AIM/MATERIAL CHINA

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I. Country Specific Features
II. Data Sources
III. Model Overview
IV. Some Results of Application
V. Ongoing / Future Activities

I. Country Specific Features

- **Disaggregated Electricity Sectors**
  - **Fossil: ELC, ELO, ELG**
  - **Hydro: ELH**
  - **Nuclear: ELN**
  - **New Renewables: ELW, ELP, ELB**
- **Soft Link with Bottom-up Approach**
  - **Technology Improvement**
  - **Efficiency Change**

II. Data Sources

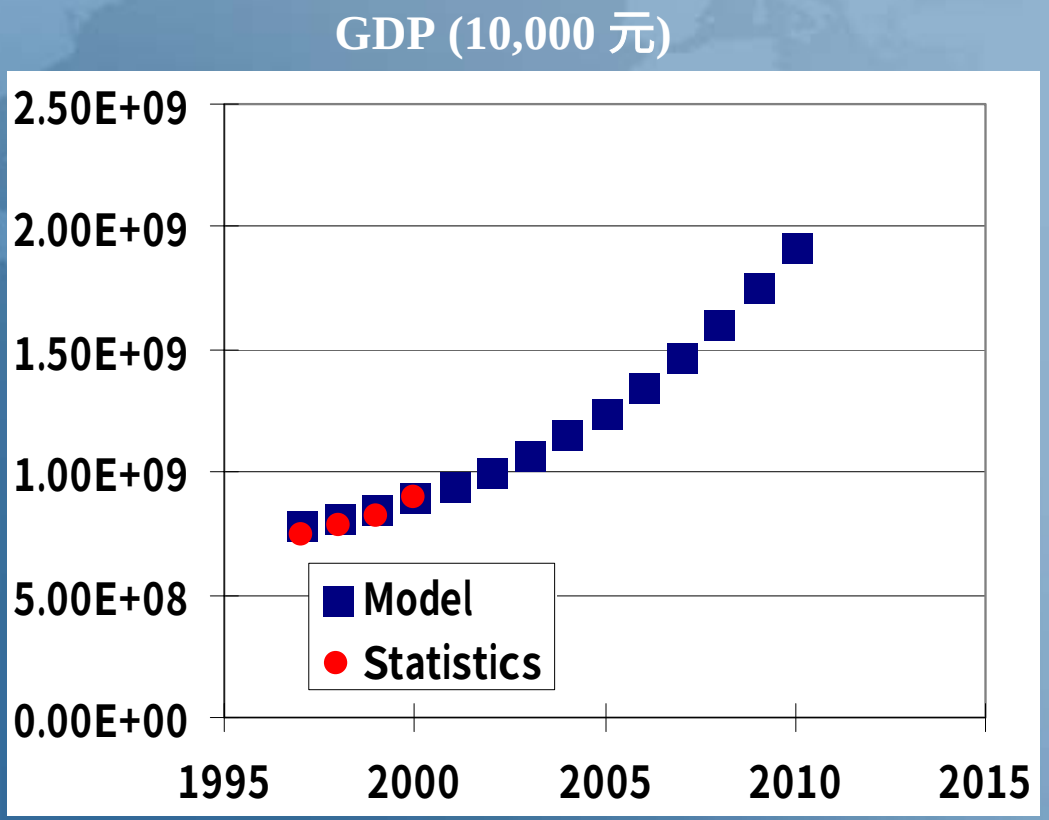
- **Latest China Input-output Table (1997)**
  - **124 Sectors → 31 Sectors → 38 Sectors**
- **China Energy Balance Tables**
- **Other Statistics**
  - **China Environmental Statistics**
  - **Biomass Energy Resources and Uses**
  - **Other New Renewables**

III. Model Overview

- 38 Sectors ✕ 31 Commodities
- More Details in Energy-related Activities
  - Electricity Disaggregated into 8 Sectors
  - Other 6 Sectors for Energy Production and Conversion/Processing
  - 5 Sectors For Energy-intensive Industries
    - Iron & Steel
    - Pulp & Paper
    - Non-metal Mineral Products
    - Non-ferrous
    - Chemical
  - Other Energy-intensive Sectors
    - Heat Supply
    - Passenger Transportation
    - Freight Transportation
- Environmental Industry Sector and Environmental Investment
- 1997-2030, Step = 1 Year
- Wastes: SO_2 , Solid Wastes, Waste Water

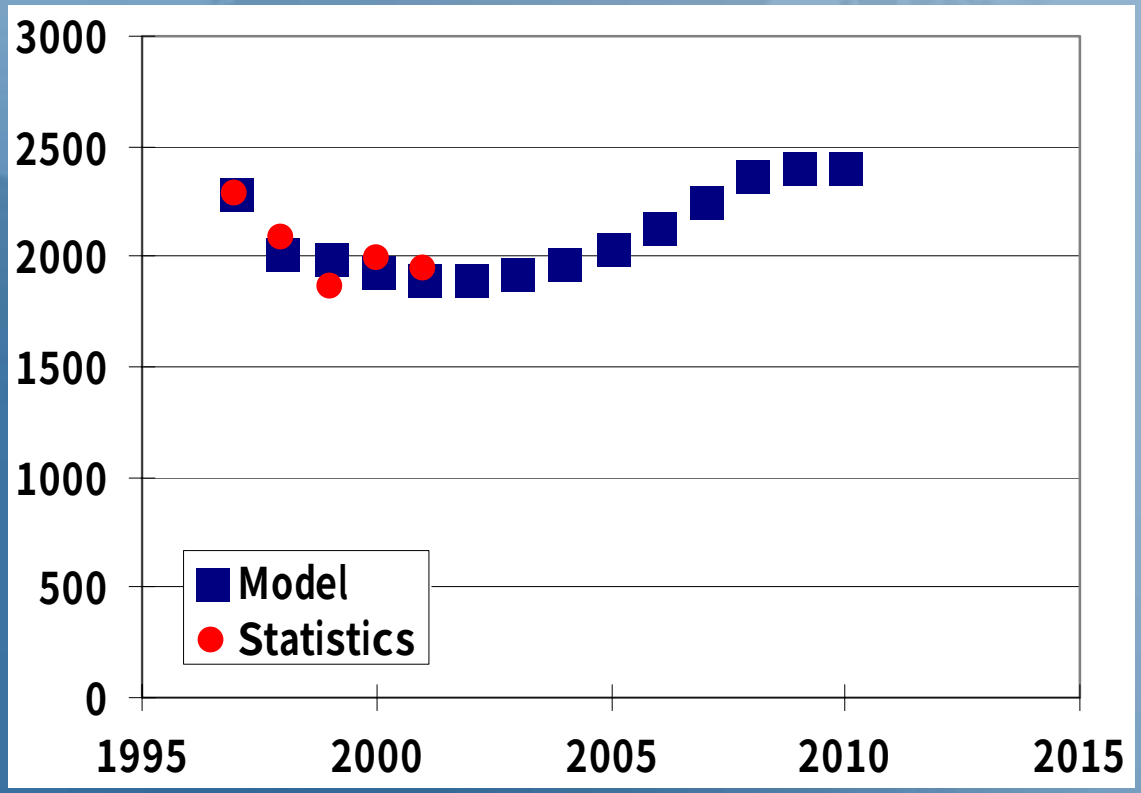
IV. Some Results of Application

- **General Trend**



Source of statistics: China Statistical Yearbook 2001, SSB China.

SO_2 Emissions (10,000 t)



Source of statistics: China Environmental Annual Reports, SEPA China.

- **Evaluating the Effects of CDM between China and Japan**
  - **Soft Link between Bottom-up and Top-down**
  - **Two Priority Areas Identified by Bottom-up**
    - **Electric Power Generation**
    - **Iron & Steel Production;**
  - **Energy Efficiency Gaps between China and Japan**
    - **42% (Iron & Steel)**
    - **24% (Electric Power Generation)**
  - **Potential Scale of CDM Cooperation Based on Bottom-up**
    - **CDM Fund / Domestic Annual New Investment**
      = 17% (Iron & Steel)
      = 15% (Electric Power Generation)

- Excluding Transition Cost;
- Several Efficiencies Improvement through CDM:
  - Energy Efficiency
  - Labor Efficiency
  - Capital Efficiency
  - Pollution Generation and Treatment Efficiency

Accordingly, the results tend to be the upper bond estimation.

- Scenarios
  - Bau: without CDM Cooperation
  - CDM: with CDM Cooperation since 2003, No Upper Bound on Total Investment
  - CDMB: with CDM Cooperation since 2003, Total Investment Upper-bounded

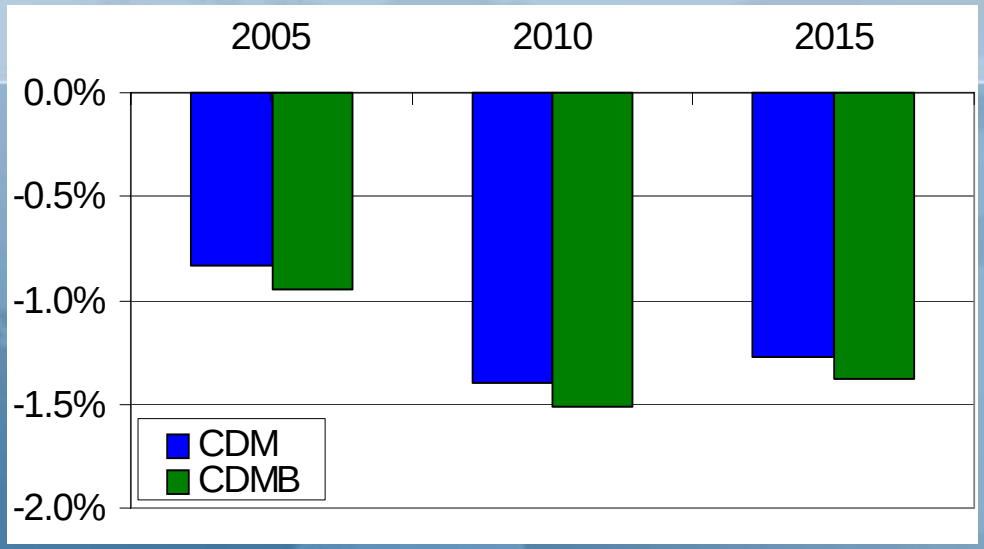
Percentage of CO_2 Emission Changes in Sectoral Total

	CDM	CDMB	Difference
Iron & steel			
2005	**-3.18%**	**-3.38%**	**-0.20%**
2010	**-4.26%**	**-4.33%**	**-0.07%**
2015	**-3.80%**	**-3.84%**	**-0.05%**
Electricity			
2005	**-1.20%**	**-1.31%**	**-0.11%**
2010	**-2.59%**	**-2.76%**	**-0.17%**
2015	**-2.55%**	**-2.70%**	**-0.15%**

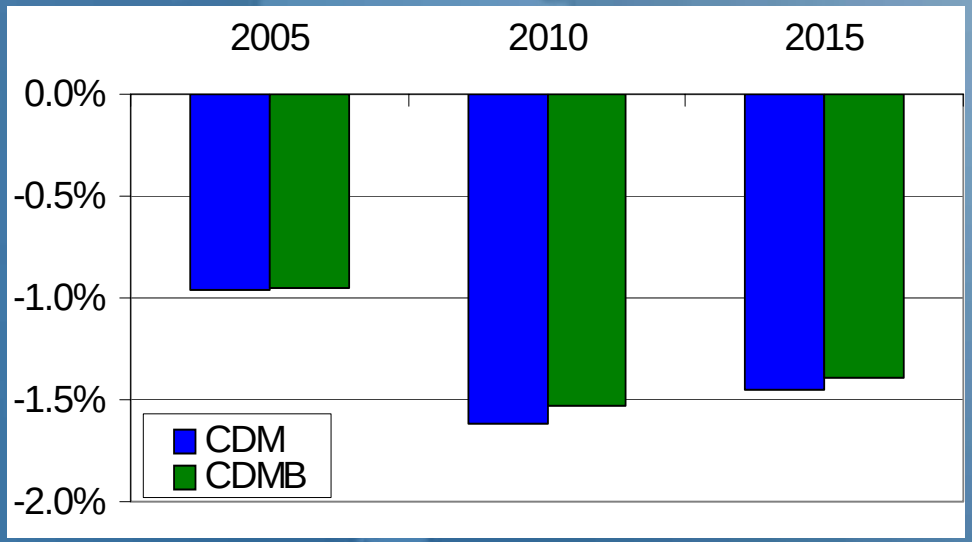
- *For the two sectors with CDM projects, CO_2 emissions will be reduced by around 4% in iron and steel production sector and 3% in electric power generation sector.*

- *Both of them have more reductions in CDMB scenario.*

- **Compared to the BaU scenario, national GDP is increasing in both CDM and CDMB scenarios.**
- **However, the scale of GDP increase is much different: in CDM scenario, GDP increases by 0.12% in 2005, 0.22% in 2010 and 0.18% in 2015; while in CDMB scenario, GDP increase is as minor as 0.01% in 2005, 0.02% in 2010 and 0.01% in 2015.**
- **The reason for this difference is that in CDMB scenario total investment is assumed to be constant as BaU scenario. While in CDM scenario, not only the efficiency is improved, the total investment is increased as well.**
- **For this reason, in CDM scenario, even though the CO_2 reduction is not as many as the reduction in CDMB scenario, the effect of carbon intensity change is more obvious than that in CDMB scenario.**



CO_2 Reductions as Percentages of National Total

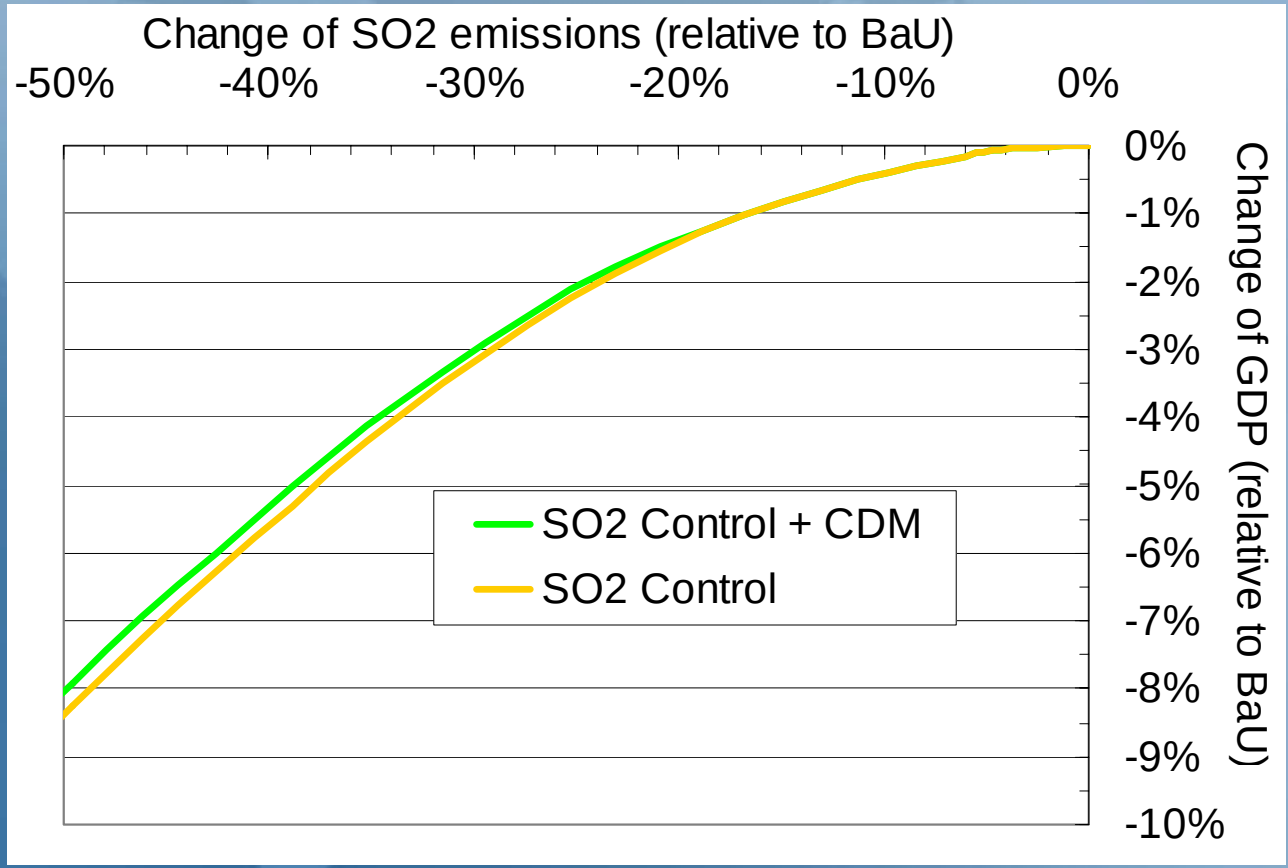


Changes of Carbon Intensity

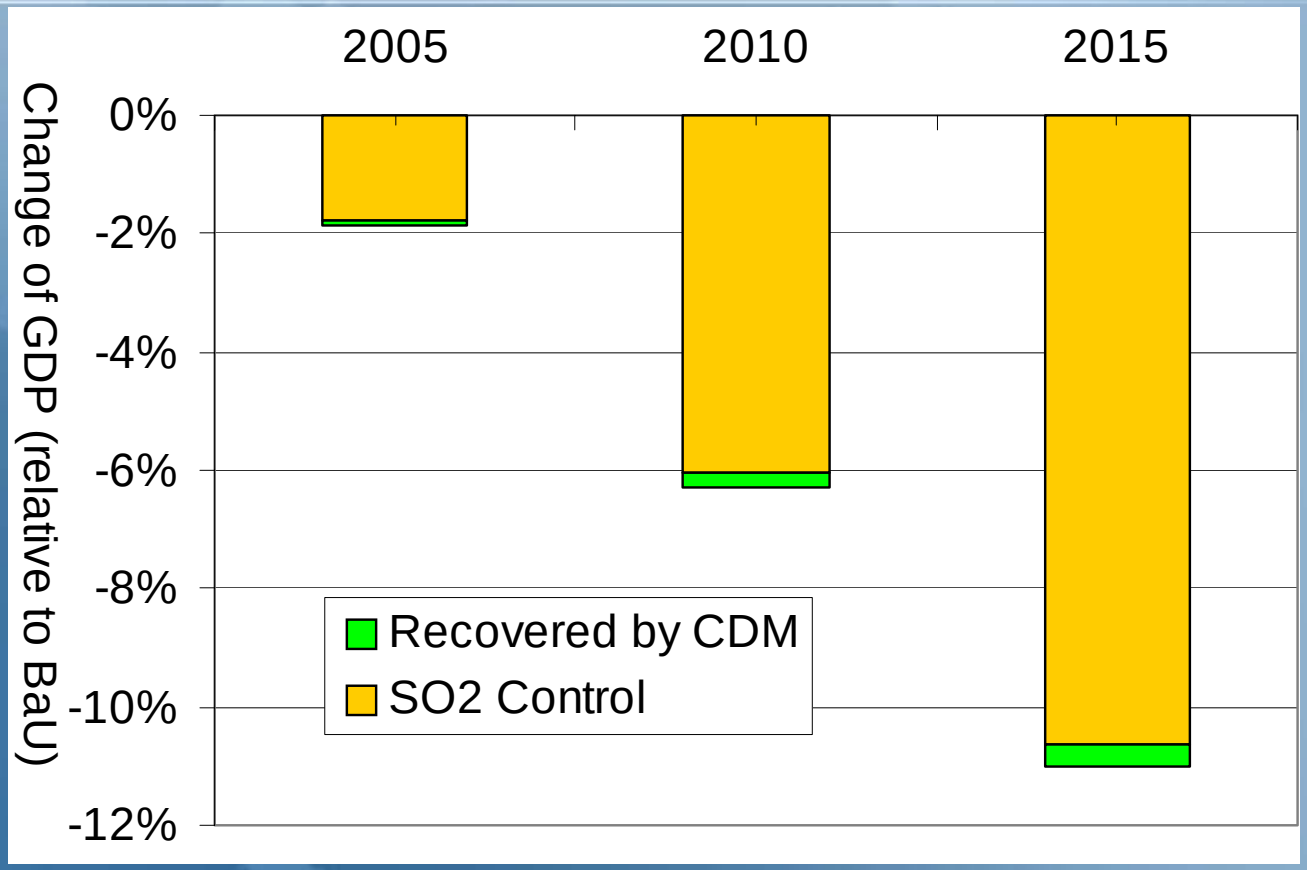
- **In China, local environmental pollution control has a higher priority than global environmental issues. Environmental protection against air pollution, water pollution and solid wastes disposal requires immediate attention. Mitigation of these pollutions will cause a loss in GDP because capital, labor and other intermediate inputs are required by these environmental activities.**

- **To analyze the possible effects of Clean Development Mechanism cooperation under such specific circumstances, a scenario for SO_2 control is proposed as SO_2 reduction by 0.5% every year compared to the previous year since 1998.**

- **Part of the GDP loss from SO_2 control can be recovered by CDM: 0.07% in 2005, 0.26% in 2010 and 0.35% in 2015.**



SO_2 Reduction and GDP Loss

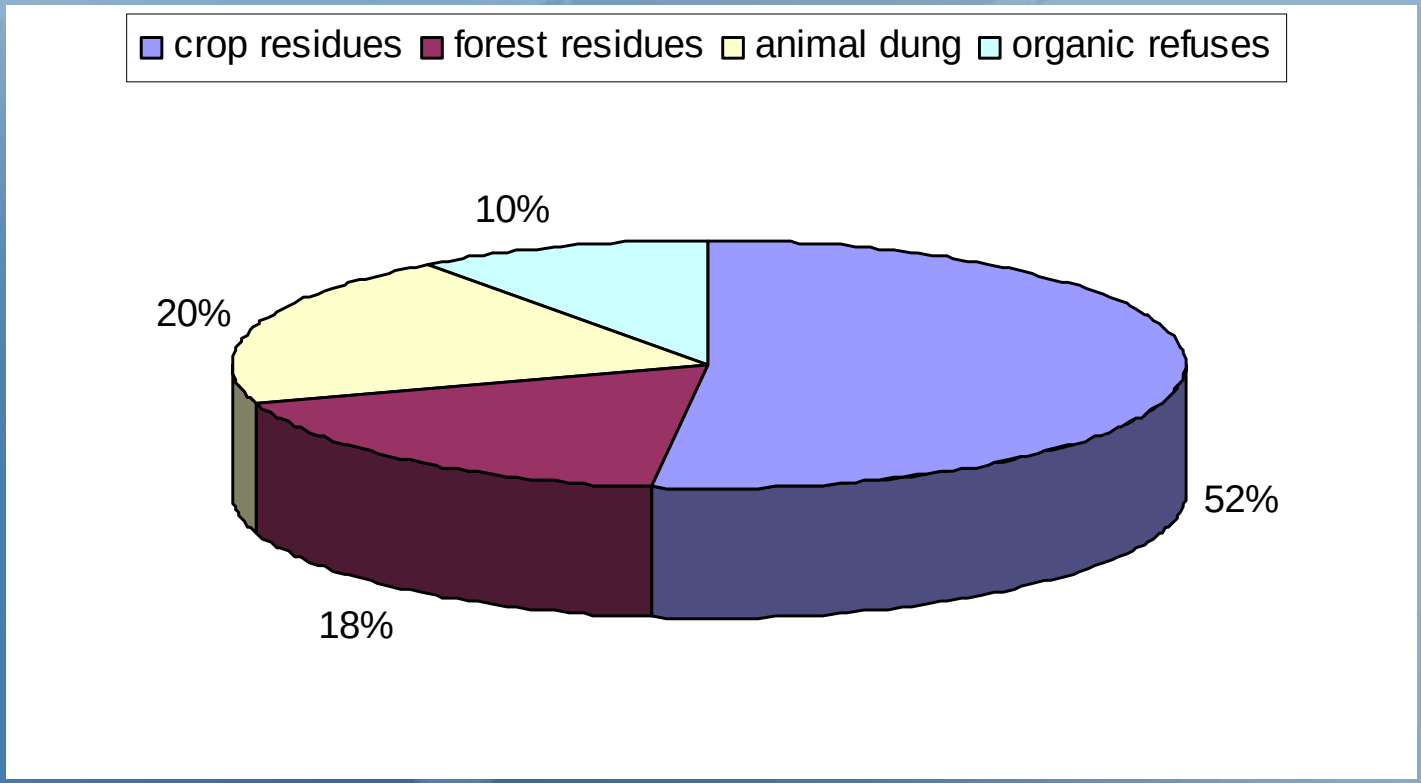


Recovery of GDP Loss from SO_2 Control by CDM

- From a point of view of macroeconomics, CDM will influence not only the sectors where CDM projects are implemented, but also other relevant sectors and the whole national economy.
- The effects of CDM are generated through the changes of investment and its re-allocation across sectors, and the improvement of technology efficiencies for production and pollution management activities.
- GDP loss from a moderate SO_2 control can be recovered by 0.07% - 0.35% by CDM implemented around the first commitment period.
- The scale of possible CDM cooperation is a very uncertain issue. Soft link to the bottom-up model helps reduce the subjective conjectures.

V. Ongoing / Future Activities

- **Biomass Energy**
  - **Biomass Electric Power Generation**
    - **Bagasse-based**
  - **Rural Residential**
    - **Forest Residues: Firewood**
    - **Crop Residues: Stalk**
    - **Animal Dung and Organic Refuses: Bio-gas/Direct Burning**



Major sources of biomass energy in China

Mix of rural energy in China

	1998		1999	
	(10000tce)	(%)	(10000tce)	(%)
Commercial energy	5990.16	22.4%	5956.36	22.6%
Bio-gas	118.9	0.4%	143.1	0.5%
Stalks	12279.7	45.8%	12502.4	47.4%
Firewood	8400.9	31.4%	7790.6	29.5%
Total	26789.66	100.0%	26392.46	100.0%

Source: China Energy Statistical Yearbook 1997-1999, China State Statistics Bureau, 2001.

- *Environmental Industry (?)*
- *Health Impact (?)*
- *Waste Recycling (?)*
  - *Iron & Steel*
    - *Waste Steel*
  - *Pulp & Paper*
    - *Domestic Waste Paper Recycled*
    - *Imported Waste Paper*