



Review

Environmental message framing: Enhancing consumer recycling of mobile phones



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ABSTRACT

Consumer recycling of electronics in the Nordic region is well-developed, however there is scope for further improvement particularly with respect to certain product groups including mobile phones. Enhanced recycling of mobiles brings multiple benefits in reduced environmental impact and the conservation of scarce resources. The study investigates consumer decision-making in this area and how it might be positively influenced by environmental messaging. The do-nothing option in mobile phone recycling is shown to be environmentally negative and the body of do-nothing consumers is a large potential source of environmental improvements. Better understanding of decision-making leads to suggestions on how the re-framing of environmental messages concerning mobile recycling could ultimately give rise to higher rates of recycling.

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1. Introduction

Nordic consumers display relatively advanced behaviour in terms of electronic waste recycling. The clearest objective measure of this is the per capita collection of waste, and this figure as a proportion of waste being consumed (or put on the market) in the Nordic territories. With respect to both metrics, the Nordics are leading in European and probably worldwide terms (Baxter et al., 2014, 2015a). Recent studies (Baldé et al., 2015) have highlighted the high rates of electronic waste generation in the Nordic countries, particularly Norway—and this has been reported in the European press in a highly negative fashion

(for example “Nordmenn kaster mest elektronisk avfall”, 2015; “World’s mountain of electrical waste”, 2015). Arguably, however, the amounts of waste properly recycled through approved schemes should also be taken into account—and a better metric of net e-waste accumulation is the mass per capita that does not enter the appropriate recycling value chain. By this metric, Nordic countries perform relatively well in European and worldwide terms.

Nonetheless there remains substantial untapped recycling potential for consumer electronics in the Nordic region, particularly for certain product groups including mobile phones which provide the principal focus of this study. Whilst further improvements to already well-developed policy and infrastructural frameworks to support recycling are certainly possible, here we focus on consumer-behavioural factors and in particular the psychological and motivational factors that underpin the decision-making process. Hence, the paper suggests ways in which Nordic consumer

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mobile phone recycling might be improved, first by identifying and understanding the underlying influences and causes that inhibit it, and then by offering strategies for environmental messaging aimed at addressing these issues.

2. Literature/theoretical analysis

The following sections explore important elements of consumer decision-making concerning waste electronics recycling with a particular focus on mobile phones. The results of significant calculations from life-cycle assessment of the environmental impact of the waste treatment value chain are also highlighted. The work establishes a direct link between consumer decisions and environmental impact, ultimately exploring how environmental communication might be best shaped to foster more responsible consumer behaviour and lower overall environmental impacts.

The drivers for consumer recycling behaviour have been a major subject of research over recent decades. Work has included profiling of those more and less likely to recycle in terms of demographics and socioeconomics (for example Berger, 1997), examining barriers to and drivers for recycling in terms of facilities and services (for example Martin et al., 2006), and not least considering consumers' attitudes, knowledge and experience concerning recycling (for example Schultz et al., 1995). Psychological and motivational factors are recognised as being very important, and have attracted extensive research in several related areas, as outlined below.

As already mentioned, Nordic consumer perspectives on recycling in general and electronics in particular are relatively sophisticated. Scandinavia is recognised as world-leading in waste electronics collection and recycling with high collection rates and well-established infrastructure for processing and treatment of waste. Elements supporting electronics recycling such as take-back schemes via retailers and/or municipal actors have been in place for perhaps two decades (Tanskanen, 2012) and electronics recycling is strongly advertised and promoted. In some other parts of the world, introducing and developing the basic electronics recycling agenda remains very much the focus of activity to the present day (Tanskanen, 2012).

Historically, consumer recycling behaviour has been seen as being influenced primarily by relatively mundane factors such as consumer awareness and access or opportunity to recycle. However, in line with other Western societies, Nordic consumer recycling in general has become broadly normal behaviour (Thomas and Sharp, 2013). Consumers are broadly aware that recycling is an option and how to do it. This broad assumption seems relatively safe for waste electronics in the Norwegian context. It follows that Nordic consumers are broadly aware of the distinction between – if not the precise environmental consequences of – responsible and irresponsible disposal of waste electronics items. Here, responsible disposal is taken to signify return of the equipment into the official recycling system, whereas irresponsible disposal is assumed to mean disposal in ordinary domestic waste. It however emerges that the recycling decision may be more complicated than this simple binary choice.

The broad concept of consumer awareness in recycling is usefully further broken down by White et al. (2011) who describe levels of construal and mind-sets. Low-level construal, associated with a concrete mind-set, primarily concerns the mechanics of recycling (how to do it) whereas high-level construal, associated with an abstract mind-set, concerns purpose (why it should be done). It seems very clear that the relatively sophisticated average Nordic consumer is firmly in the latter category. Hence, to a significant degree, encouraging enhanced consumer electronics recycling in the Nordics should mean tackling issues of purpose.

2.1. Consumer decisions in electronics and mobile phone recycling

Mobile phones represent a somewhat curious and unusual case for consumer recycling. As mentioned above, many if not most consumer recycling decisions are effectively binary—the consumer elects to recycle the item in question responsibly, or to dispose of it irresponsibly (normally signifying disposal in normal domestic waste). However, for mobile phones there is a very significant third option of do-nothing, meaning retaining the electronic product after use. The obsolete mobile phone stored in a desk drawer or cupboard is consistently recognised as an especially significant issue in mobile phone recycling and consumer behaviour (see, for example, Ongondo and Williams, 2011).

Recycling rates of mobile phones are rather low, and there is a host of both direct and indirect evidence in the literature to this effect. Irresponsible disposal of mobile phones is actually relatively rare—the levels of electronics in domestic waste are quite low (Baxter et al., 2015a). However, responsible recycling is also rare. Scott (2014) reported that the worldwide proportion of new phones ultimately being responsibly and irresponsibly recycled are comparable (each at 3–4% of sales), but are dwarfed by the proportions of phones being retained, or passed on/resold (each in excess of 40%). Polák and Drápalová (2012) also report recycling rates of mobile phones below 10%. Earlier studies (for example Huisman et al., 2008) suggest that most small electronic items (less than 1 kg in mass) are not collected and recycled in significant numbers. In Norway, estimates from the producer responsibility organisation, Elretur AS (private communication) suggest that of the order of 150,000 handsets per annum are collected for recycling, against annual handset sales exceeding 2 million.

In terms of environmental efficiency, responsible recycling is principally in competition with do-nothing and significant environmental improvements could be achieved by improving responsible recycling's "performance" in this competition. The effect of do-nothing is very clearly exposed in a recent Norwegian survey ("Three out of four Norwegians", 2015) which shows that over three-quarters of the population have at least one mobile phone that is not in use, with two phones per head of population on average falling in this category. For larger electronic items in particular, take-back and recycling via official channels is also vulnerable to competition from the legal yet unofficial scrap metal sector—where local recyclers may offer financial or other incentives to acquire waste with a positive material value, principally from bulk metals such as steel. Research indicates that this is relatively rare for Nordic countries but potentially a factor elsewhere in Europe (Huisman et al., 2015) and it is known to represent a particular issue in Finland (Baxter et al., 2015a).

Consumer recycling is almost invariably framed in an environmental context – sustainability and environmental protection are the ostensible reasons for recycling – and as a result, appeals to consumers regarding recycling are often positioned in this context. It should however be noted that, in line with other broadly socially-responsible activity such as sustainable fashion (Valente et al., 2015), consumers are only marginally motivated by environmental factors. For electronics recycling, there are a range of other factors in consumer decision-making.

- Physical factors and convenience are particularly important in distinguishing between large and small items. More precisely, larger items are taken to signify those for which irresponsible disposal is relatively more difficult and/or less attractive to the consumer. These typically include large white goods, TVs, computers or telecommunications equipment. The size of such items may largely preclude their disposal in ordinary household waste. Retention of these products may be inconvenient because of their

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