
Article 3(a)	Article 3(1)(a)
—	Article 3(1)(b) to (d)
Article 3(b)	Article 3(1)(e)
Article 3(c) to (h)	Article 3(2)
Article 3(i)	Article 3(1)(f)
Article 3(j)	Article 3(1)(g)
Article 3(k)	Article 3(1)(h)
Article 3(l)	—
Article 3(m)	Article 3(1)(i)
—	Article 3(1)(j) to (o)
Article 4	Article 4
Article 5(1) to (2)	Article 5(1) to (2)
—	Article 5(3) to (4)
Article 5(3)	Article 5(5)
—	Article 6(1)
Article 5(4)	Article 6(2)
Article 5(5)	Article 7(1) and (2)
—	Article 8(1)
Article 6(1), first and second subparagraphs, and (3)	Article 8(2), (3) and (4)
Annex II(4)	Article 8(4), second subparagraph, first sentence
Article 6(1), third subparagraph	Article 8(5)
Article 6(6)	Article 8(6)

Directive 2002/96/EC	This Directive
Article 6(2)	Article 9(1) and (2)
Article 6(4)	Article 9(3)
Article 6(5)	Article 10(1) and (2)
—	Article 10(3)
Article 7(1)	—
Article 7(2)	Article 11(1) and Annex V
—	Article 11(2)
—	Article 11(3)
Article 7(3), first subparagraph	Article 11(4)
Article 7(3), second subparagraph	—
Article 7(4)	—
Article 7(5)	Article 11(5)
—	Article 11(6)
Article 8(1)	Article 12(1)
—	Article 12(2)
Article 8(2), first and second subparagraphs	Article 12(3)
Article 8(2), third subparagraph	Article 14(1) (partly)
Article 8(3), first subparagraph	Article 12(4)
—	Article 12(5)
Article 8(3), second subparagraph	Article 14(1) (partly)
Article 8(4)	—
Article 9(1), first subparagraph	Article 13(1), first subparagraph
Article 9(1), second subparagraph	—
Article 9(1), third subparagraph	Article 13(1), second subparagraph
Article 9(1), fourth subparagraph	Article 13(1), third subparagraph
Article 9(2)	Article 13(2)
Article 10(1)	Article 14(2)
Article 10(2)	Article 14(3)
Article 10(3)	Article 14(4)
Article 10(4)	Article 14(5)
Article 11	Article 15
Article 12(1) (partly)	Article 16(1) to (3)
Article 12(1), first subparagraph (partly)	Article 16(4)
Article 12(1), second subparagraph	Article 16(1) and (2) and Article 17(2) and (3)

Directive 2002/96/EC	This Directive
Article 12(1), third subparagraph	Article 16(3) and (5)
—	Article 17(1)
Article 12(1), fourth subparagraph	Article 18
Article 12(2)	Article 16(5)
Article 13	Article 19
—	Article 20
Article 14	Article 21
Article 15	Article 22
Article 16	Article 23(1)
—	Article 23(2) to (4)
Article 17(1) to (3)	Article 24(1) to (3)
Article 17(4)	Article 7(3)
Article 17(5)	Article 7(4) to (7), Article 11(6) and Article 12(6)
—	Article 25
Article 18	Article 26
Article 19	Article 27
Annex IA	Annex I
Annex IB	Annex II
—	Annexes III, IV and VI
Annexes II to IV	Annexes VII to IX
—	Annexes X and XI
—	Annex XII



Discover aleo

Who we are.

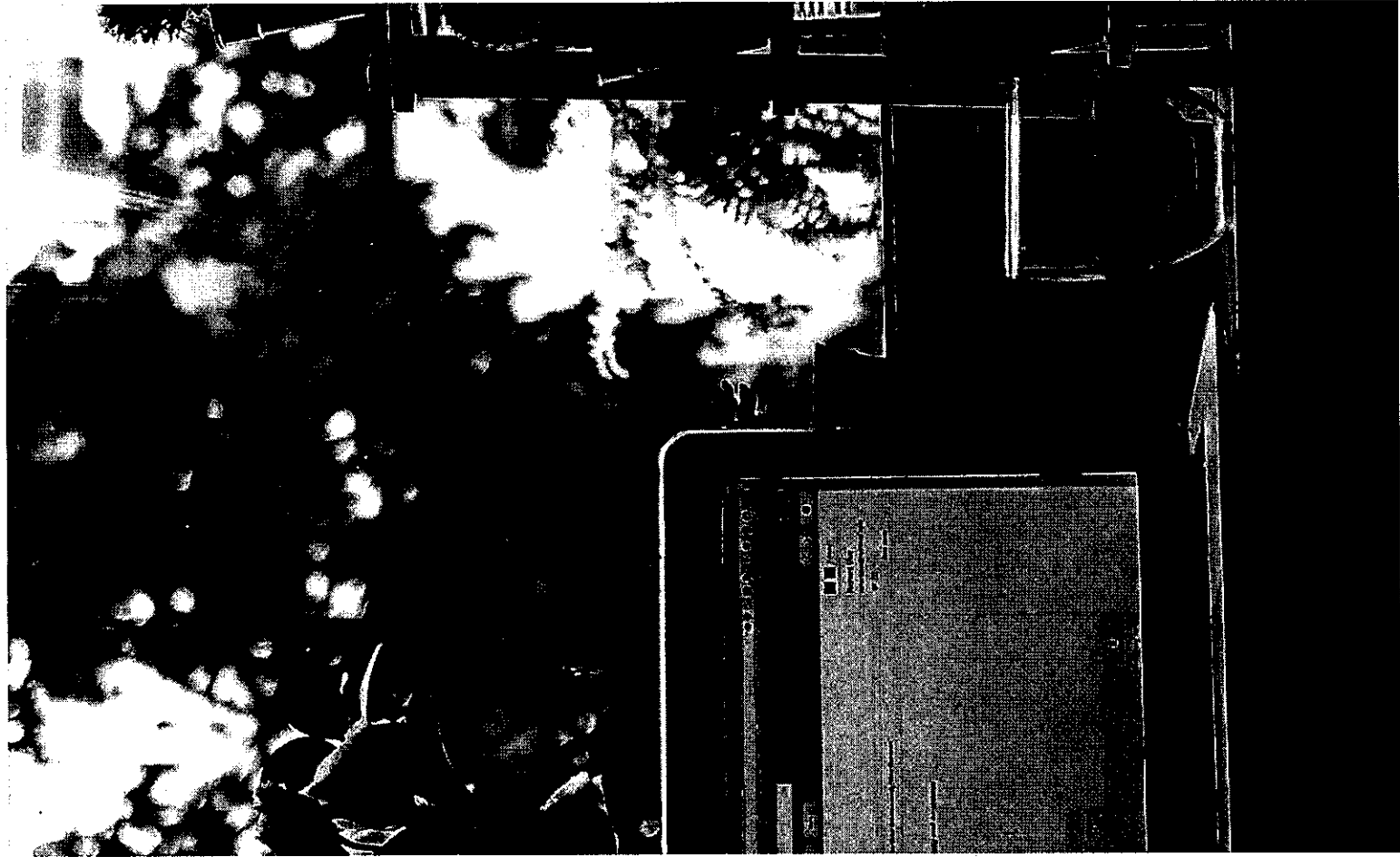
What we do.

What we fight for.

aleo

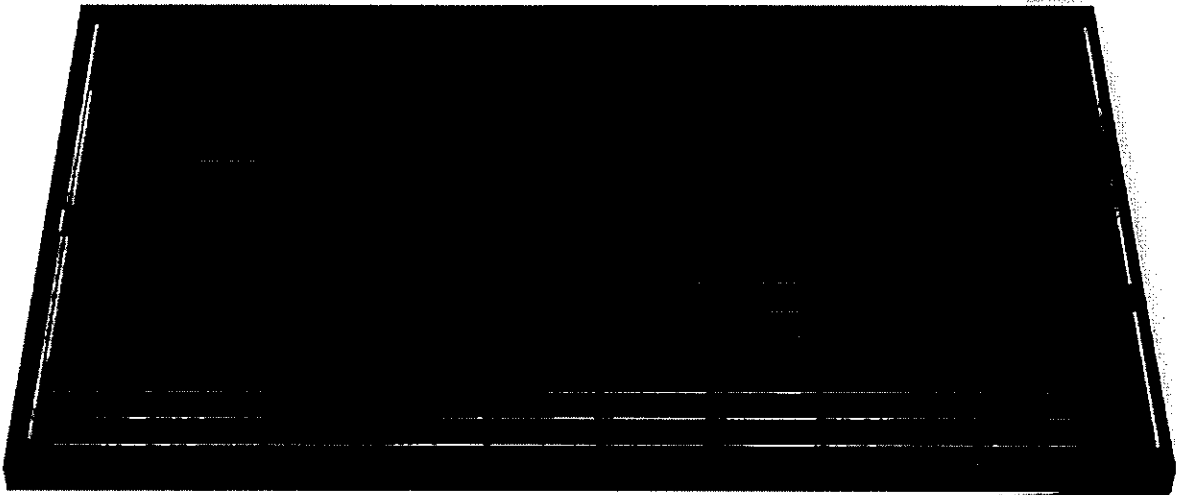
Solar energy must be made reliable as it is getting mainstream.

Being more and more self consumed in every part of the world to power everyday life, solar energy supply is expected to be stable and reliable.



also provides a reliable
solar experience.

Our premium solar modules combined with industry-leading warranties enable customers to enjoy the benefits of solar energy, without any hassle.



With aleo, your customers go solar easily.

We stand behind our craft. Whatever happens. That's why
we offer industry-leading warranties.

PRODUCT GUARANTEE

Up to **25** years

PERFORMANCE GUARANTEE

25 years

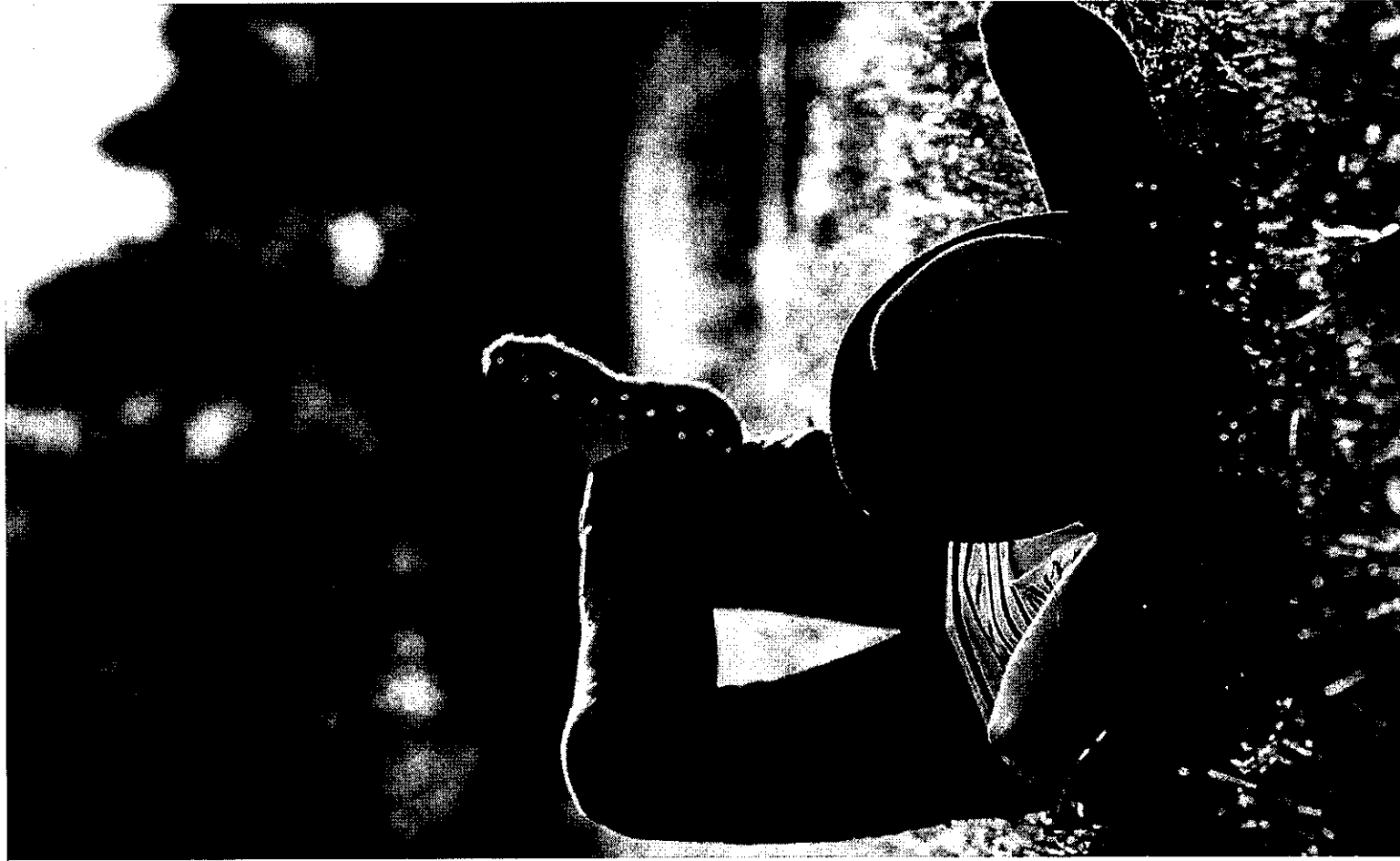
FIRST 2 YEARS PERFORMANCE

98% of the nominal
power guaranteed

AFTER SALES

100%

of costs covered in case of
after sales case under
guarantee (residential)



We believe in premium craftmanship.

We are experts in our craft and know that every solar module we produce is an advocate for solar energy. That's why our commitment to quality is uncompromising.



Know-how is key

People, processes, knowledge, and experience. These are the constituents of advanced, high-quality solar panels. We've been building solar modules for years and apply the lessons we've learned to every step of the process. Selecting materials, associating and testing them. This work is not a commodity. Providing consistent output for 25 years is a big challenge, but at aleo we embrace it.



We strive for perfection

We care for people to get the yields they were promised for the next two decades at least. That's why we put all our efforts in manufacturing high quality modules made to last.

2XIEC

Dampheat: 2000h
Thermal cycles: 400 cycles
Humidity EVA and backsheet
Freeze cycle: x 20
UV tests: x 20

2XEL

Before lamination
During flashing step

ISO 9001
ISO 14001
ISO 50001

OHSAS compliant
PID free

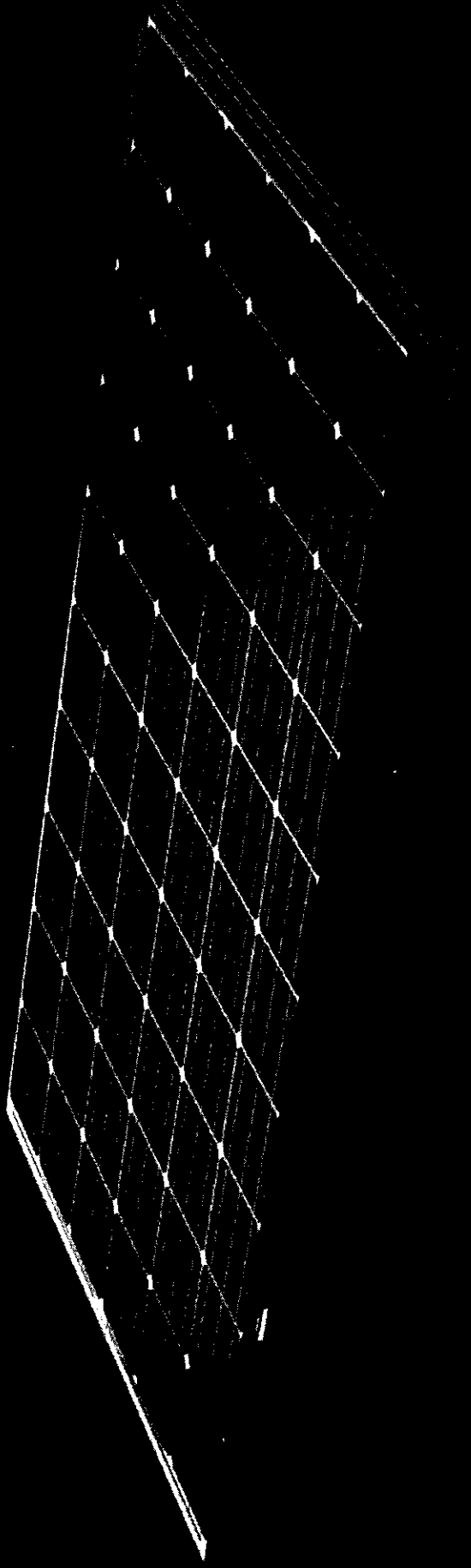
Salt mist corrosion resistance
Ammonia corrosion resistance

100% diodes tested
100% snail trail free



High power. High yields. Up to 310 W.

High power modules are at the core of our know-how. Our high efficiency monocrystalline HE Tec technology features industry-leading power classes, with 60 cells modules up to 310W.



Built to perform

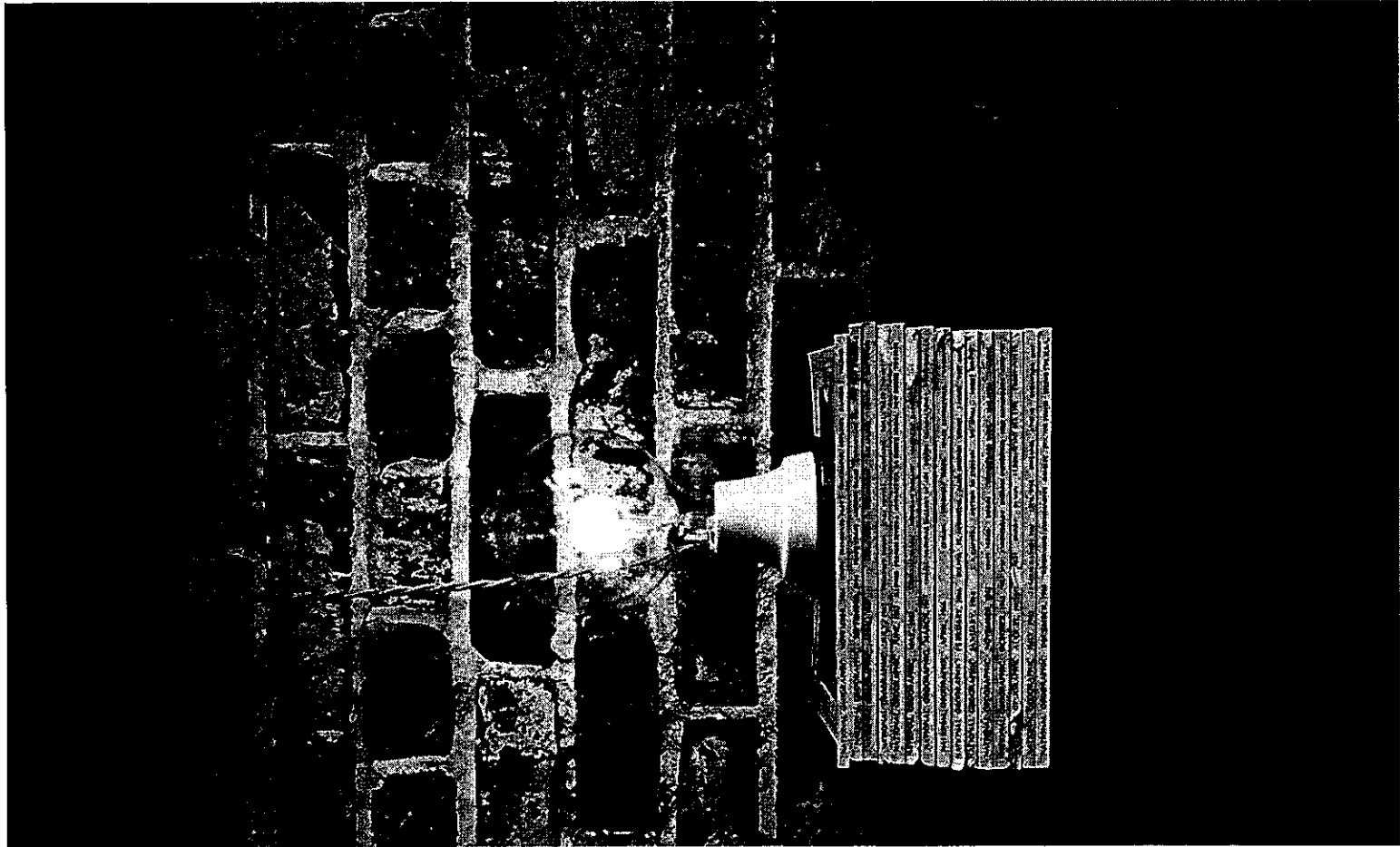
Thanks to low LID and optimized conception, HE Tec modules produce significantly more yields than traditional crystalline technologies. A one year field study led at Politecnico di Milano proved the distinctive features of our technology.

Up to **+5,7%**

more yields over
Tier 1 European
polycrystalline module*

More energy. To power more needs.

From sunrise to sunset, HE Tec modules perform better and help people power more of their needs with a reliable solar electricity.



Product range

4 60 cells modules -

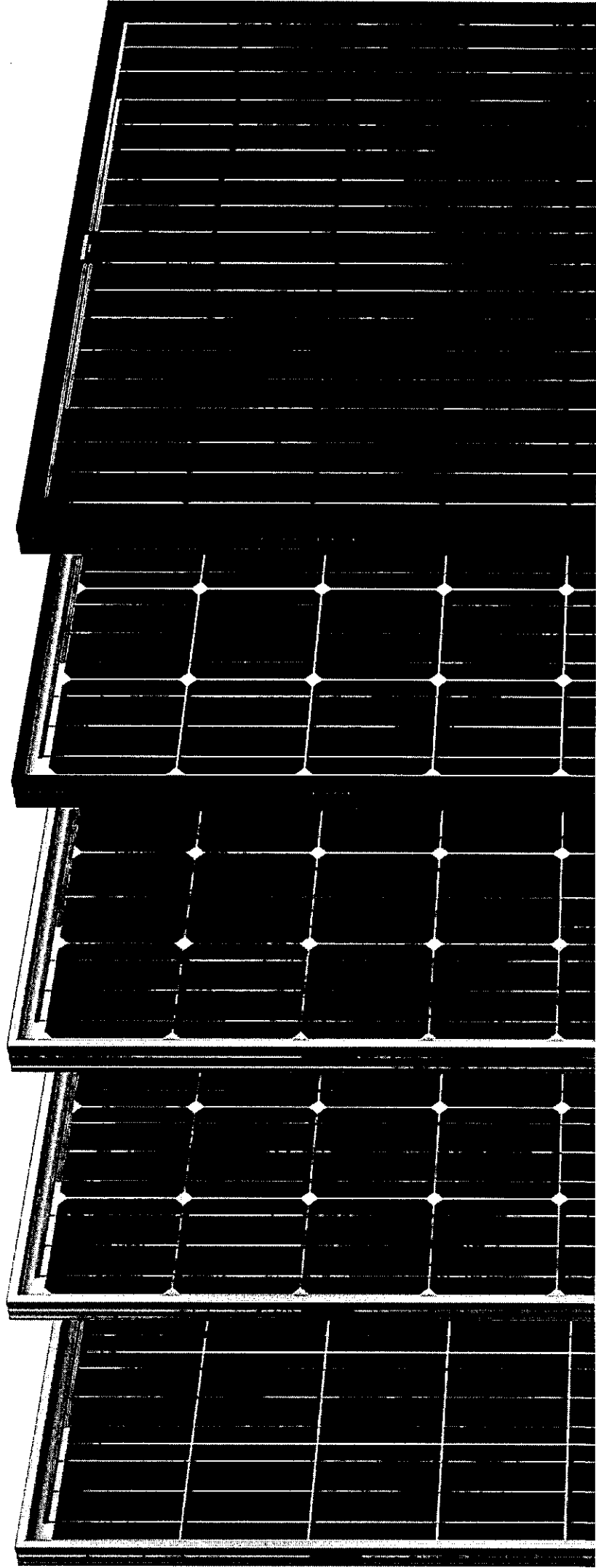
P18
255W - 260W

P19
290W - 295W

S19 - HE Tec
300W - 310W

S59 - HE Tec
300W - 310W

S79 - HE Tec
295W - 305W

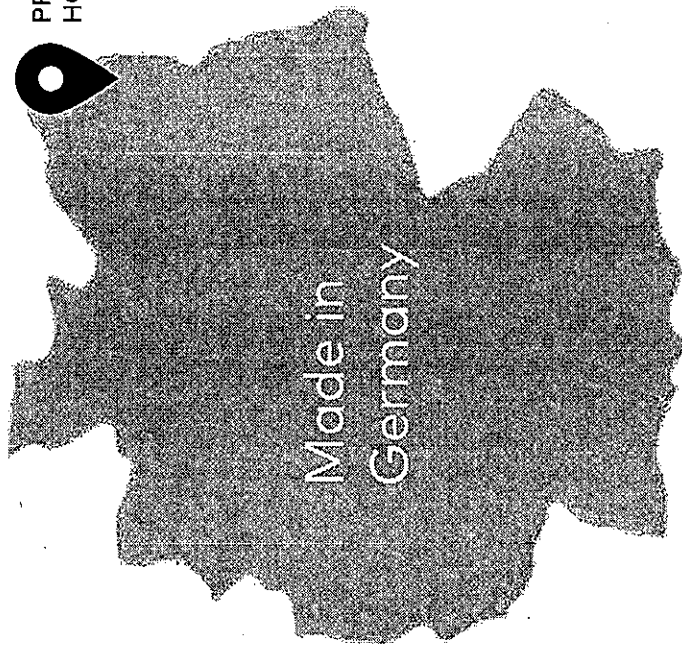


Manufacturing know-how since

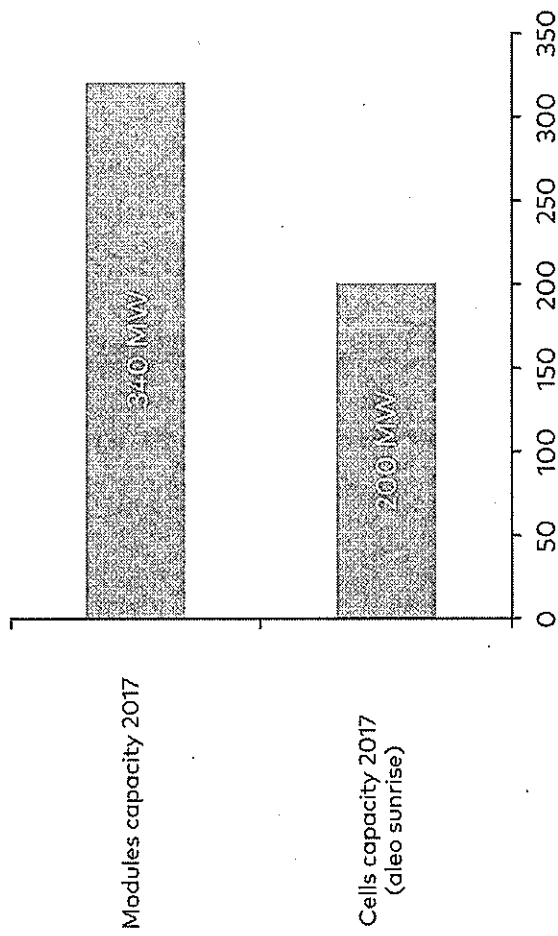
2001

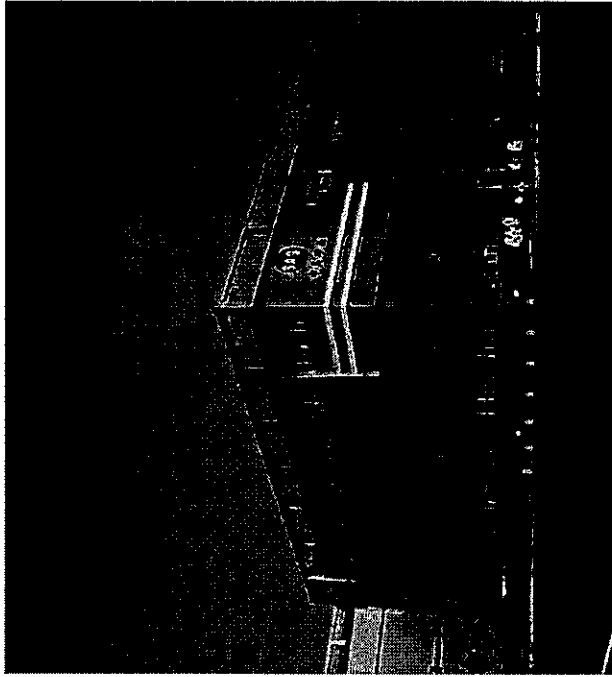
330

employees



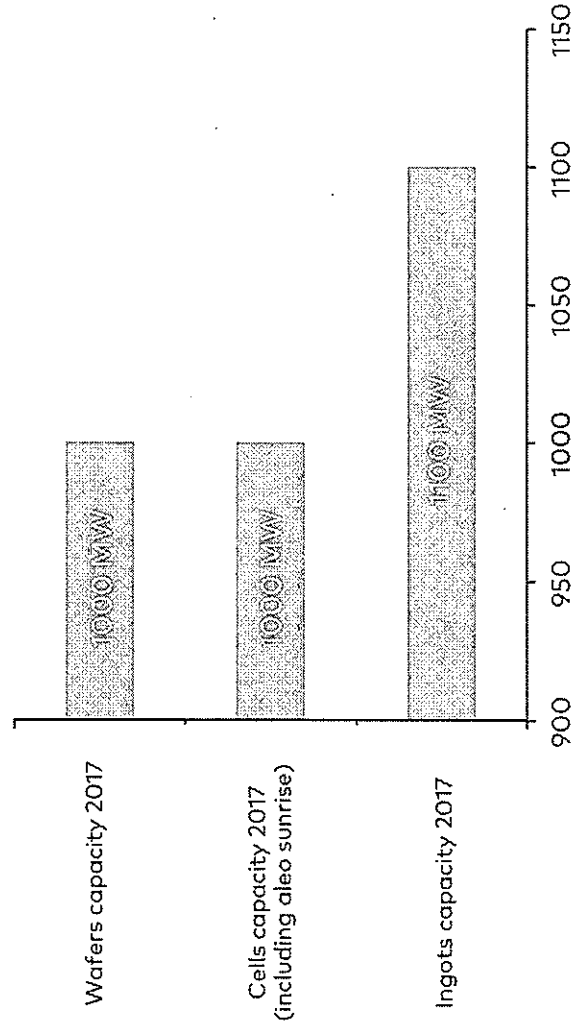
PRENZLAU
HQ - Manufacturing site



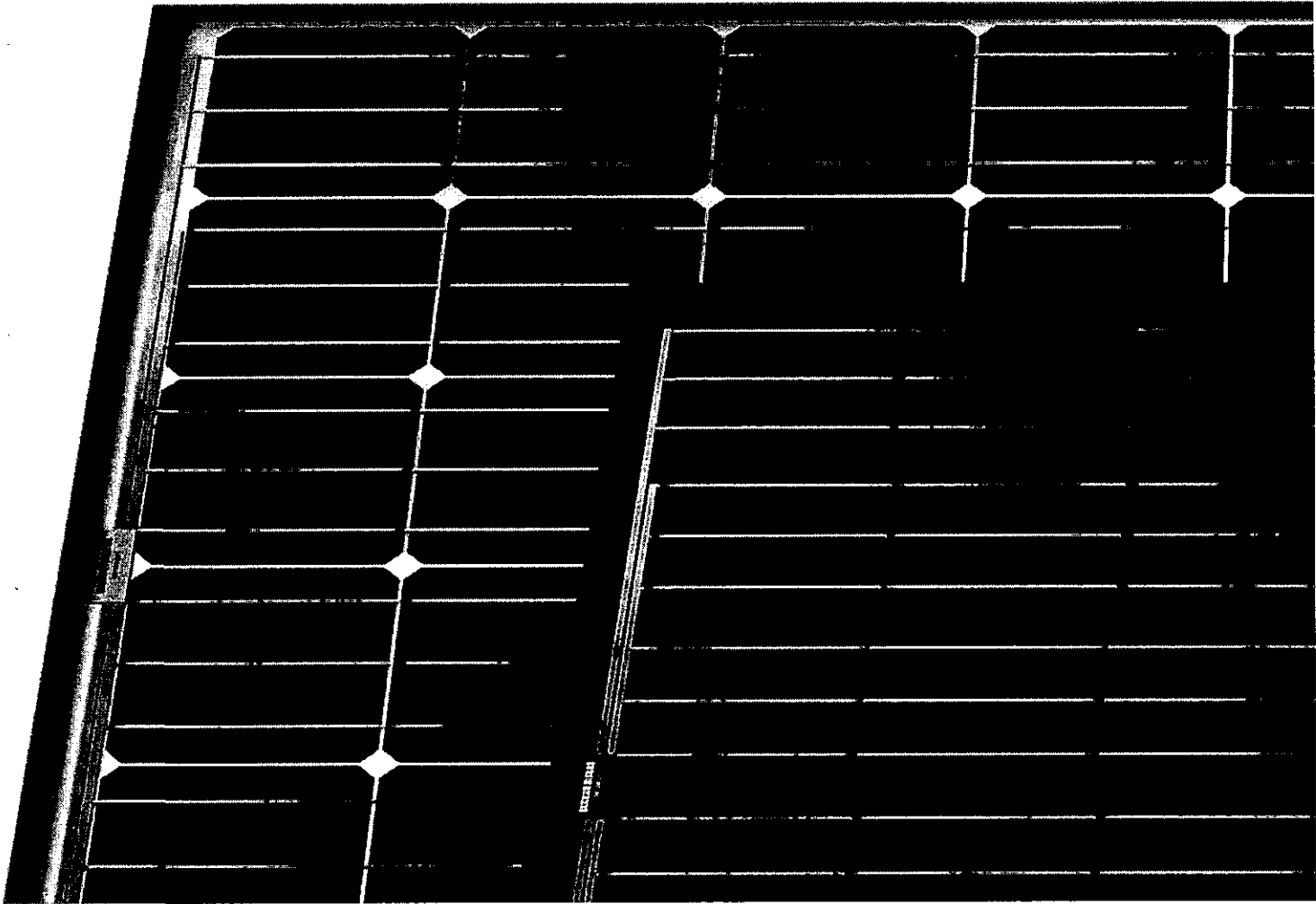


8500
employees

Founded in
1981



Revenue 2016
1 Mrd \$

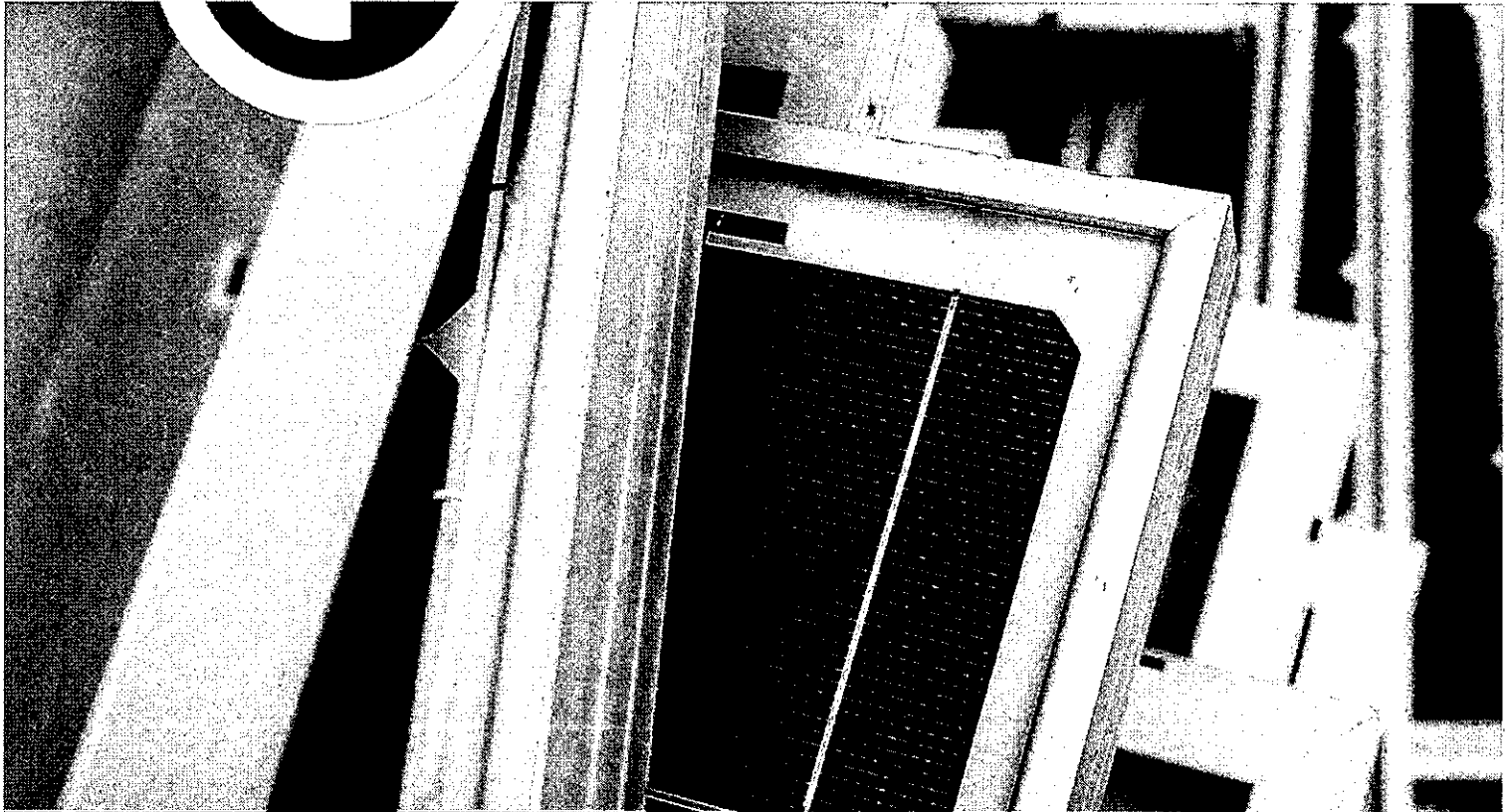
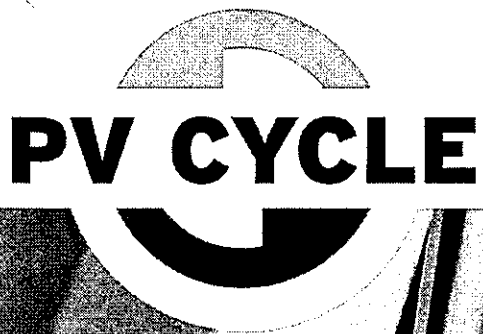


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to your customers ?

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CONFORMITÉ AVEC LA RÉGLEMENTATION DEEE

PV CYCLE

**LA SOLUTION DEEE POUR PANNEAUX
PHOTOVOLTAÏQUES USAGÉS**

Le décret 2014-928, en vigueur depuis le 23 août 2014, rend obligatoire la collecte séparée et le traitement des panneaux photovoltaïques usagés en France. Les Producteurs (fabricants/importateurs) et les Distributeurs (revendeurs) se voient imposer de nouvelles obligations légales.

PRODUCTEUR

Qui est Producteur ?

Un Producteur est une personne qui :

- est en France et fabrique ou fait fabriquer des panneaux photovoltaïques pour la France (FABRICANT);
- est en France et revend, sous son propre nom ou sa propre marque, des panneaux produits par d'autres (REVENDEUR);
- est en France et met sur le marché, à titre professionnel, des panneaux photovoltaïques provenant de l'étranger (IMPORTATEUR);
- est à l'étranger et vend en France des panneaux photovoltaïques par communication à distance (VENTE EN LIGNE/À DISTANCE).

Obligations du Producteur

- Organiser et financer la collecte et le recyclage des panneaux photovoltaïques mis sur le marché, par adhésion à un organisme agréé ou par la mise en place d'un système individuel préalablement approuvé par arrêté ministériel :
 - L'obligation de collecte est rétroactive et collégiale puisque tous les panneaux photovoltaïques doivent être collectés, indépendamment de la marque ou de la date de mise sur le marché;
 - Le paiement de l'éco-participation est obligatoire pour les panneaux photovoltaïques mis sur le marché depuis le 23 août 2014.
- Déclarer les panneaux photovoltaïques mis sur le marché auprès de l'organisme agréé.
- Informer les acheteurs, consommateurs et opérateurs de traitement sur la fin de vie des équipements.
- Remplir les obligations relatives à la conception et au marquage des équipements :
 - Favoriser l'éco-conception afin de faciliter le démantèlement et la valorisation ;
 - Apposer le pictogramme de la « poubelle barrée ».

DISTRIBUTEUR

Qui est Distributeur ?

L'article R 543-174 du Code de l'environnement définit comme Distributeur toute personne qui, quelle que soit la technique de distribution utilisée, fournit à titre commercial des équipements électriques et électroniques (EEE) à celui qui va les utiliser.

Important : Les Producteurs dans le cadre du Décret sur les déchets d'équipements électriques et électroniques (DEEE) peuvent également être considérés comme Distributeurs et doivent le cas échéant s'acquitter de leurs obligations en vertu des deux statuts.

Obligations du Distributeur

- Afficher l'éco-participation, et assurer son intégration dans votre système de facturation.
- Mettre en place la reprise « un pour un », puisqu'à la vente d'un équipement neuf, vous acceptez de reprendre l'ancien équivalent rapporté par le consommateur.
- Informer les consommateurs sur le fonctionnement de la filière et les solutions de reprise disponibles.

En rejoignant PV CYCLE France, vous pourrez vous mettre en conformité avec toutes les responsabilités mentionnées précédemment en vertu du Décret français sur les DEEE. Vous participerez ainsi à la collecte dédiée de panneaux photovoltaïques usagés et bénéficierez des services suivants :

- Un service de collecte et de recyclage complet pour toutes les technologies photovoltaïques ;
- Un réseau de points d'apport volontaire établi et en pleine croissance ;
- Expertise et conseil dans toutes les requêtes relatives au photovoltaïque ;
- L'utilisation du logo PV CYCLE et d'autres matériels de communication.

Pour plus d'informations, visitez www.pvcycle.fr
ou écrivez nous à france@pvcycle.org

LES SERVICES DE PV CYCLE

PV CYCLE France est un éco-organisme à but non lucratif agréé par les pouvoirs publics pour organiser la collecte et le traitement des panneaux photovoltaïques arrivés en fin de vie utile. Fondé en 2014 par et pour la filière photovoltaïque, PV CYCLE France gère les aspects administratifs et opérationnels de la conformité DEEE pour les Producteurs et Distributeurs de panneaux photovoltaïques et représente la filière auprès des autorités.

PRODUCTEURS

Service de conformité réglementaire

- Enregistrement des adhérents au Registre national des Producteurs et déclaration des volumes mis sur le marché
- Conseils aux entreprises
- Campagnes de communication
- Audit des metteurs en marché et des prestataires de traitement

Services de collecte séparée et de traitement

- Collecte séparée :
 - Points d'apport volontaire
 - Collecte sur site pour les grands volumes
 - Collecte via la reprise par les Distributeurs
- Valorisation et traitement
- Traçabilité des déchets

Adhérez à PV CYCLE et bénéficiez de nos solutions complètes de mise en conformité réglementaire et de gestion des déchets. Les adhérents de PV CYCLE peuvent s'enregistrer en France ou dans plusieurs pays selon leurs besoins.

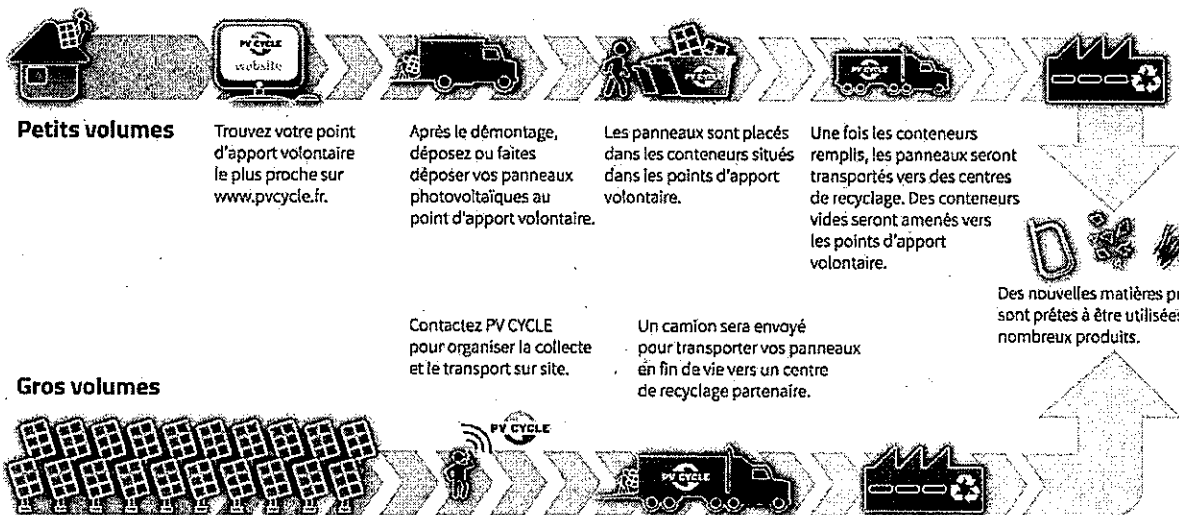
DISTRIBUTEURS

PV CYCLE met à votre disposition un **dispositif logistique** ainsi que des **outils d'information** :

- Infrastructure de collecte, transport et traitement pour toutes les technologies de panneaux photovoltaïques
- Outils d'information et de communication à destination du grand public, des consommateurs et des professionnels
- Conseils aux entreprises

Contribuez activement à la collecte des panneaux photovoltaïques usagés: inscrivez-vous sur www.pvcycle.fr et devenez point d'apport volontaire PV CYCLE.

NOTRE SYSTÈME



Des conditions spéciales peuvent s'appliquer. Pour de plus amples informations, veuillez contacter PV CYCLE.

L'ÉCO-PARTICIPATION

L'éco-participation est une contribution environnementale visible s'appliquant à chaque panneau photovoltaïque neuf et permettant de financer et développer les opérations de collecte, de tri et de recyclage actuelles et futures.

Elle s'applique à la date de mise en marché d'un panneau photovoltaïque et indique la conformité du fabricant ou importateur français avec la législation DEEE. Le montant est fixé par un barème. Les vendeurs ne peuvent faire ni rabais ni marge sur cette contribution visible.

Toutes les décisions qui concernent l'éco-participation, dont la définition du barème, sont prises par les représentants de la filière photovoltaïque siégeant au Conseil d'Administration de PV CYCLE France.

Pour plus d'information, visitez notre site Internet

www.pvcycle.fr



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