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European Commission

EFTA

4th Indo-European Conference on Standards & Emerging Technologies

7th December 2023 | The LaLiT, New Delhi, India

CIRCULAR ECONOMY (E-WASTE)

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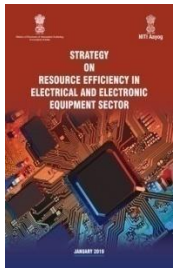
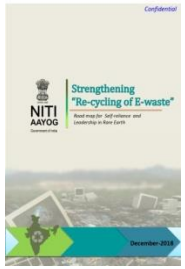
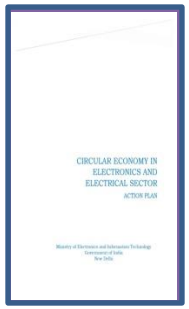
Ministry of Electronics and Information Technology

Background







'Resource Efficiency & Circular Economy for EEE Sector' released by NITI Aayog & EAC-PM & on 22/01/19. Strategy paper drafted along with MeitY

NITI Aayog released a report on "Strengthening Recycling of E-waste" for strengthening recycling of e-waste on 12.09.19, prepared by MeitY

'Circular Economy for EEE Sector' : Action Plan, prepared by MeitY submitted to NITI Aayog on July 2021

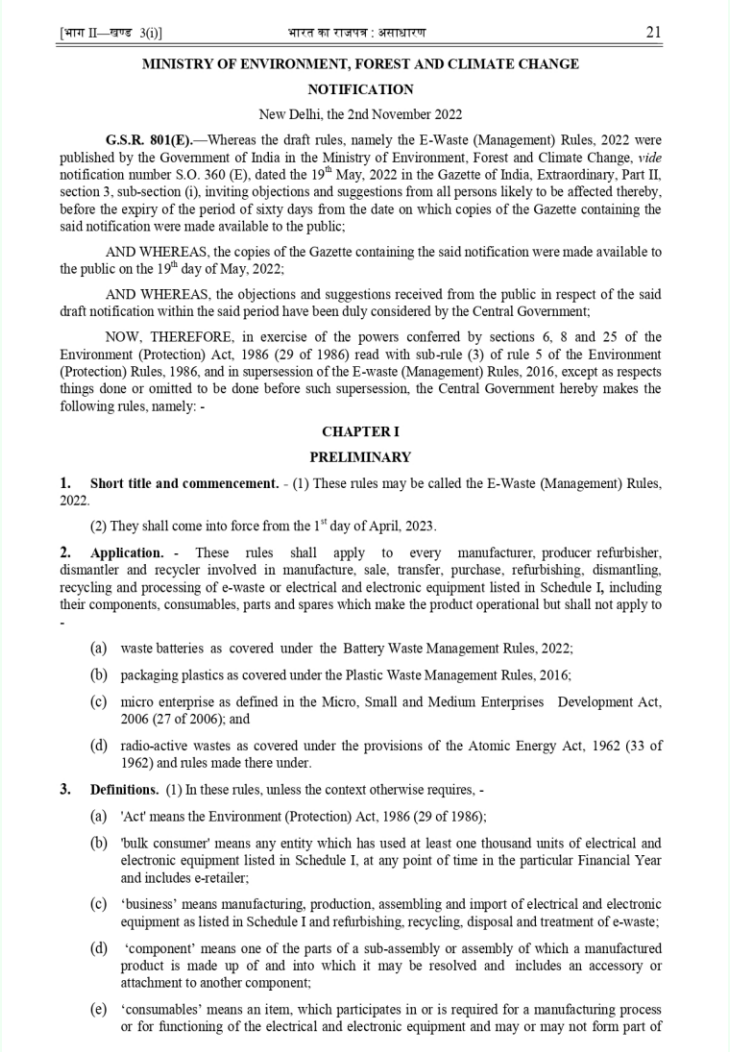
NITI initiated follow up since November 2021

Key Action Plan- highlights

- Design and other CE principles for electronics & electrical sector
- Bring out a “Sustainable Product Policy”
- Tracking SRM and encourage manufacturing to use them
- Institutional arrangement to track critical materials
- Set up material sampling labs to assess the SRM presence in products,
- Upgrade informal sector to formal economy to boost collection & better segregation and enrich materials value
- Create infrastructure, affordable technology, local machines to ensure RE in recycling
- Incentivize manufacturers for recyclable design, SRM use in future products
- Adopt internationally harmonized resource efficiency/circular economy.
- Adopt international standards: EU’s CEN/CENELAC in entire value chain
- Green Skill Development Programme,
- Green public procurement (GPP) in-line with global frameworks & BPs.

Action Taken: E-waste Management Rules 2022

- Enacted since 1st April 2023
- Applicable to manufacturer, producer, refurbisher, dismantler & recycler
- 'digitalized systems approach'
- authorization replaced by registration online portal
- EPR mandatory 'Registration of Stakeholders'
- Producers of notified EEE to submit annual E-Waste Recycling targets
- Schedule-I expanded 21 to 106 EEE
- generation & transaction of EPR Certificate
- environmental compensation & verification & audit



[भाग II—खण्ड 3(i)] भारत का राजपत्र : असाधारण 21

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 2nd November 2022

G.S.R. 801(E).—Whereas the draft rules, namely the E-Waste (Management) Rules, 2022 were published by the Government of India in the Ministry of Environment, Forest and Climate Change, *vide* notification number S.O. 360 (E), dated the 19th May, 2022 in the Gazette of India, Extraordinary, Part II, section 3, sub-section (i), inviting objections and suggestions from all persons likely to be affected thereby, before the expiry of the period of sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;

AND WHEREAS, the copies of the Gazette containing the said notification were made available to the public on the 19th day of May, 2022;

AND WHEREAS, the objections and suggestions received from the public in respect of the said draft notification within the said period have been duly considered by the Central Government;

NOW, THEREFORE, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, and in supersession of the E-waste (Management) Rules, 2016, except as respects things done or omitted to be done before such supersession, the Central Government hereby makes the following rules, namely: -

CHAPTER I

PRELIMINARY

1. Short title and commencement. - (1) These rules may be called the E-Waste (Management) Rules, 2022.

(2) They shall come into force from the 1st day of April, 2023.

2. Application. - These rules shall apply to every manufacturer, producer refurbisher, dismantler and recycler involved in manufacture, sale, transfer, purchase, refurbishing, dismantling, recycling and processing of e-waste or electrical and electronic equipment listed in Schedule I, including their components, consumables, parts and spares which make the product operational but shall not apply to -

(a) waste batteries as covered under the Battery Waste Management Rules, 2022;

(b) packaging plastics as covered under the Plastic Waste Management Rules, 2016;

(c) micro enterprise as defined in the Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006); and

(d) radio-active wastes as covered under the provisions of the Atomic Energy Act, 1962 (33 of 1962) and rules made there under.

3. Definitions. (1) In these rules, unless the context otherwise requires, -

(a) 'Act' means the Environment (Protection) Act, 1986 (29 of 1986);

(b) 'bulk consumer' means any entity which has used at least one thousand units of electrical and electronic equipment listed in Schedule I, at any point of time in the particular Financial Year and includes e-retailer;

(c) 'business' means manufacturing, production, assembling and import of electrical and electronic equipment as listed in Schedule I and refurbishing, recycling, disposal and treatment of e-waste;

(d) 'component' means one of the parts of a sub-assembly or assembly of which a manufactured product is made up of and into which it may be resolved and includes an accessory or attachment to another component;

(e) 'consumables' means an item, which participates in or is required for a manufacturing process or for functioning of the electrical and electronic equipment and may or may not form part of

Action Taken: R&D to develop cost effective Recycling Technologies

Centre of Excellence on E- Waste Management

1. **PCB Recycling Technology trough Pyrometallurgical followed by Hydrometallurgical process**

- Patent filled
- Technology augmented to 300 Kg/day capacity: TRL: 6
- Recycling services to 5 industries for recovery of precious metals
- Completed design augmentation of recycling process equipment: 1000 kg/ day.
- Designed the dismantling system equipment for SMEs & large scale.
- Technology transferred to **2** NAMO eWaste, Faridabad

2. **Li ion Recycling Technology trough Pyrometallurgical & Hydrometallurgical routes**

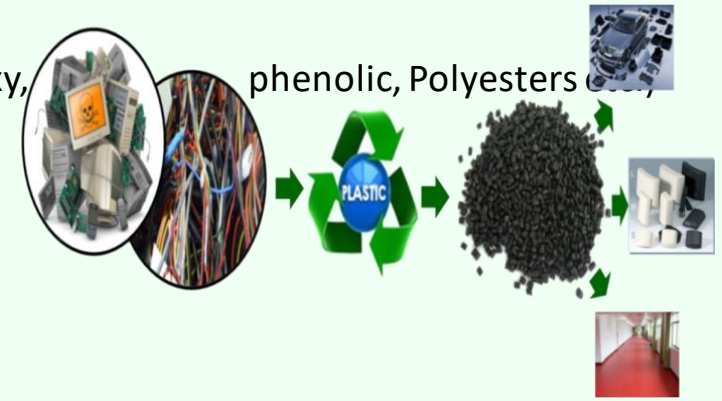
- Patent filled
- Technology transferred: **30**
- Selective metal recovery process from both stabilized: TRL: 6
- High metal recovery with less burning loss through pyro-mettalurgical route
- 100 % Li, 90 % Co, 100 % Mn extracted through H.M. route using selective solvent

Action Taken: R&D to develop cost effective Recycling Technologies

Centre of Excellence on E- Waste Management

3. **WEEE Plastics Recycling**

- 7 categories of plastics: (ABS, HIPS, PC, PP, PVC, nylons, Epoxy, phenolic, Polyesters ...)
- Technology matured : TRL: 7
- Patent awarded
- Technology Transferred **2**



4. Rare Earth extraction from Fluorescent Lamp Phosphors

- Technology matured : TRL: 6
- Red Phosphor:Y_2O_3:Eu3+ Y-67.2%, Eu-6.5%, Green:$CeMgAl_{10}O_{17}$:Tb3+Ce-9.5% Tb-5.3%,Mg-5.7%,Al-31.3%.
- Blue :BaMgAl10O17: Eu2+, Eu-1.9%, Ba-12.4%, Mg-2.7%,Al-32.4%
- Patent filled

5. Rare Earth elements extraction from spent Permanent Magnets

- Technology matured : TRL: 5
- Patent filled

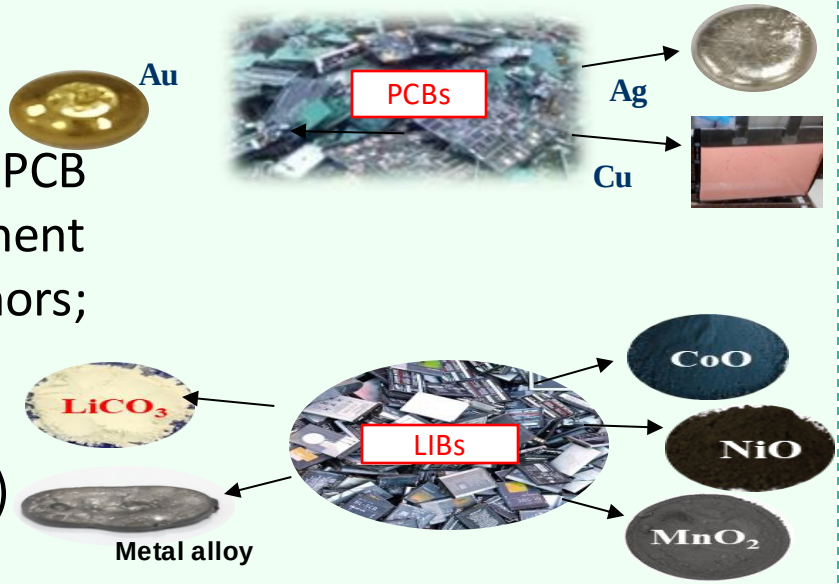
6. **Recovery of valuable materials from end-of life silicon solar cells**

- Technology matured : TRL: 2
- Thermal treatment, Chemical processing (dissolution and extraction), recovery of solar grade Si,
- Treatment of waste chemicals

Action Taken: R&D to develop cost effective Recycling Technologies

Centre of Excellence (CoE) on E-waste management

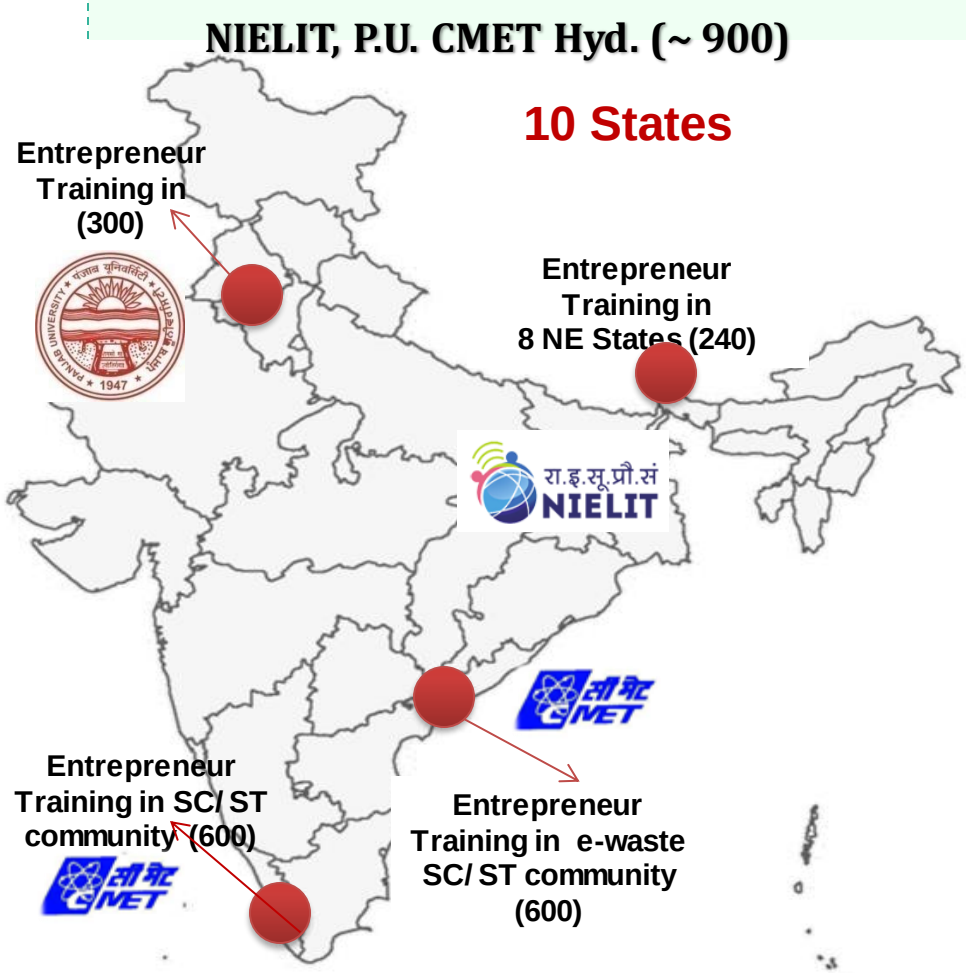
- CoE established at C-MET, Hyderabad.
- Recycling Technologies developed (a) PCB recycling (b) Li-ion batteries (c) Permanent Magnets, (d) Fluorescent Lamp Phosphors; and (e) Photovoltaic solar cells.
- 4 Start-up incubated,
- ToT: **2** industries (PCB), **18** (Li-ion battery)



Manufacturing of NdFeB Magnets from Spent Magnets

- A process for preparation of high purity Neodymium metal & praseodymium metal from secondary rare earth sources
- A pilot plant for Rare Earth (Neodymium) magnets manufacturing from spent magnets

Action Taken: Skill and Capacity development



E-waste dismantling/segregation facility set up at NIELIT Gangtok, PU Chandigarh, CMET Hyderabad

Standard content on e-waste dismantling, segregation developed

Course curriculum developed for skill development recognized by NSQF.

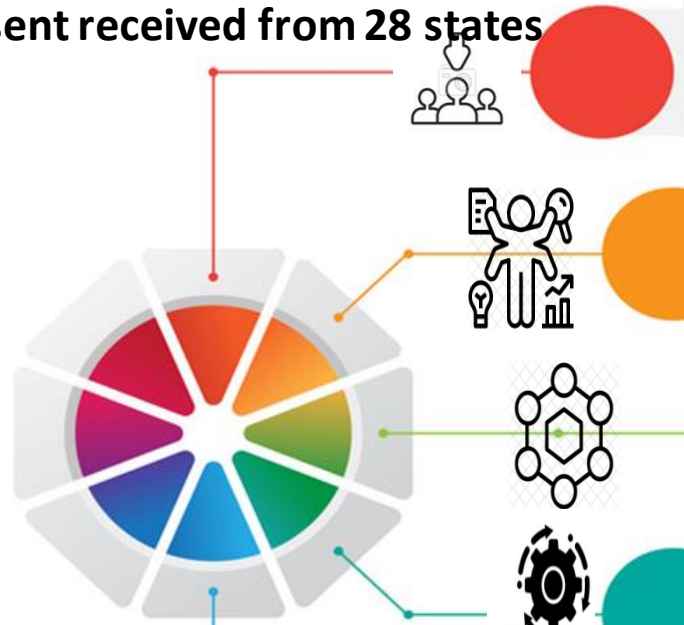
>900 skilled manpower created for generating entrepreneurs

AICTE recognised M. Tech Course on E-waste at IIT Hyderabad

Action Taken: Recycling clusters: Technology proliferation Informal sector

Objectives: Train informal 15,000 operators, register them as micro- entrepreneurs, ensure their capacity building, provide adequate tolls, equipment, technology, finance

Consent received from 28 states



Accelerators to submit execution plan, list of 15000 candidates

Skilling informal operators for dismantling, segregation & micro- entrepreneurs

30 Cluster formation : Accelerators to assist informal sectors to apply the scheme to obtain fund

Technology handholding with indigenously developed tech. to identified Accelerators/ provide technology

CDP scheme of M/o MSME- in-principally agreed

Accelerators to submit operation & completion certificate of MSME clusters to labs

Action Taken: Incentive Scheme- State of Art Recycling facilities

- Amended SPECS Guidelines, notified 18/36/2020, dated 3/3/20222
- Recycling facility for extraction of precious metals from e-waste components, including PCB (both populated & bare), Li-ion batteries, spent magnets, Solar PV panels, catalytic converters & any other components from electronics waste (any one components or in combination)
- The scheme provides financial incentive of 25% on capital expenditure

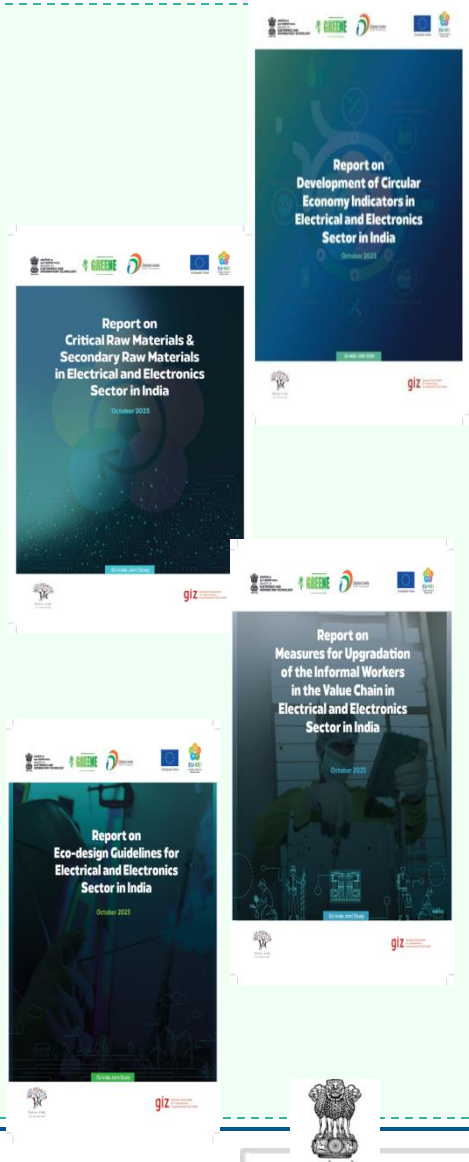
Status: **6 proposals so far received**

Action Taken: Global Best Practices

Project Contour

1. Studies on Global BAT, identifying CRM & tracking SRM
2. Adoption of internationally harmonized best practices: EU's Prospecting Secondary raw materials in the Urban mine and Mining wastes (**PROSUM**)
3. Techno-financial analysis, comparison of local/global recycling/refurbishment technology & compilation of BP
4. Adoption of best practices i.e Create value chain, Trading, Integration of SRM with global supply chain
5. Integration and upgradation of informal sector
6. Develop guidelines with Global Best Practices to promote Eco-design
7. Identify the products with best environmental performance
8. Evaluate the performance, productivity and waste discharge

Major Deliverables: Study reports, Devise CE index for policy decision



Action in progress

- Skill development of informal sector, repairing centres etc.
- Awareness programmes on e-waste management, RE/CE label to make consumers responsible towards product usage & safe disposal
- Sustainable product policy to promote design for recyclable & longer lasting products
- Adopt design for recyclability, disassembly, repair-ability and log lasting products
- Incentive Structure for Manufacturer under PLI scheme
- Product subscription/lease model
- Incentive plans to promote best available technologies
- Adoption of best practices i.e Create value chain, Trading, Integration of SRM with global supply chain
- Guidelines to promote Eco-design with global best practices,
- Criteria for identifying products with best environmental performance

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