



Environmental Tax- A Potential Policy Tool on VOC Control in China

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Structure of the Presentation



1. Background and Introduction

2. Current Practices of VOC control in China

3. Comparative Analysis

4. Framework Design of Environmental tax on VOC Control

5. Conclusion



1. Background and Introduction

1.1 Environmental and Social Problems that China is facing



Climate Change



Water Pollution



Desertification



**Health Impact of
Pollution**



Food Security



**Resource
Scarcity**

Beijing



Shanghai



Guangzhou



Nanjing



Air
Pollution
PM_{2.5}
VOC, NO_x

Chongqing



Tianjin



Xi'an



Hangzhou



Impacts of Air Pollution



Acid Rain



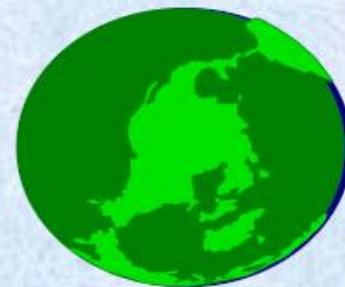
Visibility and Ecosystem



Water Quality Eutrophication



Human Health



Climate Change

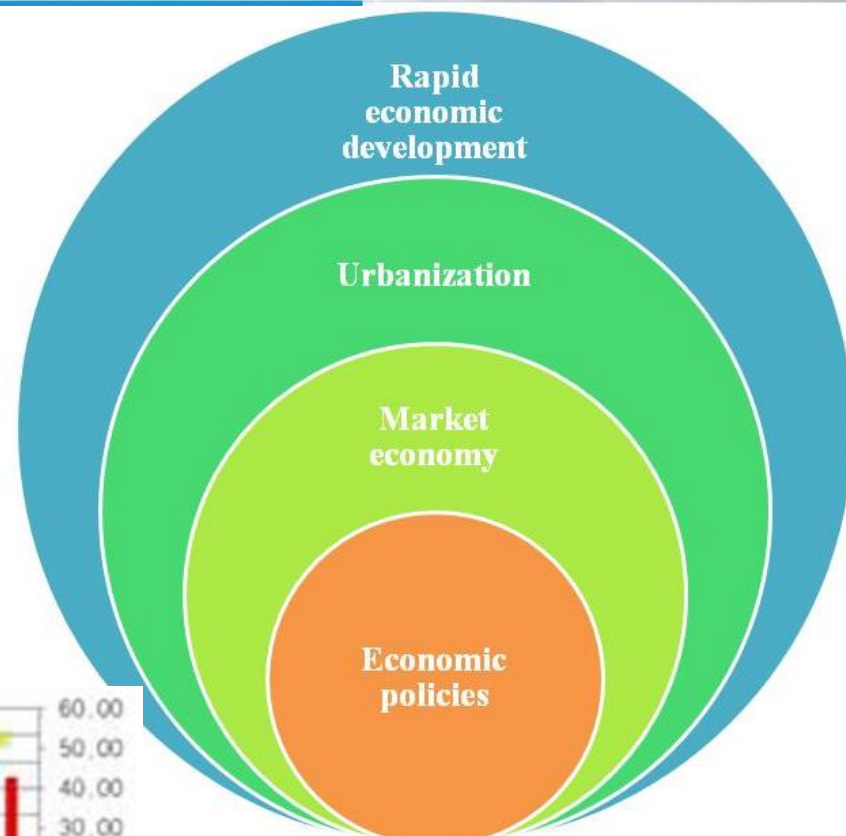


Stratospheric Ozone Depletion

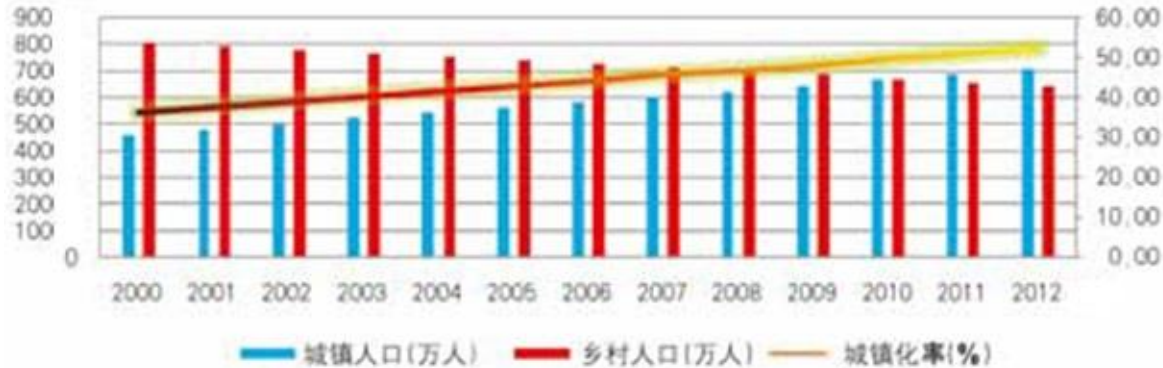


Air Toxics

GDP Growth Rate of China compared with the World average



(million)



Source: China Urban Statistic Yearbook, 2013

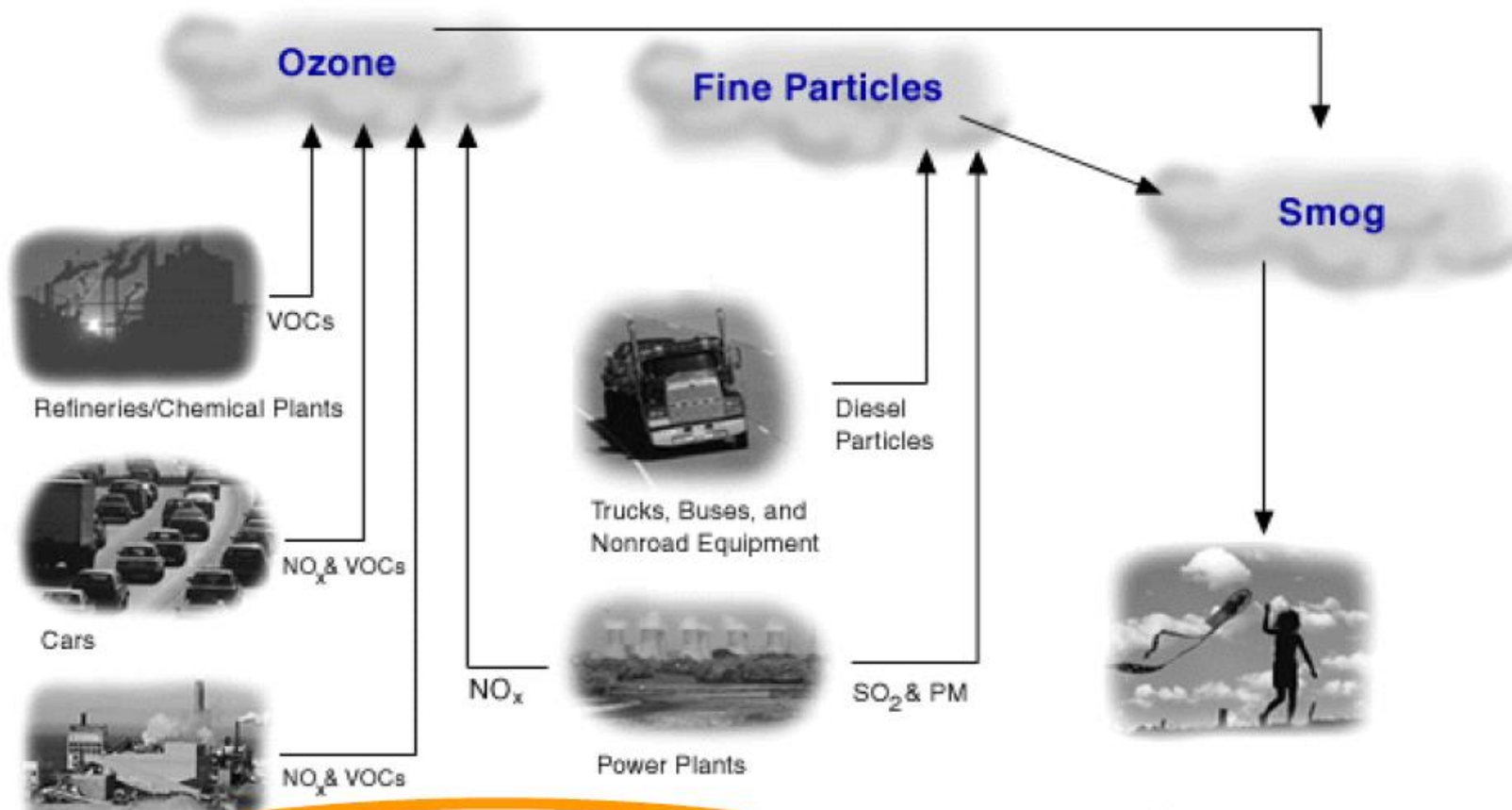
Urban & Rural Population and Urbanization Rate in China



2. Current Practices of VOC Control in China

VOC

Any organic compound (excluding methane), boiling point less than or equal to 250° C (482 ° F) could be emitted as gaseous molecule into the atmosphere



VOCs = volatile organic compound gases

PM = particulate matter

NO_x = nitrogen oxide

SO₂ = sulfur dioxide

Secondary Pollutants

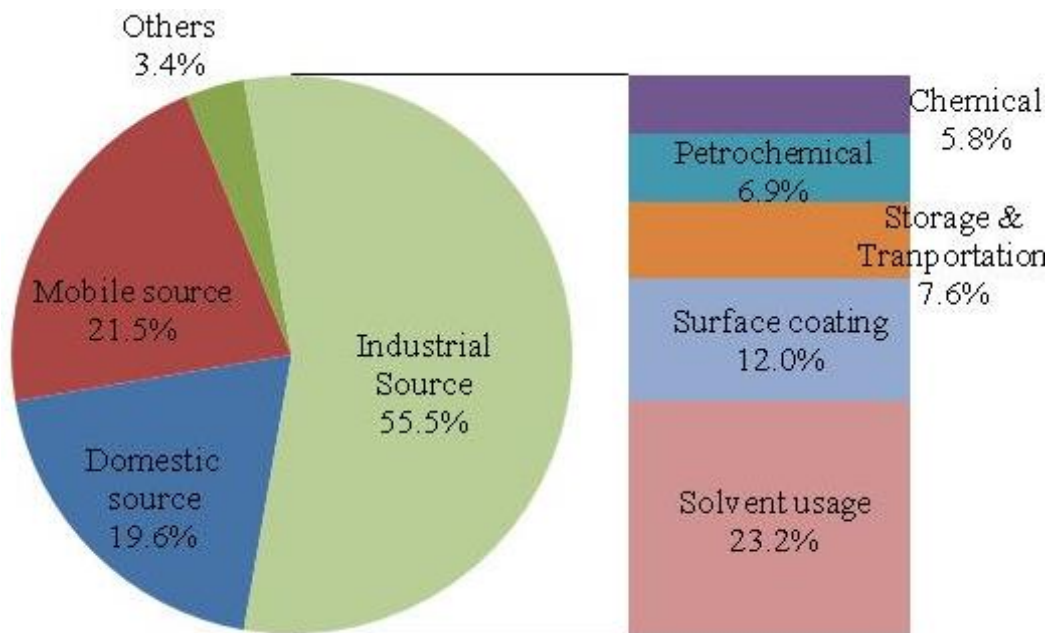
2.1 VOC Pollution Situation in China

Category [↕]		Emission Source [↕]		
Natural Source [↕]		Vegetation emission, forest fire, wildlife emission, wetland anaerobic process etc. [↕]		
Anthropogenic Source [↕]	Stationary Source [↕]	Industrial Source [↕]	Production of products containing VOCs [↕]	Solvents refining or organic compound production industries, such as oil refining and petrochemical, organic chemical [↕]
			Storage, transport and sales of products containing VOCs [↕]	Storage, transport, distribution and sales of fuel, gas, and organic solvents [↕]
			Production of VOCs contained products as raw material [↕]	Painting, synthetic material, food and beverage, adhesives, commodity, agricultural chemical, and tire production industries [↕]
			Use of products containing VOCs [↕]	Coating of equipment manufacturing, semiconductor and electronic components manufacturing, packaging and painting, pharmaceutical chemical, plastic and rubber manufacturing, artificial leather, artificial board production, paper, textile, steel making industry etc. [↕]
	Domestic Source [↕]	Architectural decoration, oil smoke, trash burning, straw burning, clothing dry cleaning etc. [↕]		
Mobile Source [↕]		Transportation such as mobile vehicles and ships, and off-road vehicle emission [↕]		

Classification of China VOC Emission Sources

Breakdown of Man-made VOC Emission in China

- no official VOC emission data released in China yet;
- man-made VOC emission: 22-26 million tons per year from 2006-2010;
- major source: solvent usage, mobile source, and domestic source



(2009 estimated)

2.2 VOC Control Policies in China

2.2.1 Regulations(1)

Guidance on Promoting the Joint Air Pollution Prevention and Control to Improve the Regional Air Quality:

- Firstly lists the VOCs as one of the key air pollutants, together with SO₂, NO_x and particles;
- signals that China will put VOC pollution control on the agenda.

Air Pollution Prevention and Control Action Plan: “Ten Measures on Air” :

- 2017 v.s 2012, PM_{2.5} of Beijing-Tianjin-Hebei, Yangtze River Delta and Pearl River Delta region reduced by 25%, 20% and 15%;
- the strictest plan on air pollution control;
- clear emission reduction targets accompanied by punishment for officials who fail to meet the targets.

2.2 VOC Control Policies in China

2.2.1 Regulations(2)

➤ detailed provisions on VOC comprehensive control:

- Technology retrofit of ‘Leak Detection and Repair’ (LDAR) in petrochemical industry;
- Oil and gas vapor recovery in petrol stations, oil storage tanks and trucks, and crude and refined oil products docks;
- Improve VOC emission limit standards for coatings, adhesives and other products;
- Promote use of water-based paint and low-VOC solvents; and
- Impose pollution charges on VOC emission separately from other air pollutant.

2.2 VOC Control Policies in China

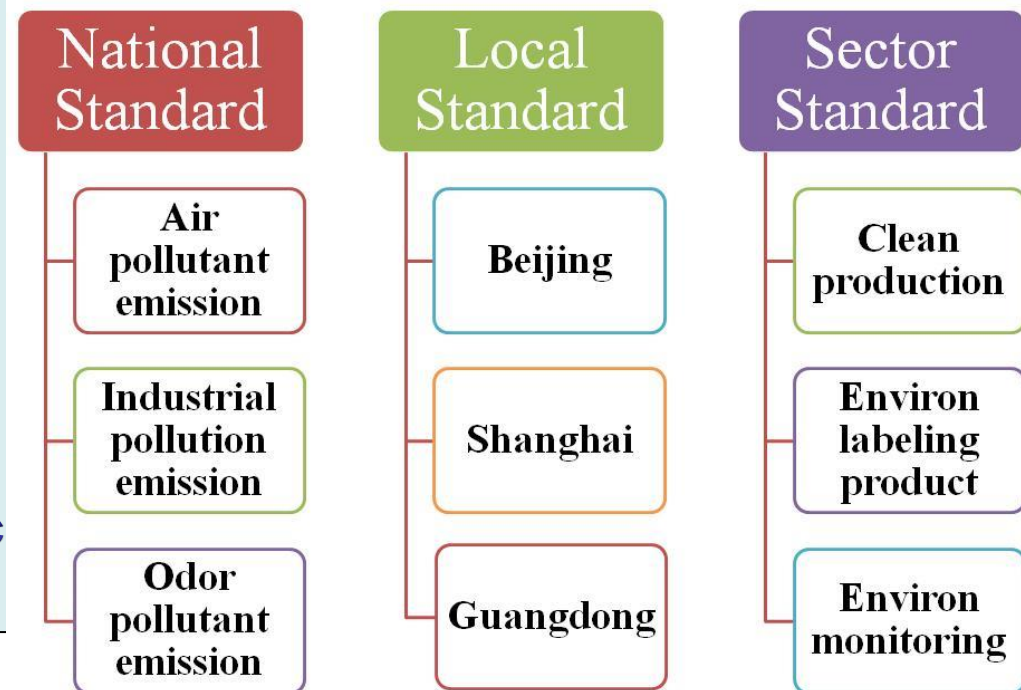
2.2.2 Pollution Charge

- Since 1970s, key economic instrument;
- Charge on air pollutants according to the type and the amount of the pollutant, each with a specific pollution factor;
- Rate: 0.6 CNY/pollution equivalent, 1.2 for SO₂, NO_x from Jun 2015;
- Only the top 3 pollutants with the most pollution equivalent will be charged;
- Most of the VOCs could not be charged due to the lack of emission monitoring, measurement and the relatively small amount.

2.2 VOC Control Policies in China

2.2.3 Environmental Standards

- Consists of the national, local and sector standards;
- Over 30 standards with criteria on VOCs limitation;
- Coking, steel rolling, rubber, oil refining, artificial board, gas transportation & storage, synthetic & artificial tanning, chemical fibre, coating, printing, adhesive, cooking fume;
- No national standard specific on VOC emission limits.



2.2 VOC Control Policies in China

2.2.4 Clean Production Audit

- In 1993, China started to practice clean production in industry;
- In 2002, the 9th National People's Congress promulgated the *Clean Production Promotion Law*, amended in 2012;
- Clean production audit, voluntary for many VOC involved enterprises, mandatory only in 3 situations:
 - ✓ Pollution emission exceed national or local standards,
 - ✓ Energy intensity exceeds the limitation on unit product energy consumption, or
 - ✓ Enterprise uses or discharge toxic and harmful raw materials

2.2 VOC Control Policies in China

2.2.5 Government Green Procurement (GGP)

- Start in 1990s, government procurement policy;
- In 2003, promulgated the *Government Procurement Law*, regulates government procurement should be in favor of environmental protection;
- *Government Procurement Catalog of the Environmental Labeling Products* : MEP,MOF
 - ✓ Low- or zero-VOC products, painting, furniture, sealers, artificial board, plastic products, construction & decoration materials.
 - ✓ 8 technical requirement – environmental sector standards
- GGP only focus on product, lack of service procurement; no independent regulation on GGP



3. Comparative Analysis



SWOT Analysis on VOCs Control Policies in China

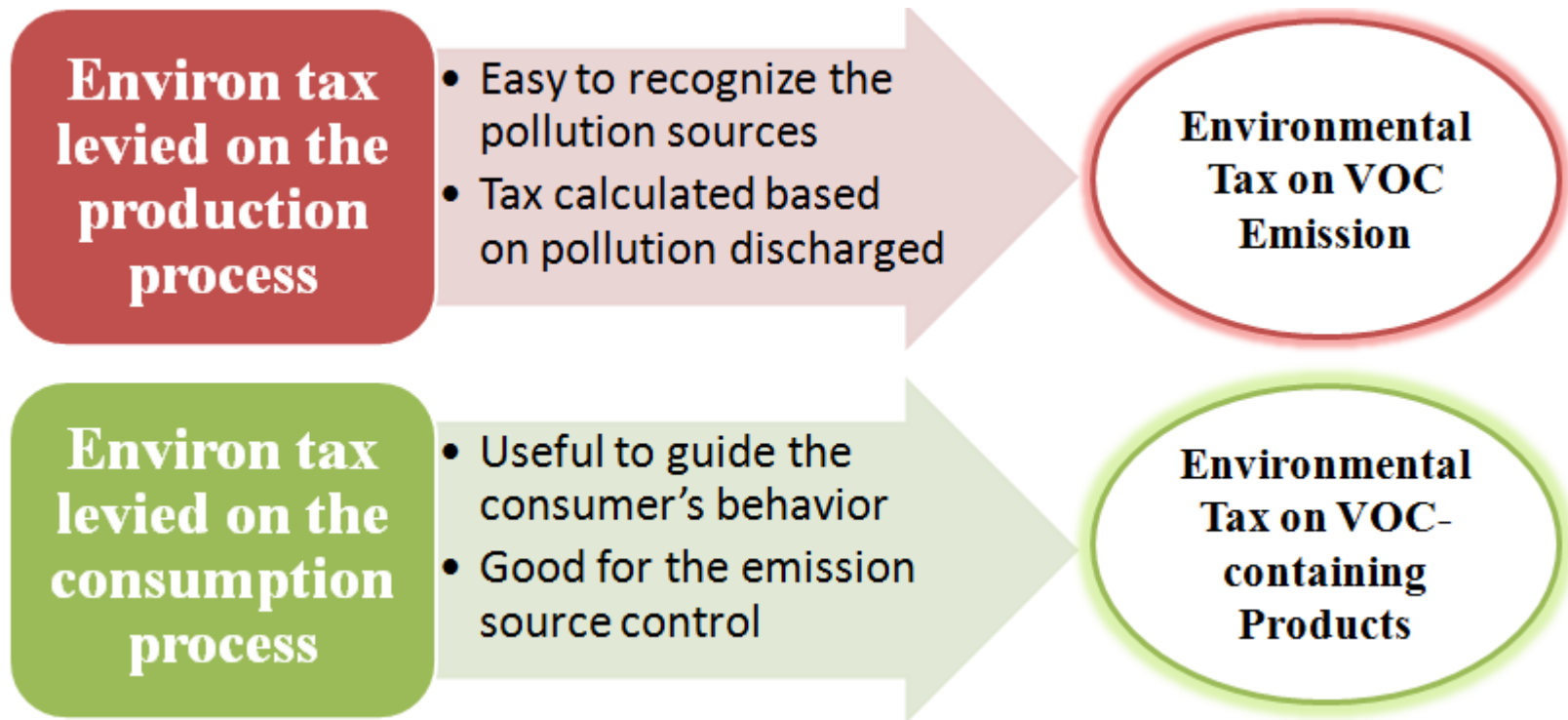
Policy on VOCs			Internal		External	
			Strengths	Weaknesses	Opportunities	Treats
Existing Policy	Command & Control Instrument	Environmental Standard	over 30 years practices, command & control instrument, target accessibility	no specific national standard on VOC emission limits yet	promote env. monitoring, env. management and projects for emission reduction	pollution transfer due to inadequate env. standards of China
		Clean Production Audit	implement over 20 years with specific law	updated regulation missing, mandatory only in 3 situations	takes 6 points in the performance assessment for "Ten Measures on Air"	technical barriers, economic feasibility
		Government Green Procurement (GGP)	almost 10 years practices, mandatory procurement on environmental friendly products	small scope (lack of service procurement), no specific regulation on GGP (only <i>Gov. Procurement Law</i>)	in the process of acceding to WTO GPA	GGP mechanism and market needs improved according to GPA
	Economic Instrument	Pollution Charge	over 30 years practices, raising revenue for env. protection and capacity building	low rate, low enforcement	going to separately charge on VOC emission	in the process of "env. fee to tax"
Emission Trading		Pilot practices in 11 provinces from 2007	government propelling, no emission trading on VOCs yet	with broad market prospective	establish the system of emission trading, and the coordination with other env. policies	
Potential Policy	Economic Instrument	Environmental Tax	on the basis of pollution charge, experiences learned from the "road toll to fuel tax"	would not be implemented in the 12 th FYP	Newly established <i>Env. Protection Law</i> , still with possibility to include the tax on VOC emission	change current institutional mechanism; increase operating cost



4. Framework Design of Environmental Tax on VOC Control



4. Framework Design of Environmental Tax on VOC Control



4.1 Environmental Tax on VOC-containing Products

- Process of using VOC-containing products (solvent usage & surface coating) contributes 35% of total VOC emission and over 60% of industrial VOC emission;
- An effective method of VOC emission source control by levying tax on these products;
- 22 types of products under four groups/industries subject to VOC product taxation (The products and group products are enlisted according to the *Statistic Catalog of Products* which was released by the National Bureau of Statistics in 2010);
- Taxpayers-consumers, tax base-amount of consumption and value of the VOC-containing products, rate is 5-15% of the price, collected in the consumption chain, in the initial stage collect on the product manufactures.

4.2 Environmental Tax on VOC Emission


- In cases there is no or limited VOCs emission during the use of VOC-containing product;
- Production of products containing VOCs, storage, transport and sales of products containing VOCs, production of VOCs contained products as raw material;
- Production processes of 40 types of products under 12 groups/industries subject to VOC emission tax (The products and group products are enlisted according to the *Industry Classification Standard of National Economics* (GB/T 4754-2011));
- Taxpayers- any polluter, tax base- product gravity \times VOC emission factor or real amount of emission, rate is CNY1.2/ pollution equivalent, collected by the local environmental supervision departments.

Preliminary Design Framework of the Environmental Tax on VOCs Control

Tax Category (Statistic NO.)	Specific Product (Statistic NO.)	Tax Category (Statistic NO.)	Production Process of Specific Products	Tax Category (Statistic NO.)	Production Process of Specific Products
Environmental Tax on VOC-containing Products		Environmental Tax on VOC Emission		Environmental Tax on VOC Emission	
Tax on Tanning Products (19)	Semi-finished tanning (1901)	Tax on Farm and Sideline Production (13)	Livestock (132)	Tax on Alcohol Production (151)	Alcohol (1511)
	Tanning (1902)		Vegetable oil (133)		White wine (1512)
	Suitcases, bags and similar products (1903)		Aquatic products (136)		Beer (1513)
	Tanning gloves and clothing accessories (1904)	Tax on Condiments and Fermentive Production (146)	Gourmet powder (1461)	Wine (1515)	
	Wallets, seat covers and relevant tanning products (1905)		Soy source, vinegar and similar products (1462)	Textile footwear (1951)	
Tax on Wood Products (20)	Wood processing products (2002)		Other fermentive and condiments (1469)	Tax on Footwear Manufacturing (195)	Leather footwear (1952)
	Artificial boards (2003)	Tax on Chemical Commodities (268)	Soap and synthetic detergent (2681)		Plastic footwear (1953)
Tax on Chemical Product (26)	Pesticide (2606)		Beauty or makeup preparations (2682)		Tax on Petroleum Refining (251)
	Paint (2608)		Preparations for oral or dental hygiene (2683)	Tax on Coking (252)	
	Ink and similar products (2609)	Odiferous substances (2684)	Coke		
	Pigments (2610)	Others (2689): Deodorizer, lubricating preparations, matches, candles	Tax on Basic Chemical Raw Material Production (261)		Retort carbon
	Dye (2611)			Gas stations (gasoline and diesel) (5264)	Coal tar
	Filler and similar products for sealing (2612)	Tax on Vehicle Fuel Retail (526)	Tax on Transportation (for oil) (5X)	Tax on Pharmacy Manufacturing (27)	Organic chemical raw material (2614)
	Synthetic Materials (2613) - plastic in primary forms (261301), synthetic rubber (261302)	Tax on Transportation (for oil) (5X)			Ship transportation (for oil) (522)
	Chemical reagent and additives (2614)		Pipeline transportation (for oil) (570)		Drugs (272)
	Special chemical products (2615)	Tax on Storage (for oil) (59)	Road transportation (oil tank trucks) (543)	Biopharmaceutical manufacturing (276)	
	Forest chemical products (2616)		Other storage (for oil) (599)		
Film Processing chemicals (2618)					
Env. pollution treatment chemicals (2619)					
Tax on Chemical Fiber (28)	Artificial fiber (2802)				
	Synthetic Fiber (2803)				

Conclusion

- China is facing significantly heavy smog pollution, which is partly induced by the $PM_{2.5}$ precursor – VOC.
- As the great amount of VOC emission has not been controlled very well, carrying out the VOC pollution prevention and control allows of no delay.
- China is studying to introduce the environmental taxation which an effective economic tool is applied worldwide.
- By conducted the comparative analysis of several existing and potential VOC control policies in China, it is suggested to introduce environmental tax by levying VOC-containing product tax and VOC emission tax respectively.



Thank you!

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