ELETRONIC WASTE (E-WASTE) MANAGEMENT

NUR NABILA MALISA BT MAZLAN
NUR IRSALINA BT AH KHALILUDIN
GU YUZHE
FARAH ZULAIHA BT FEZARUDIN
WU FEI
LIANG FANG YUAN
YANG BIN

WHAT IS E-WASTE ?

- Electronic products that have become unwanted, non-working or obsolete, and have essentially reached the end of their useful life.
- Certain components of some electronic products contain materials that render them hazardous, depending on their condition and density
- Monitors & CRT, keyboards, laptops, modems, telephone boards, hard drives, floppy drives, Compact disks, mobiles, fax machines, printers, CPUs, memory chips, connecting wires & cables

- According to Federal Environmental Protection Agency (EPA), estimates show that 4 million tones of e-waste is disposed of into landfills and 40% of lead and 70% of other toxins in landfills are the outcome of the dumped e-waste.
- E-waste is dumped in landfills the toxic heavy materials which are non-biodegradable and flammable gradually seep out and pollute the water resources and soil.

CAUSES OF INCREASING E-WASTE

DANGER OF E-WASTE

Material	Occurrence in E-waste	Health and Environmental Impact
Beryllium	Copper-beryllium alloys, springs, relays and connections	• beryllium sensitization/chronic beryllium disease • **human carcinogens** • released as beryllium oxide dust or fume during high temperature metal processing
Cadmium	Contacts, switches, nickel-cadmium (Ni-Cd) batteries, printer inks and toners	• persistent and mobile in aquatic environments (ATSDR 2000) • **damage to the kidneys and bone toxicity**, released if plastic is burned or during high temperature metal processing
Lead	Circuit boards/ cathode ray tubes CTR	• Risk for small children and fetuses • **Damage to the nervous system, red blood cells, kidneys and potential increases in high blood pressure;** • Incineration can result in release to the air

Source : https://www.slideshare.net/gauravpahuja3012/ce-105-ewaste-ce-105vcs

DANGER OF E-WASTE

Material	Occurrence in E-waste	Health and Environmental Impact
Mercury	Lighting devices that illuminate flat screen displays, switches and relays	• **Impacts the central nervous system** • Land filling and incineration of flat panel displays results in the release to the environment
PCBs (polychlorinated biphenyls)	Insulating fluids for transformers and capacitors, flame-retardant plasticizers	• **Suppression of the immune system, liver damage, cancer promotion, damage to the nervous system** • Damage to reproductive systems

Source : https://www.slideshare.net/gauravpahuja3012/ce-105-ewaste-ce-105vcs

E-WASTE IN MALAYSIA

- Authorised by Department of Environment Malaysia (DOE) and in cooperation with JICA Technical Cooperation (TC).
- About 130 collection centers and 153 recovery facilities all over Malaysia (mainly located in Penang).
- Common collected E-appliances are :-

  -television;

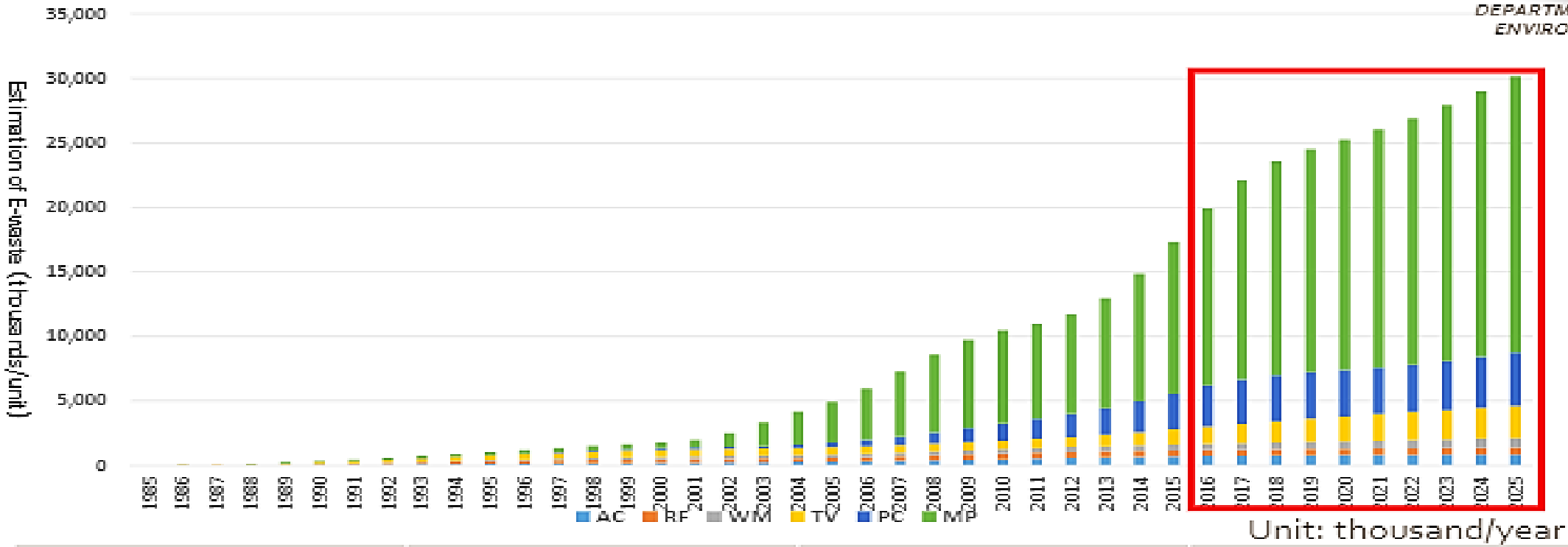
  -white goods (refrigerator and washing machine);

  -personal computer (desktop/laptop);

  -and handheld devices (mobile phones).

Estimated E-waste Generation on Malaysia

JABATAN ALAM SEKITAR
DEPARTMENT OF ENVIRONMENT

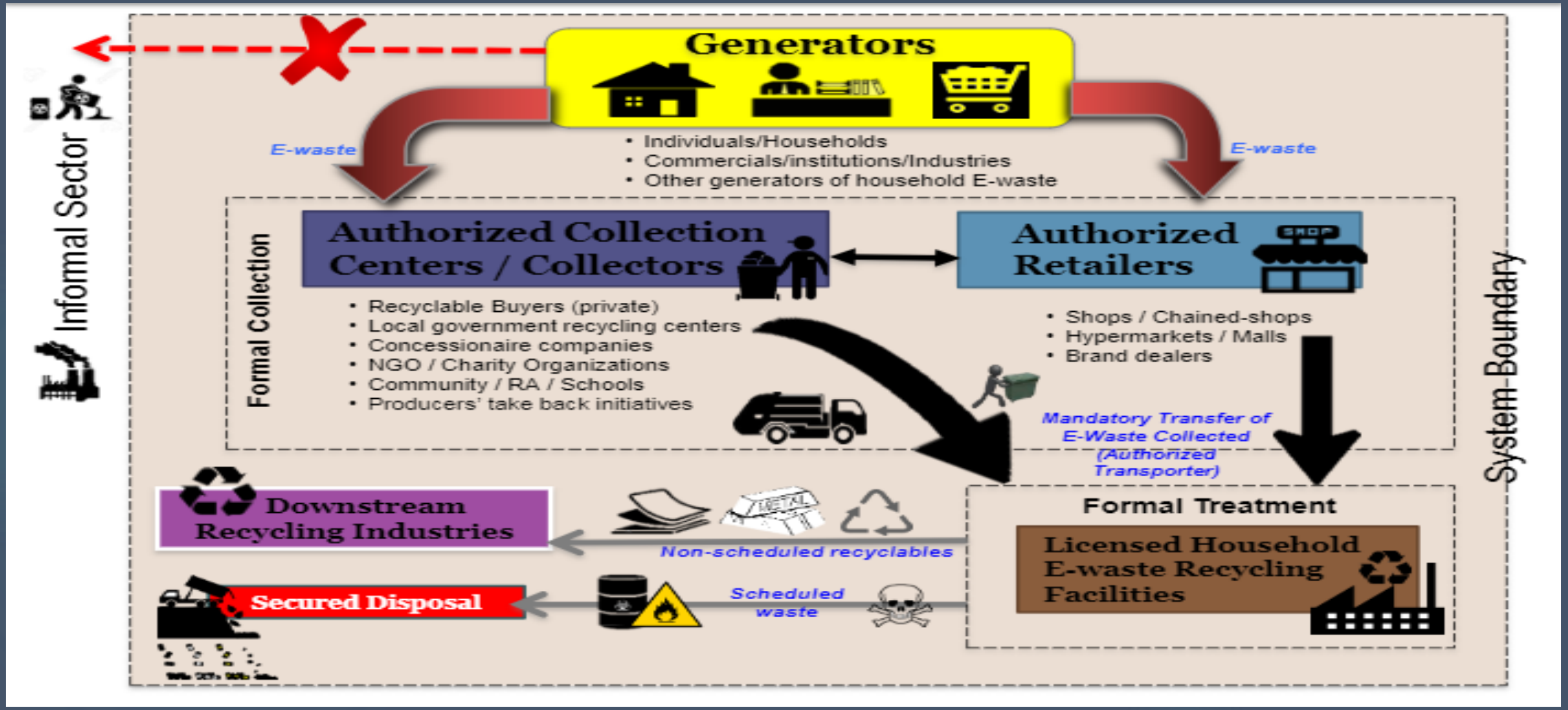


Unit: thousand/year

Item	2016	2020	2025
TV	791	1,128	1,587
Refrigerator	421	458	488
Washing Machine	264	345	445
Air Conditioners	441	677	789
TOTAL	**1,917**	**2,608**	**3,309**

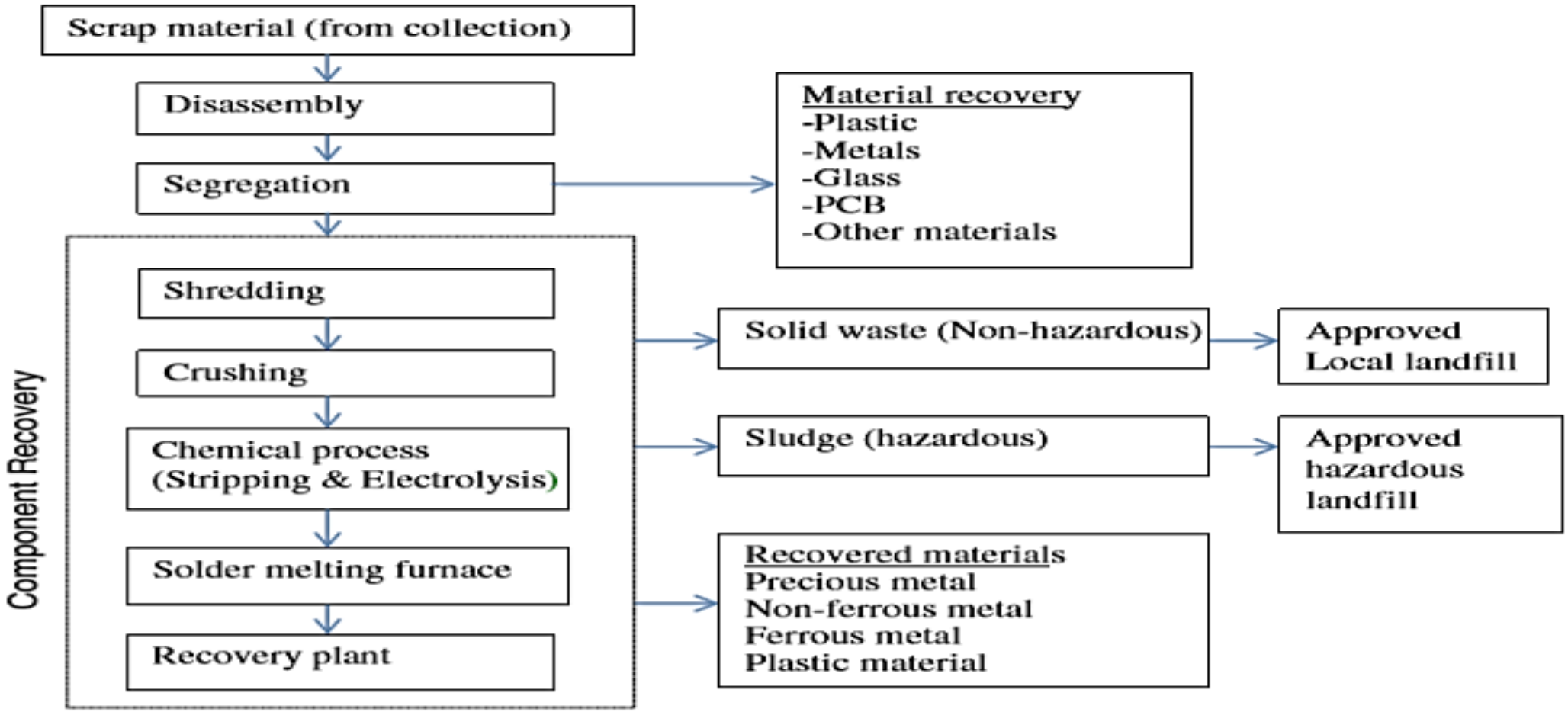
Source : E-waste Inventory Project in Malaysia, 2016

Responsibilities of Stakeholders



Source : Collection, Storage, Handling and Transportation of Household E-waste Malaysia (2018)

E-waste Recovery Process Flow



Source : Article 'Electronic waste: present status and future perspectives of sustainable management practices in Malaysia' (2014)

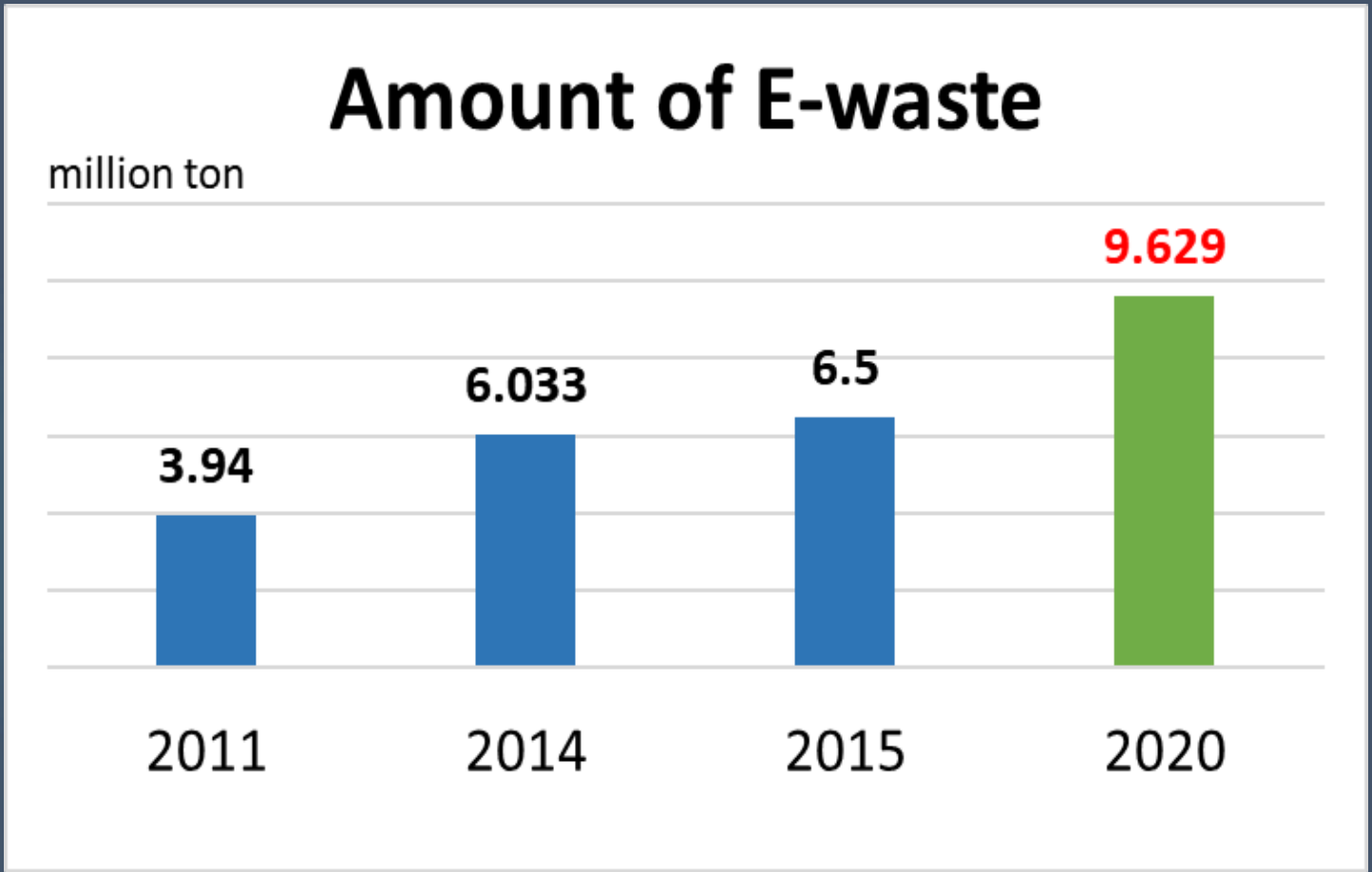
LAWS AND REGULATIONS IN MALAYSIA

- E-waste from industry: Environmental Quality (Household Scheduled Waste) Regulation 2005 (drafting)

  Generated E-waste must be treated and disposed at prescribed or or licensed premises by DOE in Environmentally Sound Manner (ESM).

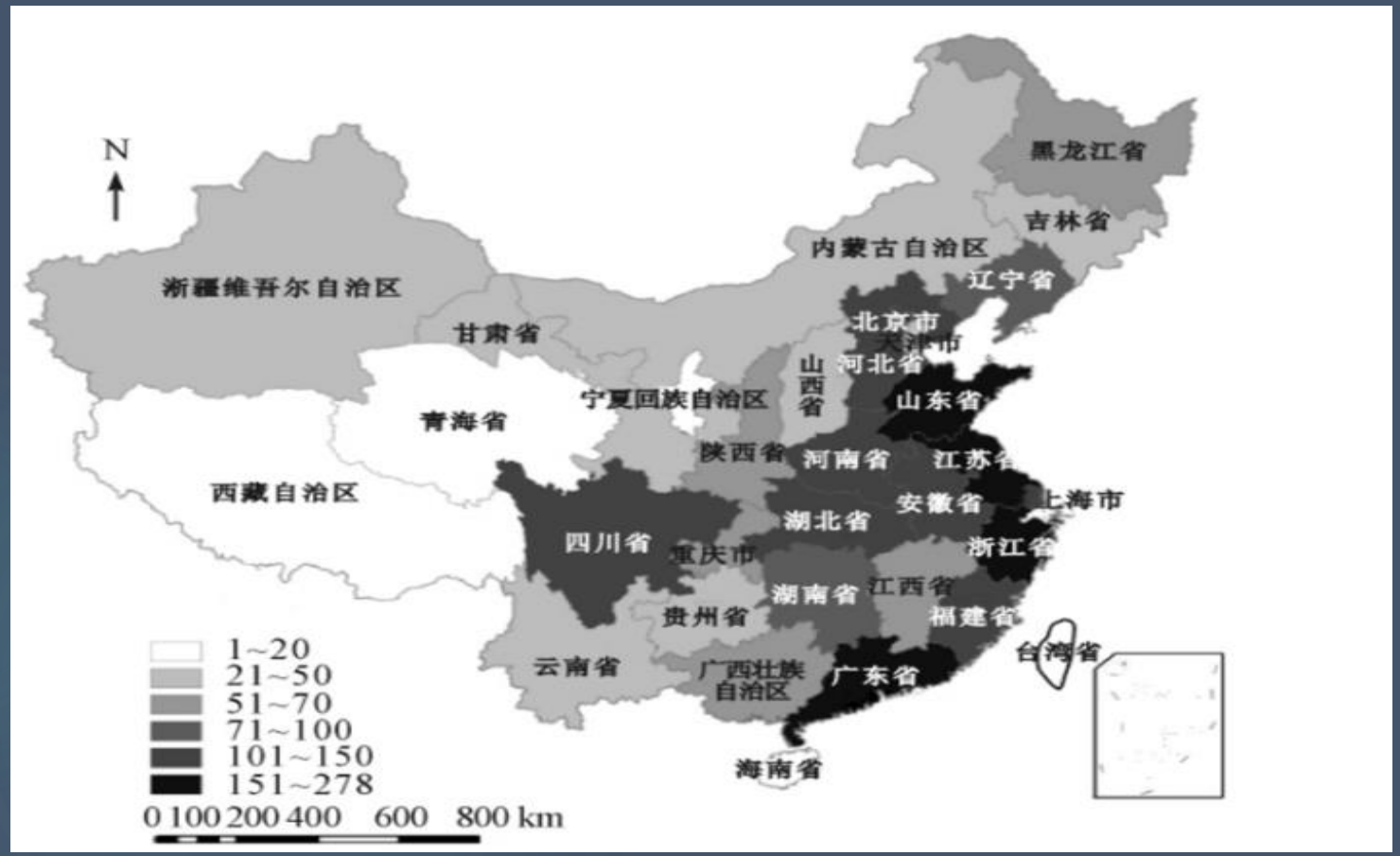
- No regulation for E-waste produced by household.

E-WASTE IN CHINA



- Rank **the second** in the world, after America
- The average annual growth rate is **over 10%**

The Distribution of E-wastes in China



Weight/$\times 10^4$ton

The Recycling of E-waste in China

- annual increase of **20%**.
- **137 million** by **2020**.
- **109** qualified e-waste recycling enterprises
- handled **141 million** electronic waste in **2015**

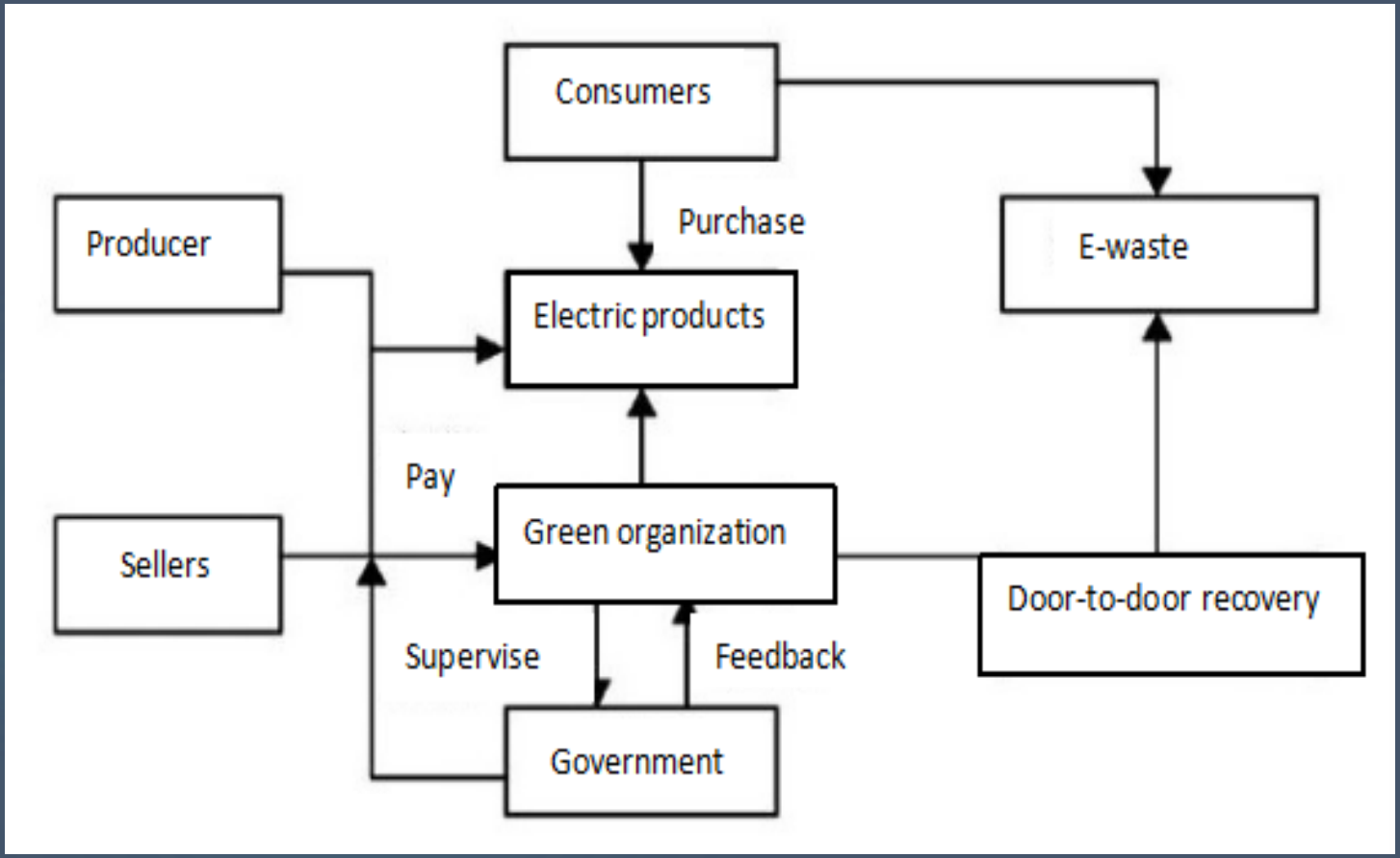
  nearly 40% of the world

Problems of Recycling in China

- Being sold or discarded by households and units **directly**.

- **Low proportion** of electronic waste being dismantled through formal ways

E-waste Recovery System



- **Change the recycling model** that used to rely solely on individual recycling, producers buying
- Establish a number of **large e-waste recycling enterprise**, and utilize the **high-tech network platform** to realize the efficient e-waste recycling model.

Laws concerning E-waste in China

year	law
1995	Environmental Pollution Prevention and Control Law of Solid Wastes
2006	Testing Methods for Regulated Substances in Electronic products
2007	Methods for the prevention and control of environmental pollution from electronic waste
2011	Regulations on the administration of recycling and treatment of waste electrical and electronic products
2016	The 13th five-year plan

E-waste in Shanghai

- E-waste in Shanghai mainly comes from:
  - ✓ Television
  - ✓ Refrigerator
  - ✓ Washing machine
  - ✓ Air conditioner
  - ✓ Microcomputer

- the **old for new policy** issued in 2009

Source : 我国主要电子废弃物产生量预测及特征分析　张伟，蒋洪强，王金南，卢亚灵
上海市电子废弃物处理处置现状研究　刘雨浓，王景伟，陈斌，施珺洁

BENEFITS OF RECYCLING E-WASTE

- Recycling E-waste conserves resources
- Reduce the amount of waste sent to the landfill
- Saves energy
- Recycling E-waste considerably reduces pollution

CONCLUSION

- Need e-waste policy and legislation
- Encourage and facilitate organized recycling system
- Should subsidies recycling and disposal industries
- Collect fee for any manufactured for disposal toxic materials
- Awareness programme at school or public

THANK YOU