Countering WEEE Illegal Trade

Countering WEEE Illegal Trade
Summary Report

Market Analysis
Legal Analysis
Crime Analysis
Recommendations roadmap

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Please cite this publication as:
Huisman, J., Botezatu, I., Herreras, L., Liddane, M., Hintsa, J., Luda di Cortemiglia, V., Leroy, P., Vermeersch, E., Mohanty, S., van den Brink, S., Ghenciu, B., Dimitrova, D., Nash, E., Shryane, T., Wieting, M., Kehoe, J., Baldé, C.P., Magalini, F., Zanasi, A., Ruini, F., Männistö, T., and Bonzio, A., Countering WEEE Illegal Trade (CWIT) Summary Report, Market Assessment, Legal Analysis, Crime Analysis and Recommendations Roadmap, August 30, 2015, Lyon, France

Design and Production by:
Ms. Susana Wong Chan

ISBN
Print: 978-92-808-4559-4
Electronic: 978-92-808-4560-0

THIS PROJECT AND THE RESEARCH LEADING TO THESE RESULTS HAS RECEIVED FUNDING FROM THE EUROPEAN COMMUNITY'S SEVENTH FRAMEWORK PROGRAMME (FP7/2007-2013) UNDER GRANT AGREEMENT N° 312605 (FP7-SEC2012-312605)

DISCLAIMER

This document summarises the key findings from the CWIT project. Individual project deliverables containing all details are subject to final review by the end of October 2015. Some deliverables will be restricted to law enforcement agencies only. For more information see: www.cwitproject.eu.

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30 August 2015

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1. EXECUTIVE SUMMARY AND INTRODUCTION

Photo credit: Lucía Herreras

EXECUTIVE SUMMARY

The research undertaken by the Countering WEEE Illegal Trade (CWIT) project found that in Europe, only 35% (3.3 million tons) of all the e-waste discarded in 2012, ended up in the officially reported amounts of collection and recycling systems.

The other 65% (6.15 million tons) was either:

- exported (1.5 million tons),
- recycled under non-compliant conditions in Europe (3.15 million tons),
- scavenged for valuable parts (750,000 tons)
- or simply thrown in waste bins (750,000 tons).

1.3 million tons departed the EU in undocumented exports. These shipments are likely to be classified as illegal, where they do not adhere to the guidelines for differentiating used equipment from waste, such as the appropriate packaging of the items. Since the main economic driver behind these shipments is reuse and repair and not the dumping of e-waste; of this volume, an estimated 30% is e-waste. This finding matches extrapolated data from IMPEL on export ban violations, indicating 250,000 tons as a minimum and and 700,000 tons as a maximum of illegal e-waste shipments.

Interestingly, some ten times that amount (4.65 million tons) is wrongfully mismanaged or illegally traded within Europe itself. The widespread scavenging of both products and components and the theft of valuable components such as circuit boards and precious metals from e-waste, means that there is a serious economic loss of materials and resources directed to compliant e-waste processors in Europe.

Better guidelines and formal definitions are required to help authorities distinguish used, non-waste electronic and electrical equipment (such as equipment coming out of use or in post-use storage destined for collection or disposal) from WEEE. Penalties must be harmonised to simplify enforcement in trans-border cases.

Organised crime is involved in illegal waste supply chains in some Member States. However, suspicions of the involvement of organised crime in WEEE are not corroborated by current information. Increased intelligence will lead to a more comprehensive understanding of the issue.

Importantly, case analysis of illegal activities outlines that vulnerabilities exist throughout the entire WEEE supply chain (e.g. collection, consolidation, brokering, transport, and treatment). Offences include: inappropriate treatment, violations of WEEE trade regulations, theft, lack of required licenses/permits, smuggling, and false load declarations.

To address vulnerabilities more coherent multi-stakeholder cooperation is essential. For this purpose a recommendation roadmap with short, medium, and long term recommendations has been developed. These recommendations aim to reduce illegal trade through specific actions for individual stakeholders; to improve national and international cooperation to combat illegal WEEE trade, actions such as:

- Increasing involvement, and improving awareness of users in the early stages of the e-waste chain;
- An EU-wide ban on cash transactions in the scrap metal trade;
- Mandatory treatment of WEEE according to approved standards, and dedicated mandatory reporting of treatment and de-pollution results;
- Better targeting, more upstream inspection, and national monitoring;
- An Operational Intelligence Management System (OIMS) to support intelligence-led enforcement and identify the risks associated with organised crime groups;
- A National Environmental Security Task Force (NEST), formed by different authorities and partners, to enable a law enforcement response that is collaborative and coordinated at national, regional, and international level; and
- Dedicated training of judges and prosecutors.

1. INTRODUCTION

The Countering WEEE Illegal Trade (CWIT) project provides a set of recommendations to the European Commission to assist various stakeholders in countering the illegal trade of WEEE, also known as 'e-waste', within and from Europe. Funded by the Framework Programme (FP7), this two-year security research project brought together a unique group of experienced professionals from the WEEE industry, enforcement agencies, international organisations, lawyers, academia and consultants specialised in supply chain security. The project commenced in September 2013 and concluded in August 2015.

The consortium consisted of:

- Compliance & Risks Ltd.,
- Cross-border Research Association,
- INTERPOL (coordinator),
- United Nations Interregional Crime and Justice Research Institute (UNICRI),
- United Nations University (UNU) (scientific coordinator),
- WEEE Forum, and,
- Zanasi & Partners.

WEEE contains hazardous substances such as mercury and cadmium. Therefore illegal WEEE handling, often in poorer countries, leads to significant adverse health issues and environmental pollution. At the same time, EU Member States are losing a vast amount of valuable rare earth metals and other important minerals due to increasing illicit activities, poor compliance rates, and limited enforcement activities in WEEE.

These issues called for increased attention and enhanced enforcement in the context of WEEE trade, transport and treatment. The CWIT project was established to identify the policy, regulatory, procedural and technical gaps as observed in today's business environment, and to suggest tangible improvements. CWIT aims to assist WEEE-related industries, and, governmental policy and enforcement actors, to enhance capabilities to seriously reduce illicit activities around WEEE in the future.

More specifically, the outputs of the CWIT project comprise a set of recommendations related to the European legal and policy framework, taking into account the objectives and constraints of all key government and business stakeholders. The project also provides a roadmap to assist in the implementation of all recommendations and ideas on future research and technologies that would contribute to the reduction of the illegal trade of WEEE.

In addition, the CWIT project established a multi-layer platform for information exchange among the various actors involved in countering WEEE illegal trade. Key stakeholders who have also greatly contributed to the project include: EU-level policy makers and regulators; national law enforcement agencies (including police, customs and environmental inspection agencies); producers of electronics and WEEE treatment industries.

In achieving these objectives, the CWIT consortium, among other tasks:

- Estimated the volume of WEEE generated in Europe;
- Identified actors involved in the WEEE export market;
- Examined the legal framework related to WEEE and its implementation within and outside the EU;
- Analysed the involvement of organised crime in the global distribution of WEEE; and,
- Developed an understanding of the methods, destinations and routes used to carry out illicit WEEE shipments.

The CWIT project Coordination and Support Action was developed in 7 Work Packages (WPs), with identified tasks and deliverables. Each WP was led by one of the consortium partners. The relationship between WPs was developed and highlighted in the deliverable reports. The following diagram shows a brief description of the Work Packages:

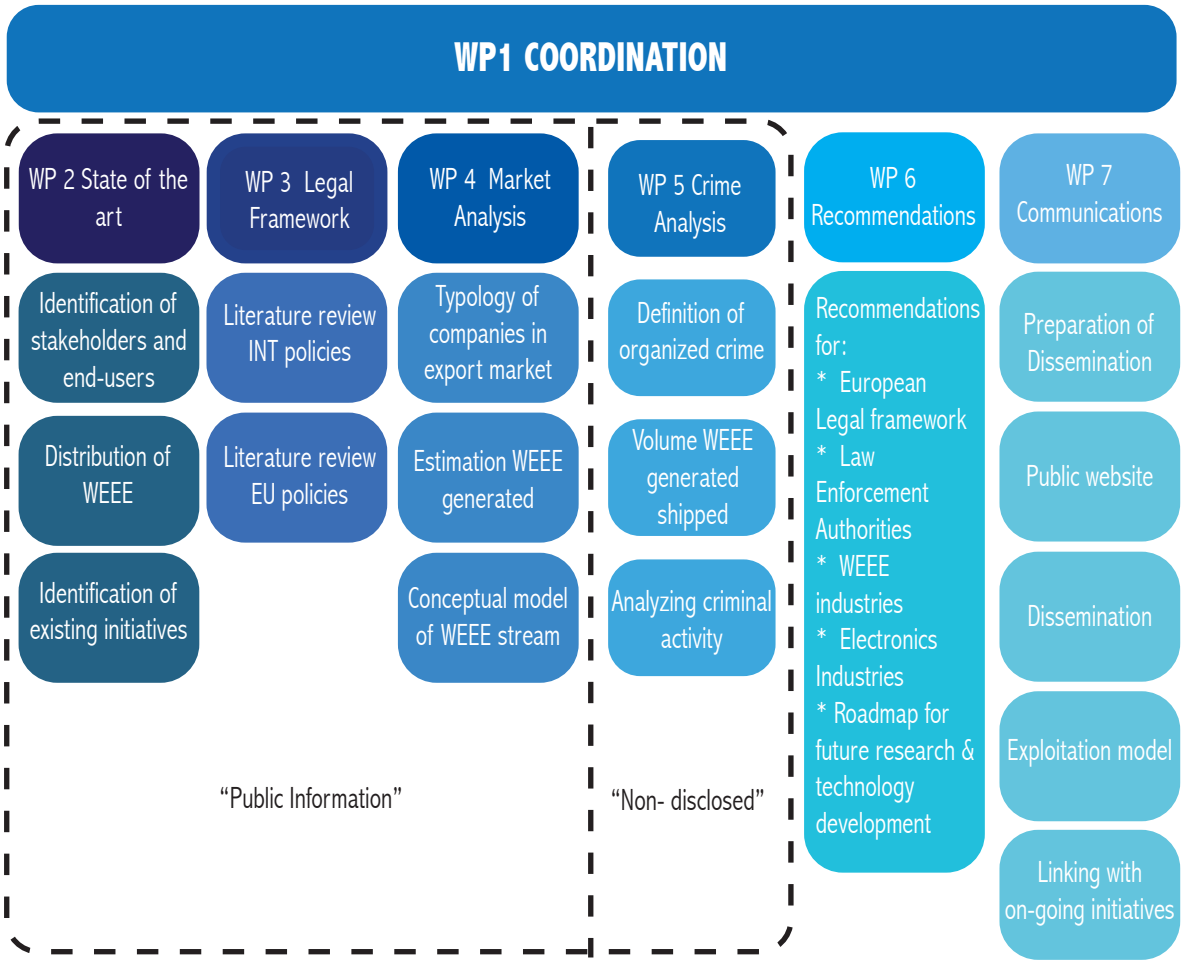


Figure 1. CWIT project structure

WP1 – Management and Coordination (INTERPOL)
The objective of Work Package 1 was to coordinate and monitor the progress of the CWIT project and to ensure the achievement of the project objectives. A High-Level Advisory Board was set up to provide advice and support to the consortium
(see: http://www.cwitproject.eu/advisory-board/).

WP2 – WEEE Actors and Amounts (WEEE Forum)
The objective of Work Package 2 was to produce an overview of the European WEEE industries and the relevant actors in these industries. There was a particular focus on the end-users involved in the fight against the illegal trade of WEEE. Activities included the mapping of all the relevant stakeholders; an analysis of the distribution of WEEE; and the gathering and analysis of existing initiatives, projects and studies to form the LibraWEEE. This information was made available to all project partners via the C2P information management system ('knowledge database') and served as input to all the other work packages.

WP3 – Legal Framework (Compliance & Risks Ltd.)
Work Package 3 built on the intelligence gathered in WP2 and its objective was to provide a global overview of the current legislation in place at international, European, and national levels. By engaging with stakeholders through questionnaires, WP3 comparatively evaluated the different national political and regulatory environments on WEEE. WP3 also delivered input for recommendations on best policies that support actions countering the illegal trade of WEEE.

WP4 – Market Assessment (United Nations University)
The aim of Work Package 4 was to create an up-to-date and accurate picture of the industry built around the trade in WEEE. Based on the information and identification of the WEEE operators in WP2, this work package gathered all key facts and figures on the amounts of electrical and electronic equipment (EEE) placed on the EU market and the resulting WEEE flows.

The total volume of WEEE generated in Europe was estimated and a conceptual model of the WEEE stream was created, which included lifespans and destinations of the discarded equipment. The market assessment described all reported flows and the resulting gap analysis on missing quantities was the starting point for the crime analysis in WP5.

WP5 – Crime Analysis (INTERPOL)

The objectives of Work Package 5 were to conduct a comprehensive study of the involvement of organised crime groups in the global distribution of WEEE, identify the specific criminal activities and modus operandi associated with illegal WEEE shipments, and to provide an estimation of the volume of WEEE that is generated and illegally traded. Law enforcement and compliance gaps were analysed and a system of best practices to mitigate the illegal trade in WEEE was developed.

WP6 – Recommendations (Cross-border Research Association)

The objective of Work Package 6 was to provide a set of recommendations to policy makers, compliance and law enforcement authorities and industries. WP6 aims to heighten awareness of WEEE issues, facilitate discussions between stakeholders and increase the resilience of the WEEE industry against illegal trade. The recommendations are delivered in the form of reports specifically tailored to the target audience. A strategic roadmap was created to equip the European Commission with information to guide future research and technology development.

WP7 – Dissemination (WEEE Forum)

The objective of Work Package 7 was to ensure that the results of the project have a lasting impact on European society and that many international organisations can use these results. The dissemination has been achieved through a range of traditional and new media strategies.

2. MARKET ANALYSIS

One of the objectives of the CWIT project is to construct an accurate picture of the WEEE trade flows for Europe, with comprehensive facts and figures on the WEEE volumes. It is vitally important to understand the impact of market dynamics and economic drivers, so as to successfully intervene in the illicit trade in WEEE. The research focused on the analysis of:

- The WEEE actors and typology of the WEEE chain;
- The estimation of the volumes of WEEE generated and its destinations; and
- The economic drivers behind illicit trade.

2.1. The WEEE chain

A generic typology provides a standardised way of mapping WEEE flows and associated market behaviour. However, the actual market flows between various actors are country specific. There is a high degree of heterogeneity in terms of size, number and types of actors involved in these flows as visualised in Figure 2. More details are provided in Deliverable 2.1 Mapping of WEEE actors.

To better understand these actors and the many different data and literature sources, the consortium developed two support tools:

- Database of e-waste stakeholders: this is an online database providing an overview of the key actors per country, according to publicly available sources and official registers: http://www.cwitproject.eu/reports-downloads/database-ewaste-stakeholders.

- The LibraWEEE (http://www.libraweee.eu/) is a compilation of documents, studies and initiatives dealing with or containing information on WEEE flows, market behaviour, guidelines and support documents for policy makers and enforcement agencies. There are currently 179 documents included in the LibraWEEE, which is publicly available. The repository also allows for additional contributions. More details can be found in Deliverable 2.4 Inventory of WEEE related research and in Deliverable 4.1 Typology of companies involved in the export market.

Photo credit: Shutterstock

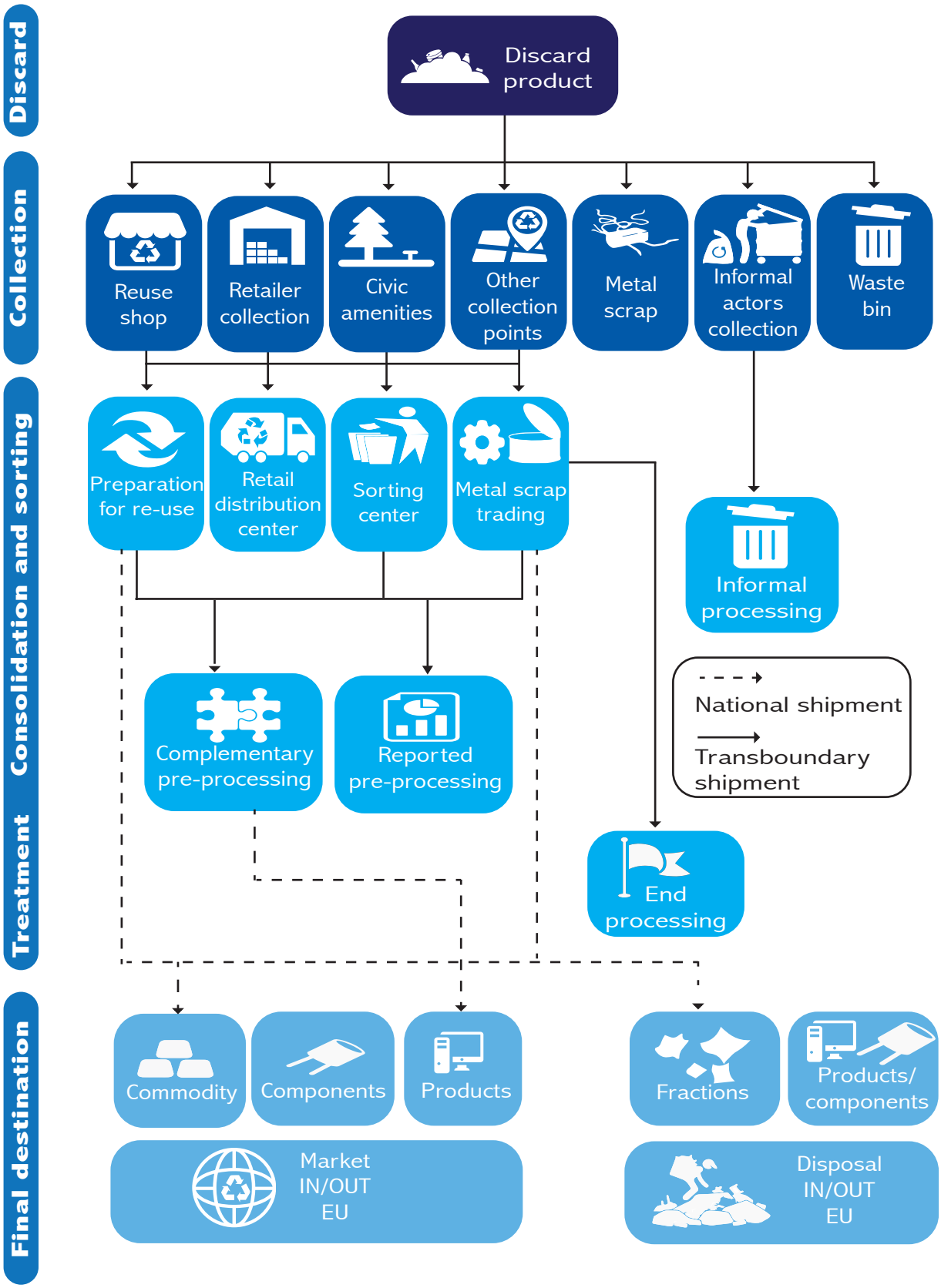


Figure 2. Actors in the WEEE chain

2.2. The WEEE volumes

In Figure 3 the WEEE amounts documented in the market assessment for 2012 are presented.
For the EU-28 plus Norway and Switzerland (EU28+2), the total amount of WEEE generated is 9.45 million tons:

- 3.3 million tons are reported by Member States as collected and recycled;
- 0.75 million tons are estimated to end up in the waste bin and
- 2.2 million tons of WEEE are mixed with metal scrap.

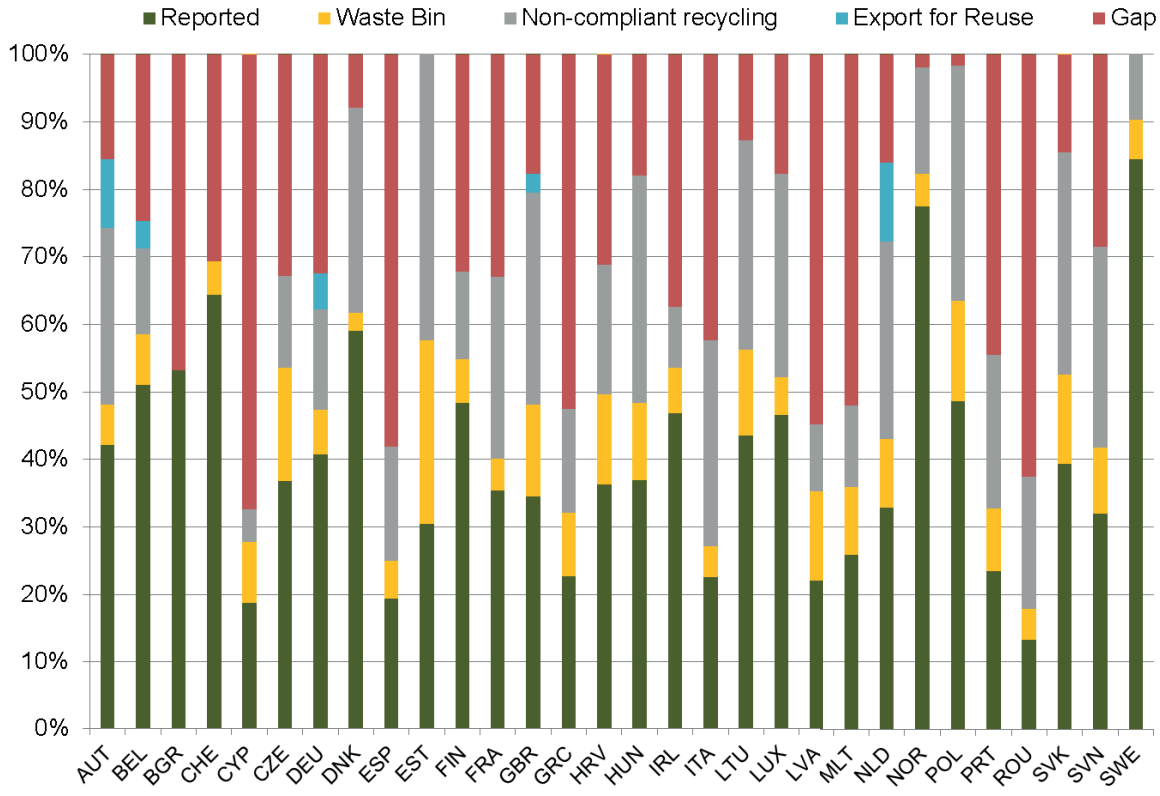
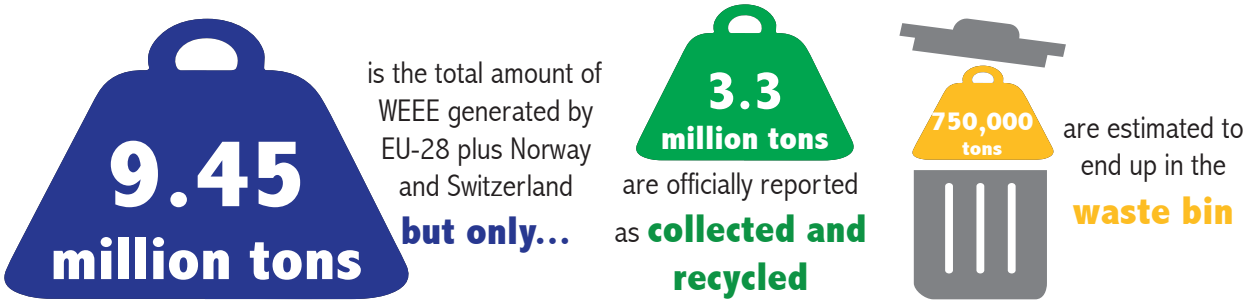


Figure 3. 2012 EU WEEE amounts documented per Member State

The above numbers are grouped to total EU numbers and are visualised in a flow diagram in Figure 8. The arrows represent the WEEE flows for the EU28+2 in 2012. The top part constitutes the WEEE generated, including potentially reusable appliances, being a total discarded amount of 9.45 million tons. These amounts are determined by UNU in a report for the European Commission – DG Environment, on establishing a common methodology for the calculation of EEE placed on the market and the resulting WEEE generated for each Member State. The uncertainty with this calculated value is approximately 10%; this is due to assumptions around a product's residence time in the economy.

It should be noted that the diagram has been simplified by only showing the initial destinations. In reality, feedback loops and illegal activities occur with each flow, including from the officially reported flow. In total, 3.3 million tons are reported by Member States as collected and recycled. However, there are only a few Member States that have implemented conclusive reporting and monitoring of de-pollution and up-to-standard treatment conditions.

A number of producer compliance schemes voluntarily chose to put reporting/monitoring schemes in place. The expectation is that more Member States will make such



schemes mandatory over the years, through the implementation of the CENELEC and WEEELABEX standards. However, it cannot be ruled out that there is subsequent trading of WEEE to other destinations from this supposedly secured flow.

Around 750,000 tons of mainly small appliances end up in the waste bin, with varying amounts per country of between 1 and 2 kg per inhabitant per year. The literature review covered 15 countries that were grouped into low, middle and high-income countries and the data was then extrapolated to EU28+2 totals. It also revealed that data is presented in different formats covering different years. For wealthier or larger economies, there is more data available in the literature indicating kg of WEEE per inhabitant per year.

Where the data is available as a percentage of residual household waste, it is multiplied with the total amount of residual household waste from households and services. All data is related to the total WEEE generated from both businesses and households and by combining the best compositional estimates, allocated to the individual collection categories. The weight based results are obviously predominated by small appliances (+/-60%) and small IT equipment (+25%) to the total waste bin amounts, which are easiest to throw into the waste bin due to their small size.

Figure 4. Example of (identifiable) WEEE in mixed metal scrap

A further conservatively estimated amount of 2.2 million tons of mainly steel dominated consumer appliances, is collected and processed under non-compliant and sub-standard conditions with other metal scrap. The amount is derived from various estimates of the concentration of WEEE in ferrous metal scrap, which again is not sampled in a regular and harmonised manner. In literature, information on this is also scarce. For the countries with available data, the amount ranges between 2% and 4%. From these studies, it is estimated that the average concentration of WEEE in metal scrap in those countries is at least 2%. This conservative assumption is used to estimate the amounts of WEEE that are mixed with metal scrap, leaving upwards potential for higher amounts, for instance due to WEEE parts derived from professional appliances that are difficult to be characterised as WEEE when this flow is sampled.

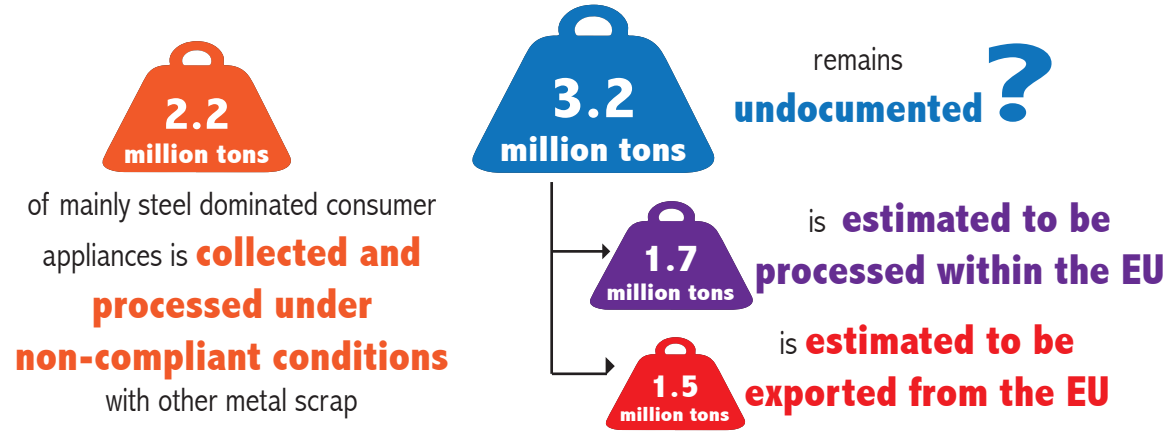


Figure 5. Example of (unidentifiable) WEEE in mixed metal

The combined totals leave a gap of roughly 3.2 million tons. The further destinations are extrapolated and estimated from various information sources, the individual mass balances per collection category and the economic values and drivers behind the WEEE trade. It is estimated that a further 1.7 million tons are initially processed within the EU. Based on a market survey with contributions from members of the European Electronics Recyclers Association (EERA), it is estimated that 750,000 tons of valuable parts do not make it to the official collection points. This includes significant amounts of refrigerator compressors (84,000 tons out of 300,000 tons are scavenged, roughly equal to the annual CO_2 emissions of 5 million cars!) and cable and IT components (180,000 tons), all of which are commonly exported to Asia, predominantly as material fractions for further separation.

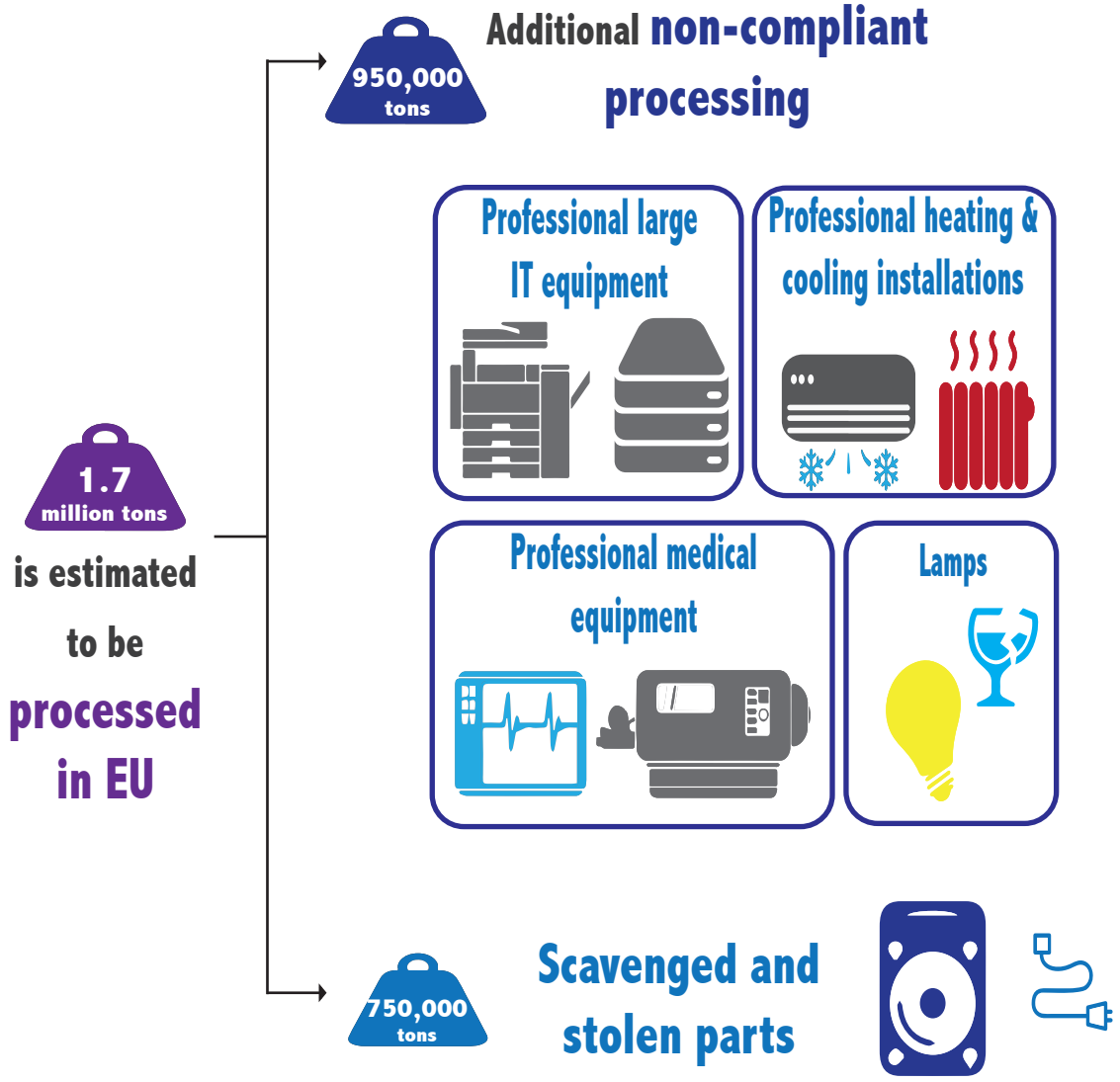
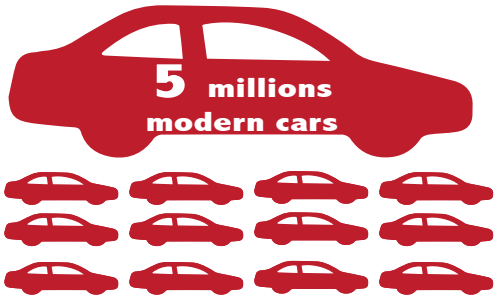


Figure 6. Compressors removed from fridges

Another 950,000 tons of additional non-compliant collection and treatment is estimated to take place out of sight, for instance professional appliances (heating and cooling installations, large IT equipment, large tools and compressors, medical equipment, etc.), commonly processed by installation companies (up to 500,000 tons), as well as lamps (90,000 tons) that are not observed at export destinations at all. These lamps likely end up in, for example, glass containers.



84,000 tonnes of fridge compressors are stolen before collection, equal to the CO_2 equivalent of 5 million modern passenger car on the road... Annually!

Figure 7. Example of unreported professional equipment: Professional cooling appliances

As a cross-check: The total sum of reported and non-compliant collection and recycling is also consistent with the reported treated volume of printed circuit boards received by the large smelters from the EU markets, following detailed surveying of EERA end-processors. The generated amount of waste printed circuit boards is determined by multiplying the percentage of printed circuit boards with the waste generation per UNU key. The result is around 50-55% of the printed circuit boards from Europe make it to end-processing. This confirms that more recycling is indeed taking place in Europe than is officially reported and matches with the individual mass balances of the related collection categories. Furthermore, the overall observation and ratios of amounts processed in the EU versus exported, is in line with the WEEE mass balances, and, trends in the more detailed country studies available for the Netherlands, Belgium, France, Italy, United Kingdom, and Germany.

In total, 1.5 million tons are leaving the EU. 200,000 tons are documented as UEEE exports. This figure is based on more detailed mass balances for five high income countries and covers the highest value portion of the export for reuse totals; being relatively well-tested and functioning (often IT) equipment. These devices typically have considerable remaining lifetime and thus reuse value and are commonly covered for example by professional refurbishers and/or charity organisations donating well-tested computers to educational institutes in Africa. This flow is most likely also occurring for other rich EU countries, however this could not be quantified in this project.

The remaining 1.3 million tons is also predominantly UEEE, but is frequently mixed with WEEE and repairable items. The entire amount is a grey area subject to different legal interpretations and susceptible to export ban violations. At some point in these reuse activities; the originally discarded WEEE is no longer regarded as waste. This occurs where the items are refurbished, tested and properly packed for export.

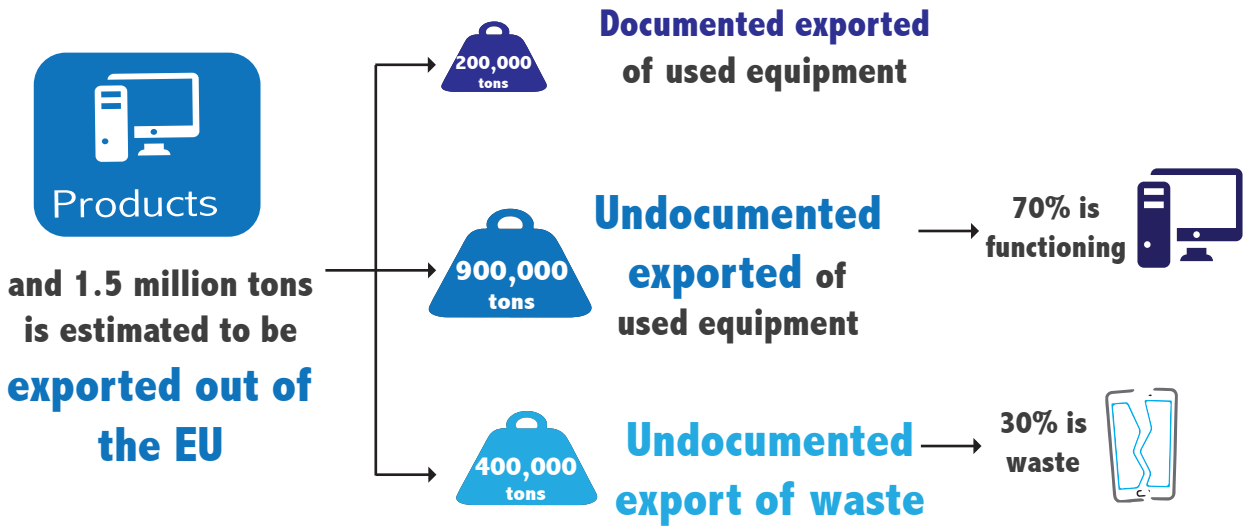
However, the entire amount is a grey area since there are many more issues besides the distinction between WEEE versus UEEE. Shipments often include parts, functioning but very old UEEE with no real value or market anymore, or with very short remaining lifespans as well as WEEE which is repairable, and relatively new but non-functioning appliances ideal for harvesting of spare parts, etc. In any case, many shipments are not following the existing guidelines as sorting, testing and packaging in Europe comes at a cost.

The quality of a large part of these shipments of products needs to improve. The remaining 1.3 million tons (based on the most recent literature sources, and combined with inspection observations) is estimated to consist of around 70% as functioning second-hand items (900,000 tons) and 30% of WEEE (400,000 tons), including repairable items. These values represent only the type of products involved in indicated mixed types of shipments.

When it comes to the point in distinguishing whether a shipment is legal or illegal, the volumes estimated match with extrapolated data from IMPEL enforcement actions regarding the violations in WEEE shipments, which indicates that between 250,000 and 700,000 tons are the subject of WEEE violations annually. This includes shipments with missing documentation and incorrect notifications.

Finally, following national surveys by INTERPOL, only 2,000 tons are reported as seized illegal shipments, leading to some form of sentencing and/or administrative fines or civil penalties (minimum value). It appears that it is not a lack of inspections, but rather the difficulty and lack of intelligence and evidence gathering prior to prosecution that hampers solid court cases and thus proper sentencing.
More details can be found in Deliverable 5.2 Estimation of the volume of WEEE illegally traded.

In short, mismanagement of discarded electronics within Europe involves ten times the volume of e-waste shipped to foreign shores in undocumented exports, as illustrated in Figure 8 summing all flows.
More details on all flows can be found in Deliverable 4.2 WEEE Market Assessment and in Deliverable 4.3 Report on the dynamics of WEEE stream.



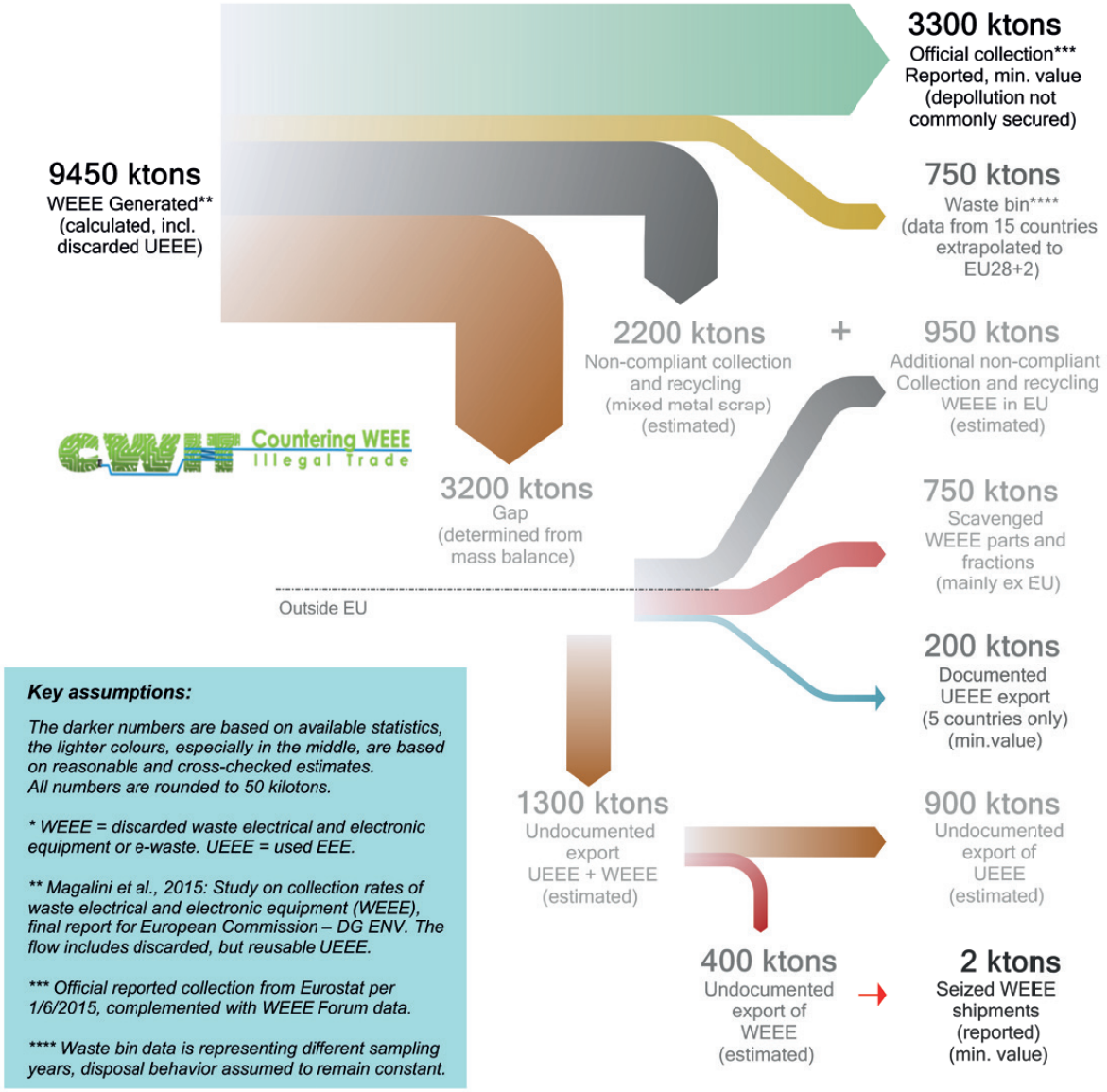


Figure 8. The 2012 EU WEEE Flows

2.3. The economic drivers

To what extent does the mismanagement of volumes that occurs all along the WEEE chain damage the environment and the European economy at large? How does this affect the EU's vision to turn the linear economy into a circular economy?

In this respect, it should be noted again that the main driver behind exports is the reuse value combined with the avoided costs of sorting, testing and packaging. The economic values of the exports cannot be quantified in detail because there is no clear information. The exports involve too many individual appliance types and different price levels in the receiving countries. The Environment Agency in the UK provides an example of a typical profit value of £8,000 for a container of mixed, unsorted and untested equipment sent to Africa. This indicates that the magnitude of the reuse value is multiple times the material value of the contents.

Secondly, the economic value is determined from rough calculations on the intrinsic economic value of flows based on values of copper, steel, aluminium, gold, silver, palladium and plastics that are not available for compliant treatment. This approach is chosen since net treatment costs are too specific per individual collection category and per individual markets __and recyclers. Hence, a rough approach is taken to determine the order of magnitude of economic impacts due to loss in the entire WEEE chain:

- Amounts in the waste bin contribute to roughly €300-600 million of lost material value due to poor disposal behaviour of consumers.
- Scavenging of valuable components, only considering compressors from temperature exchange equipment, hard disks, memory and other small IT components amounts to roughly €200-500 million. Scavenging is mainly happening at collection points, so the loss for the legitimate recycling industry can be tackled with more enforcement and control over the material collected and entering the recycling chain.
- The remaining portion in the gap amounts to another €300-600 million when excluding the value of UEEE in the export amounts.

In total, the intrinsic value of materials not available for compliant processing in Europe is between €800 million and €1,700 million. This value functions as a rough order of magnitude of the economic consequences of illegal trade and sub-standard behaviour. It should be noted that this does not necessarily represent the net value nor profit that can be recovered in practice, due to the actual handling nor the processing costs that also need to be accounted for as well as the less than 100% recovery levels in reality for the materials specified.

Interestingly, the CWIT estimations align with research recently conducted independently of the project. An external source estimates that the value of recycling of WEEE will be €2.15-3.67bn by 2020. With the assessed size of the non-compliant (or illegal) WEEE stream, this means that the total value (compliant and unreported/illegal/exported) represent a minimum of €1.2bn and maximum of €2.6bn, in 2015, which falls in the range of this external reference.

A different environmental dimension and concern is the avoidance of compliance costs mainly related to de-pollution and other costs in order to operate up-to-standard. From analysis, these costs are of a lower order of magnitude compared to the materials value of around €150-600 million. These figures indicate very roughly the maximum potential loss for compliant processing activities and the EU economy at large. The outcomes of the unique CWIT Market Assessment, for the first time covering the EU as a whole, clearly shows that despite the legislation, there are still considerable environmental and economic concerns. These relate to exports to developing countries and the quality of collection and treatment in Europe itself.