Guidelines for Determination of Processing Capacity of E-Waste Recycling facility by SPCBs/PCCs

CENTRAL POLLUTION CONTROL BOARD
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Guidelines for determination of processing capacity of e-waste recycler's by SPCBs/PCCs

1. The processing capacity of an e-waste recycling facility should be determined based on the capacity of the installed plants and machineries per hour (maximum number of hours allowed 20 hours per day) and should have adequate space for the followings:

    a. recycling ope1rations comprising of dismantling (manual or mechanical), shredding, ball milling, separation system (magnetic separator, eddy current/electro static separators, gravity separators), smelting operation, pyro/hydro/electrometallurgy operations/electrowinning and any other operations employed for producing end products (**List of Minimum Machineries in E-Waste Recycling facility is attached in Annexure 1**)
    b. raw material storage (E-Waste – Waste Electrical and Electronic Equipment)
    c. storage for products of recycling
    d. storage for non-recyclables
    e. storage for hazardous waste
    f. pollution control equipment/devices (cyclone, bag house, alkaline scrubber, off gas treatment facility, stack, etc, and ETP)
    g. operation control area

2. SPCBs/PCCs should verify the plants & machineries processing capacity and other supporting facilities as above and and then only grant CTO specifying capacity (Tonnes per Annum) based on such verification;

3. End products of recycling are as below:
    a. Gold in the form of nuggets
    b. Copper in the form of shreds or powder or ingots/bars
    c. Aluminum in the form of shreds or powder or ingots
    d. Iron in the form of bales or shreds

4. SPCBs/PCCs should give annual processing capacity in terms of weight of waste electrical and electronic equipment (WEEE) which the recycler can process.
(**Example 1:** - **ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1… = 15000 Tonnes per Annum**).

    Example 2: - **CEEW1, LSEEW2 = 1000 Tonnes per Annum**)

    In case of a recycling facility which has capability of recycling printed circuit board (PCB) only, the SPCBs/PCCs should mentioned quantity of PCB

    (**Example 3**: - printed **circuit board (PCB) = 500 Tonnes per Annum**).

    Note: SPCBs/PCCs to ensure that the installed plants and machines are capable of processing e-waste and they should verify it before granting CTO

5. SPCBs/PCCs while issuing common CTO for recycling and refurbishing operations, the Recycling capacity and Refurbishing capacity should be given separately.
(Example: **Recycling Capacity = 400 Tonnes per Annum and Refurbishing Capacity 100 Tonnes per Annum**)

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6. Standalone dismantling facilities (other than at E-Waste Recycling unit) be allowed only if a recyclers apply for the same. Further, such recycler shall take responsibility of flow of material i.e. quantity of raw electronic waste received and quantity of dismantled electronic waste supplied to the recyclers from the said dismantling facility. The same shall also be reported in the annual return of recycler. Further, name, address and other details of such dismantler shall be the part of CTO issued to the recycler instead of individual CTO to such dismantlers. The concerned SPCBs/PCCs, therefore, should also verify the standalone dismantling facility before entering its details in the CTO of recycler.

7. Recyclers should maintain material flow record at each stage of processing in terms of input and output weight. Recyclers should also maintain records of following products / non –recyclable / Hazardous Waste materials besides the end products, as derived from E-waste, as below for ensuring material balance as per the requirement of the EPR Portal:

    a. Other metals such as Tin (Sn), Palladium (Pd), Platinum (Pt), Silver (Ag), Rare Earth metals if any
    b. Plastic
    c. Puff
    d. Rubber
    e. Oil
    f. Refrigerant gases
    g. Residues of Recycling
    h. Hazardous Waste generated and its disposed to TSDF facility

    The record should be verified by SPCBs /PCCs /CPCB / Auditors.

8. Recyclers should have data sanitization systems including hardware and software

9. **Examples for determining processing capacity:**

    Different case scenarios for determination of annual processing capacity of e-waste recycling facility are given below:

    Scenario 1 : Single line operation

    In this scenario, recycling facility has a single line of operation for producing end-products. The facility can have single or multiple stage of processing in a line operation.



A1 and A2 is the processing capacity in **Tonnes per hour** and **A1 is greater than A2**. If plant runs for 20 hours in a day, then **E-Waste processing capacity** is equal to **20 hours in a day** multiplied by **A2 Tonnes per hour** = **20 A2 Tonnes per day**.

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Example 1

A1 = 5 Tonnes per hour for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…

A2 = 4 Tonnes per hour for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…

Assuming 330 days of operation in a year and 20 hours of operation per day (3 shift),

The annual capacity will **be 20 hours in a day x 4 Tonnes per hour x 330 days** = **46200 Tonnes per Annum.** The recycler **can be given a capacity in terms of ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1..., & L1W1…. = 46200 Tonnes per Annum**

Example 2.

A1 is 2 Tonnes per hour only for ITEW1, ITEW2, CEEW1 and CEEW2

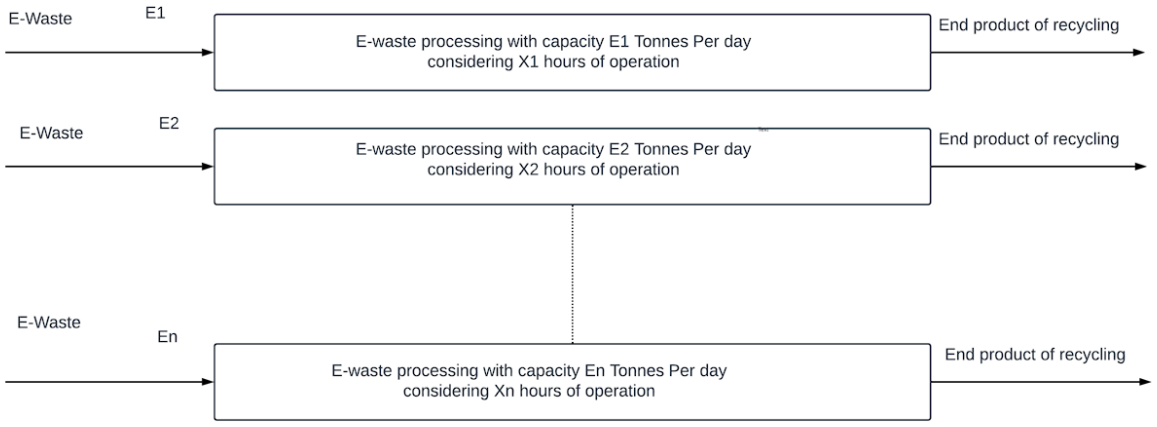
A 2 is 3 Tonnes per hour only for ITEW1, ITEW2, CEEW1 and CEEW2

Assuming 330 days of operation in a year and 8 hours of operation per day (in case of one shift),

The annual capacity will be **8 hours in a day x 2 Tonnes per hour x 330 days** = **5280 Tonnes per Annum**. The recycler **can be given a capacity in terms of ITEW1, ITEW2, CEEW1 & CEEW2 = 5280 Tonnes per Annum**.

Scenario 2: Multiple line of operations:

In this scenario, recycling facility has multiple lines of operation for producing end-products. The facility can have single or multiple stage of processing in a line operation. E1, E2, E3, ----- and En is the e-waste processing capacity per day assuming '**X1**', '**X2**', '**X3**' -------'**Xn**' hours of operation in each line



The e-waste recycling capacity of this facility shall be equal to (E1+ E2+E3+------+En) multiplied by number of days of operation in year = C Tonnes Per Annum. The recycler can be given a capacity of '**C**' Tonnes per Annum of E-Waste.

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Example 1. Where the Recycling facility has **three independent line of operation**

E1 = 100 Tonnes per day with **20 hours of operation in a day** for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…;

E2 = 15 Tonnes per day with 8 hours of operations in a day for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1..., & L1W1…;

E3 = 30 Tonnes per day with 16 hours of operation in a day for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1..., & L1W1…;

The **annual capacity** of the **recycling facility** shall be equal to **(100+15+30) Tonnes per day * 330 days =47850 Tonnes per Annum.** The recycler **can be given a capacity of 47850 Tonnes per Annum for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1..., & L1W1….;**

Example 2. Where the Recycling facility has **three (3) independent line of operation E1, E3 and E5 and two (2) dependent line of operation E2 and E4**

E1 = 80 Tonnes per day with 20 hours of operation in a day for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…;

E2 = 35 Tonnes per day with 16 hours of operation in a day for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…;

E3 = 38 Tonnes per day with 8 hours of operation in a day for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…;

E4 = 5 Tonnes per day with 8 hours of operation in a day for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…;

E5 = 45 Tonnes per day with 16 hours of operation ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…;

The **annual capacity** of the **recycling facility** shall be equal to (**80+38+45) Tonnes per day * 330 days = 53790 Tonnes per Annum**. The recycler **can be given a capacity of 53790 Tonnes per annum for ITEW1…, CEEW1…, LSEEW1…, EETW1…, TLSEW1…, MDW1.., & L1W1…..**

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Annexure 1

List of Minimum Plants and Machineries in an E-Waste Recycling Facility

S. No	Machineries
1.	Dismantling Tables (with Suction Hoods connected with cyclone and stack of height 3 meter above roof/shed)
2.	Shredder
3.	Magnetic Separator
4.	Density Separator
5.	Eddy Current Separator
6.	Conveyor (for Passage of WEEE to Shredder), Sorting Conveyor
7.	Compressor Cutting Machine
8.	Refrigerant Gas Recovery with control mechanism
9.	Compressor Oil Recovery with control mechanism
10.	CRT Cutting Machine with control mechanism
11.	Component Removing Machine (CRM)
12.	Bailing Machine/Compactor/Hydraulic Press
13.	Degaussing Machine/Data Wiping Machine/Hard Disk Drive Breakers
14.	Furnace and/or Smelting Furnace
15.	Precious Metal Recovery System, Along with all other requisite facilities/processes as per the Guidelines for environmentally sound recycling of E-Waste: Implementation Guidelines for Recyclers & Refurbishers under E-Waste (Management) Rules, 2016 available on CPCB's web site. (Note: Pyro metallurgical operations or Hydro metallurgical operations/Chemical Leaching or Electro-metallurgical operations) should have pollution control measures in place for example cyclone, scrubber, off gas treatment, and venting arrangement).
16.	Wire Stripper and/or Wire Cutter and/or wire peeling machine
17.	Tube light/CFL Recycling
18.	Air Pollution Control Devices
19.	ETP of adequate capacity, Sludge Drying Bed and Evaporator etc.
20.	Weighing Bridge
21.	Weighing Machines/Equipment

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