

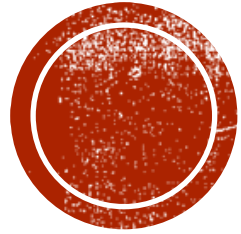
E-WASTE MANAGEMENT IN INDIA

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E-WASTE SITUATION ANALYSIS



WHAT IS E-WASTE AND WHY SHOULD WE MANAGE IT?

E-waste or Waste Electrical and Electronic Equipment (WEEE) is loosely discarded, surplus, broken, obsolete electrical and electronic devices like mobile phones, IT equipment, household appliances. E-waste contains hazardous substances and components like lead, mercury cadmium, printed circuit boards, arsenic, silicon, chromium, barium, bromine, poly vinyl chloride and other heavy metals.

E-waste is one of the fastest growing waste stream. In India it is growing at a rate of 30% per annum [2]. The key reasons for this are **increasing rate of consumption** and **high obsolescence rates** due to technology upgradation.

E-waste is a not desirable but there is value and a huge business opportunity in it.

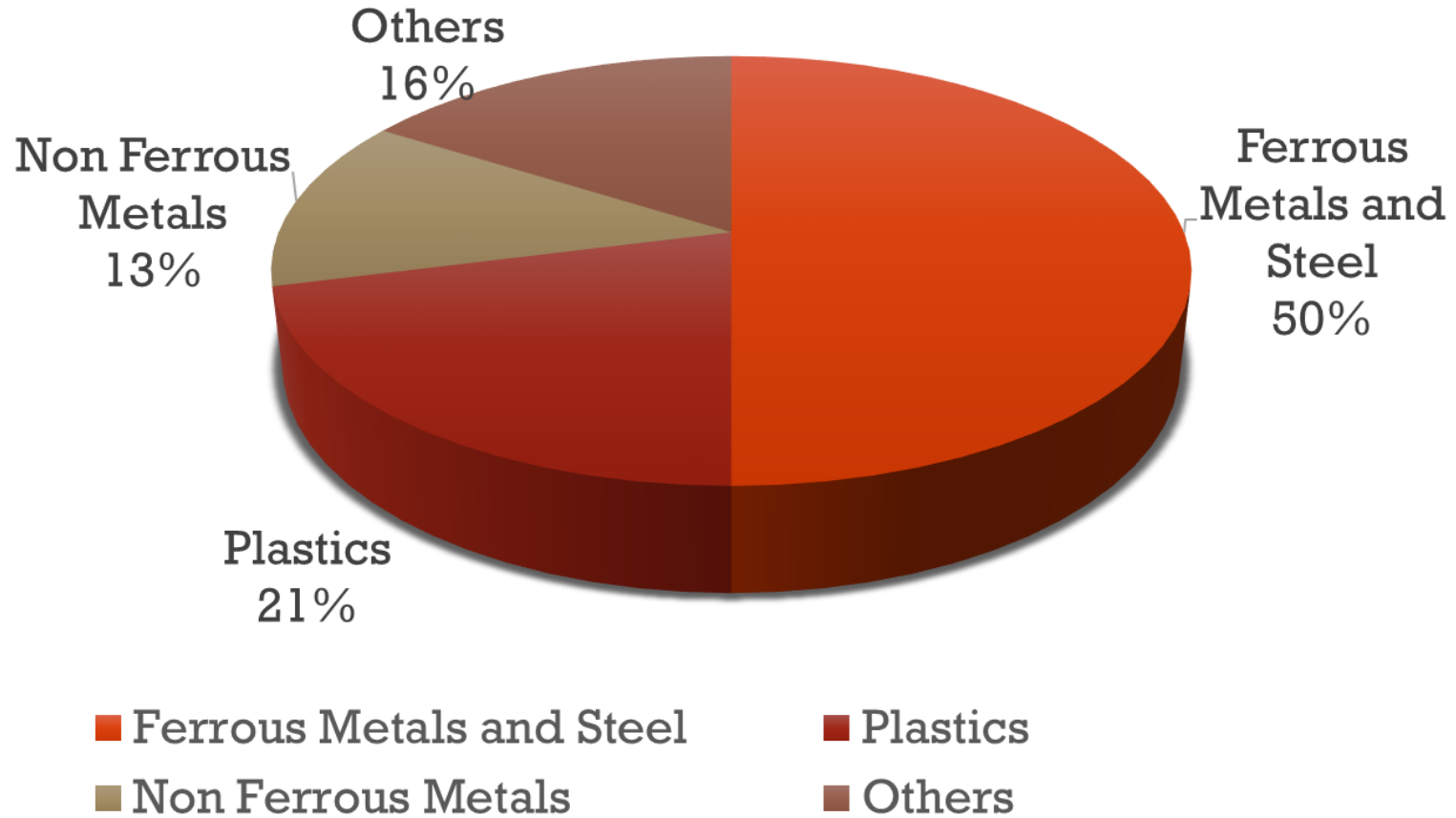
- 1 E-waste_Business_Model_Pune.pdf
- 2 <http://www.assochem.org/newsdetail.php?id=5725>
- 3 <http://ewasteguide.info/making-profit-from-m>

COMPOSITION & RESOURCE POTENTIAL OF E-WASTE

Composition of E-waste:

- Ferrous metals & steel
- Non-ferrous metals
- Plastics
- Glass
- Wood and plywood
- Printed Circuit boards
- Concrete and ceramics
- Rubber and other items

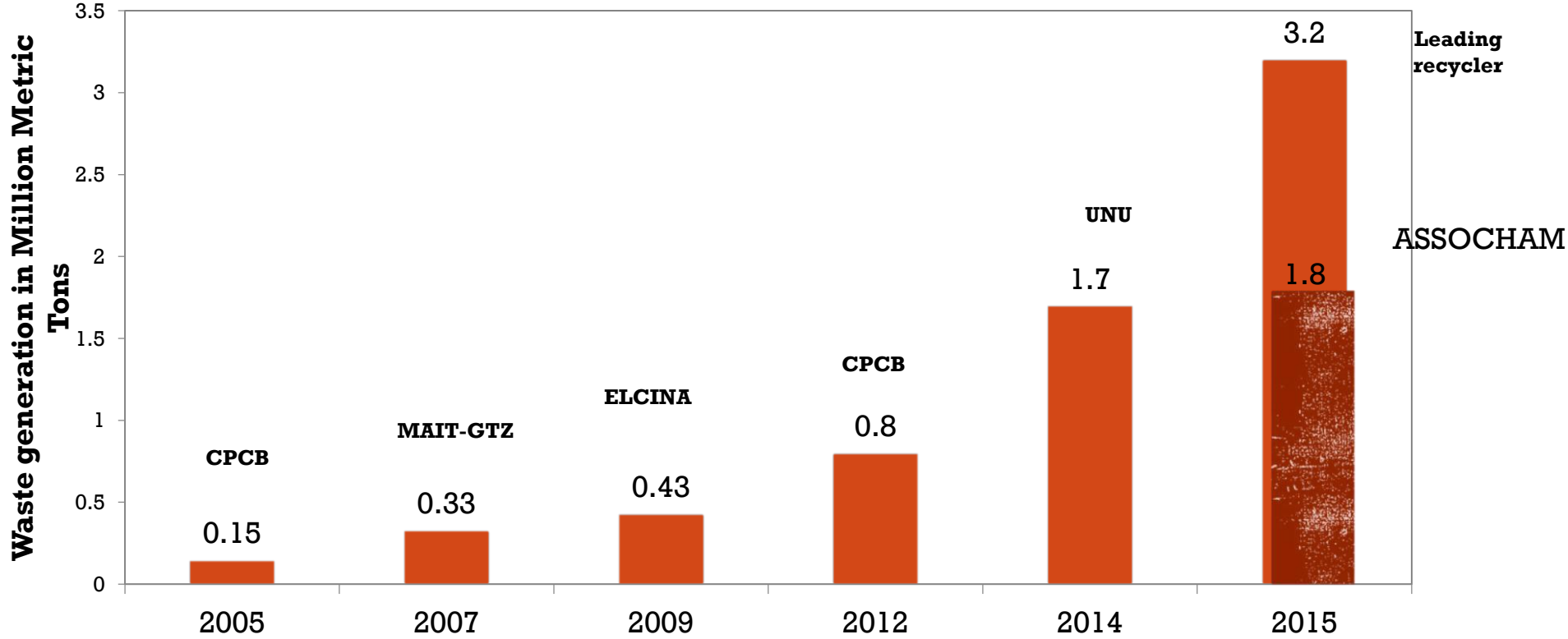
Resource potential from E-Waste



GENERATION OF E-WASTE IN INDIA

- Globally, it is estimated that the total amount E-waste generated in 2014 was 41.8 MMT which is is forecasted to increase to 50 MMT per annum in 2018
- In Asia, E-waste generated was 16 MMT in 2014 with China generating the highest (6 MMT) followed by Japan (2.2 MMT) and India (1.7 MMT)

E-waste generation estimates in India



Note:

- Additionally, **0.05 MMT is imported**
- E-waste generation is expected to reach 5.2 MMT as per ASSOCHAM

MMT – Million metric tonnes per annum

INVENTORIZATION OF E-WASTE (A CHALLENGE)

Inventorization of E-waste is one of the most critical challenges. There is no established and agreed upon methodology to conduct an inventory. While CPCB estimated a quantity of 0.8 MMT in 2012, a UN report estimated 1.7 MMT in 2014 and a leading Indian recycler estimated it to be 3.2 MMT in 2015 which is expected to grow to 20 MMT by 2020.

Inventorization exercises were undertaken by both public bodies like MPCB, EPTRI (Hyderabad) and by market research companies like IMRB. These studies were conducted in cities like Mumbai, Pune, Hyderabad, Bangalore and Kolkata. Broadly, the research methodologies adopted were:

- Determining E-waste generated based on **sales data** and **equipment obsolescence rates and rigorous market study**
- Determining E-waste generated based on **tracer method** i.e. by tracking a component of a particular electronic good (Example: CRTs received by a recycler to estimate the number of PC disposed)



Recycled CRTs are used to track the amount of PC waste generated

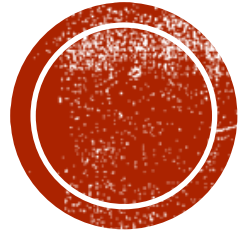
PROLONGED E-WASTE STORAGE (A CHALLENGE FOR INVENTORIZIZATION)

Case study – Prolonged computer storage in Uganda:

As per the study conducted by Wasswa, Schuep [2008] about 300,000 computers were in use in Uganda. Additionally, 25,000 new and 4,000 second hand computers were imported in 2007. New computers have a life of 8-9 years while second hand computers have a life of 5 years. Around 53,000 of these were estimated to reach their end of life by 2007.

However, it was revealed that only a minor fraction of the end-of-life equipment (10%) reached the waste stream while a big chunk of E-waste was in storage.

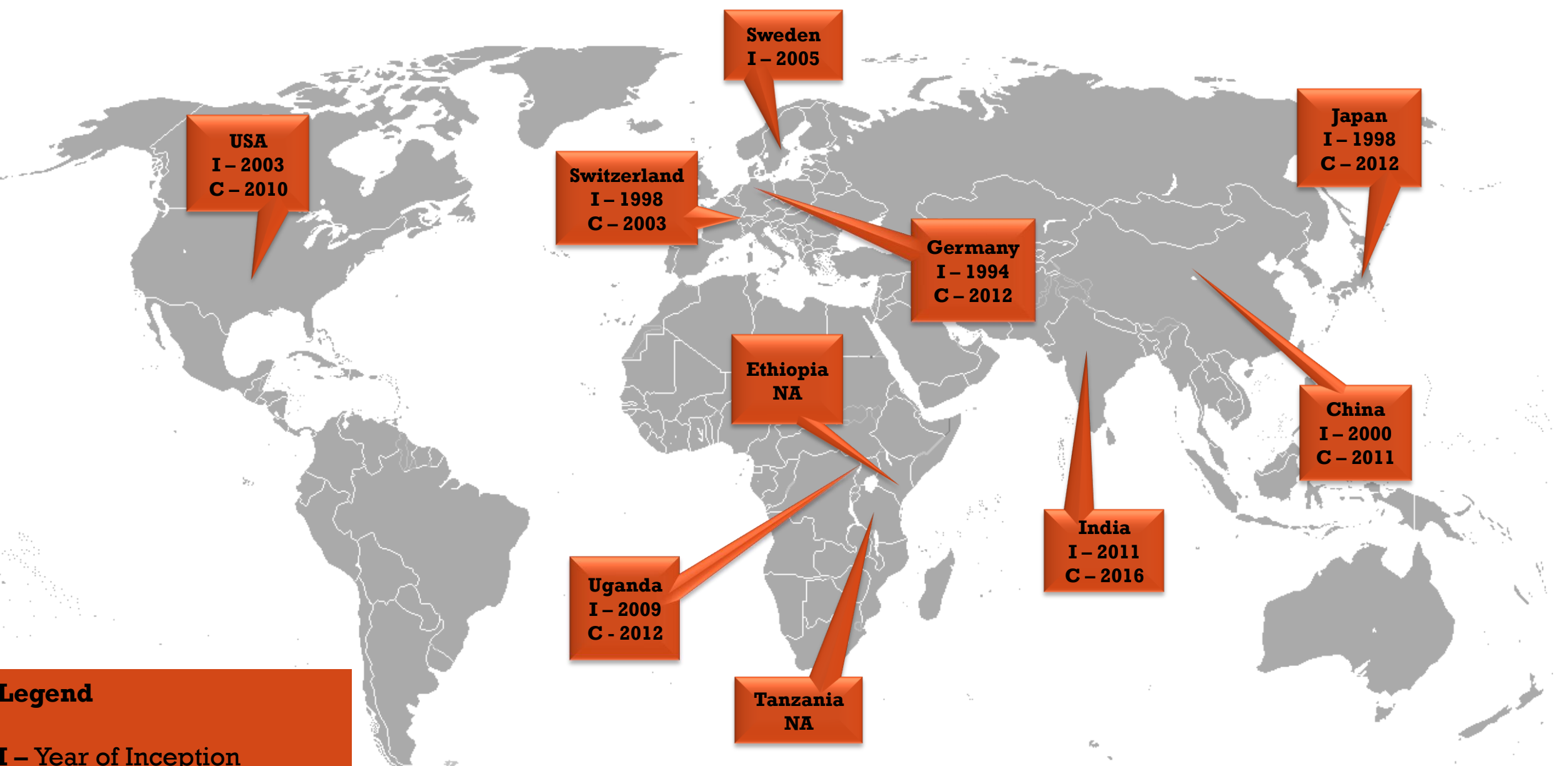




E-WASTE POLICY AND REGULATIONS



GLOBAL OVERVIEW OF E-WASTE POLICIES



Legend
I - Year of Inception
C - Current legislation

EVOLUTION OF THE E-WASTE POLICY IN INDIA

Pre-2011 Rules:

- E-waste (Management and Handling) Rules drafted in India in 2010 and were in effect from May 2012
- Prior to this, E-waste management was covered under the Hazardous Wastes (Management and Handling) Rules, 1989 as amended in 2003 and 2008
- Collaborative effort and pressure from groups such as MAIT, Greenpeace and Toxic Links culminated in introduction of E-waste (Management and Handling) Rules, 2011

EVOLUTION OF THE E-WASTE POLICY IN INDIA

Key highlights of 2011 rules:

- The rules define the key stakeholders namely producers, consumers, bulk consumers, collection center, EPR, dismantlers, recyclers, SPCB/PCC and CPCB
- Procedures were described for
 - **Authorization** – for producers, collection agencies, dismantlers and recyclers
 - **Registration** – for dismantlers and recyclers
- Bulk consumers had to maintain records of E-waste generated
- Role of **CPCB and SPCB** was well defined as regulatory bodies overseeing the implementation of rules
- Introduction of '**Extended Producer Responsibility**', a globally practiced EWM strategy
- Reduction in the use of Hazardous Substances (RoHS) in electrical and electronics equipment

EVOLUTION OF THE E-WASTE POLICY IN INDIA *contd...*

Key impacts of 2011 rules:

- **Boost to the formal recycling sector** – Introduction of the rules and mandate to obtain authorization to process E-waste resulted in increase in the registered recyclers from 23 units in 2011 of capacity 0.09 MMT [1] to 138 recyclers / dismantlers are registered with CPCB with a capacity of 0.35 MMT [2]

The 138 recyclers / dismantlers are spread across only 13 States in India which implies that either the E-waste generated in other States is collected & transported to these 13 States or that their E-waste is disposed unscientifically

1 http://rajyasabha.nic.in/rsnew/publication_electronic/E-waste_in_india.pdf

2 http://cpcb.nic.in/Ewaste_Registration_List.pdf

EVOLUTION OF THE E-WASTE POLICY IN INDIA *contd...*

Key impacts of 2011 rules:

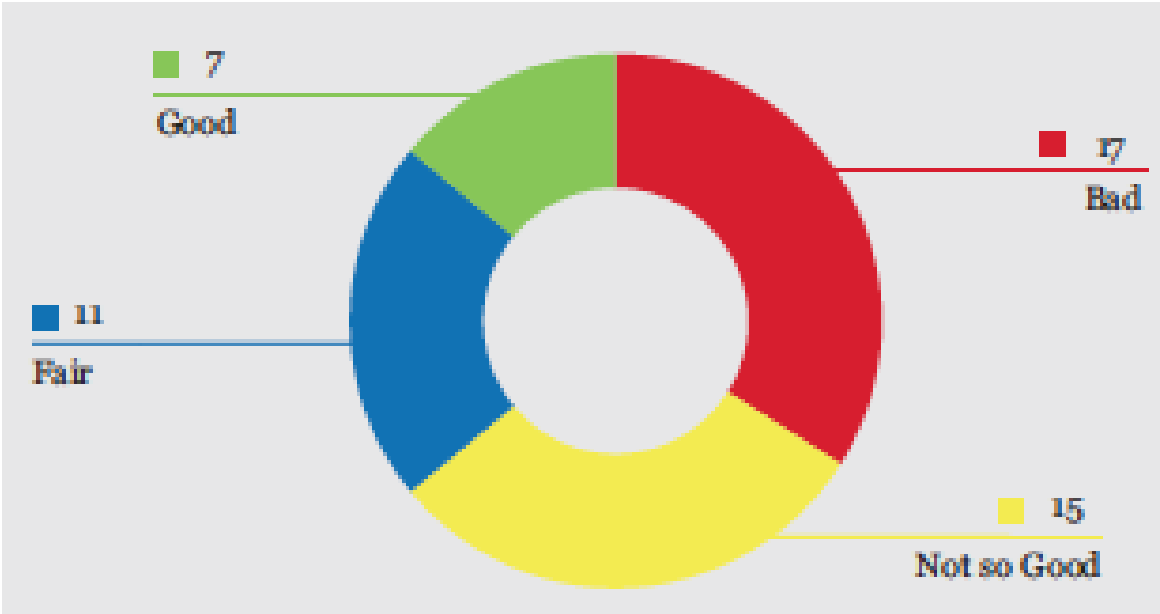
- **Introduction of the concept of EPR in India** – EPR was introduced for effective E-waste management (EWM) and action by stakeholders like producers, manufacturers, retailers, dealers to establish an operationally and economically viable E-waste management ecosystem. In this EWM strategy, the producers are assigned the responsibility to finance and organize environmentally sound ‘end of life management’ of their products
- However, this did not equate to effective execution by producers. Some action was observed by a handful of producers who address B2B EWM but largely individual consumers and general public were oblivious to this provision or mandate.

1 http://rajyasabha.nic.in/rsnew/publication_electronic/E-waste_in_india.pdf

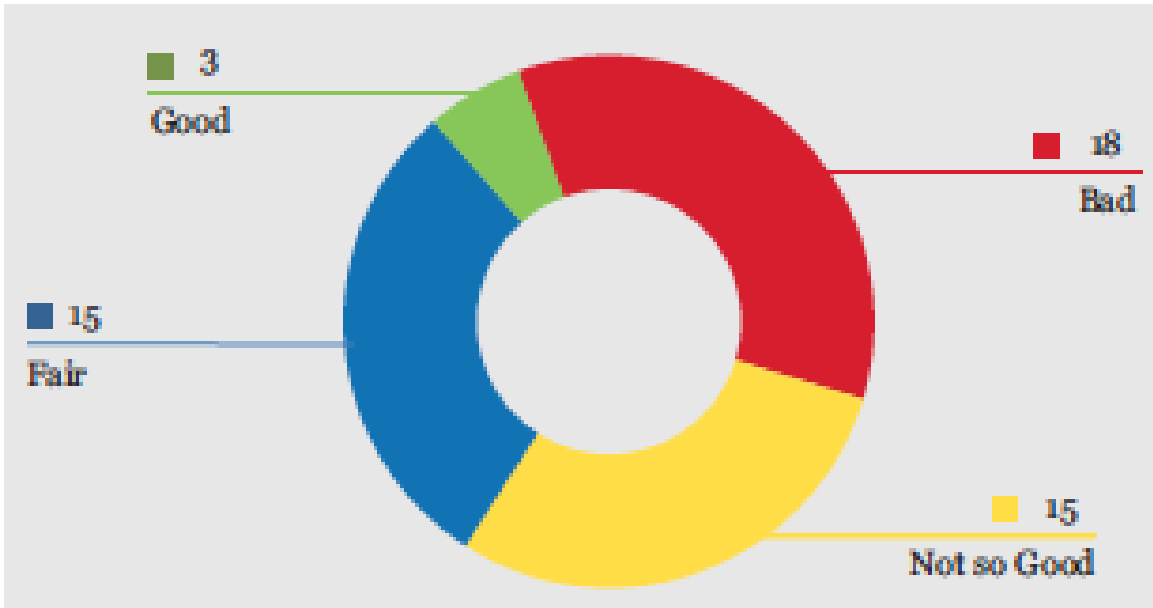
2 http://cpcb.nic.in/Ewaste_Registration_List.pdf

EPR PERFORMANCE OF INDIAN BRANDS

Toxics Link, an environmental NGO and a key stakeholder in the Indian E-waste landscape, conducted a study in 2014 and in 2015 to assess the implementation and effectiveness of EPR by producers. They rated 50 brands (companies) on a scale of 85 points in the 2014 study which expanded to a 200 point scale in 2015 [1,2]. The brand ratings in four categories (Good, Fair, Not so good, Bad) in 2014 and 2015 are shown below:



Brand rating in the 2014 study



Brand rating in the 2015 study

More brands fall under the category of 'Not so good' and 'Bad'

- 1. Time-to-Reboot by Toxics Link
- 2. Time-to-Reboot-2-Full-report by Toxics Link

EVOLUTION OF THE E-WASTE POLICY IN INDIA *contd...*

Gaps identified:

- Ineffective enforcement and monitoring systems for compliance with policy (such as submission of Form-2 or Form-3)
- Loopholes regarding collection of E-waste (responsibility vested with multiple stakeholders)
- No target-oriented goals for stakeholders
- No auditing or check procedure in place
- Absence of penalties for violators

- Financial impact of formalizing a historically informal sector not addressed
- Financial incentives to set-up and operate E-waste processing plants
- Tax benefits or incentives for stakeholders

Note: 2016 Rules discussed in the next slides attempt to address the points highlighted in green

E-waste (Management) Rules, 2016:

- The E-waste (Management) Rules, 2016 notified in March 2016 which supersedes the E-waste (Management and Handling) Rules, 2011 will come into force from October 2016
- The equipment list applicable under the rules now also include components, consumables, spares and parts of EEE, CFLs and mercury containing lamps
- The new rules identify and define roles and responsibilities for a new set of stakeholders like manufacturers, dealers, retailers, e-retailers and refurbisher, Producer Responsibility Organization (PRO)

(PRO is a co-operative industry body formed to collectively meet the EPR obligations of its member organizations)

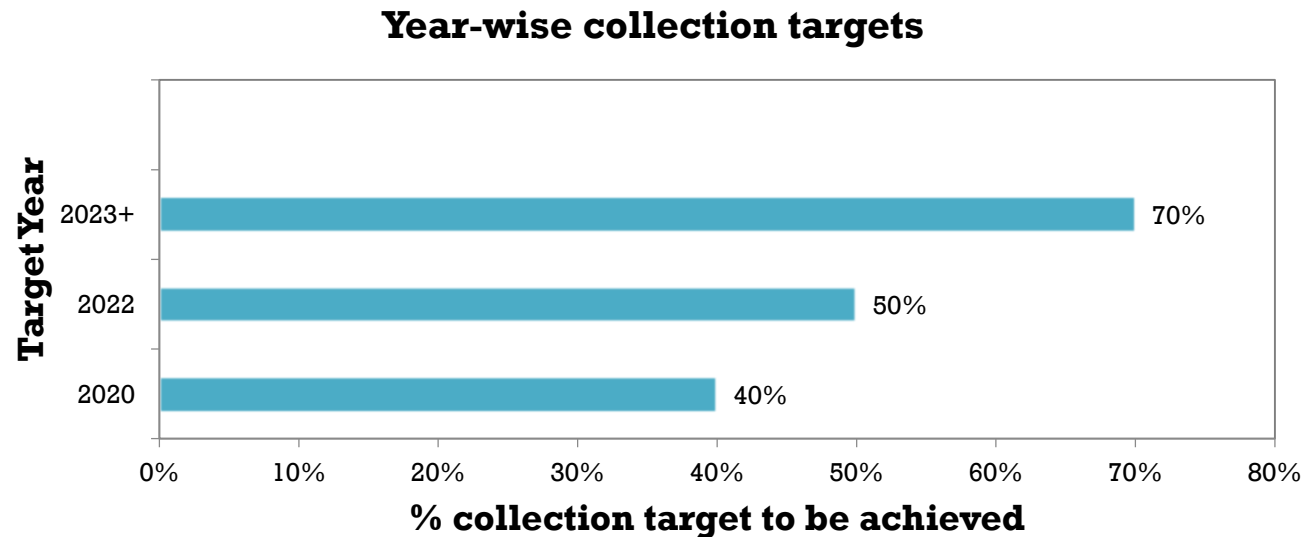
E-waste (Management) Rules, 2016:

- The issues related to the informal sector have also been addressed by introducing the role of Department of Labor to ensure safety, health and skill development of the workers involved in the dismantling and recycling operations
- Collection of E-waste is exclusively the Producer's responsibility and collection centers are an important element of the E-waste rules for collection and channelization of E-waste to recyclers
- Consumers and bulk consumers need to ensure that their E-waste is channelized through collection centre or an authorised dealer or dismantler or recycler or through the designated take back service provider

EVOLUTION OF THE E-WASTE POLICY IN INDIA *contd...*

E-waste (Management) Rules, 2016:

- To reinforce and strengthen the **EPR framework**, the following options have been provided:
 - Set-up of **PRO (individual /collective), E-waste exchange, take back / buy back programs, Deposit Refund Scheme**
 - The import of EEE is allowed only for those producers who has EPR authorization
 - Producers are liable for E-waste collection with defined collection targets to be met over the next 7 years



- Department of Industry has been given the responsibility of earmarking or allocation of industrial space or shed for E-waste dismantling and recycling in the existing and upcoming industrial park, estate and industrial clusters

EVOLUTION OF THE E-WASTE POLICY IN INDIA *contd...*

Business Implications of 2016 rules:

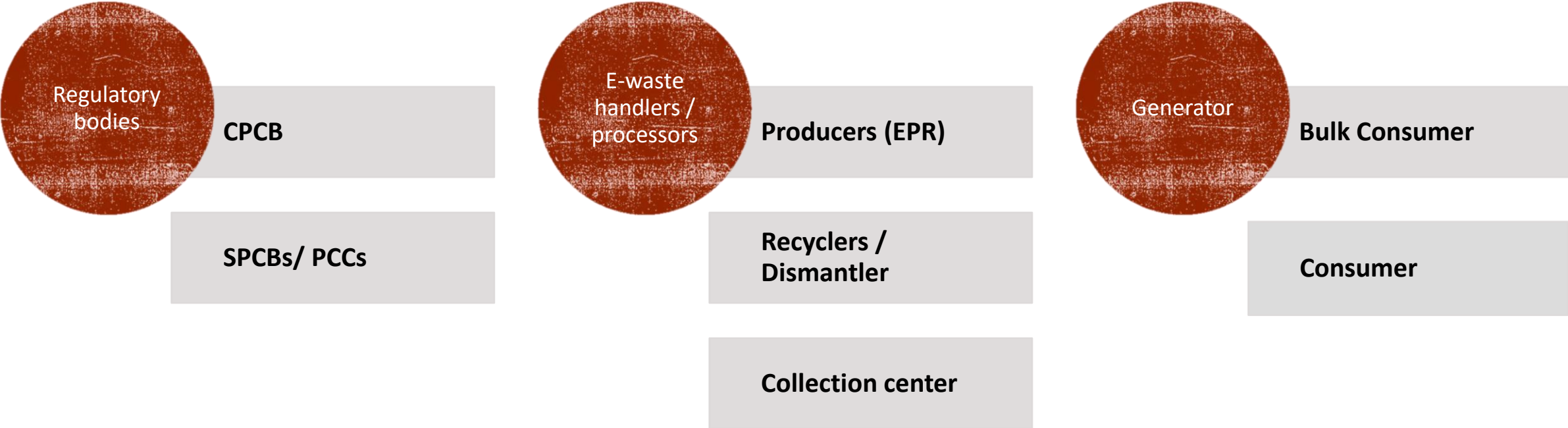
The above reforms and reinforcements to the 2011 rules can facilitate increased business opportunities in the formal sector such as:

- Reduced leakage of E-waste to the informal sector that practices unscientific recycling methods
- Improved collection from bulk consumers and from producers who need to comply with EPR leading to increased raw material supply to recycler
- Boost to the CFL / mercury lamps recycling industries

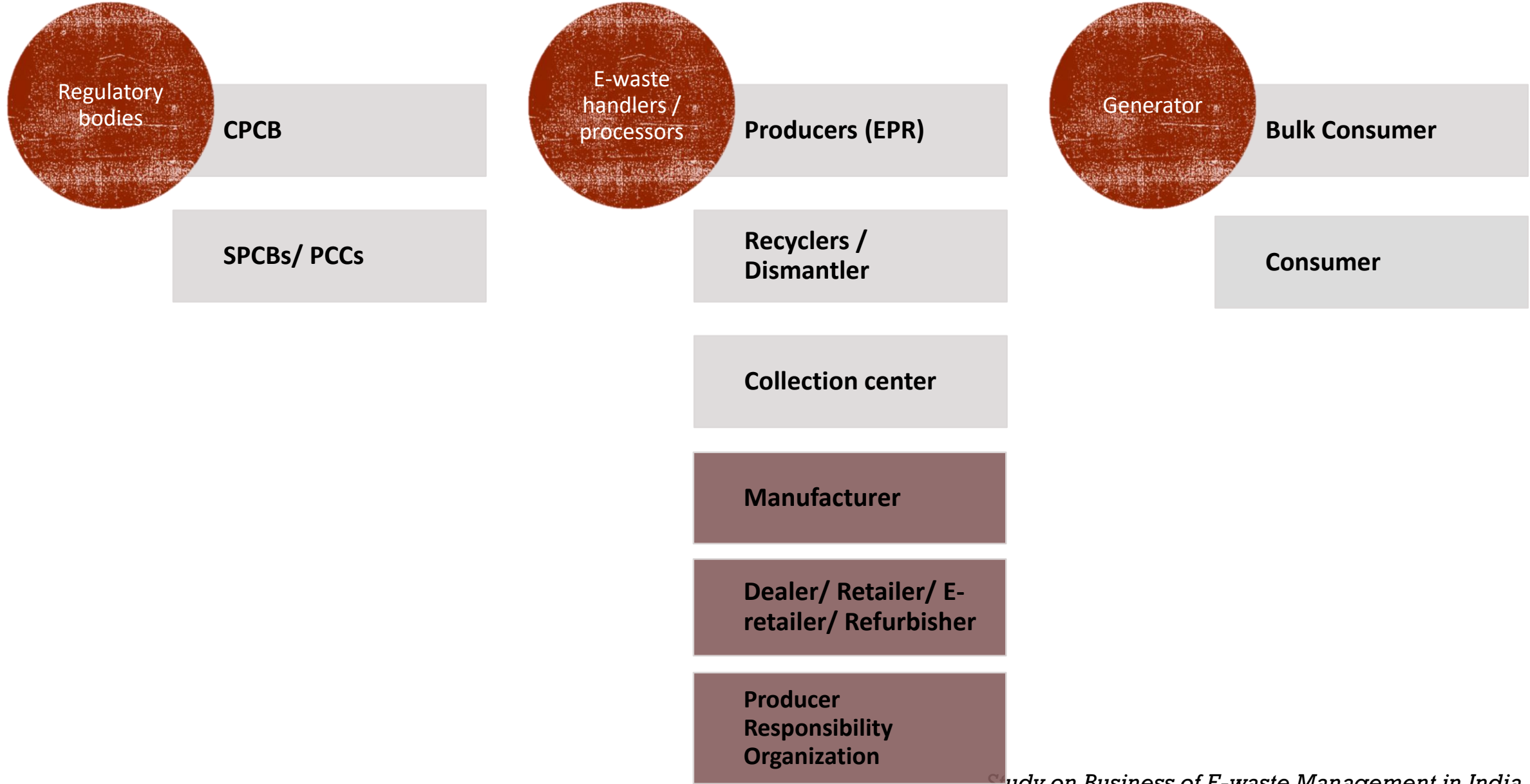
Note on CFL:

- In addition to the 2016 policy recognizing CFLs and mercury lamps as E-waste, India has signed the Minimata convention in September 2014 to phase out usage of mercury by 2020.
- But the Electric Lamp and Component Manufacturers Association of India (ELCOMA)/ CFL producers are challenging the rules, June 2016

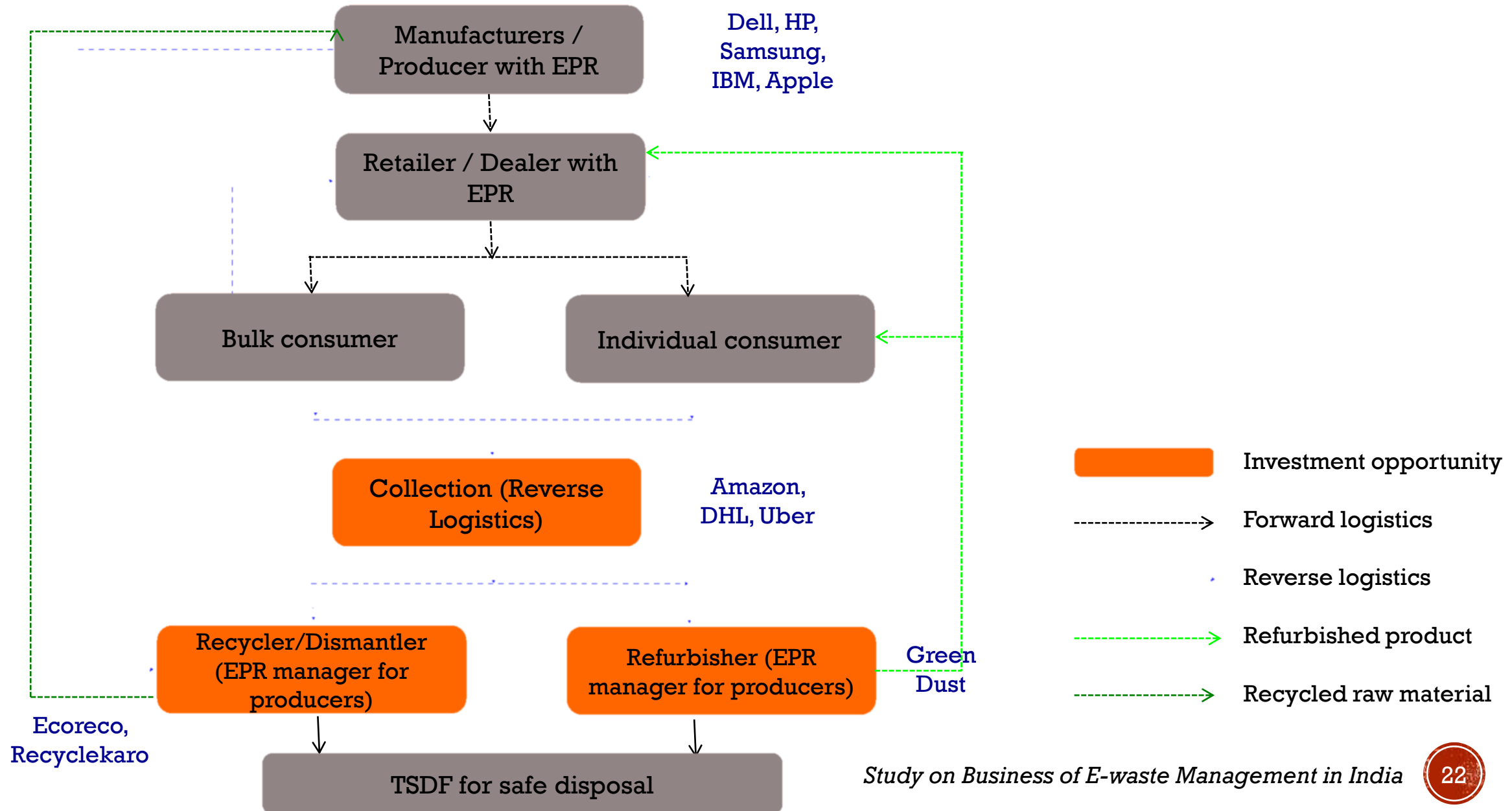
STAKEHOLDERS UNDER E-WASTE RULES, 2011



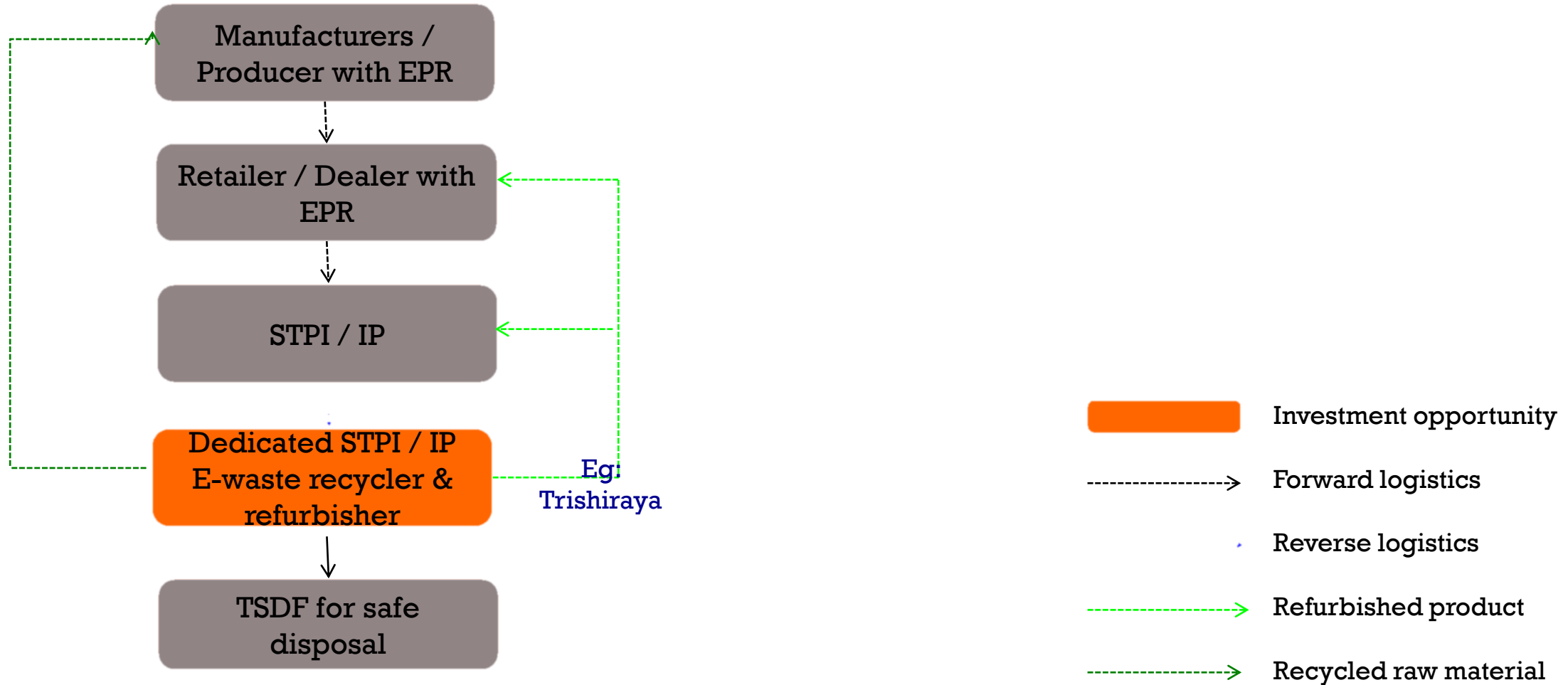
STAKEHOLDERS UNDER E-WASTE RULES, 2016



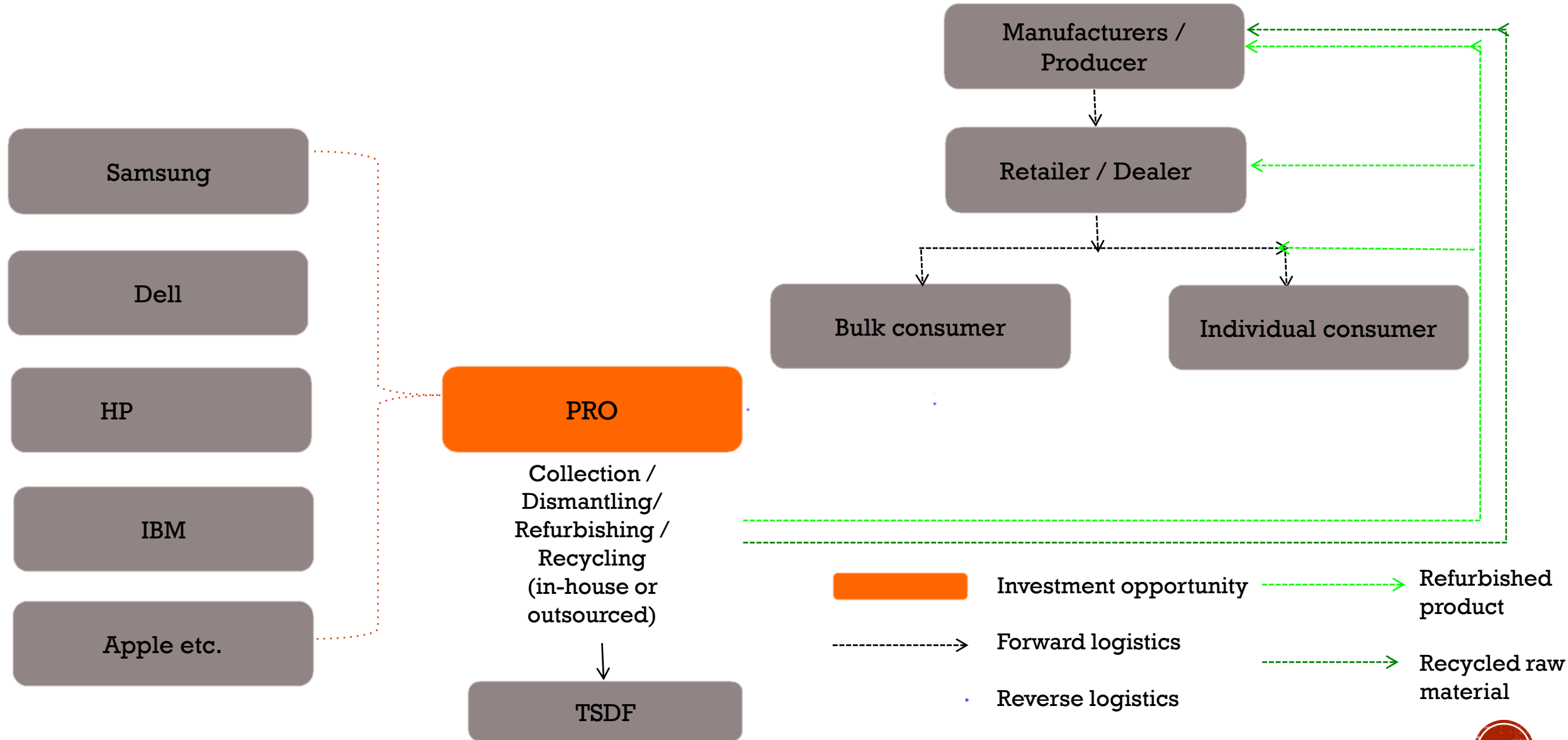
MODEL 1 - BUSINESS TIED WITH COMPANIES PRACTICING EPR AND BUSINESS WITH BULK CONSUMERS



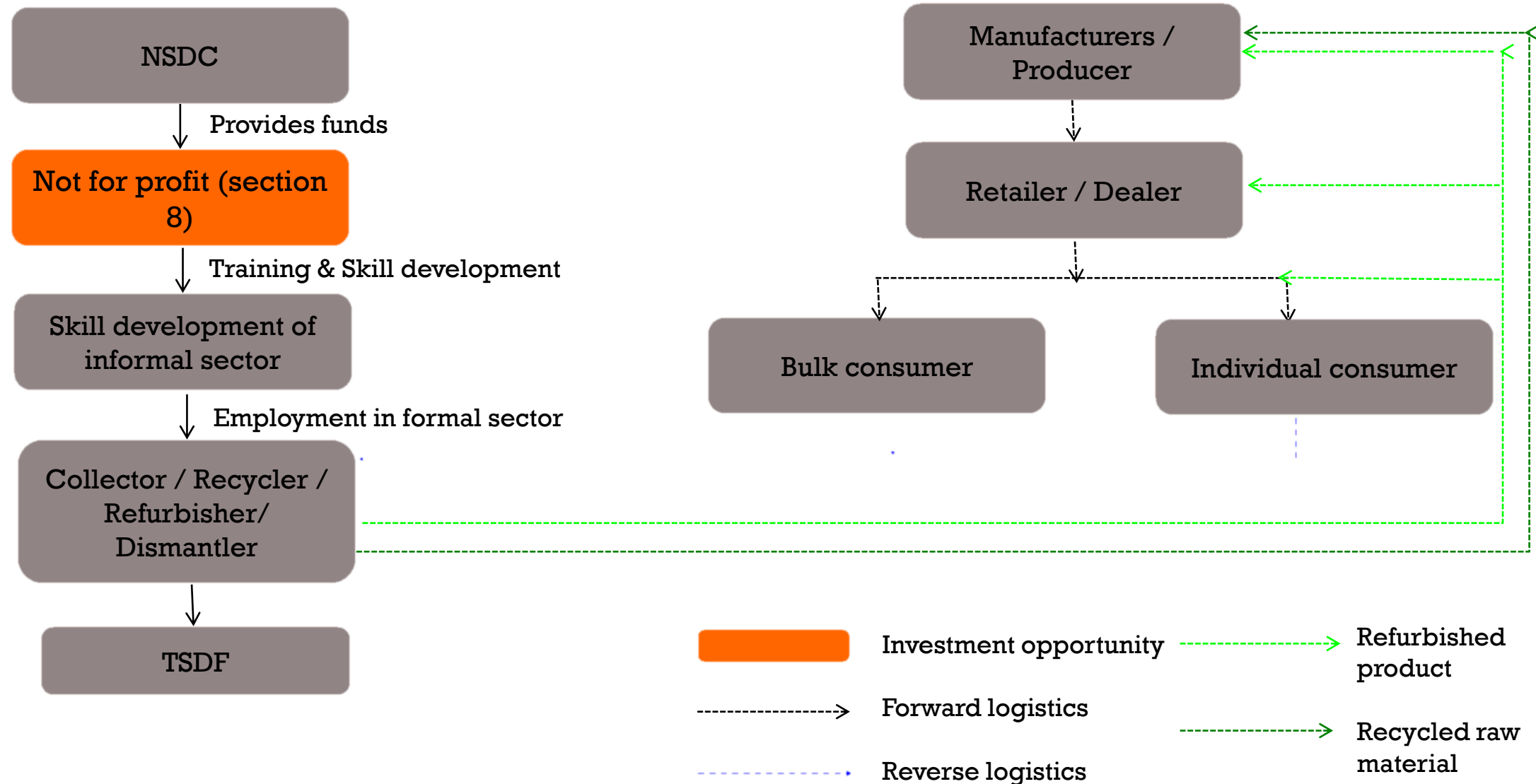
MODEL 2 - BUSINESS TIED WITH SOFTWARE TECHNOLOGY PARKS OF INDIA (STPI) AND INDUSTRIAL PARKS (IP)



MODEL 3 - BUSINESS FOCUSING ON PRO THAT OPERATES COLLECTION CENTRES WITH PRODUCERS, RECYCLERS/REFURBISHERS



MODEL 4 - BUSINESS INVOLVING INFORMAL SECTOR - THEIR ROLE & CONTRIBUTION IN E-WASTE VALUE CHAIN



SUGGESTED READING MATERIAL

1. Study to assess EPR compliance performance by Producers in 2014

<http://toxicslink.org/docs/Time-to-Reboot.pdf>

2. Study to assess EPR compliance performance by Producers in 2015

<http://toxicslink.org/docs/Time-to-Reboot-2-Full-report.pdf>

3. Comparison of electronic waste recycling in India and Switzerland

http://www.ewasteguide.info/files/Sinha-Khetriwal_2005_EIAR.pdf

4. Study of Producer Responsibility Organizations in Switzerland

http://ewasteguide.info/files/Khetriwal_2008_JEnvMgmt.pdf

5. Business plan for a E-waste dismantling unit in Uganda

[https://www.unido.org/fileadmin/user_media_upgrade/What we do/Topics/Resource-efficient_low-carbon_production/Businessplan DismantlingUganda final 150318.pdf](https://www.unido.org/fileadmin/user_media_upgrade/What_we_do/Topics/Resource-efficient_low-carbon_production/Businessplan_DismantlingUganda_final_150318.pdf)

6. Study by Greenpeace to examine the impact of EPR on innovation and greening of products

<http://www.greenpeace.org/international/PageFiles/24472/epr.pdf>