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# The United Kingdom Ministry of Defence and the European Union's electrical and electronic equipment directives



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## ABSTRACT

The growth of the generation of Electrical and Electronic Equipment (EEE), and the use of hazardous substances in the production of these items, has required legislation to minimise the harm to the environment that their existing use, ultimate disposal and continued growth of the sector may pose. The European Union (EU) started to tackle this problem with the passing of two Directives in 2002, which focused on restricting the use of hazardous substances (RoHS - 2002/95/EC) and organising the recycling or disposal of discarded electronic and electrical equipment (WEEE - 2002/96/EC). These Directives have been recently recast and their scope widened; however, one exception to them remains items specifically designed for defence and military purposes. This paper looks at how and why these European Directives were passed, the impact they have had on defence in the United Kingdom (UK) up to the present moment, what impact the further extension of those directives might have on UK defence policy and how the UK Ministry of Defence (MOD) has begun to prepare for any extension, including the use of alternative products from the commercial market, and substituting less harmful materials. The paper reviews the information available to carry out future decision making and what level of decision making it can support. Where the data is insufficient, it makes recommendations on actions to take for improvement.

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## 1. Introduction

The Information Technology revolution has spread right across society, with seventy-two percent of British adults using a PC every day (Office of National Statistics, 2015) and eighty-six percent of UK households having Internet access in 2015 (Office of National Statistics, 2015a). Extend this across the entire developed world and add in businesses and organisations in both the Public and Private Sectors, one can quickly see how much of a problem the generation of waste electrical and electronic equipment, known as e-waste, is becoming, as consumers, businesses and organisations upgrade their systems. Part of the problem is the toxic substances that are used in the production of these items, such as mercury, cadmium and lead. In an effort to tackle this problem, the European Union (EU) passed two Directives in 2002, which focused on restricting the use of hazardous substances (Restriction on Hazardous Substances (RoHS) – 2002/95/EC) and organising the recycling or disposal of discarded electronic and electrical equipment (Waste Electrical and Electronic Equipment (WEEE) – 2002/96/EC). However, there were a number of important exceptions,

one being defence. This paper will look at what the e-waste problem actually consists of, the two European Directives designed to tackle it, how they have impacted on the UK Ministry of Defence (MOD) and UK defence and what impact any extension might have.

## 2. The E-waste problem

The last two decades have seen a revolution in Information Technology. This revolution has provided many benefits to society, with a whole host of commercial, medical, household, transport, scientific, educational, communications and defence applications, alongside the development of the Internet and World Wide Web (Atkinson and Castro, 2008). The development of this technology has been rapid, especially in terms of overall performance and storage capacity with developers such as Intel and Advanced Micro Devices Inc. (AMD) bringing out new products every eighteen months or so. Where the average consumer might have kept a PC for around four years in the mid-1990s, by the early 2000 s, this had dropped to two years (Scanlon, 2004). It is not only PCs that now use this technology but household items such as televisions (for example the latest flat-screen Liquid Crystal Display (LCD) TVs), entertainment systems (such as MP3 players, tablets and game consoles), mobile phones, kitchen appliances and digital

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cameras, as does equipment in the wider economy, from medical scanners to supermarket checkouts. All of this has meant firstly, an increase in the number of products 'brought to market' by leading manufacturers in both the developed and developing worlds, for example, 302 million PCs were sold globally in 2014, compared to 134.7 million in 2000 (Statistic Brain, 2015). This has led secondly, to an increase in the e-waste generated across the globe, as people increasingly either buy to replace (rather than get something repaired) or buy to upgrade (keeping up with the latest developments). Indeed, as availability and affordability of this technology improves, e-waste generation is predicted to increase substantially in the developing world by 2020 (Schlupe et al., 2009).

In addition, reports by the United Nations have continued to highlight the growing problem of e-waste:

- Manufacturing mobile phones and personal computers consumes three percent of the gold and silver mined worldwide each year; thirteen percent of the palladium and fifteen percent of cobalt (Schlupe et al., 2009, p. 7);
- Modern electronics contain up to sixty different elements – many valuable, some hazardous, and some both (Schlupe et al., 2009, p. 6);
- Carbon dioxide emissions from mining and production of copper and precious and rare metals/rare earth elements used in electrical and electronic equipment are estimated at over twenty-three million tonnes (Schlupe et al., 2009, p. 10);
- The global production of e-waste was estimated at 41.8 million tonnes in 2014 (Baldé et al., 2015, p. 8);
- This is expected to increase to around 50 million tonnes by 2018 (Baldé et al., 2015, p. 8);
- Countries like Senegal and Uganda can expect e-waste flows from PCs alone to increase by between four and eight fold by 2020 (Schlupe et al., 2009, p. 49).

These problems are compounded by the fact that much of the e-waste is improperly handled, even in China, where imports have been banned. Agbogbloshie near Accra (Ghana), Guiyu (China), Taizhou (China), Delhi and Bangalore (India) all have e-waste processing areas. The uncontrolled burning, disassembly and disposal of such waste causes a number of environmental and health problems due to the release of a variety of toxic substances (Grossman, 2006).

### 3. The EU's WEEE directive

The European Union's WEEE Directive (2002/96/EC), based on Article 175 of the European Community Treaty, was passed into European Law on 13 February 2003 (European Union, 2003a), but did not enter UK law until 1 July 2007. The overall aim of the legislation is to conserve landfill and to support more sustainable development by encouraging recycling. It requires producers to contribute towards the collection of their products at the end of their life-cycle and includes the costs of appropriate treatment of waste and specific targets for recycling and recovery (European Union, 2011). The Directive originally applied to the following categories of electrical and electronic equipment (BIO et al., 2008):

- Category 1 – Large Household Appliances;
- Category 2 – Small household Appliances;
- Category 3 – IT and Telecommunications Equipment;
- Category 4 – Consumer Equipment;
- Category 5 – Lighting Equipment
- Category 6 – Electrical and Electronic Tools;
- Category 7 – Toys, Leisure and Sports Equipment;
- Category 8 – Medical Devices;

- Category 9 – Monitor and Control Equipment;
- Category 10 – Automatic Dispensers.

After three-years, a review of Member States and stakeholders was conducted, which found that the proportion of e-waste being collected separately had jumped to around eighty-five percent but only thirty-three percent of that was being reported as having been treated according to legislation. In addition to this, approximately thirteen percent was still going to landfill and fifty-four percent was potentially going for sub-standard treatment either inside or outside the EU (European Union, 2008a). The directive has therefore been revised a number of times. Indeed, a look at the legislative history (Powell-Turner et al., 2011) shows that both the European Commission and Council have been willing to propose and pass amendments where there has been enough evidence to provide justification. Such a trend is likely to continue, especially as the directive was modified as recently as July 2012 with Directive 2012/19/EU, which came into force on 13 August 2012 and became effective on 14 February 2014 (European Union, 2012; European Commission, 2015). From 2016, EU members are required to recycle 45% of electronic equipment placed into the market, a figure that rises to 65% in 2019. All this however is linked to the producer responsibility regime, and it is unclear as to whether EU members will be able to count WEEE they consider to have been recycled outside of this regime, towards their targets using substantiated estimates. For example, a study by the charity WRAP indicates that between 400,000 and 550,000 t of WEEE in the UK alone might be recycled in the light iron waste stream and thus remain unreported (Francavilla, 2015). From 15 August 2018, the legislation will apply to (European Union, 2012):

- All EEE, including photovoltaic panels, equipment containing ozone-depleting substances and fluorescent lamps containing mercury (certain types of EEE will continue to be excluded from the scope of this Directive);
- Increase the volume of EEE that Member States are required to collect and use;
- Require retail shops with an EEE sales area of at least 400 m<sup>2</sup> to offer free take-back of very small WEEE;
- Introduce tighter requirements for shipping EEE to non-EU countries.

The ten categories that are in use currently will be replaced with six (European Union, 2012):

1. Temperature exchange equipment;
2. Screens, monitors, and equipment containing screens having a surface greater than 100 cm<sup>2</sup>;
3. Lamps;
4. Large equipment (any external dimension more than 50 cm) including, but not limited to: Household appliances, IT and telecommunication equipment, consumer equipment, luminaires, equipment reproducing sound or images, musical equipment, electrical and electronic tools, toys, leisure and sports equipment, medical devices, monitoring and control instruments, automatic dispensers, equipment for the generation of electric currents;
5. Small equipment (no external dimension more than 50 cm) including, but not limited to: Household appliances, consumer equipment, luminaires, equipment reproducing sound or images, musical equipment, electrical and electronic tools, toys/leisure/sports equipment, medical devices, monitoring and control instruments, automatic dispensers, equipment for the generation of electric currents;
6. Small IT and telecommunication equipment (no external dimension more than 50 cm).

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