Chapter 8

Standards for ICT:
A Green Strategy in a Grey Sector

Tineke Egyedi
DIRoS, The Netherlands

Sachiko Muto
Delft University of Technology, The Netherlands

ABSTRACT

This chapter analyzes standardization of mobile phone chargers to explore the role that compatibility standards might play in mitigating the negative impact of ICT on the environment. Building on insights gained from the economics of standards literature, the authors explore how the inherent effects of compatibility standards—such as reducing variety, avoiding lock-in, and building critical mass—can have positive implications for the environment. They argue that current standardization literature and policy have overlooked this important (side) effect of compatibility standards. Excessive diversity and incompatibilities in ICT generate e-waste, discourage re-use, and make recycling economically unviable; the authors, therefore, develop an economic-environmental framework for analyzing sustainability effects of compatibility standards and apply it to the case of mobile phone chargers. They conclude that well-targeted compatibility standardization can be equated to ecodesign at sector level and should be considered as an eco-effective strategy towards greening the IT industry.

INTRODUCTION

Following a much-publicized intervention by the European Commission, the mobile phone industry finally agreed in 2009 – after dragging its feet for two years – to introduce a standardized charger based on the micro-USB plug. In the Commission’s communication surrounding the process, it was explicitly announced that by introducing compatibility there would be a reduction in the generation of e-waste and a significant benefit for the environment. The phone charger case illustrates that compatibility standards can contribute fundamentally towards improving the sustainability of the information and communication technology (ICT) sector.

In the remainder of the chapter we first consider the need to limit the direct impact of the ICT sector on the environment – which is negative and growing rapidly – by reviewing figures on energy consumption, use of scarce resources and e-waste. We briefly introduce the variety of sustainability-
targeted standardization activities already being undertaken by actors worldwide, before looking more closely at the sustainable impact of compatibility standards as such. Based on their effects on the market, we extend our economics of standards framework to include implications for the environment. These effects are illustrated by the mobile phone chargers case. Finally we discuss the potential use of compatibility standardization to achieve sustainability policy goals.

**ICT AS A SOLUTION OR PART OF THE PROBLEM?**

Implicit in many recent policy reports about the contribution of ICT as an enabler for sustainability in other sectors (Climate group, 2008; Capgemini 2009) is the assumption that ICT itself is a clean sector. The negative externalities1 generated by the sector are often disregarded. For example, the influential Climate Group study (2008) notes that fifteen percent of the CO\textsubscript{2} emissions in 2020 can be saved by applying smart ICT in other sectors. However, the direct environmental and rebound effects, that is, the unintended side effects that negate the intended environmental benefits, are ignored or covered up (e.g. Climate Group, 2008, p.50). The parallels between current promises of ICT towards making an environmental contribution and the hopes held in the 1990s entail a warning. The rebound effects of the paperless office (direct, primary environmental effect) and teleworking (indirect, secondary environmental effect) have become classic examples (Egyedi & Peet, 2003; Van Lieshout & Huygen, 2010). While teleworking was hailed as a means to reduce mileage to work, studies show that it increased other transport (e.g. Travel during leisure time); and while ICT was expected to reduce paper use (i.e., ‘de-materialization’), in reality – and primarily because of computers – between 1988 and 1998 it increased by a quarter (O’Meara 2000, p.129). Indeed, in stark contrast with the immaterial notion conveyed by concepts such as ‘virtual’, ‘web’ and ‘the cloud’, the impact of ICTs on the environment is highly concrete. It relates to the energy and materials used in manufacturing products; the packaging and logistics of distribution; the energy and material consumption during use; and disposal at end-of-life. At each of these stages, standards can play a sustainability-enhancing role. Here, we focus on the two key problems of energy use and e-waste.

**Energy Use**

ICT is responsible for a growing proportion of the global energy consumption and greenhouse gas emissions. In a high profile report titled ‘The Internet Begins with Coal’ Mills (1999) already cautioned about the large amount of energy required for Internet use. He calculated that half a kilogram of coal was needed to send a file of 2MB. The energy consumption of the Internet, which was at the time eight percent of the total energy consumption of the United States, was estimated to rise within twenty years to 30 - 50 percent. Although Mills was accused of exaggerating (Koomey et al. 1999), he was justified in highlighting the rapid growth of the Internet and the enormous amount power which ICT requires (OECD, 2009, p.15). A major culprit is the energy necessary to cool the heat released by ICT equipment. In fact half the electricity in server rooms is spent on air conditioning (Clevers & Verweij 2007, p.22). Given the rising number of ICT users worldwide, number of ICT devices per person, capacity of processors, need for data storage and the trend toward always-on (ITU, 2008, p.4), it is to be expected that the current energy consumption of the ICT sector will increase further.

In 2006, the electricity consumption of ICT in the Netherlands amounted to 8.4 terawatt hours per year (Clevers & Verweij, 2007). This is equivalent to a capacity of 960 megawatt per hour. To indi-
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