



**FEDERAL STATE UNITARY ENTERPRISE
RADIO RESEARCH AND DEVELOPMENT INSTITUTE (NIIR)**

Strategies and policies for the proper disposal or reuse of E-Waste in the Russian Federation



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E-waste recycling

According to the view (after 2015), developed by WSIS+10, priority of waste recycling over waste disposal should be implemented on the basis of the hierarchical approach to waste treatment involving the following sequence:



- E-waste prevention;
- Pre-processing of e-waste for re-use;
- Recycling e-waste as secondary material resources;
- Recycling e-waste as secondary energy resource.

E-waste is divided into:

- E-waste which could be re-used;
- E-waste which could be recycled to obtain secondary material and energy resources.

In order to assess e-waste capability for re-use it is necessary to test its functionality the same way as for the new electrical or electronic equipment of corresponding type before its distribution among end-users. This test is allowed anywhere meeting the requirements for such testing.

Upon detection of failure e-waste could be repaired.

E-waste collection and storage



When collecting e-waste, it is necessary to take into account the following:

- Suitability for further operation;
- Degree of wear for some units and components;
- Damages of some units and components;
- Cost of usable e-waste;
- Cost of e-waste materials;
- Expenses needed for e-waste pre-processing as compared to expenses needed for e-waste fragmentation.

In order to organize e-waste collection, it is reasonable:

1. To collect e-waste in places where electrical or electronic equipment was distributed among end-users.
2. To collect different types of e-waste into separate packages capable to maintain e-waste property unchanged for further storage and transportation. Separate packages are used for image transmitting equipment, refrigerating equipment, computer mainframes, keyboards, audio record players and radio receivers, LCD devices, chemical batteries, filament lamps, vacuum cleaners, clothes washers, refrigerators without cooling agents, and other e-waste.



E-waste collection and storage



Damaged e-waste should be placed in individual packages ensuring safety during storage and transportation.

During collection phase it is permitted to mix different types of e-waste subject to the following conditions:

- Chemical batteries are removed;
- Damaged e-waste does not generate hazardous substance under normal conditions;
- Most of hazardous substance is contained in e-waste in solid fixed form;
- E-waste treatment has no negative impact on the environment and people's health;
- E-waste does not generate hazardous substance under normal conditions.

E-waste storage

E-waste should be stored in packages ensuring its safety and unchanged properties under normal conditions.

Mixed storage of different types of WEEE is possible under the same conditions as for collection.



E-waste transportation



Packages for e-waste transportation should bear warning marks (information about hazardous substances and etc.).

In special cases (e.g. when waste lots including e-waste contain precious metals and are intended for refinery), waste lots are to be packed and marked in accordance with the requirements specified for such cases.



Basic principles E-waste disassembly



- Disassembly is firstly aimed at possible e-waste re-use for the initial or other purposes after additional processing.
- When re-use is not possible, e-waste is subject to other ways of disposal, with the burning being a least preferable way of disposal.
- E-waste is recommended to be disassembled under environment-friendly conditions (e.g. at special sites with weatherproof covering or within warmed premises with impermeable floor).
- In most cases e-waste is disassembled manually.
- E-waste disassembly could be divided into several phases to use different tools.
- During e-waste disassembly, matters, substances and components must be completely/entirely removed/extracted, should they are hazardous and their incomplete removal would lead to a substantial contamination of the waste flow.
- During e-waste disassembly, matters, substances and components could be partially removed, should the benefits of their complete removal/extraction from the points of view of human health and safety or environment protection be incommensurate with their removal/extraction expenses.
- During disassembly of oversized e-waste, it would be reasonable to install guard fence and accordingly equip worksite.



Features of E-waste disassembly

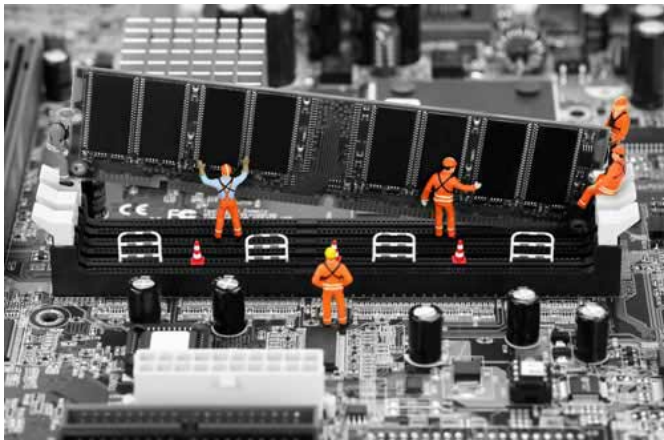
- E-waste is usually disassembled in the assembly-reverse order taking into account specifics of relevant e-waste type.
- Prior to disassembly, all fluids contained in e-waste should be removed and packed separately meeting relevant safety requirements. Special caution is required while extracting volatile, explosive and flammable fluids.
- Disassembling should take into account specifics of different types of e-waste due to certain components and parts.



The reuse of E-waste



The reuse of e-waste has greater environmental benefits (reducing the rates of e-waste /ICT generation) and social benefits (helping to reduce the digital divide in developing countries) than recycling. After prior repair (if needed) or software upgrade, such equipment will then be of benefit to new users.



Reuse makes for great resource efficiency, especially energy efficiency, since it avoids the extraction of new raw materials and consumption of the energy required for the manufacture of new equipment. The work involved in renovating and repairing equipment such as desktop PCs, portable computers and mobile telephones, in addition to facilitating social inclusion of the most disadvantaged segments of society, serves to increase and enhance the knowledge and skills of the technicians and professionals working in the ICT-related disciplines.

The following specific measures could be proposed to address e-waste issues



Elaboration (improvement) of regulation on e-waste management;



Continuous analysis of actual market for electronic equipment;



Development of e-waste control and management system for proper recycling and reuse from ecological and economical point of view;



Social advertising campaigns promoting careful use and repair (to the extent practicable) of household appliances and consumer electronics, and that it is needless to constantly update them;



Regular sharing of the best practices with international organizations and foreign partners.



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