
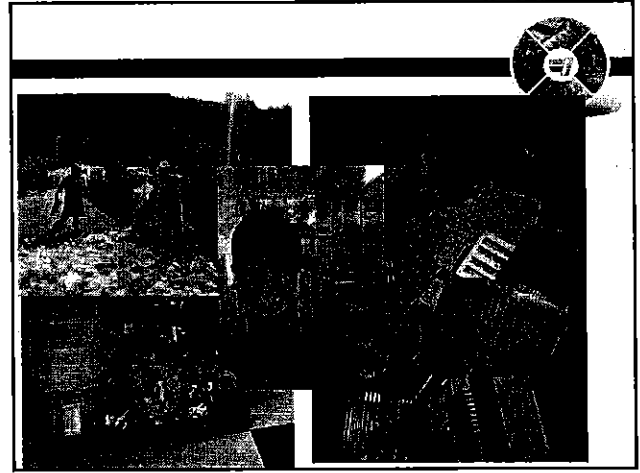


**附件四、國際電子廢棄物回收管理夥伴
會議第三天簡報**

How to dismantle and recycle E-Waste properly?

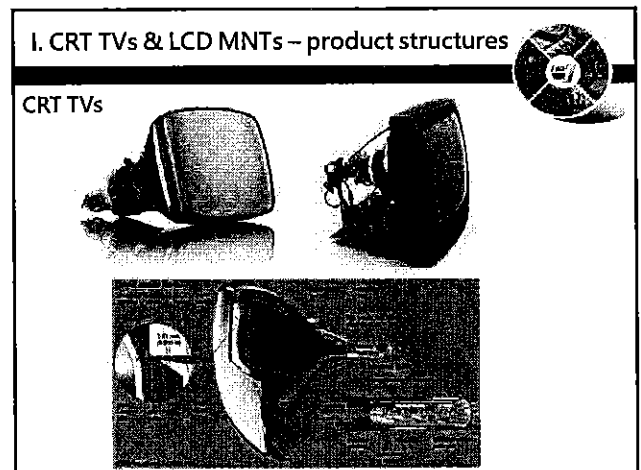


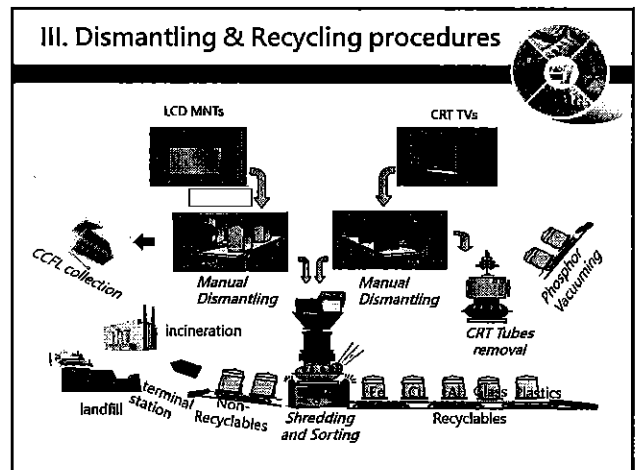
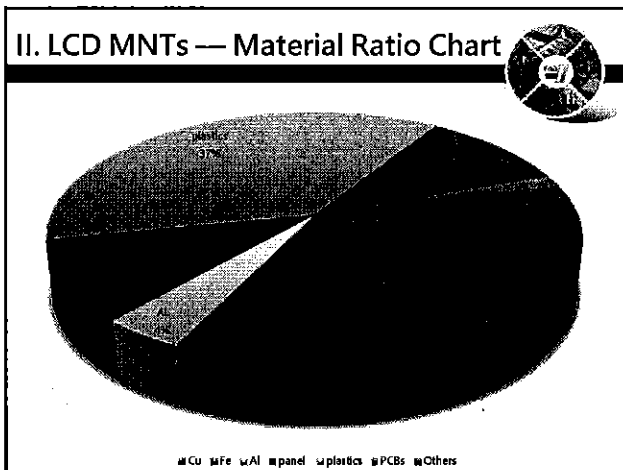
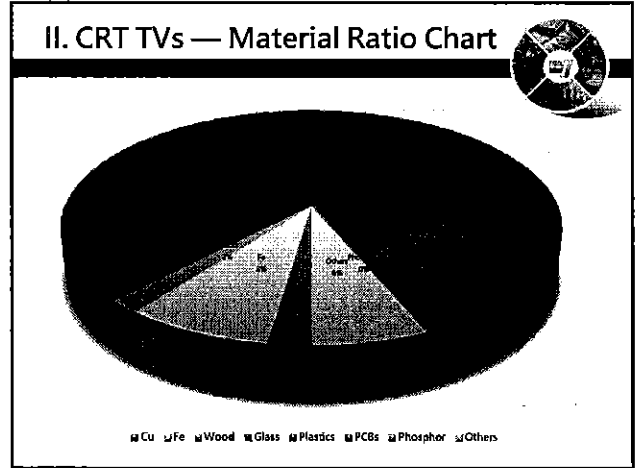
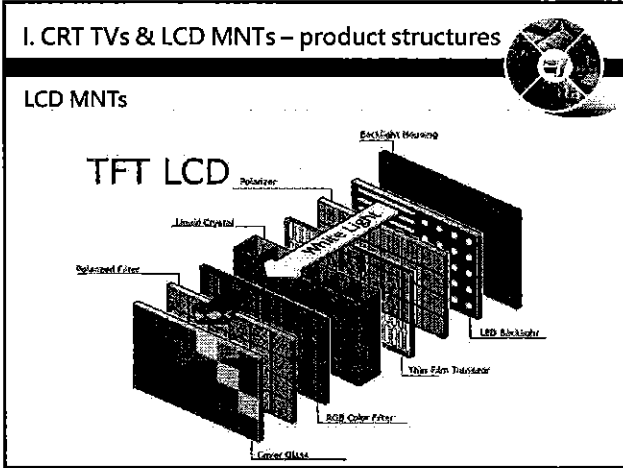
www.fgd.com.tw



Outlines


- I. CRT TVs & LCD MNTs – Product Structures
- II. CRT TVs & LCD MNTs – Material Pie Charts
- III. Dismantling & Recycling Procedures
- IV. E-Waste Recycling Flowchart
- V. Plastics Separation Procedures
- VI. High Value Materials And Products Derived From E-waste





III. Dismantling & Recycling procedures


CRT TVs



| | | |
|--------------------------|---------------------------|--------------------|
| 1. Cut The Wire | 2. Dismantle Back Cover | 3. Remove PCB |
| 4. Tube Pressure Release | 5. Remove Deflecting Yoke | 6. Remove Speakers |

III. Dismantling & Recycling procedures


CRT TVs



| | | |
|--|--------------------------------------|--------------------------|
| 7. Separation Of Front Cover And Tubes | 8. Remove Implosion Protective Frame | 9. Cutting CRT |
| 10. Separation Of Panel Glass And Pannel Glass | 11. Vacuuming Shrapnel | 12. Final Glass Grinding |

III. Dismantling & Recycling procedures


LCD MNTs

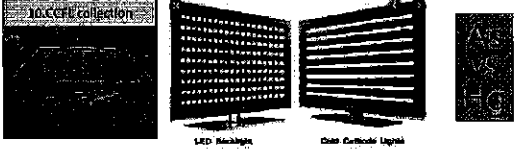


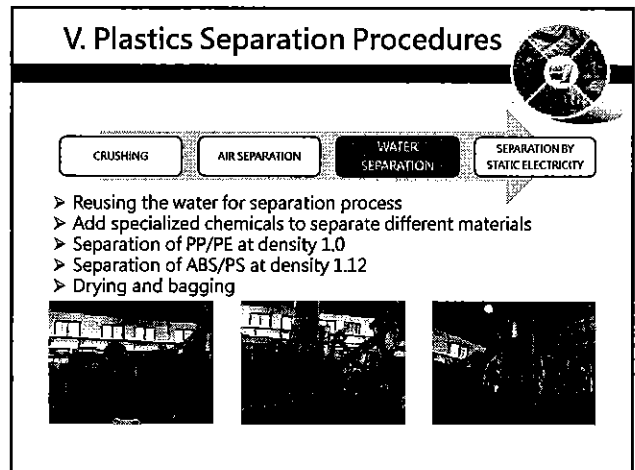
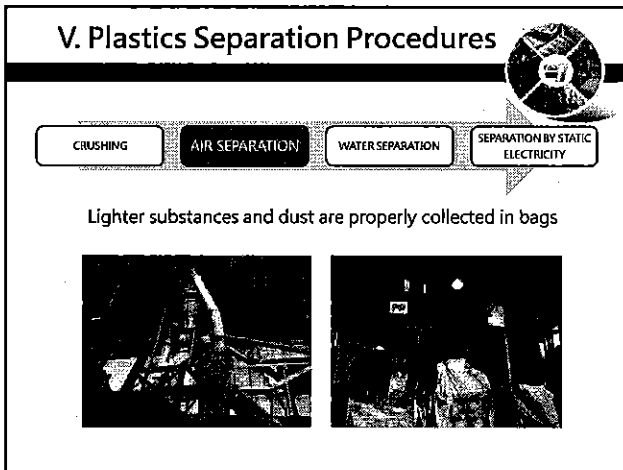
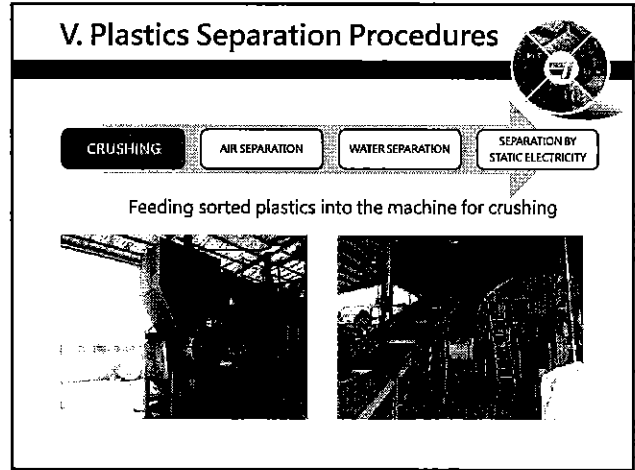
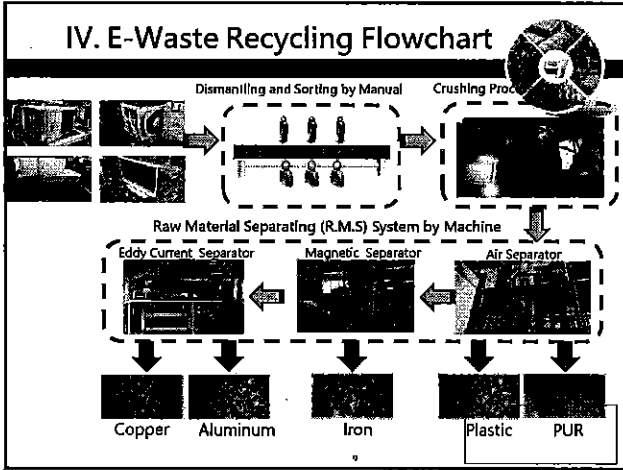
| | | |
|-----------------|--|--------------------------------|
| 1. Cut The Wire | 2. Remove The Base | 3. Remove The Back Cover |
| 4. Remove PCB | 5. Separation Of The Frame And LCD Panel | 6. Remove The Aluminum Housing |

III. Dismantling & Recycling procedures


LCD MNTs



| | | |
|-------------------------------------|---|----------------|
| 7. Separation Of LCD Panel And PCBs | 8. Panel Collection | 9. Remove CCLs |
| 10. CCL collection |  <p>LED Backlight CCFL Backlight</p> | |



V. Plastics Separation Procedures




CRUSHING

AIR SEPARATION


WATERSEPARATION

SEPARATION BY STATIC ELECTRICITY


- Preliminary elimination of rubber material by natural characters
- Purification of ABS to 98%
- Purification of PS to 95%
- Purification of PP to 95%




VI. High value materials and products derived from E-Waste




Waste Electronics To Precious Metals



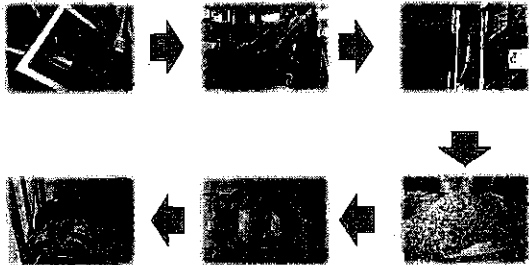
Waste Glass To Glass Blocks




VI. High value materials and products derived from E-Waste



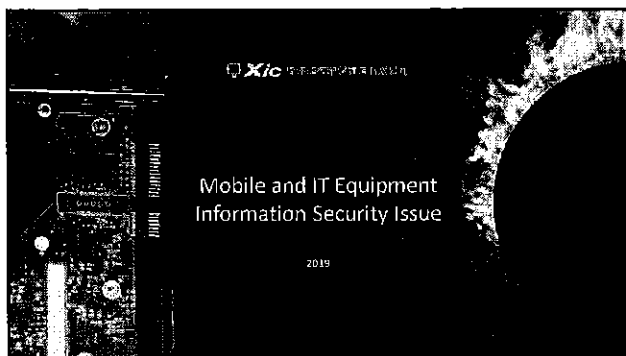
Waste Plastics To Products






Thank You

www.fgd.com.tw



Why We Need Data Destruction

- Personal/Business data stored on tapes, hard disks, flash drives... and all other storage devices.
- Delete the data and make it completely unreadable so that no one else can access your personal information.
- People may simply delete the data on their device by emptying the recycle bin. This only marks the data on the drive as "available" so when someone installs new programs or saves files, the information of the new data will take the place of your "deleted" files.
- The one sure-fire way to make sure your information is permanently deleted is to use a data destruction company.




Importance of Data Destruction

- Data destruction is to keep your files and folders that were stored on your device from falling into the wrong hands.
- Even you think that your erasure software had been successful, simply throwing out your electronic device is a gamble!
- Anyone with the right expertise and determination could figure out a way to recover data from a drive that was improperly destroyed.

Data Destruction Demands

- **Health care business:** The collection and storage of protected health information (PHI) is a key responsibility of healthcare organizations. In USA, a comprehensive IT asset disposition plan can help hospitals and doctor's offices to comply with HIPAA regulations by ensuring the security of PHI contained on hard drives and other data-bearing devices.
- **Every business:** When we think of industries where data security is an absolute priority, financial services, healthcare and technology usually are the first that come to mind. But in our digital-first world, every business has an obligation to their customers, employees and shareholders to protect the confidential data they use every day.




Methods of Data Destruction

METHOD 1: SECURE DATA WIPING

To render data almost completely irretrievable, the drive must be securely wiped or erased using one or more methods. Wiping a drive usually involves actually adding new data to the drive that replaces any encoded information with only zeroes or ones. This is because all digital data is based on binary code, which is comprised of a series of zero and ones.

METHOD 2: DRIVE SHREDDING & CRUSHING

One of the most effective methods in preventing data breaches following IT asset disposition is to destroy the devices on which the data is stored. After properly crushing or shredding a hard drive, optical disk or other storage medium, retrieving any data from the device is virtually impossible.



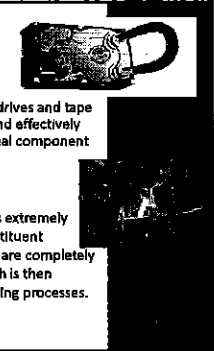
Methods of Data Destruction

METHOD 3: DEGAUSSING

In this process, data storage media including hard drives and tape are exposed to a strong magnetic field. This quickly and effectively erases any data stored on the device, making it an ideal component of most secure data erasure and secure ITAD plans.

METHOD 4: FIREMELT



FIREMELT is a pyrometallurgical process which uses extremely high temperatures and a collector metal to melt constituent materials. This ensures that all data and components are completely destroyed in a homogenous molten metal bath, which is then poured into ingots for use in subsequent metal recycling processes.




Our Business Model

Sipl Partner Facility of Sipl Asset Recovery

Secure e-Waste and IT Asset Disposition:

Global Coverage

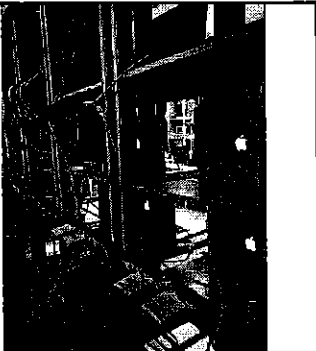
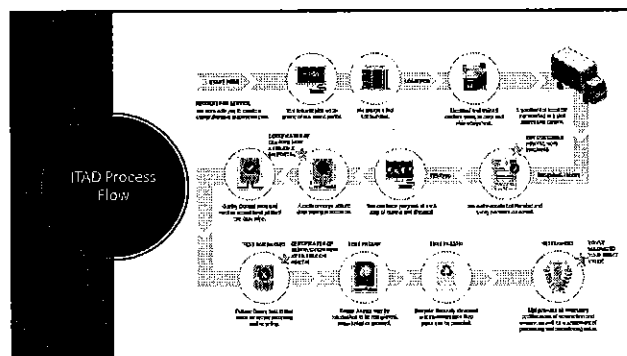
| Country | ITAD Services Available | Special Requests |
|----------------|-------------------------|------------------|
| USA | ✓ | ✓ |
| Canada | ✓ | ✓ |
| UK | ✓ | ✓ |
| France | ✓ | ✓ |
| Germany | ✓ | ✓ |
| Italy | ✓ | ✓ |
| Spain | ✓ | ✓ |
| Japan | ✓ | ✓ |
| China | ✓ | ✓ |
| India | ✓ | ✓ |
| Australia | ✓ | ✓ |
| South Africa | ✓ | ✓ |
| Brazil | ✓ | ✓ |
| Mexico | ✓ | ✓ |
| Argentina | ✓ | ✓ |
| Colombia | ✓ | ✓ |
| Venezuela | ✓ | ✓ |
| Egypt | ✓ | ✓ |
| Saudi Arabia | ✓ | ✓ |
| UAE | ✓ | ✓ |
| Qatar | ✓ | ✓ |
| Russia | ✓ | ✓ |
| Poland | ✓ | ✓ |
| Czech Republic | ✓ | ✓ |
| Slovakia | ✓ | ✓ |
| Hungary | ✓ | ✓ |
| Croatia | ✓ | ✓ |
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| Philippines | ✓ | ✓ |
| Indonesia | ✓ | ✓ |
| Malaysia | ✓ | ✓ |
| Singapore | ✓ | ✓ |
| Thailand | ✓ | ✓ |
| Vietnam | ✓ | ✓ |
| Myanmar | ✓ | ✓ |
| Burma | ✓ | ✓ |
| Laos | ✓ | ✓ |
| Cambodia | ✓ | ✓ |
| Timor-Leste | ✓ | ✓ |
| East Timor | ✓ | ✓ |
| Brunei | ✓ | ✓ |
| Sri Lanka | ✓ | ✓ |
| Nepal | ✓ | ✓ |
| Bhutan | ✓ | ✓ |
| Maldives | ✓ | ✓ |
| Yemen | ✓ | ✓ |
| Oman | ✓ | ✓ |
| Kuwait | ✓ | ✓ |
| Bahrain | ✓ | ✓ |
| Saudi Arabia | ✓ | ✓ |
| Qatar | ✓ | ✓ |
| UAE | ✓ | ✓ |
| Uzbekistan | ✓ | ✓ |
| Kazakhstan | ✓ | ✓ |
| Kyrgyzstan | ✓ | ✓ |
| Tajikistan | ✓ | ✓ |
| Georgia | ✓ | ✓ |
| Armenia | ✓ | ✓ |
| Azerbaijan | ✓ | ✓ |
| Belarus | ✓ | ✓ |
| Poland | ✓ | ✓ |
| Czech Republic | ✓ | ✓ |
| Slovakia | ✓ | ✓ |
| Hungary | ✓ | ✓ |
| Croatia | ✓ | ✓ |
| Slovenia | ✓ | ✓ |
| Lithuania | ✓ | ✓ |
| Latvia | ✓ | ✓ |
| Estonia | ✓ | ✓ |
| Belgium | ✓ | ✓ |
| Netherlands | ✓ | ✓ |
| Sweden | ✓ | ✓ |
| Norway | ✓ | ✓ |
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| Finland | ✓ | ✓ |
| Ireland | ✓ | ✓ |
| Portugal | ✓ | ✓ |
| Greece | ✓ | ✓ |
| Turkey | ✓ | ✓ |
| Israel | ✓ | ✓ |
| South Korea | ✓ | ✓ |
| North Korea | ✓ | ✓ |
| Philippines | ✓ | ✓ |
| Indonesia | ✓ | ✓ |
| Malaysia | ✓ | ✓ |
| Singapore | ✓ | ✓ |
| Thailand | ✓ | ✓ |
| Vietnam | ✓ | ✓ |
| Myanmar | ✓ | ✓ |
| Burma | ✓ | ✓ |
| Laos | ✓ | ✓ |
| Cambodia | ✓ | ✓ |
| Timor-Leste | ✓ | ✓ |
| East Timor | ✓ | ✓ |
| Brunei | ✓ | ✓ |
| Sri Lanka | ✓ | ✓ |
| Nepal | ✓ | ✓ |
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| Tajikistan | ✓ | ✓ |
| Georgia | ✓ | ✓ |
| Armenia | ✓ | ✓ |
| Azerbaijan | ✓ | ✓ |
| Belarus | ✓ | ✓ |

Facility Based ITAD Services

- Reverse Logistics
- Audit
- NIST Erasure
- Test
- Sell
- Recycle
- Redeploy

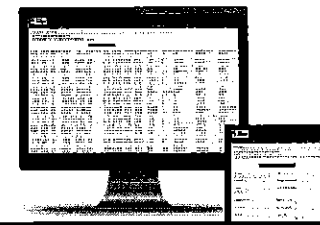
Special Requests

- DOD Wipe
- Pre-audit
- HOLD Assets / Storage
- Cloud Lock / Password Removal

Customer Web Portal

Track your shipments, assets, and certs – Real Time

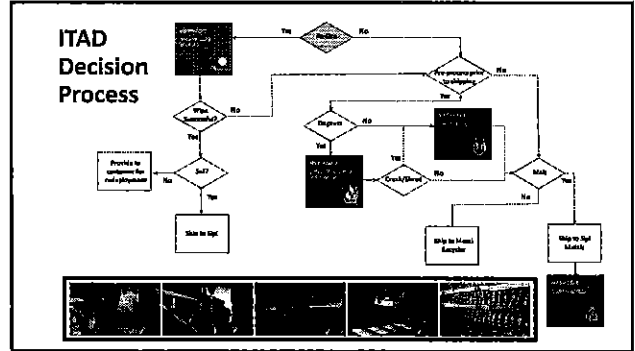


- Asset Tracking
- Inventory Management
- Reporting
- Compliance
- Customer Support




- Onsite IT Asset Disposition
- Secure Destruction
 - Shredding
 - Crushing
 - Wiping
- Data Center Decommission
- Relocation

Sipi Asset Recovery
(Partner)
Portfolio of Services



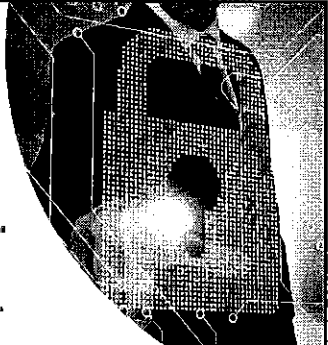
QC Process

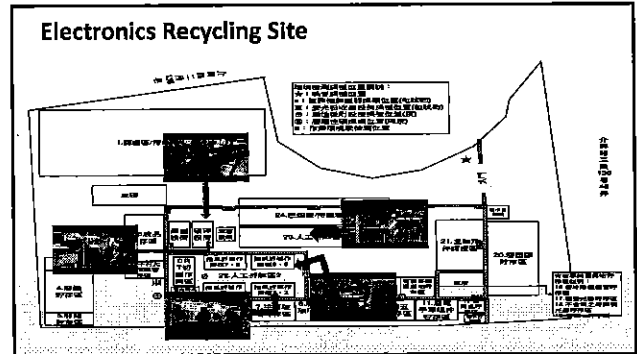
- All equipment is tested and confirmed for properly working key functions or components. Nonfunctioning or equipment failing tests is designated as teardown or scrap.
- Test results for assets, including batteries, are recorded.
- QC daily verification of test results.
- Documented procedures for the removal of all non-manufacturer's labels with a QC verification.
- Documented grading system which includes details of any cosmetic issues or limits to non-key functions.
- Bar code tracking of assets through the entire processing flow to include serial numbers.
- Serialized scans of assets into inventory with an established bin location system.
- Cycle Counts.
- Serialized bar code tracking of final sale or other disposition of assets



Security

- Professional security guards on premise during working hours
- In-house closed-circuit camera surveillance with digital recording
- Secure inventory cages
- Controlled access in and out of facilities, including the opening, closing and securing of all dock doors by security staff
- 24 hour - 7 days a week - Independent alarm monitoring service
- Metal screening and detection equipment - both hand held and full body
- ID badges / Access Control
- Motion detectors/Glass alarms in sensitive areas
- Controlled visitor/guest policies and procedures
- Required employee training of site and data security requirements
- Key Controls/Daily Reconciliation





Data Wiping/ Destruction Site

- System
- Server
- Laptop
- Mobile phone
- Printer
- HDD
- Others

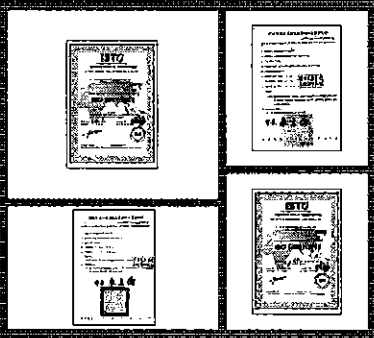
Our Markets

INDUSTRIES & VERTICALS

- Technology
- Financial Institutions
- Healthcare/Hospitals
- Insurance
- Datacenter
- Retail
- OEMs

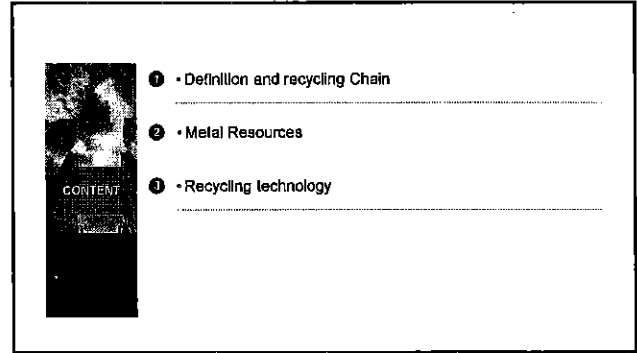
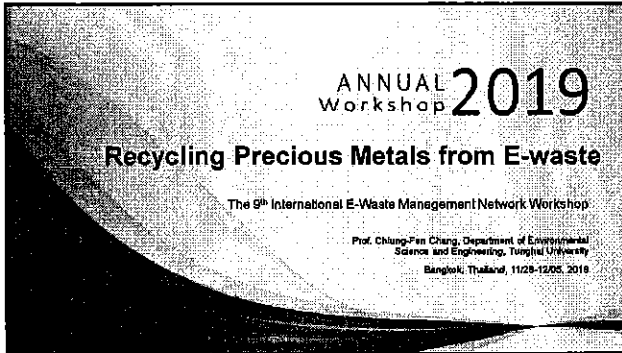
Certifications

- ISO 9001
- ISO 14001
- Permit of Regulated Recyclable Waste collection and treatment



Next Steps / Q&A





Definition

- Electronic waste or e-waste describes discarded electrical or electronic devices. Used electronics which are destined for refurbishment, reuse, resale, salvage recycling through material recovery, or disposal are also considered e-waste.
- Electronic waste or e-waste, now, is an emerging problem due to the numerous components which are inherently hazardous and highly toxic in nature.
- In the meantime, they also contain precious metals (ferrous and non-ferrous metals), which possess high value to be recycled.

Recycling Chain

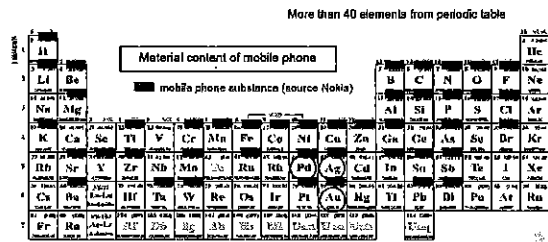
- The appropriate handling of e-waste can both prevent serious environmental damage and recover the valuable materials as well, especially for metals.
- The recycling chain for e-wastes contain three sequential steps:

```

    graph LR
      WEEE --> Collection
      Collection --> Dis-manling
      Dis-manling --> Pre-processing
      Pre-processing --> End-processing
      End-processing --> Recycled_metals[Recycled metals]
      Collection --> SCS[Separated components & fractions]
      Dis-manling --> SCS
      Pre-processing --> SCS
      End-processing --> SCS
      Recycled_metals --> RHW[Re-use Handling of final waste]
  
```

China's RECYCLING - FROM E-WASTE TO RESOURCES

Materials content of mobile phone/Nokia



Cited from: RECYCLING – FROM E-WASTE TO RESOURCES

Recycling Technology-Pyrometallurgy

- Each material stream has a specific set of technologies that can be used to recover the metals. The unit operations are often proprietary or patented. The methods can be grouped into three aspects:
- Pyrometallurgy
 - High temperatures to chemically convert the feed materials and separate metals and impurities into different phases so valuable metals can be recovered.
 - The high temperatures in the furnace or smelter are generated via the combustion of fuel or via electrical heating.
 - Examples of technical hardware are submerged lance smelters, converters, rotary furnaces, electric arc furnaces etc.

Cited from: RECYCLING – FROM E-WASTE TO RESOURCES

Recycling Technology-Pyrometallurgy

- The first patent in 1867: The Miller process for gold recycling
- An industrial-scale chemical procedure used to refine gold to a high degree of purity (99.95%). It was invented by Francis Bowyer Miller (patented 1867).
 - This chemical process involves blowing a stream of pure chlorine gas over and through a crucible filled with molten, but impure, gold.
 - This process purifies the gold because nearly all other elements will form chlorides before gold does, and they can then be removed as salts that are insoluble in the molten metal.
 - The Miller Process can remove base metals and silver in large scale rather than small scale but cannot remove platinum group metals (PGMs).

https://en.wikipedia.org/wiki/Miller_process

Recycling Technology-Pyrometallurgy

- The Miller process for gold recycling
 - Easy and cheap way
- You need the units composed of
 - Materials of impure gold
 - Furnace
 - Graphite Crucible
 - Chlorine Gas

Cited from: RECYCLING – FROM E-WASTE TO RESOURCES

High Level Precision Metal Refining Processes

The Miller process 99.5%

$$\text{Ag} + 1/2 \text{Cl}_{2(g)} \rightarrow \text{AgCl}_{(s)}$$

$$\text{Cu} + \text{Cl}_{2(g)} \rightarrow \text{CuCl}_{2(s)}$$

$$\text{Zn} + \text{Cl}_{2(g)} \rightarrow \text{ZnCl}_{2(s)}$$

$$\text{Sn} + \text{Cl}_{2(g)} \rightarrow \text{SnCl}_{2(s)}$$

Platinum Group Metals (PGMs)

The PGMs (platinum group metals) are: platinum (Pt), palladium (Pd), rhodium (Rh), ruthenium (Ru), iridium (Ir), and osmium (Os).

Recycling Technology-Pyrometallurgy

The copper recycling:

PCB (Printed wiring boards) and small electronic devices, etc., can be directly treated.

Problem? (Unit + Reduction of Pollutants)

- Formation of VOCs, dioxins and acid gases from the organic substances in the feed material, as well as any generated dust.
- Destruction or capture processes, such as adiabatic coolers, scrubbers, and catalytic decomposition are used in combination for optimal.
- Formation of dioxins during smelting can be prevented by good control of the process conditions:
 - sufficiently high temperatures and long residence time in the smelter, complete combustion, constant process conditions via automated control and rapid cooling of the off-gas to below 180-250°C.
- Heat is recovered from the off-gas for use in subsequent processes using the generated heat in the most efficient way as possible.

Recycling Technology-Hydrometallurgy

- use strong acidic or caustic watery solutions to selectively dissolve and precipitate metals e.g. leaching, cementation, solvent extraction etc.
- Gold is recovered by cyanidation. In cyanidation, metallic gold is oxidised and dissolved in an alkaline cyanide solution. When gold dissolution is complete, the gold-bearing solution is separated from the solids.
- Gold is recovered by Aqua Regia (HNO₃ + HCl) is more difficult than cyanidation (Focus on the quality of the gold)
 - Silver forms silver chloride (AgCl)
 - Tin reacts to meta stannic (Tn(IV)) acid that hinders gold dissolution
 - PGM cannot be removed efficiently with aqua regia

Cited from: RECYCLING – FROM E-WASTE TO RESOURCES

Recycling gold from E-wastes by Aqua Regia (HNO₃ + HCl)

$$\text{Au} + 3\text{HNO}_3 + 4\text{HCl} = \text{HAuCl}_4 + 3\text{NO}_2 + 3\text{H}_2\text{O}$$

$$3\text{Na}_2\text{S}_2\text{O}_3 + 15\text{H}_2\text{O} + \text{HAuCl}_4 = 4\text{NaHSO}_4 + 32\text{HCl} + \text{Au}$$

Recycling gold from E-wastes by Aqua Regia (HNO₃ + HCl)



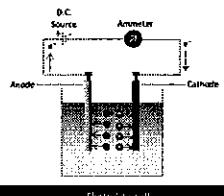
Recycling Technology-Hydrometallurgy- Cyanidation process



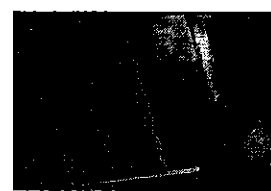
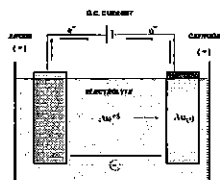
- Elsner Equation: $4 Au(s) + 8 NaCN(aq) + O_2(g) + 2 H_2O(l) \rightarrow 4 Na[Au(CN)_2](aq) + 4 NaOH(aq)$
- The material complexity of the circuit boards highly complicates the hydrometallurgical processes. Interactions during leaching reduce the effectiveness of metal recovery, require additional processing steps and difficulties to treat intermediates might be created. Highly toxic solution!

Recycling Technology-Electrometallurgy

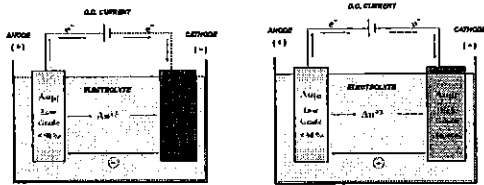
- Electro-metallurgy
- use electrical current to recover metals, e.g. electro-winning and electro-refining of metals.
- Electrowinning, also called electroextraction, is the electrodeposition of metals from their ores that have been put in solution via a process commonly referred to as leaching. Electrorefining uses a similar process to remove impurities from a metal.



Recycling Technology-Electrometallurgy-Gold Deposition



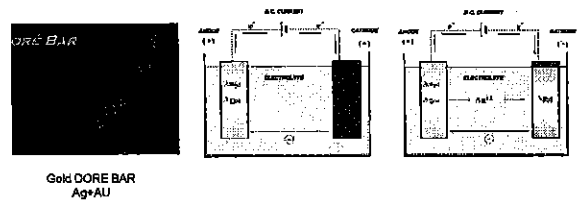
Recycling Technology-Electrometallurgy-Gold Refining



Gold from RECYCLING - FROM WASTE TO RESOURCES <http://www.gold.org/australia/industry/gold-refining>

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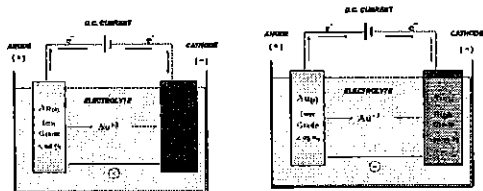
Recycling Technology-Electrometallurgy-Gold Refining



Gold from RECYCLING - FROM WASTE TO RESOURCES <http://www.gold.org/australia/industry/gold-refining>

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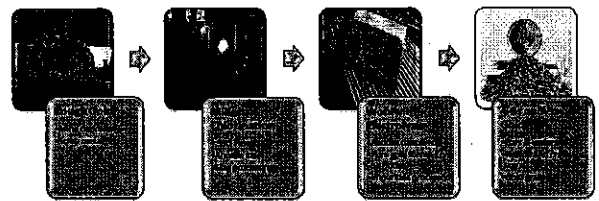
Recycling Technology-Electrometallurgy-Gold Refining



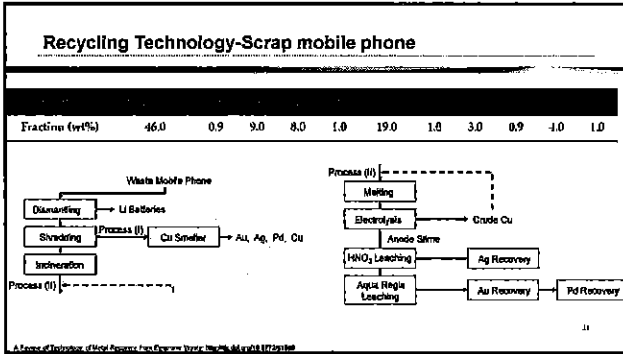
Gold from RECYCLING - FROM WASTE TO RESOURCES <http://www.gold.org/australia/industry/gold-refining>

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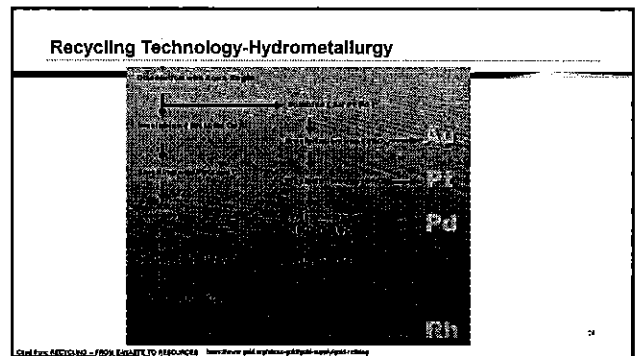
Recycling Technology- Pyrometallurgy+Electrometallurgy



<http://www.mint.ca/1014691/02%20Gold%20Refining%20The%20Source%201%2010E.pdf>



- ### Future: From Pollution to Resources
- Innovation of Technology
 - Treat in an environmentally sound manner
 - Recover valuable materials maximally
 - Recover valuable materials at high purity



| REFINING TECHNIQUE | REMOVES BASE METALS | REMOVES SILVER | REMOVES PGMS | LARGE SCALE REFINERS | SMALL SCALE REFINERS |
|--------------------------------|---------------------|----------------|--------------|----------------------|----------------------|
| CUPELLATION | ✓ | ✓ | ✓ | ✓ | ✓ |
| INQUARTATION AND PARTING | ✓ | ✓ | ✓ | ✓ | ✓ |
| WILLEX PROCESS | ✓ | ✓ | ✓ | ✓ | ✓ |
| WOHLWILL ELECTROLYTIC PROCESS* | ✓ | ✓ | ✓ | ✓ | ✓ |
| FAZIER CELL | ✓ | ✓ | ✓ | ✓ | ✓ |
| AQUA REGIS PROCESS** | ✓ | ✓ | ✓ | ✓ | ✓ |
| PYROMETALLURGICAL PROCESS | ✓ | ✓ | ✓ | ✓ | ✓ |

*CAN ONLY BE USED WHEN INITIAL GOLD CONTENT IS ABOUT 98%
 **ONLY SUITABLE WHEN INITIAL SILVER CONTENT IS LESS THAN 10%
 -COPPER REMAINS IN GOLD

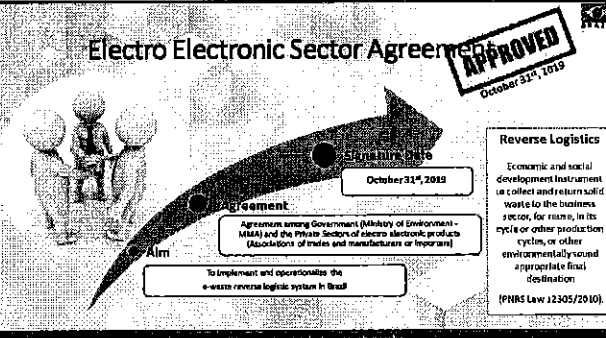
https://en.wikipedia.org/wiki/List_of_chemical_elements

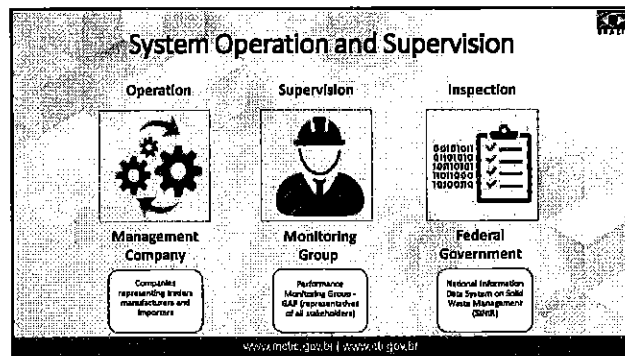
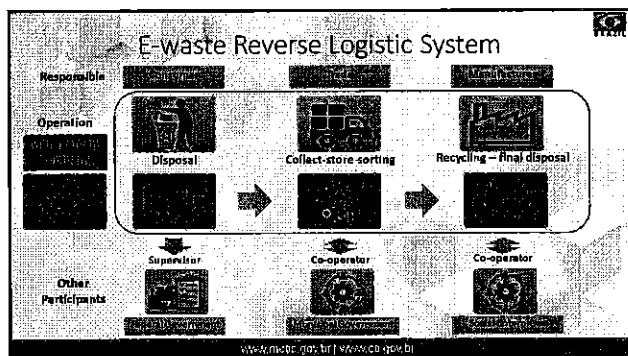
| Z | Symbol | Element | Origin of name ⁽¹⁾ | List of chemical elements | | | | Boiling point | CP | Electro-positivity | Abundance in Earth's crust ⁽²⁾ |
|----|--------|---------|--|---------------------------|--------|---------------|---------|---------------|------|--------------------|---|
| | | | | Group | Period | Block | Density | | | | |
| 79 | Ag | Gold | English word, from medieval Latin <i>aurum</i> (Latin <i>aurus</i>) | 11 | 6 | 105 (dms/134) | 19.302 | 3337.33 | 1175 | 0.119 | 0.04 |




Centro de Tecnologia da Informação Renato Archer
 WORKSHOP 2018
 INTERNATIONAL E-WASTE MANAGEMENT NETWORK
 DECEMBER 2nd - 4th / BANGKOK - THAILAND
Brazilian E-waste Reverse Logistic System
 Marcos Pinheiro
 Center of Information Technology Renato Archer - CITI
 Ministry of Science, Technology, Innovation and Communication - MCTIC

www.mctic.gov.br | www.ci.gov.br

Electro Electronic Sector Agreement

APPROVED
 October 31st, 2019
Reverse Logistics
 Economic and social development instrument to collect and return solid waste to the business sector, for reuse, in its cycle or other production cycles, or other environmentally sound appropriate final destination (PNRS Law 12305/2010).
Agreement
 October 31st, 2019
 Agreement among Government (Ministry of Environment - MMA) and the Private Sector of electro electronic products (Associations of trade and manufacturers or Importers)
Aim
 To implement and operationalize the e-waste reverse logistic system in Brazil
www.mctic.gov.br | www.ci.gov.br



System Regulation Requirements

Recycling requirements

- Environment license operation by national agency (Sinema)
- Recycling process must be qualified by Management Company
- To comply with Brazilian standard ABNT NBR 18.156: 2013

Operational requirements

- At least to comply with recommendations of management guide (disposal, collection, logistics and reverse manufacturing) presented by the agreement.

Communication requirements

- To create a communication plan to spread the System implementation for everyone involved and especially on raise consumer awareness.

www.mctc.gov.br | www.cb.gov.br

System Main Characteristics

Waste **240V** Nominal voltage. All household equipments whose operation depends on electrical currents.

System Coverage **400** Cities. The largest Brazilian municipalities (bigger than 80,000 inhabitants).

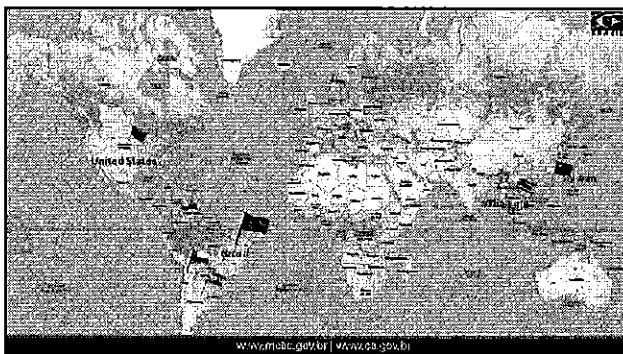
System Duration **8.5** million km². Municipalities distributed in a continental territory.

System Goal **1.5** million tons. Volume of 1.8 million tons equipment placed in the market per year.

System Goals **17%** volume. Of equipments placed on the market (based on EAM - Base year 2019).

System Schedule **5** years. Reach 17% of the volume (20 thousand tons) in 5 (five) years.

www.mctc.gov.br | www.cb.gov.br

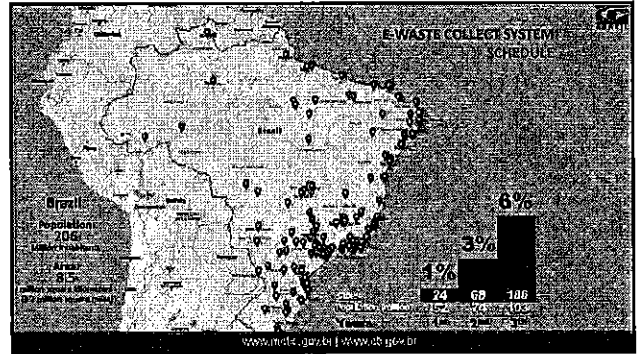
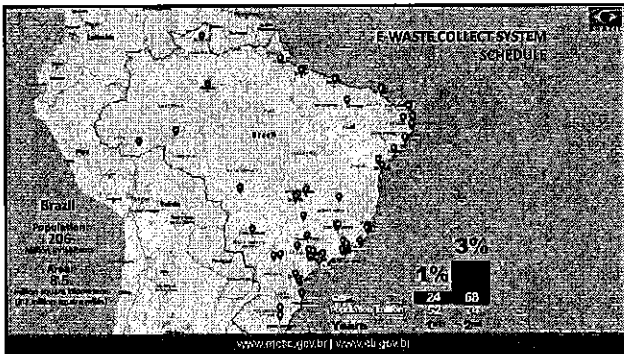
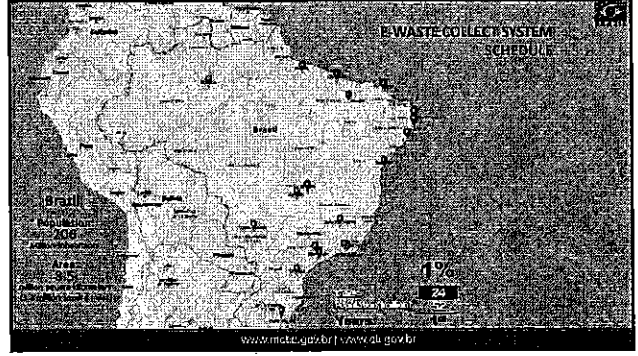
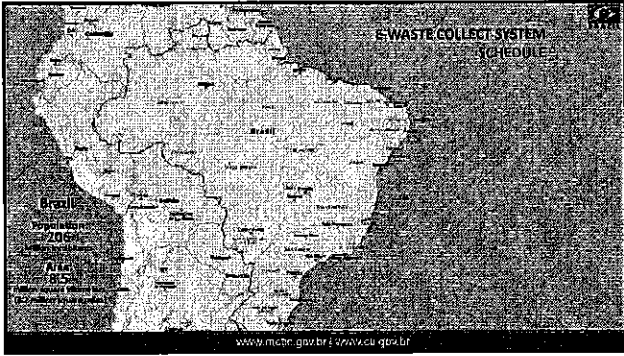


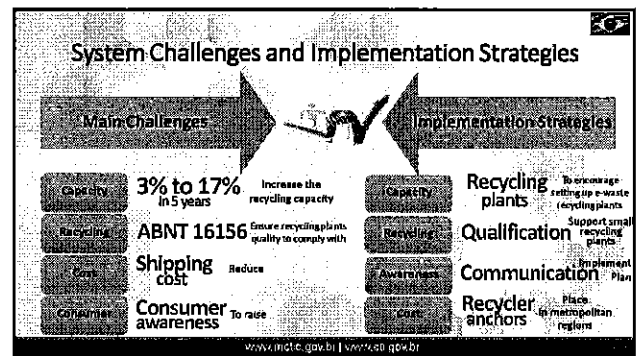
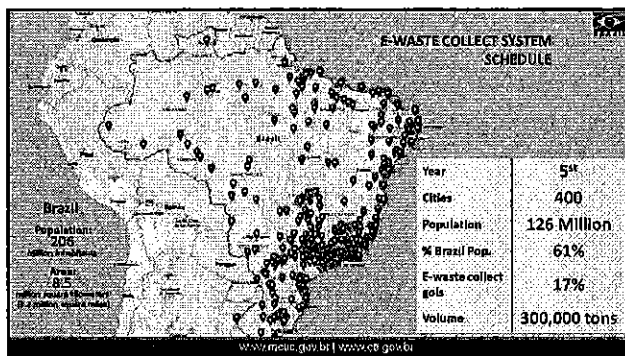
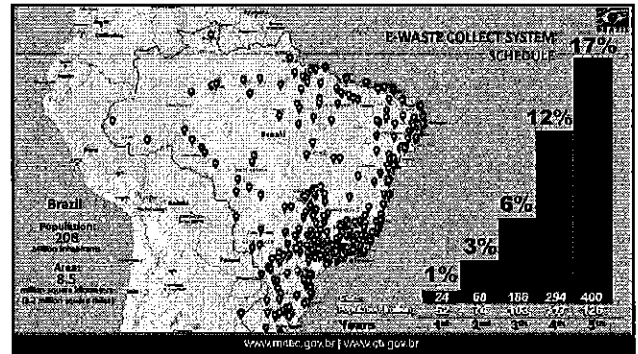
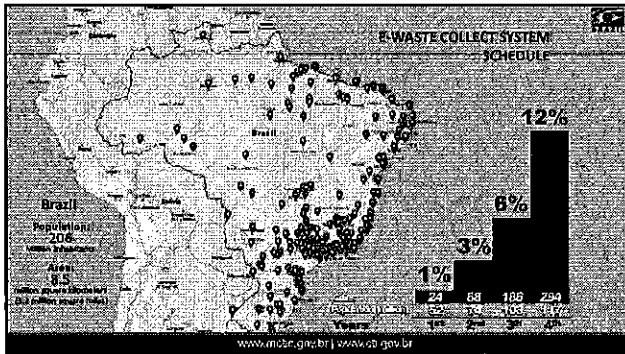
Brazil

Population: **206** million inhabitants


Area: **8.5** million square kilometers (3.2 million square miles)

www.mctc.gov.br | www.cb.gov.br







Final Remarks



Implementing and operationalizing the Brazilian e-waste reverse logistic system will be a Great Political and Technological Challenges, but on the other hand a Great Social and Economic Opportunity, which is why the main stakeholders are optimistic.

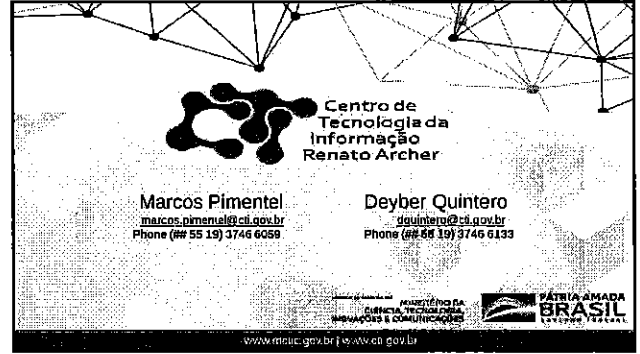


Once the Sector Agreement has been signed, Brazil is Surely Moving to a New Level of E-waste ESM Maturity and International recognition.



In the near future Brazil should reduce the electronic impact on environment and public health, as well as promote the circular economy and economic and social development, goals Idealized by the National Solid Waste Policy.

www.minc.gov.br | www.cb.gov.br




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Phone (# 55 19) 3746 6133

Ministério da Ciência, Tecnologia e Inovação



www.minc.gov.br | www.cb.gov.br





WORKSHOP 2019
INTERNATIONAL WASTE MANAGEMENT NETWORK
DECEMBER 11th - 14th 2019

greenk
technology

Greenk Movement 2019 - Brazil

MARCO SPINTELLI
Director of Information Technology, Ministry of Health - DTI
University of Science, Technology, Innovation and Communication - UCTIC

greenk

THE BIGGEST E-WASTE CHALLENGE

HOW TO MOBILIZE THE ENTIRE POPULATION FOR THE CORRECT DISPOSAL?

HOW TO GENERATE SIGNIFICANT VOLUMES OF DISPOSAL?

movimento
greenk

A CAUSE MARKETING START-UP WITH THE MISSION OF PROMOTE E-WASTE CORRECT DISPOSAL.

PROMOTE THE CORRECT DISPOSAL VOLUMES
IMPROVE THE ENVIRONMENTAL EDUCATION
MEDIA, GOVERNMENT AND INDUSTRY ENGAGEMENT

OUR ENGAGEMENT VECTOR

GENERATION

FUTURE CONSUMERS OF ALL BRANDS.
HIGH ENVIRONMENTAL CONSCIENCE.
PREFER BRANDS WITH PURPOSE.
LEAD THE HOUSEHOLD CONSUMPTION DECISION.
DIFFICULT TO BE ACHIEVED BY THE REGULAR MEDIA.

THAT IS WHY WE GEN Z LANGUAGE TO DISCLOSE OUR CAUSE.

geek + green = greenk

GAMIFICATION
+ DIGITAL INFLUENCERS
+ GREENK DIGITAL CULTURE

IN JUST 3 YEARS WE HAVE ESTABLISHED PARTNERSHIPS WITH THE MAIN PLAYERS OF THE CIRCULAR ECONOMY IN BRAZIL.

INSTITUÇÕES
 SÃO PAULO
 SÃO PAULO

ASSOCIADOS
 abnee
 GBCSA
 eletrão

MÍDIAS
 SÃO PAULO

OUTROS PARCEIROS
 terra

OUR PRODUCTS

greenk

COPA
 MAIOR CAPTAÇÃO
 DE LIQU
 ELETRÔNICO
 EP - EFM, Arquiteta
 P. C. S. Hemerfor
 2019

MEDIA & LIVE
 MARKETING

EDUCATION
 ENGAGEMENT

PUBLIC AND PRIVATE ENVIRONMENTAL SCHOOLS TOURNAMENT.

TORNEIO
greenk
INTERMEDIAR

A COMPETITION OF WHICH SCHOOL MOST COLLECTS E-WASTE.

TORNEIO
greenk
INTERESCOLAR

2018

80.000 STUDENTS

42 SCHOOLS

GOAL 10 TONS

RESULTS 79,6 TONS

IMPROVING ENVIRONMENTAL CONCERN
GENERATING CONSISTENT VOLUMES.

TORNEIO
greenk
INTERESCOLAR

2019

200.000 STUDENTS

150 SCHOOLS

GOAL 200 TONS

RESULTS 223 TONS

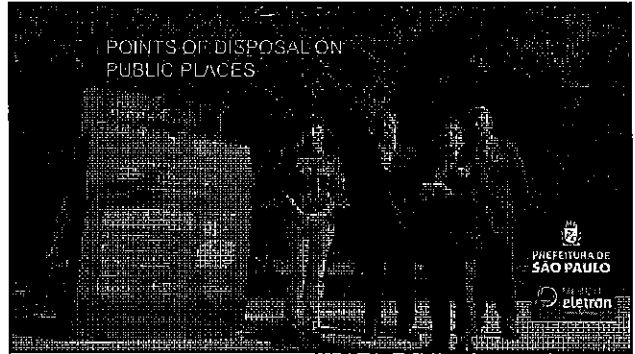
GREENK SCHOOL TOURNAMENT 2019

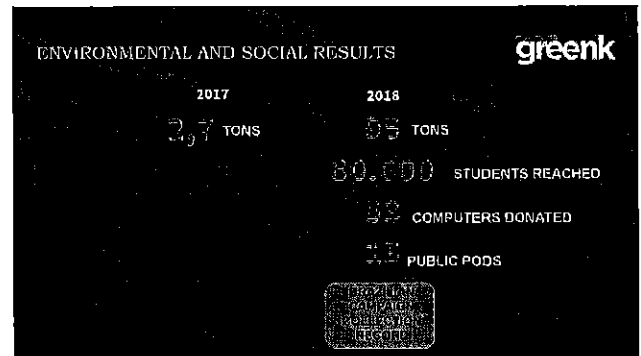
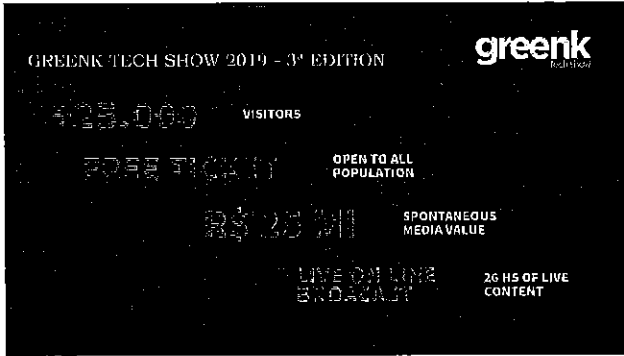
LIVE MARKETING
ACTIVITIES DONE IN CLASS


GREENK SCHOOL TOURNAMENT 2019

E-WASTE BUS




MINI HANDS ON CLASS
SEE E-WASTE DIFFERENT COMPONENTS
RARE METALS, PLASTICS, CHEMICAL COMPONENTS. 150 SCHOOLS VISITED





ENVIRONMENTAL AND SOCIAL RESULTS 


| 2019 | 2020 |
|----------------------|-----------------------|
| 240 TONS | 600 TONS |
| 200,000 STUDENTS | 1,000,000 STUDENTS |
| 60 COMPUTERS DONATED | 100 COMPUTERS DONATED |
| 15 PUBLIC PODS | 25 PUBLIC PODS |

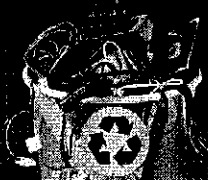




OUR MISSION

EDUCATE AND ENGAGE THE CORRECT DISPOSAL

- ➔ COST EFFECTIVE E-WASTE COLLECTION
COLLABORATE WITH SECTOR AGREEMENT
- ➔ LONG TERM ENVIRONMENTAL EDUCATION.
COLLABORATE WITH SCHOOL CURRICULUM
- ➔ PROMOTE SIGNIFICANT VOLUMES
ACTIVATE CIRCULAR ECONOMY

GREENK MILESTONS 



PHASE 1: PRE SECTOR AGREEMENT:
REACH 1,000 TONS/YEAR
PLATFORM REACHABLE TO 100,000'S
BOARD PARTNERSHIP
PARTNERSHIP WITH STRATEGIC COMPANIES
REVENUES BY SPONSORSHIP

PHASE 2: SECTOR AGREEMENT
20 CITIES + 20,000 TONS/YEAR
FINANCED BY REGULATORY ENVIRONMENTAL OBLIGATIONS AND
SPONSORSHIP
REGULATORY COMPLIANCE
GLOBAL INTERNATIONAL RECOGNITION

PHASE 3: GLOBALIZATION
ORGANIZATIONAL RESPONSIBILITY
EXPANSION TO LATIN AMERICA
FINANCED BY SPONSORSHIP AND REVENUES

**IF YOU USE
TECHNOLOGY
AND DEFEND OUR
PLANET
BE WELCOME TO
OUR MOVEMENT**





IF YOUR COMPANY
PRODUCES OR USE
TECHNOLOGY

AND HAS
ENVIRONMENTAL
CONCERN

OR NEED A PURPOSE
CONNECTION WITH
Z GENERATION:

BE WELCOME!

faça parte

movimento
greenk

deste movimento

#GOGREENK

www.greenk.com.br

   /greenk_oficial

greenk

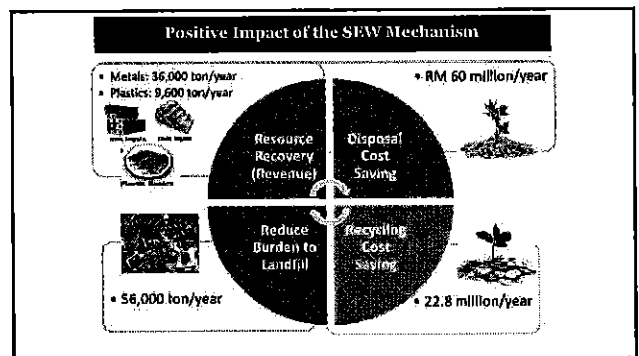
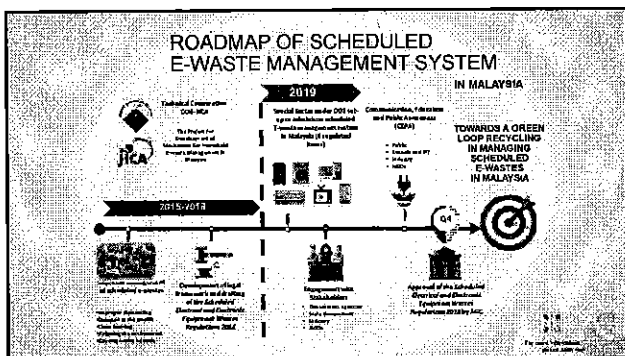
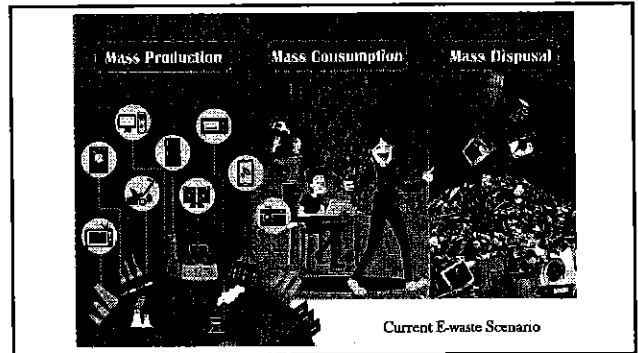
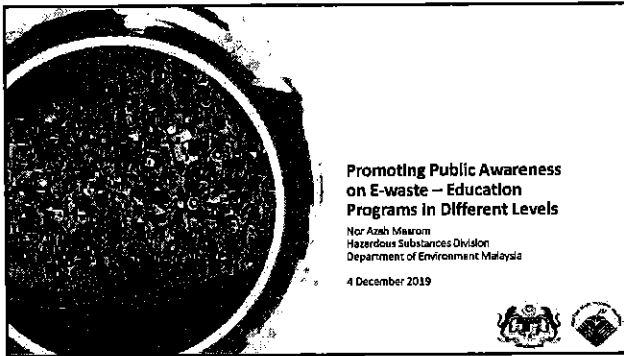
Thank You !

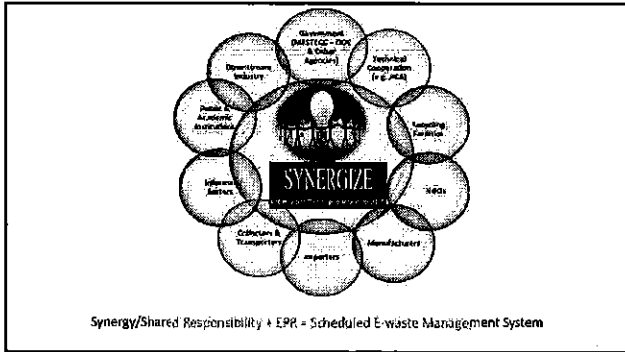
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marcos.pimentel@greenk.com.br

FERNANDO PERFEITO
fernando@greenk.com.br

Conexão
Entre
Tecnologia
e Sustentabilidade

greenk





Members of Taskforces from Public and Private Sectors

| Government | |
|------------|---|
| | ■ Ministry of Energy, Science, Technology, Environment and Climate Change |
| | ■ National Solid Waste Management Dept. (JPSPN) |
| | ■ Ministry of Housing, Local Government and Urbanism (KPKT) |
| | ■ Ministry of International Trade and Industry (MITI) |
| | ■ Ministry of Finance (MOF) |
| | ■ Ministry of Domestic Trade, Cooperatives and Consumerism (KPDNKK) |
| | ■ Royal Malaysian Police |
| | ■ Royal Malaysian Customs Department (JKDM) |
| | ■ Malaysian Investment Development Authority (MIDA) |
| | ■ Energy Commission |
| | ■ Economic Planning Unit (EPU), Prime Minister's Office |
| | ■ Attorney General Chamber (AGC), Prime Minister's Office |
| | ■ Local Government Authority (inc. Sabah and Sarawak) |

Members of Taskforces from Public and Private Sectors

| Private Sector Association | |
|----------------------------|--|
| | ■ Federation of Malaysian Electrical Appliance Dealers' Association (FOMEDA) |
| | ■ Federation of Malaysian Consumers Association (FOMCA) |
| | ■ Malaysia Retailers Association (MRA) |
| | ■ Federation of Malaysian Manufacturers (FMM) |
| | ■ The National ICT Association of Malaysia (PIKOM) |
| | ■ The Japanese Chamber of Trade and Industry Malaysia (JACTIM) |
| | ■ Association of Scheduled Waste Recyclers, Malaysia (ANSWERS) |

COMMUNICATION PLAN FOR E-WASTE AWARENESS RAISING

- E-waste as the SIGNATURE PROGRAM for MESTECC
- Promotion through social and mass communication media
- Involvement of all agencies under MESTECC and DOE state offices
- Budget
- Review by the Minister of MESTECC in Q4/2019

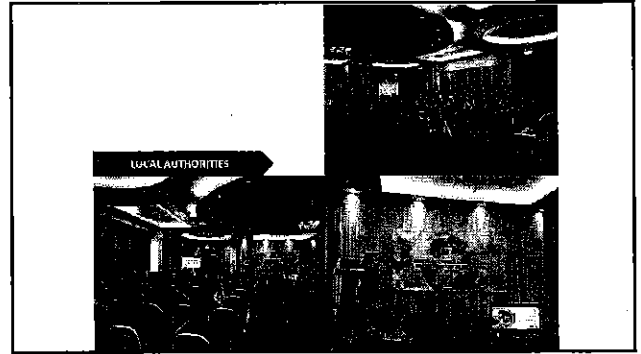
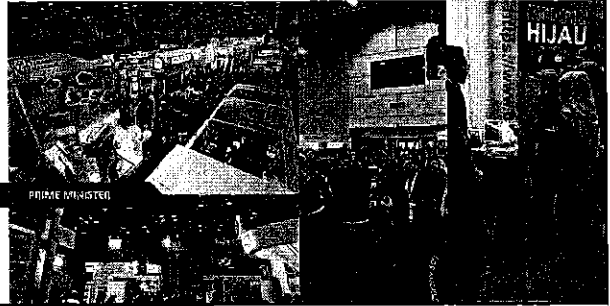
TASK FORCE MEETING

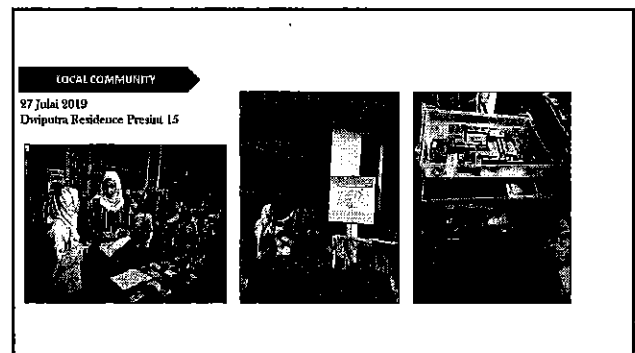
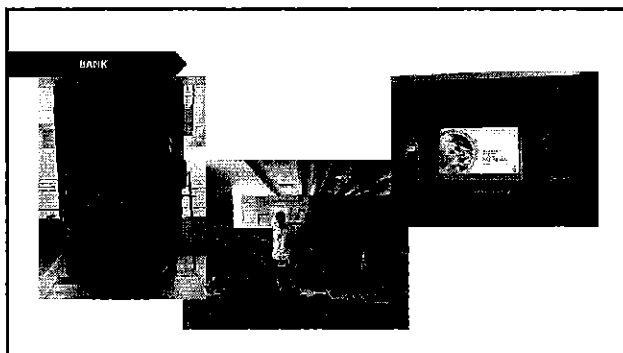
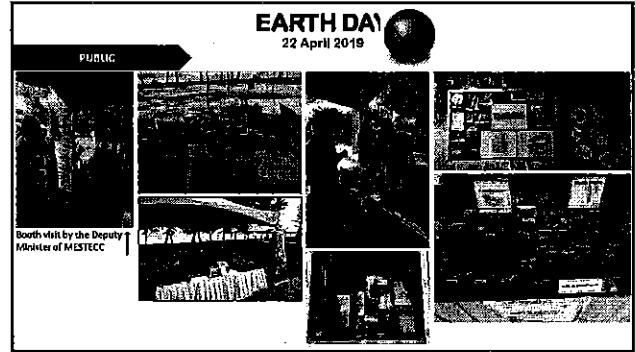
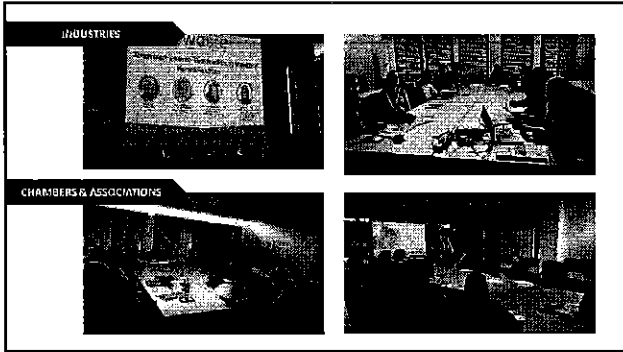


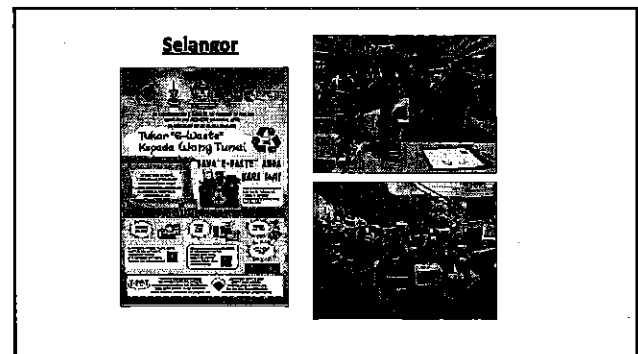
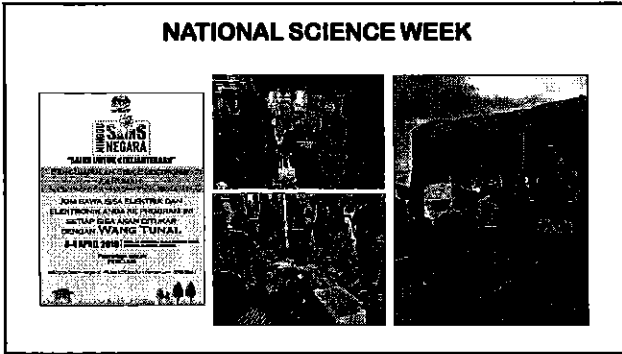
- Government agencies
- Manufacturers/importers
- Collectors/retailers
- Recyclers



INTERNATIONAL GREENTECH AND ECO PRODUCTS EXHIBITION 2019 9-11 OCTOBER 2019 35,000 visitors from 35 countries










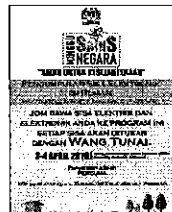


Sabah

- 8 Oktober 2019
- Dewan Dato Syahbandar Makang, Kuala Penyu


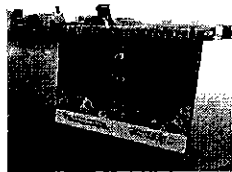




Communication, Education & Public Awareness



- Minggu Sains Negara 2019
- 3-4 April 2019
- Sekolah Menengah Sains Kuching Utara

INFORMATION DISSEMINATION

<Calendar>





<Banner> <Leaflet>

Official Portal on Household E-waste : <http://www.doe.gov.my/hhew/>

Purpose

- To make more user-friendly website so that people can easily access the necessary information such as:
 - ✓ Collection points near their premises
 - ✓ FAQ
 - ✓ Events
 - ✓ Seminar documents



Short Video for Awareness Raising

Purpose

- To provide general public with a necessary information in a friendly manner aiming to make them aware of the necessity and importance of proper household e-waste handling, as well as the required action
- To be utilized on a variety of occasions including the domestic and international events organized by DOE, as well as education at school.

Target

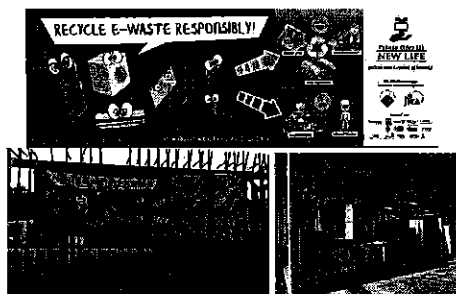
- General public

Specification

- 5-min long animated film
- English voice over
- English and Malay subtitles



Banners at recycling facility



EXPLODED E-WASTE DISPLAY



- Additional materials: Brochures, pamphlets, calendars

On-going Initiatives

- E-waste education module development with Ministry of Education Malaysia
- Short video on Scheduled E-waste management
- Engagement with the informal sectors

