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Environmental Governance and Economics for Sustainable Low Carbon Society in East Asia

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Outline of Presentation

- Sustainable Development/Low Carbon Society
- Environmental Kuznets Curve
- Japanese experiences
- Regional cooperative approach/
Environmental governance for SD

Sustainable Development

- Most common definition of Sustainable Development: *"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* (*Our Common Future*, 1987)
- Development with ecological/environmental sustainability + economic and social sustainability

Sustainable Development (2)

- Economic Interpretation/definition of SD
- Dasgupta(2001, 2007)---Social Well-being/QOL
- Constituents and Determinants of QOL
- Productive Base · · · Criteria for SD
- Wealth · · · Capital Assets (Man-made Capital, Human Capital, Natural Capital and Knowledge)
- Critical Natural Capital
- Inclusive Wealth and Institutions

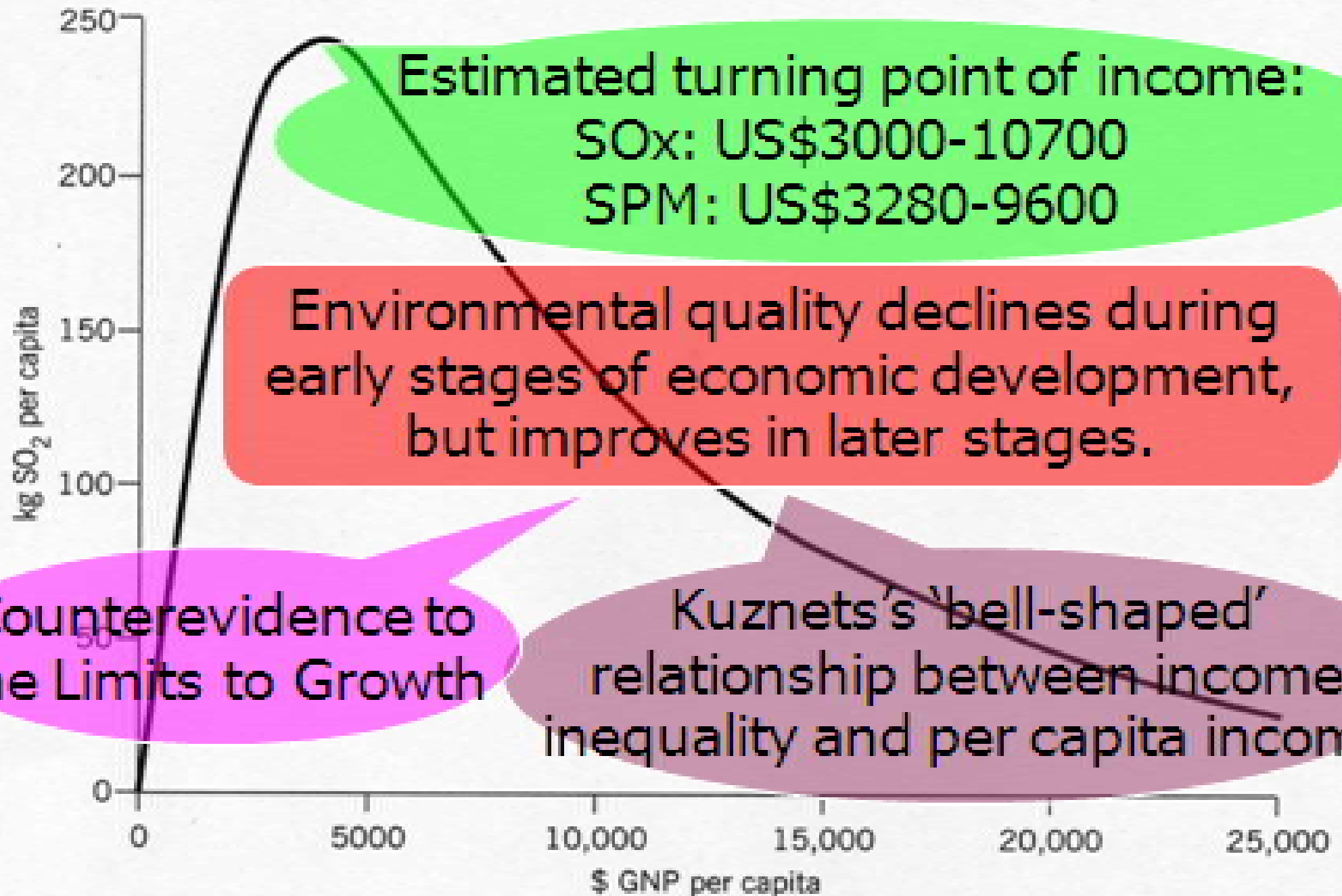
Low Carbon Society

- Low carbon society is necessary to protect climate which is critical natural capital
- Low carbon society can be realized through ambitious reduction target and climate policy in developed country
- Low carbon society is a necessary condition for sustainable development/society, but not enough
- Global (developed countries' and developing countries') low carbon society

Can we overcome the trade-off between environmental conservation and economic development

- Conventional wisdom · · · trade-off
- Internalization of external diseconomy
- Decoupling strategy
- Dematerialization
- Factor4/Factor10, Porter hypothesis
- Environmental fiscal reform/double dividend

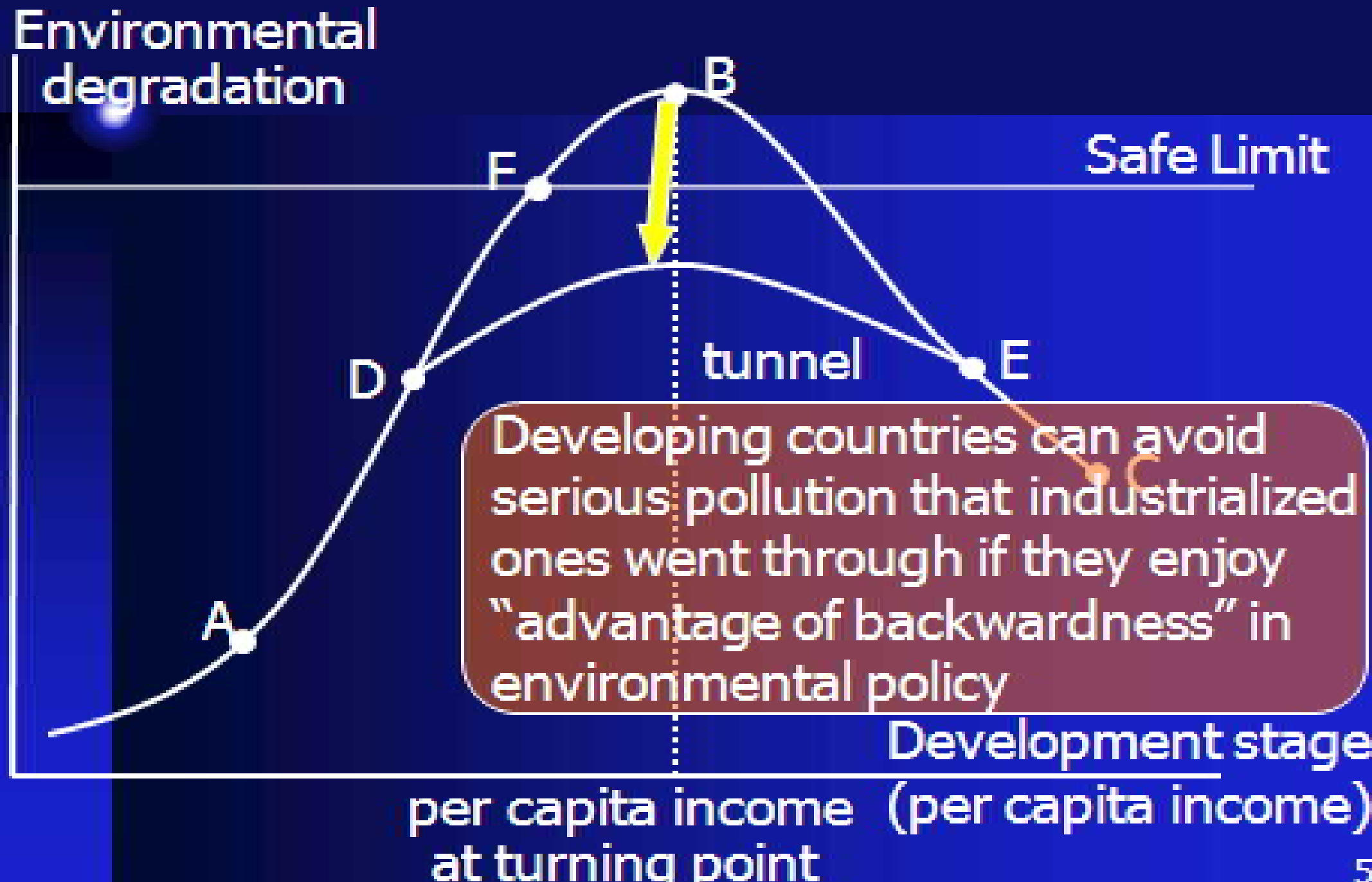
Env. Kuznets curve hypothesis



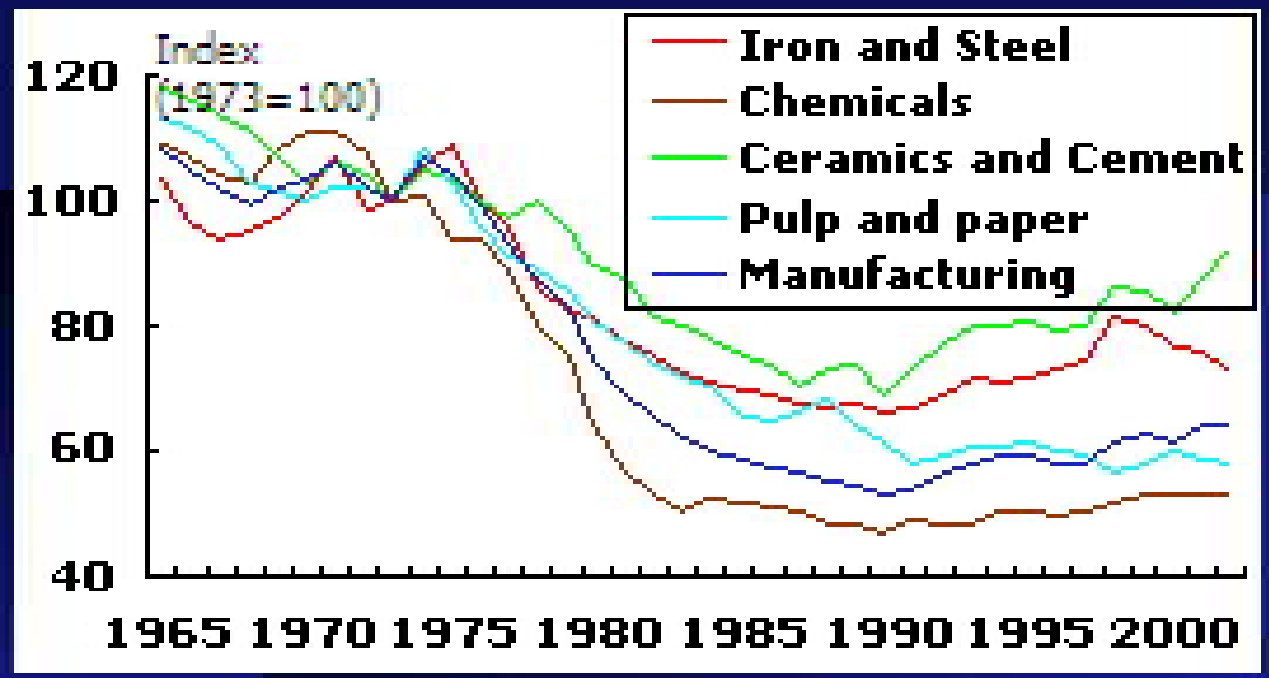
Critiques to the E Kuznets Curve

- Econometric method to the EKC
- Range of environmental pollution and pollutants that EKC can explain
- Explanatory power of the factors environmental movement
N-shaped curve
- Earth's resource base vs. indefinite economic growth(Arrow et al., 1995)

Munashinge's Curve on "Tunnel Cut"



Delink of Econ. Growth and Env

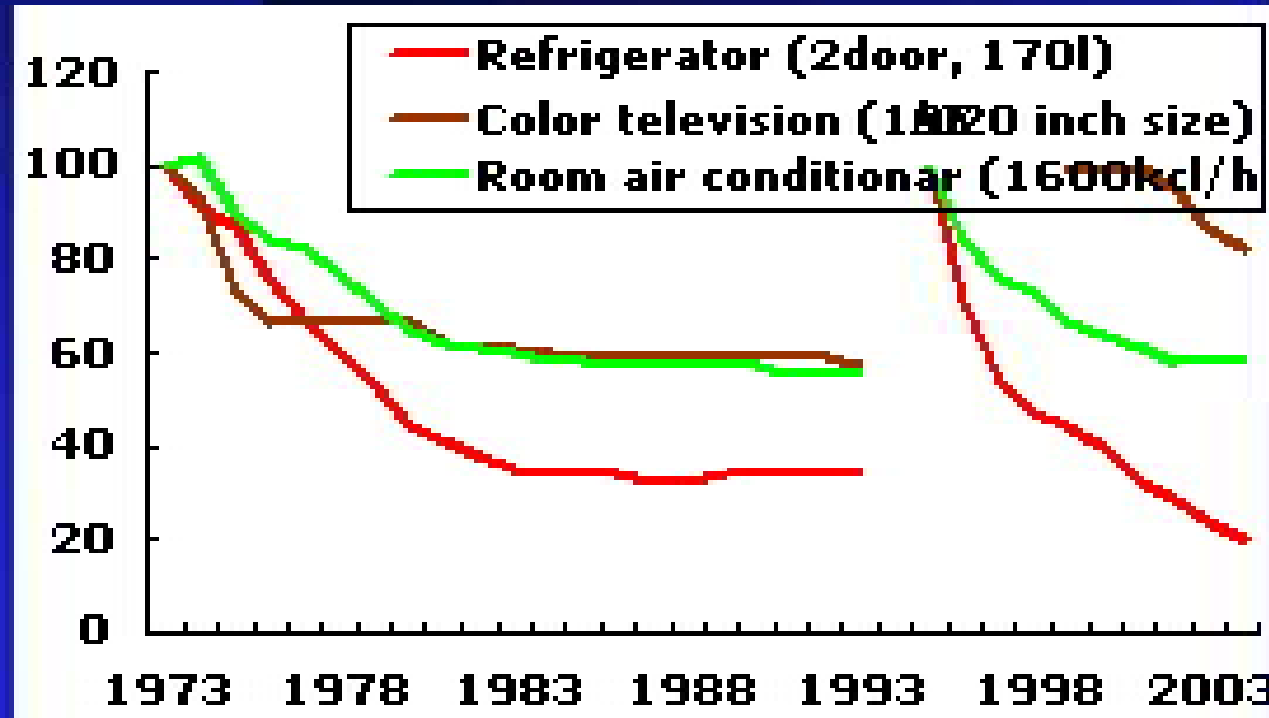


* GDP in Japan grows to double during 1973-96

- Resource productivity (Energy productivity) became double



Technological progress induced by rise in energy price **and environmental regulation**

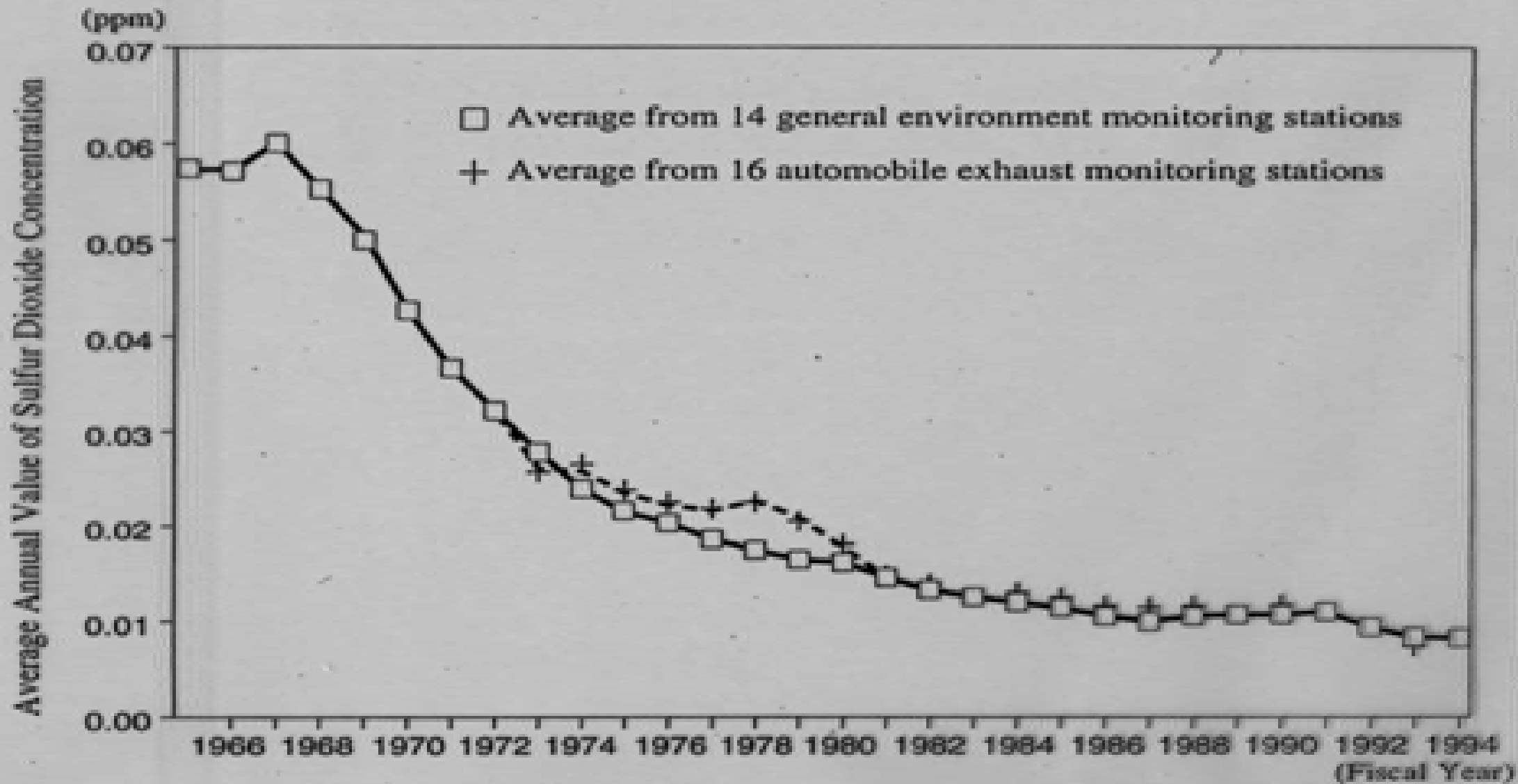


The above indicates energy efficiency in industrial sector, and the lower shows energy efficiency of electronic appliances in Japan.

A Brief History on Kogai

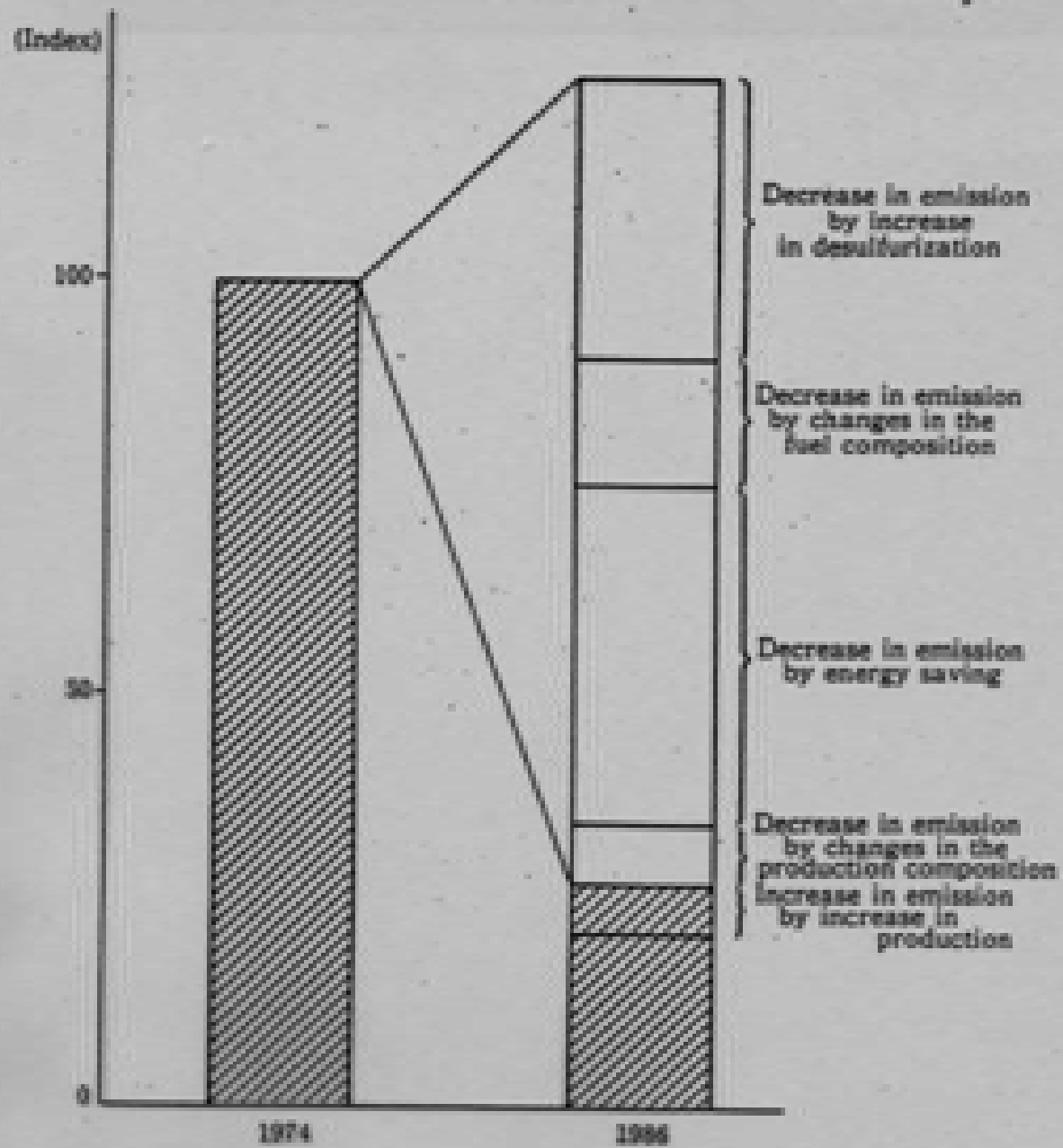
- Minamata mercury poisoning/disease(1956)
- Irreversibility/Anti-pollution movement
- Kogai litigation/court case
- Local initiative
 - pollution control agreement(1964)
 - environmental ordinance(1968)
- Pollution Diet(1970), Environmental Agency(1971)
- Victims of pollution-related health damage

**Figure 2-2 Changes in Average Annual Sulfur Dioxide Values
(average of data from continuously-monitoring stations)**



Source: *Quality of the Environment in Japan (1996)*

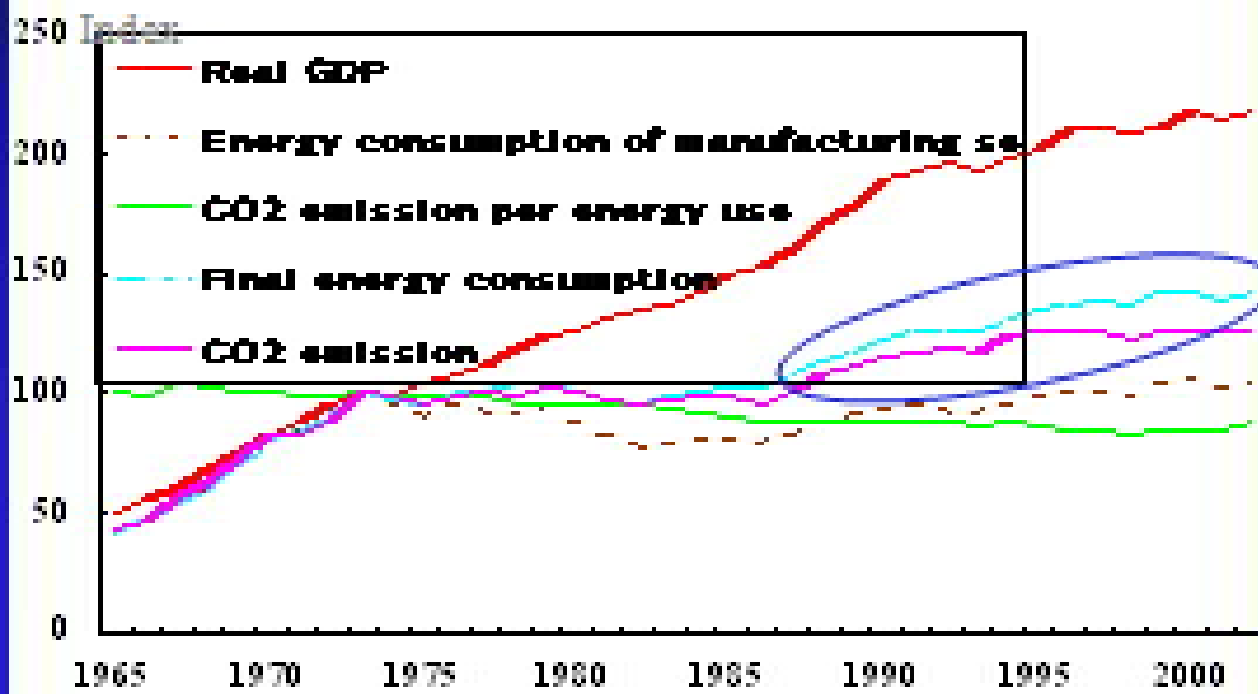
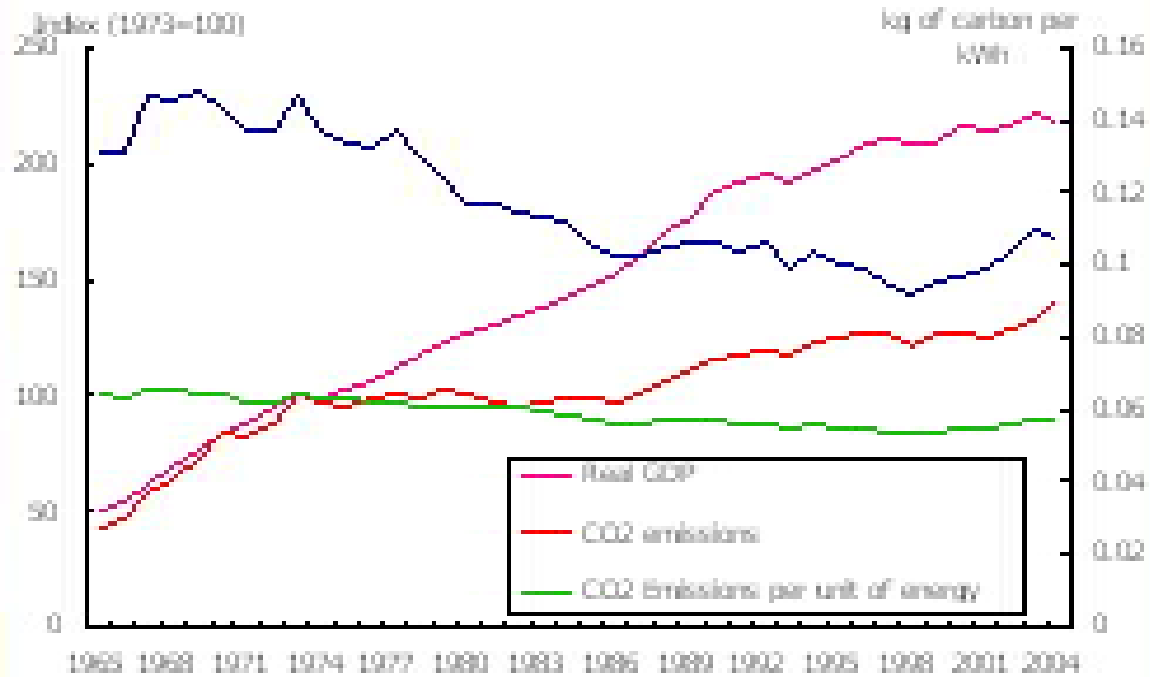
Figure 4 Analysis of Emission of Sulphur Oxides and Causes of Their Changes



Note: For the index, the emission of 1974 is set at 100.

Source: Environment Agency 1992: 75

Relinkage of GDP and CO₂ Emission



* Power generation companies have devoted efforts to raise efficiency to reduce CO₂ emission per unit

* **Relink** the GDP and CO₂ emission after the year 1987 in Japan

The above shows per unit and total CO₂ emission in power sector in Japan and the lower shows the relationship between GDP and CO₂ emission in Japan

Lessons and Implications

- Irreversibility/Paradigm shift---Pollution Diet(1970)
- Local initiative/court/movement . . .
- Comprehensive environmental policy . . . clear signal for market, organization and individuals
- Stringent target + regulation(ppp) + integrated policy (environmental and industrial policy)
- Environmental regulation, pricing (policy) and technological innovation
- Capacity development---learning capacity/ creativity of people and organization + institutions

Seriousness and Features of Env. Disruption in East Asia

- Rapid industrialization and high economic growth(catch-up style of economic development)
- Pre-welfare state · · · public health issue
- Local, regional, and global env. issues
- Region as victim/polluter
- Economic and ecological interdependence

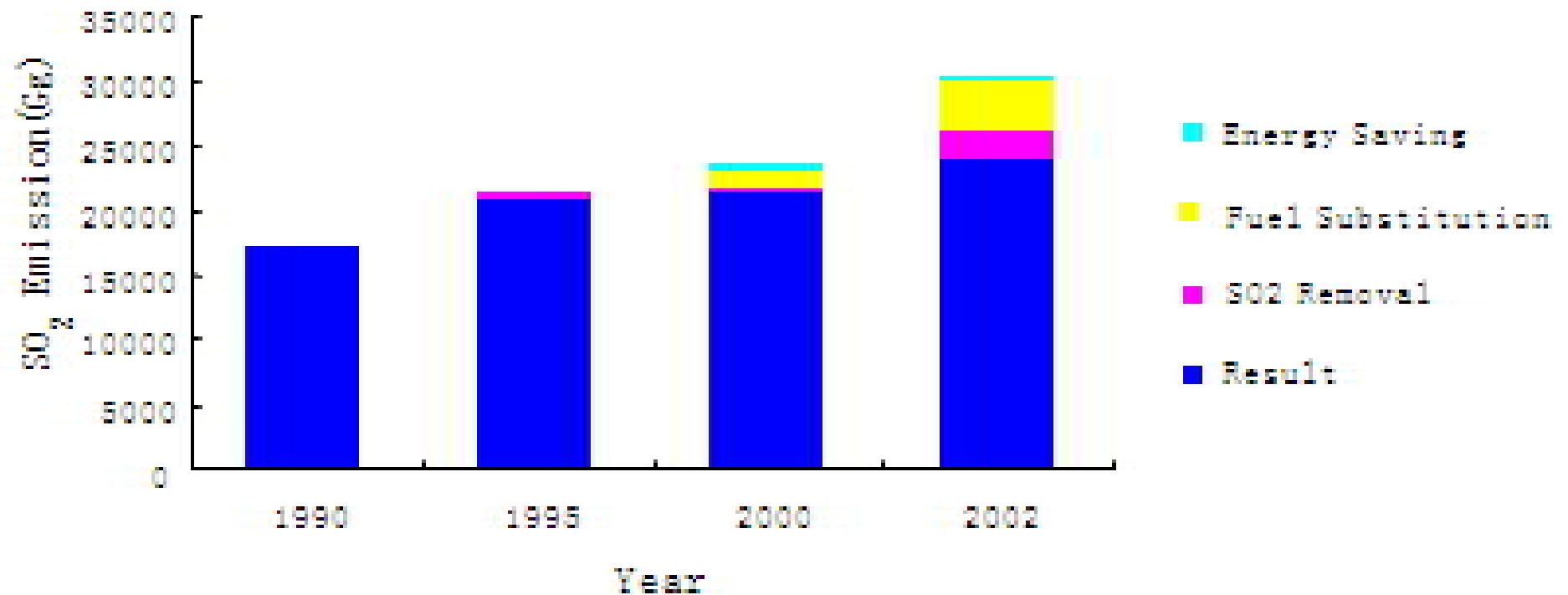
表 1 - 31 環境悪化による被害の経済評価 (実質額)

番 号	①	②	③	④	⑤	⑥	⑦
研究者名称	過・張 (1990)	社会科学 院(1998)	孫炳彦 (1997)	East-West Center (Smil, V., 1996)	世界銀行 (1997)	徐嵩齡 (1998)	夏光 (1998)
研究対象年	1983	1993	1992	1990	1995	1993	1992
実質被害合計 (億元, 1983年価格)	879.2	1,585.7	578.5	801.5(± 225)	1,498.4	1,545.9	520.3
環境汚染	381.6	499.4	578.5	217.2(±41.9)	1,498.4	443.6	520.3
大気汚染	124.0	211.5	319.3	91.7(±24.9)	1,388.5	179.9	305.4
健康損害	37.6	35.9	137.3	31.3(± 8.2)	1,202.1	63.5	106.4
死亡	(?)	[17.4]	(?)	[21.7]	397.1	19.8	(?)
酸性雨汚染	46.1	132.8	94.4	25.8(± 8.8)	141.1	73.6	73.9
水質汚染	251.8	150.1	252.0	72.3(±16.4)	109.9	139.0	187.8
健康損害	83.2	75.9	124.5	36.4(±11.5)	55.6	77.8	101.3
死亡	(?)	(?)	(?)	9.7(± 0.6)	(?)	39.5	(?)
固体廃棄物汚染等	5.7	137.8	7.2	53.2(± 0.6)	—	124.7	27.0
生態破壊	497.6	1,086.3	—	584.4(±183)	—	1,102.2	—
参考：GNP 物価指数 (1983年=100)	100.0	217.3	189.5	164.6	293.3	217.3	189.5

(注) 実質額は名目額と GNP 物価指数との比で算出。名目額は表 1-29に同じ, GNP 物価指数は『中国統計年鑑』1995, 96年版より算出。ほかは表 1-29に同じ。

実際のSO2排出量と環境対策の効果

Effect of different measure



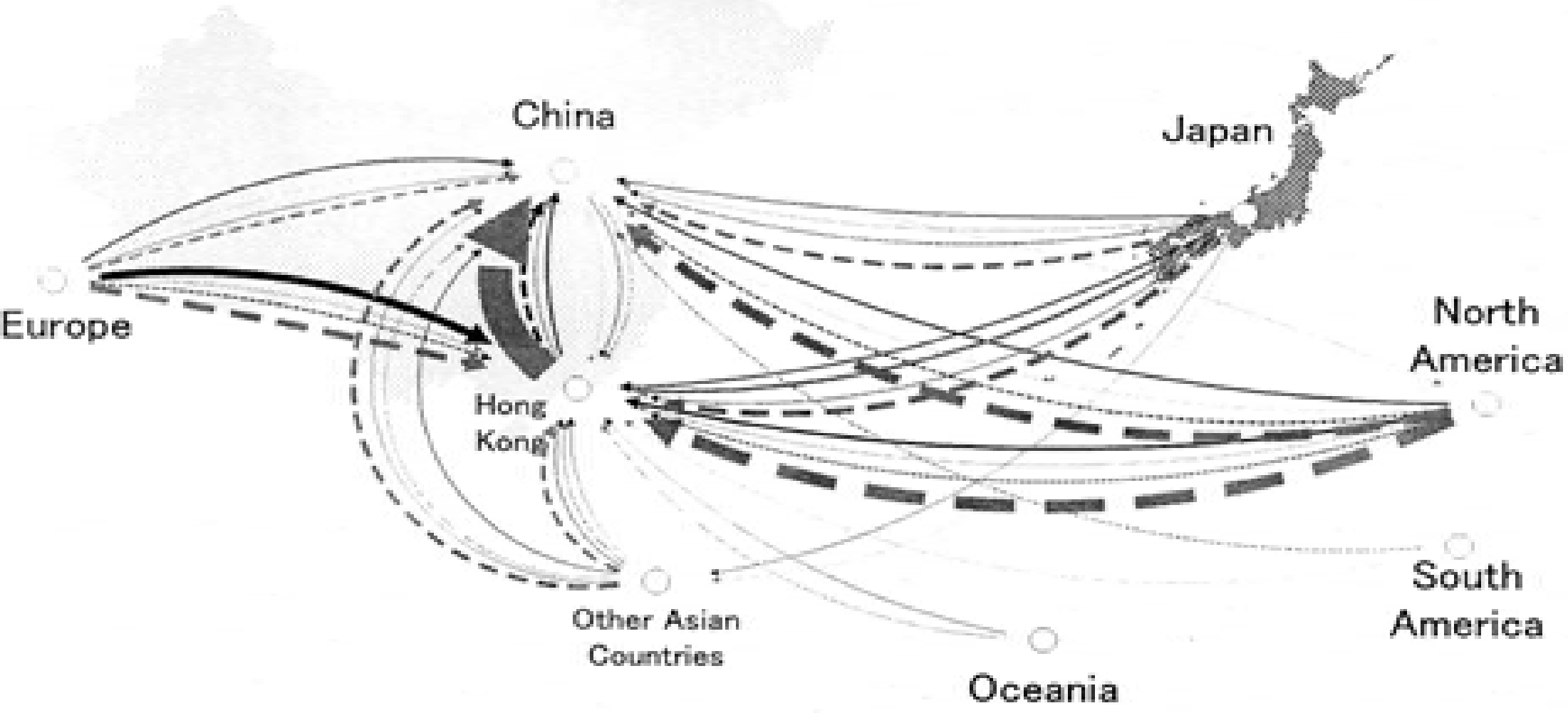
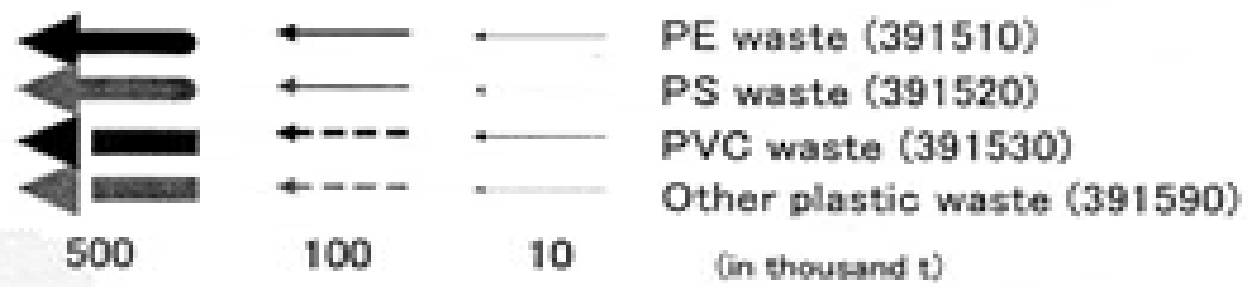
Causes of pollution in China

- Energy (coal)/Industrial structure(heavy)
- Enforcement capacity of environmental policy
- Lack of environmental infrastructure
- Economic system(catch-up and transition) · · ·
domestic and global
- Government/Judicial/Political system
- Societal environmental consciousness · · ·
education/learning capacity

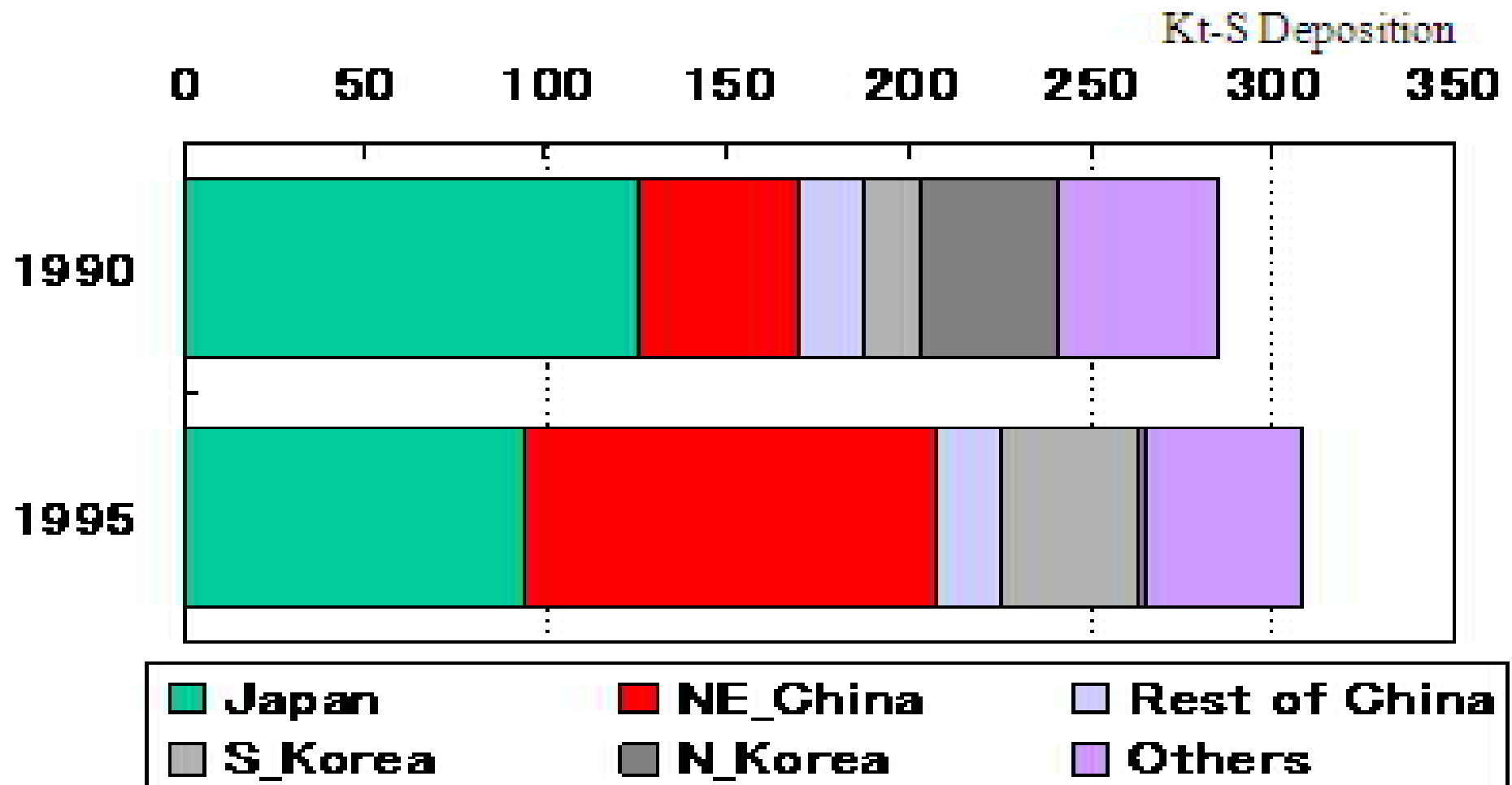
Environmental Governance in East Asia

- A comparison of environmental governance between current China and Japan in late 1960s/1970s
- Top-down environmental policy----advantages and disadvantages
- Environmental policy in the relationship of central government and local government
- Behavior of local government

Material Flow of Waste Plastics, 2002

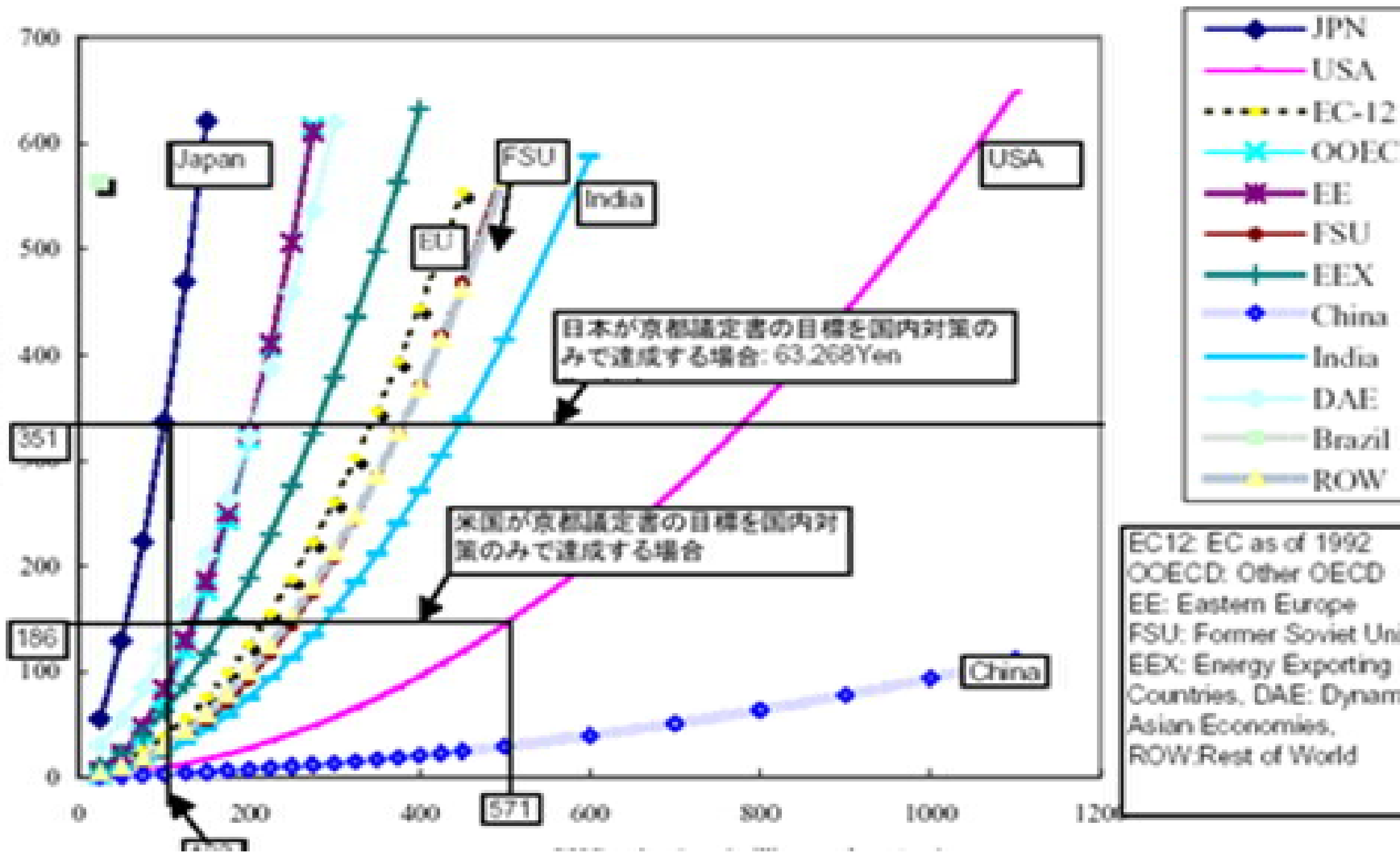


Sulfur Deposition in Japan Contributed by Source in 1990 and 1995

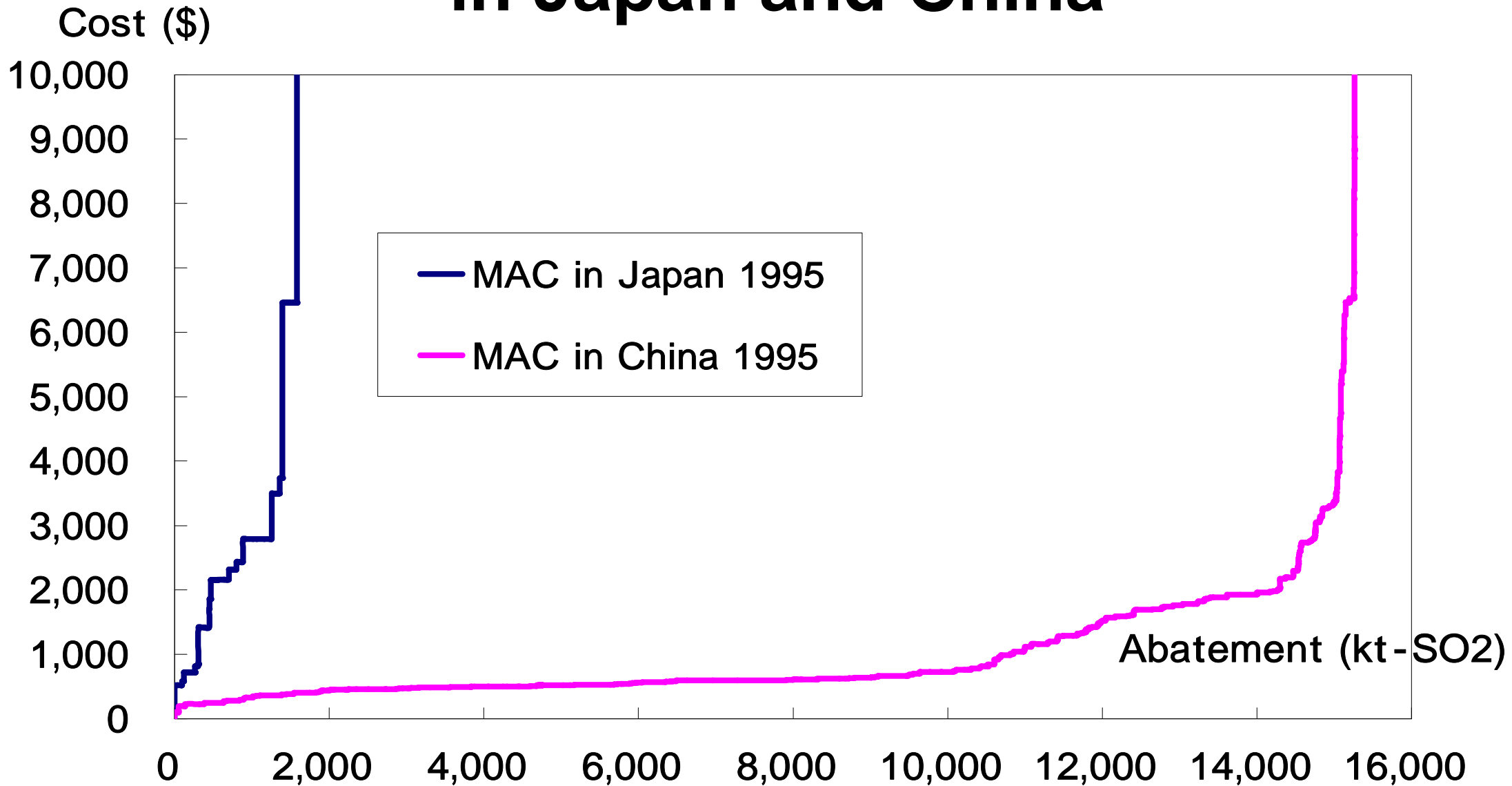


Nakata and Ueta (2007) "Sulfur Emissions Control in China," Energy and Environment.

MAC of CO2 in China, Japan, etc.

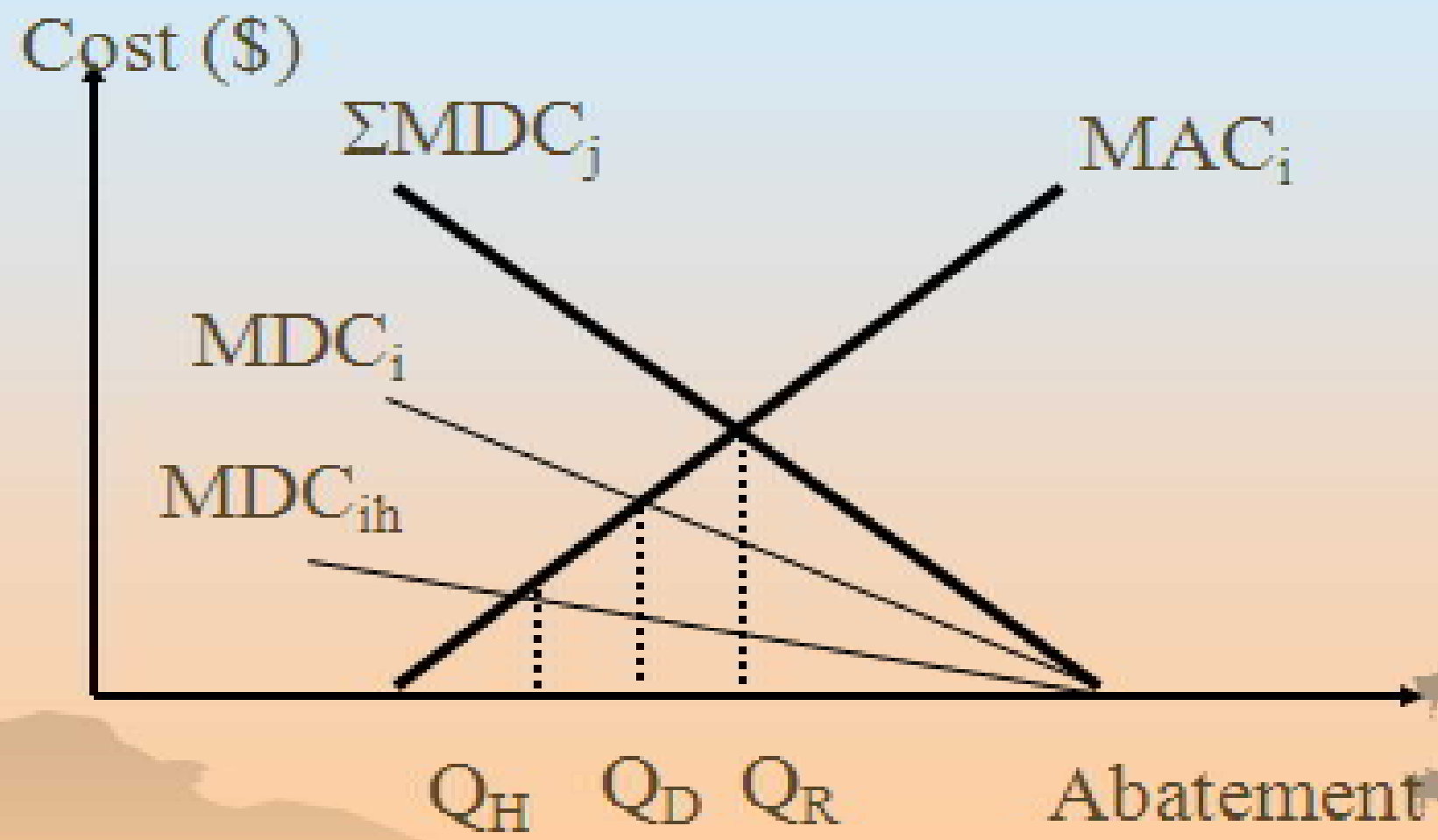


Marginal Abatement Cost Curves in Japan and China



Nakata and Ueta (2003) "Sulfur Emissions Control in China," mimeo.

Regional Optimum / Domestic Optima



Nakata and Ueta (2003) "Sulfur Emissions Control in China," mimeo.

Regional Cooperative Approach

- Ecological interdependence with economic · ·
- MAC of CO₂/SO₂ in China and Japan
- Local pollution and environmental/health damage in China
- Domestic and regional optima
- Co-benefits (Ancillary benefits)
- Clean Development Mechanism

Conclusion(1)

- Institutions/governance for sustainable development
- Institutions for creating knowledge, innovation /diffusion/transfer system(IPR)of technology
- Global democracy/equity/fair market
- Crucial role of central government

Conclusion(2)

- Network/communication of local initiative
- Multi-level environmental governance for sustainable development
- Regional economic/environmental community---collaboration for common base of scientific knowledge---Regional IPCC
- Contribution of intellectual network

- Source

- Slide 7, 9, 10, 14 :Ueta and Mori (2007)
- Slide 18 :Yamamoto (2008)
- Slide 21 :Yoshida (2005)