E-waste is the waste generated from used electronic devices and household appliances which are not fit for their originally intended use and are destined for recovery, recycling and disposal. As per the estimates of the United Nations Environment Program (UNEP), worldwide 20-50 million tonne (Mt) of e-waste, including old phones, TVs, microwaves, washing machines, dishwashers and computers (contain hazardous materials including polychlorinated biphenyls (PCBs), lead and mercury), is getting discarded into landfills each year (United Nations Environment Programme, 2006). Box 1 illustrates some of the adverse effects of e-waste.

The rising global e-waste problem is driven by the rapid growth of technology and a high rate of obsolescence in the electronics industry. "Worldwide, e-waste constitutes a valuable ‘urban mine’-- a large potential reservoir of recyclable materials. At the same time, the hazardous content of e-waste constitutes a ‘toxic mine’ that must be managed with extreme care", as said by David Malone, UN Under-Secretary-General and Rector of UNU.

As per the Global E-Waste Monitor Report (2014), 41.8 Mt of total e-waste was generated globally in the year 2014 (Baldé, C.P., Wang, F., Kuehr, R., Huisman, J., 2015). Based on the data obtained from the report, it is estimated that there would be a ~19 per cent rise (i.e. 49.8 Mt) in the total amount of e-waste generated, and 14 per cent increase in e-waste generated per inhabitant (6.7kg/inh.) in year 2018. Thus, an increasing trend in global e-waste generation data in – absolute terms and per inhabitant is observed with the increase in global population (Figure 1). Considering the same growth rate, the waste generation data is projected for next 15 years till year 2030. It is found that, with a 19 per cent increase in global population (8.4 billion) in 2030, the global waste generation data in absolute terms is expected to rise by 76 per cent (and become 73.7Mt) whereas waste generated per inhabitant is expected to rise by 58 per cent (and become 9.3 kg/inh.) in year 2030 as compared to that in year 2014. The magnitude of the e-waste problem would be thus huge if not tackled in time!

**Box 1: Adverse effects of e-waste**

- The e-waste generated in 2014 contained an estimated 16,500 kt of iron, 1,900 kt of copper, 300 tonne of gold (equal to 11 per cent of the world’s total 2013 gold production), as well as silver, aluminum, palladium plastic and other resources with a combined estimated value of USD 52 billion.

- Toxins in that e-waste include 2.2 Mt of lead glass, 0.3 Mt of batteries, as well as mercury, cadmium, chromium and 4,400 tonne of ozone-depleting substances (CFCs).

- Health problems associated with such toxins include impaired mental development, cancer, and damage to livers and kidneys.
On assessment of continent-wise e-waste generation (in year 2014), it is found that Asia generated the maximum e-waste of 16 Mt which was 3.7 kg/inh.

![Figure 2: Continent-wise e-waste generation (Mt) and average annual e-waste generated (kg/inh.) in 2014](source)

Country-wise e-waste generation data (in year 2014) pointed out that USA topped the list with ~7 Mt (22.1kg/inh.) of e-waste generation, whereas discarding 1.6 Mt (or 1.0kg/inh.) of e-waste in 2014, India was on the fifth spot, behind the US, China, Japan and Germany, globally in that order. Moreover, currently a 69 per cent increase (i.e. 2.7 Mt) is observed in the e-waste generation quantity in absolute terms in India.

**E-waste recycling in India**

According to Central Pollution Control Board’s data (CPCB, 2015), in 12 Indian states, 138 units of dismantler/recyclers having a total capacity of 349,154.6 MTA have been registered as on 27th November 2014, showing an increase of 8 per cent (i.e. 149 units) and 32 per cent (i.e. 461,058.7 MTA) respectively registered as on 14th December 2015 (CPCB, 2016).

Some of the rules, regulation and related to e-waste in India are as follows:
- The Hazardous Waste (Management and Handling) Rules, 2003
- The E-Waste (Management and Handling) Rules, 2011
- Electronic Waste Handling and Disposal Draft Law, 2013

**Why e-waste recyclers should go for certification?**

E-waste contains several toxic materials such as mercury, lead, and cadmium, which must be processed, recycled and disposed responsibly in order to prevent harm to the eco-system. Unfortunately, about 95 per cent of the electronic waste produced in India is handled by the informal recycling sector, improperly using crude techniques and polluting processes (like open air incineration, acid stripping and manual dismantling) and employ poorly paid workers, including women and children in these hazardous processes, which leads to environmental pollution and grave health risks.

Industry certification programs are thus need of the hour as they set requirements for safer recycling and disposal of e-waste.

Globally there exist some of the following e-waste certification programmes (an indicative list) which include guidelines that define responsible and effective e-waste management:
- R2 Solutions (R2)
- The Recycling Industry Operation Standard (RIOS)
- The Basel Action Network (e-Stewards)
In order to prevent aforementioned environmental pollution and health hazards associated with electronic waste, and ensure recovery of valuable resources, one needs to look for a good electronic waste recycler, who ensures sustainable and responsible recycling. Thus, having an e-waste certificate would have several benefits:

- Distinguishes a company as an industry leader and positions it as preferred recyclers of e-waste and supplier of recycled material.
- Ensures transparency and indicate a company’s level of compliance.
- Creates confidence that the organization is abiding by the data security standards. Data security is essential for both individuals and corporate organizations as most transactions take place electronically and once these electronics reach the end of their useful lives, the data on them must be destructed to ensure that information is not misused. Responsible e-waste recyclers ensure that their data is either put straight into processing or kept in a secure place until its processing and destruction occurs.

Bibliography


CPCB, 2016. *List of registered e-waste dismantler/recycler in the country (as on 14-10-2015)*, s.l.: Central Pollution Control Board (CPCB).


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About Emergent Ventures India Pvt. Ltd. (EVI)

*EVI is an integrated sustainability & clean energy consulting company headquartered in India. EVI’s work encompasses advisory services around policy & strategy, technology and finance. EVI has worked for Governments (Ministries, Departments & Agencies), Development Banks, Donors, Private & Public Corporate and non-profit organizations in more than 25 countries. EVI’s team has a pool of experienced professionals with proven expertise in climate change mitigation & adaptation, climate vulnerability & risk assessment, renewable energy development, waste management, transportation, Smart Cities among other areas. EVI helps e-waste recyclers prepare for undergoing certification process.*

Contact Details:
Emergent Ventures India Pvt. Ltd.
Address: 11th Floor, Vatika Professional Point, Golf Course Extension Road, Sector-66, Gurgaon-122001, Haryana, India
Website: www.emergent-ventures.com
Email: contact@emergent-ventures.com
Facebook: https://www.facebook.com/Emergent-Ventures-India-577250735715415/?ref=br_rs
Twitter: evitweets
Phone: +91 124 4319500
Fax: +91 124 4319501