



# HOLISTIC WASTE MANAGEMENT APPROACH FOR ECO TOWNS

*Bringing Back Clean Environment*  
公害の克服



*Polluted 1960s*  
1960年代の公害



*Present Environment*  
現在の環境



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# OVERVIEW

## 内容

- Why waste?  
なぜ廃棄物なのか？
- A holistic approach!  
総合的アプローチ
- UNEP and IETC  
国連環境計画と国際環境技術センター
- Conclusion  
結論





# WHY WASTE? 今なぜ廃棄物なのか

## Increase in the volumes of waste

**TABLE 4**  
Waste Generation  
Projections for  
2025 by Region

Region	Current Available Data			Projections for 2025			
	Total Urban Population (millions)	Urban Waste Generation		Projected Population		Projected Urban Waste	
		Per Capita (kg/capita/day)	Total (tons/day)	Total Population (millions)	Urban Population (millions)	Per Capita (kg/capita/day)	Total (tons/day)
AFR	260	0.65	169,119	1,152	518	0.85	441,840
EAP	777	0.95	738,958	2,124	1,229	1.5	1,865,379
ECA	227	1.1	254,389	339	239	1.5	354,810
LCR	399	1.1	437,545	681	466	1.6	728,392
MENA	162	1.1	173,545	379	257	1.43	369,320
OECD	729	2.2	1,566,286	1,031	842	2.1	1,742,417
SAR	426	0.45	192,410	1,938	734	0.77	567,545
Total	2,980	1.2	3,532,252	7,644	4,285	1.4	6,069,703

Source: World Bank





# WHY WASTE? 今なぜ廃棄物なのか

35億人が廃棄物管理システムのない地域で生活している



Source: World Bank



# WHY WASTE? 今なぜ廃棄物なのか

新しい廃棄物の主流: 電子機器廃棄物や医療関連廃棄物



Source: World Bank





# Water and sanitation

## 水と衛生

Year	Population			Water Supply Coverage (%)						Sanitation Coverage (%)						
	Total	Urban	Rural	Total		Urban		Rural		Total	Urban		Rural			
	('000)	(%)	(%)	Total Access	Household Connections	Total Access	Household Connections	Total Access	House Connections	Total Access	Sewer Connections	Total Access	Sewer Connections	Total Access	Sewer Connections	
Asia and the Pacific	1990	3,263,921	33	67	74	38	95	70	64	22	34	13	70	33	16	2
	2002	3,838,218	39	61	82	43	94	73	75	24	49	16	75	37	33	3
East and Northeast Asia	1990	1,349,962	33	67	74	55	99	85	62	40	32	10	71	28	12	1
	2002	1,502,315	42	58	80	64	94	92	70	43	50	20	73	43	33	3
North and Central Asia	1990	215,178	65	35	91	71	96	86	82	42	82	64	92	83	63	26
	2002	217,858	63	37	91	72	98	90	79	40	79	63	90	84	59	26
Pacific	1990	26,672	70	30	89	67	100	93	63	6	90	54	99	77	69	0
	2002	31,828	73	27	87	69	99	92	53	8	87	55	98	75	57	0
South and Southwest Asia	1990	1,232,183	28	72	71	21	90	56	64	7	23	9	58	29	9	1
	2002	1,550,605	31	69	85	26	94	54	80	13	39	10	69	27	25	3
Southeast Asia	1990	439,926	32	68	73	14	91	37	65	3	48	2	67	6	39	0
	2002	535,612	41	59	79	23	91	45	70	8	61	3	79	7	49	0

Source: Figures derived from data in *Meeting the MDG drinking water and sanitation target: A mid-term assessment of progress*. WHO and UNICEF. 2004. United Nations, New York.

Source: <http://www.adb.org/Water/Indicators/MDG-7/Table-02.pdf>

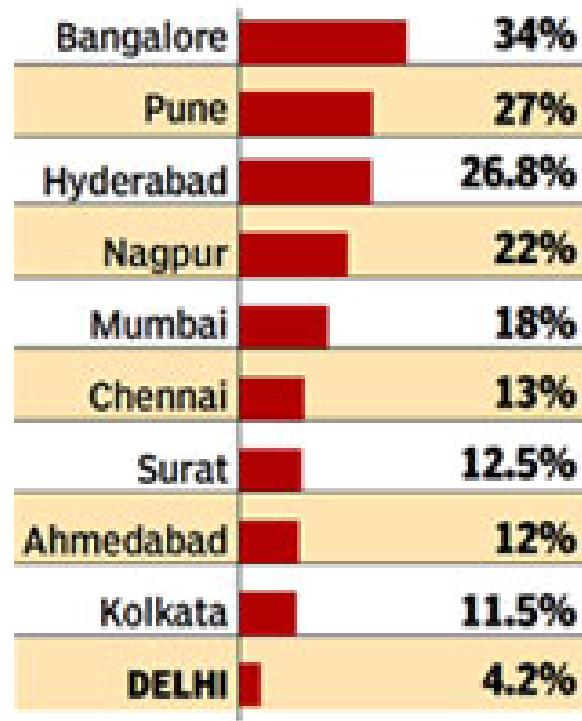
# Gaseous emissions

温暖化ガス排出



## THE AIR WE BREATHE

Air pollution rise in Indian cities between 2002-10, compared to other nations



**60  $\mu\text{gm}^{-3}$**   
(micro grams per cubic metre of air) is India's national air quality standard.

### Rise in air pollution

#### India's neighbours

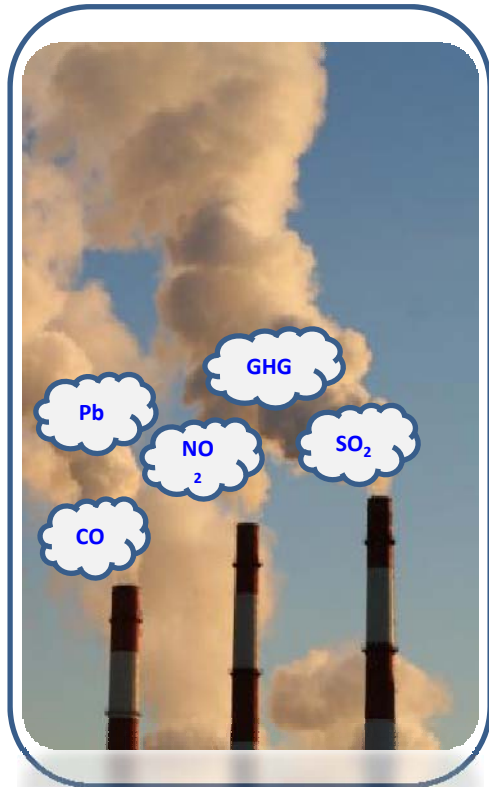
Dhaka (Bangladesh)	6.2%
Lahore (Pakistan)	2.3%
Karachi (Pakistan)	2.1%

#### Elsewhere

Shanghai (China)	13.7%
New York (US)	13.0%
Seoul (S. Korea)	9.5%
London (UK)	5.6%

Source: <http://www.hindustantimes.com/india-news/newdelhi/india-tops-china-in-air-pollution-level-increase/article1-966208.aspx>

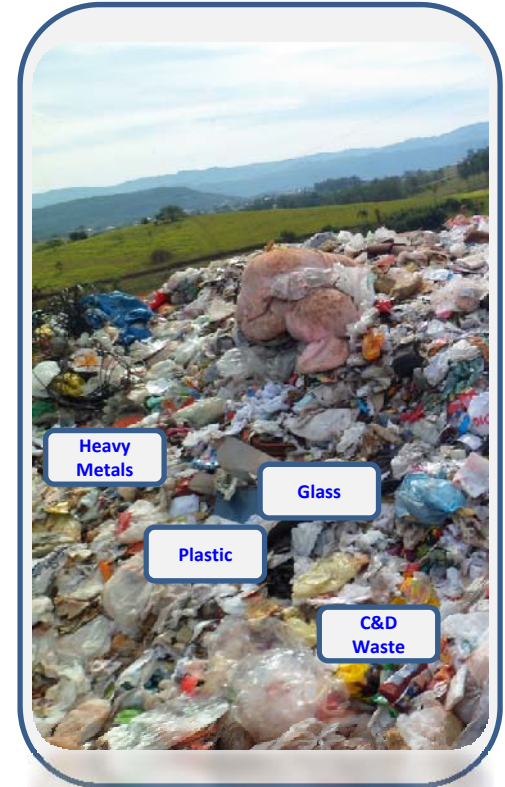
# 'Silo' Approach to Waste Management



Air Pollution



Water Pollution

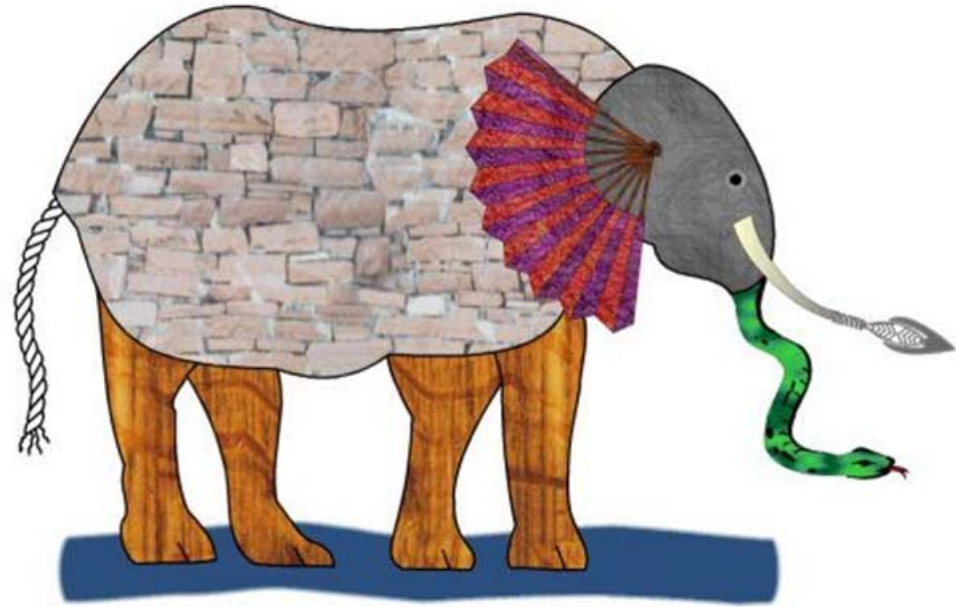


Soil/Land Pollution



# From 'Silo' to 'Holistic' Approach to Waste Management

- Silo Approach facilitates the “Sector” Specific Specialist Technology Development
- It may be good for one stream or form of waste, but might not be the optimal solution
- **Holistic Waste Management** = Breaking the “*Silo*”
- **Holistic Waste Management** = Integrated Waste management + Interlinkages with waste forms
- **Holistic Waste Management** = putting the pieces together



Looking at the big picture can lead to a new way of seeing the problem.

Let us “see” the whole elephant.

# Holistic Approach: Breaking the 'Silo'

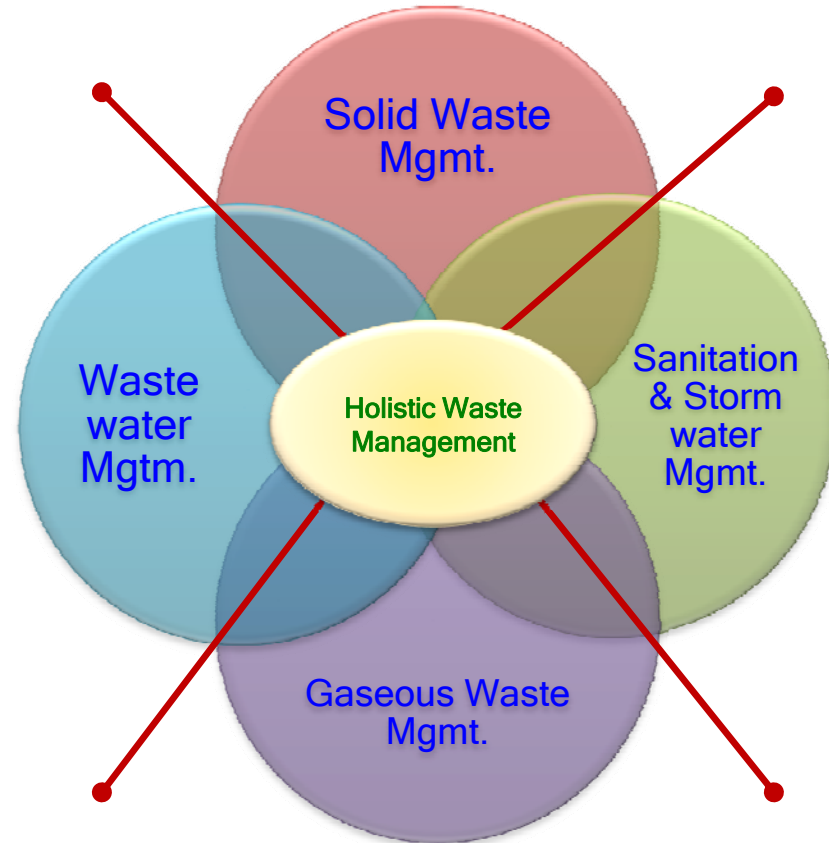


# Holistic Waste Management

Holistic system approach here means the

**Inter-sectoral** waste interlinkages (solid, liquid and gaseous), and

**Multi-media pollution** issues arising from waste handling of one form or one waste sector





# Holistic Waste Management

Sector

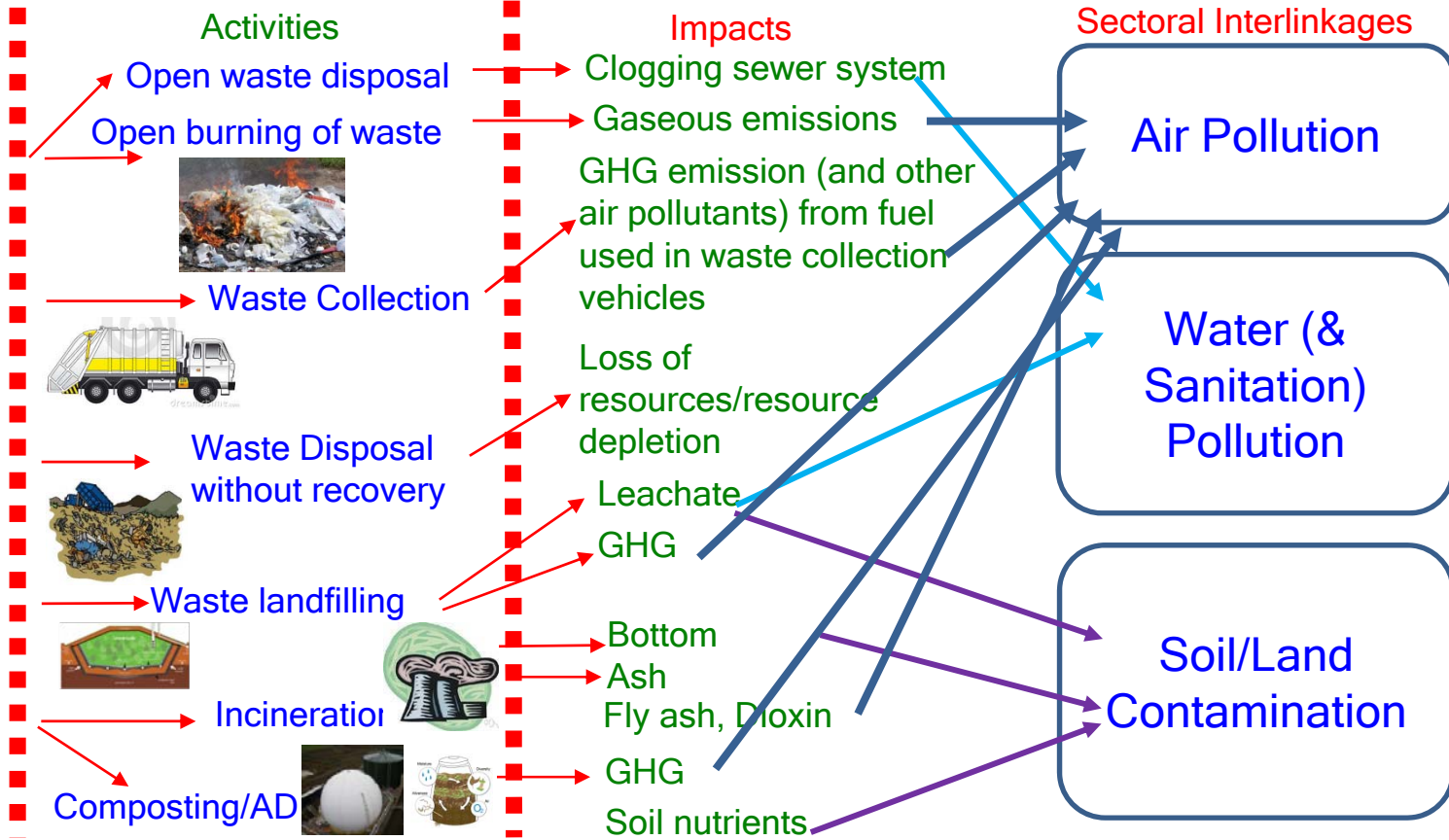
Activities

Impacts

Sectoral Interlinkages



Municipal Solid Waste Management



# Solid, Liquid, Gaseous Nexus – Mercury waste

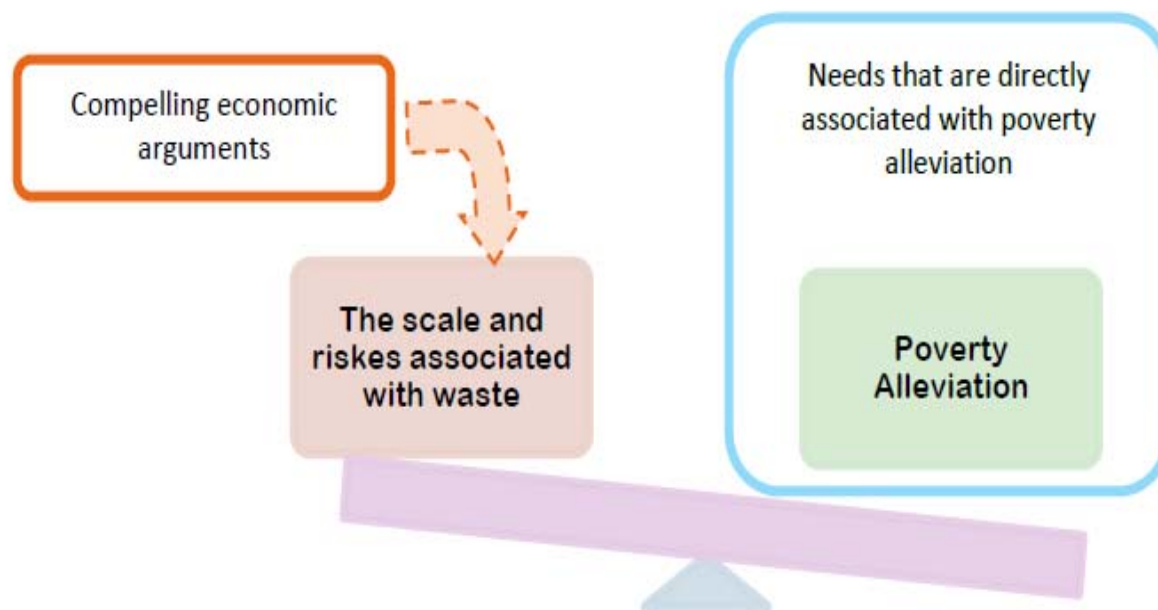
「水俣条約」採択 2013年10月10日 in 熊本



Plenipotentiaries on the Minamata Convention on Mercury  
October 9, 2013 Tree-planting ceremony

# WHY SHOULD DEVELOPING COUNTRIES MAKE WASTE A PRIORITY ?

なぜ途上国は、廃棄物問題を優先的に取り組むべきなのか



*The policy and budget attention in developing countries regarding waste management and other higher prioritized problems*



# WHY SHOULD DEVELOPING COUNTRIES MAKE WASTE A PRIORITY ?

なぜ途上国は、廃棄物問題を優先的に取り組むべきなのか



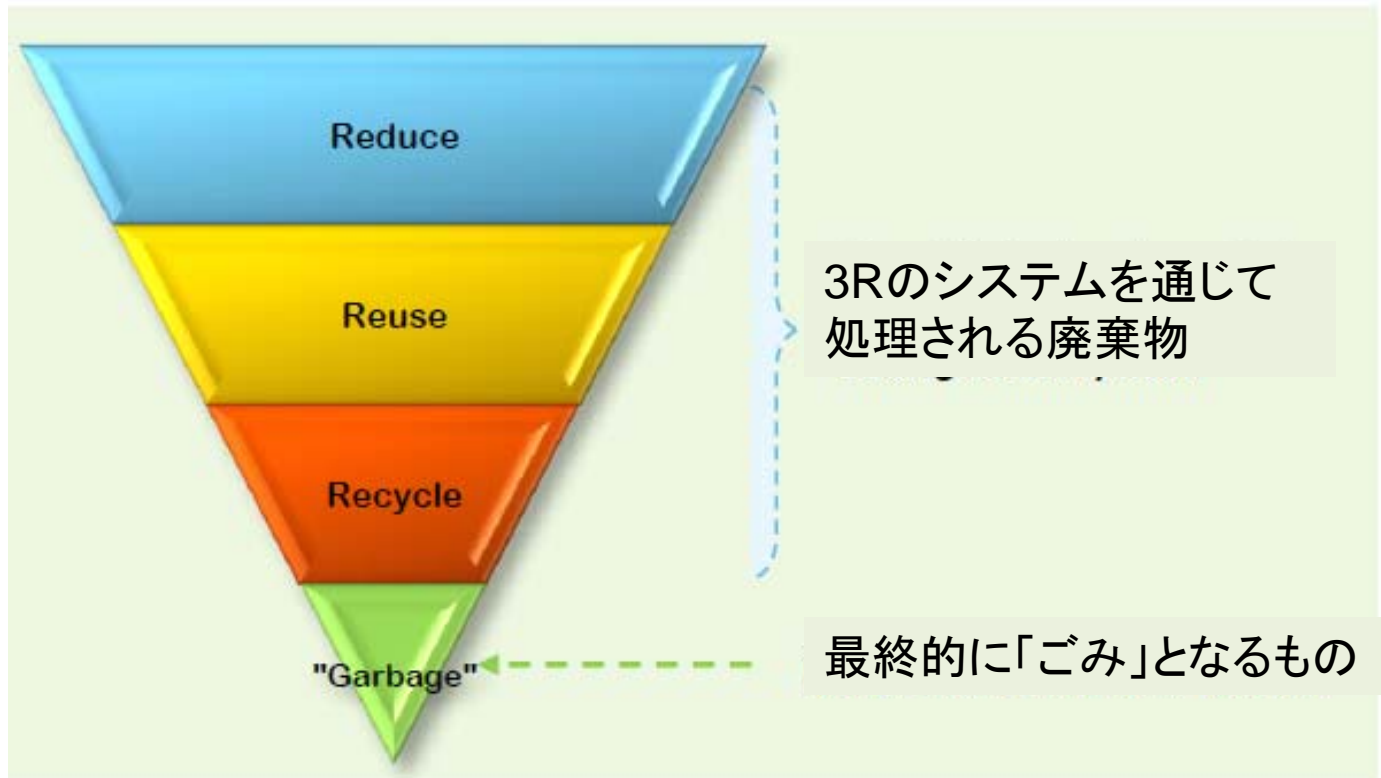
*IETC's task of urging countries to manage their waste better and to move from words to action in the development of more effective waste management systems*





# WASTE HIERARCHY AND 3R

廃棄物ヒエラルキー(階層)と3R  
リデュース・リユース・リサイクル







# Focus of technology support: Turning challenges into opportunities

技術支援への焦点： 困難を好機にかえる

20<sup>th</sup> CENTURY

WASTE  
MANAGEMENT

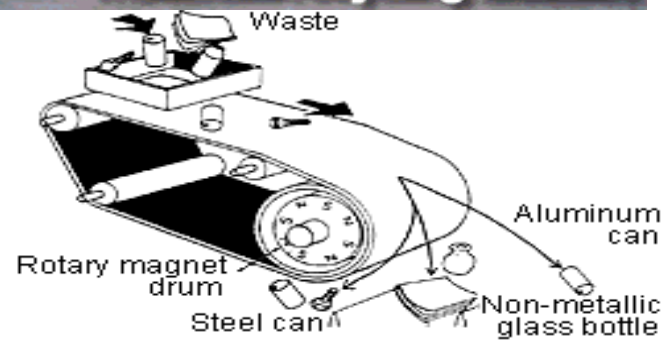
“How do we get rid of our waste efficiently with minimum damage to public health and the environment?”

21<sup>st</sup> CENTURY

RESOURCE  
MANAGEMENT

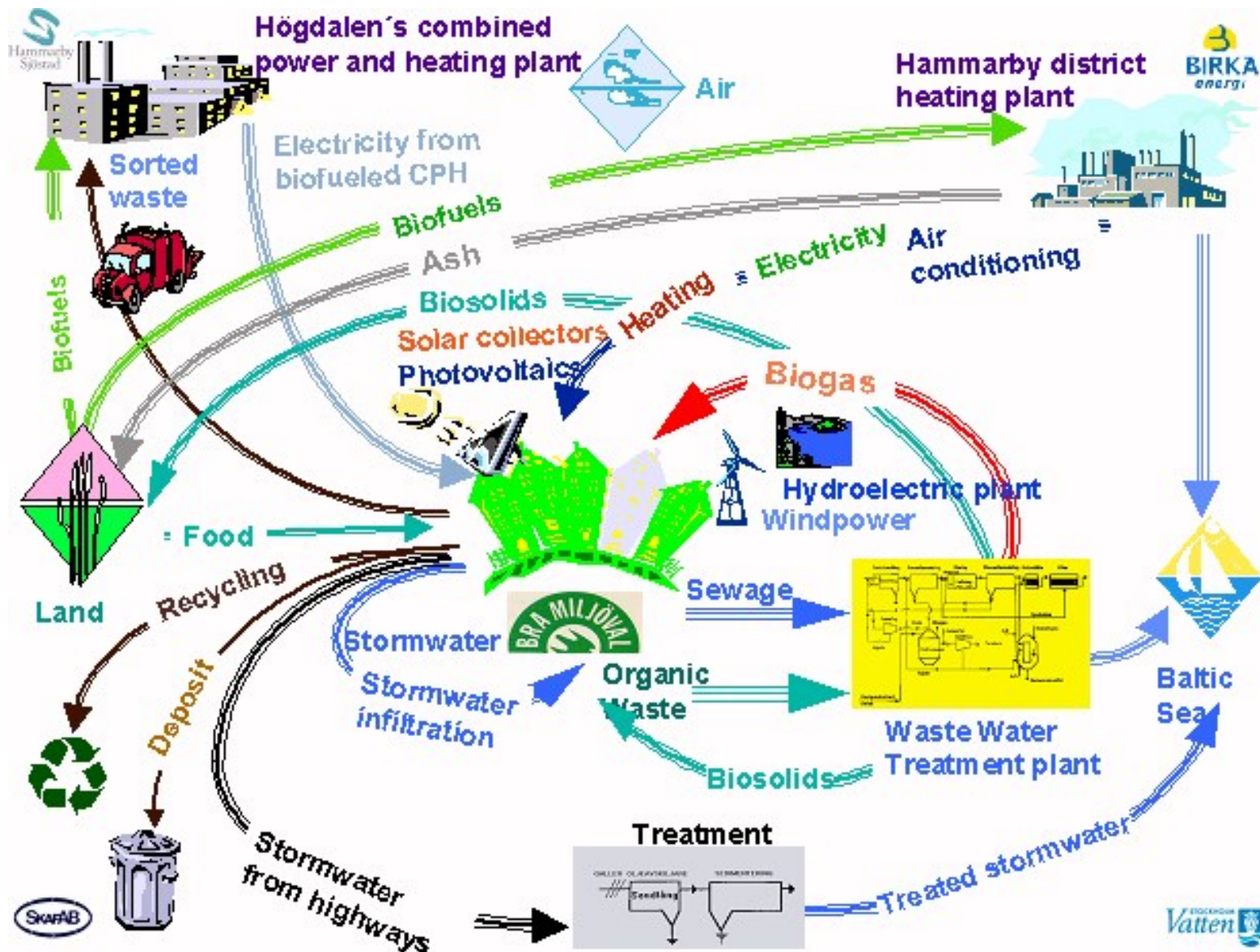
“How do we handle our discarded resources in ways which do not deprive future generations of some, if not all, of their value?”

Source: Dr. Paul Connett, Zero Waste, Power Point



# CITIES ECOLOGICAL FOOTPRINTS – CLOSING THE LOOP

都市のコロジカル・フットプリント – 環を閉じる



Hammerby Sjöstad, Stockholm - Sweden



# United Nations Environment Programme

## 国連環境計画 (UNEP)

- 1972年国連総会において設置決定 -

### 5 Divisions of UNEP

- Environmental Law and Conventions (DELIC)
- **Technology, Industry and Economics (DTIE)**
- Early Warning and Assessment (DEWA)
- Environmental Policy Implementation (DEPI)
- Communications and Public Information (DCPI)



# Division of Technology, Industry & Economics 技術・産業・経済局 (DTIE)

## 6 Branches of DTIE

- **Sustainable Consumption and Production Branch (持続可能な生産と消費部門)**
- **Energy Branch (エネルギー部門)**
- **Ozon Action Branch (オゾン・アクション部門)**
- **Economics and Trade Branch (経済・通商部門)**
- **Chemicals Branch (化学物質部門)**
- **International Environmental Technology Centre (国際環境技術センター)**

# INTERNATIONAL ENVIRONMENTAL TECHNOLOGY CENTRE

## 国際環境技術センター



- The International Environmental Technology Centre (IETC) is a branch of the Division of Technology, Industry, and Economics (DTIE) and is leading the waste management portfolio within UNEP.
- UNEP IETC focuses on identifying and showcasing environmentally sound technologies (ESTs) and management practices, primarily in relation to waste.



# International Environmental Technology Centre

## 国際環境技術センター (IETC)

The image shows two side-by-side browser windows displaying the International Environmental Technology Centre (IETC) website. The left window shows the English version, and the right window shows the Japanese version.

**English Version (Left Window):**

- Header: United Nations Environment Programme (UNEP) logo and navigation menu (Home, About IETC, Our Work, Contact us / Access, Information Resources).
- Section: **IETC International Environmental Technology Centre**
- Section: **OUR MANDATE**
  - Text: "The International Environmental Technology Centre (IETC) is a branch of the United Nations Environment Programme (UNEP) / Division of Technology, Industry and Economics (DTIE). Its main function is to promote the application of environmentally sound technologies (ESTs) in developing countries and countries in transition. Currently IETC focuses on waste management areas."
  - Image: Three recycling bins (blue, red, yellow).
  - Text: "The challenges of waste management" and "Turbid forest stream water, disaster, urban".
- Section: **IETC HIGHLIGHTS**
  - Text: "International expert mission to the Tohoku region" and "In collaboration with the Japanese".

**Japanese Version (Right Window):**

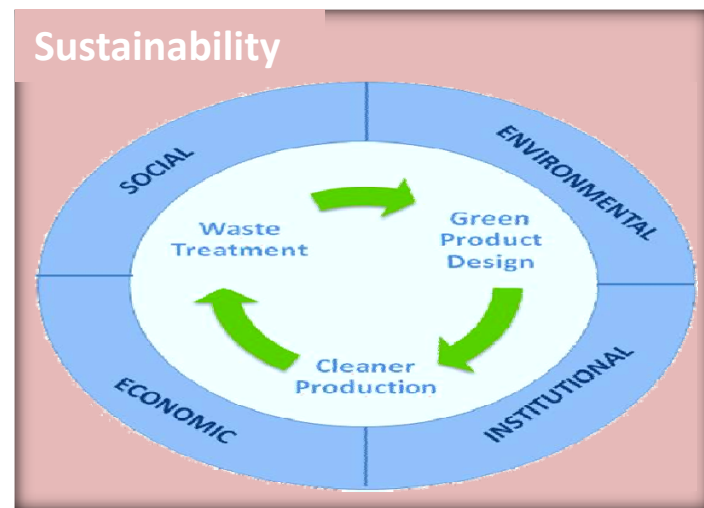
- Header: 国連環境計画 国際環境技術センター (UNEP/IETC) logo and navigation menu (HOME, ニュースセンター, 出版物, カレンダー, 実績, Milestones, UNEP ストア).
- Section: **国際環境技術センター (IETC)**
- Text: "IETCは管理システムを中心、空気と水質、水と衛生のための環境上適正な技術(EST)を促進、実施しています。2004年以降、IETCは下記2分野を中心に活動しています。"
- Buttons: 廃棄物管理, 水と衛生
- Section: **ハイライト**
  - Text: "廃棄物管理: 東京の地震と津波による瓦礫の処理に関する国際共有のための国際専門家会議"
  - Text: "ワン・ワールド・フェスティバル2012 への参加: 2012年2月4-6日(土・日):大塚国際交流センター"
  - Text: "エコアートフェスタ大塚2011 - 2011年10月29-30日(土・日):大塚国際交流センター"
  - Text: "生物多様性シンポジウム〜大都市と生物多様性の関わりを見てみよう〜生物多様性/自然環境への参加: 2011年10月28日(日):大塚国立自然史博物館"
  - Text: "UNEP IETCのオフィスで大塚府立千賀高等学校の学生の来訪を受けました(報告) 2011年9月22日"
  - Text: "第37回国見民話まつりの参加: 2011年9月11日、花博記念公園 自然観察広場にて"
  - Text: "廃棄物管理: 電気電子部品廃棄物(WEEE/E-waste)の回収システム"



# UNEP IETC: HOLISTIC WASTE MANAGEMENT

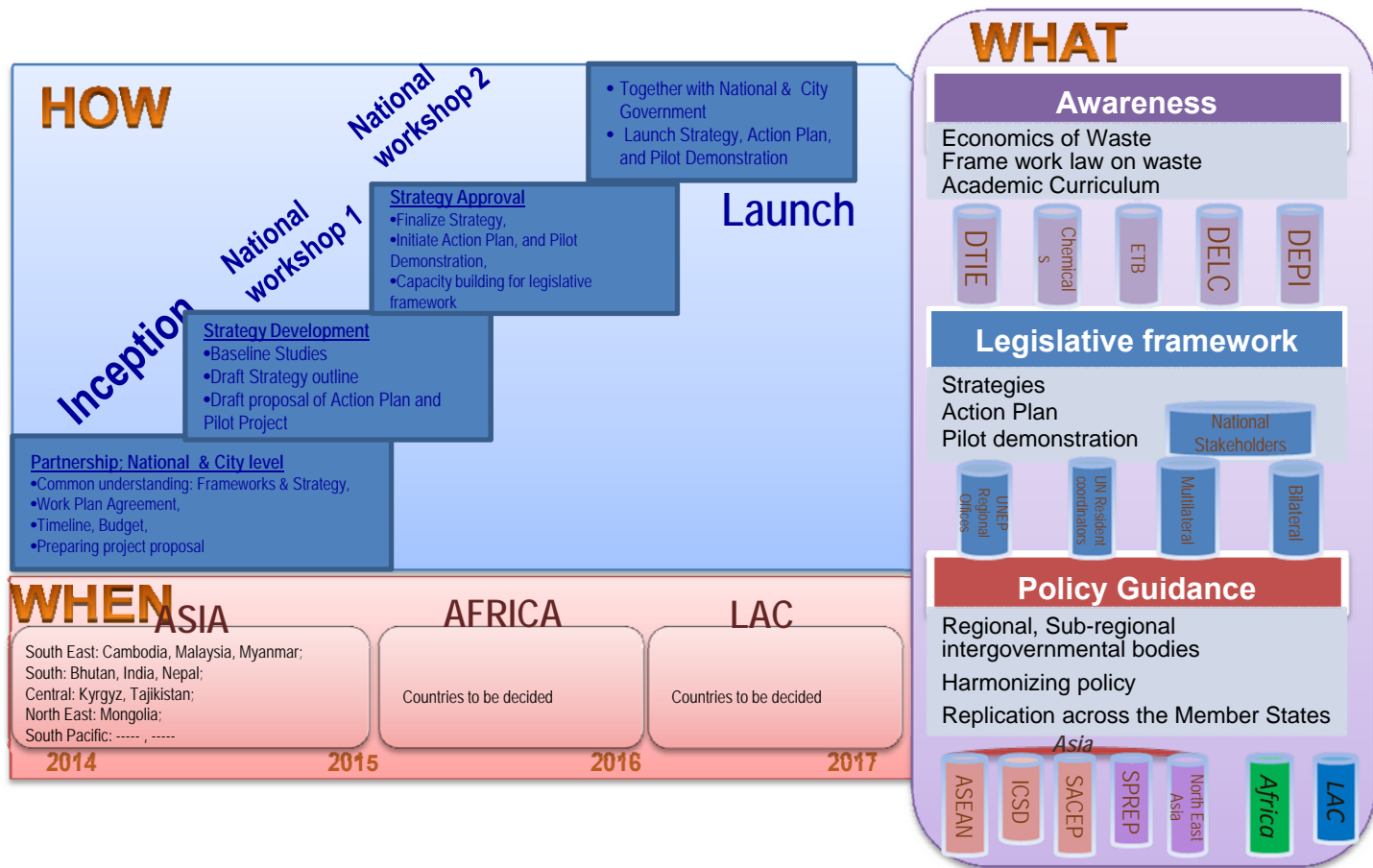
## 国連環境計画と国際環境技術センター 廃棄物管理

- Holistic approach to waste
- Waste → Resource (From linear to closed-loop material cycle)
- Promote Prevention Policies: Anchor 3R





# IETC SUPPORT FOR NATIONAL AND CITY WASTE MANAGEMENT STRATEGIES





# IETC EXPERIENCES – ISWM

## IETCの経験 — 統合的廃棄物管理



- Wuxi New District, China – 2008
- Pune City, India – 2008
- Maseru City, Lesotho – 2009
- Matale City, Sri Lanka – 2009
- Novo Hamburgo, Brazil – 2009
- Nairobi – 2010
- Bahir Dar, Ethiopia – 2010
- Pathum Thani, Thailand – 2011
- Addis Ababa – 2011



- Danang, Vietnam - 2012
- Kampot, Cambodia - 2012
- Bangkok – 2012
- Honduras - 2013

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Web: <http://www.unep.org/ietc>

## Conclusion

結論

**Partnership,  
Partnership and  
Partnership  
Thank You...**

