

# Specific Waste Streams

## Construction & Demolition (C&D)

### WEEE / E-waste



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# C&D Waste

- ❖ Construction and demolition (C&D) waste is not a monolithic waste stream
- ❖ It is a family of waste streams. Therefore, it is important to define the types of materials, which could be available in C&D waste
- ❖ The most common materials could be paper/cardboard, garden/vegetation, wood/timber, carpets, other textiles, rubber, glass, plastics, metals, hazardous wastes, ceramic, soil/rubble <150mm, cobbles/boulders, clean soil, concrete, plasterboard, bricks, asphalt/bitumen, cement sheet, insulation, and others.
- ❖ Based on the local information and pilot surveys, a list of materials should be prepared for designing comprehensive sample analysis



# WGF - Material Densities

- ❖ The other important issue is to identify the material densities
- ❖ This will establish local volume to weight conversion factors
- ❖ Example from Melbourne Australia

Material	Density	Material	Density	Material	Density
Paper/Cardboard	0.1	Plastics	0.2	Concrete	1.5
Garden/Vegetation	0.15	Metals	0.9	Plasterboard	0.2
Wood/Timber	0.3	Hazardous Wastes	0.2	Bricks	1.2
Carpets	0.3	Ceramics	1.0	Asphalt/Bitumen	0.8
Other Textiles	0.15	Soil/Rubble <150mm	1.4	Cement Sheet.	0.5
Rubber	0.3	Cobbles/Boulders	1.4	Insulation	0.05
Glass	0.7	Clean Soil	1.6	Others	0.3



# WGF – Proportion of Materials

- ❖ After analyzing the samples, the distribution of material type could be established in proportion or percentage with respect to the total C&D waste
- ❖ This distribution could vary from place to place and sector to sector depending upon the types of the building materials and type of technology
- ❖ Example from Melbourne Australia

Category	Maunsell (1993) [% by weight]	Survey [% by weight]
Paper/Cardboard	1.2	0.4
Garden/Vegetation	0.1	1.7
Wood/Timber	12.2	9.5
Carpets and Other Textiles	1.2	0.5
Rubber	1.1	0.1
Glass	0.5	0.2
Plastics	1.1	0.5
Metals	7.3	4.5
Ceramics	4.5	0.9
Soil/Rubble, Cobbles/Boulders, & Clean Soil	41.7	40.9
Other <sup>(1)</sup>	29.0	40.8
Total	100	100

<sup>(1)</sup> Other includes concrete, plasterboard, bricks, asphalt/bitumen, cement sheet, and insulation

# Survey at Landfill Site

- ❖ Prior to collecting and analysing the samples (waste collection vehicles), it is important to get information from landfill site records about the timing, number of vehicles and the amount of C&D waste

Sample No. 1            Location: Landfill site Y  
 Sample Type:            C&D waste vehicle  
 Sample Type:            Mixed C&D waste / segregated  
 Volume: 3 m<sup>3</sup>            Weight: 1000 Kg

Component	Wet Weight		Composition	
	kg	Moisture Content	Calorific Value	
Soil/Rubble, Cobbles Boulders				
Ceramics				
Paper/ Cardboard				
Wood / Timber				
Plastic				
Carpet / Textiles				
Rubber				
Leather				
Garden / Yard / Vegetation				
Wood				
Glass				
Metals				
Others*				
	<b>Total</b>			



# Survey for Recovered Materials

- ❖ Either there could be dedicated transfer stations / landfills for C&D waste or there may be transfer station / landfills for mixed waste

Location: Transfer station / Landfill Y  
 Type: C&D waste / Mixed municipal waste  
 Date of Survey:

Component	Recovered
	kg
Soil/Rubble, Cobbles Boulders	
Ceramics	
Paper/ Cardboard	
Wood / Timber	
Plastic	
Carpet / Textiles	
Rubber	
Leather	
Garden / Yard / Vegetation	
Wood	
Glass	
Metals	
Others*	
<b>Total</b>	



# Survey at C&D Sites

- ❖ A major portion of C&D waste is reused at the same C&D site or sent to another C&D site

Site No. 1 Location: District B

C&D waste generator: Residential / Commercial / Industrial / Government

	<b>Re-used on site C&amp;D Waste Tons</b>	<b>and recyclables Tons</b>	<b>Discarded &amp; sent to landfill Tons</b>
<b>Soil/Rubble, Cobbles Boulders</b>			
<b>Ceramics</b>			
<b>Paper/ Cardboard Wood / Timber</b>			
<b>Plastic</b>			
<b>Carpet / Textiles</b>			
<b>Rubber Leather</b>			
<b>Garden / Yard / Vegetation</b>			
<b>Wood</b>			
<b>Glass Metals</b>			
<b>Others*</b>			
<b>Total</b>			



# Overall Data

	Recycling at C&D site %	Recovery at landfill site %	Discarded for landfill %
<b>Soil/Rubble, Cobbles Boulders</b>			
<b>Ceramics</b>			
<b>Paper/ Cardboard</b>			
<b>Wood / Timber</b>			
<b>Plastic</b>			
<b>Carpet / Textiles</b>			
<b>Rubber</b>			
<b>Leather</b>			
<b>Garden / Yard / Vegetation</b>			
<b>Wood</b>			
<b>Glass</b>			
<b>Metals</b>			
<b>Others*</b>			
<b>Total</b>			

- ❖ Others may include concrete, plasterboard, bricks, asphalt/bitumen, cement sheet, and insulation



# E-waste Management

## E-WASTE VOLUME I

[http://www.unep.or.jp/Ietc/Publications/spc/EWasteManual\\_Vol1.pdf](http://www.unep.or.jp/Ietc/Publications/spc/EWasteManual_Vol1.pdf)  
[http://www.unep.or.jp/Ietc/Publications/spc/EWasteManual\\_Vol2.pdf](http://www.unep.or.jp/Ietc/Publications/spc/EWasteManual_Vol2.pdf)

*Inventory Assessment Manual E-waste Management Manual*

**Capacity building of local partners on  
E-waste Inventory and Management:**

**Training and application of manuals  
through field projects Phnom Penh, ....**



# E-waste Definition

1. Reference Matrix based on National and/or Local Laws
2. based on International Initiatives / MEAs

Regulation/ Drivers	Drivers		
	Definition of Electrical and Electronic Equipment (Yes/ No)	Definition of loss of utility (Yes/ No)	Definition of way of disposal (Yes/ No)
“Hazardous” waste			
“Non-Hazardous” waste			
Regulation related to Basel Convention			
Any other regulation			



# Methodology for Inventory

Table 4.1: Data Requirements for WEEE/E-waste Inventory Assessment

Methodology/ Data Requirement	Saturation Level		Number of Household	Calculated Sales			Stock Data	
	Household	Industry		Export Data	Import Data	Manufacturing / Production	Private	Industry
Time Step Method	√	√	√	√	√	√	√	√
Market Supply Method				√	√	√		
Carnegie Mellon Method				√	√	√		
Approximation 1	√	√	√				√	√
Approximation 2				√	√	√		

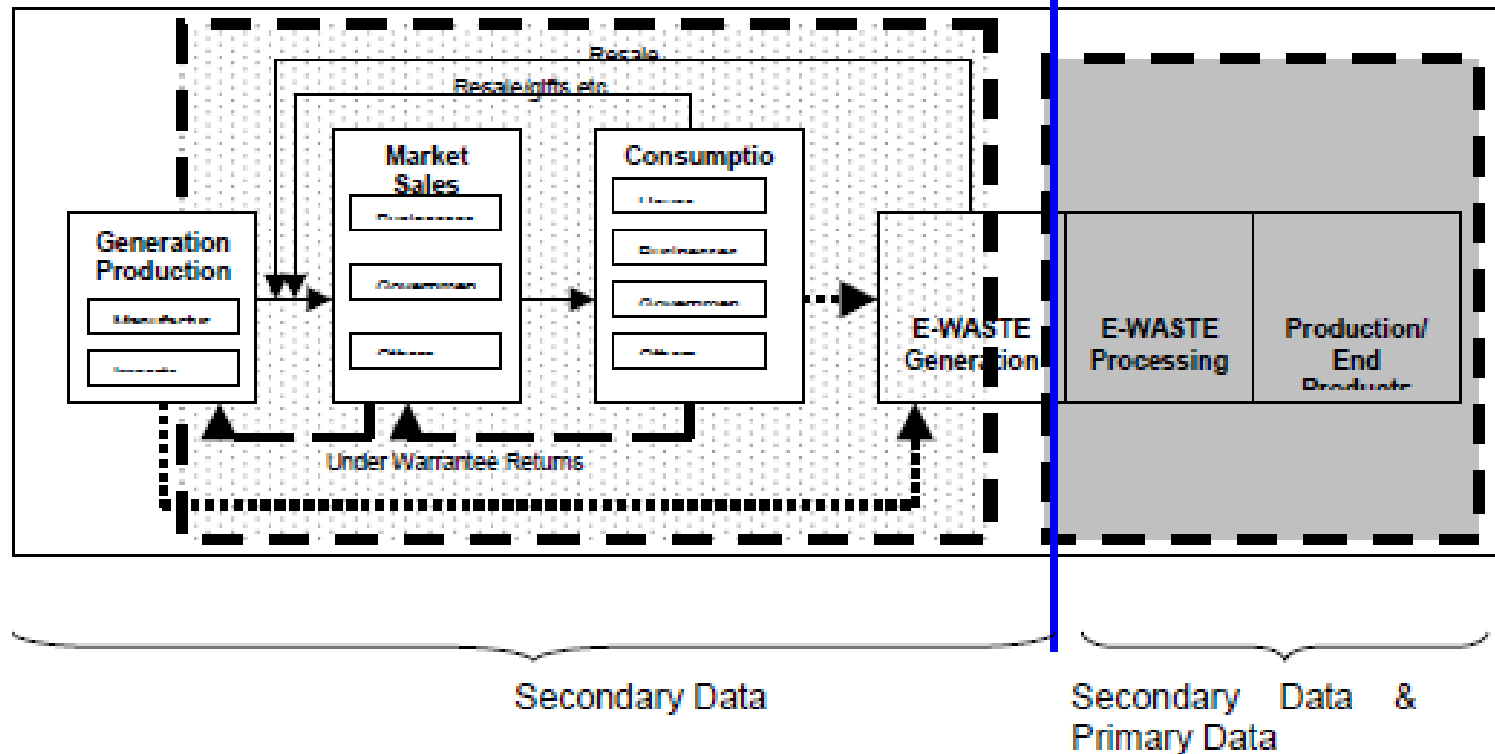
Methodology/ Data Requirement	Average Lifetime	Storage data	Reuse	Recycle	Landfill
Time Step Method					
Market Supply Method	√				
Carnegie Mellon Method	√	√	√	√	√
Approximation 1	√				
Approximation 2					



# Inventory Assessment

1. Upstream demarcation
2. Downstream demarcation

Figure 5.1: Demarcation of WEEE/E-waste trade value chain for Inventory Assessment



# Guidance for Inventorization

**Establish study area / geographical limits**

**E-waste trade chain / tracer item tracking**

**Inventory / obsolescence rate / scenario analysis  
(Secondary data)**

**Primary data analysis / confirmation of  
obsolescence rate**

**WEEE /  
E-waste  
Inventory**

**Products / by products / waste products**

**Trade economics**

**Impacts (social / environmental /  
business)**

**Data**

**Available**

**And**

**Collection**



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***Thank You...***

