Energy Future and Policies: AIM-China Activities

AIM-China/Emission Team

13th AIM International Workshop, Feb.17-18, 2008

AIM-China Modeling Activities

- Energy and GHG Emission scenario up to 2030
- 2050 Study
- Energy Tax Assessment
- Post-2012 options for China
- Key technology options and assessment
- Assessment for Summer time
- AIM-Local/China

Energy and GHG Emission scenario up to 2030

- Energy Strategy energy scenarios
- World bank energy scenarios: Baseline and rebalance scenario
- IEA WEO-2007

GDP and Its Growth Rate Projection in China from 2000 to 2030

		2000	2005	2010	2020	2030
Low Economic Growth	GDP, billion Yuan	9800	18395.6	28827.1	59413.5	106401
	Billion $, by exchange rate	1195	2271	3744	7716	13818
	Billion $, by PPP		9349	14650	30195	54075
	Growth rate, %		9.48	7.6	6.7	5.4
Structure	Primary industry	16.4	12.4	11	9	8
	Secondary industry	50.2	47.3	49	47	45
	Tertiary industry	33.4	40.3	40	44	47
High Economic Growth	GDP, billion Yuan	9800	18395.6	29091.5	63390.4	123538
	Billion $, by exchange rate	1195	2271	3778	8233	16044
	Billion $, by PPP		9349	14785	32216	62784
	Growth rate, %		9.48	9.6	8.1	6.9
Structure	Primary industry	16.4	12.4	11	9	7
	Secondary industry	50.2	47.3	51.5	50	45
	Tertiary industry	33.4	40.3	36	40	48

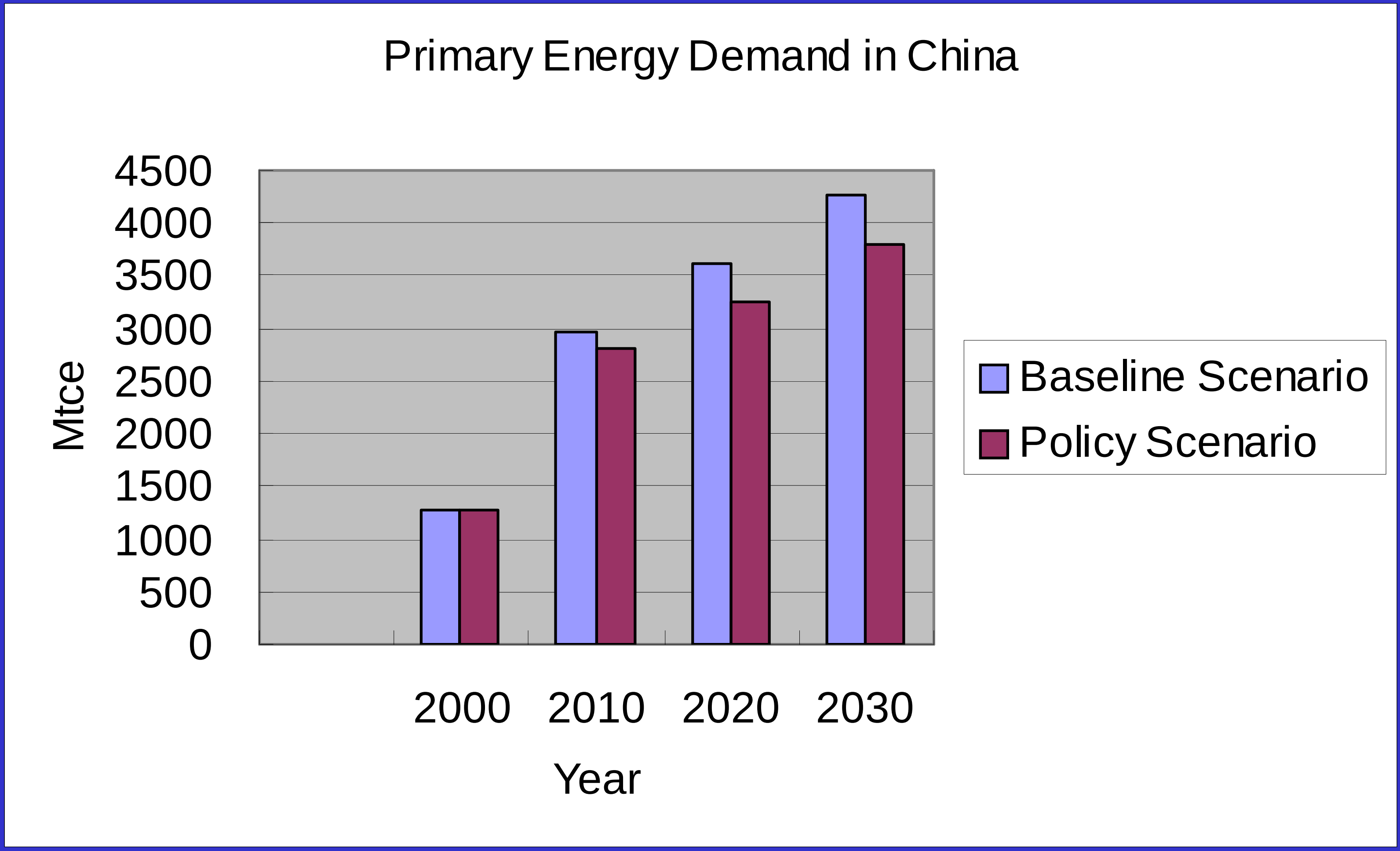
Projection on China's Population during 2000~2030, million units

	1990	2000	2005	2010	2020	2030
Population	1141	1284	1308	1395	1485	1494
Urban	302	465	562.44	683.55	876.15	1000.98
Rural	840	819	745.56	711.45	608.85	493.02
Urbanization rate	26%	36%	43%	49%	59%	67%

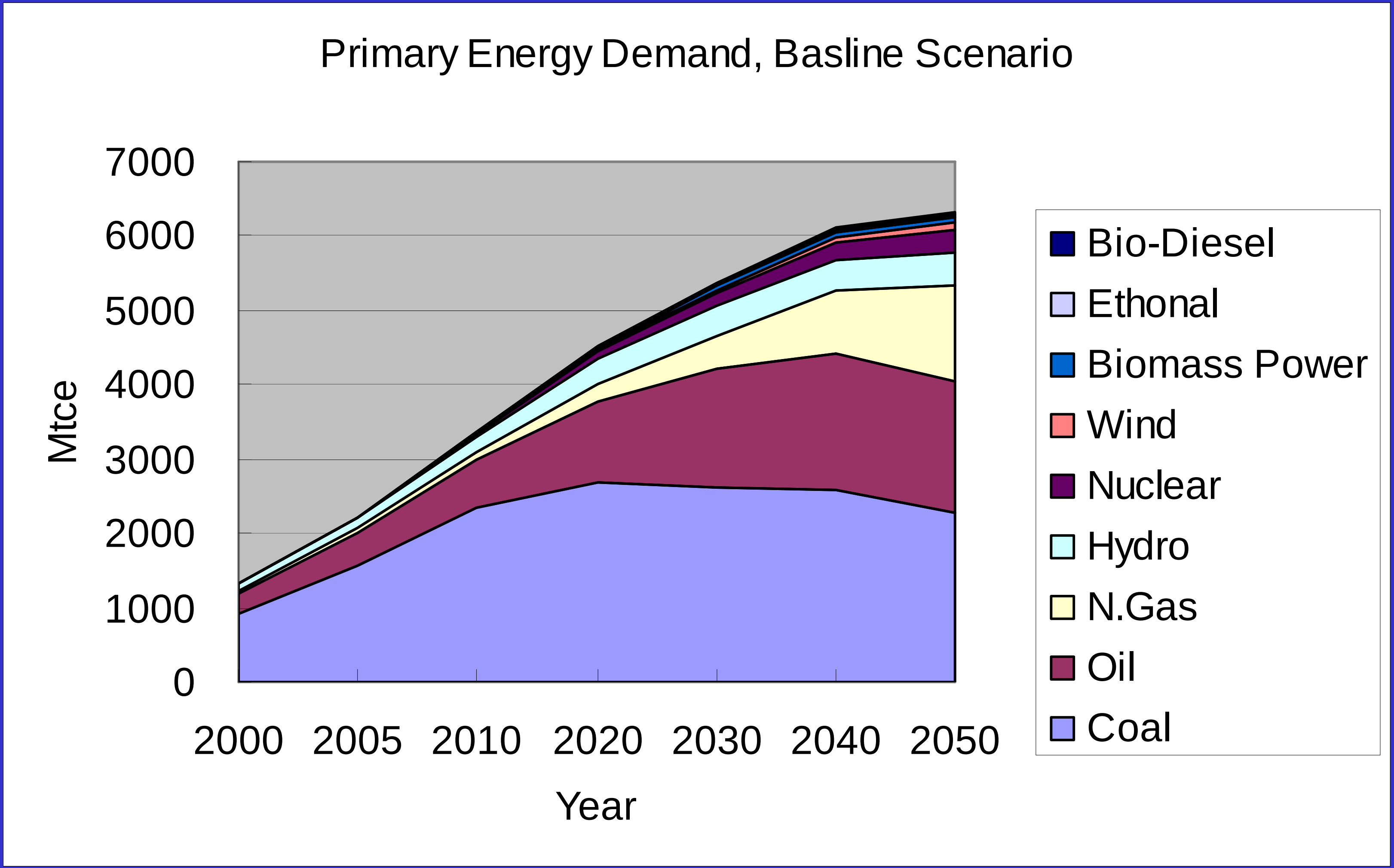
China's GDP Per Capita Projection

		2000	2005	2010	2020	2030
Low Economic Growth	Yuan	7632	14064	20665	40009	71219
	$, by exchange rate	927	1780	2684	5196	9249
	$, by PPP	3879	7148	10502	20333	36195
High Economic Growth	Yuan	7632	14064	20854	42687	82689
	$, by exchange rate	927	1780	2708	5544	10739
	$, by PPP	3879	7148	10598	21694	42024

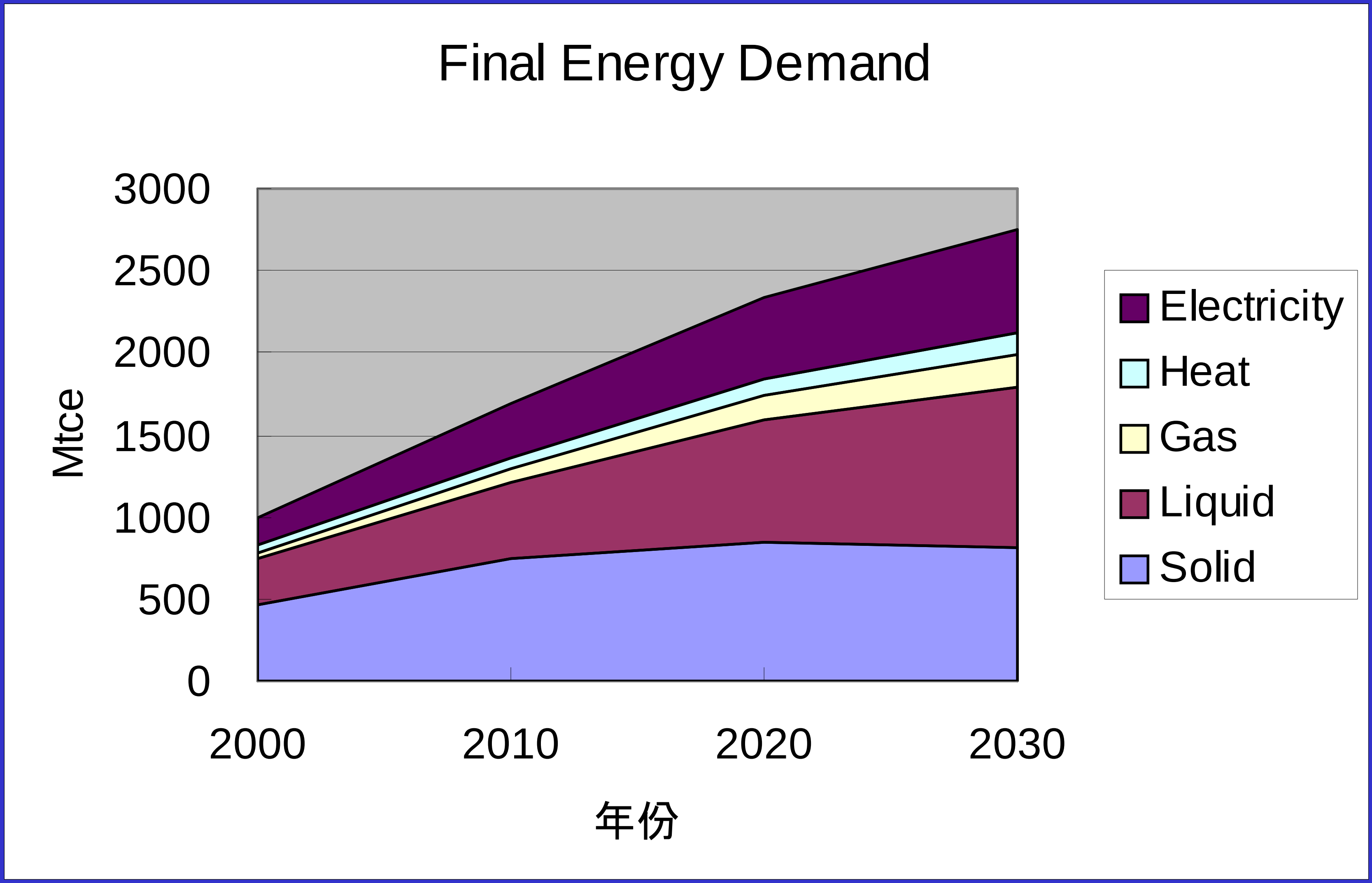
2006 Results

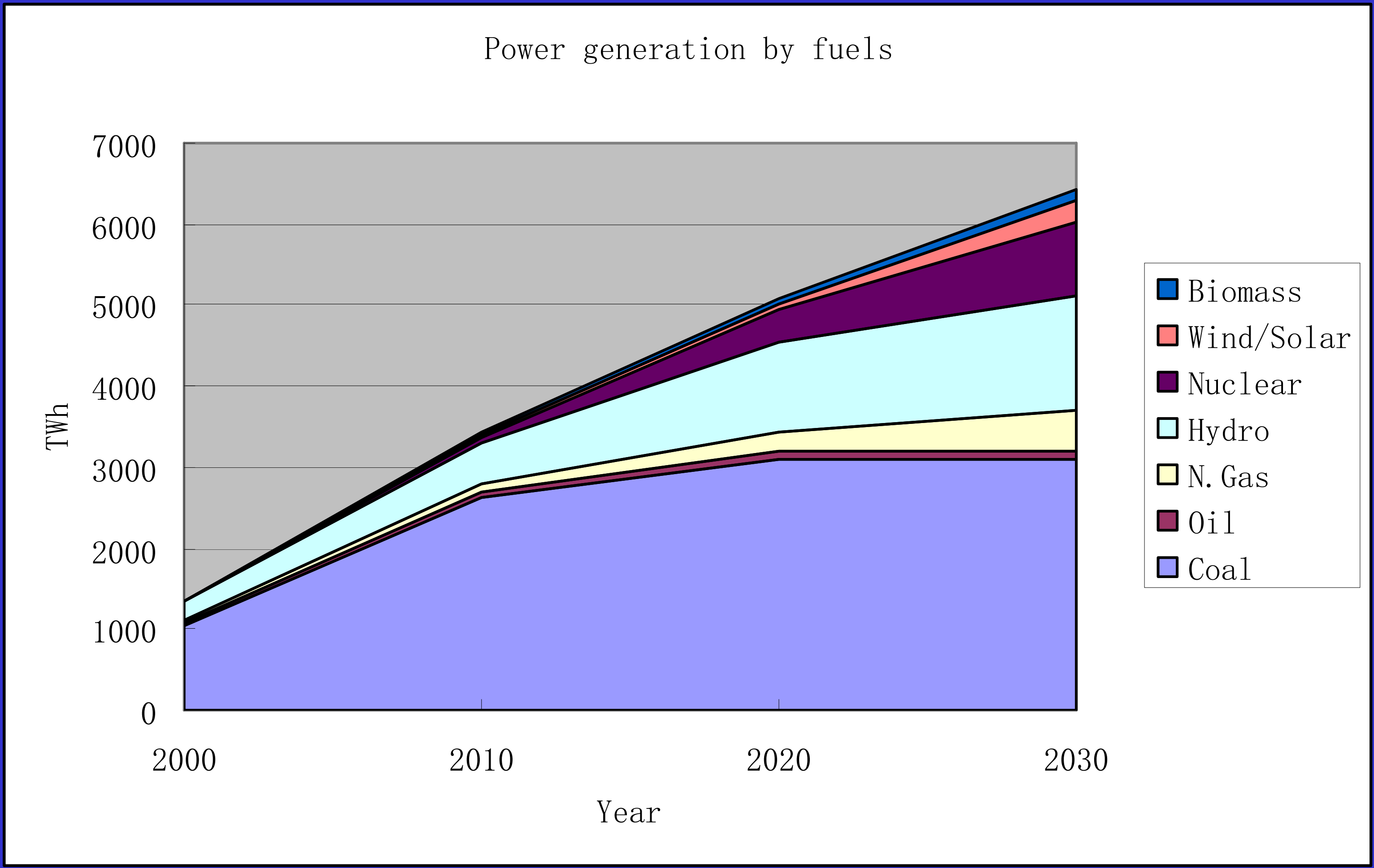


2007 Results

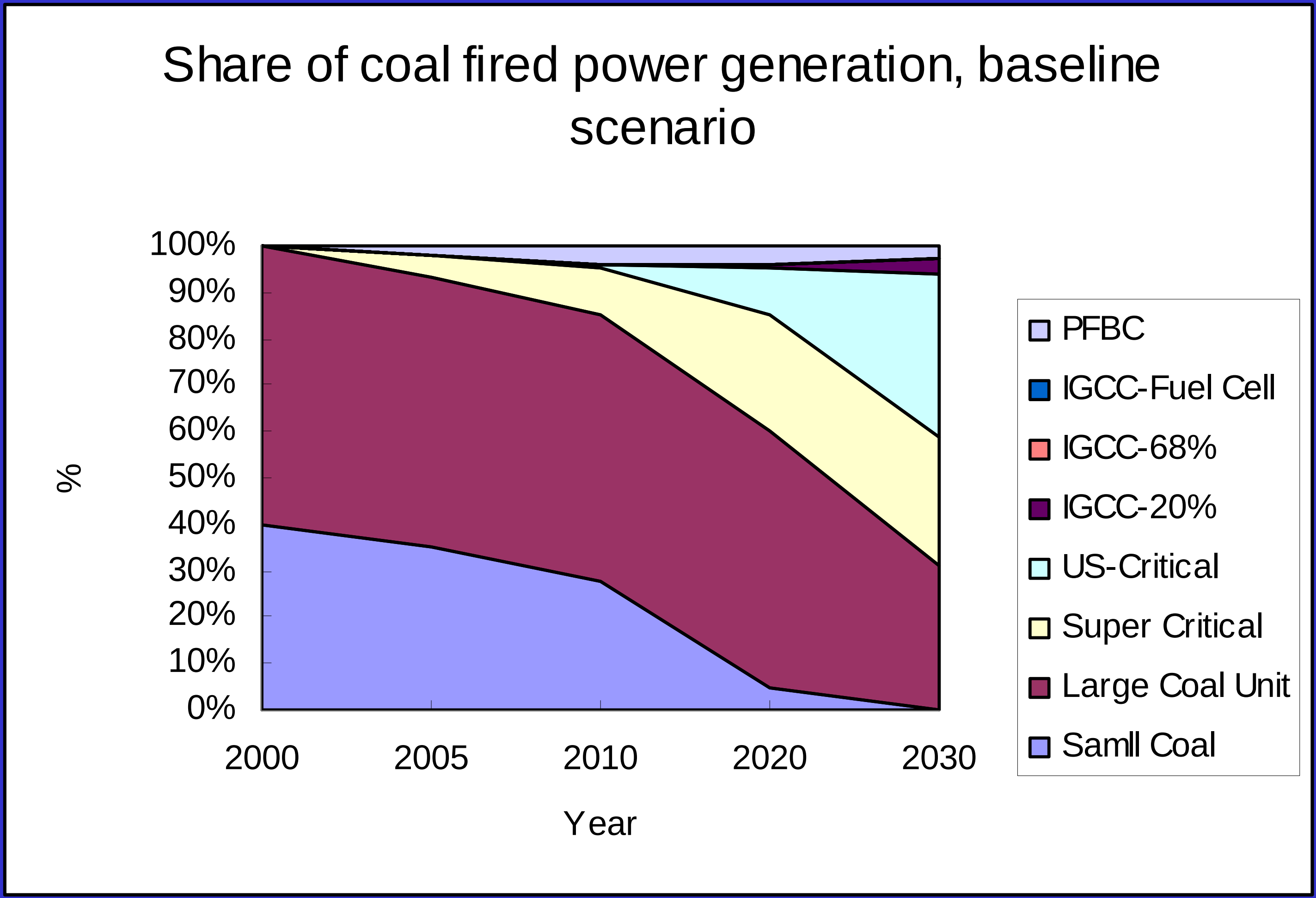


2007 Results

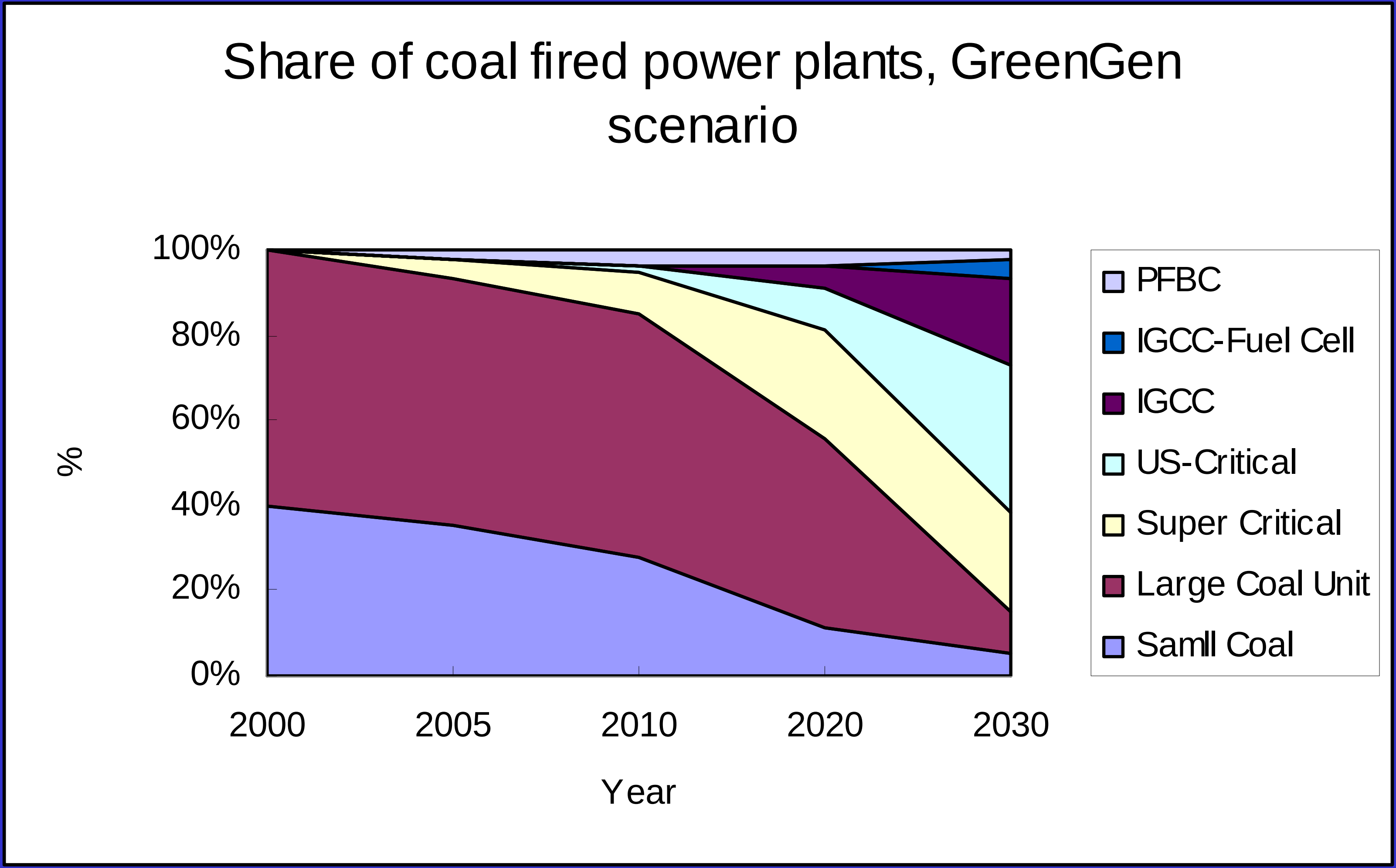


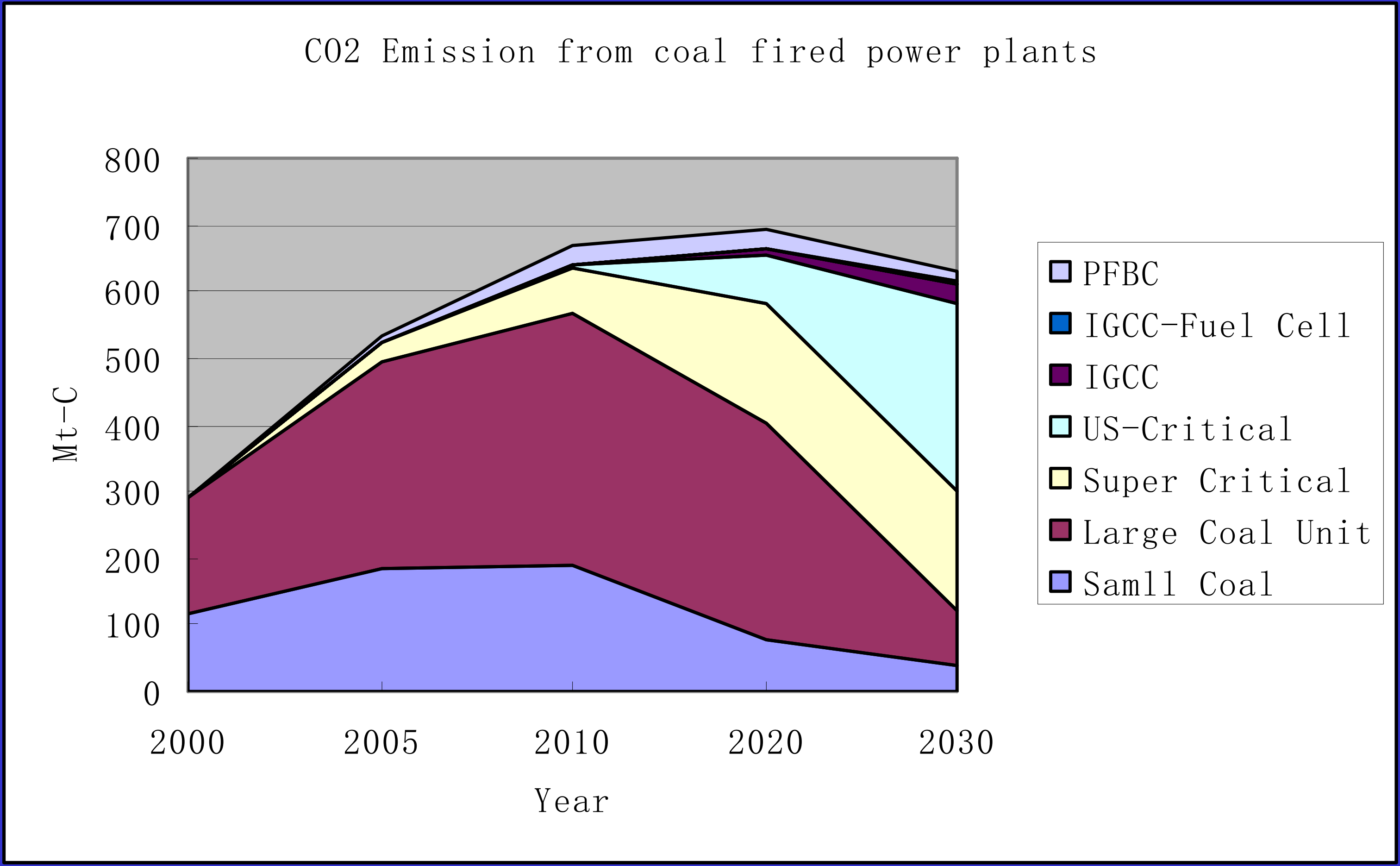


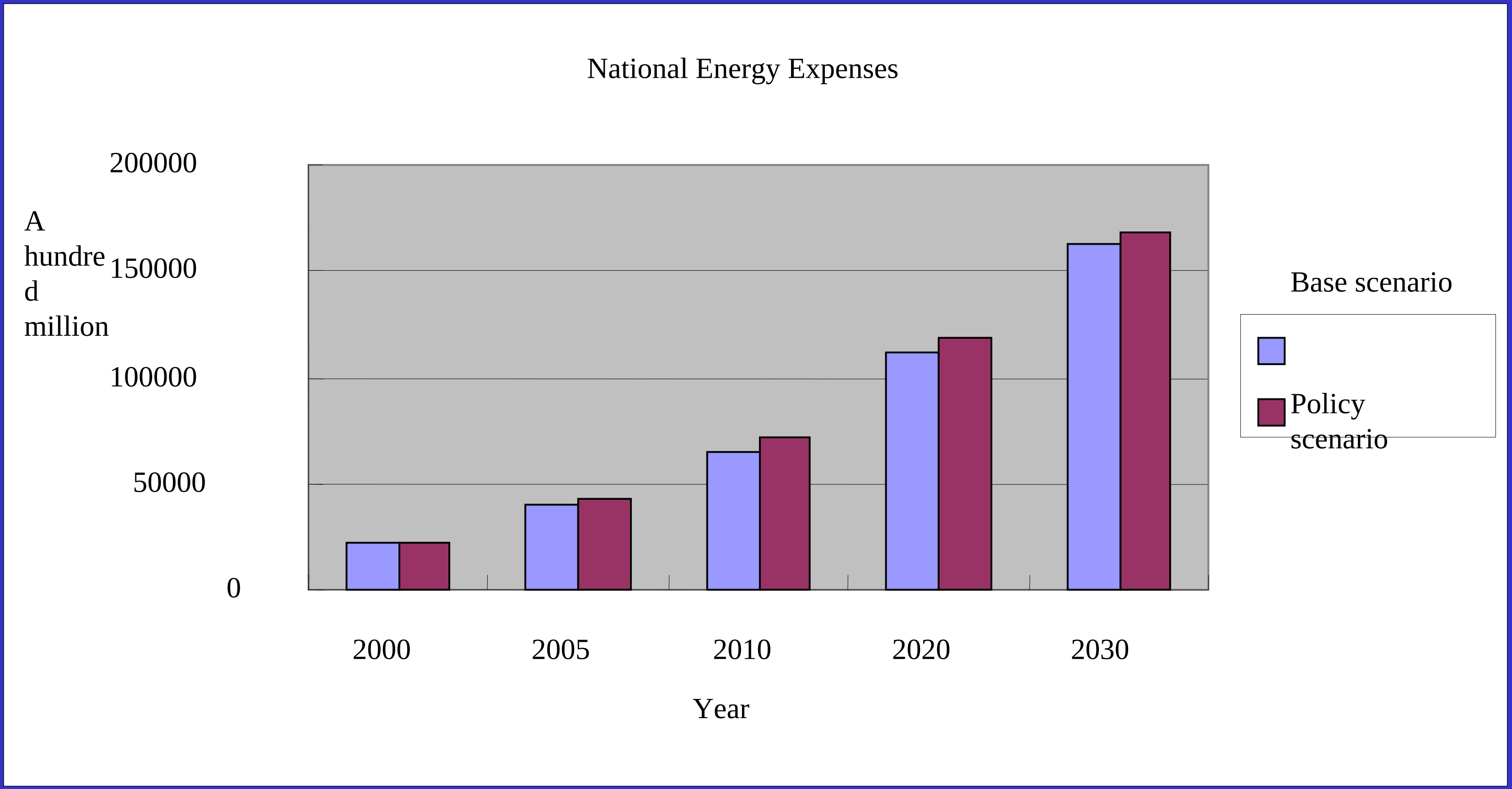
Power generation by fuels
7000
6000
5000
4000
3000
2000
1000
0
TWh
2000
2010
2020
2030
Year
Biomass
Wind/Solar
Nuclear
Hydro
N.Gas
Oil
Coal



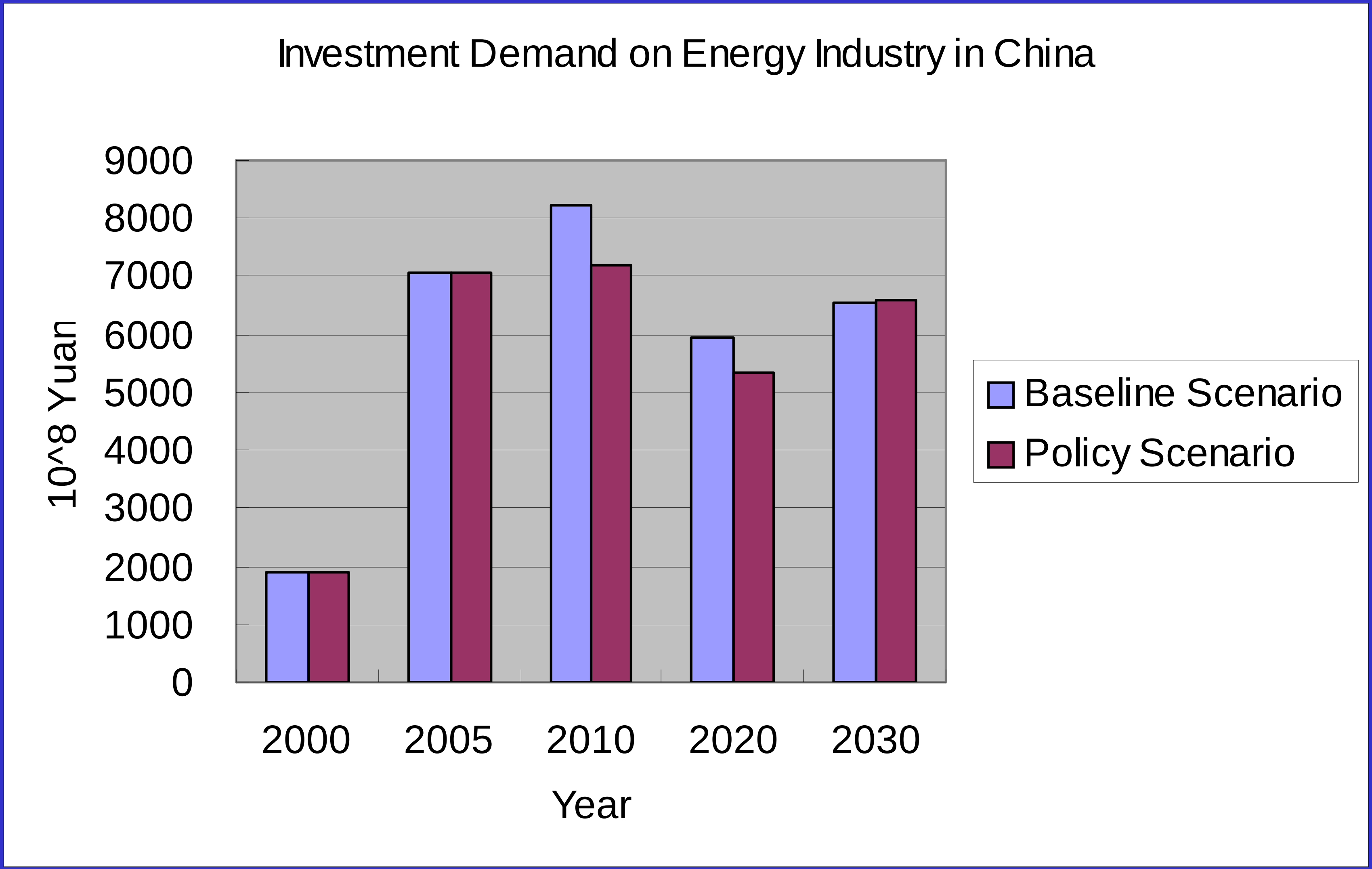
Share of coal fired power generation, baseline scenario
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
%
2000
2005
2010
2020
2030
Year
PFBC
IGCC-Fuel Cell
IGCC-68%
IGCC-20%
US-Critical
Super Critical
Large Coal Unit
Samll Coal


Share of coal fired power plants, GreenGen scenario
100%
80%
60%
40%
20%
0%
%
2000
2005
2010
2020
2030
Year
PFBC
IGCC-Fuel Cell
IGCC
US-Critical
Super Critical
Large Coal Unit
Samll Coal

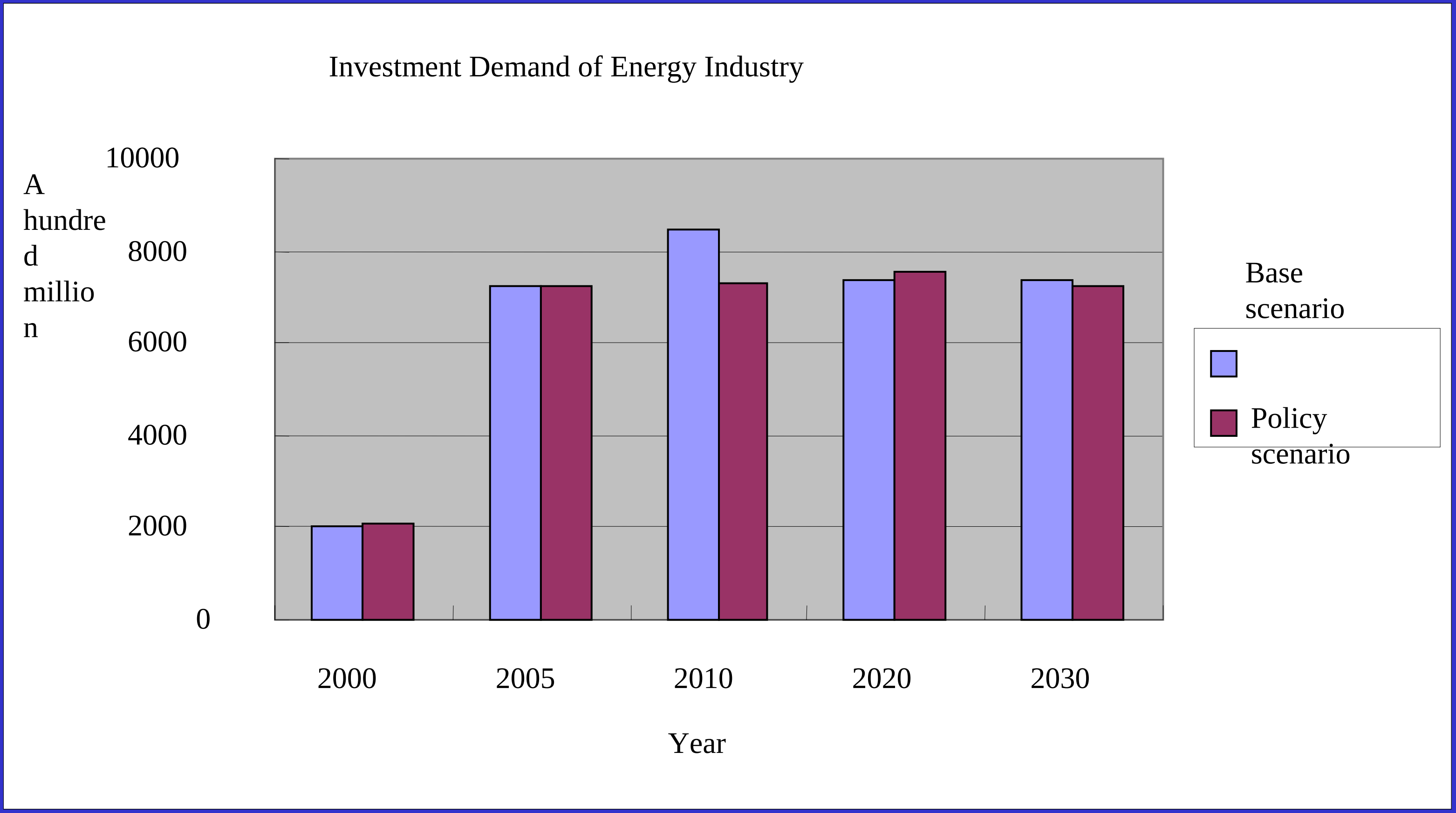

CO2 Emission from coal fired power plants
800
700
600
500
400
300
200
100
0
Mt-C
2000
2005
2010
2020
2030
Year
PFBC
IGCC-Fuel Cell
IGCC
US-Critical
Super Critical
Large Coal Unit
Saml1 Coal


National Energy Expenses
A hundred million
200000
150000
100000
50000
0
2000
2005
2010
2020
2030
Year
Base scenario
Policy scenario

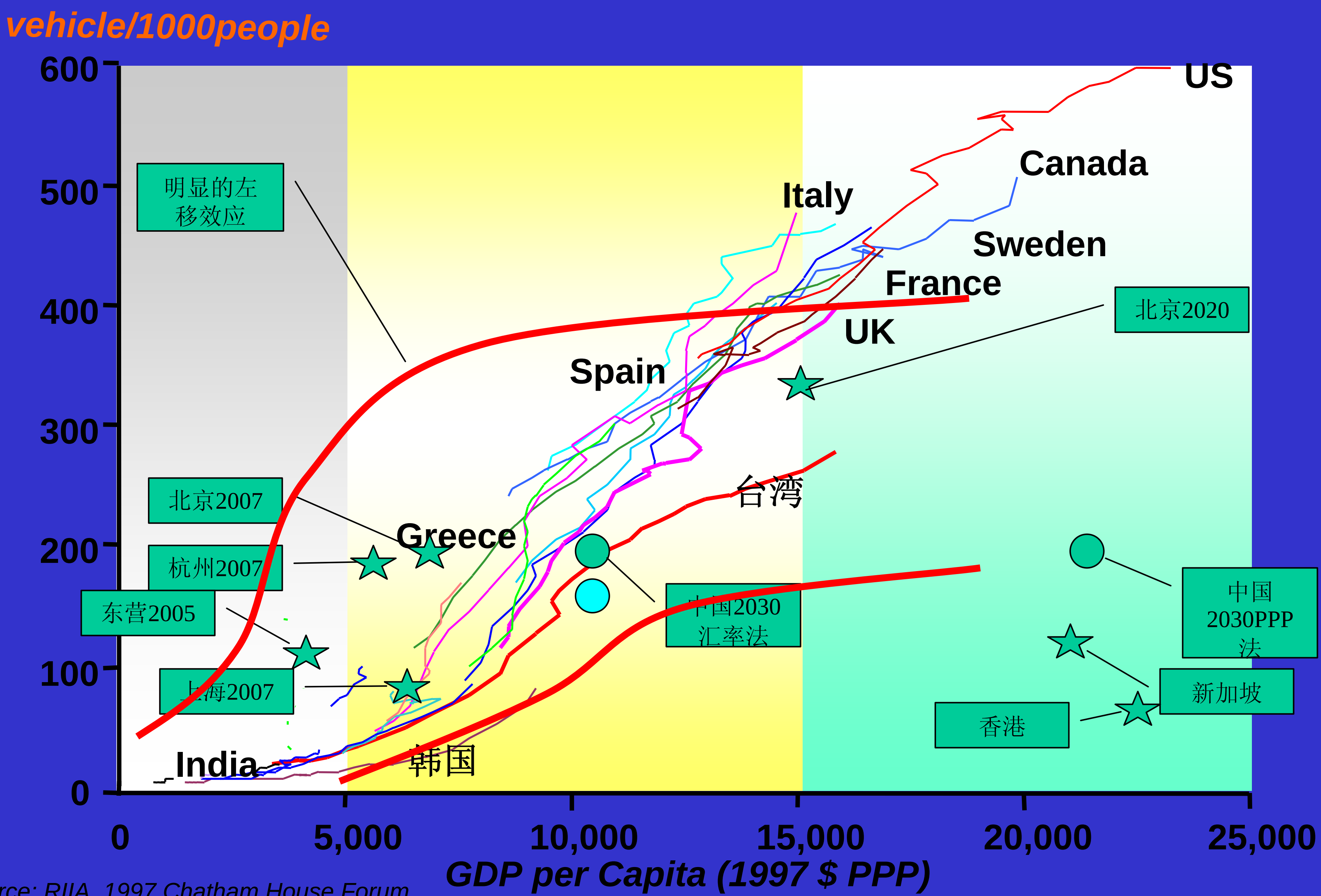
2006 Results



2007 Results

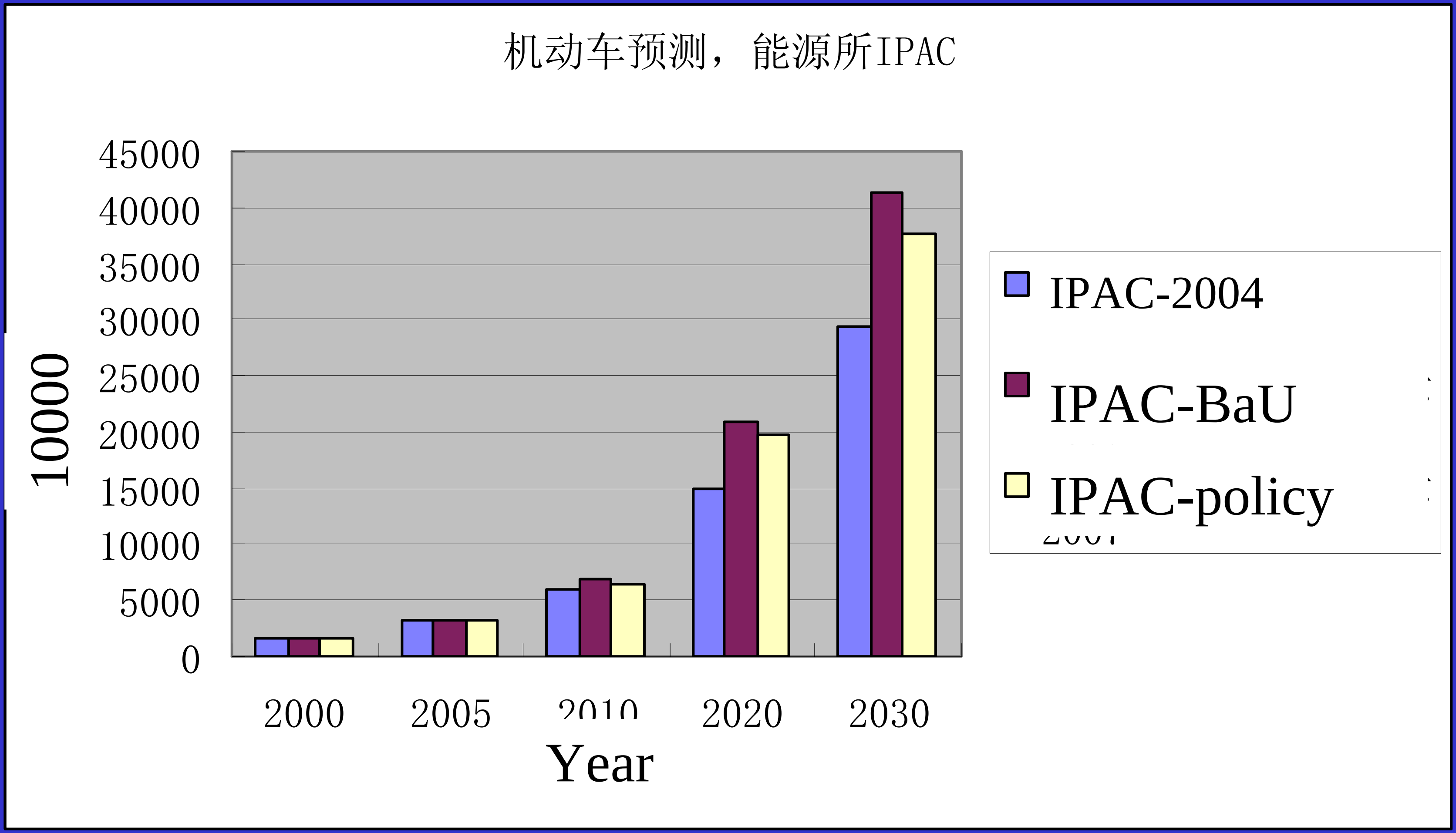


Ownership of Vehicle

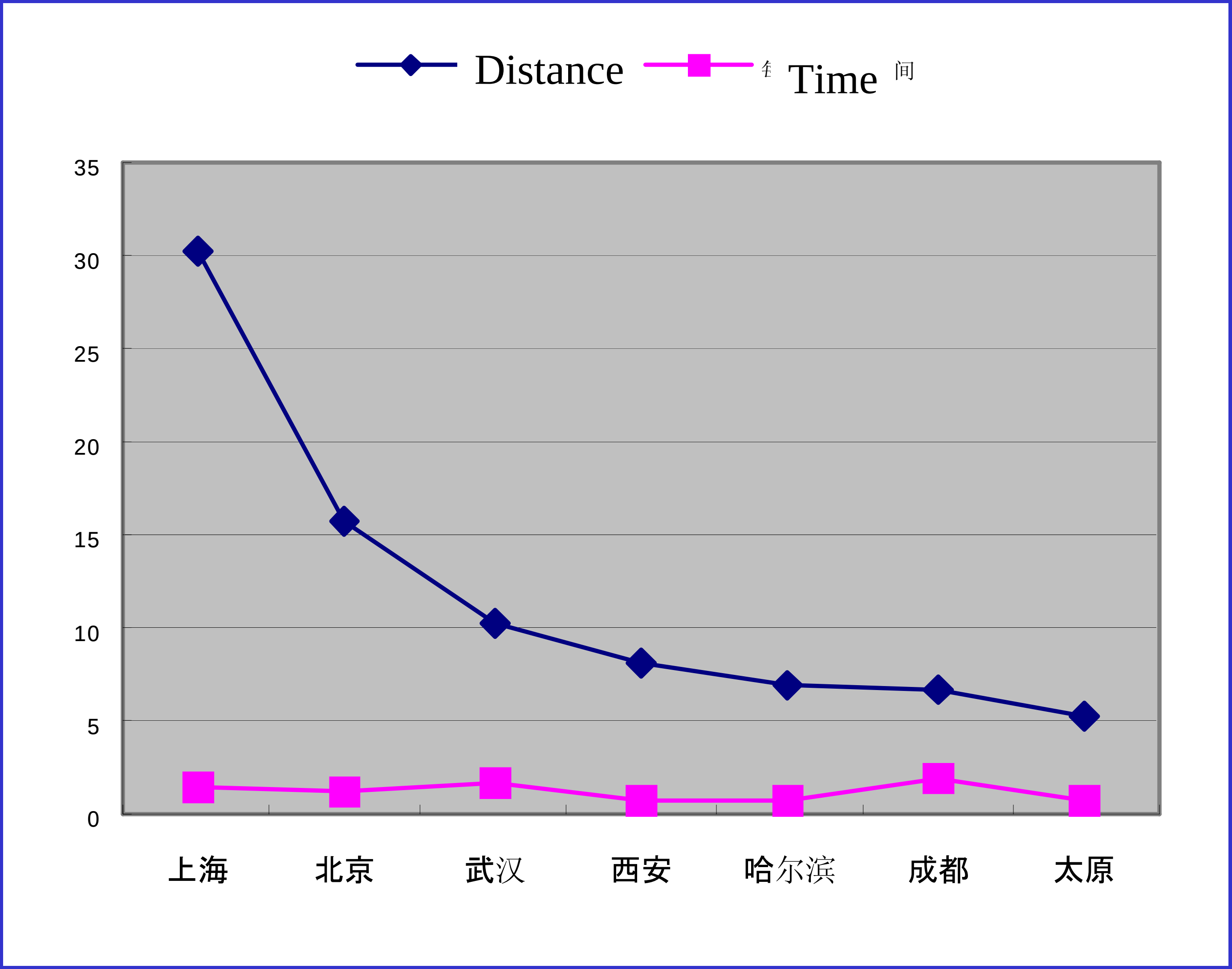


Source: RIIA, 1997 Chatham House Forum

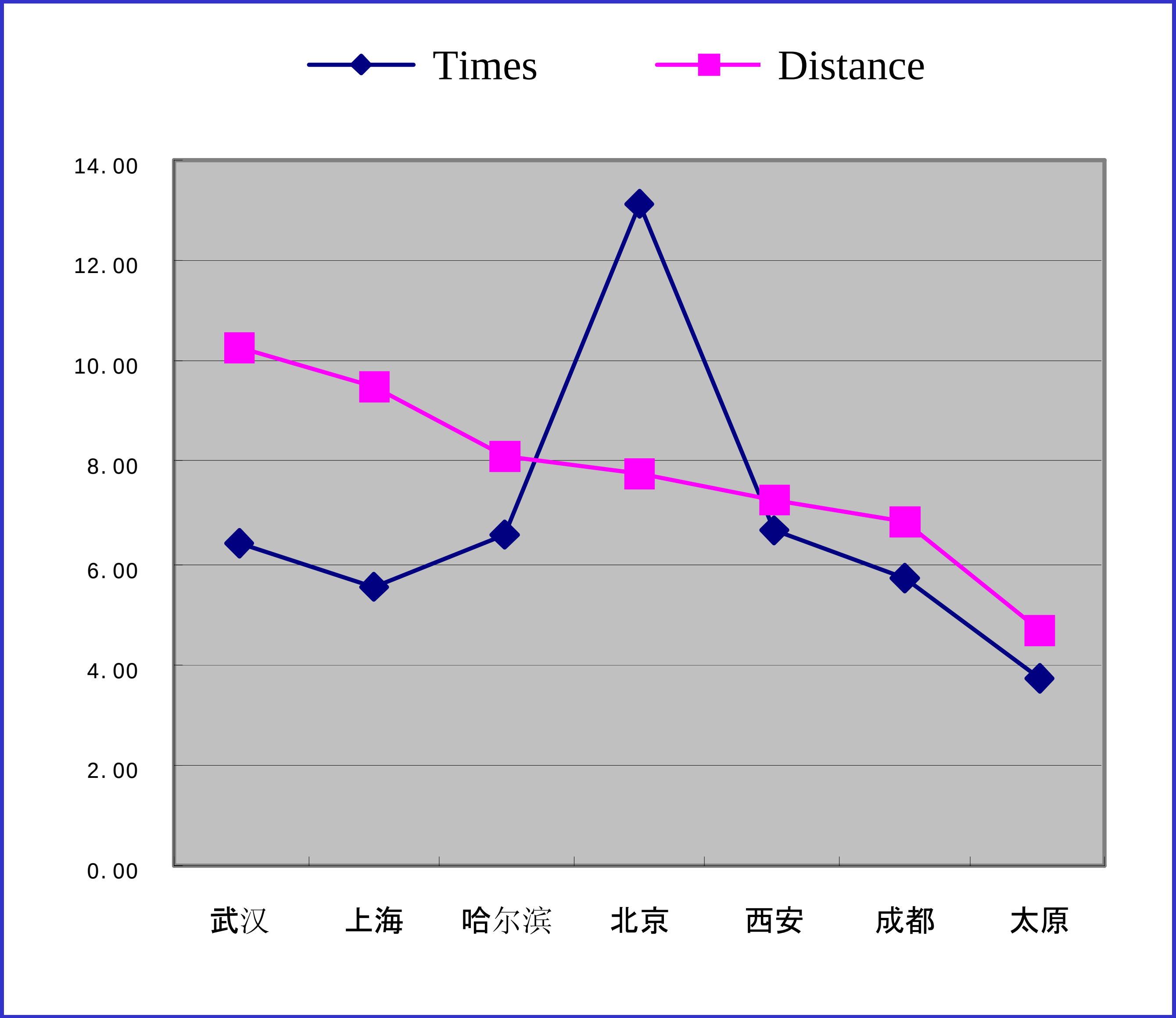
Forecast of vehicle, 2008 results

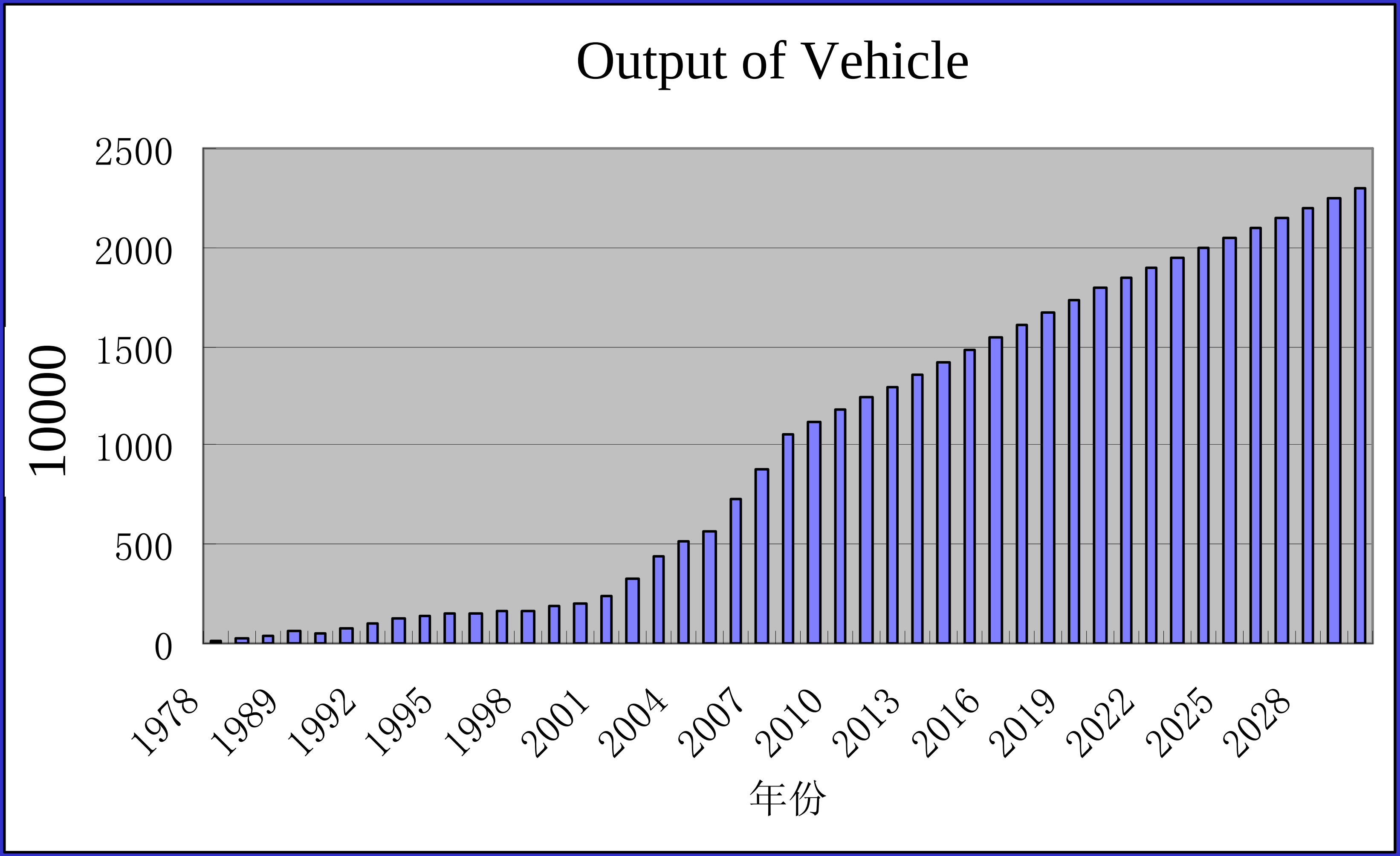


Distance for commute and time

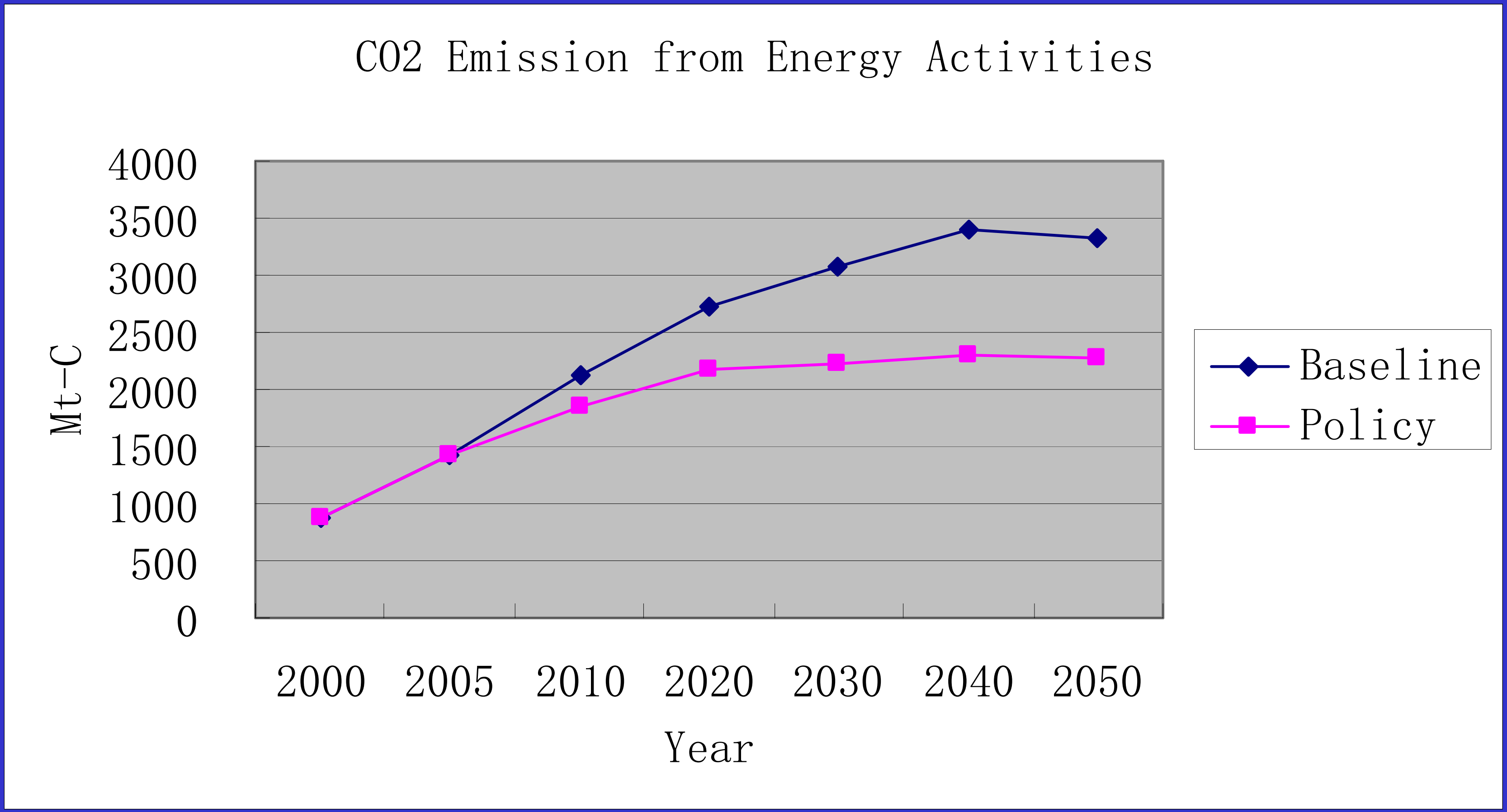


Times to take vehicle and distance， per week



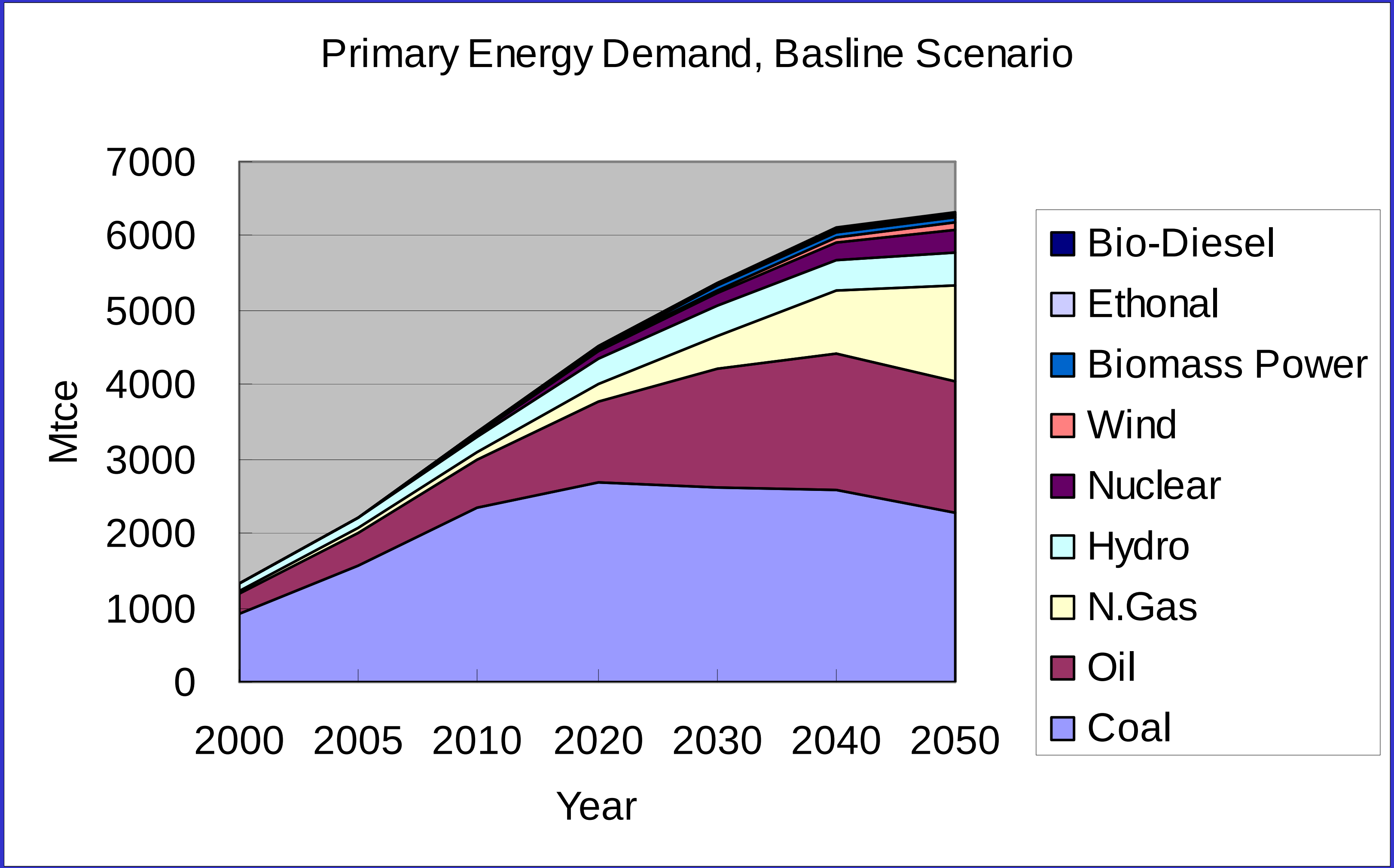

Output of Vehicle
10000
2500
2000
1500
1000
500
0
1978
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
年份

2007 Results

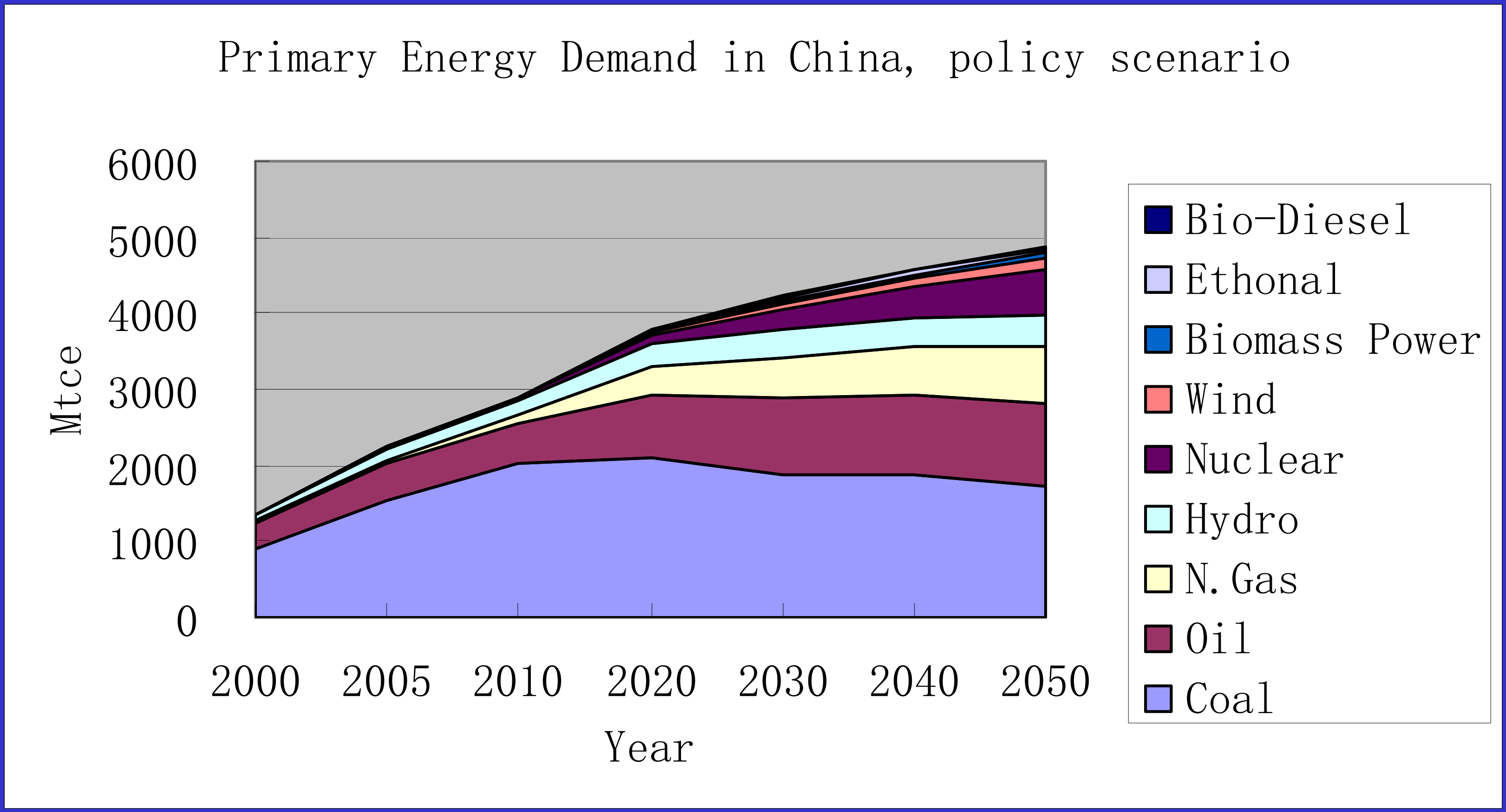


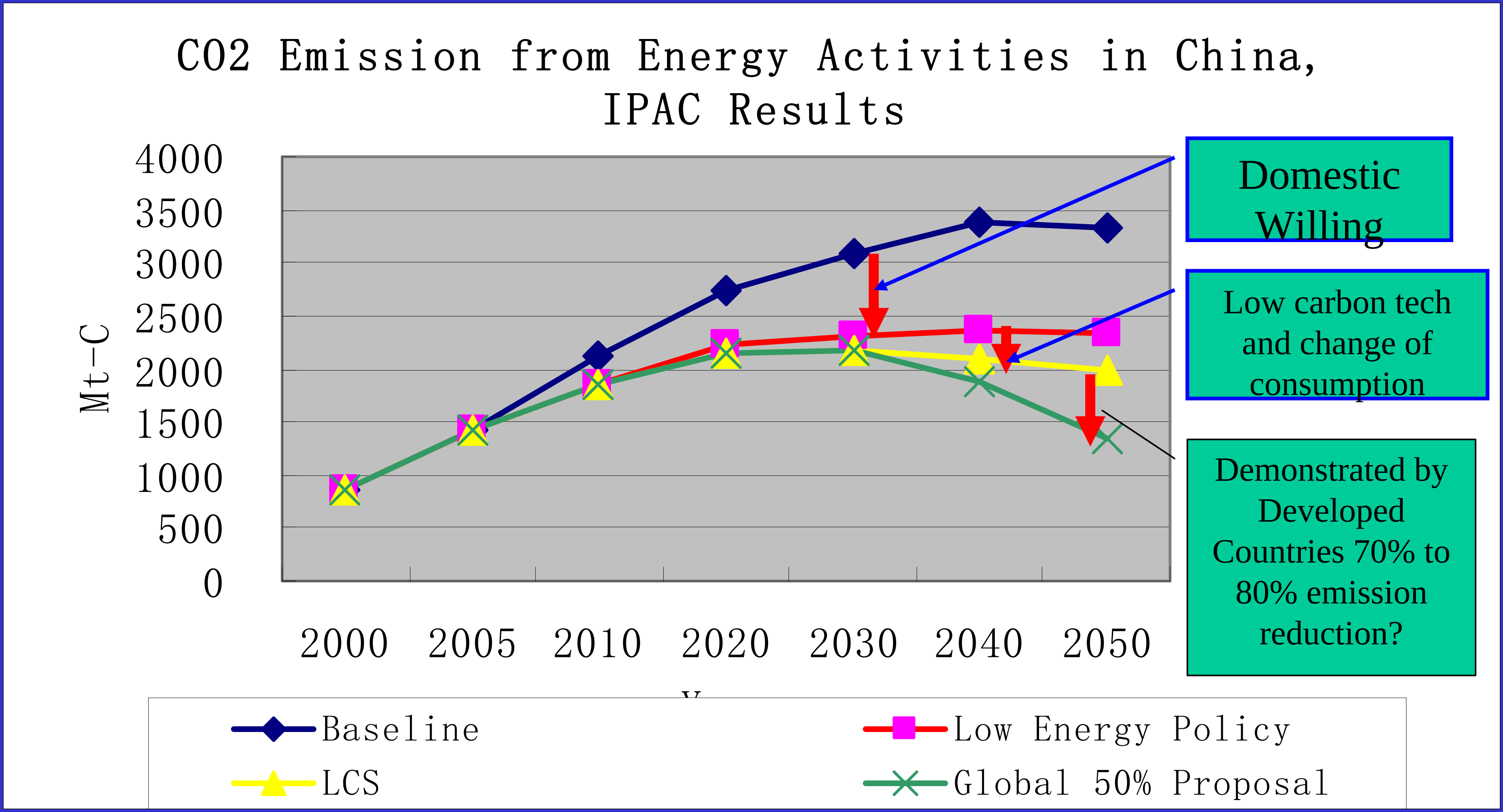
2050 studies

- Energy Strategy energy scenarios
- LCS
- China's Low Carbon Economy development path study

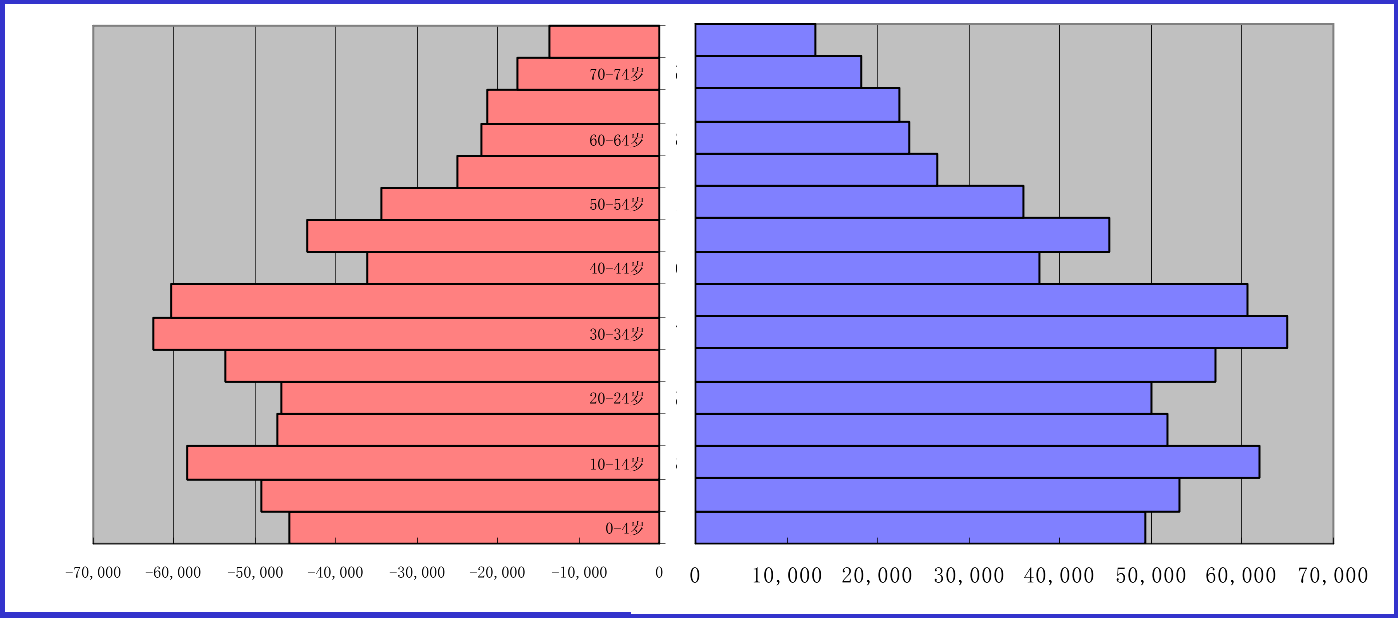


Primary Energy Demand, Basline Scenario
7000
6000
5000
4000
3000
2000
1000
0
Mtce
2000
2005
2010
2020
2030
2040
2050
Year
Bio-Diesel
Ethonal
Biomass Power
Wind
Nuclear
Hydro
N.Gas
Oil
Coal

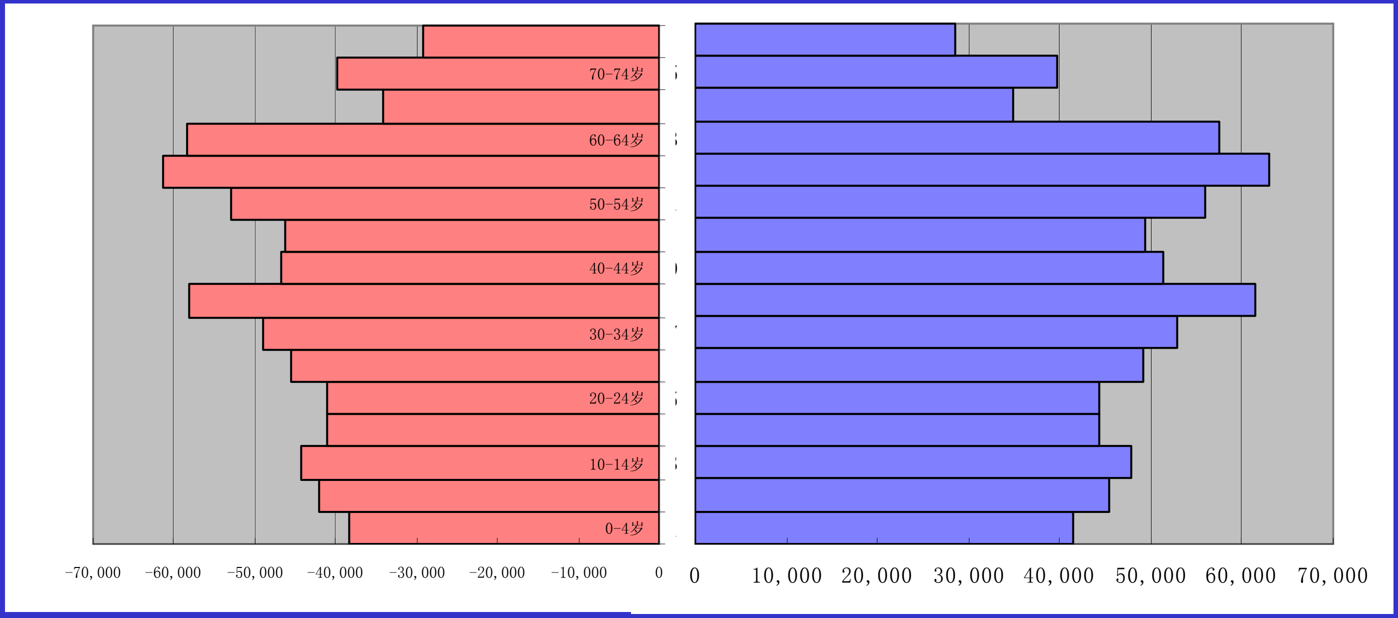

Primary Energy Demand in China, policy scenario
6000
5000
4000
3000
2000
1000
0
Mtce
2000
2005
2010
2020
2030
2040
2050
Year
Bio-Diesel
Ethonal
Biomass Power
Wind
Nuclear
Hydro
N.Gas
Oil
Coal


CO2 Emission from Energy Activities in China, IPAC Results
Mt-C
4000
3500
3000
2500
2000
1500
1000
500
0
2000
2005
2010
2020
2030
2040
2050
Domestic Willing
Low carbon tech and change of consumption
Demonstrated by Developed Countries 70% to 80% emission reduction?
Baseline
Low Energy Policy
LCS
Global 50% Proposal

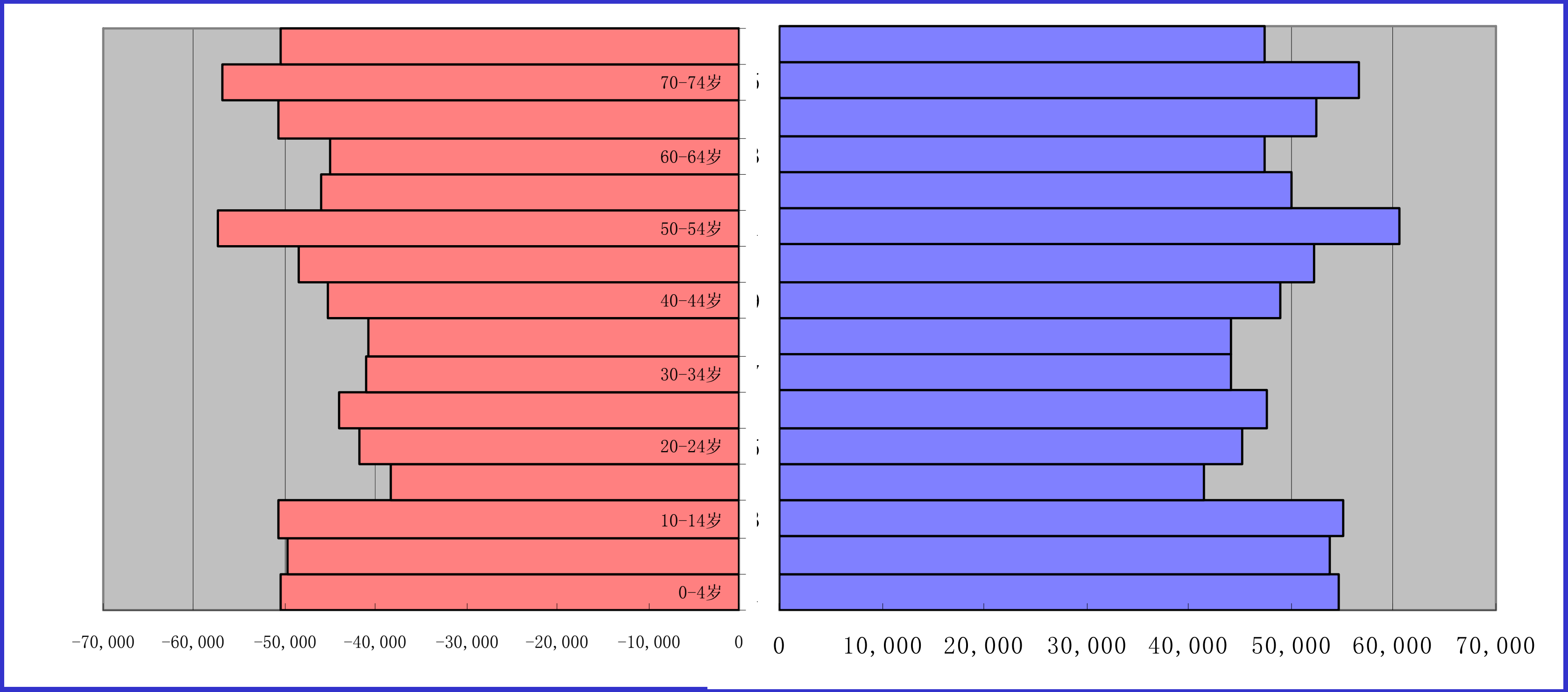
Population in 2005



Population in 2030



Population in 2050



IPCC Range

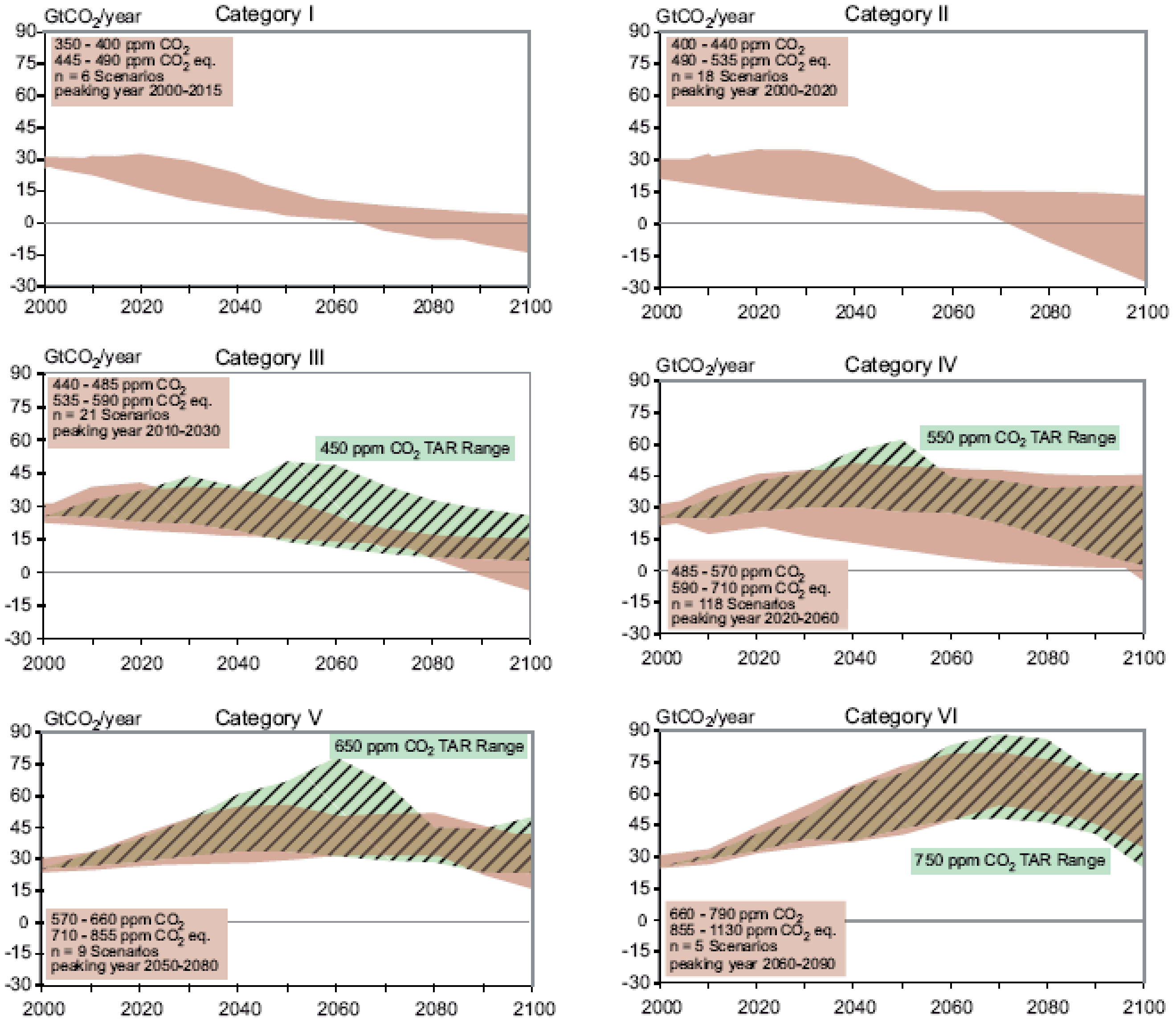


Figure SPM.7: *Emissions pathways of mitigation scenarios for alternative categories of stabilization levels (Category I to VI as defined in the box in each panel). The pathways are for CO_2 emissions only. Light brown shaded areas give the CO_2 emissions for the post-TAR emissions scenarios. Green shaded and hatched areas depict the range of more than 80 TAR stabilization scenarios. Base year emissions may differ between models due to differences in sector and industry coverage. To reach the lower stabilization levels some scenarios deploy removal of CO_2 from the atmosphere (negative emissions) using technologies such as biomass energy production utilizing carbon capture and storage. [Figure 3.17]*

IPCC Range

Table SPM.5: *Characteristics of post-TAR stabilization scenarios [Table TS 2, 3.10]*[a)]

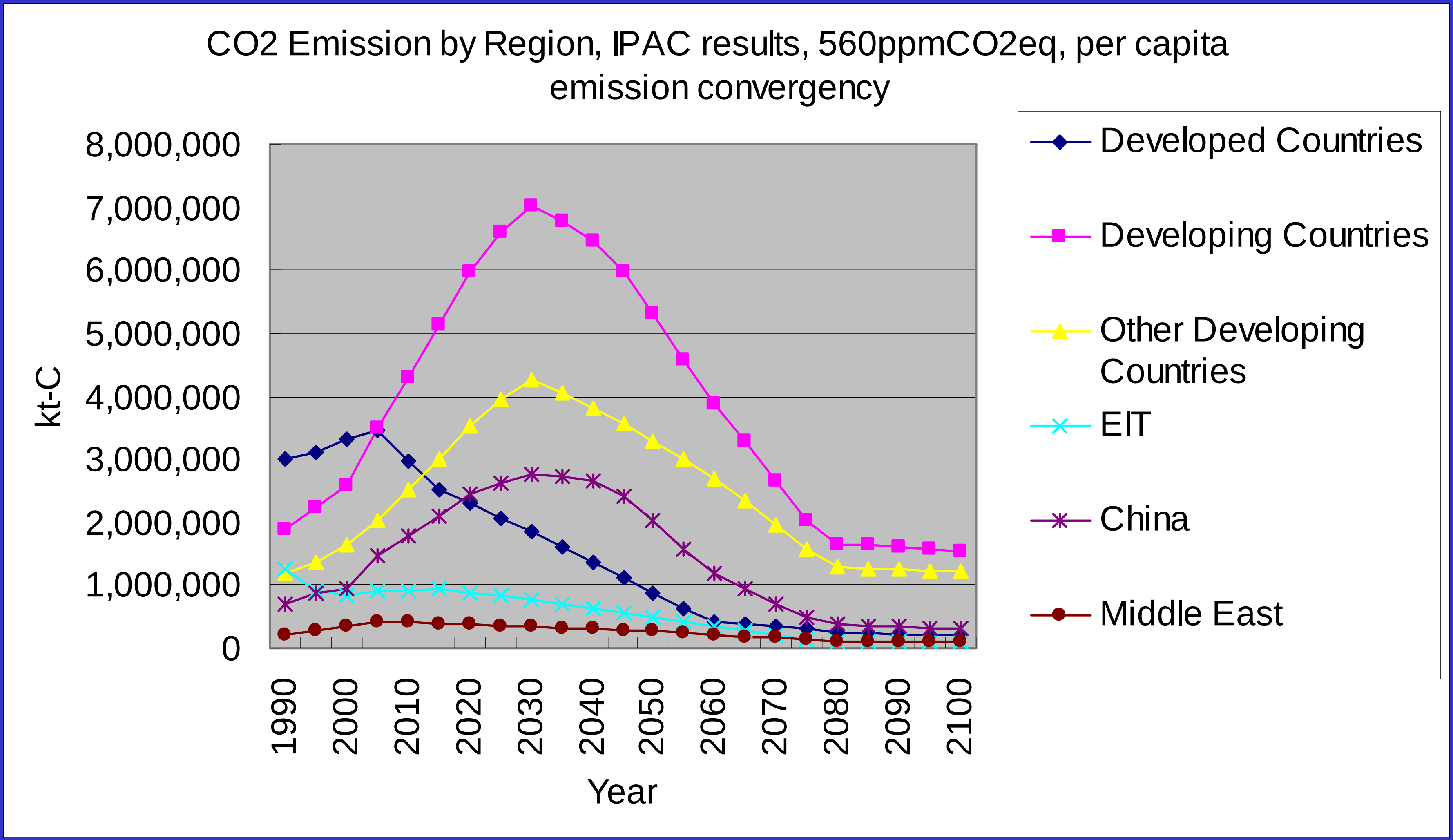
Category	Radiative forcing (W/m^2)	CO_2 concentration[c)] (ppm)	CO_2-eq concentration[c)] (ppm)	Global mean temperature increase above pre-industrial at equilibrium, using "best estimate" climate sensitivity[b), c)] (°C)	Peaking year for CO_2 emissions[d)]	Change in global CO_2 emissions in 2050 (% of 2000 emissions)[d)]	No. of assessed scenarios
I	2.5-3.0	350-400	445-490	2.0-2.4	2000-2015	-85 to -50	6
II	3.0-3.5	400-440	490-535	2.4-2.8	2000-2020	-60 to -30	18
III	3.5-4.0	440-485	535-590	2.8-3.2	2010-2030	-30 to +5	21
IV	4.0-5.0	485-570	590-710	3.2-4.0	2020-2060	+10 to +60	118
V	5.0-6.0	570-660	710-855	4.0-4.9	2050-2080	+25 to +85	9
VI	6.0-7.5	660-790	855-1130	4.9-6.1	2060-2090	+90 to +140	5
						Total	177

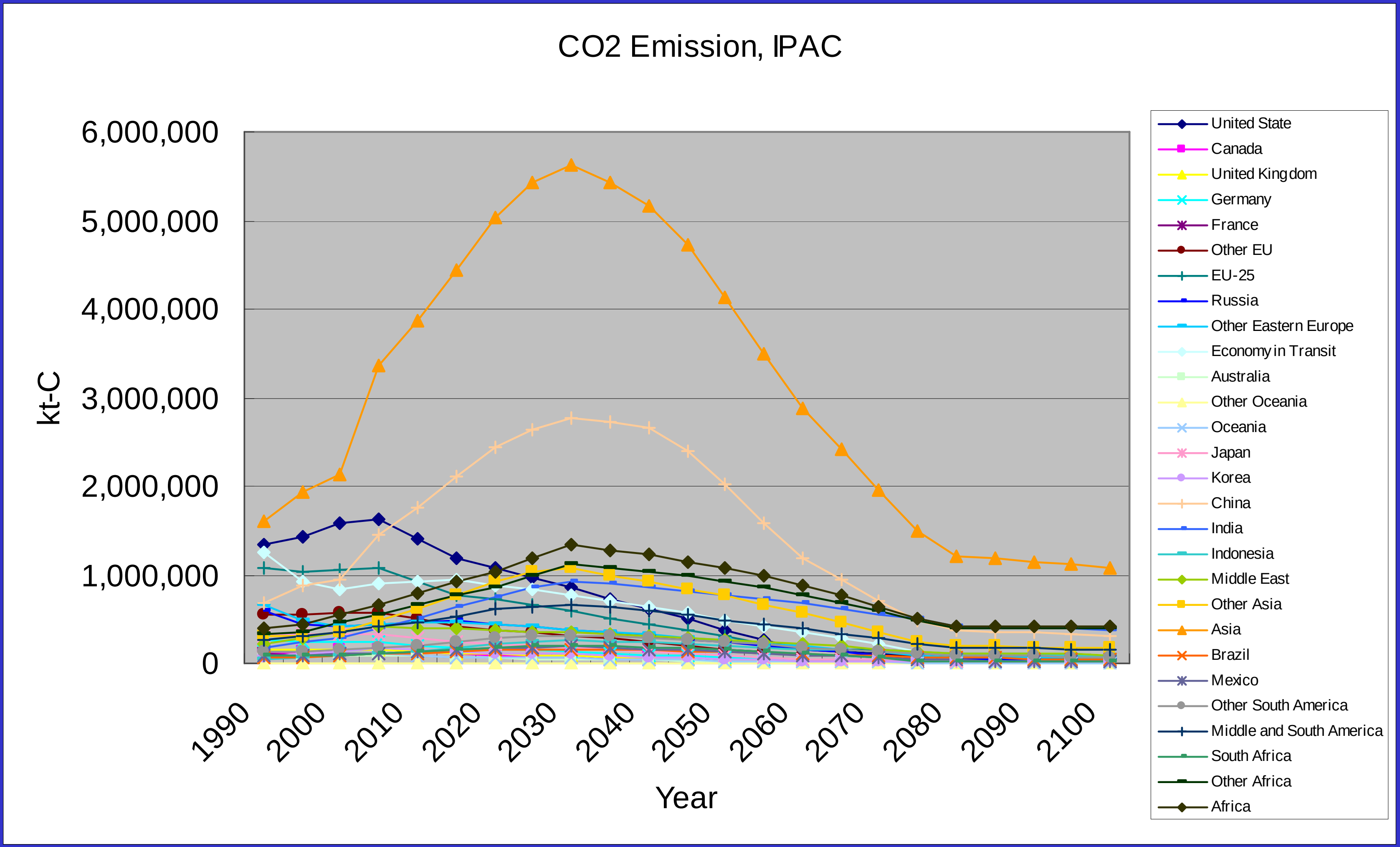
a) The understanding of the climate system response to radiative forcing as well as feedbacks is assessed in detail in the AR4 WGI Report. Feedbacks between the carbon cycle and climate change affect the required mitigation for a particular stabilization level of atmospheric carbon dioxide concentration. These feedbacks are expected to increase the fraction of anthropogenic emissions that remains in the atmosphere as the climate system warms. Therefore, the emission reductions to meet a particular stabilization level reported in the mitigation studies assessed here might be underestimated.

b) The best estimate of climate sensitivity is 3°C [WG 1 SPM].

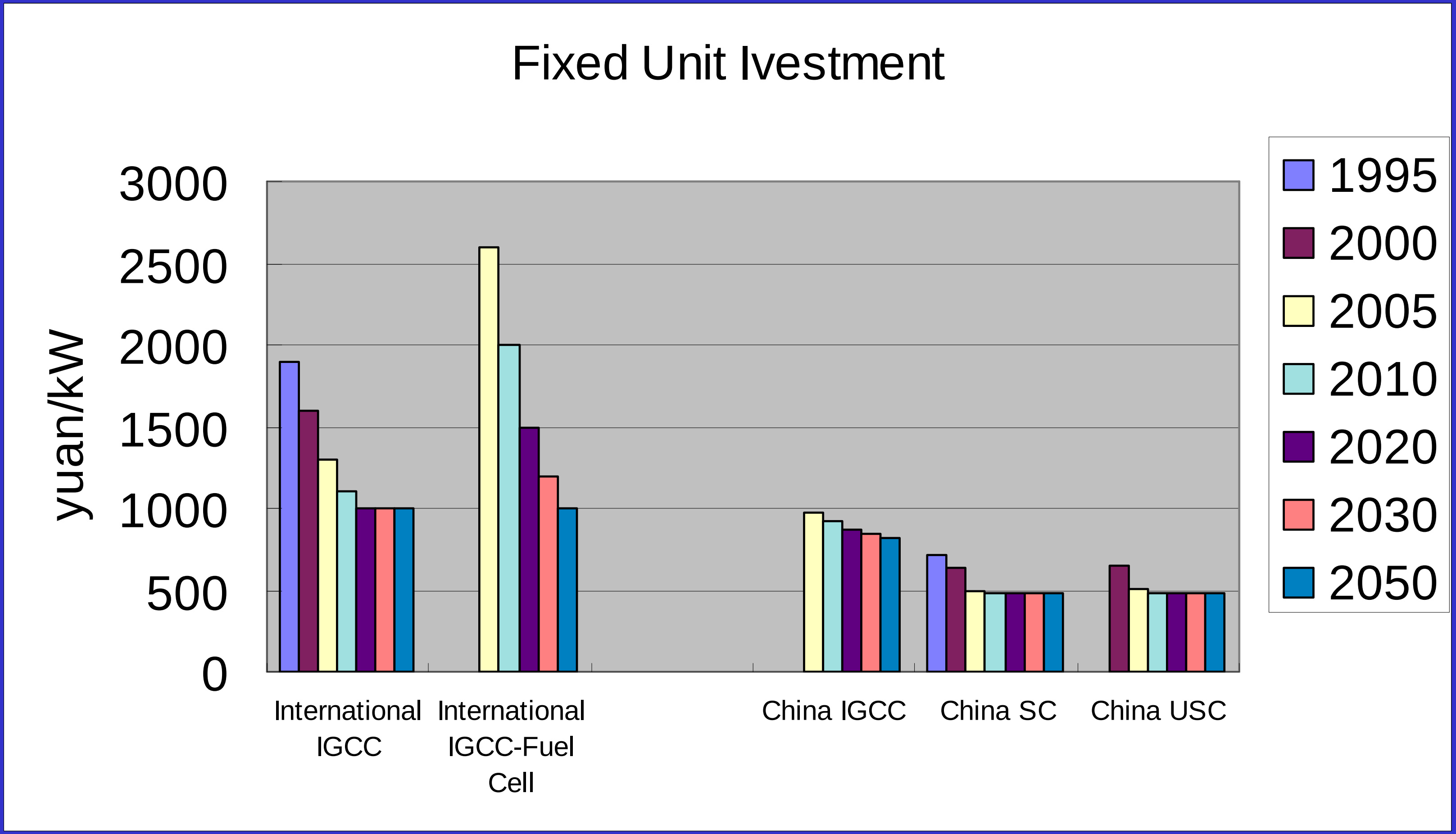
c) Note that global mean temperature at equilibrium is different from expected global mean temperature at the time of stabilization of GHG concentrations due to the inertia of the climate system. For the majority of scenarios assessed, stabilisation of GHG concentrations occurs between 2100 and 2150.

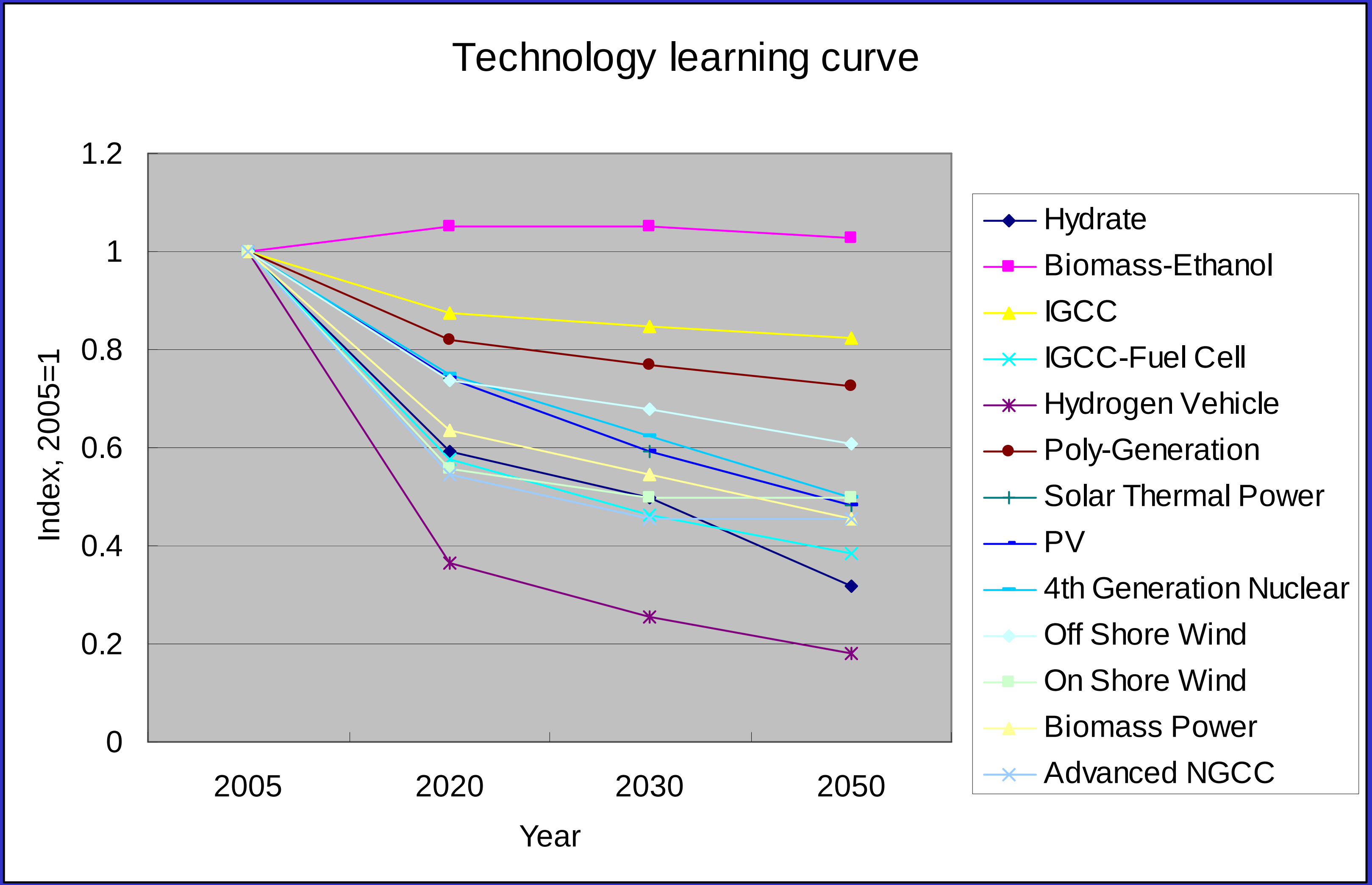
d) Ranges correspond to the 15^{th} to 85^{th} percentile of the post-TAR scenario distribution. CO_2 emissions are shown so multi-gas scenarios can be compared with CO_2-only scenarios.


CO2 Emission by Region, IPAC results, 560ppmCO2eq, per capita emission convergency
kt-C
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
Year
Developed Countries
Developing Countries
Other Developing Countries
EIT
China
Middle East



CO2 Emission, IPAC
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
kt-C
1990
2000
2010
2020
2030
2040
2050
2060
2070
2080
2090
2100
Year
United State
Canada
United Kingdom
Germany
France
Other EU
EU-25
Russia
Other Eastern Europe
Economy in Transit
Australia
Other Oceania
Oceania
Japan
Korea
China
India
Indonesia
Middle East
Other Asia
Asia
Brazil
Mexico
Other South America
Middle and South America
South Africa
Other Africa
Africa


Fixed Unit Ivestment
yuan/kW
3000
2500
2000
1500
1000
500
0
International IGCC
International IGCC-Fuel Cell
China IGCC
China SC
China USC
1995
2000
2005
2010
2020
2030
2050



Technology learning curve
1.2
1
0.8
0.6
0.4
0.2
0
Index, 2005=1
2005
2020
2030
2050
Year
Hydrate
Biomass-Ethanol
IGCC
IGCC-Fuel Cell
Hydrogen Vehicle
Poly-Generation
Solar Thermal Power
PV
4th Generation Nuclear
Off Shore Wind
On Shore Wind
Biomass Power
Advanced NGCC

Energy Tax System Design: Objectives

- Review, assess international experience for energy tax
- By using model, make a quantitative cost-benefit analysis of application of energy tax
- Design energy tax system in China, with full consideration of existing tax system

Tax rate 1

	2006	2010	2020	2030
Coal	0	50	80	120
Gasoline/ Diesel	0	500	800	1200
LPG	0	250	400	600
Other Petroleum Products	0	250	400	600
N. Gas	0	250	400	600
Feedstock	0	200	320	480
Nuclear	0	50	80	120
Hydro	0	0	0	0
Other Renewable	0	0	0	0

Tax rate 2

	2006	2010	2020	2030
Coal	0	100	120	140
Gasoline/ Diesel	0	1000	2000	3000
LPG	0	500	500	500
Other Petroleum Products	0	500	500	500
N. Gas	0	500	500	500
Feedstock	0	300	300	300
Nuclear	0	100	120	140
Hydro	0	0	0	0
Other Renewable	0	0	0	0

Tax rate 3

	2006	2010	2020	2030
Coal	0	150	180	200
Gasoline/ Diesel	0	1500	2200	3000
LPG	0	700	700	700
Other Petroleum Products	0	700	700	700
N. Gas	0	700	700	700
Feedstock	0	300	300	300
Nuclear	0	150	180	200
Hydro	0	0	0	0
Other Renewable	0	0	0	0

Tax rate 4

		2006	2010	2020	2030
煤炭	Coal	0	200	250	300
汽柴油	Gasoline/ Diesel	0	1500	2200	3000
LPG	LPG	0	700	700	700
其 他 石 油制品	Other Petroleum Products	0	700	700	700
天然气	N. Gas	0	700	700	700
原 料 用 能源	Feedstock	0	300	300	300
核电	Nuclear	0	200	250	300
水电	Hydro	0	0	0	0
其 他 可 再生能源	Other Renewable	0	0	0	0

Tax rate 5

		2006	2010	2020	2030
Coal	煤炭	0	300	400	500
Gasoline/ Diesel	汽柴油	0	1800	2400	3000
LPG	LPG	0	1000	1000	1000
Other Petroleum Products	其他石油制品	0	1000	1000	1000
N. Gas	天然气	0	1000	1300	1700
Feedstock	原料用能源	0	300	300	300
Nuclear	核电	0	300	400	500
Hydro	水电	0	0	0	0
Other Renewable	其他可再生能源	0	0	0	0

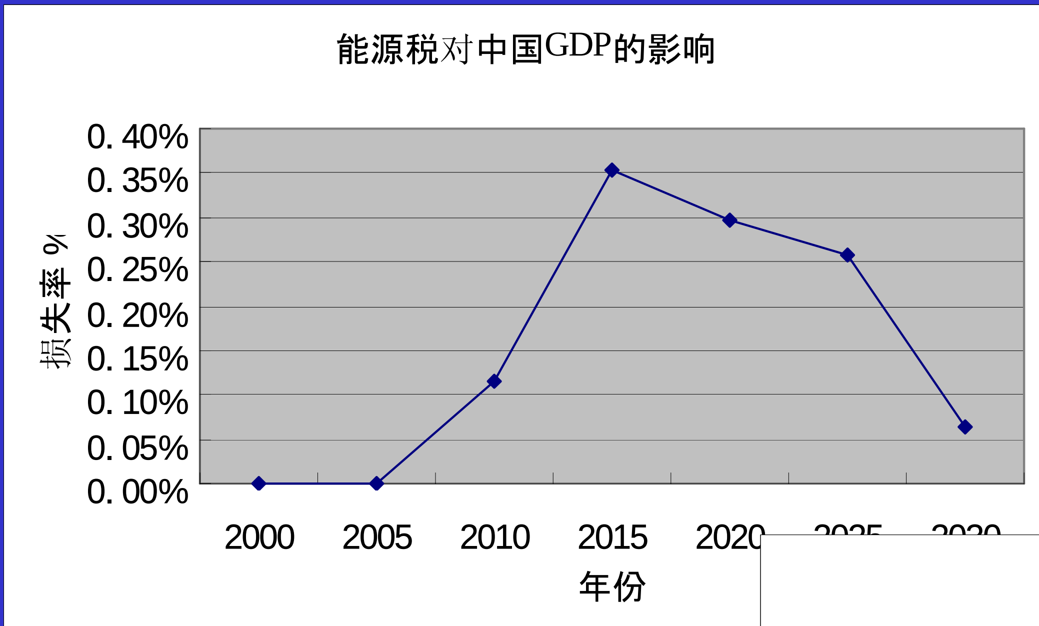
Tax rate 6

		2006	2010	2020	2030
Coal	煤炭	0	400	500	600
Gasoline/ Diesel	汽柴油	0	2500	3500	4500
LPG	LPG	0	1500	1500	1500
Other Petroleum Products	其他石油制品	0	1500	1500	1500
N. Gas	天然气	0	1500	1900	2200
Feedstock	原料用能源	0	500	600	700
Nuclear	核电	0	400	500	600
Hydro	水电	0	0	0	0
Other Renewable	其他可再生能源	0	0	0	0

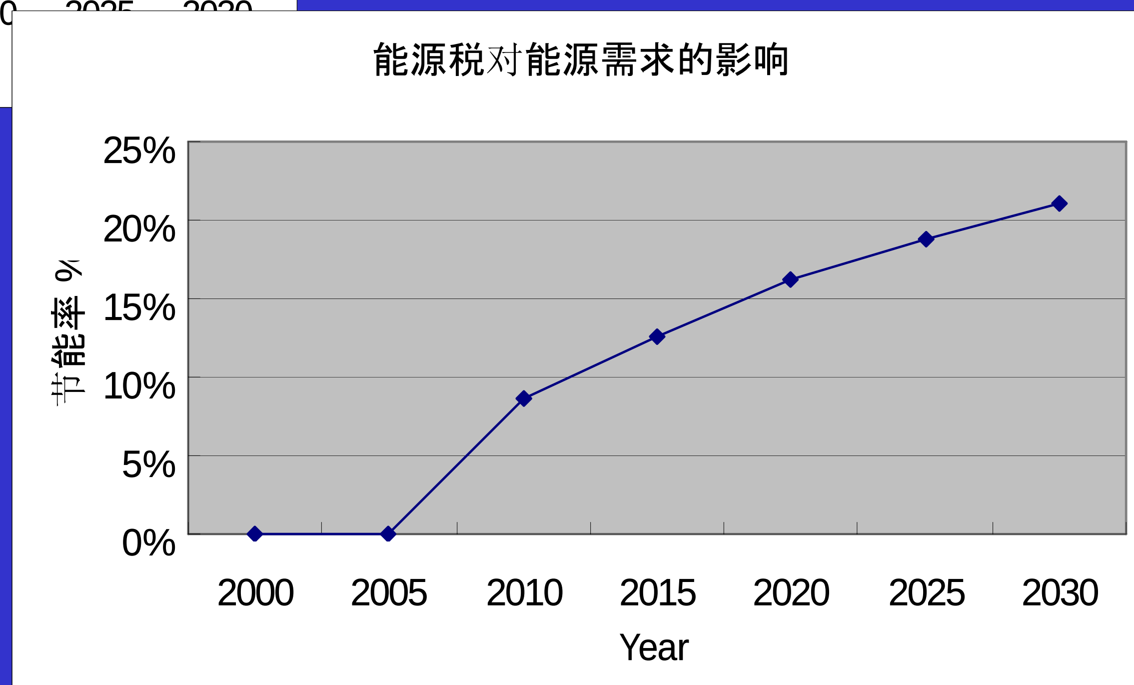
Tax rate 7

		2006	2010	2020	2030
Coal	煤炭	0	500	600	700
Gasoline/ Diesel	汽柴油	0	4000	5500	7000
LPG	LPG	0	2000	2500	3000
Other Petroleum Products	其 他 石 油 制品	0	1500	1500	1500
N. Gas	天然气	0	2000	2500	3000
Feedstock	原 料 用 能 源	0	600	700	800
Nuclear	核电	0	500	600	700
Hydro	水电	0	0	0	0
Other Renewable	其 他 可 再 生能源	0	0	0	0

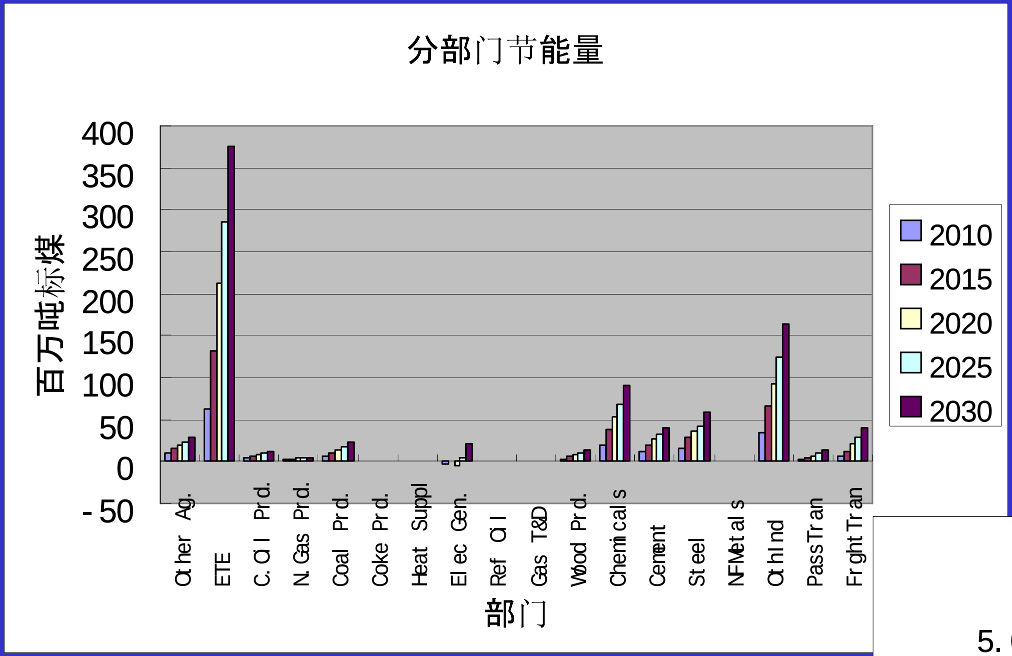
Impact on GDP



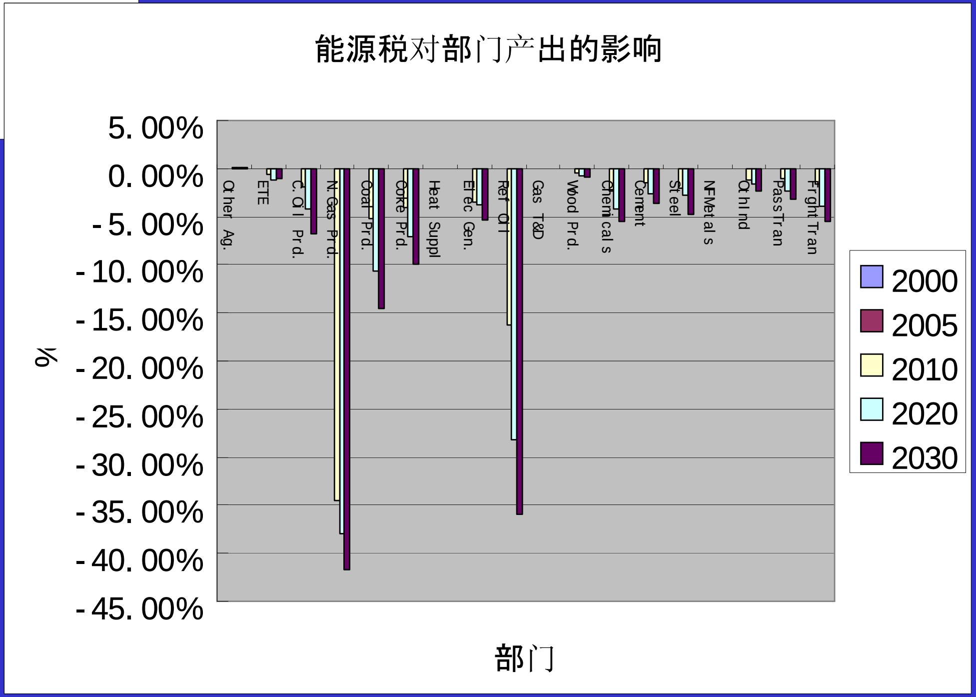
Impact on Energy Demand

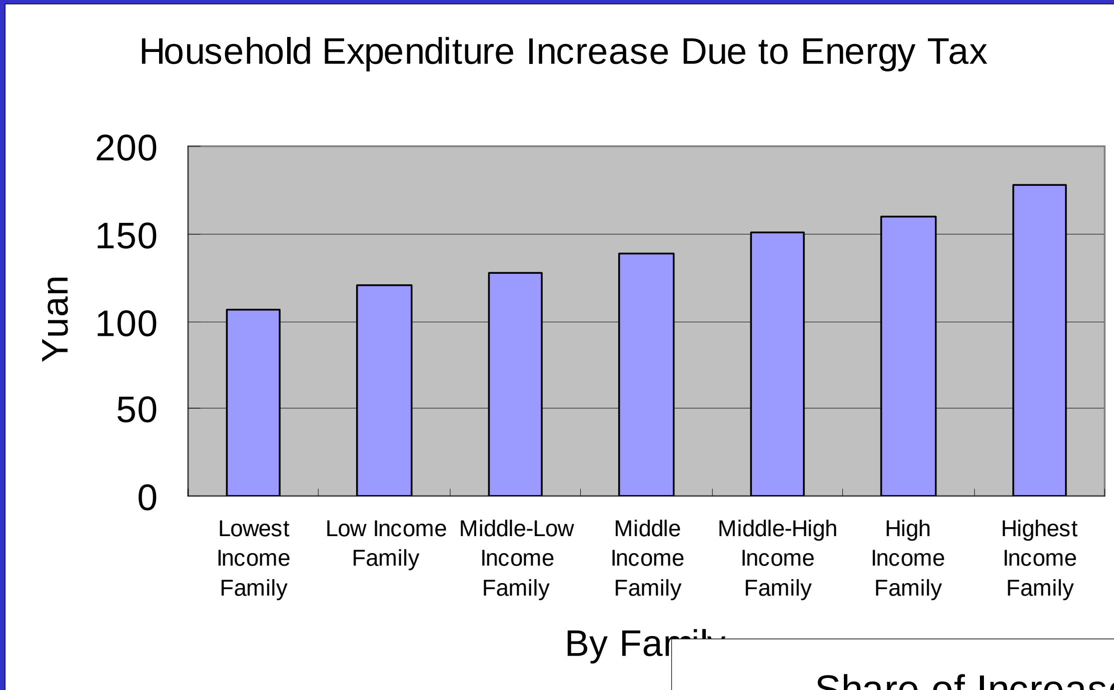


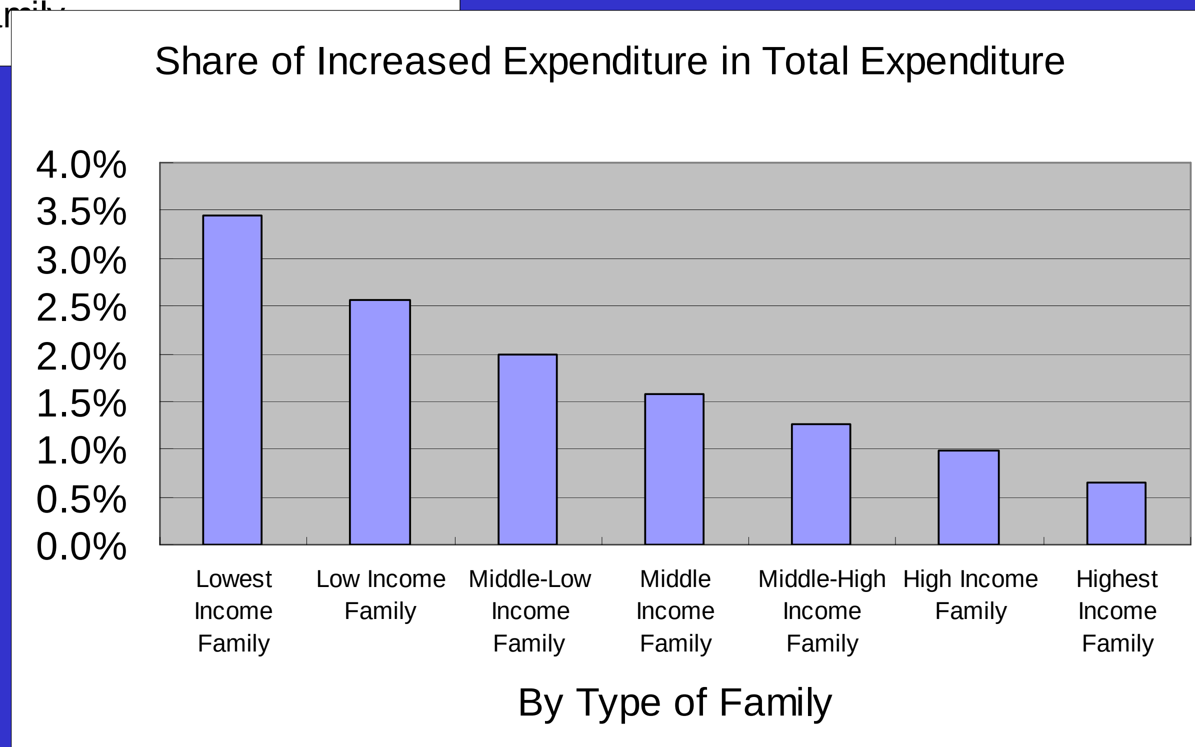
Impact on sector energy



Impact on sector output



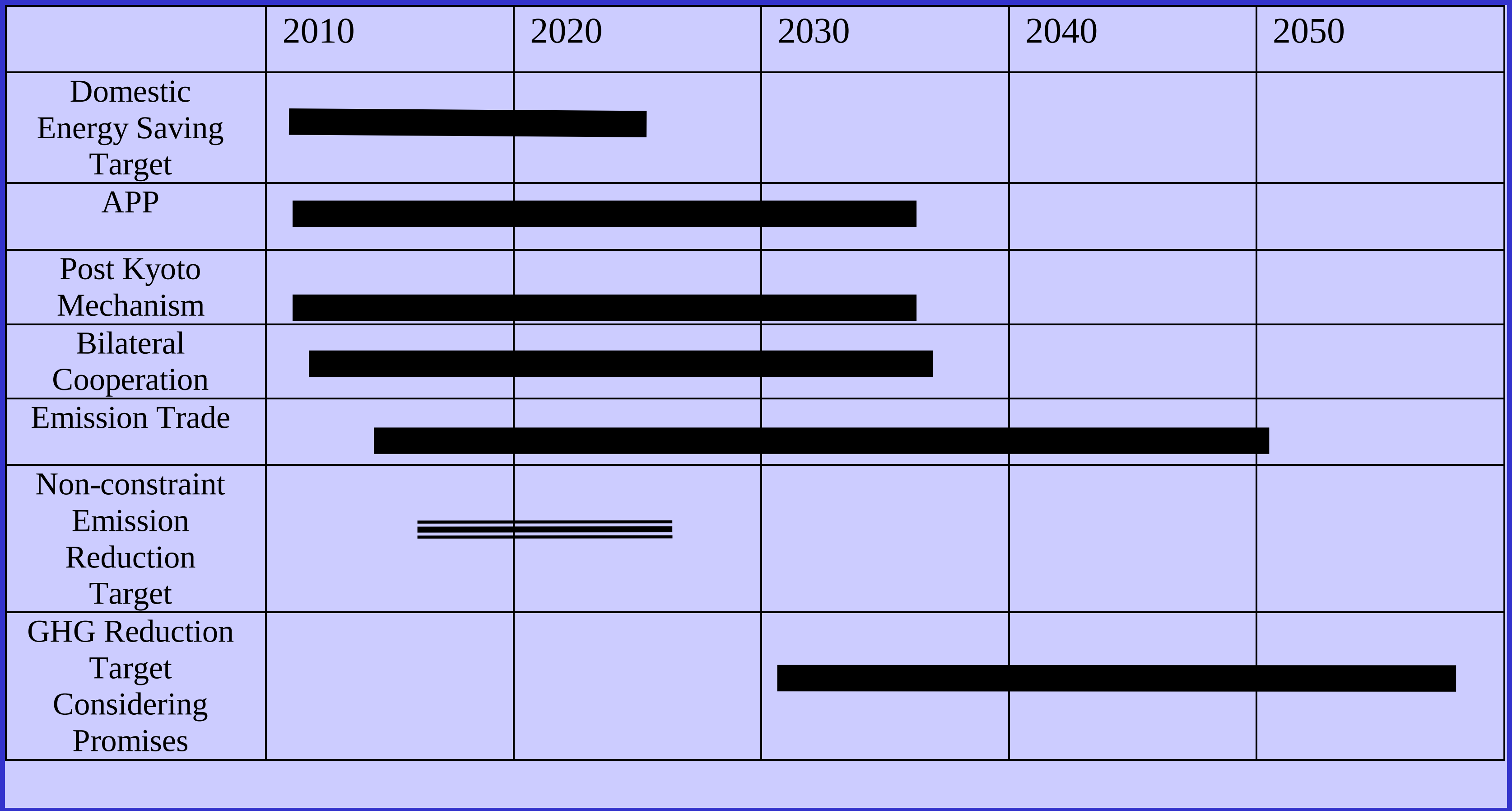

Household Expenditure Increase Due to Energy Tax
Yuan
200
150
100
50
0
Lowest Income Family
Low Income Family
Middle-Low Income Family
Middle Income Family
Middle-High Income Family
High Income Family
Highest Income Family


Share of Increased Expenditure in Total Expenditure
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
Lowest Income Family
Low Income Family
Middle-Low Income Family
Middle Income Family
Middle-High Income Family
High Income Family
Highest Income Family
By Type of Family

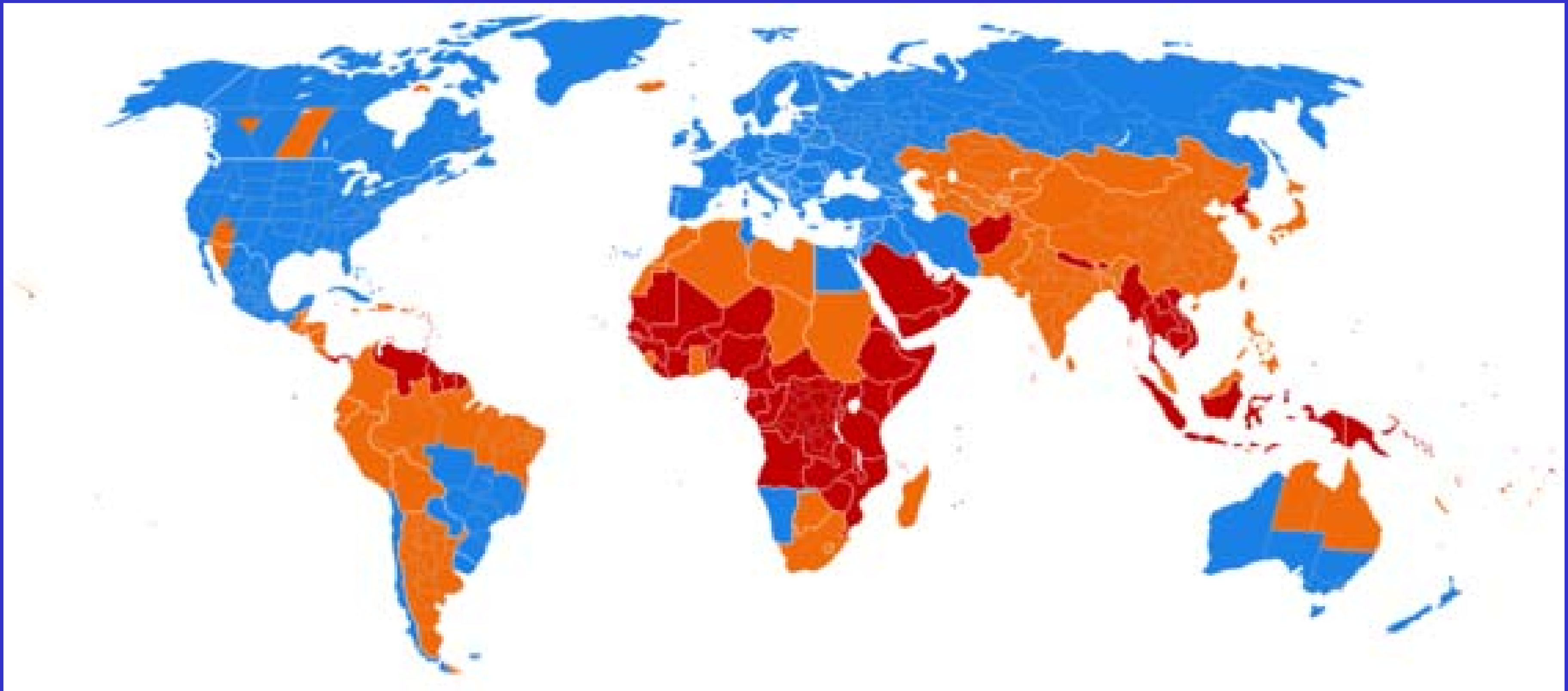
Energy Tax System

- Levy on: coal, petroleum, natural gas
- Exception : renewable energy, energy as feedstock
- Who pay: energy mining industry
- Energy import: levy by custome
- How to calculate: based on physical unit, ton, m3
- Period to levy:
  - scheme 1, based on month
  - Scheme 2, each half year
- Where to pay: headquarter, site for energy mining
- Tax rate: increase step by step, suggest to use tax rate 2

Post 2012 option road map of China



夏时制实施国家图：110 个国家



蓝色:目前正实行夏令时间的地区；橙色:曾经实行夏令时间但目前没有使用的地区；红色:从来没有实行过夏令时间的地区

Summer time map

What is summer time impact on

User of Lighting, air conditioner mainly include residential, service and industry

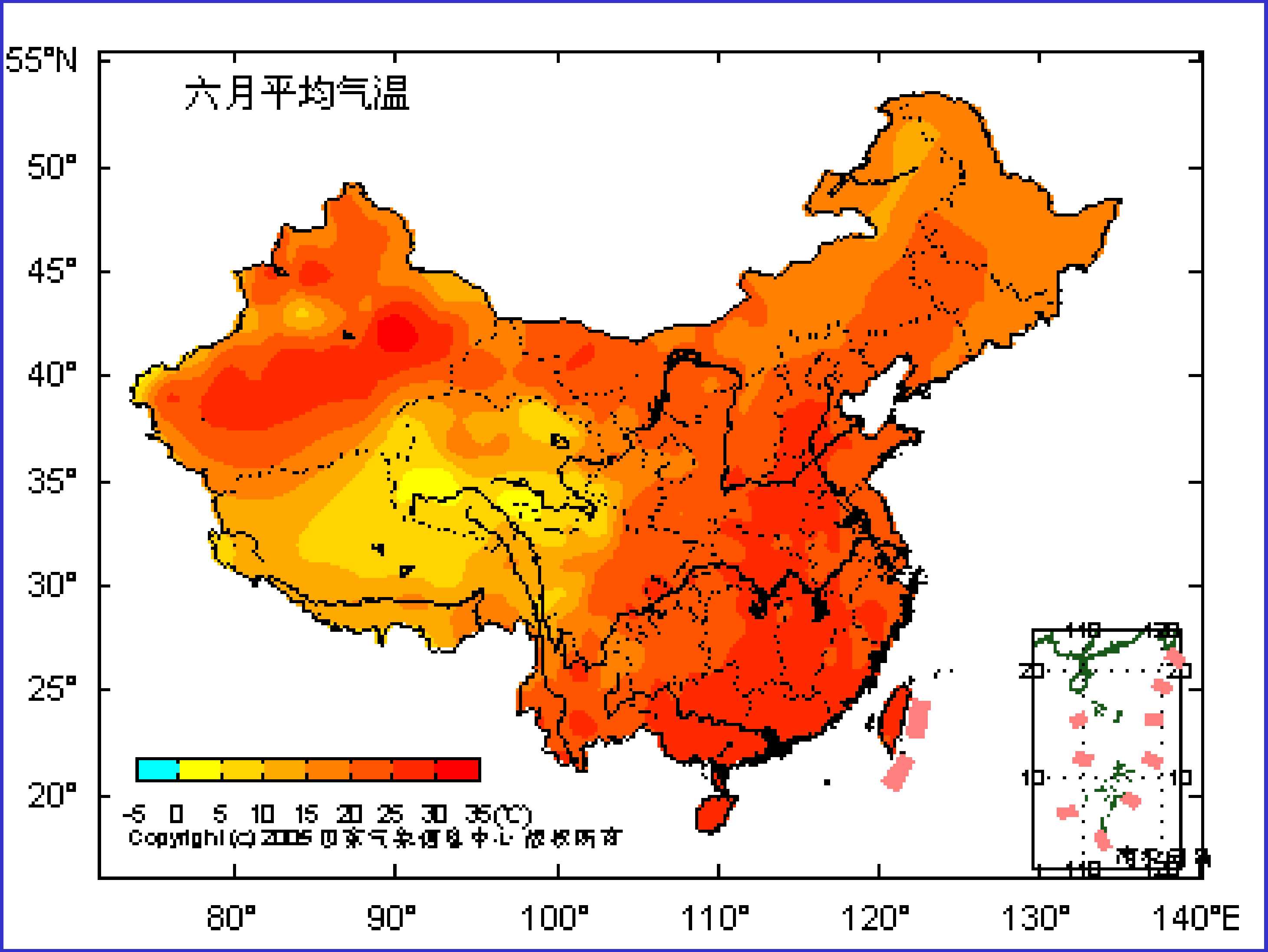
Urban residential is the major party impacted by summer time. There is strong social time regime.

- Time for office
- Shopping, consumption time.
- Media time

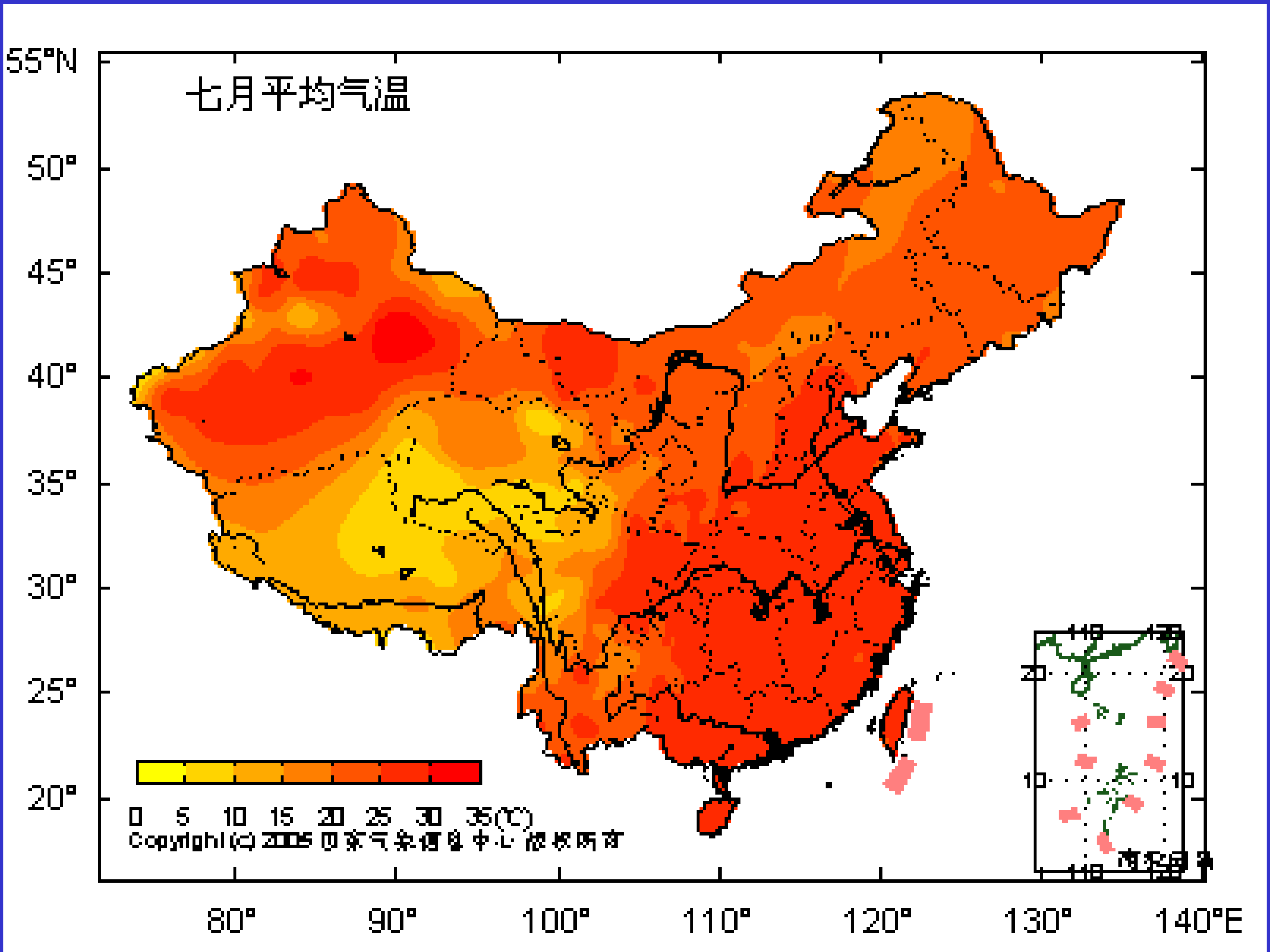
Capital city's sunrise and sun set time(a longest day in between May to October)

地区	省份	省会(首府)	日照最长一天 (大约)	日照时间(大约)	日出时间	日落时间	经纬度
东北地区	黑龙江	哈尔滨	6.19	15小时45分钟	3.43	19.26	E126°41' N45°45'
	吉林	长春	6.2	15小时半	3.56	19.24	E125°18' N43°55'
	辽宁	沈阳	6.18	15小时10分钟	4.11	19.24	E123°23' N41°48'
华北地区	北京	北京	6.24	15小时	4.47	19.47	E116°25' N39°55'
	天津	天津	6.2	15小时	4.45	19.4	E117°10' N39°10'
	山东	济南	6.19	14小时半	4.53	19.33	E114°17' N30°36'
	山西	太原	6.16	14小时半	5.7	19.54	E112°33' N37°51'
	河南	郑州	6.18	14小时半	5.12	19.41	E113°42' N34°44'
	河北	石家庄	6.21	12小时50分钟	5	19.48	E114°26' N38°03'
	陕西	西安	6.18	14小时20-分钟	5.33	19.59	E108°55' N34°15'
华中地区	安徽	合肥	6.22	14小时	5.6	19.2	E117°16' N31°51'
	江西	南昌	6.21	14小时	5.19	19.17	E115°53' N28°41'
	湖南	长沙	6.2	14小时	5.32	19.28	E112°55' N28°12'
	湖北	武汉	6.2	15小时	4.58	19.4	E120°10' N30°15'
华东地区	上海	上海	6.18	14小时	4.5	19	E121°28' N31°14'
	浙江	杭州	6.25	14小时半	5	19.4	E120°10' N30°15'
	江苏	南京	6.2	14小时	4.59	19.14	E118°46' N32°03'
华南地区	福建	福州	6.19	13小时半	5.11	18.57	E119°17' N26°06'
	广东	广州	6.21	13小时半	5.42	19.15	E113°16' N23°06'
西部地区	新疆	乌鲁木齐	6.19	15小时20分钟	6.27	21.55	E87°35' N43°48'
	内蒙古	呼和浩特	6.21	15小时	5.2	20.8	E111°38' N40°48'
	青海	西宁	6.19	14小时半	5.54	20.34	E101°49' N36°37'
	宁夏	银川	6.2	14小时50分钟	5.31	20.22	E106°13' N38°28'
	甘肃	兰州	6.14	14小时半	5.47	20.23	E103°50' N36°03'
	重庆	重庆	6.13	14小时	5.53	19.54	E106°33' N29°33'
	四川	成都	6.18	14小时	6.1	20.9	E104°04' N30°39'
	贵州	贵阳	6.2	13小时半	6.1	19.49	E106°43' N26°34'
	云南	昆明	6.19	13小时40分钟	6.2	20.1	E102°40' N25°05'
	西藏	拉萨	6.2	14小时	6.56	20.59	E91°02' N29°39'
	广西	南宁	6.19	13小时半	6.2	19.34	E108°21' N22°47'
	海南						

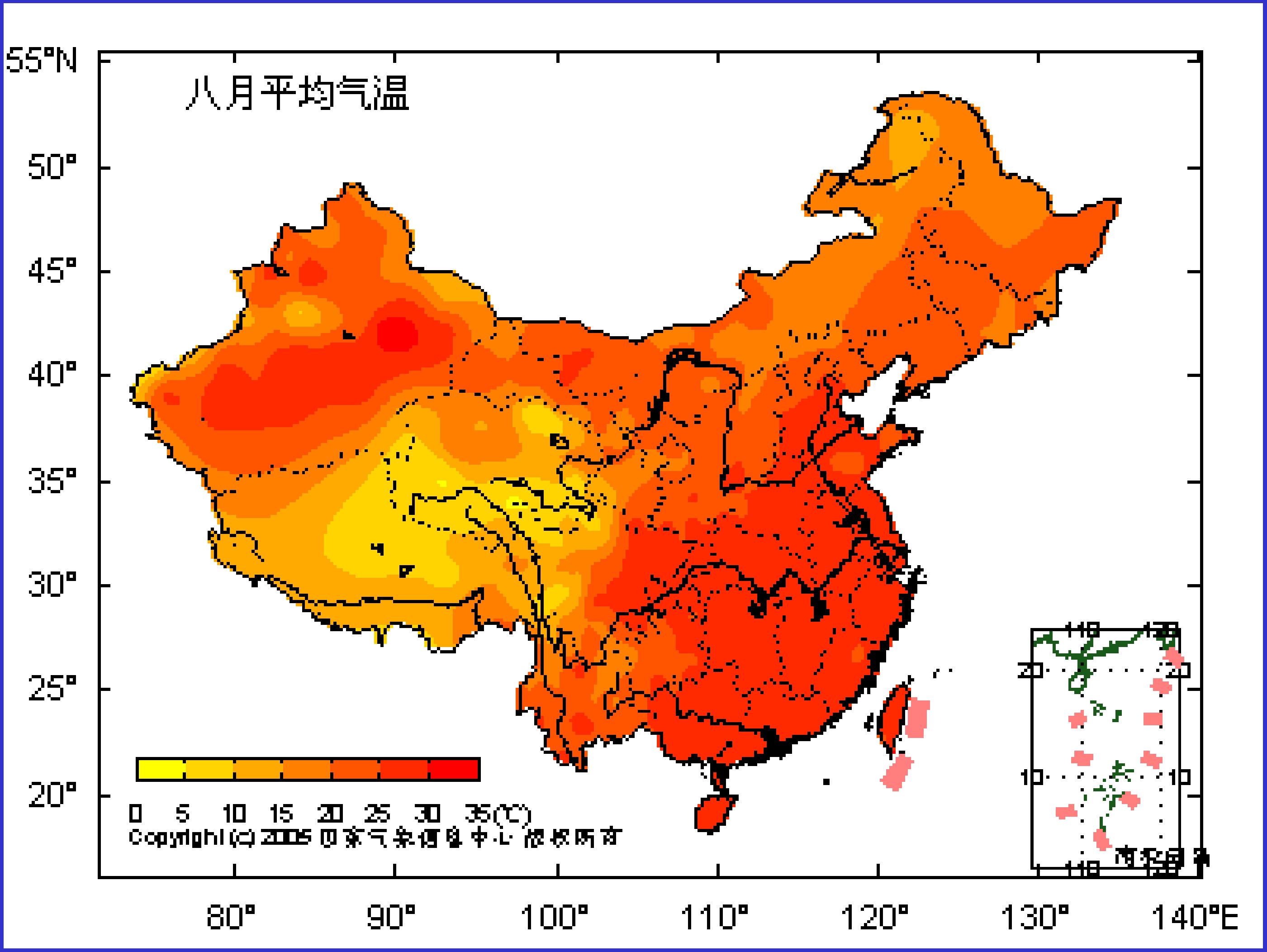
Temperature in June



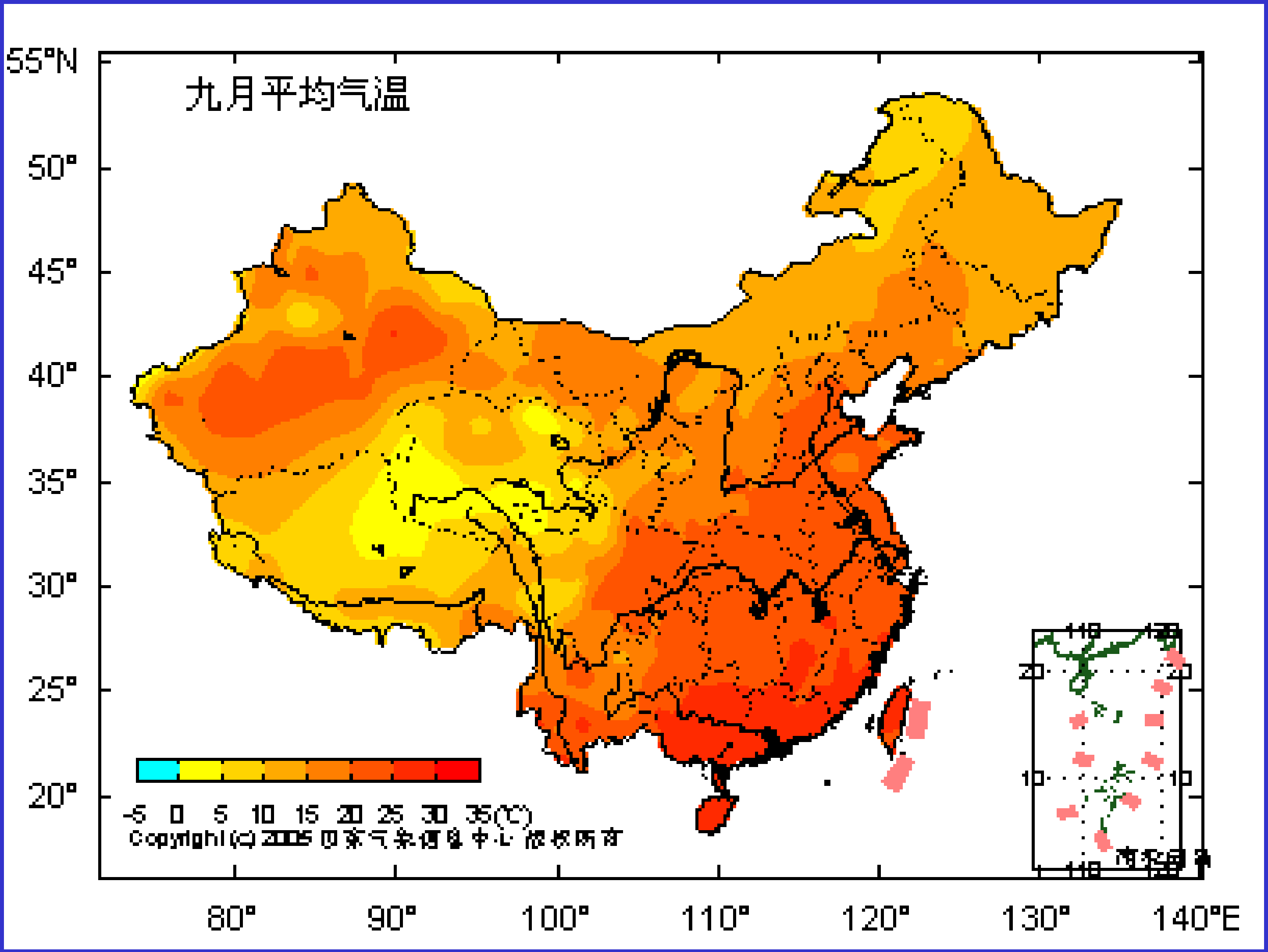
Temperature in July



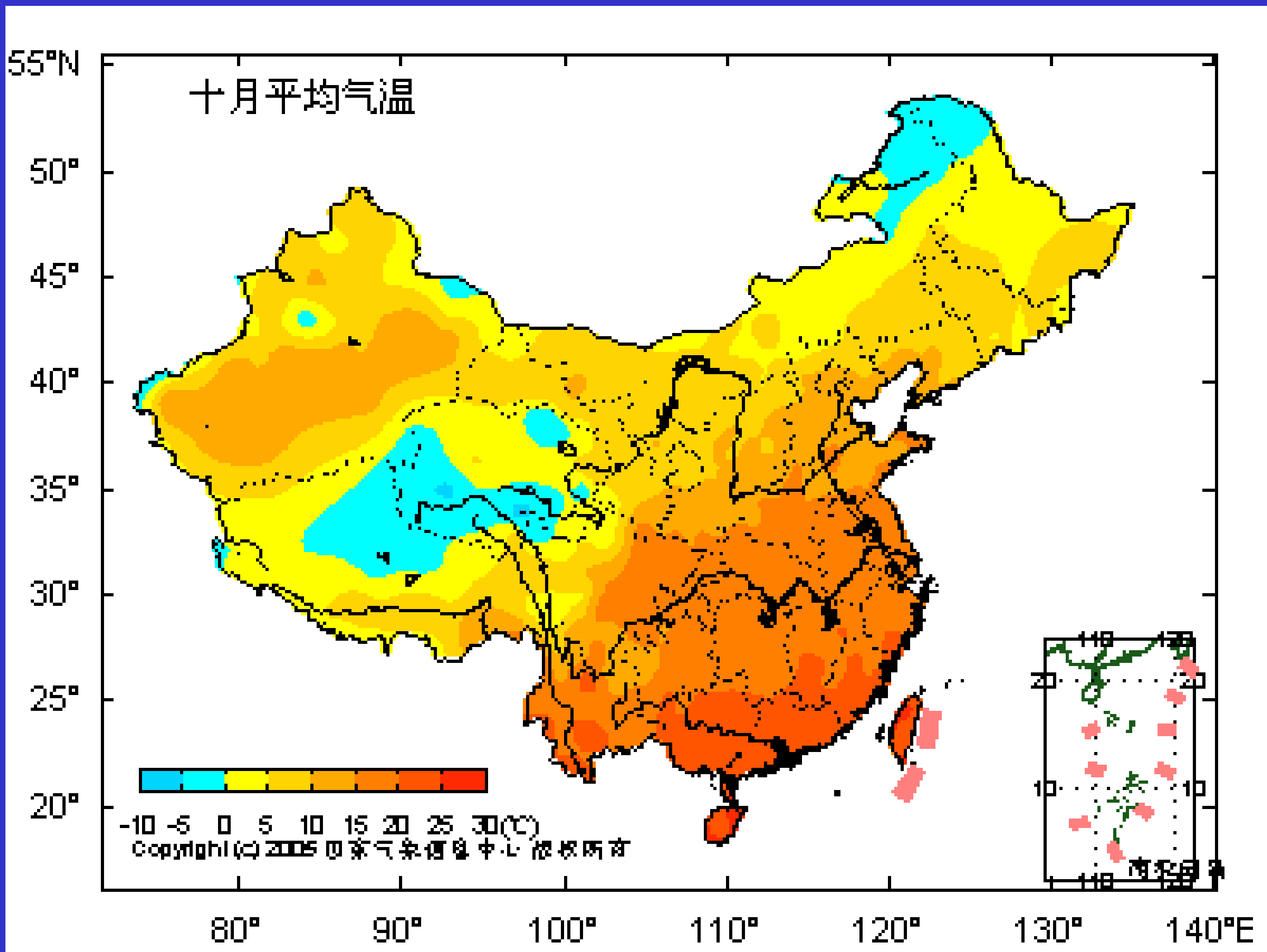
Temperature in August



Temperature in September



Temperature in October



Lighting and air conditioner setting for urban

regions	province	Hours for lighting without summer time	Hours for lighting, with summer time	Hours saved	Rate to use lighting	Diffusion rate of energy saving light	More hours for air-con due to summer time
东北地区	黑龙江			小时	60%		
	吉林	3.5	2.5	1小时	60%	65%	
	辽宁	3.5	2.5	1小时	60%	65%	
华北地区	北京	3.5	2.5	1小时	70%	90%	
	天津	3.5	2.5	1小时	60%	82%	
	山东	3.5	2.5	1小时	60%	80%	
	山西	3.5	2.5	1小时	60%	65%	
	河南	3.5	2.5	1小时	60%	65%	
	河北	3.5	2.5	1小时	60%	65%	
	陕西	3.5	2.5	1小时	55%	65%	
华中地区	安徽	3.5	2.5	1小时	55%	65%	
	江西	3.5	2.5	1小时	55%	65%	0.5
	湖南	3.5	2.5	1小时	55%	65%	0.5
	湖北	3.5	2.5	1小时	55%	65%	0.5
华东地区	上海	3.5	2.5	1小时	70%	90%	1
	浙江	3.5	2.5	1小时	70%	80%	1
	江苏	3.5	2.5	1小时	70%	80%	0.5
华南地区	福建	3.5	2.5	1小时	70%	75%	0.5
	广东	3.5	2.5	1小时	70%	80%	1
西部地区	新疆	3.5	2.5	1小时	50%	60%	
	内蒙古	3	2	1小时	50%	60%	
	青海	3	2	1小时	50%	60%	
	宁夏	3	2	1小时	50%	60%	
	甘肃	3	2	1小时	50%	60%	
	重庆	3.2	2.2	1小时	60%	60%	0.5
	四川	3	2.5	0.5小时	60%	65%	
	贵州	3	2.5	0.5小时	55%	60%	
	云南	3	2.5	0.5小时	50%	65%	
	西藏	3	2.5	0.5小时	40%	75%	
	广西	3	2.5	0.5小时	50%	65%	
	海南	3.5	2.5	1小时	60%	75%	1

Lighting setting after summer time for rural

地区	省份	非夏时制照明时间（小时）	夏时制照明时间（小时）	节约灯光照明时间	开灯率 %	节能灯普及率 %
东北地区	黑龙江	2.5	2	0.5小时	45%	20%
	吉林	2.5	2	0.5小时	45%	20%
	辽宁	2.5	2	0.5小时	45%	20%
华北地区	北京	3.5	2.5	1小时	60%	70%
	天津	3.5	2.5	1小时	50%	50%
	山东	3.5	2.5	1小时	50%	40%
	山西	2.5	2	0.5小时	45%	20%
	河南	2.5	2	0.5小时	45%	20%
	河北	2.5	2	0.5小时	45%	65%
	陕西	2.5	2	0.5小时	45%	20%
华中地区	安徽	2.5	2	0.5小时	55%	20%
	江西	2.5	2	0.5小时	45%	20%
	湖南	2.5	2	0.5小时	45%	65%
	湖北	2.5	2	0.5小时	55%	20%
华东地区	上海	3.5	2.5	1小时	60%	40%
	浙江	3.2	2.2	1小时	60%	40%
	江苏	3.2	2.2	1小时	60%	40%
华南地区	福建	3.2	2.2	1小时	60%	35%
	广东	3.2	2.2	1小时	60%	40%
西部地区	新疆	2.5	2	0.5小时	45%	20%
	内蒙古	2.5	2	0.5小时	45%	20%
	青海	2.5	2	0.5小时	45%	20%
	宁夏	2.2	2	0.5小时	45%	20%
	甘肃	2.2	2	0.5小时	45%	20%
	重庆	3.2	2.5	0.7小时	45%	20%
	四川	2.2	1.5	0.7小时	45%	20%
	贵州	2.2	1.5	0.7小时	45%	60%
	云南	2.2	1.5	0.7小时	45%	20%
	西藏	2	1.5	0.5小时	30%	50%
	广西	2.2	1.5	0.7小时	50%	20%
	海南	2.2	1.5	0.7小时	45%	30%

Electricity saved due to summer time, 10^8 kWh

	2005	2010	2020	2030
Urban lighting	45. 9	68. 6	102. 6	144. 8
Rural lighting	34. 7	53. 9	58	49. 8
Urban Air-Con	−3. 9	−5. 5	−7. 5	−8
Service lighting	67	71	92	109
Total	143. 8	188	245. 1	295. 5

AIM/Local-China

- Extension of power sector
- Cement sector
- Steel sector
- Used in Gains-Asia Study

Power generation

- Check data from other source, provided by AIM team
- New power plants
- LPS for IGCC
- LPS for Nuclear

Check data from other source, provided by AIM team

			FENGTAN 5											
			FENGTAN 6											
314		HUN12	Dongjiang Hydro	652324	MANASI	Zixing City	HUN	XJ	Xinjiang	Hunan	22%	86.13	44.18	HUN
					不明				Hunan			不明	不明	
315		HUN13	Wuqiangxi Hydro	652324	MANASI	Yuanling County	HUN	XJ	Xinjiang	Hunan	39%	86.13	44.18	HUN
					Yuanling County				Hunan			110.39	28.45	
												110.39	28.45	
316		HUN14	Suangpai Hydro	652324	MANASI	Yunlong	HUN	XJ	Xinjiang	Hunan	36%	86.13	44.18	HUN
					Yunlong				Yunnan			101.59	24.83	
												99.47	25.83	
317		HUN15	Jiangya Hydro	652324	MANASI	Jiangya	HUN	XJ	Xinjiang	Hunan	5%	86.13	44.18	HUN
					Jiangya	Jiangya			Hunan	Hunan		110.76	29.50	
												110.77	29.50	
318		GD18	Fengshuba Hydro	652324	MANASI	Longchuan Co	GD	XJ	Xinjiang	Guangdong	16%	86.13	44.18	GD1
					Longchuan Co				Guangdong			115.25	24.10	
												115.25	24.10	
319		GD19	Qingxi Hydro	652324	MANASI	Dapu Co	GD	XJ	Xinjiang	Guangdong	24%	86.13	44.18	GD1
					Dapu Co				Guangdong			不明	不明	
												116.72	24.32	
320	643?	GD20	Feilaixia Hydro	652324	MANASI	Qingyuan City	GD	XJ	Xinjiang	Guangdong	11%	86.13	44.18	GD2
			FEILAITIA 1		不明				不明			不明	不明	
			FEILAITIA 2											
321		GD21	Xinfengjiang Hydro	652324	MANASI	Heyuan County	GD	XJ	Xinjiang	Guangdong	21%	86.13	44.18	GD2
					Heyuan County				Guangdong			114.69	23.73	
												114.69	23.73	
322		GX04	Tianshengqiao 1	652324	MANASI	Xingyi City	GZ	XJ	Xinjiang	Guizhou	45%	86.13	44.18	GX0
			TIANSHENGQIAO-1		不明				Guizhou			不明	不明	
323		GX05	Tianshengqiao 2	652324	MANASI	Xingyi City	GZ	XJ	Xinjiang	Guizhou	45%	86.13	44.18	GX0
			TIANSHENGQIAO-2		不明				Guizhou			不明	不明	
324	不明	GX06	Guigang Hydro	652324	MANASI	Guigang	GZ	XJ	Xinjiang	Guizhou	37%	86.13	44.18	GX0
												86.22	44.30	
325		GX07	Bailongtan Hydro	652324	MANASI	Mashan Co	GX	XJ	Xinjiang	Guangxi	47%	86.13	44.18	GX0
					不明				Guangxi			不明	不明	
326	不明	GX08	Mashi Hydro	652324	MANASI	Guangxi	GX	XJ	Xinjiang	Guangxi	40%	86.13	44.18	GX0
												86.22	44.30	
327		GX09	Yantan Hydro	652324	MANASI	Dahua Co	GX	XJ	Xinjiang	Guangxi	49%	86.13	44.18	GX0
					不明				Guangxi			不明	不明	

Nuclear Power Plants, by 2007

号	Nmae of Plant		Unit	start cons（年）	start gen 年	Capacity（万KW）
1	大亚湾		1		1994	94.4
2	大亚湾		2			94.4
3	秦山		1		1994	27.9
4	秦山		2		2002	61
5			3		2004	61
6	岭澳		1		2002	93.5
7			2		2003	93.5
8	秦山		4		2002	66.5
9			5		2003	66.5
10	田湾		1		2007	100
11			2		2007	100
	田湾-2		3	2008		106
			4			106
12	岭澳		3			100
13			4			100
14	秦山		6			65
15			7			65
16	三门	AP-1000	1	2009	2013	100
17		AP-1000	2	2009	2013	100
18	阳江	CPR-1000	1	2008	2013	100
19		CPR-1000	2			100
	阳江-2		3			100

Nuclear Power Plants, by 2030, 94GW

mae of Plant		Unit	start cons	start gen	Capacity
荣成石岛湾-3	CPR-1000	19			100
	CPR-1000	20			100
	CPR-1000	21			100
	CPR-1000	22			100
红岩河	CPR-1000	1	2008	2010	106
	CPR-1000	2	2008	2010	106
红岩河-2	CPR-1000	3			106
	CPR-1000	4			106
福清		1			100
		2			100
台山	EPR	1			160
	EPR	2			160
百龙	CPR-1000	1	2010	2016	108
	CPR-1000	2	2010	2016	108
芜湖	CPR-1000	1	2011	2017	108
	CPR-1000	2	2011	2017	108
连云港	CPR-1000	1	2010	2016	108
	CPR-1000	2	2010	2016	108
河源		1			100
		2			100
		3			100
		4			100
田湾-3	AES-91	1			106
		2			106
		3			106
		4			106
田湾-2，陆丰		1			100
		2			100
		3			100
		4			100
百龙-2		1			110
		2			110
		3			110
		4			110
三门-2		1			110
		2			110
		3			110
		4			110

IGCC, by 2020

mae of Plant			Unit	start cons （年）	start gen 年	Capacity （万KW）
天津	华能		1	2007	2009	25
天津	华能		1			40
			2			40
天津大港	大唐		1			40
			2			40
东莞	大唐 /广核电		1			40
			2			40
			3			40
			4			40
沈阳	大唐	多联产	1			40
		联产甲醇1:	2			40
			3			40
			4			40
深圳煤化工	大唐		1			
浙江半山	华电		1			20
江苏海门	国电		1			
海南	国电		1			
廊坊IGCC	中电投		1			40
			2			40

China LPS Inventory Checking-- Steel Sector

- LPS amount to:70

- Checked item

--Name, place ,postalcode, longitude and latitude by LPS

--Technology :CON, ARC,OPEN by LPS

--Output value:

Stock value by LPS and technology in 2000

Output value by LPS and technology in 2000(added by HU)

Operation rate= Output value / Stock value in 2000

Output value by LPS and technology in 2005(added by HU)

-- Technology introduction

--Energy consumption kind by LPS and technology

China LPS Inventory Checking-- Steel Sector

- Related note

--LPS name and postalcode checked base on China Steel Yearbook, 2001 P382—P387.

--Longitude Latitude checked base on <China Placename list > 1997, China map publishing company

--Stock value by technology and LPS checked base on China Steel Yearbook, 2001. P216—P219

--Output-Value in 2000 was added by HU for calculate the operation-rate.

--Output-Value in 2005 was added by HU, but only have total steel output - value by LPS , have not by technology data

--Have not stock –value in 2005

China LPS Inventory Checking-- Steel Sector

- Related finds

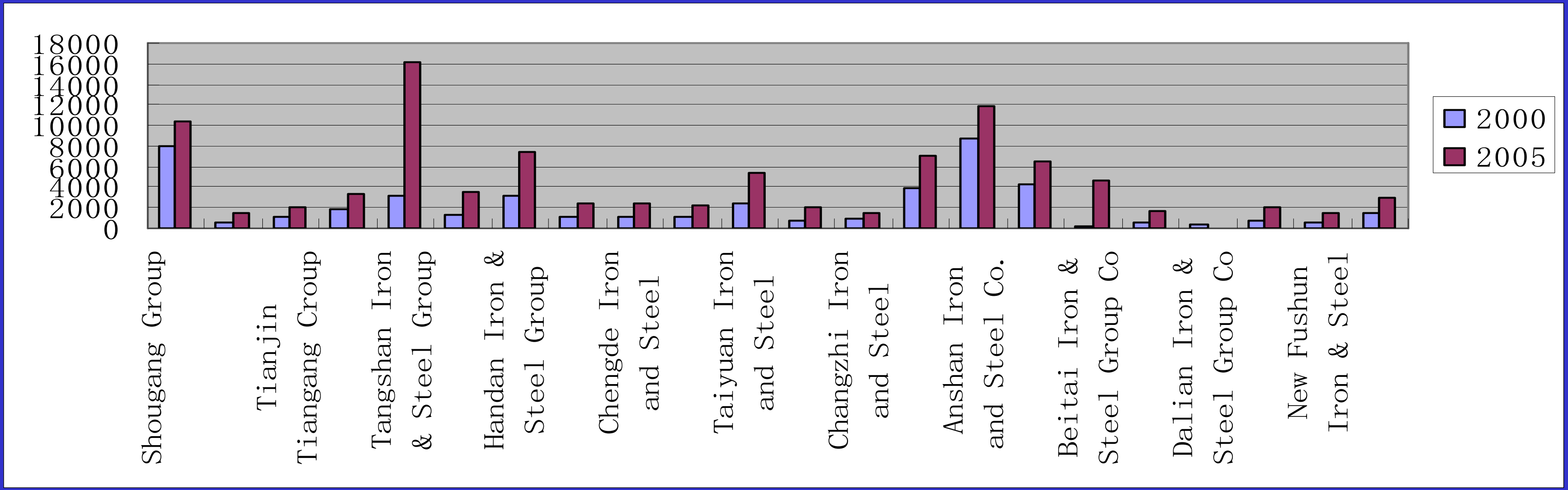
2000: Steel output: 128.5Mt
LPS output: 118.2Mt (91%)

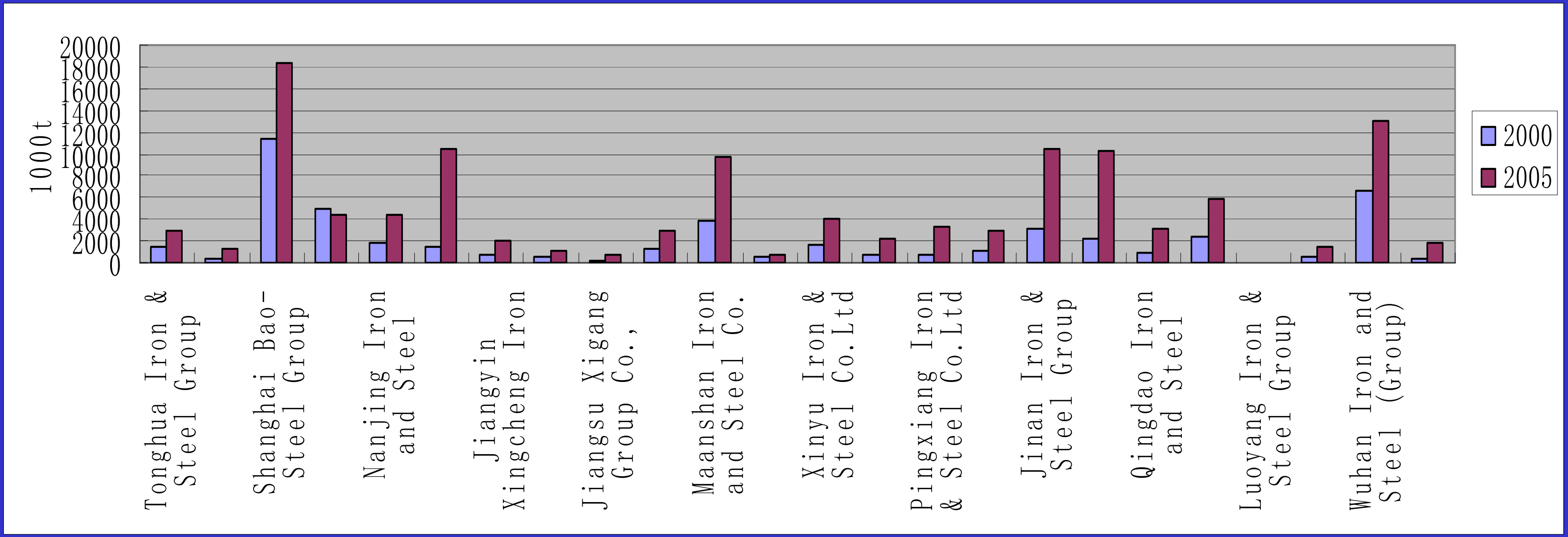
2005:Steel output: 352.4Mt
LPS output: 264.6Mt (75%)

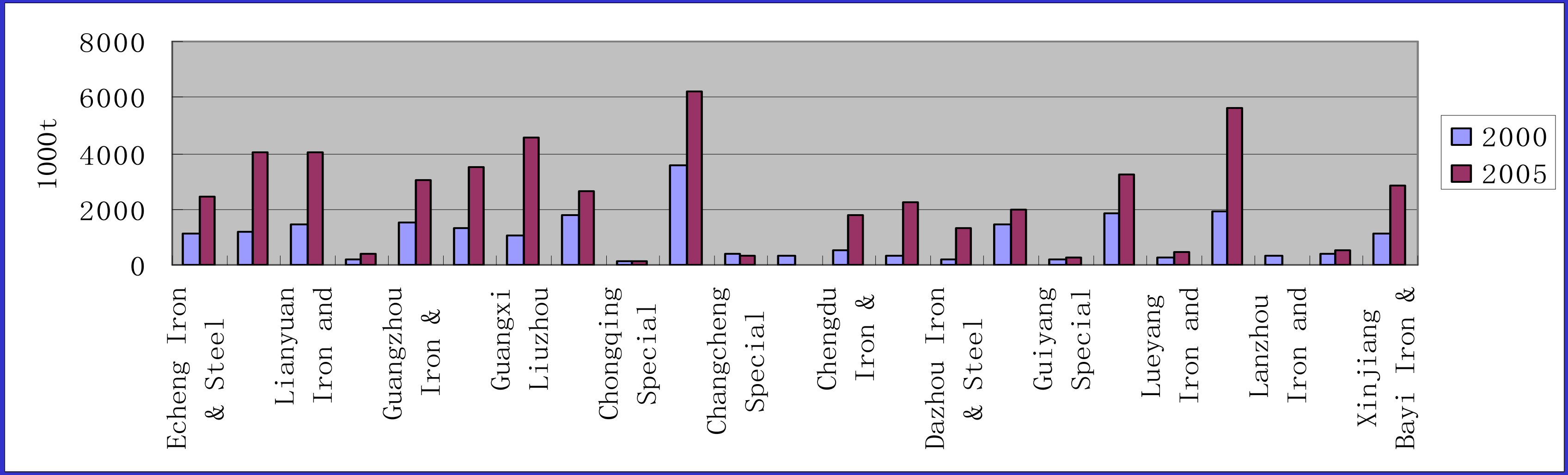
2000: only 1 plant output/year exceed 10Mt (Shanghai Baoshan)

2005: add to 8 plant output/year exceed 10Mt

Steel output by LPS







8000
6000
4000
2000
0
1000t
2000
2005
Echeng Iron & Steel
Lianyuan Iron and
Guangzhou Iron &
Guangxi Liuzhou
Chongqing Special
Changcheng Special
Chengdu Iron &
Dazhou Iron & Steel
Guiyang Special
Lueyang Iron and
Lanzhou Iron and
Xinjiang Bayi Iron &

China LPS Inventory Checking-- Other Sector

- Cement Sector (in progress)
- Petrochemical Sector (in progress)
- Oil Refinery Sector (in progress)

Cement, by 2005

Cement Production lines

- **1000T/D(104)**
- **2000T/D(85)**
- **2500T/D(221)**
- **5000T/D(166)**
- **10000T/D(4)**

10000吨/天

所属集团
安徽枞阳海螺水泥股份有限公司
安徽铜陵海螺水泥有限公司
徐州海螺水泥有限责任公司

5000吨/天

安徽枞阳海螺水泥股份有限公司
安徽荻港海螺水泥股份有限公司
安徽海螺集团宁国水泥厂，宁国市
安徽怀宁海螺水泥有限公司
安徽三狮和德水泥有限公司，广德县
安徽铜陵海螺水泥有限公司
安徽铜陵上峰水泥股份有限公司
安丘山水水泥有限公司，山东
长兴众盛水泥有限公司，浙江长兴
常州盘固水泥有限公司，江苏金坛
巢东水泥股份有限公司
池州海螺水泥股份有限公司
德州晶华集团大坝有限公司
鄂尔多斯市蒙西建材有限责任公司
福建龙麟集团龙岩市福龙水泥厂
富阳三狮水泥有限公司
广东光大企业集团有限公司
广东省亨达利水泥有限公司

所属集团
河南义马煤业水泥有限公司
黑龙江宾州水泥有限公司
湖北娲石股份有限公司
湖北雄骏水泥有限公司
湖南泓溧水泥有限公司
华润水泥控股有限公司
华新水泥（黄石）股份有限公司
华新水泥股份有限公司
吉林亚泰集团
吉林亚泰明城水泥（石灰石）有限公司
吉林亚泰水泥有限公司
嘉新京阳水泥有限公司
建德海螺有限责任公司
建德红狮水泥有限公司
建德三狮水泥有限公司
江苏恒来建材股份有限公司
江苏蛟桥水泥股份有有限公司
江苏巨龙水泥集团有限公司
江苏联合水泥有限公司
江苏双龙集团有限公司
江苏天山水泥溧阳分公司
江西兰丰水泥集团
江西万年青水泥股份有限公司瑞金水泥厂
康达(承德)水泥有限公司
康达（山东）水泥有限公司
昆钢华云实业公司
立马控股集团股份有限公司
溧阳市汉生特种水泥有限公司
溧阳市金峰水泥有限公司
辽宁工源水泥集团有限公司
辽源市金刚水泥厂
鹿泉东方鼎鑫水泥（集团）有限公司