



## E-Waste Recycling Units in Developing Economies

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**ABSTRACT**

*E-waste and its hazards have denied maintaining the tranquility in the modern human's brain. Now that we are aware of the entire arduous task that lies behind us to take care of the waste which we are generating has slowly started to intervene with our conscience of what we leave for the future generation. Heavy metal contamination? Poisonous environment to live on? Will the scenario be so bad one of the coming days that we'll need to pay for our environment? Pay for air? That shouldn't be a surprise! We all pay for pure water now! What further? | It was this disturbed tranquility which leads us to work upon the jeopardize we and our presumptuous behavior has created. The concept of developing and developed economies is brought about because the developed economies have a better approach towards management of this e-waste. The concepts of who should be accepted by the developed economies not because of just the profit factor but also because it is necessary for every individual on earth to sensitize himself to protect his native place. Here, meaning the planet Earth. | This paper presents a holistic view on requirements to set up a recycling unit and how the developing countries are facing the problems to set up an efficient unit. |*

**KEYWORDS :** e-waste management, recycling units, WEEE, MOEF

**INTRODUCTION:**

The life spans of computers have dwindled over the period of time from a good number of 6 years to hardly 2 years and maybe even lesser. Not just computers, laptops, mobile phone, i-pods, electronic machinery such as washing machines, refrigerators etc seem to possess same problem of dwindling lifespan. There is no doubt a huge deal of harmful emission erupting out of the landfills and open burning of the e-waste. The countless poisonous chemicals, the lead in the circuit boards, dioxin formation from burning of the halogenated plastics, mercury from liquid crystal display backlights, cathode ray glasses all ending into lands, water streams entering within the ecosystem and hindering the normal lifestyle and metabolism of the living organism. The list seems to be endless, but what now is required is a deal with these harmful chemicals in a smart and efficient manner.

The export of electronic wastes from developed countries to that of the developing countries has brought such menace in the handling the electronic waste. Certainly deteriorating the scenario from what it is at present. The exported waste may be getting out of their country but it stays very much within the earth they are a part of too. Though it may be appealing to go about on how pathetic the scenario is, it is more so important to find for a solution. To counter-act the harm we've already done and prevent the further losses. The developed countries now however have started being a little more sensitive about the issue, specially the European countries. They set for us an example as to how can we re-cycle the waste and put to use rather than allow dumping it and allowing the toxic composition poisoning us to a wipe out we should be afraid of. It is however understood that the e-waste revenue generation might not be as much promising and profitable as it seems at the current mindset of people and the insensitivity towards the sensitive issue we now face.

The e-waste disposal needs an integrated approach to be recycled and reused and minimizing the effects of the toxins within the waste. The WEEE Directive (European community) has set the skeletal work that needs to be taken care of when dealing with Electronic goods which further down the lane will become eventually a waste. The main points that the WEEE works around and about are reduce, reuse, recovery, re-cycle and disposal. The focus on each of the following points will be made in the subsequent sections.

Though now the laws in the developing countries are being put up to combat the issue much is left to be done. In spite of MOEF norms being put up hardly if at all is the functional change. The business of unskilled people taking care of huge masses of toxic e-waste continues and it will continue to flourish. I dare to say so. That is so because we have the problem, we are sensitive we have the rules but who will be the prosecutors? More importantly even if the prosecu-

tion takes place, who will do the job of re-cycling if we do not have recycling farms? Like the WEEE clearly and precisely states, the waste management will not be a one step process. The attempts to reduce the effects start right from the industry where the electronic good is made to the consumer followed by disposal, dismantling re-suining and recycling.

The skeleton behind e-waste re-cycling unit will be mentioned in the further section and so will be the glimpse of problems a developing economy faces to create a proper effective recycling unit.

**SKELETON OF NEW RECYCLING UNIT SETUP:**

Setting up a recycling unit can be done as a private business or can be set up with the collaboration of the government. The grants and permissions obviously before setting up the recycling unit have to be obtained by the government. A proper Project report containing the aims, requirements, economics, monetary funding, disposal etc has to be submitted to explain the setup of the re-cycling unit being established. The e-waste being one of the toxic wastes the recycling unit has to be set up at a location which is considerably far off from the local popular but at the same time at a position where it isn't completely cut off from the city. This brings the first requirement, i.e. the proposed location. This would be followed by development of the building. The offices, the labs, work stations, different departments, sanitation, every single detailing has to be given to put up the building of the re-cycling unit.

The Laboratory or office equipments: The recycling unit has to employ four basic methods to take up effective re-cycling, which are [1]:

1. **EQUIPMENT DISMANTLING:** manual separation of different components would be required to be done. Sorting into Recyclable and Renewable also need to be done. Such a procedure need much of manual work to be done and for that use of Gloves, Laminar Air Flows and other advanced work stations needs to be provided to the person doing the dismantling.
2. **MECHANICAL DISMANTLING:** The removal of reusable material like iron, glass, mercury and other metallic components versus the removal of plastics and other toxic wastes, on the basis of their basic mechanical properties. Huge belts are administered which are often aided with a magnet beneath them which separates iron to the other trash. Such a technology allows easy and fast removal of waste. Many more of such technologies are need to be brought in, in order to sort the waste on the basis of their basis specific mechanical properties.
3. **INCINERATION AND REFINING:** After the mechanical sorting of the e-waste in order to achieve pure metallic sub-

stances a different department for incineration and refining needs to be employed. This can either be a part of proper recycling units or can be sold to the factories which are in need of that particular product so they can purify and re-cycle the raw material they've achieved from the e-waste.

4. **CHEMICAL RECYCLING:** For the purposes of extremely pure metals or other materials, chemical recycling is needed to be done. Chemical recycling is usually done for the precious materials like silver and Gold from the circuit boards. Technology needs to be incorporated in a re-cycling unit for the same.
5. **OTHER OFFICE EQUIPMENTS:** a recycling unit must contain technologies which can employ a safer work station for the workers. Also, ensuring the toxic waste out of the recycling unit to be disposed off in an environment friendly manner needs to be done. Technologies for that too require to be set up.

This above presents only the Plant and Machinery that needs to be installed. Further more Vehicles would be required to collect, dispose and transfer the product. A whole well laid plan needs to be put up to start a recycling unit. And of all, most importantly setting up a recycling unit with skilled manpower is a must.

#### **PROBLEMS FACED BY THE DEVELOPING ECONOMIES:**

The setting of a recycling unit may seem a simpler task. But the hurdles that stand in front are of much more importance to be dealt with in a developing country than in a developed country. Setting up of recycling unit easily will cost around 25-30 Crores. Such money needs to be funded by private organizations or the government. A developing country which already has the problem of people being unemployed, poverty, hunger and other such problems have lead to government already be in such a pressure that not except few are interested in solving that problems right now. The technological knowledge which is required to set up the factory is complex. The profits not being as rewarding as it might seem the recycling unit business barely if at all attracts people.

One of the most important issues is un-awareness. People in countries like India and China live in dire conditions, deal with highly toxic waste and play on their lives without knowing the harm they are doing to themselves and to the environment. Also, the general public does not know the potential threats of carelessly dumping the e-waste into the common dump yard.

According to the MOEF guidelines in India, every citizen is responsible for the e-waste, starting from producers to the recyclers [2]. The MOEF norms in India have clearly put down the responsibilities of the producer, consumer, dismantler and the recycler. Though the norms in developing countries like India have been clearly put up, not many people understand the need and the seriousness of the situation.

#### **CONCLUSION:**

The setting up of the recycling unit in a developing country is easier than making people aware and sensitive about the seriousness of the situation. Not just the import of e-waste which is needed to be stopped but also, it is required to stop the people to handle the toxic e-waste without proper knowledge. Therefore, need of stringency in laws. The government and the general public should be equally sensitive about this problem and this problem can be fought only when everyone puts an equal effort. Essentially there is a major demand of having more people to work for this kind of an arrangement and attraction towards e-waste management system.

## **REFERENCES**

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