Implications of WEEE & RoHS Directive on Indian Component Suppliers

Presented by

Shubha .J. Shanbhag

Research Associate

Network for Preventive Environmental Management Public Trust, Nagpur.

Background

Potential loss of resource from non-recycled waste electrical and electronic equipment in Europe in 1998 was

- **1.4 million tonnes of ferrous metal**
- **1.2 million tonnes of plastic**
- **Over 600,000 tonnes of copper**
- **Over 300,000 tonnes of Aluminium**
- **Over 300,000 tonnes of glass**

Failure to efficiently recycle WEEE results in

- **Significant loss of resources**

- **Associated impact on environment in terms of**

-mining

-transport

-and energy to produce raw materials

Waste Electrical & Electronics Equipment (WEEE) Directive (2002/96/EC)

- **Came into force - 13th February 2003**

- **Based on the "precautionary principle"**

- **It considers WEEE as one of target areas to be regulated, in view of application of principles of prevention, recovery and safe disposal of waste.**

Objectives

- Prevention of waste from electrical and electronic equipment (WEEE)
- To increase the reuse, recycling and other forms of recovery of WEEE wastes so as to reduce the disposal of waste.
- Improve **environmental** performance of all operators involved in the life cycle of electrical and electronic equipment, particular those involved in WEEE treatment.

Definitions

•**EEE equipment-** any equipment which is dependent on electric currents/electromagnetic fields & designed for use with a voltage rating not exceeding 1000 V for A.C and 1500 V for D.C

•**WEEE-** any EEE which is waste including all components, subassemblies & consumables which are part of the product at the time of discarding.

•**Prevention-** measures aimed at reducing the quantity & harmfulness to the environment of WEEE and materials and substances contained therein

•**Treatment-**any activity after WEEE has been handed over to a facility for depollution, disassembly, shredding, recovery or preparation for disposal and any other operation carried out for the recovery or disposal of WEEE

•**Reuse-**any operation by which WEEE or components thereof are used for the same purpose for which they were conceived

Recycling-the reprocessing in a production process of waste materials for the original purpose or for the other purposes ,but excluding energy recovery

Recovery- any operations as mentioned in directive 75/442/EEC

•**Disposal-** any operations as mentioned in directive 75/442/EEC

Who is “ the Producer?”

A producer is defined as any company which irrespective of the selling technique used:

- Manufactures and sells own brand electrical and electronic equipment
- Resells equipment produced by other suppliers under its own brand
- Imports or exports affected equipment into an EU Member State

Restriction of the use of certain hazardous substances (RoHS) Directive 2002/95/EC

- **Purpose**

- to restrict the use of hazardous substances in electrical and electronic equipment
- to contribute to the protection of human health
- to enhance environmentally sound recovery and disposal of WEEE.

Single Market Directives

•As Restriction of the Use of Certain Hazardous substances (RoHS) directive sets product standards for electrical and electronic equipment it is a “Single Market” Directive

•The WEEE directive ,however sets minimum requirements for member states , which they can exceed if they wish , and is not a “single market” directive.

Scope	WEEE	RoHS
Large Household Appliances	*	*
Small Household Appliances	*	*
IT& Telecommunication Equipment	*	*
Consumer Equipment	*	*
Lighting Equipment	*	*
Electrical and Electronics tool	*	*
Toys	*	*
Medical Equipment Systems	*	-
Automatic Dispensers	*	-
Monitoring and Control Instruments	*	*

Requirements of RoHS

•From 1 July 2006,new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl ethers and polybrominated diphenyl ethers.

•maximum concentration values

•Exemption materials and components of electrical and electronic equipment

The Banned Substances

- **Lead (Pb)-**some exemptions are permitted

- **Mercury (Hg)-**permitted in certain type of lamps

- **Cadmium (Cd)-** exempted for electroplated coatings

- **Hexavalent Chromium (CrVI)**-Chromium is only banned in the hexavalent form and chromium metal and trivalent chromium are not restricted.

- **Polybrominated biphenyl ethers (PBB)-**PBB was used as a flame retardant in plastics but PBB is no longer produced but some may be present in recycled plastics

Polybrominated diphenyl ethers (PBDE)-

- **Tetrabromodiphenyl ether (tetra-BDE)-**this is no longer in production but may occur in recycled materials
- **Pentabromodiphenyl ether (Penta-BDE)-**not normally used in electrical equipment , main use is in furniture foam
- **Octabromodiphenyl ether (Octa-BDE**)-used in very small quantities in electrical equipment
- **Decabromodiphenyl ether (Deca-BDE)-**The European Commission has stated that the status of this substance will be reviewed on the completion of comprehensive risk assessment.

Concentration Limits and Definitions

The maximum concentration values for banned substances are likely to be:

•0.1% weight of lead, mercury, hexavalent chromium, PBB and PBDE in “homogeneous materials” and

•0.01% weight of cadmium in “homogeneous materials”

Homogeneous material- “a unit that cannot be mechanically disjointed into single materials”

At present, several different interpretations of "homogeneous materials" are in circulation

•"**Assemblies**"-if this interpretation is adopted, the use of six banned substances will not decrease significantly as manufacturers will be able to continue using them in many products.

•"**components**"- this interpretation would significantly reduce the quantities of most of six substances but their widespread use could continue legitimately.

•**"in materials**"- this interpretation would permit the use of least quantities of six substances and would prevent manufacturers using them as thin coatings on parts and components.

Materials approach

It could be argued that RoHS Directive implies that this interpretation is the correct one because the exemptions apply to all materials

For example

1.High melting point solders (not component that contain these)

2.Mercury in certain lamps

3.Lead in solders for servers

The only apparent exemption is lead in ceramic parts, which implies the complete device

Exemptions under RoHS Directive

Mercury

•Mercury in compact fluorescent lamps not > 5 mg per lamp

•Mercury in straight fluorescent lamps for general & special purposes

Lead

•Lead in glass of CRTs, electronic components & fluorescent tubes.

•Lead as an alloying element in steel containing up to 0.35% lead by weight, in Al up to 0.4%lead by weight, in Cu up to 4%lead by weight

•Lead in high melting temperature type solders

•Lead in solders for servers, storage and storage array systems and in solders for network infrastructure equipment

•Lead in electronic ceramic parts

Cadmium

•Cadmium plating (cadmium & its compounds in electrical contacts*)

Chromium

•Cr+6 as an anti-corrosion of the carbon steel cooling system in absorption refrigerators

Eight proposed new exemptions

"compliant pin VHDM connector systems",

"lead as a coating material for the TCM C-ring",

"lead and cadmium in optical and filter glass",

"optical transceivers for industrial applications",

"lead in solders consisting of more than 2 elements for the connection between the pins & the package of microprocessors

"lead in high melting temperature type solders

"lead in solders to complete a viable electrical connection internal to certain integrated circuit packages

"safety equipment for fire and rescue services"

Grounds for granting an exemption

- The existence of alternatives that do not contain 6 restricted substances
- Whether changes to the alternative technology is practical
- Whether alternatives have a negative impact on the environment or human health or consumer safety
- Impact on reliability that may create an increased risk to consumer safety
- Heath hazards of alternative materials
- Impact on global warming
- Release of toxic materials into the environment
- The existence of patents that may restrict manufacturer's options
- Potentially excessive cost increases.

The Key WEEE Directive Requirements

❖**Treatment, Recovery, and Recycling:**

- The systems to provide for the treatment of WEEE are to be set up by producers or third parties acting on their behalf.

- Recovery, reuse, and recycling targets for each of the ten categories of WEEE waste to be met by **December 31, 2006**

- New targets for the medical equipments category are to be set by **December 31, 2008.**

Product Design

- **Producers should not prevent, WEEE from being reused**
- **Where appropriate ,priority should be given to the reuse of WEEE and its components, subassemblies and consumables.**
- **Where reuse is not preferable, all WEEE collected separately should be sent to for recovery in the course of which a high level of recycling and recovery should be achieved.**
- **In addition, producers should be encouraged to integrate recycled material in a new equipment**

	Minimum targets by avg weight of appliance	
	Recovery%	**Reuse& recycling%**
Large household appliances	80	75
Small household appliances	70	50
IT and telecommunications equipment	75	65
Consumer equipment	75	65
Lighting equipment	70	50
Electrical and electronic tools	70	50
Toys leisure and sports equipment	70	50
Medical devices	To be defined December 2008	
Monitoring and control instruments	70	50
Automatic dispensers	80	75

NetPEM

- Whole appliances which are re-used for their original purpose
- Components, sub-assemblies and consumables re-used for their original purpose or recycled
- WEEE where energy has recovered in a power plant
- Remaining WEEE which is disposed of to landfill

Technical requirements in accordance with article 6(treatment)

Sites for storage of WEEE prior to their treatment

-impermeable surfaces, where appropriate ,decanters and cleanser-degreasers

-weather proof covering for appropriate areas

Sites for treatment of WEEE:

-appropriate storage for disassembled parts

-appropriate containers for storage of batteries, PCBs/PCTs containing capacitors and other hazardous waste

The Key WEEE Directive Requirements

❖**Separate collection**

•Public collection points,distributor take-back programmes and other separation and collection efforts will be deployed.

•For business to business relationships ,producers ,or third parties must provide for the collection.

•All these systems must be in place by **August 13,2005.**

•A minimum rate of collection of 4kg on average per head per year of population has been set , to be achieved by **December 31,2006**.

•The targets are to be revised by **December 31, 2008**.

As a minimum the following substances and components have to be removed from any separately collected WEEE

- **Polychlorinated biphenyls**
- **Mercury containing components**
- **Batteries**
- **PCBs of devices if the surface of PCB is greater than 10 Square cm.**
- **Toner cartridges, as well as color toner**
- **Plastic containing brominated flame retardants**
- **Asbestos waste**
- **Cathode ray tubes**

- **CFC,HCFC,HFC,HC**
- **Gas discharge lamps**
- **Liquid crystal displays of a surface greater than 100 Square cm**
- **External electric cables**
- **Components containing refractory ceramic fibres**
- **Components containing radioactive substances**
- **Electrolyte capacitors**

Treatment of separately collected WEEE

•Cathode ray tubes

•Equipment containing gases that are ozone depleting or have a global warming potential (GWP) above 15,such as those contained in foams and refrigeration circuits.

•Gas discharge lamps

The Key WEEE Directive Requirements

❖Financing Obligations

•By **August 13,2005**, producers have to provide financing for the collection ,treatment , recovery & disposal of WEEE from private households.

•A visible fee will be allowed on new equipment for up to **8** yrs to reflect these cost for all categories, except category **1** which can show this fee for **10** yrs.

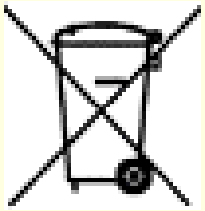
•Producers will also be responsible for WEEE from users other than private households .

•To prevent "**Orphan WEEE**" producers will be required to place a guarantee on end-of –life recovery on all new equipment.

The Key WEEE Directive Requirements

❖Labeling and Related Requirements

•After **August 13, 2005**,producers will be required to mark all products with the "**wheely bin**" logo.



•Producers will also be required to inform users of the return & collection facilities available to them.

•Producers must provide information on E& E components and materials as required by reuse, recovery and recycling facilities.

WEEE & RoHS Directive:Key Dates

- **31 December 2006-**Member States ensure that targets for collection, reuse or recycling, and recovery have been met.
- **1 July 2006-** new electrical and electronic equipment put on the market does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl ethers and polybrominated diphenyl ethers.

Overview of the Indian Electrical & Electronics Sector

The overall production base of the Indian electronics industry is widely distributed across various segments.

- **Consumer Electronics**
- **Electronic Components**
- **Computer Industry**
- **Control Instrumentation & Industrial Sector**
- **Communication & Broadcasting Sector**
- **Strategic Electronics**

Exports from electrical and electronics sector

Item	2002-03	2003-04
Consumer electronics	750	825
Industrial electronics	1400	1515
Computers	550	1440
Communication and broadcast equipment	500	165
Strategic electronics	-	-
components	2400	3755
Total	5600	7700

Impact of WEEE & RoHS Directive on Non EU Suppliers.

•Makes the complete production chain relevant and its effect passes down the chain of production and downstream (i.e. from OEMs to SMEs)

•In addition to aggressive timetables and targets, companies will face significant costs related to compliance.

•Long term effects - on innovation in processes and product engineering in the electrical & electronics equipment manufacturers.

•Non-compliance will lead to loss of significant market size.

NetPEM

Impact on business processes including

Compliance Reporting: Reports must include new EU trade documents, labeling on equipment, tracking reuse, and disposal compliance.

Product Design: Manufacturers will need to ensure that all components used are WEEE/RoHS-compliant with product-level testing needed to certify conformity. They must also design products for easy disassembly & recycling

Procurement: Additional parameters of compliance requirements, declarations from suppliers, and measures to ensure conformance need to be put in place.

Service and Repair: For products with long product lifecycles, manufacturers need to track, repair and upgrade histories to support end-of-life processing.

Production Processes: Changes in the production process based on the enhanced requirements placed on product design, labeling etc.

Administration and Implementation: Additional staff is required to administer and support these requirements.

Recycling: Research into cost-effective recycling practices

NetPEM

Savings & Opportunities

• Refurbishment or remanufacture, employing new components and sub-assemblies to replace failed items

•Disassembly to recover components and sub-assemblies for re-use using similar design techniques for servicing and maintenance

•Recovery of materials for recycling, by incorporation easy break-away sections for disassembly

•Recovery of materials for energy recovery in a power plant

•Saving on disposal to landfill

Thank You !