

Energy Future and Policies: AIM-China Activities

AIM-China/Emission Team

12th AIM International Workshop, Feb.19-21, 2007

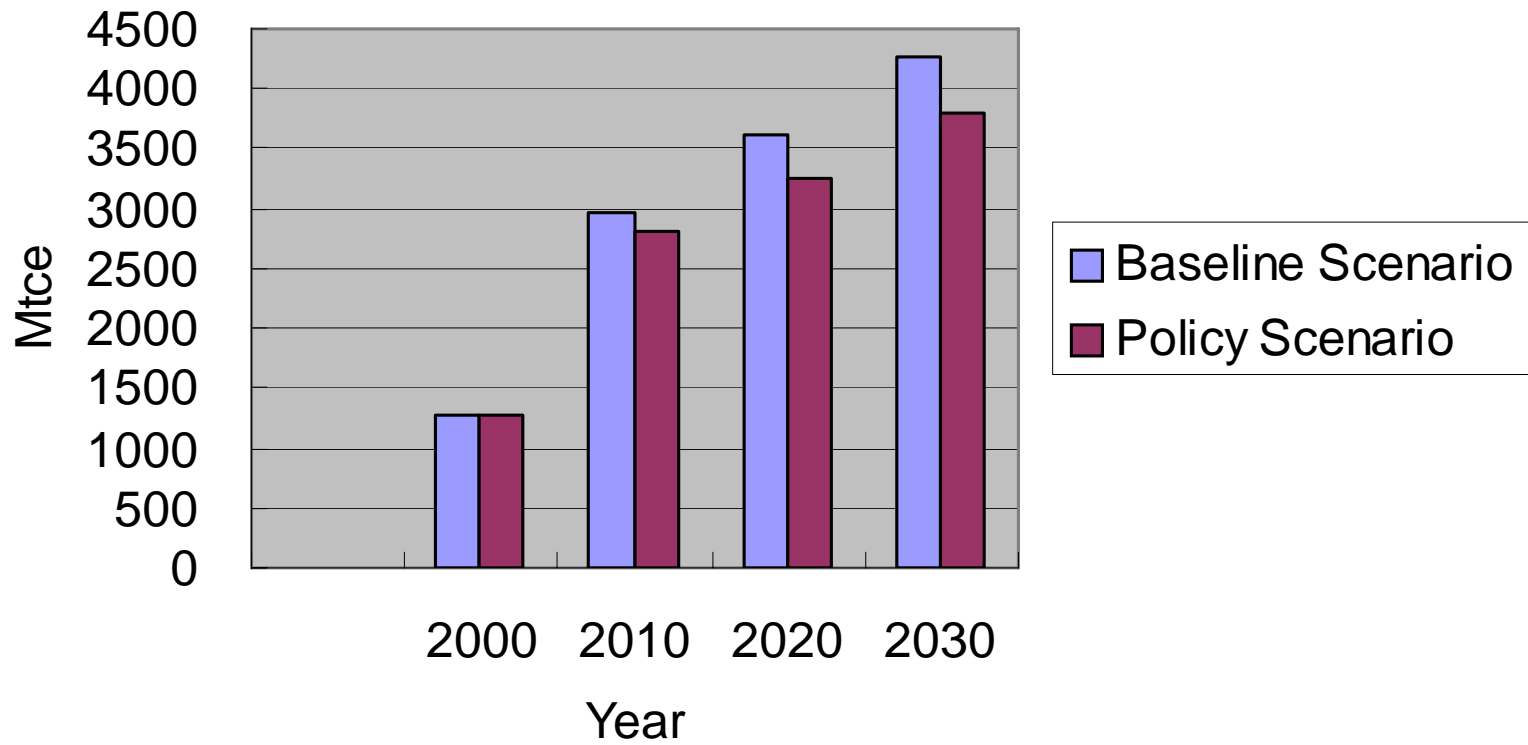
AIM-China Modeling Activities

- Energy and GHG Emission scenario up to 2030
- AIM-Local/China
- LCS-2050 Study
- APEIS
- 11th Five Year Plan Energy Target Assessment
- Energy Tax Assessment
- Fuel Tax Assessment

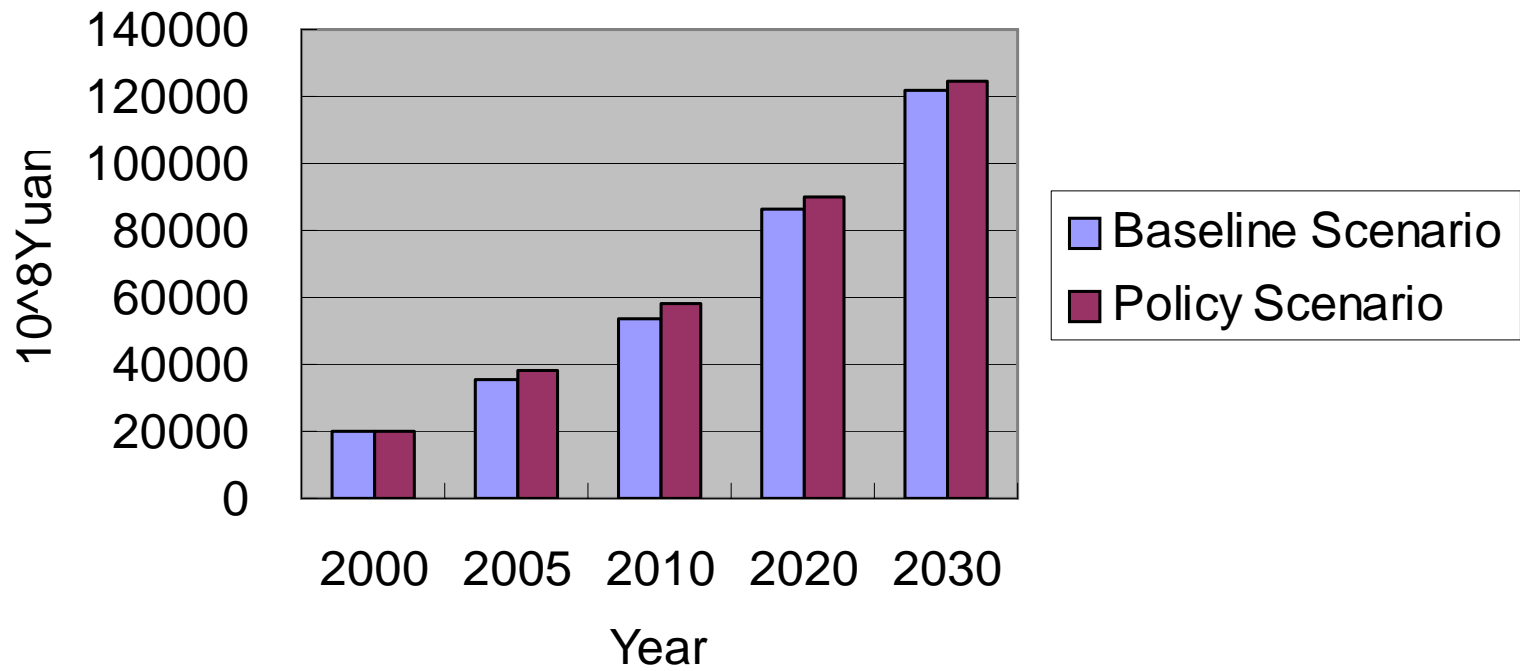
Energy and GHG Emission scenario up to 2030

- Including most recent energy data(up to 2004 and 2005)
- National plan(Economy growth, energy conservation plan, renewable energy plan)
- Circulating Economy Modeling(Process linkage within AIM/Enduse model)

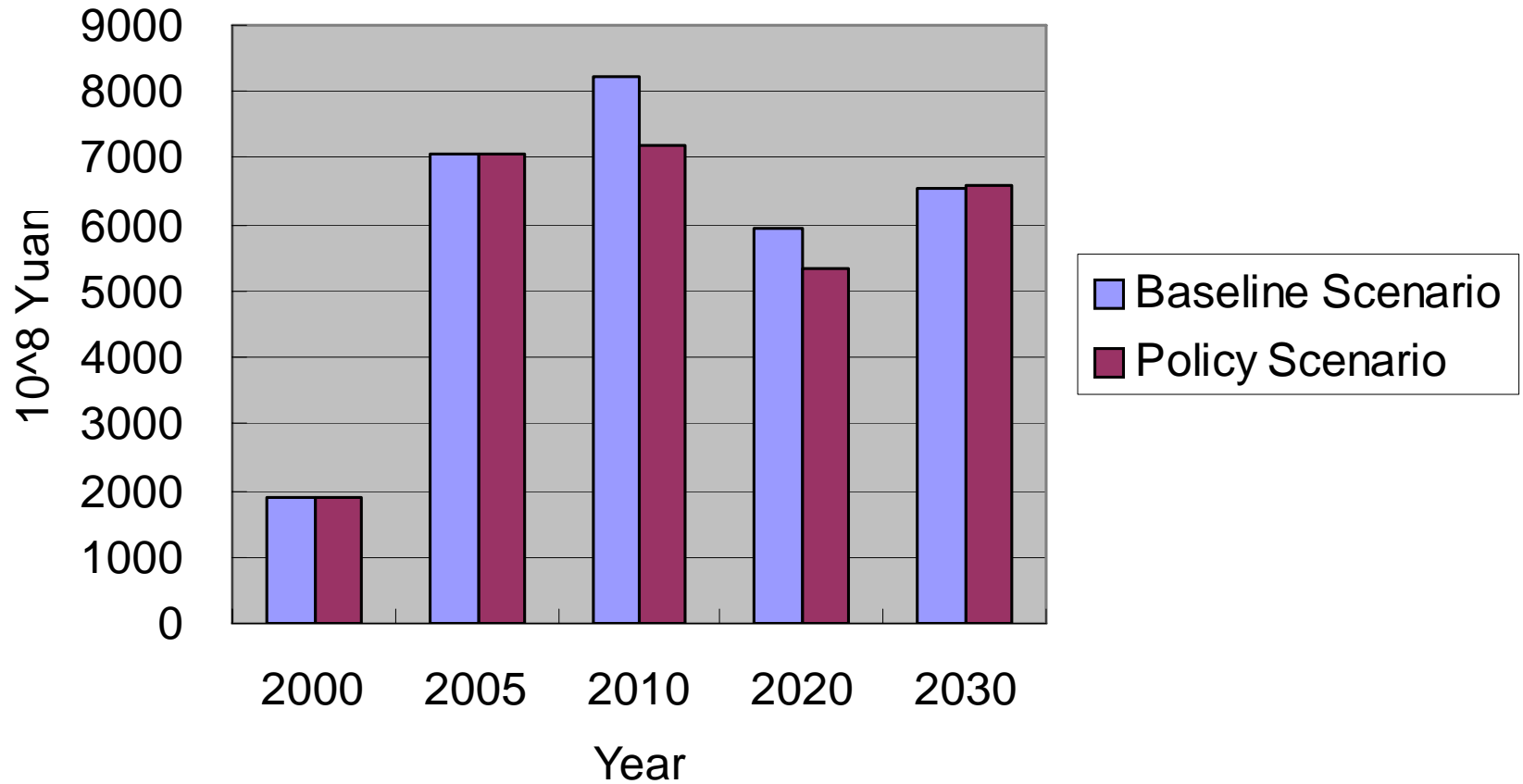
Primary Energy Demand in China



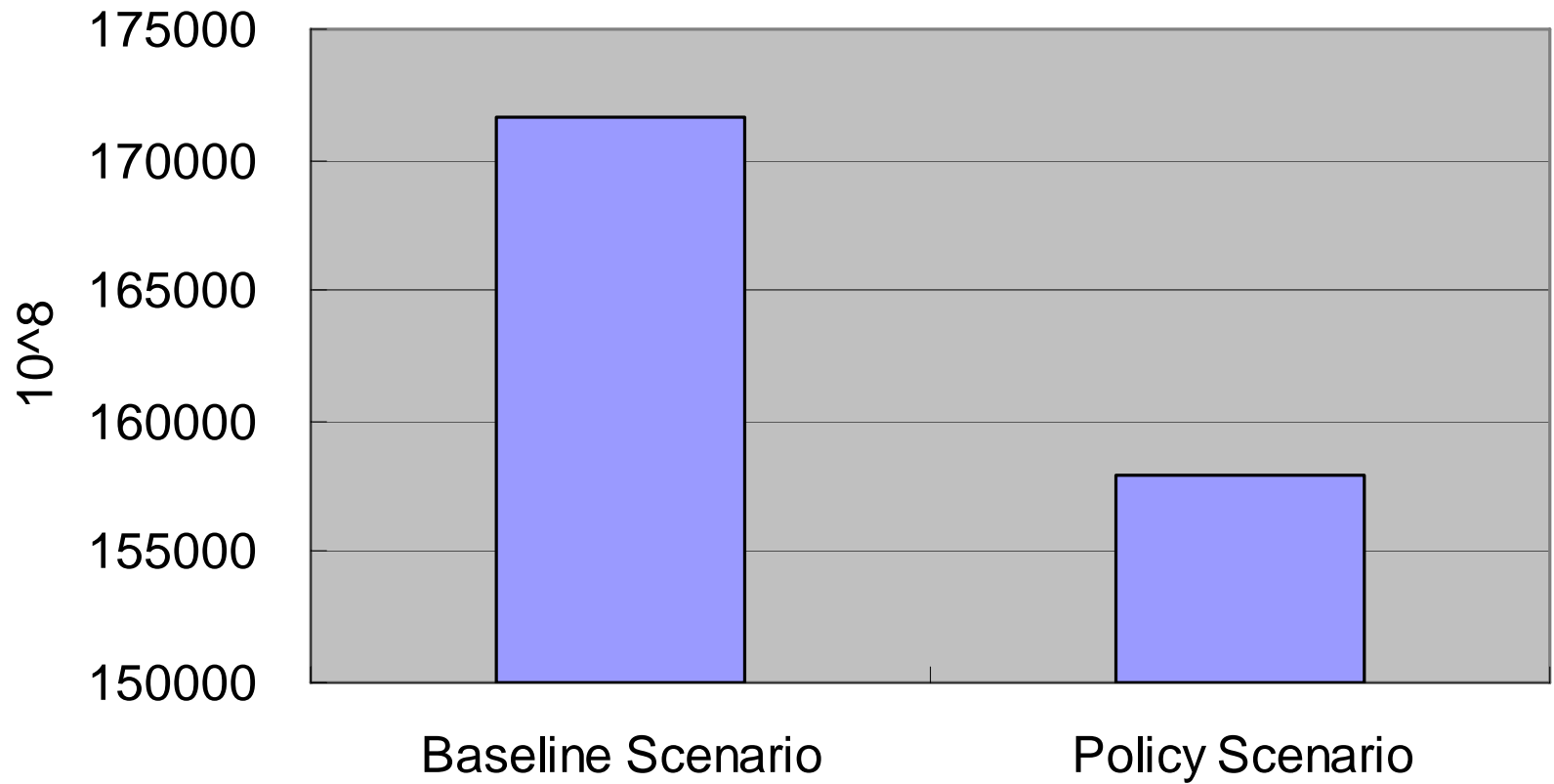
Energy Expenditure on Energy



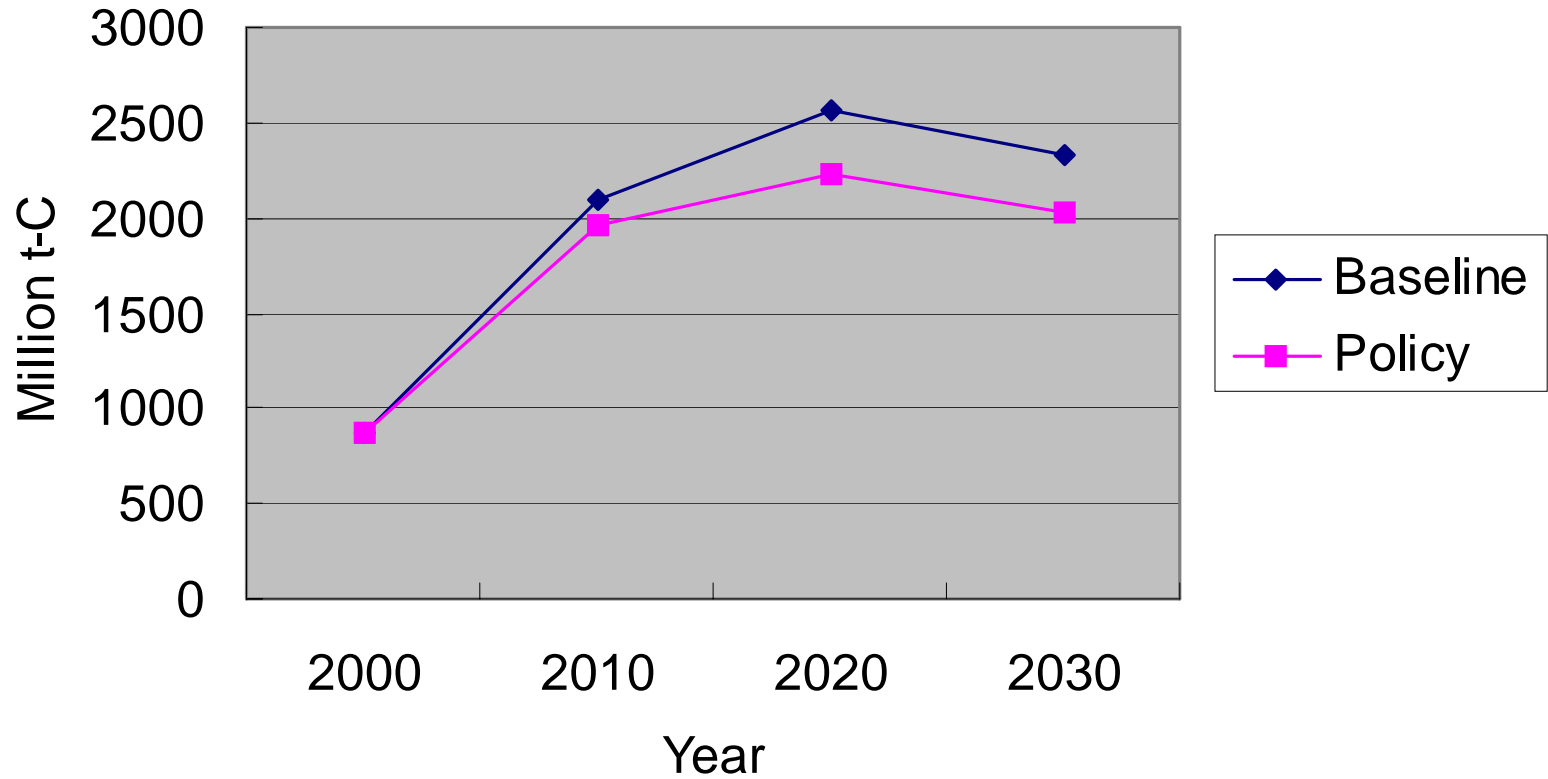
Investment Demand on Energy Industry in China



Accumulated Investment on Energy Industry in China, 2005-2030



CO2 Emission in China



AIM/Local-China

- Three new sectors: Ammonia, Ethylene, Refinery
- Macro-economic data revised
- Revised for non-ferrous: separate copper, aluminum, lead and zinc.
- Revised for cement: more than 200 LPS
- Revised for electric Power generation sector: 100more LPS
- Check SO₂ emission by province.

AIM/Local-China: Next

- Finish new version of AIM/Local-China before May
- Link with GIS for output
- Discuss about the direction of AIM/Local-China
- Used for provincial energy target and emission target analysis
- Support other studies: Gains-Asia Project

AIM/Local-China: Future Direction

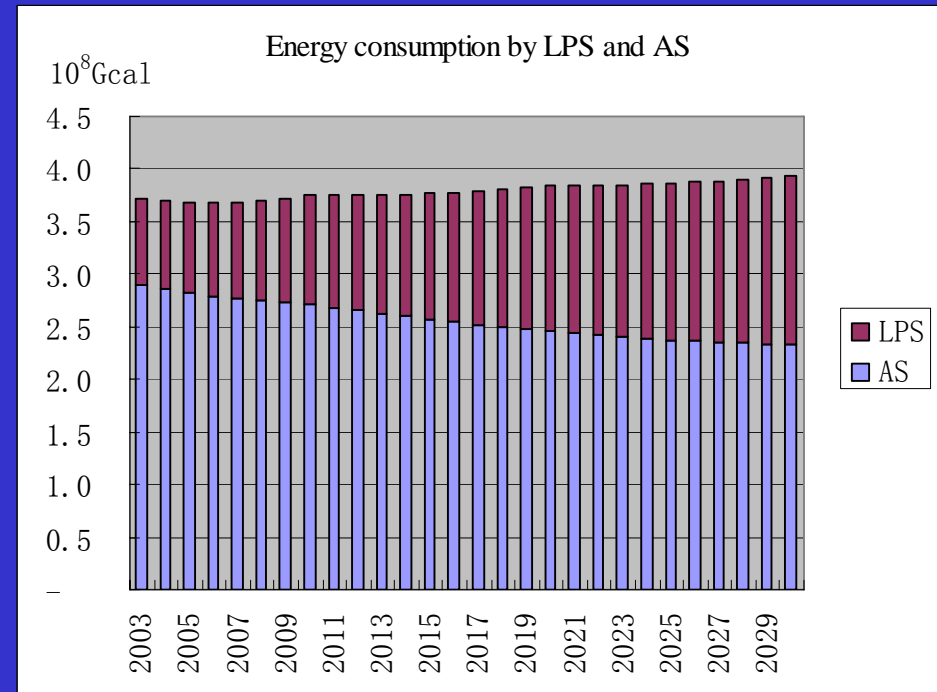
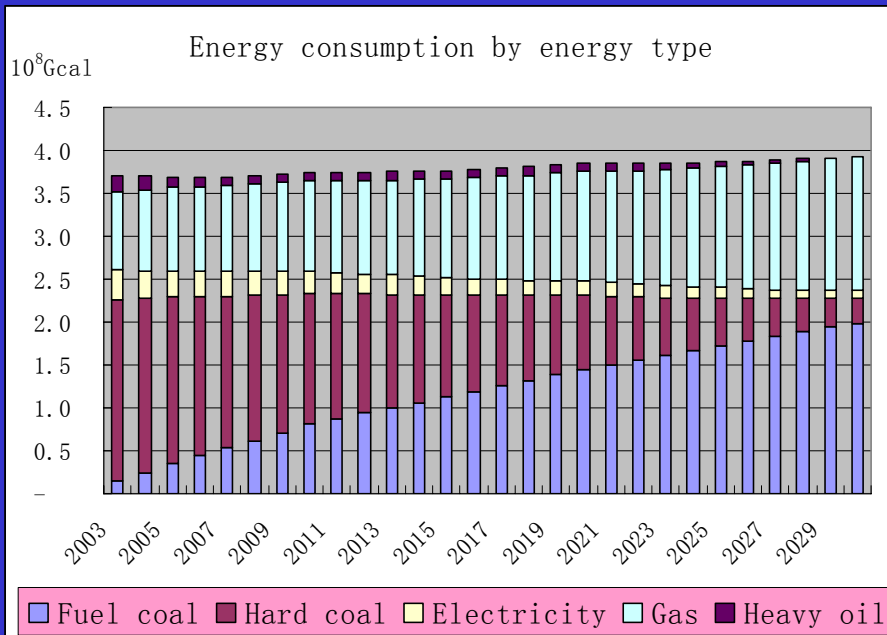
- Provincial energy demand and emission scenarios
- Regional economic, energy and environment development analysis: western, north-eastern, middle, and coastal area
- Energy flow maybe necessary to be included
- More detailed information on energy supply, by grade of energy resource.

LPS in non-ferrous: example

Copper (1000t)					
LPS	2000	2005	2010	2020	2030
Zhongtiaoshan Nonferrous Metals Co.Ltd	32. 567	27. 225	90	150	150
Shanghai Xinye Copper Co.Ltd	0	55. 568	210	280	280
Zhangjiagang Joint Copper Co.Ltd	0	122. 116	250	250	250
Ningbo Jintian Copper Co.Ltd	0	100. 01	260	260	260
Tongling Nonferrous Metals Co.	172. 225	361. 7	361. 7	420	420
Jiangxi Copper Co.	194. 225	421. 738	421. 738	450	450
Daye Nonferrous Metals Co.	0	179. 191	179. 191	220	220
Yunnan Copper Group Co.	151. 596	322. 551	322. 551	350	350
Jinchuan Nonferrous Metals.Co.	0	156. 3	300	300	300
Baiyin Nonferrous Metals Co.	52. 949	77. 527	180	180	180
Shandong Jinsheng	0	0	0	400	400
Total	603. 562	1823. 926	2575. 18	3260	3260
		70. 14%	61. 31%	50. 15%	50. 15%
		2600. 406	4200	6500	6500

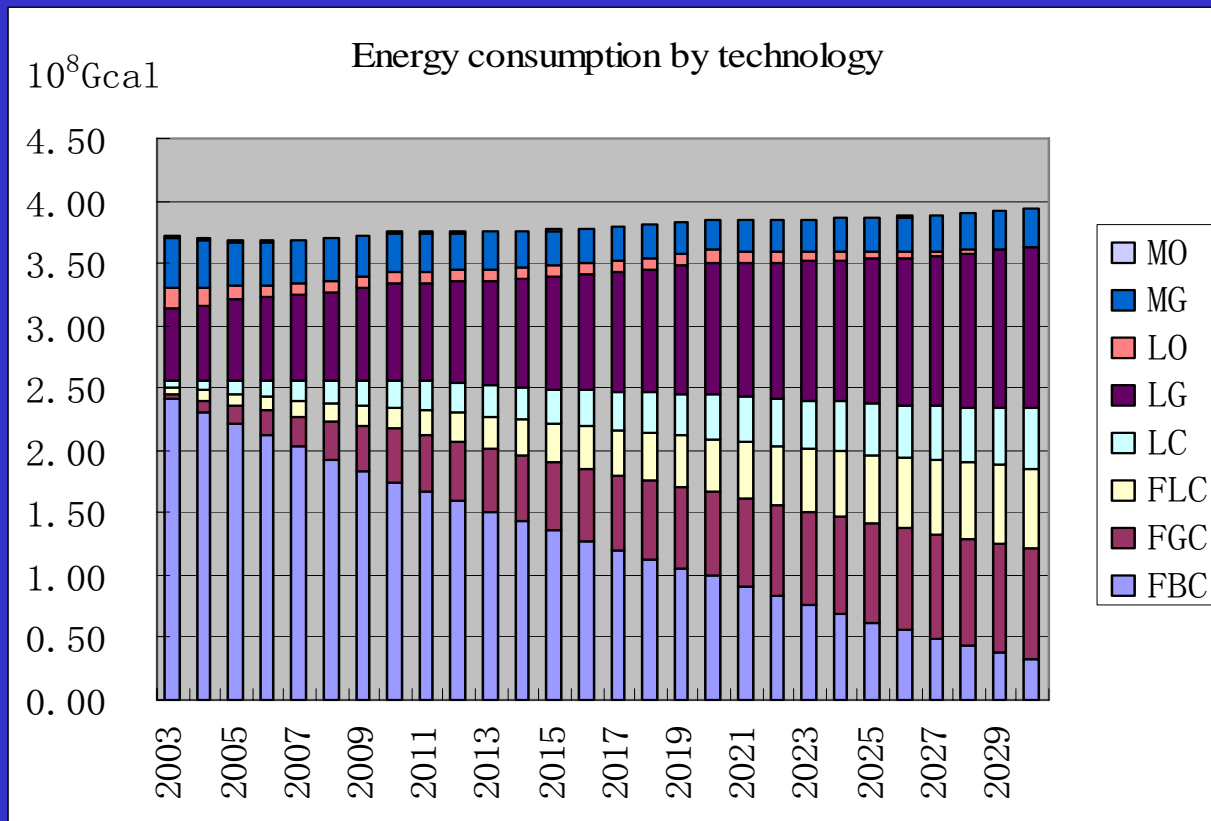
Modeling result for Ammonia- BAU scenario

- Energy consumption
 - By LPS and AS (upper right)
 - By energy type (lower left)



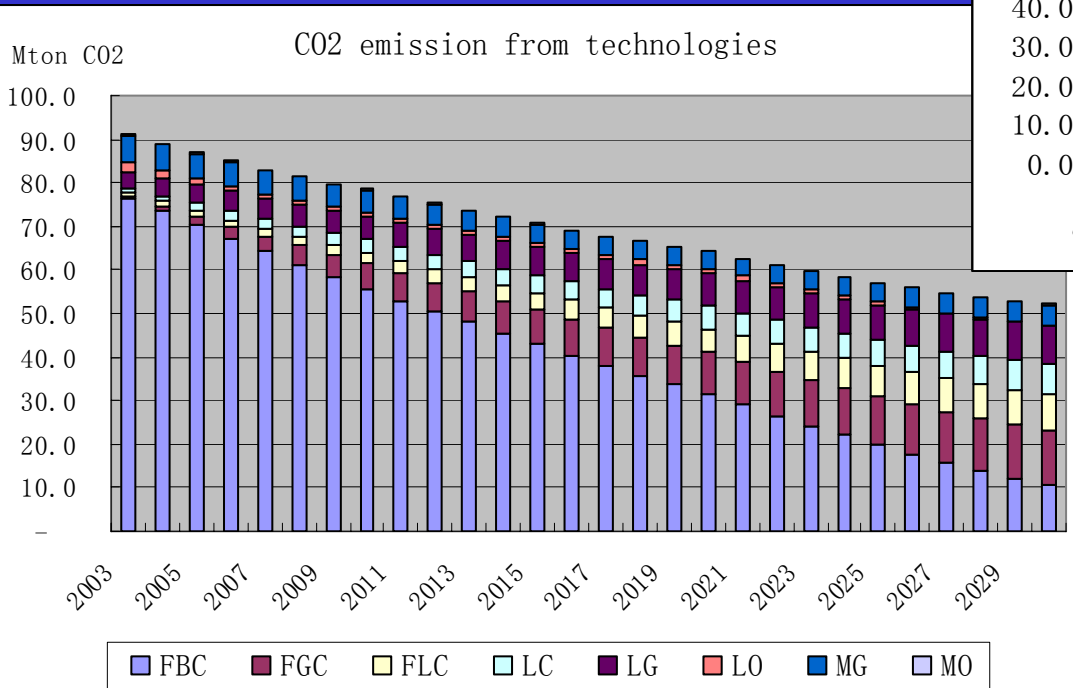
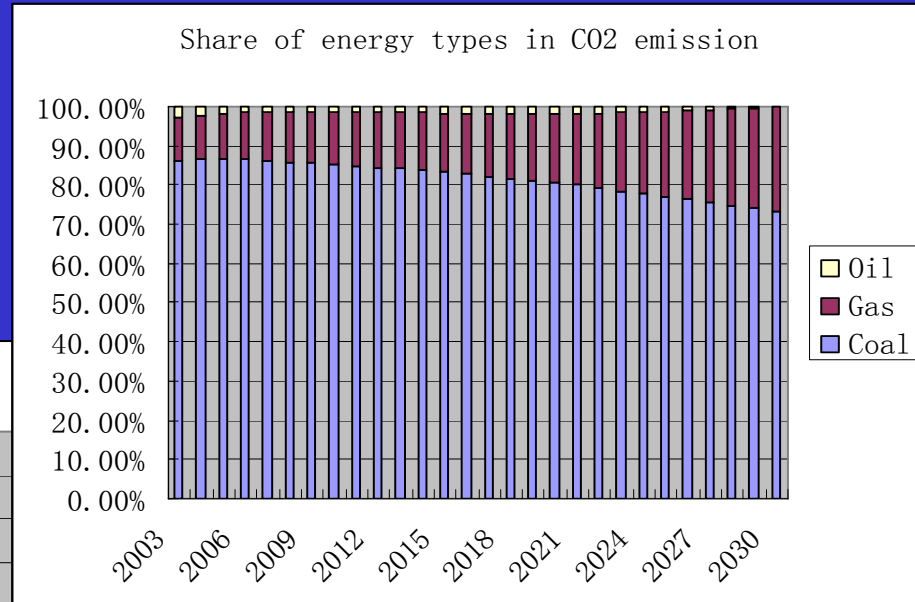
Modeling result for Ammonia- BAU scenario

- Energy consumption by technology



Modeling result - BAU scenario

- CO2 Emissions
 - By energy (upper right)
 - By technology (lower left)



APEIS

- Identify SPOs for China
- Start to use Snapshot
- Preliminary reporting
- A Common SPO database is necessary

11th Five Year Plan Energy Target Assessment: Objectives

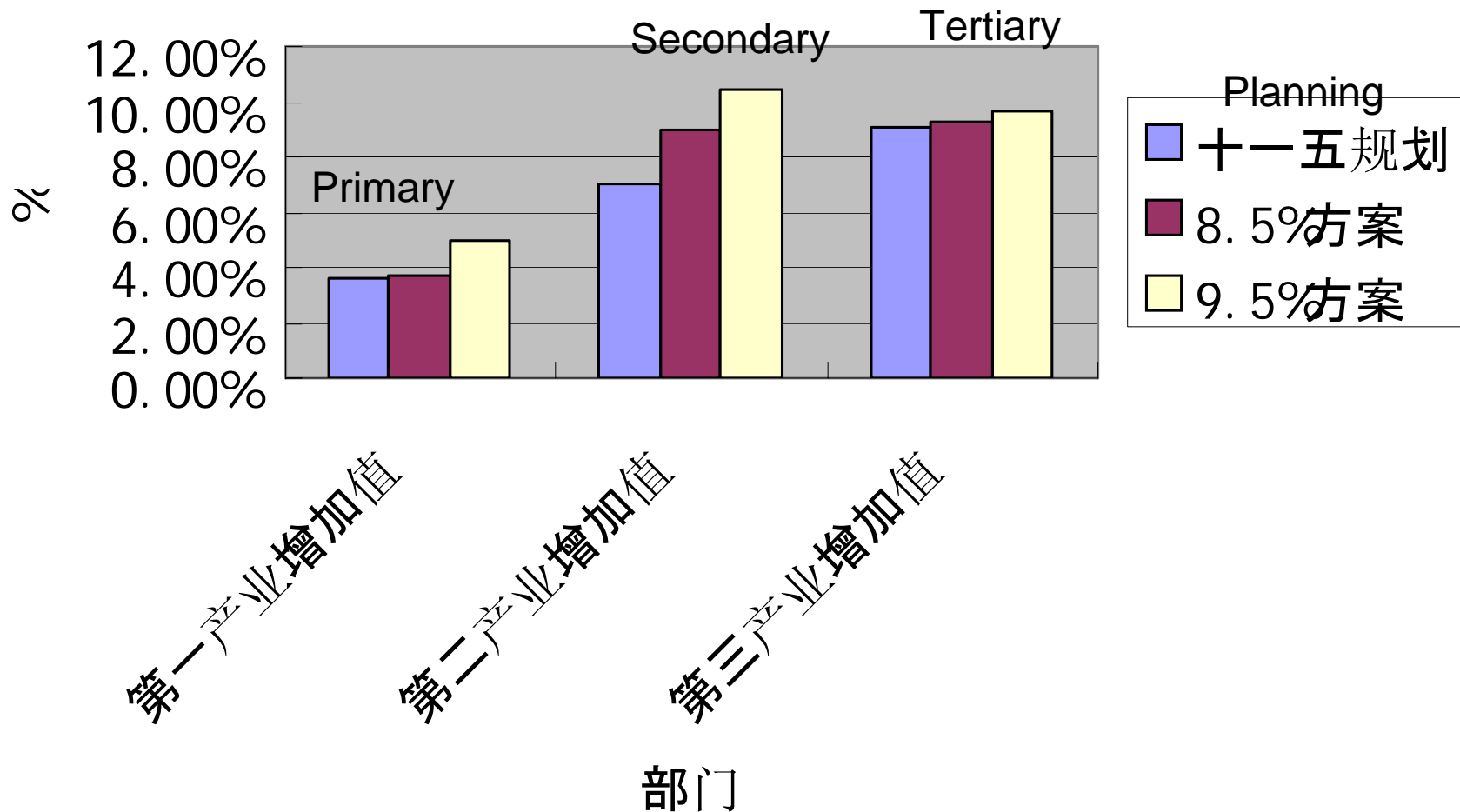
- Identify potential to reach the target
- Identify the contribution of economic mix optimization and technology progress
- Identify the contribution by sectors
- Identify necessary policy options to reach the target

Methodology for 20% Energy Target Sector Based Analysis

- ✓ Distribute GDP by sectors with IPAC-AIM/CGE model, three scenarios: national planning growth rate, 8.5% growth rate scenario, 9.5% growth rate scenario
- ✓ Physical output by major energy intensive sectors by linking with value added (mix change of products in the sector, price index etc.)
- ✓ Energy demand simulation by IPAC-AIM/Technology model
- ✓ Identify the sector contribution to 20% target
- ✓ Policy assessment and recommendation

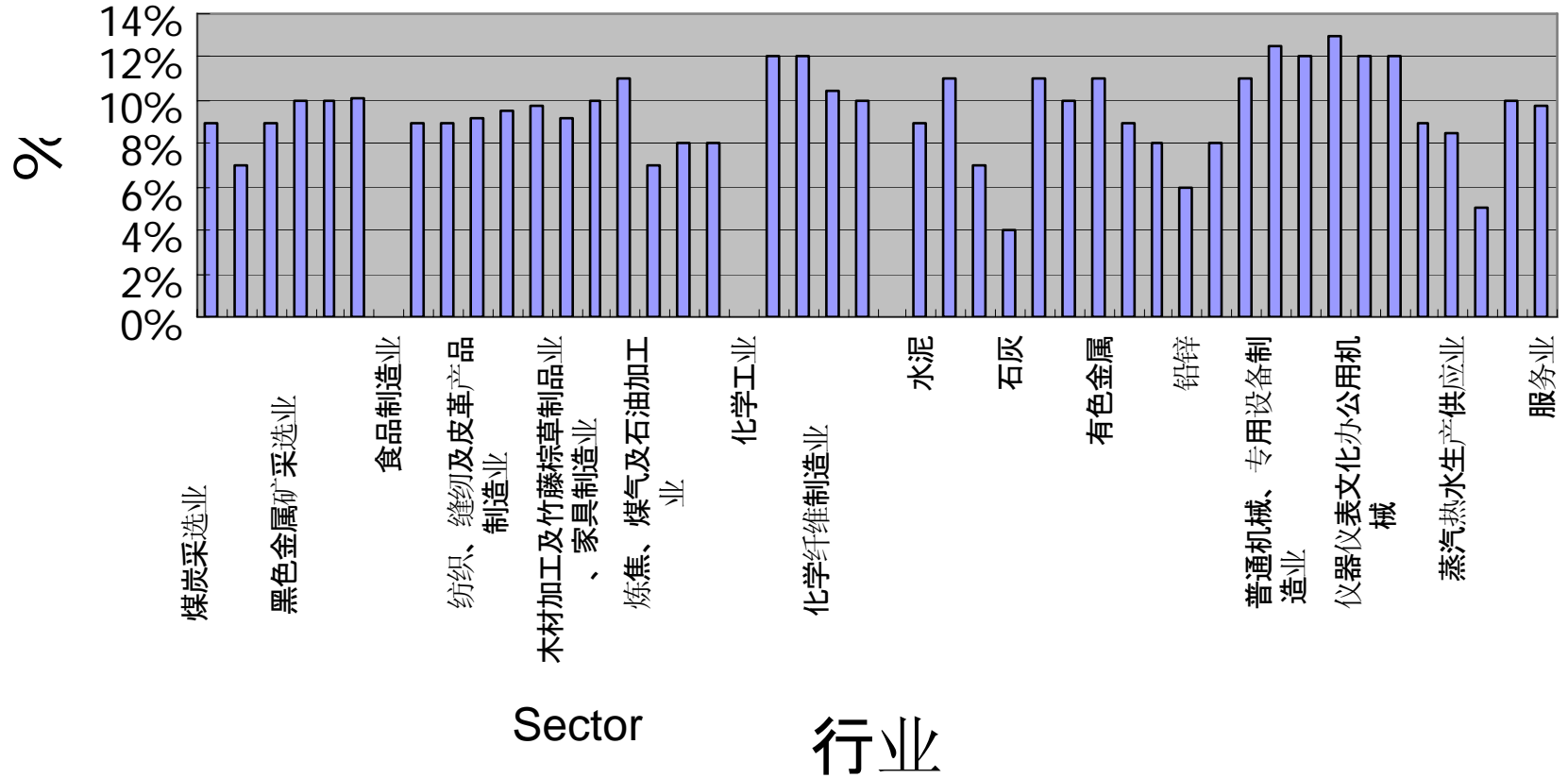
GDP Growth in 11th Five Year Plan and higher growth scenario

十一五经济增长



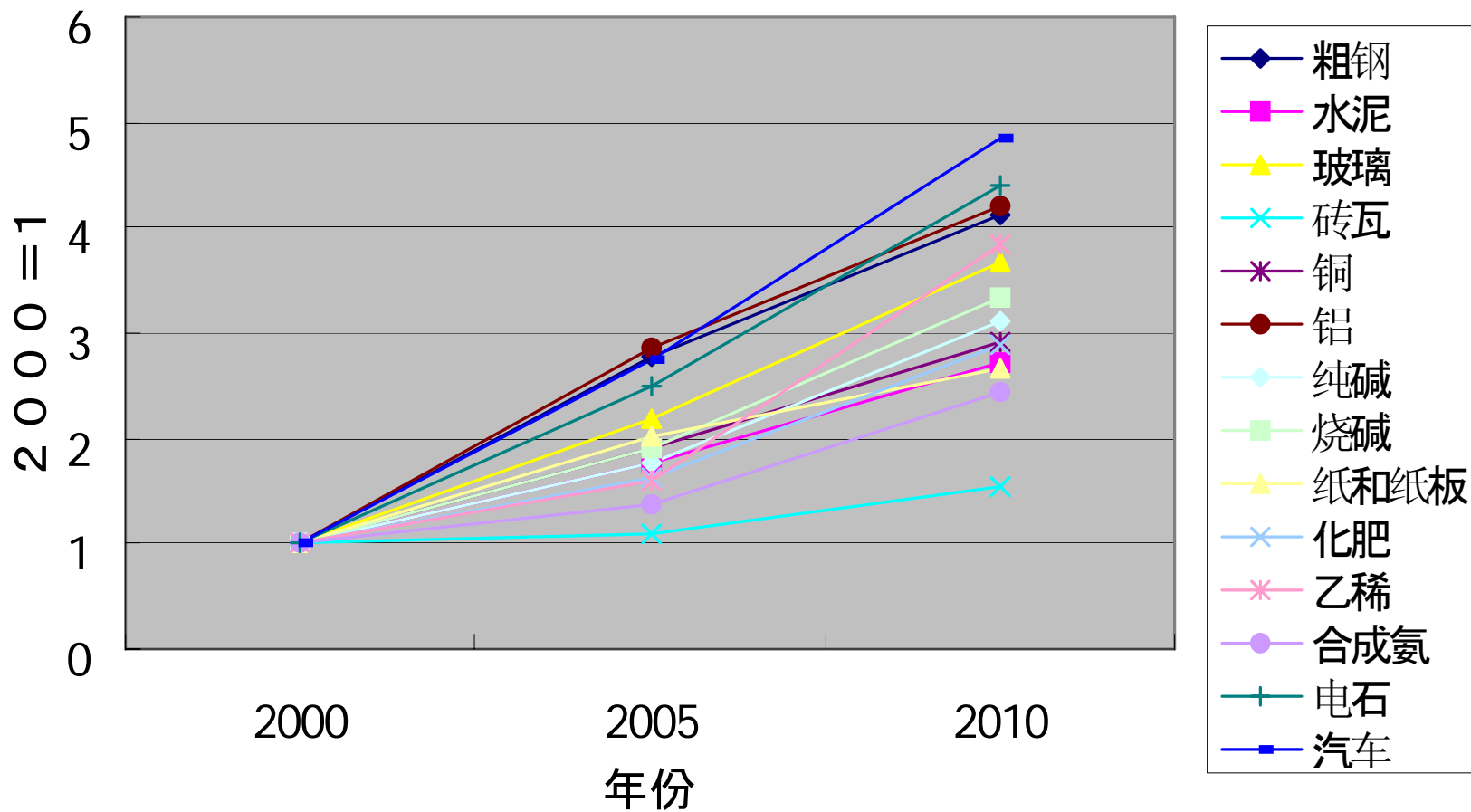
GDP Growth by Sector, 9.5% scenario

2005-2010年GDP增长: 9.5%方案



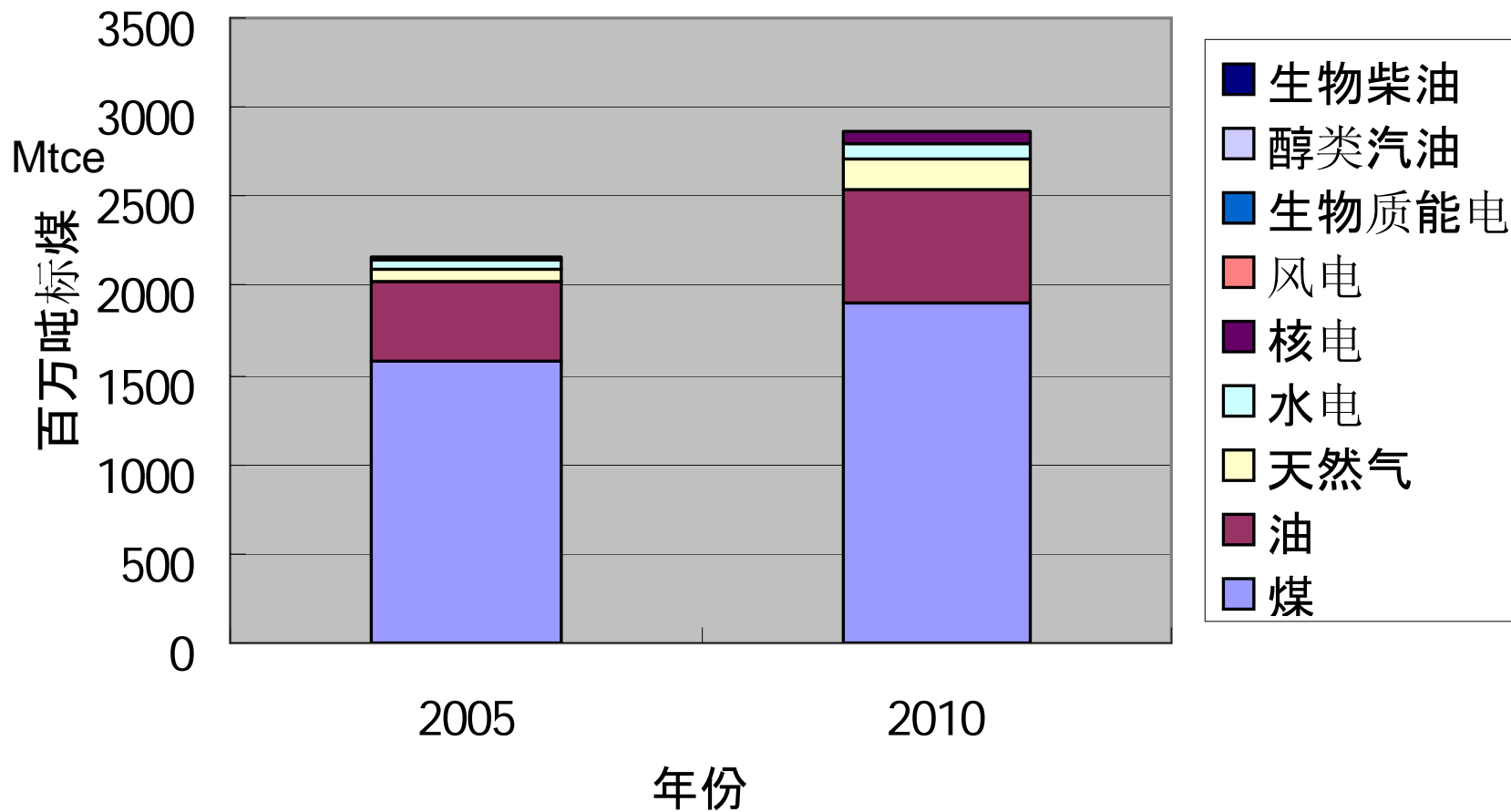
Energy intensive products output index

主要高耗能产品预测, 9.5%方案



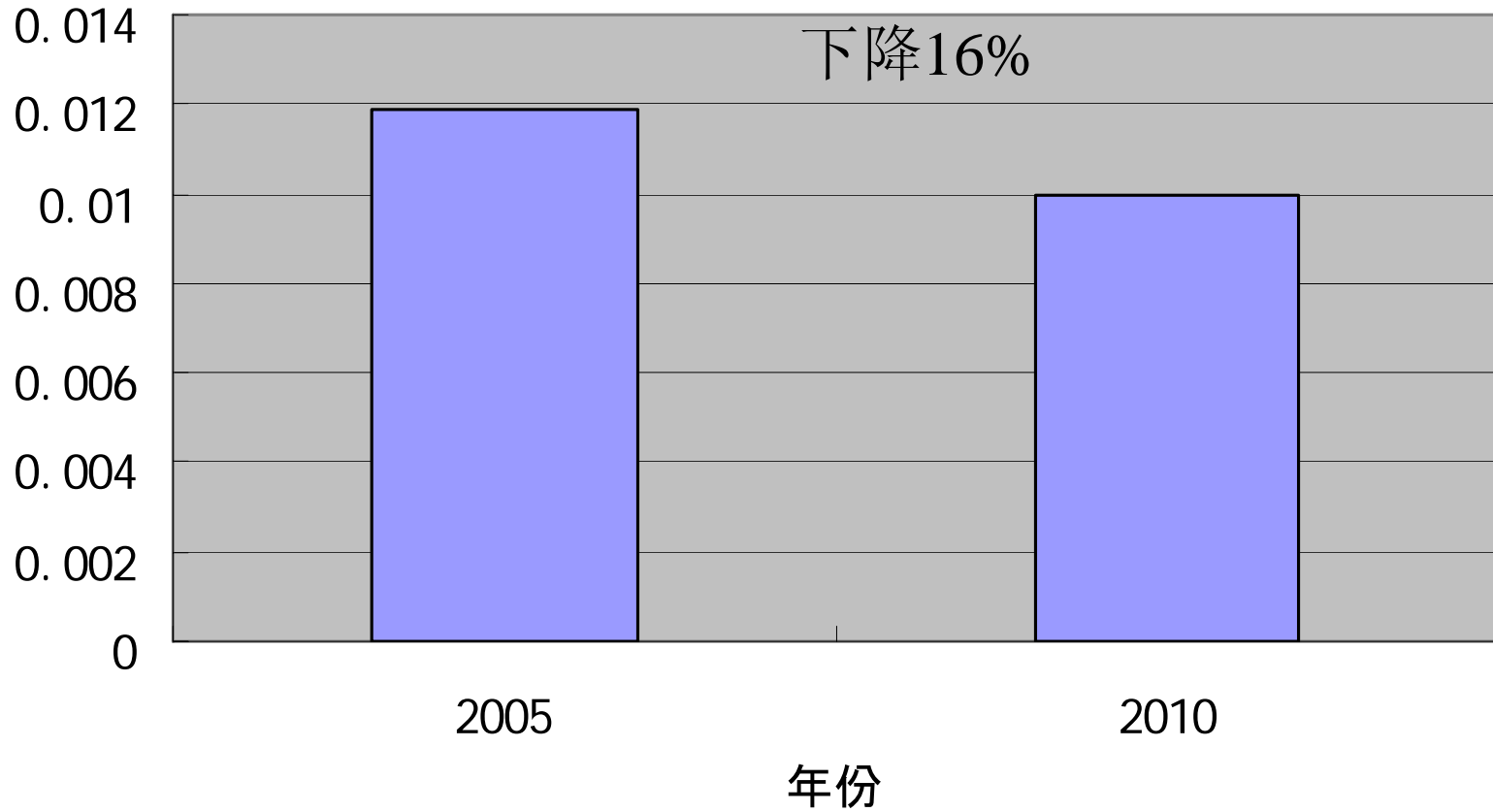
Primary energy demand, 9.5% scenario

一次能源需求量, 9.5%方案



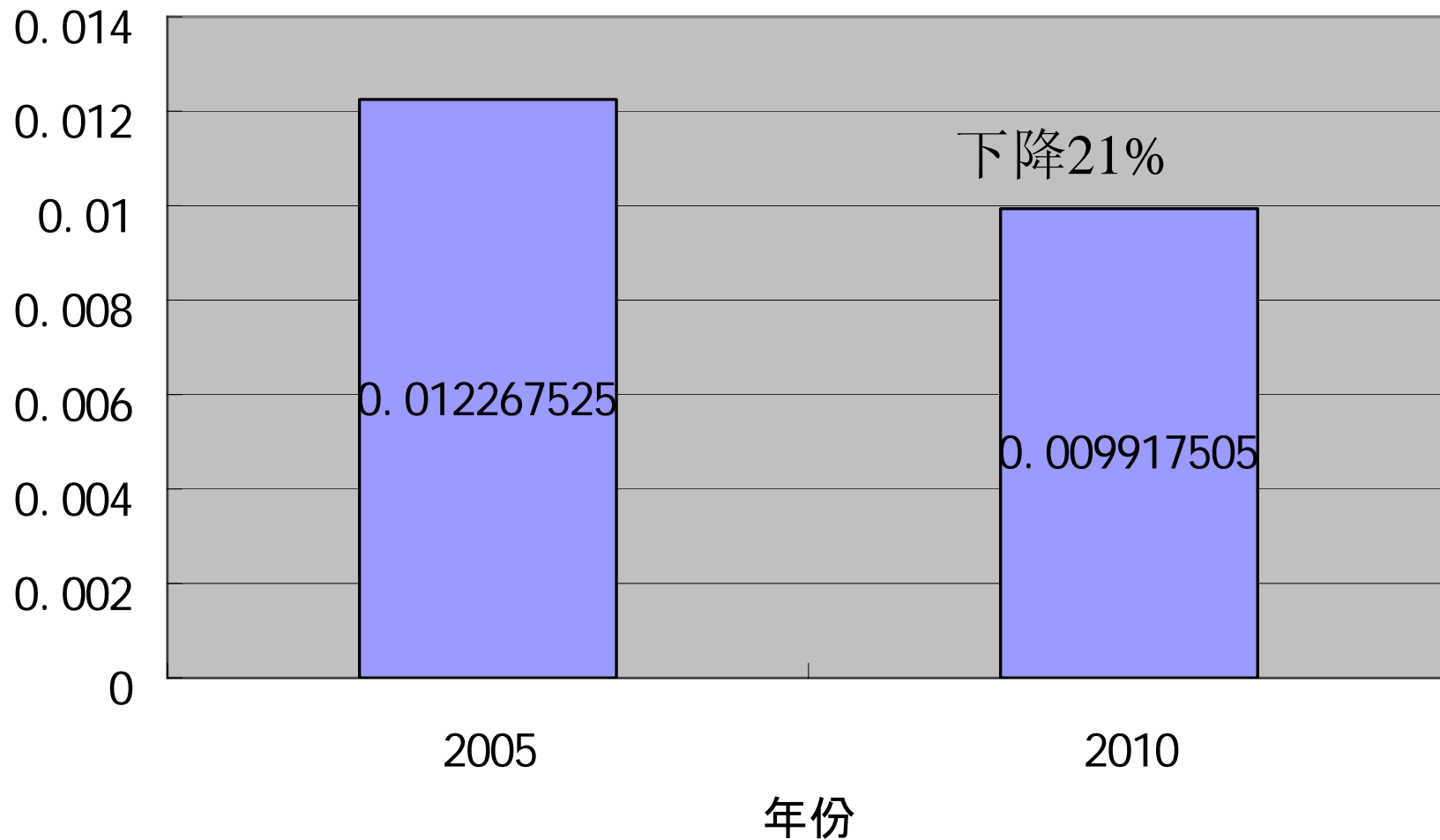
Energy intensity, 9.5% scenario

能源强度, 9.5%方案

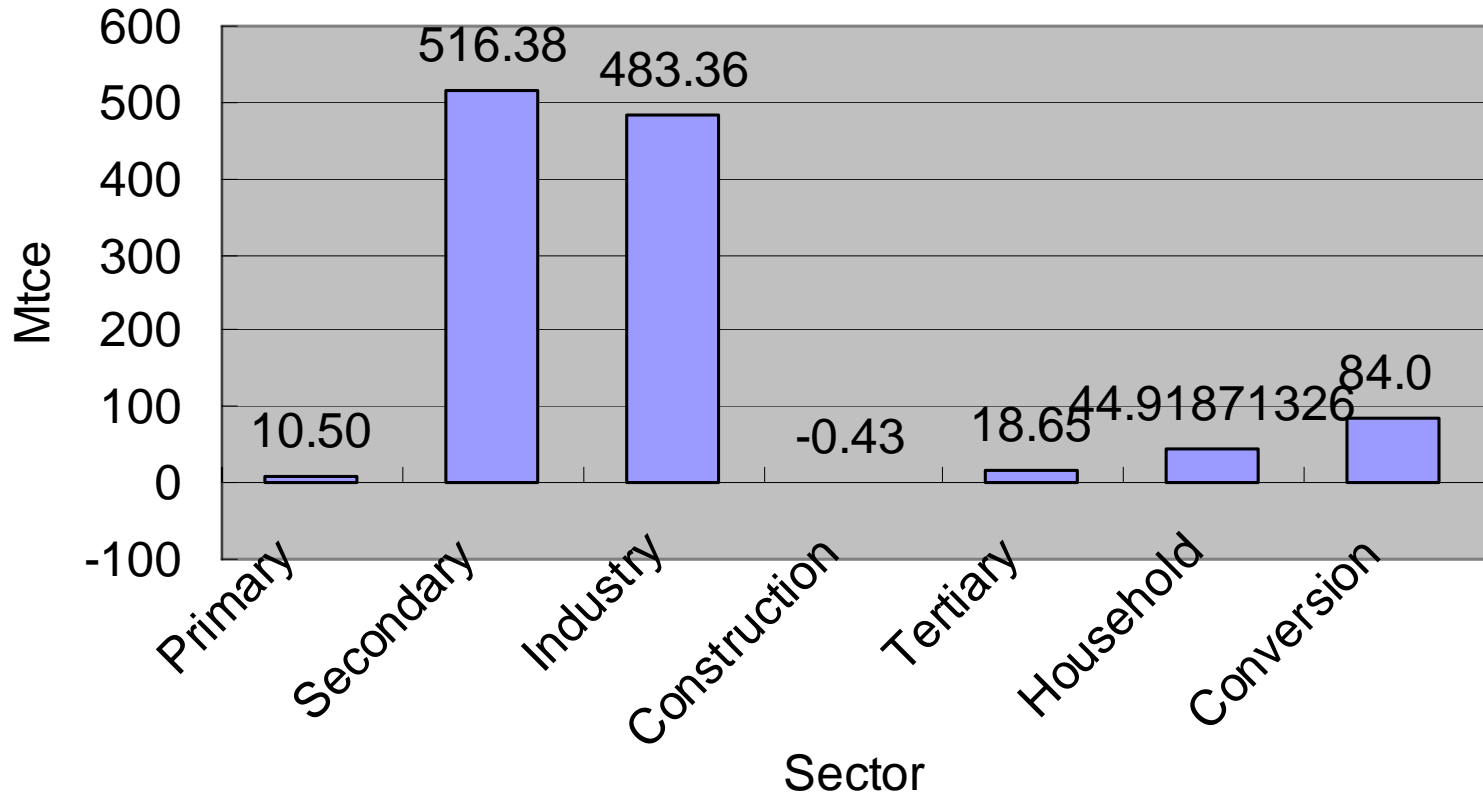


Energy intensity, 9.5% policy scenario

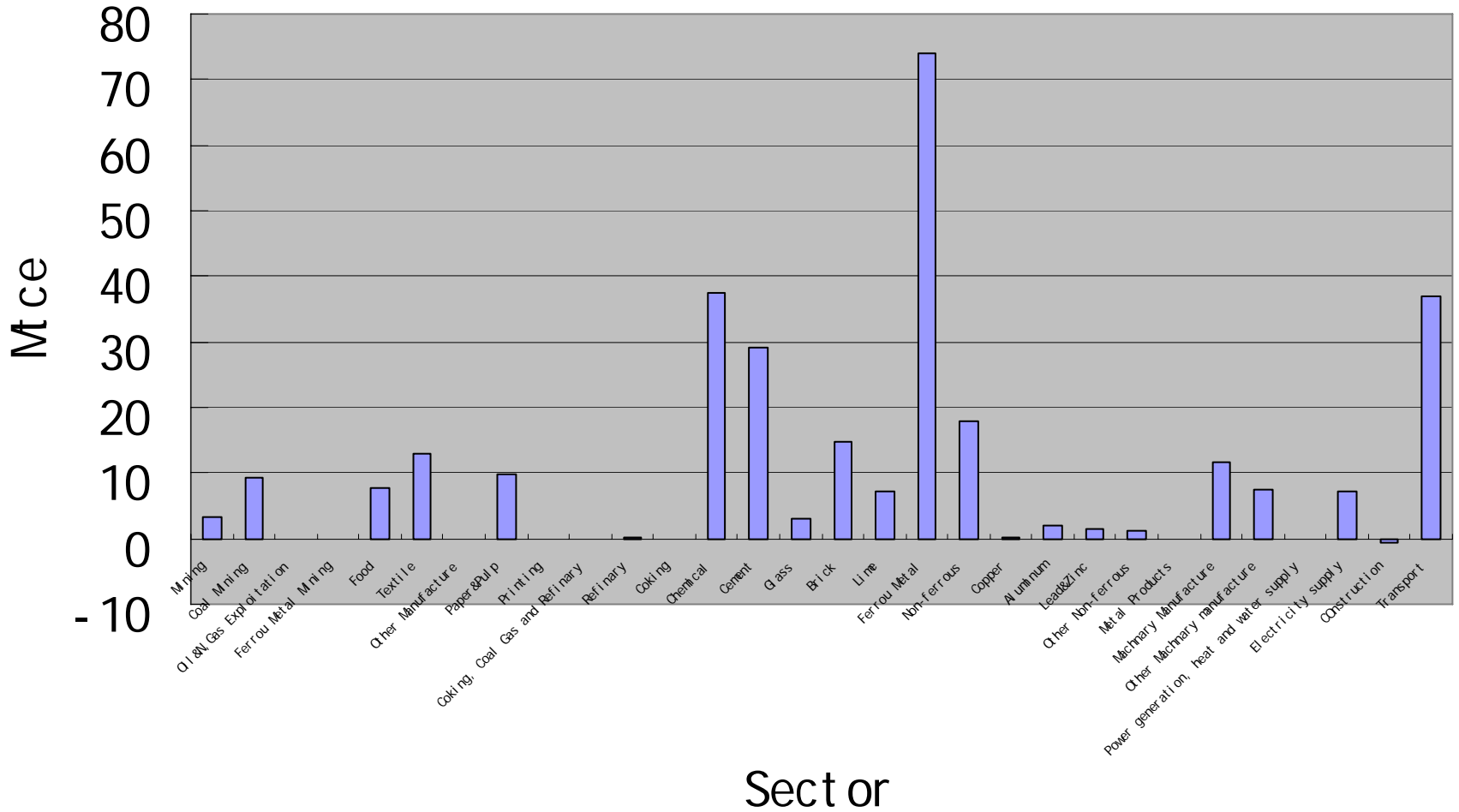
能源强度, 9.5%方案一政策情景



Contribution by Sector to the 20% target



Energy Saving by Sector, 9.5% Policy Scenario



Policy Options

- ✓ Fiscal Policies:
 - Fuel tax, at 2008
 - Levy export tax, and reduce payback for value-added tax for energy intensive products (government announced the new regulation in last half of 2006, twice)
- ✓ Investment policies
 - Much more investment on environment friendly city development(landfill, waste water processing etc.)
 - Investment on public transport, especially on subway and city railway
 - Using government policy to change the way for private investment

Policy Options

- ✓ Energy saving:
 - Industry energy saving policies
 - Raising significantly energy efficiency standard(many new technologies are already available)
 - Building energy efficiency standard

- ✓ Renewable energy policies
- ✓ Environment policies
 - co-benefit/conflict between energy and environment
 - Rich region in China should change their principal for local development (reached Europe GDP/capita based on PPP)

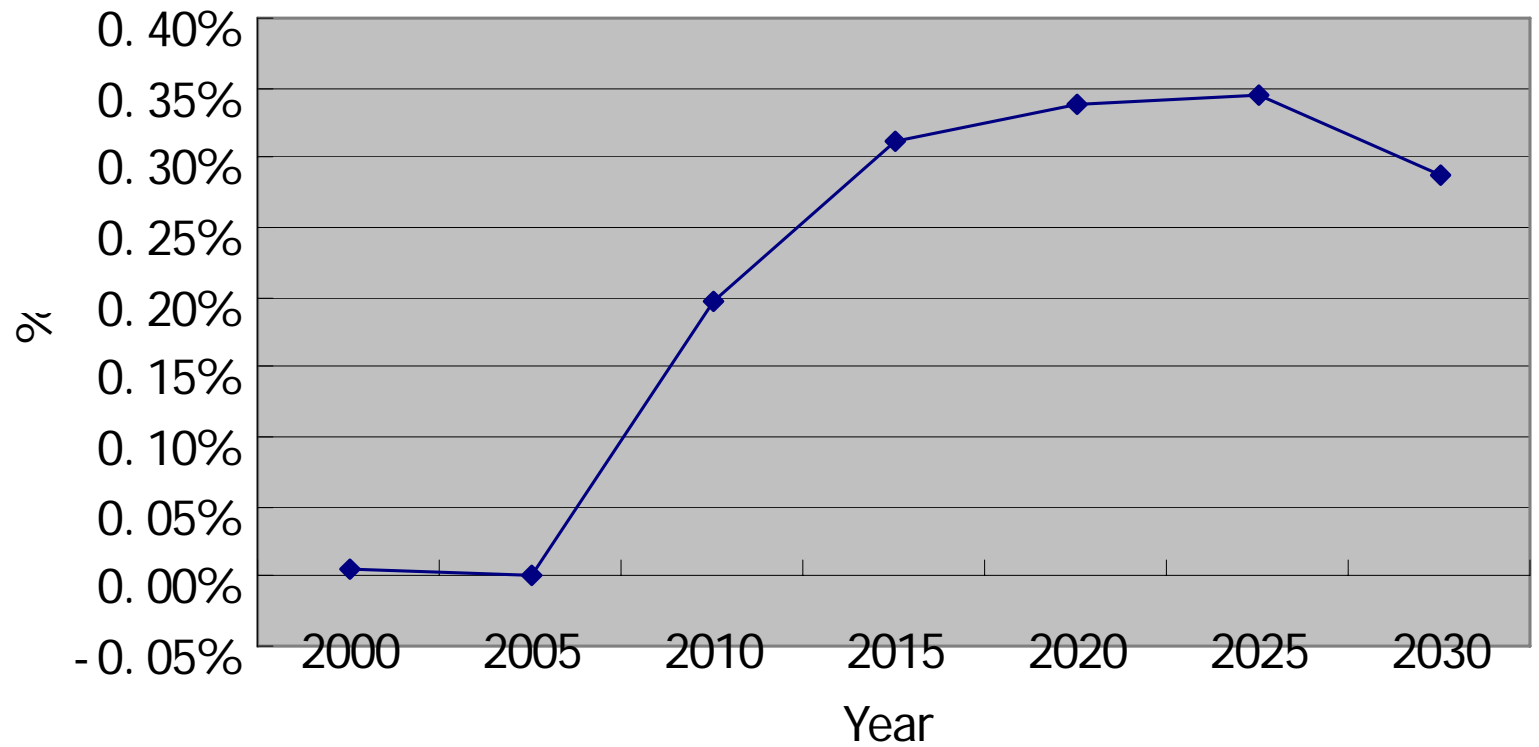
Energy Tax Assessment

- Design the energy tax system
- Assessment the tax rate by using IPAC-SGM and IPAC-AIM/Technology Model

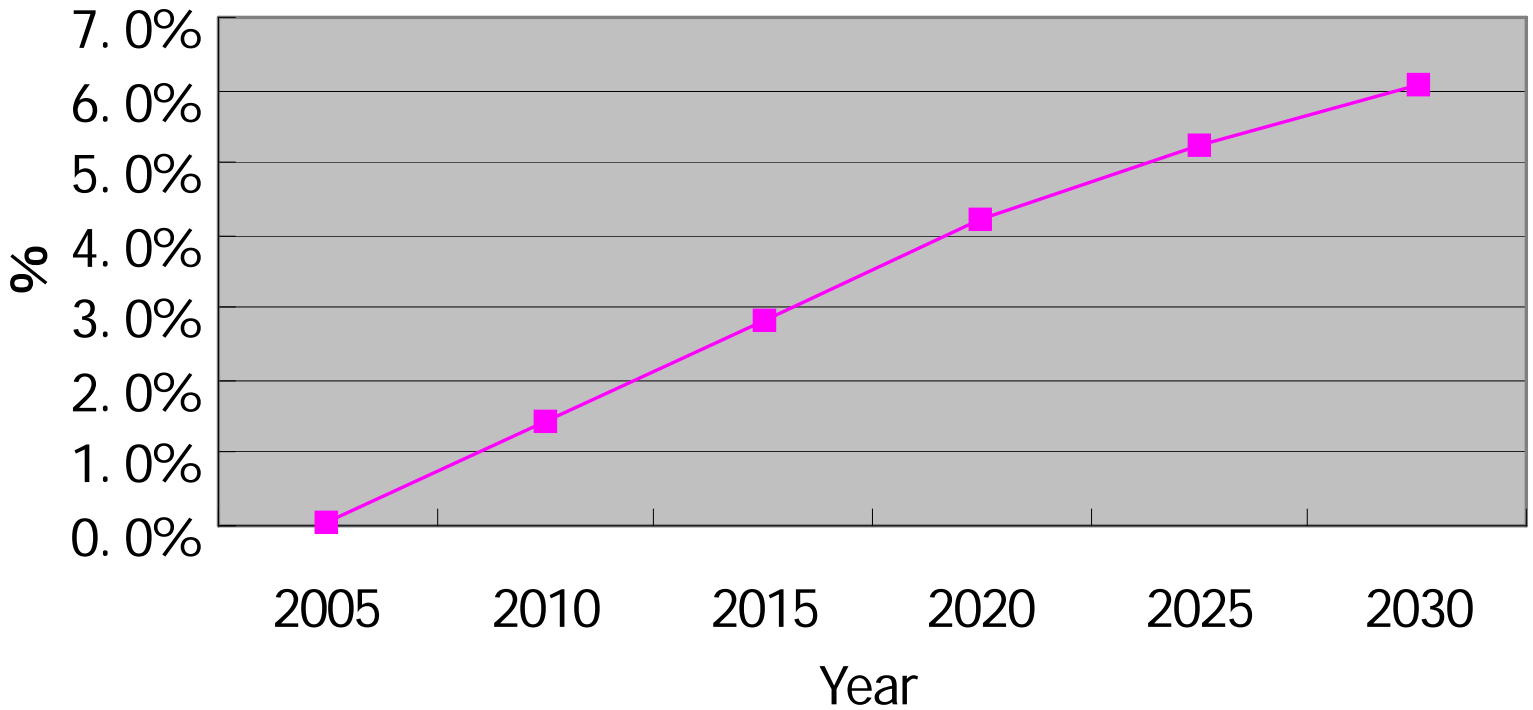
Fuel Tax Assessment

- Decide best tax rate by using IPAC-SGM and IPAC-AIM/Technology Model

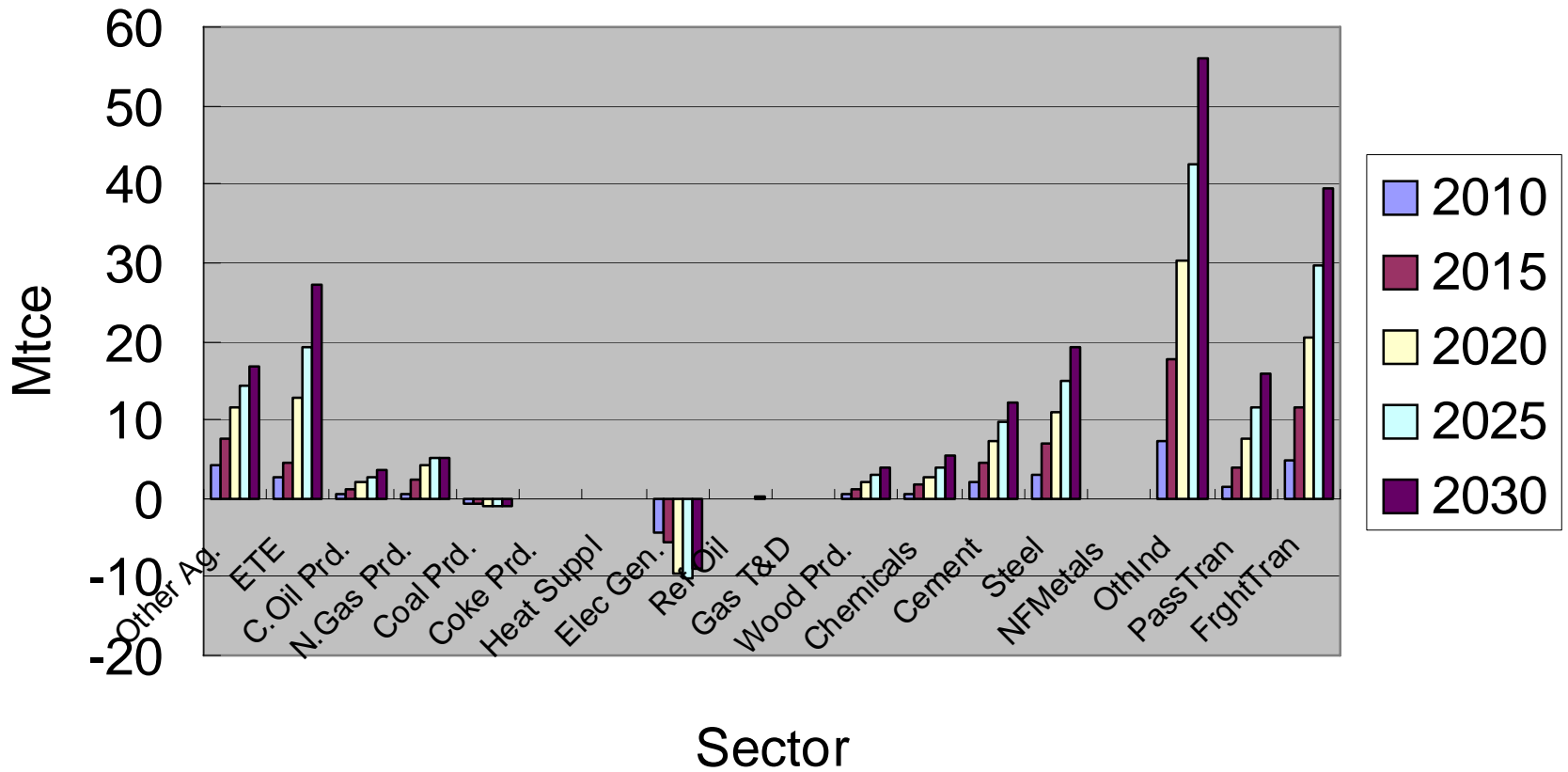
GDP Loss by Fuel Tax, Fuel tax rate case 1



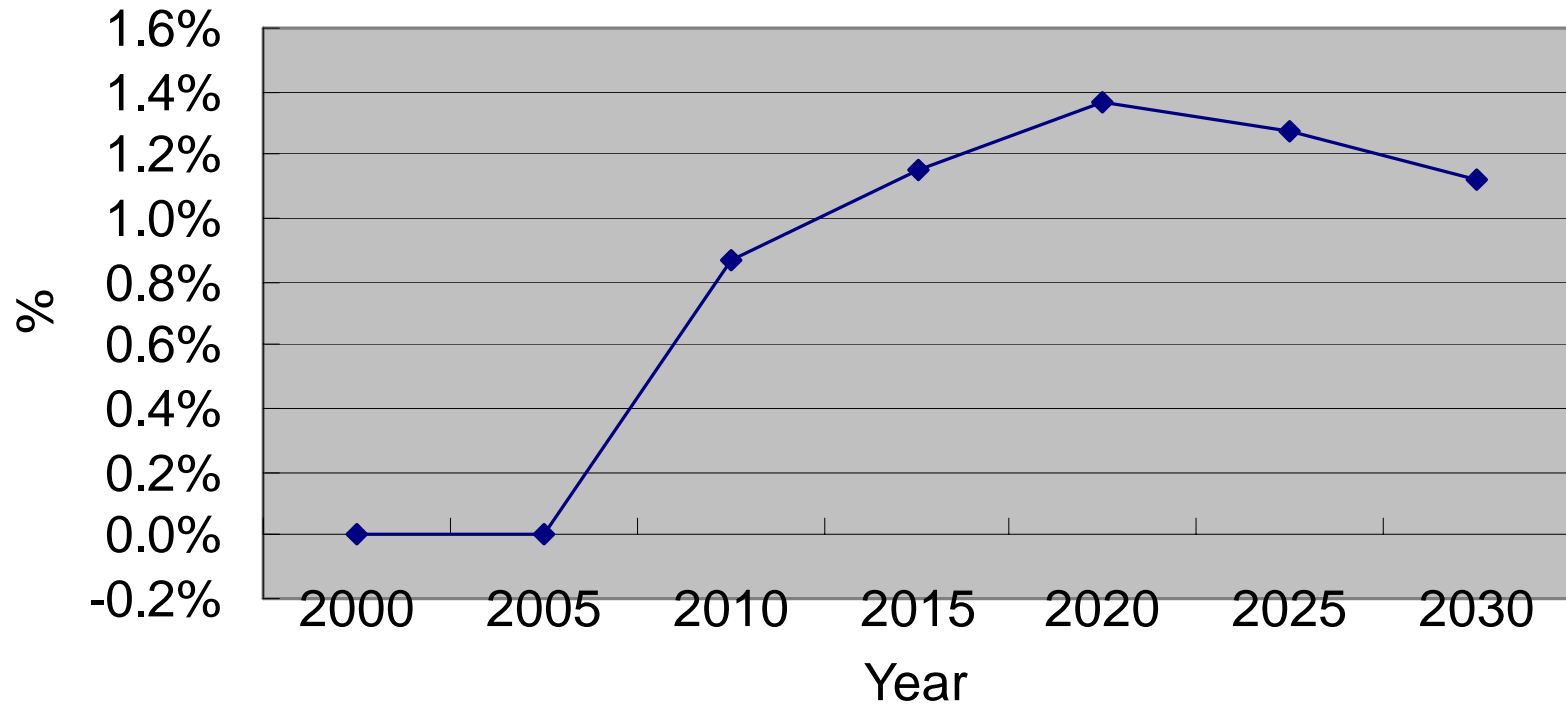
Energy Saving Rate, Fuel tax case 1



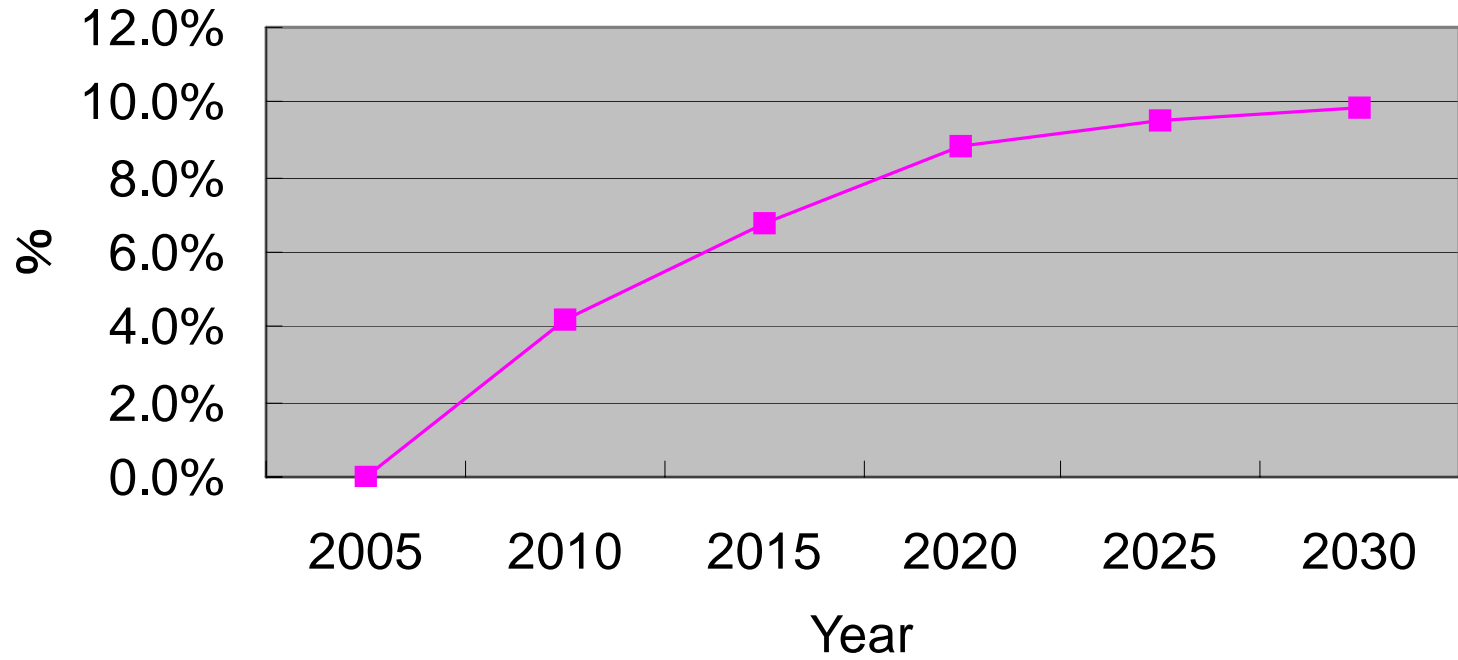
Energy Saving by Sectors, fuel tax case 1



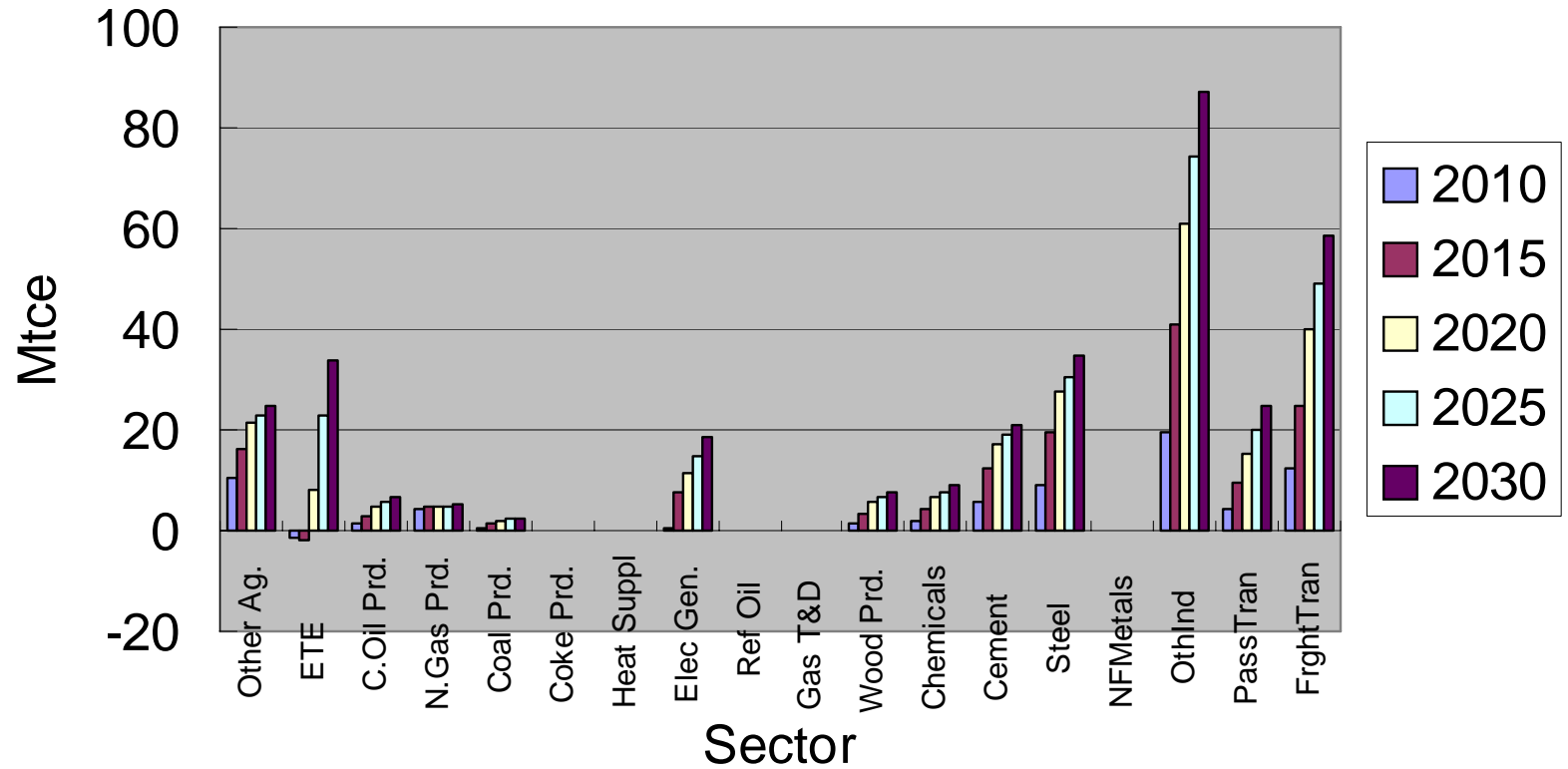
GDP loss by Fuel Tax, case 6



Energy Saving Rate, Fuel Tax case 6



Energy Saving by Sectors, fuel tax case 6



IPAC Contribution to international study

- New IPCC scenario database
- Input for New GCM run
- IPCC New Emission Scenario discussion
- EMF-22
- IEA WEO-2006/IEA WEO-2007

Our next study: Energy

- Energy tax system: finish by end of this year and ready to report to government and public
- Quantification analysis for 20% energy intensity target
- Early Warning System: A few days to 2 year
- Energy Scenarios, 2020/2050
- Energy Technology R&D Assessment
- Energy Intensive Products Forecast
- Circulating Economy Modeling
- Regional Energy Future

Our next study: Climate Change

- 2050 Emission Scenario: together with other country team, focusing on the common target in 2050
- EMF-22
- Modeling extension for new IPCC scenarios
- Study on collaboration of APP, what is Chinese demand
- Study on China-EU Partnership: what should we do.
- Post-Kyoto Commitment