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Green Computing "Electronic Waste"

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Abstract:

Green computing is a well-balanced and sustainable approach of designing, manufacturing, using and managing the various products in a proper way to contribute good (less hazards) environment. Green computing represents a responsible way to address the issue of environment. Now a day's electronic products has widely used by the users for satisfying the needs. After satisfying the needs, wasted electronic product properly destroy by the industry or users. If these electronic products are not properly destroy its major impact on environment. Therefore, the researcher studies of Green Computing "Electronic Waste". The present research, researcher study Green computing, E –waste, E-waste dismantler, E –waste Recyclers etc.

Keywords: *Green computing, E –waste, E-waste dismantler, E –waste Recyclers*

Introduction:

Green computing is also known as green technology is the environmental responsible and eco friendly use of computers and resources. Green computing is mostly focus on less energy, reducing waste and promoting sustainability. Green technology has a potential role to play in enhancing environmental sustainability. Green computing includes four key areas which is helps to reduce e-waste these are as follows.

Green design:

Organizations are properly designing of energy-efficient computers, Laptops, servers, Copying equipment, telephones, printers, projectors and other digital devices etc.

Green manufacturing:

Green manufacturing mostly focus on electrical, electronics and telecommunication equipment are properly manufactured and reduce the manufacturing process. The respective manufacturing process has essential eco-environment.

Green use:

Green use means environmentally sound manner reduction of electricity and energy saving of computers and their peripheral devices.

Green disposal:

Green disposal is a life ended equipments or computers are appropriately disposing or recycling.

The above four key areas significant for reduction of e-waste and making eco- environment. E-waste means electronics product near to end of their useful life or discarded electrical or electronic devices. The electronic or electrical devices are more harmful to human health. E-waste includes various products these are TVs, computer monitors, printers, scanners, keyboards, mice, cables, circuit boards, lamps, clocks, flashlight, calculators, phones, answering machines, digital /video cameras, radios, VCRs, DVD players, MP3 and CD players. These products are daily used by the people. The manufacturing industry has use of metals and chemicals for manufacturing of the equipment. These chemicals and metals are more harmful to the human and children. It also impact on environment.

Review of Literature:

1. **Brett H. Robinson** research on E-waste: An assessment of global production and environmental impacts. As per opinion of researcher recently global production of e-waste is estimated to be 20-25 million tons per year. The e-waste mostly produced in Europe, the United States and Austroliya, China, Eastern Europe, and Latin America. In the respective country e-waste workers suffer negative health effects through Skin contact and inhalation.

2. **Mr. N. P. Jadhav, Mr. R. S. Kamble, Mr. S. V. Kamble**, Green Computing-New Approaches of Energy Conservation and E- Waste Minimization. The researcher was focus on energy conservation of equipment. Computer organization or industries use of some non-toxic material in preparation of equipment or computer have to come to realize that going green in their relations and reduced cost.

3. **Arundhati Kanungo** Green Computing: A Solution to E-Pollution. Under this research study researcher writing here computer is a part of human lives, both at work or home. Green computing reduces the hazardous materials, increase energy efficiency during the products lifetime and promote the recyclability.

4. Ranjita Panda E-waste Management: A Step towards Green Computing. The researcher use of electronic gadgets finding the last two decades has led to generation of a huge amount of electronic wastes resulting in soil, water and environmental pollutions. Thus pollution control and environmental safety has become the greatest concern of environmental scientists and activists worldwide. In this paper, we discuss about various sources of e-wastes, their effects and recommend steps for management of these toxic and hazardous wastes so as to make the development process sustainable and green.

Why Green Computing:

Green computing is responsible for environmentally and eco-friendly use of computer and their resources. Reduce, Reuse and Recycle equipment is the key pillar of green computing.

In today's world everywhere telecommunication, electrical, electronic equipment largely used in different places like business, homes and other places. Even, we can see the use of this equipment is very large therefore manufacturing of these products is very large. Overall these equipment lives is very small. After end of life of these equipment properly dismantlers or disposed. The proper disposal of equipment is necessary for green environment. If not proper disposal of equipment its harm to our environment, hence in Maharashtra number of dismantlers and recycle institution established.

Objective:

1. A Study of Green Computing
2. A Study of E-waste.
3. A Study of Information technology and telecommunication equipment E-Waste Quantity Processed by Dismantlers / Recyclers (MT)
4. A Study of Consumer electrical and electronics E-Waste Quantity Processed by Dismantlers / Recyclers (MT)

Methodology:

For the present study secondary data have been used. The secondary data is collected from website, Online books, online study material, Pollution control board etc.

Scope of the Study:-

A. Geographical Scope - This study is proposed to be conducted in Maharashtra.

B. Periodical Scope – This study will cover the period of two year 2019, 2020.

Data Analysis and Interpretation:

District wise E-waste processed by Recyclers

Sr. No.	Name of District	Name of producers	Total number of producers	
			2019	2020

1	Thane	Recyclers	03	02
2	Raigad		01	02
3	Mumbai		02	02
4	Dhule		01	01
5	Pune		02	03
6	Palghar		00	02
7	Nagpur		00	01
8	Nashik		00	01
	Total			09

The above table showing district wise recycle producers. Total 14 recyclers unit have working in the year 2020 out of them five new recycler's producers working in the Raigad, Pune, Palghar, Nagpur and Nashik District respectively. Total 09 recyclers Units have working in the year 2019.

District wise E-waste processed by Dismantler

Sr. No.	Name of District	Name of producers	Total number of producers	
			2019	2020
1	Thane	Dismantler	19	22
2	Raigad		11	11
3	Mumbai		06	06
4	Nagpur		02	02
5	Pune		29	33
6	Ahmednagar		01	01
7	Kolhapur		03	03
8	Nashik		04	04
9	Aurangabad		09	09
10	Solapur		01	01
11	Buldhana		01	01
12	Palghar		03	03
13	Osmanabad		01	01
	Total		90	97

The above table showing district wise dismantler centers. Total 97 dismantlers have working in the year 2020 out of them seven new dismantlers working in the Thane and Pune district respectively. Total 90 dismantlers have working in the year 2019. Thane and Pune district more dismantlers working as compare to other district.

Information technology and telecommunication equipment E-Waste Quantity Processed by Dismantlers / Recyclers (MT)

Sr. No.	Type of E-Waste	Processed by Dismantlers/ Recyclers	Processed by Dismantlers	Processed by Recyclers
		2019	2020	2020
1	Answering Systems	12.005	0.9	.003
2	Cellular telephones	2326.424	351.102	129.02167
3	Centralized data processing: Mainframes, Minicomputers	601.072	780.246	316.692
4	Copying equipment	106.144	10.217	11.608
5	Cordless telephones	10.201	1	
6	Electrical and electronic typewriters	660.245	530.72	0.128
7	Facsimile	5.314	0.5035	0.033
8	Pay telephones	5.2	0	
9	Personal Computing: Laptop Computers (Central Processing Unit with input and output devices)	560.763	197.75.72	183.3821906
10	Personal Computing: Notebook Computers	258.5345	3.53	1.026
11	Personal Computing: Notepad Computers	117.778	8.04	
12	Personal Computing: Personal Computers (Central Processing Unit with input and output devices)	1718.8575	648.56397	1047.143791
13	Printers including cartridges	892.031	1173.864	379.1992074
14	Telephones	189.889	205.69108	14.71942
15	Telex	21.58	12.1	
16	User terminals and systems	146.421	106.26	150.776

The above table showing Information technology and telecommunication equipment E-Waste

Quantity Processed by Dismantlers / Recyclers (MT) in the year 2019 and separate data showing dismantlers and recyclers in the year 2020. In the type of e-waste 16 equipment covered, out of them Printers including cartridges, Personal Computing: Personal Computers (Central Processing Unit with input and output devices), Personal Computing: Laptop Computers (Central Processing Unit with input and output devices), Electrical and electronic typewriters, Centralized data processing: Mainframes, Minicomputers, and Cellular telephones was highly dismantlers in the year 2020 as well as year 2019. It means peoples are highly used these products. If these products are not dismantlers it impact on human body and environment.

The recycle units are significant for balancing eco-environment. These centers dismantler's equipments recycled and formed new product. The dismantlers and recycle process no any hazards to the environment and human. Cellular telephones, laptops, personal computers and printers are mostly recycled in the year2020.

As compare to dismantlers equipment to recycler's equipment ratio is more than 60 percent. Therefore this system is support to; less impact on environment and to make green computing.

Consumer electrical and electronics E-Waste Quantity Processed by Dismantlers / Recyclers (MT)

Sr. No.	Type of E-Waste	Processed by Dismantlers/ Recyclers	Processed by Dismantlers	Processed by Recyclers
		2019	2020	2020
1	Television sets (including sets based on (Liquid Crystal Display and Light Emitting Diode technology))	398.798	363.64909	1241.76
2	Refrigerator	271.77	713.291387	1594.708
3	Washing Machine	385.95	148.78	1307.467
4	Air-Conditioners excluding centralized air conditioning plants	3215.9	317.92	1368.336
5	Fluorescent and other Mercury containing lamps	143.91	4.84	22.361
6	Others	1076.4	439.35	48.86

Above table indicate Consumer electrical and electronics equipment dismantlers and recycle in M.T. The Consumer electrical and electronics equipments are daily used in every family. Therefore these equipment are mostly used and life ended equipments are wasted. The electrical and electronics are needed of dismantlers and recycle. Otherwise these equipments have impact on human and environment.

Television sets and Refrigerator has widely used, therefore dismantlers and recycle is more than other equipment. The television set was dismantler of 363.64909 MT and recycle 1241.76 MT in the year 2020. Refrigerator, washing machine, Air-conditions was highly recycled as compare to dismantlers of the equipments in the year 2020.

As compare to dismantlers electrical and electronics equipment to recycler's electrical and electronics equipment ratio is 100 percent. Therefore this system is support to; less impact on environment and to make green computing.

Conclusion:

Main target of the green computing is to reduce harmful effect from our environment. Green computing includes efficient –effective use of electronic and electrical equipment and Information technology and telecommunication equipment. All processing and manufacturing units must take e-west management for making green computing. In Maharashtra lots computers and electrical and electronic equipments are used for business working. While, respective equipments have recycled time to time for fewer hazards to the environment. The manufacturing and processing units produce less impact on environment.

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