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Deliverable 6.4

Recommendations for the electronics industry



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EXECUTIVE SUMMARY

With a multi-faceted insight into the current situation regarding waste electrical and electronic (WEEE) exports and mismanagement, the consortium developed a set of 16 clusters of recommendations tailored for different stakeholder groups that were split among four Deliverables. Deliverable 6.1 largely covers recommendations related to the EU legal framework, Deliverable 6.2 covers recommendations for law enforcement organisations, Deliverable 6.3 comprises recommendations for the WEEE treatment industry, and Deliverable 6.4 outlines recommendations for the electronics industry. In order to ensure the full implementation of the proposed recommendations as well as to guide the European Commission's future research and development efforts, Deliverable 6.5 provides a roadmap for future research and technology development.

The 16 recommendation clusters are visualized in a roadmap diagram (Figure 1). The approximate time required to implement these and the target stakeholders are illustrated in the diagram. In addition it distinguishes between the recommendations that are mostly support measures, support policies and those primarily focused at support for law enforcement.

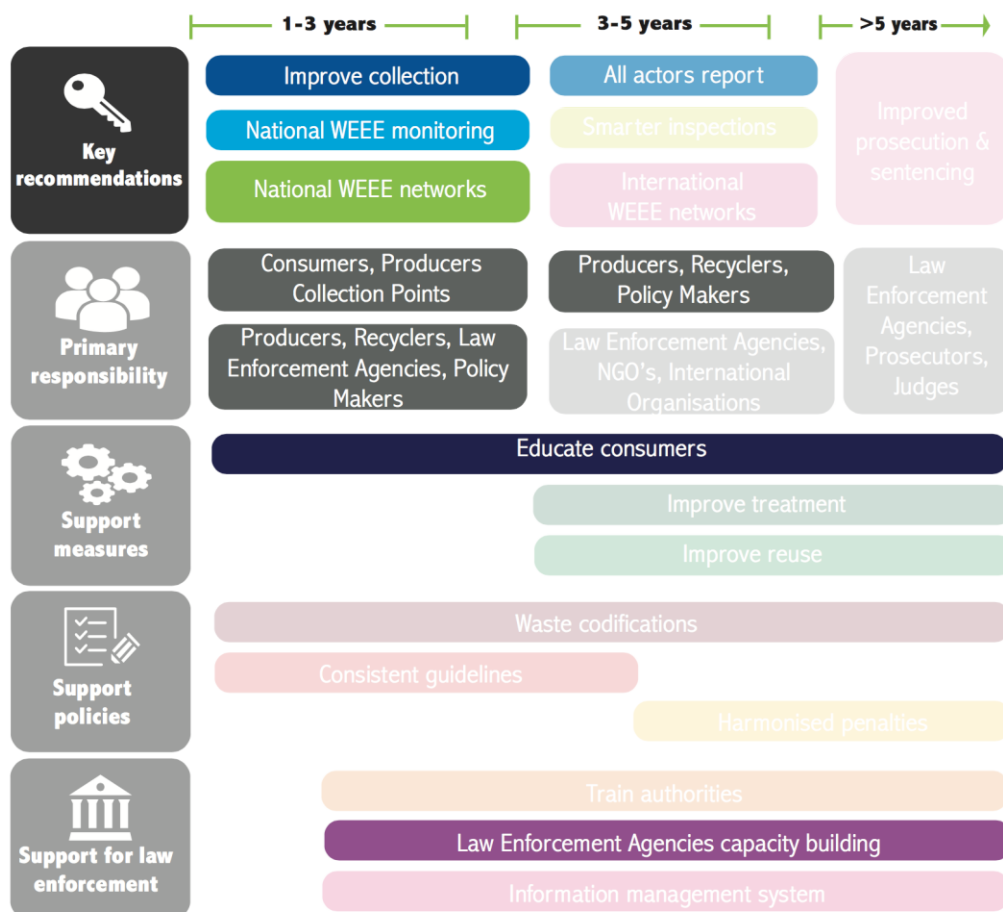


Figure 1. Roadmap diagram (recommendations appearing in D 6.4 are shown in bright colours)

This deliverable deals with the recommendations involving the EEE industry, in particular WEEE compliance schemes as the organisations created by EEE manufacturers to meet the responsibilities derived from the WEEE Directive. These are relevant actors in the WEEE value chain and their role and expertise become significant assets for the fight against WEEE illegal trade. The document provides several specific

recommendation clusters – as visualized in the figure below- which combined with other recommendations addressed to other types of stakeholders, compose a complete set of recommendations covering the whole WEEE value chain.

The main recommendation clusters and suggested actions are the following:

- Educate consumers
 - Action: Information and awareness campaigns for users
- Improved collection
 - Action: Make collection points more easily accessible and more visible
 - Action: Increase the number of collection points or their density
 - Action: Improve security at collection points
- National WEEE monitoring
 - Action: Develop a national WEEE monitoring strategy
 - Action: Local monitoring and benchmarking
 - Action: Improve information and access to information
 - Action: Harmonise sampling of WEEE in residual solid waste
- All actors report
 - Action: Reporting obligations for all actors collecting WEEE products
- Improve national cooperation (national WEEE networks)
 - Action: Establish a National Environmental Security Task Force (NEST)
 - Action: Enhance multi-stakeholder networks
- Guidelines to capacity development for law enforcement agencies
 - Action: Establish public-private partnership scheme

Two of the main recommendations clusters in Deliverable 6.4 deal with the improvement of WEEE collection and education of consumers. Studies have revealed that many problems with regard to WEEE are related to the lack of public awareness, which results in the improper disposal of WEEE. In addition to this, in many EU countries, collection facilities are exposed to thefts of the end-of-life product or valuable components thereof. Such practices increase invisible flows and reduce collection rates making it difficult to reach collection targets.

The suggested improvement actions in these clusters are:

- Roll out and/ or continue communication campaigns for end users to raise awareness around the proper disposal of WEEE and attitudinal surveys to investigate motivations and potential incentives for users in support of communication campaigns;
- Assess the possibility of running law enforcement campaigns for end users to tackle fly tipping and improper curb side disposal of WEEE; and
- Increase the number of collection points and make them more easily accessible, and theft-proof.

Furthermore, accurate mass balance calculations, based on reliable quantitative data, are crucial to determine progress towards achieving WEEE collection targets and the amounts of e-waste that end up outside the official WEEE chain. A cluster recommending monitoring tools at local and national level, and improvement of the data available for such exercises is included in this document. More recommendations involving the EEE industry are briefly included in this deliverable and belong to clusters that are further described in Deliverables 6.1, 6.2 and 6.3. This group of recommendations comprises the support and participation of the EEE industry in multi stakeholder networks focused on tackling illegal trade and improving collection reporting. Compliance schemes know the intricacies of the sector, the actors and drivers involved, and in many instances become the link between users, producers and policy makers. This puts compliance schemes, and EEE producers by extension, in a privileged position to create synergies between stakeholders.

1 INTRODUCTION

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 various forms of non-compliant conditions in Europe (3.15 million tons) or not reported;
- Scavenged for valuable parts (0.75 million tons); or
- Simply thrown in waste bins (0.75 million tons) (see details on CWIT Deliverables 4.3, Report on the dynamics of WEEE stream and 5.2, Volume of WEEE illegally traded).

1.3 million tons departed the EU in undocumented exports. These shipments are susceptible to be illegal shipments, 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; from this volume, an estimated 30% is e-waste. This finding matches extrapolated data from IMPEL on export ban violations, indicating 0.25 million tons as a minimum and 0.7 million tons as a maximum of illegal e-waste shipments (IMPEL, 2008, 2011 & 2012).

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 electrical and electronic 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 (CWIT Deliverable 6.5). These recommendations aim to reduce illegal trade through specific actions for the EEE industry and to improve national and international cooperation to combat illegal WEEE trade.

The stakeholders mainly targeted in this deliverable (see Figure 2) are compliance schemes and additionally:

- Consumers;
- The WEEE industry such as WEEE recyclers and the re-use industry;
- Policymakers (local, regional, national and European) implementing rules to enhance communication and training;
- Enforcement agencies, inspectors of company sites and at ports, auditors of recycling and reuse standards.

Deliverables 6.1 and 6.2 deal in depth with recommendations for policy makers and enforcement agencies whilst Deliverable 6.3 involves the WEEE industry (WEEE recyclers and re-use).

2 EDUCATE CONSUMERS

This recommendation fits mainly under the theme of education and awareness raising, while focusing exclusively on the collection stage of the WEEE chain. In all European countries, the first step of the WEEE chain is composed of end users or ‘WEEE generators’, both consumers (B2C) and professional organisations (B2B). For reasons of simplicity we refer to ‘consumers’ in general. At the early stage in the chain, consumer behaviour is key as they determine the channelling of e-waste to their first destinations. Hence, they should be made aware of their responsibilities in order to reduce the volume of appliances being mixed up with general municipal solid waste. Secondly, the public at large should be more intensively informed about bringing end-of-life appliances to the ‘right’ collection points to reduce export of WEEE and its negative effects (Sander & Schilling, 2010). These two concerns have also been highlighted by participants in the CWIT final conference. It should be noted that “educate consumers” was the most popular recommendation cluster among those participants in the CWIT final conference who responded to our request for written feedback. The participants view this measure as a good means to increase collection rates and have indicated that bringing WEEE materials to the appropriate channels is one of the quickest wins and consumer habits can, to a large extent, determine if the equipment goes to legal or illegal streams (for more details see Annex B, CWIT final conference feedback summary).

“Get to the root of the problem: when waste crosses the border, it is already almost too late”
 CWIT Final Conference, Lyon, June 2015

Educate consumers to return WEEE and reduce the quantity of WEEE in the waste bin

CWIT Deliverable 4.2 (Report on volume of used EEE and WEEE generated) determines the amount of WEEE in the waste bin in the EU-28, plus Norway and Switzerland. For 2012 the total amount of WEEE generated was 9,500,000 ton and from this around 700,000 ton is found in the waste bin. It comprises mainly small appliances, such as lamps, small equipment and small IT equipment. This was around 1.3 kg/inhabitant for both high-income countries and middle- and low-income countries. For some low-income countries, there were rather different amounts found. More specifically for certain countries, the estimations of the size of the problem reveal more details on consumer awareness. In 2011, Ecodom, a producer responsibility organisation in Italy, commissioned IPSOS¹ to conduct a survey to assess Italians’ awareness on the matter. The study revealed that the real problem with regard to WEEE in Italy is related to public awareness: 24% of all Italians do not know what a collection station or municipal collection point is, or have never used one (24%). 58% of discarded large household appliances are not taken back by retailers; for small appliances, the percentage rises to 88% and of these at least 17% are disposed of incorrectly, while 51% are kept unused in consumers’ homes. The situation is no better for IT and electronic devices: 86% are not returned to retailers.

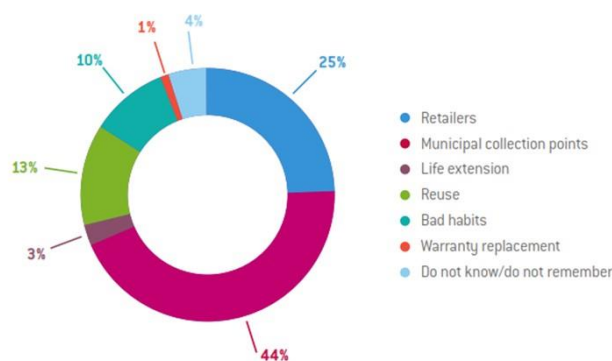


Figure 2. WEEE disposal method, by waste stream: total streams, by weight, in Italy, 2011. Source: Household Waste Generated in Italy. Report financed by Ecodom.

¹ See more on IPSOS at <http://www.ipsos.com/>

The second very interesting finding is that consumers are poorly informed about WEEE: 71% of Italians know absolutely nothing about it. However, some reassuring aspects did also emerge: “The survey revealed an information deficit on the part of consumers, but it also showed that their awareness of the need to protect the environment is growing”. As a solution for reducing the environmental impact of unsound WEEE management, more than 28% of those interviewed suggested an increase in communication and information directed at consumers.

A 2012 study by UNU-IAS estimates that a total of 2.3 kilogram of WEEE per inhabitant in the Netherlands (38.000 tons per year) consists mostly of small appliances, small IT appliances and lamps (Huisman et al., 2012). The key finding in the Dutch Future Flows report, which contains extensive waste stream sampling, is that on average 0.88% of all residual household waste is WEEE which means that 2.1 kg/inh of WEEE in 2010 is not available for collection. Due to the high number of data points, the uncertainty in these amounts is rather low; the main leakage of WEEE for these three collection categories is further confirmed and quantified by CWIT Deliverable 4.2.

Educate consumer to bring WEEE to the ‘right’ collection points

An IMPEL publication stated that it is also possible that those in industry who are involved in international waste trade inadvertently perform illegal activities, i.e. they make mistakes in reporting or fail to report due to basic lack of awareness and understanding on the regulatory frameworks (IMPEL-TFS, 2005, p.68). In other words, the lack of awareness often results in an increase of unreported, hence untraceable flows of WEEE. This will also affect national collection rates, which have a target established by Directive 2012/19/EU on WEEE.

In 2014, ECOTIC², a Romanian WEEE Compliance Scheme (Eco Tic) carried out a survey about WEEE in Romanian urban areas. From 1000 of the phone interviews performed, only 36.1% of the respondents declared that they handed WEEE over to authorised parties. Of those who reported not handing over WEEE to authorized parties, 27.2% said they had given it to those who collect waste metal, these entities not being authorized, 34.1% gave them to relatives / friends, and 26.3% still keep it in households. Only 4% stated that they collect WEEE separately. Survey participants mentioned as main barriers the perception on the process (mostly incorrect) and the lack of information. Only 39.6% knew that WEEE may contain hazardous components for the environment and the human health.



Figure 3. Small appliances in the waste bin

Action: Information and awareness campaigns for users

For an end-user it can be hard to distinguish between a serious waste handler or broker and a dubious one involved in illegal activities. Knowledgeable and vigilant end-users, with a good understanding of the legislation and of administrative procedures in place, demanding a proper handling of their waste and able to distinguish easily between serious and dubious waste handlers are less likely to put their waste in the hands of criminal organizations than producers that are less knowledgeable. Therefore, enabling waste

² For more details on ECOTIC see <http://www.ecotic.ro/en/ecotic-en/>

producers by making it easier to do right is an important step in reducing the amount of waste illegally exported.

According to an ISWA report (2011) there are still criminals and criminal organizations intentionally seeking to profit from waste trafficking. Now, the necessity to inform private households specifically is not a voluntary element. There is actually a legal requirement in Article 14 of the WEEE Directive (Information for users) which says:

(...) 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; (...)*



Figure 4. Campaign for consumers in Sweden promoted by El Kretsen, a Swedish compliance scheme (source: <http://www.el-kretsen.se/film/>).

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.

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. (...)

The responsibility for public awareness is thus primarily assigned to individual EU Member States. The question is, though,

how this is implemented effectively in practice and what improvements are possible.

Initiatives supporting this strategy for consumers are:

- Running attitudinal surveys to devise national behavioural change campaigns to increase collecting rates. Consumers may have low incentives to appropriately dispose of the WEEE. Stakeholders should further investigate motivations and potential incentives for users.
- Running communication campaigns based on attitudinal surveys. These will improve results and be more efficient economically;
- In certain countries or population sectors, campaigns should not only provide information on the actor's responsibilities and resources available, but also focus on the consequences of incorrect behaviour. See, for example, INTERPOL's campaign: Turn back crime³. Clear information on how stakeholders' acts may support illegal activities may be part of the campaign content;

³ See <http://www.interpol.int/News-and-media/Turn-Back-Crime/Turn-Back-Crime>

- Assess the possibility of local enforcement campaigns for end users in order to tackle fly tipping and improper curb side disposal of WEEE.

For professional organisations:

Regular updates on the legislative framework and available resources should be part of communication campaigns addressed to targeted audiences. Specific communication campaigns to provide information around the resources available, on the legal obligations and how to meet them, such as the national register of EEE producers and WEEE industry, could be addressed to interested parties. In particular:

- Counselling on the rules and regulations related to proper waste handling in general and trans-boundary shipments of waste, in particular;
- Making the regulations of transboundary waste shipments more clear, understandable and coordinated;
- Improve accessibility of information on downstream actors (see improvement actions on national registers under the “national WEEE monitoring” recommendation).

The CWIT consortium identified synergies between different types of actors that have common interests such as EEE producers, WEEE compliance schemes and preparing for re-use organisations, in order to carry out WEEE collection campaigns. Besides common interests in raising collection rates, these organisations usually have a great deal of experience in communication campaigns and deep knowledge of the WEEE value chain actors and the drivers behind it, for which reason, they are can be considered good assets to participate when putting in place the recommendations described in this chapter.

3 IMPROVED COLLECTION

How can theft of WEEE be averted? Both overall WEEE theft and theft of valuable parts (cannibalisation or scavenging), at WEEE collection points, for instance by increasing surveillance and physical security. This



Figure 5. Curb side fridge (missing compressor).

recommendation is associated mainly with the enforcement and control theme because of its focus on crime prevention. It is also linked to the education and awareness theme as long as it concerns implementation of new security solutions that involve training of, for example, security personnel and e-waste handlers. In the context of the CWIT project, the theft problem has been discussed for instance at a workshop held in Seville, Spain (June 2014): *“The recycling plant manager expressed his concern about the poor conditions in which WEEE is usually received. In some cases the most valuable components of WEEE, for example components containing*

copper, are removed by unauthorised actors before they reach the treatment plant [...]”.

According to the experts attending the Seville workshop (See CWIT Deliverable 2.2, Report on WEEE components and recycling) the consequences of such activities include:

- Lower value of the waste received at official treatment plants;
- Increased uncontrolled release of hazardous substances to the environment (e.g. CFC gases);
- Higher WEEE damage rate, reducing compliance with depollution regulations and preparing for re-use possibilities;

- Lower collection rates, difficulties to reach collection targets set by law; and
- Support of irregular economic activities, which results in infringement of several laws, tax evasion and unfair competition for authorized actors, amongst others.

The vulnerabilities of the collection points are also described in literature. According to a 2009 report, municipal collection sites are frequently exposed to unlawful activities. Avoiding dubious activities like cherry picking carried out in the collection facilities and maximising collection, is of vital importance. Providing easily accessible, free of charge, collection points for consumers and educating local consumers on easily accessible waste collection points, would be useful measures towards increasing collection (Gregory et al., 2009). There are cases when operators responsible for access control at collection points allow players to do cherry picking in exchange for money. The occurrence of thefts is high where there is uncontrolled access in collection sites. Actors collecting and consolidating WEEE are often exposed to offers of bulk purchase by different economic operators (CWIT Deliverable 4.1, Typology of WEEE operators). One participant in the CWIT final conference considers the leakages from collection points (private actors/shops) as the biggest vulnerability in his country (see Annex B for details).

Furthermore, Sander & Schilling (2010) are of the view that official collection points are a better means to collect e-waste than roadside collection in order to protect against theft and cannibalisation. It appears that regulatory authorities are only partially successful in controlling theft of WEEE from roadsides. Such inspections are also associated with fairly high costs.

Specific inspections of "up-stream facilities", i.e. waste producers, collection points, and interim storage, recovery and disposal operators, are useful with a view to identifying and eliminating future illegal waste exports further down the chain. It appears that those "up-stream" inspections are not generally carried out throughout the EU. If controls are not well-performed at an early stage, it creates a burden to be borne by Member States performing inspections at a later stage, i.e. during the transit or at the destination point. Several Member States are transit countries for waste and hence are very much dependent on inspections performed by Member States from which the waste was produced or through which the waste first transited for ensuring these shipments are legal or not.

In many EU countries thefts at collection points or diversion of WEEE to non-reported flows occur very often. The high frequency of these practices may indicate a high rate of profitability versus low risk for informal actors, and complex enforcement and prosecution. A survey conducted among recyclers performed by the CWIT project showed that an average of 29% of fridges received at treatment plants lack compressors. Respondents also reported that the percentage of cannibalised IT equipment that reaches treatment plants, ranges between 5 and 90% with an average value of 36%. Specifically in this environmentally very damaging case, it is not too complicated to investigate origins upstream and to provide clear signals that such undesired behaviour is unacceptable. Based on a market survey with European Electronics Recyclers Association (EERA) members contributing, 750 ktons of valuable parts not making it to the official collection points are estimated, including significant amounts of compressors (84 kton, roughly equal to the CO₂ equivalent of 5 million modern passenger cars on the road, annually) and cable and IT components (180 ktons), all of which are commonly exported to Asia predominantly as material fractions for further separation (see CWIT Deliverable 4.3, Report on the dynamics of WEEE stream).



Figure 6. Curb side TV cannibalised.

In response to CWIT surveys, several countries have highlighted a few important points pertaining to WEEE collection. For example British respondents noted the involvement of crime groups in WEEE thefts. These groups are commonly aware of the official pick-up schedules at the municipal collection points, stealing valuable WEEE products and parts before the council trucks scheduled visits. Apparently council authorities have not been consistent in reporting such cases, as they are mostly providing this service free of charge. There is some evidence of council vehicle drivers selling equipment after having picked it up. Criminal acts also take place in legitimate businesses that have contracts with civic amenity sites. It appears that the operators who are actually paid to consolidate or recycle WEEE that has been collected at civic amenity sites, select high-value WEEE from what they collect and export it to make an additional (illicit) profit. In Scotland mechanisms for collecting WEEE from households are not unified across municipalities. For example in Glasgow, unlike the rest of the country, street pick-up of WEEE is available to the consumers, free of charge. While this has the potential to positively contribute to the number of municipality pick-up arrangements, illegal street collection by informal actors has been identified as the number one modus operandi for acquiring electronic equipment for export from Scotland. And Glasgow seems to be one of the least rigorous cities in terms of oversight of pick-ups. This weakness, together with the fact that it hosts one of the two big international ports (which reduces logistics costs), makes Glasgow a major hub for the illegal WEEE trade and management in the country.

Crime may be displaced to another step of the WEEE value chain (such as for instance, door to door collection by informal actors). So far, collection points are one of the most vulnerable steps of the WEEE value chain. They are often managed by municipalities which may lack of resources and do not have a high economic interest in running the activity (security measures and WEEE flow control are more relevant at private logistics and recycling companies which clearly have an economic dependence on WEEE).

Participants in the CWIT final conference consider securing collection facilities as the basis to guarantee an efficient process since it is the beginning of the whole problem and also view the implementation of this recommendation cluster as a cost-effective measure (see more on Annex B, CWIT final conference participant feedback summary).



**Figure 8. School campaign
launched by REPIC (UK WEEE
Compliance scheme)**

Action: Make collection points more easily accessible and more visible

Providing easily accessible, free of charge collection points for consumers and educating local consumers on easily accessible waste collection points would be useful measures towards increasing official collection.

- Best practices such as e-tools or Apps (see Figure 9 for an example of a Greek website) to identify the closest authorised collecting facility are already in place in many countries. These initiatives are usually supported by WEEE compliance schemes, consumers associations and competent authorities. The CWIT project identified the publicly available information on WEEE stakeholders⁴. The database includes links to the networks of collection sites in many European countries, and shows best practices implemented.



Figure 9. Map of collection points for WEEE collection in Greece provided by a WEEE compliance Scheme (source: www.electrocycle.gr)

- The location of collection points is also a relevant point for consideration. The closer to high populated areas, the more efficient and useful the site will be. However, sometimes space in urban areas is expensive or simply not available, hence location in outer areas, sometimes industrial areas accessible by car, are the place chosen to set collection points. After closing time, these sites become perfect targets for thefts if security measures are not adequate, besides users are reluctant to cover long distances to dispose of the waste. A good system to indicate the location of the collection point is also necessary to increase user's participation.
- Sometimes specific agreements or collection campaigns include the placement of single collection containers in public spaces. In these situations it is suggested to use sturdy containers with locking systems placed in visible areas, for example in indoor commercial centres, yet not open not-surveyed spaces (such as outdoor parking lots).

Action: Increase the number of collection points or their density

The network of civic amenities and retailer's facilities is considered the main network of collection points. Initiatives to expand the collection network have been implemented in some EU countries, mainly by compliance schemes, producers and competent authorities. In many instances, these initiatives, instead of promoting the setting up of new (fixed) collection points, take advantage of existing infrastructures, or set mobile solutions, in order to reduce costs and maximise effectiveness. Examples include the following:

- Specific campaigns with organisations that have public attendance regularly, like schools, big factories or commercial centres, these campaigns usually consist of temporary or fixed location of WEEE containers for the collection of WEEE;

⁴ See WEEE stakeholders database on www.cwitproject.eu

- Specific campaigns with professional associations of activities that install and uninstall EEEE appliances, such as air conditionings, luminaires or photovoltaic panels. Professional installers have access to old appliances and sometimes they lack the knowledge to know how to properly dispose of the WEEE. Economic incentives may apply in certain countries;
- Itinerant collection points;
- Door to door collection. Although it requires more resources, door to door collection, sometimes supported by preparing for re-use organisations, has proved to be a good collection solution for small areas; and
- Allow recycling and logistic facilities to become collection points, by expanding the scope of their activity permits.

Studies of collection trends and user's behaviour provide very useful information to design collection networks and collection campaigns. See for example the DOXA survey performed by Ecodom, a compliance scheme in Italy (Ecodom, 2013). In 2012, over a 1000 phone interviews were conducted in Italy to collect information on the reasons why Italians do not dispose of WEEE. The results of the survey indicated that 13% of respondents did not bring large household appliances to collection points because it is considered a hard task and they request a door to door collection system. 10% of respondents knew that they should bring large household appliances to collection points but never found the time to do it.



Figure 10. Campaign of Portuguese compliance scheme, (Amb3e) in collaboration with firefighter's stations.

Action: Improve security at collection points

Some key issues must be addressed before one can go ahead with this recommendation. The first obvious question concerns cost-effectiveness of security solutions to be deployed at collection sites.

Apparently CCTV systems, guarding, fences, and intruder alarms could deter thieves effectively from stealing WEEE from the collection points. However, it is not sure whether municipalities can afford to deploy these measures throughout hundreds of the WEEE collection points. Therefore, one could look for rather inexpensive security solutions such as sturdy collection containers, strong locks and latches, and lighting around the collection points.

Another question is how swiftly the security at the collection points could be improved. It is fair to assume

that installation of the security measures would take a relatively short time, from a few days to a couple of weeks per collection point. However, the main issue that delay the installation is related to the design of security solutions, finding funding for the security solutions, and getting permission for installing extra security at the collection points. There is also a risk of displacement of crime: increasing security at one collection site might relocate theft of WEEE to



Figure 11. Theft at a municipal collection point in Chiclana, Cádiz (ES).

other locations, less secured collection points.

Case study. A French example to secure collection points.

During the CWIT Final Conference, held in Lyon in June 2015, one of the speakers representing Eco-systèmes, a French compliance scheme, described the actions carried out in some French civic amenities in order to reduce the theft of WEEE. The technical activities that were implemented are:

- Optimisation of collection frequency
- Locked and secured shipping containers
- Video surveillance on sites (Video protection)
- Marking of WEEE allowing traceability



Figure 12. Left: locked and secured shipping containers; right: marking of WEEE.

It is worth mentioning that pilot experiences have been carried out with good results. Measures implemented need maintenance and cooperation with collection point managers. In fact, during 2014 and 2015, Eco-Systèmes planned 10000 visits to collection points in order to study the current situation and to

deal with the following topics:

- Management of the Collection frequency;
- Training;
- Management sorting;
- Marking; and
- Propose and implement Container.

White goods collected at collection points are marked in order to indicate that they come from an official collection point (see **Error! Reference source not found.12**). Scrap dealers and pre-processors accepting EEE in a radio of 50 Km are informed of this, therefore the delivery of such equipment by an individual to one of these facilities will raise suspicions of theft.

Extensive alarm and video surveillance at a collection point was estimated in 5000-10000 euros. The costs of the measures implemented in this situation is mostly supported by local entities.

In addition to this, OCAD3E, the French Clearing House systematically engages actions for municipalities, such as:

- A dedicated lawyer. From 2010 to 2014 : 215 lawsuits, 102 judgments;
- OCAD3E obtained from the police force a specific timesaving pre-complaint form to be filled in online;
- New objective is to identify cross border activities; and
- Additional financial support for municipalities enforcing measures to secure WEEE.

Case study. Project Identis WEEE

A best practice identified in this topic is the project "IDENTIS WEEE", financed by the LIFE Programme of the European Union. The project entered the testing phase in some areas of Emilia-Romagna at the beginning of 2013. The goal is to show the possible increase in the collection of products such as cell phones, light bulbs, electronic toys, TVs and appliances that have a significant environmental impact and which contain valuable materials such as iron, aluminium, glass, tungsten and palladium, among others. (...) New hi-tech containers, unique in Europe, were deployed which can be accessed with the bar codes in the bills of the users already participating in the service, and with specific cards (distributed to 19,000 families taking part in the trial). These new containers enable the control and proper disposal of WEEE⁵.

Other specific recommendations

- It is well known that WEEE collected at the retailer's facilities is usually under better surveillance and in better conditions (no cannibalisation). Therefore it is suggested that retailers play an active role in national collection networks and monitor their performance.
- Benchmarking the performance of collection at municipalities will help identify the sites that are underperforming and may need urgent improvements at their facilities. See cluster "All actors report" in CWIT Deliverable 6.1 for further information on this topic.
- Under the European Commission's Mandate 518 (EC, 2013) given to CENELEC, TC111X-WG6 is working on an EN standard for WEEE collection and logistic facilities. This document will likely set certain conditions to avoid thefts of WEEE at collection points. Given the vast network of collection points (sometimes not even publicly registered), it is realistic to expect further dialogue among WEEE actors to undertake the implementation, verification and funding of such requirements, should they become mandatory or be identified as best practice.
- Logistics is also a point for consideration. In many EU countries, municipalities and retailers have agreements with compliance schemes around the frequency of WEEE pick-ups. Collection points schedule the pick up when the WEEE load reaches a certain amount in order to improve transport efficiency. A well planned collection logistic system may improve withdrawal frequency, therefore reducing the risk of WEEE long stays subject to thefts.

The scale of the implementation in this recommendation will determine the length of the implementation process, i.e. improving the security in one single collection point is a short term activity, whilst adapting the security of a whole region or country may take more time and considerable resources. In addition, the approach to implement this measure has as well many possibilities. The initiative may be addressed and managed by one single municipality, a regional consortium of municipalities or a whole country. Hence the number of actors and resources will vary significantly from one scenario to the other.

Case study: Mandatory hand-over to WEEE compliance schemes in France

The French legislation includes a requirement for household WEEE collected via selective collection and retailers' free take-back obligation to be returned to accredited or approved producers' systems.

Article L541-10-2 of the environmental code amended by Act No. 2014-856 of 31 July 2014 - Art. 91 says:

[...]

The treatment of household waste electrical and electronic equipment collected via selective collection, and of used electrical and electronic equipment taken back from users by retailers free of charge, is ensured

⁵ see <http://identisweee.net/en>

through systems to which the persons mentioned in the first paragraph make a proportionate financial contribution and which are accredited or approved by orders issued jointly by the Ministers for the Economy, for Industry, for Ecology and for Local Authorities.

[...]

A decree of the Conseil d'Etat specifies the conditions for implementing this article and the penalties applicable to infringements.

This text requires household WEEE collected via selective collection and retailers' free take-back obligation to be treated through systems put in place by producers (accredited take-back schemes or approved individual systems) (UNU, 2009).

Furthermore, article R543-194-1 of the French Environmental code states the following:

Article R543-194-1

Waste treatment operators are not permitted to treat household waste electrical and electronic equipment collected separately or taken back free of charge by retailers pursuant to article R.543-180 unless they have entered into waste treatment contracts with accredited take-back schemes of producers in accordance with the provisions of Articles R. 543-189 and R. 543190 or with producers which have put in place approved individual systems in accordance with the provisions of Articles R. 543-191 and R. 543-192.

If it is determined that a treatment operator treats any of the waste mentioned in the preceding paragraph without having entered into such a contract, the prefect of the department where the operator in question is based shall notify the operator of the allegations against it and the penalties it faces. The operator in question shall be given an opportunity to present its written or oral observations within one month, assisted by an advisor or represented by a proxy of its choosing, as appropriate.

At the end of this proceeding, the prefect of the department where the operator in question is based may, by means of a reasoned decision which indicates the grounds and time-limits allowed for appeals, impose an administrative fine for an amount which takes into account the seriousness of the infringements observed and the benefits gleaned and may not exceed €750 for a natural person or €3,750 for a legal entity per ton of household waste electrical and electronic equipment treated or stored at the operator's site.

Decisions issued pursuant to this article must mention the time-limit and methods for paying the fine. The fine shall be collected in accordance with the provisions of Decree No. 20121246 of 7 November 2012 on public accounting and fiscal management (...)

The four actions suggested above can be implemented as stand-alone proposals but will certainly be more effective if implemented together, because they complement each other. The first two actions have been previously carried out in many European countries as logical action points in the implementation of the WEEE Directive.

4 NATIONAL WEEE MONITORING

The CWIT consortium have identified several factors that prevent accurate estimation and national monitoring of WEEE flows. First, in many cases, such as the selling of products for reuse or fractions for treatment (including trading through metal scrap plyers), acquired through informal collection are neither reported in official statistics nor traced (CWIT Deliverable 4.1, Typology of WEEE operators). Second, not all European countries have a requirement for pre-processors to report and record the amounts and destinations of all types of input and output fractions in place, in accordance with the Waste Framework Directive. And in many countries it is only applicable to hazardous fractions. Third, the WEEE Directive

contains no specific requirement on reporting the amounts of Annex VII components obtained from selective treatment or on reporting of their destinations activities (CWIT Deliverable 4.1, Typology of WEEE operators). And finally, informal collection activities usually do not find a place in official statistics and are not monitored (CWIT Deliverable 4.1, Typology of WEEE operators).

Participants in the CWIT final conference have highlighted the importance of maintaining an independent national register in place where “put on market” and WEEE treated volumes by producers and recyclers are recorded in every member state. They have also referred to a lack of homogeneity among the member states with regard to WEEE collection and reporting, essential components for monitoring WEEE flows. Reporting on a national level is considered necessary for obtaining better quality data. Better data management would help decision makers to allocate resources and make sound decision. According to them a national monitoring system would be the most effective complement to enforcement that would also allow efficient inspection of upstream waste sites (see Annex B, CWIT final conference participant feedback summary).

Action: Develop a national WEEE monitoring strategy

In order to improve collection and to intervene where needed, one needs to know where and how much EEE there is in different markets. Improved facts support the setting of appropriate collection targets and to re-align actors in the WEEE chain to collect more and treat better. Furthermore, improved knowledge of EEE stocks and WEEE flows helps to effectively intervene in different stages of the collection and trading chain and to improve financial planning and to have necessary recycling capacity. This enables finding the right balance in costs versus benefits in collection. Hence, it is recommended to improve and expand the current mapping practices for quantifying the e-waste flows in different countries, which forms the basis for comprehensive national flow tracking and monitoring that can emerge over time.

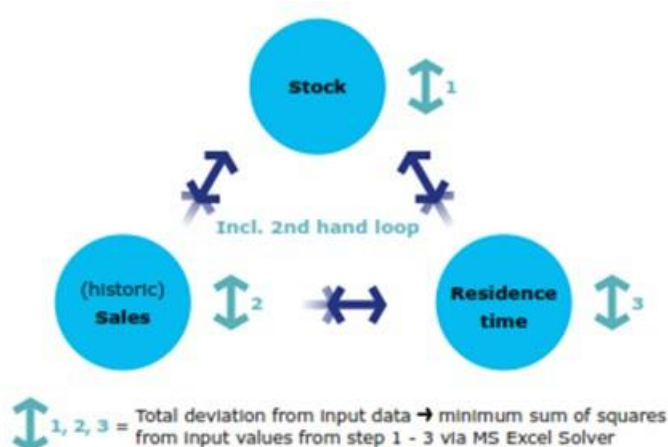


Figure 13. Structure of the UNU WEEE Generated Model.

In addition to this, in the CWIT final conference, the necessity of having updated national data on WEEE performance was stressed. Currently Eurostat platform provides data updates every three years, which does not seem adequate for enforcement and assessment of compliance purposes. One of the speakers at the conference pointed out the need of incentives from the EC to implement measures that will raise collection rates in Member States. A representative of the EC indicated that the management plan of action for 2016 includes actions to understand the performance of Member States and build proposals to deal with infringement cases.

Monitoring of flows should cover all end-of-life stages, including user behavior and disposal patterns, collection and waste trading, treatment within and outside the national boundary, and final destinations of waste equipment, components and fractions. The quantification of these flows should also connect to corresponding actors, which can facilitate the identification of leakage and complementary flows and incidentally also support crime analysis towards target companies or individuals deliberately working beyond legal boundaries in collection, trade and sub-standard or non-compliant treatment. Accurate national mass balance calculations should be based on reliable data analysis rather than on qualitative guesses and anecdotal impressions (Wang et al, 2013). This is crucial if one wants to determine our progress towards the WEEE collection targets, or if we want to estimate amounts of e-waste that ends up outside the official WEEE take-back and treatment channels.

This recommendation involves observing amounts of newly purchased EEE, the number of products in stock at households and business units, tendencies in abandoning obsolete EEE as well as various end-of-life disposal scenarios. The close observations of these and other indicators, that help assess streams of EEE and WEEE in a country, link the recommendation to the monitoring and reporting theme. The analysis from the mass balances per each product categories from the final users to the final treatment destinations is instrumental to identify undocumented flows that are not treated by proper practices. Qualitative and quantitative mapping of various collection and treatment routes by separator actors provides a factual basis for the identification of intervention potential and possibly even of environmental crimes related to misconducts and illegal activities. It is crucial that the monitoring would be organized on a national level, so that compliance schemes, recycler and inspection agencies can discuss and develop actual interventions.

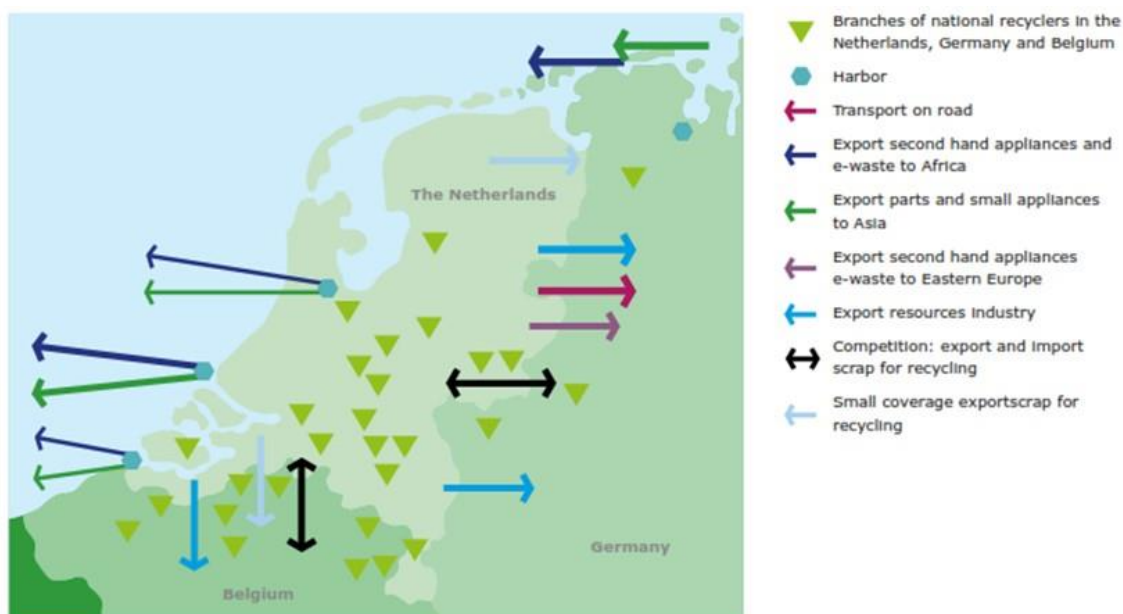


Figure 14. Flows resulting from a national monitoring exercise performed by UNU and mandated by Wecycle (WEEE Compliance Scheme) in the Netherlands (2010).

Accurate mapping of EEE/WEEE quantities and flows is not a single stage activity, but rather a development trajectory in which, over time, the monitoring and oversight is developing. The various stages of a national monitoring framework and the implementation trajectory are further explained in ANNEX A . In any case, it requires both the collection of high-quality data as well as sophisticated modelling and analysis of results. Established and harmonised methods and models developed by researchers can greatly reduce the complexity and difficulty of applying such calculation. Apart from establishing functional models to estimate the overall quantities of WEEE generated, mapping of all collectors and recyclers in the end-of-life phase is significant to identify the target actors that may conduct criminal or illicit activities. This involves investigation of the activities and capacity of all relevant companies and thus cooperation to conduct such market assessment with those active in WEEE collection, treatment (pre-processing and end-processing), and export of WEEE and components. The outcome of the flow mapping shall be interpreted into concrete suggestions to governmental and enforcement agencies to identify potential loopholes or target actor where WEEE is improperly treated.

The analysis from the national WEEE flow mapping can provide quantitative as well as qualitative indications for crime prevention in the following aspects, including the types and amount of WEEE handled through the corresponding activities.

- Thefts of the collected waste appliances from the municipal collection points, which usually lead to illegal trade or export.
- The flow of obsolete equipment collected from households and business units, which is treated outside appointed channels and connected improper practices and potentially directly exported as waste without notification. This may, amongst other things, include false custom declaration of WEEE as reuse equipment, leading to severe environmental impact and health damages.
- The flow of WEEE which is collected and pre-processed by national recyclers (which is not the official or registered recyclers for national take-back systems), and its parts or fractions are exported to another country without any notification and reporting to the customs and relevant authorities.

In order to carry out a comprehensive analysis of national e-waste flows, both a sophisticated research team, preferably well aware of the national situation and for instance already assisting enforcement agencies in their data analysis, are instrumental to facilitate the work. Based on the analysis result on potential loopholes for management, follow-up investigation and checking towards the target actors shall be conducted in order identify the potential misconduct and improve further management. A description of the set-up to implement national WEEE monitoring is further developed in ANNEX A.

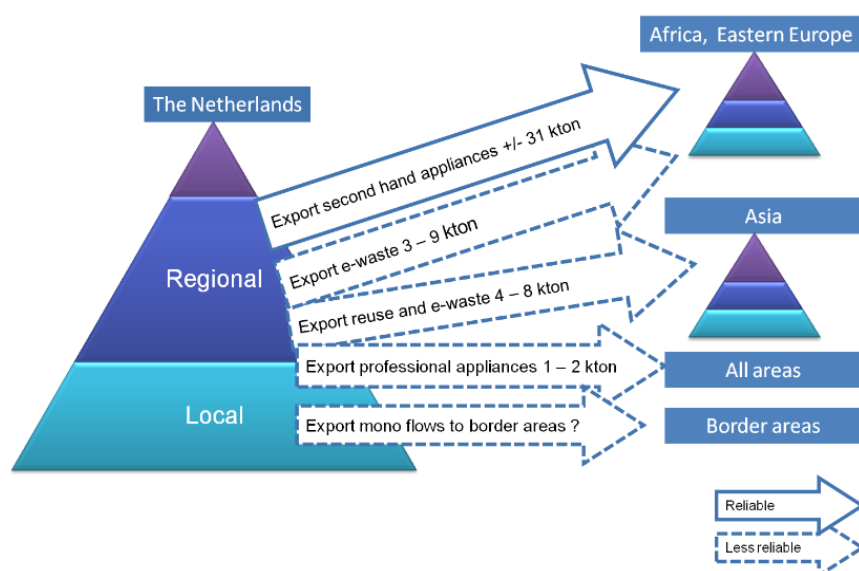


Figure 14. Assessment of Dutch Export flows and types 2010.

All in all, there are a number of key benefits of national WEEE monitoring:

- First of all, it allows us to find the gap between the total quantity of WEEE generated and its distribution through various end-of-life collection and treatment scenarios and actors. The extensive market research and identification of non-reported WEEE streams helps to understand how and where these can be found. The analysis of the data shall provide an indication of which end-of-life stages have the most potential for illegal export of WEEE and other illicit activities. This can provide a list of “hotspot” areas

for further investigation on their activities and involved quantities.

- The detailed insights on the size and nature of exports of used, mixed used and non-functioning EEE and of WEEE derived fractions and illegal shipments can assist in more targeted interventions. Based on the findings on mapping national flows and examination of export statistics and customs seizure records, enforcement agencies shall look into specific company or cases to identify illicit activities. Also better security throughout the WEEE chain, especially at collection sites, would reduce theft or any kind of unauthorized removal of e-waste from the official WEEE chain.
- A monitoring system needs to be established in order to track the performance of all actors involved in the end-of-life management. Regular reporting and data collection can be established to streamline the analysis, enhance the WEEE quantification work and improve the overall performance over time. By setting up such reporting and monitoring system, more accurate result can be updated with less work and spending on data gathering.

- National monitoring provides also a factual basis for more mandatory reporting and identification of actors collecting and treating WEEE that could be covered, which is the next recommendation cluster.

Action: Local monitoring and benchmarking

The action proposed in this section is applicable to any type of collection point, and is highly recommended to implement it especially in civic amenities and retailers. Monitoring of the flows in collection amenities for further benchmarking should be put in place. We suggest a simple mass balance, showing input and output material.

Further analysis of this information by a regional platform or collective task force will allow to:

- Calculate collection performance (Kg collected/inhabitant) at collection points;
- Compare performances between collection points and identify those with performances out of the ordinary;
- Carry out targeted inspections and further research at collection points that show under/over performances. Inspections and field visits will allow to identify the causes of “strange” performances and to identify good and bad practices, leakages of WEEE etc; and
- Implement targeted solutions to increase official collection.

Case study. Local benchmarking in the Netherlands.

In 2011 UNU performed a national monitoring study in the Netherlands as a request from a national compliance scheme Wecycle (Huisman et al., 2012). The ‘Future Flows’ report provides a good example of local benchmarking. Such benchmark performed for the Netherlands is displayed in 15: It shows the collection performance per individual municipal collection point in kg/inh for 2010. It illustrates that especially in the east and south of the Netherlands more complementary trading takes place and that WEEE is appearing in other channels. An additional field survey proved that most collection points follow the contract with Wecycle, the main producer compliance scheme in the Netherlands, and thus that part of the WEEE stream is following other channels before it reaches municipal collection.

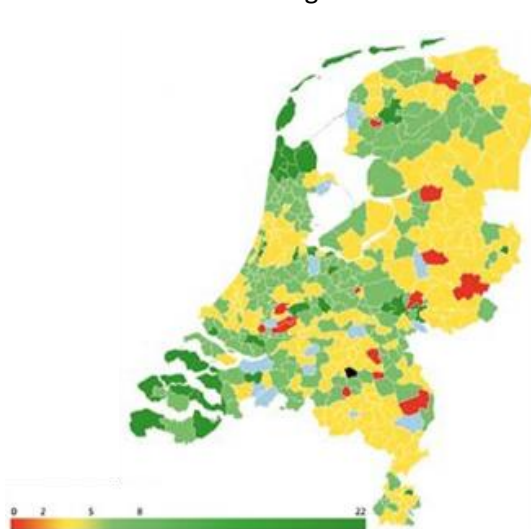


Figure 15. Example: benchmark of collection of Dutch municipalities 2010 (Huisman et al., 2010)

As an example, such investigation provides much more clues how and where to intervene in order to improve collection and also where not to intervene. The Dutch study performed in 2011 compiled information on the performance of civic amenities (municipal collection points). When the results of these collection points were studied in more detail, they found that performance varied between 0.7 kg and 20 kg/inhabitant with an average of 5.2 kg/inhabitant. A field study (100 locations) and benchmark was done to obtain more information. This included two questions: Is the collected WEEE handed over to the national WEEE compliance scheme (for Wecycle)? Does WEEE reach the municipal collection points as expected or are others actors able to collect significant amounts of WEEE before it reaches these container parks? The extended field survey showed that a small part of the collection points did not strictly follow the contract. When this happened, it mainly concerned large household appliances, small household

appliances and small IT sold to other parties.

Trade also occurred for special products like mobile phones often returned to charity organisations or cables separated from equipment and sold to traders because of high copper prices. Based upon these results, it

was calculated that 7,000 ton of WEEE were sent to the local or regional metal scrap processors. Later during the investigations, via another market survey, the research determined that another 19,000t of WEEE were sent directly to the national recyclers. The “Future Flows” study concluded that collection point benchmarking showed that substantial amounts did not reach the collection.

Action: Improve information and access to information:

Work Package 4 shows that there is a remarkable heterogeneity in terms of size and types as well as the number of actors involved in WEEE flows at European level. Plus, the actual market flows between various actors are very country-specific. WEEE managers that may want to carry out trading activities between different member states within Europe or beyond face a different panorama in every EU country and this complicates compliance. To improve visibility of authorised facilities, it is recommended to:

- Create specific lists for WEEE related companies or, in generic compilations, specify at least the specific European Waste Code handled. It is quite common to find WEEE processing companies involved in demolition waste or end-of-life vehicles management in public registers. Official registers translated and published in English, in addition to national language would facilitate the work of enforcement agencies as well as other WEEE actors having international perspective.
- Further improvement that can enhance traceability and transparency could be achieved with regular (and notification of) updates, including availability of contacts details of the entity managing the register.
- Terminology to describe different activities and actors should preferably be standardized for the sake of clarity and transparency. The implementation of this recommendation may be quite complex, given that it will require the coordination of all competent authorities and policy makers at EU and lower levels.

Action: Harmonise sampling of WEEE in residual solid waste

Around 700.000 tons, roughly 8% of all WEEE, mostly small WEEE, is disposed of by EU consumers in the residual waste. It is vitally important to have a good dataset to analyse the progress of this substandard method to treat WEEE. A complicating factor in CWIT Deliverable 4.2 analysis revealed that data is found in different formats. For example, it is unclear whether the scope of WEEE differs, they have incomplete spatial resolution, the data may be measured inconsistently throughout seasons, and there can be a lack of time series. In practice, sampling analysis is mostly done at municipal level, where it is used for policymaking in that municipality. Only a few countries have official national data in a comparable format. Also a centralized data collection and dissemination is lacking. Therefore, we propose:

- To prepare guidelines to ensure comparable WEEE scoping in the sampling protocol to make EU waste bin sampling data better comparable;
- To collect data on WEEE in residual waste in a centralized manner, for instance via EU organizations, or other international organizations that operate on environmental data, or statistics; and
- To disseminate the available data in a harmonized way in a database.



Figure 16. Fridges at a recycling facility.

5 ALL ACTORS REPORT

Unreported and misreported WEEE flows are particularly prone to illegal trade and improper treatment. This recommendation cluster deals with the common problem of non-reporting, incorrect reporting and underreporting of collected and treated WEEE amounts. The objective is that through more stringent and focused regulations as

well as through more frequent governmental audits, site inspections and other controls, the degree of proper reporting can be increased over the coming years. This recommendation is further developed under CWIT Deliverable 6.1 (Recommendations related to the European legal framework) and is mainly addressed to policy makers. However, practices in the implementation of this recommendation in some countries involved and affected WEEE compliance schemes and therefore it is briefly described in the present deliverable.

The research conducted under the framework of CWIT Work Package 2 highlights the importance of accurate reporting statistics. Compliance schemes are required to regularly report to competent authorities the amounts of WEEE collected. However it has been observed that compliance schemes only monitor and control a part of the WEEE collected and treated. In addition to this, many holders and recyclers of WEEE already report, but not to a unified database on a national level. In certain EU countries, producers and compliance schemes on one side and treatment operators on the other, report WEEE collected to different competent bodies, sometimes using different and, worse, incompatible codifications.

Another specific issue to be dealt with in this cluster is the mixing of WEEE with mixed metal scrap (for example allowed in the UK as 'non-obligated LHA'- large household appliances).

This recommendation on ensuring that all actors with access to WEEE report their collection is very important. As indicated above, it has direct impacts both on WEEE chain companies (as reporters) and on government agencies (such as policy makers setting the reporting requirement and enforcers).

The main advantages of improved reporting of WEEE flows are:

- It will be easier to reach higher collection targets set by law. National and European WEEE registers lack adequate information. Better information makes it easier for policymakers to develop policies. National observatories collecting all actors' data have been regulated in the transpositions of the WEEE Directive in certain countries.
- Unreported flows cannot be tracked hence potentially go into illegal trade or improper treatment (we do not record, we do not know). Enforcement campaigns addressed to reporting actors are highly recommended. Information that will be reported could be accessed by law enforcement agencies. This will contribute to a better utilisation of resources through a risk based approach to inspection and monitoring. Failure to report is directly related with waste traceability, invisible flows and tax evasion. Authorised facilities are the victims of this problem as they have to compete with non-authorised facilities treating unreported waste.
- Reduction of tax evasion by waste business (in the purchase of unreported WEEE). A report on the UK prepared by Eunomia corroborates that analysis and views derived from industry suggest that the real cost of tax evasion is likely to be considerably higher than previously thought. The report states that evidence on tax evasion is very limited, yet in the waste sector it is widely believed to be taking place on a very large scale (Taylor et al., 2013)



Figure 17. Washing machines at a shredding facility.

Penalties for not reporting might be a proper incentive to enhance reporting (see recommendations on the harmonisation of penalties types and legal framework in CWIT Deliverable 6.1). At the same time, incentives for each actor for reporting should probably be considered as a complementary recommendation.

Action: Reporting obligations for all actors collecting WEEE products

Countries such as the Netherlands, France, Italy and Spain have implemented policies that widen the scope of actors to report WEEE collected. France, for example, requires the setting up of an observatory to identify all players involved in the collection or treatment of WEEE on the market. At the same time France is considering to require a contractual agreement between producers and WEEE treatment managers, therefore all operators handling WEEE will be contractually related to producers or WEEE compliance schemes.

The Netherlands is setting up a national WEEE register where any stakeholder under the definition of producer or treatment operator should report. The Spanish transposition of the WEEE Directive requires the creation of a national register where all types of actors having access to WEEE will report WEEE Collected.

Other recommendations

The CWIT consortium concluded that certain items should be taken into account when setting up national registers:

- *Detailed reporting* – The description of the WEEE reported should be unequivocal and understood by all reporters. For instance, the mixing of WEEE with mixed metal scrap is an issue of concern that impedes a clear accountability of the WEEE generated. A clear definition of WEEE to be reported should be prepared and shared with EU member countries, so that all types of WEEE are clearly recorded (also described in CWIT Deliverable 6.1). However, too detailed reporting may be costly for some stakeholders. In some countries, such as the UK, protocols have been developed by industry led groups to assist in determining the proportions of different categories of WEEE in mixed loads. These protocols can be applied to all small mixed WEEE (SMW) and large domestic appliances (LDA) received from Local Authority DCFs (designated collection facility) for treatment. The environment agencies have set out in their guidance note (GN04) how the protocols should be used, including where they can be used for non DCF sourced WEEE (UK protocols¹). The protocols remove the need for WEEE to be manually separated and categorised prior to processing (UK protocols²)⁶. The protocols can also be used to apportion the materials derived from the treatment of WEEE. Other countries such as Germany (EAR) and Austria apply statistical procedures to get detailed figures of WEEE collected.
- *Harmonised codification* – In order to improve traceability and comparability, all actors should report using the same codes or codes that allow comparability. Preferably using a detailed set of codes that will allow traceability of the different types of WEEE (WEEE categories), and in particular WEEE that is likely to be illegally traded or mistreated (CFC containing appliances, CRTs etc.) See recommendation on improved codification for further information (See CWIT Deliverable 6.1 for more information).
- *Communication* – Information to all actors is an essential factor for this tool to be successful as well as targeted enforcement campaigns, which will take considerable coordination efforts but in exchange can be quite effective. A source of financing to set in place the e-tool, coordination,

⁶ [http://www.360environmental.co.uk/documents/January%202011%20v2%20\(GN04%20guidance\).pdf](http://www.360environmental.co.uk/documents/January%202011%20v2%20(GN04%20guidance).pdf)

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/292632/bis-14-604-weee-regulations-2013-government-guidance-notes.pdf

management and monitoring is necessary. Budget to implement this action may come from public authorities and EEE producers, according to the examples described above.

- *Control of data collected* – Controls that will assess consistency and reliability of the data reported by actors should be put in place. Quantities reported by actors may be audited regularly by enforcement agencies, national registers or WEEE compliance schemes. An annual mandatory audit for actors reporting products or waste beyond certain limits is a validation system already in place in some countries for waste such as packaging. In other EU countries, audits to producers are part of the requirements included in the WEEE Schemes permits. In addition to this, in certain EU countries, WEEE compliance schemes and competent authorities have carried out campaigns to identify and reduce the number of free riders (EEE producers not fulfilling their WEEE reporting and financing obligations). This measure, besides the obvious enforcement purpose, increases the quality and representativeness of the data collected.

A coordinated approach from competent authorities and private management is necessary. Input from the EEE industry and Compliance Schemes in the development of such platform could be of high value in increasing the (cost) efficiency and adaptability of the tool to potential users.

6 IMPROVE NATIONAL COOPERATION (NATIONAL WEEE NETWORKS)

This recommendation cluster concerns enhancing cooperation and communication between organizations involved in the WEEE trade and countering illegal trade in WEEE. The first group include all types of stakeholders identified in the WEEE value chain, such as consumers, traders, the WEEE industry, NGOs, EEE producers and compliance schemes, logistic companies etc. The competent authorities involved in countering illegal trade include police authorities, tax and customs authorities, special waste shipment units, state and regional environmental authorities and prosecution offices. Poor cooperation results in a lack of training and information for competent authorities, and a difficulty for police to identify the environmental crimes and the type of evidence required for prosecution.

Action: Establish a National Environmental Security Task Force (NEST)

The action that is recommended to strengthen cooperation and communication, is for countries to form National Environmental Security Task Forces (NESTs) to ensure a coordinated multi-agency response to tackle the illegal trade in WEEE. The NEST brings together different national authorities to tackle environmental crimes. The NEST concept is developed to tackle all environmental crimes, but based on priorities, sub-task forces can be created within the NEST with a focus on a specific crime type, such as the illegal trade in waste and/or WEEE. This recommendation is further developed in Deliverable 6.2 (Recommendations for law enforcement organisations).

WEEE compliance schemes may play a relevant role in this Task Force because they know the intricacies of the WEEE sector, the actors and drivers behind at local and national level. Furthermore, it is in their interest to have a regularisation of the WEEE sector and increase collection rates.

While some environmental crime issues can be addressed by a single agency, in most cases an effective response requires the knowledge and expertise of multiple agencies working together. By creating a team of experts, each with specialised skills, a NEST could ensure that all criminal activities related to the illegal trade in WEEE are addressed. The NESTs centralise all the efforts against environmental crime, ensuring a coordinated response that avoids duplication of efforts, ensures the efficient use of resources, and facilitates intelligence, capacity, and capability exchange among agencies. Being part of the NEST involves communication, information exchange, and compliance and enforcement actions.

Within the NEST, it is recommended the participation of police and compliance authorities, customs, environmental compliance enforcement agencies, prosecution offices and international cross border agencies. In addition, the NEST can connect with other organizations to discuss different topics and exchange knowledge, such as WEEE compliance schemes and industry networks amongst others. In some cases, it may be appropriate to invite specific participants for individual actions and operations with the task force being maintained by a core group.

The NEST is intended to frequently or even on an on-going basis assist in tackling WEEE problems. The structure for cooperation differs, it can range from authorities to cooperate on a case-by-case basis, to authorities merging into one organization. The most common NEST structure is for different authorities brought together in the task force. To ensure a successful NEST, secure, regular and real-time communication is important by for example: secure e-mail services, real-time information exchange on a case by case basis, teleconferences and face-to-face meetings.

All WEEE stakeholders are recommended to play a role in the implementation of this recommendation. Public-Private Partnerships (PPPs) are recommended. Private partners are advised to have an advisory role, as they do not have access to restricted case information. The exchange of information from local and national monitoring and benchmarking on collection rates would provide useful information to the law enforcement sector that will allow them to identify irregular activities in the WEEE value chain. Similar information could be shared in other parts of the WEEE supply chain.

Action: Enhance multi-stakeholder networks

WP4 (Market Assessment) proved that the WEEE value chain is a complex and extensive network of different types of actors covering multiple activities and affected by different levels of enforcement and legislation. Therefore the CWIT project recommends to involve different types of stakeholders in programmes aimed at tackling WEEE illegal trade. This action is fully developed under CWIT Deliverable 6.1 (Recommendations related to the European legal framework).

"Every country has to involve all stakeholders to be efficient"

CWIT Final Conference, Lyon, June 2015

An example of this approach was presented during the CWIT final Conference by a representative of the French ministry of sustainable development. The French government implemented during the past years a number of legislative texts affecting all types of stakeholders involved in the trade of WEEE. The commitment of the French authorities materialised in different strategic programs.

Policies to reinforce the current regulations upstream (on collection) involving different types of stakeholders such as compliance schemes and scrap dealers were put in place. The main goal of such policies is to collect more in legal networks:

- EPR schemes: higher collection rates required from PROs (producer responsibility organisations). In France, collective PROs are non-profit private companies, set up and governed by producers themselves and approved by the Government for periods up to 6 years). WEEE PROs are directly in charge of waste treatment and have direct relations with treatment operators.
- Obligation to organise specific collection events in dense urban centres (which have less permanent collecting points: idea = avoid dumping on the pavement).

- Obligation to develop new channels of collection (especially with scrap metal dealers which need to be professionalized)

Other policies affecting downstream, aiming at putting more pressure on illegal networks were also approved such as a regulatory requirement for treatment operators (including sorting) to set up a contract with PROs, which will also contribute to professionalization of treatment operators.

Enforcement activities were also included in the plan of actions with an extensive inspection campaign on WEEE sites in order to identify illegal practices.

The expertise of WEEE compliance schemes may be a good input in the preparation and implementation of such measures.

7 GUIDELINES TO CAPACITY DEVELOPMENT FOR LAW ENFORCEMENT AGENCIES

This strategy is fully described under CWIT Deliverable 6.2 and proposes a range of measures for enhancing the capacity of law enforcement agencies (e.g., police, customs, environmental organisations, etc.) to counter WEEE-related crime.

The CWIT research outcomes have shown that a lack of knowledge and expertise is a major impediment in the detection of WEEE violations and illegal shipments. This is restated in the impact assessment for the recent revision of the WSR by the European Commission, which puts forth a lack of training for inspectors as a serious setback in enforcement activities for many member states (Geeraerts, Illes & Schweizer, 2015). Insufficient guidance and training often prevents officers from proving the illegal nature of a shipment.

Some stakeholders in the CWIT midterm workshop recommended that personnel from enforcement bodies, such as environmental inspectors and agents from relevant organisations should be specifically trained in methods that experts use to identify illegal trade and treatment of WEEE. They also considered it beneficial for customs staff to have specialised training to help them distinguish WEEE from used EEE (CWIT Deliverable 2.2, Report on WEEE components and recycling). A couple of respondents for the CWIT questionnaires noted that additional training for prosecutors on environmental law issues could be useful, whereas specific training on WEEE issues would be better suited for environmental inspectors and police (CWIT Deliverable 5.4, Gap analysis).

The importance of adopting robust training schemes in the context of the EWSR (European Waste Shipment Regulation - EU Regulation 259/93) has also been highlighted by some member states (EUROSAI, 2013). IMPEL recommends putting in place an enforcement strategy and a multi-year programme for the enforcement of TFS (Transfrontier Shipment) regulations (EU Regulation 259/93), where knowledge and training programmes run by environmental agencies, customs and police form important components (IMPEL-TFS, 2004).

Action: Establish public-private partnership scheme

Setting up a partnership programme between law enforcement authorities and the WEEE industry would facilitate knowledge exchange and expertise. Government agencies should assist industry actors to gain a greater understanding of WEEE legislation and compliance therewith. In return, industry experts should provide technical knowledge to government officers on critical issues like distinguishing WEEE from used EEE and identifying the hazardous nature of a shipment.

This proposal could be emphasized using the idea of Smart enforcement of a voluntary scheme of the WEEE industry with the law enforcement agencies. If best practices are adopted, the cost of enforcement could be

significantly reduced as well as the burden of administrative requirements (taking into account that over-detailed procedures and regulations should be avoided).



However the main problem to implement this proposal is the lack of resources and the high costs of inspections and enforcement actions. Being a low priority crime, the high cost of inspections and enforcement measures needs to be reduced, not in detriment of compliance but encouraging best practices that have been proven to be more efficient in terms of applied procedures and processes as well as more effective in terms of results. Considering these circumstances and the requirement of feasibility, one proposal that could be interesting is the preparation of a document on the best practices that should inform a voluntary

scheme on smart enforcement to be agreed by the industry and law enforcement agencies.

Case study. The INTERPOL Pollution Crime Working Group

The INTERPOL Pollution Crime Working Group initiates and leads a number of projects to combat the transport, trade and disposal of wastes and hazardous substances in contravention of national and international laws. Pollution crime has a clear and direct human impact due to the hazardous nature of the substances in question. The trans-boundary movement of waste and hazardous substances generally occurs from more developed countries to less developed countries, therefore calling for an international strategy. The INTERPOL Pollution Crime Working Group brings together specialized experts and criminal investigators from around the world to work on project-based activities on a global level.

One of the current projects of this working group is the Electronic Waste Sub-group, which has been established to identify the illegal networks responsible for shipping thousands of tons of electronic waste from the industrial to the developing world. With the establishment of Project Eden, members of the former Global E-waste Crime Group will provide operational support and act in an advisory role to this project. Members of the CWIT consortium and the CWIT High Level Advisory Board (HLAB) have been invited to participate in this group as well, which will ensure the continuity of the collaborative bonds created during the CWIT project.

8 CONCLUSIONS

As the organizations created by EEE manufacturers to comply with the WEEE Directive, producer compliance schemes play a pivotal role in the cost-effective collection and recycling of WEEE. The WEEE collection gaps appear to be enormously high in the EU comparing the percentage of WEEE generated versus the reported collection amounts. A substantial portion is dumped into the waste-bin by consumers instead of being deposited at authorized collection facilities. As the starting point in the WEEE supply chain, consumers need to be more intensively informed about bringing end of life appliances to designated collection points in order to prevent WEEE mismanagement and illegal exports. Hence it is recommended for compliance schemes and EEE producers to run awareness campaigns for end-users communicating the negative consequences of improper disposal, updates on the legislative framework, available resources and official collection amenities. Making it easier for end-users to identify nearby collection sites, making collection points more easily accessible, providing mobile solutions like door-to-door collection, allowing recyclers to engage in collection, expanding the network of civic amenities and retail collection points are some practical suggestions aimed towards improving official collection rates. Compliance schemes are already known to be actively supporting such initiatives in some countries.

Moreover, in order to set appropriate collection targets and to effectively intervene at the different stages of the WEEE collection and trading chain, one needs to have a good knowledge of the quantities of EEE placed in different markets. This can be accomplished through the accurate monitoring WEEE flows in the country. A national monitoring strategy is an important but missing element in most EU countries and needs urgent development. The monitoring of all WEEE flows will provide quantitative as well as qualitative indications, such as the thefts of collected waste appliances at municipal collection points, the flows of obsolete equipment collected from households to unreported channels, the WEEE amounts pre-processed by national recyclers and so forth. This information will enable compliance schemes, recyclers and inspection agencies to develop appropriate interventions at the right points in the WEEE chain. Stringent reporting obligations and regular governmental audits will tackle the problem of unreported and misreported WEEE flows and compliance schemes can support in the implementation of such requirements.

Considerable improvements are also required in the current information exchange system between competent authorities and the numerous stakeholders in the value chain, in order to identify WEEE violations and provide evidence for prosecution. While this recommendation is mostly aimed towards policy makers and law enforcement, compliance schemes are uniquely placed to support these activities due to their in depth understanding of the complexities of the WEEE sector. In fact, the entire electronic industry, including compliance schemes and law enforcement bodies could strongly facilitate each other's work by setting up public-private partnership programs for exchange of knowledge and expertise. There are knowledge gaps on WEEE legislation and compliance by the industry actors whereas technical knowledge on critical issues like distinguishing WEEE from used EEE and identifying the hazardous nature of a shipment is missing on the part of government officials. Establishing voluntary partnership schemes is strongly advocated to fill in existing gaps in knowledge and provide the necessary expertise to the electronic industry for greater compliance and law enforcers to fulfil their responsibilities more effectively.

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Work Package 2, *WEEE Actors and amounts.*

Work Package 2, Deliverable 2.1, *Mapping of WEEE actors.*

Work package 2, Deliverable 2.2, *Report on WEEE components and recycling.*

Work package 4, *Market assessment.*

Work package 4, Deliverable 4.1, *Typology of WEEE operators.*

Work package 4, Deliverable 4.2 *Report on volume of used EEE and WEEE generated.*

Work package 4, Deliverables 4.3, *Report on the dynamics of WEEE stream.*

Work package 5, Deliverable 5.2, *Volume of WEEE Illegally Traded.*

Work package 5, Deliverable 5.4, *Gap analysis.*

Work package 6, Deliverable 6.1, *Recommendations related to the European Legal Framework.*

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Official meetings

CWIT Workshop, Seville, Spain on 18 June 2014.

CWIT Mid-term Conference, Lyon, France, from 16 to 17 October 2014.

CWIT Final Conference, Lyon, France, from 25 to 26 June 2015.

ANNEX A. SET-UP AND IMPLEMENTATION STAGES OF A NATIONAL MONITORING STRATEGY

From UNU experience in several country studies in Europe, in order to comprehensively map the national WEEE flows, the following steps are instrumental to develop more continuous oversight on EEE stocks and WEEE flows:

- *Accurately measure the quantities of EEE in stock and of WEEE generated from all household and business users*, which provides a baseline for the total waste amount in the society. Such measurement should involve the use of functional models as well as data gathering on EEE placed on the market and lifespan profiles of products (through consumer surveys on stock and disposal information). A typical example is available from (GfK 2009). Various household possession survey formats were applied by surveying companies like GfK and IPSOS, see also (IPSOS 2011). They are typically covering a limited number of products in households only as a first step and gradually being detailed and refined over the years and then also covering EEE in businesses and the public sector as well to acquire a more comprehensive picture. Drawback of the latter exercise is the surveying cost, which can be substantial. In line with the WEEE Directive, there are currently national registers that collect information from EEE producers on the EEE placed on national markets. It is recommended to assess the representativeness of the data stored in such databases and, if required, implement measures to counteract free riding (producers not reporting).
- *Closely monitor the performance of national WEEE take-back and treatment system, which is set up by producers and/or government*. Such performance includes the quantities of WEEE collected at the municipal and national level, the quantities of WEEE delivered from collection points to the contract recyclers, the quantities and final (crossing-boundary) destinations of various recycling output fractions. The implementation of this action requires high coordination skills among many different types of actors, therefore it can be considered a medium term action. A management body, such as a task force, regional authority or e-platform, should be in place. Its role is the collection of data, analysis and reporting conclusions. It can, at the same time, be in charge of regular visits to collection points for checking purposes and training of site's staff. This body will report to the organisations managing collection points and enforcers (if official targeted inspections are requested). Staff in charge of collection points will require training for data collection. It is also advisable that third parties plan regular visits to collection points, especially at the beginning of the implementation of this action, for checking purposes. Many WEEE compliance schemes have undertaken similar actions in Europe, therefore it is a relevant actor to consult and count with when considering the implementation of this action. WEEE compliance schemes are in a privileged position to understand and connect involved parties.
- *Estimate the quantities of WEEE being disposed of as mixed residual waste*, by carrying out sampling of the municipal solid waste, preferably on a local or regional level. From Deliverable 4.2 we learn that around 700,000 ton of WEEE is disposed of in the waste bin. It comprised mainly small appliances, such as lamps, small equipment and small IT equipment. This was 1.3 kg/inhabitant for high-income countries and 1.4 kg/inhabitant for middle- and low-income countries. For some low-income countries, there were rather different amounts found. As an example, in the Netherlands for the Dutch Future Flows report, substantial analysis was done regarding the WEEE content of residual waste. The research is based on a large amount of individual surveys originally issued by municipalities and made available. Several hundred surveys are investigated to calculate the amount of WEEE ending up in incineration more accurately. The analysis revealed that local waste policies

can significantly affect the amounts of WEEE that is discarded of as household waste. The average amount of WEEE for so-called PAYT communities, (Pay-as-you-throw), a municipality where a household must pay for the amount of household waste discarded, the WEEE in waste bins is about 1 kilogram per inhabitant/year less compared to the average in the Netherlands where a flat tax or an annual disposal fee is used. This suggests that PAYT is successful in reducing the amounts of WEEE that otherwise would be discarded with residual household waste. This illustrates that spending money on raising public awareness alone does not suffice and helps to identify alternative interventions in the way municipal solid waste is collected, affecting WEEE as well.

A complicating factor in the EU analysis on the subject revealed that data is found in very different formats covering different years and very different sampling methods. A more specific recommendation here is to establish a more robust sampling and documentation protocol to make EU waste bin sampling data better comparable.

- *Systematically investigate the collectors and recyclers that engage in the WEEE business*, whose recycling capacities and activities are not reported or registered to relevant authorities. Increase the understanding and monitoring of these actors at both regional and national levels similarly supports appropriate interventions to increase collection. Market assessment can:
 - Highlight the flows and behaviour of local and regional traders and recyclers up to national recyclers.
 - Determine the amount of scavenging of certain products and components like computer parts and compressors at local levels,
 - Identify and collect statistics on the data of equipment from the reuse shops, refurbishment companies, as well as charity organisations and thus the amount of reuse and refurbishing and possibly subsequent (legitimate) shipment outside the country, which also reveals which amounts cannot physically be collected anymore in the national territory.
 - Reveal non-reported but substantial amounts of complementary recycling of predominantly LHA with mixed metal scrap. In view of the total quantities of WEEE, identification of these amounts that still recycled is a crucial element to complete the national mass balance. In addition, monitoring of these fractions can also help to avoid substandard treatment of for instance appliances like refrigerators that due to their CFCs should be collected separately, see also (WRAP 2013, 2014). Alternatively, with proper accounting of these volumes the national WEEE collection statistics can be improved.
 - Quantify the B2B quantities involved: Installation companies for specific professional appliances like professional cooling and air conditioning installations, servers and mainframes, medical equipment and vending machines. Surveying specifically professional appliances often collected and send to recyclers, or sometimes exported, helps to complete the national mass balances but also to identify free-riders and small but potentially harmful exports of specialised equipment.
- *Compile and analyze custom data on declaration of waste shipment related to WEEE and its components*. By means of cooperation and joint analysis with enforcement agencies, it is possible to quantify the magnitude of exports and the most common appliances and routings. As an example in the advanced assessment in the Dutch study, the market assessment as above is in detail compared with the inspection databases and experiences. As a result of the analysis, the following drawing was concluded: The analysis effort is very instrumental in the understanding the complex and diverse nature of export flows as well as where one specifically can intervene to stop the illegal part of exports.
- After the data from these aspects are collected, a *national WEEE accounting analysis* can bring all information together by interconnecting all stakeholders, activities and flows. To identify the

resulting inevitable data gaps, the mass balance can be completed as far as possible, from the generation source of e-waste to its final destinations of all materials and fractions. From there, as an evolution, further research can be planned for those parts of the chain and appliance types and actors expected to be related to the observed data gaps.

The following set-up is the basic condition to implement national WEEE monitoring:

- Form a research team that establish the scientific methods, evaluation models and data collection guidance for the mapping practices. The harmonization of the WEEE classifications and mapping approach would help collect comparable data and compile more accurate estimates on key indicators.
- Establish a data collection scheme and an “all-actors-involved” working network, which motivate relevant stakeholders to contribute to the data gathering while reducing administrative burden and costs. The first thing to do is to aggregate the best available data from existing reporting system and statistics. Authorities should collaborate more closely with already existing data sources, such as data of national statistical offices, retailers and importers to capture more accurate data on sales of EEE (types and weights). If there is still critical data missing for undocumented flows, it is then desired to make action plans to collect the necessary new data. Closer collaboration with stakeholders might require introduction of new reporting requirements.
- Ensure well prepared classification of EEE products and components (see also Recommendation Cluster “improve waste codification” in Deliverable 6.1 and Baldé et al., 2015). In addition, templates for (consumer) surveys can be established to ensure efficient data collection for this relatively expensive research component as well as proper sampling size and representative data gathering.

ANNEX B. CWIT FINAL CONFERENCE PARTICIPANT FEEDBACK SUMMARY

CWIT FINAL CONFERENCE PARTICIPANT FEEDBACK SUMMARY 25-26 June 2015

Forty-two participants responded to our request for feedback on their personal views related to the recommendation clusters set forth by the CWIT consortium. The recommendation groupings constitute four main themes and a cluster of four recommendations under each theme listed in the table below.

Theme 1	Theme 2	Theme 3	Theme 4
1.1 Educate consumers	2.1 Improve treatment	3.1 Waste codifications	4.1 Information management system
1.2 Improve collection	2.2 Improve reuse	3.2 Consistent guidelines	4.2 LEA capacity building
1.3 National WEEE monitoring	2.3 National WEEE networks	3.3 Train authorities	4.3 International WEEE networks
1.4 All actors report	2.4 Smarter inspections	3.4 Harmonize penalties	4.4 Enhance prosecution and sentencing

In the feedback form six questions were outlined in relation to the above framework. The questions and the corresponding answers are presented below.

A. Please select up to three recommendation clusters (of the 16 total) which you believe have the highest benefit-cost ratio (i.e. benefits exceed highly the implementation costs), as well as high likelihood of bringing sustainable improvements/positive results?

Listed below are the number of votes received for each recommendation in descending order.

- 1.1 Educate consumers (16)
- 4.3 Improve international WEEE networks (13)
- 1.2 Improve collection (12)
- 4.4 Enhance prosecution and sentencing capabilities (12)
- 3.2 Consistent guidelines (11)
- 2.4 Smarter inspections (10)
- 4.1 Enhance international information management (9)
- 3.4 Harmonize and enhance penalty systems (7)
- 4.2 Invest in capacity building for law enforcement agencies (7)
- 1.4 All actors report (7)
- 1.3 National WEEE monitoring (6)

- 2.3 Enhance national WEEE networks (6)
- 2.2 Improve reuse (5)
- 3.1 Improve waste codification (5)
- 2.1 Improve treatment (4)
- 3.3 Government capacity building, train authorities (3)

B. Please write brief justification about your top 3 choices (please indicate the recommendation cluster number).

The summary of the reasoning provided behind the selection of each recommendation is described below.

1.1 EDUCATE CONSUMERS

16 participants selected this as having highest priority with the following justifications.

- Education is the first step for a change.
- Consumers are the starting point for WEEE flows and hence need to be convinced about the importance of bringing old equipment to a legitimate collection point. Failure to do so will result in improper disposal and/or storing those in households.
- Consumers must understand how their discarded equipment lands up in illegal e-waste shipments. So awareness is essential for consumers to recognise their role in solving the WEEE problem.
- Consumers are not well informed about the externalities associated with the WEEE. An increase awareness raising would help improve better collection and eventually treatment efficiencies.
- It appears that a majority of offences are committed due to a lack of awareness in regulation and consequences, excluding criminal cases motivated by economic benefits. Raising awareness of collecting and treating WEEE in monitored system would bring positive results. This has to be in balance on the other end with efficient enforcement and dissuasive fines.
- Consumer awareness will lead to better sorting of WEEE.
- Consumer habits can determine if the equipment goes to legal or illegal streams.
- Proper disposal by consumers will increase collection rates and prevent leakage.
- The quickest win is provided if consumers bring WEEE materials to the appropriate channels.
- Creating consumer responsibility is one of the best improvement measures.

1.2 IMPROVE COLLECTION

12 participants selected this recommendation as having the highest priority with the following justifications and comments

- This is the beginning of the whole problem and is the first step in preventing leakages.
- It is the initial point in the process of disposal and securing these facilities is the basis to guarantee an efficient process.
- The example of Norway is cited, where leakages from collection points (private actors/shops) is highly visible and apparently the biggest vulnerability.
- There is a natural tendency for people to behave better under vigilance and securing collection points will result in better behaviour.
- This is important to prevent thefts and acts as an obligation to guarantee the consumer that the discarded equipment will be properly recycled and treated.
- This measure ensures that no material falls into the hands of scavengers. However take-back systems should not have monopoly.
- Proper collection (possibly regulator approved), is a big step in preventing illegal activity.

- Securing collection points is a relatively low-cost measure.
- This is a cost-effective measure.

Comments

One respondent indicates that security at collection points should include ban in cash transactions.

2.4 SMARTER INSPECTIONS

12 respondents indicated this as being highest priority with the following justifications and comments

- To use limited resources effectively, targeted inspection is essential. To implement this measure, it is important to acquire enough information on how to target the right shipments in order to use resources effectively.
- It is important for inspections to be targeted to (illegal) upstream waste sites for control purposes in order to prevent illegal activities going downstream.
- Because recycling companies in Germany report they are never inspected.
- Due to limited resources available this is a useful measure In terms of costs and benefits.
- It is a key measure for smarter selection.

Comments

Inspection strategies should include guidance on gathering and analysing intelligence data and requires a consistent and harmonized approach. The risk indicators developed in some countries can be used by others.

4.3 INTERNATIONAL WEEE NETWORKS

13 respondents marked this as having the highest priority with the following justifications and comments

- The current situation in this regard is very poor and definitely needs improvement. This positive step will also enable putting in place some other recommendation measures.
- Illegal networks have no borders.
- A global approach is the key towards solving the problem.
- Illegal WEEE export is an international concern and hence requires international cooperation to prevent this activity.
- It is an established fact that WEEE thefts are cross-border (within EU & beyond) organised crimes and hence reinforcing international cooperation is essential.
- This is crucial to coordinate internationally about the application of international regulations around WEEE.
- Co-operation among international agencies and governments is very important because the actions implemented within the European Union will be incomplete if no actions are taken in the destination countries of illegal WEEE shipments.
- One step in enhancing international cooperation is to strengthen existing networks E.g. IMPEL). The networks include police, prosecutors, customs etc.
- Communicating and sharing information results in the creation of best practices.
- This is an important improvement measure as it will assist in learning from each other's experiences.
- There is a requirement for operational meetings for LEAs and operators at the EU level.

Comments

Cooperation between existing networks such as Interpol, Encicrimenet/ Europol and IMPEL TFS

needs to be used (and linked) for exchange of modus operandi and if possible nominal data. This will lead to intelligence led enforcement/ policing/ inspections. The national desks at Europol can play an important role for the exchange and storage of this data.

4.4 ENHANCE PROSECUTION AND SENTENCING

12 respondents were in favour of this as being the first priority with the following justifications and comments.

- Currently there is a lack of awareness by judges and prosecutors leads which is the reason behind the infrequent and low sentences.
- There is a big gap in this area and the improvement step will support some of the other recommendation measures.
- The current legal system lacks a consistent and harmonized concept of appropriate sanctions.
- To achieve a level playing field, avoid port hopping, fight against fraud, forgery, etc .it is necessary that the last link in the enforcement chain, prosecutors and judges are being well trained and are aware of the specific issues in this complex working field. Initiatives as the IMPEL TFS prosecutors project, ENPE, Eurojust needs to be supported. It is important for the prosecution, sentencing and punishments to be more or less harmonized within the European Union.
- As this measure implies specialised training to tackle "specialised" environmental crimes, it is a necessary positive step.
- An effective enforcement regime requires specialized prosecutors and judges who are educated on the issues surrounding WEEE in order to enable them to effectively deal with WEEE related breaches and offences.
- As a positive step to deter and combat crimes, it is important to inform potential perpetrators about the consequences of criminal actions. This is both a preventive and reactive improvement measure.

Comments

In this context one respondent noted the need for enforcement to be strengthened by hiring more personnel, creating more efficiency, reducing bureaucracy, developing a more harmonized approach, increasing the exchange of information, and giving easy access for stakeholders to report suspicious or criminal acts. Another respondent indicated that enhanced prosecution and sentencing should include swift and dissuasive penalties, not necessarily penal but substantial monetary penalties. The need for international cooperation among judges was also suggested as an improvement step. Finally, according to one participant Member States which do not comply with the targets of the WEEE Directive should be prosecuted as well.

3.2 CONSISTENT GUIDELINES

11 respondents supported this as being the highest priority with the following justifications and comments

- Distinguishing between what is legal and what is illegal in many cases is a big problem.
- More guidance is needed for Annex VI and getting a common understanding is essential.
- Many terms are ambiguous and in need of clarification.
- An effective discussion on WEEE issues is not possible without precise and exact definitions. Consistent guidelines will help standardisations and assist the development of clear notions and recommendations.

- Consistent interpretation of e-waste vs. used goods is necessary to prevent illegal shipments. Export for repair is still a grey area and there is a need for consistent interpretation.
- Following up on this recommendation will ensure a level playing field.
- This is a necessary step to facilitate all actions along the UEEE/WEEE chain.
- Consistent guidelines will facilitate legal trade.
- Consistent clear guidelines will make inspections and prosecutions easier and thereby increase the likelihood of conviction.
- This measure is essential as currently there is a large number of diverse practices. The existing system is hard to understand and implement for many actors in the value chain.
- Consistent guidelines would assist enforcement bodies and notifiers of waste.
- Proper knowledge and training are important and to reach this goal consistent guidelines are essential.

Comments

It is recommended for the guidelines to contain information for customs and exporters on how to distinguish between UEEE and WEEE (e.g. which kind of test, what kind of packaging, what reports etc.), and include common and simpler procedures for notifications. Another suggestion is to cover information on how to calculate the economic value of offences related to illegal shipments/collections. The economic rationale will help draw attention from police, prosecutors and judges.

4.2 LEA CAPACITY BUILDING

7 respondents were in favour of this recommendation as having the highest priority with the following justifications and comments

- Inspecting WEEE is particularly difficult calling for more investment in capacity building in law enforcement agencies.
- There are fewer inspections and few specialized prosecutors due to the limited capacity in law enforcement agencies.
- Given the amount of waste produced it is necessary to increase resources (financial and personnel).
- More financial capacity is required to increase the risk of detection for illegal operators and exporters, which is a big measure to counter these activities.
- There is a need for more monitoring and enforcement, which requires increased capacity. Targeted enforcement by knowledgeable regulators will facilitate early detection and prevent crimes.
- Law enforcement authorities need more operators and operational meetings at the EU level.

Comments

Capacity building should include better cooperation across law enforcement agencies like police, customs, environment etc.

4.1 INFORMATION MANAGEMENT SYSTEMS

9 respondents indicated this to be the highest priority with the following justifications

- Currently there are strong knowledge gaps in the international arena.
- More information is required on what is happening and what the economic incentives are for people involved in illegal export of WEEE.
- An information sharing system for authorities is highly important. All company data in this information platform should be digitalized.
- Illegal trade is an international issue and the management of international information is crucial.
- E-waste trafficking requires a global approach. Improving information exchange as well as cooperation and collaboration with the international authorities and will help in the successful management of the e-waste stream.

- International information management and dissemination is crucial as this assists in building capacity and allows the member states to push the requirement for action /agenda of illegal e-waste shipments. Member states often do not see the global context of a problem.

Comments

The international information exchange needs to be improved and enhanced. This requires a channel which is secured and easy accessible. According to the amendments of the European Waste Shipment Regulation EU member states are obliged to draft inspection plans based on risk assessments. This obligation is an opportunity to connect the data between law enforcement agencies and supervision bodies. Within Europe there are networks which are useful for this like Envicrimenet, Europol, Interpol and Impel TFS.

3.4 HARMONIZE PENALTIES

6 respondents selected this as top priority with the following justifications.

- This is important because presently e-waste related crimes are not given the importance they deserve either by the police or by the public.
- Currently the legal system lacks a consistent and harmonized concept of appropriate sanctions.
- The penalties vary considerably across countries depending on the location where illegal waste shipments are detected. The diverse penalty systems are definitely in need of greater harmonization.
- Coordinated approach with other member states is necessary to hinder illegal exports.
- It is absolutely necessary to create global rules in this area.
- WEEE crime is a global issue and needs tough and harmonized responses. The general aim is to raise awareness on “victimless” environmental crimes, even if this crime may not actually fall into the “victimless” category.

1.4 ALL ACTORS REPORT

7 participants selected this as a top priority recommendation with the following justifications and comments

- It is important to take into account the data reported by WEEE managers (waste managers holding permits to collect and treat WEEE), distributors and take-back systems. Not only the data reported by the take-back systems.
- A harmonized reporting system is necessary making it mandatory for all actors to be registered, including private businesses, treatment plants etc.
- The more collection facilities (waste managers, municipal collection points, etc.) are authorized to collect WEEE, more WEEE will be collected properly in accordance with the WEEE Directive leading to an improvement in WEEE collection and recovery rates.

Comments

It is necessary to find incentives for legal/informal actors to report on collected WEEE and EEE for reuse. One option is to legalise WEEE collection in the informal sector although controlling the quality of WEEE treatment in these sectors will still be required.

2.2 IMPROVE REUSE

5 participants selected this as high priority with the following justifications

- Reuse is an upstream solution and should be done in a much higher degree.
- Improve reuse as this would help prolonging the lifespan of an equipment. However, the problem is people do not normally want a second-hand item even though it is environment friendlier.
- Prolonging the durability of electronic goods by improving reuse, facilitating repair (e.g. separation of components) can reduce the tsunami of e-waste and render the problem more manageable.

- Reuse will always be a driver because people in less developed countries need the technology. It is important to regulate but allow reuse in countries with low labour costs. This makes reuse feasible and will help grow micro economies in less developed countries.
- Reuse is the main business in the global south countries (non-OECD) for over 15 years. It is also one of the main drivers of U/WEEE shipments. Reuse is also an actual topic in Europe. So setting global standards is a viable option.

3.1 WASTE CODIFICATION

5 participants viewed this as being high priority with the following justifications

- Targeted TFS/WSR related inspections necessitate better information in the customs declarations (including waste codes) and following up on this recommendation is a fairly simple and concrete task.
- Harmonization of codes is intrinsic to assist in investigation and cross-collaboration between agencies/enforcement bodies.
- Common waste codes are necessary for all e-waste transports, including downstream flows from treatment plants. This will facilitate prosecution and enforcement and make the systems more efficient.
- This is the key measure to enable distinguishing between EEE, UEEE and WEEE.
- It is important to speak in the same language within the EU to help prevent illegal exports.

2.3 NATIONAL WEEE NETWORKS

6 respondents selected this as top priority with the following justifications and comments

- Strengthening networks is necessary for information sharing and collaboration.
- Operating within networks helps in finding common and agreed solutions.
- Enhancing WEEE networks would lead to a better exchange of experiences and best practices resulting in more intelligence led inspections, upstream site inspections, capacities building of relevant authorities. The ultimate result will be a simplification of legislation and reaching a common understanding we are the creators of the system which is well misused by criminals.
- Networking and bringing stakeholders together is essential to take common decisions.

Comments

Plenty of knowledge exists but we have to learn how to make use of it. It is recommended to use existing agencies rather than forming new ones.

1.3 NATIONAL WEEE MONITORING

6 respondents recommended this as being of high priority with the following justifications and comments

- A lack of homogeneity among the member states is prevalent with regard to WEEE collection and reporting. Reporting on a national level is required for obtaining better quality data and sound decision-making processes.
- It is important to make sure that all member states have an independent national register in place where “put on market” and WEEE treated volumes by producers and recyclers are recorded.
- Better data management helps decision makers to allocate resources.
- Monitoring system would be the most effective complement to enforcement. Monitoring would allow efficient inspection of upstream waste sites.

Comments

The EC should require that the monitoring systems in all Member States are uniform so that leakages could be more easily traced. The financing of monitoring should take into consideration the “polluter pays” principle.

2.1 IMPROVE TREATMENT

4 respondents noted this as being of high priority with the following justifications and comments,

- The main driver for WEEE collection and recycling is its economic value. WEEE is regarded as a promising secondary source of metals. High tech, green and sustainable technologies for metal recovery from WEEE would provide an incentive for improved collection and treatment efficiencies.
- This is an important measure to negate environmental damage and health risks to people working in the treatment sector.
- It is the key to minimizing risks to health and damage to environment.

Comments

Make CENELEC EN 50625- series legally binding either by the EC (implementing acts) or by legislator permits of take-back systems etc. in member states.

3.3 TRAIN AUTHORITIES

2 respondents indicated this as top priority with the following justification

- There is a big knowledge gap in the law enforcement agencies. Only a handful of specialists are operating in governmental administrations.

C. Please identify the least relevant recommendation cluster from the list of the 16 recommendation clusters
 Please also explain the reason for this (e.g. high cost; low impact; high risk of failure in terms of sustainable results etc.).

The least relevant measures identified by participants are listed below. The rationale behind the selection is listed in the table below. 1.1, 1.4, 4.2, 1.2 and 3.4 have the maximum selections as being low priority.

RECOMMENDATIONS	JUSTIFICATIONS
1.1 EDUCATE CONSUMERS (3 selections)	If the main problem is supposed to be thefts from collections points, educating consumers will not help. Moreover, the economic driver for illegal export is far more important than whether or not the consumer knows what to do.
	This is the last priority step as consumers are mostly aware or feel the need to behave in an environmentally friendly manner.

Consumers are often aware of illegal practices but are not concerned.
Economic incentives will only bring about a change.

1.4 ALL ACTORS REPORT (3 selections)	No justification given by one participant.
	Notes are not legible.
	This measure appears to be a resource intensive and bureaucratic solution. Other recommendations are of higher priority.
4.2 LEA CAPACITY BUILDING (3 selections)	Investing in infrastructures (e.g. more buildings) is not the most essential step. Measures should be more action oriented.
	We should make better use of existing resources.
	Authorities to counter this illegal activity already exist but are not effective. More administrative costs will not solve anything.
1.2 IMPROVE COLLECTION (3 selections)	Illegal shipments do not start from the collection points but before.
	This is a low-impact measure
	The “ban on cash” recommendation is least relevant, because the analysis done is incomplete and some other possibilities and actions carried out in other countries have not been studied.
3.4 HARMONIZE PENALTIES (3 selections)	Highly unlikely to happen. Member States will not consent to this. It will therefore be a high-cost measure.
	Unrealistic as legal traditions vary greatly across European nations.
	Many differences exist between Member States. Harmonizing and enhancing the system would not be an efficient option.
2.1 IMPROVE TREATMENT (2 selections)	Other things have more priority in the EU. Outside the EU improving treatment is an essential step.
	The available technology for treatment is already very good.
2.2 IMPROVE REUSE	The gap between and criminal actions (illegal trade, inappropriate

(2 selections)	treatment) will continue to exist or even become larger.
	This is a long term project.
4.4 ENHANCE PROSECUTION AND SENTENCING (2 selections)	<p>A useful but not very essential step. This is an internal issue for governments</p> <p>Notes are not legible.</p>
3.1 WASTE CODIFICATION (2 selections)	<p>This is relevant but not a priority. Harmonized interpretation is the key. Actors indulging in illegal activity will never code this as an "illegal activity".</p> <p>From the recyclers' point of view, this does not have a significant impact as the processing of various types of WEEE does not necessarily differentiate greatly.</p>
3.2 CONSISTENT GUIDELINES (1 selection)	Consistent guidelines already exist in countries. Harmonization is more necessary.
4.1 INFORMATION MANAGEMENT SYSTEMS (1 selection)	It is difficult to talk to different authorities in the same country and outside. This is a next to impossible mission.
4.3 INTERNATIONAL WEEE NETWORKS (1 selection)	International cooperation between enforcement agencies is already successfully facilitated by INTERPOL (NCB), EUROPOL (Sicna), EUROJUST (J:T). What might be useful is to include more agencies like environmental agencies in these networks.
1.3 NATIONAL WEEE MONITORING (1 selection)	The national monitoring system is based mainly on the collected material in kilograms. One of the weaknesses is the leakage of washing machines in the metal scrap sector. This is a known issue but monitoring in kg instead of a proper using figures may be misleading. The leakages in terms of weight may be high but in terms of environmental impact this may be one of the less important streams.
THEME 1 (2 selections)	Integrity in WEEE collection sites is important but waste shipments must be regulated and controlled which is of higher priority as it is money driven. Focus must be given to TFS and data collection.

	These are purely national issues.
THEME 4 (1 selection)	It seems many projects, activities, approaches already exist in this field but few are aware of them. Hence, there is a greater need to improve coordination to execute what has already been developed.

Comment

One respondent considers all recommendations very relevant but harmonizing penalty systems maybe a difficult recommendation to start with. More awareness among legal entities is necessary before addressing penalty systems.

D. Have we missed one (or more) highly important recommendation cluster (s) from our current list? If yes, can you please indicate them, with a brief justification?

The additional recommendations provided are listed below. The first section outlines recommendations that have are covered in the CWIT recommendation clusters, either directly or indirectly. The second section comprises additional suggestions that have not been addressed in the CWIT deliverables. The last section lists the generic suggestions on the study methodology.

Suggestions covered in the CWIT deliverables

- Ban on cash transactions. It is the best means to reduce theft at borders if adopted in the EU (mentioned by 2 participants). One participant recommends ban on cash payment for metals specifically as it is the first step in black marketing.
- Make it more profitable to discard waste in the country or within EU.
- Working better with environmental friendly treatment outside the EU or in downstream activities.
- Share risk indicators- "what to look for".
- Hold operational meetings for intelligence officers at EU level in order to discuss tactics, current cases etc.
- Taxability of transaction would enable the financing of metal scrap dealers.
- Illegal shipments and other activities also take place from the take-back systems and within established systems and should be taken note of.
- Due to the relatively high profits gained from illegal waste trade, economic incentives for proper waste collection and treatment are crucial. One example is establishing a deposit system for e-waste and batteries.
- Waste prevention (including how to measure).
- Collaboration with receiving countries (mentioned by 2 participants). This is considered an important measure by one participant in order to address the problem of imports from the recipient countries' perspective.
- Consider how to facilitate flows within the supply chains between verified locations, e.g. establishing green lanes between pre-authorized or certified locations or put in place simplified procedures.
- In addition to "securing collection", add the importance of the location of collection points-e.g. shops.
- Ensure clear systems and description of tasks across authorities. Include what information can be disseminated and on what basis.
- Design policies in tandem with economic principles as money talks.
- Discuss the issue of "victimless" crime. Devise ways of finding ways of exposing victims (from pollution or from former owners of discarded WEEE) will facilitate potential prosecutions.
- Improve reuse of metals by producers. This is a difficult step in the circular economy because the reused material has to satisfy the producer and the product has to be competitive in comparison to new materials.

- Consider using CWIT or other organisation to initiate the process of establishing a central repository for storing data, listing best practices, successful prosecutions, etc. that should be accessible to all enforcement authorities in the 28 Member States. The repository should be simple. Establish ownership for post CWIT.
- Waste codifications should make distinctions between UEEE and product.
- Map downstream activities. Make unannounced audits internal control of take-back companies to be able to secure that the map downstream corresponds to the terrain.
- Mention the possibility of imposing a monitoring system considering the “polluter pays” principle as in France and Croatia.
- Stress the issue of capacity building in receiving countries although it is often a political decision.

Suggestions not covered in the CWIT deliverables

- Provide technical support to African countries.
- Planned obsolescence.
- Focus on upstream activities.
- Enforcement process approach and roles of actors.
- Give NGOs right to take legal actions against planned obsolescence etc.

Generic suggestions on study methodology

- Take into consideration just the French case study for topic 1 is not an inclusive approach. So it is recommended to include other case studies in other member countries and highlight good and bad practices.
- Participant sees a lack in prioritization of recommendations and to which entity it is targeted, i.e. who exactly needs to follow up on the recommendations. Further, it is not clear which areas need further investigations.
- It is essential to analyse in detail the model applied for WEEE in each Member State, assess the strengths and weaknesses, negative and positive aspects in each case. This project, with the implications and possible consequences, cannot focus only on a case study. All the possible models and options across Europe as the French case, need to be analyzed and taken into account in this project and its final recommendations.

E. Could you please note below, which of the four CWIT Themes/Topics you see of highest importance (“HIGH”) and of lowest importance (“LOW”)-again, with a brief justification.

Theme 3 and 4 are considered of the highest importance with 17 votes each. Theme 4 is considered of lowest importance with 6 votes.

Themes	High Priority	Low Priority
Theme 1	16	5
Theme 2	11	5
Theme 3	17	4
Theme 4	17	6

Justifications for high priority

Theme 1

- Producers don't reuse as the amount is not high enough.
- Improved collection rates will better control the e-waste streams and all related actors.
- It is one of the best methods to reduce illegal activities.
- Use only reliable operators with high operation standards.
- This is the most important measure to be taken in order to improve quality of data.
- It is an example of a best practice.

Theme 2

- To help identify where to direct investments and resources.
- Reuse means extending the life of EEE.
- Economy is the main driver.
- Recovery of materials from WEEE as a secondary source is the main driver for recycling.
- It is an example of a best practice.

Theme 3

- Needs clearer descriptions to be pictured as black and white and not grey areas.
- Clear and precise legal framework is the foundation for continuous work.
- Legal framework and prosecution/enforcement are essential.
- Important to implement the same regulations (but be careful with Basel Convention).
- Legal framework must be in place before enforcement takes place.
- Legal framework is well placed, but there is still need for improved implementation
- A level playing field is essential in all countries. This is also needed to accomplish the goal of WEEE legislation being implemented in all Member States.

Theme 4

- Legal framework and prosecution/enforcement are essential.
- Important to be managed with efficiency and in a cooperative manner.
- A same level playing field is essential in all countries.

Justifications for low priority

Theme 1

- Collection is not the main problem
- These are only upstream solutions.

Theme 2

- If other themes are well-managed this becomes less important.

Theme 3

- Proper networking would resolve this issue

Theme 4

- Fines would be more effective than prison sentences.
- Criminal actors will always devise new means of violating.
- This is more of a long-term issue.
- If the system only relies on enforcement and prosecution, the same is already lost before it even started.
- Since priority is an issue, the other three clusters are of more importance.
- Preventive measures should include incentives rather than prosecutions.

- Because of different national judicial systems, exchanges of experiences is not efficient in such major incidents.

F. When it comes to the follow-up dissemination, detailed implementation planning and the actual implementation of the CWIT recommendation clusters (after August 2015), do you think your organization could play some role in this process? If yes, can you please provide some practical details (and, the name of your organization, if possible)?

Several participants have extended their willingness to support the CWIT project in a number of ways.

Austria

The Austrian working group on reducing illegal trade with wastes has expressed willingness to support.

Croatia

The environmental administration of Croatia is willing to take part in the implementation of the project recommendations. Croatia has established a national monitoring system for WEEE. However, the request needs to be formally submitted for approval from the management of the Ministry for Environmental and Nature Protection of Republic of Croatia.

France

The French Environmental Office (OCLAESP) has to run this request in the office. A second attendee from this administration expressed willingness to support Cluster 4.

Eco-systèmes, France is ready to organise press relations.

The University of Poitiers, France could help in disseminating the information for educational purposes and create guidelines/recommendations for e-waste collection at the university.

A PhD. Student researching on the WEEE sector has offered general support.

Germany

The regional government of South Hessen (Land Hessen/Regierungspresidium Darmstadt), Germany is interested in CWIT.

The Institute for Structural Policy and Economic Development (ISW), Germany, is part of the WEEE MODELS Project consortium, which carried out a best practice study on WEEE logistic solutions and legal frameworks in 3 regions. ISW is also involved in CWIT findings and recommendations and future WEEE projects.

A German agency in Baden-Württemberg has offered help if required from a German competent authority for transfrontier shipments and take-backs.

SAA Sonderabfallagentur Baden-Württemberg GmbH

Norway

The Norwegian Environmental Agency has expressed interest in contributing without referring to details.

The Norwegian Environmental Agency wants to be informed when the recommendations are more concrete.

Spain

ECOASMEUES, Spain has offered general support.

The Spanish Federation of Recovery and Recycling (FER) has offered help.

Sweden

A contact person from the Swedish police force has offered help depending on the final scope.

Switzerland

The Swiss Federal Office for Environment (FOEN) can provide information on: Information exchange between enforcement agencies, best practices, repatriation cases and guidelines on waste and used products.

The Netherlands

One contact detail has been given without indicating any support for the recommendation clusters.

The Dutch Environment and Transport Inspectorate has expressed interest in contributing to CWIT. Human Environment and Transport Inspectorate, Intelligence and Investigation Division (ILT-IOD).

United Kingdom

The Environmental Agency, England is willing to extend support.

Other

EPA has offered support in disseminating in the US, especially government agencies and stakeholders.

A PhD researcher focussing on metal recovery from WEEE via sustainable biological technologies, has expressed interest in contributing to CWIT in the area of sustainable metal recovery technologies. The institute is looking for partner to collaborate in our metal recovery technology to scale up to a pilot scale.