

A Better World through applications of

Clean Waste from Electricity and Electronic Equipments

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Our environment needs a break, hence it is our responsibility to investigate how we can contribute to that cause.

This book is an attempt to look into how we alter our supply chains and our recycling industry, together with policies and standards to make sure that the impact we leave behind is not one of dirt and misery but one of good deeds and future potential.

For those who still refuse to see the truth regarding our impact on our environment and potential solutions; this book has been printed on an extra large font to make sure that it is accessible and visible to the most elusive eyes.

Since the concept of reverse supply chain has been invented, the eco-impact studies on closed-loop supply chain (including reverse supply chain) are continually developed (i.e. Bloemhof-Ruwaard, et al. (1996), Daniel et al. (1999), Guide and Van Wassenhove (2002), Krikke et al. (2003), Spengler, et al. (1997), and Thierry et al. (1995)). However, there still are a few blanks in the field such as the ones related to the recycling industry.

The specific industry confronts problem: the conflict between huge potential profitability coming from the Waste Electrical and Electronic Equipment (WEEE) business extension internationally (i.e. José Pla-Barber and Francisco Puig, 2008) and strict related WEEE regulations of different nations, such as China, which reject the business development between nations (Wang, W., 2008 and Wang, X., 1996).

Due to the several reasons such as Greenhouse effect and Global Warming (Alexiadis, 2007), the political and legislation requirement (EU, 2000; President's Council on Sustainable Development, 1996), corporation social responsibility (Michael J Maloni and Michael E. Brown 2006) and cost efficiency (Lund 1983; Porter and Van der Linde 1997), to make the businesses sustainable could be one of the most important objectives for corporate enterprises on the Earth (i.e. International Aluminum Institute, 2002 and international Iron and Steel Institute, 2002).

The recycling industry plays some particularly important role (Hai-Yong Kang and Schoenung J. M. 2005) among all the enterprises and in the sustainable processing cycle. Besides, it performs a very important role in the reverse supply chain picture because of its business nature (Hai-Yong Kang and Schoenung J. M. 2005). It's called demanufacturing process.

Organizations including the recycling firms keep searching for new and better ways to gain competitive advances in the highly competitive environment and fast-growing global market. “To firms, competitiveness meant the ability to compete in the world markets with a global strategy” in order to “creating and sustaining superior performance” (Porter M. 1985).

For WEEE, different national recovery systems have been in place for years among most of the European countries, for example in Switzerland, The Netherlands, Belgium, and Sweden (Zoeteman et al. 2009). Meanwhile, according to Directive 2002/96/EC of the European Union (EU), all EU member states have to have an operational End-of-Life recovery system for e-waste as of August 13, 2005 (Zoeteman et al. 2009). Non-EU member states like Norway, The Baltic States, and Switzerland, as well as Asian countries like South Korea, and Japan are adopting similar legislation.

While the recycling corporation implements its competitive strategy, there are always practical problems for such companies to solve. Some example is described as following: The environment legislations have been developed and got stricter and more elaborate than before. Such as in Europe, the EU reregulation enhances producers' responsibility or product stewardship for several branches of industry which makes Original Equipment Manufacturers (OEMs) formally responsible for the set-up of a take back and recovery system for products discarded by the last user (Krikke, et al. 2005).

Also, the EU WEEE regulations present strict rules on export of WEEE to the non-OECD countries (Wang W. 2008 and Kolk A. et al. 2001). Meanwhile, the states such as China also have built strict national regulations on control of trans-boundary movements of WEEE (Wang W. 2008 and Wang X. 1996). Furthermore, economic issue appears, for instance, the high labour cost presents barrier to the companies which are interested in the WEEE recycling business. Especially, there is common knowledge that the processing costs can be decreased dramatically in the low wage countries.

Hence, the idea of cooperation with the reprocessing available companies or building the own facilities in the non-OEDC countries (i.e. China) might be implemented.

1.2 Company Introduction

Better world BV is a recycling company and international orientated business corporation in mainly ferro and non-ferro retaining refuse substances with 70 years history. The company concerns electr(on)ical appliances as one of the important development areas for the

company's business activities. At this moment, it only takes a few percentage of workload within the company.

The main source of electr(on)ical equipments scraps that the company operates is personal computer scraps. Brandon Metaal buys these computer scraps from former tier companies. Further, the company has two main processing systems for WEEE material recycling. Disassembling is the key function for the two systems. One of both is manual dismantling system at facility in Ningbo, China; the other is automatic

processing equipments group at facility in Waalwijk, the Netherlands.

1.3.1 Legislation issues on WEEE trans-boundary movement

Zoeteman et al. (2009) states material recycling in a globalized economy is enforced by many governments and strongly promoted in the EU. Legislation issues concerned by global WEEE streams should be focused.

The Basel Convention of 1989 established worldwide requirements for the movement of hazardous waste and obliged the parties to minimize the generation of such waste and to ensure its environmentally sound management. The European Union transposed the Convention by Council Regulation (EEC) No 259/93 (the Waste Shipment Regulation) and, as from 1998, prohibited the export of hazardous wastes to non-Organization for Economic Co-operation and Development (OECD) countries.

Different regimes apply to shipments of wastes for disposal and for recovery, as well as to hazardous and "green-listed" non-hazardous wastes, and to some special categories in-between.

Shipment of hazardous wastes and of wastes destined for disposal is generally subject to notification procedures with the prior consent of all relevant authorities of dispatch, transit, and destination, while green-listed wastes, as a rule, may be shipped for recovery within the OECD like

normal commercial goods and only have to be accompanied by certain information. Shipment of non-hazardous wastes to non-OECD countries depends essentially on whether the importing country accepts them and which procedures it wants to apply. Regulation No 259/93 was replaced in July 2007 by the new Regulation (EC) No 1013/2006 on shipments of waste, which streamlines the existing control procedures, incorporates recent changes of international law, and strengthens the provisions on enforcement and cooperation between member states in case of illegal shipments (Zoeteman et al. 2009).

Zoeteman et al. (2009) claim the export is as yet of no significance For China. Still figures for the total amount of WEEE imported are difficult to obtain. Importing e-waste is formally prohibited, although enforcement is still weak in China.

1.3.2 EU/NE WEEE export and WEEE Hazardous Components import

It is allowed to export WEEE from EU/NE to non-OECD countries (i.e. China) conditionally in accordance to the EU WEEE directive. There are two main prerequisites which need to be fulfilled if the company wanted to have the export licence of WEEE from EU.

The first one is that the receiving country agrees the application of exporting the WEEE into the mainland of China; the second one is that the transported WEEE has to be contaminated with non-hazardous substances.

Zoeteman et al. (2008) claim “Waste from electrical and electronic appliances, including scrap, is listed in part 1B of annex V of the Regulation on shipments of waste (Regulation EC 1013/2006 of the European Parliament and of the Council on Waste). Therefore export to non-OECD countries, with the aim of recovery, is allowed as far as consent is given by the receiving country.

This holds only for WEEE that is not contaminated with hazardous substances like mercury, lead, or PCB's. The WEEE directive itself states that waste that is exported to countries outside the EU may not be included in the recovery rates unless it is proven that treatment is in accordance with the requirements of the Directive.”

Regulation (EC) No 1013/2006 of 14 June 2006 on shipments of waste was also promulgated subsequently, which establishes procedures and control regimes for the shipment of waste, depending on the origin, destination and route of the shipment, the type of waste shipped and the type of treatment to be applied to the waste at its destination. The regulation (1013/2006/EC) was amended on regulation (1418/2007/EC), which provides control measures for the export of green list waste and came into force on 29 November 2007. Amendment was also made in July 2008 by the regulation EC 740/2008.

Under its annex □ ('GREEN' LISTED WASTE), some wastes was listed which should be subject to the general information requirements laid down in its article 18, including electrical assemblies consisting only of metals or alloys, electronic scrap (e.g. printed circuit boards, electronic components, wire, etc.) and reclaimed electronic components suitable for base and precious metal recovery (European Union. Regulation (EC) No 1013/2006 of the European Parliament and of the Council on Shipments of Waste.)

At the end of 2007 the European Commission introduced a new regulation on exports to non-OECD countries (Regulation EC 1418/2007) which replaced Regulation EC 801/2007. The new regulation contains an update of the procedures that need to be followed for the export of green listed wastes for 44 countries (instead of 21 in the old version). It also contains adapted regulations for exports to China of for example plastics, which reduced the requirements of notification and consent (Zoeteman et al. 2008).