Designing Closed-loop Supply Chains: Implementation of the WEEE directive in the UK[1]

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The Waste Electrical and Electronic Equipment (WEEE) directive impacts retailers of electronic and electric equipment across the European Union. However, there are differences between solutions developed at country level. As a consideration of the various models of closed-loop supply chain can be valuable, this paper presents the implementation of the WEEE directive in the UK, concentrating on the role of retailers and cooperation with logistics providers in designing cost-effective and sustainable solution for electronic and electric waste. It is an important case, since the British model seems to be effective: According to BERR estimations, in 2007 in the UK, 7kg of WEEE was collected per head of population, against a 4kg target set by the EU.

The WEEE directive (Directive 2002/96/EC) became European law in 2003, and in the UK the directive was implemented in July 2007. It is also linked with the earlier directive (Directive 2002/96/EC) on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS). Detailed solutions vary between EU members and are specific to each member state.

Implementation of the directive in the UK requires that all producers, distributors and retailers need to be somehow involved in reprocessing of electronic and electrical waste. However, over 50 percent of British businesses are not aware of their responsibilities with regard to the WEEE (see www.eversheds.com), while only 36 percent of SME retailers had heard about it (see www.netregs.gov.uk).

EEE Producers

Producers are considered in this context to be all organisations that manufacture, import and re-sell electronic equipment under private label, and therefore some retailers are treated as producers even though they are not directly involved in manufacturing. All companies that place product on the market for the first time are defined as producers. There is a requirement that they will provide their own compliance solutions or will join an approved Producer Compliance Scheme (PCS). PCSs deal with WEEE on behalf of the producers (transport, treatment, reporting), while the producer pays a fee depending on its annual turnover. In both situations, producers must cover the costs of the collection, treatment, recovery and disposal of items. Producers are also responsible for marking all new EEE products using the WEEE label.

EEE Distributors

EEE distributors are defined as the organisations that sell the equipment, and this definition applies to retailers and wholesalers, including those involved in distance and Internet trading. Distributors are responsible for providing

1. This article was created as part of the research completed within the BestLog, Best Practices in Logistics project financed by the European Union. More about the project and good practices in logistics can be found at www.bestlog.org

information to the customers regarding EEE environmental impact, explaining the reasons for recycling, explaining to the end consumers the meaning of the WEEE logo, and showing how to dispose of and recycle used goods. Distributors and retailers should provide a take back-scheme that allows returning WEEE free of charge, which could be a distributor or in-store take-back. In-store take-back is for household goods only, and the customer could return one item of product equivalent to an item newly bought. Return could be performed by customer to the store (small items) or for large products an item could be taken when new one is delivered. In this case, the company could charge the customer for delivery. Items collected in-store could be delivered via a PCS, in which case distributors should cover all transportation costs, but not costs of processing. Alternatively, items could be sent directly for processing. For the large and bulky items, distributors must register their storage facilities.

Alternatively, distributors and retailers could join a distributor take-back scheme that is built upon network of Designated Collection Facilities (DCF). The scheme is run by Valpak Retail Services Ltd. (appointed by the British government) and Valpak has over 1100 civil amenity sites designated as DCFs across the country. The annual fee for joining the distributor take-back scheme depends on annual turnover and type of WEEE.

Collected EEE should be recycled in the authorised treatment facilities that operate under government licenses, or could be exported by approved organisations (even if 'export' is within the EU).

Treatment of collected EEE promotes re-use in the first instance, then items could be recycled or materials/components could be recovered and send for further processing. All processing is done in the Approved Authorised Treatment Facilities.

UK WEEE in Figures

1556 Designated Collection Facilities, the network includes:

1,111	Civic Amenity Sites where WEEE can be disposed
238	Waste Transfer Stations
39	Retail Distribution Centres
67	Non-profit Organisations
101	Commercial Organisations

37	Producer Compliance Schemes registered by environmental agencies in the UK
4,065	Producers registered in the Producer Compliance Schemes
2,680	Distributors participating in the Distributor Take-back Scheme
248	Authorised Treatment Facilities that process WEEE
41	Approved WEEE Exporters
1.5 mn tonnes	Household EEE – reported weight placed on the UK market during 2007
4 kg	Target weight of WEEE collection set by the EU per head of population
7 kg	Estimated WEEE weight collected during 2007 in the UK
3 kg	Weight of collected WEEE per person in the UK over the EU target

Source: Department of Business Enterprise & Regulatory Reform (BERR) WEEE Progress Report, December 2007 (see www.berr.gov.uk)

The EEE waste is separated into ten categories and includes 'household' and 'non-household' waste. There are differences between these two waste streams, not only in term of type of waste but also in the collection process. Thus for each stream a different solution (B2B or B2C) is used.

Wincanton and Comet Partnership

This section focuses on the B2C solution developed and tested by Wincanton in the UK. It could be used as inspiration for designing a reverse logistics system elsewhere, as in several EU countries the WEEE directive is still in the process of being implemented.

The WEEE solution was tested in partnership between Wincanton and British retailer Comet. The pilot allowed the development of a new model for a closed-loop supply chain that supports WEEE implementation. In 2003, a take-back system for fridges and freezers was introduced followed by a trial that included 37 stores. The scheme was expanded to a national service to collect and recycle all large white goods, fridges, and TVs in April 2005 and the scheme was 'Best Partnership Project for Recycling' in the 2005 the National Recycling Awards (the award scheme is exaplained at www.nationalrecyclingawards.com). Wincanton, as a third party logistics operator was able to offer an end-to-end solution, linking both logistics and waste treatment processes.

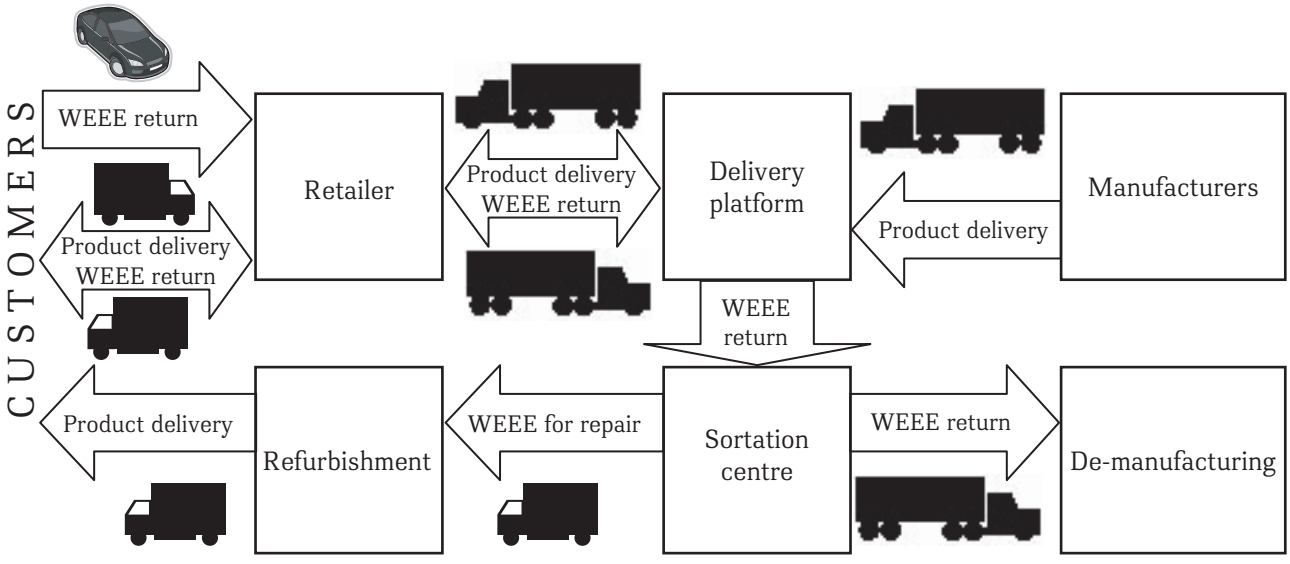
In 2005, a network of 'sortation' centres was established where WEEE items are delivered. Household waste collected from over 250 Comet stores across the UK are transported to three regional centres, where the items are sorted. Cooperation with social enterprises allow re-use of 20 percent of items – they are repaired, refurbished, tested and put back into the market, mainly through charity shops or delivered to some social groups in need, while in the centres, people learn new technical skills.

Items remaining after sorting are delivered to Wincanton's treatment facility registered with the Environment Agency as an Approved Authorised Treatment Facility and located in Billingham, northern England. In Billingham, around 400,000 fridges, 300,000 TVs and 100,000 tonnes of mixed WEEE are processed each year. While Comet remains the largest customer from the retail sector, the service offered by Wincanton has been extended and other retailers have been included,. Wincanton also provides logistics services for other collection networks.

Financial as well as Environmental Gains

The financial results of processing the WEEE items could be positive, especially when metal prices are growing, including the precious metals used for computer components. However, there is

Figure 1 | WEEE Return logistics



always an important cost factor in the WEEE implementation – transport from the customer, or retailer, to the treatment facility via sortation centres.

Wincanton's solution is based on the principle that, wherever possible, empty runs are used to transport EEE waste. Trucks that deliver new products, on their way back, instead of 'transporting air' are carrying electronic equipment for processing. There is also a spare transport capacity from the south of England to the north, where the processing facility is located. In such a situation, additional transport is not necessary - there is no need to create a separate transport network dedicated solely to the WEEE, but it is possible to extend the supply chain by including the 'return' function.

Using the existing logistics network for WEEE, Wincanton is not only able to reduce transport costs, but also there is no need for increased transport intensity, which means lower external costs for the directive implementation: fewer trucks on the road, higher utilisation and less Co2 emission.

In this model, where underutilised transport capacity is used for WEEE transportation, both financial and external costs are lowest. This factor should be taken into consideration when the system for collection, sortation and processing of EEE is created.

There is also a need to include transport and logistics providers at the earliest stage of system design, so that the same trucks that deliver the product also will take back the old EEE, to both sortation centres and treatment facilities. Close cooperation between retailers, logistics providers and organisations that are processing electric and electronic equipment is the best option to build a cost effective, environmentally and socially friendly solution, creating a real closed-loop supply chain that includes both delivery and return logistics, from product manufacturing to recycling.

About Wincanton

Wincanton PLC is one of leading supply chain solutions providers in Europe and offers a range of services to leading companies across various industries.
Wincanton employs over 30,000 people and operates in 15 European countries. Annual company turnover was GBP1.9bn in the year ending 31st March 2007