

*Session2*

Create a Recycling Society

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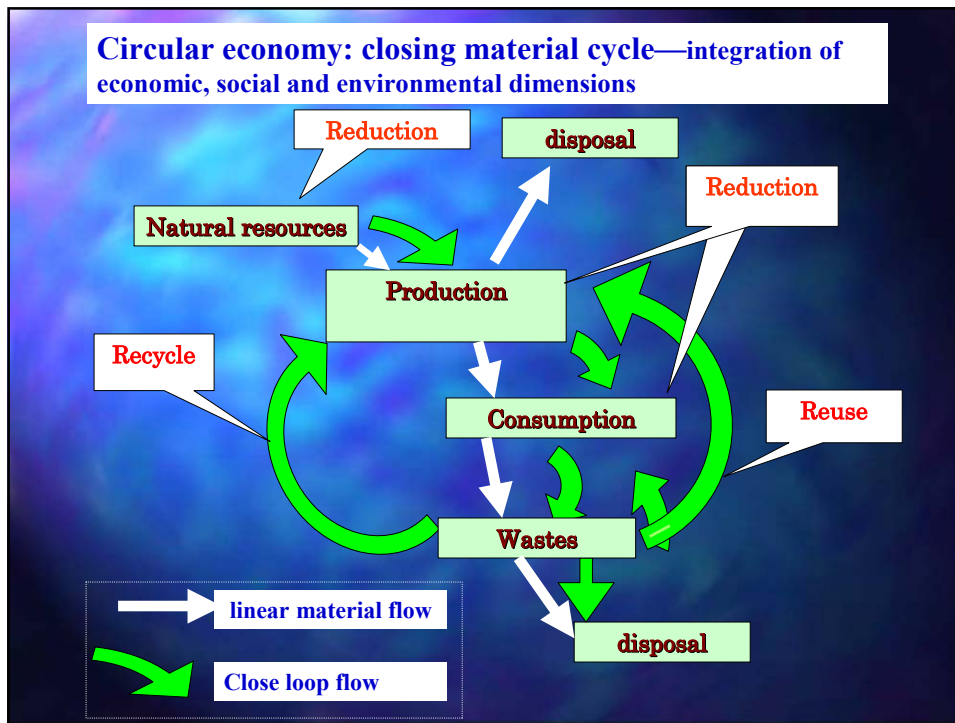
# Circular Economy in China: *Current Practice and Prospect*

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## Outline

1. Circular economy: *international perspective*
2. Circular economy: *Chinese perspective*
3. Current practice and prospect
4. Challenges to development of circular economy



## 1 international perspective: *Germany*

Circular economy essentially originated from “garbage economy” (Reduction, recycle, reuse and disposal), and then extended to 3R of materials in industrial sectors in the 1990s.

1. Before the 1970s: garbage dumped or land-filled
2. 1972: issuance of the Law of Waste management—shut down the dumpsites and started by incineration
3. After oil crisis: electricity and heat generation from the incineration.
4. 1986: revised the Law and made effort in reduction and reuse.
5. 1996: issued the Circular Economy and Waste Management Law (KrW/AbfG)
  - *Rebuild German garbage disposal system and applied extended responsibility to producers*

the percentage of reused garbage to the total generated raised to 50% in 2000, from 15% in 1990

Domestic garbage	Percentage collected (%)	Percentage reused (%)
Organic garbage	50	96
Waste paper and cardboard	87	100
Glass	78	100
Metal in wrappage	65	100
Plastic and paper wrappage	75	97
Cell	35	100
Automobile cell	95	100
Tire	94	98
Textile	70-80	70-80

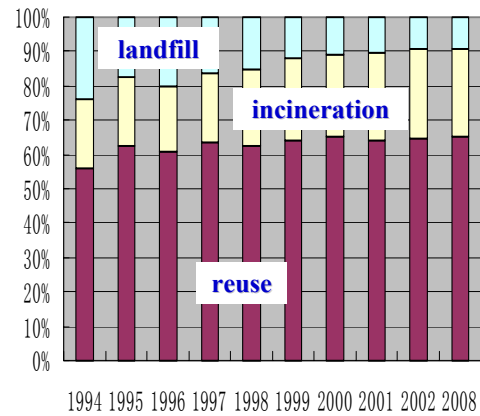
## 1 international perspective: *Japan*

**Likewise, building “circular/recycling society” in Japan also is also motivated by waste issue and aims at reforming the traditional patterns of social end economic development.**

- Domestic wastes: 50 million Tons; industrial wastes: 400 million Tons; 1 Kg domestic wastes per capital per day.
- 1. Incineration but lack of capacity of final landfill.
  - Industrial wastes: by 2000, the landfill capacity nationwide can sustain for 3.9 years, and Tokyo area, 1.2 years;
  - Domestic wastes: nationwide---12.2 years ; Tokyo area—11.2 years
- 2. Root-causes: massive production, massive consumption and massive disuse/disposal.
- 3. Since 2000, issued 1 basic law for promotion of building circular society, governmental green purchase, and 7 special laws related to different wastes reuse.

## 1. international perspective: *others*

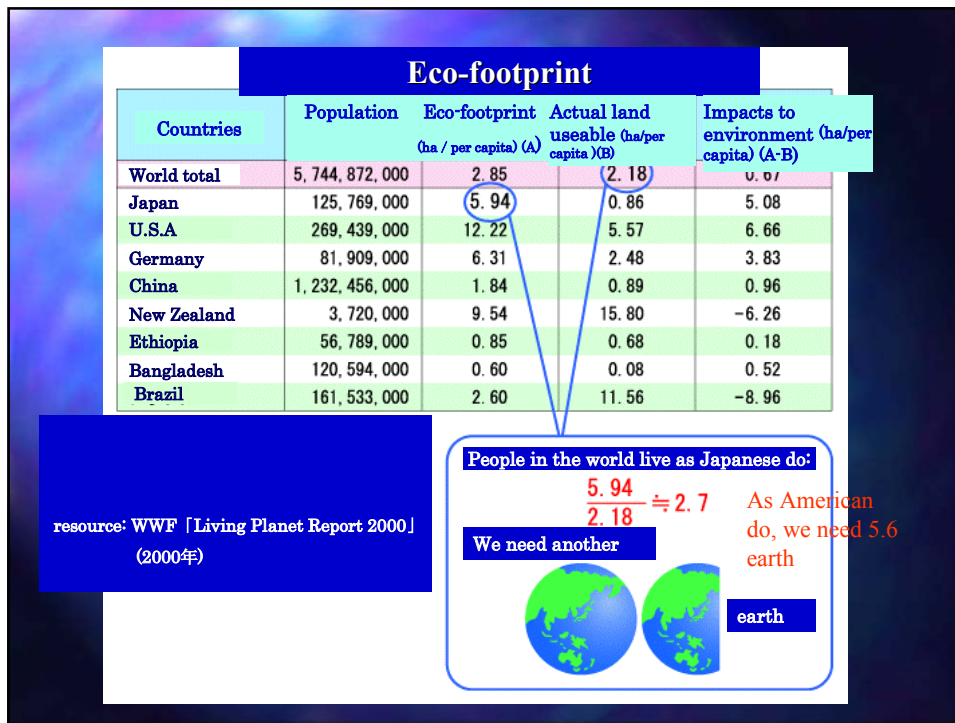
- No terminology of circular economy in other developed countries, but 3R of wastes have been a focus in their agendas of EP and SD activities
- Cleaner production and eco-industrial park are significant initiatives in promotion of sustainable industries.



Percentages of waste reuse, incineration and final landfill in Denmark

## 1. international perspective: general

**In a word, initiatives of circular economy in developed countries focus on waste issue caused by post-industrialized society, after most of industrial pollution and urbanization-oriented pollution have been resolved. Then the initiatives extend to industrial sector and ultimately aim to changing traditional patterns of production and consumption.**



## 2. Chinese perspective

### Three motivations/purposes for advocating circular economy:

- To resolve compound environmental problems needs integrated strategies to essentially reform the traditional patterns of economic growth and social development.
- As a result of Chinese strategic evolution in environmental protection.
- To achieve the goals of all-round well-off society strategy and promote new model of industrialization.

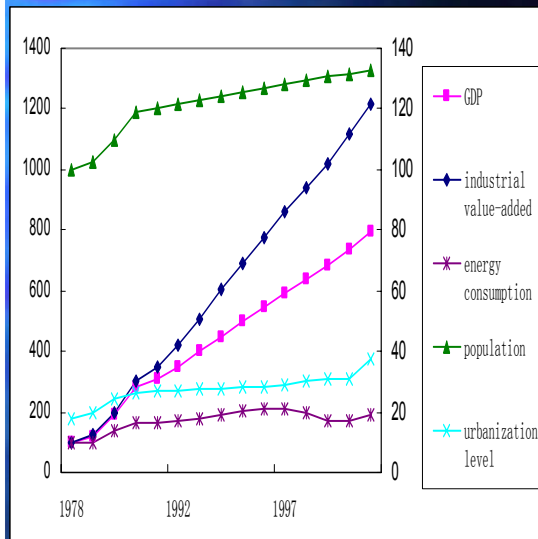
## 2 Chinese perspective

### A. Compressed/shortened industrialization/urbanizations and compound environmental problems

1. **Industrialization:**
  - European and American developed countries—150-200 years;
  - Japan—around 100 years;
  - new industrializing economies—50 years around;
  - *China—will be less than 50 years*
2. **Urbanization:**
  - 20 years from 1978 to 1999, urbanization level raised by 12%;
  - European industrialized countries took 50 years in late 19<sup>th</sup> century, with same growth.
  - Urbanization level: 37% in 2003, 46% in 2010; 55% in 2020.

### Social and economic achievements and their implications for environment :1978--2001

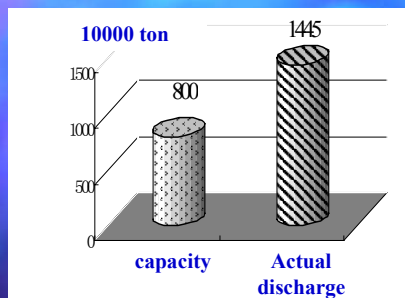
- GDP growth at 9.5% annually in last 23 years from 1978 to 2001;
- Per capital GDP—1000 US\$ around at present.
- As compared to 1978, in 2001:
  - GDP increased by 6.9 times;
  - Industrial value-added, by 11 times;
  - Energy consumption, by 1.3 times;
  - Urbanization level, by 20%;
  - Population, by 300 million.



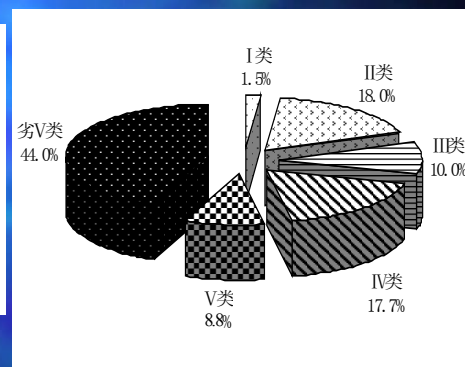
## 2. Chinese perspective

### Compound environmental problems:

- industrial pollution,
- urban related pollution,
- ecological degradation,
- new environmental issues, and
- global environmental issues.

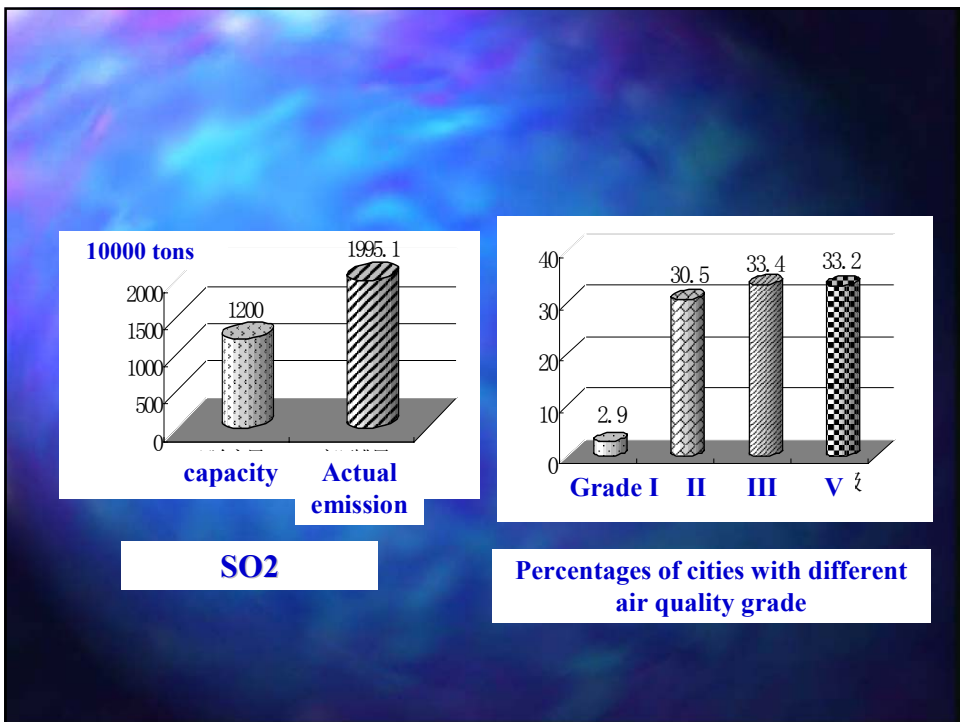
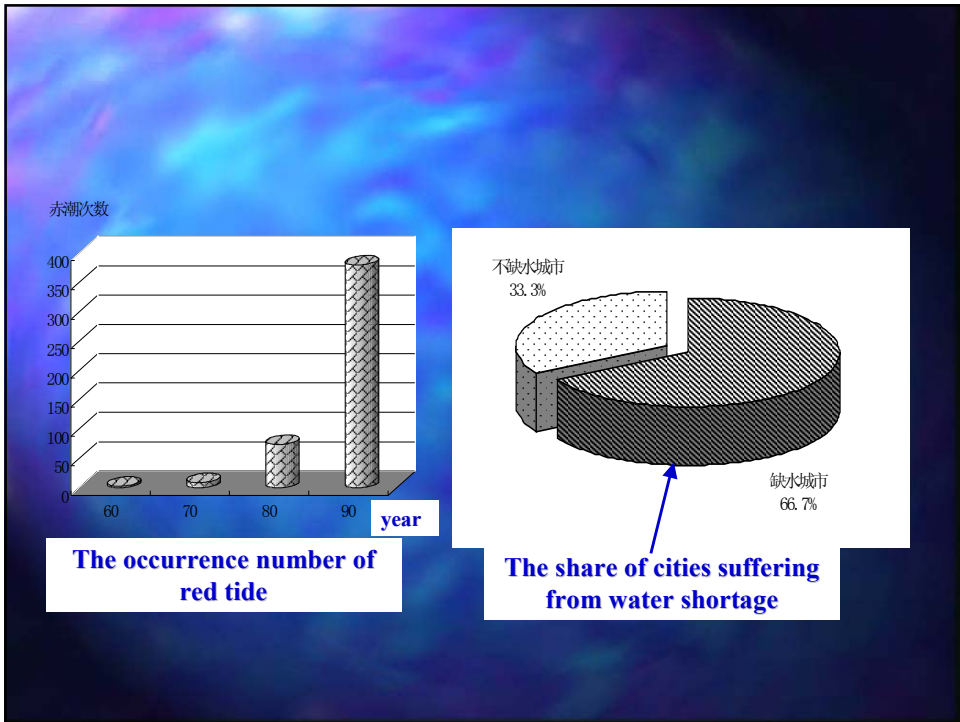


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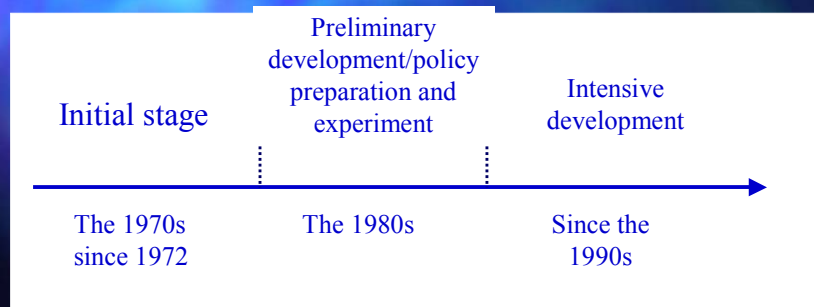
**Water qualities in seven rivers**





## 2. Chinese perspective

### B. Evolution of Chinese environmental strategies: from the isolated to the integrated in dealing with environmental protection and economic development



## 2. Chinese perspective

1. **1970s:**
  - Industrial pollution control at the end-of-the-pipe;
  - Comprehensive utilization of industrial wastes, including waste water, gas and solid
2. **1980s:**
  - Began to reconsider the limitation of the end-of-the-pipe strategy;
  - Set environmental protection as a national basic policy;
  - General guidelines: among economy, urban/rural, and environment, synchronize their planning, implementation and development; and give same importance to economic benefits, social benefits and environmental benefits.
  - Basic principles in pollution control: prevention first, and integration of prevention and abatement.

*Yet, no essential changes in practices.*

## 2 Chinese perspective

### 3. 1990s

- (1) Take SD as a national strategy;
- (2) Change the traditional patterns of economic growth;
- (3) strategic restructure of economic development;
- (4) Win-win principle of conserving environment while economic

#### Booming

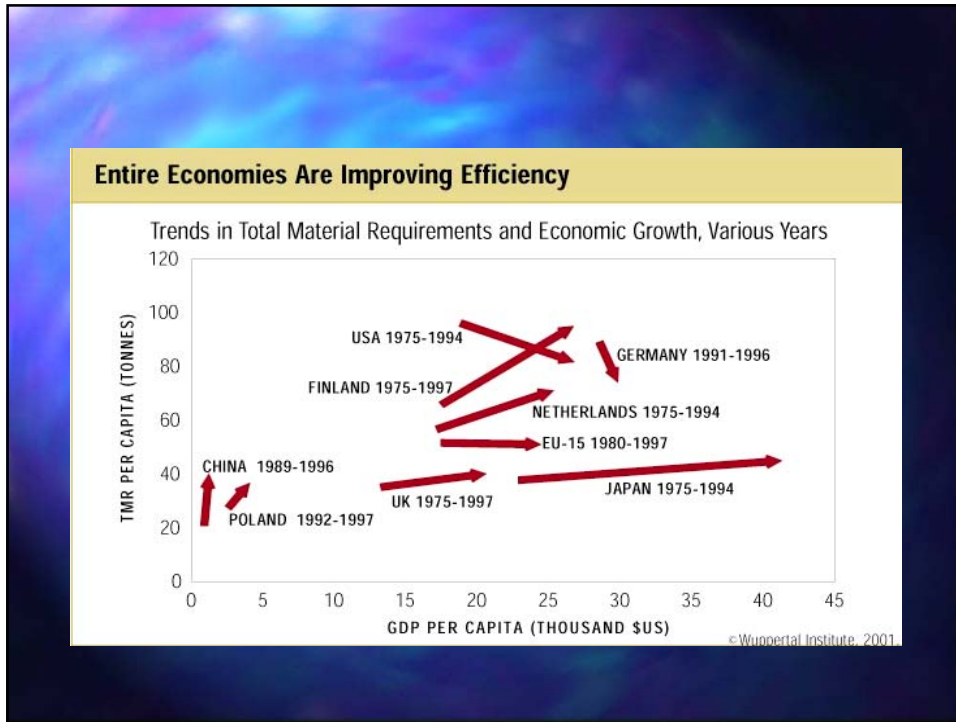
- *promote co-benefits between economic restructure and pollution control;*
- *set up successful cases in coordinated development between environment and economy;*

- (5) Very positively political position on environmental protection
- (6) Environmental protection as a core target in the strategy of building all-round well-off society in new century

## 2. Chinese perspective

### C. All-round well-off society

1. **Goal 1:**
  - Fourfold GDP by 2020, against 2000;
2. **Goal 4:**
  - Increase in capacity of sustainable development;
  - Improvement in ecologic environment;
  - Significant raise in efficiency of resource use;
  - Promotion of harmonious relationship between human and nature;
  - In a word, the whole society should move towards such a civilized road as well-developed economy, rich life and sound ecologic environment.



	Population	GDP/per
2000	1.2 billion	US\$800
2020	1.6 billion	US\$3000

- *the building of well-off society will produce 4-5 times of impacts on environment, against the current situation.*
- *the solution is to raise the eco-efficiency of economic activities by 4-5 times and much more, if the current situation of environment would be improved.*

## 2. Chinese perspective

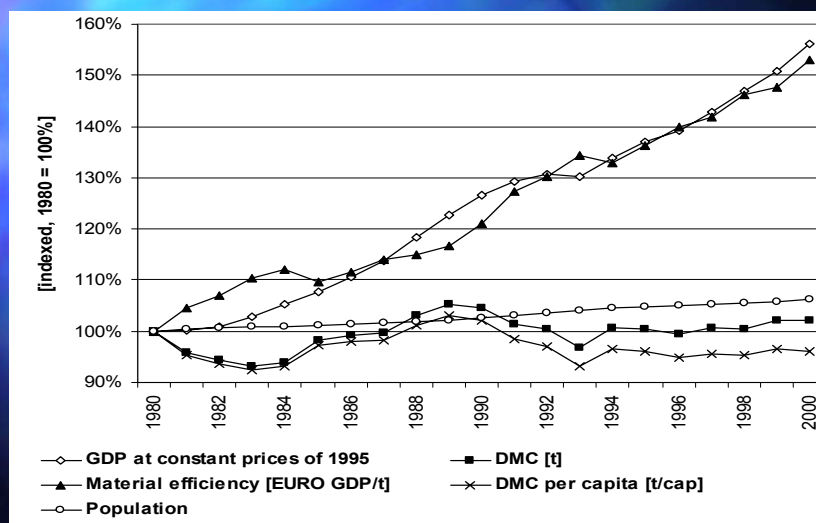
### Criteria for new road of industrialization:

- Much more scientific-and-technologic-oriented;
- Good economic benefits;
- Low resources input/consumption;
- little pollution;
- Full use of human resources.

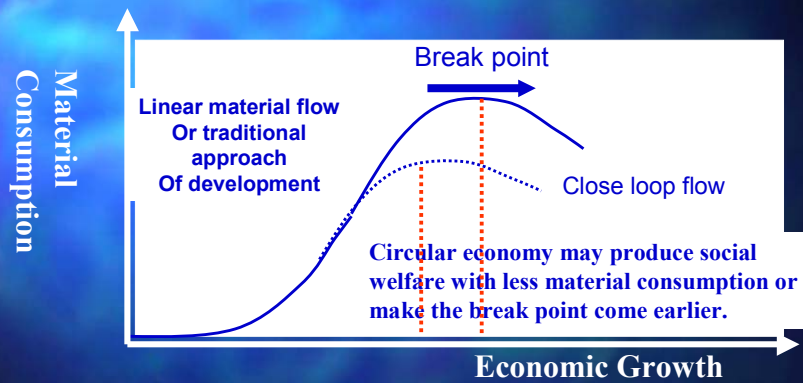
*Therefore, in order to resolve compound environmental issues, achieve the goals of building the all-round well-off society, and meet the criteria of new road of industrialization, Chinese national government has strong interests in promoting development of circular economy.*

***Is it possible?***

### Population/GDP/Material Efficiency/ Domestic Material Consumption of 15 Nations in EU



## Economic Growth and Environmental Impact ----- Kuznets Curve(1955) and its modification



### 3 Current practice and prospect

Therefore, circular economy concept and practice cover three levels: cleaner production—small cycle, eco-industrial park/industrial symbiosis—medium cycle, and regional cycle.

#### 1. Cleaner production

- A decade experiences in promotion of cleaner production;
- 2002, Cleaner Production Promotion Law;
- Cleaner production auditing in 400 enterprises of 20 industrial sectors in 20 provinces and cities;
- 20 cleaner production centers;
- 10,000 trainees;
- 50,000 enterprises with ISO 14000 series certification
- Several hundreds products with environmental labels

### 3 Current practice and prospect

#### 2. Six eco-industrial park/industrial symbiosis

- **Guigang Sugar Manufacture Park;**
  - Sugar cane land—sugar processing—goeey wastes—alcohol plant—wastes liquid—fertilizer plant—compound fertilizer—land
  - Sugar process—waste cane—paper plant—wastes—cement plant
- **Nanghai Eco-industrial Park**
  - environmental industry and waste reuse industry-oriented
- **Baotou Eco-industrial park**
  - Coal—power generation—electrolytic aluminum—aluminum product processing—reuse of aluminum reuse and recycle;
  - coal—power generation—waste—construction materials
  - Coal—power generation—heat supply;

### 3 Current practice and prospect

#### 2. Six eco-industrial park/industrial symbiosis

- **Shihezi Paper Manufacture Park;**
  - Grass land—paper manufacture—waste water treatment—grass land;
  - Grass land—stockbreeding—livestock products—waste water treatment—grass land—eco-Tour
- **Changsha Huanxin Eco-industrial Park**
  - Agriculture—manufacture and process—environmental industry
- **Lubei Chemical industry Park**
  - Phosph-Ammonia—vitriol oil—cement;
  - Seawater—salt—alkali—heat and power supply
  - Seawater—water use

### 3 Current practice and prospect

#### 3. Regional levels

- **Liaoning Provincial Plan and initiatives in circular economy**
  - Enterprise level:
    - by 2007, 600 enterprises meet the standards of cleaner production;
    - A number of enterprises achieve targets of zero emissions;
    - several big industrial groups build up inter close-material-flow
  - Building up several eco-industrial parks
  - Develop waste reuse industry---create a resource-recycling society
    - by 2010, reused water accounts for 30% of wastewater;
    - Collected garbage ratio by different categories---60%;
    - Collected ratio---80%---in waste battery, household electronic appliance, waste computers, paper, metal, plastic, etc.

### 3 Current practice and prospect

#### 3. Regional levels

- **Guiyang Municipal Plan and initiatives in circular economy for next 20 years**
  - Close Material flow in production system
    - Eco-industry
    - Eco-farming
    - Tourism and eco-services
  - Close material flow in urban infrastructural system
    - Water-flow;
    - Energy---air pollution control
    - Solid waste reuse and recycle
  - Ecological construction system
    - Living environment improvement
    - Green buildings
    - Natural conservation



## 4 Challenges

1. **Low awareness and lack of relevant knowledge and know-how.**
2. **Not all local governments and ministries responsible for economic development pay much attention to promoting circular economy.**
3. **relevant legislation and policies are not in place.**
4. **Technology is always an obstacle hindering the development of cleaner production, eco-industry and waste reuse.**

*Thank you*

## Toyama City's Eco-Town Project



by Jun Nomura  
Environment Policy Division, Toyama City

### What Is the Eco-Town Project?

This project aims at making an environmentally-friendly town while promoting the local economy.

Based on the “zero emission” concept

## How Toyama City Came to Engage in This Project

1889 The municipality of Toyama City

1960s Pollution became a big social problem



Global environmental problems



1998 Toyama City Environmental Basic Plan

## Toyama City Environmental Basic Plan

( one of its major objectives )

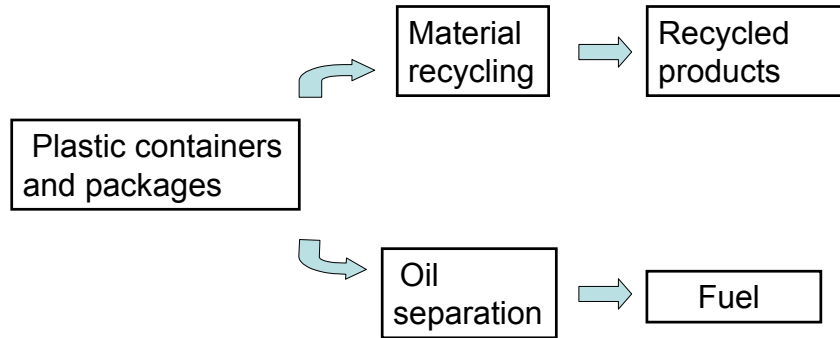
Making Toyama an environmentally-friendly and recycling-orientated city.



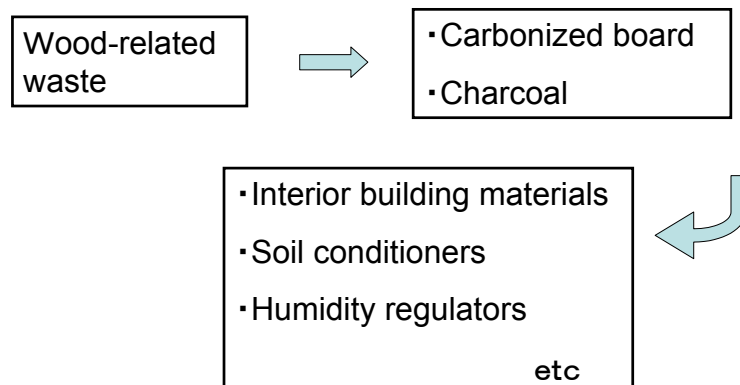
Eco-town Project

Four Recycling Plants Aiming at Recycling Within the Boundary of the Local Community

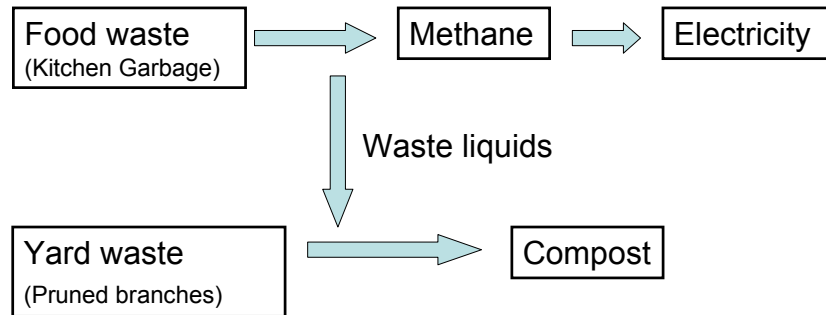
*The hybrid waste plastic recycling plant*



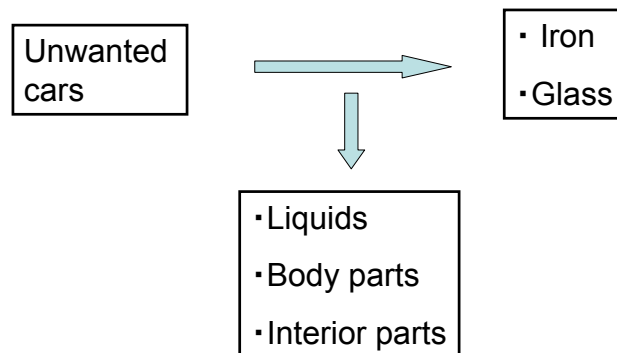
*The wood-related waste recycling plant*



### The *Food and Yard Waste recycling plant*

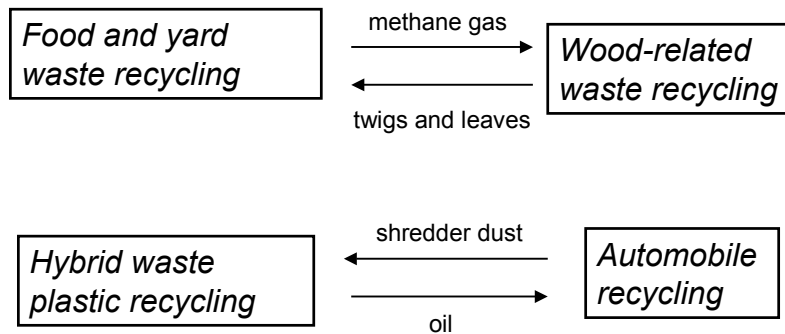


### The *automobile recycling plant*



Resource recovery rates 90% or more

The four plants mentioned above provide mutual benefits within the Premises of the eco industrial sites



## What Remains to Be Done and Future Prospects

- ① Waste supply which meets our requirements in terms of quality and quantity have to be secured
- ② Recycled products need to be returned and sold reliably on the market

## What we plan to implement in the second term project

- Waste material energy center project
- Bio mass recycling project
- Foam Polystyrene recycling project
- Waste cooking oil recycling project
- Waste tire recycling project

Toyama City has every intention to develop and expand this project to realize a truly “environmentally-friendly and recycling-oriented city.”



## PROFILE of West-Japan Auto Recycle Co. Ltd. (WARC)

### 1. Company Profile

LOCATION: Kitakyushu Ecotown, Fukuoka, JAPAN

CAPITAL: 100 Million Yen (0.8 Million US\$)

SHAREHOLDERS: Yoshikawa, Mitui & Co., Nippon Steel Corp, etc.

AREA: Total 20,000 m<sup>2</sup> Plant 4,500 m<sup>2</sup>

CAPACITY: 1,000 Cars/Month on the basis of 8 hours/day

### 2. Dismantling Process

#### 2-1. Concept

“SHREDDER-LESS” dismantling process i.e. To complete dismantling without shredding operation by 4 parts-collecting sections and 1 car-body pressing section into the shape of 50x60x70cm set on a 62m long line

No1 Section: Suction of Fuel, LLC and Oils plus Removal of Bonnet

(Main Equipments) Flaco's Liquid Suction Systems x 2

No2 Section: Removal of Tires, Battery, Fleon gas and Collection of Front/Doors Glass

(Main Equipment) Fleon Gas Collector x 2, Glass Collecting tools x 1 set

No3 Section: Removal of Engine/Mission, Suspensions, Exhaust pipe, and Catalyst plus

Collection of Rear Glass

(Main Equipments) Turnover x 1, Hydraulic Cutter x 1,

Electric Cutter x 1, Cantilever Crane x 1

No4 Section: Removal of Nonferrous Parts such as wiring harness,

Various Motors, Heater Core, Evaporator, Radiator and Computer Board

(Main Equipment) Hydraulic Body Grips x 1, Cantilever Crane x 2

No5 Section: Tri-axially pressing a body-shell into about 50x60x70cm

(Main Equipment) 600 ton Press Machine x 1

In addition, one Al- remelting furnace from engines and one Cu-reproducing machine from wire harness are being operated inside the company.

#### 2 - 3. Main Features

- (1) No ASR(Automobile Shredder Residues) because of “shredderless”
- (2) Reproduction of High quality Fe scraps usable at LD converters
- (3) Execution of High Recycling Ratio---90% excluding thermal recycle
- (4) Presentation of Technical Information regarding Dismantlability and Recyclability toward Car Manufactures



### 3 . Present Performance

Since started operations in February 2001, the number of ELVs dismantled has steadily increased as follows. Note that the above-mentioned capacity of 1000 cars/month can be achieved by 6 operators in the dismantling line, that is 45 cars per 8 hours per day, and presently 1500 cars/month by the addition of 3 more operators for the extra 8 hours per day.

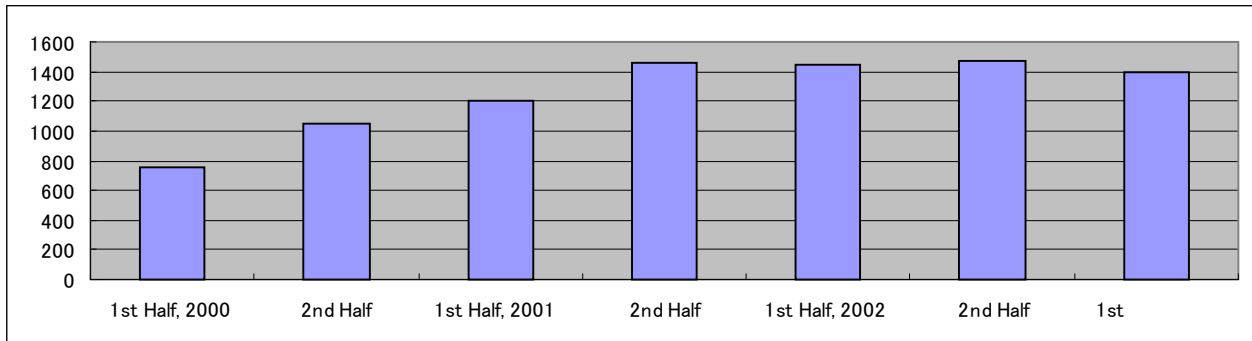


Fig.1 Change of Cars Dismantled by Time

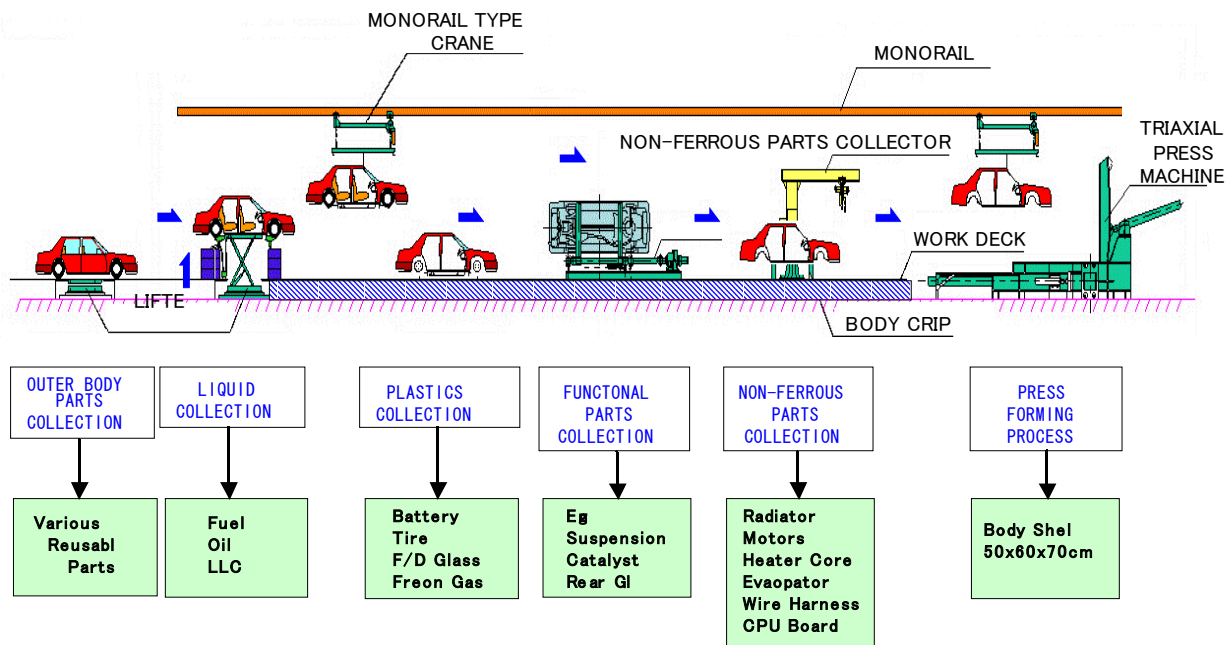


Fig.2 ELV Dismantling Flow at WARC

#### Features of WARC Process

1. On-line Part-by-Part Collecting System to Obtain High Recycle Ratio
2. High Efficient Dismantling Process at Speed of 8.5 Minutes/Car

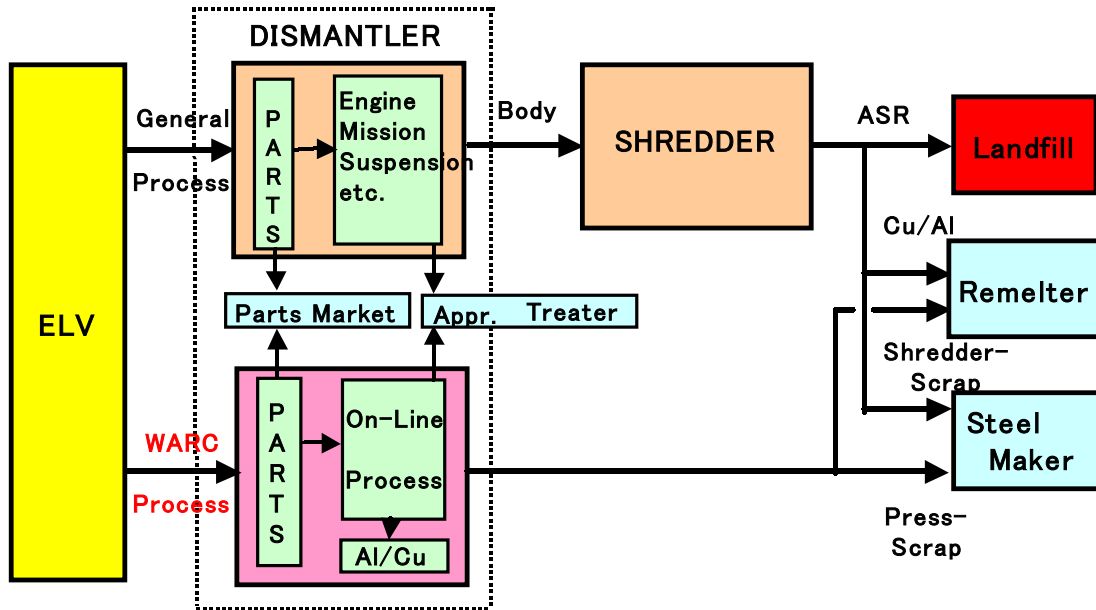


Fig.3 ELV Recycling Flow -General Process vs. WARC Process

Features of WARC Process

1. Shredder-less → ASR free → No Need to Landfill
2. Press-Scrap Return to BF Steel Maker → Horizontal Recycle

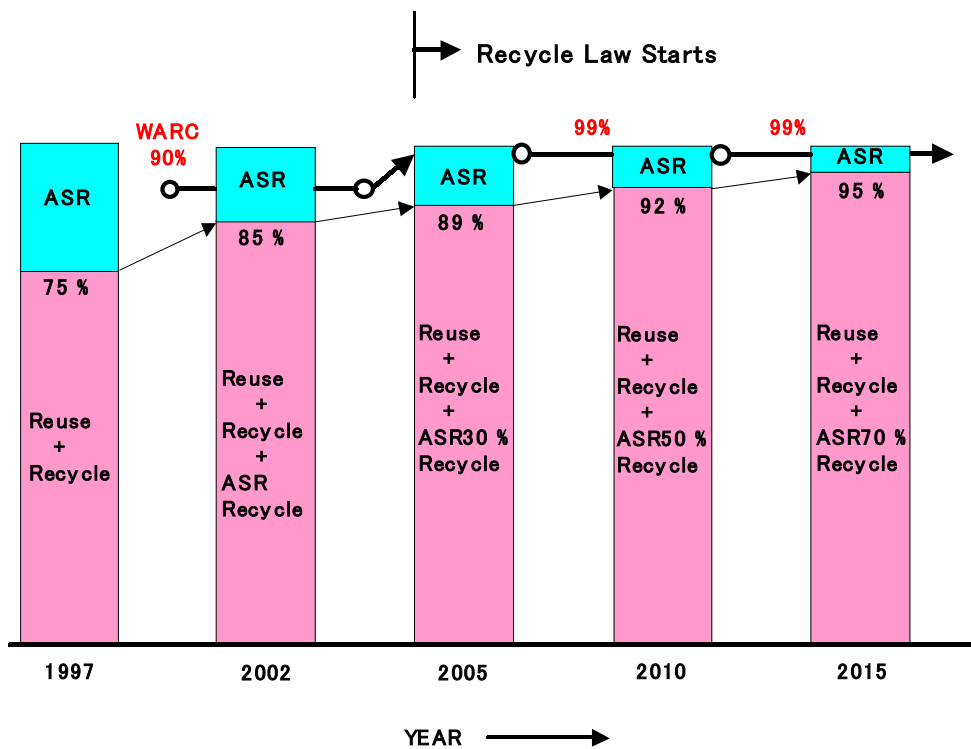


Fig.4 Recycle Rate of ELV - Country Target vs. WARC

Korea Report for  
Korea & Japan Society of Waste Management

# Key Factors & Future Tasks of the Extended Producer Responsibility System in Korea

November 2003

Prepared by Young-Seok Lee, Deputy Director,  
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## I . Direction for Resource-Recycling Waste Management Policy

### 1. Basic scheme

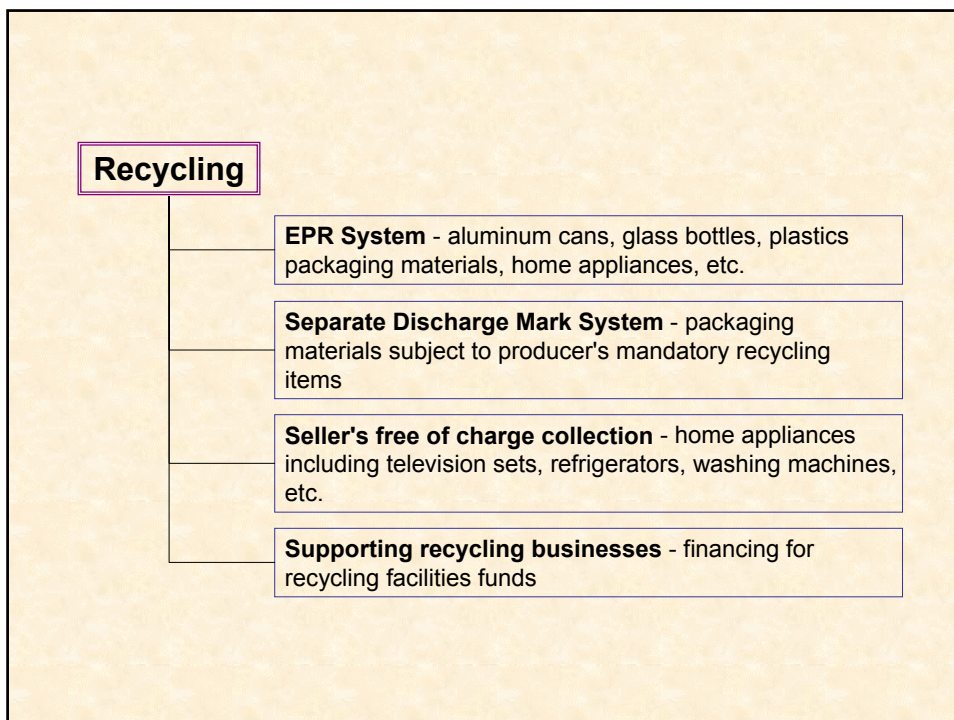
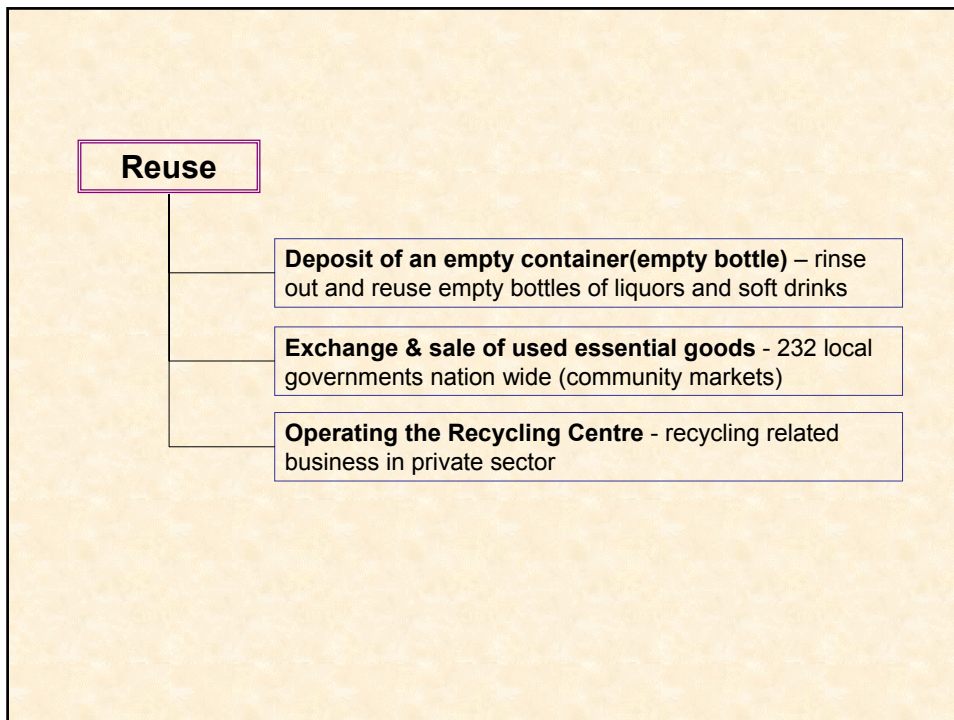
- In order to establish the Resource-Recycling Society substantial reduction in waste generation is required, during the process of manufacture, distribution and consumption as much as possible, however,
  - inevitably generated waste should be reused by repairing and partially replacing components, and,
  - for un reusable waste the adoption of recycling system is encouraged to save resources and protect from environmental pollution.

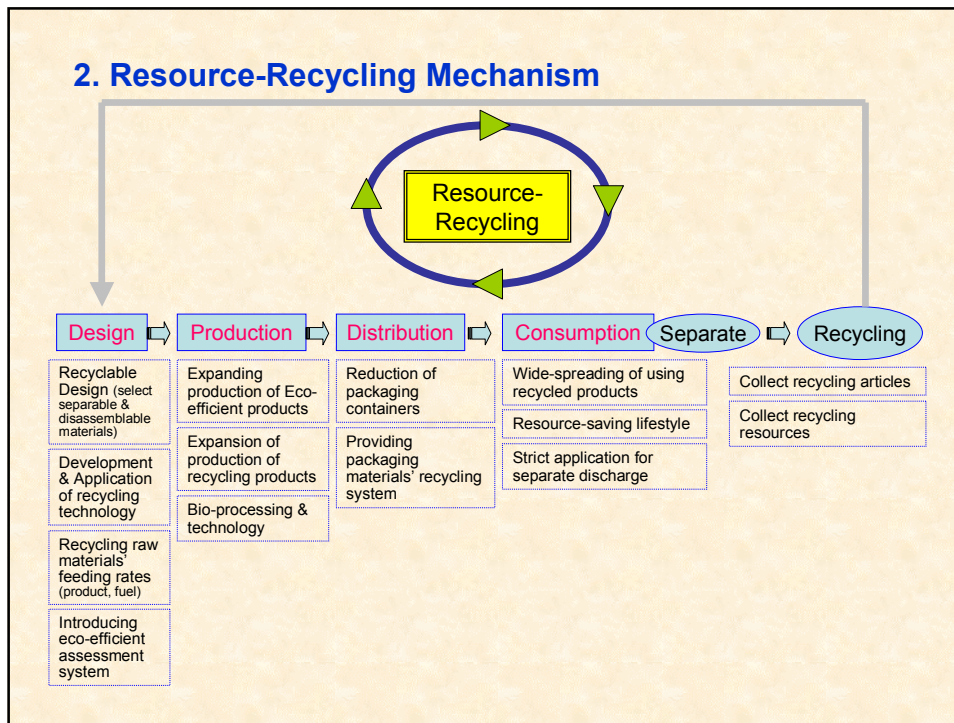
### Reduction

**Minimizing the use of disposable products -**  
Disposable Products-containers-plastic spoons, plastic bags, shopping bags, etc.

**Restriction on over-packaging -** food/beverage, cosmetics, quasi drug, clothing, etc.

**Waste Disposal Charges System -** plastic goods, insecticide, chewing gum, tobacco, antifreeze, etc.





## II . Key Factors of Extended Producer Responsibility System

### 1. EPR System

#### a. Background

- Under the current mass production and consumption system, the government and consumers alone cannot identify the full responsibility for **realizing the Resource-Recycling Society** by reducing and recycling waste, thereby:
  - The **Extended Producer Responsibility (EPR)** has been introduced to expand the producer's responsibility, based on the guidelines for waste reduction. The system aims to improve recyclability by adopting a new structure to use reusable & recyclable materials all throughout the production process, from design to manufacture.
  - EPR System, with its ultimate goal to implement "Socio-Economic Structure based on Resource-Recycling System" motivated by the promotion of the waste reduction and recycling structure, had already been introduced by most of the OECD Member countries as specified below:
    - ❖ 15 countries from Europe including Germany (DSD), U.K, France, Hungary; 4 countries from Asia including Japan, Taiwan, Australia; other countries from South America including Mexico and Brazil.

#### b. Preliminary Process

##### Enforcement of Deposit-Refund System

- This system has been enforced **since 1992**, for the purpose of boosting the waste recycling, subject to **20 target items** including aluminium cans, glass bottles, paper packs, and home appliances. This system mandates producers **to deposit their recycling costs** in advance, based on their **total production quantity**. Then, the deposit will be **reimbursed when producers present a fact sheet on their recycling rate**

##### Initiating the pilot program for EPR System before its enforcement in 2003

- Pilot program for EPR System subject to 7 target items including home appliances, aluminium cans, glass bottles, and tires has been initiated since the year 2000, under the voluntary agreement signed between government and business providers.

##### Fostering the preliminary condition to enforce plastic EPR System efficiently

- **Established the co-operation system to foster appropriate condition for recycling system** between government and concerned industries, **acquired financial resources to build infrastructure** for plastic recycling, and arranged a private sector's organization initiated by the relevant pilot program.
- **Reflecting diverse opinion of relevant industries and promoting amendment of related laws and regulations**
- Reflected various comments to the system with the collected opinion **from the expertise of relevant industries and private sector' corporations over 30 times** in respect of producer's recycling target items and detailed enforcement regulations, etc.
- Carried out the **amendment of recycling regulations** based on the **result of these collected comments**.

## 2. Key Factors

### Items subjects to the producer's mandatory recycling

Existing deposit-refund Items	Products	home appliances including TV sets, refrigerators, air-conditioner, washing machines, computers, tires, lubricants, fluorescent lamp, batteries, etc.
	Packaging materials	paper packs, aluminium cans, glass bottles, and PET bottles (foodstuffs, liquors, cosmetics, detergents, some portion of pharmaceutical products)
Newly introduced Items	Products	<b>mobile phone devices, mobile phones, and audio sets</b>
	Packaging materials	<b>plastic packaging materials</b> (foodstuffs, liquors, cosmetics, detergents, pharmaceutical products) <b>EPS buffer</b> (home appliances)

For the **film type of packaging materials and fluorescent lamp** among the plastic packaging materials included in newly introduced items, will subjected to recycling liability from 2004, and for **mobile phone devices and audio sets** , from 2005.

### Recycling Charges

- Recycling cost is calculated based on the expected sum of waste collecting and recycling, as set forth in the relevant regulations.
- In the event a recycling-required producer failes to reach the mandatory quantity of recycling, the producer will be subjected to the recycling charges for a **reminding-portion** by **adding up additional dues of certain rate with recycling charges**.

### Estimation of Mandatory Recycling Quantity

- Calculated by assessing the recycling-required producer's given overall recycling conditions such as production quantity, recycling achievement, recycling technology applicable in targeting items, and capacity of recycling facilities.

### Performance system for producer's Mandatory Recycling Quantity

- Establishing the recycling plant by producer's own cost
- Outsourcing to recycling business provider
- Affiliating producer himself with the mutual aid association and paying a certain dues, and then outsourcing the recycling



#### Acknowledgement of outperformed achievement for Mandatory Recycling Quantity(Banking)

- In case a producer outperforms his recycling quota, he can **reserve and use the credit for the excess performance during the next two years**. Hence, this system minimizes the producer's risk arising from economic fluctuations.

#### Obligation of Seller's free of charge collection for newly sold home appliances

- In regards to selling home appliances including television sets, refrigerators, washing machines, computers, and mobile phones, as a new products, when a consumer requests the used products to be collected, the seller is obliged to collect them free of charge.

#### Enforcement of Separate Discharge Mark System for packaging materials

- **Separate Discharge Mark System** subject to the mandatory target items of recycling-required producer has been introduced by unifying the conventional material classification mark system with recyclable mark system.

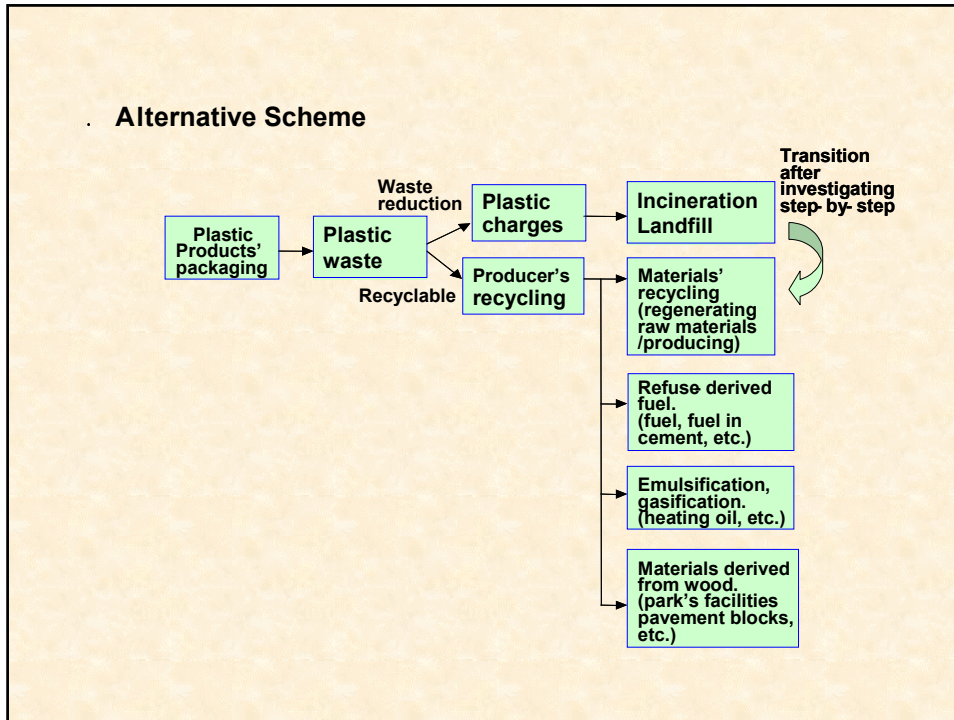
### 3. Reinforcing the plastic waste recycling system

#### Background

- While the annual plastics consumption tends to be increasing drastically, the current recycling rates (14.9%) are considerably low comparing to other materials, hence,
  - a comprehensive framework should be promoted for plastic recycling, in order to implement **Socio-Economic Structure based on Resource-Recycling System**.

#### <Current status of recycling rates by principal materials, in 2000>

Items	Papers	Aluminium cans	Glass bottles	Plastics
Recycling Rates	59.8%	63.1%	67.4%	15%



#### 4. Roles of Principal Parties

<b>Consumer</b>	<ul style="list-style-type: none"> <li>o Strict compliance with Separate Discharge System for recyclable articles.</li> <li>- package materials with the Separate Discharge Mark, must be discharged separately.</li> <li>- Separate Discharge should be performed according to the each municipal, county, and district's Collection System.</li> </ul>
<b>Producer</b>	<ul style="list-style-type: none"> <li>o Assume the recycling liability strictly.</li> <li>o In case of a-fulfillment failure, the producer should pay the Recycling Charges.</li> <li>o Performs the Separate Discharge Mark.</li> <li>o Free of charge collection for the newly sold home appliances</li> </ul>
<b>Local Government (municipal, county, district)</b>	<ul style="list-style-type: none"> <li>o Manages Separate Discharge system strictly for EPR subjected packaging materials</li> <li>o Implements an appropriate system under each local governments in conformance with the Separate Collection guidelines.</li> </ul>
<b>Korea Resources Recovery &amp; Reutilization Corporation</b>	<ul style="list-style-type: none"> <li>o Manages overall duties on institutional execution including accept and control, the production quantity record per producer, compliance action plan and fact sheet reports, as well as monitoring the recycling liability performance, and imposing charges.</li> </ul>
<b>Ministry of Environment</b>	<ul style="list-style-type: none"> <li>o Supports and manages overall institutional conduction such as enacting and amending the laws and ordinances, imposing Mandatory Recycling Quantity, inspection of mutual aid associations and public corporations.</li> </ul>

### III. Future Tasks

- Endeavor to establish the autonomous and reasonable **cost-sharing system** (selection, transportation cost, etc.) among the **producer ↔ local government ↔ recycling business providers** subject to the new items including plastics.
  - support to implement the efficient hand-over system of recycling articles among the concerned parties.
- On-sight inspection and complement on the overall process from Separate Discharge by item, collection to recycling.
- **Furnish infra-structure facilities for plastic, fluorescent lamp, home appliances, etc.**
  - Motivate the private sector industries to follow the quality standard of plastic refuse-derived fuel and to expand recycling facilities.

- **Initiate the promotion campaign for plastic recycling products** (refuse-derived fuel, emulsified)
  - promote the plastic recycling products' purchasing campaign targeting the public institutions and private sector.
- **Monitoring the performance process of EPR System** and creating **system improvement plan** (research outsourcing)
  - provide alternative plan to solve the problem throughout the on-sight investigation from Separate Collection, selection, recycling, to sales process.

## 12<sup>th</sup> NEAC

### Session 2. Create a Recycling Society

#### **The governmental policy to enhance capacity of regional authorities to transfer to “Environmentally efficient society”.**

Case of Russia

T.Petrova, Ministry of Natural Resources RF

The Russian Federation similar to the other countries of the former USSR has inherited from the previous regime the environmentally unsound structure of economy characterised with the low efficiency of use of natural resources and high level of the environmental pollution.

Compared to the developed countries, the national indicator of energy consumption per unit of GDP is 2-3 times greater and that of the greenhouse gases emission – 3-4 times. The consumption of the forest resources for production of 1 ton of paper is comparatively 6-7 times high. For the recent 10 years the non-efficiency of national economy has even grown by 30-60%.

The annual volume of wastes produced by all sectors of the economy is estimated as 2 bln tons, 60% of that is being disposed. For the period of 1995-2002 the volume of toxic wastes increased from 90 to 139 mln.t.

The GDP volume in the country has dropped by 50% since 90s but for the recent 4 years it has indicated the rising trend. This growth is mostly accounted for the sectors connected with use of natural resources. In case of retaining this pattern of the economic growth the fuel and energy sector, oil and gas, metal production and forestry might be the dominating sectors of the Russian economy by 2010. It might aggravate the existing environmental situation in the country.

However on the other side the gradual reconstruction and liquidation of unefficient enterprises is under way. And the situation might improve in our country. But it is a long-term process, the notable changes can be expected only by 2010.

There are good prerequisites created by the activity of the Ministry of Natural Resources RF to counterbalance the situation: the approval of the Ecological Doctrine of Russian Federation (2002), the development of the legislative base providing efficient use of natural resources (Federal Law on Environmental Protection, Federal Law on Industrial and Municipal Wastes, the Governmental Decree on the Routine of the State Cadaster of Wastes and Toxic Wastes Registration, etc.), the Federal target program “Ecology and Natural Resources of Russia” (2002-2010), the intensifying international cooperation in the environmental sphere and a growing participation in the international agreements connected with taking the national obligations in this sphere.

For the last years some regions of Russia have succeeded in the introduction of advanced and environmentally sound technologies basing on

international cooperation with neighbouring countries and accumulated a positive experience in this sphere.

It is the most rapidly developing regions – the Russian north-west territory– Leningradskaya, Murmanskaya, Arkhangelskaya, Kaliningradskaya oblasts, etc.

*Cleaner Production Programme,*

The case is the Cleaner Production Programme, implemented within the framework of the Russian - Norwegian co-operation based on the appropriate intergovernmental agreement of 1992. It has been supported since 1994 by the Ministry of Natural Resources of the RF and local authorities. The Russian-Norwegian Cleaner Production Centre (RNC) has been set up to arrange, carry out and disseminate the CP Programme.

Its objectives – the most efficient use of resources and prevention of climate change, mitigation of the negative impact of the process of production at all stages of the life-cycle (production, use and disposal).

The program consists of 3 components:

1. Capacity building in the Clean Production – training of the high managers and engineers, post- courses, project proposals and recommendations for modernization of the industrial process at their enterprise - inventory and assessment of proposals
2. Capacity building in the Financial Engineering - training in the business-plan development for the selected projects and in the concordance procedure with an investor.
3. Reforming the existing enterprises management system.

Over 1600 specialists from more than 500 enterprises have been trained since then, mainly representatives of Russia's north-west territory, that is the regions of Arkhangelsk, Vologda, Kaliningrad, Kirov, Leningrad, Lipetsk, Murmansk, Novgorod; the Republics of Karelia and Komi; and the City of Saint-Petersburg.

The programme is addressed to the major branches of the industry. Now it has been extended to the Asian part of Russia. Under support of the Arctic Council now the program is being implemented at the Norilsk ore mining and processing enterprise (“Norilskiy Nikel”), the territory of Krasnoyarsk. There have been done highly efficient proposals on utilisation of sulfur dioxide extracted from the emissions for industrial production of sulfur as the main world producer.

As the practice shows, each dollar invested into the Programme yields 2 to 5 dollars of profit, due to substantial cut in consumption of electric power, raw material and water and increase in waste recovery. A finance and credit line has been established in co-operation with the NEFCO (Nordic Environment Finance Corporation). Based on the Finance Engineering Programme, it will help choose the projects most attractive in respect of rational

us of resources and reduction of effluents, to be then implemented at concrete enterprises.

At present a number of such projects are being prepared, and credit agreements have been signed and executed with many companies.

*“Policy of Clean Production”*

As result of 10-years activity of the Cleaner Production Centre the Document “Policy of Clean Production” has been proposed in order to increase the priority of the clean technologies in the environmental cooperation activity of the major European countries and international organisations (European Union, etc.). This strategic document consists of the following activities to be implemented in the coming decade:

1. Capacity building (Rising awareness on the negative impact of production on health and environment, development of educational programs)
2. Integration of efforts on the “life-cycle principle” of the governmental, regional and local bodies basing on new instruments (environmental management, environmental marking, etc.)
3. Communication – wide participation and sharing of responsibilities mainly through the involvement into joint projects and partnership with western neighbouring countries
4. Implementation – development of economic instruments
5. Research - support of the innovative preventive technologies
6. Plan of Actions – and special sectoral plans
7. Financing

This year the document has been included into the major European strategies (“Northern Dimension” of the European Union, the Barents Euro-Arctic region program). The Russian territory has been selected as the focal area of the implementation of this Strategy

*International “Round Table” – December 2004*

The regional policy of the Clean Production based on Russian-Norwegian Center has proved its efficiency and vital significance to be extended over the entire country.

In connection with the 10th anniversary of the Cleaner Production Programme in Russia the Center in collaboration with the Russian Regional Environmental Centre makes a proposal, approved and supported by the Ministry of Natural Resources of the RF, aimed at holding in Moscow, probably in December 2004, the first Russian Cleaner Production Round Table, with the participation of many foreign specialists.

It is expected that the Round Table will contribute to the extension of the focal area of the Program “Clean Development” over the entire territory of Russia.

It will be discussed the feasibility to perform the environmental reconstruction of the economy and its sectors (industry, energy, transport, municipal services and agricultural production) for the period of 7 years – by 2010.