



Regional Economic Integration and E-Waste Management in China

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Outline

- Status Quo of Production and Consumption of Electric and Electronic products in China
- Influence of East Asia Regional Economic Integration to the Management of Electronic Waste in China
- Problems and Obstacles Impacting E-waste Management in China
- Policy framework for electronic waste management under regional economic integration
- Policy Recommendations

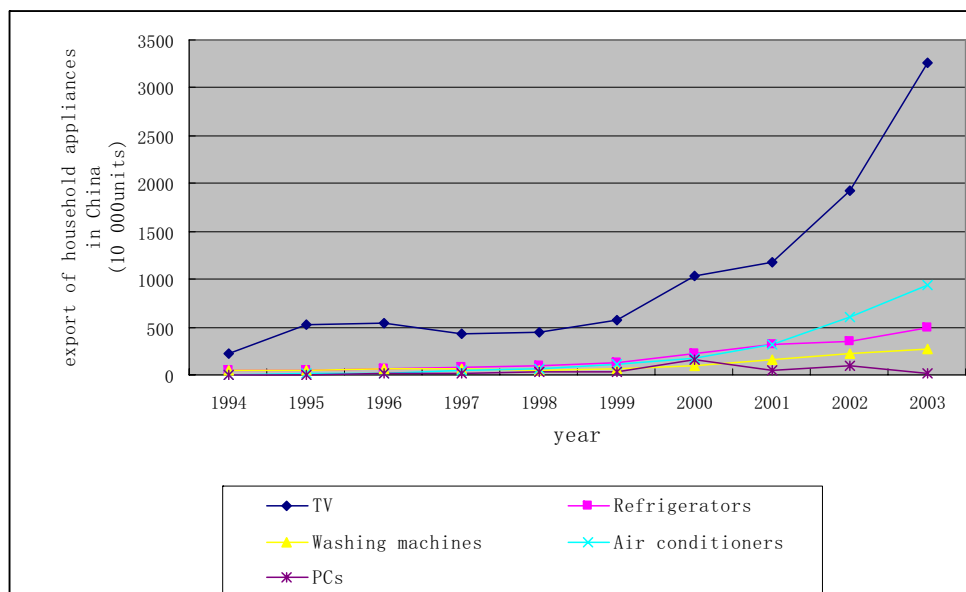
1、 Status Quo of Production and Consumption of Electric and Electronic products in China

- China has become one of the largest producers and consumer of electric and electronic appliances in the world.

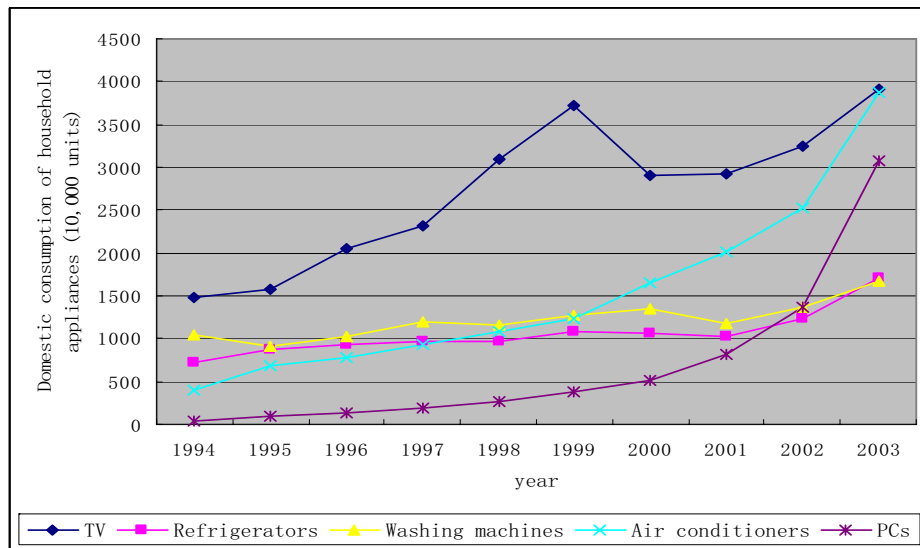
Output value of household electric and electronic appliances reached 405 billion yuan (more than 50 billion USD) in 2005

- China is a major export country of electric and electronic products.
 - Half of the electronic and electric products which China exports at present is the electric equipment products, including 5 categories: consumable electronic products, electronic devices and components products, household electric appliances, computer-related products and communication products.
 - The export volume of electric products in 2003 reached 113 billion dollars, accounting for 25.8% of the total volume of whole country's export.

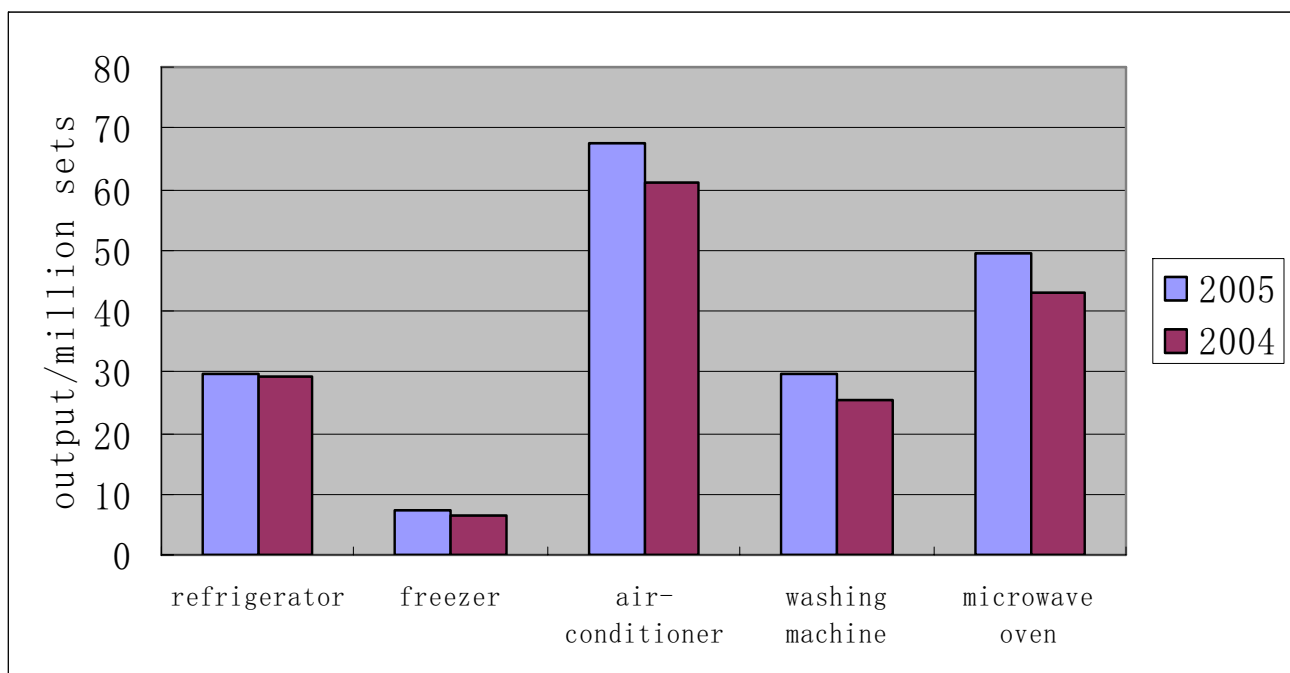
Export of major household appliances and PCs in China (1994-2003)



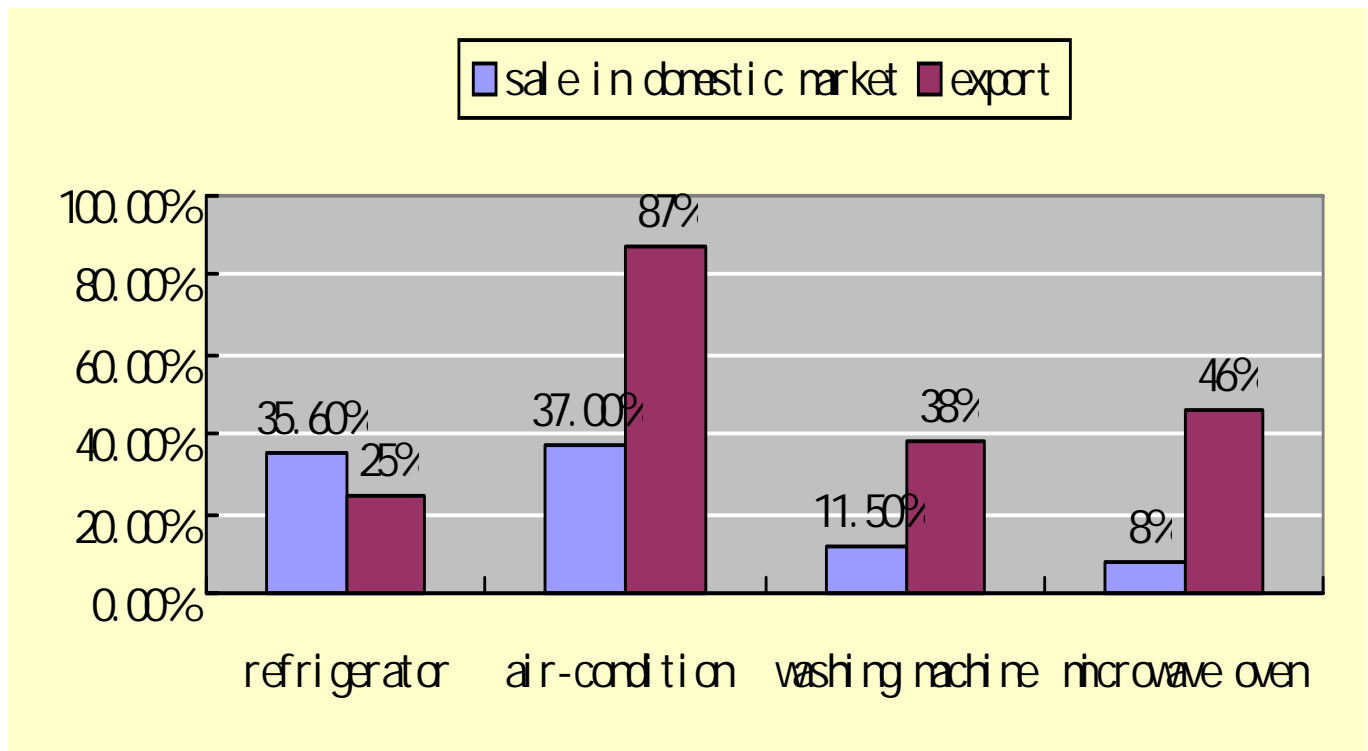
Domestic consumption of major household appliances in China



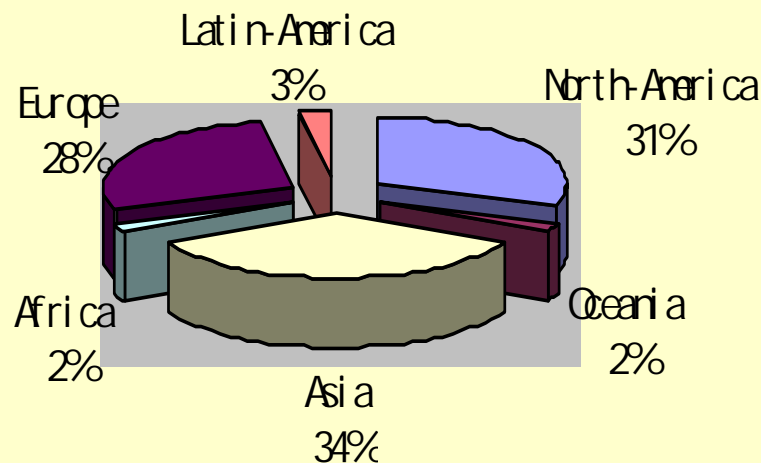
Output of major household electric appliances in China (2005)



Comparison of growth rates of domestic marketing and export of some China household electric appliance



Export Market of China Household Electric Appliances in the World (2003)





Generation of E-Wastes in China

- Source of E-wastes in China
 - Households
 - Offices
 - Manufactories
 - Import from other countries
 - legal imports
 - illegal imports



Volume of E-wastes generation in China (estimated)

- TV: 4million sets/per year
- Washing Machine: 5 million sets
- Refrigerator:5 million sets
- Computer: 6 million sets
- Mobile phone: 30 million sets
- Total weight of E-wastes: 1 million Ton

Prediction of Annual Obsolescence of E-wastes in China (Mainland)

Year	Amount of Obsolescence by year (10 000 units)				
	Color Television Sets	Household Refrigerators	Household Washing Machines	Air conditioners for Room	Personal Computers
2004	1485.15	446.84	666.74	342.94	375.90
2005	1573.32	444.50	872.73	389.48	1337.21
2006	2041.25	578.01	1048.14	676.43	1376.40
2007	2324.63	727.45	903.76	771.19	3079.10
2008	3088.52	869.56	1022.98	923.68	3177.35
2009	3718.75	924.22	1187.42	1089.14	4782.64
2010	5833.94	966.81	1158.85	1235.02	7190.08
2011	3251.85	973.45	1280.54	3668.45	10796.10
2012	3917.88	1086.99	2530.44	2524.40	16190.75
2013	4041.73	2094.18	1374.37	3875.04	24251.37
2014	4251.48	1242.00	1673.12	2992.61	90491.88
2015	4449.13	1714.78	1519.46	3250.11	80904.88

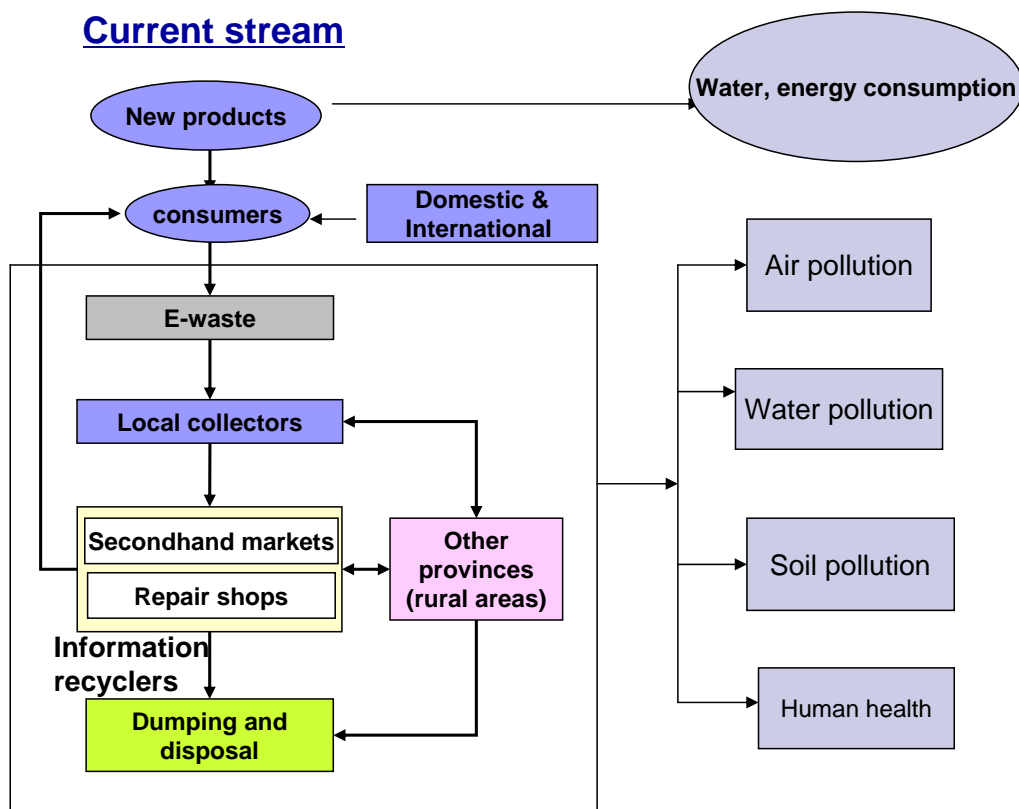
List of import-prohibited old and useless electric products in China

- TV sets
- Refrigerators
- Air-conditioners
- Computers
- Microwave ovens
- Washing machines
- Mobile communication equipment
- Printers
- Copycats
- Other electronic products

Trade of E-waste in China

- China is the destination for a large proportion of e-waste shipments from developed countries.
The United States e-waste recycling industry once declared that around 80% of the e-waste they received was exported into Asia, and around 90% of it went to China (BAN 2002). Guiyu of Guangdong's Chaozhou, Hainan, Zhejiang's Taizhou and some other places of China have become the largest distributing centers of electronic wastes.
- Illegal Trading of E-waste in China
Sources:
America
EU countries
Japan
Korea

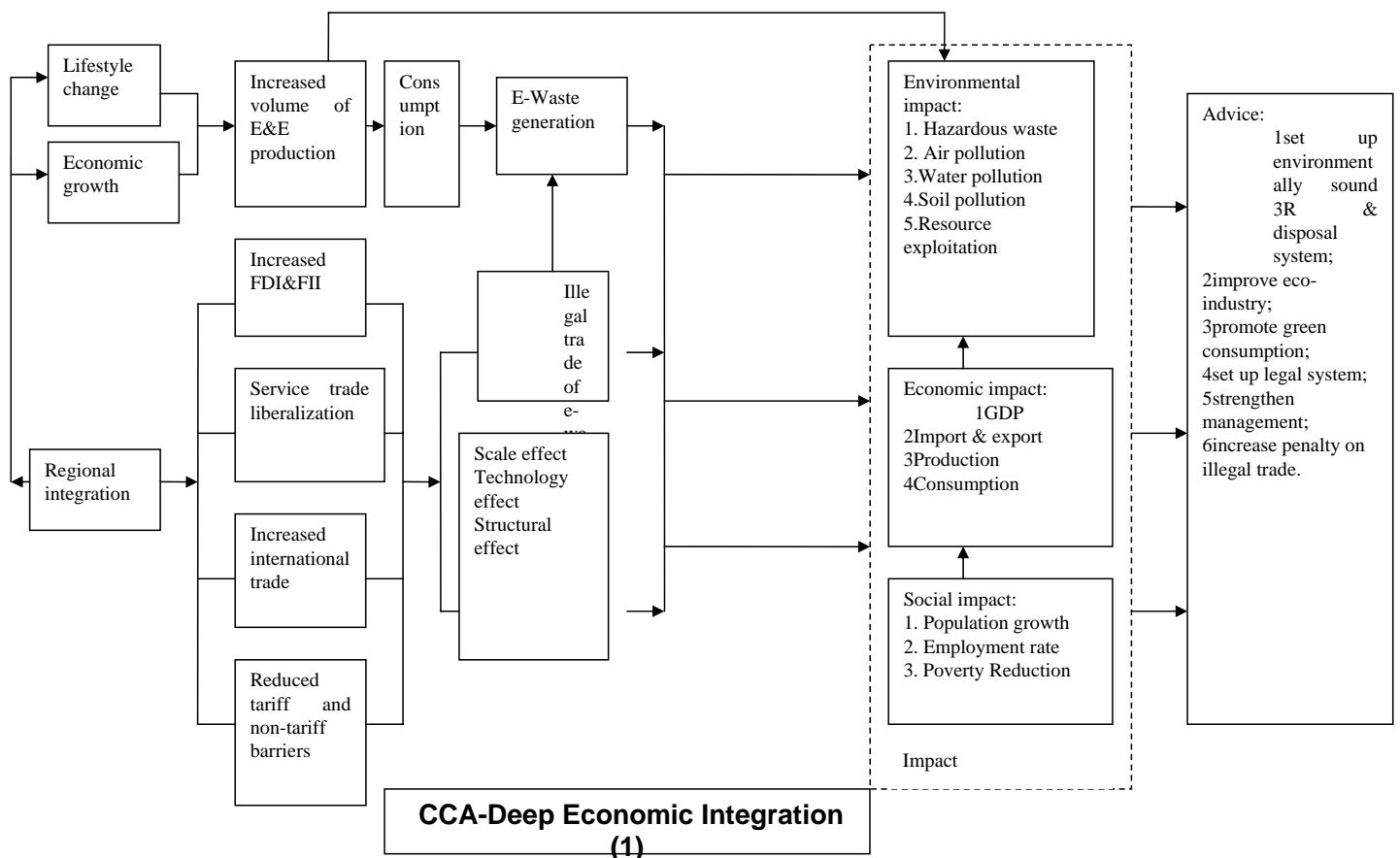
E-waste stream and environmental problems

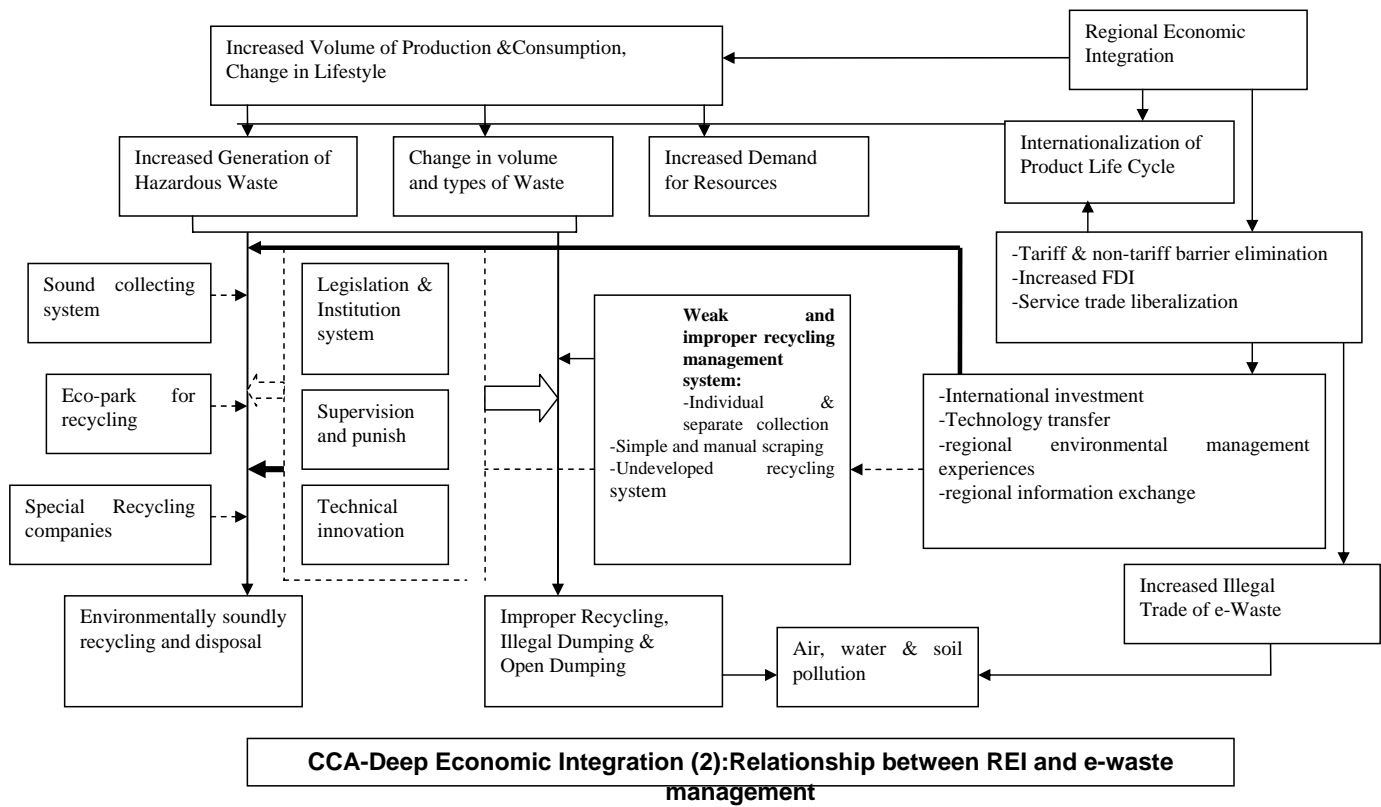


2、 Influence of East Asia Regional Economic Integration to the Management of Electronic Waste in China

The main impact factors of advanced regional economic integration on China's E-waste management

- Tariff
- Non tariff barriers
- Investment facilitation
- Service trade liberalization





Evaluation of Impacts of Shallow Regional Economic Integration

		Tariff & non-tariff barrier elimination Increased FDI Service trade liberalization			
		Scale effect	Technology Effect	Structural effect	Policy effect
Economic Impacts					
GDP		↑	↑	↑	↑
Electric & electronic appliance productivity		↑	↑	↑	↑
Market growth of e-products		↑	↑	↑	↑
Import	e-products	↑	↑	↑	↑
	Recyclable e-wastes	—	—	—	—
	Illegal e-waste		○	↓	↑
Export	e-products	↑	↑	↑	↑
	Recyclable e-wastes	—	—	—	—
	Illegal e-waste	—	—	—	—
Employment		↑	↓	↑ ○	↑
Consumption		↑	↑	↑	↑

SEI Impact	Tariff & non-tariff barrier elimination Increased FDI Service trade liberalization			
	Scale effect	Technology Effect	Structural effect	Policy effect
Social Impacts				
Poverty	↑ ○	—	↑ ○	↑ ○
Public welfare	↑	↑	↑	↑
Working condition	↓	↑	↑	↑
Public environmental awareness	↓	↑	↑	↑
Health	↓	↑	↓	↑

SEI Impact	Tariff & non-tariff barrier elimination Increased FDI Service trade liberalization			
	Scale effect	Technology Effect	Structural effect	Policy effect
Environmental Impact				
Water quality	↓	↑ ○	↓	↑ ○
Air quality	↓	↑ ○	↓	↑ ○
Soil quality	↓	↑ ○	↓	↑ ○
Landscape	↓	↑ ○	↓	↑ ○
Hazard waste	↓	↑ ○	↓	↑ ○
Resource consumption	↓	↑ ○	↓	↑ ○
Environmental governance system (legislation, institution and policies)	↓	↑	↓	↑ ○

“↑”——general positive impact; “↑↑”——stronger positive impact;
 “↑○”——no obvious positive impact;
 “↓”——general negative impact; “↓↓”——stronger negative impact;
 “○”——no impact;
 “—”——uncertain or no evaluation

Evaluation of Impacts of Deep regional Economic Integration



DEI		Tariff & non-tariff barrier elimination Increased FDI Service trade liberalization			
Import	Scale effect	Technology Effect	Structural effect	Policy effect	
Economic Impacts					
GDP		↑ ↑	↑ ↑	↑ ↑	↑ ↑
Electric & electronic appliance productivity		↑ ↑	↑ ↑	↑ ↑	↑ ↑
Market growth of e-products		↑ ↑	↑	↑	↑ ↑
Import	e-products	↑	↑	↑	↑
	Recyclable e-wastes	↑	↑	—	↑
	Illegal e-waste		○	↑	↑ ↑
Export	e-products	↑ ↑	↑ ↑	↑ ↑	↑ ↑
	Recyclable e-wastes	↑	↑	↑	↑
	Illegal e-waste	↓	—	↑	↑ ↑
Employment		↑ ↑	↓ ○	↑ ○	↑
Consumption		↑ ↑	↑ ↑	↑ ↑	↑ ↑

DEI		Tariff & non-tariff barrier elimination Increased FDI Service trade liberalization			
impact	Scale effect	Technology Effect	Structural effect	Policy effect	
Social Impacts					
Poverty		↑ ○	—	↑ ○	↑
Public welfare		↑	↑ ↑	↑ ↑	↑ ↑
Working condition		↓ ↓	↑	↑	↑
Public environmental awareness		↓	↑	↑	↑
Health		↓	↑	↑ ○	↑ ↑

DEI impact	Tariff & non-tariff barrier elimination Increased FDI Service trade liberalization			
	Scale effect	Technology Effect	Structural effect	Policy effect
Environmental Impact				
Water	↓ ↓	↑	↑	↑ ↑
Air	↓ ↓	↑	↑	↑ ↑
Soil	↓ ↓	↑	↑	↑ ↑
Landscape	↓ ↓	↑	↑	↑ ↑
Hazard waste	↓ ↓	↑	↑	↑ ↑
Resource consumption	↓ ↓	↑	↑	↑ ↑
Environmental governance system (legislation, institution and policies)	↓ ↓	↑ ↑	↑ ↑	↑ ↑

REI and e-waste management: Comprehensive analysis

- Challenges by REI
 - Increase water, energy consumption and pollution caused by expanding production scale of e-products;
 - Increase a large amount of e-wastes which cause water, air and solid pollution and health risk;
 - technology innovation brought by regional economic integration can lead to stimulate the purchase desire, accelerate the speed of update and discard, thus increase the output of e-waste;
 - Illegal e-wastes trade will still be quiet a pressure for the environment management;
 - The professional and big scale recycling system after REI will impact on our traditional individual recycling industries, which may led to unemployment and other social problems.

REI and e-waste management: Comprehensive analysis

- Opportunities led by REI:
 - REI will increase the economic income (GDP), thus providing more sufficient capital to implement environment management of the e-waste.
 - REI will speed up the complete and improvement of all the laws, systems and mechanisms in the country ;
 - REI will contribute to spread technology effect;
 - Service trade liberalization will facilitate different kinds of advanced e-waste treatment technologies service items regional flow;
 - Help to attract more FDI in e-waste management, bringing with new management ideas and advanced technologies;
 - More information exchange, advanced ideas and experiences from other countries.

Recent Efforts in China

Legislation:

- Measures for the Pollution Control of Electronic Information Products (MII)
- Ordinance on the Management of Waste Household Electrical and Electronic Products (NDRC, in drafting, Responsibilities of different parties in household electrical and electronic wastes collection and treatment)
- Home Electronic and Electrical Wastes Pollution Prevention and Control Technical Policy (SEPA)
- Solid Waste Pollution Prevention and Control Law
- Cleaner Production Promotion Law
- Circular Economy Law (in approving of NPC)

Pilot projects on e-waste collection and reuse/recycle

Pilot projects on circular economy

Circular economy planning

Construction of circular economy industrial park



Gaps and Obstacles of China's current e-waste management system

- **Administrative system**

The management of e-waste at present involves several administrative departments (NDRC, MITI, SEPA etc.), the competent administrative department of the e-waste has not been definitely promulgated. Different departments have their own administrative means and focal points in the process of exercising their functions, but functions are overlap and crossover.

- **Management mechanism**

there is still not a sound mechanism in China to encourage enterprises to be involved in cleaner production of e-products and comprehensive utilization, recycling and harmless disposal of e-waste.



Gaps and Obstacles of China's current e-waste management system

- **Legislative system**

There is still not a legislation giving comprehensive consideration to the laws on the overall control and administration from environment-friendly design and cleaner production of e-products to utilization and harmless disposal of the e-waste.

Some of regulations are obviously colored by departmental interests. Some of them are overlap.

- **Policies and institutions**

China is short of economically incentive policies and supporting policies on e-waste management, recycling and harmless disposal.



Policy Framework for sound e-waste management in China

- **China's policy framework for electronic waste management should include the following aspects:**
 - Guiding policy: through establishing and perfecting laws and regulations, to make clear the concept, principle and guiding ideas for China's electronic waste management;
 - Compulsory policy: to formulate mandatory regulations and systems for electronic waste management;
 - Incentive policy: to establish economic policies for electronic waste management;
 - International & REI related policy: Including MEAs and policies concerning electronic waste trading under economic globalization and regional economic integration.



Proposed Policy Package: Guiding policy

- Principles should be set up in legislations and regulations, such as:
 - Control of whole life cycle of e-product
 - Producer Pays Principle (PPP) and Extended Producer Responsibility (EPR)
 - 3R(reduce, reuse and recycle) principle with the priority of Reduce
- In the out-coming "Circular Economy Law", the principle of Reduce, Reuse and Recycle (3R), with the priority of Reduce, has been formulated to give clear requirements of reclaiming, utilization and disposal of the waste products for producers. These important concepts and principles will become guideline and basis for electronic waste management in the future.



Proposed Policy Package:

Compulsory policy

- The license system of electronic waste collection and sale
- Strict environmental management measures for pollution control of enterprises engaged in electronic waste dismantling, utilization and disposal (including set up and perfect e-waste collection, dismantling, disposal standard, certificate and label)
- Environmental supervision policy of electronic waste recycling.
- Compulsory collection institution of high pollution electronic waste.
- Extended Producer Responsibility for electronic products manufacture.
- The prohibition or limitation of toxic or hazardous substances used in electronic products manufacturing.



Proposed Policy Package:

Incentive policies

- Imposing special tax or fee for e-waste disposal;
- Tax preference policy or low-interest loans to enterprises engaged in e-waste reuse and recycling ;
- Deposit-restitution system;
- Special fund for electronic waste treatment and disposal to provide subsidy to e-waste professional collection, environmental friendly disassembly and disposal.



Proposed Policy Package: REI related policies

- **Tariff policy:** Reducing tariff of e-waste handling and recycling equipments so as to importing more foreign advanced equipment and products;
- **Non-tariff policy:** Develop and perfect the import restrictions and the prohibition list of e-waste to prevent the illegal trade of e-waste;
- **FDI related policy:** Attract FDI in the field of e-waste dismantling and recycling, use of foreign capital and advanced technology to solve the e-waste handling and disposal problems;
- **Service trade policy:** Promote more open of environmental services market in the region, and encourage foreign service companies to enter China's electronic products green design, recycling areas;
- **International cooperation policy:** Develop regional cooperation mechanism, including the mechanism for the exchange and sharing of information, dialogue mechanisms and joint action mechanism against illegal trade in electronic waste, and promote technological transferring and experiences learning.



Suggestions for policy-making ——priority policies

- Domestic based policy: developing environmental friendly e-waste collection, dismantling, disposal system;
- REI based policy 1: regional joint management mechanism against illegal trading of e-waste, including information sharing platform, common prohibited e-waste list; monitoring system and remedy system;
- REI based policy 2: Promote more open of environmental services markets of e-waste recycling in the region.

Feasibility of establishing policies for electronic waste management under REI

- China has proposed a series of significant strategic policies for strengthening environmental protection, which is to provide guarantee for establishing and perfecting more strict electronic waste management policies;
- Globalization and regional economic integration have provided opportunities and possibilities for solving electronic waste management problems in China;
- China will play more active roles to promote trade-environment negotiations in WTO, FTAs, MEAs and other forum;
- Enterprises and public environmental consciousness have been significantly improved, and the recognition of electronic waste recycling is increasing.

■ CBA for proposed policies

Domestic based policy: developing environmental friendly e-waste collection, dismantling, disposal system

Costs:

- Imposing special tax or fee for e-waste disposal;
- providing subsidy to e-waste professional collection, environmental friendly disassembly and disposal;
- administrative costs;
- Technology transferring and purchasing fee;
- Equipment and infrastructure investments;
- Transportation costs of materials and products;
- Personnel resources costs;
- Capacity building.

Benefits

- good environmental quality;
- better health;
- reuse and recycled resources;
- financial revenue of e-waste reuse and recycling enterprises

CBA for proposed policies

REI based policy 1: regional joint management mechanism against illegal trading of e-waste, including information sharing platform, common prohibited e-waste list; monitoring system and remedy system;

Costs:

- Administrative and supervision costs;
- Information collection and exchange;
- Equipment and infrastructure investments;
- Communication and transportation costs;
- Personnel resources costs;
- Capacity building;
- Job placement.

Benefits

- good environmental quality ;
- better health;
- reuse and recycled resources

CBA for proposed policies

REI based policy 2: Promote more open of environmental services markets of e-waste recycling in the region

Costs:

- Administrative costs;
- Negotiation costs;
- Communication and transportation costs;
- Personnel resources costs;
- Capacity building.

Benefits:

- good environmental quality ;
- better health;
- reuse and recycled resources;
- financial revenue of service companies
- providing more jobs.



Thanks!