



中国环境与发展国际合作委员会  
CHINA COUNCIL FOR INTERNATIONAL COOPERATION  
ON ENVIRONMENT AND DEVELOPMENT

# Special Policy Study on Mercury Management in China

SPS Project Team

2011 Annual General Meeting  
Nov. 16, 2011





# Project Mandate

Policy Recommendations on mercury  
pollution prevention and control in China

Offer advice for prevention and  
control of pollution by other  
heavy metals

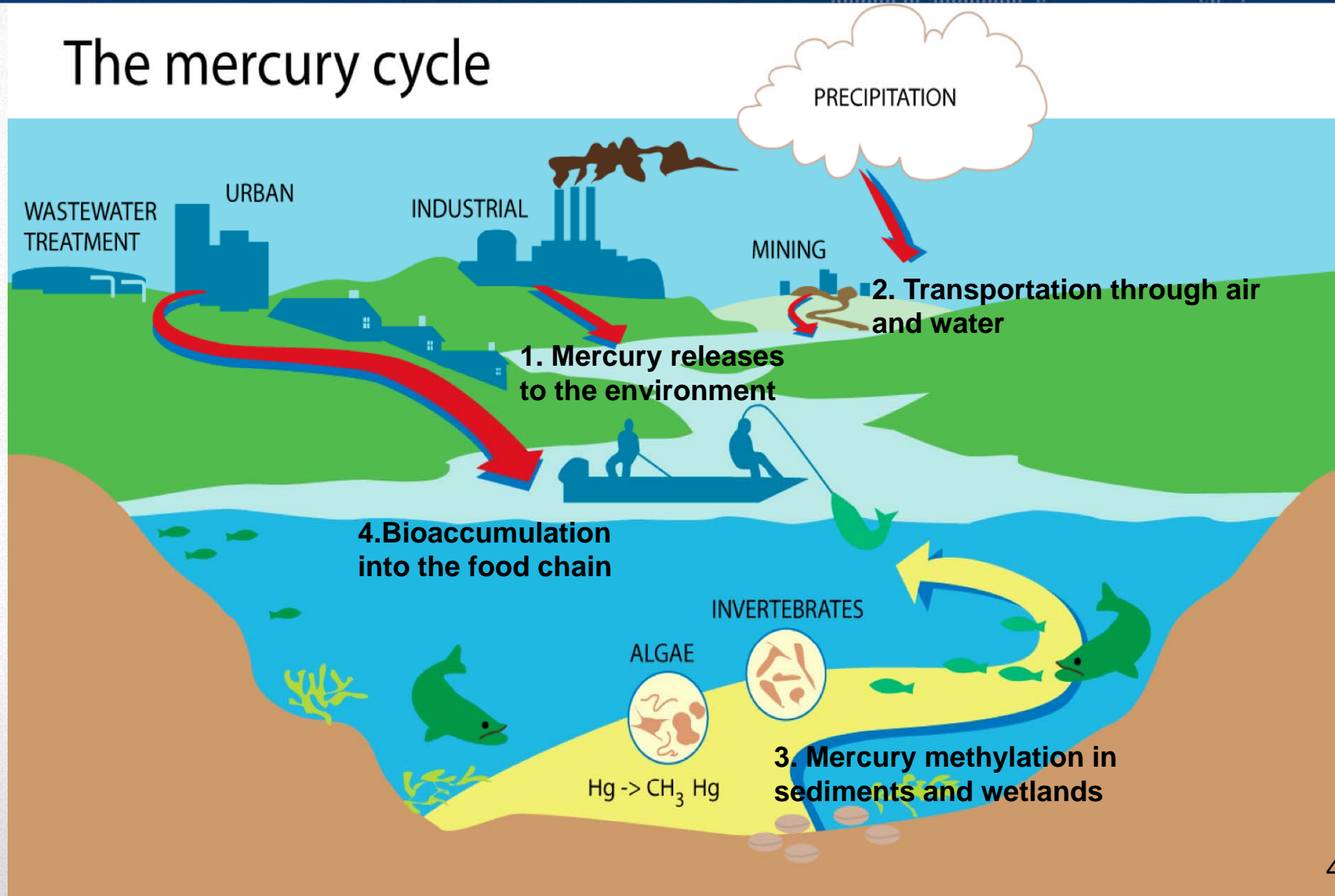


# Outline

- 1. Background**
- 2. Key findings**
- 3. Strategy and action plan for mercury management in China**
- 4. Recommendations for priority action**



# The mercury cycle





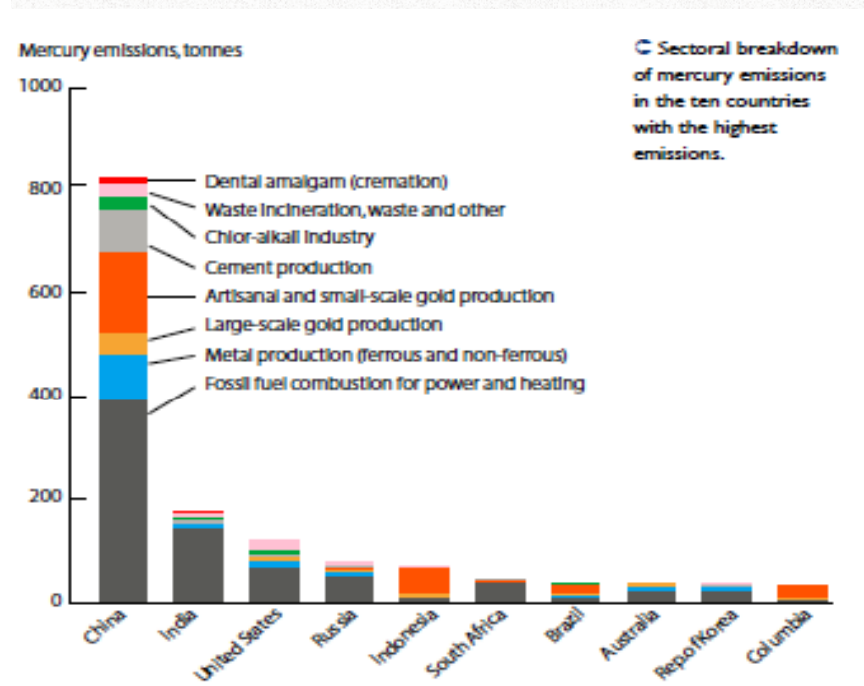
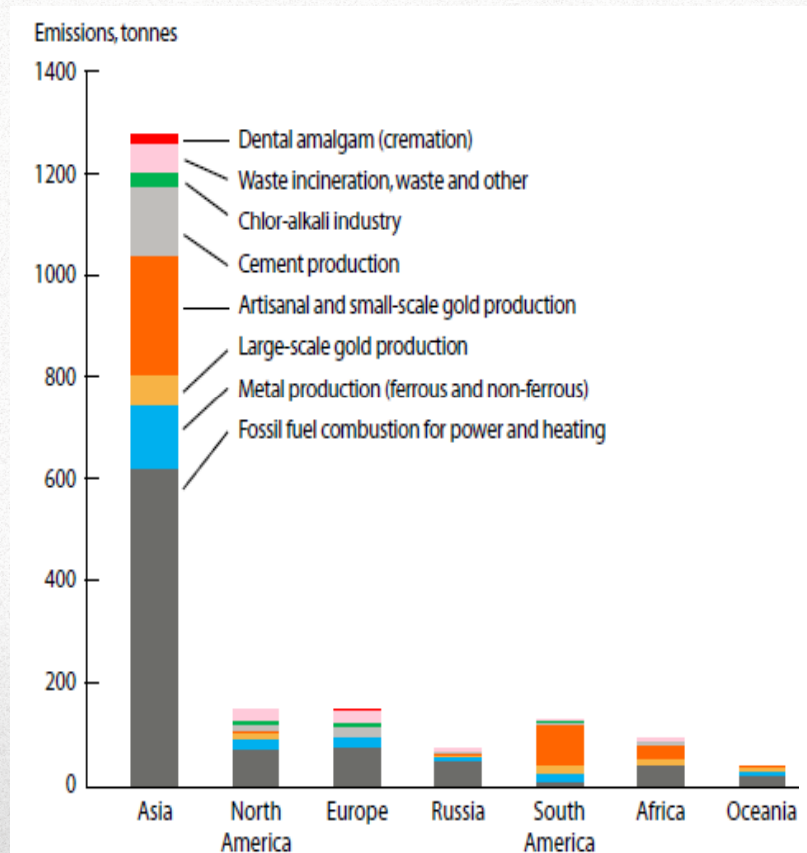
# 1. Background

- Mercury is persistent, bio-accumulative, long-range-transportable around the world and toxic at very low levels to human health and aquatic and terrestrial ecosystems.
- China has reduced its mercury use and releases, but remains the world's largest producer, consumer, and releaser of mercury to the environment.
- China's management of mercury needs to address growing expectations for public health, environmental protection, and occupational safety. The 12<sup>th</sup> 5-year plan offers an opportunity to build a national mercury strategy and action plan.
- Meaningful mercury treaty obligations will assist China to manage mercury in accordance with its green development plans and its international trade interests.



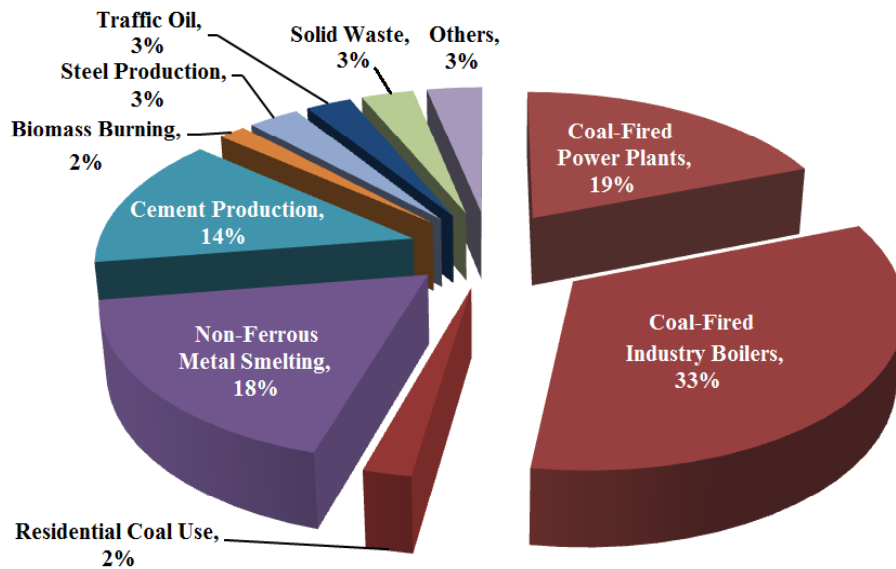
# ...Two goals

- Prevent the Exposure of Chinese Citizens to mercury
- Reduce Mercury Release to the Environment

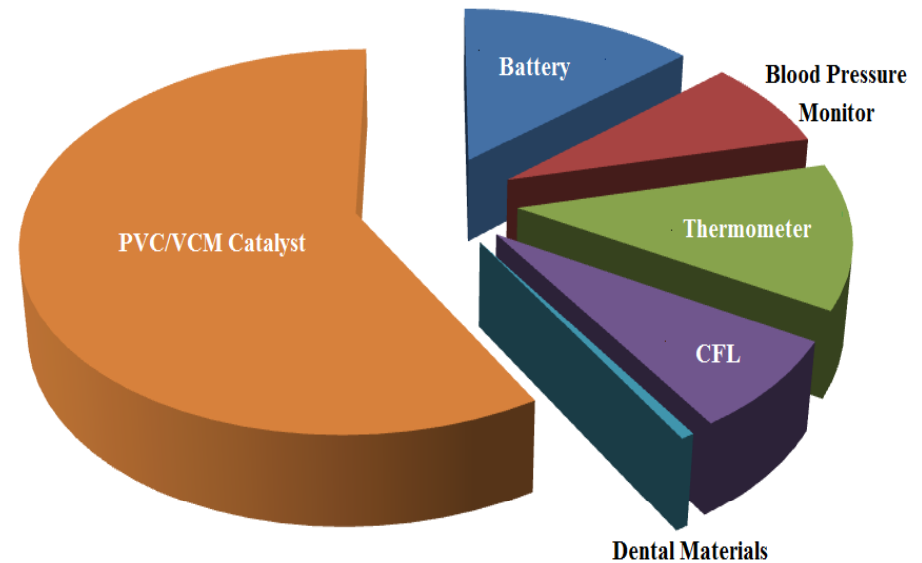




# ...Mercury Pollution in China



Atmospheric mercury emissions from major sectors in China in 2007



Major sectors and their mercury use in China in 2007



## ...Health Impacts of Mercury Pollution in China

### Mercury exposure pathways

1. Dietary exposure
2. Environmental exposure
3. Occupational exposure
4. Exposure from products

Populations that may be at risk:

- ◆ Coastal populations where fish and seafood can be important sources.
- ◆ People living close to sources of mercury pollution and consuming locally grown food.
- ◆ Workers with occupational exposure in the mining, smelting and PVC industries.



Photo by Eugene Smith, Minamata,







## 2. Key Findings

- China's economic development continues to pursue the goal of "a well-off society by 2020". This rapid development has come with environmental costs that can and should be reduced.
- Collectively, China's coal combustion, smelter, cement, and other sectors are the largest global source of anthropogenic emissions of mercury to air.
- China's VCM/PVC sector is the biggest global consumer of mercury (approx. 800 tonnes).
- China's mercury-added products sector uses about 550 tonnes.
- China's total mercury use of about 1,350 tonnes is more than 50% of global demand.



## 2. Key Findings

- Local mercury pollution issues arise from contaminated sites and small inefficient smelter operations.
- Occupational health and safety issues can be reduced by improving working conditions at smelter, PVC and cement facilities.
- Regulatory systems and institutions need to strengthen policy development, implementation and compliance.
- Significant reductions of mercury releases can be made by adopting available technologies and through co-benefits from the control of other air pollutants.



### 3. Mercury Strategy and Action Plan

- (1) A Mandatory National Pollution Release & Transfer Registry (PRTR)
- (2) Measures to Reduce Risks to Public Health
- (3) Rigorous Management of Contaminated Sites
- (4) Actions to Strengthen the Regulatory Regime
- (5) Improved Environmental Performance of Key Industries
- (6) Support for Green Transformations (industry and communities)
- (7) Measures to Reduce Knowledge Gaps
- (8) International Cooperation Measures



## ...Co-Benefits for Prevention and Control of Pollution by Other Heavy Metals

- **Coal burning:** lead, cadmium, thallium and zinc
- **Non-ferrous metal smelting:** lead, cadmium, zinc and copper
- **Management/regulatory regime strengthened**
  - Pollution Release and Transfer Registry
  - Improved capacity to develop and implement mandatory standards nationally



# ...Considerations in Setting Priorities

---Qualitative view of anticipated benefits from actions by various sectors

Sector	Quantity of Mercury Involved	Opportunities for Early Actions	Benefits for Health and the Environment		Co-Benefits for other Heavy Metals
			China	Global	
Coal Fired Power Plants	++				
Coal Fired Boilers	+++				
Non-Ferrous Smelters	++				
Cement Production	++				
VCM/PVC Production	++++				Zero
Battery Production	++				
Thermometers	++				Zero
Blood Pressure Monitors	+				Zero
Compact & Fluorescent Lamps	+				Zero
Dental Amalgam	+				Zero
Mercury Mining	++++				

good	better	best
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Qualitative scale of 'Use' of mercury or the 'Release' of mercury.

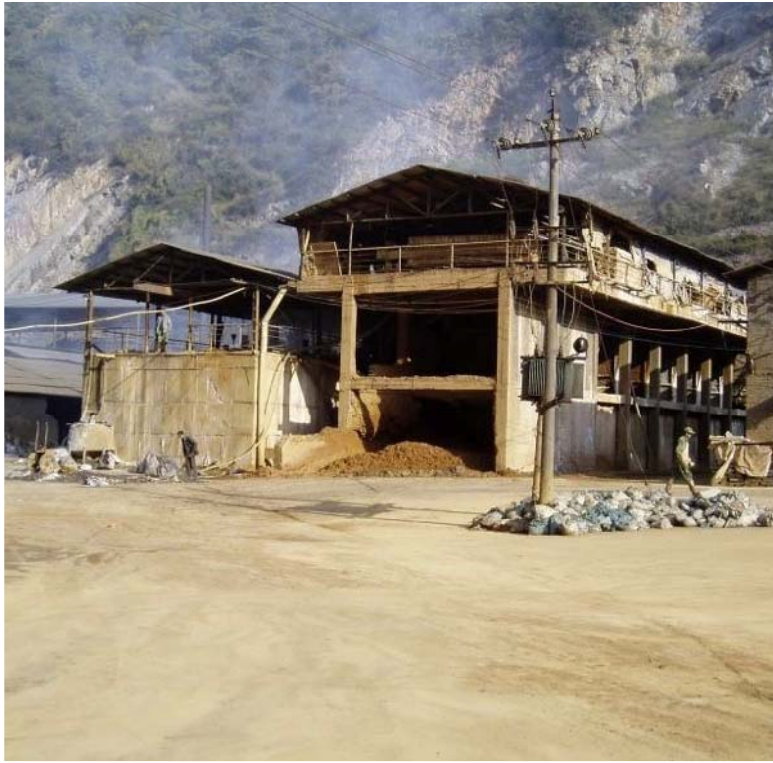
+= Not Much; += Medium Amount ;++++= Large Amount ;++++= Very Large Amount.



## 4. Recommendations for Priority Action

### (1) Take Early Actions that Offer Public Health and Environmental Benefits

- Close Small Highly Polluting Smelters
  - Close the remaining small, inefficient and highly polluting non-ferrous metal smelters





## 4. Recommendations for Priority Action

### (1) Take Early Actions that Offer Public Health and Environmental Benefits

- Reduce Emissions from Coal Combustion
  - Promote implementation of best available techniques;
  - Reduce the demand for coal combustion;
  - Obtain co-benefits from control of other pollutants.
- Protect Citizens at Risk from Mercury Exposure
  - Ensure secure management of contaminated sites and mine tailings;
  - Strengthen inspection and enforcement to eliminate illegal practices (e.g. small scale gold mining; improper waste disposal).



## ...Protect Citizens at Risk

**Workers Handling used PVC Catalyst**



**Children Playing with Mercury**







## 4. Recommendations for Priority Action

### (2) Major Reductions in Mercury Emissions and Releases

- **Coal-fired boilers:** use natural gas where feasible, or low-mercury coal; replace small inefficient plants and set emission limits for larger plants.
- **Coal-fired power plants:** set progressively more stringent emission limits for 2015 and 2020.
- **Non-Ferrous Smelters:** phase in emission limits based on international technologies and encourage domestic research and development.
- **Cement Sector:** phase in emission limits and seek co-benefits from other pollution control measures.



## ...Estimated Reduction of Emissions to Air

<b>Sector</b>	<b>Baseline emissions in tonnes</b>	<b>Anticipated reduction in tonnes by 2020</b>
<b>Coal-fired Power Plants</b>	123	49 (40%)
<b>Coal Fired Boilers</b>	213	85 (40%)
<b>Non-ferrous Smelters</b>	116	111 (96%)
<b>Cement Production</b>	90	50 (55%)
<b>Total</b>	<b>542</b>	<b>295</b> (55%)



## 4. Recommendations for Priority Action

### (3) Reduce Mercury Use and Demand

#### VCM/PVC Sector

Achieve cost-effective mercury-free PVC production processes:

- Actively seek opportunities to shift from coal to oil or gas based processes;
- Where coal is used, support development and adoption of low-mercury and mercury-free catalysts to meet the announced national targets for 2012, 2015 and 2020;
- Invest in research on mercury-free processes.

Set binding regulations to track and control mercury in the VCM/PVC industry waste streams and by-products.



## 4. Recommendations for Priority Action

### **(3) Reduce Mercury Use and Demand**

#### **Closed-Loop Systems for Mercury Consuming Industries**

- Develop recycling and waste handling regimes to reduce and eliminate new inputs of mercury.
- Consider a cap on the supply of mercury by 2015.

#### **Improve Standards for Mercury-added Products**

- Develop and implement regulations to establish stricter standards.
- Develop and promote the use of mercury-free or low-mercury-added products.
- Improve recycling technologies and promote the creation of the necessary industries.



## ...Estimated Reduction of Mercury Use

<b>Sector</b>	<b>Baseline Use in tonnes</b>	<b>Anticipated Use Reduction in tonnes by 2020</b>
<b>VCM/PVC Production</b>	780	780 (208+286+286) (100%)
<b>Battery Production</b>	140	112 (80%)
<b>Thermometers</b>	109	54 (50%)
<b>Blood Pressure Monitors</b>	118	40 (34%)
<b>Compact Fluorescent Lights</b>	68	47 (70%)
<b>Flourescent Lamps</b>	130	101 (78%)
<b>Total</b>	<b>1345</b>	<b>1134 (84%)</b>



## 4. Recommendations for Priority Action

### (4) Build a Strong Foundation for a Mercury- Free Green Economy

- **Management and Regulation (policy and implementation)**
  - Create a mandatory inventory of mercury releases.
  - Strengthen all phases of the regulatory life cycle and systems, including implementation and enforcement.
  - Strengthen industry engagement with staff dedicated to understanding and oversight of key sectors.
- **Knowledge and innovation**
  - Enhance monitoring of mercury in foods, people and the environment.
  - Foster new green technologies adapted for use in China.
  - Promote education and increased awareness at all levels.



# Special Policy Study - The Team

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The Team Thanks You for This Opportunity







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