



WHITE PAPER: Calculating business value and environmental benefit of digital software distribution.

INFORMATION AND COMMUNICATIONS TECHNOLOGY AND THE ENVIRONMENT

The Information and Communications Technology (ICT) sector is predicted to have an 8.7% share of the global GDP by 2020¹ and will play an increasingly significant role in the way people live, work, play and learn. Innovations within the ICT sector will lead to increases in efficiency and productivity while enhancing the quality of life, stimulating emerging economies and spurring global economic growth. As global population grows, however, reaching nearly 8 billion by 2020², the quality and availability of natural resources will decline while costs for those resources will significantly rise. The ICT sector and the computing industry in particular have the potential to address large-scale global environmental issues, such as climate change, by applying innovative developments to traditional business strategies. Microsoft Corporation is one such company in the ICT sector supporting the transition to a low-carbon economy through its products and services.

MICROSOFT'S INNOVATIVE PRODUCT DISTRIBUTION STRATEGY

In 2006, e-commerce product sales in the United States increased by 29% to \$146.4 billion. Americans purchased \$17.2 billion worth of computer hardware and software products online in 2006, which represents about 10% of the U.S. market.³ As one step toward meeting the increasing demand for online products, Microsoft announced plans in January 2007, to make its popular Office 2007 product suite available for digital download via its online store, MS Office Online⁴. "Microsoft is committed to making it very easy for customers to purchase and download its software," said Joe Peterson, Corporate Vice President of the Market Expansion Platform Group at Microsoft Corp. Through electronic software distribution, "we can offer our customers on-demand access to our most popular products in a fast and easy way."

Although roughly 80% of 2007 Microsoft Office sales depend on the traditional retail distribution strategy -- a full packaged product (a DVD, plastic and cardboard packaging and related print material) sold through traditional retail stores -- Microsoft is systematically identifying additional benefits of online sales and digital delivery. Following a successful pilot program where customers could download a trial version of Office 2007, Microsoft commissioned a comparative carbon footprint study to quantify the new strategy's carbon emissions savings. Findings from the study demonstrate significant environmental benefits by providing software to customers through digital download. These environmental benefits, coupled with reduced costs and added convenience for both provider and customer are increasingly driving the rapid transition to online sales and digital delivery.

MS OFFICE 2007 DISTRIBUTION CARBON FOOTPRINT STUDY

The Office 2007 comparative carbon footprint study conducted by WSP Environment and Energy found that digital delivery reduced total tonnes of carbon emissions by 88%. Framed another way, digital delivery of Office 2007 is eight times more carbon efficient than producing and shipping a DVD and its associated packaging through traditional retail distribution channels. As depicted in Figure 1, the elimination of transportation and packaging provides the greatest opportunity for carbon emissions reduction. Full package product materials-related emissions were the largest contributor until customer transportation (to and from the retail store) was included in the model. Customer transport was, in this study, included because the objective of the study was to compare two different methods of distribution and assess their full carbon impacts.

¹ The Climate Group. "Smart 2020: Enabling the low carbon economy in the information age." 2008. Available at <http://www.smart2020.org/>

² United Nations. "World Population Prospects: The 2006 Revision Population Database." 2006. Available at: <http://esa.un.org/unpp/>

³ CNNMoney.com. "Online sales spike 19 percent." May 14, 2007. Available at http://money.cnn.com/2007/05/14/news/economy/online_retailing/

⁴ Microsoft Office Online. 2008. Available at <http://us1.trymicrosoftoffice.com/default.aspx>



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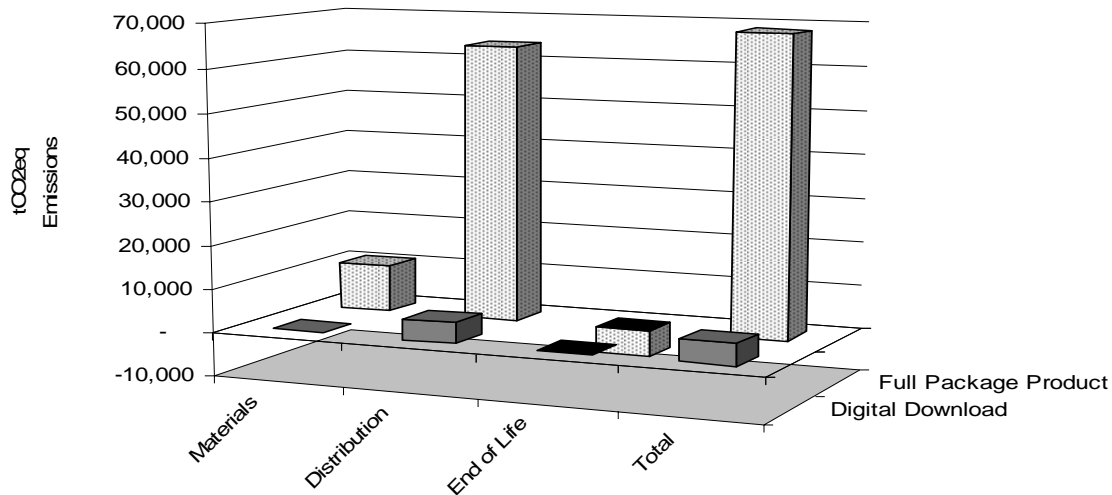


Figure 1: Distribution CO₂eq Emissions based on 10 million purchases

Based upon Microsoft's projected sales of Office 2007 (10 million units) over one year, the study determined that carbon emissions avoided through online purchasing is equivalent to:

- the electric consumption of 7,715 US households, or
- 13,008 passenger cars driven in one year, or
- 231 acres of avoided Amazon rainforest deforestation.

Microsoft worked with its partners, Accenture and WSP Environment & Energy, to apply leading standards for product carbon footprinting in accounting for greenhouse gas emissions arising from the complete lifecycle of its software products and supply chain as well as defining the lifecycle for the traditional retail in-store distribution channel. Based on several distribution scenarios, the study captures carbon emissions associated with the raw materials, production, distribution, customer purchase, and end-of-life processes for 10 million off-the-shelf retail software units. Microsoft then compared these results to the online delivery model for 10 million downloads, accounting for the data centers used for hosting software downloads, transfer of that software through the web and even the energy used by a customer's personal computer to download the Office 2007 program. Avoided carbon emissions associated with downloading one copy of Office 2007 are roughly equal to the emissions arising from one gallon of gasoline.

BUSINESS VALUE OF ONLINE DISTRIBUTION CARBON FOOTPRINT STUDY

By taking a two-fold approach -- utilizing a new software delivery channel and applying a Carbon Model to quantify emissions avoidance -- Microsoft has identified a number of valuable market opportunities. Findings from a study of this nature can be leveraged to support corporate environmental sustainability programs, reduce operational and manufacturing costs, increase opportunities for leadership on environmental and social responsibility issues and establish a unique market niche.



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GREENHOUSE GAS EMISSIONS REDUCTION OPPORTUNITIES

Applied across the industry, the Carbon Model can help technology companies evaluate opportunities to improve energy and carbon efficiency in transportation, logistics, supply chain, materials and distribution. In the 2007 study, for example, transportation was identified as one of the largest contributors to carbon emissions for off-the-shelf products. By making products available online via digital download, companies can choose to eliminate nearly 100% of the carbon emissions associated with transportation because individual customers can procure goods and services without driving to a retail store – one of the single largest carbon emissions contributors to the traditional retail distribution model. Identifying such opportunities throughout the entire product life-cycle can contribute to significant resource efficiencies and cost reductions.

While other studies have attempted to quantify the benefits to distributing products through online channels, this analysis establishes a new accounting standard for digital delivery. For software and other digital media, the carbon savings are significantly greater than for products, such as apparel, because digital media is completely delivered to the customer via digital download rather than simply being ordered online and then shipped.

COST SAVINGS OPPORTUNITIES

While the study did not focus on cost savings associated with digital delivery, it is clear that there are significant associated savings, from both the provider and customer perspective. Traditional product-related expenses, such as packaging, logistics and transportation expenses, and other costs of goods sold such as lost inventory are all but completely eliminated. Time-to-market can be reduced to minutes instead of days, benefiting both the provider and customer. These savings can translate to higher profitability per unit, higher volumes and lower prices.

Additional benefits to consumers and companies include improved back-up and reliability for purchased products, a more efficient means of distributing licensed versions across large organizations, substantial reductions in waste and improved management processes.

INDUSTRY IMPLICATIONS OF ONLINE DISTRIBUTION CARBON FOOTPRINT STUDY

As the industry moves towards greater use of electronic software distribution, not only will environmental and cost-savings benefits become more explicit, but operational processes will become more efficient. With product transactions occurring entirely in digital form, the involvement of intermediaries such as manufacturers, distributors, retailers, and delivery services will become negligible, making the relationship between producer and customer increasingly more direct and therefore even more important.⁵ Findings from the comparative carbon footprint study can be leveraged in communications materials to help build and manage ever-critical customer relationships.

CARBON OFFSETTING OPPORTUNITIES

Although e-commerce is on the rise, the majority of software sales still occur through traditional retail distribution channels. By anticipating increasingly important customer relationships, however, technology companies can both increase consumer awareness of environmental issues and encourage a more rapid transition to online sales and digital delivery. Voluntarily purchasing carbon offsets to mitigate emissions associated with traditional packaging and retail channels can provide a short-term means of internalizing product environmental costs while supporting sustainability programs and increasing company visibility. As demonstrated in the 2007 study, costs for offsetting off-the-shelf retail software units are relatively low. Based on a typical price of \$7.00 per tCO₂e emissions for quality renewable energy credits, the total cost of offsetting 100% of Office 2007's projected sales (10 million units) would be approximately \$500,000 or \$0.05/unit.

⁵ MacInnes, Ian; Kongsmak, Kasama; Heckman, Robert. "Implications of Pure Electronic Commerce for Vertical Integration." 15th Bled Electronic Commerce Conference. June 17-19, 2002. Available at [http://ecom.fov.uni-mb.si/proceedings.nsf/Proceedings/C4B09B1103C191E3C1256E9F00365278/\\$File/macinnes.pdf](http://ecom.fov.uni-mb.si/proceedings.nsf/Proceedings/C4B09B1103C191E3C1256E9F00365278/$File/macinnes.pdf)



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MARKETING OPPORTUNITIES

As outlined above, findings from the comparative carbon footprint study can be leveraged in company marketing materials, internal communications materials and external reports. Key messages can serve to educate customers, build and manage relationships as well as communicate corporate commitment to environmental responsibility, thereby increasing visibility with internal and external stakeholders and solidifying reputation. Well-conceived environmental messaging can also increase the uptake of digital delivery by appealing to a customer's desire to be environmentally responsible.

CONCLUSION

The ICT sector has the potential to address large-scale global environmental issues, such as climate change, by applying innovative developments to traditional business strategies. Through electronic software distribution, technology companies, like Microsoft, are supporting the transition to a low-carbon economy. A comparative carbon footprint study commissioned by Microsoft and conducted by WSP Environment and Energy with support from Accenture found that digital delivery of Microsoft Office 2007 reduced total tonnes of carbon emissions by 88% when compared to producing and shipping a DVD and its associated packaging through traditional retail distribution channels.

Applied across the industry, the Carbon Model can help technology companies evaluate opportunities to improve energy and carbon efficiency throughout the product life-cycle, reduce costs, expand environmental sustainability programs, reduce time to market and increase company visibility. Most importantly, Microsoft's distribution carbon footprint study confirms that through innovation, technology companies can expand into new markets and new business models, thereby increasing market share and leadership opportunities.

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