

SCAVENGING OF WEEE:

environmental and
economic consequences
for society

Commissioned by EERA

Conducted by SOFIES
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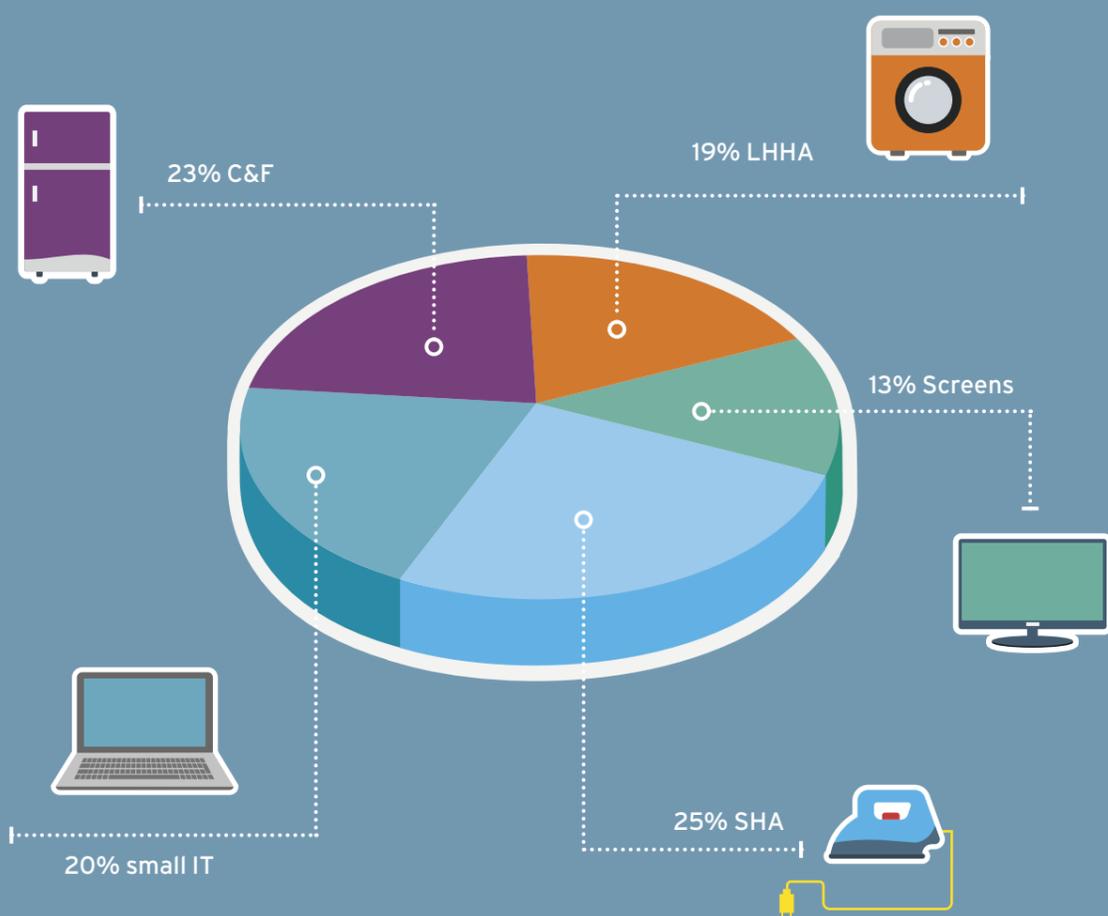
SCAVENGING OF WEEE: ENVIRONMENTAL AND ECONOMIC CONSEQUENCES FOR SOCIETY

In 2019 EERA Members and other EU recyclers provided data referring to 2018 operations on scavenging of products collected; data provided covered more than 520,000t of WEEE treated, 43 treatment locations in 9 different countries. Data covered also various collection categories: for cooling and freezing there were 13 responses, for screens 14, large household 14, small household 9 and IT equipment 15.

Two main elements were investigated:

- the scavenging of whole products, particularly those having higher economic value or re-use potential, and
- scavenging of components, which has environmental and economic consequences.

THE PERCENTAGE OF PRODUCT CATEGORIES IN THE STUDY

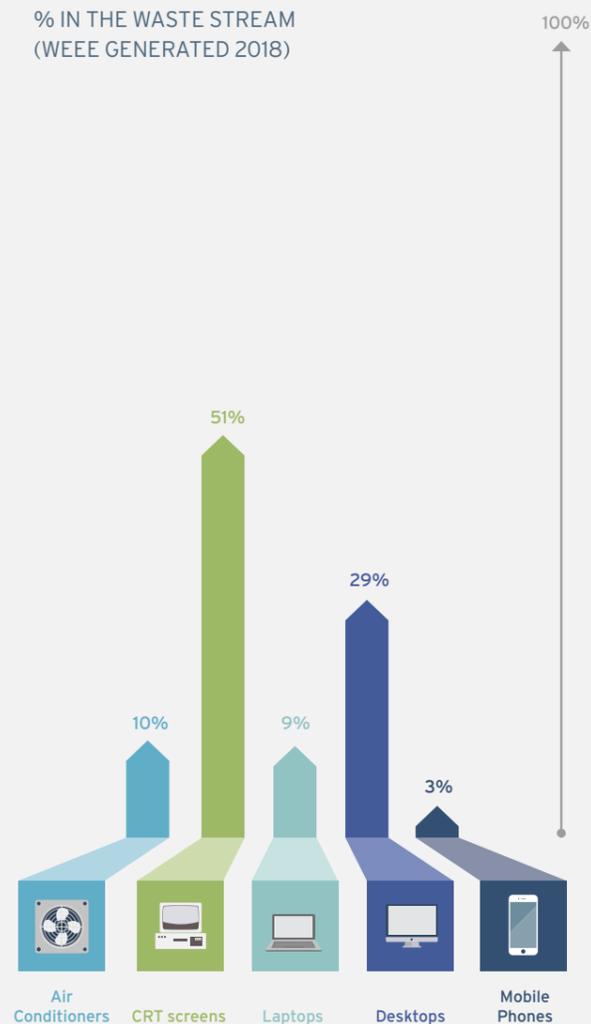


SCAVENGING OF WHOLE PRODUCTS

Quite often products discarded by consumers are scavenged, particularly in collection categories Screens, Cooling and Freezing and IT: this because of non-registered recycling (products with high economics value) and trading and export of valuable products (for reuse purposes, legitimate or not). Products considered in the analysis were air conditioners, PC (desktops and laptops), and mobile phones. The share of CRT screens in the waste stream was also analysed.

The figure below shows how, for all the products having high intrinsic economic value (like air conditioners) or potential reuse-value (like desktops, laptops and mobile phones) the share of products observed by recyclers in the waste stream is lower than the corresponding amount expected considering the estimations of waste generated in 2018. For CRT devices the effect is opposite.

% IN THE WASTE STREAM (WEEE GENERATED 2018)



% OBSERVED BY RECYCLERS

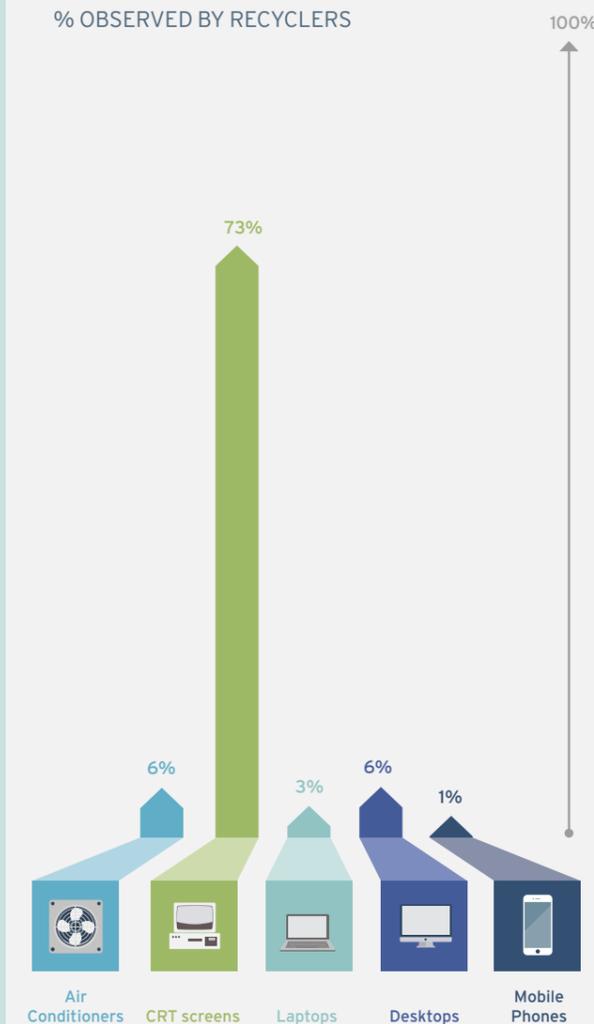


Figure 1: share of products collected versus the theoretical waste generated (within the relevant collection category).

SCAVENGING OF COMPONENTS

In addition to scavenging of whole products, discarded equipment collected is scavenged for materials and components at collection points or during the steps prior to hand over to the recycling plant. This has both environmental and economic consequences. From an environmental perspective the impacts undermine:

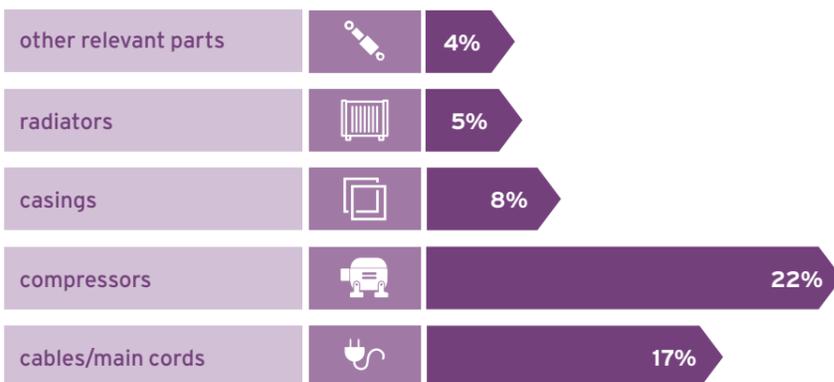
- the reasoning behind the WEEE Directive itself and the Circular Economy package (increase the level of environmental protection and the recovery of material to feed EU economy);

- the potential to recover critical raw material (CRM) recovery as in many cases scavenged components (printed wire boards - PWB, hard disk drives - HDD, batteries) are likely not channelled to the right end-processing plants and critical mass to foster CRM treatment and recovery is missing.

SCAVENGING LEVEL COOLING AND FREEZING



Scavenging level

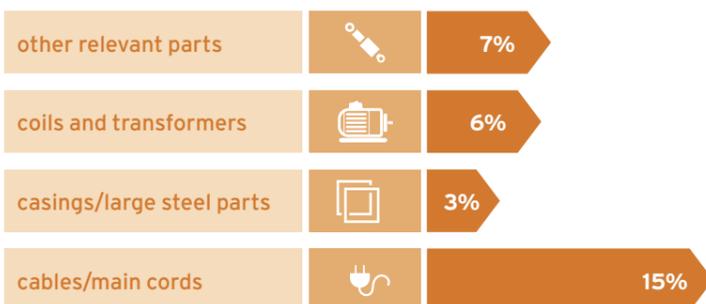


2018 data based on 120,000 tons.
Note: Only 23% of C&F generated is reported as collected in EU.

SCAVENGING LEVEL LARGE HOUSEHOLD



Scavenging level

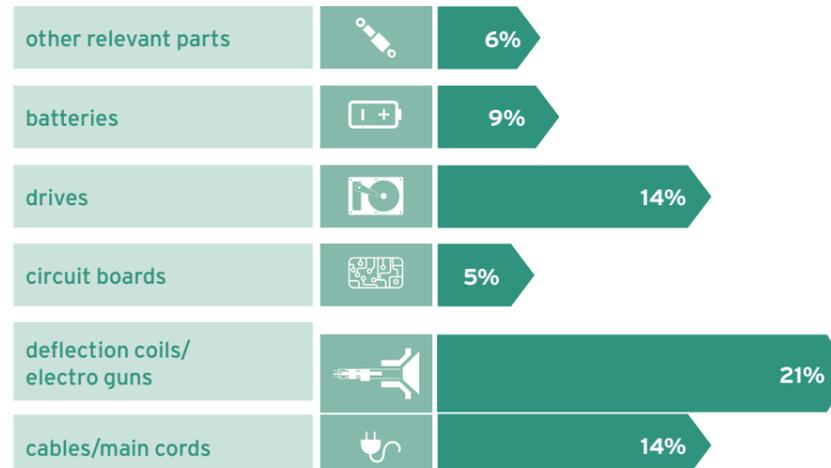


2018 data based on 99,000 tons.
Note: Only 19% of LHHA generated is reported as collected in EU.

SCAVENGING LEVEL SCREENS



Scavenging level

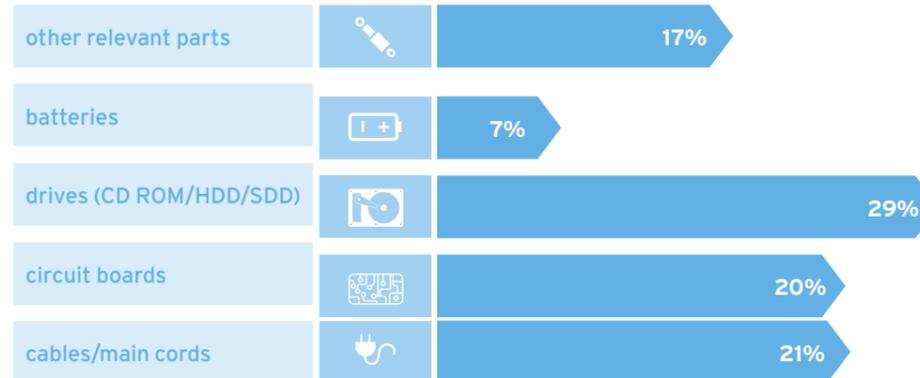


2018 data based on 67,500 tons.
Note: 13% of the treated screens in EU are still CRT's.

SCAVENGING LEVEL SMALL HOUSEHOLD INCLUDING IT



Scavenging level



2018 data based on 133,500 tons.
Note: 45% of the treated SH at recyclers consist of laptops, tablets, mobile phones and game consoles.

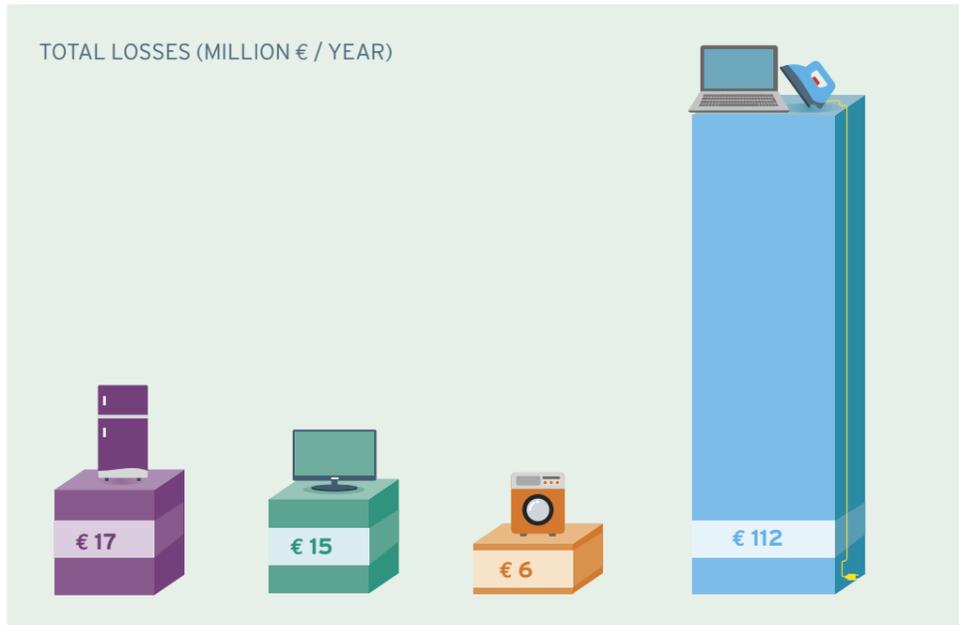
From an environmental perspective, the scavenging level of compressors is most concerning, because of the release of the ozone depleting gasses contained in the refrigeration circuit.

When extrapolating the figures to entire EU volumes, based on 1 million tonnes of fridges generated, this would equal 3.6 million tonnes of CO₂ equivalent, or the annual emissions of 2 million cars.



From an economic perspective the profitability of recyclers is also impacted, particularly under the current business model adopted by Compliance Schemes in Europe¹ with contracts only indexed on fluctuation of main commodities and not considering that scavenging of components and material is also not predictable and varying over time. In many cases market dynamics cause higher scavenging when the value of commodi-

ties is higher and fees paid by Compliance Scheme, as consequence, are lower. From an economic point of view, when considering the total WEEE Generated in EU28 (including Norway and Switzerland), the losses related to **materials and components** were estimated for the year 2018 amount to more than 150 M€ of diverted material value and more than 152,000 t of material.

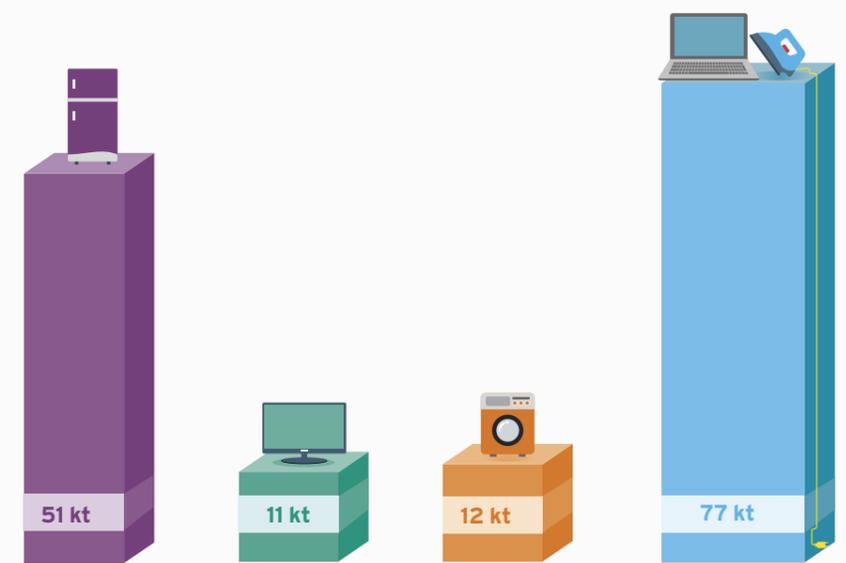


¹The model of collection and treatment by compliance schemes or Producers Responsibility Organisations - PRO's is present in the majority of the European countries. However there are exceptions like Germany where the model is different.

VALUE (IN MILLIONS €) OF SCAVENGED COMPONENTS IN 2018



TOTAL LOSSES (KT / YEAR)



RECOMMENDATIONS

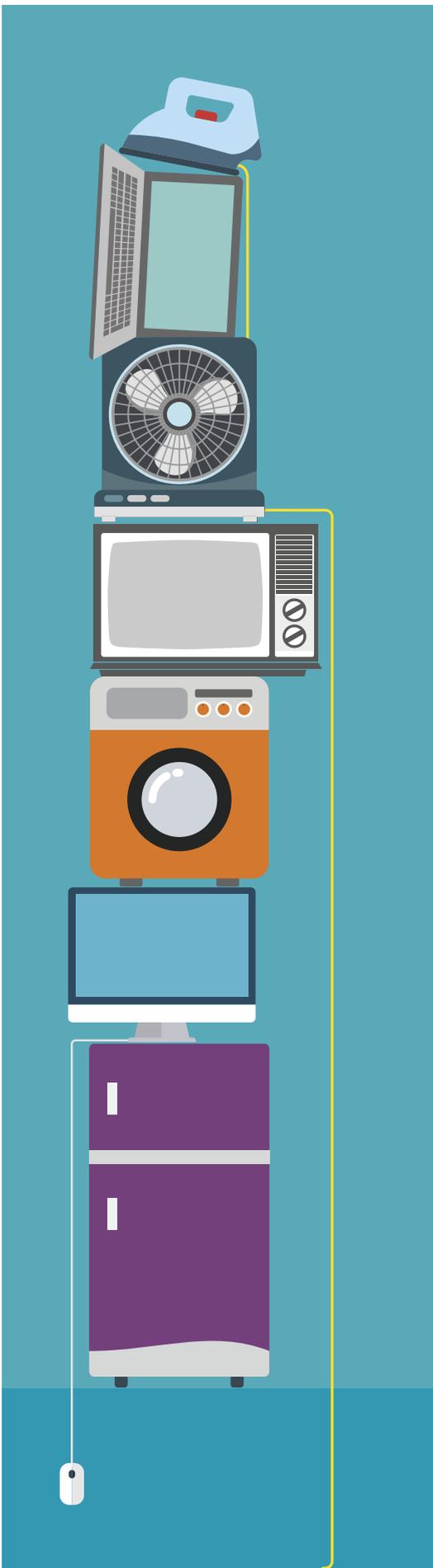
Scavenging of whole products and components is a reality across Europe and is mainly happening after the discard of products by final users. Despite the magnitude is varying over time, from country to country and also for the same company over years, effects are clear.

Environmental effects of scavenging are relevant in terms of emissions of ozone depleting substances in old refrigerators containing CFC/HCFC that still represent 43% of the appliances in the waste stream, but also Mercury (connected with scavenging of flat panels); and potential dissipation of CRM is also a major concern especially considering the EU efforts in securing access to such materials. Quality of material collected should be a priority for European Union, especially considering that standards are available (EN50625 series, particularly EN 50625-4 on Specification for the collection and logistics associated with WEEE) and should be made mandatory. Scavenging of components is totally outside the control of the recycling plant, but still highly influencing the profitability of the company and the competitiveness when bidding for recycling tenders. While there is general agreement on the need of implementation of quality standards, to proof compliance with the WEEE Directive, and the creation of a level playing field, it is important to highlight that legitimate pressure from EEE industry, which are ultimately responsible under EPR, to reduce or keep costs down is conflicting with

some of the market forces that are creating economic losses and particularly the scavenging or cherry picking of valuable fractions from waste generated.

The following actions are recommended

1. To reduce scavenging significantly **make the EN 50625-4 on Collection and Logistics mandatory** in all EU members states. This will lead to better material yields, less environmental damage and increases the changes to recover for instance Critical Raw Materials - CRMs.
2. **Establish an observatory** to monitor the **scavenging** level in different countries/markets and associated environmental impacts, plus a common basis (indicators based on average market values of fractions) to estimate the economic losses due to scavenging.
3. **Identify alternative financing model** (e.g. indexing) or **compensation** mechanisms (e.g. deduction from compensation sometimes paid to collection points) to balance the economic losses caused by scavenging.
4. **Raise the awareness on importance of quality in collection** to foster the **design of better policies and operational practices**, also in conjunction with the implementation of the Circular Economy Package and the EIP on Raw Materials.



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Prospecting Secondary raw materials in the Urban mine and Mining wastes

- www.prosumproject.eu

CWIT project:

Countering WEEE Illegal Trade (CWIT)

- www.cwitproject.eu

Sofies:

Sofies leading sustainability

- <https://sofiesgroup.com/en/>

EERA:

European Electronics Recyclers Association

- www.eera-recyclers.com

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