Sustainable trade and green electronics initiatives

Stage 1: A review of initiatives in Europe and Japan and their implications for Asian suppliers

FINAL REPORT

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ABSTRACT AND KEY MESSAGES

Purpose and scope
The purpose of this work was to map existing sustainable trade and green electronics initiatives in Europe and Japan and to provide an initial assessment of implications for Asian Small & Medium Enterprise (SME) electronics suppliers.

Regulatory and other developments
There are various regulatory and other developments in Europe that are significant or potentially significant for such suppliers. In the short term the most important is the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment 'RoHS ', which came onto force on 1 July 2006, restricting or banning certain hazardous substances. All main producers and their suppliers must comply or their new products will be removed from the market. Japan introduced a 'RoHS' law on the same date, although this applies to marking products not restricting hazardous substances. In this area Japan has had voluntary agreements in place for some time.

Also important in the short-term is the Directive on Waste from Electrical & Electronic Equipment (WEEE). This Directive officially came into force in 2006 and has been transposed into national law in most EU Member States (MS).

A number of other environmental and product-related Directives and other initiatives are at the proposal and discussion stage, including 'EuP' (Eco-design of Energy-using Products) and 'REACH' (Registration, Evaluation and Authorisation of Chemicals). These do not have any major immediate requirements but could be significant in the medium to longer term in imposing eco-design and information provision requirements on suppliers.

In Japan, laws relevant to WEEE were already established in 2001.The main laws are the LPEUR Law for promoting the Effective Utilisation of Resources, the Home Appliances Recycling Law (HARL) and the Green Purchasing Law. The first sets a framework for producer responsibility and recycling across all industry sectors, the second requires green purchasing by the government sector and the third gives producers of four main EEE appliance types responsibility for take back and recycling. These laws will already have had the effect of greening the supply chains of Japanese EEE companies since suppliers will have been required to comply with environmental requirements in specifications.

There are some similarities but many differences between the European and Japanese situations, drivers and scope of legislation. Suppliers to Japanese firms may be better prepared for environmental change than others if they have already responded to product environmental specifications. Nevertheless the common denominator is pressure for improved product environmental performance.

In addition to these regulatory developments there have been other environmental developments relating to products that may have implications for electronics suppliers, including:

- Green and socially responsible supply chain requirements and management by leading EEE companies, including partnership arrangements with suppliers
- The development of The Electronics Industry Code of Conduct (EICC).

- The establishment of supply chain standards with the Global Environmental Sustainability Initiative (GeSI)
- Developments in eco-labeling and energy labelling schemes.
- Development of other national RoHS legislation e.g. in China and South Korea.
- The development of eco-design standards by the International Electrotechnical Commission (IEC)
- The increasing adoption of other international standards e.g. ISO 14001, ISO 9001, OHS 18001 and SA8000.

Implications for EEE suppliers - general

The general implications of these developments for all EEE producers and suppliers are as follows:

- Compliance with higher standards is a competitive necessity for suppliers to global markets. All EEE producers and component suppliers are already or will be required to comply with continually increasing expectations and standards of environmental performance in developed country markets. In some markets there are growing requirements to comply with improved standards on social performance.

- RoHS is the most pressing compliance issue, followed by WEEE but the others e.g. EuP are significant. Developments need to be closely monitored and suppliers made aware and prepared.

- Compliance may require significant investment for suppliers in many areas, including product-redesign, re-tooling of production lines, new materials, new processes, product testing facilities (in-house or by third parties), personnel training, management time and expenditure on consultants or advisers, potential write-off of redundant products and materials, investment in integrated management systems. Investment is likely to be an ongoing not one-off requirement as the performance bar is continually raised.

- Suppliers which fail to meet compliance requirements or deadlines will be marginalised. SMEs which are not under the control or influence of major national or transnational EEE companies, or which are not well-informed by governments or trade associations are potentially at most at risk of being unprepared for compliance.

Impacts on Asian SMEs

The country reports covering China, India and Thailand as well as the research for this report suggest that product environmental regulations and other developments, especially the European RoHS, are having or will have major impacts on Asian SME EEE suppliers.

In the short term, impacts on Asian electronics SMEs, their employees and dependent communities are likely to be generally negative:

- Preparedness for compliance is low among many SMES due to a combination of low awareness, limited technical and management capacity and often limited external information and support for compliance.
- The costs of compliance (RoHS is estimated as adding 5-10% to production costs) will be prohibitive for many already operating on low profit margins.
- As multinational companies ‘green’ their supply chains, non-compliant suppliers will be eliminated from major supply chains and markets.

- SMEs will be most affected and marginalised. Many may be restricted to domestic markets, forced to downsize or forced to close.
- SMEs account for the majority of electronics enterprises (over 26,000 in China) and a very large proportion of employment in what is a key industry for Asian Economies. There could be significant unemployment impacts in locations where other work is unavailable. The extent of the impact is unclear, however, since many Japanese companies and TNCs have been working on lead replacement for several years
- Since larger companies have been better placed to gear themselves for compliance they are likely to become more dominant at the expense of SMEs.

In the medium to longer term the country reports present a more positive picture.

- Having adapted to change, the electronics industries will have enhanced capability in environmental management and eco-design, and be better placed to respond to compliance challenges and market opportunities.
- Raised awareness as well as mounting problems could help to stimulate and clean up WEEE recycling industries.

Gaps and needs for capacity building

The country reviews suggest limited or no preparedness for compliance among many SMEs although there have been efforts to address the problem, especially in Thailand. There are generally likely to be significant capacity gaps for many SMES and a general need for capacity-building support through governments, trade associations or other agencies. The impact is likely to be greatest in China, which has a much larger industry and greater numbers of SMEs involved

This report suggests management and technical needs for support in the area of information and eco-design. Other needs such as access to capital and marketing support are outside of the scope of this report.

Management elements which need to be in place in suppliers include:

Systems

- Implementing management systems of appropriate sophistication, basic for small firms and more sophisticated for medium-sized or larger firms.

Information

- Timely and relevant information to keep abreast of changes and be aware of implications.
- Development and implementation of strategies for phasing out of hazardous substances, including investment in new production lines, equipment and materials, testing arrangements, training of personnel and other changes;

Planning

- Developing and implementing strategies for re-designing products and production processes as necessary to facilitate recycling, energy efficiency or other requirements and providing requisite information to customers in accordance with WEEE or other requirements.
- If required to comply with customers' corporate responsibility requirements (e.g. EICC), developing plans for improving working conditions.

Organisation

- Developing management resources and skills to manage compliance and change, in particular planning, quality management (including auditing) and eco-design
- Integration of eco-design and green procurement into organisational processes

Technical elements which need to be in place in suppliers include:

Awareness and training
- Basic awareness
- Specific training including legislation and implications, planning for and managing change, management of eco-design, use of design tools, collection and communication of life cycle information (especially for EuP)

Technical implementation:
- Available technologies for hazardous materials substitution.
- Testing methods and options,
- Use of eco-design tools and information systems for compliance.

The analysis suggests a likely need for the European Commission (EC), possibly in cooperation with Japan, and through appropriate national agencies, to provide some level of support to SMEs in Asian countries affected by RoHS, WEEE and other future initiatives e.g. EuP and REACH.

Planning
The immediate need is to develop an overall short and long-term plan for the Asian region as a whole and individual countries according to the country needs as proposed in the country reports.

This overall plan could include development and implementation of information and communications processes, briefings for senior management, training in compliance requirements and management, specialist training in eco-design, supply chain management and, as relevant, Corporate Social Responsibility (CSR) issues, specialist technical training e.g. on testing.

In the short term the focus of effort will need to be on RoHS compliance and concentrate on basic information and communication, and training across all areas, building on any existing initiatives and reaching as many SMEs as possible.

The medium to longer term plan would be to provide ongoing support to help SMEs to respond to future regulatory change and other initiatives in an effective way. The broad areas of need would remain the same but are likely to be at a more sophisticated level as skills and knowledge are developed. There would be a need to institutionalise training and education programmes within the trade associations, professional training bodies and universities in India, Thailand and China.

Planning for the longer term is likely to include building on short and medium term initiatives as well as positioning to respond to continuing developments in Europe, Japan and the US.

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FOREWORD

This review was conducted by The Centre for Sustainable Design (CfSD) at University College for the Creative Arts (UCCA) as part of the Asia Eco-Design Electronics Programme (Asia-Pro Eco) supported by the European Commission. The main work for this review was conducted in January to March 2006 in parallel with other country studies by AEDE Programme collaborators for India, China and Thailand.

Other reports under the AEDE Programme, including a summary report and a survey of supply chain environmental management, can be downloaded from www.cfsd.org.uk/aede.

The country reports for China, India and Thailand should be referred to for relevant details relating to these countries.

Subsequent activities planned under the Programme include working conferences, the development of training tools and information links to help suppliers implement European and Japanese environmental and sustainability regulations relating to electronics and electrical equipment (EEE).

The general purpose of this work was to map existing sustainable trade and green electronics initiatives in Europe and Japan and to provide an initial assessment of implications for suppliers.

Specific aims were to:

- Provide an overview of existing legislation pertaining to environmental and sustainability requirements in Europe and Japan relating to EEE;
- Provide an analysis of the implications for suppliers in Asia of proposed EU and Japanese environmental legislation and voluntary agreements relating to EEE, especially impacts on employment creation, marginalisation of small suppliers and subsequent impacts on poverty alleviation initiatives.
- Assess voluntary industry initiatives on electronics and environment in Europe and Japan, including implications for Asian suppliers.
- Identify key electronics industry associations, multipliers and information dissemination routes in Europe and Japan.

The focus of the review of European legislation and other initiatives was on the following:

- The Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC) (“the RoHS Directive”)
- The Directive on Waste Electrical and Electronic Equipment (2002/96/EC) (“the WEEE Directive”)
- The Framework Directive 2005/32/EC on the Eco-design of Energy-using Products (EuP),
- The proposal for a new EU regulatory framework for chemicals, COM (2003) 644 called REACH (Registration, Evaluation and Authorisation of Chemicals),
- Integrated Product Policy (IPP)

The focus of the review of Japanese legislation was on the following:

- The Home Appliance Recycling Law (HARL)
- Law for the Promotion of Effective Utilisation of Resources (LPEUR)

Based on the European and country specific overviews, gaps and future management and technical needs are identified including short, medium and long term capacity building needs of suppliers in relation to meeting the forthcoming EU and Japanese legislation.

For the purposes of this study, ‘management’ issues include the integration of eco-design, green procurement and supply chain issues into existing management systems. ‘Technical’ issues include training requirements for eco-design and process change.

The assessment also attempts to identify

- Specific gender related issues that may exist for the sector.
- Implications for small and medium-sized enterprises (SMEs).
- Potential poverty alleviation measures for SME suppliers who face the danger of being marginalised as a consequence of the EU (and Japanese) measures.

The outcome of this set of activities is a report for Europe that will include a comparative analysis with the Japanese situation. The study will contribute to the background materials for the working conferences

The study was conducted through desk research drawing on literature and other information available, including reports to date (see Annex 1 for references).

1 INDUSTRY OVERVIEW

Electronics and electrical equipment (EEE) production and marketing is a major global industry characterised by a high product diversity, high volumes, continual growth and rapid technological and industry change. The total value of world trade in EEE, including information technology (IT) was US$b 202 in 2003 (UNCTAD).

The main product categories covered by the sector (as covered by the European WEEE Directive) include large household appliances, small household appliances, IT and telecommunications equipment, consumer equipment, lighting equipment, electrical and electronic tools, toys leisure and sports equipment, medical devices, monitoring and control instruments and automatic dispensers. The size and importance of the sector is magnified when considering the vast array of components and sub-assemblies manufactured and used in making and supplying end-products. The sector is larger still when considering use in products not classified as EEE but containing electronics and, or electrical assemblies e.g. automotive electronics.

The global industry is dominated by large transnational corporations (TNCs) based in the US, Japan, Europe, Taiwan, Korea and elsewhere, but, depending on the product sector, there are diverse types and size of firm, including large numbers of small and medium-sized enterprises (SMEs) producing specialist products, components and assemblies.

There are some well-known and obvious differences between the European and Japanese EEE sectors. One is that in Europe's large, open market all of the major TNCs have manufacturing and/or distribution operations. There are also relatively few European – based EEE transnationals – exceptions being Philips and Siemens. In Japan, however, the presence of foreign companies is much more limited. There is a much larger number of big-name firms such as Sony which together dominate the home markets and supply chains as well as being big players in international markets

EEE production by TNCs, as well as by other larger producers in developed countries, is characterised by long supply chains with high levels of outsourcing and subcontracting, much of it to Asian countries. Reducing labour costs through low cost sourcing has been the primary motive for this trend which is likely to continue

While there is significant domestic production in Europe, Japan and the US (value around US$b 57), imports from China, Philippines, Malaysia and Thailand were US$b 36 to the EU and US$b 17 to Japan in 2003.

EEE is now a significant foreign exchange earner for many Asian countries as well as supplying growing domestic markets. Further sector information is provided in the country reports which highlight the importance of the sector for China, India and Thailand. For example, EEE accounts for around a quarter of the value of exports from China.

By providing employment the growth of the sector will at least have improved standards of living for many, and contributed to general economic development in China, India and Thailand. To the extent that industry earnings accrue to the countries' national economies there may also be significant wider benefits such as investment in industrial and technological development and in physical and social infrastructure, including education and training.

SMEs account for a very high proportion of electronics companies (e.g. around 99% of the over 26,000 electronics companies in China) and a large proportion of sector employment (e.g. over half in China). Considering the scale and structure of the EEE sector, especially the number and role of SMEs, it is important to understand the implications of European and Japanese legislation and other initiatives on Asian EEE suppliers.

In the Asian countries being examined EEE players may include:

a) Major national original equipment manufacturing (OEM) and original equipment design and manufacturing (OED) companies (privately or state owned – as in the case of China).
b) Corporately-owned and controlled subsidiaries of foreign-based TNCs (brand companies).
c) Locally-owned companies where a substantial part of production is sub-contracting to foreign TNCs in a close partnership arrangement, including investment, training and support for the supplier.
d) Locally-owned SMEs operating independently and supplying domestic and international markets and customers directly or through intermediaries.

In general it is category d) where companies are likely to have least access to information and resources for responding to international environmental regulations and other product or initiatives.

A key question in assessing impacts is the relative numbers of such companies and the number of employees and dependants affected. The country reports suggest that numbers are significant. However, the degree to which companies are connected to the international supply chain will vary. Some are, especially first tier OEMs, but many in lower tiers may not be connected.

Other information would also be helpful in assessing impacts, including such things as relative pay, working conditions, equal opportunities (no discrimination on the base of gender or race).

The importance of the SME EEE production sector to the economy needs to be assessed in each case, as well as the consequences for individuals and the economy if SMEs were disadvantaged relative to larger firms.

A healthy SME sector is widely recognised as beneficial for employment and for economic and community development, as well as an important source of innovation.

If SMEs were adversely affected by European or Japanese legislation the consequences would depend on the structure of the economy and EEE industry, and on the opportunities for alternative activity.

If, for example, displaced employees from a weakened SME sector were forced to work instead in larger EEE firms whose position had been strengthened, the consequences for individuals would depend on the relative conditions and rewards. The consequences for the economy as a whole would depend on the nature of these larger firms. If they are domestic or other firms investing in innovation then this should benefit the economy. If they are manufacturing subsidiaries with little or no design and innovation, then a decline in SMEs could reduce the relative level of innovation in the economy and this may be harmful to the economy as a whole.

Furthermore, a healthy SME sector favours local earnings and the local economy whereas foreign manufacturing subsidiaries may ‘repatriate’ profits to parent companies.

In assessing impacts on SMEs the following and other factors will in the capacity of firms to respond to regulatory and other change in what is already a fast-changing and competitive industry:

- Industry structure, especially relationships between SMEs and larger firms: Where SMEs are supplying to larger firms then the latter will have an important role in driving growth in the EEE sector in a country or area. Where larger firms are mainly sourcing components internationally their role in the national, regional and local economy will be more limited.
- Relative size (by turnover and numbers of employees)
- Growth and organisation of firms in the sector, especially SMEs
- Resources, including skills, investment in training and technology and access to capital,
- Other attributes, including management systems certification to international standards.

The size and structure and other details of the EEE sector in the countries relevant to this study are summarised in the separate country reports.

2 LEGISLATION AND INDUSTRY INITIATIVES

This section provides an overview of existing legislation pertaining to environmental and sustainability requirements in EU and Japan as well as an overview of broader industry initiatives in Europe, Japan and internationally which are relevant to EEE suppliers.

2.1 Regulatory developments in Europe

Main developments

The main product-related environmental legislative developments specific to EEE are as follows:

- The Directive on the Restriction of Certain Hazardous Substances (2002/95/EC) ('RoHS'), passed in March 2003; and
- The Directive on Waste from Electrical & Electronic Equipment (2002/96/EC) ('WEEE'), passed in March 2003.

All EU Member States (MS) have been obliged to transpose these Directives into national legislation and to implement the practical requirements stated in the respective Directives. At the time of writing this report transposition and implementation was in the final phase across Europe as outlined below. Only a few countries had not enforced WEEE.

The main other product-related pieces of environmental legislation relevant but not specific to EEE are:

- The proposed Directive on Eco Design and Energy Using Products (2005/32/EC) ('EuP') passed in 2005;
- The proposed Directive on Registration, Evaluation and Authorisation of Chemicals (COM (2003) 644) ('REACH');
- The Communication on Integrated Product Policy (IPP) published in June 2003.

These remain at the consultation and discussion stage but may have significant implications for EEE suppliers.

General requirements of all of these regulatory and other initiatives are summarised in the following section. Key elements are set out in the Appendices.

The implications for EEE suppliers are discussed in Section 3.

Scope and status of legislative developments

RoHS

The European Parliament and Council Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC) ("the RoHS Directive") bans the putting on the EU market of new EEE containing more than the permitted levels of lead, cadmium, mercury, hexavalent chromium and both polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. There are a number of exempted applications for these substances.

RoHS is an Article 95 'single market' Directive which came into force on 1st July 2006. Legislation has been passed in Member States (MS), although some Accession countries have a one year derogation for implementation of RoHS (see Annex 4 for status in all EU Member States).

New products entering the market from that date will be subject to testing and non-compliant products removed. Non compliant producers will be subject to fines. The implications are discussed further in Section 3.

Further information on RoHS is provided in Annex 2 and on www.cfsd.org.uk/aede

WEEE Directive

The European Parliament and Council Directive on Waste Electrical and Electronic Equipment (2002/96/EC) ("the WEEE Directive") aims to prevent WEEE arising, to encourage reuse, recycling and recovery of WEEE and to improve the environmental performance of all operators involved in the lifecycle of electrical and electronic equipment, especially those dealing with WEEE. The Directive sets requirements relating to criteria for the collection, treatment, recycling and recovery of WEEE. It makes producers responsible for financing most of these activities; retailers/distributors also have responsibilities in terms of the take-back of WEEE and the provision of certain information. Private householders are to be able to return complete WEEE without charge.

The WEEE Directive applies to all electrical and electronic equipment placed on the EU market which falls into any of ten product categories (see Annex 2) up to 1,000 volts AC or up to 1,500 volts DC.

The Directive is an Article 175 'environmental' Directive. Unlike the RoHS Directive market harmonisation has not been a key aim and so, beyond implementing basic requirements MS may transpose the Directive to their own levels. This has resulted in diversity in approaches and levels of implementation.

WEEE legislation has been passed in all MS except the UK where legislation is expected to be come into force on 1 January 2007. In the case of France legislation has been passed but the law

does not come into effect until July 2006. As noted for RoHS, some Accession countries have a one year derogation for implementation.

Across MS the implementation of WEEE has given rise to practical difficulties and complexities, each MS having to establish its own methods for household WEEE collection, dealing with historical WEEE and WEEE form other users, financial arrangements, compliance systems and registration processes.

The implications for suppliers are discussed in Section 3 and the status of RoHS and WEEE is summarised in Annex 4.

Further information on WEEE is provided in Annex 3 and on www.cfsd.org.uk/aede

EuP

The Framework Directive 2005/32/EC on the Eco-design of Energy-using Products (EuP), is intended to provide coherent EU-wide rules for eco-design and ensure that disparities among national regulations do not become obstacles to intra-EU trade.

The Directive does not introduce directly binding requirements for specific products, but defines conditions and criteria for setting, through subsequent implementing measures, requirements regarding environmentally relevant product characteristics (such as energy consumption) and allows them to be improved quickly and efficiently. The target date for the first national laws is August 11 2007. Once the Directive is adopted by MS the EC may set eco-design requirements for specific energy-using products which have a significant impact on the environment, are sold in high volumes, have clear potential for improvement and where performance has not been satisfactory as a result of self regulation or existing laws.

EuP covers energy-using products selling more than 200,000 units in the EU and covers a much wider range of products than RoHS and WEEE. In principle any energy-using product can be covered except for transport systems which are excluded.

Products to be covered are still under consideration. Fourteen separate preparatory studies are being conducted for boilers, water heaters, PCs and computer monitors, office systems (such as printers), consumer electronics (including TVs), standby units, battery chargers and external power supplies, office lighting, street lighting, residential air conditioning, electric motors, commercial refrigerators and freezers, domestic refrigerators and freezers, and domestic dishwashers and washing machines. The results of these studies will be produced at various stages during 2007.

By encouraging manufacturers to design products with the environmental impacts in mind throughout their entire life cycle, the EC implements one aspect of Integrated Product Policy (IPP) (see the section on IPP below) and accelerates the move towards improving the environmental performance of energy-using products. After adoption of the Directive by the Council and the European Parliament, the Commission, assisted by a Committee, will be able to enact implementing measures on specific products and environmental aspects (such as energy consumption, waste generation, water consumption, extension of lifetime) after impact assessment and broad consultation of interested parties.

Climate change is one driver for the Directive but not the only one since eco-design considers all impacts.

The Directive is unlikely to come into force generally within the EU before 2009. Individual MS may nevertheless bring forward the programme. For example the UK may bring implementation forward for consumer electronics and other products under the UK Climate Change Programme, the national programme for achieving the UK's Kyoto target for cutting greenhouse emissions.

It is expected that enforcement will be through self declaration and CE or other labeling and products may be subject to random testing e.g. by Trading Standards officers in the UK. Information provided may include embedded energy and other impacts as well as performance in use. Producers will be expected to establish management systems and supply technical documentation on life cycle assessment and compliance.

Implications for Asian suppliers are considered in Section 3 and further details are provided in Annex 5 and on www.cfsd.org.uk/aede. At present it is a case of 'watch this space' rather than there being immediate requirements. However, proactive companies and countries may start preparing for the EuP Directive through research projects e.g. Hong Kong Polytechnic University and the Hong Kong Green Manufacturing Alliance (Federation of Hong Kong Industries) started a pilot project in March 2006.

REACH

On 29 October 2003, the European Commission adopted a proposal for a new EU regulatory framework for chemicals, COM (2003) 644. Under the proposed new system called REACH (Registration, Evaluation and Authorisation of Chemicals), enterprises that manufacture or import more than one tonne of a chemical substance per year would be required to register it in a central database. REACH would furthermore give greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances. This information would be passed down the chain of production.

Failure to register will mean that a substance cannot be imported into the European market. Details of enforcement mechanisms are not yet available but it is expected that registration checks will be carried out and non-compliant suppliers subject to possible prosecution as well as withdrawal of products.

The proposal is now being considered by the European Parliament and the Council of the EU for adoption under the so-called co-decision procedure.

REACH is intended to control hazardous chemicals use in the EU but not to ban specific substances.

REACH applies to and has major implications for electronics companies manufacturing within the EU or importing products and materials where the total quantity entering the market is above specified levels. The main implication at this point appears to be the cost of testing and registration for producers or importers in the EU. Since it applies to materials of concern contained in products it will place requirements on suppliers along the supply chain to declare material content and in practice, this may also mean further testing and documentation

In this sense it could be even more onerous than RoHS for EEE transnationals and their supply chains with respect to testing and documentation

Further information on REACH is provided in Annex 6 and on www.cfsd.org.uk/aede

Integrated Product Policy (IPP)

An EC initiative, IPP is an EC policy approach to reducing the environmental impact of products by using an appropriate mix of supply-side and demand-side environmental product policy (EPP) tools. At the MS level there have different levels of proactiveness to reducing environmental considerations of product life cycle impacts, to integration of EPP approaches, to integration of EPPs with other aspects of environmental policy and integration of EPPs with other, non-environmental, government policies. At the European Union (EU) level, the EC is concerned with harmonising EPP approaches between MS since the various countries have been progressing at widely differing rates.

While businesses will be involved in implementing some supply-side aspects of EPP, for example applying eco-design and participating in eco-labelling, IPP development and implementation is primarily a task for government, especially on demand-side measures.

IPP is being increasingly recognised not only as an approach to integrating EPPs but also as a key aspect of national MS strategies for sustainable consumption and production (SCP), and sustainable development. It is named as one of the major innovative elements in the EU's 6th Environmental Action Programme. However, it is still viewed by many as a very broad brush approach with few 'teeth'.

In its 2003 Communication on IPP the Commission published a timetable for action as follows:

- 2005: Issue of a practical handbook on LCA best practice and a discussion document on the need for product design obligations on producers (these do not appear to have materialised yet).
- 2006: Development of an action programme for greening of EC procurement.
- 2007: Identification of a first set of products with the greatest potential for environmental improvement.

IPP remains at the discussion stage and there are no immediate requirements for suppliers. Depending on how IPP is implemented through policies and Directives, however, it could have significant implications in the medium to longer term - for example in any future requirements for green purchasing by national governments.

While the principles and the term – IPP - remain in use within the EC and some Member States, the term IPP itself has lost favour in recent years.

The implications for Asian suppliers are further considered in Section 3 and further information on IPP is provided in Annex 6 and on www.cfsd.org.uk/aede

Drivers and implementation issues

There are various drivers for the above developments:

- Concerns regarding hazardous materials and environmental and health risks along the product life-cycle (RoHS and REACH);
- The growing volume of waste EEE as production and consumption expands and product life is often short. The problem has been heightened by a serious shortage of landfill capacity in some countries or areas (WEEE)
- The need to reduce greenhouse emissions and recognition of the need to improve product energy efficiency (EuP)

- Recognition of the need for more efficient legislation and an integrated approach to product policy so that policy and regulation in one area does not have adverse effects in another (IPP);
- Application of fundamental principles of product environmental policy and regulation, especially Polluter Pays and Producer Responsibility.
- Recognition of the need for harmonisation of existing and new product environmental regulation across MS in order to minimise barriers to trade (RoHS and REACH)
- Recognition of the need for international standardisation (REACH)

Because of the waste volume problem, and because EEE often contains hazardous substances which may present an environmental and health risk (for example potential pollution from waste disposal and problems in waste recycling) EEE has long been identified as a Priority Waste Stream in by the European Commission (EC). This has resulted in regulatory developments specific to EEE, namely the WEEE and RoHS Directives. These Directives have been developed in parallel with other non EEE-specific more general Directives and other initiatives following from the principle of Producer Responsibility for end-of-life waste as well as aims of pollution prevention and health and safety risk reduction.

Regardless of EC Directives, most European countries already have some level of related legislation and some already operate 'take back' and recycling schemes. Implementation of WEEE has been easier where recycling schemes and infrastructure already existed for household electronics, for example Germany

A key driver for EC legislation has accordingly always been harmonisation and standardisation of approaches to facilitate the workings of the single market. In the present context, the RoHS Directive under Article 95 ('harmonisation') has benefited from common regulatory approaches across MS once agreement had been reached on details, especially substances and concentrations.

Conversely the WEEE Directive under Article 175 has been implemented under environmental and not harmonisation aims which has led to different approaches in each MS with respect to scope, pricing, responsibilities, producer registration, and collection and recycling arrangements. For example, there is no central clearing house for European registration and a lack of uniform procedures for registration.

In some countries such as Germany there is to be separate collection and recycling of different recycling categories whereas in others such as the UK EEE waste is likely to be mixed in single skips. The former approach gives a greater incentive for eco-design along the supply chain for a particular product or category, with the aim of reducing end-of-life waste and facilitating disassembly and recycling for the specific product. Mixed collection provides less incentive since recovery of good quality material becomes more difficult if material is contaminated.

Because of the lack of a Europe-wide scheme, a particular concern is that where equipment is made in one country and sold in another, producers or importers might be forced to pay waste treatment contributions twice.

This and other issues highlights the importance for suppliers of gaining good quality information on technical and legal elements of legislation – whether selling direct, through subsidiaries or agents. A key issue for many is the definition of a 'producer' in Europe and whether subsidiaries are classified as such for the purposes of RoHS and WEEE.

Lobbying by and consultation with industry, amendments and practical difficulties have led to protracted delays in implementation of WEEE, especially in the UK. In January 2006 EC official Klaus Kogler reported to the European Parliament's environment committee that efforts to implement the law faced serious handicaps. In combination they could lead to 'severe market barriers and unintended side effects for producers'. It is still possible that the WEEE Directive could be substantially revised but a decision will be made after current research into the situation.
It has asserted in some quarters that WEEE and RoHS, along with other European environmental regulation, has been motivated by an agenda of erecting barriers to trade. The EC has extensively stated that this is not the intention and has counter-argued, for example, that EEE suppliers within and outside the EU will benefit from having effectively only one standardised compliance requirement (at least for RoHS) for all of the large European market as opposed to having disparate separate requirements for each country.

In the case of RoHS and WEEE, and potentially for EuP and REACH offsetting any potential barriers for suppliers by providing information and other assistance is an underlying purpose for Asia Eco-Design Electronics (AEDE) Project.

2.2 Regulatory developments in Japan

Main developments
The main areas of relevant legislation are as follows:

- Fundamental Law for Establishing a Sound Material-Cycle Society (2001).
- Law for the Promotion of Effective Utilisation of Resources (LPEUR) in 2001.
- Home Appliances Recycling Law (HARL) in2001.
- Green Purchasing Law (GPL) was passed in 2001.
- Waste Management Law passed in 2003
- Japanese RoHS: This was passed in July 2006.

There have been some regulatory developments specific to EEE, in particular HARL, but the emphasis has been on implementing a structured range of general legislation aimed at creating a 'recycling economy'. The general structure is set out in Annex 5, also see www.cfsd.org.uk/aede

The first three laws relate to the 3R's of 'Reduce, Reuse, Recycle'. The GPL applies to government purchasing and aims to create a green market for a number of publicly procured products. The Waste Management Law applies to disposal.

Scope and status of legislative developments
Developments are summarised here. The implications for Asian suppliers are discussed in Section 3. Further details of general law in this area are provided in Annex 8.

Fundamental Law
The 3Rs strategy is underpinned by the Fundamental Law for Establishing a Sound Material-Cycle Society that was put into force in January 2001 and establishes the basic principles under which other environmental legislation should operate. This imposes the obligations of different sectors and the measures to be taken by national government and comes under the responsibilities of Ministry of Economy, Trade and Industry (METI).

Under this Fundamental Law come the two key laws that then govern the practical application of detailed regulation. The Waste Management Law basically deals with disposal whilst the Law for Promotion of Effective Utilisation of Resources (LPEUR) deals with the 3Rs through product-related law. This sequence of waste and recycling law is also then supported by a Green Purchasing Law, creating legislative circularity for the production process and a complementary range of strategic goals. Also below LPEUR comes the Home Appliances Recycling Law (HARL).

Thus there is a full range of legislation applied across both the municipal and industrial/ commercial waste streams. The legislative structure is illustrated in Annex 5.

Hazardous substances in EEE and WEEE are not specifically covered within this framework of waste legislation. Nevertheless Japan now has its own version of RoHS and implementation was timed to coincide with implementation of the European RoHS in July 2006

LPEUR

LPEUR was applied in April 2001 and provides for 3R measures to be taken by business in the production stage across a number of industries and product categories . This includes design, labeling for separate collection and the development of an end-of-life (EoL) take-back systems. It applies responsibilities to each party in the supply and consumption trail:

Businesses
- Rationalising the use of raw materials with the aim of minimising materials use and waste
- Using recyclable materials and reusable parts
- Promoting their use at EoL

Consumers
- Using products for as long as possible
- Using products with high recycled content
- Cooperating in separate collection

National and local government
- Taking financial measures
- Promoting green procurement
- Promoting technology development

Ten designated industry areas and 69 product items were identified to be addressed by LPEUR, covering around 50% of municipal and industrial wastes. This all-encompassing law therefore requires that even those products not directly covered by specific 'producer responsibility' are under pressure and scrutiny to be encouraged towards improved environmental performance. It has also led to the development of additional take-back schemes for household PCs and portable batteries.

It should be noted that, although LPEUR and HARL are stated to be based on 'producer responsibility' there is a major element of 'consumer responsibility' since consumers pay for the schemes. In this sense there they differ from WEEE which will be wholly paid for by producers.

For some years, Japanese consumers have had the ability to return EoL computers through a national take-back scheme where the computer could be packaged, taken to a local Post Office and returned to the manufacturer at consumers' expense. In October 2003, manufacturers voluntarily started to include a recycling mark on computers entitling consumers to return them free of charge at EoL but with an additional recycling fee incorporated in the sale of the product.

For compact rechargeable batteries, a national returns system has been set up at manufacturers' cost with collection points in shops and a national recycling centre.

Green Purchasing Law

In May 2000 the Green Purchasing Law was enacted to establish green purchasing as national policy. Under the law, all governmental bodies must conduct green purchasing. Each body must create and publicise its purchasing policy each year, implement green purchasing based on the policy and summaries and report purchasing records. There are over 150 items on the list which includes office equipment, lighting and electrical goods.

The Green Purchasing Law complements and supports voluntary purchasing initiatives, in particular the Green Purchasing Network, established in 1996 to promote green purchasing, which has over 2800 members including EEE companies like Matsushita Electric, Sony and NEC.

HARL

HARL was passed in 2001 and gives the producers – manufacturers and importers – of four domestic appliance types the responsibility of providing a national take-back scheme and achieve recycling targets.

Air conditioners, washing machines, televisions and fridges/freezers were targeted as the items where the greatest environmental net benefit could be achieved. Some new categories are under consideration but these are not yet defined.

The regulations lay down specific recycling targets for the four types of appliance and only relate to household waste equipment. Business WEEE is not covered by HARL, although under LPEUR businesses have a duty to maximise recycling.

There are no targets for collection, but items collected must be recycled through the system. The system commenced in April 2001, at which point manufacturers took responsibility for the collection and recycling of these items. A levy is placed on consumers for each unit disposed of.

The scheme includes two consortia, 'A' (Panasonic, Matsushita and Toshiba) and 'B' (Mitsubishi, Fujitsu, Hitachi, Sanyo, Sharp and Sony. 'A' has 25 recycling centres and 'B' 15 centres.

Japanese RoHS

Hazardous substances in products have already been substantially phased out by major companies voluntarily in preparation for the European RoHS.

The Japanese RoHS Law was passed on 1 July 2006, its timing coinciding with enforcement of the European RoHS.

The purpose of this law appears to be to ensure consistency in standards for products destined for home, EU and other markets and to pick up any laggards which have not conformed voluntarily.

The Japanese RoHS appears to focus on marking rather than being a materials restriction law.

Drivers and implementation issues

Sustainable waste management has been a high priority for the Japan for the last 20 years with its enormous manufacturing base and limited natural disposal options. Existing landfill space for commercial purposes is due to run out in 2008 and the government has been following a planned strategy since the early '90s under the basic 3Rs – Reduce, Reuse, Recycle.

HARL legislation is just part of a coordinated range of legislation formulated by government in close cooperation with industry. With annual waste arisings of 450 million tonnes from all sources the country has been seeking to reduce dependency on both natural resources and land disposal, and to mitigate society's environmental impact. Sustainable development is seen as an essential part of economic progress. This mindset seems to be carried through to Japanese industry which, with its cultural commitment to R&D, appears to view the challenge as an opportunity to improve manufacturing and design processes.

There also appears to be a national agenda of developing a competitive edge in recycling and other environmental technology. Japanese used voluntary agreement and a lead-free road map from late 90s to drive lead and other hazardous substance out of products ahead of legislation in Europe. As a result many Asian suppliers have already been hit by Japanese requirements through the supply chain.

Apart from the Japanese RoHS all of the above laws and regulations have already been enacted in 2001. Implementation of legislation appears to have been relatively smooth and successful in the Japanese 'compliance culture'. Key features of the implementation process for HARL, for example, have included the following:

- Joint development by industry and the relevant Japanese ministries.
- Clear responsibilities, a clear timetable and clear environmental objectives.
- Application was focused in order to gain what was considered to be the optimum achievable benefit e.g. a focus on key household electronic products not all WEEE types.
- Provision to industry of a risk-free framework in which to invest.

Implementation has been supported by administrative arrangements and by major investment in infrastructure, in particular the establishment of recycling centres across the country. Industry has been heavily involved in the process and leading EEE companies have established recycling plant.

2005 recycling levels resulting from HARL were estimated as follows: air conditioners 60%, televisions 55%, fridges/freezers 50%, washing machines 50%.

Administration of HARL has been supported by a simple, fully trackable ticketing system.

2.3 Other related developments affecting EEE suppliers

Main developments
In addition to regulatory developments in Europe and Japan there have been a number of other international developments with implications for the environmental and social performance of EEE suppliers.

These fall into the following main categories which are specific to EEE:

- Green and socially responsible supply chain requirements and management by leading EEE companies, including partnership arrangements with suppliers

- The development of The Electronics Industry Code of Conduct (EICC).
- The establishment of supply chain standards with the Global Environmental Sustainability Initiative (GeSI).
- Developments in eco-labeling and energy labelling schemes.
- Development of other national RoHS legislation e.g.in China and South Korea.
- IEC Standards for eco-design

To these can be added other relevant developments such as the increasing adoption of international standards e.g. ISO 14001, ISO 9001, OHS 18001 and SA8000. While not EEE or product-specific the first three provide now widely recognised generic frameworks for assurance of environmental, quality and occupational health and safety (OHS) management by suppliers. SA8000 is increasingly accepted as assurance of ethical working conditions.

Some industry initiatives relate to Europe and Japan, but consideration of industry initiatives, need to be considered in the broader context in view of the industry prominence of US-based and other TNCs (especially Hewlett Packard) and their involvement in the EICC. .

Green and CSR initiatives by individual companies
Supply chain management is a major activity in an industry where outsourcing is commonplace.

Major EEE companies have generally been among the leaders in environmental management, for example in ISO 14001 certification, green procurement and in reporting on performance. Most majors will have their own networks of suppliers for whom environmental performance will be one purchasing consideration along with cost, delivery and quality. This applies to both local suppliers in Europe or Japan, and suppliers in host countries for subsidiary operations

For example, Philips and Siemens from Europe and Sony from Japan have well established supplier partnership arrangements, including provision of information, training and other support.

More recently some leading EEE companies have embraced sustainability and corporate social responsibility (CSR), and have established expectations and requirements on social performance by suppliers, including such issues as working conditions and use of child labour. This area can be expected to grow in response to customer, investor and other demands, including the EICC.

Auditing of suppliers on environmental and social as well as quality matters has become the norm among leading purchasers.

With regard to EEE take-back and recycling some companies have been especially active in Europe. For example an alliance has been formed between Sony, Electrolux, Braun, and Hewlett-Packard to implement their own pan-European collection scheme.

The Electronics Industry Code of Conduct
The first wave of CSR developments in the EEE sector focused on environmental aspects. However, various US companies launched the Electronics Industry Code of Conduct (EICC) on 21st October 2004, which includes social and ethical issues as well. Hewlett-Packard (HP) facilitated collaboration on the code between itself, Dell, IBM and electronics manufacturing companies Celestica, Flextronics, Jabil, Sanmina SCI, and Solectron. The code was developed to establish and promote unified industry expectations for socially responsible practices across the electronics industry's global supply chain. The code potentially provides a route for a harmonised

approach for monitoring suppliers' performance across several areas of CSR, including labour and employment practices, health and safety, ethics, and environmental protection.

On 10th November 2004 - Cisco Systems Inc. HP, Microsoft and Intel Corporation announced the formation of a new supply chain working group to develop integrated implementation plans for the EICC. The new working group, facilitated by Business for Social Responsibility (BSR), will develop common mechanisms and tools that will enable compliance with the Code. The companies will work collaboratively with suppliers and partners in the supply chain to develop common approaches to supplier survey, reporting methods, auditing tools, risk assessments and programmes. The joint effort reflects the participating companies' commitment to leadership in the area of CSR and their desire to help suppliers streamline their reporting requirements and make performance easier to verify (see www.eicc.info)

Global e-Sustainability Initiative (GeSI)

The Global e-Sustainability Initiative (GeSI) is a joint initiative of an international group of Information and Communications Technology (ICT) service providers and suppliers, with the support of the United Nations Environment Programme and International Telecommunication Union. GeSI seeks to contribute to sustainable development in the ICT industry by taking a leadership role in collaborative exploration and responsible management of the evolving interfaces among industrial, ecological, and social systems. Information about GeSI members and ongoing activities can be found at www.gesi.org.

Joint EICC and GeSI initiative on supply chain corporate responsibility

The EICC Board and GeSI have agreed to partner in the development and deployment of a consistent set of tools and processes to measure and monitor Supply Chain Corporate Responsibility performance across the Information and Communications Technology (ICT) sector. EICC IG and GeSI agree that leadership and transparency will be the driving themes of their partnership.

The initiative plans to seek the following results for the (ICT) sector:

- Safe working environments where workers who are treated with respect and dignity.
- Improved global environmental stewardship.
- Increased efficiency and less duplication of effort for participants.
- Greater alignment and understanding among participants about best practices in improving social and environmental performance in the supply chain.
- Involvement of key stakeholders who demonstrate interest in the ICT sector by providing a mechanism for timely interactive dialogue

EICC IG and GeSI are partnering on the following deliverables:

- A risk assessment tool and methodology to assess risks in the supply chain.
- A supplier self assessment questionnaire for collecting supplier performance data.
- A common auditing approach and methodology.
- A web based eTool that will facilitate efficient information flow between participating companies.
- A standardised supply chain reporting framework.
- Capacity building plans to improve awareness and skills of suppliers, auditors, and workers.
- Shared communications, marketing and stakeholder relations documents, plans and events.

Developments in eco-labeling and energy labeling
Some general eco-labeling schemes have been successfully established in certain European countries such as Sweden (as noted above in Annex 2 under IPP and EPP), and apply to some EEE goods. In general, however, product eco-labelling has not so far been a significant issue for EEE producers, products and consumer markets.

In contrast, energy labeling is well established across various appliance categories e.g. US Energy Star. Such labeling, however, normally only applies to the use phase of a product's life cycle.

At the European level current initiatives include proposals on energy labeling of household appliances and the EU Energy Star Agreement.

There is presently no scheme for providing customer information on embodied energy although leading B2B customers practicing eco-design will require such information from main suppliers.

Developments in other RoHS legislation
Stimulated by the European RoHS, various countries have sought to develop their own versions, including China and South Korea. The precise motivation is not clear. While concern about pollution and health and safety is one factor, another may be more strategic, namely to ensure the competitiveness of domestic industries in responding to European and Japanese RoHS. It is not practical or efficient for one part of a company or industry to go lead-free while another part is using lead solder.

These other versions of RoHS appear to go beyond the European RoHS and are still under development. This may be a precautionary approach in case the scope or requirements of the European RoHS should become more demanding in future.

The China RoHS is being developed alongside a WEEE law contains 25 articles covering prevention of pollution, 'cradle to grave' management, non-toxic packaging, implementation (stated to be I January 2006 but now mid 2007), product labeling, producer obligations and penalties.

The California RoHS law is due to be implemented on January 1, 2007. It will place a fee on computer monitors and TVs containing cathode ray tubes (CRTs) in order to fund recycling. It contains RoHS equalising measures which would prevent the sale of any electronics products in the State which would be prohibited in the EU because of the presence of heavy metals. It is intended to harmonise production and markets so that producers do not manufacture separate products for each market. It is unlikely to have any impact on the key players who will already have re-designed products for EU compliance.

Other States are likely to follow for inter-State and international harmonisation.

Development of IEC Standards
The International Electrotechnical Commission (IEC), in cooperation with the EC (CEN) has been developing a programme of standardisation to assist with the implementation of the EuP Directive. Various standards have been proposed or planned (CENELEC, December 2005), including: IEC 114 (eco design guide for product designers), EC 109 (guide for product standards). IEC TC 111 (materials composition - proposed), IEC 113 (materials declaration), IEC TR 62321 (measurement and testing), IEC TR 62139 (environmental aspects in product standards), IEC TR 62018 and 62087 (power consumption).

Developments in ISO and other international standards.
Various ISO standards relate to the environmental performance of products, including ISO TR 14062 for product eco-design and ISO 14040 for life cycle assessment. These are guidelines only and not standards for certification

The main standards for company certification. ISO 9001 and ISO 14001, are now well established and widely adopted in the EEE industry, at least among larger firms. Although production rather than product-oriented they have had a major influence in pushing quality and environmental management along supply chains. The same can be said for safety standards which are growing in prominence (eg. OHS 18001)

ISO 9001 certification has been especially growing in China, which is the leading country for uptake worldwide with around 50,000 companies certified across all industry sectors . There has also been extensive adoption in other Far Eastern countries. Analyses of uptake by country and sector are available commercially and may indicate information on company types. A rough estimate from available aggregate data would suggest that around 10% or 5000 of the Chinese certified companies are in the electronics and information technology (IT) sector.

Socially-related standards are less well developed but adoption of SA8000 has been growing across many industries with around 800 enterprises certified worldwide. Certification of Asian electronics companies is still limited, however. By 30 June 2005, certified companies in the sector included eight in China, one in India, one in the Phillipines and one in Thailand (source www.sa-intl.org).

ISO is also developing a draft standard ISO 26000 on Social Responsibility in spite of opposition from some ISO members (notably the US which also opposed an ISO standard for OHS). This is due to be published in 2008 and will be a voluntary not a certification standard aimed at enhancing the credibility of claims made in corporate reports or elsewhere regarding the social responsibility of companies.

Drivers and implementation issues
A key factor driving environmental and social concerns and initiatives in the EEE sector has been a major restructuring of the sector with an increasing shift of manufacturing, particularly to South-Asia East. As noted above, electronics and information communication technology (ICT) now represents a major part of exports from East and South-East Asia. This shift has affected all major OEMs whether European, Japanese, US or other.

In an increasingly globalised industry, growing attention has been given to life-cycle impacts. While the electronics industry has often portrayed itself as ‘clean’, its environmental performance has come under increased scrutiny, in its core operations, supply chains and end disposal of waste. Poor health, safety and environment (HSE) standards in electronics waste recycling in countries such as China have been exposed by such non-government organisations (NGOs) as the Silicon Valley Toxics Coalition.

Concerns about working conditions and use of child labour in outsourced manufacturing have led to the development of SA8000, the Industry Code of Practice and to initiatives by particular companies with respect to managing their suppliers and supply chains and disposal or recycling of products

Leading companies are increasingly applying environmental and socially responsible purchasing criteria alongside quality, performance cost and other criteria.

International standards, although voluntary, are increasingly becoming de facto compliance requirements for operating in certain markets by providing assurance, especially to business-to-business (B2B) customers that management systems are in place.

Major companies are going beyond requirements for self-declaration to requires for RoHS management

In a globalised market there are likely to be increased demands for common, standardised approaches in order to facilitate trade.

2.4. Europe-Japan comparison

From the review above, when considering the European and Japanese situations there are both similarities and differences in regulatory approaches, drivers, industry intitiatives and practical implementation of environmental and social performance requirements relating to EEE products and suppliers.

Similarities

- Fairly advanced levels of regulation relating to reducing WEEE in some European countries.
- Potentially similar RoHS regulation across Europe as well as in Japan
- Some similar drivers: pollution and health risk prevention, shortage of landfill (at least in some EU countries).
- Established EEE recycling infrastructure in some EU countries as well as in Japan although the scale and level of coordination is much greater in Japan
- Significant involvement of major electronics companies in recycling in some EU countries as well as in Japan.
- Major European-based as well as Japanese companies engaged in environmental procurement and supply chain partnership, and in pushing quality, safety and environmental management and standards along supply chains.

Differences

- Relevant legislation in the EU is more EEE specific whereas in Japan it is part of a more general waste legislative framework.
- WEEE is based on producer responsibility and paid for by producers whereas HARL involves consumer as well as producer responsibility and is paid for by consumers
- In Japan consensus has been fairly easy to establish whereas in the EU there are 25 countries with different cultures and levels of greenness.
- WEEE under HARL covers four types only (fridges, air conditioner units, TVs and washing machines) whereas the European WEEE covers many products
- Apart from the new RoHS in Japan, Japanese regulation and implementation in this area is well established whereas regulation is still being developed in most EU countries, especially the less environmentally advanced MS in southern and Eastern Europe.
- There is no specific equivalent of EuP, REACH and IPP in Japan, and no specific Green Purchasing Law in the EU.
- RoHS is law in the EU. Lead-free, etc has been voluntary in Japan until now but the Japanese RoHS law will clean up laggards (see Section 2)

- There are differing motivations and levels of urgency within the MS and between these and Japan. Harmonisation is a major driver for the EU and compliance obligations a key driver for MS. Japan has a critical need to reduce waste to landfill. It also appears to regard waste reduction as a strategic opportunity for technology development.
- In Japan there appears to have been a more cooperative approach between industry and government in regulatory development and a high level of industry involvement in recycling infrastructure and technology development. While some EEE companies in Europe have been involved in practical initiatives, much industry energy has gone into lobbying against legislation or for amendments.
- In Japan there are a significant number of OEM producers, with a captive collection markets, high levels of vertical integration, low barriers to re-use of collected material, clearly defined collection routes and logistics, transparent cost mechanism, development of new process technologies and guaranteed minimum volumes for recyclers. The opposite situation applies for most EU countries.
- European and US-based companies appear to have been more involved in the social and ethical side of CSR and in assessing suppliers' performance in these areas. Japanese-based companies do no appear to have been very active in these areas so far.

3 IMPLICATIONS FOR ASIAN EEE SUPPLIERS

This section sets out the general implications for Asian EEE suppliers, focusing on SMEs, which, as noted above, are likely to be the most vulnerable to changes in regulation.

3.1 General implications for suppliers

The following can be concluded from the foregoing review and from the country reports.

1 Compliance with higher standards is a competitive necessity for suppliers to global markets

Regardless of organisation, all EEE producers and component suppliers are already or will be required to comply with continually increasing expectations and standards of environmental performance in EU, Japanese and other developed country markets. Added to these are, at least in some markets and for some TNC customers, growing requirements to comply with improved standards on social performance. Developments in EICC and GeSI supply chain codes have already been referenced. The situation regarding pay and conditions at Foxconn's Longhua plant, manufacturing iPods and other products under contract, has been widely exposed and brought adverse publicity and reputational harm to Apple. It has also highlight wider problems for companies outsourcing to Asia, and may increase demands for contracting companies to improve their performance

Compliance with basic and growing environmental (and social) standards is increasingly a condition of market entry and efficient compliance a competitive necessity alongside price, quality and delivery.

While suppliers exporting to Europe and Japan will be most affected in the short term, there is a general global trend towards higher standards and towards standardisation to facilitate and not impede global trade.

2 RoHS is the most pressing compliance issue but others are significant

The most pressing issue for all suppliers in the short term is compliance with European, Japanese and other RoHS requirements.

WEEE is a major issue for those suppliers defined as producers in Europe (i.e. with offices and distribution or production facilities) but all suppliers must be at least able to supply required information to OEMs operating in Europe and Japan and may be required to apply eco-design to product re-design.

The other developments such as EuP mainly pose medium to longer term requirements, especially to suppliers of energy-consuming products. Again they will need to supply information and may be required to apply eco-design. Design for energy efficiency will become increasingly important. IPP may drive green public procurement as well as requirements for eco-design.

Compliance with legal requirements, especially RoHS and WEEE is mandatory for companies supplying to relevant markets. Non-compliance imposes potential fines or other penalties for producers. Suppliers which create compliance problems for OEM or other customers are likely to be rejected.

All of these developments require suppliers to be aware of and understand applicable laws and the implications for their business e.g. in the EU whether they are classified as a 'producer'

Compliance with other developments is mainly voluntary, such as compliance with company and international standards and the EICC. However such standards and codes often operate as de facto regulatory requirements when they become the competitive norm for operating in a particular market.

In summary the hierarchy of issues with respect to time horizons is probably for Asian suppliers as a whole

- Immediate: RoHS
- Short to medium term (next 1-2 years): WEEE
- Medium-longer term (4-6 years): EuP
- Longer-term: CSR

For individual firms the hierarchy may vary according to their products, customers and markets. The timetable for action may be brought forward for sales to some customers and countries.

3 Compliance may require significant investment for suppliers

Depending on markets, products and processes, compliance may mean significant expenditure in the short-term by Asian and other companies in the following areas, especially for RoHS compliance:

- Product-redesign
- Re-tooling of production lines
- New materials
- New processes
- Product testing facilities (in-house or by third parties)
- Personnel training
- Management time and expenditure on consultants or advisers

- Potential write-off of redundant products and materials
- Investment in integrated management systems

Precise figures are not available of the costs to industry as a whole or for individual companies across all phased-out materials under RoHS. The cost will depend on the product and existing processes but various estimates suggest an average 5-10% increase in production costs.

Investment is likely to be an ongoing not one-off requirement as the performance bar is continually raised.

More generally, competing in global markets or supplying to TNCs requires investment in management systems, including being certified to or at least operating to the general requirements and principles of ISO 9001 (and to ISO 14001 in some cases). Management systems standards specifically require monitoring regulatory and other developments relevant to the business, and, in the case of ISO 9001, ability to meet customer requirements; they require planning and resourcing for achieving compliance and improvement.

Operating in line with such standards is basic sound management as well as providing required assurance to business-to-business (B2B) customers. Companies not following such sound practices are not likely to succeed in international markets regardless of environmental compliance and may damage the reputation of the industry in that country. For example, quality problems with some Chinese electronics components have been reported anecdotally.

4 Suppliers which fail to meet compliance requirements or deadlines will be marginalised

Because of their far-reaching implications, especially on industry costs and competitiveness, regulatory developments are relatively slow and involve extensive consultation with industry and other interested parties. Suppliers must nevertheless monitor the agenda and gear themselves up for compliance and be able to move fairly quickly once decisions are made.

Suppliers which fail to comply are likely to be forced out of major global markets or lose OEM or intermediary customers operating in such markets. They may as a result be forced out of business or restricted to domestic markets or lower value export markets.

Retailer pressure, especially by the major chains, could be a significant influence. For example Wal-Mart has stated that it is going green and Ikea is focusing on the social as well as environmental dimension of the supply chain.

TNCs and larger firms are already close to the agenda and regulatory processes and have invested heavily in compliance. They will have communicated requirements to first tier suppliers and in many cases provided assistance. Larger firms are generally more environmentally aware than SMEs.

Japanese companies appear to be highly aware of regulatory and other requirements, and have communicated these to suppliers. They also appear to exert high levels of control and influence along their supply chains. Japanese EEE companies have also developed a reputation for greenness and requiring improved environmental performance from their suppliers.

SMEs which are not under the control or influence of transnationals or major national OEMs are potentially at most at risk of being unprepared for compliance, especially with RoHS. Thumbnail surveys (see country reports) have suggested generally low levels of awareness of European

legislative developments until relatively recently, although out of necessity there is now likely to be growing awareness of RoHS and investment in RoHS compliance.

The task of awareness raising and preparation for compliance appears to have been mainly left to industry, especially to individual companies, in most Asian countries. Government support appears to have been generally limited. An exception has been Thailand where a more strategic national approach has been taken with extensive information and support for suppliers. The situation with respect to involvement by government and trade associations is clarified in the country reports (see www.cfsd.org.uk/aede).

How much SMEs are likely to be marginalised for inability to comply with RoHS is uncertain. It may be the case that they are already being marginalised on quality grounds if they are not certified to ISO 9001 or able to meet demanding price, specification, quality, volume and delivery timetable requirements.

5 The potential scale, and social and economic impacts of SME marginalisation are uncertain but likely to be significant in the short term

The broad scale of impacts on SMEs, dependent communities and the economies in the respective countries will depend on various factors:

a) The number of SMEs supplying to European and Japanese markets via major OEMs or TNCs
b) The number significantly affected by RoHS and other legislation (i.e. the number required to make significant investment in product change).
c) The present state of preparedness and investment.
d) The number which may specifically lose contracts for failure to comply (i.e excluding those not supplying to international markets anyway, or which have been supplying but are already being forced out for other reasons such as quality problems).

The country reviews suggest that the numbers of SMEs in categories a) and b) are significant, the numbers in category d) could be significant and the present state of awareness, preparedness and investment is generally low, especially among lower tiers of supply chains.

6 The manner of implementation of RoHS and WEEE may have contributed to difficulties for Asian SMEs

The reported lack of awareness and preparedness of many Asian SMEs has potentially resulted from:

- A lack of communication and well-defined and established communication channels between the EC and SMEs, via government and industry associations or other methods.
- A lack of a central point of communication and advice in the EU, including a lack of accessible information on the status of implementation in the various countries.
- A possible lack of understanding by national government agencies and industry associations
- The protracted implementation process which may have given the wrong signals that compliance was not an immediate issue
- Disparate approaches to WEEE in the various countries.

All of these factors may have contributed to the lack of awareness and confusion, especially enormous information management issues for companies at both the top and throughout the supply chain.

They provide lessons for future implementation. In the context of EEE and environmental performance the next relevant Directive is EuP. At this stage are there are studies being undertaken on fourteen separate product categories with a range of stakeholder consultation. EuP comes under DG Enterprise (ENT) and DG Transport and Energy (TREN), and will not be subject to separate regulatory approaches in different states and the need for complex implementation arrangements, a source of many problems under WEEE.

3.1 Potential social, economic and competitiveness implications

The country reports suggest that there may be significant numbers of SMEs and people engaged in manufacturing for international markets **and** needing to phase out hazardous materials. If so, then European and Japanese regulations and other requirements may, at least in the short term have negative impacts. These may potentially include the following:

For SMEs

- The overall effect on SMEs may be negative in the short term but this depends on how the players respond and markets develop
- If large companies and TNCs perceive that there may be a risk in their supply chain, they may switch to more reliable larger suppliers, creating a threat of lost business to SME suppliers. For example, increasing requirements for lead-free supply chains (or networks) may result in a number of smaller suppliers, unable to provide lead-free solutions in time, being phased out of the supply chain. Inability to implement eco-design or supply environmental information may also be problematic in relation to WEEE compliance.
- Those SMEs involved international business will have to invest significantly to achieve compliance, and this may reduce their competitiveness and possibly even their viability. Those not investing will lose any international sales to Europe or Japan but may be advantaged in domestic markets by being in a stronger financial position. Where suppliers failing to comply cannot switch sales to domestic or less particular international markets, there may be lay-offs and even liquidation if they are completely dependent on supplying to the EU market or a particular major OEM or TNC.
- In the medium to longer term there may not be any significant impact and even a positive impact: In the SME sector everywhere there are high start-up and failure rates. In the fast-moving EEE sector suppliers have to be responsive to rapid technological change, prepared to invest, and be competitive on price and quality. Firms which do not manage these things well will not survive anyway.
- A structural industry effect might be to reduce the number of SMEs and increase the dominance of TNCs subsidiaries or contract manufacturers and assemblers.

For employees, dependents and communities

- The impacts on employees, dependents and communities in Asian countries will depend on the buoyancy of the EEE market and economy and ability of firms to switch sales to alternative markets, and the ability of any laid off people to find work quickly elsewhere; also on the relative wealth or poverty of those affected.
- The worst case situation is where employees are relatively poor, there are no immediate alternatives and lay-offs or closures result in impoverishment for employees and dependents.

- Where a community is dependent on a thriving SME sector company, there may be negative knock-on effects in the event of lay-offs or closures.
- The gender effects are uncertain but if SMEs provide relatively more or better opportunities for women in employment, education and training, compared to subsidiaries or assemblers, the disadvantaging of SMEs would have a net negative effect.
- The effect may depend on the cultural dimension and structure of the SME workforce, including the proportion which of women working casually and the proportion of migrant workers.

For industry and national economic development and competitiveness
The scale of any negative effects may or may not be significant when set against local, regional or national economic development.

If however, there has been a lack of investment and preparedness across the industry as a whole, it is possible that some countries' industries and even national economies may be competitively disadvantaged relative to others that have taken a more strategic approach, for example Thailand.

Government and trade associations
The potential for adverse effects on an important industry sector suggests a need for respective governments and trade associations to be proactively engaged in supporting their respective SME electronics sectors with environmental compliance.

Wider issues
When developments in Europe and Japan are considered alongside developments in the US, where many States are considering separate RoHS legislation, it has been suggested in some quarters that globally, suppliers may be unable to meet demand for lead-free and this could create shortages and problems for TNC end customers. Whether this turns out to be the case is unclear, but any supply problems may slow the global transition process and enable some buying of time for suppliers. A key factor may be how far China goes in enforcing its own proposed RoHS.

4 GAPS AND FUTURE NEEDS

The country reports suggest that there are serious gaps in the capacity of many SME suppliers in China, India and Thailand to meet requirements stemming from European regulatory and other product environmental requirements.

Evidence to date suggests that there are generally likely to be significant capacity gaps for many firms and that there is a general need for capacity-building support.

This report focuses on management and technical needs for support in the area of information and eco-design. Other needs such as government policies (such as tax breaks), access to capital and marketing support are outside of the scope of this report.

We consider potential needs in two main areas: Management and technical. Responding effectively to regulatory change and other developments requires skills in both.

4.1 Management needs

Where not already in place, suppliers need to have in place management systems of appropriate sophistication, basic for small firms and more sophisticated, ideally certified to ISO 9001 (and ISO 14001) for medium-sized or larger firms.

Management elements which need to be in place include:

Information
Companies need timely and relevant information to keep abreast of changes and need to be aware of implications through investment in, e.g.

- Monitoring systems
- Compliance control
- Internal communication and information systems
- External communication with customers, industry associations, national regulatory authorities and government agencies
- Subscription services
- Advisory services

Planning

- Developing and implementing strategies for phasing out of hazardous substances, including investment in new production lines, equipment and materials, testing arrangements, training of personnel and other changes;
- Developing and implementing strategies for re-designing products and production processes as necessary to facilitate recycling, energy efficiency or other requirements and providing requisite information to OEM customers or labelled finished products in accordance with WEEE or other requirements.
- If required to comply with customer's social responsibility requirements (e.g. under EICC) developing plans for improving working conditions.
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Organisation

- Developing management resources and skills to manage compliance and change, in particular planning, quality management (including auditing) and eco-design
- Integration of eco-design and green procurement into organisational processes

4.2 Technical needs

Awareness and training
This is a basic need. SMEs generally have little awareness and understanding of environmental and CSR issues, and as yet few governments in China, India, Thailand and Asian countries (outside of Japan and South Korea) have started programmes covering eco-design, hazardous materials substitution and recycling.

The main areas of need are likely to be in

- Legislation and implications
- Planning for and managing change
- Management of eco-design
- Use of design tools
- Collection and communication of life cycle information (especially for EuP)

Technical implementation
Suppliers are likely to need practical advice in such areas as

- Available technologies for hazardous materials substitution.
- Testing methods and options, including use of in-house, industry facilities or independent certifiers. Testing and analysis of products and the technologies is a pressing need. Sony, for example, has had to retrain a thousand quality auditors to undertake testing and analysis of products to comply with RoHS
- Training in eco-design, including use of design tools
- Information systems for compliance.
- Collection of good quality data

For those companies that have manufacturing operations in Europe or are otherwise deemed producers in Europe under WEEE, they will also have to set up take-back and recycling requirements of the nationally transposed WEEE Directive. There may be problems in that many companies from South East Asia have sales/marketing offices in Europe - with no environmental management function - and many may not be aware that they are deemed to be a 'producer' under WEEE and will have to join compliance schemes or make their own arrangements for recycling

Those that come under the scope of RoHS will need to establish in-house testing facilities or make arrangements with third parties.

5 CAPACITY BUILDING PLANS

The foregoing analysis suggests a likely need for the EU, possibly in cooperation with Japan, and through appropriate national agencies, to provide some level of support to SMEs in Asian countries affected by RoHS, WEEE and other initiatives.

There are various arguments for providing such support according to need (e.g the degree of disadvantage and any impoverishment caused by such initiatives):

- An ethical argument for assistance: since suppliers have been required to invest to provide environmental benefits for Europe; also since the suppliers most affected are likely those least able to afford it;
- A fair trade argument: to ensure that regulations are not a barrier to trade
- 'Producer responsibility' reasons: many of the suppliers' OEM customers are based in Japan or Europe.
- The type of capacity-building support envisaged is mainly information and training which is relatively inexpensive.

Plans need to be formulated at the detailed level through government, trade association and industry stakeholders, taking account of specific country and sub-sector needs.

The following suggests an indicative structure for such plans in the short, medium and long term.

5.1 Short term plans

There is an immediate need to develop an overall short and long-term plan for the Asian region as a whole and individual countries specifically according to the country needs analyses.

This overall plan could include

- Development and implementation of information and communications processes, including possibly an intranet site
- Briefings for senior management
- Development and delivery of training in compliance requirements and management
- Development and delivery of specialist training in eco-design, supply chain management and, as relevant, CSR issues.
- Development and implementation of specialist technical training e.g on testing.
- For those classed as producers provision of training on establishing a recycling scheme (e.g. researching recyclers, developing evaluation criteria, payment processes)
- Developing booklets, CD-Roms or downloadable information in national languages

Training could be formal or through workshops. Use of the internet, for example provision of webinars, could be considered if there is good ICT infrastructure in individual countries.

In developing training plans the following need to be considered
- Training needs analysis
- Provision of basic awareness
- Training on specific and tailored eco-design concepts.
- Training of trainers is desirable.
- Training in national language.
- Many SMEs in developed and developing countries are disconnected from trade associations – therefore SMEs will also need to be targeted directly

Plans will also need to take account of preferred national approaches, for example government or industry initiatives and provision of support to date or planned.

Government regulation and voluntary industry initiatives are equally important in promoting eco-design. A combination of standards set by governments, economic incentives provided by governments and voluntary industry wide initiatives are needed to make eco design a priority amongst producers and suppliers.

In the short term the focus of effort will need to be on RoHS compliance and concentrate on basic information and communication, and training across all areas, building on any existing initiatives and reaching as many SMEs as possible.

One approach could be to target key first tier suppliers who would cascade the information to their own suppliers.

5.2 Medium term plans

The medium to longer term plan would be to provide ongoing support to help Asian SMEs to respond to future regulatory change and other initiatives in an effective way.

The broad areas of need would remain the same but are likely to be at a more sophisticated level as skills and knowledge are developed.

In the medium and longer term there would be a need to institutionalise training and education programmes within the trade associations, professional training bodies and universities in India, Thailand and China.

Other areas of training could be on gaining competitive advantage through innovation.

5.3 Long term plans

Planning for the longer term is likely to include building on and extending short and medium term initiatives as well as positioning to respond to longer-term developments in Europe, Japan and the US. These need to be kept under review but are likely to include:

- Increasing requirements to apply eco-design and provide LCA information along the supply chain
- Increasing requirements to conform to CSR requirements along the supply chain.

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ANNEX 2: The European 'RoHS' Directive

The Directive

The European Parliament and Council Directive on the Restrictions of the Use of certain Hazardous Substances in Electrical and Electronic equipment (2002/95/EC) ("the RoHS Directive") bans the putting on the EU market of new Electrical and Electronic Equipment (EEE) containing more than the permitted levels of lead, cadmium, mercury, hexavalent chromium and both polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants from 1 July 2006. There are a number of exempted applications for these substances

General requirements for producers

The Directive is implemented through national laws. Manufacturers will need to ensure that their products - and the components and subassemblies of such products - comply with the requirements of the national regulations by the relevant date in order to be put on the Single Market. The Regulations will also have an impact on those who import EEE into the European Union on a professional basis, those who export to other Member States and those who rebrand other manufacturers' EEE as their own.

These Regulations do not affect the application of existing legal requirements for EEE, including those regarding safety, the protection of health, existing transport requirements or provisions on hazardous waste. In other words, existing legislation on EEE and hazardous substances must also be complied with.

The main requirement of RoHS national regulations is that from 1 July 2006 a producer (as defined in the relevant regulations) may not put new EEE containing lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ethers (PBDE), in amounts exceeding the established maximum concentration values, on the market in the EU. Certain applications (listed are exempt and there is also an exemption for spare parts for the repair of equipment put on the market before 1 July 2006. The Regulations also do not apply to the re-use of equipment that was put on the market before the same date.

Producers must be able to demonstrate compliance by submitting technical documentation or other information to the enforcement authority on request and retain such documentation for a period of four years after the EEE is placed on the market.

Scope

The RoHS requirements apply to all EEE containing hazardous substances put on the European Union Single Market on or after 1 July 2006, which falls into any of the eight broad categories listed below. Guidance includes indicative (but not exhaustive) examples of products under each of the categories. The Directive and regulations specify a voltage range within which the products in the eight categories must fall in order to come within the scope. This is up to and including 1,000 volts AC or up to and including 1,500 volts DC.

The eight broad categories for RoHS reflect eight of the ten categories in Annex 1 of the Waste Electrical and Electronic Equipment (WEEE) Directive,(2002/96/EC). In addition, the RoHS Regulations apply both to electric light bulbs and to household luminaires.

Categories of electrical and electronic equipment covered by the RoHS Directive are:

1) Large household appliances
2) Small household appliances
3) IT and telecommunications equipment
4) Consumer equipment

5) Lighting equipment, (including electric light bulbs and household luminaires)
6) Electrical and electronic tools (with the exception of large-scale stationary industrial toolls
7) Toys, leisure and sports equipment
8) Automatic dispensers

The two categories of the WEEE Directive not included within the scope of the RoHS Regulations are Medical Devices and Monitoring & Control Instruments. However, Article 6 of the RoHS Directive places an obligation on the European Commission to present proposals for including EEE falling within those two categories within the scope of the RoHS Directive, once scientific and technical evidence has demonstrated that such proposals are feasible. In this respect, the Commission has asked independent consultants to undertake a study to review the current position. The results of that study should be available in mid-2006.

For many products, the decision on whether they are included within the scope of these Regulations is reasonably straightforward. However there are a number of products (particularly in specialised or industrial sectors), where there may be significant areas of doubt and uncertainty. Independent advice may be necessary in those cases.

Exemptions

Given that the scope of the RoHS Directive is drawn from that of the WEEE Directive, certain provisions in the WEEE Directive may apply to EEE within the RoHS Directive so as to limit its scope. There is, however, no express provision in the RoHS Directive to this effect.

Producers must rely on their own legal advice on all questions of scope when assessing “grey area” products (those whose inclusion within the scope of the RoHS Directive is in doubt) that have been discussed in the Technical Adaptation Committee (TAC) of Member States and is reflected in the Commission’s non-legally binding Frequently Asked Questions document on the WEEE and RoHS Directives.

Broad categories of exemptions (see also WEEE Directive) are:.

- EEE intended to protect national security and/or for military purposes
- Products where electricity is not the main power source
- Products where the electrical or electronic components are not needed to fulfil the primary function
- Electrical and electronic equipment that is part of another type of equipment
- Batteries
- Large-scale stationary industrial tools.
- Spare parts for the repair of EEE placed on the market before 1 July 2006.
- The reuse of EEE placed on the EU market before 1 July 2006.
- The specific applications of lead, mercury, cadmium, hexavalent chromium, PBB and PBDE detailed in national regulations.

The European Commission continues to reviewed the status of specific materials, including recently Deca BDE in polymeric applications and the use of lead in lead-bronze bearing shells and bushes. A Commission Decision extending the list of exemptions in the Annex of the RoHS Directive to include these applications was adopted on 13 October 2005.

The Commission has also reviewed the status or extent of three of the exemptions in the original text of the Annex, of five other new cases for further exemptions and one clarification of one of the existing exemptions. This review was completed (and a report published) in December 2004 and a Commission Decision both amending and extending the list of exemptions in the Annex was adopted on 21 October 2005.

Further cases for exemptions may be included within proposals for new Commission Decisions in 2006.

Maximum Concentration Values

For the purposes of the RoHS Directive, a maximum concentration value of up to 0.1% by weight in homogeneous materials for lead, mercury, hexavalent chromium, PBB and PBDE and of up to 0.01% by weight in homogenous materials for cadmium will be permitted in the manufacture of new EEE. These values were established through the adoption of a Commission Decision on 18 August 2005.

'Homogeneous material' means a material that cannot be mechanically disjointed into different materials. The term 'homogeneous' is understood as "of uniform composition throughout", so examples of "homogeneous materials" would be individual types of plastics ceramics, glass, metals, alloys, paper, board, resins and coatings. The term 'mechanically disjointed' means that the materials can, in principle, be separated by mechanical actions such as unscrewing, cutting, crushing, grinding and abrasive processes.

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Compliance Requirements

Producers must demonstrate compliance with the Regulations by providing the enforcement authority (on request) with satisfactory evidence of such compliance in the form of relevant technical documentation or information. The UK intends to accept self-declaration as the basis of the compliance regime. The enforcement authority will carry out market surveillance to detect non-compliant products and may conduct tests for this purpose.

There is no prescribed method to demonstrate compliance but producers may wish to consider the role that both materials declarations and component or material analysis could play: -

Producers of EEE could obtain an assurance from their suppliers that any materials, components, assemblies or equipment provided do not contain more than the permitted level of any of the six restricted substances, except where the application of any of those substances comes within the scope of the RoHS Regulations' exempted applications. Producers are required to keep appropriate records for a period of up to four years after the particular EEE product was placed on the market.

A variety of materials declarations for suppliers are being developed by industry at the moment. Some finished or end product manufacturers have already started to publish such data on their websites.

Producers of EEE to be placed on the market may wish to undertake (or ask a third party to undertake) their own analysis of the components or materials that they use in their products. This action may be undertaken either to verify supplier declarations or to establish the presence or otherwise of the restricted substances in those cases where no declaration is available. It may also be undertaken if there are doubts over the reliability of declarations.

Producers or third parties may employ any suitable analytical technique in order to establish that their products comply with the maximum concentration values of the six restricted substances. The criteria for analysis will depend on the quantity of product put onto the market (less for small producers than for large producers), the relationship with suppliers, the risk of a banned substance being present, and the potential impact of that substance on the environment. Producers must ensure that they understand and take into account any limitations of the analytical technique they use.

Current exemptions are

- Mercury in compact fluorescent lamps not exceeding 5 mg per lamp.
- Mercury in straight fluorescent lamps for general purposes not exceeding:
  - 10 mg in halophosphate lamps
  - 5 mg in triphosphate lamps with a normal lifetime

- 8 mg in triphosphate lamps with a long lifetime.

- Mercury in straight fluorescent lamps for special purposes.
- Mercury in other lamps not specifically mentioned in this Annex.
- Lead in glass of cathode ray tubes, electronic components and fluorescent tubes.
- Lead as an alloying element in steel containing up to 0.35% lead by weight, aluminium containing up to 0.4% lead by weight and as a copper alloy containing up to 4% lead by weight.
- Lead in high melting temperature type solders (i.e. lead based alloys containing 85% by weight or more lead).
- Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunication.
- Lead in electronic ceramic parts (e.g. piezoelectronic devices).
- Cadmium and its compounds in electrical contacts and cadmium plating except for applications banned under Directive 91/338/EEC (OJ No. L 186, 12 July 1991, p. 59) amending Directive 76/769/EEC (OJ No. L262, 27 September 1976, p. 201) relating to restrictions on the marketing and use of certain dangerous substances and preparations.
- Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators.
- Deca BDE in polymeric applications
- Lead in lead-bronze bearing shells and bushes
- Lead used in compliant pin connector systems.
- Lead as a coating material for the thermal conduction module c-ring.
- Lead and cadmium in optical and filter glass.
- Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight.
- Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages.

ANNEX 3: The European 'WEEE' Directive

The Directive

The European Parliament and Council Directive on Waste Electrical and Electronic Equipment (2002/96/EC) ("the WEEE Directive") aims to prevent WEEE arising, to encourage reuse, recycling and recovery of WEEE and to improve the environmental performance of all operators involved in the lifecycle of electrical and electronic equipment, especially those dealing with WEEE. The Directive sets requirements relating to criteria for the collection, treatment, recycling and recovery of WEEE. It makes producers responsible for financing most of these activities; retailers/distributors also have responsibilities in terms of the take-back of WEEE and the provision of certain information. Private householders are to be able to return complete WEEE without charge.

General requirements for producers

The Directive and national legislation establish the following requirements for producers, for example for the UK

- Registration with National Clearing House .
- Reporting of sales in order to calculate market shares
- Permitting or licencing arrangemenrts
- Responsibility for financing the collection, recovery and recycling of separately collected WEEE allocated to them according to their market shares.
- Reporting evidence of its treatment at authorised treatment facilities, according to the Agencies' treatment guidance.
- Reporting evidence that they have met the Directive's recovery and recycling/reuse targets for the separately collected WEEE allocated to them;
- Marking new equipment they put onto the UK market, according to the Directive's requirements; and to provide certain information, as far as this is needed, on types of new equipment they put on the market, to facilitate the treatment and recovery of WEEE;
- Financing the treatment, recovery and disposal of the waste arising from this equipment unless they make alternative arrangements with the business users (applies to producers supplying new equipment to business users after 13 August 2005)
- Those producers who have supplied equipment to business users prior to 13 August 2005 have this responsibility for this equipment if it is discarded when they supply new replacement like for like equipment; if there is no replacement purchase, the business user is responsible for financing the treatment and recovery of the equipment purchased prior to 13 August 2005
- Whichever party takes responsibility will need to report evidence of its collection, treatment and recovery according to the Directive's recovery and recycling/reuse targets.

Retailers and distributors of electrical and electronic equipment are obliged to

- Provide free in-store take-back of WEEE on sale of new like for like equipment; or to provide alternative arrangements to last holders of WEEE, via a compliance scheme approach. Retailers and distributors providing instore take-back need to ensure that the WEEE they collect is delivered to a designated collection facility to enable the WEEE to be sent for treatment and recovery; and
- Ensure that private householders are informed of WEEE take-back facilities available to them and encouraged to participate in the separate collection of WEEE.

Applicability

The Directive and national regulations apply to all electrical and electronic equipment placed on the market in respective countries which falls into any of ten product categories, unless the

equipment is part of another type of equipment which does not fall into any of these categories. The Regulations also specify a voltage range into which the products in the ten categories must fall to be covered by the scope. This is up to 1,000 volts AC or up to 1,500 volts DC.

The ten product categories are:
1) Large household appliances
2) Small household appliances
3) IT & telecommunications equipment
4) Consumer equipment
5) Lighting equipment
6) Electrical and electronic tools
7) Toys leisure and sports equipment
8) Medical devices
9) Monitoring and control instruments
10) Automatic dispensers

The Regulations do not apply to:

- Equipment intended specifically to protect national interest and for a military purpose, e.g arms, munitions and war material.
- Filament light bulbs
- Household luminaires
- Large-scale stationary industrial tools
- Implanted medical equipment and infected medical equipment at end of life

If components, sub-assemblies and consumables (e.g. batteries, tapes, disks) are present in a product within the scope of the Regulations at the time it is separately collected, they are subject to national treatment requirements but are not specifically covered by WEEE regulations.

The process of establishing applicability and exemptions is continuing.

Other product types which are deemed to be outside the scope of the Regulations include

- Products where electricity is not the main power source e.g. an electric thermostat for a gas heating system.
- Products where the electrical or electronic components are not needed to fulfil the primary function eg toys, musical greetings cards.
- Items which are electrical and electronic equipment that is part of another type of equipment or a fixed installation eg a car radio, lighting on an aircraft

ANNEX 4: Implementation status of RoHS and WEEE

All EU Member Sates (MS) have been required to transpose the Directives into appropriate national legislation and supportive arrangements by the specified dates, whether by new legislation and initiatives or building on what is already in place. The main requirements and obligations were to come into effect from 13 August 2005.

Implementation has been characterised by protracted negotiation on technical details, for example on product exemptions and permissible levels of hazardous substances, and issues of practical implementation. There has been slippage from original target dates as the practical difficulties of implementation have become clearer, both the implications of RoHS for product design and production, and in establishing registration, recycling or other arrangements under WEEE.

The final phase of implementation of RoHS and WEEE has nevertheless now been reached.

All Member States have now transposed the RoHS Directive so that it will come into force on 1 July 2006.
Most MS have passed legislation transposing the WEEE Directive. The UK is still engaged in industry consultation but WEEE legislation is expected to be passed in June 2006. France has passed legislation but it will not take effect until July 2006. Italy has drafted legislation but it has not yet been passed. The Luxembourg situation is not clear.

The Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia have passed RoHS and WEEE legislation but have been granted temporary derogation until 31/12/2008 on recovery targets because of a lack of recycling infrastructure.

In some countries (eg Netherlands, Sweden and Denmark) electronic take-back laws and collection schemes were already in place. In most countries, for example the UK, new regulations and schemes are being established.

Transposition and implementation in all MS is required to meet the general and specific requirements of the Directives and so there are common requirements for producers across MS, for example in the need for producers to register under WEEE, and in banned substances under RoHS.

Each MS differs or has differed with respect to the following:

- Timetable for implementation: This has varied widely but July 2006 is the common date for control of hazardous substances and implementation of WEEE.
- Scope of legislation: Some MS have developed separate legislation and regulations for each Directive (e.g. the UK) and some have transposed the Directives into one piece of legislation (e.g. Germany). The legislation has been new in all but some countries were able to build it into existing laws.
- Registration arrangements under WEEE: Each country is in the process of establishing registration arrangements and establishing a national body. The clearing house model proposed by the UK appears to be the preferred model.
- Collective or individual registration arrangements differ between countries.
- Collection arrangements: Arrangements differ between countries, but local authorities are generally responsible for collecting segregated domestic WEEE and producers for commercial WEEE.

- Compliance schemes vary between countries as do financing arrangements and recovery/recycling targets.

Transposition status

Country	Status	Notes
Austria	**Transposition completed**	Waste Management Law amended12/04; Ordinance on Waste Treatment adopted 12/04; Electro Ordinance adopted 8/05.
Belgium	**Transposition completed**	RoHS Directive transposed nationally in 10/04, WEEE transposition completed by Flanders 12/04, Wallonia 3/05, and Brussels 6/04.
Cyprus	Transposition with derogation	Regulation transposing RoHS & WEEE Directives adopted 7/04 Derogation of WEEE targets until 31/12/08.
Czech Republic	Transposition with derogation .	Amendment to Waste Act published 1/05 transposes RoHS Directive and provides enabling powers for WEEE. Further draft amendment and draft WEEE Decree published 6/05 Derogation of WEEE targets until 31/12/08.
Denmark	**Transposition completed**	RoHS Directive transposed 10/04, transposition of WEEE Directive completed 5/05.
Estonia	Transposition with derogation	RoHS Directive transposed 4/04. WEEE Directive partially transposed by Waste Act amendment (4/04). Draft Decree on Treatment of WEEE published 2/05, further amendment of Waste Act expected 9/05 and Decree on Registration expected by end 2005 Derogation of WEEE targets until 31/12/08.
Finland	**Transposition completed**	Waste Act amended 6/04 and Ordinances completing transposition of the RoHS and WEEE Directives adopted 9/04
France	**Transposition completed**	Basic Decree transposing RoHS and WEEE Directives passed 7/05. Subsidiary Orders to be adopted on detailed RoHS and some WEEE requirements. WEEE to take effect 1 July 2006
Germany	**Transposition completed**	ElectroG Law transposing RoHS and WEEE Directives published 3/05.
Greece	**Transposition completed**	Decree transposing RoHS and WEEE Directives adopted 3/04
Hungary	Transposition with derogation	RoHS Decree adopted 10/04. WEEE Directive transposed by Decrees of 9/04 and 10/04 and by an amendment to the Product Fees Act in force from 1/05. Derogation of WEEE targets until 31/12/08
Ireland	**Transposition completed**	Regulations amending the Waste Management Act and Regulations on WEEE and RoHS adopted 7/05
Italy	Transposition not completed	Draft Decree transposing the RoHS and WEEE Directives awaiting final approval. Subsidiary legislation will follow.
Latvia	Transposition with derogation	RoHS Directive transposed 8/04. WEEE Directive partially transposed by amendments to Waste Law 2/04 and 12/04, and further measures expected in 9/05 and 10/05. Derogation of WEEE targets until 31/12/08
Lithuania	Transposition with derogation	RoHS Directive transposed 8/04. WEEE Directive partially transposed in 9/04 and 10/04, but a draft Law amending the Law on Waste Management has not yet been approved by Parliament. Derogation of WEEE targets until 31/12/08
Luxembourg	Transposition not completed	Regulation transposing WEEE & RoHS Directives published 1/05, but transposition will not be complete until an environmental agreement has been signed between the Chamber of Commerce and central and local govt.
Malta	Transposition not completed. Derogation	RoHS Regulations adopted 8/04. Eco-tax imposed on EEE from 9/04. Draft WEEE Regulations published for consultation 10/04, but still not adopted. Discussions ongoing on conditions for ecotax exemptions, and on relationship between eco-tax and WEEE Regulations. Derogation of WEEE targets until 31/12/08
Netherlands	**Transposition completed**	Decree and Regulation adopted 7/04. In force from 1/05 for all categories except lighting (13 Aug 2005), except for provisions on take-back and marking (effective 13 Aug 2005) and RoHS (effective 1 July 2006).
Poland	Transposition	RoHS Ordinance adopted 10/04. Latest draft of WEEE Act issued 5/05,

	with derogation	and adoption by Parliament expected 9/05. Derogation of WEEE targets until 31/12/08
Portugal	**Transposition completed**	Decree-Law transposing the RoHS and WEEE Directives adopted 9/04 and published 10 Dec 2004.
Slovakia	Transposition with derogation	Amendment to Waste Act adopted 12/04 transposed the RoHS Directive and the producer responsibility provisions of the WEEE Directive. A Ministerial Order adopted 4/05 provides detailed instructions about registration, the guarantee, marking, reporting and RoHS exemptions. A draft Ministerial Order on collection and recovery targets will define the amount of WEEE each producer must collect and recover in each category. Derogation of WEEE targets until 31/12/08
Slovenia	Transposition with derogation	Decree transposing the RoHS Directive and partially transposing the WEEE Directive adopted 11/04. A Decree defining criteria for tenders for managing the public service part of the WEEE management system was also published 11/04, but was amended 6/05. Environmental Product Charges Decree of 10/04 introduces an eco-tax on WEEE. It will be amended to postpone introduction of product charge to Jan-2006. Derogation of WEEE targets until 31/12/08
Spain	**Transposition completed**	Royal Decree transposing the RoHS and WEEE Directives adopted 2/05.
Sweden	**Transposition completed**	Statutory Order transposing the RoHS and WEEE Directives adopted 4/05.
United Kingdom	Transposition not completed	RoHS legislation passed 7/10/05 WEEE legislation expected June 2006

ANNEX 5: The European ‘EuP’ Directive

The Directive

The EU is developing framework legislation which aims to set energy efficiency and other eco-design requirements for energy-using products (EUP). The European Parliament and the Council adopted a final text on 6 July 2005, which was published in the Official Journal on 22 July 2005

The Directive 2005/32/EC on the eco-design of Energy-using Products (EuP), such as electrical and electronic devices or heating equipment, provides coherent EU-wide rules for eco-design and ensure that disparities among national regulations do not become obstacles to intra-EU trade. The Directive does not introduce directly binding requirements for specific products, but does define conditions and criteria for setting, through subsequent implementing measures, requirements regarding environmentally relevant product characteristics (such as energy consumption) and allows them to be improved quickly and efficiently. Products that fulfil the requirements will benefit both businesses and consumers, by facilitating free movement of goods across the EU and by enhancing product quality and environmental protection. The Directive constitutes a breakthrough in EU product policy and introduces many innovative elements together with concrete application of the principles of the "better regulation" package.

Aims

The environmental impacts of energy-using products take various forms, such as energy consumption and related negative contribution to climate change, consumption of materials and natural resources, waste generation and release of hazardous substances.

Eco-design, which means the integration of environmental considerations at the design phase, is arguably the best way to improve the environmental performance of products. This framework directive defines the general policy and principles to be followed in developing specific implementing measures relating to eco-design in energy using products. In general, eco-design requirements could apply to a wide range of domestic, commercial and industrial equipment and their component parts, but the framework directive does not include a list of products at this stage.

Implementing measures would be proposed and adopted by the European Commission, advised by a regulatory committee of Member States' representative and following extensive consultations with industry and other interested parties. This approach does not require co-decision on the implementing measures and is intended to speed negotiation and delivery of effective policy measures where these are needed.
The creation of a coherent framework for environmental product policy will avoid the adoption of uncoordinated measures that could lead to an overall negative result; for example eliminating a toxic substance from a product, such as mercury from lamps, might lead to increased energy consumption, which on balance would have a negative impact on the environment.

A Community framework will also ensure that no divergent national or regional measures that could hinder the free movement of products and reduce the competitiveness of businesses are taken.

By encouraging manufacturers to design products with the environmental impacts in mind throughout their entire life cycle, the Commission implements an Integrated Product Policy (IPP) and accelerates the move towards improving the environmental performance of energy-

using products. After adoption of the Directive by the Council and the European Parliament, the Commission, assisted by a Committee, will be able to enact implementing measures on specific products and environmental aspects (such as energy consumption, waste generation, water consumption, extension of lifetime) after impact assessment and broad consultation of interested parties.

There are not obligations for all energy-using products, but only for those meeting criteria such as important environmental impact and volume of trade in the internal market and clear potential for improvement, for example where market forces fail to make progress in the absence of a legal requirement.

This policy initiative is expected to increase the effectiveness and synergies of other EU legislative acts and initiatives concerning environmental aspects of products. Examples of related measures are the Directives regulating the management of waste from electrical and electronic equipment (WEEE) and the use of certain hazardous substances used in this equipment (RoHS) as well as Directives related to the energy efficiency of appliances such as the Energy labelling Directive Existing Directives on minimum energy efficiency requirements shall be considered as implementing this Directive for the products that they cover with regard to energy efficiency during use.

Products which have been awarded the Eco-label will be considered as compliant with the implementing measures in so far as the Eco-label meets the requirements of the implementing measure. Although the EMAS registration on its own does not grant presumption of compliance to the products manufactured by the enterprise, enterprises which have an EMAS registration, which includes product design, may use directly their environmental management system for demonstrating that their product complies with the applicable implementing measure.

The final text was adopted in July 2005 and the implementation deadline for Member States is 11 August 2007

ANNEX 6: The European 'REACH' Proposal

The Proposal

On 29 October 2003, the European Commission adopted a proposal for a new EU regulatory framework for chemicals, COM (2003) 644. Under the proposed new system called REACH (Registration, Evaluation and Authorisation of CHemicals), enterprises that manufacture or import more than one tonne of a chemical substance per year would be required to register it in a central database.

This proposed EU regulation will replace 40 existing legal acts and create a single system for all chemical substances. It will introduce a new European Chemicals Agency to be established in Helsinki, Finland, which will manage the registration of substances, through the setting up of a database. It will play an important role also in the evaluation and authorisation of substances.

It is expected that the final decision on REACH will be reached by the European Parliament and Council in autumn 2006. The Commission expects entry into force of the Regulation for spring 2007. Thereafter it will take about a year for the REACH Agency to be operational. Accordingly the operational requirements of REACH are expected to start to be applied from 2008 onwards

Aims

The aims of the proposed new Regulation are to improve the protection of human health and the environment while maintaining the competitiveness and enhancing the innovative capability of the EU chemicals industry. REACH would furthermore give greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances. This information would be passed down the chain of production.

REACH will improve the current EU chemicals legislation, which distinguishes between so-called "existing" and "new" chemicals. All chemicals that were put on the market before 1981 are called "existing" chemicals. They amount to around 100,000. Chemicals introduced after 1981 (around 4,300) are called "new" chemicals. While new chemicals have to be tested, there are no systematic provisions for the existing substances. Consequently, in volume terms, safety information is sketchy for around 99% of these existing chemicals.

As national competent authorities are responsible for the risk assessment of new chemicals, the process is slow, cumbersome and resource-intensive. For example, since 1993, 140 high-volume chemicals have been singled out for risk assessment, of which only a very limited number have completed the process. In addition, the existing system discourages the introduction of new and possibly safer chemicals – thereby giving no incentives for innovation.

Requirements

REACH will require manufacturers and importers to gather comprehensive information on properties of their substances produced or imported in volumes over 1 tonne per year and to submit the necessary information to demonstrate their safe use in a registration dossier to the European chemicals agency. Failure to register will mean the substance cannot be manufactured or imported to the EU market.

Member States' public authorities will examine registration dossiers and substances of concern. They will also scrutinise all proposals for animal testing to keep it to the minimum absolutely

necessary. Use-specific authorisations will be required for chemicals that cause cancer, mutations or reproduction problems, or that accumulate in our bodies and in the environment. Authorisation will be granted only to companies that can show that the risks are adequately controlled or if social and economic benefits outweigh the risks and suitable alternative substances do not exist. This will encourage substitution of unsafe substances by safer ones.

Consultation process

The proposal has been drafted in close consultation with all interested parties, including an Internet consultation. This has allowed the Commission to propose a streamlined and cost-effective system. The proposal is now being considered by the European Parliament and the Council of the EU for adoption under the so-called co-decision procedure.

Assessment of impacts on supply chains

As part of work on impact assessment a study has been carried out into the impact on supply chains in various sectors including electronics.

The following key messages can be drawn from the study:

- There is limited evidence that higher volume substances are vulnerable to withdrawal following the REACH registration requirements. However, lower volume substances under 100 tonnes are most vulnerable to being made less or non profitable by the REACH requirements**.** The one-off costs of registration can demand a significant share of the available cash flow for chemical producers, in particular SMEs. This may lead to a decision not to register part of their portfolios where the one-off costs of registration represent a substantial proportion of the annual profit.
- There is limited evidence that downstream users will be faced with a withdrawal of substances of greatest technical importance to them. The study shows that chemical suppliers and formulators will prefer to register substances that are technically important to downstream users in order to keep their portfolio and avoid the potentially high costs of reformulation and/or re-engineering which could otherwise result for their customers.
- SMEs can be particularly affected by REACH having regard to their more limited financial capacity and lower market power in terms of passing on costs.

Companies have recognised some business benefits from REACH. The study found a number of business benefits of REACH within the investigated supply chains, especially to formulators and downstream users. Benefits mentioned by certain companies include: better information about substance properties and dangerous components in preparations, easier risk management and rationalisation of substance portfolio.

ANNEX 7: Integrated Product Policy (IPP)

Integrated Product Policy

An EC initiative, IPP is a governmental approach to reducing the environmental impact of products by using an appropriate mix of supply-side and demand-side environmental product policy (EPP) tools. Integration is designed to optimise results and may take place at various levels. At the national level there may be integrated consideration of product life cycle impacts, integration of EPP approaches, integration of EPPs with other aspects of environmental policy and integration of EPPs with other, non-environmental, government policies. At the European Union (EU) level, the EC is also concerned with harmonising EPP approaches between Member States since the various countries have been progressing at widely differing rates.

While businesses may be involved in implementing some EPPs, especially on the supply-side, IPP development and implementation is primarily a task for government, especially on demand-side measures.

IPP is being increasingly recognised not only as an approach to integrating EPPs but as a key aspect of national strategies for sustainable consumption and sustainable development.

IPP continues mainly to be the subject of discussion rather than application, in the EC and even in those countries which are relatively advanced in EPP application.

IPP developments

On 18 June 2003, the European Commission published a Communication on Integrated Product Policy (IPP) outlining its strategy for reducing the environmental impact caused by products. The Communication builds on a stakeholders consultation exercise following the adoption in February 2001 of the Commission's Green Paper on Integrated Product Policy (IPP) aimed at improving the environmental performance of a wide range of products throughout their life cycle. The term IPP was first coined in a 1998 paper to the EC.

Progress in IPP application has been slow because of the practical barriers, for example the lack of clear objectives, conflicts of interest, and a lack of coherent approaches where government activities are decentralised. A major barrier at the national level is gaining treasury acceptance of new economic instruments.

Organisational as well as economic and practical complexities and barriers apply to implementing IPP, for example demand-side and supply-side tools being 'owned' by different European Directorates-General (DGs) and government departments with different priorities.

At the EU level, the principle aim of integrating national EPP policies is itself an area of difficulty. Member States have been progressing EPP at different speeds and with differing approaches, and some hardly at all. At the same time, the EC prefers a voluntary to regulatory approach in this area. The scale of the task has become even greater with enlarged EU membership.

Because of the complexities, there has been an emerging consensus towards treating full comprehensive integration as an ideal to aim at and taking a simpler, more pragmatic view of IPP. It now tends to be viewed as an approach to defining the specific optimum mix of EPPs to reduce the impacts of particular, high impact product groups.

Ongoing discussion is further maintained by the Informal IPP Network of European national government contacts.

Aims

The manufacture, use and ultimately disposal of products are the source of many of the environmental challenges we face today. Further, the quantity of products is rising, partly due to increases in disposal income and smaller households. Existing environmental product related policy have tended to focus on large point sources of pollution such as industrial emission and waste management issues, rather than the products themselves and how they contribute to environmental degradation at other points in their life cycle.

IPP seeks to address this. It is aimed not at reducing consumption, but seeks to reduce the environmental impact of increased consumption. The policy is based on five key principles:

- **Life-Cycle Thinking –** it considers a product's life-cycle and aims for a reduction of its cumulative environmental impacts - from the "cradle to the grave". In so doing it also aims to prevent individual parts of the life-cycle from being addressed in a way that just results in the environmental burden being shifted to another part. By looking at the whole of a product's life-cycle in an integrated way, IPP also promotes policy coherence. It encourages measures to reduce environmental impacts at the point in the life-cycle where they are likely to be most effective in reducing environmental impact and saving costs for business and society. Finally, it should be noted that where the Commission has referred to 'Life-Cycle Thinking', it does not mean 'Life Cycle Assessment' (LCA). LCA involves the quantification and assessment of the environmental impacts of a product throughout its life-cycle in narrowly defined boundaries.
- **Working with the Market –** setting incentives so that the market moves in a more sustainable direction by encouraging the supply and demand of greener products. This will reward those companies that are innovative, forward-thinking and committed to sustainable development.
- **Stakeholder Involvement –** it aims to encourage all those who come into contact with the product (i.e. industry, consumers and government) to act on their sphere of influence and to encourage co-operation between the different stakeholders. Industry needs to look at how to better integrate environmental aspects in the design of products while consumers can assess how they can purchase greener products and how they can better use and dispose of them.
- **Continuous Improvement –** improvements can often be made to decrease a product's environmental impacts across its life-cycle, whether in design, manufacture, use or disposal, taking into account the parameters set by the market. IPP aims for a continuous improvement in these rather than setting a precise threshold to be attained. As a result, companies can set their own pace and can focus on the most cost-effective improvements.
- **A Variety of Policy Instruments –** the IPP approach requires a number of different instruments because there are such a variety of products available and different stakeholders involved. These instruments range from voluntary initiatives to mandatory regulations and from the local to the international scale. Within IPP, the tendency is designed to work with voluntary approaches, although mandatory measures might also be required. The determining factor is the effectiveness of the tool to achieve the desired result with regard to sustainable development.

The Commission intends to adopt a two-pronged approach towards the implementation of IPP. It will focus on improving existing environmental management tools, for example the EU Eco-Management and Audit Scheme (EMAS), to make them more product focused. Furthermore, the Commission will take action to improve the environmental performance of products that have the greatest potential for such action.

Environmental Product Policy (EPP) Developments

EPPs have existed in various forms in European countries since the 1980s and the general picture has been as follows

- The main activity has been in the northern European countries, especially Denmark, Sweden, and The Netherlands. These have been most advanced in their thinking and in implementing a variety of policy instruments.
- Other countries such as Germany and Austria have been quite active and Finland and Belgium increasingly so. There has been discussion but relatively little activity in the UK in the past but it is now becoming more proactive. There has been very little activity in the southern European countries although there have been recent eco-labelling progress in Spain.
- Where EPPs have been developed, the main emphasis in environmental objectives and issues has been on reducing waste, toxic materials and emissions. Increasing resource efficiency, including energy efficiency has been one aspect, and there has been some energy labeling.
- The focus has been on consumer products rather than business-to business products.
- The main EPP instruments used so far by countries include eco-labels, public information, procurement, and in some countries economic instruments, negotiated agreements, self declarations, eco-design awards, product-oriented environmental management systems (POEMS) and producer responsibility.
- The EC has initiated some EPP instruments also, including the unsuccessful EU Flower eco-labelling scheme, but mostly these have been Directives or other policies for implementation in Member States

ANNEX 8: Waste Regulation in Japan: General

Introduction

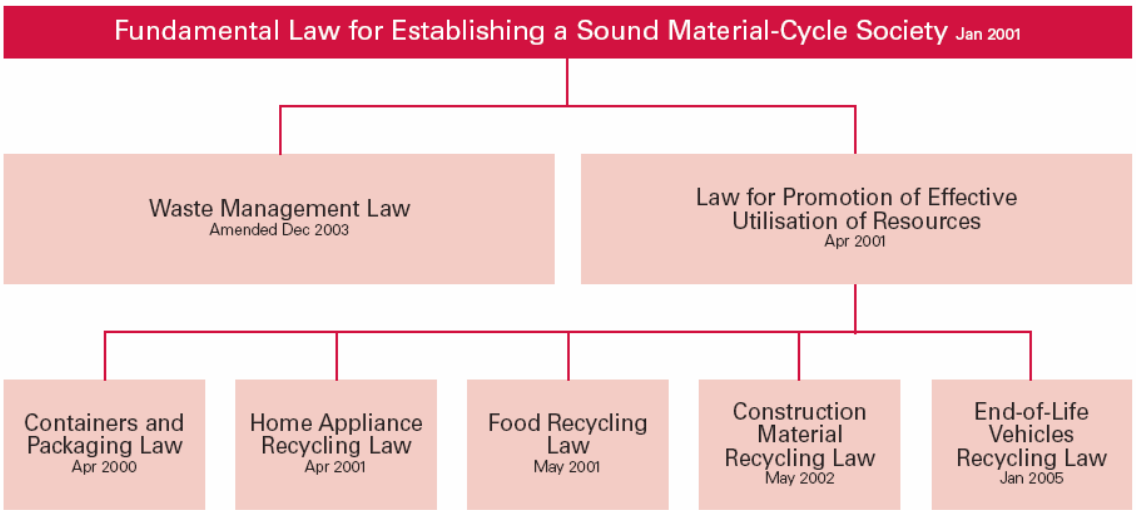
Sustainable waste management has been a high priority for the Japan for the last 20 years with its enormous manufacturing base and limited natural disposal options. Existing landfill space is due to run out in 2008 and the government has been following a planned strategy since the early '90s under the basic 3Rs – reduce, reuse, recycle.

WEEE legislation is just part of a coordinated range of legislation formulated by government in close cooperation with industry. With an annual 450 million tonnes of waste arising from industrial production and consumption, the country has been seeking to reduce dependency on both natural resources and end disposal, and sees sustainable environmental development as an essential part of economic progress. This mindset seems to be carried through to Japanese industry which, with its cultural commitment to R&D, appears to view the challenge as an opportunity to improve manufacturing and design processes. The Japanese government has therefore built an environmental strategy around the 3Rs – reduction of waste generation, reuse of parts, and recycling of used products as raw materials – with the aim of reducing dependence on natural resources and mitigating society's environmental impact.

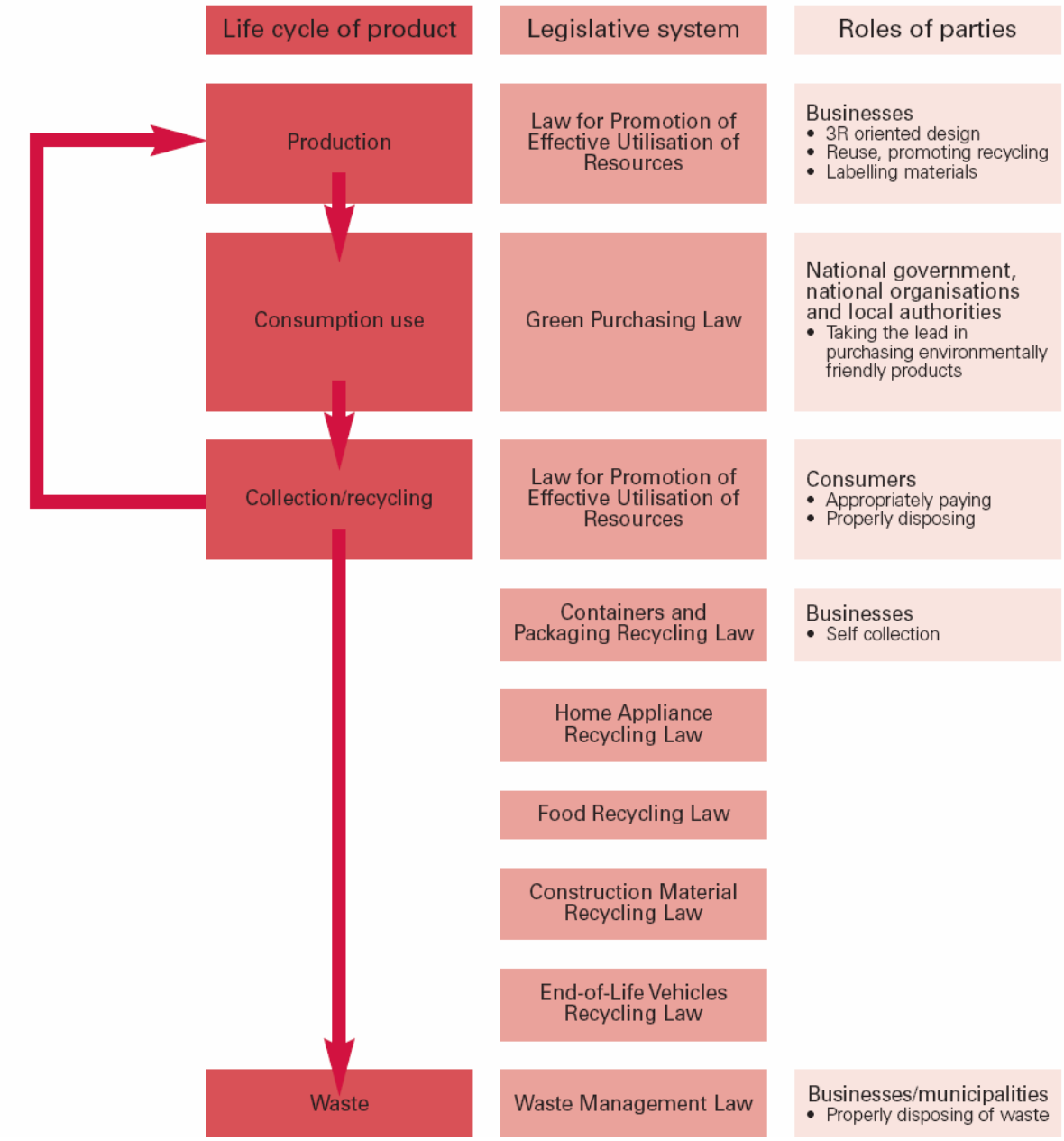
Main legislation

This strategy is underpinned by the Fundamental Law for Establishing a Sound Material-Cycle Society5 that was put into force in January 2001 and establishes the basic principles under which other environmental legislation should operate. This imposes the obligations of different sectors and the measures to be taken by national government and comes under the responsibilities of METI.

The Home Appliances Recycling Law (HARL) and the Law for the Promotion of Effective Utilisation of Resources (LPEUR) in 2001. In addition, the Green Purchasing Law (GPL) was passed in 2001, which effectively created a green market for a number of publicly procured products.



Under this come the two key laws that then govern the application of detailed regulation 'on the ground'. The Waste Management Law basically deals with disposal whilst the Law for Promotion of Effective Utilisation of Resources (LPEUR) deals with the 3Rs through product-related law. This sequence of waste and recycling law is also then supported by a Green Purchasing Law, creating legislative circularity for the production process and a complementary range of strategic goals.



Thus there is a full range of legislation applied across both the municipal and industrial/commercial waste streams.

ANNEX 9: Japan LPEUR

The key driving legislation for the Home Appliance Recycling Law (HARL) is LPEUR: The Law for the Promotion of Effective Utilisation of Resources. This was applied in April 2001 and provides for 3R measures to be taken by business in the production stage up to Producer Responsibility. This includes design, labeling for separate collection and the development of an end-of-life (EoL) take-back system.

Ten designated industry areas and 69 product items were identified to be addressed by LPEUR, covering around 50% of municipal and industrial wastes, and including the following

Purpose	Requirement	Products
Resource saving products	Ensure rational use of raw materials, prolong product life and reduce generation of new products	Cars Electrical home appliances Personal computers Pinball machines Metal furniture Gas and oil appliances
Resource reutilised products	Ensure use of recyclable materials or reusable parts	Cars Electrical home appliances Personal computers Pinball machines Metal furniture Gas and oil appliances Bathroom and kitchen systems Copying machines Devices using compact rechargeable batteries (power tools, cordless phone, electric bicycle, etc)
Specified labelled products	Labelled to facilitate separate collection	Aluminium and steel beverage cans PET beverage bottles PVC construction materials Paper packaging Plastic packaging Compact rechargeable batteries
Resource recycled products	Promote self-collection and recycling	Compact rechargeable batteries Personal computers 29 specified products using compact rechargeable batteries (power tools, mobile phones, video cameras, shavers, etc)
By-products	Promote reuse of by-products as recyclable resources	Coal ash from electricity generation Construction waste

This all-encompassing law therefore requires that even those products not directly covered by specific producer responsibility are under pressure and scrutiny to be encouraged towards improved environmental performance. It has also led to the development of additional take-back schemes for household PCs and portable batteries.

It applies responsibilities to each party in the supply and consumption trail:

Businesses
- Rationalising the use of raw materials with the aim of minimizing materials use and waste
- Using recyclable materials and reusable parts
- Promoting their use at EoL

Consumers
- Using products for as long as possible
- Using products with high recycled content
- Cooperating in separate collection

National and local government
- Taking financial measures
- Promoting green procurement
- Promoting S&T development

For some years, consumers have had the ability to return EoL computers through a national take-back scheme where the computer could be packaged, taken to a local Post Office and returned to the manufacturer at consumers' expense. In October 2003, manufacturers voluntarily started to include a recycling mark on computers entitling consumers to return them free of charge at EoL but with an additional recycling fee incorporated in the sale of the product.

For compact rechargeable batteries, a national returns system has been set up at manufacturers' cost with collection points in shops and a national recycling centre.

ANNEX 10 : Japan HARL

The Home Appliance Recycling Law (HARL) was passed in 1998 giving the producers – manufacturers and importers – of four domestic appliance types the responsibility of providing a national take-back scheme and achieve recycling targets.

Air conditioners, Wshing machines, televisions and fridges/freezers were targeted as the items where the greatest environmental net benefit could be achieved. Japan has ~44 million households disposing of ~18 million of these units each year, equating to ~1 million t. Before HARL, 71% of these items were disposed of through untargeted disposal, mostly as waste, although there would have been a significant quantity entering the scrap metal industry. The remainder were exported (24%) or sold as second-hand goods (5%). Since HARL, it would appear that ~62% are entering the take-back process and achieving an average 72% recycling rate. History does not currently relate what happened to the 38% that do not enter, but it is assumed that they get resold or exported although there is acceptance that 1-2% are 'illegally' disposed of which would suggest fly-tipping. If this is the case, this equates to around 100,000+ units a year, a not inconsiderable problem.

Requirement

The regulations lay down specific recycling targets for the four types of appliance and only relate to household waste equipment. Business WEEE is not covered by HARL, although under LPEUR businesses have a duty to maximise recycling.

The recycling levels are as follows:

- Air conditioners 60%
- Televisions 55%
- Fridges/freezers 50%
- Washing machines 50%

'Recycling' is defined as the total weight of waste sold for recycling or reuse divided by the total input. There are no targets for collection, but items collected must be recycled through the system. The system had to be in place for commencement in April 2001, at which point manufacturers took responsibility for the collection and recycling of these items.

Logistics

The regulations required manufacturers and importers to set up a national collection and recycling infrastructure. Manufacturers split themselves into two groups which then set about building the recycling plants on the basis of shareholdings:

- Group A – 40% of the market with Matsushita (Panasonic) and Toshiba as the two largest members: 25 recycling plants
- Group B – 60% of the market with Hitachi, Mitsubishi, Sharp, Sanyo, Sony and Fujitsu
- as key members: 15 recycling plants

Group A has effectively contracted out the operation of the plants to waste management companies whilst Group B has built the plants itself. Plants are built on the basis of prime manufacturers having the main shareholding whilst the other manufacturers and importers take a small shareholding.

These plants are fed by a national collection system operating through 380 designated

collection points that act as bulking and transfer facilities. The plants will only take back product brands related to their Group companies. Collection is carried out primarily through electrical retailers who are required to take back used products from consumers either when they purchase a new product or if a consumer delivers the old product back to where it was bought from with proof of purchase. On delivery to the retailer, the consumer will pay a national recycling fee plus an additional amount (£2.50 – £10) put on by the retailer to cover transport costs to the collection point.
The national recycling fees are currently:

- Television (CRT) ¥2,700 yen (~£13.50)
- Fridge/freezer ¥4,600 (~£23)
- Washing machine ¥2,400 (~£12)
- Air conditioning unit ¥3,500 (~£17.50)

A fridge/freezer unit could therefore end up costing the consumer over £30 on disposal.
A voucher system is used to track all items and enable the recycling centre to claim back the recycling fee from the retailer. These vouchers can also be purchased from the Post Office and consumers can take products direct to the designated collection points although only about 10% do. In this instance the recycling plant would claim the recycling fee back from the Post Office (as municipalities also can).

The regulations apply strict monitoring requirements: all recycling plants are required to submit monthly returns showing the number of units received and the level of recycling achieved.

ANNEX 11 : Electronics Industry Code of Conduct

Led by Hewlett Packard, the Electronic Industry Code of Conduct (EICC) was initially developed by a number of companies engaged in the manufacture of electronics products between June and October 2004. Participating companies included Celestica, Dell, Flextronics, HP, IBM, Jabil, Sanmina SCI, and Solectron. Companies adopting/endorsing the code and/or joining the Implementation Group include: Celestica, Cisco, Dell, Flextronics, Foxconn, HP, IBM, Intel, Jabil, Lucent, Microsoft, Sanmina SCI, Seagate, and Sony. Version 2.0 was released in October 2005 (see www.eicc.info).

The EICC outlines standards to ensure that working conditions in the electronics industry supply chain are safe, that workers are treated with respect and dignity, and that manufacturing processes are environmentally responsible. Considered as part of the electronics industry for purposes of this Code are Original Equipment Manufacturers (OEMs), Electronic Manufacturing Services (EMS) firms and Original Design Manufacturers (ODMs) including contracted labor that may design, market, manufacture and/or provide goods and services that are used to produce electronic goods. The Code may be voluntarily adopted by any business in the electronics sector and subsequently applied by that business to its supply chain and subcontractors.

General requirements

To adopt the Code and become a participant, a business must declare its support for the Code and seek to conform to the Code and its standards in accordance with a management system as set out in the Code.

- Participants should regard the code as a total supply chain initiative. At a minimum, participants shall require inext tier suppliers to acknowledge and implement the Code.
- A business, in all of its activities, must operate in full compliance with the laws, rules and regulations of the countries in which it operates. The Code encourages Participants to go beyond legal compliance, drawing upon internationally recognized standards, in order to advance social and environmental responsibility.
- Participants are committed to obtaining regular input from stakeholders in the continued development and implementation of the Electronic Industry Code of Conduct (EICC).

The Code is made up of five sections. Sections A, B, and C outline standards for Labor, Health and Safety, and the Environment, respectively. Section D outlines the elements of an acceptable system to manage conformity to this Code. Section E adds standards relating to business ethics.

A. LABOR

Participants are committed to uphold the human rights of workers, and to treat them with dignity and respect as understood by the international community.

Recognized standards such as the Universal Declaration of Human Rights (UDHR), Social Accountability International (SAI) and the Ethical Trading Initiative (ETI) were used as references in preparing the Code and may be a useful source of additional information.

The labor standards are:

1) Freely Chosen Employment
2) Child Labor Avoidance
3) Working Hours
4) Wages and Benefits
5) Humane Treatment.
6) Non-Discrimination
7) Freedom of Association

B. HEALTH and SAFETY
Participants recognize that the quality of products and services, consistency of production and workers' morale are enhanced by a safe and healthy work environment. Participants also recognize that ongoing worker input and education is key to identifying and solving health and safety issues in the workplace.

Recognized management systems such as OHSAS 18001 and ILO Guidelines on Occupational Safety and Health were used as references in preparing the Code and may be a useful source of additional information.
The health and safety standards are:
1) Occupational Safety
2) Emergency Preparedness Emergency situations and events are to be identified and assessed, and their impact minimized by implementing emergency plans and response procedures, including: emergency reporting, employee notification and evacuation procedures, worker training and drills, appropriate fire detection and suppression equipment, adequate exit facilities and recovery plans.
3) Occupational Injury and Illness
4) Industrial Hygiene.
5) Physically Demanding Work
6) Machine Safeguarding
7) Dormitory and Canteen

C. ENVIRONMENTAL
Participants recognize that environmental responsibility is integral to producing world class products. In manufacturing operations, adverse effects on the community, environment and natural resources are to be minimized while safeguarding the health and safety of the public.
Recognized management systems such as ISO 14001, the Eco Management and Audit System (EMAS) were used as references in preparing the Code and may be a useful source of additional information.
The environmental standards are:
1) Environmental Permits and Reporting
2) Pollution Prevention and Resource Reduction
3) Hazardous Substances
4) Wastewater and Solid Waste.
5) Air Emissions
6) Product Content

D. MANAGEMENT SYSTEM
Participants must adopt or establish a management system whose scope is related to the content of the Code. The management system must be designed to ensure (a) compliance with applicable laws, regulations and customer requirements related to the participant's operations and products; (b) conformance with the Code; and (c) identification and mitigation of operational risks related to the Code. It should also facilitate continual improvement.
The management system should contain the following elements:

1) Company Commitment
2) Management Accountability and Responsibility
3) Legal and Customer Requirements.
4) Risk Assessment and Risk Management.
5) Performance Objectives with Implementation Plan and Measures
6) Training
7) Communication Process
8) Worker Feedback and Participation
9) Audits and Assessments
10) Corrective Action Process
11) Documentation and Records

E. ETHICS

To meet social responsibilities and to achieve success in the marketplace, Participants and their agents are to uphold the highest standards of ethics including:

1) Business Integrity
2) No Improper Advantage (no bribes)
3) Disclosure of Information
4) Intellectual Property
5) Fair Business, Advertising and Competition
6) Protection of Identity
7) Community Engagement

ANNEX 12: Trade Associations

China Semiconductor Industry Association

China Electronics Enterprises Association

Consumer Electronics and Television Manufacturers' Association

Electronics Industries Alliance (US)

Electronics Industry Association of Japan (EIAJ)

Electronics Industries Association of the Philippines

Electrical and Electronics Institute (Thailand)

European Electronic Component Manufacturers Association (EECA)

European Information and Communications Technology Industry Association (EICTA)

European Committee of Domestic Equipment Manufacturers (CECED)

India Electronics Components Industries Association (ELCINA)

Japan Electronics and Information Technology industries Association (JEITA)

The European Engineering Industries Association (ORGALIME)

The Consumer Electronics Association (US)

The Electrical and Electronics Association of Malaysia (TEEAM)

The Hong Kong Electronic Industries Association (HKEIA)

World Electronic Forum (WEF)