



## Chapter IX

# Virtual Networking without a Backpack? Resource Consumption of Information Technologies

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## Abstract

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*This chapter concentrates on the environmental impacts of the increasing use of the Internet. It highlights that the Internet and Internet applications are far from being purely virtual, but are clearly linked to the use of natural resources. With the growth of the Internet's infrastructure there is a seemingly inevitable increase in the resource consumption for the production of electronic equipment and its electricity consumption. A number of conclusions can be made regarding the minimisation of environmental risks and maximisation of ebusiness' potential to dematerialise. The presented findings are mainly based on findings derived from research within the Digital Europe project, which was conducted as the first pan-European study of the social and environmental impacts and opportunities of e-commerce and information communication technologies. Supported by the European Commission, the project has been led by the research organisations Fondazione Eni Enrico Mattei in Italy, Forum for the Future in UK and the Wuppertal Institute in Germany.*

## Introduction

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The transition from an industrial society to a service society proceeding in many countries of the world is supported by information and communication technology (ICT) and ICT applications. The industrial society was primarily about large-scale production and distribution of goods. Within the service society, added value is increasingly generated from immaterial production factors such as information and know-how, and a large number of functional areas such as the economy, politics, legislation, culture or health depend to an increasing degree on knowledge. Adoption of this knowledge is supported by ICT. Thus ICT can be accounted as a key technology within the service society.

The diffusion of ICT within societies can be illustrated by the adoption of the Internet. Even if only experts knew the medium “Internet” at the beginning of the 90s, it became mass media in the middle of last decade. About 600 million people have gone online in the last 15 years – this is about 10% of the world population. And there are forecasts that there will be 710 million users of the Internet in the year 2004 (e.g., Cyber Atlas, 2003). On average, 81% of EU enterprises accessed the Internet in 2002, and a majority of them had their own Web site or homepage (European Commission, 2003). Even if the initial euphoria about the new technology is subsiding, every day we hear news about large ICT investments, technology innovation and new areas of ICT applications.

As ICT and ICT applications increasingly spread, so do also the ecological problems of this trend appear to become more relevant. For example, increasing Internet use is linked with increasing electricity use. However, ICT is generally not seen to be associated with significant environmental problems. In fact, the opinion predominates that new communication media are just as virtual as their contents. Sometimes it is even seen as an innovation, which would make possible a sustainable and resource-efficient way of life per se.

This chapter highlights the environmental impacts of the increasing use of the Internet. The following section provides insights into the physical elements of the ICT infrastructure with a specific focus on the Internet, and provides a classification of environmental effects caused by ICT. The subsequent sections discuss the direct and indirect effects as well as the systemic effects on the consumption of natural resources. Finally, conclusions are drawn on how to develop a more resource-efficient information society.

This book contribution is based mainly on findings derived from research within the Digital Europe project. The project was conducted as the first pan-European study of the social and environmental impacts and opportunities of e-commerce and information communication technologies. Supported by the European Commission, the project has been led by the research organisations Fondazione Eni

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