WASTE MANAGEMENT IN SOLAR PHOTOVOLTAIC PLANTS

Prepared by:	Reviewed by:	Validated by:	Aproved by:
EDPR PT EMS Manager	*EDPR EU EMS Manager*	*EDPR PT EMS Management Representative*	*EDPR EU EMS Management Representative*
Name: Vasco Soares	Name: Ángela Toledo	Name: Timóteo Monteiro	Name: Manuel Fernández
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0 CHANGE CONTROL

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1 OBJECTIVES AND SCOPE

This document describes the main existing procedures and means in EDP Renewables Portugal (EDPR PT) for proper management and control of generated waste in operation and maintenance activities in its Solar Photovoltaic Plants in the EMS scope set out in the file "*Facilities in the EMS scope*".

The creation and development of this procedure was done according to the document EXPR-GLB_TSO&M-SPV-00024 "*Waste Management and Module Recycling*", and will hereon act as an addition to this document and main reference for waste management guidelines for EDPR PT's Solar Photovoltaic Plants.

2 REFERENCES

- ISO 14001:2004 Standard.
- EMS Manual.
- EXPR-EU/EMS-GEN 00007 "*Operational control, monitoring and measurement*".
- EXPR-GLB_TSO&M-SPV-00024 "*Waste Management and Module Recycling*"

3 DEFINITIONS

- **Broken or defective equipment**: Equipment or materials that should not be immediately treated as waste, but instead attempted to be repaired.
- **Construction and Demolition Waste (CDW):** waste generated from civil construction and demolition activities.

- **Hazardous Waste:** «any type of waste that shows at least one trait that is hazardous to the environment or for public health, as specified in the European Waste Catalogue…» *in DL 178/2006, de 5 de Setembro*.
- **Industrial Waste:** «specific waste generated from industrial production processes…» *in DL 178/2006, de 5 de Setembro*.
- **Waste:** «any substance or object disposed of or which its owner intends to dispose of...», *in DL 178/2006, de 5 de Setembro*.

4 ABBREVIATIONS

- **CDW**: Construction and Demolition Waste.
- **EDPR PT:** EDP Renewables Portugal.
- **EMS**: Environmental Management System.
- **EWC:** European Waste Catalog.
- **MSW:** Municipal Solid Waste.
- **SILiAmb:** Integrated Environmental Licensing System of the Portuguese Environment Agency.
- **SP:** Operation and Maintenance Service Providers.
- **WEEE:** Waste Electric and Electronic Equipment.
- **WTF:** Waste Transfer Note.

5 PROCEDURE

Due to the very nature of Solar Photovoltaic Plants as a facility and the type of waste that may be generated from its operation and maintenance activities, the waste management responsibilities are delegated to the corresponding Service Providers in charge of the facility's maintenance. This action should always be based in legal and formal support, that contractually binds both parts.

Operation and maintenance activities in Solar Photovoltaic Plants predominantly generate the following types of waste: maintenance material (such as contaminated cloths, excess consumables), damaged or defective components of photovoltaic modules, and in some cases,

even the actual equipment whenever it's unrepairable, MSW and green waste from vegetation control.

Service Providers are to recover and direct generated waste to adequate and licensed waste handlers. SP may store generated waste in their own central warehouses, prior to delivery to waste handlers. No waste burning activities of any kind are permitted. As for the case of damaged large components, its final destination should always be specified and agreed upon before its transportation.

Non-hazardous generated waste are not to be stored anywhere in the Solar Photovoltaic Plant or its exterior for periods longer than 5 days. Whenever necessary to store waste in the facility for this time period, the SP is required to adequately label it according to the European Waste Catalogue. Additionally, the SP is also required to correctly store waste according to its properties, and will have to provide adequate containers themselves. The storage location must be subjected to EDPR PT's approval, and may not be in protected or restricted areas. The approval of these locations on EDPR PT's behalf is by the Solar Photovoltaic Plant Manager.

Hazardous waste are prohibited to be stored in the facility, and should always be collected and stored in adequate conditions, in order to prevent possible spills and other occurrences that may cause contaminations. This task is also at the responsibility of the Service Provider.

Service Providers are required to register and report all generated waste in these facilities quarterly to EDPR PT, which in turn will be reported in SIS. The SP's report is required to contain at least the following information:

- Solar Photovoltaic Plant designation;
- Waste quantities and transport information (origin and final destination) sorted by EWC code;
- Defective or damaged Electric and Electronic Equipment sent for reparation and its final destination.

The selected waste handlers for transport and final destination of generated waste must be properly licensed for the corresponding functions. The SP is required to provide EDPR PT with the corresponding documentation and evidences regarding this matter, as well as any future update. Additionally, the service provider should also send EDPR PT a copy of its own annual

waste registration from SILiAmb, and should provide any and all WTFs asked by EDPR PT, for the purpose of verification.

Regarding the selection of waste transporters and handlers, waste destinations regarding recycling, re-use or recovery should always be privileged, comparatively to elimination.

As for damaged or faulty electric and electronic equipment, repairing should be always a priority before considering it a waste, according to European and Portuguese legislation on this specific waste type. Afterwards, the same waste destination priority that was mentioned above is applicable.

Considering the performed maintenance and operation activities, if the Service Provider needs to acquire any electric and electronic equipment, it is required by the Directive 2012/19/EU of the European Parliament And Of The Council of 4 July 2012 on Waste Electrical and Electronic Equipment (WEEE) to be legally registered as a producer or importer of electric and electronic equipment. Therefore, the SP is obligated to present evidences of legal compliance regarding this matter to EDPR PT. This is also applicable regarding the possibility of Electrical and Electronic Equipment (EEE), such as photovoltaic modules, which became unusable and unrepairable. In these cases, the same legislative dispositions apply, and Service Providers are to select adequate WEEE handlers and provide EDPR PT with the corresponding documentation regarding certification as an EEE importer / WEEE producer and handler.

The Service Provider formalizes the acceptance of these responsibilities, as well as the compliance of all related legal obligations, with the acceptance of the formal contract (side letter to the Operation and Maintenance Contract, declarations, contractual annexes, etc). In the stated document, the Service Provider assumes, among other responsibilities, the obligation to follow all dispositions regarding this procedure.

Furthermore, Service Providers are required to participate in environmental training sessions, as well as emergency drills and both audits to EDPR PT facilities, and also accept possible visits to its own facilities were waste generated in in EDPR PT's Solar Photovoltaic Plants are stored.

6 RESPONSIBILITIES

EDPR PT EMS Manager:

- Receive the quarterly information regarding waste produced in EDPR PT's Solar Photovoltaic Plant(s), as well as damaged and repaired Electric and Electronic Equipment, and report this information in SIS.
- Receive the corresponding Waste Transfer Notes and guarantee that the selected waste handlers are adequate.
- Guarantee that, when applicable, the Service Provider is legally registered as a producer or importer of electric and electronic equipment.
- Receive the SP's annual waste report from SILiAmb.
- Develop and promote environmental training sessions, as well as emergency drills and internal audits in this scope.

EDPR PT O&M Manager for EMS:

- Guarantee that the SP provides immediate solution for any and all contract / side letter breaches.

Photovoltaic Plant Manager:

- Periodically check the state of all facility elements and equipment, and guarantee that generated waste is managed according to the procedure's specifications.

Service Provider:

- Provide the EDPR PT EMS Manager and O&M Manager for EMS with the corresponding evidences of adequate legal compliance and licensing regarding the production or importing of electric and electronic equipment.
- Provide the EDPR PT EMS Manager and O&M Manager for EMS with the requested Waste Transfer Notes, which in turn serve to assess the adequate licensing of the selected waste handlers.
- Comply with all dispositions in this procedure, as well as all legal implications associated with waste management in EDPR PT's Solar Photovoltaic Plants.

7 TEMPLATES

Not applicable.