



GeSI
GLOBAL e-SUSTAINABILITY
INITIATIVE

The Contribution the ICT Industry Can Make to Sustainable Development

A Materiality Assessment by the
Global eSustainability Initiative

April 2008

Prepared by:



Business for Social Responsibility

Dear Colleagues,

In response to rapid advances in communications technology and the rise of new and complex international marketplaces, GeSI organized a series of stakeholder workshops to discuss Technology Convergence and Sustainability in the Fall of 2005. Subsequent to this effort, in 2007, GeSI commissioned Business for Social Responsibility (BSR) to identify the materiality of key sustainability issues and prioritize the relative risks and opportunities. The results of BSR's investigation are captured in this report titled, "The Contribution the ICT Industry Can Make to Sustainable Development."

This report determines the sustainability issues that are of highest consequence to the ICT industry and creates a guide that allows GeSI to design our future strategy to address the issues of greatest significance to the ICT sector. This information will also inform decision making and strategy development in GeSI member companies and highlight opportunities for multi-stakeholder collaboration. Additionally, these findings can enhance investment analysts' understanding of the ICT sector and support their engagement with ICT companies.

I wish to express my gratitude and appreciation to the many members without whose efforts this assessment of ICT stakeholder materiality would not have been possible. The members of the GeSI materiality working group, under the expert leadership of Sirima Satama of Cisco Systems, came together with the ICT stakeholders to collaborate with BSR to provide this comprehensive and detailed analysis of sustainability.

Luis Neves

Chairman of the Board

Global eSustainability Initiative

This report was commissioned by the Global eSustainability Initiative (GeSI) and prepared by Business for Social Responsibility (BSR). The report is intended to inform GeSI and the wider community of companies and stakeholders on the contribution that the Information and Communications Technology (ICT) industry can make to sustainable development. Specifically, this report is intended to identify the issues that might be considered of greatest material significance to the ICT sector.

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1. INTRODUCTION

BSR was asked by the Global eSustainability Initiative (GeSI) to define issues that are potentially material to the Information and Communications Technology (ICT) industry with the goal of understanding what contribution the ICT industry can make to sustainable development. Four key target audiences were kept in mind:

- **Companies:** to inform decision making, strategy development and sustainability report creation.
- **Investment analysts:** to inform mainstream and socially responsible investment communities and support their engagements with ICT companies.
- **Civil Society:** to inform and consult other stakeholders including Non-Governmental Organizations (NGOs), academia and industry associations.
- **The Global eSustainability Initiative (GeSI):** to inform the development of GeSI's future strategy and work plan such that it focuses on issues most material for the ICT sector.

What It Is	What It Is Not	What Is Next
<ul style="list-style-type: none"> • A process for GeSI to help shape its strategy based on an identification of the most material issues for the ICT industry • A signpost to issues upon which stakeholders can be engaged with in more depth • A resource for businesses running their own, company-specific materiality processes 	<ul style="list-style-type: none"> • A detailed study of each sustainability issue and its potential impact on business and society • An in-depth list of what companies can or should do on each issue 	<ul style="list-style-type: none"> • For GeSI: Integrate this analysis in future strategy • For stakeholders: further participation with GeSI on issues that are most relevant to them • For Companies: implementation of their own materiality processes

2. METHODOLOGY

In preparation for this report BSR undertook a materiality analysis for the ICT industry, categorized by Service Providers, Equipment Manufacturers, Consumer Electronics and Internet and Software.

In line with an agreed definition of materiality (described below), BSR used a range of criteria to rank issues according to their “influence on the success of ICT businesses” and “influence on stakeholder decision making.”

Influence on Success of ICT Businesses:

- Strategic priority for the business
- Significance to successful delivery of products and services
- Risk to the business
- Coverage in investment analysts' reports
- Company issues management

Influence on Stakeholder Decision Making:

- Significance to achievement of Millennium Development Goals
- Inclusion in Universal Declaration of Human Rights
- Significance to achievement of environmental sustainability
- Issue raised during stakeholder interviews
- Inclusion in Socially Responsible Investment (SRI) surveys
- Media profile
- Inclusion in Global Reporting Initiative (GRI) reporting guidelines
- Inclusion in more than 50% of ICT sustainability reports surveyed
- Public policy profile

Interpreting the Analysis: The BSR analysis established a list of issues that are potentially material to companies in the Service Provider, Equipment Manufacturer, Consumer Electronics and Internet and Software sectors. However, it is important to note that:

- The business strategies of individual companies within any one sector will be different (for example, the extent to which they are invested in emerging economies). This means that the significance of any one issue will vary between individual companies within a sector; this level of granularity is not captured in the BSR analysis.
- It is unlikely that any single company will be totally located within any one sector. For example, a “Consumer Electronics Company” may also provide IT and software services. The categorization used by BSR is intended to help with the process of issue prioritization and recognize the significant differences that do exist across the ICT industry as a whole. The categorization is not intended to suggest that every ICT company can be forced into a false box and for this

reason a single company will most likely need to look across more than one sector to identify its material issues.

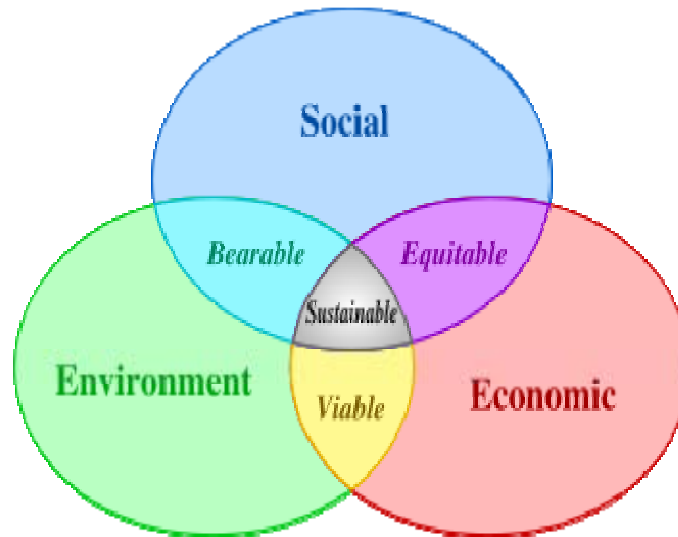
- All of the listed issues are important; it is their relative significance that is being judged.

Considerations in the Analysis: In the process of identifying and prioritizing the issues the following considerations were taken into account:

- **Global Consultation:** Stakeholders and companies from across the world were consulted to ensure that the identification of issues reflected global trends and priorities. These consultations took the form of telephone interviews and three multi-stakeholder engagements (in San Francisco, Hong Kong and Paris)
- **Global Research:** Desk-based research took into account developed economies (such as Europe and North America), emerging markets (such as China, India, Russia and Latin America) and developing economies (such as Africa and South Asia)
- **Definition of Materiality:** The following definition of materiality was used: “companies in the ICT sector should prioritize issues that substantively influence the assessments and decisions of stakeholders and that have significant influence over the success of ICT businesses”
- **Definition of the Industry:** Despite convergence, the ICT industry remains characterized by diversity. To help the analysis — and understand which sustainability issues are likely to be more relevant to some companies rather than others — this report has been divided into the following sub-sectors:
 - Consumer Electronics: companies that design, manufacture and/or market consumer electronics including personal computers, handheld devices, electronic games equipment, stereos, televisions and cameras.
 - Equipment Manufacturing: companies that manufacture telecommunications equipment (both network and consumer products) for wireless communications and line-based communications.
 - Service providers: companies that provide wireless and fixed line communication services.
 - Internet and software: companies that provide Internet and software services.

Note that it is unlikely that any single company will be located in any one part of the sector. For example, a “Service Provider” may also be an Internet Service Provider or Content Provider, while a “Consumer Electronics Company” may also provide IT and software services. The categorization is intended to help with the process of issue identification and prioritization, but is not intended to suggest that every ICT company can be forced into a false box.

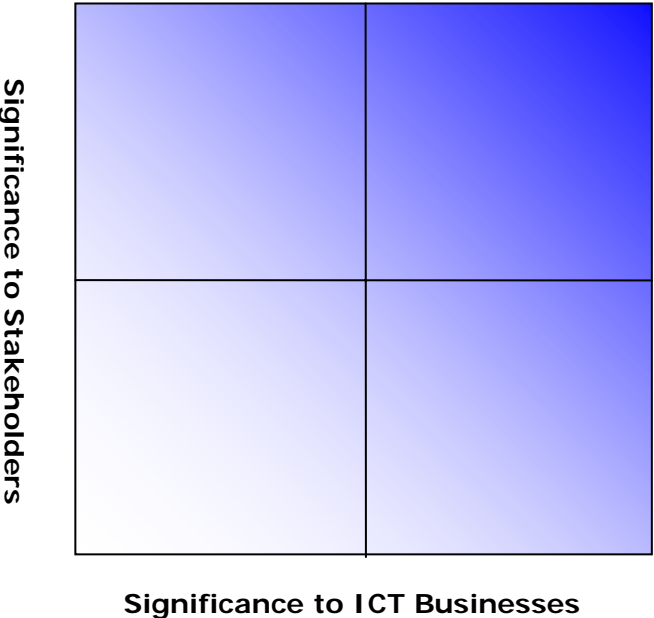
- **Definition of Sustainable Development:** “The interdependent and mutually reinforcing pillars of sustainable development are economic development, social development, and environmental protection.”¹



- **Informed by business strategies and future trends in the ICT industry:** In the process of identifying the material issues, 12 companies were consulted on their business strategies and their views on where the ICT industry can make the most substantial contribution to sustainable development.
- **Informed by analysis and research:** The identification of issues was informed by:
 - 30 Company sustainability reports
 - [20] Stakeholder interviews
 - 15 Company interviews
 - Company investor presentations
 - Desk-based research of business trends
 - Desk-based research of sustainability trends
- **Focused on those areas where the ICT sector can make the most substantial contribution to sustainable development:** While the ICT industry has many opportunities to contribute to sustainable development, this paper focuses on those issues where the ICT industry can make the most substantial contribution. Specifically, this report focuses on ten categories of

¹ United Nations, World Summit Outcome Document, 2005

issues, while a full list of all individual issues and their potential significance to both stakeholders and the ICT industry is found in the annex.



3. ICT INDUSTRY OVERVIEW AND TRENDS

The following trends will have a significant impact on the contribution that the ICT sector can make to sustainable development.

Ubiquitous Computing Drives Convergence

- **Pervasive Computing:** The miniaturization and embedding of micro-electronics into non-ICT objects and wireless networking will make computers ubiquitous. The computer as a dedicated device is gradually disappearing, with its information processing capabilities being made available in other devices such as the mobile phone and other handheld devices.
- **A Networked World:** Wireless communications are allowing us to be connected everywhere, all the time. Further development of mobile phone networks and wireless local area networks (WLAN) will play an important role in this development. Innovation in mobile technology allows objects to be linked in real time and communicate with each other.
- **Convergence in Consumer Products:** Devices will converge further, for example the emergence of integrated TV, PC and mobile phone into one single device. Increasingly we see examples of converged services and products such as Internet services delivered to TV sets via web TV, email and Internet access via digital TV decoders and mobile phones and web casting of radio and TV programs on the Internet.
- **From PC to Mobile:** Access to content is gradually moving away from solely the PC to mobile handsets. In China, Japan and South Korea the majority of Internet access is via mobile phone. In total over 750 million people access Internet content via a mobile phone today.² In the developing world and in parts of the emerging economies where rural access and penetration is still relatively low, consumer electronic products, mainly mobile phones, will have more basic functions and will not be fully converged.
- **Convergence in Service Delivery:** Triple Play — the bundling of fixed and mobile telephony, Internet access and content and TV — requires an IP-based Next Generation Network. As more consumer electronics devices and other objects that we use in our daily lives, such as lighting, heating and cooling equipment, become Internet enabled a next generation of Internet or IP will emerge. The next-generation IP (IPng or IPv6, which will make billions more IP addresses available) was developed to deal with the explosion of Internet use as a consequence of convergence in products and services.
- **More Innovation:** In general, convergence to IP and broadband has decentralizing effects, allowing for more innovation. Whereas traditional telecommunications innovations were more centralized due to the nature of

² Tomi T. Ahonen and Alan Moore, Communities Dominate Brands, Business and Marketing Challenges for the 21st Century, January 8th 2007, http://communities-dominate.blogs.com/brands/2007/01/putting_27_bill.html

the networks and relevant technologies, a converged medium that transmits generic content stimulates innovation at the ends and places it in the hands of the users. As a result, more highly customized devices, services and applications become possible.

- **Consumer-Driven Evolution of the Web:** The Internet has become a social computing phenomenon and platform that no longer serves as an isolated information silo where users download information. The web, also referred to as web 2.0, is an interactive platform where users can generate and share their own content. This trend is characterized by decentralization of authority and the emergence of open-source software that allows users to create software content with little intellectual property rights restrictions.
- **Emerging Markets:** Mobile penetration in emerging markets is reaching saturation levels in major cities. Most rural areas do not yet have access to ICTs, but this is changing rapidly as international and local service providers are expanding access to rural areas. High-tech manufacturing in emerging markets will continue. Where manufacturing in China is slowly moving up the value chain, India is starting its high-tech manufacturing at the top of the value chain, in niche areas where highly skilled labor is required, then slowly moving down. Fab City in India, a semiconductor manufacturing hub in Hyderabad, is illustrative of this trend.³
- **Developing Markets:** Developing markets are experiencing rapid growth in access to ICTs. As ICT penetration reaches a saturation level in the developed world, developing markets offer a great potential for companies to capitalize on the millions of potential users of ICTs. The mobile phone is more successful in bridging the digital divide than the personal computer, mainly because of the more reasonable price point for mobile phones. Developing markets will be wireless-centric, not PC-centric.⁴ ICT growth in developing nations is still challenged by the public policy environment for ICTs and the price of handsets, despite recent efforts to create a more open investment climate for international operators and initiatives to develop cheaper devices, such as the \$100 laptop. Other obstacles are related to developing the right ICT skills and building an infrastructure for modern ICTs in these nations.

Consequences for the ICT Sector

Convergence is leading to increased competition within the ICT sector, as companies are all looking to deliver an end-to-end converged product or service to their customers.

Service Providers: While Service Providers traditionally offered only fixed-line or mobile telephony, services now also include Internet, entertainment content, IT and other services. Convergence in networks also occurs as the services that were previously offered through multiple networks are moving to one single IP-

³ Physorg.com, India Eyes Hi-Tech Manufacturing, February 23rd, 2006, <http://www.physorg.com/news11145.html>

⁴ Less is More, the Economist, July 7th, 2005, C.K. Prahalad, (The Fortune at the Bottom of the Pyramid)

based network. Evolving business models require continuous restructuring in a sector that is known for rapid innovation and change. Service Providers are also experiencing significant growth providing IT services to business customers.

Consumer Electronics: The mobile phone and other devices (such as MP3 players and game machines) are the main convergence devices. These devices need to be human centric versus device centric, with a high degree of customization and ability to interact through voice, networking and content sharing on the web. In emerging and developing markets, where mobile penetration rates and purchasing power are still relatively low, new handsets are designed that are cheaper and customized to these markets.

Equipment Manufacturers: Convergence reduces the number of physical devices required for transmission and reception of communications and media, whereby a broadband-connected computer could serve as a user's television, telephone and portal to the World Wide Web.

Internet and Software: The web is the new hub for social interaction and content generation. New social and collaboration software as well as new social networking websites will emerge and will continue to drive innovation. Internet companies will have more responsibilities and accountability over their users' actions.

4. ISSUE CATEGORIES

While the ICT industry has many opportunities to contribute to sustainable development, this report focuses on those issues where the ICT industry can make the most substantial contribution.

Specifically, this report focuses on ten **categories**, each containing **individual issues** that gained greatest significance during the research and engagement process. For each of these categories the report briefly describes why the issues are important to the ICT sector and the potential for the ICT sector to provide solutions or mitigate risks. A full list of all individual issues and their potential significance to both stakeholders and the ICT industry is found in the annex.

These issue categories were discussed at stakeholder engagements held in San Francisco, Hong Kong and Paris, during which a number of questions were raised:

- Some “individual issues” are relevant to more than one “category.” For example, worker health and safety is relevant to the categories of Waste and Materials Use (e.g. exposure to dangerous chemicals), Employee Relationships and Supply Chain.

For this reason it became clear that there is no single ideal way to categorize issues. However, it also became clear that having a small number of top-level categories was more desirable than simply providing a long list of individual issues. For this reason we have cross-referenced individual issues between categories.

- The nature of the ICT industry is such that one company’s supply chain is another company’s internal operations. This paper contains “supply chain” as its own category since many ICT companies implement sustainability strategies via supply chain processes. However, many stakeholders expressed a desire for the ICT Industry to develop an integrated approach to employee and worker relations throughout the value chain of ICT companies.
- It was also noted that there are some “themes” that are relevant to a number of categories, which we highlight here:
 - **Consumer Education:** The importance of Consumer Education came through across a diverse range of issues, such as product energy use, product disposal, privacy and security.
 - **Public Policy:** Similarly, the approaches that companies take to Public Policy were deemed to be important across all of the issues contained in this report, notably on climate change, privacy and security, freedom of expression, and waste and materials use.

- **Social Life-Cycle Analysis:** It was noted during one discussion that while business is increasingly undertaking environmental life-cycle analyses for products, there is an opportunity to undertake a similar exercise for social issues. This could cover aspects as diverse as worker health during production and disposal through to consumer privacy and education during product use.

ISSUE ONE: CLIMATE CHANGE

Why is Climate Change Important to the ICT Sector?

Climate change is fundamentally altering the planet: the earth has warmed by 0.7 degrees C since around 1900 and will warm more in coming decades due to past emissions. Climate change will likely have a devastating impact on ecosystems and economies, especially in the poorest parts of the world.⁵

Climate change presents the ICT sector with risks and opportunities:

- Impact of more extreme weather events (such as extreme heat, more powerful storms and increased flooding) on the reliability of telecommunications networks
- Increasing cost and scarcity of energy to power ICT equipment
- Increasing the energy efficiency of telecommunications networks
- Manufacturing more energy-efficient ICT products
- “Dematerialization” and the provision of ICT services that have the potential to reduce the climate change impact of customers (such as conferencing and e-commerce, and replacing “products” with “services” such as lease options for laptops)
- Increasing efficiencies regarding data and energy passing over networks through digitization

What is the potential of the ICT Sector to Provide Solutions to Climate Change?

There are four main ways in which the ICT industry can contribute to climate change solutions.

Increase Network Energy Efficiency

- **Telecommunications network energy efficiencies:** The energy demands of running a telecommunications network are significant — they typically account for over 70-90% of a telecommunications company’s total energy use.⁶ Moreover, total energy use is likely to increase in future years as take-up of broadband increases and mobile networks grow.

To address this issue Telecommunications Service Providers can work with Equipment Manufacturers to increase the energy efficiency of network equipment and with each other to share mobile base stations.

- **High-tech data center efficiencies:** The energy consumed by data center servers and related infrastructure equipment has doubled worldwide between

⁵ HM Treasury, Stern Review: the Economics of Climate Change, 2006, pp.2

⁶ From various sustainability reports

2000 and 2005.⁷ A consortium of IT companies and professionals seeking to lower the overall consumption of power in data centers recently launched the Green Grid to promote energy efficiency through methods such as fresh air cooling and more energy-efficient equipment.

- **Renewable energy:** Given the growing energy use of ICT networks, ICT companies can reduce their climate change impacts by purchasing green energy from the grid.⁸ Renewable energy also provides a business opportunity for smaller and medium-sized enterprises in developing countries. In Ghana, for example, renewable energy powered telecommunications services are offered to people in rural areas, creating both a positive impact on climate change and providing a solution to the digital divide.⁹

Increasing Real Estate Energy Efficiency

ICT companies, especially telecommunications companies, often own substantial amounts of real estate such as offices and retail outlets. For this reason opportunities exist for ICT companies to increase the energy efficiency of their real estate.

Design ICT Products That Reduce Climate Change Impact

- **More energy-efficient products:** Pervasive computing is having a substantial impact on end user energy use. Equipment manufacturers and consumer electronics companies can design products that are more energy efficient or which reduce their impacts on climate change by equipping them with renewable sources of energy. Handset manufacturers are increasing the charging efficiency of phones, while Japanese mobile phone maker DoCoMo and Chinese electronics maker HTW provide solar-powered mobile phones.
- **Products with climate change applications:** ICT companies have an opportunity to design ICT products with specific application to climate change. Microelectronics, for example, can be used to detect severe weather patterns and monitor water levels at an early stage to prevent flooding.

Introduce ICT Services That Reduce Climate Change Impact

- **Flexi-working and conferencing:** The ICT sector can stimulate flexible working through broadband access and wireless communications. If 10% of the EU 25 workforce were to become flexi-workers, this could save 22.17

⁷ InformationWeek, Data Center Energy Consumption Has Doubled Since 2000, February 2007, <http://www.informationweek.com/news/showArticle.jhtml?articleID=197006210>

⁸ Forum for the Future, Earth Calling, The environmental impacts of the mobile telecommunications industry, November 2006, pp.17

⁹ Telecom Management Partner (TMP) and United Nations Foundation (UNF) initiated the eCARE project in December 2003. UN Environment Programme (UNEP) and a local NGO, Kumasi Institute of Technology and Environment (KITE), were brought on board as implementing partners in eCARE by UNF. Ghana Telecom adopted the initiative into the company's Corporate Social Responsibility portfolio, *GT Cares*, in February 2005

million tonnes of CO₂ a year.¹⁰ Web-based video and teleconferencing capabilities can help to reduce the greenhouse gas emissions by replacing business travel and daily commutes with Voice over IP (VoIP) services. If 20% of business travel in the EU 25 was replaced by video conferencing, this would save 22.3 million tonnes of CO₂.¹¹

- **E-Commerce:** The Internet and Software sector, as well as the Service Providers, can contribute to the reduction of greenhouse gases by increasing online transactions and reducing the number of retail stores. It has been estimated that 209 million tonnes of CO₂ could be saved through Business-to-Consumer e-commerce.¹²

¹⁰ The association of European Telecoms Network Operators and the World Wildlife Fund, Saving the climate @ the speed of light: ICT for CO₂ reductions, May 2005

¹¹ Ibid

¹² Ibid

ISSUE TWO: WASTE AND MATERIALS USE

Why is Waste and Materials Use Important to the ICT Sector?

Electronic waste (e-waste) is the most rapidly growing segment of the municipal waste stream. For example, in the EU the volume of e-waste is expected to increase by 3 to 5 percent a year. Developing countries are expected to triple their output of e-waste by 2010.¹³ E-waste from electronic products such as broken or obsolete computer monitors, central processing units (CPUs) and cell phones contain toxic materials that present health hazards and environmental damage through land contamination and water and air pollution.

The materials used in ICT products can also have significant implications for worker health and safety, such as exposure to hazardous substances and chemicals during the production and disposal phases (see the Employee Relationships Category for more).

The ICT sector has a significant role to play in reducing e-waste and hazardous materials use in the design, manufacturing and end-of-use management of products and equipment.

What is the Potential of the ICT Sector to Provide Solutions to E-Waste and Materials Use?

There are three main ways in which the ICT sector can address the related issues of waste and materials use.

Design for the Environment

- **Reducing Obsolescence:** Many mobile phone and entertainment electronics are designed and built with moving components (such as motors and gears) that only last until technical or stylistic innovations make them obsolete. In the U.S. 130 million mobile phones are thrown out every year.¹⁴ There is an opportunity — especially for Consumer Electronics companies and Equipment Manufacturers — to find solutions by: (1) working with other vendors to share product design information that can prolong the life of a device; (2) increasing battery life and energy sources for battery charges; and (3) upgrading components to ensure longer use of electronic equipment. An example that was raised a number of times during the process was the need for “universal chargers” for consumer electronics products such as cell phones and laptops.
- **Reducing Hazardous Materials Use:** Regulations in the EU (RoHS and REACH) and increasingly in Asia (China RoHS), in combination with our

¹³ Press Release, “Basel Conference Addresses Electronic Wastes Challenge.” November 27, 2006, United Nations Environment Programme (UNEP). Available at: <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=485&ArticleID=5431&I=en>

¹⁴ Forum for the Future, Earth Calling...the Environmental Impacts of the mobile telecommunications industry, November 2006, pp.10

increased knowledge of hazardous substances, are driving ICT companies to evaluate their materials use. The ICT sector can reduce hazardous materials in a number of ways, such as using alternative products that contain less hazardous materials, (e.g. LCD panels and plasma screens for televisions) and reducing Chlorofluorocarbons (CFCs), Halons and other Ozone Depleting Substances that are often used as coolants for telecommunications equipment.

- **Packaging:** The global packaging industry is estimated at \$417 billion and employs more than 5 million people all over the world.¹⁵ Chemicals and materials used to make packaging are mostly hazardous to human health and the environment, and the creation of packaging can use significant amounts of energy. The ICT sector can make a contribution by minimizing or eliminating packaging (for example through the online delivery of products) and by reducing the amount of packaging sent to landfill.
- **Using Recycled Materials:** The ICT sector can reduce eWaste by increasing the percentage of recycled materials that are used in its products.

End-of Life of Management of ICT Products and Equipment

- **End-of-Life Management:** The increasing amount of toxic waste as a consequence of obsolete and unwanted electronic devices and network components being thrown away rather than re-used or recycled is an environmental risk. The ICT sector can ensure that equipment and other electronic products are managed such that their components are re-used and waste is managed appropriately. Producer responsibility and product take-back regulation also creates an incentive for producers to pay attention to the design phase of their product/packaging's life cycle.
- **End-of-Life Product Management in the Developing World:** While major PC vendors have recycling programs in place for used IT equipment, such products risk being sold on to brokers for disposal in countries less able to manage the waste. Some of the equipment is repaired or refurbished for use in those countries, becoming important components in bridging the "digital divide," but a lot of equipment — up to 75 percent, according to some estimates — is beyond repair. ICT equipment manufacturers, service providers and consumer electronics manufacturers can find new ways to deal with electronic waste in developing countries, either through public-private partnership in these countries, or through industry collaboration.

Water Use

- **Reducing Water Use:** The significance of water use varies across the ICT industry. Some companies are not heavy users of water (such as telecommunications companies, which mainly use water in day-to-day office use and to wash vehicles), while other companies are intensive users of water

¹⁵ PRIMEDIA Business Magazine & Media, Inc. Global Packaging Market, February 1, 2003. Online. Paper, Film & Foil Converters. July 22, 2005 http://pffc-online.com/mag/paper_global_packaging_market/

(such as semiconductor companies, which use significant amounts of water during the manufacturing process). Key aspects include water management strategies, reducing water use and wastewater discharge.¹⁶

¹⁶ Pacific Institute, Corporate Reporting on Water: A Review of Eleven Global Industries; May 2007

ISSUE THREE: ACCESS TO ICT

Why is Access to ICT Important to the ICT Sector?

Spreading access to ICT products and services is of critical importance to the ICT sector and for the contribution it can make to sustainable development. Growing the number of customers (whether in developing, emerging or developed markets) is an increasingly important source of top-line growth for many ICT companies and opens up the opportunity to enable other social and environmental benefits.

What are the Main Ways in Which the ICT Sector can Improve Access to ICT?

It is helpful to distinguish increasing access to ICTs along three dimensions: (1) developing and emerging markets; (2) developed markets; (3) age, ability and language. It is also interesting to note how access to ICTs in emerging and developing markets has become an issue of much greater business and strategic significance to Service Providers and Equipment Manufacturers than to Consumer Electronics companies.

Developing and Emerging Markets

Approximately two in every three people in the US have access to a computer, while in sub-Saharan Africa fewer than two in every 100 do.¹⁷ However, while PC use is growing, it is the lower price point of mobile technology and its potential for socially beneficial application (such as access to market price information or weather forecasts) that is the source of most potential in the ICT industry.

For example, in 2006 rural customers accounted for more than half of China Mobile's 53 million new subscribers¹⁸ and a number of companies have had success marketing mobile handsets in the \$20-\$40 range. An increasingly large number of reports suggest that this growth is in part driven by real social benefits such as mobile banking or convening village meetings.¹⁹ Financial transactions can also be used as a tool to swap airtime for goods and service and make transactions using phones.

Competition for customers in China and India is helping to boost the production of low-cost PCs. In 2005 the One Laptop Per Child (OLPD), at a \$100 each, was initiated by the Massachusetts Institute for Technology (MIT). Intel has also designed an inexpensive laptop and last year Microsoft launched an effort in China to reduce cost barriers to personal computers in emerging markets by allowing suppliers to cut the initial price of PCs and letting consumers pay for them over time with prepaid cards.²⁰ In August of 2007 Lenovo announced that it

¹⁷ "The digital sector can make poor nations prosper," Financial Times, Michael Dell, May 3, 2006

¹⁸ Fortune Magazine, "China's Mobile Maestro," July 2007

¹⁹ Vodafone 2006 Corporate Responsibility Report and Fortune Magazine, "China's Mobile Maestro," July 2007

²⁰ Microsoft to Expand R&D in China, Wall Street Journal, May 22, 2006

will also sell a basic personal computer aimed at China's rural market and priced at \$199.²¹

- 80% of the world's population lives within range of a mobile network — only 25% have a mobile phone (the Economist – July 7, 2005)
- 6 million new mobile subscribers are added in India every month (CSK - Nokia - 02.01.2007)
- Of the 162 million Internet users in China, 122 million have broadband (Fortune Magazine, September 8, 2007)
- There were 2 million people using mobile phones in Africa in 1998, and in early 2006 there were 120 million (International Herald Tribune, 02.24.2006)
- 60% of the world without mobile phone connections are in India or China, 14% in Southeast Asia and 13% in Africa (BDA consulting, Beijing, 2006)

Developed Markets

There are opportunities to deploy ICT networks, products and services in remote and rural areas of the developed world. This is becoming increasingly important as access to online resources and information becomes a critical aspect of economic and social participation. For example, in the UK BT has connected 99% of all homes and businesses to broadband-enabled exchanges.²²

Age, Ability, Language

ICT companies can provide socially inclusive products and services that enable accessibility for people of all ages and abilities, and all relevant languages. This can be important in developed markets (such as helping the elderly or people with disabilities participate in the economy), and in emerging and developing markets (such as providing services in multiple languages). For example, Vodafone provides text-to-speech software enabling blind people to read text messages.²³

²¹ Lenovo Targets Rural China With Basic PC, August 3, 2007, <http://www.iht.com/articles/ap/2007/08/03/business/AS-FIN-COM-China-Lenovo-Cheap-PC.php>

²² BT Sustainability Report, www.bt.com/betterworld

²³ Vodafone Corporate Responsibility Report, www.vodafone.com/responsibility

ISSUE FOUR: FREEDOM OF EXPRESSION

Why is Freedom of Expression Important to the ICT Sector?

The right to Freedom of Expression is contained in Article 19 of the Universal Declaration of Human Rights: “Everyone shall have the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive, impart information and ideas through any media and regardless of frontiers.” This right should only be restricted in narrowly defined circumstances based on internationally recognized standards and principles, such as national security, public health or morals.

Over recent years ICT has increasingly become the platform over which citizens are able to exercise their right to freedom of expression. This presents the ICT sector with a number of emerging and growing risks and opportunities:

- Providing ICT as a positive means of supporting accountability, participation and free expression
- Responding to demands, laws and regulations that seek to limit content
- Understanding and responding to local cultural variations in what content is deemed socially acceptable
- Designing and providing the hardware functionality that enables legitimate as well as illegitimate restrictions on free expression by governments

What is the Potential for the ICT Sector to Enhance Freedom of Expression?

The risks and opportunities for the ICT sector in enhancing Freedom of Expression fall into three main categories: User Access Controls, Content Standards and Free Expression/Censorship.

It should be noted that issues of Freedom of Expression manifest themselves in very different ways across the ICT sector. For example, Service Providers and Internet Companies are often the gateway to information (for example, through search results or the provision of content) while Equipment Manufacturers, Consumer Electronics Companies and Software firms build the functionality and features that enable both legitimate and illegitimate content restrictions.

User Access Controls

Service Providers, Internet and Software Companies can provide services that allow users to control access to or to filter content — a common example is the provision of tools that enable adults to prevent their children from accessing inappropriate adult content on web sites or mobile phones. This can include music, web pages, video and TV content, and is seen by many as a legitimate and beneficial use of filtering technology. For example, Vodafone Italy launched a new mobile phone for children, allowing parents to control the use of their child's phone through pre-programmed contact numbers, restrictions on Internet

browsing ability and a responsible use manual. The role of Equipment Manufacturers and Consumer Electronics Companies is usually to provide the hardware functionality that allows users to control their own content access.

Content Standards

Service Providers, Internet and Software Companies can also control the delivery of content that may be inappropriate for certain audiences, such as adult material or gambling, or that may be illegal, such as content related to child exploitation or terrorism. This is distinct from User Access Controls in that it is the company (or their business/government customer), rather than the end user, that is controlling access to the content.

A challenge for Service Providers and Internet companies is that legitimate standards for acceptable content are only at an early stage of development (a good example is provided by the Internet Watch Foundation in the UK) and that cultural expectations for what is deemed to be acceptable content are subject to significant local variations.

A distinction can also be made between companies providing the content themselves or through a “walled garden” (in which content restrictions may be enforced at the company’s discretion) and where the company provides access to “the whole world” through Internet search (where far fewer content restrictions are likely to be in place, and are more likely to be defined by law).

Free Expression and Censorship

The growth of ICT products and services has undoubtedly increased the sum of free expression across the globe. However, ICT companies — especially Service Providers and Internet Companies — are increasingly responding to government demands, laws or regulations that can restrict access to content. The number of states that limit access to Internet content has risen rapidly in recent years: a recent OpenNet Initiative study found evidence of filtering in over 20 countries.²⁴

The dilemma for ICT companies is to understand the distinction between when these demands are legitimate (for example, to tackle terrorism or fight crime) and where they are illegitimate (for example, to limit political speech). Even where restrictions may be viewed as illegitimate under international human rights standards, the company may effectively have no choice but to comply with the law. For many ICT companies these restrictions run counter to a core mission of increasing expression. Efforts are well underway to develop guidance on how ICT companies may promote free expression while remaining within the law.

Finally, for Internet Companies and Service Providers it should be noted that the issue is essentially one of “responding to government demands for content restrictions.” By contrast, for Equipment Manufacturers and Software Companies the issue is one of “selling products that enable the government customer to impose their own content restrictions.”

²⁴ www.opennet.net

ISSUE FIVE: PRIVACY AND SECURITY

Why are Privacy and Security Important to the ICT Sector?

The right to privacy is contained in Article 12 of the Universal Declaration of Human Rights: “No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honor and reputation. Everyone has the right to the protection of the law against such interference or attacks.” The right to privacy should only be restricted in narrowly defined circumstances based on internationally recognized standards and principles and consistent with the rule of law.

The amount of data that is captured, stored and transferred over ICT networks has grown significantly over recent years. This growth has inevitably been accompanied by a rise in the importance that both business and stakeholders attach to the privacy and security of online data.

This presents the ICT sector with a number of emerging and growing risks and opportunities:

- Striking the right balance between user privacy and the provision of personal information to government authorities as part of their efforts to investigate, prevent and prosecute illegal activities
- Tackling spam and other instances of e-commerce fraud such as phishing
- Protecting children from being inappropriately contacted by other users

What is the Potential for the ICT Sector to Enhance Privacy and Security?

The risks and opportunities for the ICT sector in enhancing privacy and security fall into four main categories: Customer Privacy and Data Security; Partnering with Law Enforcement; Online Risks and Safety; Protecting Minors.

Customer Privacy and Data Security

Users are increasingly concerned about data security (for example, that their personal data will be obtained by unauthorized sources) and privacy (for example, that personal information will be over-used for commercial purposes such as direct marketing and advertising).

In response ICT companies are taking a greater interest in the purpose for which data is collected, and an increasingly proactive stance on user privacy. For example, Google now deletes information that could tie a search request to specific computer or Internet user after 18 months and Ask.com allows users to opt out of having search data recorded in the first place. The trend is towards greater user control over their own data, which also implies a great need for consumer education and awareness raising. In addition the security functionality and features of products and services — hardware, software, and how the two relate — is of key strategic significance and competitive advantage for ICT companies.

Partnering with Law Enforcement

Law enforcement agencies have a long history of accessing personally identifiable information held by telecommunications companies as part of their legitimate efforts to investigate, prevent and prosecute illegal activities — names, addresses, billing details and call records can all be of value in solving crime. However, as the amount of online activity grows, so does the number and type of companies holding information of potential value to law enforcement agencies, such as IP addresses, user names and email records held by Internet companies. Moreover, ICT companies increasingly operate in countries lacking in the rule of law and governments are taking an increasingly strong stance on national security. Taken together, these trends lead to an increasing risk of human rights violations.

The room for maneuver that ICT companies have in distinguishing legitimate from illegitimate law enforcement requests (or acting differently when this is known) is slim and efforts are underway to develop guidance on how ICT companies may respond to law enforcement requests consistently while minimizing human rights risk.

Online Risks and Safety

Internet users have long been familiar with problems of spam and phishing (a type of fraudulent activity where customers are sent messages that look like they have come from a trusted source to persuade them to divulge personal information). However, smarter phones and the adoption of standard Internet technologies have also left mobile phone users vulnerable to attack: according to research from the International Telecommunication Union (ITU), more than 80 percent of phone users worldwide have received unsolicited text messages on their phones.

Security software companies can help to prevent spam for Internet users and mobile operators can safeguard content received on the handset. Using anti-spam and anti-spoof technology, operators can detect abnormal patterns in messaging traffic, confirm legitimate senders, filter content and block suspicious messages. Mobile operators can also use technology to share spam control with their subscribers by providing solutions to black-list certain phone numbers and block messages coming from these phones.

Protection of Minors

As the average Internet user and mobile phone user is getting younger and spending increasing amounts of time online in chat rooms and on social networking sites, there is an increasing risk of minors being inappropriately contacted. ICT Service Providers can play a role in filtering content to create a secure environment for minors to interact and find information online, and also collaborate with law enforcement agencies.

ISSUE SIX: EMPLOYEE RELATIONSHIPS

Why are Employee Relationships Important to the ICT Sector?

Rapid change in the ICT sector is characterized by innovation and the need for a highly educated workforce. Convergence in the industry has an affect on employee relations as acquisitions and mergers require employees to adapt to new business cultures and new business services and products. There are opportunities too: modern technologies such as videoconferencing can facilitate flexible work options and improve the overall work-life balance.

The ICT sector is also a substantial employer in the manufacturing sector, where worker rights on issues such as freedom of association, collective bargaining, working hours, health and safety, and wages are highly relevant.

How can the ICT Industry Improve Employee Relations?

The ICT industry can address a number of issues when ensuring that it treats employees well.

Occupational Health and Safety

The ICT sector includes a large manufacturing sector (supplying Consumer Electronics, Service Providers and Equipment Manufacturers in particular) and employs millions of workers in manufacturing jobs around the world. Issues such as exposure to dangerous chemicals, the impact of local pollution and the importance of good ergonomics during manufacturing are critical aspects for the ICT industry to address. (See also Waste and Materials Use.)

ICT Service Providers have a large number of employees, especially engineers and technicians, on the road; for all the large Service Providers this will number tens of thousands each. It is important to keep employees and the public safe by promoting and ensuring safe driving methods.

Freedom of Association and Collective Bargaining

The ICT industry has a range of approaches to Freedom of Association and Collective Bargaining. While once state-owned ICT Service Providers generally recognize active trade unions, newer parts of the industry — such as Software and Internet companies — tend not to have active relationships with trade unions. However, Freedom of Association and Collective Bargaining are important issues for the ICT industry, especially in manufacturing, where they are seen by many as critical to the achievement of other worker rights on aspects such as wages and working hours.

Employee Diversity

Employee diversity is a specific challenge for the ICT industry, whose heavy engineering, technology and science-based activities often lead to a male-

dominated workforce. Diversity will be important for maintaining good customer relationships and having a complete understanding of customer needs. As ICT companies become increasingly global, it will also be important to recruit local employees as well as relocate employees from the head office country. Age is also an important aspect of diversity in ICT, especially as the employment of older engineers in ICT Service Providers is under pressure with the introduction of the latest generation of network equipment.

Talent Acquisition and Retention

The ICT industry is highly competitive and thrives on innovation. For these reasons it is important for ICT companies to attract and retain highly qualified employees. This can be achieved in many ways, such as through partnerships with global and national universities, scholarships and the maintenance of a healthy work-life balance.

Working Hours, Wages and Benefits

It is increasingly understood that long working hours can increase worker turnover, injury and illness, and that these effects can have a negative impact on business productivity. There are also a number of legal standards relating to hours, wages and benefits that ICT companies need to ensure compliance with. (See also Supply Chain.)

ISSUE SEVEN: CUSTOMER RELATIONSHIPS

Why are Customer Relationships Important to the ICT Sector?

Convergence in the ICT industry means that companies which traditionally only provided one service now provide many. Consumer Electronics companies and Equipment Manufacturers increasingly manage business models that provide additional services such as software and Internet services; Service Providers are increasingly competing against traditional media companies in content. As Service Providers transform their business models, often through mergers or acquisitions, and move some of their core activities such as call centers abroad, maintaining customer satisfaction is critical to the maintenance of revenues.

How can the ICT Industry Improve Customer Relations?

Maintaining high levels of customer satisfaction manifests itself in a number of different ways, including network reliability, disaster response, business resilience, clarity of billing and pricing, and responsible marketing.

Network Reliability

Customers are most likely to be satisfied — and the social benefits of ICT most likely to be realized — if ICT networks perform to a high degree of reliability. Evidence suggests that network reliability is also one of the key factors in growing the uptake of ICT in emerging markets. Operators and competing local exchange carriers need network reliability so that they can reduce implementation costs and compete in meeting service-level agreements.

Disaster Response and Business Resilience

Disaster response and business resilience are important to customers as society becomes increasingly exposed to natural or man-made disasters. The ICT network is critical to the functioning of the emergency services and can also help locate family, friends and employees.

Companies are managing increasing risk in their networks and systems due to shifting weather patterns and more extreme weather conditions. Temporary or even longer term loss of email can have significant impacts on customers and employees and in some cases catastrophic impacts if there is no access to emergency services at that time. Internet and Service Providers can offer emergency access to mission-critical applications and data through standby data management services. ICTs can also help to send SMS, video clips or warning messages to wireless handheld devices such as mobile phones and PDAs to warn tourists, local residents and businesses of emergency situations.

Clarity of Pricing and Billing

Clear price setting and billing is important in maintaining good customer relationships. This is especially true for Service Providers with converged,

multiple or complex services (mobile, fixed, Internet, TV, etc.), though less true for Internet companies that secure their revenue from advertisers rather than individual users.

Responsible Marketing

ICT companies need to ensure that marketing is always honest, truthful, decent and fair, and that all employees responsible for company advertising, direct marketing and point-of-sale material carry out their responsibilities in a manner that upholds these values. Poor advertising practices (such as over-selling of inappropriate services, over-aggressive marketing to children, unclear terms and conditions, and the misleading use of "rebate checks") can rebound through a negative impact on reputation and customer satisfaction.

Further, as advertising shifts from traditional TV and print media (where it is easy to "place" advertising next to specific features) to web 2.0 Internet media (where the placing of an advertisement can be more random), so ICT companies are exposed to greater "risks by association."

ISSUE EIGHT: SUPPLY CHAIN

Why is the Supply Chain Important to the ICT Sector?

The ICT industry has become the most globalized industry after the garment industry, with ICT products and equipment supplied by multiple companies across many countries and assembled by more than one manufacturer.²⁵

Over recent years the ICT industry has increasingly relocated its manufacturing to low-income countries and emerging markets. This has led to the rise of issues commonly associated with other industry sectors, such as wages, working hours and worker rights.

Some specific features of the ICT supply chain include:

- The need for quality, which can result in high-quality facilities at a constant temperature
- Rapid development of new products and components
- Seasonal fluctuations in supply
- Exposure to chemicals in the factory setting
- Long hours and overtime
- A division between manufacturing and assembly (usually undertaken by contract manufacturers) and research, development, design and marketing (usually undertaken by Service Providers and branded Consumer Electronics companies)
- A networked supply chain, with many ICT companies supplying to each other
- Challenges in providing decent and fair working conditions, specifically regarding working hours, freedom of association and collective bargaining

How can the ICT Industry Improve the Sustainability of its Supply Chain?

Improving the sustainability of the supply chain is a bigger issue for Consumer Electronics, Equipment Manufacturing and Service Provider companies than it is for Internet and Software companies. Improving sustainability in the ICT supply chain can cover three dimensions.

Environmental Impacts

Significant environmental impacts can exist throughout the ICT supply chain, including materials use, pollution, energy use, hazardous substances, wastewater, solid waste and air emissions. ICT companies can put in place policies, processes and incentives to ensure that environmental regulations are complied with and environmental performance is improved. (See also Climate Change and Waste and Materials Use.)

²⁵ CSR Issues in the ICT Hardware Manufacturing Sector, SOMO ICT Report, Irene Schipper, Esther de Haan, September 2005, pp.22

Health, Safety and Labor Standards

A large number of internationally recognized health, safety and labor standards (such as those set forth by the International Labour Organization) require implementation throughout the ICT supply chain. This covers issues such as Freedom of Association and Collective Bargaining, Child Labor, Working Hours, Wages and Benefits, Occupational Safety, Industrial Hygiene and Ergonomics. (See also Employee Relationships and Waste and Materials Use.)

Supply Chain Integration

The ICT industry has made progress addressing supply chain issues in recent years and has an opportunity to continue along this path. Key features include:

- Taking a collaborative, industry-wide approach (such as that pursued by GeSI) and promoting global standards (such as that put forward by the Electronic Industry Code of Conduct, EICC)
- Learning the lessons of other sectors (such as retail and apparel) by taking a proactive approach to "improving conditions" via capability building, rather than simply "monitoring conditions" via repeat audits
- Examining how core business processes can have positive impacts in issues such as working hours and overtime
- Engaging with local communities in sourcing countries to establish community relations and infrastructures to deal with potential harmful impacts from ICT manufacturing in nearby factories

ISSUE NINE: PRODUCT USE ISSUES

Why are Product Use Issues Important to the ICT Sector?

The sustainability impact of a company goes beyond its own operations and into the way in which its products and services are used by society. The ICT industry is no different and the way we use ICT products and services can have a significant impact on our health and social well-being.

How can the ICT Industry Address These Various Product Use Issues?

Examples of product use issues that are specific to the ICT industry include issues as diverse as customer safety while driving, mobile theft, electromagnetic emissions, the visual impact of the ICT network and enabling an improved work-life balance.

Safety While Driving

The use of handheld mobile phones by drivers is illegal in many European countries, some US states and a number of Asian and South American countries. While hands-free mobile phones pose less of a risk than handheld ones, research suggests that using hands-free phones still distracts drivers and impairs safe driving ability — the distraction can arise from mental distraction in addition to physical distraction.

Service Providers can contribute in a positive way by providing proactive education and communication about safe driving.

Mobile Theft

Consumer electronic handheld devices are turning into valuable mini portable laptops. Additional services and expanded capacities of today's phones make them an increasingly popular target for theft and fraud. Every year in the US, more than 37 million cell phones are lost, stolen or damaged.²⁶

ICT companies can put in place protection mechanisms such as Equipment Identity Register databases to blacklist stolen phones, and new wireless technologies such as RFID and software can help to locate, track and register the stolen equipment and trace it back to the person who stole it.

Enabling Work-Life Balance

ICTs are blurring the distinction between our business and personal life. Wireless technology allows us to be available all the time. Portable devices and remote access to company servers allow us to work nonstop as well. An unhealthy work-life balance can arise and potentially have negative impacts on our lives.

²⁶ Advanced Wireless Solutions

However, the ICT industry can help create a healthier work-life balance by enabling more flexible work solutions — such as homeworking, teleconferencing and videoconferencing — and by providing advice on how ICT solutions can be used to bring a positive rather than negative impact on the work-life balance.

Local Environmental Impacts and Visual Impacts

The siting of base stations by Service Providers can have an impact on both the physical and aesthetic environment, for example in areas of high biodiversity value.

Service Providers can help by sensitive siting of base stations, sharing sites, designing network equipment to blend in with the local surroundings, and by managing specific biodiversity issues for sites of special interest, such as the migratory patterns of animals and birds.²⁷

Electromagnetic Emissions

The past decade has witnessed public concern about the health effects of radio frequency fields emitted by handsets and base stations. However, international health and safety guidelines, endorsed by the World Health Organization (WHO), are in place to ensure radio waves stay below a certain level, limiting the public's exposure to them.

Although there is no evidence to convince experts that the use of mobile phones and the masts that make them work carries health risks, many stakeholders are still concerned. ICT companies can continue to address these concerns by funding and publishing research and by providing advice to the public.

Social Application of ICT Products and Services

As ICT innovation creates opportunities to move many of our activities online, there is an opportunity to utilize ICT products and services for a range of social benefits. These include:

- E-learning and education
- Telemedicine, such as diagnosis and treatments from a remote location or the secure storage of health records
- E-government, such as using the Internet or mobile devices to improve access to and the quality of public services

²⁷ Forum for the Future, Earth Calling – Environmental Impacts of the Mobile Telecom Industry, November 2006, pp. 13

Why is Economic Development Important to the ICT Industry?

The size of the ICT industry alone results in significant economic impact, for example through the jobs created and company spending in the economy. A recent IDC study estimates that the EU's IT industry employs nearly 2.6 million workers in 365,000 IT businesses, contributing over €250 billion a year in tax revenues to European governments. Further, each €1 in ICT products sold generates further spending in upstream and downstream services, peripheral products and support.²⁸

However, the use of ICT products also has the potential to bring significant indirect economic benefits. The economic impact of ICT is proving particularly significant in enabling remote and rural populations to participate in the economy, especially in emerging markets through access to market information or financial services. Finally, the role of ICT in globalization, offshoring and outsourcing is changing the way society thinks about the location of jobs.

How can the ICT Industry Address Economic Development?

The risks and opportunities involved with global economic development fall into four main categories: Economic Development; Bribery and Corruption; Intellectual Property Rights; and Offshoring/Outsourcing.

Economic Development

Convergence of ICT products and services can bring a number of opportunities for Economic Development, including:

- Increasing business productivity by reducing the cost of communications and storing and processing data
- Enabling new ways of working, such as teleworking and video conferencing
- Enabling new types of enterprise, such as online business
- Providing software products that can reduce bribery and corruption and facilitate good governance

The degree to which these benefits are achieved will depend greatly on how well policy makers and regulators respond to the challenges of convergence.

Bribery and Corruption

Corporate scandals of recent years have made companies increasingly aware that corrupt practices pose serious and costly risks to their reputations and sustainability.

²⁸ http://ec.europa.eu/enterprise/ict/policy/doc/wg2_report.pdf

In the ICT sector there appear to be three main areas of corruption and bribery: (1) large-scale corruption involving large sums of money but very small numbers of people, such as during privatization or large equipment contracts; (2) endemic business corruption and small-scale corruption, where bribes or corrupt practices are simply part of a wider corruption culture in the country concerned; and (3) small-scale corruption that involves paying someone off to get something done, such as paying a bribe to get a phone installed.

These practices impede economic development and the ICT industry can address them through their own operations. However, the ICT industry also has an opportunity to address bribery and corruption through the provision of software products that encourage good governance, prevent bribery and eliminate fraudulent accounting.

Intellectual Property Rights (IPR)

Technology innovation is pushing the boundaries of national and international legislation. The Internet and digitization possibilities mean that national rules do not necessarily provide satisfactory protection from the misuse of material or the creation of inappropriate content. Internationally based legislation can help clarify cross-border issues, as well as develop global IPR standards, but there is controversy as to whether legal frameworks can capture the impacts of technology innovation such as open source. There are limits to legislation and in some cases legal action could hinder ICT innovation.

A 10-point decrease in the EU's overall software piracy rate could add over €80 billion to its combined economies, and generate over 150,000 high-wage jobs in the IT sector.²⁹

Piracy is especially relevant to Internet and Software companies, which are challenged with a host of counterfeit products. In China there is little respect for intellectual property rights and sites such as MySpace are badly copied and even called MySpace in more than one occasion.³⁰ Earlier this year, Symantec filed eight lawsuits against companies it accused of selling pirated security software.

Outsourcing and Offshoring³¹

The rapid increase in offshoring and outsourcing by many ICT companies is due in large part to the potential cost savings that are achievable as low-wage labor pools are tapped in low-income countries. Many companies are now locating

²⁹ IDC "Expanding the Frontiers of Our Digital Future: Reducing Software Piracy to Accelerate Global IT Benefits", December 2005. Economic Study commissioned by the Business Software Alliance 7 Commissioner McGreevy's closing speech, Patent Hearing July 12th. In this context, also cp. the Commission Study on Evaluating the Knowledge Economy, available under http://ec.europa.eu/internal_market/indprop/docs/patent/studies/patentstudy-report_en.pdf.

³⁰ Wowed by China's Net, Fortune Magazine, September 8th, 2007

³¹ Outsourcing and offshoring are two related, but distinct topics. Outsourcing is the movement of an internal business function to an external company, regardless of the location of the external company is in the same country or not. Offshoring is the movement of a business function to another country, regardless of whether it stays in the same company or not.

administrative- to mid-level customer care in offshore locations including India, Argentina and the Philippines, while locating the high-end/value-add work in near-shore locations such as the Czech Republic or Egypt. By using this model of outsourcing, companies both improve their customer relations while building economic opportunities in the sourcing economies.

The ICT sector contributes to wealth generation, employment and education in the sourcing countries through its outsourcing and offshoring activities. For example, India's revenue from outsourcing was \$22 billion in 2005-2006 and more than 1.3 million jobs were created due to outsourcing contracts during the past decade.³²

There are also varying levels of risks involved with off shoring and outsourcing:

- Labor and Environmental risk: Working conditions and environmental standards can often be lower in developing countries and emerging markets, with laws and regulations often poorly enforced by local regulators and governments. For this reason ICT companies can be especially vigilant that outsourcing and offshoring does not lead to unacceptable labor and environmental standards. (See also Supply Chain and Employee Relationships.)
- Country risk: There are significant political and socio-economic risks involved with doing business overseas.
- Operations and transaction risk: Weak controls in outsourced operations and transactions may affect and pose a risk to customer privacy.
- Privacy concerns: Privacy risks vary by job type — for example, relatively lower-risk activities include computer source-coding or application development and maintenance, whereas higher-risk activities include any function using personal data, such as call centers or transaction processing.

³² Business Week, January 2006, Angling to be the Next Bangalore, <http://www.dataart.com/downloads/angling-to-be-the-next-bangalore.pdf>

ANNEX ONE: FULL LIST OF ISSUES

This Annex provides a full list of potentially most material issues for the Service Providers, Equipment Manufacturers, Consumer Electronics and Internet and Software companies.

Service Providers

<p>Greatest significance to both businesses and stakeholders</p>	<p>Accessibility (Developing and Emerging) Accessibility (Developed) Consumer Privacy and Data Security Partnering with Law Enforcement Online Risks and Safety Protection of Minors Electromagnetic Emissions Freedom of Expression User Access Controls Content Standards Climate Change Risk Company Energy Use and Climate Change ICT Services and Climate Change Hazardous and Harmful Materials Consumer Products Recycling Network Equipment Recycling Outsourcing and Offshoring Economic Development Social Application of Products and Services Social and Environmental Standards in Supply Chain Clarity of Pricing and Billing Working Hours and Wages</p>
<p>Greatest significance to businesses</p> <p>Significance to stakeholders</p>	<p>Customer Satisfaction Network Reliability Business Resilience</p> <p>Talent Acquisition and Retention Intellectual Property Rights</p>
<p>Greatest significance to stakeholders</p> <p>Significance to business</p>	<p>Accessibility (Age, Disability, etc.) Freedom of Association and Collective Bargaining</p> <p>Enabling Work-Life Balance Employee Diversity ICT Products and Climate Change Obsolescence Waste Reduction Bribery and Corruption</p>

Other potentially material issues	Customer Safety While Driving Visual Impact Mobile Theft Local Environmental Impacts Responsible Marketing Disaster Response Employee Safety in the Vehicle Fleet Ozone Depleting Emissions Paper Consumption Raw Materials Usage Packaging Water Use
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Consumer Electronics

Greatest significance to both businesses and stakeholders	Consumer Privacy and Data Security Climate Change Risk Company Energy Use and Climate Change ICT Services and Climate Change ICT Products and Climate Change Product Transport and Logistics Hazardous and Harmful Materials Product and Component Recycling Social Application of Products and Services Social and Environmental Standards in Supply Chain Outsourcing and Offshoring Wages and Working Hours
Greatest significance to businesses Significance to stakeholders	Customer Satisfaction Business Resilience Talent Acquisition and Retention Interoperability Intellectual Property Rights
Greatest significance to stakeholders Significance to business	Accessibility (Age, Disability, etc.) Accessibility (Developing and Emerging) Employee Diversity Obsolescence Packaging Raw Materials Usage Pollution Prevention Waste Reduction Occupational Health and Safety Freedom of Association and Collective Bargaining

Other potentially material issues	Clarity of Pricing and Billing Freedom of Expression User Access Controls Content Standards Enabling Work Life Balance Responsible Marketing Disaster Response Ozone Depleting Emissions Paper Consumption
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Equipment Manufacturing

Greatest significance to both businesses and stakeholders	Accessibility (Developing and Emerging) Accessibility (Developed) Consumer Privacy and Data Security Online Risks and Safety Electromagnetic Emissions Freedom of Expression Content Standards Climate Change Risk ICT Services and Climate Change ICT Products and Climate Change Hazardous and Harmful Materials Obsolescence Social Application of Products and Services Social and Environmental Standards in Supply Chain Wages and Working Hours
Greatest significance to businesses Significance to stakeholders	Business Resilience Talent Acquisition and Retention Intellectual Property Rights
Greatest significance to stakeholders Significance to business	Accessibility (Age, Disability, etc.) Protection of Minors User Access Controls Employee Diversity Company Energy Use and Climate Change Product Transport and Logistics Raw Materials Usage Consumer Products Recycling Water Usage Waste Reduction Disaster Response Occupational Health and Safety Freedom of Association and Collective Bargaining

Other potentially material issues	Customer Safety While Driving Clarity of Pricing and Billing Pollution Prevention Enabling Work Life Balance Mobile Theft Outsourcing and Offshoring Responsible Marketing Ozone Depleting Emissions Paper Consumption Packaging
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Internet and Software

Greatest significance to both businesses and stakeholders	Accessibility (Developing and Emerging) Consumer Privacy and Data Security Partnering with Law Enforcement Online Risks and Safety Protection of Minors Freedom of Expression User Access Controls Content Standards Climate Change Risk Company Energy Use and Climate Change Customer Satisfaction Social Application of Products and Services Bribery and Corruption Outsourcing and Offshoring
Greatest significance to businesses Significance to stakeholders	Open Source Computing Business Resilience Interoperability Talent Acquisition and Retention Intellectual Property Rights
Greatest significance to stakeholders Significance to business	Accessibility (Age, Disability, etc.) Employee Diversity ICT Products and Climate Change ICT Services and Climate Change Packaging Waste Reduction Bribery and Corruption Responsible Marketing

Other potentially material issues	Accessibility (Developed) Enabling Work Life Balance Social and Environmental Standards in Supply Chain Clarity of Pricing and Billing Disaster Response Employee Safety in the Vehicle Fleet Product Transport and Logistics Ozone Depleting Emissions Paper Consumption Pollution Prevention
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ANNEX TWO: LESSONS FROM THE PROCESS

To our knowledge this is the first time that a materiality process has been systematically undertaken at the level of an industrial sector. In this way the process represented an experiment in the application of the materiality principle.

With this in mind GeSI and BSR thought it would be helpful to highlight a few key “lessons learned” from the process that may be helpful for the field of business, sustainability and corporate social responsibility:

- **Materiality is often in the “eye of the beholder.”** One half of the materiality principle is “significance to stakeholders.” However, stakeholders are diverse and promote a wide range of very different issues. Asking the question “What issues should the ICT industry focus on?” resulted in a wide range of different issues and priorities. These issues are not necessarily in competition with one another, but this (healthy) diversity of perspectives made prioritization in accordance with the materiality principle a challenging task.
- **The output of the materiality process appeared to be of more value to companies than to stakeholders.** While all participants in this process appeared to conclude that it was a worthwhile exercise, companies tended to find the final product (a list of potentially material issues) to be of far greater value than stakeholders, with the possible exception of investors. The nature of this process meant that any single issue is necessarily dealt with in a fairly summary fashion; by contrast, it felt that stakeholders would derive greater value from dialogues going much deeper on single issues of particular relevance or interest to them.
- **The principle of “completeness” is much easier to debate and discuss than the principle of “materiality.”** GeSI and BSR ran this materiality process primarily to prioritize issues. However, with a few exceptions, the feedback received was often to add new issues to the list rather than prioritize the most important. It took a high level of discipline to maintain a focus on the principle of materiality rather than completeness.

ANNEX THREE: LIST OF RESOURCES

Note: Please be aware that being listed as an organization consulted during this process does not imply that the organization endorses or agrees with the contents of this report.

Stakeholders Interviewed: F&C Asset Management, JP Morgan, Calvert, ASrIA, Ethical Funds, Sustainability Asset Management, KLD, Forrester Research, Greenpeace, WWF, Human Rights Watch, Center for Democracy and Technology, Electronic Frontier Foundation, Privacy International, Institute for the Future, Association for Stimulating Know How (ASK), USTA, Consumer Electronics Association, Berkman Center for Internet and Society, and Enlightenment Economics

Stakeholders Attending Engagements: Center for Democracy & Technology, Ethical Funds, Global Reporting Initiative, Good Electronics, Pacific Institute, UC Berkeley, WWF, The Climate Group, ASrIA, Global Institute for Tomorrow, SynTao, Asia Monitor Resource Center, FTSE4GOOD, Greenpeace, The Climate Group, European Metalworkers' Federation, International Metalworkers' Federation, JP Morgan and Ethifinance

Non-GeSI Member Companies Attending Engagements: SprintNextel, Adobe, SAP and McAfee

Companies Interviewed: BT, Cisco, Deutsche Telekom, Ericsson, France Telecom Group, HP, Microsoft, Motorola, Nokia, Telefonica, Telus and Vodafone

Sustainability Reports/Company Web Sites Read: Alcatel-Lucent, Apple, AT&T, Bell Canada, BSKyB, BT, Cisco, Dell, Deutsche Telekom, Ericsson, France Telecom Group, Google, Juniper, HP, Huawei, IBM, Infosys, Microsoft, Motorola, Nokia, NTT, Oracle, Sony, Telefonica, Telus, Toshiba, Verizon, Vodafone and Yahoo!

Reports Read:

- Forum for the Future, "Earth Calling...The Environmental Impacts of the Mobile Telecommunications Industry," November 2006
- F&C Investments, reo Research. "Managing Access Security and Privacy in the Global Digital Economy," January 2007
- Pew Center on Climate Change and Pew Center on the States, "Climate Change 101, Understanding and Responding to Climate Change"
- Fuhr, Joseph P. Jr. and Pociask, Stephen B. (2007), "The Green Effects of Broadband Services: Economic and Environmental Benefits," the American Consumer Institute
- Pamlin, D. and Szomolányi-Magyar, K. (2006), "Saving the Climate @ the Speed of Light, the First Roadmap for Reduced CO2 Emissions in the EU and Beyond"
- Mines, C. and Gillett, Frank E. (2007), "The Greening of IT," April 19, 2007

- Mines, C. (2007), "Tapping Buyers' Growing Interest in Green IT," Forrester Research, May 10, 2007
- Teske, S., Zervos, A. and Schäfer, O. (2007), Greenpeace International and European Renewable Energy Council (EREC) "Energy Revolution, a Sustainable Energy Outlook"
- ITU/UNCTAD (2006), "World Information Society Report: Beyond WSIS"
- Brigden, K., Labunska, I., Santillo, D. and Walters, A. (2007), "Cutting Edge Contamination: A Study of Environmental Pollution During the Manufacture of Electronic Products," Greenpeace International
- The Pacific Institute, "Corporate Reporting on Water: a Review of Eleven Global Industries"
- Vodafone (2004), "The Impact of Mobile Phones in the Developing World"

Other Resources:

- Environmental Leader, "HP, IBM, Others Launch Hi-Tech Energy Efficiency Initiative," February 27, 2007. Available at <http://www.environmentalleader.com/2007/02/27/hp-ibm-microsoft-others-launch-hi-tech-energy-efficiency-initiative/>
- Institute for the Future (2006), "2006 Ten-Year Forecast Perspectives: A Decade of Shapeshifting"
- Sylvers, E. (2006), "Connecting Developing Nations," *International Herald Tribune*, February 17. Available at <http://yaleglobal.yale.edu/display.article?id=7002>
- McDonald, J. (2007), "Lenovo Targets Rural China With Basic PC," *International Herald Tribune*, August 3, 2007. Available at <http://www.ihrt.com/articles/ap/2007/08/03/business/AS-FIN-COM-China-Lenovo-Cheap-PC.php>
- Markoff, J. (2007), "At Davos, the Squabble Resumes on How to Wire the Third World," *The New York Times*, January 29, 2007. Available at <http://www.nytimes.com/2007/01/29/business/worldbusiness/29cheap.html>
- Young, S. Ovum Ltd. (2007), "Climate Change and ICT: Beyond CSR," Presentation at the Information Age "Effective IT Summit"
- Montgomery, N. (2006), "European Survey Puts the Environment High on the Business and IT Agenda," AMR Research
- Harris, L. "Creating Marketplace Competition for Privacy," ABC News, August 15, 2007. Available at <http://www.abcnews.go.com/Technology/story?id=3482625&page=1>
- Weidman Grunewald, E. (2007), Presentation by Ericsson, "Telecom, Sustainability and Climate Change." Available at http://www.ericsson.com/ericsson/investors/events/2007/weidman_telecom_sustain.pdf