



PROMOTION OF SUSTAINABLE DEVELOPMENT IN THE CONTEXT OF REGIONAL ECONOMIC
INTERGRATION PROJECT

VIET NAM NATIONAL STUDY ON E-WASTE

Huynh Trung Hai ¹
and research group^{1,2}

(1)- *Institute for Environmental Science and Technology (INEST) – Hanoi University of Technology (HUT)*

(2)- *National Economics University*

OUTLINE

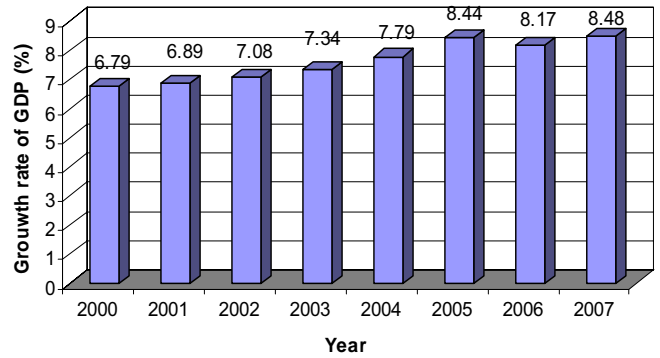
- ❖ Introduction
 - ❖ Purpose of the study
 - ❖ Current status of solid and E-waste management in Viet Nam
 - ❖ Effect of economic integration on economic and environment conditions of E-waste sector
 - ❖ Current policy targets and measures relevant to E-waste
 - ❖ Recommended policy
 - ❖ Analysis of the recommended policy
 - ❖ Conclusions
 - ❖ Future works
-

INTRODUCTION

Situation of Socioeconomic development

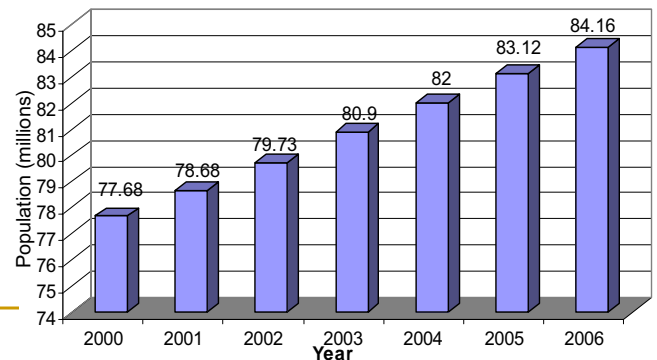
Socioeconomic development

- GDP has rapidly grown from 2000 – 2007 with average rate of over 7,5%
- GDP per capita is continuously creasing: from 415\$ in 2000 to 850\$ in 2007



Population growth

- Population in 2006: 84.155.800
- The population growth rate: appx. 1,3%/year

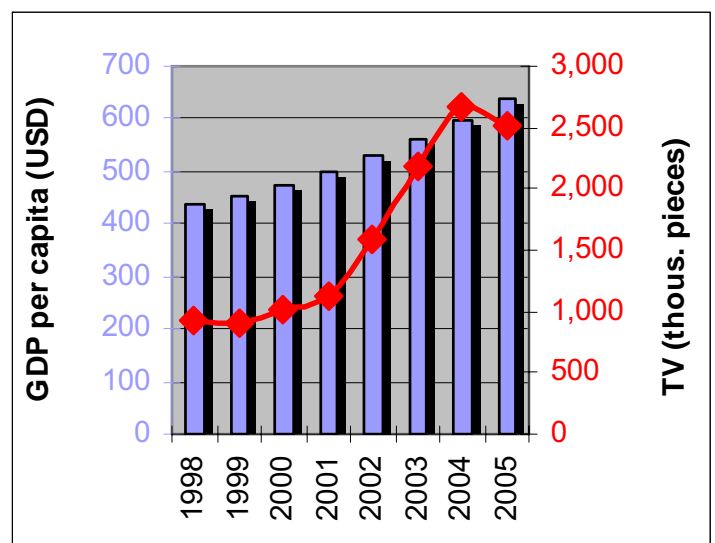


General Statistics Office of Vietnam, 2000-2007

INTRODUCTION

Situation of Electronic industry development

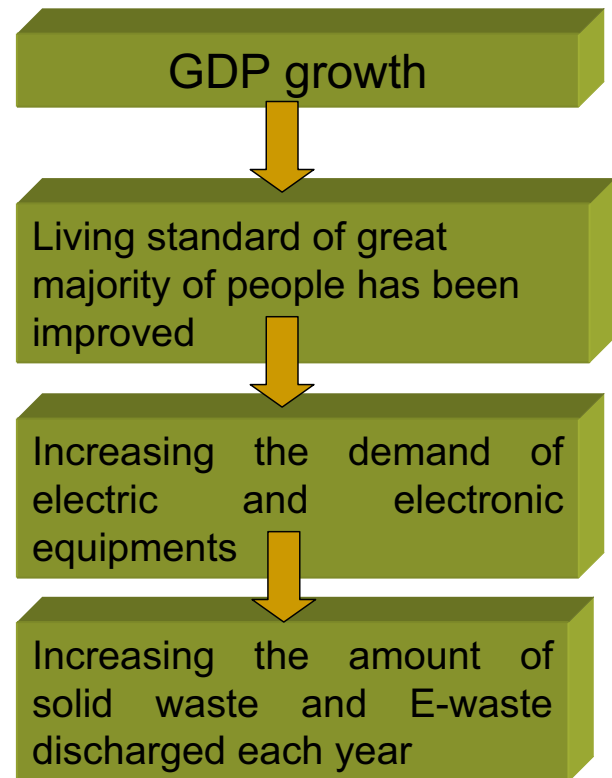
- Average index of Industrial output value : 114.2 % from 1998 to 2005 for products such as air-con., television etc.
- In 2004, 2,659.7 thousand TVs were assembled and produced, increased by 136.3 % compared to this figure in 2001, annually increases by 26.9% on average



GDP per capita and TV production

INTRODUCTION

- ❖ According to socio- economic development policy of Viet Nam until 2010 and vision toward to 2020, information technology and electronic industry are given priorities for development in the period of national industrialization and modernization with target of becoming an industrial country in 2020.
- ❖ Vietnamese industry is strongly developed especially electronic industry. As a consequence, over 15 million tons of solid waste and E-waste is generated each year. This number is continuously increased by 10-16% annually.. Solid waste and E - waste become a serious problem in Viet Nam.

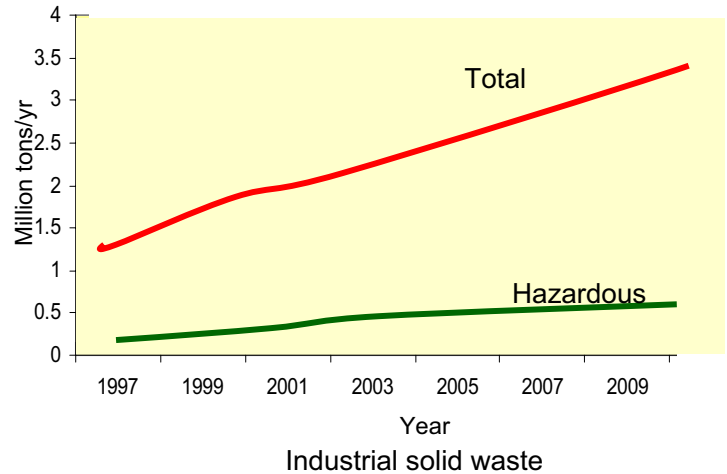
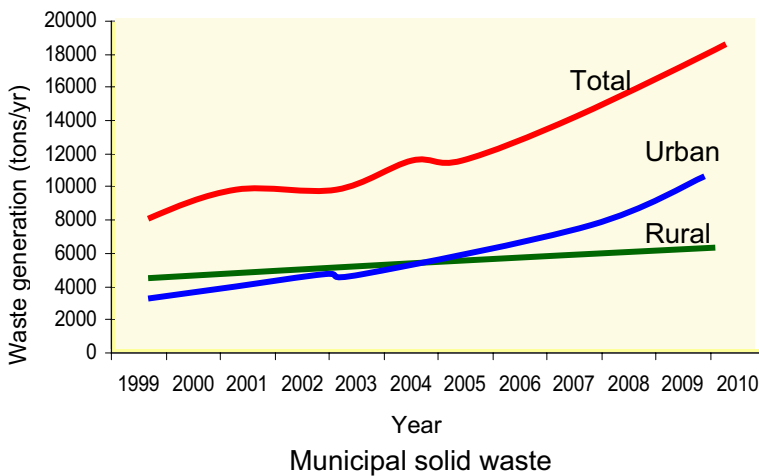


PURPOSE OF THE STUDY

To provide an overview of the current status of e-waste generation and policies in force for E-waste management in Viet Nam as well as to propose an appropriate policy in responding to the process of regional economic integration.

CURRENT STATUS OF SOLID WASTE AND E-WASTE MANAGEMENT IN VIET NAM

Solid waste management



- **Waste recycling:** Recyclable wastes were collected at household, industrial enterprises by waste dealers or collected at the landfills by waste collectors, then were recycled at the craft villages. However the amount of recycled solid waste in Viet Nam is not remarkable.
- **Waste treatment:** the most popular way for solid waste treatment is disposal to the landfill.

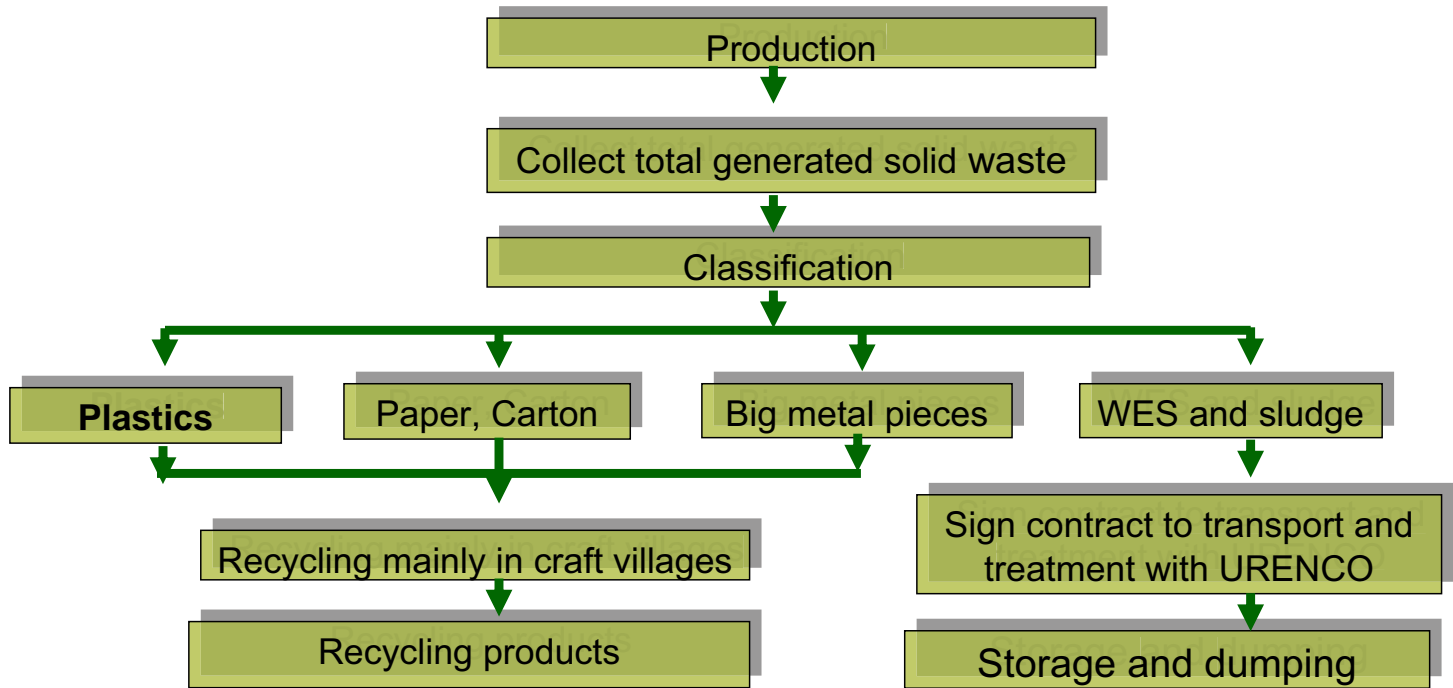
CURRENT STATUS OF SOLID WASTE AND E-WASTE MANAGEMENT IN VIET NAM

E-waste management

- **Industrial Electronic wastes (IEW)**
The total amount of IEW was estimated about 1,630 tons annually:
 - In the North: 1,370 tons (84%)
 - In the Centre: 6-7 tons (0,4%)
 - In the South: 254 tons (15,6%)
- **Electric and Electronic home appliances:**
It is estimated about 133,00pcs (TVs, washing machine, ext) and 300,000 sets of computers per year.

CURRENT STATUS OF SOLID WASTE AND E-WASTE MANAGEMENT IN VIET NAM

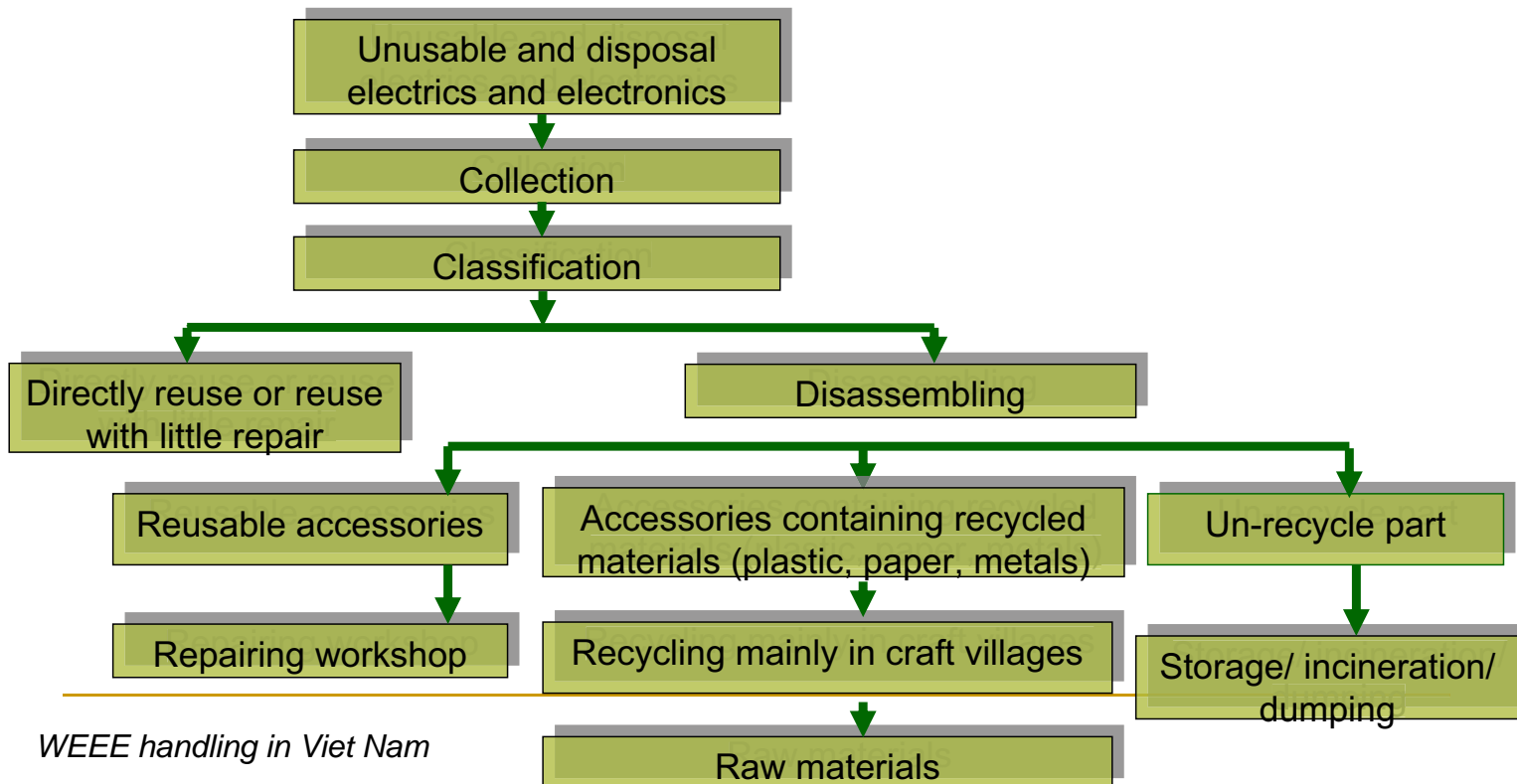
E-waste handling



Procedure of management and treatment of industrial E- waste in Viet Nam

CURRENT STATUS OF SOLID WASTE AND E-WASTE MANAGEMENT IN VIET NAM

E-waste handling



WEEE handling in Viet Nam

EFFECT OF ECONOMIC INTEGRATION ON ECONOMIC AND ENVIRONMENT CONDITIONS OF E-WASTE SECTOR

❖ Economic integration

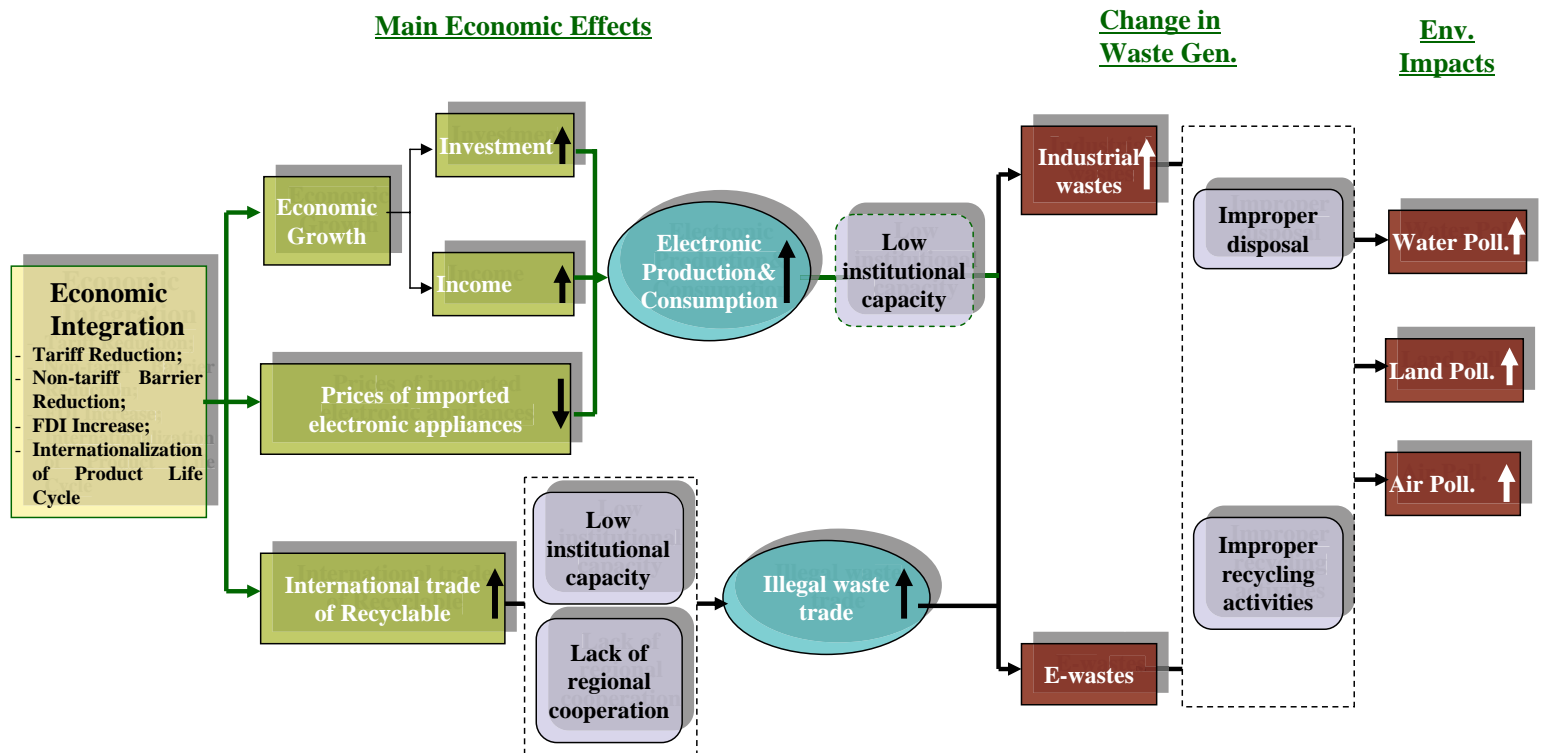
- Since Viet Nam joined in ASEAN (1995), the import tax for electronic products from ASEAN countries has been reduced from 25% to 5% on average, especially reduced from 50% to 5% for some electronic home appliances.
- After conclusion of the trade agreement between Viet Nam and United State in 2000, Viet Nam agreed to undertake a wide range of market-liberalization and reduced import tax for the products from United State.
- After becoming the 150th member of WTO in 2007, Viet Nam will reduce import tax by 44% on average for 1.812 import tariff lines.

EFFECT OF ECONOMIC INTEGRATION ON ECONOMIC AND ENVIRONMENT CONDITIONS OF E-WASTE SECTOR

❖ Main effect of economic integration

- Create opportunities for economy development in general and electronic industry in particular,
- Promote the industrialization and modernization in Viet Nam,
- Promote recycling activities including WEEE reuse and recycling,
- Create more jobs, and increase labour income,
- Increase environmental pollution risk.

EFFECT OF ECONOMIC INTEGRATION ON ECONOMIC AND ENVIRONMENT CONDITIONS OF E-WASTE SECTOR



Causality Chain Analysis of the Effects of Regional Economic Integration on E-Wastes management in Vietnam

EFFECT OF ECONOMIC INTEGRATION ON ECONOMIC AND ENVIRONMENT CONDITIONS OF E-WASTE SECTOR

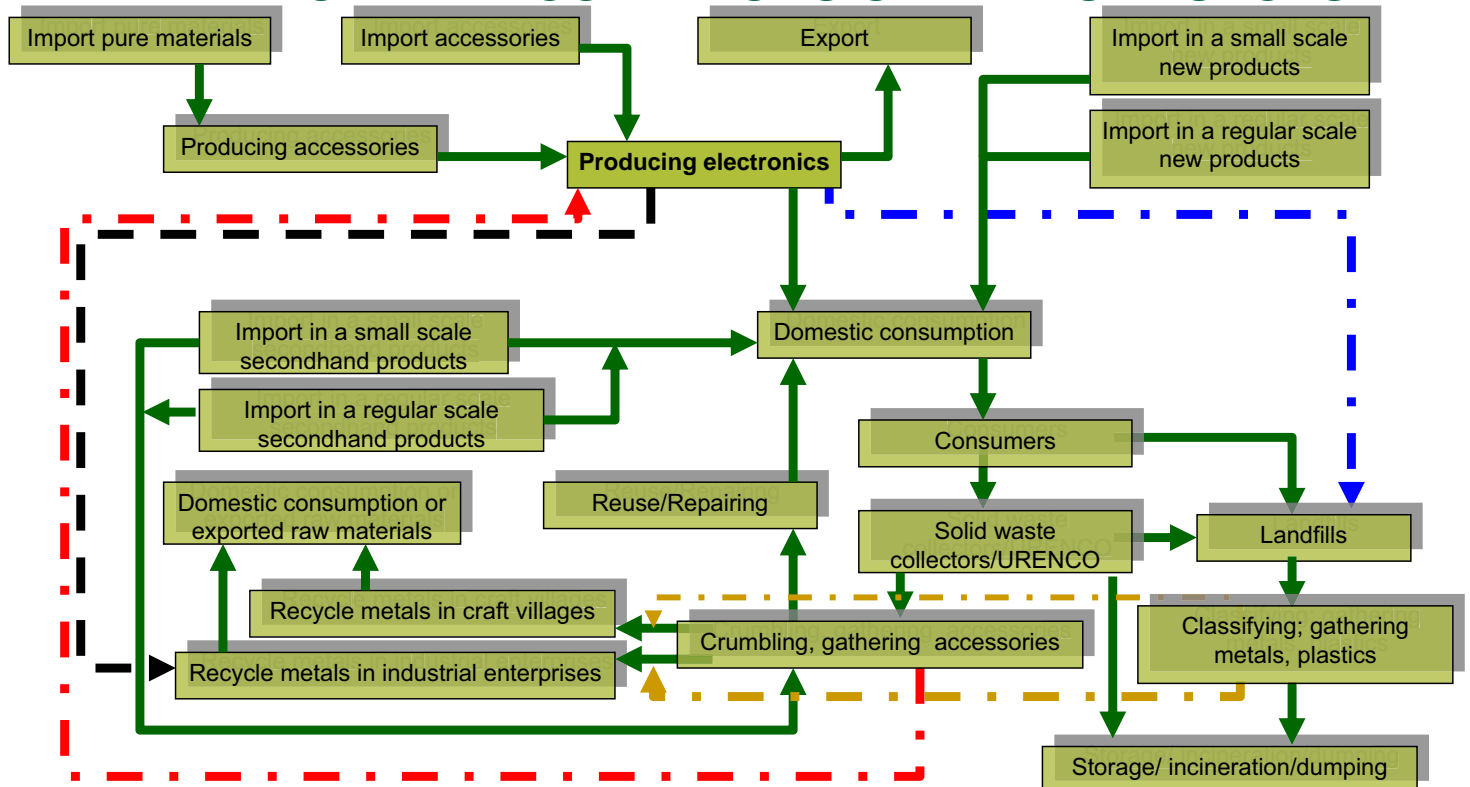


Diagram of the cycle of electrics and electronics in Viet Nam

CURRENT POLICY TARGETS AND MEASURES RELEVANT TO E-WASTE

Policy or Legal Instrument
The Environmental Protection Law 2005 of November, 29, 2005.
Decree No174/NĐ-CP of November 29, 2007 related to environmental protection fee for solid waste.
Decree No 59/2007/ND-CP of April 9, 2007 on solid waste management.
Decree No. 67/2003/ND-CP. Environmental protection fee for waste water discharge.
Decision No 23/2006/QĐ-BTNMT of December 26, 2006, promulgating the list of hazardous wastes.
Decision 155/1999/QĐ-TTg on the Promulgation of Regulation on Hazardous Wastes Management.
Circular No 12/2006/TT-BTNMT of December, 16, 2006 guiding the operating conditions, procedures for compilation of dossiers registration and licensing of operation, and hazardous waste management identification numbers.
Interministerial Circular No 002/2007/TLT-BTC-BTNMT of August 30, 2007 guiding the implementation of article 43 of the Environmental protection law regarding the criteria for and condition on the import of scraps.
The Ministry of Natural Resources and Environmental is developing the Decree on Environmental protection free for gas emission. This Decree may be promulgated in 2008.

CURRENT POLICY TARGETS AND MEASURES RELEVANT TO E-WASTE

Weakness

- Lack of clarity in relation to national and local authorities for inspection, limited capacity undermine the development of standards as well as their enforcement.
- The regulations are not effectively enforced and overlapped.
- The information about environmental problems is not readily accessible to the public. The lack of environmental awareness has led authorities to be lenient on industries for fear of economic losses. Moreover, the public could not participate in environmental policy-making and/or implementation.

CURRENT POLICY TARGETS AND MEASURES RELEVANT TO E-WASTE

❖ Current policies related to E-Waste management

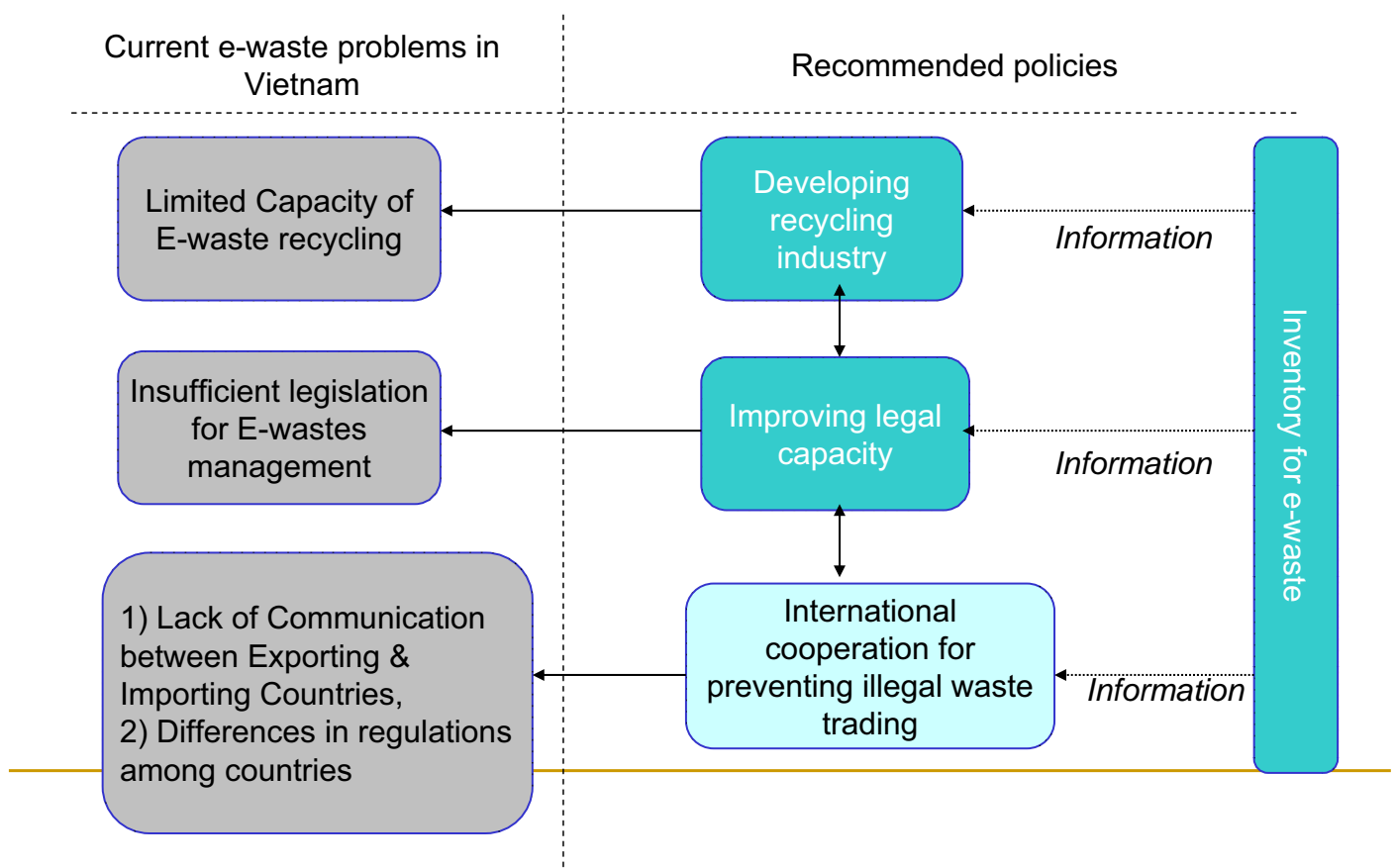
- Viet Nam has no any specific regulation relate to E-Waste management yet
- “The National Strategy for waste reduction, reuse, and recycling until 2020” is presently being prepared with the targets as follows

2015	2020
✓ 100% of MSW will be classified at the sources in a city.	✓ 100% of MSW will be classified at the sources in a city.
✓ 45% of urban, 70% of industrial parks and economic zones own a certified central wastewater treatment system.	✓ 100% of urban, industrial parks and economic zones own a certified central wastewater treatment system.
✓ 80% of SW is collected, to compost 30%of DW, 50% of CW is reused and recycled.	✓ 100% of SW is collected, to compost 80%of DW, 90% of CW is reused and recycled.
✓ The use of recycled products is up to 20%. ext	✓ The use of recycled products is up to 50%.
	✓ 10% of industrial enterprises apply cleaner production technologies, 70% of businesses apply ISO 14000. ext

❖ Weakness

- Recycling is a profitable business in Viet Nam, but currently implemented mainly in informal sector with backward technology.
- Waste import is permitted, but lacks of proper monitoring and international cooperation to ensure the compliance with the government regulations.

RECOMMENDED POLICY



RECOMMENDED POLICY

1. Developing recycling industry

- Establish 7 collection and separation points: 1 at each economic area;
- Establish 3 recycling centres: in the North, Centre and South;
- Establish the centre of research, development, and transferring recycling technologies;
- Human resource development;
- Enhance the community's awareness and social responsibility.

Stakeholders

- ✓ Ministry of Science and Technology,
- ✓ Ministry of Industry and Trade,
- ✓ Ministry of Natural Resources and Environment,
- ✓ Ministry of Construction,
- ✓ Ministry of Finance,
- ✓ Ministry of Education and Training,
- ✓ Environmental Urban Companies,
- ✓ Electronic industry's union,
- ✓ Women's Union,
- ~~✓ Research Centres: Universities, Institutes, consultant companies;~~
- ✓ Distribution of civil electronic products network.

RECOMMENDED POLICY

2. Improving legal capacity

- The National action plan for E-waste,
- Guideline collecting and classifying E-waste,
- Guideline recycling E-waste,
- Guideline treatment E-waste,
- Regulations related to the import and export of E-waste,
- Encouragement the use of recycled products,
- Enhance the managers' and community's awareness.

Stakeholders

- ✓ Ministry of Science and Technology,
- ✓ Ministry of Natural Resources and Environment,
- ✓ Ministry of Construction,
- ✓ Ministry of Finance,
- ✓ Ministry of Industry and Trade,
- ✓ Ministry of Public Security,
- ✓ Electronic industry's union,
- ✓ Women's Union,
- ✓ Community.

RECOMMENDED POLICY

3. International cooperation for preventing illegal WEEE trade

- Develop the common regional technical barrier for E-waste,
- Promulgate the decree for monitoring of the import-export of E-waste activities in the region,
- Strengthen capacity for the custom officers, police, and environmental police,
- Establish the special office for preventing illegal E- waste trade in the region.

Stakeholders

- ✓ Ministry of Natural Resources and Environment,
- ✓ Ministry of Industry and Trade,
- ✓ Ministry of Finance (General Department of Custom),
- ✓ Ministry of Public Security (General Department of Environmental Police),
- ✓ Electronic Industry's union,
- ✓ People committees of the border provinces.

RECOMMENDED POLICY

4. WEEE inventory

Stakeholders

- ✓ Ministry of Natural Resources and Environment,
- ✓ Ministry of Science and Technology (*General Statistics Office of Vietnam*),
- ✓ Ministry of Industry and Trade,
- ✓ Ministry of Finance (General Department of Custom),
- ✓ Ministry of Public Security (General Department of Environmental Police),
- ✓ Electronic Industry's union,
- ✓ Environmental Urban Companies,
- ✓ Distribution network,
- ✓ Community,
- ✓ Universities, Research Institutes, Consultant centers.

ANALYSIS OF THE RECOMMENDED POLICY

❖ Cost – benefit analysis (developing recycling industry)

- Inputs:

Population in 2006: 84.155.800,

The population growth rate: 1,35%/year

WEEE: 1kg/capt/year (Rolf Widmer at el, EIAR 25, 2005; Thailand: 58 tonnes/65 million of peoples)

Large HH (TV, Air-con, WM, PC, refrigerator): 42% of WEEE (APME)

Recycling efficiency: 80%

WEEE compositions

Price of materials: price of recycled material is 30% of below ones, except ferrous and coal.

Material	(%)
Iron and steel	47.9
Copper	7
Aluminum	4.7
Plastic (equal to coal)	15

Material	Price (\$US/ton)
Copper	8000
Aluminum	2500
Iron and steel	500*
Coal	150*

Source: (ETC/RWM)

www.metalprices.com, *: VN market price

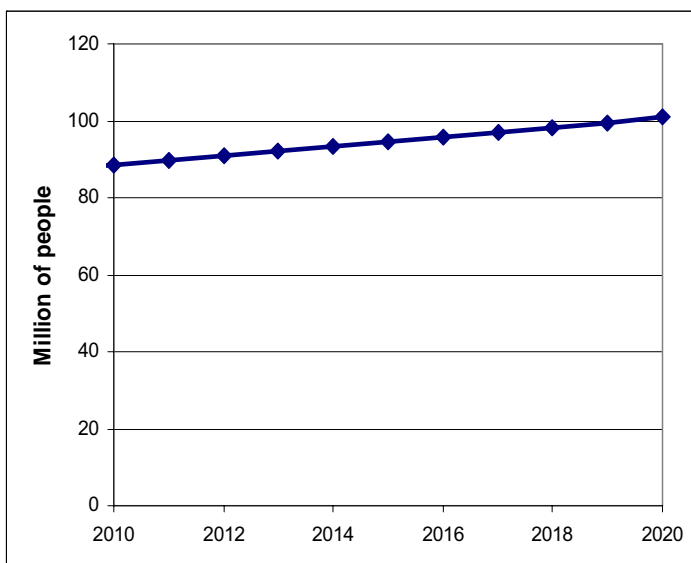
Dumping cost : 10\$/ton (Hanoi URENCO and Hai Phong URENCO)

Depreciation period: 20 years

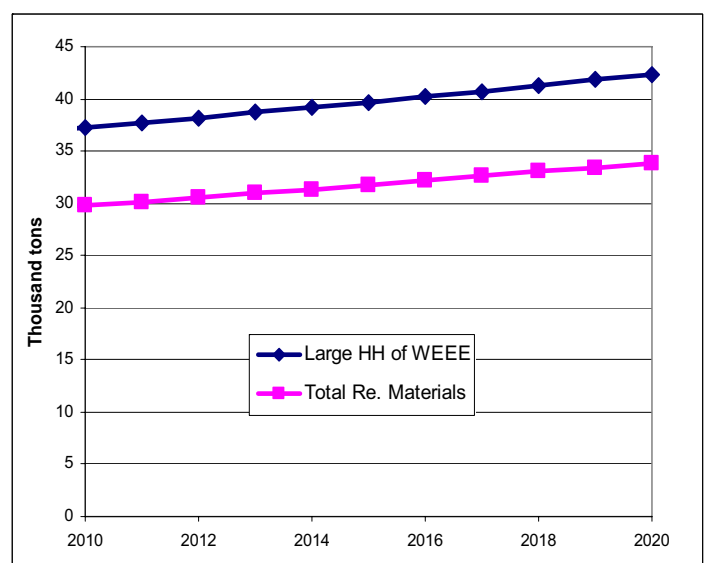
ANALYSIS OF THE RECOMMENDED POLICY

❖ Cost – benefit analysis (developing recycling industry)

- Output:



Population of Viet Nam



Quality of generated WEEE waste in Viet Nam

ANALYSIS OF THE RECOMMENDED POLICY

❖ Cost – benefit analysis (developing recycling industry)

- Investment cost: M\$US

Item	2010
Collection points	7
Recycling centres	15.6
Research institution	5
Total	27.6

- Annual cost (including 5% of the investment cost)

Thousands \$US

Item	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Labour											
Collection Point	700	700	700	700	700	700	700	700	700	700	700
Recycling Center	450	450	450	450	450	450	450	450	450	450	450
Research Institution	360	360	360	360	360	360	360	360	360	360	360
Energy											
Collection Point	287	291	295	298	302	306	310	314	318	322	327
Recycling Center	720	729	739	748	758	768	778	788	798	809	819
Research Institution	120	134	151	169	191	215	243	275	311	351	397
Investment											
Collection Point	350	350	350	350	350	350	350	350	350	350	350
Recycling Center	780	780	780	780	780	780	780	780	780	780	780
Research Institution	250	250	250	250	250	250	250	250	250	250	250
Tools											
Collection Point	35	35	35	35	35	35	35	35	35	35	35
Recycling Center	78	78	78	78	78	78	78	78	78	78	78
Research Institution	25	25	25	25	25	25	25	25	25	25	25
Land											
Collection Point	350	350	350	350	350	350	350	350	350	350	350
Recycling Center	150	150	150	150	150	150	150	150	150	150	150
Research Institution	50	50	50	50	50	50	50	50	50	50	50
Research Budget	500	500	500	500	500	500	500	500	500	500	500
Total	5,205	5,233	5,262	5,293	5,329	5,367	5,409	5,455	5,505	5,560	5,620

ANALYSIS OF THE RECOMMENDED POLICY

❖ Cost – benefit analysis (developing recycling industry)

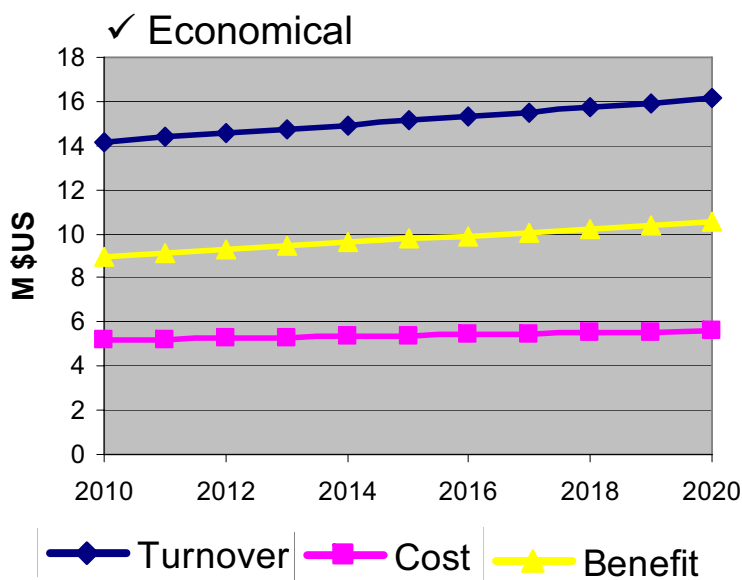
- Turnover

Item	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Recycled materials, ton	29,776	30,163	30,555	30,952	31,354	31,762	32,175	32,593	33,017	33,446	33,881
Iron and steel	14,292	14,478	14,666	14,857	15,050	15,246	15,444	15,645	15,848	16,054	16,263
Copper	2,084	2,111	2,139	2,167	2,195	2,223	2,252	2,282	2,311	2,341	2,372
Aluminum	1,399	1,418	1,436	1,455	1,474	1,493	1,512	1,532	1,552	1,572	1,592
Plastic	4,556	4,615	4,675	4,736	4,797	4,860	4,923	4,987	5,052	5,117	5,184
Turnover, M\$US											
Reduced dumping expenses	0.298	0.302	0.306	0.310	0.314	0.318	0.322	0.326	0.330	0.334	0.339
Benefit from recycled materials											
Iron and steel	7.146	7.239	7.333	7.428	7.525	7.623	7.722	7.822	7.924	8.027	8.131
Copper	5.002	5.067	5.133	5.200	5.268	5.336	5.405	5.476	5.547	5.619	5.692
Aluminum	1.050	1.063	1.077	1.091	1.105	1.120	1.134	1.149	1.164	1.179	1.194
Plastic	0.683	0.692	0.701	0.710	0.720	0.729	0.738	0.748	0.758	0.768	0.778
Annual turnover	14.179	14.363	14.550	14.739	14.931	15.125	15.322	15.521	15.723	15.927	16.134

ANALYSIS OF THE RECOMMENDED POLICY

❖ Cost – benefit analysis (developing recycling industry)

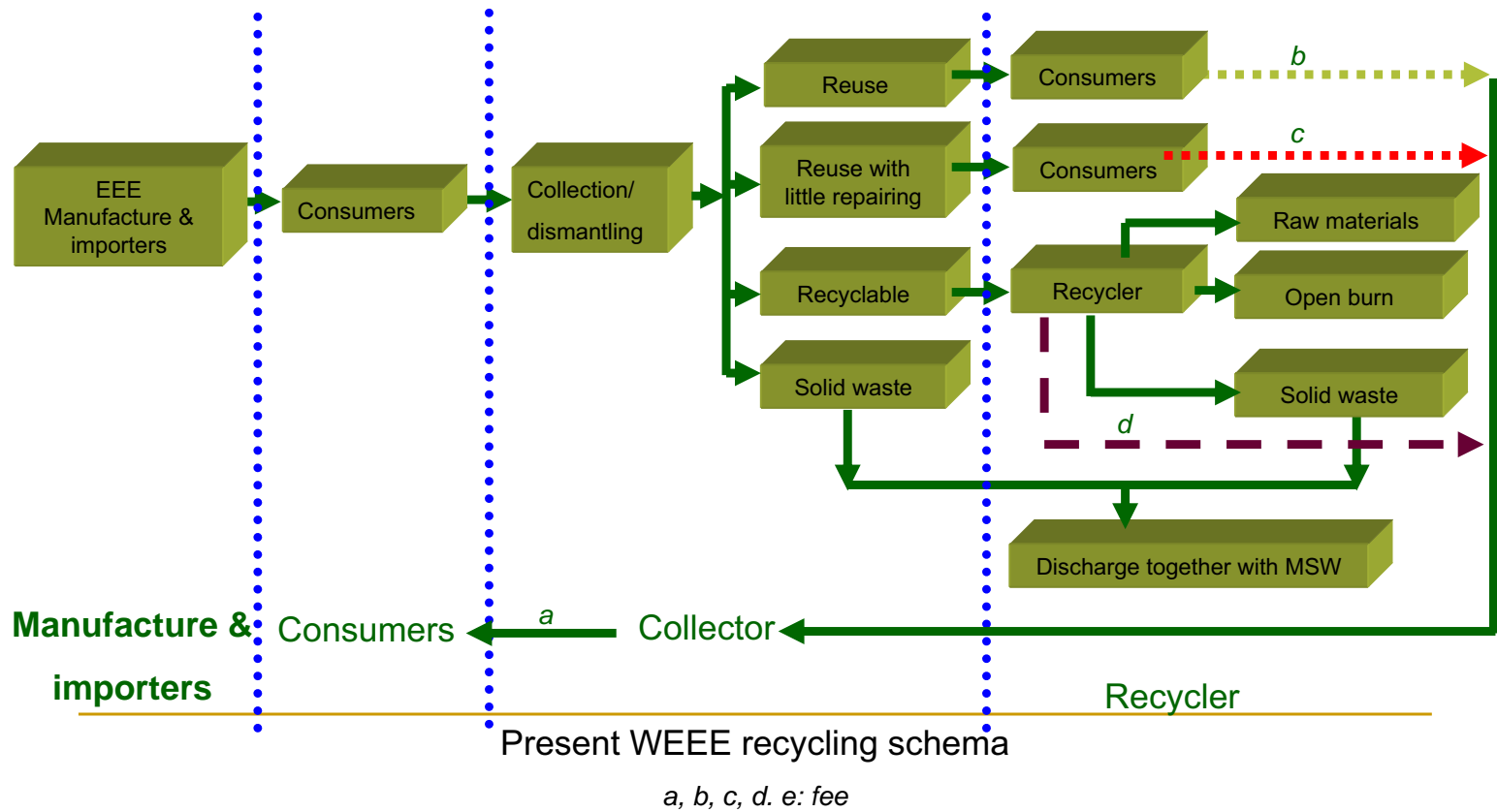
- Benefit



- ✓ Reduce pollution for better environmental protection and public health protection,
- ✓ Create more jobs and reduce the society pressure,
- ✓ Save the natural resources,
- ✓ Contribute to implementing the international conventions.

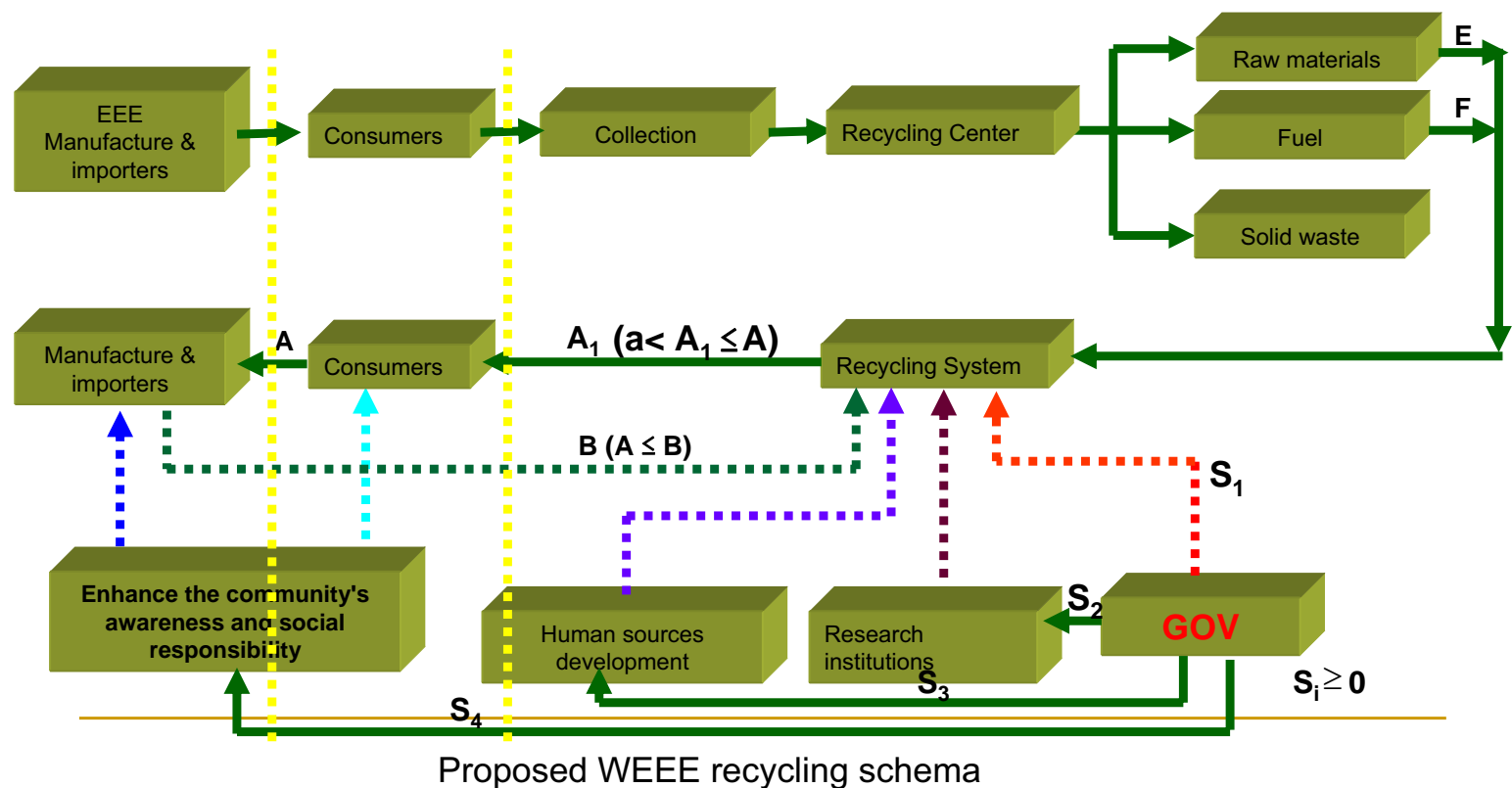
ANALYSIS OF THE RECOMMENDED POLICY

❖ Feasibility analysis



ANALYSIS OF THE RECOMMENDED POLICY

❖ Feasibility analysis



ANALYSIS OF THE RECOMMENDED POLICY

❖ Feasibility analysis


- ✓ Resolution 41-NQ/TW issued on 15 Nov 2004 by the Politburo,
- ✓ The Environmental Protection Law 2005:
 - Article No 65 related to waste recycling
 - Article No 5: The national's policies for environmental protection
(Term No 7 related to establish and develop the environmental industry)
- ✓ Decree No174/NĐ-CP on November 29, 2007 related to environmental protection fee for solid waste,
- ✓ The public and leaders are aware of environmental and public health protection issues,
- ✓ Business interest in recycling (high benefit),
- ✓ Adequate human source, skilled labour;
- ✓ Participation of the institutions and university system,
- ✓ International cooperation: change and share the experience,
- ✓ The technology is not completed (mechanical and physical processes).

ANALYSIS OF THE RECOMMENDED POLICY

❖ Obstacles

- **The habit of people,**
- **The difficulty in collecting WEEE.**

ANALYSIS OF THE RECOMMENDED POLICY

 The recommended policy “Developing recycling industry” includes establishing 7 collection/separation points, three recycling centers, and a R&D center; developing human resource; and enhancing the community’s awareness and social responsibility:

- ✓ is less expensive,
- ✓ brings significant benefits in the field of: economy, environment, natural resources,
- ✓ requires stronger environmental regulations.

CONCLUSIONS

1. Regional economic integration: promote development of industry in general and electronic industry in particular contributing to Viet Nam’s socio-economic and GDP growth.
2. WEEE is increasing (both from domestic and international sources) that promotes reuse and recycling activities of WEEE. However the lack of special regulations directly related to WEEE management may lead to negative impact of WEEE recycling on environment and community’s health.
3. WEEE recycling not only brings economical benefit, saves natural resources, and protects environment, but also contributes to development of environmental industry in Viet Nam.
4. To develop recycling industry, it is crucial to have supporting measures including improvement of legal capacity, international cooperation for preventing illegal trade of WEEE as well as WEEE inventory.

FUTURE WORK

WEEE inventory

- Cost: 500,000\$US
- Benefit: information, database

THANK YOU VERY MUCH FOR YOUR ATTENTION