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# What is driving the firms to be greener: observations from China

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## Main Contents

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- ▶ **An overall understanding on Chinese economy and stage of environ. management;**
- ▶ **A glance of environmental problems in China;**
- ▶ **Existing measures against industrial pollution;**
- ▶ **Emerging CEM policies;**
- ▶ **Future perspectives: the way forward.**

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## Country Profile - China



- **Population:** 1,319.98 mill.
- **Area:** 9,598,100 km<sup>2</sup>
- **Jurisdiction:** 31 provinces
- **GDP per capita (PPP):** \$5,370
- **GDP growth rate:** 11.4%
- **GDP composition:** Agriculture 11.7%, **industry 49.2%**, service 39.1%
- **Labor force:** agriculture 42.6%, **industry 25.2%**, services 32.2%

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## China's Economy Growth and Structure Changes

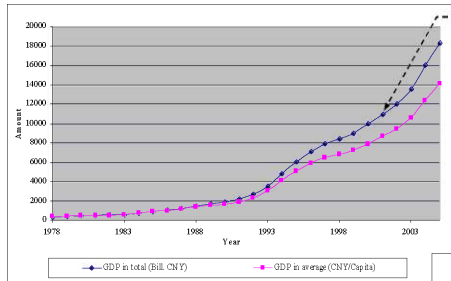


Fig: GDP growth of China during 1978-2005.

Obvious structure changes in economy since 1990's with nearly half shared by the secondary industries

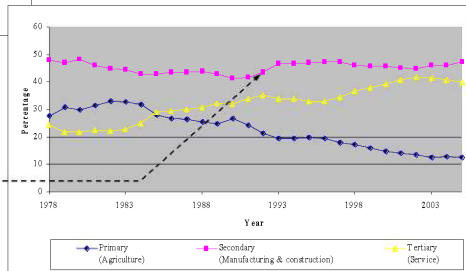
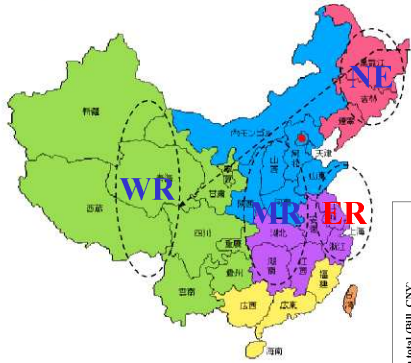


Fig: GDP structure of China during 1978-2005.

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## Geographically Economic Imbalance in China



**Measures:**

- Prospering traditional industrial bases in NE from 2004;
- Western development strategy since 2000;
- Promoting economic rise in central since 2007.

Uneven development in economy is obvious geographically. Per capita GDP in east is 2.5 times higher than that in west in 2005.

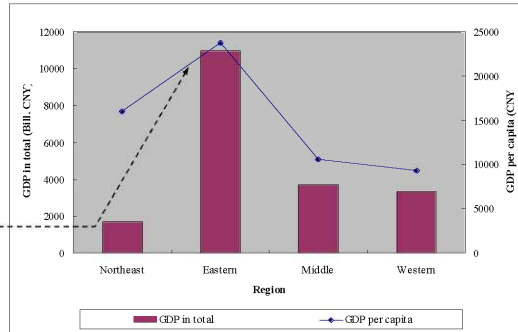
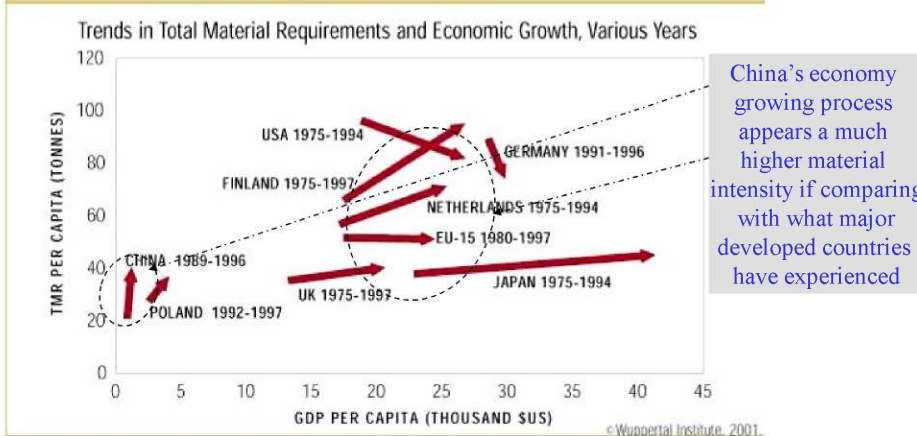


Fig: GDP of different regions of China in 2005.

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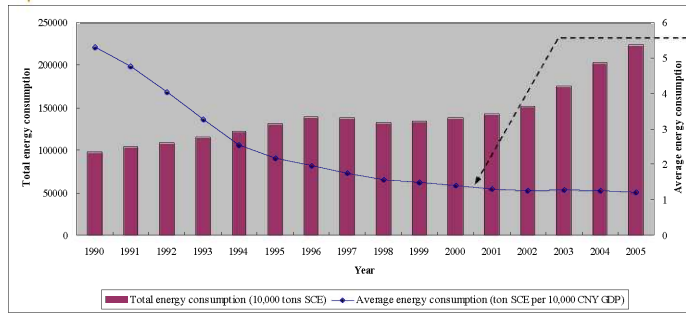
## An International Comparison on Material Consumption

### Entire Economies Are Improving Efficiency



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## An International Comparison on Energy Use



The total energy use have doubled in the last 15 years while the energy intensity kept decreasing.

Fig: Energy consumption of China during 1990-2005.

However, the average energy intensity of economy in China is still quite high if comparing with developed countries and also typical economies in transition.

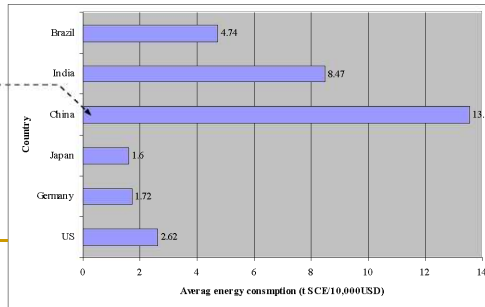
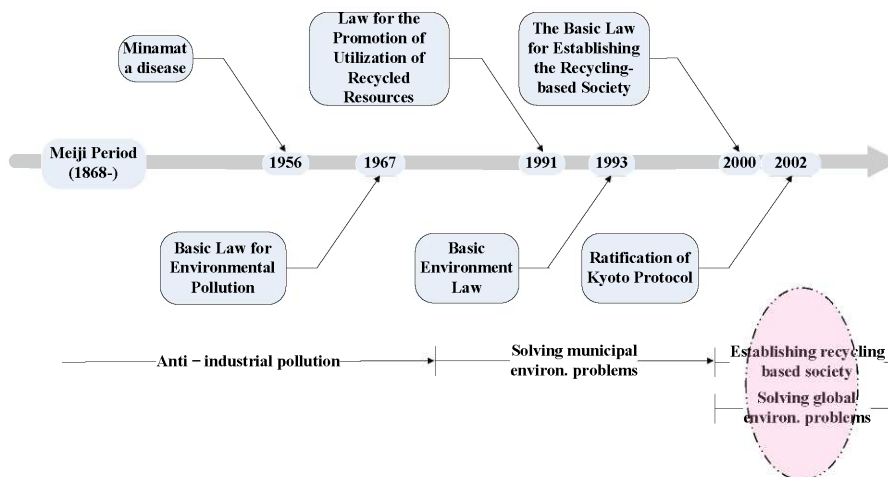
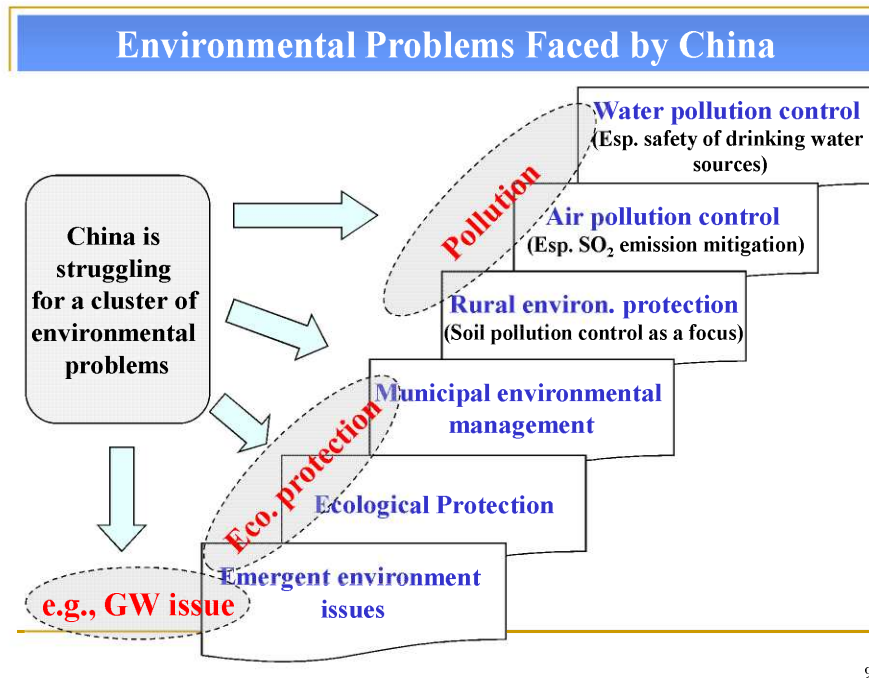


Fig: Energy intensity in China and selected countries.

## Environmental Protection History in Japan





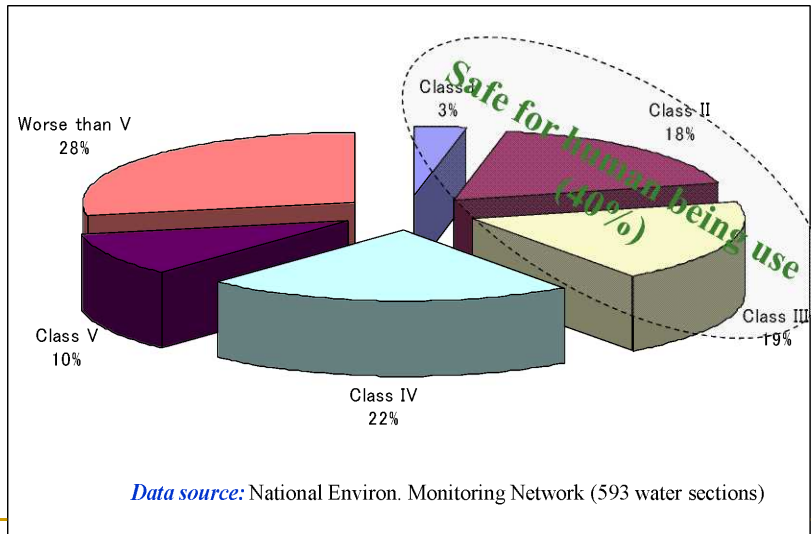
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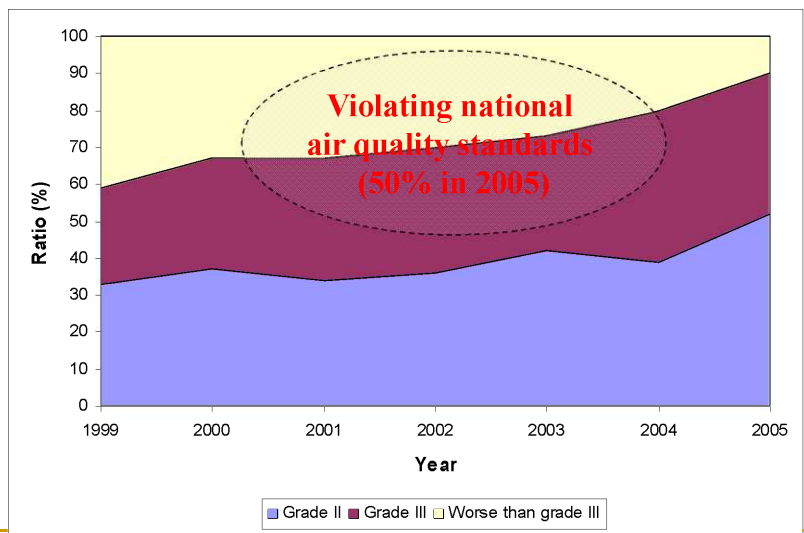
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### Surface Water Quality (in 2006)



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### Air Quality in Urban Areas



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## Example Pictures



A polluted small stream



A small factory without air cleaning facilities



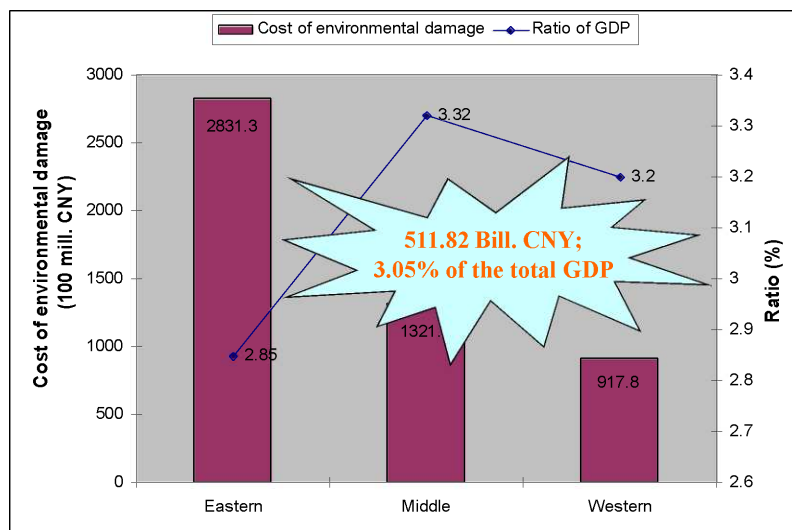
A standard MSW landfill site in BJ



Yellow dust in Spring of BJ a few years ago

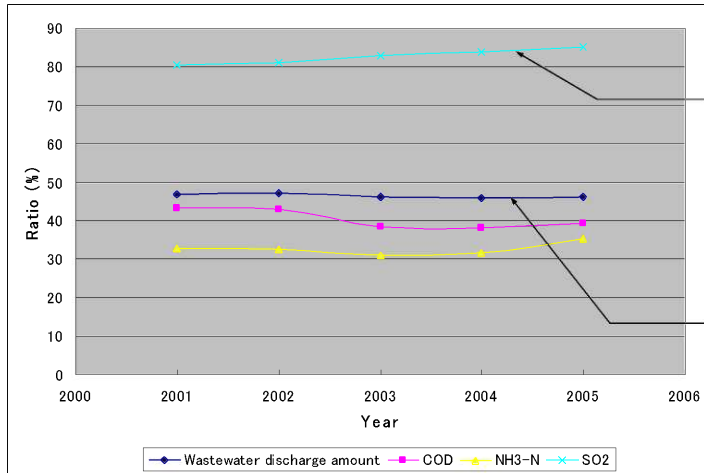
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## Cost of the Environmental Damages (in 2004)



Data source: (CAEP et al., 2006) 14

## Industrial Contributions to the Pollution



**Air pollutants:**

- Over 80% of SO<sub>2</sub>;
- Growing emission trend.

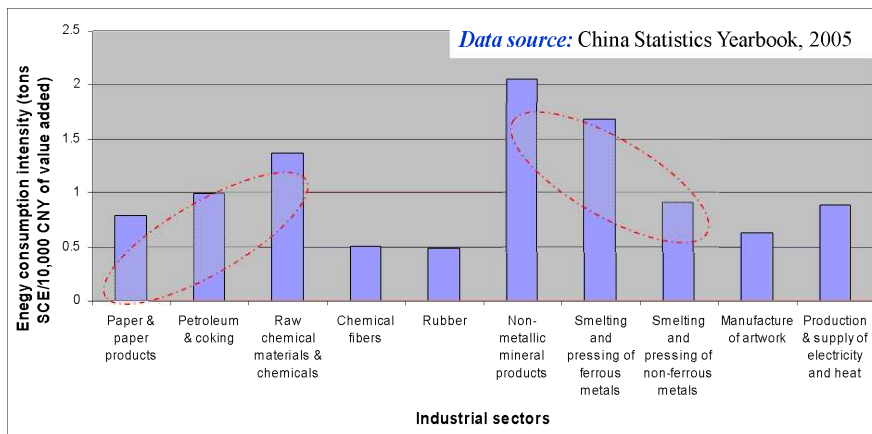
**Water pollutants:**

- Half of the wastewater discharge;
- 40% of COD;
- 30% of NH<sub>3</sub>-N.

*Data source:* National Environ. Statistics Yearbook

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## Major Industrial Sectors for Environ. Burden



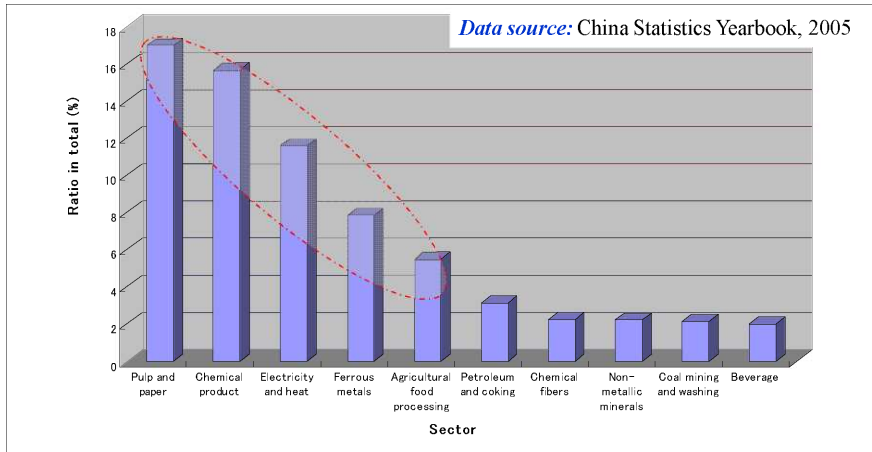
*Data source:* China Statistics Yearbook, 2005

## Energy Consumption Intensities in 2005

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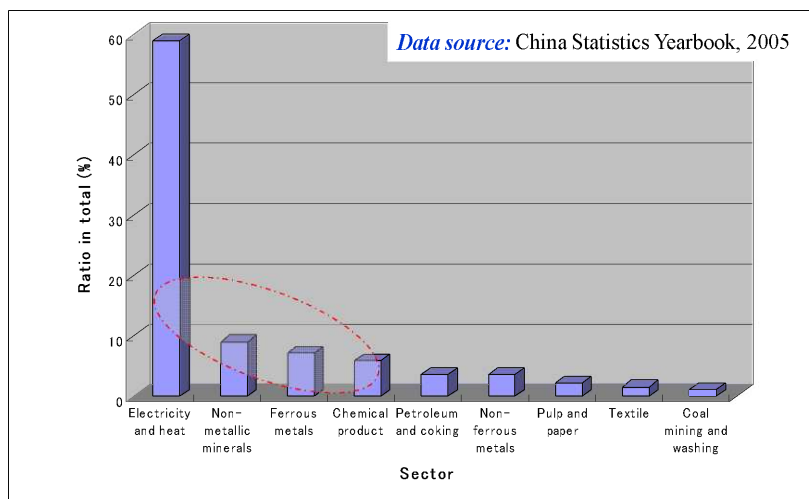
**Major Industrial Sectors for Environ. Burden**



**Ratio of wastewater discharge amount in 2005**

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**Major Industrial Sectors for Environ. Burden**



**Ratio of SO<sub>2</sub> emission in 2005**

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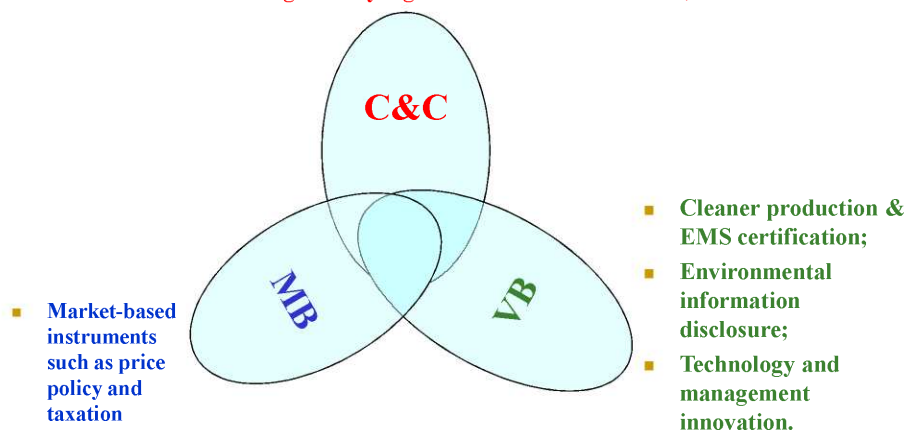
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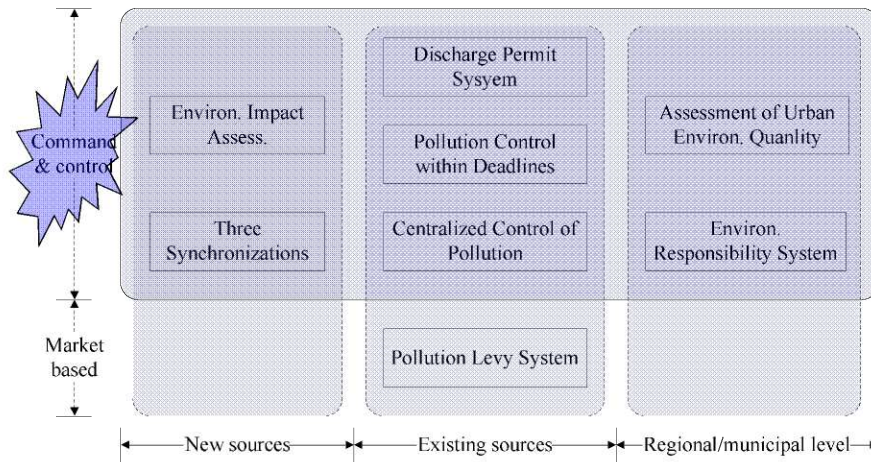
## Optional Measures for the CEM

- **EIA & three synchronizations to regulate the new installations;**
- **Obsolescence of out-of-date production capacities;**
- **Emission mitigation by legislative and standard tools;**



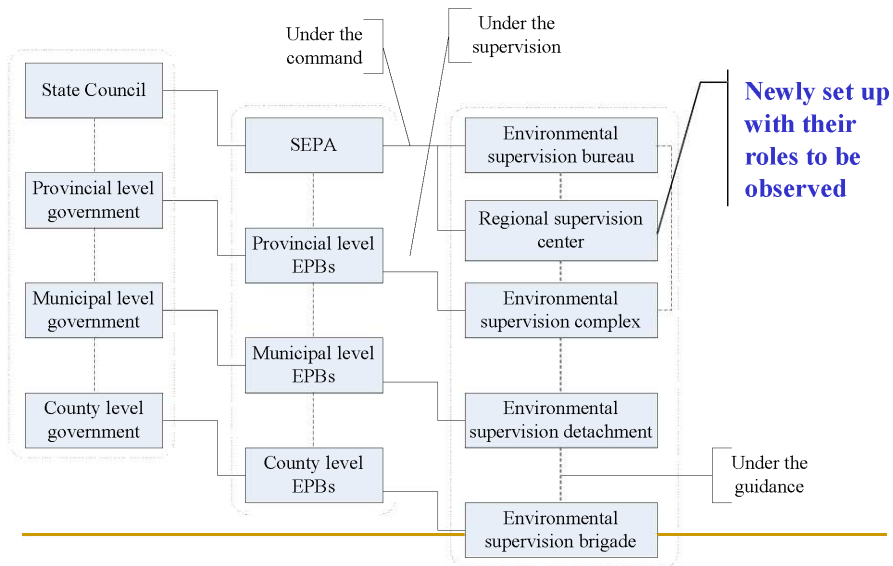
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## Traditional Environ. Management Systems in China



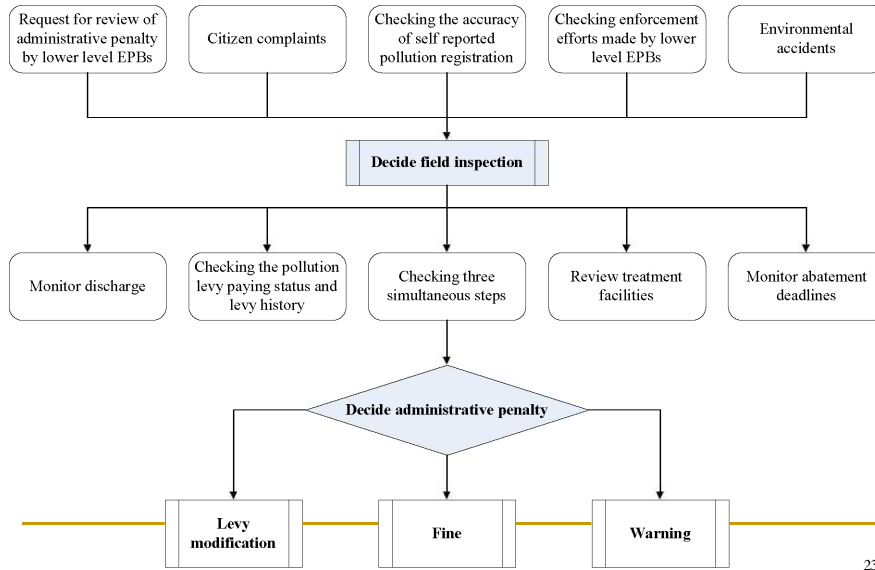
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## Organizational Structure for Enforcement



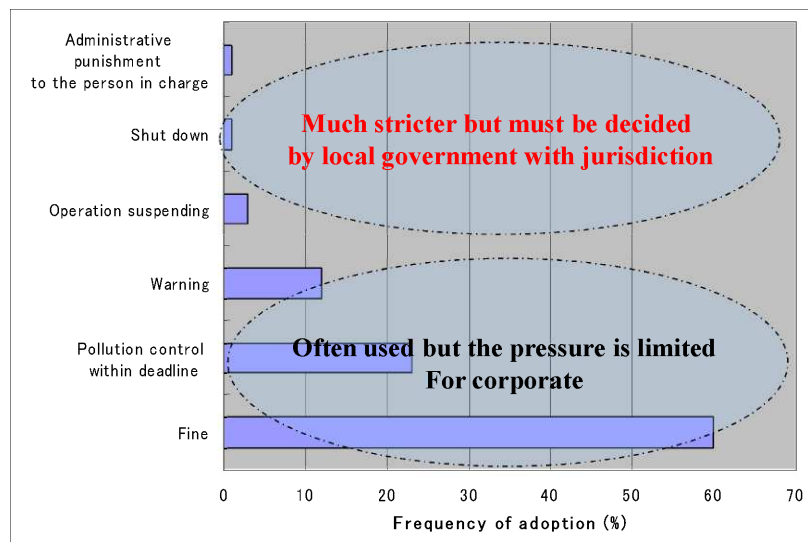
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## Procedures for Field Inspection to Enterprises



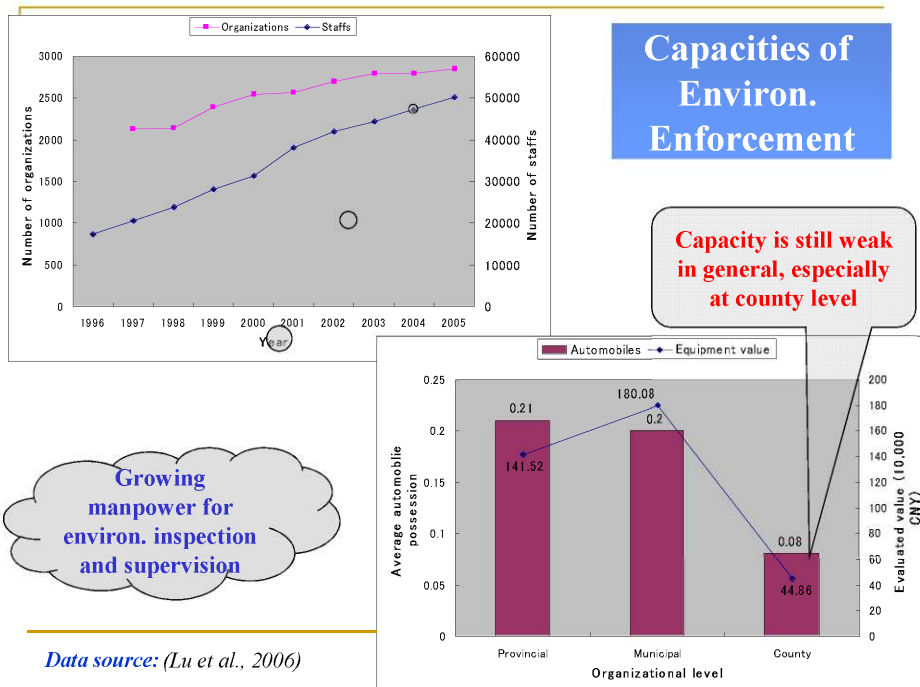
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## Frequency of Adoption of Optional Penalties



Data source: (Lu et al., 2006)

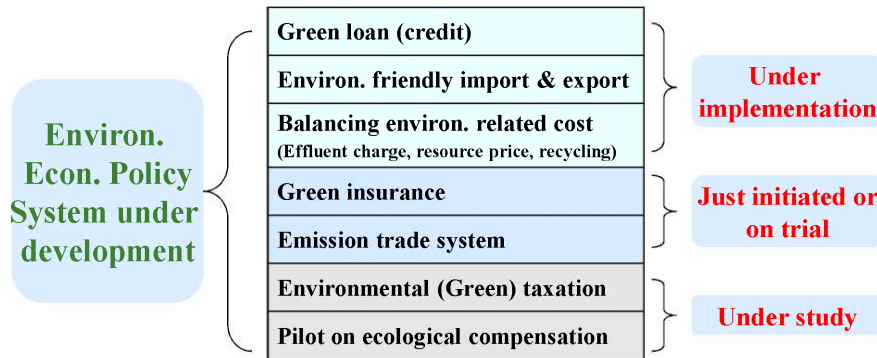
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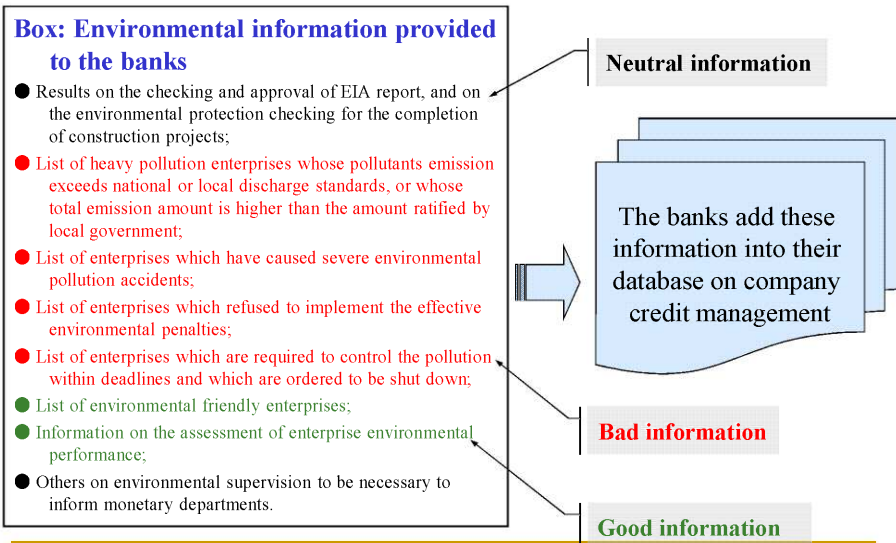
## Systematic Environ. Econ. Policies under developing



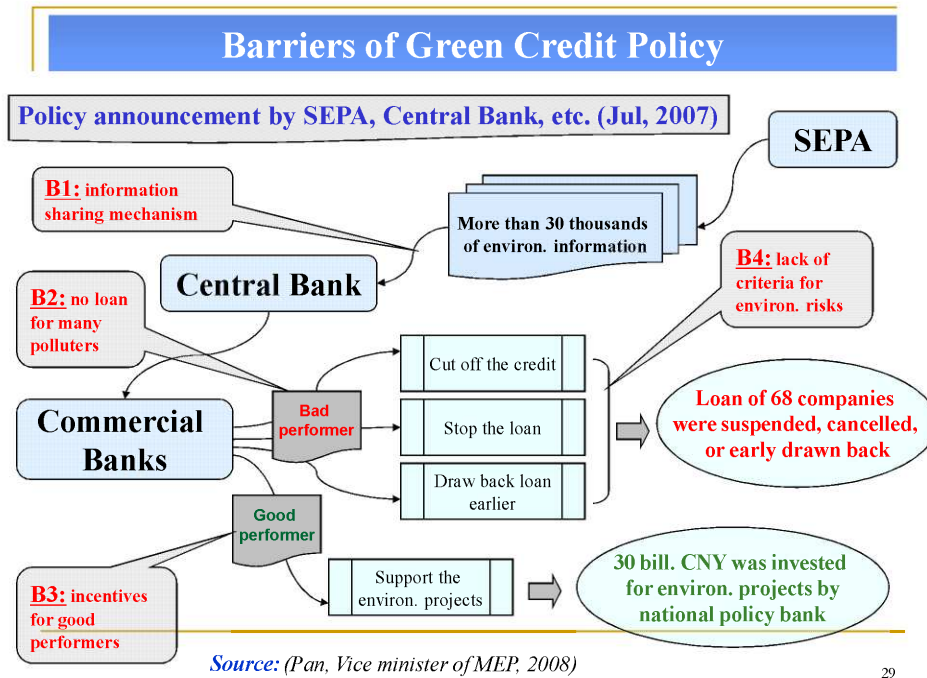
Source: (Pan, Vice minister of MEP, 2007)

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## Green Credit as An Example of Emerging Policies

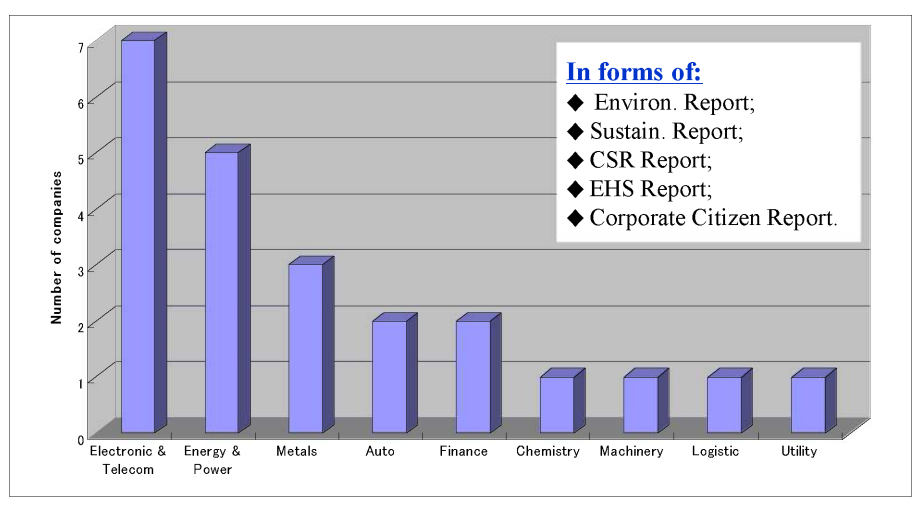


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### EID: Number of Companies with Vol. Environ. Reports



*Data source: <http://www.syntao.com/>, (As of April, 2007)*

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## Reasons of Vol. Environ. Reporting

### In China:

- ◆ Needs for the image promotion of company;
- ◆ Show the attitudes to support government policy;
- ◆ Pressures from consumers, NGOs and communities are minor factors.



### In US and Europe:

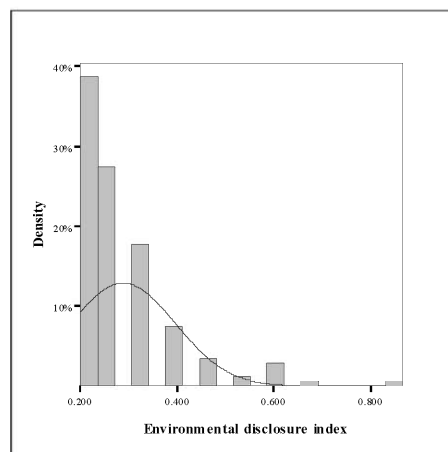
Pressures from consumers, NGOs and communities are major driving forces.

There is no bad news on CEM performances in these reports

Source: <http://www.syntao.com>

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## EID Level and Determinants of Listed Companies



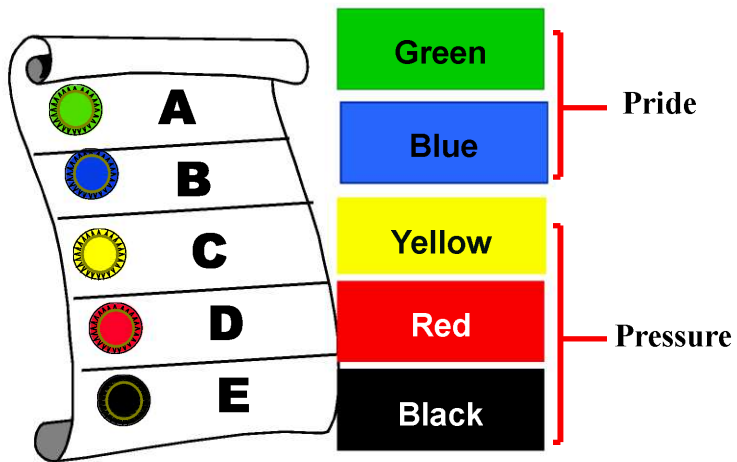
- Nearly 40% of the sampled companies opened no substantial environmental data to the public based on the content analysis;
- Corporate EID effort is significantly relative to its environmental sensitivity and the size;
- Shareholders and creditors tested in effecting the EID, are found to be still weak;
- companies are selectively opening their environmental information;
- The better the company's economic performance is, the more information on environmental investment and pollution control cost is disclosed.

Data source: (Liu et al., 2008), N=175

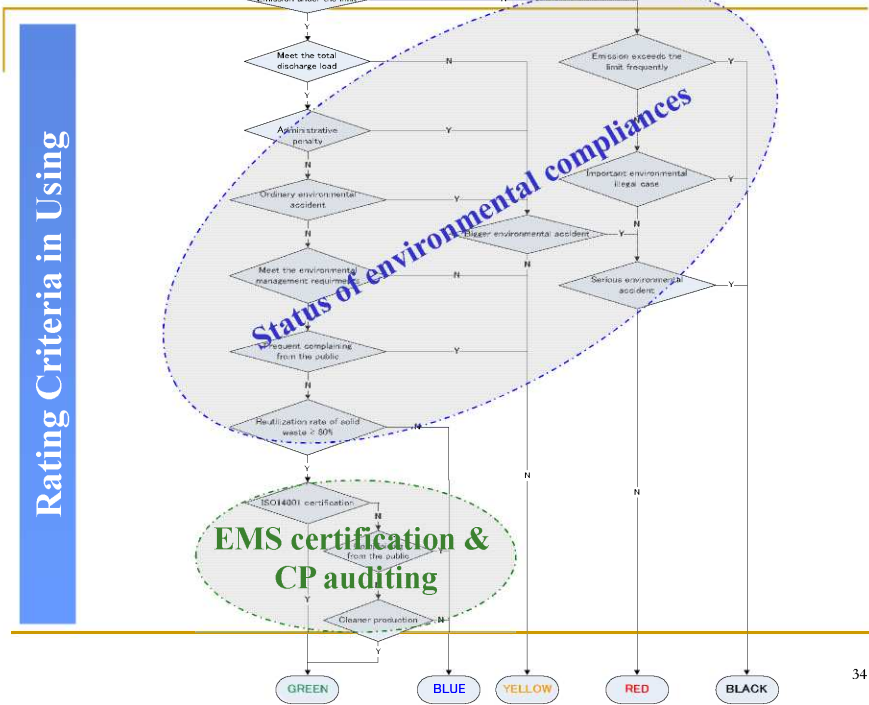
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**Mandatory EID Based on Performance Rating**

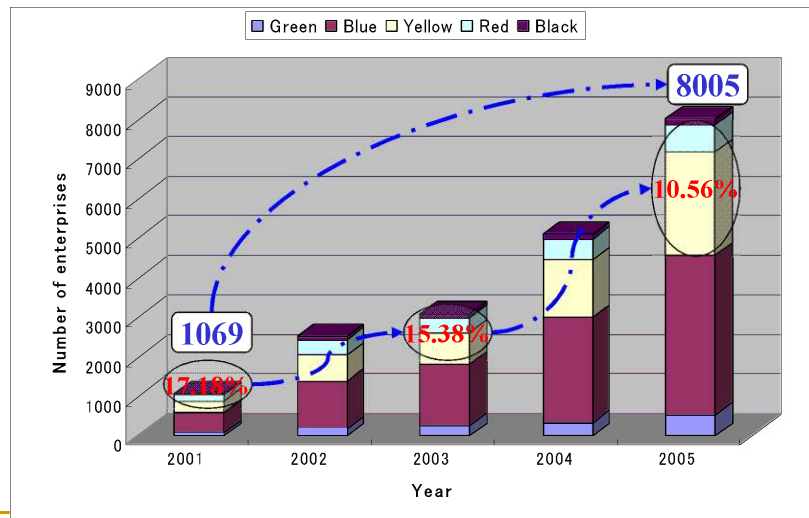


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## Results of CEM Rating Practice in Jiangsu Province



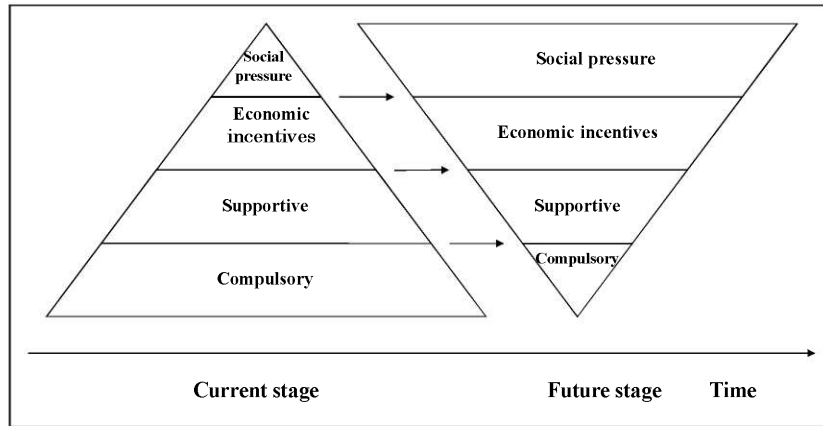
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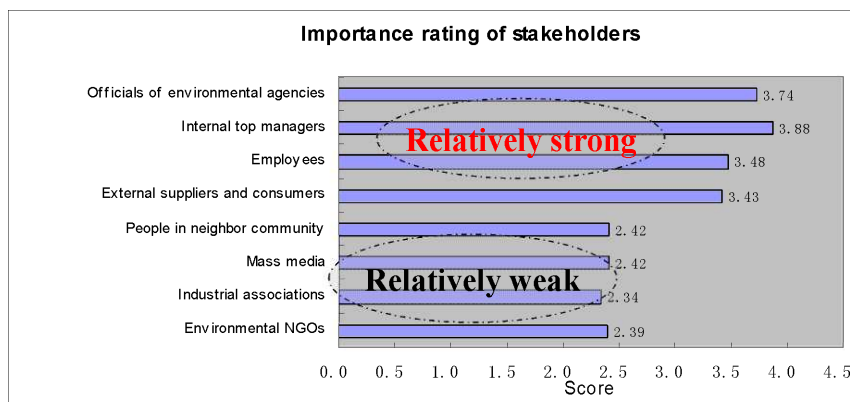
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**Structure Evolution of Integrated CEM Driving Mech.**



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**Stakeholder Power for CEM at Current Stage**



Data source: (Liu et al., 2008), N=132

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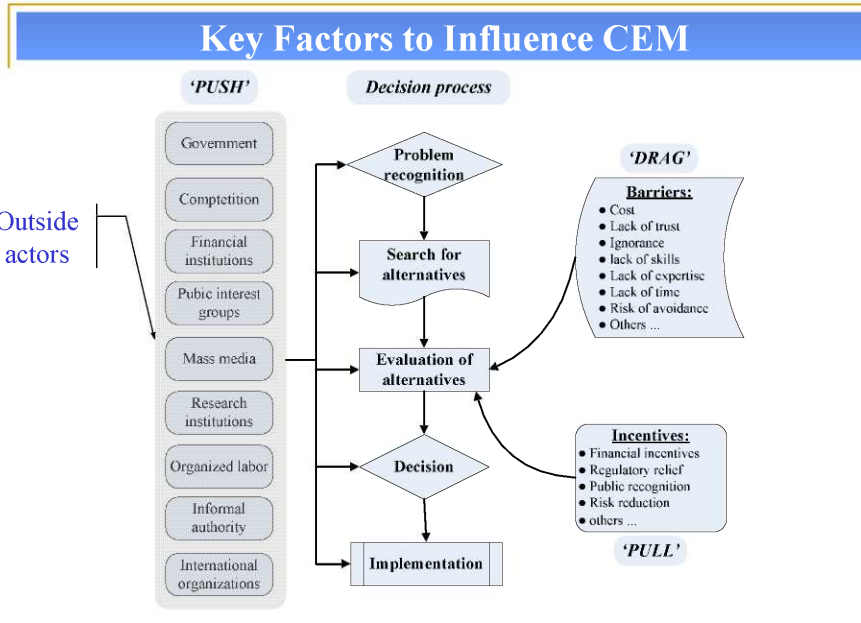


Fig.: Decision making framework at firm level (Adapted from Yap, 1998)

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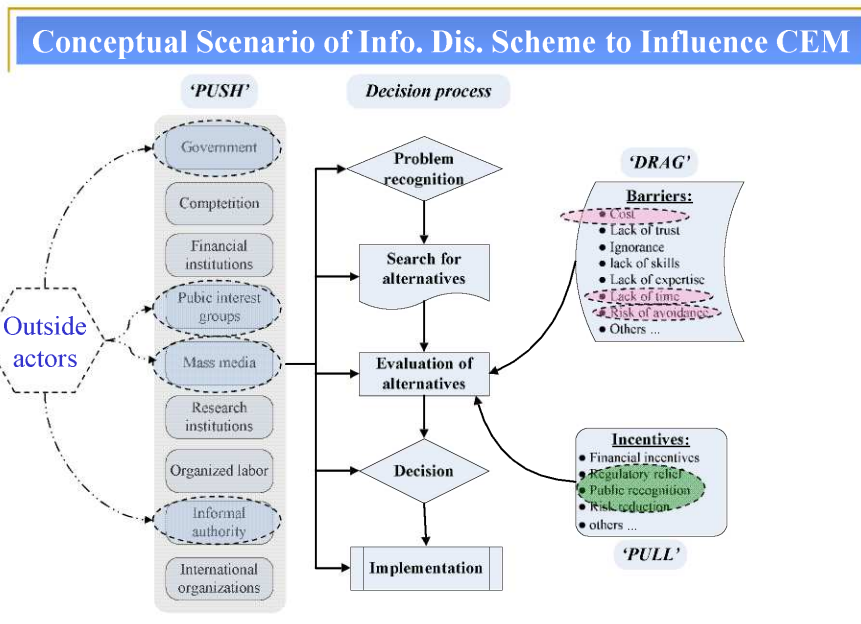


Fig.: Decision making framework at firm level (Adapted from Yap, 1998)

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## Brief Summary

- Fighting against pollution is still the highest priority for China;
- Environmental performance of manufacturing sectors must be largely improved due to their big share in emissions;
- China has practiced different types of policies for CEM, but it is not sufficient to help the change of CEM from being reactive to be proactive;
- Stakeholders of firms should be more active to enhance the effectiveness of CEM tools;
- The concerns from the firm related stakeholders shall also be scrutinized during developing CEM policies.

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*Thank you for your attention!*

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