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The High Cost of Calling

Critical Issues in the Mobile Phone Industry

November 2006

Joseph Wilde & Esther de Haan

In today's globalised world of instant communication, mobile phones are a nearly ubiquitous feature of everyday life in most developed and many developing countries. Ninety percent of the population of Western Europe now has access to a mobile phone, and mobile phone penetration in large Asian countries like China and India is rising exponentially. In 2006, mobile phone sales will reach a volume of 935 million handsets, representing a value of US $136 billion.

This SOMO report covers the industry's top five manufacturers of mobile phones, Nokia, Motorola, Samsung, Sony-Ericsson and LG, comparing the companies' corporate social responsibility (CSR) policy with the results of SOMO-commissioned field research into the actual conditions at mobile phone factories in China, India, Thailand and the Philippines.

Despite the clean image often portrayed by this high-tech industry, SOMO's research at mobile phone production facilities reveals that conditions in handset factories can be appalling, especially among sub-tier suppliers of mobile phone component parts. This report documents the current situation in an industry where labourers work up to 72 hours a week with compulsory overtime, insecure employment contracts, unsafe factories, inadequate protection when working with hazardous materials, wages below the subsistence level, suppression of union rights and degrading treatment. This situation is complicated by the increasing complexity of mobile phone supply chains. Outsourced production of small component parts for handsets can often stretch into supply chains of nearly a dozen companies; the large name-brand companies have little oversight over this part of their supply chain and generally fail to take responsibility for the poor conditions there.

The High Cost of Calling

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Joseph Wilde & Esther de Haan

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Colophon

The High Cost of Calling: Critical Issues in the Mobile Phone Industry

By:
Joseph Wilde & Esther de Haan

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Abbreviations and Terminology

ACFTU *All-China Federation of Trade Unions*. China's sole legal union organization. It is a centralized, monopolistic organ with branches at different levels. See Section 4.1.2.

BFR *Brominated Flame Retardant*. A type of hazardous chemical found in mobile phones. See section 6.4.1.

CDMA Code Division Multiple Access. A type of mobile phone frequency network used in approximately 14% of mobile phones. See Section 2.1.

CM *Contract Manufacturers*. CMs are contracted by OEMs and offer full scale manufacturing and supply chain management from engineering to logistics. Two important types of CMs are EMS and ODMs. See Section 3.6 and Section 5.2.

CSR *Corporate Social Responsibility*

DRC *Democratic Republic of Congo*. 80% of the world's known reserves of tantalum is found there. See Section 6.4.4.

EICC *Electronic Industry Code of Conduct.* Electronics Industry Code of Conduct. A Code of Conduct established in October 2004. A number of electronics OEMs (but none of the mobile phone OEMs) and contract manufacturers are signatories. See Section 7.1.1.

EMS *Electronics Manufacturing Services*. These are manufacturing services companies that produce the brand name products designed by the OEMs. EMS do not own the intellectual property of the products they produce. Prominent examples of EMS are Flextronics and Hon Hai (Foxconn). See Section 3.6 and Section 5.2.2.

EPZ *Export Processing Zone*. An industrial zone set up with special incentives to attract foreign investors; imported materials are processed before re-exporting. See Section 6.5.

ETNO *European Telecommunications Network Operators' Association*. An industry lobby group for European electronic communications network operators. See section 7.1.3.

GeSI *Global e-Sustainability Initiative*. An initiative of ICT service providers and suppliers such as DT, Ericsson, Orange, Motorola and Vodafone. All signatory companies commit to a certain level of environmental and social performance. See section 7.1.2.

GSM *Global System for Mobiles*. The frequency network that serves over 75% of mobile phone users. See Section 2.1.

ICFTU *International Confederation of Free Trade Unions*. See section 6.2.

ICT *Information and Communications Technology*

ILO *International Labour Organisation*. A tripartite organisation (employers, governments and workers' representatives) responsible for setting labour standards, which can be found in over 180 Conventions and more than 190 recommendations. See section 6.2.

IPR *Individual (financial) producer responsibility*. Producers' responsibility to finance the end-of-life management of their products by taking back and reusing/recycling their own-brand discarded products. See Section 6.4.1

Final Assembly Also known as box assembly, this is the manufacturing process on which outsourcing percentages are based, as opposed to component assembly or sub-assembly. See Section 3.5.1.

MNO *Mobile Network Operator.* Telephone companies that provide mobile telecommunications services for mobile phone subscribers. See Section 5.3.

MPPI *Mobile Phone Partnership Initiative*. An initiative of the Basel Convention. See Section 7.2.4.

MVNO *Mobile Virtual Network Operator.* A company that provides mobile service without owning the underlying network, leasing it instead from another incumbent operator in that country.

NGO *Non-governmental Organisation*

ODM *Original Design Manufacturer*. ODMs are contract manufacturers that both design and produce products for OEMs. These products carry the brand name of the OEM, but the intellectual property belongs to the ODM. Prominent examples of ODMs are Compal, Quanta and BenQ. See Sections 3.6 and 5.2.1.

OEM *Original Equipment Manufacturer*. These are companies that design and build products bearing their name. The OEMs included in this study are Nokia, Motorola, Samsung, Sony Ericsson, and LG. See Section 5.1.

REACH *Registration, Evaluation and Authorisation of Chemicals*. European legislation that requires companies to test the safety of more than 30,000 chemicals and phase out the most hazardous chemicals by substituting them with safer alternatives wherever possible. See Section 7.2.2.

RoHS *Restriction of Hazardous Substances*. A European directive adopted in 2002 requiring that electronics manufacturers stop using toxic chemicals and heavy metals in their products. See Section 7.2.1.

SCWG *Supply Chain Working Group (of the GeSI).* See Section 7.1.2.

SEZ *Special Economic Zone*. A geographical region that has economic, labour and environmental laws that are more relaxed than a country's typical economic laws; its primary purpose is to increase foreign investment. See Section 6.5.

Suppliers First tier (direct) suppliers are companies that produce ready-made handsets for sale directly to an OEM. ODMs and EMS are usually direct suppliers. Sub-tier suppliers usually produce mobile phone components for sale to another company that assembles the components and sells the final product to an OEM. See Section 2.2.

WEEE *Waste Electrical and Electronics Equipment.* The European WEEE Directive became law in February 2003, setting collection, recycling and recovery targets for all types of electrical goods. The directive imposes the responsibility for the disposal of WEEE on the manufacturers of such equipment. See Section 7.2.3.

Chapter 1
Introduction

Research in the mobile phone industry

The first cellular phone was introduced in the 1980s, and developments in the industry have been fast; these days it is difficult to imagine conducting business or communicating with friends and family without a mobile phone. Yet behind the quick businessman that receives the latest market analysis through his phone lies a world of problems and issues for human rights, labour conditions, and the environment. This sector study on the mobile phone industry provides insight into trends, strategies, structures, regulation, problems and corporate responsibility initiatives at the international level.

The mobile phone industry is young, complex, growing and dynamic. These days, mobile phones serve as both an essential communication tool as well as a fashion statement. However, from the perspective of sustainable development there is less attention paid to this industry then there is to other manufacturing industries. Until recently, media and public attention on the issue of labour standards had focused primarily on the garment and footwear sectors. Research has revealed, however, that there are major problems in the production of mobile phones.

Objectives

This report aims to raise awareness of the environmental, human and regulation problems in the mobile phone sector, particularly in the production of handsets. In addition, this study and other studies carried out by SOMO aim to widen the campaign base in the electronics hardware sector in Europe and elsewhere, to provide information for campaigns and lobbying to improve conditions in the electronics supply chain. In 2005, SOMO conducted a sector study on the ICT hardware manufacturing sector as well two case studies on ICT companies (Acer and Fujitsu Siemens Computers) and two major production countries (China and the Philippines). The aim of these studies is to understand the role of manufacturers in the global supply chain, identify issues that need to be addressed and to develop strategies to address problems identified in the supply chain. All the reports can be found at www.somo.nl. In addition, SOMO is currently hosting the coordination of the recently-created international electronics network.

Target groups

The objective of this report is to inform and analyse problems related to the mobile phone industry for:

- consumer organisations to raise awareness of the problems in the mobile phone industry;
- organisations, individuals and institutions which have buying power to improve the standards regarding labour and environmental issues in mobile phone production;
- individuals and organisations lobbying corporations in the mobile phone industry to introduce and improve their codes of conduct as well as monitoring and verification systems;
- governments and policy makers involved in regulating the mobile phone industry;
- NGOs and trade unions that are campaigning or are preparing a campaign on CSR issues in the mobile phone industry;
- individuals and institutions that seek to improve supply chain responsibility, corporate transparency and sustainable products;
- individuals and organisations that seek to avoid the widening gap between rich and poor in all countries and work on alternatives to the current globalised free market economy;

Process and methods

Research for this report was conducted using a variety of methods, including both desk research and field research. Desk research, which included a literature review, analysis of other NGO research, and further online research, was carried out by SOMO researchers Joseph Wilde and Esther de Haan throughout 2006. Information on CSR policies of the major companies was gathered through analysis of the companies' websites and online codes of conduct as well as telephone interviews with CSR representatives conducted by SOMO researchers Joseph Wilde, Esther de Haan and Irene Schipper between June and August 2006.

Further sector analysis and field research was carried out by Students and Scholars Against Corporate Misbehaviour (SACOM) in China, Civil Initiatives for Development and Peace (CIVIDEP) in India, the Workers' Assistance Center in the Philippines, and SOMO in Thailand. For the field research, a total of 203 mobile phone production workers at 13 factories were interviewed. Workers were interviewed individually or in small groups at secure locations outside the factories and without the supervision of superiors. In India, additional interviews were conducted with local plant management and human resources representatives. All field research was conducted during March-September 2006.

All of the major companies in this study (Nokia, Motorola, Samsung, Sony Ericsson, LG) received a draft of this report in the form of a company profile and were given between two and four weeks to respond with comments and corrections of factual errors. KPN, Vodafone and Deutsche Telekom also got time to comment on their profiles. All companies responded to the draft report and submitted comments in October and November 2006.

Information about SOMO

The report is published by the Centre for Research on Multinational Corporations (SOMO), an independent non-profit research institute that advises non-governmental organisations and trade unions in the Netherlands and worldwide. SOMO researches multinational corporations and their international context and effects. By exposing unfair practices and systems, SOMO seeks to contribute to the struggle against exploitation, poverty and disparity and to provide means to achieve sustainable economic and social development and a globalisation based on justice. SOMO's overall objectives are:

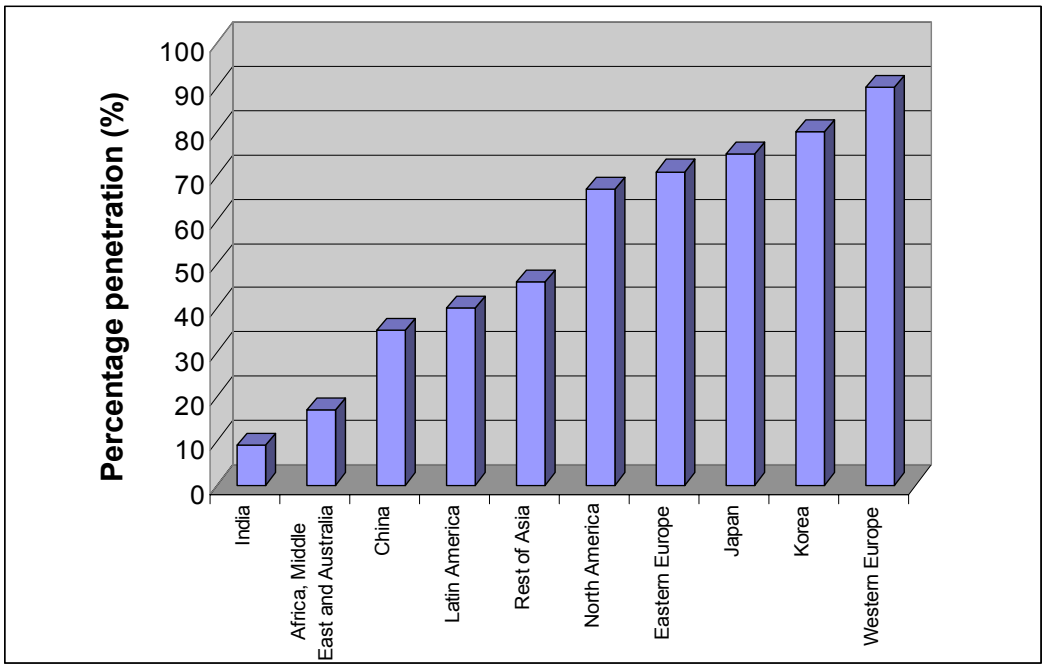
- To foster change through knowledge building: SOMO's research is directed at inducing change. The research, analysis and alternatives SOMO provides contribute to the policy advocacy of NGOs and policy development of international organisations, government and business.
- To strengthen civil society: SOMO brings fragmented knowledge together and stimulates and coordinates cooperation between organisations. In addition, SOMO conducts training with local organisations in the South.
- To influence policy: SOMO organizes workshops, public meetings and lobby activities in order to influence government policies. SOMO wants the voice and development needs of the South to be brought to the front of Northern policy making that regulates corporations.

The research and activities of SOMO focus on corporations, sectors and supply chains in an international context; Corporate Social Responsibility and International trade and investment.

Chapter 2
Defining the Mobile Telephone Handset Sector

In today's globalised world of instant communication, mobile phones are a nearly ubiquitous feature of everyday life in most developed and many developing countries. As Figure 1 reveals, nearly 90% of the population of Western Europe has access to a mobile phone. This fact means that mobile phones are big business and big bucks. In-Stat estimates that the mobile phone sales will reach a volume of 935 million handsets in 2006, representing a value of US $136 billion.[1] To put this in perspective, if the wireless handset sector were a country, it would have the 53rd largest economy in the world, just behind Ireland.

Figure 1: Mobile-Phone Penetration of Population per World Region, 2005



Based on: iSuppli Corp., 2006

[1] "Global wireless handset market grows 23% in 2006 and will reach $250 billion by 2011," EMS Now website, <www.emsnow.com> (accessed 2 July 2006).

2.1. Definition and industrial codes

The mobile phone handset sector consists of all analogue (cellular) and digital handsets used for mobile telephony. According to the United Nations Standard International Trade Classification (SITC), revision 3, mobile telephone handsets fall under the classification of electronics, specifically SITC code 7648 (Telecommunications equipment).[2] The Standard Industrial Classification (SIC) codes corresponding to mobile handset manufacture are 3669 (Radio and TV communications equipment) and 3661 (Telephone and telegraph apparatus), and the corresponding NAICS code is 334220 (Wireless communications equipment manufacturing).

Mobile phone handsets must be made to operate on one of two dominant types of mobile phone frequency networks. The most common type of air link technology is the Global System for Mobiles (GSM) network, which was developed by the European Groupe Special Mobile (the original source of the network's acronym) in the early 1990s to replace the different national standards and unify the continent in one Europe-wide system. Today, the GSM network has expanded around the world and currently serves over 75% of mobile phone users, or approximately two billion people in 50 countries. But some countries, like Japan, do not have a GSM network and instead operate on a Code Division Multiple Access (CDMA) network or Wide-band CDMA (WCDMA). CDMA technology is used in approximately 14% of mobile phones. However, the industry's leading companies are beginning to produce third generation (3G) systems, such as Universal Mobile Telecommunications Systems (UMTS), that can operate on either frequency network and are making older technologies obsolete. The next big innovation in handset technology, fourth generation (4G), is expected to produce phones for the market in 2012.[3] 4G mobile communications will have higher data transmission rates than 3G (20 megabits per second for 4G compared to 300 kilobits/second for 3G).

In this report, the terms "mobile phone" and "handset" are used interchangeably.

2.2. Types of companies

As is the case for the larger information and communications technology (ICT) industry, mobile phone production encompasses three major types of companies: Original Equipment Manufacturers, Electronics Manufacturing Services and Original Design Manufacturers. Original Equipment Manufacturer (OEMs) are companies that design and build products bearing their name, name brands largely known to the public. Prominent examples of mobile phone OEMs include Nokia, Motorola, Samsung, LG and Sony-Ericsson. Section 5.1 of this report contains more information on mobile OEMs. The other two types of companies are both known generally as contract manufacturers (CMs). CMs are contracted by OEMs and offer full scale manufacturing and supply chain management

[2] International Trade Center website, <www.intracen.org/tradstat/sitc3list.htm> (accessed 5 January 2006).

[3] Datamonitor, "Global Mobile Phones: Industry Profile," December 2005, p.8.

from engineering to logistics. Two important types of CMs are Electronics Manufacturing Services (EMS) and Original Design Manufacturers (ODMs).

Electronics Manufacturing Services are contract manufacturing services companies that produce the brand name products designed by the OEMs. EMS do not own the intellectual property of the products they produce. Most EMS are based in Western countries, but an increasing number of them are emerging in Asia (mainly China). Prominent examples of EMS are Flextronics and Hon Hai (Foxconn). Original Design Manufacturers, on the other hand, are contract manufacturers that both design and manufacture products for OEMs. These products carry the brand name of the OEM, but the intellectual property belongs to the ODM. Prominent examples of ODMs are Compal, Quanta and BenQ. Both EMS and ODMs often also produce other electronics products besides mobile phones for other OEM clients. Flextronics, for example, manufactures components and complete systems for computers, consumer electronics, and medical instrumentation in addition to telecommunications equipment (mobile phones). For more information on EMS and ODMs and the differences between the two, see Section 5.2 and Section 3.6.

Component manufacturers are also a type of contract manufacturers, but instead of producing a fully assembled handset, they produce only parts or components, such as lenses, motors or microphones, for mobile phones. Component manufacturers generally sell their products to a larger ODM or EMS contract manufacturer, who then sells the fully assembled handset to the OEMs. This means that component manufacturers lie in the sub-tiers of the supply chain where OEM oversight and codes of conduct are underdeveloped or non-existent. The result is that some of the worst labour and environmental conditions in the industry are found at component manufacturing facilities.

Another important type of company in the mobile phone industry is the mobile network operator (MNO). Although MNOs, also known as mobile service providers, do not directly manufacture handsets themselves, they have significant influence on the mobile telephone market because they provide the telecommunication service that allows people to communicate using their mobile telephone handsets. Consequently, mobile phone suppliers are attracted by mobile network operators, who are, in a sense, large scale consumers (and re-sellers) of mobile handsets. As a result, although only a fraction of their revenues come from handset sales, network operators view handset manufacturers as their most important suppliers. See Chapter 5 for more on MNOs.

Chapter 3
Industry Landscape and Trends

3.1. Slowing, but sustained, market growth

The first few years of the 21st century saw extraordinary growth in the wireless handset market. The industry's estimated compound annual growth rate (CAGR) for the years 2001-2004 averaged 22.2%.[4] Although Standard and Poor's[5] reports that global handset sales totalled more than 200 million units in the third quarter of 2005, marking the industry's biggest quarter ever, the industry's overall 2005 CAGR dropped somewhat over its previous average to 13.7%.[6] This downward trend is expected to continue, placing the projected average CAGR for the 2005-2010 period at 5.3%. By 2010, Datamonitor forecasts the number of handsets sold will reach a value of US $76.7 billion representing 627 million units.[7]

The primary reason for the decline in growth is the relative saturation of mobile phone markets in developed countries (see Figure 1). Most consumers in these markets already have at least one mobile phone, meaning that demand in these markets will primarily come from consumers wishing to upgrade and replace their current handsets. However, despite the relative decline in the industry's growth, the phenomenon of upgrading and replacing of phones in established markets is not insignificant, and is one of the reasons for the industry's projected sustained growth. Technological innovations such as high-data and 3G handsets will cause older technologies to become obsolete and require consumers to purchase upgraded phones. Another important factor sustaining the growth of the industry is an increase in the economies of developing countries, especially China and India, which contain many first-time buyers and in which demand for handsets is on the rise. Low penetration plus increasing purchasing power equals high market potential. Indeed, Figure 2 shows that the number of mobile phone users in the Asia-Pacific region is expected to nearly double in the four-year period 2005-2009.[8]

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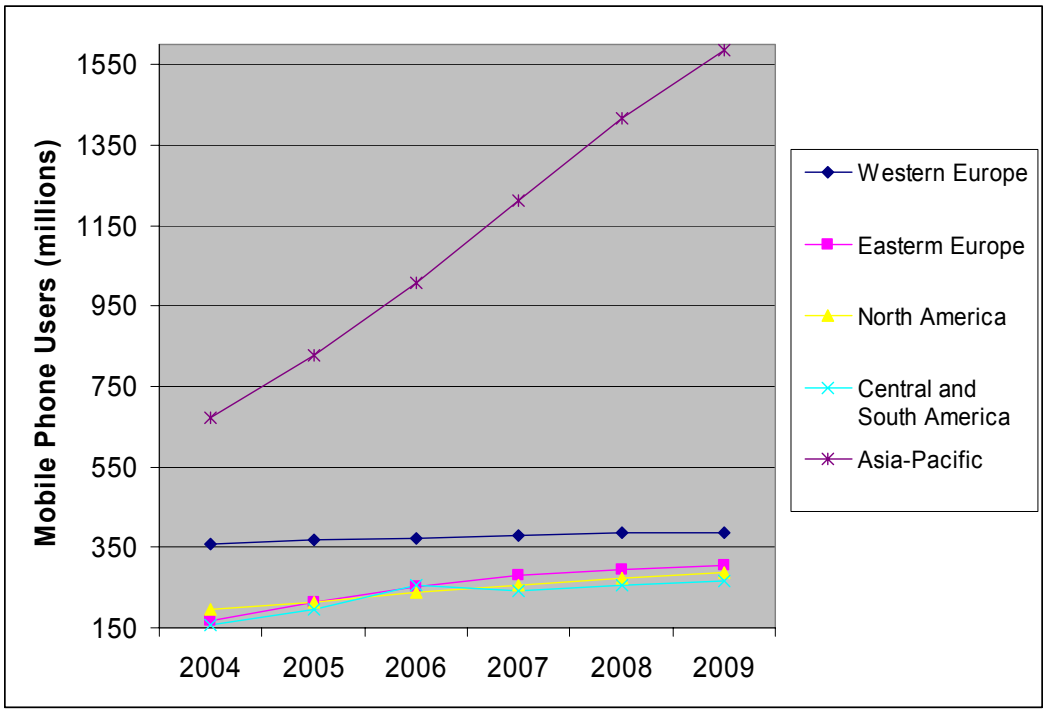
4 J. Wu, "Global OEM Manufacturing Analysis: Wireless Handset", iSupply, November 2005.
5 A. Bensinger, Standard and Poor's Net Advantage, Industry Profile: Communications Equipment, February 2, 2006.
6 Datamonitor, "Global Mobile Phones: Industry Profile," December 2005, p.3.
7 Datamonitor, "Global Mobile Phones: Industry Profile," December 2005, p.8.
8 G. Weaver, "The Mobile Phone Industry: A Strategic Overview," Reed Electronics Research, June 2005.

Figure 2: Global Mobile Phone Growth and Projected Growth by Region, 2004-2009



Based on: Reed Electronics Research, June 2005.

3.2. The strong get stronger: Concentration of market share

As revealed above, the wireless handset market is dominated by a small number of powerful players. This trend, which looks set to intensify in the coming years, is likely the result of large vendors benefiting from their economies of scale while the smaller players are suffering the effects of severe price competition (see Section 4.4). Table 1 reveals that, between 2004 and 2005, Nokia increased its market share by more than one percent and that Motorola grabbed a whopping extra five percent of the pie. Conversely, the handset vendors outside of the top five spots garnered only 23% of the market in 2005, a decrease of nearly six percent from the year-ago period. Siemens' decline in market share likely played a role the company's decision to sell the handset division to BenQ. If this trend continues, as seems probable, the smaller players may be forced to exit the market.[9]

[9] A. Bensinger, Standard and Poor's Net Advantage, Industry Profile: Communications Equipment, February 2, 2006.

Table 1: Global Sales and Market Share for Top Handset Producers, 2004-2005

Company	Sales (million units)		Market Share (%)	
	3Q 2004	3Q 2005	end-2004	end-2005
Nokia	52.2	67.0	31.0	32.6
Motorola	22.6	38.5	13.5	18.7
Samsung	23.0	25.7	13.7	12.5
SonyEricsson	10.7	13.8	6.4	6.7
LG Electronics	11.2	13.4	6.7	6.5
Siemens	12.8	9.5	7.6	4.6
Others	35.7	37.6	21.2	18.3

Source: Standard and Poor's, February 2006

Although they remain among the industry's top five producers, South Korean handset manufacturers Samsung and LG Electronics are experiencing a gradual decline in handset sales and market share. This is a significant change from the beginning of the decade when the Korean manufacturers' high-tech, expensive phones were in high demand. Just two years ago, Samsung was poised to overtake Motorola's number two spot, but its market share is now just over half the size of Motorola's.[10] Some analysts believe that the industry's shift toward the low-end segment and low-cost geographies (see Section 3.4 and Section 3.5.3) is hurting Samsung and LG because companies like Nokia, Motorola and Sony Ericsson have been more adept in making this transition.[11]

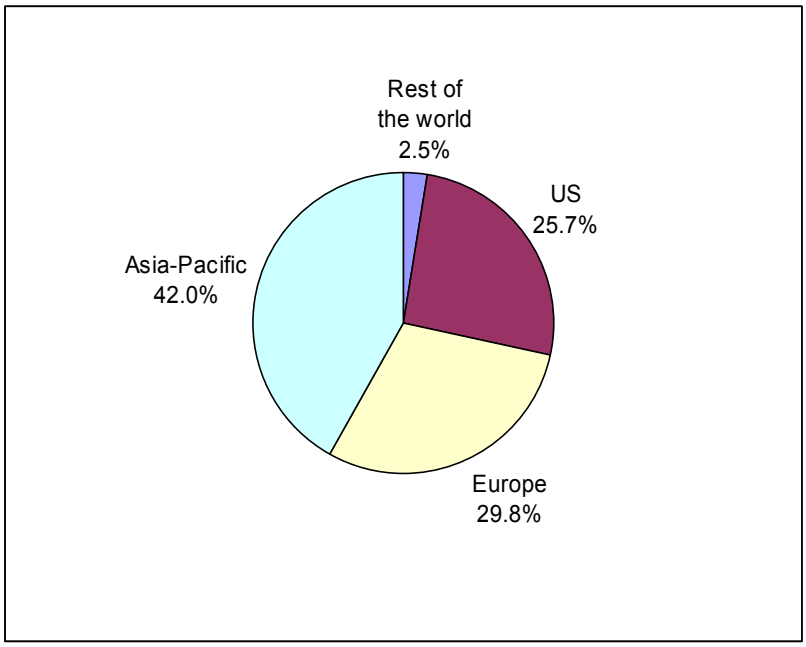
3.3. Market segmentation: Developing markets increasingly important

With slightly more than a quarter each, Europe and the United States share roughly equal portions of the wireless handset market. However, with 42% of the market and a value of US $24.8 billion, the Asia-Pacific region, which includes the saturated markets of Korea and Japan as well as emerging markets China and India, is the largest source of revenue for the industry (see Figure 3). Relative to other world regions, the Asia-Pacific share is expected to increase even further in the coming years as the number of mobile users in the region rises sharply (see Figure 2).

[10] Reuters, "Mobile phone woes dog Samsung, LG," 17 August 2006, News.com website <http://news.com.com/Mobile-phone+woes+dog+Samsung,+LG/2100-1039_3-6106797.html> (21 August 2006).

[11] Quoted in Ibid.

Figure 3: Global Mobile Phone Market Segmentation by Share of Value, 2005



Source: Datamonitor, December 2005

The rising number of mobile phone consumers in developing economies means that the low-end segment of the market is becoming increasingly important for handset manufacturers to target. The consequences of this phenomenon can already be seen in a number of other industry trends: It is causing some OEMs to rethink their outsourcing strategies (see Section 3.5.1) and may provide a boon for ODMs that specialize in low-end handset production. The increasing importance of the low-end market also means that mobile phone manufacturers will be competing fiercely to drive production costs ever lower in their attempt to gain control of this market (see Section 3.4). InCode analyst Bengt Nordstrom observes, "Nokia, Motorola and Sony Ericsson have experienced tremendous growth globally over the last few years – much of this can be attributed to the low-cost handset market, an area where LG and Samsung are not particularly strong".[12]

3.4. Driving down costs: Producing for the low-end market

Stiff competition and the desire to break into the mobile telephone market in developing countries are driving a race among mobile phone manufacturers to produce the lowest-cost handset possible. Since the beginning of 2006, many mobile phone OEMs have announced or reaffirmed their plans to launch low-cost handsets to tap into rapidly-growing emerging regions.[13]

[12] Quoted in Ibid.
[13] J. Wu, “Operations: OEMs and EMS,” iSuppli Market Watch, Volume 6, Issue 10, p.5, 27 March 2006.

Currently, the US $40 mark is the industry's floor, but many analysts warn that the price of a phone must fall even farther if the technology is to break into developing markets. Motorola, which won a contract from the GSM Association's Emerging Markets Handset Program to provide six million handsets to developing countries, is striving to produce those handsets at around US $30 in 2006.

A US $25 bill of materials has been touted by the handset industry as a goal for achieving large-scale uptake in developing countries. This bill represents the cost of the components and manufacturing cost for creating a handset. Some handset designers, such as a Cellon (China), are already approaching the US $25 mark. Cellon claims some of its basic designs can be manufactured for US $27 in volumes over one million units.[14] Portelligent estimates the current lowest-cost manufacture price of mobile telephone component parts to be the following:[15]

- US $6 Baseband
- US $2 Combo-Mem
- US $1 PM/analog
- US $2 RF chip/module (xcvr/FE + PA + sw)
- US $1 Modules/odd-forms
- US $1 Passives
- US $2 Casing
- US $2 Battery
- US $2 PCB
- US $1 LCD
- US $1 Testing
- US $1 Assembly
- US $2 SW/IP licenses
- US $1 Accessories/packout
- **TOTAL US $25 (€21)**

The global mobile telephone handset industry is thus entering a transition phase. The market will continue to grow in terms of units, but the average price per unit seems likely to decline. The majority of units manufactured between 2007 and 2010 will be priced low in order to gain market share in emerging markets like China and India. Some companies' attempts to raise the average price per unit using high-tech smart phones may help secure price stability in developed countries, but this will have little impact on the average global price. In order to stem a loss of profits due to the falling market price of handsets, major handset manufacturing companies are building production facilities in emerging markets in order to take advantage of lower labour costs.[16]

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[14] PMN, "Low-cost handset initiative promotes agenda of global inclusion," 23 February 2005, <http://www.pmn.co.uk/20050223lowcostm.shtml> (24 October 2005).

[15] Portelligent website, no date, <http://www.portelligent.com/> (28 September 2005).

[16] MarketResearch.com website, "Mobile Handheld Device Companies to Build Production Facilities in Low-cost Countries to Save Manufacturing Costs," May 2005, http://www.marketresearch.com/product/display.asp?productid=1103813&SID=89034610-332106876-

As a result of this trend, many developing countries, because of their cheap land and labour costs, have seen and will continue to see exponential growth in investment for mobile phone handset manufacturing.

3.5. Globalisation of the production network

Due to intensive competition on price, the production network of the mobile phone handset sector, like that of the information technology industry in general, has undergone and continues to undergo a good deal of restructuring. Throughout this process, a number of trends have emerged. These include vertical integration of the supply chain with increasing outsourcing, vertical re-integration by contract manufacturers, and production shifting to low-cost countries.

3.5.1. Relatively high degree of vertical integration, but outsourcing is on the rise

As in other sectors of the information and communications technology (ICT) industry, outsourcing of handset manufacturing operations is on the rise. However, the outsourcing trend is considerably less prevalent in the mobile phone industry than other ICT sectors, such as PCs. In contrast, the wireless handset sector continues to exhibit a relatively high degree of vertical integration. While mobile-phone OEMs are expected to outsource a significant portion of their production to contract manufacturers over the next few years, the majority of final assembly production will likely be kept in house. It should be noted that, for purposes of simplicity and clarity, outsourcing in this report refers to final or box assembly of handsets; the percentage of outsourced component manufacture is much higher, but is also too complex to provide accurate figures.

In 2005, approximately 30% of worldwide wireless handset production was outsourced,[17] compared to 85% outsourcing of notebook computer final assembly.[18] Sony Ericsson is the largest outsourcer in the industry, with nearly 66% of its production outsourced (primarily to Flextronics and Arima Communications).[19] However, a number of the industry's largest OEMs have chosen to keep the bulk of production in-house in order not to reveal their intellectual property on mid and high-complexity phones. For example, Motorola outsources approximately 30% of production, and industry leader Nokia outsources only about 20% of its handset production, relying largely on EMS rather than ODMs. Other major companies are even stricter in their outsourcing policy: LG outsourced

377815822> (accessed 21 September 2005).

[17] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.3.

[18] I. Schipper and E. de Haan, "Critical Issues in the ICT Hardware Manufacturing Sector," SOMO, September 2005, p.25, <http://www.somo.nl/html/paginas/pdf/ICT_Sector_Report_2005_NL.pdf>.

[19] EMS Now, "iSupply predicts limited Outsourcing for mobile-phone OEMs", 11 November 2005, <http://www.emsnow.com/newsarchives/archivedetails.cfm?ID=10983> (accessed 31 July 2006).

only three percent of its annual shipments of wireless handsets to contract manufacturers in 2005,[20] and Samsung manufactured 100% of its mobile phones in-house.[21]

There are a number of reasons that outsourcing of mobile phone production is lower than in the computer sector. To begin with, the PC industry is much more standardized than the handset industry. While there are only two primary PC platforms (Intel/AMD and Apple-based) and only a few major operating systems, there are numerous design platforms for handsets, such as Texas Instruments, Motorola, Nokia, and many more. It is unlikely that ODMs will be able to master all of these design platforms and provide full contract manufacturing services to the OEMs as they do in the PC sector.

Furthermore, wireless handsets are, in many ways, more complex than PCs, and the handset industry is driven by constant technological innovation. The development of new generation mobile phones requires immense research and development resources, and, while the design capabilities of contract manufacturers are increasing, only OEMs are likely to have deep enough pockets to pioneer new technologies. While PCs often work independently and use a standardized protocol when communicating with each other, mobile phones rely on base stations that are constructed by different companies. It is very difficult, requiring extensive field testing and radio frequency expertise, to make a wireless handset compatible with all base stations. ODMs are not likely to carry this type of technical knowledge, which continues to be the domain of the OEMs.[22]

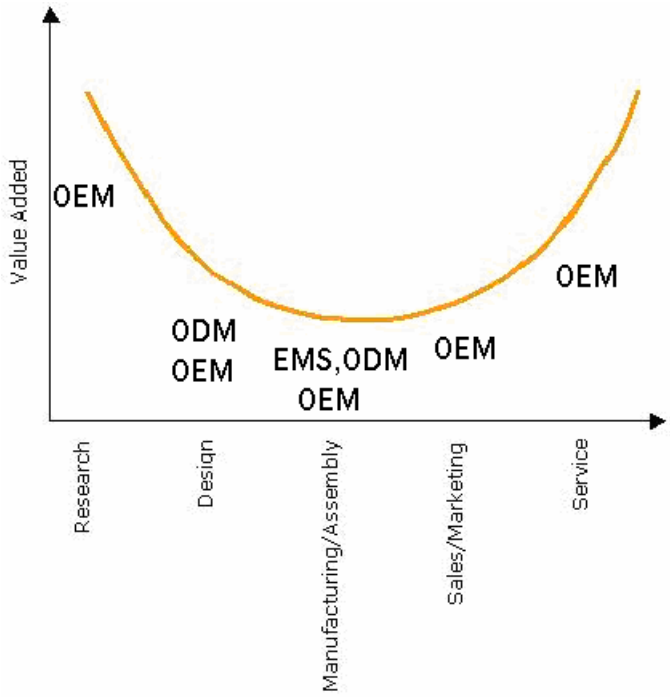
Despite the relatively low level of outsourcing in the mobile phone industry, the phenomenon is clearly on the rise. Due to rapidly changing markets and technologies, OEMs are under constant pressure to increase flexibility by scaling production volumes up or down and reduce manufacturing costs. In this regard, outsourcing production to contract manufacturers (both EMS and ODMs) has a number of advantages for OEMs such as reducing production costs, allowing them to focus on core competencies of marketing and sales, and accelerating their products' time to market.

Thus, as leaders in the industry focus on achieving market control through product innovation, they are beginning to lose their interest in the "small" profit margins of manufacturing in order to concentrate more heavily on higher value added activities such as research and service. In a process called vertical specialisation, product innovation is increasingly separated from manufacturing, thus working contrary to vertical integration. As OEMs focus more and more on understanding customer needs, design and distribution, there is pressure to get the less-profitable manufacturing assets off the balance sheet.[23] Figure 4 is based on the so-called "Smiling Curve", devised by Acer Group founder Stan Shih, which tracks the value chain of the PC industry. This graph is also useful for the mobile phone industry in understanding how manufacturing activities have relatively little value added when compared to activities such as research and

[20] J. Wu, "Operations: OEMs and EMS," iSuppli Market Watch, Volume 6, Issue 10, p.5, 27 March 2006.
[21] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.15.
[22] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.5.
[23] Bill Lakenan, Darren Boyd, and Ed Frey, "Why Cisco Fell: Outsourcing and Its Perils", Third Quarter, 2001 <http://www.strategy-business.com/press/article/19984?pg=all>.

service. The various types of mobile phone companies are plotted on the graph according to their activities in the value chain.

Figure 4: Value Chain of the Mobile Phone Industry with Company Types



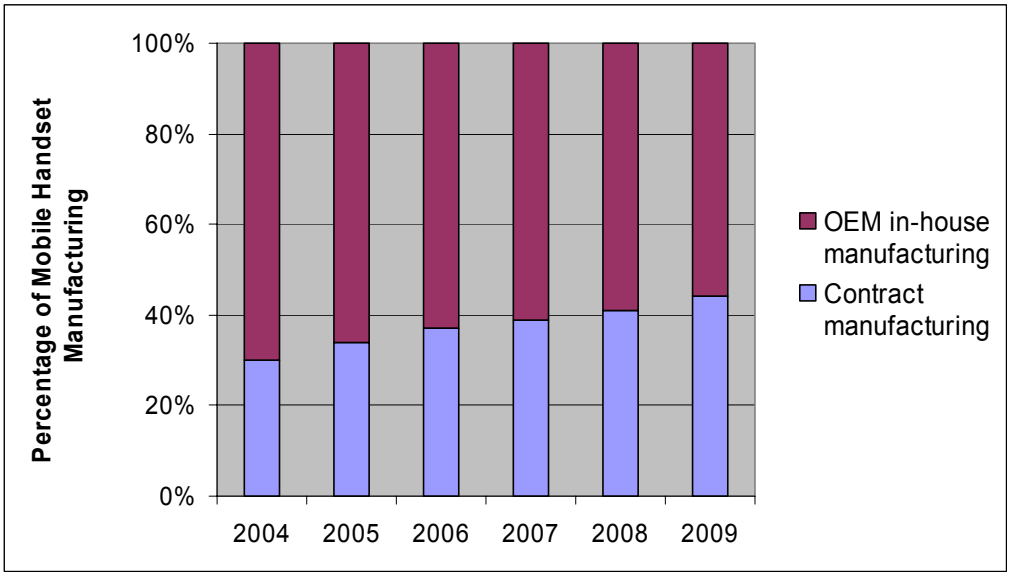
Based on: Stan Shih, "Smiling Curve"[24]

OEM companies such as Motorola and Sony Ericsson, which already outsource a significant portion of production, will likely further increase their manufacturing outsourcing, and companies that currently maintain nearly all production in-house look set to begin to outsource somewhat. Furthermore, since 2004, telecommunications operators such as Vodafone and Orange are increasingly bypassing the OEM node in the supply chain and using outsourced ODM production to market their own line of mobile phones (see Chapter 0). As a result, most analysts expect outsourcing to stay on the rise. iSupply, for example, estimates that the growth rate of the outsourced handset manufacturing sector for the 2004-2009 period will reach 6.0%.[25] Figure 5 illustrates the forecasted rise in outsourcing of mobile phone manufacturing from approximately 34% in 2005 to 44% in 2009.

[24] Reproduced in J. Wu, "ODMs face challenges in ascending the value chain," 15 August 2005, EMS Now website, <http://www.emsnow.com/npps/story.cfm?ID=13397> (accessed 8 August 2006).

[25] J. Wu, "Global OEM Manufacturing Analysis: Wireless Handset", iSupply, November 2005.

Figure 5: Estimated Percentage of Mobile Phone Production by OEMs vs. by Contract Manufacturers, 2004-2009



Source: iSuppli, November 2005

3.5.2. Vertical re-integration by contract manufacturers

Outsourcing and restructuring among OEMs have also affected industry dynamics among contract manufacturers. Since some mobile phone OEMs began to outsource and sell off production units to contract manufacturers in the second half of the 1990s, CMs have strived to offer full scale manufacturing and supply chain management from engineering to logistics. One way to achieve this is by acquiring not only the production units of OEMs, but also the specialised design manufacturing capabilities in components and software as well as the logistics. This provides CMs a way to improve their profit margins. A prime example of this trend is former ODM BenQ's recent purchase of the entire handset division of OEM Siemens (see Section 5.2.1).

The idea behind vertical reintegration is seizing greater market share through industry consolidation. Contract manufacturers believe they can make these operations more profitable than the OEMs were able to, given that manufacturing is their core competency. They expect, through consolidation, to achieve greater purchasing power, increased economies of scale, and less exposure to market variability. This model is sometimes referred to as the Own-Brand Manufacturer (OBM) model because contract manufacturers with marketing capabilities begin to sell handsets on the international market under their own name. For example, BenQ will now market dual brand BenQ-Siemens handsets internationally.

As a result of many ODMs becoming OBMs, they find themselves directly competing with OEMs even as they continue to provide contracted phones to the same OEMs. The dominant strategy for OBMs simultaneously competing with and providing for OEMs is to

segregate model types or distribution channels to avoid direct competition with particular models. The second most common strategy is simply to stay "under the radar" by selling only a small number of units directly. Some believe that this competition will be a hindrance to OEMs adopting higher levels of outsourcing in the future.[26] For example, up until 2004, Motorola was BenQ's primary customer; however, as a result of BenQ's own-brand strategy and the competition that it created between Motorola and BenQ, Motorola decided to shift its orders from BenQ to Compal Communications in 2005.

3.5.3. Production shifting to low-cost countries

The drive to produce cheap phones for emerging markets has led a number of major mobile phone manufacturers to shift their production to areas where land and labour costs are lower. China is by far the top recipient of this shifting production. In 2001, China accounted for 20% of world mobile phone production; by 2004, that figure had risen to 36%, and by the end of the decade, China is expected to host around 75% of world production.[27] Table 2 compares the estimated capacity allocation of in-house facilities of several mobile phone OEMs across different regions of the world.

Table 2: Capacity Allocation for In-House Facilities per Global Region, 2005

	BenQ Mobile	LG	Samsung	Sony Ericsson
Low-cost Countries (China, India, Brazil, Hungary, Mexico, Vietnam)	73.7%	27.2%	75.2%	100%
Mid-range Countries (Korea, Singapore, Taiwan)	5.3%	72.9%	24.8%	
High-cost Countries (Finland, Germany, US)	21.1%			

Source: iSupply Corp., March 2006

As low-cost countries compete to attract investment from the multinational mobile phone producers and promote growth in exports, setting up Special Economic Zones (SEZs) is becoming an increasingly popular solution. The number of SEZs in the world has risen sharply over the past few decades. On a global scale, there were 79 SEZs in 1975, but that number rose to more than 3,000 in 2002. Those 3,000 SEZs are located in 116 countries (almost all of them developing nations), directly employ more than 43 million people, and produce 15% of the world's total exports.[28] For more information on SEZs in China and India, see Sections 4.1.2, 4.2.3, and 6.5.

[26] I. Schipper and E. de Haan, "Critical Issues in the ICT Hardware Manufacturing Sector," SOMO, September 2005, p.25, <http://www.somo.nl/html/paginas/pdf/ICT_Sector_Report_2005_NL.pdf>.

[27] G. Weaver, "The Mobile Phone Industry: A Strategic Overview," Reed Electronics Research, June 2005.

[28] International Confederation Of Free Trade Unions (ICFTU), "Export Processing Zones – Symbols of Exploitation and a Development Dead-End", September 2003, p. 8.

3.6. EMS vs. ODMs

Although both EMS and ODMs are considered contract manufacturers, there are significant differences among them as well as a high degree of competition between them. As mentioned above, EMS are contract manufacturing services companies that produce the brand name products designed by the OEMs. EMS do not own the intellectual property of the products they produce. Most EMS are based in Western countries, but due to the growing importance of emerging markets and stiff price competition, an increasing number of them are emerging in Asia (mainly India and China). ODMs, on the other hand, are contract manufacturers that both design and produce products for OEMs. These products carry the brand name of the OEM, but the intellectual property belongs to the ODM.

As a result of their stronger design capabilities, ODMs enjoy slightly higher profit margins than EMS. Figure 4 revealed that OEMs' design activities can achieve a higher value added than manufacturing and assembly activities, the area in which EMS companies typically operate. Accordingly, average ODM margins in the handset sector currently hover around 9%-10% while EMS margins reach 3%-5%.[29] OEMs generally contract out low-end and mid-range production to ODMs in order to tap the growing market in developing countries and save on research and design expenses.

Despite lower profit margins, EMS may have an advantage over ODMs in the future as a result of technological advances and the introduction of 3G and 4G phones. This is because most ODMs do not currently have the technical capability to compete with OEMs in next generation phones, and the OEMs, wishing to retain their design advantage, will give outsourcing contracts to EMS rather than ODMs.[30] According to iSuppli, EMS providers produced approximately 17.3% of all mobile phones in 2005, a figure that is likely to rise as OEMs are increasingly incorporating EMS into their supply chain.[31]

The high degree of concentration at the OEM level means that the majority of both EMS and ODMs' sales come from a small number of customers. If they lose any of these customers, their sales could decline significantly. Strategic relationships with their major customers are thus extremely important for all contract manufacturers. Table 3 displays some of the major EMS and ODMs and their OEM customers.

[29] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.6.
[30] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.6.
[31] J. Wu, "Global OEM Manufacturing Analysis: Wireless Handset", iSupply, November 2005.

Table 3: Major EMS/ODM Mobile Phone Suppliers, 2004

Company	EMS/ ODM	Major Customer(s)	Handsets Produced in 2004 (millions)
Flextronics	EMS/ODM*	Motorola, Siemens, Sony Ericsson	74
Elcoteq	EMS	Nokia, Sony Ericsson, Philips, Siemens	37
Hon Hai (Foxconn)	EMS	Motorola, Nokia, Sony Ericsson	23
Arima Communications	ODM	Sony Ericsson	22
Solectron	EMS	Motorola	19
BenQ	ODM	Motorola, Nokia, Siemens	15**
China Electronics Corp.	EMS	Philips	11
Compal Communications	ODM	Motorola, Panasonic	8.6
Quanta Computer	ODM	Philips, Siemens, Panasonic	5.7**
Lite-On Techonolgy	ODM	LG, Siemens, Alcatel	5.5

* In 2004, Flextronics' EMS segment accounted for ¾ of its handset revenues and its ODM segment, ¼

** Includes sales for own brand

Based on: Reed Electronics Research, 2005; Citigroup/Smith Barney, 2004.

Chapter 4
Manufacturing Countries

As in other sectors of the technology industry, there is a continuing shift of handset manufacturing operations to middle and low income countries. Globally, the geographic focus of electronics manufacturing has shifted over the years, passing from developed countries to Japan in the 1960s, to Taiwan and Korea in the 80s, to Mexico in the early 90s, and to China in the late 90s and early 21st century. Today, China is clearly the dominant handset manufacturing country, but the drive to lower costs is leading manufacturers to look toward India and other Asian countries such as Thailand in search of lower costs.[32] This Chapter gives an overview of corporate social responsibility and the mobile phone manufacturing sector in several production countries. For the specific critical issues uncovered by field research in the manufacturing countries mentioned below, see Chapter 6.

4.1. China

4.1.1. Companies and production details

Mainland China is by far the largest mobile phone manufacturing country in the world. In 2001, China accounted for 20% of world mobile phone production; by 2004, that figure had risen to 36%, and by the end of the decade China is expected to host around 75% of world production. China produced 240 million mobile phone handsets in 2004.[33] Since 1999, the ICT and electronics industry has been China's largest industrial sector, and it currently accounts for more than 14% of Chinese GDP. The ICT hardware industry has been growing at a rate 10% higher than the average industrial growth. Two factors enabled this rapid growth: inexpensive labour and a large consumer market. At the beginning of 2001, there were already 144 million mobile phone users in China - more than in any other country in the world. However, over 60% of the mobile phones produced in China are exported. Nokia and Motorola alone account for nearly two-thirds of the exported GSM handsets.[34] In fact, Motorola is one of the leading foreign investors in China. As of 2005, the company had invested approximately US $3.6 billion in China and purchased over US $3.8 billion in local goods and services from 170 local, foreign and joint-venture suppliers manufacturing components in China.[35]

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[32] J. Wu, "ODMs face challenges in ascending the value chain," 15 August 2005, EMS Now website, <http://www.emsnow.com/npps/story.cfm?ID=13397> (accessed 8 August 2006).
[33] G. Weaver, "The Mobile Phone Industry: A Strategic Overview," Reed Electronics Research, June 2005.
[34] G. Weaver, "The Mobile Phone Industry: A Strategic Overview," Reed Electronics Research, June 2005.
[35] Motorola, M. Loch, Motorola, email communication with J. Wilde, SOMO, 31 October 2006.

Mainland China has more than 50 licensed mobile phone-producing factories, and many more unlicensed ones. Table 4 lists some of China's largest handset and handset parts manufacturers by region and province. The country's largest indigenous mobile phone producer is Ningbo Bird Co. Ltd, which churned out 20 million phones in 2004 and generated US $200 million in export revenue.

Table 4: Major Mobile Phone Producers Operating in China by Region and Province, 2004

Region	Province	Company
Northern China	Beijing	Capitel Group
		Chinese Electronics Corp. Telecom
		Datang Mobile
		Foxconn International
		Nokia Beijing
		Panasonic Beijing
		Sony Ericsson (Beijing SE Putian Mobile Communications)
	Tianjin	Ares Communications, Tianjin
		Dbtel Technology, Tianjin
		Motorola
		Samsung Electronics
		Sanyo Electric
	Shandong	Haier-CCT, Qingdao
		Hisense, Qingdao
		Langchao Electronic Information Industry, Shangdong
		Langchao LG Digital Mobile Communications, Ji-Nan
	Inner Mongolia	TCL Mobile, Hohhot
	Liaoning	Dalian Daxian
		Dalian Daxian Pantech Communications, Dalian
Central China	Hubei	Langchao/LG Electronics, Qinhuangdoo
		NEC Wuhan
	Guizhou	China Zhenhua Science & Technology, Guizhou
		Kyocera-Zhenhua, Guiyang
Yangtze River Delta	Shanghai	Ares Communications, Shanghai
		Dbtel Technology, Shanghai
		Siemens Shanghai
	Jiangsu	Arima Communication, Wujiang
		Benq, Suzhou
		Compal Communications, Nanjing
		Inventec Appliances, Nanjing
		Mitac Interantional, Jiangsu
		Nanjing Postel Wong Zhi Telecom
		Panda Mobile Comms, Nanjing
		Quanta Computer, Songjiang

		Solectron, Suzhou
		TAMP, Suzhou
	Zhejiang	Eastcom, Hangzhou
		Foxconn International, Hangzhou
		Mitsubishi Soyea Mobile Comm., Hangzhou
		Ningbo Bird, Fenghua
		UTStarcom, Hangzhou
Southern China	Fujiang	Amoi Mobile, Xiamen
		Chabridge Telecom, Fujian
		Legend XOCECO (Lenovo Group)
	Guangdong	China Electronics Corp, Shenzhen (Philips)
		Foxconn International, Shenzhen
		Giant Wireless Technology Ltd., Shenzhen SEZ
		Hivac Startech Film Window (Shenzhen) Co. Ltd., Shenzhen
		Huawei Technologies, Shenzhen
		Kangyou Electronics Co. Ltd., Dongguan City
		Kejian (jv with Samsung), Shenzhen
		Konka Comms., Shenzhen
		Lite-On Technology, Guangzhou
		Nokia Dongguan
		Shenzhen SED Electronics
		Soutec, Guangzhou
		TCL Mobile, Huizhou
		Telsda, Shenzhen
		ZTE Corp (Shenzhen Zhongxing Telecom Co Ltd)

Based on: Reed Electronics Research, 2005

In the 1990s, a large ICT and electronics industrial region emerged along China's coast, reaching from the south to the north, with hardware production in Guangdong Province, microchip production in Shanghai, and software development in Beijing (Peking). Southern China, particularly the Pearl River Delta in Guangdong Province, is home to a large part of the country's manufacturing, accounting for 30-40% of the country's foreign trade. Shenzhen City, in Guangdong Province, is the country's leading export zone, and Dongguan, also in Guangdong, ranks third. According to a study carried out by China's Ministry of Labour and Social Security, the wages of employees in the Pearl River Delta have increased by an average of 15% during the last 12 years. During the same period, consumer prices have risen more than 150%. As a result, workers' buying power and quality of life has dropped.[36]

Field research for SOMO's study was conducted at the facilities of three companies in the mobile phone industry in China.[37] Giant Wireless Technology Ltd., Kangyou Electronics

[36] Guangdong Statistical Yearbook 2004.

[37] This field research was conducted by Students and Scholars against Corporate Misbehaviour (SACOM

Co., Ltd., and Hivac Startech Film Window (Shenzhen) Co., Ltd. are suppliers of handset parts. All of these facilities are located in the heavily industrialized Guangdong Province in southern China

Hong Kong-based Giant Wireless Technology Ltd. offers product design, manufacturing, marketing, distribution, and brand management for customers that include Motorola, Siemens, Sanyo, Olympia, Metro, Alcatel, Atlinks, Logicom, Cobra, Southwestern Bell, and Wal-Mart. Giant Wireless is a direct (1st tier) supplier of Motorola. Giant Wireless's Shenzhen-based plant is located at the Nanshan District in the SEZ, the first economic laboratory in southern China opened up to global capital by the Chinese government. It occupies a huge production site of 3 multiple-story buildings. A housing quarter of 8 collective dormitory buildings, within a 15 to 20 minutes walk from the manufacturing base, are provided for its 5,500 internal migrant, transient workers. In response to the issues uncovered at Giant Wireless (described below), Motorola says that it takes the situation seriously and that it planned to conduct an audit in November 2006 and take corrective action with to improve conditions.

Kangyou Electronics Co., Ltd. is an enterprise of about 400 workers founded in September 2000 in Dongguan City in Guangdong Province. The factory premise is about 6,000m^2, with four blocks of manufacturing facilities. Workers are specialized in making charger plugs, ear phones, and data connectors for mobile phones. These parts are low-cost and low-value added components for cell phones and do not carry any brand's logo. Kangyou's products are not manufactured or marketed on behalf of any of the major brands; nevertheless, Kangyou and companies like Kangyou play an important role in the mobile phone industry as its products are compatible and intended for use with handsets made by the major brands.[38] Kangyou products are often sold in stores as replacement parts for big brand handsets.

Hivac Startech Film Window (Shenzhen) Co., Ltd. employs approximately 500 in the Shenzhen SEZ where it produces lenses for mobile phone handsets. Hivac Startech supplies Hon Hai Precision Industry Co., Ltd. (Foxconn), a first tier Motorola and Nokia supplier, with lenses for two of Motorola's products. Workers at Hivac Startech also claim that the company produces lenses for Nokia handsets and have produced a photograph of a lens made in the factory with the name "Nokia" on it. Upon being presented with this evidence, Nokia reviewed its supply relationships and contends that they have neither a direct nor a subcontracting relationship with Hivac Startech. It should be noted that mobile phone supply chains are very long and complex and that large electronics OEMs are sometimes unaware of the companies that occupy the sub-tiers of their supply chains. Nevertheless, Nokia asserts that no relationship exists, and, based on the evidence provided SACOM, the company claims to have commenced an independent legal investigation into the possible manufacture of counterfeit Nokia products by Hivac Startech. At the time of publication of this report, that investigation was ongoing.

– www.sacom.hk) in the period of March-September 2006.

[38] See Kangyou Electronics' website <http://www.kangyou.com.cn/english/product_show.asp>.

4.1.2. Production environment

The All-China Federation of Trade Unions (ACFTU) is China's sole legal union organization. It is a centralized, monopolistic organ with branches at different levels. The central tasks of the ACFTU are to facilitate the development of a socialist market economy and to maintain stability. Production congruency and economic efficiency are placed at a higher priority than redressing workers' grievances. Under Article 10 of the 2001 Trade Union Law, all types of enterprises with at least 25 employees, including private and foreign-invested enterprises, are supposed to contain "basic-level trade union committees" on the shop floors. A socio-political goal of the law is to pre-empt the development of independent worker unions outside the framework of the ACFTU. Despite the Trade Union Law's stipulations, only 33% of the some 480,000 foreign-funded enterprises[39] and less than 30% of private enterprises in China nationwide have set up basic-level union branches according to the law.[40] In China, there are no laws protecting workers' right to strike. While there is no law explicitly forbidding strikes, striking workers are often criminally charged for "disturbing the social order" or "provoking quarrels to create trouble". In this sense, the juridical protection of workers in China is inadequate.

One reason for the incredible industrial development boom in southern China is the government's decision to create Special Economic Zones (SEZs) in southern cities like Shenzhen and Yuhai. When the Shenzhen SEZ was first created in the early 1980s, Shenzhen was a small fishing village that has since exploded into an export-manufacturing leviathan, producing 45% of the world's watches, one-third of the world's shoes, and much of China's exportable electronic goods.[41] The central Chinese government gives SEZs special policies and flexible measures, allowing SEZs to operate under liberal economic, labour and environmental laws. SEZs in China are allowed independent financial planning and have province-level authority on economic administration. SEZs also have legislative authority in local congress and government. For more on SEZs, see Section 6.5.

Minimum wages in China differ per province, but also inside and outside the SEZ in a province. For example, Table 5 indicates the levels of legal minimum wage in Shenzhen City.[42]

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[39] All-China Federation of Trade Unions, "Unions in Foreign Enterprises," 2005, <www.acftu.org.cn/news.htm> (accessed 15 September 2005).

[40] Chang Kai, "Collective Bargaining: Problems and Solutions," International Union Rights 11(4):4, 2004, <www.ictur.org>.

[41] P. Oskarsson, "Indian Attraction: Profitable multinationals as subsidy junkies," FinnWatch, November 2005.

[42] The geographic area of entire Shenzhen city is 2,020 km^2, 327.5 km^2 of which is occupied by the SEZ. Wage levels inside the SEZ are higher than outside because the Municipal Government grants preferential policies including tax exemption and cheap land price to attract high-tech, high-valued, capital-intensive enterprises at the SEZ. With these benefits, the SEZ companies can afford to pay a slightly higher level of minimum wage, which helps recruit workers of high calibre.

Table 5: The Levels of Legal Minimum Wage in Shenzhen City, 2000 – 2006

Year	Monthly Wage (US$)		Hourly Wage (US$)	
	Shenzhen SEZ	Outside the SEZ	Shenzhen SEZ	Outside the SEZ
2000 – 2001	$68.37	$53.37	$0.39	$0.30
2001 – 2002	$71.75	$55.00	$0.41	$0.31
2002 – 2003	$74.37	$57.50	$0.43	$0.33
2003 – 2004	$75.00	$58.12	$0.43	$0.33
2004 – 2005	$76.25	$60.00	$0.44	$0.34
2005 – 2006	$86.25	$72.50	$0.49	$0.42
2006 – 2007	$101.25	$87.50	$0.58	$0.50

Source: Chinese Ministry of Labor and Social Security, 2006.[43]

4.2. India[44]

Mobile phone production only began in India in 2005. However, the period 2005-2006 has seen an influx of investment in handset manufacturing facilities by OEM and EMS companies alike. Some industry analysts see India's future in mobile phone hardware manufacturing as following that of China. Shirish Sankhe of the consulting firm McKinsey notes, "India's telecoms sector is exploding and all the big handset makers are talking about setting up manufacturing facilities here so they can cater to this strong domestic demand. They will then use India as a global manufacturing hub to source markets around the world, which is exactly what happened in China 10-15 years ago."[45]

4.2.1. Companies and production details

As the sector is in its nascent stages, most of the facilities have been in production for only a few months and are still 'ramping up' to full production. As of December 2006, OEMs LG, Nokia and Samsung, along with EMS Elcoteq and Flextronics, have set up manufacturing units in India that are now in production. Motorola plans to be in production by the first quarter of 2007 in what the company calls "the first step in a multi-phase manufacturing strategy for India."[46] A number of other key players in the industry have also announced intentions to set up in India. Table 6 provides some basic information about the handset manufacturers currently operating or planning to operate in India. Note that the manufacturing units are distributed across the country with the only cluster occurring at the Sriperumpudur belt near Chennai.

[43] Original figures were given in China Yuan (Renminbi) and converted to US$ at USD 1 = CNY 7.9.

[44] Unless otherwise noted, the information in this section is based on research conducted by the Indian organisation Civil Initiatives for Development and Peace (CIVIDEP) in March-September 2006.

[45] Quoted in J. Johnson, "Back to the future: India is gaining belated credibility as an emergent export titan," Financial Times, 30 November 2005, p.11.

[46] J. Johnson, "Back to the future: India is gaining belated credibility as an emergent export titan," Financial Times, 30 November 2005, p.11.

Table 6: Current and Scheduled Mobile Phone Manufacturing Units in India, 2006

Company	Company type	Production Start Date	Unit Location in India	Producing for
Elcoteq	EMS	April 2005	Electronic City, Bangalore, Karnataka	Nokia, Indian multinational
Flextronics (Pondicherry)	EMS	December 2005	Thirubhuvanai Village, Pondicherry.	Motorola, Sony-Ericsson
Flextronics (Chennai)	EMS	Scheduled August 2006	Sriperumpudur, near Chennai, Tamil Nadu	
LG	OEM	January 2006	Ranjangaon district, Pune, Maharashtra	Own brand
Motorola	OEM	Scheduled first quarter 2007	Sriperumpudur, Chennai, Tamil Nadu	Own brand
Nokia	OEM	December 2005	Sriperumpudur, Chennai, Tamil Nadu	Own brand
Samsung	OEM	January 2006	Industrial Model Township, Manesar, Gurgaon, Haryana	Own brand

Companies in the sector are currently importing the majority of their raw materials (75-90% of the total bill), but this is not viewed as a sustainable situation for the mobile manufacturing sector, and some key investments by component manufacturers in India suggest the potential for a component supply base to develop there. For example, currently LG sources only 10-15% of its mobile phone components domestically compared to 80% Indian sourcing for its other electronics products. The components sector is thus expected to grow in the next few years.

Mobile phone manufacturing companies in India are currently engaged largely in labour-intensive, low-technology assembly work with little of the value added production taking place in the country. The EMS companies manufacturing in India are producing for OEMs for supply to the domestic market. Elcoteq is supplying to Nokia, and Flextronics Pondicherry unit is supplying almost all of its output to Motorola. The companies are producing both GSM and CDMA handsets for all levels of the market. Many of the facilities are also engaged in production of low-volume telecommunications equipment, but the focus remains on handset production. Assembly work dominates the production processes occurring at the units. Table 7 provides information on the types of products and production processes taking place in India.[47]

[47] The information in this table is based on interviews with company management in India.

Table 7: Products and Processes of Handset Manufacturers in India

Company	Mobile phone products	Production processes
Elcoteq	Handsets and accessories	Sub assembly, full assembly, box built, PCB manufacturing and servicing/repairs.
Flextronics – Pondicherry (projected)	This unit is manufacturing handsets for Motorola, including the C115, a low-end handset.	Box build and product assembly lines. Semi knock-down operations and semi and full assembly. Flexing, packing and testing.
Flextronics – Chennai	Telecom hardware including handsets.	Plastic injection moulding and painting, PCB assembly, sheet metal enclosure manufacturing, distribution, logistics, full product assembly, testing and repairs.
LG	GSM and CDMA handsets including the high-end models: U8110, U8120, U8130 and U8138.	Assembly work.
Motorola (projected)	GSM and CDMA handsets including low-cost GSM models.	
Nokia	GSM handsets. Initially producing the 1100, Nokia's entry level handset.	Final assembly, sub-assembly and manufacturing of PCBs.
Samsung	GSM handsets. Mid-range and premium level phones only.	Assembly work.

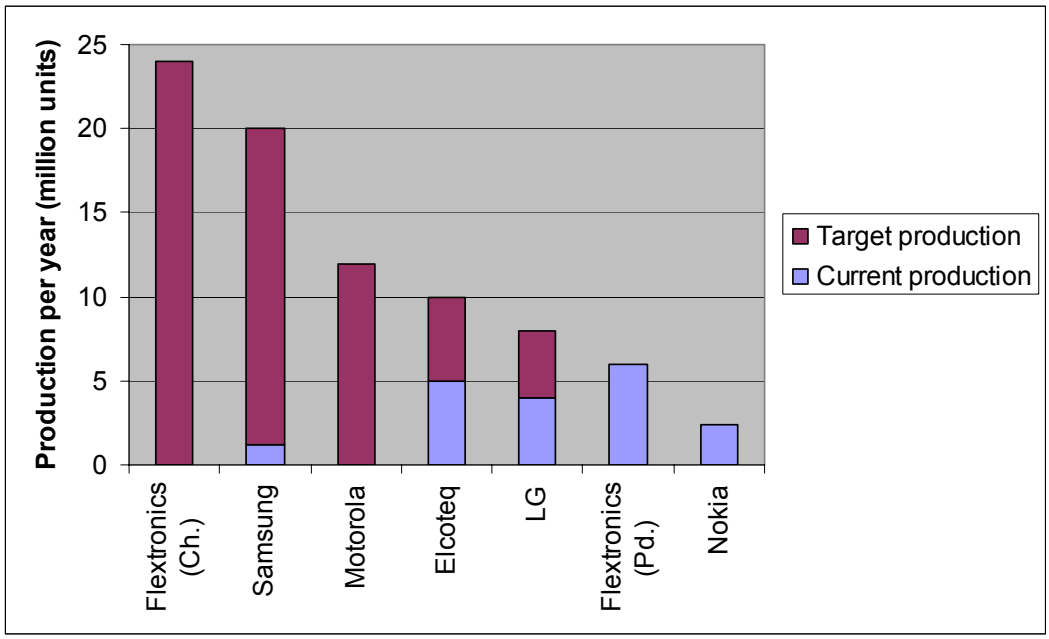
Companies located in India are currently producing largely for the domestic market but aspire to export on average 30% of their 'made in India' products. Unlike India's current electronics hardware exports, which are targeted largely at developed countries, mobile phone manufacturers indicated that exports would be targeted at relatively local markets such as Southern, Western and Eastern Africa, the Middle East, and other parts of South Asia. According to CIVIDEP, the fact that mobile phone exports originating from India will be primarily destined for developing countries could have considerable impacts on the regulatory framework that will apply to these products. For example, pressure from consumers or governments of the countries importing the product are likely to be lower (e.g. the European environmental standard RoHS will not apply to these products), and concepts such as social rating and labelling are less well-established in these countries. This may increase the need for companies to be regulated in the country of production (India) or the country where the investment originates. As of end-2006, investment in India's mobile phone production sector has come primarily from Finland (Nokia and Elcoteq), South Korea (LG and Samsung) and Singapore (Flextronics).

Figure 6 reveals that combined mobile phone production in India reached at least 18.6 million units in 2005.[48] Based on target production estimates by company managers,

[48] It should be noted that there was considerable discrepancy in reporting on production levels. The figures presented in the graph were taken from various newspaper sources in India, but LG management reported a higher figure of current production of 6 million units per annum, Flextronics

mobile phone companies in India will likely be churning out in excess of 80 million handsets by 2010. This figure could be considerably higher due to the fact that no target production figures were available for Flextronics (Pondicherry) or Nokia, whose production is almost certain to rise above current levels.

Figure 6: Current (2005) and Target Production Levels for Indian Handset Manufacturers



Because the sector is so new, the developmental impact of mobile phone manufacturers locating in India is largely unknown. Employment generation is one potential benefits, and the jobs generated so far, although limited in number, appear to provide opportunities at a level below the IT and related professions but above the more typical manufacturing jobs. Technology transfer, an often-cited benefit of foreign investment is likely to be limited if manufacturing in India continues to focus on assembly work. In addition, the costs imposed on the Indian population due to the vast incentives being offered by the government to companies setting up in India are likely to significantly dampen any net gains from the sector.

4.2.2. Employment and workforce

Direct employment by the OEM companies in India currently totals just under 4,000, but this figure will rise far beyond that when the handset production units reach full capacity.[49]

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management claimed a figure of 80 million units per annum and Nokia 48 million. This graph thus represents the lower bound production estimates for 2005.

[49] Again, this is a lower bound estimate of employment since no target employment figures were available for Samsung, LG, or Flextronics (Pondicherry). Actual target employment is likely to be much higher than 14,000.

Indirect employment from companies supplying for and servicing the mobile phone units identified in this research will be even higher. For example, Nokia estimates that the Nokia SEZ will employ a total of 10,000 employees when international component suppliers and service providers locate there. Suppliers Perlos and Aspocomp have already announced their intention to locate in the Nokia SEZ, each employing around 1,000 people.[50] Similarly, LG, which employs approximately 3,000 in all of its electrical equipment manufacturing in India, indirectly employs three times that many through outsourcing.

Table 8: Current (August 2006) and Target Direct Employment by OEM and EMS units in India

Company	Current employment
Motorola	Not yet operational
Nokia	2,400
Samsung	200
LG	150
Elcoteq	450
Flextronics – Pondicherry	500
Flextronics - Chennai	Not yet operational
Total	**3,700**

Table 9 reveals that workers in the sector are young, mostly their early twenties, highly educated compared to other manufacturing workers, and are both male and female. The concentration of female workers varies vastly across units, comprising 10% of the workforce in some units and 75% in others.

One interesting fact that emerges from Table 9 is the high level of vocational technical education among production workers in India's handset manufacturing industry. Technical qualification has become a source of prestige for families whose access to sites of secondary education had historically been limited. Thus, investing in the vocational training of a son or (increasingly) a daughter has been a major livelihood strategy for families and communities on the economic periphery of urban India who seek upward social mobility. Young workers with this technical training thus carry the burden of their parental aspirations and community expectations and are therefore willing to travel long distances and endure poor labour conditions without complaining to work at a "prestigious" multinational company.

Labour costs make up a tiny fraction of the cost of handset production in India with estimates suggesting that 1-2% of the total costs of production are attributable to wages.[51] LG estimates that labour is a smaller component of the cost structure in mobile phone production (1.2%) than in the production of other consumer electronics (1.6%). Labour costs are likely to comprise an even smaller percentage of overall costs in production that

[50] The Hindu online, "Nokia ropes in global component units," 12 March 2006, <http://www.hindu.com/2006/03/12/stories/2006031202871500.htm> (accessed 8 October 2006).

[51] This percentage is based on information given by Elcoteq, Flextronics, and LG.

is outsourced; LG estimates that, for the work they outsource, 0.5-0.6% of total costs are labour costs. The vast majority (approximately 90%) of costs for mobile phone production is for raw materials.

Table 9: Workforce Characteristics for Indian Handset Manufacturing Units

Company	Women in workforce (%)	Average age range	Education Level of Operators	Employees working as operators (%)
Elcoteq	10%	25 years old although many workers are younger.	All employees must speak English. Workers generally have ITI or other vocational training.	63%
Flextronics (Pondicherry)	40%	23-25 years old	ITI Diploma in Electronics.	
LG	45-50%	26-27 years old	15 years of education plus ITI.	
Nokia	75%	21 years old	12th standard with marks of 60% or above.	71%
Samsung	10%	Most workers are 18-22 years old	Majority of workers educated to 12th standard, some have graduated.	75%

4.2.3. Government policy and regulation

Government policy has provided a stimulus to the growth of the sector by removing the ceiling to foreign investment, providing a favourable duty structure for those manufacturing for the domestic market and offering extensive incentives to investors. Further incentives both in the form of financial benefits and regulatory relaxations are being discussed. Clearly, handset manufacturing in the context of electronics hardware is a priority area for the government.

Regarding the regulatory environment, labour laws in India are quite extensive and do offer significant protection to workers. Labour issues are therefore generally the result of the relaxation of the implementation of the laws and outright violations. Environmental legislation is more limited as many exemptions to regulation are granted to the electronics industry. Environmental regulation is further reduced by individual state policies and in Special Economic Zones. E-waste is a serious issue in India and poses a significant risk both to the environment and to those involved in handling e-waste in the informal recovery and recycling sector. There is currently no specific legislation applicable to e-waste in India.

Incentives provided by central and state governments for companies to locate in India take the form of financial benefits and relaxations of labour and environmental laws. The most significant incentive package offered to date is that associated with Special Economic

Zone (SEZ) status.[52] Setting up SEZs is becoming an increasingly popular solution applied by all states in India to promote growth in exports as well as to attract Foreign Direct Investment (FDI). According to the Indian Department of Commerce, an SEZ is "a specifically delineated duty-free enclave and shall be deemed to be foreign territory for the purposes of trade operations and duties and tariffs".[53] In addition to special rules in the trade-related area, SEZs enjoy exclusive, i.e. lax, regulations with regard to taxation, environment, labour and public disclosure. For more information on SEZs and relaxed regulation, see Section 6.5.

4.3. Philippines

The electronics industry in the Philippines has been one of the country's largest foreign exchange earners, accounting for approximately 70% of total exports since 1998 and contributing more than US $24 billion in 2002. The primary products are semiconductors, consumer electronics, and components for electronic data processing in computers and mobile phones. Approximately 800 companies are currently engaged in electronics manufacturing in the Philippines, 72% of which are foreign-owned or owned by multinationals. The electronics industry in the Philippines employs over 300,000 workers. In the Cavite Economic Zone (CEPZ), where SOMO's research s been focused, about 24,000 employees work in more than 80 electronics factories. The research for SOMO's study was conducted by the Workers' Assistance Center at three factories in the Philippines between June-September 2006.

The Philippine International Manufacturing and Engineering Services (P.IMES) in the Cavite Economic Zone is a subsidiary of Japan International Manufacturing and Engineering Services. P.IMES produces backlights for mobile phones. Workers at P.IMES indicated that the company was producing parts for Nokia and Samsung, but Nokia denies that any relationship exists, and Samsung claims that the relationship with P.IMES was terminated in 1998. Workers identified the company's other customers as Sony, IBM, Humex, Apple, Nanox, Casio and Omron.

Astec Power Phil. Inc. in Cavite, Philippines is a wholly-owned subsidiary of US-based Emerson. Astec has a total workforce of 4,000 employees producing electronic power conversion products. Among its customers are Nokia and LG, along with Sony, HP, Fujitsu, IBM, Compact and Certek Laguna.

Micro-device Technology in the Cavite Economic Zone is wholly owned by the Japanese Sumitomo Metal Micro-Devices, Inc. With 900 employees, Micro-device Technology manufactures plasma displays for Samsung. Workers at Micro-device also indicated that

[52] For a detailed description and analysis of SEZs and other incentives for foreign investment in India, see P. Oskarsson, "Indian Attraction: Profitable multinationals as subsidy junkies," FinnWatch, November 2005.

[53] Department of Commerce, Government of India, "Special Economic Zones India", http://www.sezindia.nic.in/faq.asp (accessed 31 July 2006).

the company was producing parts for Nokia, but Nokia denies that any relationship with Micro-device exists.

4.4. Thailand

In Thailand, SOMO conducted research at two factories supplying parts for Nokia handsets.

LTEC Ltd. is an electronics parts manufacturer based in Lamphun Province, Thailand. LTEC is a subsidiary of Japanese-based Fujikura and has shareholders in both Thailand and Japan. LTEC is a second tier supplier for Nokia. In addition to mobile phone chips, LTEC also produces parts for Sony cameras, Acer computer notebooks, Fujitsu microchips, IBM SIMs, Toshiba calculators, and control screens for Sharp microwaves. LTEC manufacturers approximately 200,000 mobile phone chips per day almost solely for export. The company employs more than 6,000, 60% of which are female, and plans to expand to 10,000 employees. 75% of workers are full-time, the remaining 25% employed as part-time or contract workers. LTEC is certified to ISO 9002 and ISO 14000 standards.

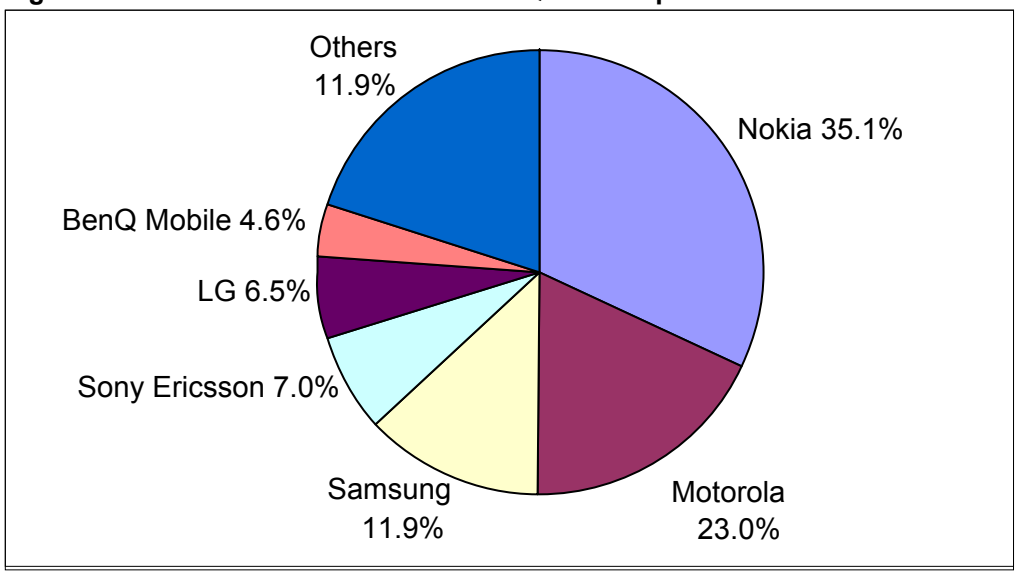
Namiki Precision (Thailand) Co., Ltd., headquartered in Japan, produces mobile phone motors for Nokia handsets at its factory in the Lamphun province of Thailand. The factory produces 72,000 motors a day. Namiki employs approximately 3,000 workers, 90% of whom are women. The company claims to adhere to ISO 9000 and ISO 14000 standards.

Chapter 5
Major Players in Mobile Phone Handset Manufacturing

5.1. OEMs

Figure 7 reveals that the market for mobile telephone handsets is dominated by a small number of large multinational OEMs, with the industry's top five companies controlling more than 75% of the market. It is interesting to note, however, that Flextronics, a contract manufacturer, is the seventh largest manufacturer of handsets worldwide, ranking just behind BenQ Mobile.

Figure 7: World Market Share based on 2Q 2006 shipments



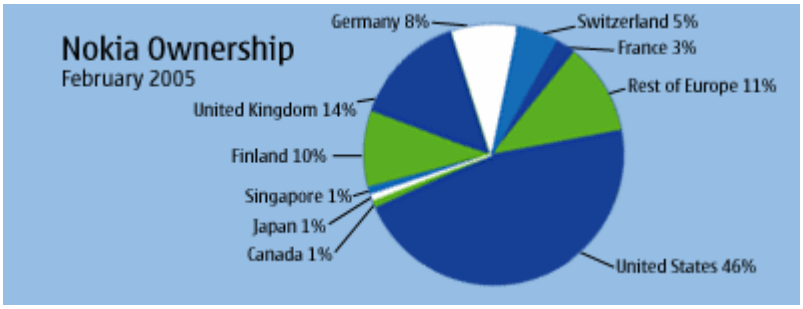
Based on: Circuits Assembly, August 2006[54]

[54] R. Norvell, "Motorola Stars in Q2 Mobile-Phone Ranking," 09 August 2006, Circuits Assembly website <http://circuitsassembly.com/cms/cms/content/view/3777/95/> (accessed 11 August 2006).

5.1.1. Nokia

Nokia, based in Finland, is a global leader in telecommunications and the world's largest mobile phone manufacturer. Nokia is a publicly-traded company on the stock exchanges in Helsinki, Frankfurt, Stockholm, London, and New York. Nokia's shareholder structure depicted in Figure 8 reveals that roughly 50% of the company's shares are owned in the US, and 50% in Europe.

Figure 8: Nokia Shareholder Structure, 2005



Source: Nokia

Nokia is the industry leader in terms of market share, and it continues to consolidate its position, churning out 78.4 million handsets in the second quarter of 2006 (2Q06), up 7% from the previous quarter and up 26% from a year ago. Nokia's market share rose to 35.1% in 2Q06, up from 33% in the second quarter of 2005.[55] Nokia's turnover in 2005 was € 34,2 billion and net profit was € 3,6 billion. Nokia consists of four business units, with the mobile phone unit accounting for approximately 63% of its net sales. Nokia employed 58,874 in 2005.[56]

In terms of strategy, Nokia announced this year that it will not be forming a proposed CDMA device company with Sanyo. Instead, Nokia intends plans to ramp down its own CDMA R&D and manufacturing by April 2007, participating selectively in key CDMA markets, with a special focus on North America. In an effort to build up its low-cost portfolio, Nokia introduced two new low-cost phones in the second quarter of 2006: the Nokia 6080, its lowest-cost camera phone, and the Nokia 6151, its lowest-cost 3G model.[57] Nokia outsources an estimated 20-25% of its final assembly to a wide range of suppliers (see Section 3.5.1).[58]

Table 10 lists Nokia's subsidiaries around the world.

[55] Nokia website, "Quarterly and annual information – Q2 2006," <http://www.nokia.com/link?cid=EDITORIAL_10934> (accessed 4 October 2006).
[56] Company.info, Nokia, <http://company.info> (accessed 9 October 2006).
[57] Nokia website, "Quarterly and annual information – Q2 2006," <http://www.nokia.com/link?cid=EDITORIAL_10934> (accessed 4 October 2006).
[58] G. Weaver, "The Mobile Phone Industry: A Strategic Overview," Reed Electronics Research, June 2005.

Table 10: Nokia Subsidiaries

Company	Country	% Nokia ownership
Nokia Inc	United States	100.00%
Nokia GmbH	Germany	100.00%
Nokia UK Limited	United Kingdom	100.00%
Nokia TMC Limited	South Korea	100.00%
Nokia Finance InternationalB V	Netherlands	100.00%
Nokia Komarom Kft	Hungary	100.00%
Nokia do Brazil Technologia Ltda	Brazil	100.00%
Nokia Italia SpA	Italy	100.00%
Nokia India Ltd.	India	100.0%
Dongguan Nokia Mobile Phones Company Ltd	China	70.0%
Beijing Nokia Hang Xing Telecommunications Systems Co. Ltd	China	69.0%
Beijing Capitel Nokia Mobile Telecommunications Ltd	China	52.9%

Source: Thomson Extel Cards Database, October 2005

While it maintains several manufacturing units in Europe and the US, Nokia is shifting some of its production to Southeast Asia, Latin America and Central and Eastern Europe in order to keep production costs low and margins and profits high.[59] The company has research and development (R&D) facilities in Finland, India, Denmark, Germany, UK, China and USA. The company's own production units are located in Salo, Finland; Bochum, Germany; Komárom, Hungary; Reynosa, Mexico; Fleet, UK; Fort Worth, USA; Manaus, Brazil; Masan, South Korea; and Chennai India.[60]

In addition, Nokia has considerable production capacity in China. Nokia began business operations in China in 1985. Today, Nokia has more than 4,500 employees working at five R&D centres and four Nokia-owned production plants (Beijing, Suzhou, Dongguan and Fujian). In addition, Nokia works with numerous contract manufacturers and parts suppliers. A 2005 study by Finnwatch and the Finnish ECA Reform Campaign identified Nokia's largest production partners and subsidiaries in China.[61]

CSR Policies[62]

Nokia adopted its initial Code of Conduct in 1997, setting out the company's vision on corporate responsibility and issues such as human rights, labour and environmental standards. According to Nokia, the code is a living document, reviewed every two years

[59] Datamonitor website, Marketline Online Database, no date, < http://www.datamonitor.com> (accessed 24 August 2005).

[60] PMN website, "Nokia establishes Indian manufacturing presence," 06 April 2005, <http://www.pmn.co.uk/newsarchive0504.shtml> (28 September 2005).

[61] L. Kaiming and D. Xin, "Day and Night at the Factory," 17 March 2005, FinnWatch & Finnish ECA Reform Campaign.

[62] Nokia responded immediately to SOMO's request for an interview regarding its CSR policies. The information in this section is based on documents available on Nokia's website; a telephone interview with A. Klemetti, Corporate Social Responsibility, and A. Oxley-Green, Sourcing and Procurement, Nokia, 12 June 2006; and Nokia's feedback on a draft of this report in October/November 2006.

adapted when necessary. It has changed a few times since 1997.[63] For example, the Global Reporting Initiative, ILO conventions, the United Nations' Universal Declaration of Human Rights and the Convention on Rights of the Child, and the SA8000 standard are specifically mentioned on Nokia's website with the disclaimer that the company tries to adhere to the "spirit" of the SA8000 when not the exact letter of this standard.[64] The company's current Code of Conduct maintains that, "Products and services sold under the Nokia brand require sourcing practices that uphold internationally accepted standards and legal compliance on human rights as well as workplace practices throughout the value chain".[65]

Table 11: Nokia's Largest Partners and Subsidiaries in China

Company	Established	Partner(s)	Products
Beijing Capitel Nokia Mobile Telecom Co., Ltd.	1995	Beijing Capitel Co. Both own 50%. One of largest joint ventures in China	GSM digital cellular systems and mobile phones
Beijing Nokia Hangxing Telecom Systems Co., Ltd.	1995	Beijing Hangxing Machinery Manufacturing Corp.	Mobile digital switches, base station controllers, fixed digital switches
Dongguan Nokia Mobile Phones Co., Ltd.	1995	Nokia's most important mobile phone factory worldwide. 500 employees	
ChongQing Nokia Telecom Co., Ltd.	1998		Products for fixed networks
Nokia CITIC Digital Technology Co. (Beijing)	1999	CITIC Technology; Academy of Broadcasting Science	Multimedia terminals
Fujian Nokia Mobile Telecommunications Ltd.	1997		Technical services for GSM 900/1800 networks
Nokia (Suzhou) Telecom Co., Ltd.	1998	Shanghai Alliance Investment Ltd.	GSM base stations and cellular transmission products

Based on: Finnwatch and the Finnish ECA Reform Campaign, 2005

Nokia participates in a number of voluntary CSR initiatives. Nokia has been a member of the UN Global Compact since 2001. Although Nokia is not a member of the Global e-Sustainability Initiative (GeSI), the company does participate in GeSI's supply chain and capabilities working groups. Nokia has not signed the Electronics Industry Code of Conduct (EICC) because it claims that its own requirements on social issues, quality, health and safety, and environment are comparable to the EICC; it thus sees no need to work with a new code.[66]

[63] A. Klemetti, Corporate Social Responsibility, Nokia, and A. Oxley-Green, Sourcing and Procurement, Nokia, 12 June 2006, interview with E. de Haan and I. Schipper.
[64] Nokia website <www.nokia.com> (3 October 2006).
[65] Nokia website, <http://europe.nokia.com/crr/pages/social/supply_chain_index.html> (24 October 2005).
[66] A. Klemetti, Corporate Social Responsibility, Nokia, and A. Oxley-Green, Sourcing and Procurement,

Nokia also claims to value stakeholder engagement in developing CSR policy. For example, Nokia specifically cites as community involvement its operational cooperation with the World Wildlife Foundation.[67] Nokia also participated in a GeSI multi-stakeholder workshop in 2005 at which some NGOs, socially responsible investors, academics and the International Labour Organization were invited to comment on what is being done by the industry. It should be noted, however, that industry initiatives such as GeSI often involve stakeholders on a relatively superficial level and that "stakeholder engagement" rarely results in stakeholders' involvement or their concerns being put into practice.

Nokia has an extensive set of global "Nokia Supplier Requirements" that includes ethical considerations for labour conditions and environmental requirements. The issues named in the supplier requirements are integrated in the contracts with the suppliers. Nokia asks that suppliers integrate the issues in their own policy and system, but believes that "having a strict supplier code of conduct will create confusion among suppliers and force them to spend too much time figuring out how to abide with the codes that different electronics companies have".[68] At the moment, Nokia does not require its suppliers to get certification on norms such as the ISO and SA8000 because it feels that, "for some areas this will become very difficult, and suppliers will not be able to comply, for example on Freedom of Association and working hours. This is specifically true for countries like China. If we want to be realistic, the standards will be difficult to achieve".[69]

The company admits that workers in the supplier factories are probably not aware of Nokia's supplier requirements; there is no direct communication with the workers on social standards, for example. Nokia expects the workers in a supplier to know the specifics of their company's policy, which it evaluates and compares to its own policies.

In terms of monitoring suppliers, "Nokia commits to monitoring the ethical performance of its suppliers and to taking immediate and thorough steps in cases where the ethical performance of its suppliers comes into question".[70] Nokia conducts two different types of assessments: 1) system assessments, which evaluate a supplier's compliance with Nokia many company requirements, and 2) in-depth assessments evaluating the supplier's performance on environmental or social issues. The in-depth assessment generally includes workers interviews, management interviews, dormitory checks, and factory checks. Nokia conducts between five and ten in-depth assessments each year and does around 100 system assessments. Nokia is also currently collaborating with the GeSI to develop a self-assessment questionnaire for suppliers.

Nokia claims that most of the suppliers it works with to supply mobile phone parts are long term suppliers, which gives them a good basis for improving social and environmental issues. In order to help suppliers understand what the requirements are, implement them,

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Nokia, 12 June 2006, interview with E. de Haan and I. Schipper.

67 Ibid.

68 Ibid.

69 Ibid.

70 Nokia website, <http://europe.nokia.com/crr/pages/social/supply_chain_index.html> (24 October 2005).

and build competence of their own, Nokia has SA8000-certified employees that give trainings.

When asked how far down the supply chain it sees its responsibility, Nokia replied that it focuses on the first tier and requires its suppliers to set requirements for their own suppliers; this will be checked during the assessment. Although it claims to strive to deal with companies that comply with international standards, Nokia notes that, "It is not feasible to cover all of the tiers, not with our own representatives. And this is not our responsibility, especially if we are talking about legal requirements".[71]

5.1.2. Motorola

Motorola, Inc., based in Illinois, USA, is a Fortune 100 company and the number two provider of mobile phones with a 23.0% share of the world market share as of June 2006. The company shipped 51.9 million handsets in the second quarter of 2006. Motorola's common stock is listed on the New York, Chicago, and Tokyo Stock Exchanges. In 2005, the company generated net sales of US $35.26 billion and a net profit (earnings from continuing operations) of US $4.52 billion, directly employing approximately 69,000 workers at 320 facilities in 73 countries. Motorola is comprised of three businesses: Connected Home Solutions, Networks & Enterprise, and Mobile Devices, which designs, manufactures, sells and services wireless handsets with integrated software and accessory products. In 2005, the Mobile Devices segment accounted for 58% of the company's net sales.[72]

Motorola's primary corporate customers are AT&T, Wireless, Cingular, Telcel Mexico, T-Mobile, Verizon and Vodafone.[73] Over the last several years, Motorola has undergone considerable restructuring in which it has shifted some production to contractors and implemented extensive layoffs to reduce costs.[74] Motorola is benefiting from a recent trend toward concentration in the industry (see Section 3.2). At the end of 2005, Motorola had increased its share by five percent from the previous year.

Table 12 lists Motorola's subsidiaries around the world.

Motorola's handsets are primarily manufactured in Asia. The company has R&D facilities located in Argentina, Australia, Brazil, Canada, China, Denmark, France, Germany, India, Ireland, Israel, Italy, Japan, Malaysia, Poland, Russia, Singapore, South Korea, Spain, United Kingdom and the United States. Motorola's own production facilities are located Brazil, China, Germany, South Korea, Singapore, and Malyasia.

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[71] A. Oxley-Green, Sourcing and Procurement, Nokia, 12 June 2006, interview with E. de Haan and I. Schipper.

[72] Motorola, M. Loch, Motorola, email communication with J. Wilde, SOMO, 31 October 2006.

[73] Thomson Extel Cards Database, 23 November 2005.

[74] Hoover's Online Database, "Company Records: Motorola," 10 January 2005.

Table 12: Motorola Subsidiaries

Company	Country
Motorola Australia Proprietary Ltd	Australia
Motorola Industrial Ltda	Brazil
Motorola Servicos Ltda	Brazil
Motorola Canada Ltd	Canada
Hangzhou Motorola Cellular Equipment Co Ltd	China
Motorola (China) Electronics Ltd	China
Motorola (China) Investment Ltd	China
Motorola SAS	France
Motorola Gmbh	Germany
Motorola Asia Ltd	Hong Kong
Motorola South Israel Ltd	Israel
Motorola Israel Ltd	Israel
Motorola Japan Ltd	Japan
Motorola Technology Sdn Bhd	Malaysia
Motorola Electronics Sdn Bhd	Malaysia
Motorola De Mexico SA	Mexico
Motorola Finance BV	Netherlands
Motorola Asia Treasury Pte Ltd	Singapore
Motorola Electronics Ptd Ltd	Singapore
General Instrument Of Taiwan Ltd	Taiwan, Republic of China
Motorola Electronics Taiwan Ltd	Taiwan, Republic of China
Motorola Ltd	United Kingdom
General Instrument Corp	
River Delta Networks Inc	
Synchronous Inc	
Network Ventures I Inc	
Motorola Credit Corp	
Tohoku Semiconductor Corp	Japan
Synchronous Inc	
Quantum Bridge Communications(R) Inc	
Force Computers	
MeshNetworks Inc	
CRISNET Inc	
Post Year End Acquisition	
Ucentric Systems Inc	
Post Year End Joint Venture	
Triarc Content Labs	

Based on: Thomson Extel Cards Database, 23 November 2005

Motorola currently uses around 3,600 suppliers globally for all of its products. The company's direct and sub-tier suppliers include Celestica, Flextronics, Foxconn International, and BenQ. Motorola outsources approximately 45% of its production of

mobile phones (see Section 3.5.1). In general, Motorola uses outsourcing to moderate the peaks and valleys in the seasonal market fluctuations and tries build up long-term relationships among good suppliers.[75]

CSR Policy[76]

Motorola has a detailed Code of Business Conduct[77] and corporate citizenship policy[78] available on its website. In place of CSR, the company prefers the term "Corporate Citizenship", and, on the most basic level, understands this to be a respect for people and planet. The concept of corporate citizenship covers nine major issues areas including innovative products, ethics and transparency, environmental quality, diversity and inclusion, safe and healthy workforce, economic opportunities and growth, supplier relationships, community support and shareholder value. Employees are made aware of Motorola's vision of CSR through trainings, called "town halls", as well as through a number of other mechanisms such as monitors/screens placed throughout the workplace constantly reminding them of Motorola's vision.[79]

Motorola is heavily involved in international initiatives because it says it realizes that solving problems cannot be done on an individual company basis and that the entire industry must be involved if conditions are to be improved. Motorola is active in the Global e-Sustainability Initiative, for which the company has done a good deal of benchmarking. Motorola has a leadership role within the Supply Chain Working Group (SCWG) of the GeSI; Motorola's Michael Loch is the co-chair of the SCWG, and Motorola is part of the Guidance Group, which coordinates the collaborative efforts of GeSI and the Electronics Industry Code of Conduct Implementation Group.

Motorola's 2005 Corporate Citizenship Report[80] outlines a number of different areas/ways in which Motorola claims to engage stakeholders. These include engaging socially responsible investors, conducting an employee engagement survey, engaging with suppliers (see below), maintaining a government relations office, and engaging stakeholders affected by operations at the local level.

Motorola sees its responsibility as covering the entire supply chain, but its main focus is on first tier suppliers with the expectation and the requirement that they push the standards on to their suppliers. The company outlines a number of principles that suppliers must abide by such as no forced labour, no child labour, anti-discrimination, freedom of association, fair working hours and wages, safe and healthy working condition, and environmental sustainability. On its website, the company stipulates, "As a condition of doing business with Motorola, suppliers will conform to these expectations and

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75 M. Loch, Director of EHS Strategic Functions, Motorola, 13 July 2006, interview with J. Wilde, SOMO.

76 Motorola responded immediately to SOMO's request for an interview regarding its CSR policies. The information in this section is based on documents available on Motorola's website; a telephone interview with M. Loch, Director of EHS Strategic Functions, Motorola, 13 July 2006; and Motorola's feedback on a draft of this report in October/November 2006.

77 Available at <http://www.motorola.com/content.jsp?globalObjectId=75-107> (accessed 5 June 2006).

78 Available at <http://www.motorola.com/content.jsp?globalObjectId=1646> (accessed 5 June 2006).

79 M. Loch, Director of EHS Strategic Functions, Motorola, 13 July 2006, interview with J. Wilde, SOMO.

80 Available at <http://www.motorola.com/mot/doc/6/6219_MotDoc.pdf> (accessed 5 June 2006)

endeavour to have their sources in the supply chain do so as well. Motorola will assess conformance to these expectations and will consider a supplier's progress in meeting these expectations and their ongoing performance in making sourcing decisions".[81]

Motorola verifies compliance with its standards by conducting audits among first tier suppliers. In order to monitor compliance, it claims to conduct a large number of audits. For each new supplier or for any supplier that has changed or restructured in any way, Motorola conducts a "capability mapping" audit. In 2005, Motorola conducted more than 75 assessments of Motorola suppliers around the world, including both capability mapping and more in-depth assessments. Suppliers operating in "high risk" areas were especially chosen for these audits. Motorola's criteria for choosing suppliers to audit include geographical location and the type of labour force. If problems are identified during an audit of a supplier, Motorola works with the supplier and has the supplier create a Corrective Action Plan that contains sustainable corrective actions. If the supplier chooses to not fix the issue or does not implement sustainable solutions, Motorola will terminate the relationship. In addition to audits, Motorola led the effort to develop the GeSI Supplier Self-Assessment Questionnaire and is in the process of rolling it out. As of October 2006, questionnaires have been completed for 115 facilities from 68 different suppliers.[82]

During the audits, Motorola evaluates what its suppliers are doing to manage their own supply chains. According to Michael Loch, the company is trying to build deep supplier relationships in order to have their standards penetrate deeper into the supply chain. Although Motorola does not proactively monitor sub-tier suppliers, Mr. Loch notes, "If we become aware of a problem in a second or third tier supplier, we will investigate and engage at that level".[83] A recent example of this is when SACOM, after conducting research for this study, alerted Motorola to concerns relating to a Chinese mobile phone component supplier, Hivac Startech Film Window (Shenzhen) Co., Ltd. In September, 2006, nine female Hivac Startech workers called on Motorola directly to take action to improve the poor health and safety and labour conditions at Hivac Startech's factory in Shenzen, China. Upon receiving this information, Motorola began an investigation of its relationship with Hivac Startech. With SACOM's assistance, Motorola was able to confirm that Hivac Startech sourced two lenses to Motorola's direct supplier, Hon Hai Precision Industry Co., Ltd. (Foxconn). Once Motorola verified a connection to Hivac Startech, Motorola retained an international social auditing firm, Intertek, to interview the workers and perform an audit of Hivac Startech. Intertek substantiated the claims of the workers, and Motorola now claims to be working to improve conditions at Hivac Startech.

5.1.3. Samsung Electronics Co., Ltd.

The Samsung Group, based in Seoul, is the top business group in South Korea, and its electronics unit is the group's flagship. In 2005, Samsung made sales of US $79.5 billion and an operating profit of $7.5 billion. Samsung Electronics controlled 11.9% of world

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[81] Motorola, <http://www.motorola.com/content.jsp?globalObjectId=1671-9224> (accessed 6 May 2006).

[82] M. Loch, Director of EHS Strategic Functions, Motorola, 1 November 2006, communication with J. Wilde.

[83] Ibid.

market share in mobile phones, produced 26.3 million handsets, and employed 123,000 workers in 2Q06. In September, 2004, Samsung announced it would invest 10.3 billion Won (US $1.5 million) to expand its mobile handset production base in China.[84]

Although it remains among the industry's top five producers, South Korean handset manufacturer Samsung is experiencing a gradual decline in handset sales and market share. This is a significant change from the beginning of the decade when the Korean manufacturer's high-tech, expensive phones were in high demand. Two years ago, Samsung was poised to overtake Motorola's number two spot, but its market share is now just over half the size of Motorola's.[85] Some analysts believe that the industry's shift toward the low-end segment and low-cost geographies (see Section 3.4 and Section 3.5.3) is hurting Samsung because its competitors have been more adept in making this transition. Samsung is the only mobile phone OEM that manufacturers 100% of its mobile phones in-house (see Section 3.5.1). [86]

The majority of Samsung Electronics' mobile phone production takes place in South Korea and China. Samsung Electronics has mobile phone R&D facilities in Kyungki (Korea), Yokohama (Japan), Beijing (China), Bangalore (India), Staines (UK), and Texas (USA). The company's mobile phone production sites include Gumi (S. Korea), Tianjin (China), Shenzhen (China – a joint venture with Samsung Keijan), Manaus (Brazil),Tijuana (Mexico) and India.[87] Table 13 lists some of Samsung Electronics' production subsidiaries around the world.[88]

CSR Policy[89]

Samsung's 2006 Global Code of Conduct for employees is rather vaguely worded and lacks detail. It states that the company "will comply with international standards, related laws and regulations, and internal regulations governing the health and safety of its employees", but contains no specific references to the appropriate international standards. The Code declares that the human rights of all employees will be respected and that there will be no discrimination on any kind of grounds. Samsung has not signed the EICC, nor is it a member of the GeSI or the Global Compact. Instead of describing Samsung's policy in CSR issues such as human and labour rights, the "Social Responsibilities" section of the company's website lists a number of community-based projects that include sponsoring

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84 K. Tae-gyu, "Samsung Goes Local for Cell Production," *The Korea Times* online, 13 November 2005, <http://times.hankooki.com> (accessed 21 November 2005).

85 Reuters, "Mobile phone woes dog Samsung, LG," 17 August 2006, News.com website <http://news.com.com/Mobile-phone+woes+dog+Samsung,+LG/2100-1039_3-6106797.html> (21 August 2006).

86 Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.15.

87 K. Tae-gyu, "Samsung Goes Local for Cell Production," *The Korea Times* online, 13 November 2005, <http://times.hankooki.com> (accessed 21 November 2005).

88 Samsung 2005 Annual Report, <http://www.samsung.com/AboutSAMSUNG/SAMSUNGGROUP/AnnualReport/pdf/05_finacial_overview_company_profile.pdf>

89 Samsung was unavailable to give an interview regarding its CSR policies, but it did provide feedback on a draft of this report in November 2006. The information in this section is based on documents available on Samsung's website and that feedback.

"public-interest activities such as academic advancement, art, culture and sports"[90] and having its employees do volunteer work.

Table 13: Samsung Electronics Production Subsidiaries

Company	Country
Samsung Electronics Huizhou Company (SEHZ), Huizhou	China
Samsung Electronics Suzhou LCD Co., Ltd. (SESL), Suzhou	China
Tianjin Samsung Electronics Company (TSEC), Tianjin	China
Suzhou Samsung Electronics Co., Ltd. (SSEC), Suzhou	China
Shenzhen Samsung Kejian Mobile Telecommunication Technology Co., Ltd.	China
Shandong Samsung Telecommunications Co., Ltd., Weihai	China
China Printed Board Assembly (TSED), Zhongshan	China
Tianjin Tongguang Samsung Electronics Company (TTSEC), Tianjin	China
Tianjin Samsung Telecom Communication (TSTC), Tianjin	China
Tianjin Samsung Electronics Display (TSED), Tianji	China
Samsung India Electronics Ltd. (SIEL), New Delhi	India
Samsung Telecommunications India Private Ltd. (STI), New Delhi	India
P.T. Samsung Electronics Indonesia (SEIN), Cikarang	Indonesia
Samsung Electronics Display (M) Sdn. Bhd. (SDMA), Seremban	Malaysia
Samsung Electronics (M) Sdn Bhd. (SEMA), Klang	Malaysia
Samsung Electronics Philippines Manufacturing Corp. (SEPHIL), Laguna Calamba	Philippines
Thai Samsung Electronics Co., Ltd. (TSE), Bangkok	Thailand
Samsung Vina Electronics Co., Ltd. (SAVINA), Ho Chi Minh City	Vietnam
Samsung Electronics Hungarian Co., Ltd. (SEH), Budapest	Hungary
Samsung Electronics Slovakia, S.R.O. (SESK), Glanta	Slovakia
Samsung Electronica Da Amazonia Ltda. (SEDA), São Paulo	Brazil
Samsung Electronics México (production) (SEM), Queretaro	Mexico
Samsung Méxicana S.A. de C.V. (SAMEX), Tijuana	Mexico

Samsung has committed itself to complying with international environmental agreements and using as few harmful materials as possible by phasing out hazardous chemicals identified by the European RoHS directive. The company has ambitious goals concerning the recycling of "waste products for the benefit of the environment" but provides little information on how it plans to achieve these goals.

Samsung does not have a separate code of conduct for suppliers, but its Global Code of Conduct makes a brief reference to "business partners". The Code states simply that, "The Company will select business partners in accordance with business objectives", and, "The Company will actively encourage business partners to fulfil their own social responsibilities with respect to safety within the workplace and the individual rights of their

[90] Samsung, "Global Code of Conduct," 2006.

employees". Again, no details are given. Samsung states that the phase-out of hazardous chemicals should also apply to all of its suppliers.

5.1.4. Sony Ericsson Mobile Communication AB

The joint venture between Japan-based consumer electronics maker Sony and Sweden-based Ericsson combines the cellular phone operations of both companies. Sony and Ericsson each own half of the venture, which began operations in October 2001 and is based in London, UK. Sony Ericsson was established to draw on the cellular technology of Ericsson (the world's leading maker of wireless infrastructure equipment) and Sony's expertise in developing popular consumer electronics. In 2005, the joint venture had approximately 5,000 employees, had sales worth €7.3 billion, a net income of €356 million and controlled 7.0% of the global mobile phone market. Sony-Ericsson is the industry's top outsourcer, contracting out 65.9% of its production in 2005, primarily to Flextronics and Arima Communications (see Section 3.5.1).[91]

Sony Ericsson has R&D facilities in Sweden, Japan, China, the UK, and the USA. It's in-house production is carried out in large part by its Chinese subsidiary Beijing SE Putian Mobile Communications in Beijing, China as well as Sony's production facilities in Alsace (France), Iwate (Japan), and Gifu (Japan). Sony Ericsson's recent awarding of a contract to EMS Foxconn for mobile phone manufacture suggests that the company is making a drive to tap the entry and mid-level segments, probably in emerging markets.[92]

CSR Policy[93]

Since the joint venture between Sony and Ericsson in 2001, Sony Ericsson has operated under a corporate social responsibility code. According to Mr. Pellbäck-Scharp, when Sony Ericsson talks about Sustainability and CSR, it is referring to the triple bottom-line – sustainable in terms of environment, wellbeing (both workers and society), and profitability. According to Sony Ericsson, this code helps employees make the ethical decisions necessary to perform their job duties on a daily basis. Although Sony Ericsson is not a member of GeSI, its parent Ericsson is a member, and Sony Ericsson keeps close watch on the developments within GeSI. For example, with regard to the supplier questionnaire developed by GeSI, Sony Ericsson already has its own questionnaire for suppliers, but it is waiting to see how the industry initiative standardises things before it changes. Sony Ericsson also stays abreast of developments in the EICC, but right now it feels that its own code of conduct is more extensive.[94]

Because it is a joint venture, Sony Ericsson doesn't have financial or CSR reports of its own – it is covered in each of its parent's reports. Direct communication with stakeholders

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[91] J. Wu, "OEMs and EMS – Foxconn makes inroads with Sony Ericsson," iSuppli, 7 December 2005.

[92] G. Weaver, "The Mobile Phone Industry: A Strategic Overview," Reed Electronics Research, June 2005.

[93] Sony Ericsson responded immediately to SOMO's request for an interview regarding its CSR policies. The information in this section is based on documents available on SE's website; a telephone interview with M. Pellbäck-Scharp, Director Environment & Supplier Quality Assurance, Sony Ericsson, 18 August 2006; and SE's feedback on a draft of this report in November 2006.

[94] M. Pellbäck-Scharp, Director Environment & Supplier Quality Assurance, Sony Ericsson, 18 August 2006, telephone call with J. Wilde, SOMO.

is one area Sony Ericsson is trying to improve. It has decided to focus on improving communication with it's suppliers first. In the fall of 2006, it held a "supplier day" in which suppliers were invited to attend, and Sony Ericsson's new Supplier Social Responsibility Code was presented.

When it comes to supply chain responsibility, Sony Ericsson sees itself as a leader in ethical standards in the ICT industry. When Ericsson began moving many of its manufacturing operations from Sweden to Asia in 1998, Ericsson developed the industry's first code of conduct for suppliers. Given its relatively high level of outsourcing, Sony Ericsson's 2006 Supplier Social Responsibility Code is appropriately extensive. The Code covers topics such as safety requirements, fair and honourable business practices, and basic human rights, including workers rights and child labour. The Code also includes a section on monitoring and compliance, noting that Sony Ericsson inspects all first tier suppliers to ensure the requirements are realized on a practical level. Ericsson experts have trained others on how to conduct supplier audits.

Sony Ericsson quality auditors are also trained in CSR auditing, and many audits include both aspects. Sony Ericsson claims that a supplier must first meet Sony Ericsson's CSR requirements, or it is not even considered. In Sony Ericsson's experience, the suppliers that have high CSR standards are well-managed and are thus also competitive on price and quality. All first tier suppliers, of which there are several hundred, have been audited by Sony Ericsson. In connection with the 2005 revision of its Supplier Social Responsibility Code, more CSR questions were added to the audits. The company expects its first tier suppliers to pass the code down to their suppliers. In the questionnaires and during audits, suppliers are asked to demonstrate what they are doing to inform their suppliers of the standards and to monitor them. Second and third-tier suppliers are, however, not directly audited by Sony Ericsson.

The Code explains that Sony Ericsson will terminate a relationship with a supplier if "serious breaches of the Code persist or recur". If, during an audit, a problem is identified, the normal procedure is to ask for an explanation and assist in devising a correction plan, then conduct a re-audit. If the problem persists, a supply development program is instituted in which Sony Ericsson assists the supplier in capacity building in order to address the problem. If the problem still persists, Sony Ericsson will stop new orders with the supplier and the supplier will thus be phased out.

Sony Ericsson's environmental policy contains a phase out plan to eliminate halogenated flame retardants and hexavalent chromium by the end of 2005. The company participates in several programs to collect materials and to dispose of them in a proper way. Sony Ericsson furthermore cooperates with UNEP to set up a framework for "proper management of products for recycling and re-use". Another interesting environmental initiative is Sony Ericsson's environmental product declarations. For each of its products, Sony Ericsson has a declaration, accessible from their website, containing information

about “relevant environmental aspects of each product such as material content, energy consumption, batteries, packaging and recycling”.[95]

5.1.5. LG Electronics

LG Electronics was created in 1958 and is based in Seoul, South Korea. The company is organised in four business groups, of which the Mobile Communications group, which manufactures CDMA and GSM handsets, is the most important in terms of sales. In 2005, the company had sales of US $23.8 billion and made a profit of US $703 million, 55% of which came from handset sales. In 2005, The company employed 77,652 people, 46,000 of whom were located outside of Korea.

Although it remains among the industry’s top five producers, South Korean handset manufacturer LG Electronics is experiencing a gradual decline in handset sales and market share. This is a significant change from the beginning of the decade when the Korean manufacturer’s high-tech, expensive phones were in high demand.

LG has R&D facilities in Kasan-dong, Seoul (South Korea); Anyang, Kyunggido Province (South Korea); Sandongsheng (China); Beijing (China); Yantai, Shandong Province (China – a joint venture (51%) with Langchao); and Paris (France). The company’s own production sites are located in Seoul (Korea); Cheongju (Korea); Taubate, San Paulo (Brazil); Pune (India), Qinhuangdoo (China – a joint venture (40%)with Langchao); and Yantai, Shandong Province (China – a joint venture (51%) with Langchao). LG is one of the industry’s lowest outsourcers, contracting out only three percent of final assembly of wireless handsets in 2005.[96]

CSR Policy[97]

LG’s Code of Ethics, published in 2004, is rather vaguely worded and lacks detail. It contains no information about suppliers, nor are there any specific references to appropriate international standards for human rights and labour conditions. The Code only mentions that there are “appropriate procedures for the health and safety of their employees in the execution of their duties” and ”separate safety procedures for dangerous work sites”. There is an Ethics Bureau for explanations of the Code and reporting complaints.

LG’s CSR policy concentrates more on the environment than on labour. LG claims to prevent environmental pollution and to preserve natural resources as much as possible.[98] The company’s website states, “We consider [environmental health and safety] one of the

[95] The Sony Ericsson product declarations can be accessed at <http://www.sonyericsson.com/spg.jsp?cc=global&lc=en&ver=4001&template=pc1_5_2&zone=pc&lm=pc1> (accessed 17 August 2006).

[96] J. Wu, “Operations: OEMs and EMS,” iSuppli Market Watch, Volume 6, Issue 10, p.5, 27 March 2006.

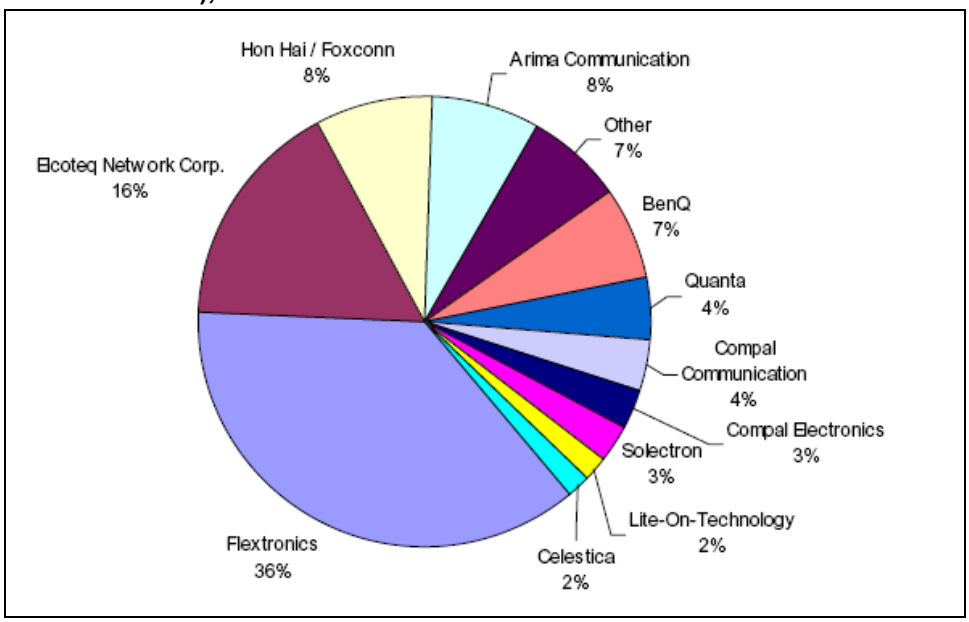
[97] LG was unavailable to give an interview regarding its CSR policies, but it did provide feedback on a draft of this report in November 2006. The information in this section is based on documents available on LG’s website and that feedback.

[98] LG, “Management by principle”, nd, <http://www.lge.com/about/corporate/html/corporateculture_management.jsp>, (accessed 13 March).

most important factors in the decision-making process, and believe it to be paramount when finding new business sectors". The procedures for dealing with this phase out are elaborated upon in its 2005 Sustainability report. Through its Green Program, LG claims that it uses stricter guidelines than those established by the EU (see Section 7.2).[99] LG has established hazardous substance management standards, which include measures such as the inspection of components on delivery. The company has installed X-ray Fluorescence equipment in its foreign and domestic workplaces and subsidiaries to check whether or not its products or parts and materials contain hazardous substances.[100] The company also has various environmental programmes that include reducing the amount of Greenhouse gases it emits at its factories and making its handsets more recyclable.

LG's policy toward suppliers is also underdeveloped. LG claims that it evaluates all potential partner companies to see whether they comply with its fair trade standards to determine whether to start business with the other company or not. On its website, the company declares that by July 2005 all hazardous chemicals were phased out of its products and those of their suppliers, but no information is give on how this has been verified.[101]

Figure 9: Percentage of Outsourced Handset Production per CM (EMS and ODM), 2004



Source: Citigroup/Smith Barney, 2004

[99] LG, "Sustainability Report 2005", p. 66
[100] Ibid, p.67
[101] LGE, nd, <http://www.lge.com/about/environment/html/Hazardous_Substances_Management.jsp>, (accessed 14 March 2006).

5.2. Contract Manufacturers

In 2005, approximately 30% of handset final assembly was being outsourced to contract manufacturers.[102] Figure 9 reveals that more than one-third of this handset outsourcing market is controlled by Flextronics.

The following Sections take a closer look at some of the world's largest ODMs and EMS.

5.2.1. ODMs

BenQ Mobile (Taiwan)

BenQ is Taiwan's largest mobile phone manufacturer. The company produced 9.5 million handsets and generated US $6.5 billion in sales in the fourth quarter of 2005, giving it control over 4.6% of the global market for mobile phones, ahead of all but the top five OEMs in the industry. In the past, Motorola was BenQ's key customer, accounting for up to 70% of production (mainly Motorola's low-end C200 phone) at the turn of the century, but BenQ has recently shifted its focus to developing its own brand for mid to high-end phones.[103] Motorola, presumably frustrated with BenQ's efforts to push its own brand phones (which compete with Motorola's), ended the relationship in 2004. BenQ made up some of that lost production by contracting to produce around four million handsets for Nokia in 2005.[104] BenQ's desire to focus on its own brand was made clear when BenQ purchased the entire handset business of German-based OEM Siemens in August 2005. Following the acquisition, which became effective on October 1, 2005, BenQ renamed the newly formed company BenQ Mobile and agreed to promote dual-branded BenQ-Siemens handsets over the next five years.[105] In addition to BenQ Mobile the BenQ Group is currently comprised of nine other companies that operate independently and produce other ICT products. Mostly as a result of the restructuring associated with the acquisition of Siemens, BenQ has seen the combined company's market share decrease over the past year (see Table 1). BenQ suffered a decrease in market share to 4% in the first quarter of 2006, down from 4.6% in 4Q 2005.[106] In order to reverse this trend, BenQ began a series of cost-cutting moves, including closing a design centre in Ulm, Germany and selling an R&D facility to Motorola. The actions culminated in the decision in early 2006 to stop funding the Siemens business it had just purchased and allow it to slide into bankruptcy, laying off nearly all 3,000 of the division's employees. BenQ is now refocusing itself on the Asian market.

Arima Communication (Taiwan)

Arima is Taiwan's second-largest handset manufacturer by volume. The company produces mainly low and mid-range phones (T100, Z200, T105) for Sony-Ericsson, which

[102] J. Wu, "Global OEM Manufacturing Analysis - Wireless Handset Module", iSupply, November 2005.
[103] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.23.
[104] G. Weaver, "The Mobile Phone Industry: A Strategic Overview," Reed Electronics Research, June 2005.
[105] PMN website, "Siemens to sell handset business to BenQ," 07 June 2005, <http://www.pmn.co.uk/newsarchive0506.shtml> (accessed 28 September 2005).
[106] CENS, "BenQ Mobile to begin talks between management and labor today," 11 May 2006, EMS Now website, <http://www.emsnow.com/npps/story.cfm?ID=19136> (accessed 25 May 2006).

accounted for 55% of handset shipments in 2004. The company also has an OEM division, which produces 3G phones and which accounted for 20% of volume in 2004.[107]

Quanta (Taiwan)
Quanta began producing handsets as an ODM in 2000. The company produces mainly for Panasonic (the X300 mid-end and A100 low-end phones) and Siemens (the CST60 low-end phone). Together, these two customers accounted for nearly 80% of Quanta's total handset shipments in 2004. Quanta's main assembly sites are in Hwa Ya and Shanghai, China.[108]

Lite-On Technology (Taiwan)
In addition to mobile phone handsets, Lite-On Technology makes a wide variety of computer, communications, and consumer electronics products, including motherboards, monitors, digital projectors, modems, digital cameras, and MP3 players. In 2003, handsets accounted for just 7% of the company's sales.[109] Since losing a Sony-Ericsson contract in 2003, Lite-On has struggled to keep up with its competitors. The company has added new customers like LG, Siemens, Nokia and Alcatel.[110]

Compal Communication (Taiwan)
Motorola and Panasonic are the main customers of Compal Group's ODM wing. In 2004, the company had the only Motorola-certified testing centre in Asia and in-house source code, and low-end Motorola phones accounted for around 80% of Compal's 2004 handset shipments. Compal offers low-end (Motorola's C115 and C155 and Panasonic's X100), mid-range (Motorola's E365 and Panasonic's A200) and high-end (Panasonic's X500) phones. Its main production facilities are located in Nanking, China, accounting for 60%–70% of total capacity.[111]

5.2.2. EMS

Flextronics (Singapore)
Flextronics is far and away the leader in terms of handset market share amongst the EMS companies, and is seventh in the world in terms of units shipped. It has more than 250 subsidiaries worldwide, providing services from design engineering, through manufacture and assembly, to distribution and warehousing.[112] In 2004, the company generated more than US $4 billion in handset revenues, representing 27.5% of its overall revenues. In addition to its traditional EMS handset business, Flextronics now generates significant revenues (US $1 billion in 2005) from its ODM handset unit. It produces for nearly all of the major OEMs, primarily Motorola, Siemens and Sony Ericsson.[113] Flextronics is a founding member of the Electronics Industry Code of Conduct.

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[107] International Institutional Database, "Arima Communications," March 7, 2006.
[108] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.24-25.
[109] Hoover's Company Records - In-depth Records, "Lite-On Technology Corporation," March 7, 2006.
[110] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.24.
[111] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.24.
[112] Hoover's Company Records - In-depth Records, "Flextronics International Ltd.," March 7, 2006.
[113] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.21-22.

Hon Hai (Foxconn) (Taiwan)
Foxconn International Holdings (FIH) is Hon Hai's subsidiary in the mobile phone manufacturing business. FIH has one of the largest footprints in the industry with over 59,000 employees worldwide and operations in Hong Kong, USA, Hungary, Cayman Islands, Taiwan, the British Virgin Islands, Denmark, Mexico, Finland, China, Samoa and Brazil.[114] Nokia and Motorola are FIH's largest customers, comprising nearly 90% of FIH's revenue in 2005, but late in the year it also secured a contract to manufacture handsets for Sony Ericsson. FIH provides Printed Circuit Board (PCB) assembly and box assembly services to its customers.

Jabil Circuit
Jabil Circuit, Inc. is a provider of worldwide electronic manufacturing services, offering comprehensive electronics design, production, product management and repair services for a number of different electronic products, one of which is mobile handsets. Nokia is one of Jabil's largest customers.[115]

Elcoteq (Finland)
Elcoteq is one of the oldest handset manufacturing companies in the business, with handset component assembly in operation as early as the 1980s. After losing a significant amount of business from Sony Ericsson due to that company's restructuring in 2001, Elcoteq itself restructured by broadening its repertoire of supply chain services to include product design (thus, it does have some ODM capabilities), new product introduction, contract manufacturing, electromechanical and final assembly, supply chain management, and repair services. Handsets represent about 80% of Elcoteq's revenues. It manufactures low, mid, and high-end phones. Nokia is Elcoteq's main customer, but it also does work for Sony-Ericsson, Motorola and Siemens. In 2003, it signed an agreement with Cellon, a handset design house, for design collaboration.[116] Elcoteq manufactures in low-cost regions such as China, Mexico, and Eastern Europe. In terms of sales, Elcoteq is primarily oriented toward Europe, with customers in Europe accounting for more than 60% of turnover.[117] In 2004, the company built a new facility in Estonia, began offering EMS services in India and Brazil, and announced its intention to build a new facility in Russia.[118]

5.3. Mobile Network Operators

Mobile network operators (MNOs), also known as wireless service providers, wireless carriers, mobile phone operators, or cellular companies, are telephone companies that provide services for mobile phone subscribers. In order to become a mobile network operator within a country, an MNO must acquire a radio spectrum licence from the government. The precise spectrum obtained depends on the type of mobile phone

[114] W/D Partners, Worldscope, "Foxconn International Holdings Limited," 30 July 2006.
[115] Standard & Poor's Corporate Descriptions plus News, "Jabil Circuit, Inc.," 28 January 2006.
[116] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.21.
[117] Hoover's Company Records - In-depth Records, "Elcoteq SE," January 31, 2006.
[118] Citigroup/Smith Barney, "Global Handset Outsourcing," November 2004, p.21.

technology the operator intends to deploy. For example, a Global System for Mobile Communications (GSM) network will require a GSM frequency range. The government may allocate spectrum using whichever method it chooses, although the most common method is an auction. Recent allocation of 3G licences in Europe have been sold by auction to the highest bidder.

Mobile network operators have significant influence on the mobile telephone market because they provide the telecommunication service that allows people to communicate using their mobile telephone handsets. Thus, if there is no mobile network operator in a particular country or region, there is no market for mobile telephones. Ron Garriques, head of Motorola's EMEA handset business, observes, "In the end we realise that it is the service providers that own the customers".[119] Consequently, mobile phone suppliers are attracted by mobile network operators, who are, in a sense, large scale consumers (and re-sellers) of mobile handsets. As a result, although only a fraction of their revenues come from handset sales, network operators view handset manufacturers as important suppliers.[120]

In addition, a trend over the past two years has been the increasing involvement of mobile network operators in handset development. Mobile network operators such as Vodafone and Orange are increasingly bypassing the OEM node in the supply chain and using outsourced ODM production to market their own line of mobile phones. Mobile network operators have been drivers of new handset features and several have also made deals with manufacturers to develop exclusive handsets for their networks.

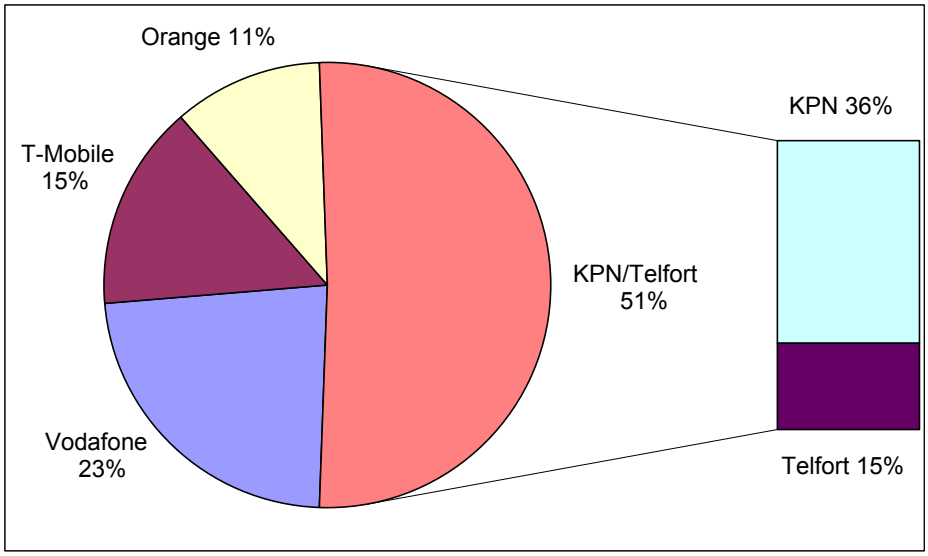
It is beyond the scope of this report to do an in-depth, field research-based investigation of the role and practices of mobile network operators in handset manufacturing. However, as final stop sellers of mobile phones to consumers, MNOs have a direct and indirect responsibility to improve standards in the mobile phone industry, and it is important to examine to analyse how MNOs view this responsibility. Given the position of MNOs at the end of the supply chain, the policies of MNOs toward suppliers of mobile phones are particularly important for the handset manufacturing industry. Thus, the CSR policies of the Netherlands' three biggest mobile network operators are outlined below, with particular focus on policies toward suppliers.

MNOs in the Netherlands

Figure 10 reveals the top five mobile network operators currently operating in the Netherlands. KPN's October 2005 takeover of Telfort pushed KPN's market share in the Netherlands just above 50%.

[119] Quoted on PMN website, "Motorola hints at reduced importance of brand," 24 June 2003, <http://www.pmn.co.uk/members/20030624motorola.shtml> (accessed 5 October 2005).
[120] J. Croca, Corporate Responsibility, Vodafone, 31 May 2006, telephone call with J.Wilde, SOMO.

Figure 10: MNO Dutch Market Share by Number of Connections, 2005



Based on: Onafhankelijke Post en Telecommunicatie Autoriteit (OPTA)[121]

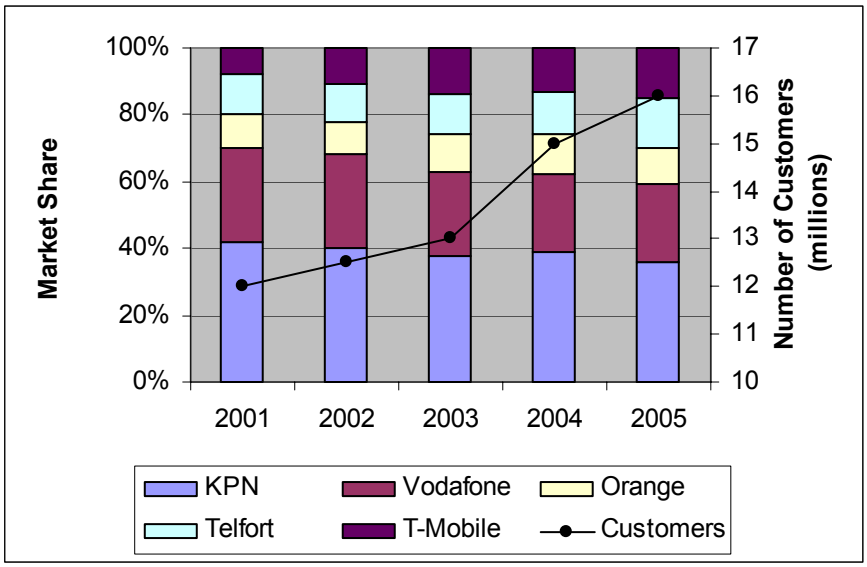
Figure 11 illustrates the dynamics of the Dutch mobile service market in which the market share of the largest network operators, such as KPN and Vodafone, has declined slightly over the past four years, accompanied by an increase for some of the smaller network operators, such as T-Mobile and Telfort. In addition, there are several dozen smaller mobile virtual network operators (MVNOs) which do not have their own infrastructure, but lease network space from an MNO. This construction indicates a high degree of competition in the Dutch mobile service provision market despite the fact that KPN, through its takeover of Telfort, now controls more than 50% of the market.

The highly developed cellular service market in the Netherlands attracts many mobile phone suppliers. The top five Dutch mobile network operators offer their service through various handsets, which they source from more than twenty different handset manufacturers, including all of the major companies mentioned in Chapter 4 of this report. MNOs report that there are no specific alliances between mobile network operators and handset manufacturers and that each mobile network operator has contacts with several handset OEMs. However, a brief examination of online product catalogues reveals that Nokia is the dominant handset supplier for all of the top five Dutch MNOs, comprising 33% of KPN's online inventory, 36% of Vodafone's, 25% of T-Mobile's, 33% of Telfort's, and 20% of Orange's.[122]

[121] OPTA, "Jaarverslag en marktmonitor 2005," March 2005, p.71.

[122] See the respective websites of the mobile network operators: <www.kpn.nl>, <www.vodafone.nl>, <www.t-mobile.nl>, <www.telfort.nl>, and <www.orange.nl> (accessed 5 October 2005).

Figure 11: Network Operator Dutch Market Share and Total Number of Customers, 2001-2005



Based on: OPTA[123]

5.3.1. KPN

Netherlands-based KPN has a code of conduct[124] in which it sets standards for its operations based on three core values (simplicity, personal approach and trust), but there is no specific mention of workers' rights, nor are there any references to the appropriate international standards for labour or the environment. KPN publishes a yearly Sustainability Report[125] that outlines its CSR initiatives and practices. KPN is not a member of GeSI, the EICC or the UN Global Compact, but is does maintain contact with GeSI.[126] KPN is a member of the European Telecommunications Network Operators' (ETNO) Association,[127] where it takes part in a number of initiatives in issue areas such as transportation and heading the working group on energy. KPN believes that there is a good deal of overlap between these initiatives.

With regard to suppliers of handsets to KPN, the company's sustainability report for 2005 states that, from 2006 onward, the company will pay more attention to the selection of suppliers. KPN acknowledges that the primary concerns when choosing a supplier are price and technical specifications, but claims that it is also beginning to look at how suppliers deal with sustainability. For example, KPN notes that, "When choosing suppliers

[123] Ibid.
[124] KPN's code of conduct is available at <http://www.kpn.com/upload/1602221_9475_1160477154191-06%23263_Bedrijfscode.pdf>.
[125] KPN's 2005 Sustainability Report is available at <http://www.kpn.com/kpn/show/id=1429275>.
[126] E. Schoenmaker, Business Excellence, and G. Teamstra, Environment Manager, KPN, 29 August 2006, telephone call with E. de Haan.
[127] For more information on industry CSR initiatives such as GeSI, EICC and ETNO, please see Section 0.

for handsets in the Netherlands, we are increasingly taking into account how much energy equipment uses when in standby mode".[128] Furthermore, potential direct suppliers must meet environmental demands concerning product components, waste processing and reuse. In a telephone interview, KPN representatives from the Business Excellence department, which handles sustainability issues, further explained that when KPN enters into contract negotiations with a supplier, KPN makes it clear that the supplier must abide by Dutch, European and International law. In terms of having suppliers comply with KPN sustainability standards beyond the law, KPN purchasing agreements have a general reference to respect for human rights. In the future, KPN plans to improve supplier requirements, for example, possibly insisting that suppliers comply with ILO standards.[129] However, in this regard KPN believes it is important to note that it is not a big enough company to be able to exert a great deal of influence with its suppliers on an individual basis.[130]

In terms of monitoring and verifying whether suppliers are complying with KPN standards, the 2005 Sustainability Report contains limited information, noting only that, "Upon request, suppliers must provide an insight into their contribution to environmental protection".[131] Thus, the company relies heavily on suppliers to monitor themselves (and their own suppliers) for compliance with legal and sustainability requirements. Although it does not monitor them itself, KPN insists that it only does business with "renowned" suppliers that also supply to companies like British Telecom and Deutsche Telekom; KPN is confident that these suppliers are responsible.[132]

Another area for improvement in KPN's CSR policy is its reach into the supply chain. KPN admits that it is difficult to be certain that its policies and standards are being observed beyond the direct suppliers of fully-assembled handsets. KPN notes that supply chains in the mobile communications industry are extremely long and complex, sometimes involving up to 10 to 20 companies, and that KPN alone cannot oversee conditions in the entire supply chain. KPN works with the OEM companies who supply handsets directly to them, and these companies assure KPN that they work with their first-tier suppliers to make sure conditions at those companies meet their standards.[133]

5.3.2. Vodafone

UK-based Vodafone publishes a yearly Corporate Responsibility report, in which it explains it's vision and activities in CSR.[134] Joaquim Croca of Vodafone Corporate

[128] KPN 2005 Sustainability Report, p.51, <http://www.kpn.com/kpn/show/id=1353661>.
[129] KPN 2005 Sustainability Report, p.51, <http://www.kpn.com/kpn/show/id=1353661>.
[130] E. Schoenmaker, Business Excellence, and G. Teamstra, Environment Manager, KPN, 29 August 2006, telephone call with E. de Haan, SOMO.
[131] KPN 2005 Sustainability Report, p.51, <http://www.kpn.com/kpn/show/id=1353661>.
[132] E. Schoenmaker, Business Excellence, and G. Teamstra, Environment Manager, KPN, 29 August 2006, telephone call with E. de Haan, SOMO.
[133] E. Schoenmaker, Business Excellence, and G. Teamstra, Environment Manager, KPN, 29 August 2006, telephone call with E. de Haan, SOMO.
[134] Vodafone's 2005 Corporate Responsibility report is available at <http://www.vodafone.com/assets/files/en/vodafone_cr_final_interactive.pdf>.

Responsibility Department explains, “Two years ago, Vodafone abandoned the ‘S’ in CSR because ‘social’ limited the concept too much. We now use the term Corporate Responsibility and take it to mean full responsibility for the company in social, environmental, labour, and other issues. This primarily means minimizing the negative impacts of the corporation and maximizing the benefit”.[135]

Vodafone participates in a number of international and inter-sectoral CSR initiatives. Vodafone sees GeSI as the best and most comprehensive initiative in relation to ethical supply chain activities. The company is also a member of the World Business Council for Sustainable Development, but is not member of the Global Compact, ETNO, or EICC. Vodafone claims that it is a signatory of the GeSI rather than EICC because it has its own Code of Ethical Purchasing (CEP) and because membership in GeSI also allows participation in working groups on other CSR related topics.

Vodafone purchases handsets from both large OEMs as well as ODMs. Its main suppliers are Nokia, Motorola, and Sony-Ericsson. Two years ago, Vodafone began to sell phones with solely its name on them, but these phones are purchased from manufacturing suppliers and not manufactured by Vodafone itself. Vodafone has a central list of suppliers that all its local operating companies can use, but the local companies are also free to use a local supplier if it finds something cheaper than on the central list. Vodafone does have a globally defined process for qualifying all suppliers that is used at both global and local operating companies. Corporate responsibility is assessed as part of this qualification process. In order to communicate its standards and expectations to suppliers, Vodafone has developed the Code of Ethical Purchasing, which it uses in selecting suppliers and deciding on purchasing agreements. The CEP includes issues like child labour, forced labour, safety and health, freedom of association, discrimination, disciplinary measures, working hours, payment, individual behaviour, and environment. The CEP is rather vague in communicating what is considered acceptable behaviour with regard to these issues, but Vodafone claims that it informs suppliers that it “expects from them no less than it expects from itself”.[136] Corporate responsibility is given a weight of 10% in Vodafone’s periodic strategic evaluation of suppliers called “scorecards”. Price and quality are weighted 20%. The scorecards form part of the information used to select suppliers.

Suppliers are informed about the CEP during initial qualification and negotiations over purchasing agreements as well as in a “supplier week” with terminals suppliers. Vodafone also asks some of its suppliers to fill in self-assessments in which they are informed and asked about the CEP and their compliance with it. Monitoring and verification is done in-house by combined teams stemming from the Supply Chain Management department (who look for things like quality and efficiency) and the CR department (which assesses CSR issues) or by an auditor trained in both. Vodafone also uses external specialist CR auditing companies in some cases. In determining which suppliers to audit, Vodafone evaluates suppliers on the basis of strategic importance and risk of non-compliance with the CEP. The risk criterion includes the size of the supplier, location of operations and type of product or service. Based on the evaluation, Vodafone conducted 15 direct

[135] J. Croca, Corporate Responsibility, Vodafone, 31 May 2006, telephone call with J.Wilde, SOMO.
[136] J. Croca, Corporate Responsibility, Vodafone, 31 May 2006, telephone call with J.Wilde, SOMO.

supplier audits in 2005 in Asia Pacific, Central and Eastern Europe and Northern Africa and made a total of 75 recommendations to suppliers for improvement of compliance with the CEP. The recommendations touched on issues such as forced labour, child labour, freedom of association, and health and safety.[137] Vodafone admits that although many of its suppliers are implementing CSR programmes, not all suppliers are in compliance with the CEP.

The company also acknowledges that there is a greater risk of poor labour and environmental standards at the sub-tier suppliers that make the parts that go into its handsets. Vodafone relies heavily on its direct suppliers to ensure that its standards are being followed further up the supply chain. However, it is not clear whether such trust is warranted; after the 2005 audits, Vodafone had to make nine recommendations for improving suppliers enforcement of the CEP standards in their own supply chains.[138] Vodafone says that it is trying to improve supply chain management on CSR issues and claims that if it has concerns about a sub-tier supplier, it will conduct audits. Vodafone claims that it has recently accompanied its direct suppliers on auditing visits at their suppliers. Vodafone notes that, "There is a risk that in the future, suppliers (both direct and sub-tier) may be audited by a number of different customers using different approaches, and there is a need to minimise confusion and ensure that there is a balance between auditing and letting the suppliers work".[139] The company is therefore working with groups like GeSI to coordinate among auditors and standardise audits.[140]

5.3.3. T-Mobile (Deutsche Telekom)

T-Mobile is the fully-owned mobile service subsidiary of German-based parent company Deutsche Telekom (DT). According to Luis Neves, DT's Senior Manager for Human Resources Strategy & Organisation, Corporate Sustainability & Citizenship, "Sustainability for DT means the whole range of our corporate social responsibility to consumers, stakeholders, investors, environment, climate, employees, civil society, etc. Our sustainability strategy covers the whole range of CSR issues".[141] In 1998, the company developed a Social Charter[142] that is based on some of the values of the UN Global Compact, International Labour Organization (ILO) standards and the OECD Guidelines for Multinational Enterprises. The Social Charter specifically mentions the prohibition of child and forced labour, freedom of association and the right to collective bargaining and protection of health and safety. DT also publishes a yearly "Human Resources and Sustainability Report" that reports its activities.[143] Sustainability policy is implemented by

[137] Vodafone, Corporate Responsibility report 2005, <http://www.vodafone.com/assets/files/en/vodafone_cr_final_interactive.pdf>, p.23.
[138] Vodafone, Corporate Responsibility report 2005, <http://www.vodafone.com/assets/files/en/vodafone_cr_final_interactive.pdf>, p.23.
[139] J. Croca, Corporate Responsibility, Vodafone, 31 May 2006, telephone call with J.Wilde, SOMO.
[140] For more information on the GeSI and the supplier self-assessment questionnaire, see section 7.1.
[141] L. Neves, Senior Manager, Human Resources Strategy & Organisation, Corporate Sustainability & Citizenship, Deutsche Telekom, 22 June 2006, telephone call with J. Wilde, SOMO.
[142] DT's Social Charter is available at <http://download-dtag.t-online.de/englisch/company/9-sustainability/040302_socialcharter.pdf>.
[143] DT's 2005 Human Resources and Sustainability Report is available at <http://download-dtag.t-

the Corporate Sustainability & Citizenship department. All monitoring and verification takes place in-house, and there are no external, independent monitors. However, DT expects that beginning in 2008, the yearly Human Resources and Sustainability report will be externally verified. In addition to the yearly report, Deutsche Telekom publishes updates and background information on its sustainability activities on its website.[144]

Deutsche Telekom is heavily involved in the Global e-Sustainability Initiative (GeSI); between July 2006 and July 2008, DT's Luis Neves is president of GeSI. DT has been especially engaged in GeSI's supply chain working group and in developing the supplier questionnaire. As part of this process, DT seeks dialogue with stakeholders over its responsibility in the supply chain.[145]

DT's mobile service branch, T-Mobile, does not produce mobile phones itself, but buys them from several different types of handset manufacturers. Nokia, Motorola and Sony Ericsson are DT's biggest suppliers of handsets, and about 80% of mobile phones is supplied by the global top five OEMs; the remaining 20% is supplied by contract manufacturers. All handsets sold by T-Mobile carry the T-Mobile logo.

Deutsche Telekom claims to be aware of its responsibility to ensure that social, health and safety, human rights and environmental standards are respected throughout its entire value chain.[146] The social charter and environment policy are part of DT's procurement guidelines. Suppliers are informed of the Charter, and DT requires that its suppliers "declare themselves willing to observe, respect and apply these basic principles throughout their sphere of responsibility".[147] DT's suppliers have also been informed about the Social Charter as a part of the GeSI questionnaire.[148] This year, DT sent the questionnaire to their top 25 suppliers. Deutsche Telekom does not directly inform its suppliers' employees about the standards and rights expressed in the Social Charter, but the company encourages the suppliers to make their employees aware of it. DT's Luis Neves notes, "Through a dialogue process, we make our major suppliers aware of our expectations".[149] Although suppliers are informed of DT's Social Charter and its expectations for CSR, DT does not yet have any official formula for how much weight CSR issues (compared to other issues like price and quality) have in choosing a supplier. However, Deutsche Telekom is now developing a strategic approach to include sustainability considerations in its supply chain.

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online.de/englisch/company/9-sustainability/PUN_2005_engl.pdf>.

[144] See <http://www.telekom.de>.

[145] L. Neves, Senior Manager, Human Resources Strategy & Organisation, Corporate Sustainability & Citizenship, Deutsche Telekom, 22 June 2006, telephone call with J. Wilde, SOMO.

[146] DT, 2005 Human Resources and Sustainability Report, <http://download-dtag.t-online.de/englisch/company/ 9-sustainability/PUN_2005_engl.pdf>, p.14.

[147] DT Social Charter, <http://download-dtag.t-online.de/englisch/company/9-sustainability/040302_ socialcharter.pdf>, p.3.

[148] For more information on the GeSI and the supplier self-assessment questionnaire, see section 7.1.

[149] L. Neves, Senior Manager, Human Resources Strategy & Organisation, Corporate Sustainability & Citizenship, Deutsche Telekom, 22 June 2006, telephone call with J. Wilde, SOMO.

In terms of monitoring, DT's Social Charter does inform suppliers that the company "reserves the right to check the observance of the basic principles in a suitable manner by spot checks and/or if there is a well-founded suspicion to do so".[150] As part of its supply chain activities and supplier development programme Deutsche Telekom introduced social audits in 2005 covering the social, environmental and ethics aspects of its top suppliers, and it plans to audit the major suppliers on a yearly basis. In 2005 Deutsche Telekom audited five suppliers. The duration of the audit process was one week and included interviews with workers at the workplace and work-related areas (dormitory, cantina).[151] According to DT, the audits did reveal the need for improvement of the situation with regard to health, safety and environment, as well as workers' living conditions and workers' rights.

To address the non-conformities DT puts in place a joint action plan and requests that the supplier implement the necessary corrective measures within an established agreed time line. After that DT makes a risk assessment to determine to which extent the supplier has implemented the requested actions. If necessary, DT will carry out a new audit. The aim is to have the supplier fully comply with DT standards. Neves reports that the suppliers audited are cooperating and resolving the identified issues.[152]

To improve the conditions at sub-tier suppliers, DT has audited a second tier supplier together with the respective first tier supplier. However, improving conditions at sub-tier suppliers remains a complicated area for all mobile network operators. Neves notes, "We encourage our suppliers to apply the same standards to their suppliers further down the value chain". DT works with its major suppliers in one-day workshops to discus different aspects related to the supply chain. An important part of the workshops is encouraging suppliers to apply the DT's Social Charter standards further into their own suppliers.[153]

[150] DT Social Charter, <http://download-dtag.t-online.de/englisch/company/9-sustainability/040302_socialcharter.pdf>, p.3.
[151] L. Neves, Senior Manager, Human Resources Strategy & Organisation, Corporate Sustainability & Citizenship, Deutsche Telekom, 22 June 2006, telephone call with J. Wilde, SOMO.
[152] L. Neves, Senior Manager, Human Resources Strategy & Organisation, Corporate Sustainability & Citizenship, Deutsche Telekom, 22 June 2006, telephone call with J. Wilde, SOMO.
[153] Ibid.

Chapter 6
Critical Issues for the Mobile Phone Industry[154]

6.1. Introduction

Conditions in the facilities where mobile phones and their component parts are produced can be appalling, especially among sub-tier suppliers of handset components. Research carried out in the context of this project has revealed a picture of workers working up to 72 hours a week with compulsory overtime, insecure employment contracts, unsafe factories, inadequate protection when working with hazardous materials, wages below the minimum wage and subsistence level, suppression of union rights and degrading treatment. These circumstances consistent with conditions endemic in the wider ICT hardware manufacturing industry as revealed by SOMO[155] and UK-based CAFOD.[156] The actual situation presents a stark contrast to the CSR policies and codes of conduct expressed by the companies above.

This Chapter identifies and describes the corporate social responsibility (CSR) issues specific to the mobile phone industry and in accordance with the CSR Frame of Reference, which has been developed by the Dutch CSR platform.[157] Information in this Chapter is based on field research conducted in China, India, Thailand and the Philippines in 2006, interviews with workers in the mobile phone industry, and earlier research by SOMO and other organisations.[158] The issues discussed are divided into four main categories: labour issues, CSR policy implementation and practice, environmental issues, and SEZs and relaxed regulations.

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[154] Unless otherwise noted, the information and issues raised in this section are based on research carried out in India by Civil Initiatives for Development and Peace (CIVIDEP), in China by Students and Scholars against Corporate Misbehaviour (SACOM), in the Philippines by the Workers' Assistance Center (WAC), and in Thailand by SOMO in the period of March-September 2006. See section 0 for more information on the research methods followed for this report.

[155] I. Schipper and E. de Haan, "Critical Issues in the ICT Hardware Manufacturing Sector," SOMO, September 2005, <http://www.somo.nl/html/paginas/pdf/ICT_Sector_Report_2005_NL.pdf>.

[156] CAFOD, "Clean up your computer. Working conditions in the electronics sector," 2004.

[157] The CSR Frame of Reference has been developed by the Dutch 'CSR Platform' and can be found at <http://mvo-platform.tuxic.nl/files/Publicaties/MVO%20Normen/CSR%20frame%20of%20reference.pdf> (accessed 10 October 2006).

[158] For more on the methodology used in this report, see section 0.

6.2. Labour issues

The International Labour Organisation (ILO) is the international tripartite (employers, governments and workers' representatives) organisation responsible for setting labour standards, which can be found in over 180 Conventions and more than 190 recommendations. None of the conventions are ratified by all governments, but the core labour standards should always be practiced, even if they are not ratified. Most trade unions and NGOs, when looking at the supply chain responsibility of companies, focus on the core labour standards - freedom of association, right to collective bargaining, no discrimination of any kind, no forced or slave labour, a minimum employment age - and several other generally accepted labour standards - health and safety measures, a maximum working week of 48 hours and voluntary overtime of 12 hours maximum, a right to a living wage and the establishment of an employment relationship.

Thomas Balmès 2004 documentary, “A Decent Factory”, provided the world a visual image of the sometimes shocking working conditions at Chinese factories supplying mobile phone handsets for Nokia. Violations documented included labourers working 12-hour shifts; female workers restricted from moving freely beyond their cramped living quarters because, if they were to become pregnant, they might be subject to a state-mandated abortion at the company’s expense; dangerous chemicals stored in working areas and in the factory’s kitchen; lack of written contract and terms of employment for employees; and pay that is well below minimum wage. The documentary further showed the often elaborate efforts of companies to keep double or even triple books for auditors’ sake and thus keep the real wages and overtime hidden.[159] Both Nokia and the Chinese supplier have claimed that the conditions at the factory in Balmès documentary have improved. SOMO’s research, however, reveals that *ad hoc* improvements at individual factories do not translate into broad progress for the industry and that, in fact, poor conditions persist and are widespread throughout the sector.

Most research into labour conditions in the ICT sector concentrates on the ILO’s eight primary labour rights, which are specified in model codes of conduct such as the International Confederation of Free Trade Unions’ (ICFTU) base code presented in Figure 12. Companies are asked to make sure that their products are produced according to these norms.

[159] Thomas Balmès, 2004, A decent factory, <http://www.ikonrtv.nl/donderdagdocumentaire/documentaire.asp?oId=2400>, (accessed 3 April 2006).

Figure 12: ICFTU Base Code of Conduct

Base Code of Conduct

Employment is freely chosen

There shall be no use of forced, including bonded or involuntary prison, labour (ILO Conventions 29 and 105). Nor shall workers be required to lodge "deposits" or their identity papers with their employer.

There is no discrimination in employment

Equality of opportunity and treatment regardless of race, colour, sex, religion, political opinion, nationality, social origin or other distinguishing characteristics shall be provided (ILO Conventions 100 and 111).

Child labour is not used

There shall be no use of child labour. Only workers above the age of 15 years or above the compulsory school-leaving age, whichever is higher, shall be engaged (ILO Convention 138). Adequate transitional economic assistance and appropriate educational opportunities shall be provided to any replaced child workers.

Freedom of association and the right to collective bargaining are respected

The right of all workers to form and join trade unions and to bargain collectively shall be recognised (ILO Conventions 87 and 98). Workers representatives shall not be the subject of discrimination and shall have access to all workplaces necessary to enable them to carry out their representation functions (ILO Convention 135 and Recommendation 143).
Employers shall adopt a positive approach towards the activities of trade unions and an open attitude towards their organisational activities.

Living wages are paid

Wages and benefits paid for a standard working week shall meet at least legal or industry minimum standards and always be sufficient to meet basic needs of workers and their families and to provide some discretionary income.
Deductions from wages for disciplinary measures shall not be permitted nor shall any deductions from wages not provided for by national law be permitted without the expressed permission of the worker concerned. All workers shall be provided written and understandable information about the conditions in respect of wages before they enter employment and of the particulars of their wages for the pay period concerned each time that they are paid.

Hours of work are not excessive

Hours of work shall comply with applicable laws and industry standards. In any event, workers shall not on a regular basis be required to work in excess of 48 hours per week and shall be provided with at least one day off for every 7 day period. Overtime shall be voluntary, shall not exceed 12 hours per week, shall not be demanded on a regular basis and shall always be compensated at a premium rate.

- **Working conditions are decent**

A safe and hygienic working environment shall be provided, and best occupational health and safety practice shall be promoted, bearing in mind the prevailing knowledge of the industry and of any specific hazards. Physical abuse, threats of physical abuse, unusual punishments or discipline, sexual and other harassment, and intimidation by the employer is strictly prohibited.

- **The employment relationship is established**

Obligations to employees under labour or social security laws and regulations arising from the regular employment relationship shall not be avoided through the use of labour-only contracting arrangements, or through apprenticeship schemes where there is no real intent to impart skills or provide regular employment. Younger workers shall be provided the opportunity to participate in education and training programmes.

6.2.1. Health and safety

Working in labour-intensive manufacturing industries such as mobile phones often involves occupational hazards, especially when workers are not sufficiently protected and/or instructed. Mobile phones are a complex mixture of several hundreds of components, many of which contain heavy metals and hazardous chemicals. Working with these dangerous chemicals puts production workers at risk. As far back as 1994, studies revealed that an electronics worker's exposure to toxics is higher than in both the chemical industry and pesticide manufacturing.[160] Information uncovered during SOMO's research shows that mobile phone workers are at risk and are enduring health problems. These hazards can often be prevented or reduced if companies take measures to protect workers.

China

Case Study: Hivac Startech in China

The most serious violations of workers' health and safety uncovered by this research were found at the mobile phone lens production facility, Hivac Startech Film Window (Shenzhen) Co., Ltd., producing lenses for Motorola phones. In the acrylic lens production department at Hivac Startech the ventilation system of the class-10,000 clean room is usually not turned on. There, women workers use a solution containing n-hexane to wash and scrub acrylic screens for cellular phones. The air in the entire workshop is permeated with pungent chemical odours that do not dissipate in the poorly ventilated room. An investigation by the Shenzhen Occupational Disease Treatment and Prevention Hospital

[160] J. LaDou, "Health Issues in the Global Semiconductor Industry", International Journal of Occupational and Environmental Medicine, 1994.

revealed that the air samples from the Hivac Startech workshop have n-hexane concentrations between 449 and 1106mg/m^3, far exceeding the permissible exposure limit (see text below).

> *N-hexane enters the human body via inhalation or skin penetration where it bio-accumulates. Human exposure to n-hexane can cause toxicity in peripheral nerves, muscle wasting, and atrophy. It can cause numbness to the feet and hands and muscle weakness in the feet and lower legs, which can lead to paralysis of the arms and legs. It can also cause dermatitis, nausea, confusion, jaundice, and coma.[161] For this reason, its usage has long been prohibited in many developed countries. To prevent poisoning, the Australian government advises that the maximum eight-hour time weighted average exposure to n-hexane not exceed 176mg/m^3.*

Hivac Startech did not provide adequate protective equipment for the workers who are exposed to n-hexane. Each worker receives only three plastic "finger gloves", but no face mask is provided. For the workers there is simply no way to prevent the chemical from permeating the skin or being inhaled. Furthermore, the company does not provide any introductory training to new workers or explanation of the dangerous effects of the n-hexane. According to the "Law of the People's Republic of China on Prevention and Control of Occupational Diseases", employers must inform workers of all current workshop protective measures and of the risk of contracting an occupational disease in the course of work. The labour contract should clearly explain this information, but Hivac Startech never signed a lawful contract with the workers.

As a result of these dangerous working conditions, in December 2005 many workers from the acrylic screen workshop began to lose their appetites, an early sign of chemical poisoning, and 12 women between the ages of 18 and 27 experienced numbness in the limbs, also clear sign of poisoning. At that time, the factory did not conduct any industrial safety investigations nor provide any treatment. The workers had either to return home or to visit nearby hospitals to seek medical care on their own. The workers claimed that, because Hivac Startech initially refused to help them, they suffered intense mental pressure and physical pain and wasted scarce money on useless over-the-counter treatments. Only after the workers brought their complaints to the local Labour Bureau did the factory finally, in February 2006, arrange for six of them to be hospitalised. Later on, three more workers were hospitalised. The nine workers, all of whom had been working at the factory for more than one year, were diagnosed with n-hexane poisoning.

Among the workers who began to show clear symptoms of poisoning in early December and were hospitalised in late February, one of them was found 50+ days pregnant in

[161] Australian Government – Department of the Environment and Heritage, <http://www.npi.gov.au/database/substance-info/profiles/47.html> (accessed 1 October 2006).

March. Because of the n-hexane poisoning, she had no choice but to follow the doctor's recommendation to abort the child, causing serious psychological, emotional and physical trauma to the young mother. If the factory had not shirked its responsibility and intentionally delayed treatment, and if the poisoned worker had received a timely physical examination and treatment when the symptoms first appeared, this tragedy would have never happened.

Adding insult to injury, the factory not only refused to pay legally mandated compensation during the treatment period, it also continuously put pressure on the hospital and the victims to end treatment and be prematurely discharged. N-hexane poisoning affects the nervous system, and it takes a very long time to recover. Normally, patients are discharged only when physical examination confirms their full recovery. At the time of writing this report, the workers have been hospitalised for 6 months, but their examination reports still indicate mild poisoning and they still feel sick. However, two of them were pressed by factory management to leave the hospital in June and are now receiving out-patient treatment in the dormitories. The victims, although gravely harmed and exhausted, are still not spared the management's harassment and continue to suffer psychological harm.

After the n-hexane poisoning incident occurred, the factory did nothing to improve the production environment or working conditions. According to the workers, when the first group of women was hospitalised, the factory began to dismiss or relocate the remaining women workers. Now, besides the five supervisors, all the workers in the workshop are new recruits. According to the workers, the solvent "white gasoline" containing n-hexane has been replaced by "lacquer thinner" containing benzene, but benzene can have effects potentially more serious than those of n-hexane (see text below).

> *Like n-hexane, benzene is absorbed into the body through inhalation. According to the Australian government, "In certain circumstances, even a brief exposure to very high levels of benzene can result in death. Worksafe Australia classifies benzene as a toxic health hazard. Exposure can result in symptoms such as skin and eye irritations, drowsiness, dizziness, headaches, and vomiting. Benzene is carcinogenic, and long-term exposure at various levels can affect normal blood production and can be harmful to the immune system. It can cause Leukaemia (cancer of the tissues that form white blood cells) and has also been linked with birth defects in animals and humans".*[162]

In September, 2006, after becoming aware of the violations detailed above SACOM representatives encouraged nine of the most severely affected workers to write a letter to

[162] Australian Government – Department of the Environment and Heritage, <http://www.npi.gov.au/database/substance-info/profiles/12.html> (accessed 1 October 2006).

Nokia and Motorola, informing those companies of the situation and asking them to exert their influence over their supplier and bring an end to the abuses (see Appendix 1). In response to the letter, Motorola acknowledged that Hivac Startech was an indirect supplier and initiated an audit of the factory through the auditing firm Intertek. The audit was carried out during the week of 18 September 2006. SACOM facilitated Intertek's interviews with the affected workers off-site, but was forbidden from going into the factory with the auditors. On October 30, Motorola provided SACOM with a summary of the audit report. The summary provided to SACOM included details about the interview with the nine poisoned workers, but did not include any information about the on-site audit. Motorola claims that, in response to the audit and the increased attention on the factory resulting from the workers' and SACOM's complaints, Hivac Startech has begun to make some improvements in the working conditions. However, neither SOMO nor SACOM could verify this claim. According to Motorola, the Intertek audit found that there have been some improvements but that the workshop ventilation situation is still bad, the protective equipment is still inadequate, and the chemical hazard training for new workers still requires improvement. Motorola says it is working together with its direct supplier Foxconn to make further improvements. On September 19, 2006, just before Intertek interviewed the nine poisoned workers, Hivac Startech agreed to pay compensation to the workers for wages and food during their hospitalisation, as is mandated by Chinese law. The company did not offer to compensate the victims for their intense stress and psychological suffering, but in order to receive any compensation at all, Hivac Startech made the workers sign statements forfeiting their right to request any more compensation. It remains to be seen when, how and if structural improvements in conditions that are satisfactory to the workers will be made at Hivac Startech. While it is commendable that Motorola has begun to engage with Hivac to improve conditions, the problem with this *ad hoc* approach is that Motorola, as well as the other major OEMs, rely on outside groups such as NGOs to alert them of problems at individual factories (such as in the Hivac Startech case) rather than making proactive and structural changes in their policy that would have an effect on the entire supply chain.

Workers at Hivac Startech also claim that the company produces lenses for Nokia handsets and have produced a photograph of a lens made in the factory with the name "Nokia" on it. Upon being presented with this evidence, Nokia reviewed its supply relationships and contends that they have neither a direct nor a subcontracting relationship with Hivac Startech. It should be noted that mobile phone supply chains are very long and complex and that large electronics OEMs are sometimes unaware of the companies that occupy the sub-tiers of their supply chains. Nevertheless, Nokia insists that no relationship exists, and, based on the evidence provided SACOM, the company claims to have commenced an independent legal investigation into the possible manufacture of counterfeit Nokia products by Hivac Startech. At the time of publication of this report, that investigation was ongoing.

At the Giant Wireless unit supplying Motorola, it appears that neither preventive nor remedial measures are taken to improve occupational health and safety (OHS). There is

no formal mechanism, such as an OHS committee, through which the workers can alert management to hazards. Nevertheless, workers have complained collectively to the production manager and demanded installation of protective equipment, but unfortunately, these requests have not been addressed by management. Women workers in particular suffer menstrual disorder, anaemia, headache, deterioration of eyesight, and bodily fatigue. Workers reported that weaker girls sometimes fainted at their work stations during the summer, but paid sick leave was not provided. Zhang Zhiying, a 20-year-old Hunan worker, expressed concerns about production safety. She complained that personal and workplace protective measures were inadequate on the shop floors and that she has to work with glues that are very irritating and can lead to symptoms of dizziness, loss of appetite, loss of memory, and damage to the central nervous system. She notes, “The management gives me 30 yuan [US $3.79] a month as an allowance because soldering work is hazardous to health. I am unwilling to take it further”.

A worker at Giant Wireless in China: “Soldering is boring and soul-sapping. I feel like a machine, ‘a work machine.’ My duty is to connect the “orange line” and “yellow line” in less than 3 seconds by using a soldering tool. The gas released is harmful to the human body”.

The worst work environment in Giant Wireless is widely believed to be the printing room. There are about 150 workers, all of them women. A former worker who was admitted to the hospital 2002 after handling the same printing task for three consecutive years explains that the room where she has to work is suffocating and that that she lost her appetite, and thus body weight, because of the paint fumes. The thin gloves she gets from the factory dissolve in the cleaning solvent. After she found blood in her urine she went to the hospital and found out her kidneys were damaged. She thinks that working with the chemicals were the cause of this. While she was in hospital the factory did not pay her wages.

On the assembly lines of the first and third shopfloors at the Kangyou Electronics unit no air-conditioner is installed. Instead, there are fans affixed to the ceilings and small exhaust fans next to each work station. However, production workers commented that ventilation is still bad, and the workplace often becomes unbearably overheated. Workers reported problems of profuse sweating when they work. In summertime, women workers sometimes faint in morning meetings. In other workshops at Kangyou, workers complained about loud noises emanating from the huge, old-fashioned stamping machines.

Kangyou does not provide its lower-level workers with paid sick leave. If they apply for sick leave, in addition to losing the day’s wages, workers forfeit their full attendance allowance. Since wages are already below the minimum standard, workers are discouraged from taking sick leave even if they are really ill to protect their meagre income. This has a detrimental effect on workers’ health.

Thailand

Case Study: Namiki in Thailand

At the Namiki unit supplying handset motors for Nokia, most female workers are on the production line doing tasks, such as welding and soldering, that involve the use of many hazardous chemicals. This job requires nose-masks, but workers report that the company does not provide them. Instead, workers must purchase their own protective equipment, including mark clothes and finger gloves because the company policy is to reduce overhead costs in the factories. There is a competition between each factory to have the lowest overhead costs. As a result, the factory spends as little as possible on protective equipment for the workers. Instead of providing protective equipment, Namiki gives each worker one carton of milk per day, which they say will help cleanse chemicals from the body. Despite the milk's healing powers, in 2005 several workers got sick and had to go to the hospital where tests found dangerous levels of lead in their bodies. The company had told the workers that lead solder is not a dangerous material. However, lead solder contains 40% lead, a heavy metal that is extremely poisonous and can cause birth defects and death. In fact, lead is so dangerous that it has been banned from electronic products by European Union's Waste Electrical and Electronic Equipment Directive (WEEE) and Restriction of Hazardous Substances Directive (RoHS). Nokia has declared that its handsets are WEEE and RoHS-compliant, but the Namiki case reveals a different reality.

Workers at Namiki also suffer the humiliation (not to mention the dangerous health consequences) of not being able to go to the bathroom. Some workers have contracted bladder infections from holding their urine too long while working on the production line. If there is no one to replace them on the line, workers are not allowed to leave to go to the toilet because of pressure to meet target goals. Also at the LTEC factory, workers further report that there are not enough toilets for the workers and that they are not clean. Although the number of new workers increased by 2,000 last year, not a single new toilet was added.

A worker at LTEC in Thailand: "We feel like we are suffering, but we all passed the health check. I had no hearing in my ear, but still passed the ear check".

Philippines

In the P.IMES factory, workers generally agreed that health and safety conditions had improved in the past year. The factory has a clinic with a permanent nurse and medicines for ordinary illnesses. A doctor is present three times a week and a dentist twice a week. Workers are entitled to eight days of sick leave per year. Workers reported that the lighting and temperature in the factory is sufficient, but sometimes there are production areas that are too hot or cold. The working areas of the workers are generally clean and not dusty. Workers handle chemicals such as alcohol, acetone, toxic, technique clean solution,

soldering materials and paints. The factory provides them with a bunny suit, head cap/hairnet, masks, gloves, safety shoes, booties and ground straps. Conditions were similar at the Astec plant supplying Nokia and LG and the Micro-device factory supplying Samsung.

6.2.2. Excessive working hours and forced overtime

Around the world, the workforce in the mobile phone industry is expected to be flexible and to work when production is needed. In a highly globalised, "high-clockspeed" industry like that of mobile phones, companies offer consumers a customised product in as little time as possible. Suppliers are expected to react to changing demands on a day-by-day basis, and because of the intense competition for contracts from OEMs, suppliers accept whatever orders are offered without considering what is possible for their workforce. As a consequence, the workforce in these factories is expected to be as flexible as the management needs.

China

At the Giant Wireless unit supplying Motorola, the *Company Manual for the Employees* states that Giant Wireless follows an 8-hour work shift system, which is perfectly in line with the legal requirement. In reality, however, Giant Wireless's typical work shift lasts from 12 to 13 hours, which far exceeds the normal work time limit. Table 14 describes the timetable of a typical day-shift assembly worker.

A worker at Giant Wireless: "Five hours of overtime work each night was mandatory. Absenteeism or refusal to work overtime would be penalized by three days' wages".

Table 14: A Typical Day for Workers at Giant Wireless

Time	Activities
6.45 AM	Wake up
7.05 – 7.20	Walk to the factory
7.20 – 7.35	Breakfast
7.35 – 7.45	Punch timecard
7.45 – 12.00	Work
12.00 – 1.15 PM	Lunch and rest
1.15 – 1.30	Punch timecard
1.30 – 5.15	Work
5.15 – 6.00	Dinner
6.00 – 10.00 or 11.00 PM	Overtime Work

An average day-shift assembly worker of Giant Wireless has to work a mandatory four to five hours after dinner (in addition to the 8-hour shift) for six to seven days in a week. This is a clear violation of the Shenzhen labor regulations. According to Article 33 of the Shenzhen labour regulations, overtime work should not exceed three hours a day.

A worker at Giant Wireless: “Sometimes when I was queuing up for my turn to take a shower, I fell asleep on my bed. I was so tired. Suddenly it was the next morning and I went straight to work”.

During the peak season, the lead time between placement of order and delivery is shortened, and production and logistic workers are required to work non-stop for some 30 hours in double work shifts, day and night. In addition to the basic 174-hour work time in a month (21.75 days of 8 hours/day), compulsory overtime work ranges between 150 – 180 extra hours. On workers’ wage statements, however, the problem of overtime work is systematically hidden. While the category of “work days in a month” shows 21.75 normal work days, the “special allowance” in a lump-sum euphemistically refers to overtime payment. The exact overtime work hours are thus neither broken down into specific components nor properly documented. In this way, the management easily passes both corporate and government officials’ audits. When the workers do have a break, they are inadequate and not enough time to rest.

At Kangyou Electronics day shift workers also have to do excessive overtime during the peak season, working from 11 to 13 hours a day. Night shift production workers start at 6:30a.m. and finish the next morning at 8:00a.m. This means that the workers spend as long as 13.5 hours in the factory, during which two hours are allocated for dinner and rest. During slow season, the shift is shortened to “only” 10 to 11 hours. Illegal overtime work is thus endemic at Kangyou. The average production worker is required to do 100 to 120 hours of overtime work a month. Workers reported often having to work continuously for seven days a week, with only Sunday night off.

At Hivac Startech, workers typically work 10-12 hours day and they have no day off on Saturday or Sunday. As a result, overtime regularly exceeds 160 hours per month, and workers indicated that when a shipping deadline is approaching, workers sometimes do 180 to 200 hours of overtime work in a month. This is a serious violation of the legal limit of 36 hours overtime per month. The company uses many different means to force workers to work overtime. For example, the factory delays and deducts wages and cuts the full attendance bonus so that workers are disinclined to resist overtime.

Hivac Startech not only forces workers to work excessive overtime hours, it also penalizes workers for resigning. In the past, the company prevented workers from resigning by deducting wages. Since April 2006, the factory has used the excuse of a “training fee”: workers resigning within the first three months must pay a US $37.97 “training fee”; after three months, the fee increases to US $63.29.[163] This deprivation of workers’ right to resign is another serious violation of Chinese labour law. Article 37 of the *Regulations on Labour Conditions in the Shenzhen Special Economic Zone* stipulates that “wages shall be paid monthly to employees themselves in form of currency. The wages paid to employees shall not be deducted or delayed without justification”. Article 23 stipulates that

[163] Original figures were given in China Yuan (Renminbi) and converted to US$ at USD 1 = CNY 7.9.

"A migrant worker may notify with 30 days' prior notice, in a written form, the employing entity of his or her decision to revoke the labour contract without penalty".

SOMO's findings on excessive overtime hours in mobile phone factories in China corroborate a Finnish-Chinese study of Nokia and its suppliers in China.[164] The Finnish study found 20% of migrant workers in mobile phone factories worked more than 12 hours per day, and 5.8% worked up to 24 hours without time off.

Thailand
At the LTEC unit supplying for Nokia, official workdays are eight hours long, but in reality employees must work 12 hours per day, and most work seven days per week (including holidays). Sundays are only occasionally off when changing shifts. The Namiki factory supplying Nokia sets a target number of work pieces. If the workers cannot not reach it, the supervisor complains rudely to them. However, if workers reach the quota, the target is subsequently set higher so that workers are constantly struggling to meet it and are forced to work overtime. If workers refuse to do overtime work, they get a warning. Workers on the probationary period are fired or moved to another department.

A worker at LTEC in Thailand: "How much would my monthly salary would be without overtime pay? Umm…. That's impossible to answer, because if we did not work overtime, we would be fired".

6.2.3. Illegally low wages and unpaid overtime

China
At the Giant Wireless unit supplying Motorola, despite extremely long working hours, production workers are underpaid. Interviews with assembly workers revealed the basic take-home wage in 2003 was as little as US $50.25/month (US $0.12/hour), which was far below the level of legal minimum wage of US $74.37 (see Table 5).[165] Worse still, Giant Wireless arbitrarily set a uniform overtime payment at US $0.45/hour, which is illegally low. According to Article 38 of the *Regulations on Labor Conditions in the Shenzhen Special Economic Zone*, overtime hourly payment should be 150% of the legal normal hourly rate on weekdays (US $0.65), 200% on Saturdays and Sundays (US $0.86), and 300% on statutory holidays (US $1.30). Thus, the discrepancy between workers' overtime wages and their lawful entitlement was considerable. The situation was so unbearable for the workers that a labour protest broke out in late March 2003, resulting in a marginal improvement in the situation.

In 2006, workers wages had increased, but were still below the minimum wage. In August, workers' pay slips indicated an average monthly wage of US $150. If the workers were

[164] L. Kaiming and D. Xin, "Day and Night at the Factory," 17 March 2005, FinnWatch & Finnish ECA Reform Campaign, p.10.
[165] Original figures were given in China Yuan (Renminbi) and converted to US$ at USD 1 = CNY 7.9.

working a normal 40-hour workweek, this would be a decent wage, but when one considers that this figure excludes deductions for insurance, rent and utilities and includes the "full attendance bonus" and an average of 160 hours of overtime work, the hourly wage falls to less than US $0.44, which is below the minimum wage. On the wage slips, the overtime work was not specified but simply put under the broad category "special allowance". Workers criticised that Giant Wireless set an unreasonably high production quota and thus their overtime work was rendered "voluntarily" (without pay). The workers indicated that they were willing to do some overtime work in exchange for more pay, but not more than two to three hours of overtime a day. This year, workers were forced to work on the International Labour Day (May 1, 2006) but were not paid times the normal hourly wage as is required by law. Basically, the wages were so low that assembly workers needed to carefully work out their monthly budgets. When the workers were sick, oftentimes due to excessive overtime work and poor occupational health conditions, their expenditures were even higher. This puts them under heavy financial pressure and many young women workers have to eat cheaply and insufficiently to save money.

In the city of Dongguan, where the Kangyou Electronics unit is located, the legal minimum wage level at the time of the research was US $72.66/month.[166] Thus, for an ordinary Chinese work month of 168 hours, the daily wage for an 8-hour shift should be US $3.46 (US $0.43/hour). But workers at Kangyou receive wages much lower than the minimum standard. Even the most senior production workers[167] receive only US $2.65/day. For overtime work on weekdays, the hourly wage should be 1.5 times the normal rate, i.e. US $0.65. Senior workers, however, reported receiving only US $0.41/hour, a rate that is the highest in the factory because of the workers' seniority, for overtime work on weekdays. Workers also receive this same hourly wage for work on weekends and holidays although the compensation on those days should be even higher. Table 15 summarizes the regular and overtime wages at Kangyou.

Table 15: Daily Wages and Overtime Hourly Wages on Weekdays at Kangyou Electronics, August 2006

Length of Employment	Basic Daily Wage (minimum = US $3.46)	Weekday Overtime Hourly Wage (minimum = US $0.65)
Probation (first 3 months)	$2.27	$0.33
Between the 4th and 9th months	$2.40	$0.34
Between the 10th and 16th months	$2.53	$0.35
From the 17th month onwards	$2.66	$0.37

At Hivac Startech, workers' basic salary in June 2006 was only US $78.48/month, lower than the Shenzhen City minimum wage of US $87.34/month. Overtime compensation was also lower than the legal standard: overtime on ordinary days was compensated at US $0.35/hour and weekends at US $0.52/hour. This is about half the legal requirement. Moreover, the wage receipts presented by the workers listed only the basic wage, food

[166] The legal minimum wage in Dongguan was raised to US $87.34 on September 1, 2006.

[167] Refers to workers in their 17th month of work. Because of the high rate of turnover, a worker in her 17th month of work is considered "senior".

subsidy, full attendance bonus, and total overtime wage. The overtime hours are not itemized, so the workers have no idea how their overtime wages were calculated. Thus makes it difficult for them to defend their legal rights.

SOMO's findings on illegally low wages in mobile phone factories in China corroborate a Finnish-Chinese study of Nokia and its suppliers in China.[168] The Finnish study also notes that, although mobile phone workers' wages have risen slightly over the past decade, living costs in southern China have more than doubled during that time, reducing workers' buying power and quality of life.

India

In India, wages at mobile phone factories are generally marginally higher than the stipulated minimum wages, but still do not suffice to cover basic needs. Workers at Samsung had relocated a considerable distance for the job and had therefore to find accommodation, this was felt to put significant strain on their incomes. At the Flextronics unit supplying Motorola and Ericsson, approximately 40 workers travel from a district 40km away to reach the Pondicherry factory. This imposes an additional transport cost of around 20% of their take home salary. Workers also noted that they currently had no dependents but would be unable to support them on their current salary. Table 16 lists the wages, gross and take-home, that workers at various mobile phone factories receive.[169]

Table 16: Wages Paid by Mobile Phone Companies in India, 2006

Company	State	Average wage for operators (in US$ per month)	
		Gross wage	Take-home wage
Elcoteq	Karnataka	$74	$51
Flextronics – Pondicherry	Pondicherry	$48	$34
LG	Maharashtra	$85	$85
Nokia	Tamil Nadu	$85	$78
Samsung	Haryana	$51 to be increased to $72 on completion of 6 months training	N/A

Mobile phone companies often used performance-based wages to force workers to work harder and keep down labour costs. At the Indian Elcoteq unit supplying Nokia, the wage comprises of a fixed component and a performance component. The latter is determined by team and individual performance against a set of subjective indicators as assessed by their supervisor. Workers reported that the subjective nature of their performance assessments left them open to the whims of supervisors, management confirmed that this was a common complaint from workers. Dissatisfaction with this system was reported to have resulted in a high level of worker turnover.

[168] L. Kaiming and D. Xin, "Day and Night at the Factory," 17 March 2005, FinnWatch & Finnish ECA Reform Campaign, p.10.

[169] Original figures were given in India Rupees and converted to US$ at USD 1 = INR 45.32.

At Flextronics in India, wages are fixed and are not dependent on performance. Soft production targets exist but achievement of these targets does not affect remuneration positively or adversely. LG has a performance component that comprises approximately 45% of the total pay for the average employee and is based on the achievement of team targets. Samsung workers receive fixed wages that are not dependent on performance.

Thailand

At the LTEC unit supplying for Nokia, new workers receive almost the same amount as workers who have been here one or two years; there is only a one or two Baht difference in pay rates between new and experienced workers. After one or two years, workers receive US $3.95/day, while new workers receive US $3.87/day.[170] On the average, the average total monthly salary, including special pay and overtime, is between US $186 and $213. Most LTEC workers said their salary does not provide enough income to support their living expenses so they must have outside income sources. Many workers secretly sell various goods such as official and underground lottery tickets, phone cards, boiled eggs, coffee and lucky numbers at work. In 2005, fuel prices soared in Thailand. Workers signed a petition in order to increase their fuel subsidy, and LTEC agreed to increased the subsidy.

6.2.4. Falsification of documents

China

Falsifying timecards and wage slips is a way for companies to pass social audits of working hours and adequate overtime pay. Cheating by factory management in order to secure long-term contracts is commonplace. The success of this tactic manifests the weak enforcement of corporate social responsibility policies.

The Giant Wireless unit supplying Motorola institutionalizes a dual book-keeping system in terms of work time records. *Time Card A* matches perfectly with a standardized 8-hour workday with at most 3 hours of overtime work per shift (with a total that is well within the legal maximum of 36-hour of overtime work in a month). The management presents only this set of time cards to the auditors.
Time Card B, however, reveals the actual work time. Assembly workers punch their time cards when they start and finish their work shifts. This set of records provides precise information for total number of hours of work in a month (including a regular five-day work week of 40 hours and overtime work hours on weekdays, weekends and statutory holidays). When the work time appears normal, as shown by *Time Card A*, accordingly, the payroll records of the workers seem consistent. The serious problem of illegal wage calculation and thus underpayment is deliberately covered up. The company has learned to deal with the “audit culture” of the global economy.[171]

[170] Original figures were given in Thai Bhat and converted to US$ at USD 1 = THB 37.5.
[171] N. Sum and P. Ngai, “Globalization and Paradoxes of Ethical Transnational Production: Code of Conduct in a Chinese Workplace,” Competition & Change, 9(2), 2005, p.181-200.

6.2.5. Degrading and abusive working conditions

Workers in mobile phone factories are often made to work under degrading conditions. They are not allowed to use the toilets, are forced to undergo bodily searches, and are verbally abused by managers. Workers are made to work long hours without a rest period and are punished for getting too tired to work hard.

China

A worker at Giant Wireless: "Our line consists of about 40 workers but we have only one leader and one assistant line leader, who fill up our work stations when we are away for a while. Even though I have controlled myself by drinking little water, I need going to bathroom by around 11 A.M. It is the most difficult moment since 7.45 A.M. when the work starts. There is still an hour to go before the noon break. Many of us have complained about the restrictive system but no one really cares. The management instruct the security guard to not to let us go unless we have valid permits."

At the Giant Wireless unit supplying Motorola, women assembly workers are placed at the lower rank of the organization hierarchy. They are rarely permitted to take breaks during the entire work shift. Assembly line girls are confined to their specific work stations for almost an entire work shift. Production is organized in a liner, non-stopping manner in accordance with the principal of scientific management. The minimization of disruptions to production, due to a human's (women's) physical needs or menstrual pains, becomes the goal. Thus, Giant Wireless workers have to ask for formal leave permits before they go to the bathroom.

A worker at Giant Wireless: "Probably I didn't have enough rest during those days…too much overtime work. Overtime work was mandatory, and absenteeism would be penalized by three days' wages. One time I rushed to the nearest drug store during the short dinner break. At 6pm, I went back to punch my time card for the overtime shift. My body was very weak. I felt dizzy. I then secretly took out the medical sheet; I just wanted to find out whether one or two pills should be taken at one time. In a split second, the line leader discovered that my hands had stopped. She came up and scolded me loudly. She even accused me of pretending to be sick. It was so miserable. I knew that the production schedule was very tight and the quota must be met that night. However, I was really sick".

Verbal abuse, lack of respect, and discriminatory managerial practice exacerbate the degrading environment. In addition to the degrading working environment, workers noted that lower-level management tended to exercise their power arbitrarily. Giant Wireless imposes fines and penalties on "misdemeanours". Hong Huimei, a 20-year-old worker, described the 3-level disciplinary company policy: "Warning A: the least serious level, in the form of a written record; Warning B: more serious, in the form of deduction of 36 yuan

[US $4.56] from wages; and Warning C: the most serious level, with a deduction of 130 yuan [US $16.46]. If you dare to quarrel with the line leader, you will surely get a Warning B. I've witnessed many cases before".

Thailand
At the LTEC unit supplying for Nokia, there is a security guard who checks everyone leaving outside of regular hours. Workers leaving must have permission papers stating the reason for leaving. Female workers are body checked by female guards, while male workers only have their bags searched. For sick leave of more than three days, a medical certificate is required, but single sick days can be granted by supervisors. However, this means that workers are dependent on the whims of the supervisor for single sick days. End-of-year assigning of promotions and rankings is also left to the discretion of the supervisors who reward some employees and not others based on their personal preferences, not on merit.

6.2.6. Lack of job security and the use of contract labour

Job security in the mobile phone manufacturing sector is increasingly under attack with a growing number of workers being employed on short-term contracts, sometimes being dismissed before their contracts convert into long-term arrangements. As a result, workers feel that their precarious employment position is hampering their ability to speak out about their labour conditions, engage in activities to protest against these conditions and/or join trade unions.

India
In line with trends towards on-demand order and a more flexible workforce, mobile phone companies often employ workers engaged in 'peripheral work' on a contract basis. Workers involved in housekeeping, catering, maintenance and security are employed via contractors. In India, the use of contract labour is such 'peripheral' activities is permissible by law, but the manufacturing unit, as the 'principal employer' for these workers, is liable for certain basic labour standards being met for these workers. Indian workers employed at LG through an external contractor reported problems such as improper payment by contractors, excessive working hours (14/16 hours) and lack of proper overtime payments. LG indicated its awareness of this responsibility, but a non-senior manager at the Indian Elcoteq unit supplying Nokia claimed that Elcoteq viewed the contracting company as responsible for the standards applicable to these workers.

Despite the fact that the use of contract workers for 'core' production work is illegal in India under section 10 of the Contract Labour Act, research indicates that this is indeed happening in handset factories. The Flextronics unit supplying Motorola and Ericsson was found to be employing workers involved in 'core' manufacturing work in India on a contract basis. According to the management, only 30% of the workforce is employed permanently with the remaining 70% employed through a labour contractor. In fact, workers indicated that *all* employees involved directly in production work were employed through a contractor operating within the company. Flextronics does not provide contract workers with the same rights as permanent employees. For example, contract workers who

become ill have the corresponding wages deducted from their monthly pay. Furthermore, one senior member of Flextronics management indicated that the future of their unit at Pondicherry was uncertain. This indicates that contract labour may be being used by the company to enable easy closure, and that footloose foreign investment and it's implications for workers may well be an issue in the sector in the future.

6.2.7. Workers without a contract

In China, workers at the Hivac Startech unit supplying Motorola claimed that they had never been given a lawful contract nor had they ever been informed of the dangers of the hazardous chemicals with which they were forced to work. In India, workers are often not given proper contractual documents or documents indicating their rights upon joining. In the case of the Flextronics unit supplying Motorola and Ericsson, workers reported that no formal contract was in place and that they only had a verbal agreement with the contractor. Nokia does give its employees an appointment letter, but several workers reported that this did not occur until between two and three months after employment had commenced. In Thailand at the LTEC unit supplying Nokia, workers said that there has never been an agreement between workers and the company concerning working regulations and that the workers are not aware of their rights. Announcements about working hours and employment policies are posted outside the nurse's room for the employees to read, but the workers do not have an personal contract.

6.2.8. Freedom of association and unionisation

The ICT hardware sector, including the mobile phone industry, is notorious for the lack of unions in its factories worldwide. Historically, ICT manufacturing was concentrated in traditionally non-union areas such as Silicon Valley, the US South, Scotland and Wales.[172] In the Asian ICT industry, many countries have either banned unions in export processing zones, or the unions have very limited access. Workers who try to organise often face severe oppression and often lack support at the national and international level. In China, independent, democratic union organising is illegal; see Section 4.1.2 for more information, or see the Section on China in the ICFTU's "Annual Survey of Violations of Trade Union Rights 2006".[173]

In India, none of the current mobile manufacturing facilities have a union or interact with unions in any way. Management at LG and Flextronics admitted that a union would not be welcomed at their units and that they would refuse to enter into negotiation with a union. Workers at Samsung and Nokia reported that, upon being hired, they had been told not to join a union or engage in any union activity. If workers are inclined to join a union, the extent to which unions can access workers at mobile phone facilities in India is likely to be highly limited as only authorised persons are able to enter the factory grounds and workers are dropped off by the transport close to or within these grounds. In addition, the

[172] B. Lüthje, "The IT industry: labour flexibility, production networks and the global downturn", Asian labour update, no.45 (October-December 2002).
[173] Available at <http://www.icftu.org/survey> (accessed 18 November 2006).

location of the units are locate in remote industrial areas is likely to make worker organisation difficult.

The Indian companies were keen to point to alternative forums in place such as formal group meetings with the general manager and supervisors, a drop box for complaints and an internet site where workers can express their grievances. However, these mechanisms lack independence since often the first contact point for any issue was the direct supervisor, which is inappropriate and ineffective because the supervisor is often the source of workers' grievances. Samsung claims that its workers do not want to join a union and that management at its Indian facility has set up an Employee Committee where employees can communicate their complaints. Workers, however, told field researchers that they did not feel comfortable with this mechanism.

In the Philippines, the P.IMES factory strictly discourages union organisation. And in Thailand, there are no labour unions at the LTEC factory nor the Namiki unit supplying Nokia.

On the company bulletin board at Namiki in Thailand: "The workers cannot group together to gossip or say anything that will destroy the reputation of the company".

The International Confederation of Free Trade Unions reports that in South Korea, trade unions are hindered by a legal clause used by large firms like Samsung. This clause forbids trade unions from gathering within 100 metres of the company.[174] And in Hungary, Samsung forbids that its workers form unions or work councils. Where attempts were made to organise, Samsung threatened to relocate.[175]

6.2.9. Right to strike

In China, there are no laws that protect workers' right to strike. While there is no law explicitly forbidding strikes, workers are often criminally charged for "disturbing the social order" or "provoking quarrels to create trouble". In this sense, the juridical protection of workers in China is inadequate.

In India, LG (under the Maharashtra IT and ITES policy) and Motorola and Flextronics Chennai unit (under the Tamil Nadu state SEZ Act) are classified as public utilities. This status, initially designed to ensure the maintenance of essential services, effectively prohibits any strike action (the definition of which includes refusal to work overtime), rendering illegal an essential bargaining tool for workers in these facilities.

[174] ICFTU, "Violence and violence of trade union rights in South Korea", 31 January 2002, <http://www.icftu.org/displaydocument.asp?Index=991214672&Language=EN>, (accessed on 13 March 2006).

[175] ICFTU, "Hungary: annual survey of violations of trade union rights", 2002, <http://www.icftu.org/displaydocument.asp?Index=991215693&Language=EN>, (accessed on 13 March 2006).

6.2.10. Poor living conditions in workers' dormitories

China

Most foreign-invested enterprises in China provide their transient migrant workers with collective dormitories in close proximity to the plants. "Production" and "social reproduction" spheres integrate with each other. When the socio-spatial distinction between "work" and "home" is blurred, management tends to abuse the labour flexibly in meeting the just-in-time global production.[176] Production workers are often required to work overtime and irregular shifts. Leisure and rest time is compromised.

Workers at Giant Wireless: "We used to have a wooden wardrobe near the door. About a year ago, when we discovered that there were three to four big rats and dozens of cockroaches hiding there, we carried it down the stairs and threw it away. We now put most of our personal belongings either on the bed or in the plastic buckets underneath the double-bunk."

Figure 13: A Giant Wireless Dorm Room Shared by Ten Women Workers, 2006

Photo taken by SACOM field researchers.

The dormitory setting at the Giant Wireless unit supplying Motorola has not undergone significant changes in six to seven years. Assistant line leader Xie Yushan and line worker Zhao Lili, both of whom began work at Giant Wireless in 1997, described the setting. "A

[176] C. Smith, "Living at Work: Management Control and the Dormitory Labour System in China." Asia Pacific Journal of Management, 20(3), 2003, p.333-58.

$20m^2$ room houses 10 persons, either men or women. The setting is all the same". As can be seen in
Figure 13, each dormitory room is equipped with a fixed fan on the ceiling, a tube light, a small table, five double-bunks, and a toilet.

The facilities in the dormitory can hardly meet the basic needs of ten adults in their everyday lives. For simple things like water bottles, rubbish bins, and stools, the workers pool money and buy these things themselves. Hot water is a luxury. Wang Yu, a 24-year-old Henan girl who has been working in Giant Wireless since July 1997, remarked, "In winter time, we need to queue up for buckets of hot water on the ground floor even if we are exhausted from work. It's very inconvenient. It's dangerous too when the staircases are wet and slippery."

The workers wish that a room housed six instead of 10 people. In coping with the overcrowded living environment, they learn to be considerate and to minimize conflicts. In the morning on an average work day, workers tend to wake up at the last minute because they are exhausted from their twelve-hour shift the day before.

Workers at Giant Wireless: "When the alarm clocks ring 6.45 a.m., physical space in the only toilet is very limited. It is yet effectively utilized. The first one usually brushes her teeth by standing next to the sink and another over the urine-trough. The third one cleans her face by using the tap water at the corner. Some others change their clothes behind the drawing curtains of the bunk beds. The remaining ones comb their hair. When the night-shift workers come back, they would usually wait along the corridor for a while until we go out by around 7 a.m."

During the Severe Acute Respiratory Syndrome (SARS) outbreak in southern China in early 2003, the hygienic conditions of the collective dormitories at Giant Wireless were worrying. The dorm management distributed to each room a bottle of household bleach but ignored other suggestions for improvements.

6.2.11. Women's rights

Women workers play an extremely important role in the mobile phone industry. In many factories, they make up a large percentage of the assembly line operators (see Table 9), often doing the most repetitive and mind numbing jobs in the plant. Female workers at the Nokia unit in India indicated that they are required to stand for 8 hours a day to man the machinery, which could be quite strenuous. Companies often prefer women workers because of their "dexterity", "nimbleness" and "focus".

In India, the main issue with respect to working hours is the use of women in night shifts or in shifts which require them to commute during the night. Standard Indian law permits women to work between 6:00am and 7:00pm. At the Elcoteq unit, women workers do not work the night shift but are allowed to work up until 10pm due to exemptions granted by

the state government to the electronics sector. At Nokia, women work the night shift but are provided with a transport from and to their homes. Some of the workers who start at 6:00am have to leave their homes at 3:30am, and several women workers reported that this caused them considerable stress.

In China, women workers at the Hivac Startech factory are denied maternity leave. In order not to lose their meagre income, pregnant women tend to continue working for as long as possible, compromising their own health and that of their baby.

In Thailand at the Namiki factory supplying Nokia, there is a health check before beginning work, and pregnant women are not hired. If a woman becomes pregnant during probation, she will be fired immediately. In 2005, many hundreds of workers who had not passed the probation yet were fired due to a slowing of orders from OEM customers. Workers who stayed on received only a portion of their former wages; the company paid 70% of the salary to the workers, except pregnant women, who only got 50%.

6.3. CSR policy implementation and practice

As shown above, mobile phone companies do have codes of conduct and requirement for suppliers, but field research into actual practice reveals that the policies and requirements are often not implemented. Workers do not have access to the codes and requirements and are not aware how it affords them rights. Often companies announce their visits in advance, and local management instructs the workers on how to answer. If auditors do question workers about conditions, which is rare, workers are afraid of reprisal from their managers if they answer truthfully.

China
Assembly workers at Giant Wireless are never given copies of the codes of conducts of Motorola and other multinational clients of the company. None of the workers interviewed had been informed by their managers about the extensive coverage of the protective clauses in the OEMs' code of conduct. Ironically, workers only had a vague knowledge about the standards because of the instructions they were given prior to pre-announced factory audits.

Workers reported that the vast majority, if not all, of the audits were announced to the company prior to the date of the audit, giving the management time to drill or coach the workers beforehand. This monitoring model is obviously not a viable way to assure factory compliance with the legal, human and worker rights standards laid down by Motorola's corporate code of conduct. Chen Choihong, a worker responsible for soldering in Assembly Line A8, was instructed to give only the "right answers" to the factory auditors sent by Motorola. She noted, "The questions are predictable and our managers have prepared the model answers. If we could answer correctly, we will be given tens of yuan. This is to buy us off, but if we don't lie, we will be punished by being fined and even dismissed". As a result, most assembly workers dare not report openly their very long working hours, wages well below the local legal minimum (due to illegal basic and

overtime wage calculations), fines and punishments, high occurrence of occupational diseases, poor living environment, and degrading treatments at work.

According to workers, corporate monitoring or auditing in Kangyou Electronics is not frequent. Whenever there are pre-announced audits, supervisors and technicians are "advised" in how to handle questions about personnel management as well as production flows. None of the rank-and-file workers interviewed in this research, all of whom had been in the factory for over a year and a half, understood the logic or purpose of multinational corporate monitoring.

Although Motorola has translated its Code of Conduct into Chinese, the nine poisoned women workers at Hivac Startech got their first look at Motorola's Code when researchers showed it to them during interviews at the hospital.

SOMO's findings regarding the lack of awareness of corporate codes of conduct and inefficacy of multinationals' audits corroborates a 2005 Finnish-Chinese study on the factories of Nokia and its suppliers in China.[177] The Finnish study found that workers were being instructed on what to say and do prior to pre-announced audits and that the auditors only checked the factory for quality and efficiency and did not inquire about working conditions.

India

In a number of the factories investigated in this research, it is unclear whether any CSR policy exists at all. Where policies do exist and are clearly articulated by the management, these are global policies of the parent company and do not appear to have been assessed in terms of their applicability to the local situation or the ways in which they can be appropriately implemented in the local context. In India for example, interviews with lower tier management indicated that even where top-tier management were fully aware of CSR policies these are not filtering down to the lower management who are responsible for their implementation. Table 17 provides a description of the CSR policies of Indian mobile phone units as communicated to the researchers by company management in India.

In terms of supply chain regulation, Elcoteq and Flextronics did report that their OEM clients monitored CSR issues. However, Elcoteq reported that, although labour standards are assessed by Nokia, this is done via management and that workers were not consulted in any form. Flextronics reported that OEM clients Motorola and Ericsson had made labour inspections, but that these seemed to focus only on extreme labour rights violations such as forced labour and child labour despite the presence of less extreme violations. Interviews with Bellpoly Moulders and EIPPL, companies supplying to LG and Samsung for their consumer electronics production (not mobile phones), yielded some insights into the companies' general supply chain monitoring process. Bellpoly Moulders reported that neither LG nor Samsung put any conditions in terms of labour or other standards and that the only conditions were those surrounding the quality of the product. No labour

[177] L. Kaiming and D. Xin, "Day and Night at the Factory," 17 March 2005, FinnWatch & Finnish ECA Reform Campaign, p.10.

inspections had been made at the unit by either LG or Samsung. Both companies reported that workers were employed on 12 hour shifts. EIPPL reported that environmental standards were imposed and that they would not be enlisted as a vendor unless they were compliant with environmental standards, but that the most significant pressure from LG was to reduce overhead costs.

Table 17: CSR Policy at Indian Mobile Phone Units, August 2006

Company	CSR Policy
Elcoteq	Senior management indicated that there was no specific CSR policy for India or for the manufacturing facility in Bangalore, but that the global CSR policy of the company applied. As part of this policy, employee rights are based on SA 8000 and OHSAS 18001, and environmental policy is based on ISO 14001. Elcoteq is currently applying for SA 8000 certification and is thus undergoing a social audit process conduced by OSHO.
Flextronics	The person responsible for CSR in the company (this person is based outside India) indicated that the company is currently developing their CSR initiative in Asia, the "Flex-pledge", which has 4 pillars covering HR issues, environmental issues, business ethics and governance and philanthropic activities. A global steering committee has been established to address CSR issues in the company. The company was a founding member of the Electronics Industry Code of Conduct. They are ISO 9000 and ISO 14000 certified.
LG	No specific CSR policy could be articulated by senior management although HR and environmental health and safety were in place, indicating that the conceptualisation of CSR may be a part-explanation for apparent policy absence. The company is a CII member and involved with ESOCON. Workers are required to sign the company Code of Conduct annually. The company has ISO and OSHA standards. The Indian subsidiary itself has not undertaken social audit, but it is audited for social issues by the parent company, which has rated the Indian subsidiary to be the highest performing of all LG subsidiaries.
Nokia	The senior technician interviewed for this study believed that no CSR policy has yet been formulated for the unit and that HR policy was still being developed. Although this could be attributed to low awareness, communications with higher levels of management did suggest that policy development was at best in its nascent stages.[178]
Samsung	Management was unwilling to give any information on CSR or HR policies. The company indicated that no ISO or other certification had been obtained as it was too early in their setting up process for this.

Philippines

At the P.IMES factory producing parts for Nokia and Samsung, codes of conduct from the clients were not posted in the factory. All workers were aware of was the quality policy for the products and the company policy, which instructs employees to show "Respect and

[178] In feedback on a draft of this report in November 2006, Nokia claimed that over 90% of employees at the Chennai unit have participated in training on Nokia's updated Code of Conduct. The company claims that it conducted an assessment of the Chennai site in October 2006, the results of which will be available in the company's next CR report, due to be published in spring 2007.

obedience to company's code of conduct and compliance to the expected work standards, while setting a good example for others to follow".

Thailand
At the LTEC unit supplying Nokia, employees agreed that they have never heard of Nokia's Code of Conduct. The only phrase they knew with reference to clients' standards was the company's motto, "Technological superiority for our customer's satisfaction". Workers reported that factory inspections happen several times per month. When customers come to inspect, they mainly are trouble-shooting. For example, when problems occur during shipping customers will come to try to solve the problem, but they will not talk with workers, only with management and supervisors. On occasion, they will ask the Safety Department about safety conditions in the factory, but they never ask about working conditions, hiring procedures, or problems of the workers. Supervisors instruct workers to avoid looking at customers (or visitors) faces.

Similarly, at the Namiki factory supplying Nokia, the workers are unaware of any corporate Code of Conduct or about other laws relating to the right to group together and to submit their requests. They have never heard about it from the shift leaders or personnel department or seen it on the company's announcement board. Workers report that corporate customers have come to visit the factory to check the quality of the products. They have never talked with the production workers. Only the shift leaders can talk to the customers, and the production workers are not allowed to look at the customer's face.

6.3.1. Transparency and stakeholder engagement

CSR is an area in which a certain degree of information should be publicly available. Indeed, a major tenet of multinational mobile phone companies' CSR policy is engagement with stakeholders and transparency on decisions that affect workers and the environment. Industry initiatives such as the Global e-Sustainability Initiative tout stakeholder engagement as a key operating principle. However, the situation on the ground in India and China tells a different story as companies are unwilling to engage with NGOs, communities or authorities on CSR issues.

In India, the only company that could site a specific example of stakeholder involvement in the country was Elcoteq, which had reportedly carried out a review of its remuneration package and procedure in terms of its social dimensions with the help of an NGO. According to Elcoteq, this review covered issues such as the extent to which current remuneration covered employees living costs and an independent assessment of the procedure for paying and verifying payment of wages to subcontractors. Unfortunately, Elcoteq was unwilling to divulge information on the content or procedure used in the review or the name of the NGO involved.

Among the mobile phone companies in India, there was great reluctance to allow any lower level management to meet with local researchers, and none of the companies were willing to allow meetings with the workers. Table 18 describes how the mobile phone

companies operating in India reacted when approached for information on their CSR policies and practice.

Table 18: Indian Mobile Phone Companies' Response to Request for Interview

Company	Response
Elcoteq	The senior management at the Elcoteq plant gave a reasonably comprehensive interview although when probed on certain issues (such as their involvement with an NGO on an audit of their remuneration) they completely closed up. Lower level management were reluctant to provide information when approached directly.
Flextronics	The department responsible for corporate responsibility gave a comprehensive interview (the department was not however located in India) and had been in direct contact with the Pondicherry manufacturing unit to source much of the information. A lower level HR manager was approached directly at the Pondicherry unit however during the meeting one of the managers' seniors found out about this, halted the meeting and demanded the researchers' notes.
LG	The senior management at the LG Noida plant gave a comprehensive interview, and showed a willingness to discuss the difficulties as well as their achievements in this area. However, researchers were not granted an audience with management at the Pune plant where mobile phone production takes place.
Motorola	Motorola had not yet set up operations in India. The researchers were able to meet with a marketing manager who provided only limited information. The person responsible for the Chennai plant was not available for interview. It should be noted that the company only publicly announced its investment in India after construction on the project had already begun.
Nokia	Nokia was unwilling to give any direct interviews with management other than a brief meeting with the marketing department. One senior technical employee did, however, give information outside the company on an informal basis.
Samsung	Samsung was unwilling to supply any information or meetings through the standard corporate communications channels. However, an interview was secured with a marketing manager who was very suspicious of the study and refused to answer many questions. At the end of the interview, the manager insisted that the information given could not be published.

6.3.2. Compliance with taxation laws

In many developing countries where mobile phones are produced, the relative ease with which mobile phone companies can evade taxation laws is an incentive to locate operations there.

In India, both Samsung and LG have been accused of significant non-compliance with tax law. Indian subsidiaries of companies manufacturing in India have been implicated in non-compliance in the form of tax evasion. LG Electronics India Limited has not been complying with Tax Deduction at Source for its Indian-based Korean employees who receive a salary paid in India and a salary paid in Korea, both of which should be taxed by the Indian employer according to Indian Income Tax Law. The amount evaded is thought to be over US $200 million. LG has also been implicated in cheating on import duties. Samsung Electronics India Limited has also not been complying with Tax Deduction at

Source for its Korean employees in India. The amount evaded is also thought to be close to US $200 million. Samsung has also been accused of evading the transfer pricing law, but Samsung argues that there has been an incorrect interpretation of the transfer pricing law and has appealed to the Commissioner of Income Tax.

6.4. Environmental issues

In the early days in California, the ICT industry was referred to as the "clean industry". The industry has built an image of a clean and non-polluting sector. But as far back as 1982, environmental problems surfaced. The Silicon Valley Toxics Coalition was formed in response to the discovery of substantial groundwater contamination throughout Silicon Valley, caused by toxic chemicals leaking from underground storage tanks belonging to ICT companies. In just one generation, the high-tech revolution has spread out all over the world, and it has become evident that the environmental impact of the industry is significant and unequally distributed. Developing countries are especially vulnerable because the majority of computers and mobile phones are produced and disassembled in these countries. Exacerbating the problem, developing country governments focus on industrial growth at the expense of environmental and social concerns. Within countries, the burden of polluting activities is disproportionately distributed to women, immigrants, poor communities and communities of colour. As part of the ICT industry, the production of mobile phones and their electronic components can have detrimental effects on the environment. Three major environmental issues related to wireless handset production are the toxicity of the substances in mobile phone components, the large environmental footprint of mobile phone manufacturing, and e-waste.

6.4.1. Use of toxic substances

Mobile phones are a complex mixture of several hundred components. Although recent government regulations, such as the EU Restriction of Hazardous Substances directive (see Section 7.2), are aimed at reducing the amount of hazardous materials in electronics, many mobile phones still contain heavy metals and hazardous materials. Table 19 contains the results of a University of Florida Study to determine the composition of an average mobile phone handset.

Many of the raw materials in Table 19 are themselves toxic or contain small traces of hazardous substances that cause pollution and can put workers at risk when handsets are produced or disposed of. For example, a typical mobile phone contains the following toxic substances: lead, brominated flame-retardants (BFRs), beryllium, hexavalent chromium, arsenic, cadmium, and antimony. Some of these substances have been prohibited by environmental regulations in Europe such as WEEE and RoHS (see Section 7.2), but these regulations do not apply to handsets destined for developing countries. Even in Europe, today's typical mobile phone contains minor quantities of lead (in applications exempted by RoHS), BFRs in component encapsulations, beryllium and antimony in some metal alloys.

Table 19: Mobile phone raw materials and their uses in a typical handset

Raw material	Use in handset	% composition of handset
Plastic	Casing	40%
Iron, Aluminium	Casing	3%
Glass and ceramics	Screen, Liquid Crystal Display	15%
Copper	Printed wiring or circuit board	15%
Magnesium	Printed wiring or circuit board	3%
Lead	Printed wiring or circuit board	1%
Gold, Arsenic, Beryllium	Printed wiring or circuit board	0.1%
Cobalt, Lithium, Carbon	Battery	4%
Coltan	Capacitors	>1%
Silver	Keyboard	>1%

Based on: University of Florida[179]

Many of these substances are classified as persistent bioaccumulative toxins (PBTs). PBTs are particularly dangerous because they do not degrade over long periods of time, and can easily spread and move between air, water, and soil, resulting in the accumulation of toxins far from the original point source of pollution. Because PBTs accumulate in fatty tissue of humans and animals, the toxins are gradually concentrated, putting those at the top of the food chain at the greatest risk. According to the United States EPA, "PBTs are associated with a range of adverse human health effects, including damage to the nervous system, reproductive and developmental problems, cancer and genetic impacts."[180] The danger is greatest for those working with the materials, especially when not provided with sufficient protection. Table 20 lists some of the toxic substances found in mobile phones.

Greenpeace recently completed a "Guide to Greener Electronics" ranking leading mobile phone (and PC) manufacturers on their global policies and practice on eliminating harmful chemicals and on taking responsibility for their products once they are discarded by consumers.[181] Greenpeace's study includes Nokia, Motorola, Samsung, Sony Ericsson, and LG. The report revealed that none of the mobile phone companies are performing satisfactorily in terms of eliminating the use of hazardous substances. Nokia ranked the highest in Greenpeace's study with a score of 7 out of 10; Motorola ranked the lowest among mobile phone companies, earning just 1.7 out of 10 points. Table 21 summarizes the findings in Greenpeace's report

[179] T.G. Townsend, "RCRA Toxicity Characterization of Computer CPUs and Other Discarded Electronic Devices," University of Florida, August 2004, A copy of this report is available at <www.ban.org>.
[180] US Environmental Protection Agency, "Persistent Bioaccumulative and Toxic (PBT) Chemicals Program," <http://www.epa.gov/pbt> (accessed 13 January 2006).
[181] Greenpeace, "Guide to Greener Electronics, " 25 August 2006, <www.greenpeace.org/electronics>.

Table 20: Toxic substances in mobile phone handsets

Substance in handsets	Use	Toxic effects
Phthalates	Used to soften plastics	One of the most widespread man-made pollutants in the environment. One of the most common phthalates is a known reproductive toxin.
Brominated Flame Retardants	Used to prevent fire, especially in circuit boards and casing	They accumulate in the environment and in the tissue of animals. Long-term exposure can damage the nervous, reproductive and endocrine systems.
Lead	Used in circuit boards and soldering	Lead is highly toxic to humans and other animals. In many developed countries it is banned from landfills, but mobile phones containing lead are still dumped in developing countries like China and India and are often dismantled by hand.
Polyvinyl chloride (PVC) plastic	Used in casing and to insulate wires and cables	When burnt, PVC produces highly-toxic dioxins. In order to get at the valuable metals inside, it is common for recyclers in Asia to burn off the plastic coating. PVC also contains other toxic substances like phthalates and TBT.

Based on: Greenpeace International

Greenpeace notes that Motorola was on track to receive a better score, but then backtracked. In October 2005, Motorola made promises to Greenpeace to remove a number of toxic substances from its products. In a July 2005 letter, Motorola committed to phasing out all toxic brominated flame retardants (BFRs) in its mobile phones by mid-2007 and to provide a phase out date for the hazardous plastic PVC by March 2006. However, after follow-up talks on their progress, Motorola sent Greenpeace a letter on May 15, 2006, stating that the company could not meet the mid-2007 timeframe for phasing out BFRs and PVC from their products. In the letter, Motorola argued that complying with the EU RoHS Directive requires more resources than expected, and that it could not go beyond that to meet the promises it had made to phase out all BFRs. Yet, as Table 21 reveals, other mobile phone companies are meeting the RoHS requirements and going beyond.[182, 183]

[182] Greenpeace International, "Motorola hangs up on toxic clean up promise," 23 May 2006, Greenpeace website <http://www.greenpeace.org/international/news/motorolabreakstoxicspromise230606> (accessed 15 July 2006).

[183] In feedback for this report, Motorola says that it "believes the Greenpeace evaluation provides an incomplete picture of the company's true performance and commitment to the environment. Motorola is already using some BFR-free boards in some of its handsets, but the company has not yet identified

Table 21: Mobile Phone Companies' Performance on Eliminating Hazardous Substances

Company	Score (from 10)	Negative points	Positive points
Nokia	7.0	- Provides info on mobile recycling, but no data on amount of mobiles actually recycled. - Weak definition of the precautionary principle	- Nokia has removed PVC in all new models and committed to making all new components free of BFRs by 2007. - Nokia has also identified other harmful substances for future elimination.
Sony Ericsson	5.3	- No reference to the precautionary principle. - No reference to supporting individual producer responsibility. - No information on amounts of e-waste collected and recycled.	- The phase out of BFRs in circuit boards completed early 2004 and complete phase out of all BFRs from early 2006. - Voluntary takeback services provided globally product-by-product
Samsung	5.0	- No BFR-free or PVC-free models on the market.	- Provides timeline of 2010 for phasing out BFRs in all applications. - Explicitly supports IPR and provides good analysis of obstacles to implementing IPR. - Take-back and recycling policy
LG	4.3	- No BFR-free or PVC-free product systems on the market. - No information about voluntary takeback program on website. - No information on what customers can do with discarded e- waste	- Provides strong definition of the precautionary principle. - Supports individual producer responsibility (IPR) while acknowledging the barriers to implementing IPR.
Motorola	1.7	- No reference to the precautionary principle. - No BFR-free or PVC-free products on the market. - No commitment to eliminating PVC or BFRs - No reference to supporting individual producer responsibility\ - No information on amount of e-waste collected and recycled.	- Provides a list of chemicals banned and reportable substances. - Has voluntary takeback programs in the US, UK and China.

Based on: Greenpeace, August 2006

alternatives for its entire portfolio. Motorola remains confident that it will achieve its goal of eliminating BFR compounds from printed wiring boards and PVC in its mobile phones".

6.4.2. Environmental footprint

In addition to the environmental risks linked to toxic products in mobiles, the effects of the use of massive amounts of natural resources such as water are also detrimental to the environment. The size of the electronic parts used in computers and mobile phones are increasingly small allowing for the production of smaller handsets. However these innovations are not without consequences. To make one 2-gram chip, of which there are up to 12 in an average mobile handset, 32 litres of water, 72 grams of chemicals and 1.6 kilos of fossil fuels are needed. This amount of fossil fuel consumption is 800 times the weight of a mobile phone. In comparison, during the production of a car only two times the weight of the car in fossil fuels are needed.

The semi-conductor industry (which makes chips) is one of the biggest consumers of electricity and biggest polluters. ST Microelectronics' chip factory in Crolles, France, uses no less than 700 cubed meters of water an hour - the equivalent of the average hourly usage of a town of 50,000 inhabitants. During chip production large quantities of toxic substances are released. These substances impact the air, water and the ground. They contribute to climate change and the destruction of the Ozone layer. The pollution produced by the semi-conductor industry is on the rise as demand for mobile phones and other chip-using electronics increases.[184]

6.4.3. E-Waste

Globally, 20-50 million tonnes of electronic waste is generated each year, and e-waste has become the fastest growing component of municipal solid waste.[185] Mobile phones and computers are the biggest problem because they are replaced most often. Experts estimate that, in the United States alone, 130 million mobile phones are thrown out each year, resulting in 65,000 tonnes of mobile phone waste.[186] The increasing rate of technological obsolescence is a critical factor in the rising amount of mobile phone e-waste. Competitive pressures and the race to develop and acquire the most advanced technology are leading to an increased rate of obsolescence of older mobile phone handsets. Currently, it is estimated that a significant technological development in the IT industry takes place every eighteen months.[187] Consumers desiring to have the latest mobile phone technology must regularly purchase new phones and often discard their outdated handsets. In developed countries, mobile phones have a lifecycle of less than two years. The sheer volume of mobile phone waste is compounded by its toxicity (see Section 6.4.1).

Although most major mobile phone companies have handset take-back and recycling schemes, the majority of these programs are currently fragmented, poorly organized, and lacking in specific targets and procedures. Many large companies also outsource the

[184] T. Güggenbühl, "La Puce à l'Oreille : L'impact du téléphone portable," Déclaration de Berne, *Solidaire* issue 185, April 2006.
[185] Greenpeace International, "Toxic Tech: Pulling the Plug on Dirty Electronics," May 2005.
[186] Inform, <www.informinc.org>, (accessed 31 October 2005).
[187] Verité and ASK, Summary report on the Multi Stakeholder Consultations On Social and Environmental Issues In the IT Sector, New Delhi and Bangalore, July 2005.

disposal and recycling of their mobile phones, and the complexity and wide geographic spread of the e-waste supply chain presents a major problem for responsible management of discarded handsets. After handsets are discarded by consumers in developing countries, it becomes very difficult to trace the waste's change of hands. Most of the waste is exported, often in violation of the Basel Convention on the Movement of Hazardous Waste, to developing countries like China and India for processing where labour costs are lower and enforcement of environmental laws is weak. Inspections of 18 European seaports in 2005 found that as much as 47% of waste destined for export, including e-waste, was illegal.[188]

Since so much of the waste is exported illegally, few of the mobile phone disposal companies are certified as operating under adequate labour and environmental conditions. In India, for example, where 25,000 workers are employed in e-scrap yards and 10-20,000 tonnes of e-waste per year is processed in Delhi alone, there is a critical lack of safe and environmentally-responsible recycling facilities and technologies. Recycling of electronic waste is primarily done informally in private households or by small enterprises where safety and environmental issues are largely neglected. In addition, labourers at these illegal or informal recovery and recycling units are overworked and underpaid. The use of child labour is common, and children often work 16 to 18 hours a day and, in some cases, live with in the facility. According to a Toxics Link Study in Delhi, labourers are paid US $0.66-$1.32/day, well below the government-mandated minimum wage of US $2.20.[189]

E-waste in India is viewed as a value-generating activity in which informal e-waste handlers pay to acquire the waste as they are able to extract value in excess of this payment and thus enable a profitable enterprise. This is a dramatic departure from the model in the west where waste-generators pay to dispose of their waste. Valuable metal extraction is performed on mobile e-waste to separate out precious metals like copper and lead. Workers separate parts of circuit boards utilizing wire cutters and pliers. Long-term exposure to the chemicals and heavy metals contained in mobile phones can lead to impaired learning and memory functions, damage to the brain and central nervous system, harm to hormone and reproductive systems, and the development of cancer.[190] Such metal recovery processes are carried out in a lengthy and unscientific manner, the health and safety environment is very dangerous, child labour is used and there are serious environmental impacts including dumping in municipal waste bins and drainage of dangerous chemicals from leaching processes in to underground municipal waste.

There is a high prevalence of mobile phone 'service centres' in India that are used mainly to address problems with the LCD, battery, and casing on mobile phones. A 'Rapid WEEE Assessment Study – Bangalore' analysed six service centres in the city: two authorised (Motorola and Nokia) and four independent. Both types of service centres had negative impacts in terms of occupational health and safety as desoldering and soldering

[188] Inspectorate of the Netherlands Ministry for Housing, Spatial Planning and the Environment (VROM), "Waste export regulations are often contravened," April 2005, <www2.vrom.nl/pagina.html?id=9396>.
[189] Toxics Link, "Waste can be a 'treat,'" <www.toxicsliknk.org> (accessed 11 January 2006).
[190] Greenpeace International, "Toxic Tech: Pulling the Plug on Dirty Electronics," May 2005.

conducted at the units involves exposure to dangerous fumes and lead (conditions were worse for workers in the independent service centres who worked in congested, poorly lit and poorly ventilated areas) and in terms of waste: unwanted batteries (containing nickel and cadmium) were thought to be being dumped in municipal waste bins.

There are a number of international regulations dealing with e-waste. These include the Basel Convention, the EU Restriction of Hazardous Substances (RoHS) Directive, and the Waste Electrical and Electronic Equipment (WEEE) Directive. More information on these regulations and initiatives can be found in Chapter 7 of this report.

6.4.4. Raw material extraction

Although it is beyond the scope of this research to do an in-depth study and analysis of raw material extraction for mobile phone production, it is important to note that mining of materials for mobile phones raises serious environmental and human rights concerns. This Section briefly explains the situation of coltan to give an example of this issues at stake.

Developing countries supply the majority of the primary materials used to make mobile phones. Copper, cobalt, gold and tantalum, precious metals needed in the production of mobiles are mostly extracted in Africa and Latin America. Coltan is the colloquial African name for columbite-tantalite, a metallic ore comprising niobium and tantalum. Tantalum is most notably used in the production of the electrolytic capacitors, which allow a high degree of miniaturisation and are thus needed in the production of small electrical devices such as mobile phones and laptop computers. In general, the electronics industry is the largest consumer of coltan; more specifically, the telecommunications industry accounts for 18% of all tantalum capacitors.[191] Only a tiny amount of tantalum is found in mobile phones (1%), but is resistance to heat makes it indispensable.

Currently, coltan is mainly mined in Australia, which accounts for over 40% of the global production, but more than 80% of the world's known reserves of tantalum is found in the Democratic Republic of Congo (DRC). Some of the mines are controlled by armed militias who use the production as a means to finance their activities. On their websites, many mobile phone companies say that they do not use tantalum from conflict zones; however, it is almost impossible for a producer to verify the provenance of the metals used. Large amounts of these precious metals are illegally transported from the DRC to Rwanda, Uganda and Burundi and then sold on as products of those countries.[192]

In the DRC, millions of people have died in the ongoing civil war, a war defined by some as a war over coltan. A proportion of the coltan mines are controlled by armed militias, and the conflicts being waged in the east of the country are directly linked with the exploitation

[191] K. Hayes and R. Burge, "Coltan Mining in the Democratic Republic of Congo: How tantalum-using industries can commit to the reconstruction of the DRC," Fauna and Flora International, Cambridge, UK, 2003.

[192] T. Güggenbühl, "La Puce à l'Oreille : L'impact du téléphone portable," Déclaration de Berne, *Solidaire* issue 185, April 2006.

of these mines as well as those for diamonds, gold and copper. Trade in these raw materials allows them to acquire arms. Because it is impossible to be certain of the origin of tantalum, NGO Fauna and Flora International, in a report commissioned by Vodafone and the Global e-Sustainability Initiative, recommend better regulation of its trade.[193] Direct long term contracts should be established with Congolese producers to allow the industries that use the tantalum to limit illegal trafficking and assure greater transparency in the origins of the metals.

The Swedish handset OEM Ericsson pioneered mobile phones that do not require tantalum, and other OEMs such as Nokia and Motorola are decreasing the number of tantalum-based capacitors in their handsets. However, this decrease is being offset by the increasing overall volume of mobile phones produced worldwide. Furthermore, multi-slot transmission and third-generation (3G) GSM handsets require the high capacitance conferred by tantalum and have caused a resurgence in demand for the ore.[194]

6.5. EPZs, SEZs and relaxed regulations

As is common in the ICT industry as a whole, mobile phone production is often located in Export Processing Zones (EPZs) or Special Economic Zones (SEZs). EPZs are defined by the ILO as industrial zones that are set up with special incentives to attract foreign investors, where imported materials are processed before re-exporting.[195] An SEZ is a geographical region that has economic, labour and environmental laws that are more relaxed than a country's typical economic laws; its primary purpose is also to increase foreign investment. The ICFTU estimates that, worldwide, just under 42 million people were employed in EPZs in 2004. The economic benefits of EPZs and SEZs to the economy of a country are limited due to the fact that the production taking place there is mostly low-tech and low-skilled with limited transfer of technologies and skills. Often the increased foreign exchange earnings from an EPZ or SEZ do not cover the investment in the zone and infrastructure that a country must make to establish a zone and the incentives given by the government to the investors. EPZs and SEZs are associated with short-term investment, heavily reliance on imported materials for production and inadequate social and environmental safeguards against pollution and labour rights abuses.

The Indian government's SEZ website identifies 14 SEZs currently in operation in India, each an average size of 200 acres, and a further 61 approved and under establishment.[196] Other sources, however, suggest that 164 SEZ projects have already obtained in-principle clearance from the government.[197] Thus, the next few years are likely to see a

[193] K. Hayes and R. Burge, "Coltan Mining in the Democratic Republic of Congo: How tantalum-using industries can commit to the reconstruction of the DRC," Fauna and Flora International, Cambridge, UK, 2003.
[194] Roskill Information Services, Ltd., *The Economics of Tantalum*, 8th Edition, London, 2002.
[195] International Confederation of Free Trade Union (ICFTU), "Behind the brand names, Working conditions and labour rights in export processing zones" (December 2004).
[196] See <http://sezindia.nic.in/Important_addresses.asp> (accessed 6 October 2006).
[197] G. Subramaniam and R. Jayaswai, "Cap on no. of SEZs," *Economic Times*, 7 June 2005.

considerable increase in the industrial activity occurring in areas with special status. Within India, fears are growing regarding the lack of transparency in SEZs, their questionable governance structures, the total lack of economic evaluation, relaxed environmental and labour regulation and accusations that they are merely providing tax shelters. The Indian farming community has intensely protested the creations of SEZs, accusing the government of forcibly snatching fertile land from them at heavily discounted prices. Motorola, Nokia and Flextronics are setting up with SEZ status in the state of Tamil Nadu. In addition to the benefits outlined for SEZs by the central government, Tamil Nadu (like many other states) has enacted its own SEZ act extending further benefits to companies, including the relaxation of labour laws. Even without these relaxations, the experience of other industrial areas operating under incentive programmes has been rife with violations of labour rights.

Although the Indian Department of Commerce, which is solely responsible for setting the laws and conditions in SEZs, maintains that SEZs follow national Indian labour laws, the department has passed a Model State SEZ Act in which it recommends that individual states relax labour regulations in SEZs under their jurisdiction.[198] One of the principal mechanisms that the government recommends is declaring companies in SEZs "public utilities". The premise is that these companies provide services that are so important for society that workers are legally prohibited from going on strike, but one must question whether toy factories, carpet manufacturers and mobile phone producers truly represent a matter of national survival. In the state of Tamil Nadu, the Essential Services Management Act of 2002 even criminalises refusal to work overtime as "striking" and stipulates a punishment of a fine or imprisonment up to three years. In addition to banning strikes through the public utilities trick, the combination of central and state SEZ regulations allow the following relaxations to labour laws:

- Allows the use of contract labour with no health, occupational or social protection;
- Exempts companies from publishing working hours, wage rates and shift work;
- Enables quick closure of factories with less than 1,000 employees;
- Exempts companies from conducting meaningful safety and health inspections;
- Waives companies' contribution to employee social security funds.[199]

Regarding the environment, the Indian government has given conflicting signals on regulation within SEZs. On the one hand, the Ministry of Commerce has stated that the "the SEZ and units therein shall abide by local laws, rules, regulations or bye-laws in regard to area planning, sewerage, disposal, pollution control and the like", but the same Ministry has also stated that the "area incorporated inside the proposed SEZ is free from environmental restrictions".[200] This confusion and ambiguity in official policy leaves environmental standards open for interpretation and susceptible to violation. One major

[198] Ministry of Commerce of the Government of India, "Model State SEZ Act", Special Economic Zones India website <http://www.sezindia.nic.in/state_sez_policy_ent.asp>.
[199] P. Oskarsson, "Indian Attraction: Profitable multinationals as subsidy junkies," FinnWatch, November 2005.
[200] Quoted in P. Oskarsson, "Indian Attraction: Profitable multinationals as subsidy junkies," FinnWatch, November 2005, p.19.

exemption from normal Indian legislation is that companies operating is SEZs are exempted from public hearings required by the Environment Protection Act of 1986. Keeping environmental information and impact assessments secret from the public removes an important oversight mechanism for protecting the environment and gives companies an incentive to reduce their environmental protection and mitigation procedures. Another major concern is the fact that companies in the SEZs are promised a steady supply of as much water and electricity as they need while many in India suffer from a severe shortage of water.[201]

Further incentives for companies to locate inside SEZs include low or no taxes, which counteracts the purported societal benefits of SEZ investment through employment generation, and lax monitoring of compliance with already weakened laws and regulations. This is a result of the duties for both promoting business in the SEZ and assuring compliance with regulations both being assigned to the same office – the Development Commissioner.[202]

Relaxed environmental regulations also create a potential safety problem. In Maharashtra, where LG is located, mobile phone manufacturing falls under the IT and ITES policy, which exempts the unit from having to obtain clearances from the Maharashtra Pollution Control Board. Similarly, Samsung as part of the IT hardware manufacturing sector in the state of Haryana is exempted from the State's Pollution Control Act. Nokia, Flextronics and Motorola, due to their SEZ status, are exempt from making Environmental Impact Assessments publicly available or holding public hearings. This greatly reduces the accountability mechanisms in place to control any environmental externalities imposed by these units.

[201] P. Oskarsson, "Indian Attraction: Profitable multinationals as subsidy junkies," FinnWatch, November 2005.
[202] Ibid, p.20.

Chapter 7
International Regulations and Initiatives

7.1. Industry Initiatives

7.1.1. Electronics Industry Code of Conduct (EICC)

Although codes of conduct were longer in coming to the electronics industry than to other industries, such as the garment and coffee industries, many mobile phone companies have developed their own code of conduct in recent years. In an effort to standardise the approach for monitoring suppliers' performance, an industry-wide Electronic Industry Code of Conduct was adopted by Hewlett-Packard, Dell, IBM and a number of contract manufacturers in October 2004. Shortly thereafter, the EICC Implementation Group was created to facilitate implementation and monitoring of adherence to the code. The EICC Implementation Group has collaborated with the Supply Chain Working Group of the Global e-Sustainability Initiative (GeSI) to produce an ICT supplier self-assessment questionnaire. See Section 7.1.2 for more on the collaboration between the GeSI and the EICC.

The original EICC covered several areas of social responsibility such as labour and employment practices, health and safety, ethics, and protection of the environment, but it was heavily criticised for not being explicit enough about compliance and enforcement mechanisms. The standards expressed in the EICC were often unclear and the document did not refer to internationally accepted standards, such as ILO-standards. In response to this criticism, the EICC was revised and re-launched in October 2005. The new EICC (version 2.0) does include a reference to international standards such as the OECD Guidelines for Multinational Enterprises, the United Nations Universal Declaration of Human Rights and the ILO standards.[203] However, despite these changes the new EICC still leaves much to be desired for an international code of conduct. For example, the EICC does not specify that overtime should be voluntary, nor that workers shall not on a regular basis be required to work in excess of 48 hours per week and overtime shall not exceed 12 hours per week. The code stipulates only that the workweek shall be no longer than 60 hours, "except in unusual situations".[204] The EICC also does not fully protect freedom of association, requiring it only when it is "in accordance with national laws", and

[203] Electronics Industry Code of Conduct, version 2.0, 10 October 2005, EICC website <http://www.eicc.info/EICCversion2.0-Oct.10,2005.pdf> (accessed 14 August 2006).
[204] Ibid., p.2.

does not mention collective bargaining.[205] To date there is no information about the impact of the code for the workers, communities and the environment.

Although several mobile phone EMS and ODMs (such as Foxconn, Flextronics, Jabil Circiut and Solectron) are party to the EICC, none of the industry's OEMs nor service providers have signed up. Several mobile phone OEMs have noted that their own code of conduct and other initiatives, such as the GeSI, are more comprehensive and generally represent a higher standard than the EICC. According to Michael Loch, Director of EHS Strategic Functions at Motorola, the EICC is a code for companies to consider if they do not have their own code of conduct or are in the process of updating their current code.[206]

7.1.2. Global e-Sustainability Initiative (GeSI)

The Global e-Sustainability Initiative is an initiative of ICT service providers and suppliers, partnered by the UN Environment Programme and the International Telecommunications Union. Of the companies mentioned in this report, Deutsche Telekom, Ericsson, Orange, Motorola and Vodafone are participants in GeSI. All signatory companies commit to a certain level of environmental and social performance through entry criteria. Among GeSI's main goals are:

- to improve and to promote products, services and access to ICT for the benefit of sustainable development,
- to gradually adopt a full Corporate Social Responsibility Agenda starting from environmental issues, and
- to promote and support greater awareness, accountability and transparency.

Some of GeSI's general principles for its members include:

- meeting or exceeding, where appropriate, requirements of all applicable legislation,
- minimising a company's own operational impacts on the environment, and
- maximising our contribution to the societies in which we operate.

In 2004, GeSI formed the Supply Chain Working Group (SCWG). The GeSI SCWG explores ways in which ICT sector companies can work more closely together to more effectively manage social and environmental risks in their supply chains. Rather than aligning existing practices, the focus is to develop best practice tools that companies can use to manage their supply chain. For example, the working group commissioned an independent study to compare GeSI members' current CSR practices against a best-practice model.

[205] Ibid., p.3.
[206] M. Loch, Director of EHS Strategic Functions, Motorola, 13 July 2006, telephone call with J. Wilde.

Building on this initial benchmarking, a Supplier Self-Assessment Questionnaire[207] has been developed. The purpose of this project is to provide GeSI members with an online questionnaire facility that they can use with their suppliers. The questionnaire is intended to raise suppliers' awareness of CSR issues, help suppliers assess to what extent they are meeting key standards, and assist GeSI members in determining whether action or investigation is needed. It will also mean that a supplier serving a number of GeSI members will only have to complete one questionnaire, making the whole process much more streamlined and efficient.[208]

Collaboration between the GeSI and the EICC

Since 2005, the supply chain working group of GeSI has been collaborating with the EICC Implementation Working Group. The deliverables of the GeSi – EICC collaboration:

- A self assessment questionnaire for suppliers (finished, workgroup led by GeSi)
- A risk assessment tool & methodology (planning Q4 2005, Work group led by EICC)
- A web based e-tool to facilitate business to business information flow (ongoing, workgroup led by GeSi)
- A common auditing methodology for auditing suppliers (ongoing, workgroup led by EICC)
- A common reporting methodology for use by ICT when reporting externally the performance of their suppliers (TBD)
- A capacity building plan to improve CSR performance in the supply chain (TBD)

Both EICC and GeSI working groups have organized stakeholder meetings aimed at "providing an update on the work [they] have carried out to date, propose next steps and to obtain feedback from stakeholders on the initiatives [they] are undertaking within the ICT industry". Although the industry's initiative to create space for stakeholders' feedback is positive, there is much to be improved in the process. Most importantly, the meetings do not involve widely representative stakeholders at different stages of the initiative, from the drafting of the Codes to its implementation. Furthermore, stakeholder meetings cannot replace a true multi-stakeholder process. Currently, the practical obstacles (language, travel costs) that many important stakeholders face in attending stakeholder meetings are unaddressed by the initiatives' leadership. Furthermore, current stakeholder involvement is limited to meetings where stakeholders are positioned in a reactive role (reaction to industries' plans and presentation), and there is no guarantee whatsoever that feedback will be taken into account. Overall, there is no clear strategy that ensures the active involvement of a representative group of stakeholders on all decision making levels.

[207] The GeSi Supplier Self-Assessment Questionnaire can be downloaded at the GeSI website, <www.gesi.org>.
[208] GeSI website <http://www.gesi.org/activ/representing.htm> (accessed 16 August 2006).

7.1.3. European Telecommunications Network Operators' (ETNO) Association

ETNO was established in May 1992 and has become the principal policy group for European electronic communications network operators. Of the mobile network operators mentioned in this report, only KPN and Deutsche Telekom are members of ETNO. ETNO's primary purpose is to promote [its] members' common interests vis-à-vis institutions of the European Union and other European organisations, particularly regarding regulation of the telecommunications industry.[209] Since 2004, ETNO has had a Sustainability Charter, and it publishes yearly environmental reports. ETNO's Sustainability Charter embraces the three pillars of the EU sustainable development strategy: environmental protection, social progress and economic growth. ETNO is also a founding member of the Global e-Sustainability Initiative and joined the United Nations Global Compact programme. ETNO has done considerable work on reducing greenhouse gas emissions of the telecommunication service industry, recently collaborating with the World Wildlife Federation (WWF) to produce a roadmap for CO^2 emissions.[210]

7.2. International Regulations on Environmental Issues

7.2.1. Restriction of Hazardous Substances (RoHS)

The European RoHS Directive, adopted by the EU in 2002, requires that electronics manufacturers stop using toxic chemicals and heavy metals in their products. It bans the use of cadmium, mercury, lead, hexavalent chromium and two types of brominated flame retardants (PBDEs and PBBs) in products marketed after July 1, 2006, with some specific exceptions. The RoHS Directive covers all electronic products on the European market, whether manufactured in the EU or imported.

Manufacturers in the ICT and electronics sector have hundreds or thousands of suppliers, and all of them must be checked for compliance. The contract manufacturer Celestica has researched compliance with RoHS/WEEE legislation since 1999. Traceability is a key part of the ban on the four heavy metals and two BFRs. Documenting the traceability of parts is required, because it is necessary to show that parts are compliant with the European directive. The positive side effect of this is the increasing transparency of the supply chain. Supplier awareness is another valuable side-effect of the RoHS. Companies must keep their fingers on the pulse of their entire supply chain to determine if and when their suppliers plan to convert their products to RoHS compliance. The case of RoHS-prohibited lead solder still being used in the Namiki factory supplying Nokia[211] reveals that this will be a difficult process to implement and monitor. It has been suggested that RoHS

[209] ETNO website, <http://www.etno.be/Default.aspx?tabid=1089> (accessed 8 June 2006).
[210] ETNO and WWF, "Saving the climate @ the speed of light," http://www.etno.be/Portals/34/ETNO%20Documents/Sustainability/Climate%20Change%20Road%20Map.pdf.
[211] See section 6.2.1.

compliant components may be slightly more costly at first, as suppliers must cover the expense of conversion.[212]

China RoHS

China has developed its own RoHS called ChinaRoHS which has become effective on the 1st of March 2006. The limits of the substances and concentration is the same as the Europese version. The key differences between the European and the Chinese RoHS are that there are no exemptions of goods to which the RoHS apply in the Chinese version, whereas with the European version medical devices and monitoring and control instruments are exempted from the standards. Penalties are different and labels and marks are required. Furthermore the companies have less than one year to comply.[213] The first in force date is 1 March 2007

In the beginning of March 2006 two of the standards were ready to be approved by the Ministry of Information Industry. It concerned the standards on 'Concentration Limits" and 'Marking'. The maximum concentration allowed will only apply to EEE, which still need to be defined. All other products may contain more than the maximum concentration limits. With respect to 'Marking" only the products that exceed the concentration limits need to be marked. Also need to be declared every hazardous component. On April 18 the final draft standards were issued, as it is a final draft not much is expected to change anymore.[214]

7.2.2. Registration, Evaluation, and Authorisation of Chemicals (REACH)

The REACH legislation[215] requires companies to test the safety of more than 30,000 chemicals already on the market, putting an end to the current artificial distinction between "new" and "existing" chemicals.[216] It not only concerns the mobile phone sector but all sectors in which chemicals are used. REACH requires companies that produce and import chemical to asses the risk arising from their use and to take necessary measure to manage this risk. This would reverse the burden of proof regarding whether chemicals are hazardous or not from the public authorities to industry for ensuring the safety of chemicals on the market. Companies that manufacture or import more than one ton of chemical substance per year would be required to register it in a central database along with the outcomes of the risk assessment. The aim of the REACH regulation is to improve

[212] Dan Shea, Chief Technology Officer, Celestica, "The Road to RoHS," 2 March 2005 <http://www.emsnow.com/npps/story.cfm?ID=9911>.

[213] ChinaRoHSSolutions, 12 June 2006, It's not just another RoHS. It's China RoHS, <http://www.chinarohs.com/>, http://www.chinarohs.com/faq.html>, (21 June 2006). Kenneth S. Rivlin & Jean-Philipe Brisson, 18 October 2004, WEEE and RoHS: basics, update and open issues, <http://thor.inemi.org/webdownload/newsroom/Presentations/03.pdf>, (21 June 2006).

[214] Industry Week, 29 May 2006, Update: China RoHS are ready, <http://www.industryweek.com/ReadArticle.aspx?ArticleID=12043>, (21 June 2006).

[215] The text of the REACH legislation can be found at the EU's REACH website, <http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm> (accessed 18 August 2006).

[216] "Existing" chemicals are the chemicals that are already on the market, inasmuch as they are not subject to safety tests.

the protection of human health and the environment.[217] Following two years of negotiation on the Commission's original proposal and following the European Parliament's first reading opinion, the Council reached a Common Position[218] on June 27, 2006. Final adoption of the proposal is expected by the end of 2006.[219]

A Chemicals Agency will act as the central point in the REACH system: it will run the databases necessary to operate the system, co-ordinate the in-depth evaluation of suspicious chemicals and run a public database in which consumers and professionals can find hazard information.

According to Greenpeace, the strongest promise of REACH is its potential to identify and phase out the most hazardous chemicals by requiring their substitution with safer alternatives wherever possible ("substitution principle").This solution-oriented requirement would offer a precautionary approach to protect health and environment. It would replace the current system which is based on establishing "safe" levels of chemical exposure. Attempts to establish safe exposure levels and effect thresholds are flawed by the impossibility of determining the consequences of long-term exposure to low levels of hazardous chemicals, singly and, especially, in combination.[220]

However, the REACH proposal currently contains a major loophole. It will permit the continued use of these most hazardous chemicals even if a safer alternative is available. To continue using the chemical, a manufacturer, for example, will simply have to demonstrate it is exercising "adequate control" of the chemical (a term that has yet to be properly defined). As it is impossible to accurately predict the effects of exposure to chemicals that persist in the environment and that build up in the body, such substances cannot be "adequately controlled". In the absence of any hard data, the fact that they are persistent and that they bioaccumulate provide a good indication of (eventual) human exposure to these chemicals.[221]

Another problem with the current legislation is that it fails to require basic health and safety information for the majority of low volume chemicals (1-10 tonnes per year), which constitute two-thirds of the substances covered by REACH. The European Trade Union Confederation points out that, as a result of the "low-volume" exemption, two-thirds of the 30,000 substances that will have to be registered under REACH will require only limited

[217] I. Schipper & E. de Haan, September 2005, CSR issues in the ICT hardware manufacturing sector, SOMO: Amsterdam, p.82-83, <http://www.somo.nl/html/paginas/pdf/ICT_Sector_Report_2005_NL.pdf>.
[218] The text can be found at <http://register.consilium.europa.eu/pdf/en/06/st07/st07524.en06.pdf> (accessed 16 August 2006).
[219] REACH website < http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm> (accessed 16 August 2006).
[220] M. Conteiro, "Toxic Lobby: How the Chemicals Industry is trying to kill REACH," Greenpeace, May 2006, p.7, Greenpeace website <http://www.greenpeace.org/raw/content/international/press/reports/toxic-lobby-how-the-chemical.pdf> (accessed 16 August 2006).
[221] Greenpeace European Unit website, <http://www.greenpeace.eu/issues/chem.html> (accessed 16 August 2006).

safety information. As a consequence, the potential health benefits of REACH for workers exposed to these chemicals will most probably be reduced.[222]

7.2.3. Waste Electrical and Electronic Equipment (WEEE) Directive

The Waste Electrical and Electronic Equipment Directive (WEEE Directive) is the European Community directive 2002/96/EC on waste electrical and electronic equipment which, together with the RoHS Directive 2002/95/EC, became European Law in February 2003, setting collection, recycling and recovery targets for all types of electrical goods.

The directive imposes the responsibility for the disposal of waste electrical and electronic equipment (WEEE) on the manufacturers of such equipment. Those companies should establish an infrastructure for collecting WEEE, in such a way that "Users of electrical and electronic equipment from private households should have the possibility of returning WEEE at least free of charge". Also, the companies are compelled to use the collected waste in an ecological-friendly manner, either by ecological disposal or by reuse/refurbishment of the collected WEEE.

The WEEE Directive obliged the twenty-five EU member states to transpose its provisions into national law by 13 August 2004. Only Cyprus met this deadline. On 13 August 2005, one year after the deadline, all member states except for Malta and the UK had transposed at least framework regulations. As the national transposition of the WEEE Directive varies between the member states, a patchwork of requirements and compliance solutions is emerging across Europe.

7.2.4. Basel Convention

The global environmental treaty known as the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted in response to concerns about escalating shipments of hazardous wastes from developed to developing countries. The treaty aims to reduce the generation of hazardous wastes and to minimize their shipment to the developing world. A primary goal is the “environmentally sound management” of hazardous wastes to protect human health and the environment. The Convention contains lists of wastes that are hazardous and establishes controls on their shipment. Among the wastes defined as hazardous are circuit boards containing lead-based solder, used in most mobile phones. The Basel Convention was adopted in 1989. It has been signed by 158 countries and was ratified and went into effect in 1992. The United States, Afghanistan, and Haiti have signed but not ratified the Convention. The US participates in Basel initiatives as a signatory but not as a party to the treaty. The Convention is administered by the United Nations Environment Programme (UNEP) and is implemented by a secretariat located in Geneva, Switzerland.

The Basel Ban Amendment, adopted in 1995, bans all exports of hazardous waste, including electronic waste, from developed countries to developing countries that are both party to the convention.[223]

[222] ETUC website <http://www.etuc.org/a/496> (accessed 16 August 2006).

Mobile Phone Partnership Initiative (MPPI)
As the Basel Convention entered its second decade, the parties to the treaty decided to form partnerships with industry to create innovative approaches to environmentally sound management of end-of-life products. The first product chosen was mobile phones, and the MPPI was launched in December 2002. Mobile phones were chosen because of the rapidly rising waste generation rates from handsets The world's leading mobile phone manufacturers are participating in the MPPI, including Nokia, Motorola, Samsung, Siemens, and Sony Ericsson.

A Mobile Phone Working Group was established consisting of the participating countries, the manufacturers noted above, and members of the Secretariat. The working group developed a work program consisting of four major projects:

- Reuse of used mobile phones
- Collection and transboundary movement of used mobile phones
- Recovery and recycling of end-of-life mobile phones
- Awareness raising and training

The last project includes four subcategories. Three of these subcategories focus on promoting awareness and training on cell phone reuse, collection, and recycling/recovery. The fourth focuses on mobile phone design and use. The goals of working group are to:

- Achieve better product stewardship.
- Influence consumers toward more environmentally friendly behaviour.
- Promote the best refurbishing/recycling/disposal options.
- Mobilize political and institutional support for environmentally sound management of mobile phones.
- Create an initiative that could be replicated to build new public/private partnerships for the environmentally sound management of hazardous and other waste streams.

[223] See <www.basel.int/text/documents.html> for the text of the Basel Convention

Chapter 8
Conclusions

The mobile phone manufacturing sector is a relatively young sector, using and producing the newest technologies and radiating innovative energy and progress. The industry projects a clean image, reflecting highly skilled jobs in research and development and 'clean rooms' where professionals work in a controlled and dust-free environment. As the industry's leading companies tout their CSR policies and programmes, it might be difficult to imagine that employees in the factories producing mobile handsets are working 12-hour workdays in poisonous workshops sometimes for months on an end without a single day's rest.

The industry has continuously shifted to countries that are perceived as cheaper, producing predominantly in export processing zones where labour rights and environmental issues have little priority. The industry predominantly employs young women, on wages below subsistence level. Forced overtime is endemic, and a lack of unions and barriers to organising means that the workers cannot negotiate improvements. The research carried out by SOMO in China, India, Thailand and the Philippines between March and October 2006 examined the mobile phone industry both on the surface and at its heart.

8.1. Characteristics of the Mobile Phone Sector

The past decade has seen rapid growth in the sector, characterized by strong competition and a high degree of concentration. The industry's top five handset manufacturers enjoy more than 75% of the world market share for mobile phones. The industry is characterised by complex, globalised supply chains and a moderate level of outsourcing to contract manufacturers. The industry average is approximately 30% outsourced production, with some companies outsourcing as much as 66% of production, and some companies none at all. This is much lower level of outsourcing than the laptop computer industry, where outsourcing reaches 90% for some computers, but the level of handset production outsourcing is expected to rise. Production continues to be shifted "offshore" to low-cost countries, especially China.

8.2. Corporate Social Responsibility Issues

Mobile phone production is characterised by short product lifecycles leading to extensive waste, rapid changes in technology with an extensive use of toxic materials, and a low degree of unionisation worldwide. The labour intensive part of the production, in particular, has moved to countries where the governments work to attract investment and create

employment. This leads to competition between governments, with incentives being given to the industry, as tax relief and relaxed labour and environmental laws.

Health and Safety

The extensive use of toxic chemicals in the production of mobile phones creates dangerous working conditions in handset factories. SOMO's research revealed that factory managers often do not provide workers with the protective equipment they need to prevent accidents and illness. The case of the nine Chinese workers poisoned by "white gasoline" (n-hexane) is a case in point. Equally as appalling was the factory's response to the situation.

Labour issues

SOMO's research found forced and underpaid overtime work to be endemic in the mobile phone sector. Employers cheat workers out of overtime pay by setting production quotas unreasonably high and falsifying time cards and wage slips. Workers are forced to do overtime and threatened with docked pay, financial penalties and being fired if they refuse.

Wages that fall below a living standard are also common in the industry. In China, none of the factories researched even paid their workers the legally-mandated minimum wage.

The degree of unionisation is extremely low. SOMO's research did not find a single mobile phone factory where a union was present. Unions are discouraged by hostile management and out-of-the way factories. Many mobile phone factories are located in SEZs or EPZs, in which unions are strictly discouraged or explicitly forbidden and where it is illegal for workers to strike. In China, where the one, state-controlled union is present, it hinders more than helps workers in learning about and asserting their rights.

Environmental issues

Mobile phones are a complex mixture of several hundred components, many of which contain heavy metals and hazardous materials. In just one generation, the high-tech revolution has spread out all over the world, and it has become evident that the environmental impact of the mobile phone industry is significant and unequally distributed. Some mobile companies have phased out the most hazardous chemicals and committed to phasing out others, but it is clear that there is much left to be done.

Electronic waste (e-waste) is one of the most pressing environmental issues associated with mobile phones. In the United States alone, 130 million mobile phones are thrown out each year, resulting in 65,000 tonnes of mobile phone waste.[224] The increasing rate of technological obsolescence (i.e. the short lifespan of mobile phones) is a critical factor in the rising amount of mobile phone e-waste. Most old mobile phones are illegally exported to developing countries such as China, India and Pakistan for disassembly, countries which lack the capacity or political will to implement controlled conditions to ensure the safe handling of toxic e-waste.

[224] Inform, <www.informinc.org>, (accessed 31 October 2005).

CSR Policies
Although some of the industry's top OEMs such as Nokia, Motorola and Sony Ericsson, have extensive codes of conduct and standards for their suppliers, SOMO found little evidence that these standards are trickling down to the level where the parts for the handsets are actually being produced. Workers in the factories had little or no knowledge of the OEMs' codes and standards or that they applied to them. Audits among first tier suppliers appear to be regular, but are almost always focussed on quality and efficiency and rarely investigate working conditions. Audits among sub-tier suppliers where working conditions are often the worst are still few and far between, and OEMs rely far too heavily on their own suppliers to monitor their own supply chains. Field research showed that this level of trust in monitoring sub-tier suppliers is not justified. When OEMs do work on remediation plans with suppliers, these are *ad hoc* and based on complaints from research or labour organisations. Rather than making a systematic change in their policies to improve conditions in the entire supply chain, companies focus on changing the individual factory or instance that has been discovered. A good example is the Motorola-Hivac Startech case; while it is commendable that Motorola has conducted an independent audit and claims to be working with its direct supplier to improve conditions at Hivac Startech, Motorola uses thousands of component suppliers, all of which may, unbeknownst to Motorola, potentially have problems as serious as Hivac Startech. OEMs need to proactively evaluate and improve conditions in the entire supply chain rather than relying on *ad hoc* research to identify problems. Industry initiatives such as the EICC and the GeSI are attempting to tackle the issue of CSR in the supply chain, but as of yet they have had little impact.

Differences between countries
SOMO's research found that the worst production conditions in the mobile phone industry are found in China and Thailand. It was in China and Thailand that SOMO found workers being poisoned and forced to do the most overtime work for wages far below the minimum standard. Conditions in India and the Philippines appear to be slightly better, but there are still problems with freedom of association, wages below a living standard, and job instability.

8.3. Points to consider

Codes of Conduct
A code of conduct does not only exist in theory, it also has to be implemented. Companies have to develop an internal system to make sure that suppliers follow the code and to be able to assess the progress of this process.

The backing of civil society is essential to the credibility of a code of conduct. A state-of-the-art code of conduct is based on the interaction between different stakeholders including companies, labour unions, non-governmental organisations (NGOs) and possible others, for example, suppliers. This is relevant to the actual development of the code and to its elaboration on a local level, i.e. when a local community has to decide to which concrete improvements should be given priority.

Workers at the companies that supply handsets and components for mobile phone companies and service providers are often not informed about the standards and the rights that are expressed in the codes of conduct and supplier requirements. Companies could do more to ensure that their code of conduct and the standards they wish to uphold are passed on directly to the workers, who are the ones to whom the standards and rights are actually addressed. In this regards, companies should engage more with local stakeholder groups such as unions and labour support organisations rather than discouraging workers from unionising as is often the case.
Companies have to give its suppliers the opportunity to implement the code of conduct without obliging them to make excessive financial sacrifices. This can be done by offering suppliers long-term contracts and fair prices.

Companies are increasingly working together in industry initiatives such as the Electronics Industry Code of Conduct. However, as described above, this Code is far too weak to ensure that workers' rights are respected.

Supply chain responsibility
Companies need to take responsibility for the entire chain of production of the products they sell. The efforts of companies to improve conditions even at their direct suppliers are insufficient. Too often, companies trust suppliers to monitor themselves (and their own suppliers) for compliance with legal and sustainability requirements. but the greatest risk of poor labour and environmental conditions lies at the sub-tier suppliers that make the parts that go into mobile phone handsets. Yet none of the companies acts sufficiently upon its social responsibility to systematically improve conditions beyond first tier suppliers. Companies rely heavily on direct suppliers to ensure that their standards are being followed further down the supply chain. The field research, however, indicates that conditions at sub-tier suppliers, even those producing for the top mobile phone companies, are often below minimum standards and sometimes downright illegal. Companies should improve their methods for monitoring suppliers and have their monitoring verified by an independent organisation, such as a local organisation. Companies emphasize that their liability ends at their direct suppliers, but they must begin to take responsibility for the entire value chain of the products they buy and sell.

Stakeholder involvement
Although some industry such as GeSI claim to engage stakeholders, there has not been structural stakeholder involvement at all levels of decision making and implementation. There is currently no clear strategy that ensures the active involvement of a representative group of stakeholders. Here the industry could take its lead from the efforts of existing multi-stakeholder initiatives, mostly active in the garment industry. These initiatives have gone through a long process of establishing mechanisms for code implementation and involving multiple stakeholders. Learning experiences show for example that training and capacity building form an integral part of code implementation.

External control

SOMO's research shows that monitoring and verification of compliance with codes of conduct and international standards is currently insufficient. In order to ensure that companies and their suppliers are actually following the standards they claim to uphold, an independent organisation must verify the situation in the factories and communities where companies operate. Codes must be integrated into the company's management system and verified externally and independently of the company. One way of doing this is through multi-stakeholder initiatives such as exists for the garment sector.

Appendix 1
Letter from workers at Hivac Startech to Nokia and Motorola

(translated into English by SACOM)

Dear Sir / Madam,

Greetings!

We are a group of young Chinese women migrant workers of Hivac Startech Film Window (Shenzhen) Co., Ltd. We have been highly dedicated to our work and are honored to produce for a well-reputed brand like you.

It is well known that Nokia, a transnational corporation emphasizing the quality of its products, ethical standards, and respect for its employees, has adhered to the best practices in its operations.

We came to Shenzhen from our homes in remote interior villages. Between October 2004 and August 2005, we entered the acrylic lens production department of Hivac Startech Film Window (Shenzhen) Co., Ltd. None of us have ever received occupational safety and health training. Every day we apply “white gasoline,” “surface cleanser,” and “etching solution” containing n-hexane to wash and scrub acrylic screens for cell phones. However, every one of us was merely provided with three fingerstalls for production safety and personal protection. We worked 8 to 12 hours a day. On the shop floor of “the class 10 thousand clean room,” where the n-hexane intensity ranged from 449 to 1106mg/m3, the working conditions were very poor. Workers often fainted during morning assemblies.

In December 2005, several of us began to lose our appetites, developing swollen legs and bodily pains. We had extreme difficulties in standing up and walking down the stairs. Meanwhile, we discovered that a number of other women workers shared the same symptoms as us. Two of them had indeed quit and returned home. We suspected that we had contracted an occupational disease. The manager then offered us a week’s leave and asked us to undertake physical examinations on our own. We visited a number of hospitals but none of the doctors were able to explain our problems. Finally, they

suggested that we go to the Shenzhen Occupational Disease Treatment and Prevention Hospital for further examination. We decided to seek our managers for help. To our disappointment, they claimed that the cause of our sickness was simply due to the conditions of our lives in the countryside, such as inadequate daily intake of zinc and calcium, lack of exercise, and the use of cold water for bathing. But why had we not heard of any similar cases among the millions of people from the Chinese countryside? We felt deeply insulted by the managers' irresponsibility.

We had no alternative but to continue to petition our managers for assistance. We also presented them the papers of suggestion for treatment sent by the hospital. Despite our request for medical care, our boss has refused to cooperate. When our bodily pains were getting more serious day after day, we took the case to the attention of the local labor bureau. In ten minutes' time upon our arrival, however, the managers showed up and threatened us, saying, "Before you file the collective complaint, think about the consequences. We will not let it go even if we have to face bankruptcy." But we insisted on complaining to the labor bureau officials. The managers reluctantly sent only one of us to the hospital. Their excuse was that the doctors there would not be able to make proper examination if many workers were admitted at one time. Our family members told them that if they were unwilling to take us to get proper treatment, we would do so on our own. The manager said, "This is none of your business. Don't get involved with this case."

At this point only two of us were able to receive treatment at the Shenzhen Occupational Disease Treatment and Prevention Hospital. They were diagnosed with poisoning due to an excessive amount of n-hexane inside their bodies. The doctor further asked if there were similar cases inside the factory. One after the other, the seven of us other workers was admitted to the hospital for medical check-ups. By then, two of us were rendered unable to walk and had to use wheelchairs.

During our stay in the hospital, Fu Juping was found to be two months pregnant. The doctor recommended that she abort her child because the n-hexane poisoning was likely to affect the growth of the fetus. Needless to say, this seriously distressed her. She cried terribly all day long and could not eat anything. We saw her suffering so much and attempted to comfort her. Every one of us understands how great a tragedy this was to her. It has almost destroyed her relationship with her husband. How could anyone bear all this pain and hardship?

Loneliness and frustration overwhelm the hospital. We receive medical injections everyday, and all we can do is eat and sleep. We constantly feel unbearable pain in our legs. We cannot sleep well and keep waking up in the middle of the night. We keep asking our doctor when we will be discharged but there is no concrete answer. Our central nervous system is badly damaged. It may take us a very long time to fully recover. We are deeply disturbed. Will we suffer irreparable damage? Will this cause problem in finding husbands? Will we be able to give birth to healthy babies? Will be able to find new jobs? How can we rebuild our self-confidence and resume our everyday lives? In the process, our family members must have been put under enormous pressure as well. Right now, two of us, Yao Chunyan and Liu Haiyan, have been forced to leave the hospital even though they have not recovered. The stingy managers of Hivac Startech required them to leave the hospital and receive outpatient treatment, against the doctor's recommendation.

During our stay in the hospital, in accordance with China's laws and regulations, workers contracting occupational disease should be entitled to economic compensation. We have negotiated with our managers many times over this legitimate right, but they are unwilling to cooperate. There seems to be nothing we can do. We are now in our early 20s and are forced to spend a large part of youthful lives alone in the hospital, suffering mentally and physically. We demand, in accordance with Article 52 of the Law of the People's Republic of China on Prevention and Control of Occupational Diseases, compensation for extreme suffering and distress (see the attached tables).

Hivac Startech Film Window (Shenzhen) Co., Ltd. is your business partner and supplier. What our factory managers have done is a serious violation of your ethical codes as well as your reputation. Your corporate image is also damaged. For the sake of your continued development and good relations, we sincerely hope that you will take effective measures to stop rights abuses in our factory. We are thankful to you and believe that you will act on the side of justice and care for us, a group of workers who have been seriously wronged.

Yours sincerely,
9 Women Workers of Hivac Startech Film Window (Shenzhen) Co., Ltd.

(undersigned)
Yao Chunyan, Liu Haiyan, Cao Yuanfang, Li Yuangui, Fu Juping, Xiang Li, Song Hua, Lai Dongmei, Hu Jing

August 8, 2006