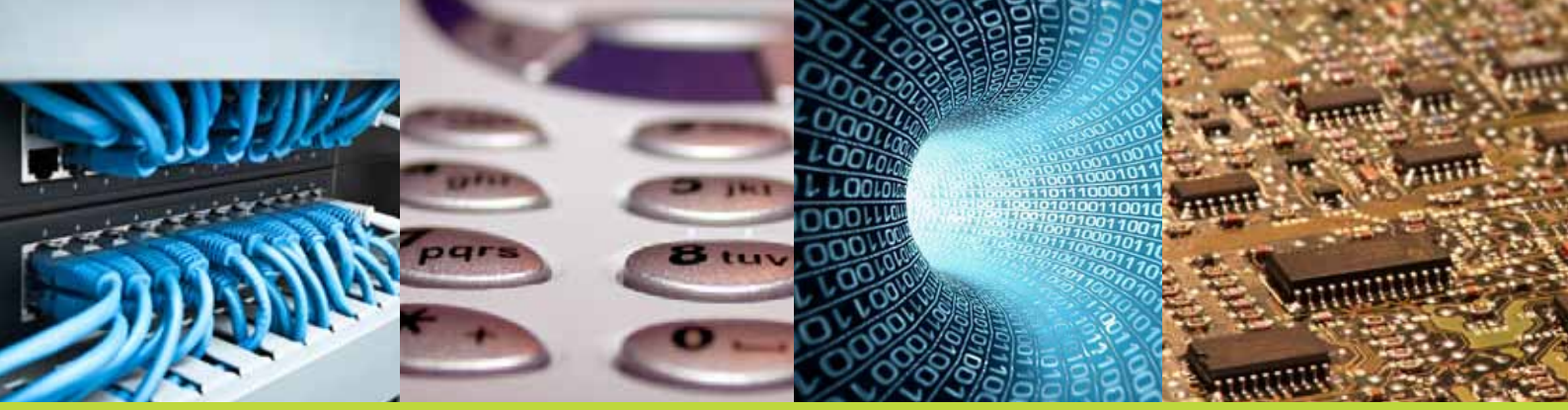


oekom Industry Focus
Information Technology

December 2011

The industry at a glance

oekom Universe IT

Total number of companies analysed	205
Number of companies in oekom Corporate Scouting	151
Number of companies in oekom Corporate Rating	54

Key sustainability issues

- Working conditions in the supply chain
- Reduction/substitution of hazardous components
- Return, recycling, reuse
- Customer information on potential energy savings and hazardous substances

oekom Prime Status

Number of companies with oekom Prime Status	33
Proportion of companies with oekom Prime Status	16.1%

n=205

Top 3 companies

Ricoh (JP)	B+
Intel (US)	B+
Motorola Mobility (US)	B
Average score of all companies analysed (n=205)	**D+**

Most frequent breaches of exclusion criteria

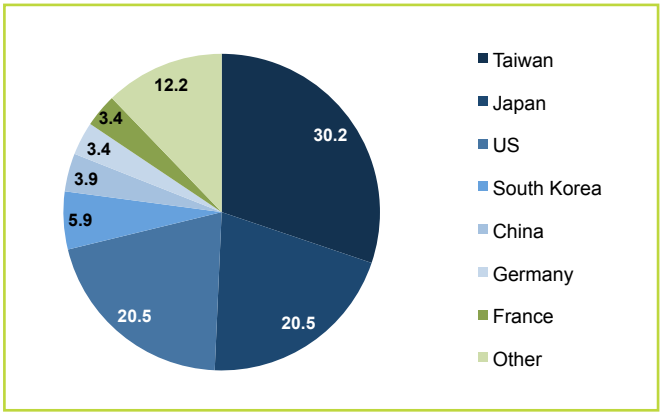
Labour rights violations	18.5%
Business malpractice	5.6%
Military	3.7%

n=54

1. Background

The digital revolution continues to advance inexorably, reaching more and more people. Between 2006 and 2010, the number of mobile phone users worldwide rose from 2.7 to 4.8 billion. In the same year, the number of internet users reached 1.5 billion – and it is growing every day. The major drivers behind these developments are companies in the IT sector. They produce the necessary hardware, from high-performance chips to smartphones, and their capacity for innovation caters to the constantly growing demand for technological innovations. Accordingly, sales in the IT industry have also risen constantly in recent years. Total sales for the IT sector in 2009 amounted to almost one trillion euros. A large proportion of this growth is accounted for by major suppliers in Taiwan and China, some of which have already overtaken the brand manufacturers in terms of sales and numbers of employees. The Taiwanese company Foxconn alone currently employs over 1.2 million workers, twice as many as Apple, Dell and Hewlett-Packard put together.

As a result, the distribution by country of the companies evaluated by oekom research has changed enormously: of the total of 205 companies in the IT sector which were analysed, 62 are based in Taiwan, 42 in the US, and the same number in Japan. South Korea, with twelve companies, and China/Hong Kong, with eight, are also comparatively well represented. Germany and France each had seven IT manufacturers in the rating.



Composition of the oekom Universe IT by country; in %; source: oekom research (2011)

oekom research

2. Key sustainability issues

The information technology (IT) sector covers the whole range of electronic consumer goods and their components, from high-performance chips to mobile terminal devices and complex digital office equipment. For some years, the entire IT sector has been undergoing a large-scale outsourcing process: An increasing number of producers are transferring their production to low-wage countries or commissioning suppliers based in these countries to manufacture their products. This means that there are hardly any manufacturing plants for the high-tech industry remaining in high-wage countries. However, the enormous price pressure is exacting a toll: abysmal working conditions and inadequate environmental standards in some suppliers in South-East Asia and Mexico are tarnishing the perceived clean image of the industry. Beyond supply chain issues, there are further unresolved problems relating to the use of substances which are hazardous to the environment and human health as well as to systems for taking back and recycling old appliances, which are often still inadequate.
Of the many areas of investigation analysed, the following represent key issues in relation to the sector's sustainability performance:

Working conditions in the supply chain

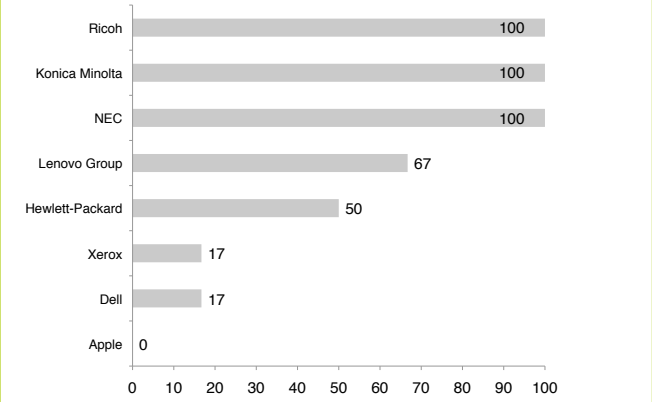
Working conditions in the IT sector's highly diverse supply chain very rarely conform to international standards. Employees in low-wage countries (for example in China, Thailand, Mexico and the Philippines) still have to contend with poor healthcare provision, huge amounts of compulsory overtime and pay that is below the minimum wage. One aspect that can be given a positive rating is the degree of transparency shown by some companies in their reporting on labour standards in their own supply chains. Apple, for example, publishes an annual Supply Chain Report containing detailed descriptions of abuses that have been uncovered. More and more producers are also making efforts (through monitoring and local audits) to check such standards effectively. Suppliers which fail to stand up to this type of scrutiny or which attract attention for negative reasons, such as the use of child labour, increasingly frequently face the threat of the supply relationship being terminated. While such a "drop & run" approach may appear to be an efficient means of exerting pressure, a long-term cooperation strategy, that also includes supportive measures such as consultancy services, training provision or joint workshops, is of greater benefit.
The industry has continued to make heavy weather of avoiding the use of "conflict minerals" (e.g. coltan and cobalt) from crisis zones in the Democratic Republic of Congo. However, the certification of smelting plants will in future give companies the chance to exclude the use of such minerals in their products. It remains to be seen which IT companies will opt to take this important step toward more sustainable procurement.

Reduction/substitution of hazardous components

Directives restricting the use of hazardous substances in Europe (RoHS), as well as in China ("China RoHS") and other countries, have led to extensive adaptation measures across the entire industry. Numerous production and logistics processes have had to be adjusted and suppliers have been compelled to conform to permissible limits. RoHS version 2, which will enter into force in the EU member states by 2013 at latest, does not legally regulate the use of additional hazardous substances. However, almost all the companies examined voluntarily go at least some way beyond the RoHS requirements in force and have, for example, substantially reduced the use of further brominated flame retardants, lowered the proportion of PVC used in their products or even completely removed such substances. However, it is still too early to tell when the computer industry will completely renounce the use of substances hazardous to health and the environment.

Return, recycling, reuse

The high level of innovation in the IT sector means that there is an ever-increasing amount of equipment in circulation. Due to improper disposal of this type of equipment, increasing quantities of toxic substances continue to enter the environment worldwide. This also means that the industry is losing not only valuable raw materials, but also components that could be built into new equipment at a relatively low cost. While the European Union, among others, has established the legal requirements for a system of closed-substance-cycle management to operate in the electrical industry, there are still major differences between companies with regard to the free return, recycling and reuse of used equipment. Prolonging their service life, for example through guarantees or the long-term availability of spare parts, could make a substantial contribution to reducing their material intensity. However, this still tends to be seen as a secondary objective. Companies like Dell and



Evaluation of measures taken by selected companies to incorporate used equipment and recycled material into new products ; scale: 0 to 100 (highest score); valid as at: 30.11.2011; source: oekom research (2011)

Hewlett-Packard do at least offer worldwide take-back guarantees on their products. Other producers, such as NEC and Ricoh, go even further, refurbishing old appliances they have taken back so that they can put them back on the market with a renewed guarantee. The industry does, however, seem to be making progress on a broader front in the reuse of used materials (e.g. plastic and metals). An increasing number of companies are reporting that they include significant quantities of recycled materials in their new products.

Customer information on potential energy savings and hazardous substances

The internet has significantly increased the opportunities for customers to find out about the environmental advantages and disadvantages of products. Internet forums and numerous test reports supply interested consumers with important background information. Nonetheless, companies are urged to improve and expand their own information channels over and above the statutory minimum requirements. The relevant data needs first and foremost to be easily accessible, intelligible and comprehensive; it is not enough merely to provide operating instructions in small print. Appropriate solutions include clearly designed internet portals or free hotlines where less technically savvy users can obtain comprehensive advice. Companies are now communicating information on energy-saving options more proactively, but they still have a lot of catching up to do, particularly with regard to substances that are hazardous to health. Information on this aspect is sometimes available only on request and frequently only in the form of product data sheets that are not very customer-friendly.

Summary

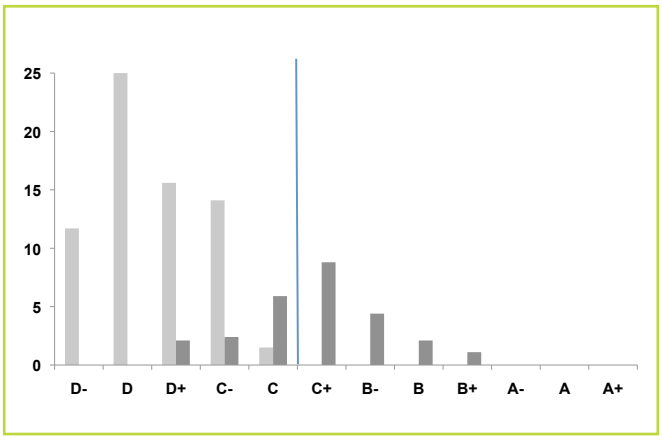
It will not be possible to resolve overnight the difficulties the large brand manufacturers face in ensuring compliance with their social minimum requirements in the supply chain. And it is not least for this reason that it will therefore be some time before interested consumers are able to purchase genuinely sustainable IT products.
On the whole, it can be said that the companies studied are facing up to the social and environmental challenges of the 21st century. This is evident not least from the high Prime quotas of 61 per cent (of the companies in oekom's corporate rating) and over 16 per cent (of all companies).

In relation to almost all relevant issues, initial steps, at least, have been taken, solutions proposed or even specific targets identified. Companies are increasingly becoming caught up in a competition to achieve the best sustainability performance. However, on a number of key issues, strict regulation by government has been and remains necessary in order to tackle systematically problems such as the take-back of used equipment or limiting levels of hazardous substances. It remains to be seen whether the incentives to compete to achieve the best sustainability performance will be powerful enough to make such statutory provisions superfluous in future.

3. Selected findings

Distribution of ratings

The highest ranking companies in oekom's IT rating universe achieved a score of B+ on the rating scale, which ranges from A+ (highest score) to D-. oekom research has awarded Prime status to a total of 33 companies, which is equivalent to 16.1 per cent of the total number of companies analysed. Prime status distinguishes those companies which are among the leaders in their sector in terms of sustainability and which fulfil the minimum requirements defined by oekom research for a specific industry. The Prime threshold for the IT sector is C+, and the average score for all the companies analysed was D+.



Distribution of scores on a scale from A+ (highest score) to D-; rating (dark grey), scouting (light grey); in %; n=205; source: oekom research (2011)

Best-performing companies in the sector

Ricoh (JP): B+ **1**

This Japanese office equipment manufacturer is a leader in terms of the sustainable design of products. For example, the energy consumption of its printers and photocopiers has steadily been cut in recent years. The company also offers its customers convenient options for returning used appliances. Over 90 per cent of its products sold worldwide can be returned free of charge. The quantity of equipment taken back by Ricoh annually has accordingly risen to around 40,000 tonnes. In addition, the company uses large quantities of recycled materials or previously used components in certain products, which for specific product groups leads to carbon savings in production of up to 93 per cent. It should also be pointed out that not only all of Ricoh's major production sites are certified to ISO 14001, but also those of 80 per cent of its suppliers.

Intel (US): B+ **2**

The world's largest chip producer provides training for its major suppliers in various regions around the world at its annual "Supplier Days". According to company data, these cover approximately 90 per cent of its entire purchasing volume. Intel also demonstrates a high degree of commitment to the issue of social engagement, particularly through projects that help to bridge the so-called "digital divide". For example, since 1998 nine million teachers in 60 countries have been taught how to improve the integration of information technology into their lessons. Intel is one of the few IT companies to include its suppliers' emissions in its carbon reporting. In addition, the company pursues ambitious reduction targets in its own chip manufacture and demands corresponding progress reports from its suppliers.

Motorola Mobility (US): B **3**

This US mobile phone manufacturer monitors its suppliers' compliance with the labour standards it sets for them through comprehensive controls such as risk profiling and on-site audits, which are carried out by independent auditors. The company has implemented ambitious programmes for the reduction of hazardous substances. All its products worldwide meet the requirements of the European RoHS Directive. In addition, Motorola Mobility has set strict limits for other substances, such as antimony, arsenic, beryllium and brominated flame retardants. Moreover, it no longer uses plasticisers (phthalates) or PVC in its new products. In order to prevent inappropriate waste disposal and the illegal export of electronic waste to developing countries, the company also conducts audits of its recycling partners.

Ups and Downs

The leading IT companies in terms of sustainability perform consistently well. With a few exceptions, they have been able to maintain or improve their ratings, despite more stringent requirements. The Chinese computer manufacturer Lenovo has made significant progress: it has improved its score to a B from the C it achieved in the last comprehensive rating and thus achieved Prime status for the first time. Konica-Minolta and the Taiwanese screen specialist AU Optronics, which underwent a comprehensive rating for the first time, not only managed to achieve Prime status, but also took top positions in the respective subsectors.

Breaches of exclusion criteria

oekom research is continuously analysing all the companies in the oekom Rating Universe in relation to potential breaches of a total of 18 exclusion criteria. These distinguish between controversial business areas, such as alcohol, genetic engineering and military, and controversial business practices such as violations of human and labour rights. Users of oekom's ratings can activate exclusion criteria individually to suit the particular requirements of their capital investments.
Almost all the companies in the IT sector have their own production sites in countries where violations of labour rights are commonplace or purchase goods from suppliers in China, Vietnam, Malaysia or Mexico. Almost one in five companies have been shown to have violated internationally recognised labour standards. At the same time, there is a growing willingness among IT companies to report transparently about such abuses, to accept justified criticism and to introduce structural countermeasures.

Labour rights violations	18.5%
Business malpractice	5.6%
Military	3.7%

n=54

5. Outlook

The incredibly fast pace of innovation in the IT sector shows no sign of slowing. This means that products which have only just been advertised as "hyper-modern" all too often become obsolete just as fast. While this short product lifecycle does mean that there is an upward trend in the energy efficiency of products, such progress is largely at the cost of other environmental aspects, such as total energy consumption during production and the dramatically increasing quantities of electronic waste. IT companies need to find appropriate solutions to both these problems quickly. For example, suppliers must be made to comply with stricter CO_2 emissions limits, and energy intensity in production must be reduced. Only a very small number of IT companies have so far called for specific limits here. In order to bring the e-waste problem under control, it will also be necessary for rigorous steps to be taken, over and above those specified by the RoHS Directive, to eliminate hazardous substances. In order to close product lifecycle loops, companies should set more targeted incentives for their customers. The buyback and subsequent refurbishment of used products, leasing and renting systems and simplified arrangements for repairing products can all significantly lengthen product lifecycles and bring about a marked reduction in waste and recycling quantities. It must also be easy and free for customers to return their used products to the manufacturer, so as to minimise the illegal export of e-waste to developing countries. Manufacturers of mobile phones are taking the lead here, but the necessary customer information is not yet available industry-wide. Partly due to the increasing scarcity of commodities and the associated costs, it will in the medium term be those companies that are able to close their product lifecycle loops as far as possible that will be at an advantage.

The following companies underwent an oekom Corporate Rating:

- Acer (TW)
- Advanced Micro Devices (US)
- Agilent Technologies (US)
- Alcatel-Lucent (FR)
- Apple (US)
- AU Optronics (TW)
- Brother Industries (JP)
- Canon (JP)
- Cisco Systems (US)
- Dell (US)
- Eastman Kodak (US)
- Electrolux SE)
- EMC (US)
- Ericsson (SE)
- FUJIFILM Holdings (JP)
- Fujitsu (JP)
- Hewlett-Packard (US)
- Infineon Technologies (DE)
- Intel (US)
- Konica Minolta Holdings (JP)
- Kontron (DE)
- Kyocera Corp (JP)
- Legrand (FR)
- Lenovo Group (CN)
- LG Electronics (KR)
- Micro-Star International (TW)
- Micronas Semiconductor Holding (CH)
- Motorola Mobility Holdings (US)
- Motorola Solutions (US)
- NEC (JP)
- Nikon (JP)
- Nokia (FI)
- Panasonic (JP)
- QUALCOMM (US)
- Ricoh (JP)
- Royal Philips (NL)
- Samsung Electro-Mechanics (KR)
- Samsung Electronics (KR)
- Samsung SDI (KR)
- Schneider Electric (FR)
- Seiko Epson (JP)
- Sharp (JP)
- Sony (JP)
- STMicroelectronics (CH)
- Sumitomo Electric Industries (JP)
- TDK (JP)
- Texas Instruments (US)
- Toshiba (JP)
- TSMC (TW)
- United Microelectronics (TW)
- Whirlpool (US)
- Wincor Nixdorf (DE)
- Xerox (US)
- Zumtobel (AT)

Assessment fields in the oekom Corporate Rating of the IT sector

Social Rating

Staff
- freedom of association
- work-life balance
- safeguarding of jobs
- health and safety
- equal opportunities
- training and education

Suppliers
- supplier standards
- supplier monitoring

Society
- human rights
- community involvement
- taxes and subsidies
- political donations
- stakeholder dialogue

Product Responsibility
- responsible marketing
- costumer information
- product recall procedures and complaint mechanisms
- reduction of digital divide
- support for e-waste recycling systems in developing countries

Corporate Governance
- independence and effectiveness of the board
- shareholder democracy
- executive compensation
- shareholder structure

Business Ethics
- code of conduct
- implementation of the code

Environmental Rating

Environmental Management
- environmental policy
- environmental management system
- environmental reporting
- environmental performance indicators
- climate change
- travel and transport

Products & Services
- hazardous substances contained in products and/or used in production processes
- energy efficiency of products
- emissions of products
- upgradability/recyclability/longevity
- take-back schemes and recycling of products
- packaging

Eco-Efficiency
- energy use
- water use
- greenhouse gas and VOC emissions
- total waste generation
- hazardous waste generation
- energy use of suppliers
- greenhouse gas emissions of suppliers

Background: the oekom Corporate Rating

oekom research currently evaluates around 3,100 companies, covering international indices such as the MSCI World, MSCI Emerging Markets and Stoxx 600, as well as numerous national indices. In addition, the oekom universe also includes non-listed bond issuers as well as companies from sectors whose products make a major contribution to sustainable development, e.g. in the area of renewable energies. The oekom Corporate Scouting process identifies from this pool of companies those which can demonstrate that they meet minimum requirements in terms of social and environmental measures and of transparency about these. Companies which do not meet these requirements are grouped together in the oekom Scouting Universe. These currently make up approximately 2,100 of the total of 3,100 companies rated. oekom research's analysts carry out an indicative rating of these companies.
A comprehensive oekom Corporate Rating is carried out of those companies which have the potential to achieve a Prime rating or at least to come close to the Prime threshold. These are then pooled together to form the oekom Rating Universe, which currently comprises around 1,000 issuers. oekom's Corporate Rating provides a comprehensive evaluation of companies' social, environmental and governance performance. The rating is based on up to 100 individual criteria, approximately one-third of which evaluate industry-specific aspects, in particular the social and/or environmental quality of the products. The information used to produce the corporate rating comes partly from the companies themselves and partly from independent external sources such as environmental and consumer associations. The results of the oekom Corporate Rating are documented in detailed rating reports.

Information on the individual findings for the 54 companies that were analysed in detail can be obtained either using the database solution ORBIT - the oekom Responsibility Benchmarking & Information Tool - or in the conventional manner via the English-language oekom Industry Report. Both tools provide a comprehensive overview of the industry's activities, and ORBIT also enables user-friendly benchmarking against a custom-compiled peer group at the individual indicator level. Should you be interested, we would be pleased to send you further information on both these offers.

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