

# Green Supply Chain Management in ASEAN

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Seminar on

“Green Supply Chain: The Key to AEC Sustainable Production”

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Institute of Developing Economies (IDE),  
Japan External Trade Organization(JETRO)

Associate Senior Research Fellow

Etsuyo MICHIDA

Etsuyo\_Michida@ide.go.jp



## Our Research Project

- ◆ UNIDO (United Nations Industrial Organization) - ERIA (Economic Research Institute for ASEAN and East Asia) - IDE conduct collaborative research on “Green Growth in Asia” from 2011- 2014 to aim at making policy recommendations to ASEAN Secretariat.
- ◆ Our project on “Examining the impact of product-related environmental regulations (PRERs) on Asian firms” is a part of this umbrella research collaboration.
- ◆ Research Questions
  - How much have firms been affected?
  - How do firms adopt PRERs?
  - What are the challenges for firms?
  - What type of firms need policy support?
  - What are the roles of GSC to adopt PRERs?
- ◆ We examine the issues above by
  - a relatively large firm survey in Vietnam and Penang, Malaysia
  - case studies

# Research Cooperation Network

## ◆ Team Members

Etsuyo Michida (IDE-JETRO): Project leader

Kaoru Nabeshima (IDE-JETRO)

Yasushi Ueki (IDE-JETRO)

Toshi Arimura (Waseda University)

Tsunehiro Otsuki (Osaka University)

Shunsuke Managi (Tohoku University)

## ◆ We are cooperating with different organizations in Asia.

- MTEC from Thailand (Environment Research Unit)
- VCCI from Vietnam
- SIRIM from Malaysia (Laboratory for testing)
- Malaysia Government (MITI), Penang government
- JEMAI from Japan (supply chain management JAMP for REACH)

## ◆ We have made presentation to ASEAN policy makers.

- The 17<sup>th</sup> Meeting of AMEICC (AEM-METI ECONOMIC AND INDUSTRIAL COOPERATION COMMITTEE) Working Group on Chemical Industry, July 5, 2012, Singapore

## Environmental Regulations and Standards

### (1) Product-related environmental regulations (PRERs)

Imposing requirements on product characteristics in order to protect human health and the environment at consumption/disposal sites  
Life cycle management of a product is often needed.

### (2) International standards

eg. ISO, IEC, Codex etc.

### (3) Private standards, certificates and requirements

Specification related to PRERs are inserted as private standards' requirements. For example,

#### Certifications

- Food Products: eg. Global G.A.P(EU), BRC (UK)
- Textile Industry: eg. Oeko-tex, Global Organic Textile Standard (GOT)
- Forest Products: FSC

#### Firms' Own Requirements

- IWAY by IKEA,
- Global Green Procurement Manuals by Assembling Companies in EE industries

*The number of similar types of regulations/requirements are increasing!*

## Examples of PRERs

Country	Year Enacted	Regulation	Description
EU	2000	ELV (End-of-Life Vehicle)	Recycle rate of ELV to be 95% by 2015
	2005	WEEE(Waste Electrical and Electronic Equipment)	Recycle rate of WEEE to 70~80%
	2006	RoHS(Restriction of the use of certain Hazardous Substances)	Restriction of lead, mercury, cadmium, hexavalent chromium, PBB ,PBDDE in EE products
	2007	REACH(Registration, Evaluation, Authorisation and Restriction of Chemicals)	Chemical regulations that regulate chemicals in article
	2009	Regulations on Automobile Exhaust Gas	Emission regulation
	2009	Rules on Exhaust for Greenhouse Gasses from Automobiles	Regulation on CO2 emission from new automobiles
	2009	ErP(Energy related Products)	The products that do not have eco design through P procurement, production, packaging, transport, consumption, disposal are not permitted to be put on markets.
U.S.	1978	CAFÉ (Energy Policy and Conservation Act of 1975 & Motor Vehicle Information and Cost Saving Act)	Require automobiles that are sold in US market to meet the standard with regard to average fuel efficiency
China	2007	China RoHS (Electronic and Information Product Pollution Prevention Act)	Relating to the regulation on 6 substances in China market

## Chemical regulations as PRERs

- ◆ **EU Restriction of hazardous substances directive(RoHS)** took effect on 1 July 2006, and is required to be enforced and become law in each member state of EU. This directive restricts the use of six hazardous materials (lead, mercury, cadmium, hexavalent chromium, PBB, PBDE) in the manufacture of various types of electronic and electrical equipment.
- ◆ **EU Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)** is a European Union Regulation of 18 December 2006 and entered force in 1 June 2007. REACH addresses the production and use of chemical substances, and their potential impacts on both human health and the environment. REACH require all companies manufacturing or importing chemical substances into the European Union in quantities of one tonne or more per year to register these substances with European Chemical Agency (ECHA). Since REACH applies to some substances that are contained in articles, any company importing goods into Europe could be affected.

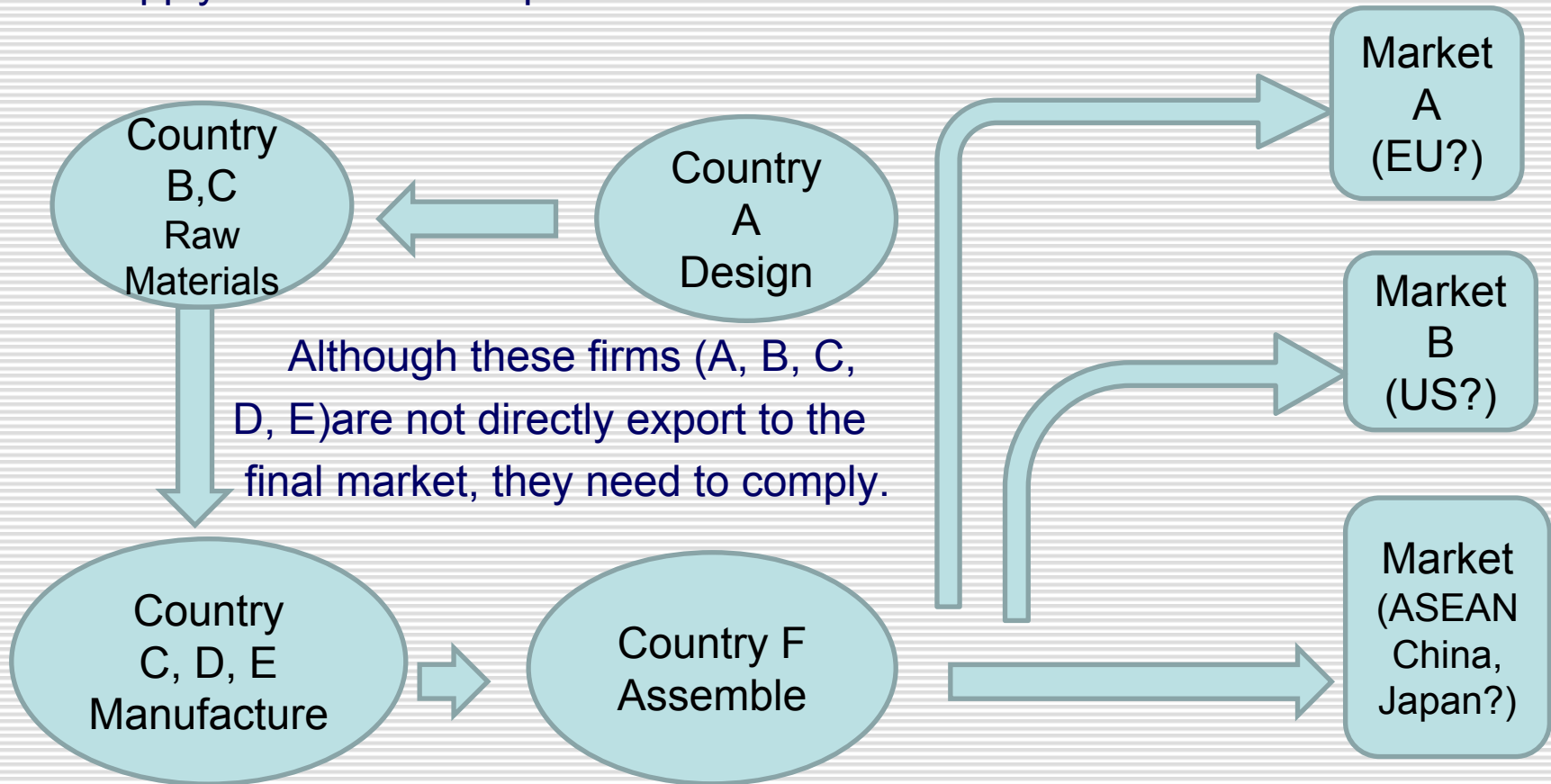
## RoHS-like regulations in different countries

Year of Implementation	Country/Region	Name	Memo
2006/July	EU	RoHS Directive	Revised by 2011/65/EU
	Japan	JIS C0950 (J-Moss)	
2007/January	California, USA	Electric Waste Recycling Act of 2003	Regulation on contained hazardous substances was implemented
2007/March	China	Administrative Measure on the Control of Pollution Caused by Electronic Information Products	The first step of the implementation
2008/January	South Korea	Act for Resource Recycling of Electrical and Electronic Equipment and Vehicles	
2008/January	Norway	Prohibition on Certain Hazardous Substances in Consumer Products	Regulate 18 substances for consumer products
2009/February	Thailand	MorOorKor. 2368-2008	
2009/June	Turkey	Turkey RoHS	Turkey WEEE and RoHS implemented in 2012
2010/January	California, USA	Assembly Bill No.1109 CHAPTER 534 the California Lighting Efficiency and Toxics Reduction Act	
2012/January	India	e-waste (Management and Handling) Rules, 2011	RoHS part is implemented in 2014.
2012/December	Vietnam	Circular No.30/2011/TT-BCT	



## Supply Chains in Asia

Supply chains of manufacturing sectors are extensive in this region due to vertical/horizontal integration in Asia. At each production stage, compliance to PRERs is required. → In Asia, compliance to PRERs is a challenge as the supply chains are complex.





# PRERs' Characteristics

- ◆ PRERs
  - Increase in number and variations around the world
  - Revisions to the PRERs are made.
  - Required through private standards as well
  
- ◆ Lead firms
  - need to conduct life cycle management
  - choose suppliers by taking into account environmental management capacity in addition to quality and price offered.
  
- ◆ Suppliers
  - May be direct exporters or indirect exporters.
  - The midstream of supply chains consist of a relatively larger number of firms including SMEs.

# Research Questions

- ◆ **Q1: How are firms affected by chemical PRERs?**
- ◆ **Q2: Are structures of supply chains affected by PRERs?**
- ◆ **Q3: How do firms adopt PRERs?**
- ◆ **Q4: What are the factors that help firms to adopt PRERs?**

# Vietnam Firm Survey

- ◆ Conducted from Nov. 2011 to Jan. 2012
- ◆ All Provinces in Vietnam and industries affected by chemical PRERs
- ◆ Sending out survey sheets to 12,000 firms and collected 1,055 firms information.
  
- ◆ **Sample: 1,055 firms**
  - Domestic firms: 54%, State own enterprises: 4%, FDI: 31%
  - Top 5 industries: Wearing Apparel: 284, Wood products: 146, Food processing: 97, Rubber: 54, Electrical equipment: 29
  - Input materials procured from China, Domestic, South Korea, Taiwan and etc.
  - Export firms: 74% (Top destination markets: EU, US and Japan)
  - Participating global supply chains:  
Yes: **28%** No: **72%** among 755 answers.

## Results from Vietnam Firm Survey 1

### Q1: How are firms affected by chemical PRERs and private standards?

#### ◆ Q1.1: How many firms have been received requests about chemicals in product?

**A1.1:** 395 or **43%** firms have received some requests about chemical substances in products by customers.

#### ◆ Q1.2: How many firms have experienced rejection of products by customers?

**A1.2:** 54 or **10%** firms have experienced rejection by customers due to chemical substances in products.

# Results from Vietnam Firm Survey 1

## Q1:How are firms affected by chemical PRERs?

- ◆ **Q1.3:** For firms that comply with PRERs, what was the motivation?
  - **Q1.3.1** Who requested to take measures on chemicals in products?  
**A:** customers (262 firms),suppliers (131), government (42)
  - **Q1.3.2** What are the reasons that firms adopt PRERs?  
**A:** Among 337 answers,
    - 139 firms “to avoid customers/buyers rejection
    - 84 firms “to comply with domestic regulations
    - 40 firms “to increase export”
    - 20 firms “to improve brand image”
    - 18 firms “to keep current transactions”

## Results from Vietnam Firm Survey 2

### Q2: Are structures of supply chains affected by PRERs?

- ◆ **Q2.1:** Have firms changed materials/inputs due to requirements of chemicals?

**A:** Among 406 firms, 29% answered “changed”.

- **Q2.2:** Do firms use different chemical substances depending on destination markets?

**A:** 127 or 51% of firms says that they change chemicals depending on the market.

- ◆ **Q2.3: Do firms change destination markets due to PRERs?**

**A:** Some firms (25 or 4% firms among answering the question) changed.

→ indicate possibility of structural change in supply chains due to PRERs in terms of destination markets as well as procurement markets

## Results from Vietnam Firm Survey 3

### Q3: How do firms adopt PRERs?

#### ◆ Q3.1: What did firms do to adopt PRERs?

- A:
1. Sending out products for testing,
  2. Production process change,
  3. Investment in new production, equipment, facility or plant,
  4. Changing inputs

#### ◆ Q3.2: After adopting PRERs, how did cost and price change? Did export increase?

##### ◆ Q3.2.1: Did costs increase when taking measures? (422 answers)

A: increase (253), unchanged (144), decrease (25)

##### ◆ Q3.2.2 Did prices change after adopting PRERs? (407)

A: increase (223) unchanged(184) decrease(8)

##### ◆ Q3.2.3: Did export change after meeting PRERs? (455)

A: 299 or 66% of firms no change, decrease (53), increase (42)



## Results from Vietnam Firm Survey 3

### Q3: How do firms adopt PRERs?

- ◆ 90% firms says customers and suppliers assistance is important to adopt PRERs.  
Although a small number, there are cases of co-investment with buyers and suppliers to meet the regulation/requirements.
- ◆ 60% of firms know the names of regulations that they need to meet but the remaining firms take measures as customers require.

## Results from Vietnam Firm Survey 4

### Q4: What are the factors that help firms to adopt PRERs?

- ◆ **Q4: What are the factors that help firms to adopt PRERs?**
  - **Q4.1: Does participating in supply chains help firms to adopt PRERs?**
    - The firms participating in global supply chains tend to be requested to take measures on chemicals in products compared to the exporting firms that do not participate in global supply chains.
  
    - Among those participating in global supply chains, no difference between FDI and domestic firms are observed.
  
  - **Q4.2: Does the nationality of lead firms make difference in information transfer with regard to PRERs?**
    - When the nationality of lead firms is EU, supplier firms tend to receive requests to manage chemical substances in products more.

## Overall Results

- In Vietnam, among **210** firms participating in global supply chains, **67%** firms are asked to take measures about chemicals in products or are asked to use specified inputs. => compliance to PRERs is achieved.  
On the other hand, among **845** not participating in global supply chains, Only **31%** are required to take measures.
  - Tightly connected supply chains help firms adopt PRERs better due to suppliers/customers cooperation.
  - The firms that do not participate in global supply chains may face difficulties to export to tightly regulated market.
- Coordination and cooperation within supply chains becomes more important.  
→Smaller firms with less capacity may face entry barrier when they wish to export to the regulated markets.
- Information might come through private standards but firms need to learn PRERs in export markets to take proactive measures.

## Results 2

- ◆ Firms that are not required to manage chemicals in products may not develop capacity to do so.
- ◆ Exporting firms that have not needed to take measures on chemicals in products seem to export to loosely regulated markets.
- ◆ Even among those firms that can comply, they use different chemicals for different markets. Implying that loosely regulated markets can become heaven of products containing chemicals that are regulated in other markets.
- ◆ In future, PRERs could be introduced in more countries reflecting an increasing level of people's concern for health and the environment.
- ◆ In order to prevent creating pollution heaven, policy need to support all firms to upgrade their chemical management.

# Lessons for policy

- ◆ If similar PRERs are independently introduced in different countries in Asia, firms need to handle multiple regulations for each trading country.
- ◆ Different testing to meet different requirement for each chemical substance can be very costly and duplications of testing among different suppliers along a supply chain has created inefficiency.
- ◆ We fear that this trend could impede competitiveness in ASEAN and Asian region as a whole. Similar situation may happen for other PRERs such as carbon food print.
- ◆ How to simplify such procedures in Asia is an important to issue to be tackled.
- ◆ Harmonization of regulations seems beneficial as we found that introduction of RoHS to EU that harmonized the EU policy increase intra-regional trade.

# Thank you very much.

- ◆ Our papers are available through IDE website

<http://www.ide.go.jp/English/Publish/Download/Dp/index.html>

Honda, Keiichiro ( 2012) “The Effect of EU Environmental Regulation on International Trade: Restriction of Hazardous Substances as a Trade Barrier,” IDE Discussion Paper No.341, IDE-JETRO.

Michida, Etsuyo and Kaoru Nabeshima (2012) “Role of Supply Chains in Adopting Product Related Environmental Regulations: Case Studies of Vietnam,” IDE Discussion Paper No. 343, IDE-JETRO.

Ramungul, Nudjarin, Etsuyo Michida and Kaoru Nabeshima(2013) “Impact of Product-related Environmental Regulations/Voluntary Requirements on Thai Firms,” IDE Discussion Paper No. 383, IDE-JETRO.

Please visit our project homepage at

<http://www.ide.go.jp/English/Research/Project/2012/a501.html>