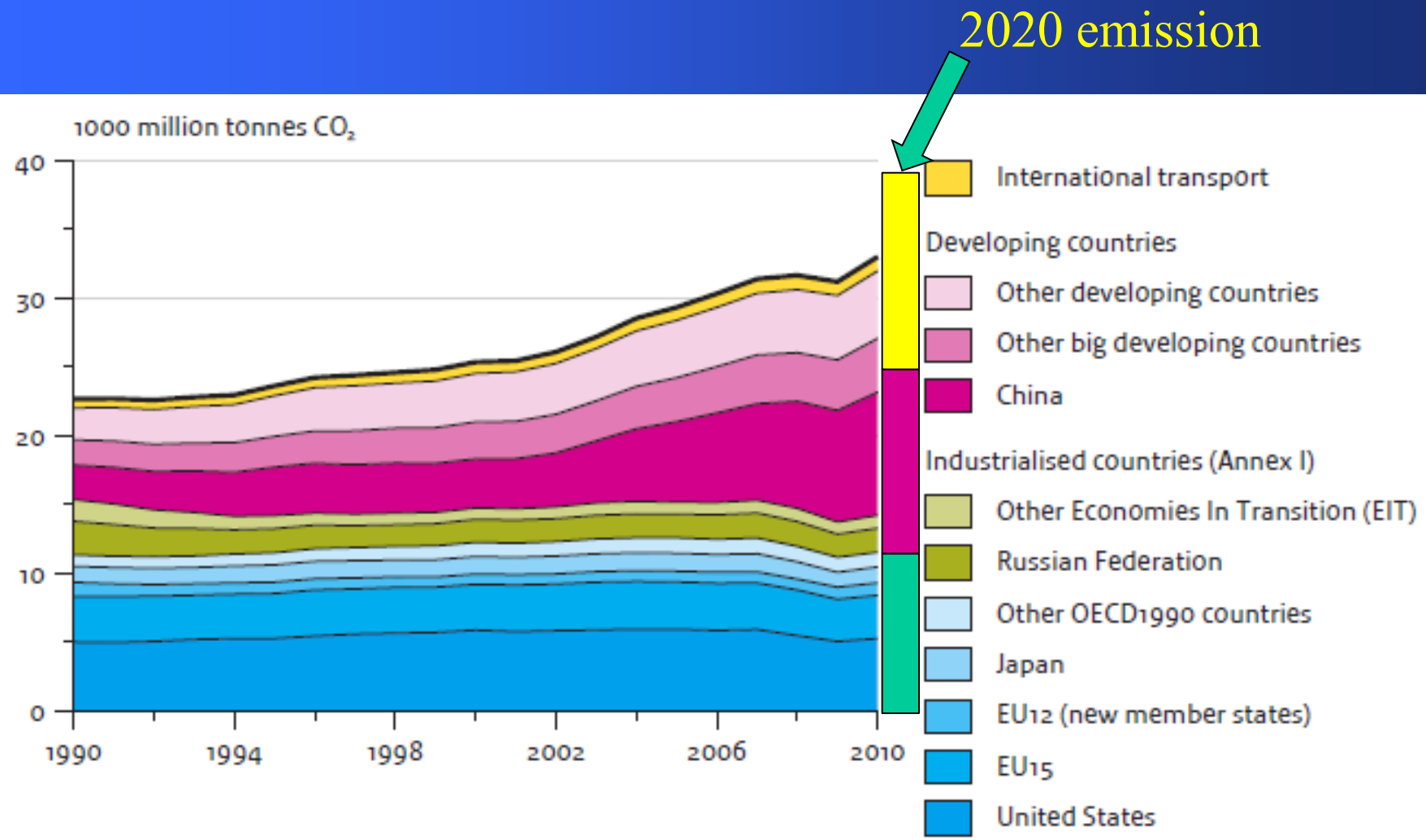
China's Low Carbon Future: 2 degree pathway

Energy Research Institute, China

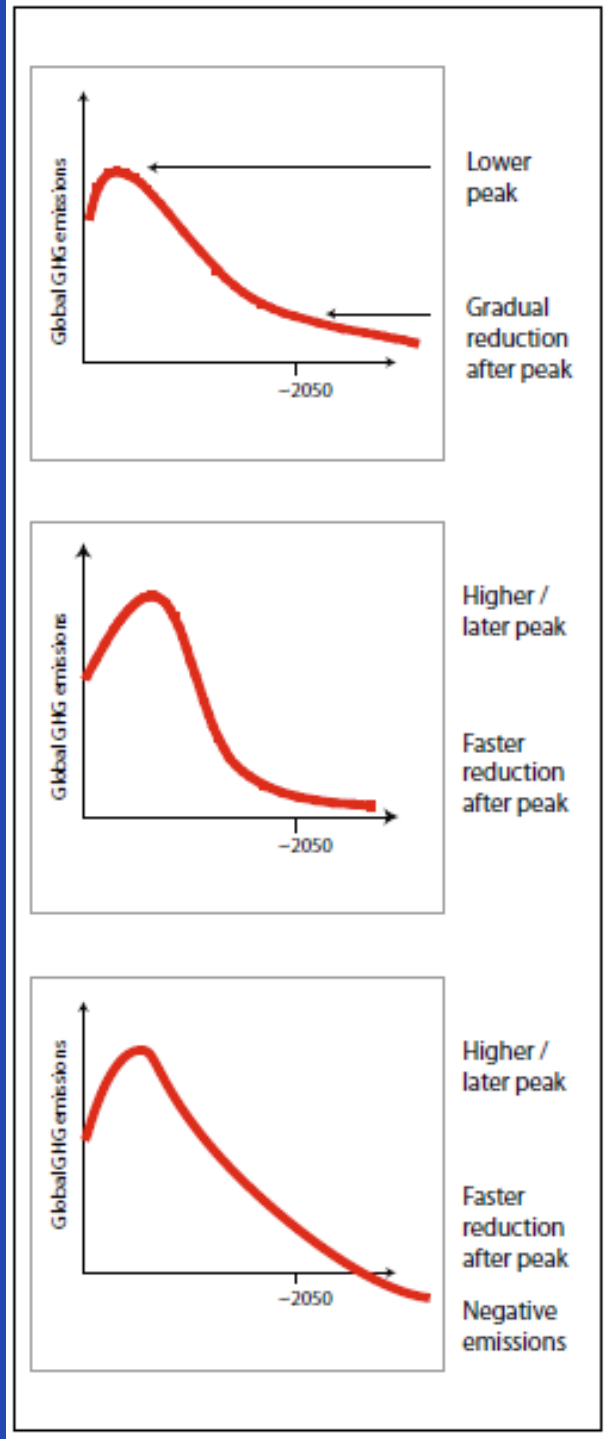
Key Points: study by 2014

- International negotiation finish by when? 2015/2017/2019
- What the major concerning to go to 2 degree target?
- What is the role of China

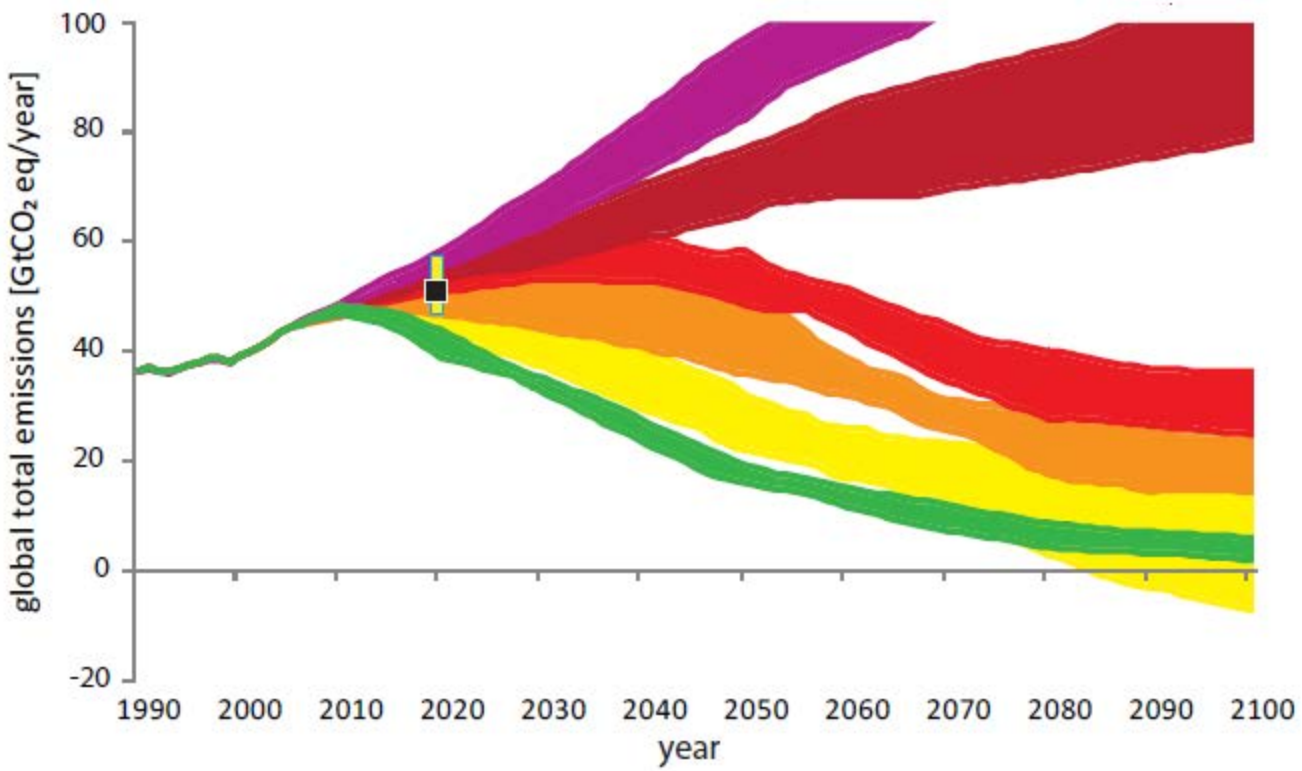
全球能源活动和水泥生产CO2 排放量
Global CO2 emission from energy and cement manufacture



Global Emission: 2 degree



Likely avoided temperature increase of IAM scenarios.
Bar superimposed in 2020 shows expected emissions from the pledges.



Legend:

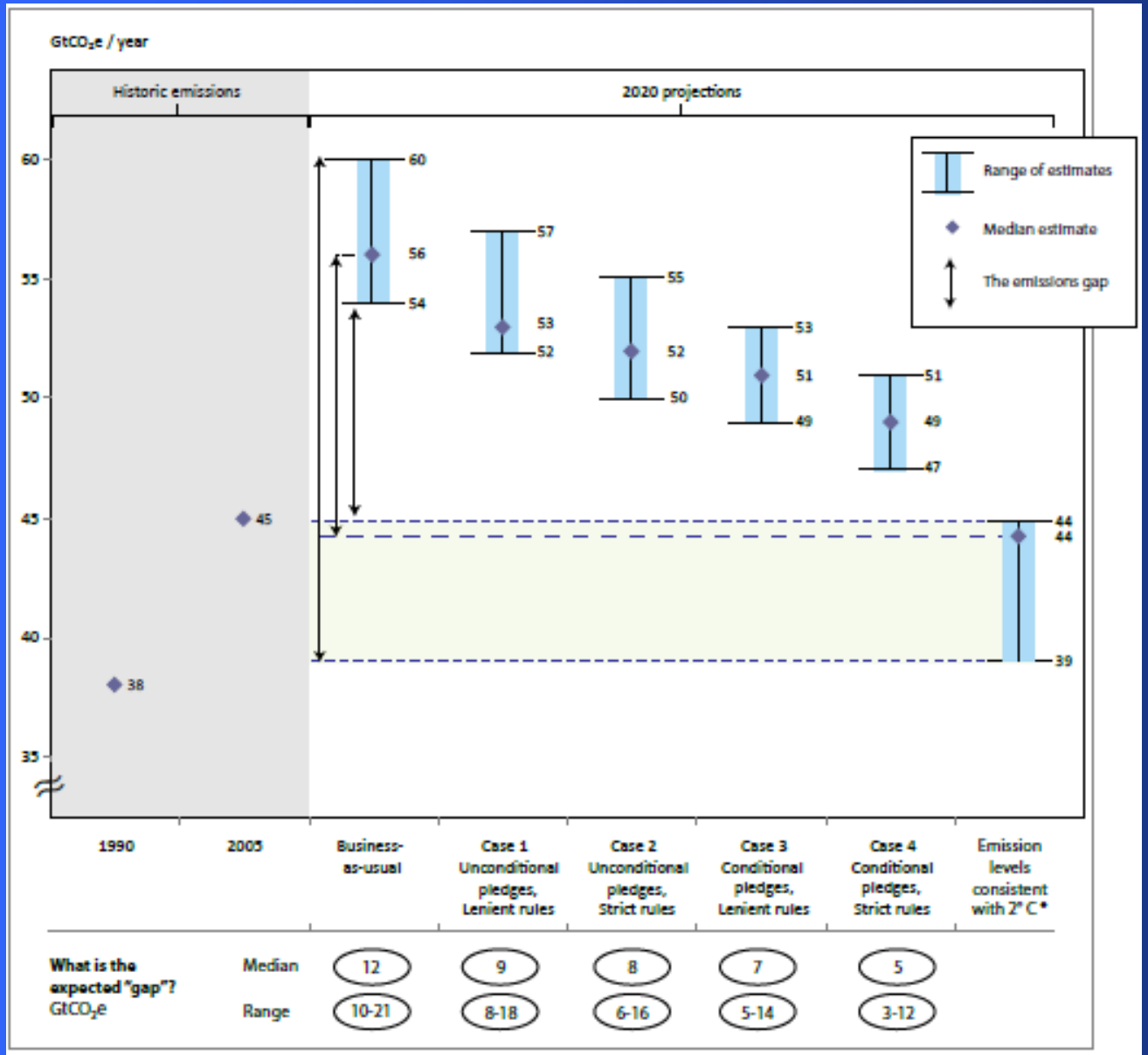
Emission levels consistent with a likely temperature increase (T) in the 21st century of:

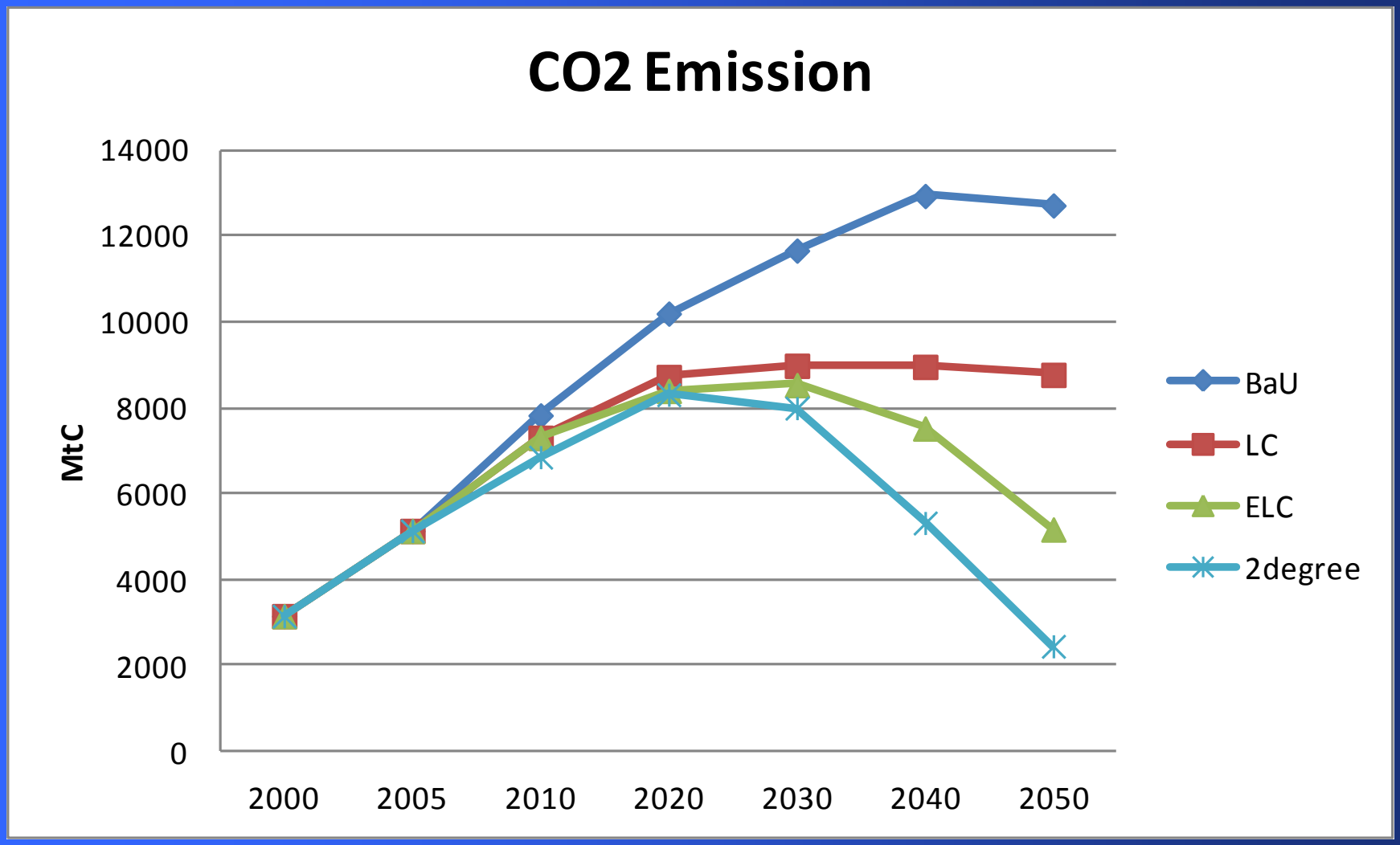
- T > 5°C
- 4°C < T < 5°C
- 3°C < T < 4°C
- 2.5°C < T < 3°C
- 2°C < T < 2.5°C
- T < 2°C

range of pledge cases

median range of pledge cases

Copenhagen Commitment: the GAP




CO2 Emission
14000
12000
10000
8000
6000
4000
2000
0
MtC
2000
2005
2010
2020
2030
2040
2050
BaU
LC
ELC
2degree

What's the future of China's low carbon policy: a big picture

- Economic structure optimization policies
- Energy efficiency policies
- Renewable energy/nuclear power generation oriented policies
- CCS
- Low carbon consumption/ lifestyle
- Land use emission reduction policies: so far relatively poor

Recent policies

- Economic structure optimization policies
  - NDRC's industry policies
  - Investment control
  - Carbon tax/other taxes: within 12th Five Year
  - Emission trading: domestic, and international
- Energy efficiency policies
  - 12th Five Year Plan target
  - Sector policies
- Renewable energy/nuclear power generation oriented policies
  - New scenario by 2020: wind 250GW, solar: 50 to 80GW
  - More policies on pricing, especially on distributed power generation, feed-in tariff.

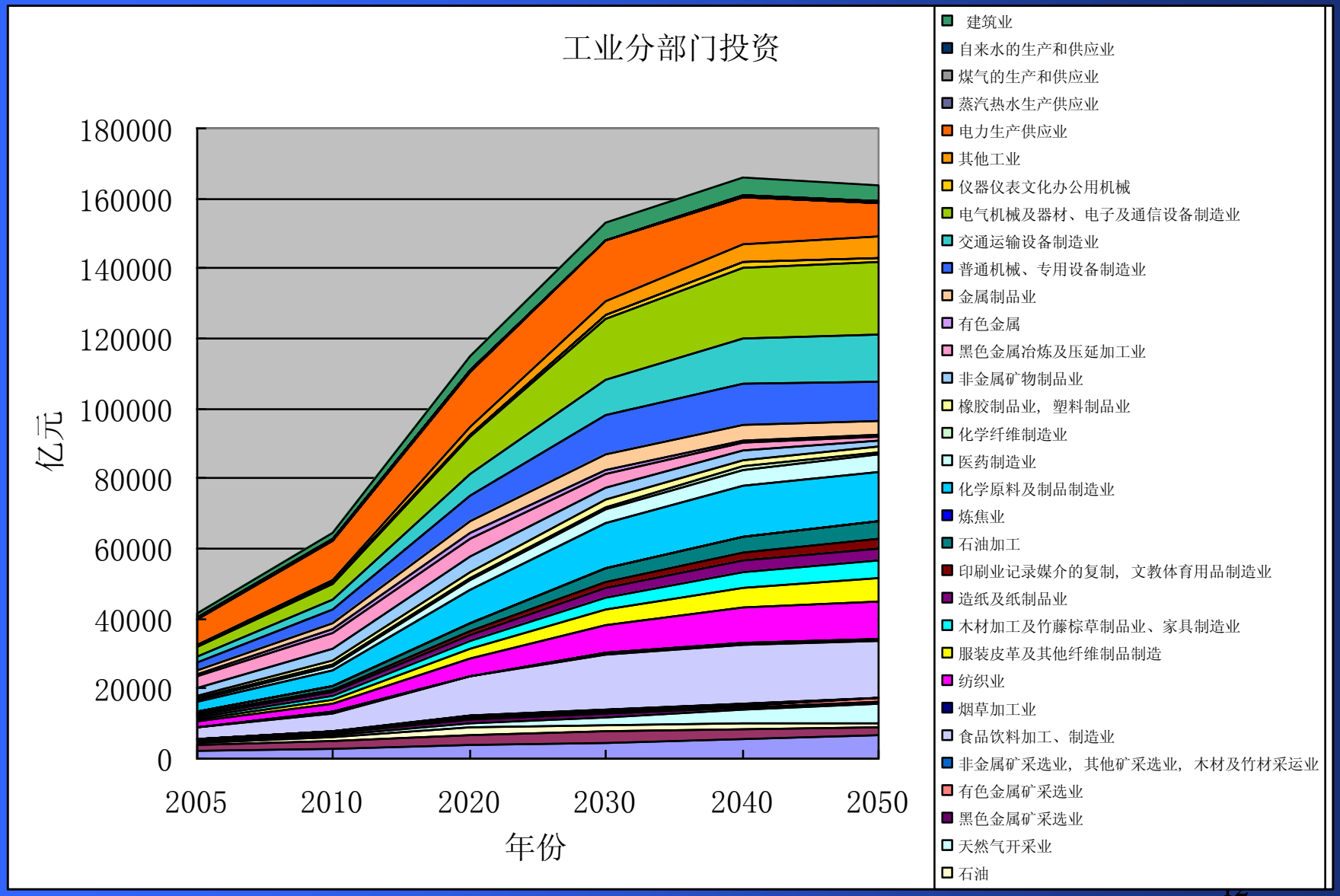
Good news

- Technology progress is much faster than our model says: learning curve effects
- High GDP growth could support low carbon development in China: all cost analysis in models are very small compared with GDP
- China's low carbon related technology manufacture is getting leading in the world: benefit for economy
- Local environment issues will be a very strong factor to go to clean production, nearly match with low carbon development

International concerning

- Peaking emission before 2030(before 2025)
- Legally bending for target 2020 and after
- Cap for the target for 2020 and after
- Full effort comparable, leading the world, and together with other countries and regions

Investment by industrial sectors



Products output in major sectors, Low Carbon and ELC

	Unit	2005	2020	2030	2040	2050
Steel	Million ton	355	610	570	440	360
Cement	Million ton	1060	1600	1600	1200	900
Glass	Million cases	399	650	690	670	580
Copper	Million ton	2.6	7	7	6.5	4.6
Ammonia	Million ton	8.51	16	16	15	12
Ethylene	Million ton	5.1	7.2	7	6.5	5.5
Soda Ash	Million ton	14.67	23	24.5	23.5	22
Casutic	Million ton	12.64	24	25	25	24
Paper	Million ton	62.05	110	115	120	120
Fertilize	Million ton	52.2	61	61	61	61
Aluminum	Million ton	7.56	34	36	36	33
Paper	Million ton	46.3	50	50	50	45
Calcium c	Million ton	8.5	10	8	7	4

Low Carbon House in 2050: comfortable and energy saving

Solar Energy

Solar PV

(25-47% 的家庭拥有屋顶光伏电池,
转换效率接近30%

Eco-Life style

减少10-20% 能源需求

Planting on top

High efficiency lighting
【LED】

减少50%照明需求,
普及率 100%

Solar energy for hot water and space heating

普及率: 20-60%
（目前 6%）

Energy monitor system
(Electric Appliance)

High insulation system

减少 60% 采暖需求,
普及率70%

Super High Efficiency Air-Con

COP =8,
普及率 100%

Fuel cell

普及率 0-20%

Heat pump

COP＝5
普及率 30-70%

Standby energy use

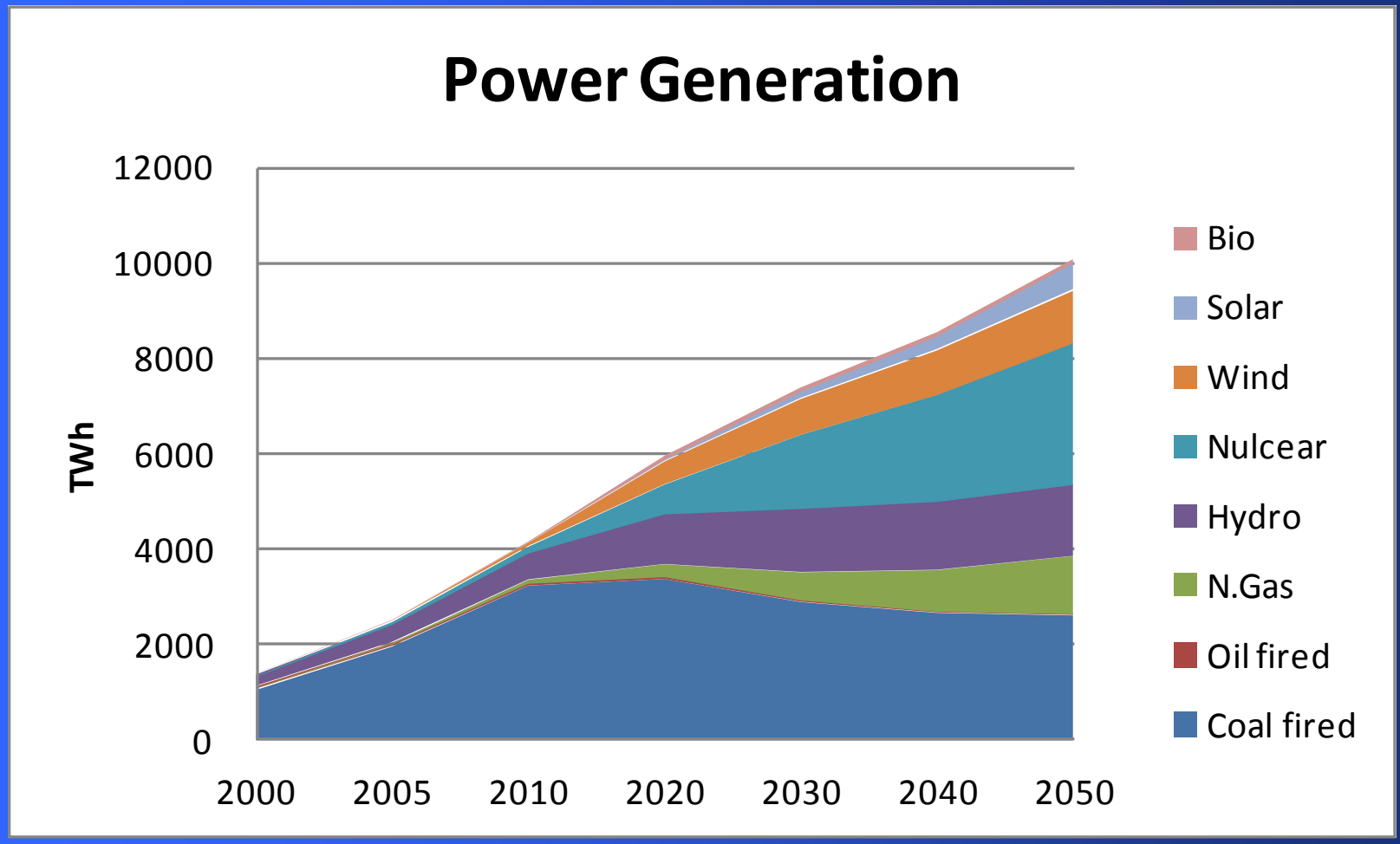
降低1/3 ,
普及率100%

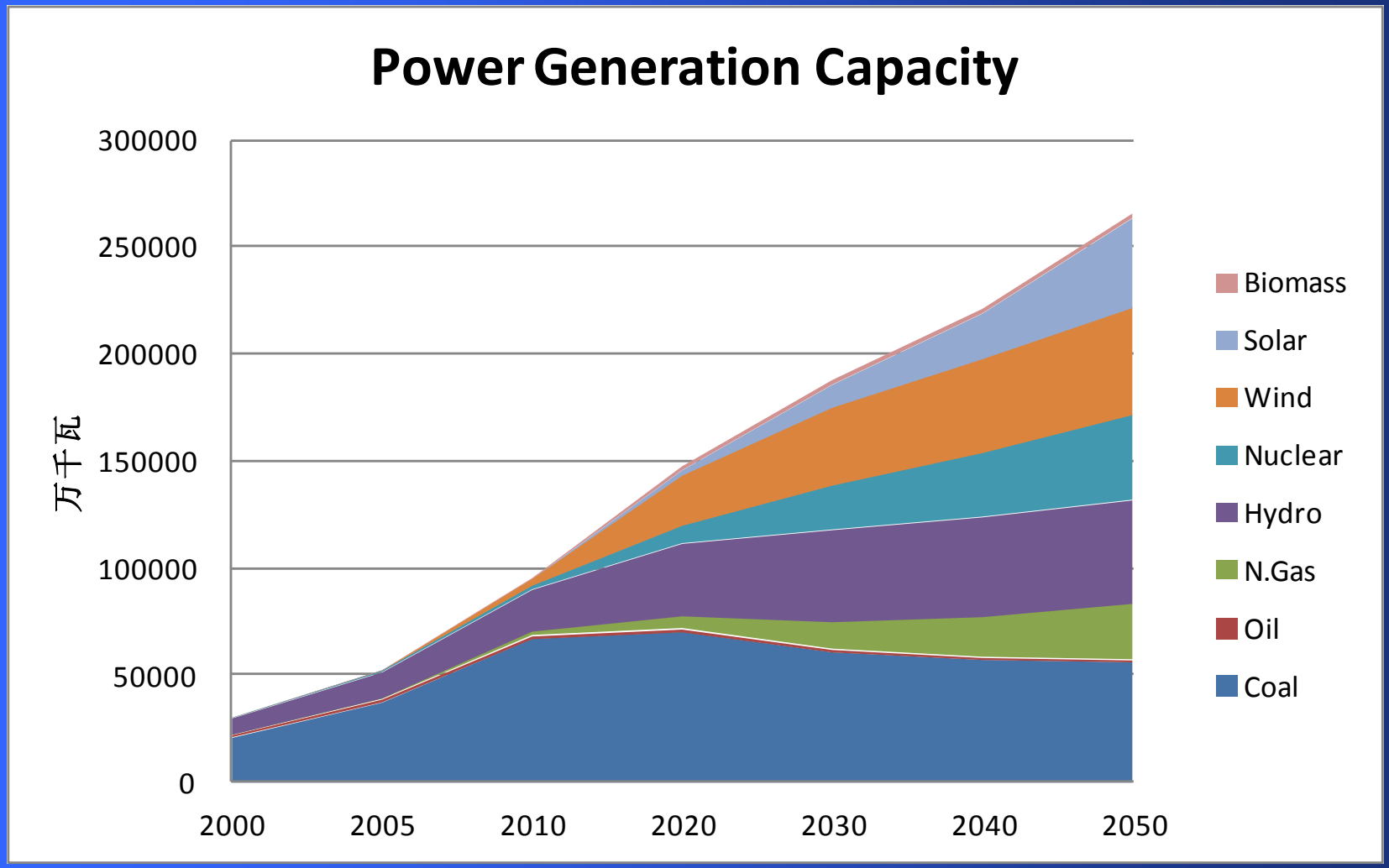
Public information
Public consumption
change

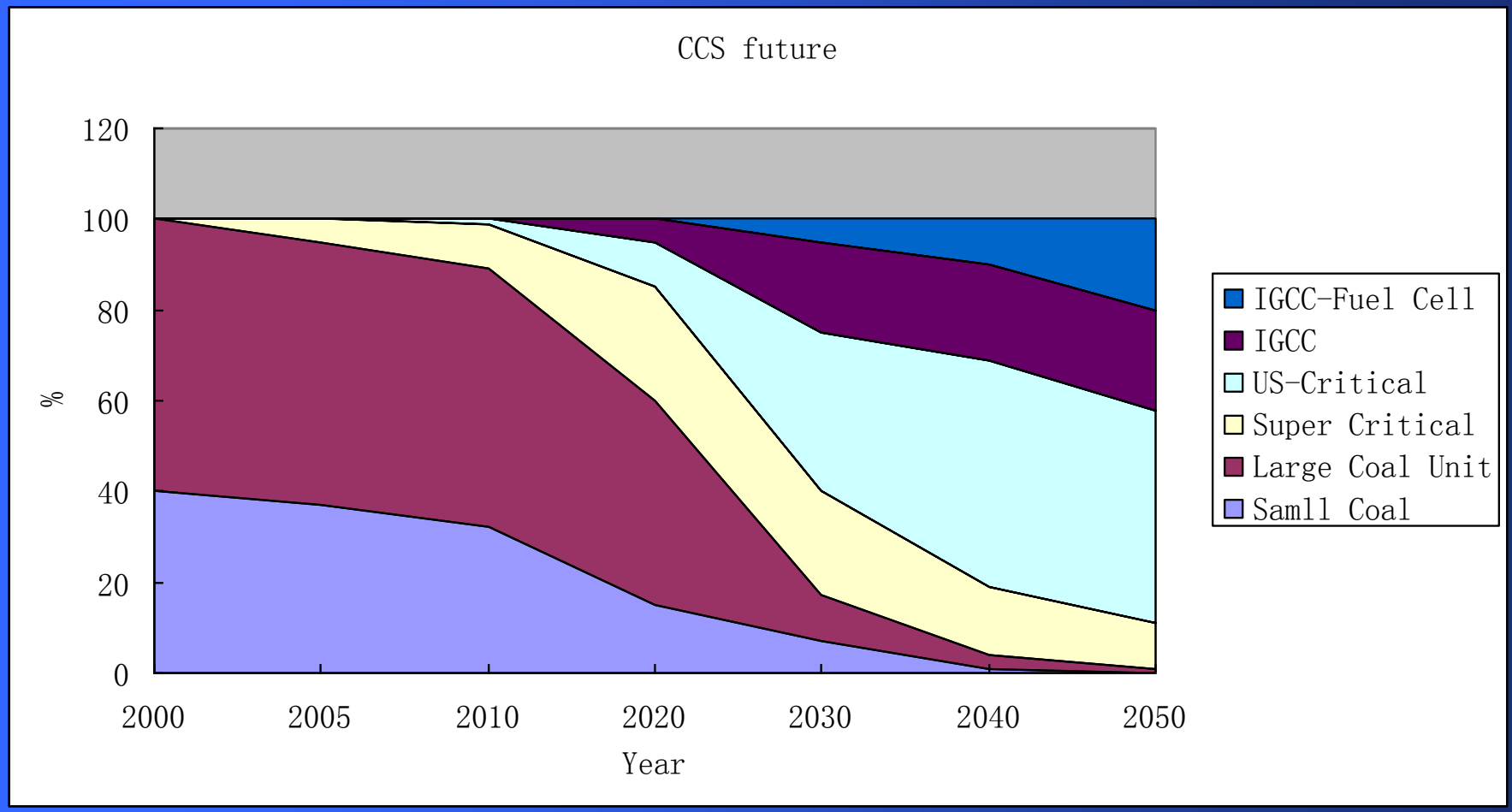
High efficiency electric appliance
Reduce energy use, and higher life level

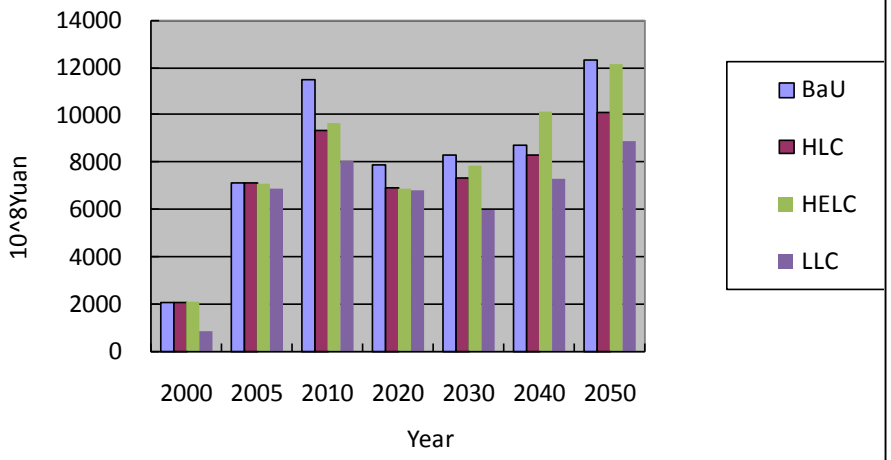
Transport, Low carbon scenario

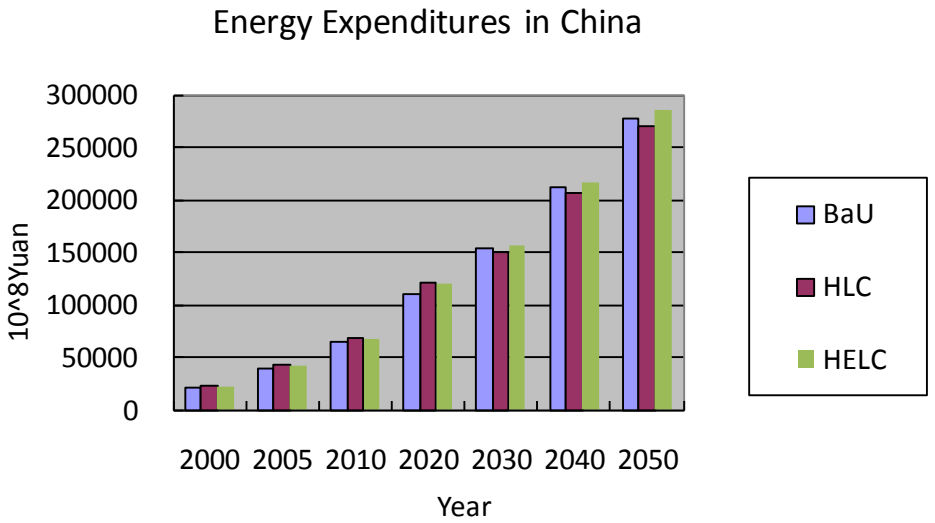
		2005	2010	2020	2030	2040	2050
Family car ownership, per 100HH	Urban	3.37	14	36	65	77	78
	Rural	0.08	0.2	8	38	70	90
Family car annual travel distance, km		9500	9500	9300	8635	8300	7480
Average engin size of family cars, litter		1.7	1.6	1.6	1.6	1.5	1.4
Fuel efficiency of car, L/100km		9.2	8.9	7.1	5.9	4.8	4.1
Share of MRT in total traffic volume, %		0.011	0.016	0.025	0.046	0.1	0.21
Share of Biofuel, %		1.10%	1.30%	4.1%	7.70%	12%	13%
Share of electric car, %		0%	0.12%	3.2%	6.80%	12.5%	19.8%
Share of fuel cell car, %		0%	0%	0.80%	1.60%	4.70%	7.90%

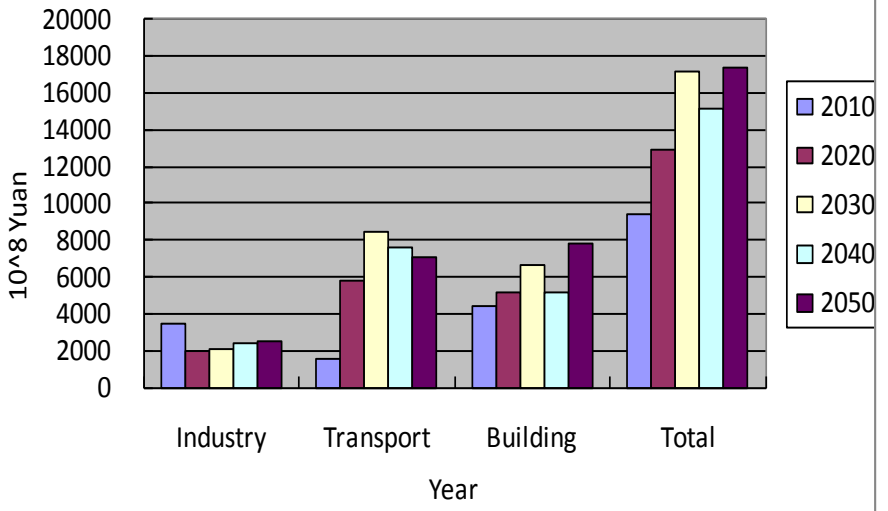

Power Generation
12000
10000
8000
6000
4000
2000
0
TWh
2000
2005
2010
2020
2030
2040
2050
Bio
Solar
Wind
Nulcear
Hydro
N.Gas
Oil fired
Coal fired

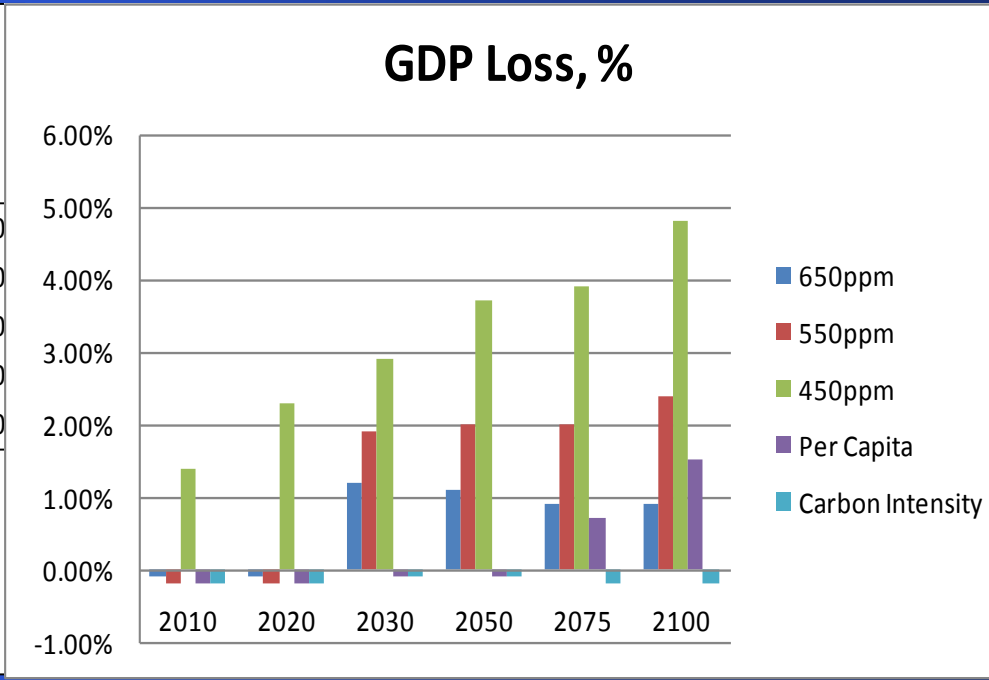

Power Generation Capacity
300000
250000
200000
150000
100000
50000
0
万千瓦
2000
2005
2010
2020
2030
2040
2050
Biomass
Solar
Wind
Nuclear
Hydro
N.Gas
Oil
Coal


CCS future
120
100
80
60
40
20
0
%
2000
2005
2010
2020
2030
2040
2050
Year
IGCC-Fuel Cell
IGCC
US-Critical
Super Critical
Large Coal Unit
Samll Coal


Investment in Energy Industry in China
14000
12000
10000
8000
6000
4000
2000
0
10^8Yuan
2000 2005 2010 2020 2030 2040 2050
Year
BaU
HLC
HELC
LLC

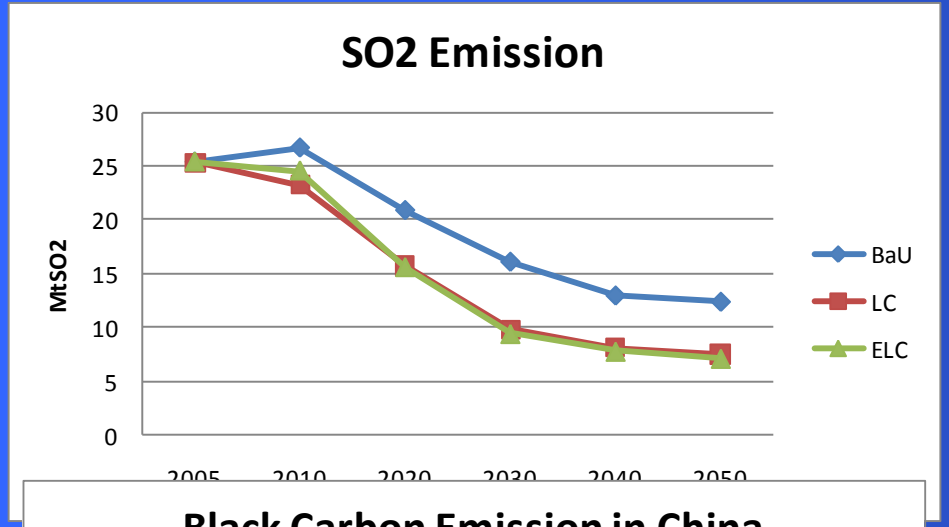

Energy Expenditures in China
300000
250000
200000
150000
100000
50000
0
10^8Yuan
2000 2005 2010 2020 2030 2040 2050
Year
BaU
HLC
HELC

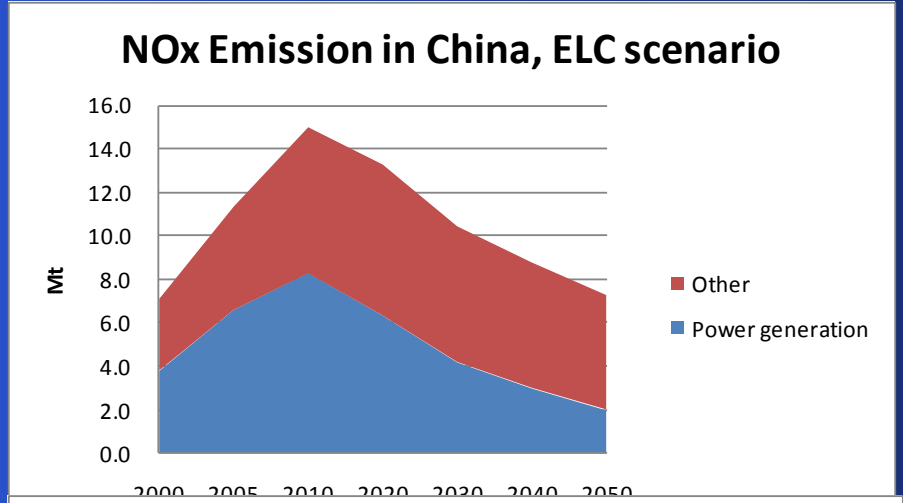

Addtional Investment in end use sectors in ELC
20000
18000
16000
14000
12000
10000
8000
6000
4000
2000
0
10^8 Yuan
Industry
Transport
Building
Total
Year
2010
2020
2030
2040
2050

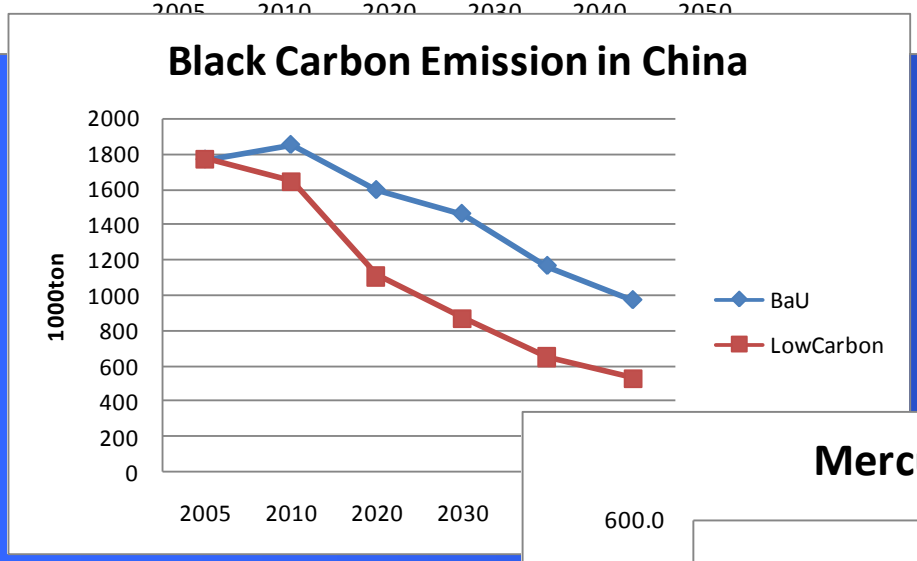

GDP Loss, %
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
-1.00%
2010
2020
2030
2050
2075
2100
650ppm
550ppm
450ppm
Per Capita
Carbon Intensity

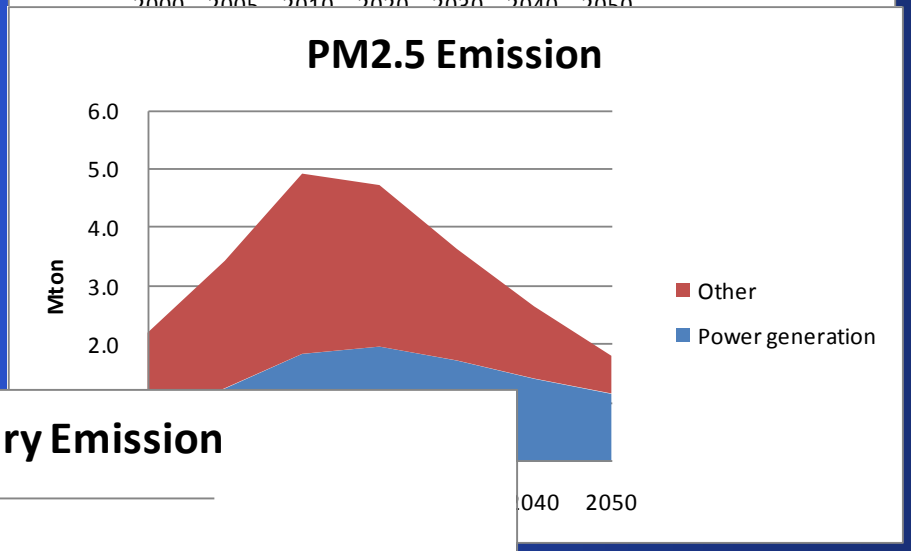
Good News: Rapid GDP growth could provide strong support

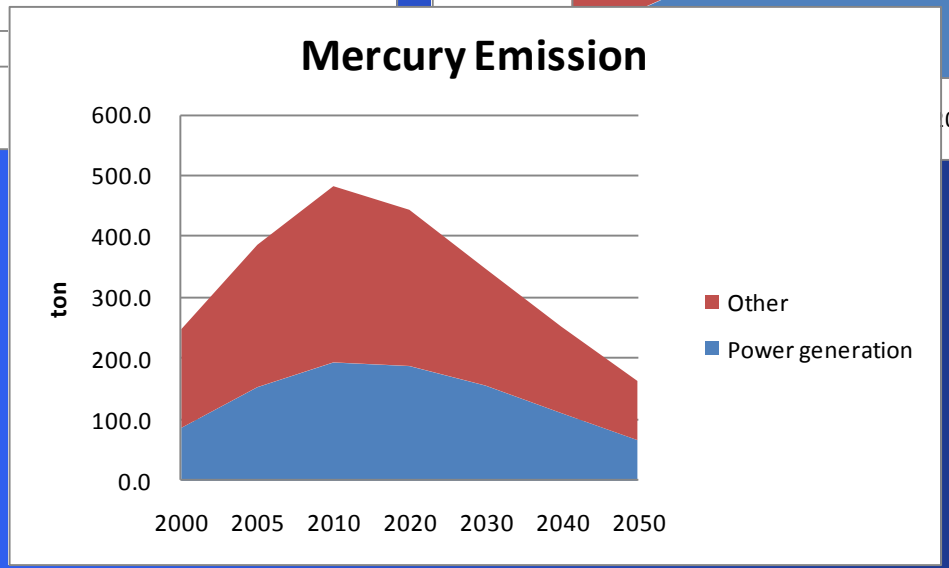
- By 2015, GDP in China could reach 75trillion Yuan(in current value)
- Newly added accumulated GDP is 450 Trillion Yuan
- Cumulated GDP is 860 Trillion Yuan
- All the investment need in all modeling study is much small


SO2 Emission
MtSO2
30
25
20
15
10
5
0
2005
2010
2020
2030
2040
2050
BaU
LC
ELC

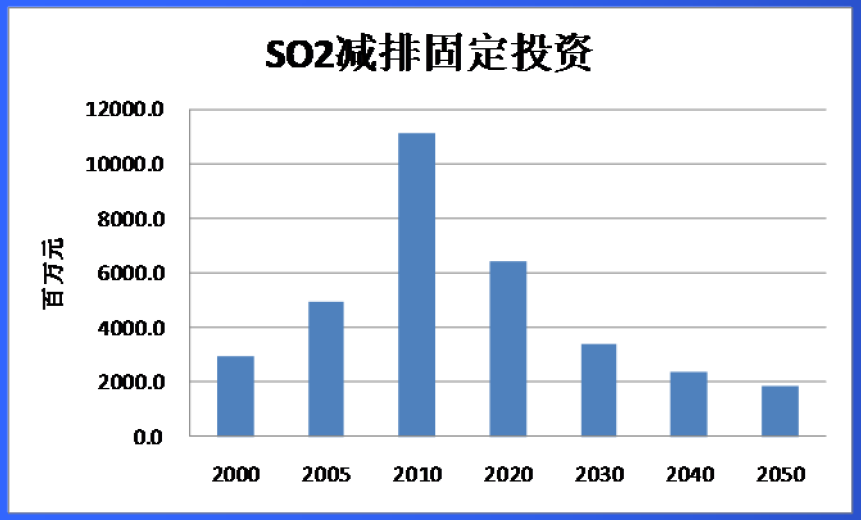

NOx Emission in China, ELC scenario
Mt
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
2000
2005
2010
2020
2030
2040
2050
Other
Power generation

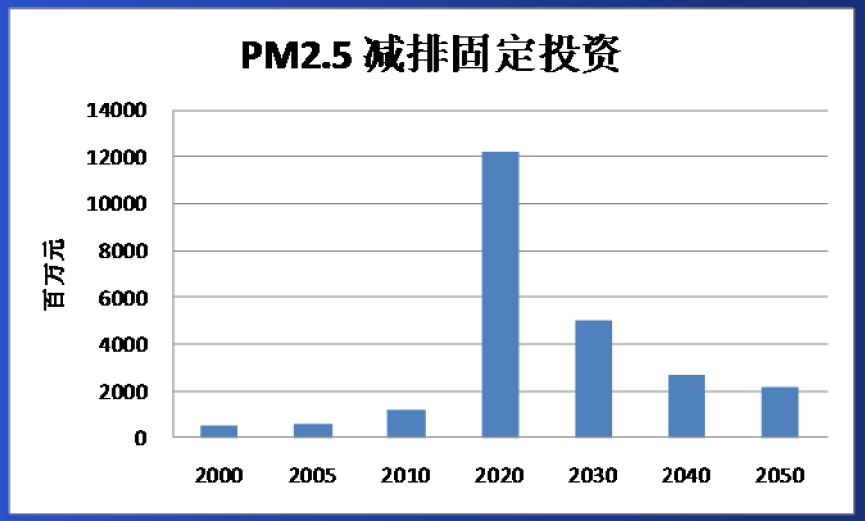

Black Carbon Emission in China
1000ton
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2005
2010
2020
2030
BaU
LowCarbon

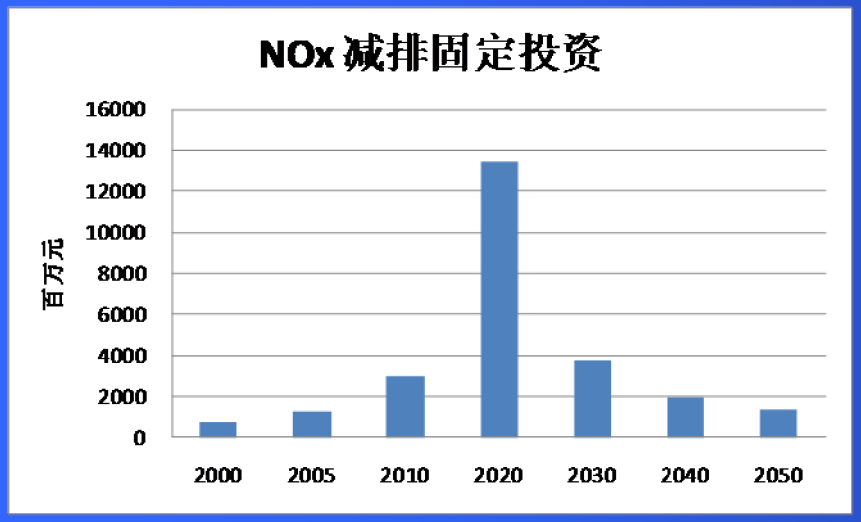

PM2.5 Emission
Mton
6.0
5.0
4.0
3.0
2.0
040
2050
Other
Power generation

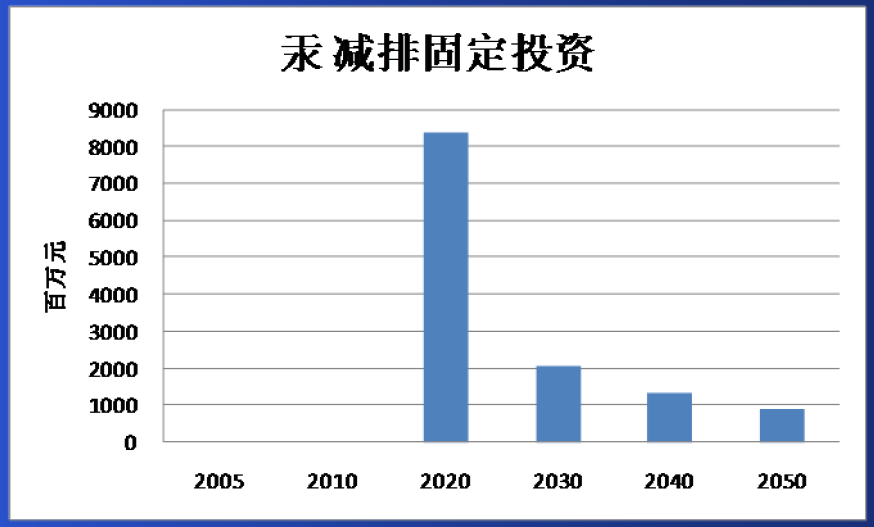

Mercury Emission
ton
600.0
500.0
400.0
300.0
200.0
100.0
0.0
2000
2005
2010
2020
2030
2040
2050
Other
Power generation

Fixed Investment for Pollution Control, million yuan





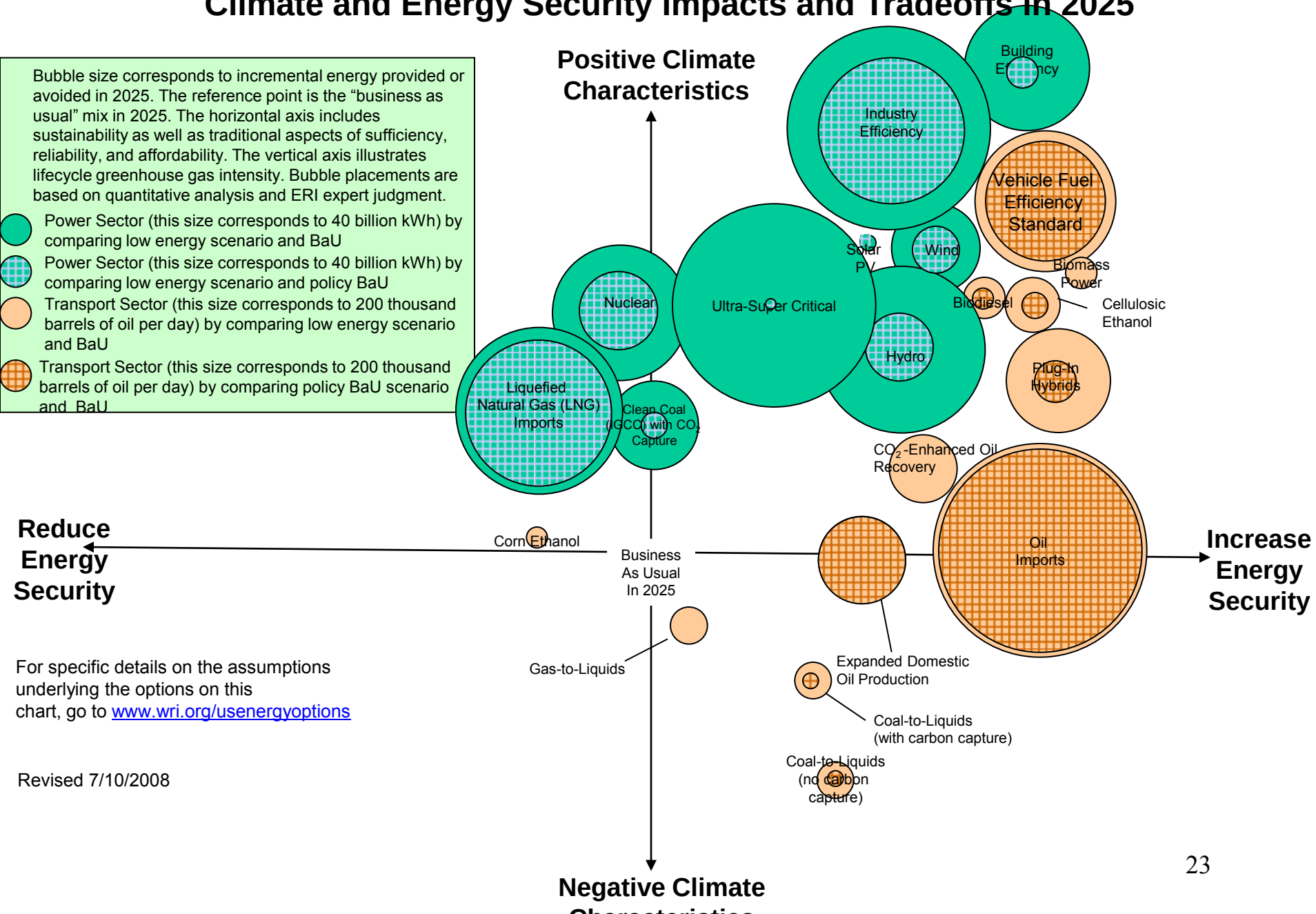




A Snapshot of Selected China Energy Options Today: Climate and Energy Security Impacts and Tradeoffs in 2025

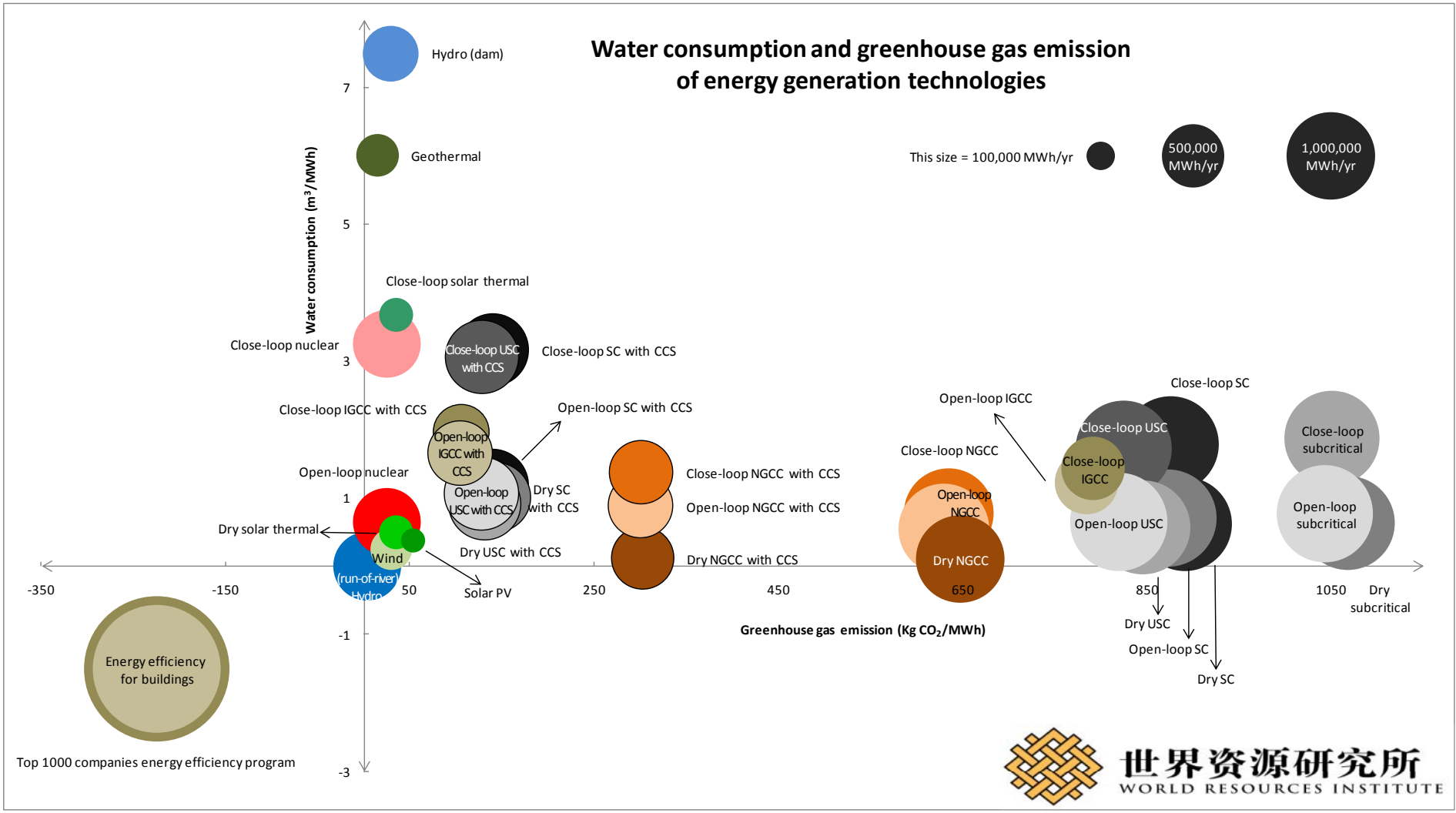
Bubble size corresponds to incremental energy provided or avoided in 2025. The reference point is the "business as usual" mix in 2025. The horizontal axis includes sustainability as well as traditional aspects of sufficiency, reliability, and affordability. The vertical axis illustrates lifecycle greenhouse gas intensity. Bubble placements are based on quantitative analysis and ERI expert judgment.

- Power Sector (this size corresponds to 40 billion kWh) by comparing low energy scenario and BaU
- Power Sector (this size corresponds to 40 billion kWh) by comparing low energy scenario and policy BaU
- Transport Sector (this size corresponds to 200 thousand barrels of oil per day) by comparing low energy scenario and BaU
- Transport Sector (this size corresponds to 200 thousand barrels of oil per day) by comparing policy BaU scenario and BaU



For specific details on the assumptions underlying the options on this chart, go to www.wri.org/usenergyoptions

Revised 7/10/2008



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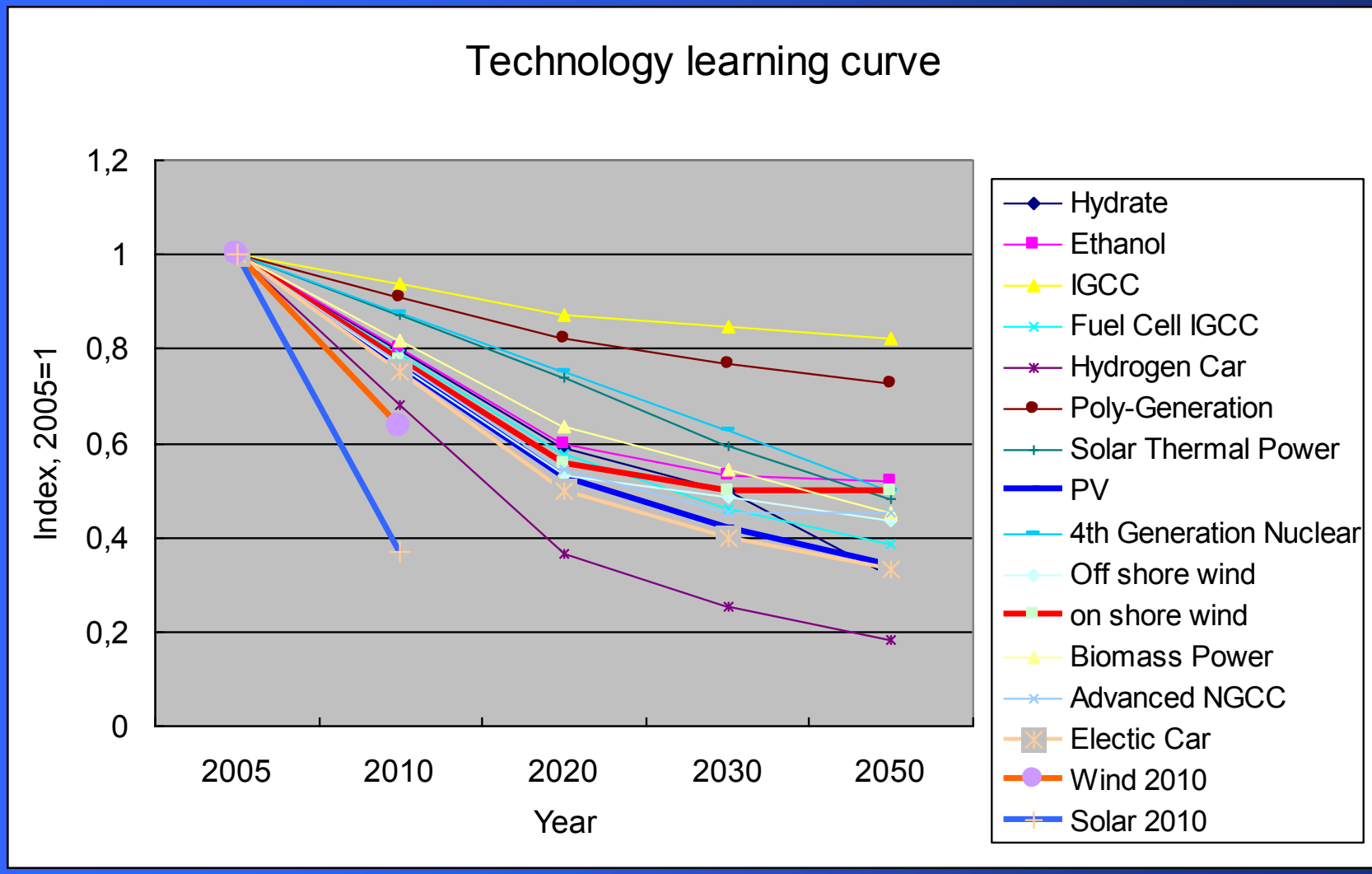
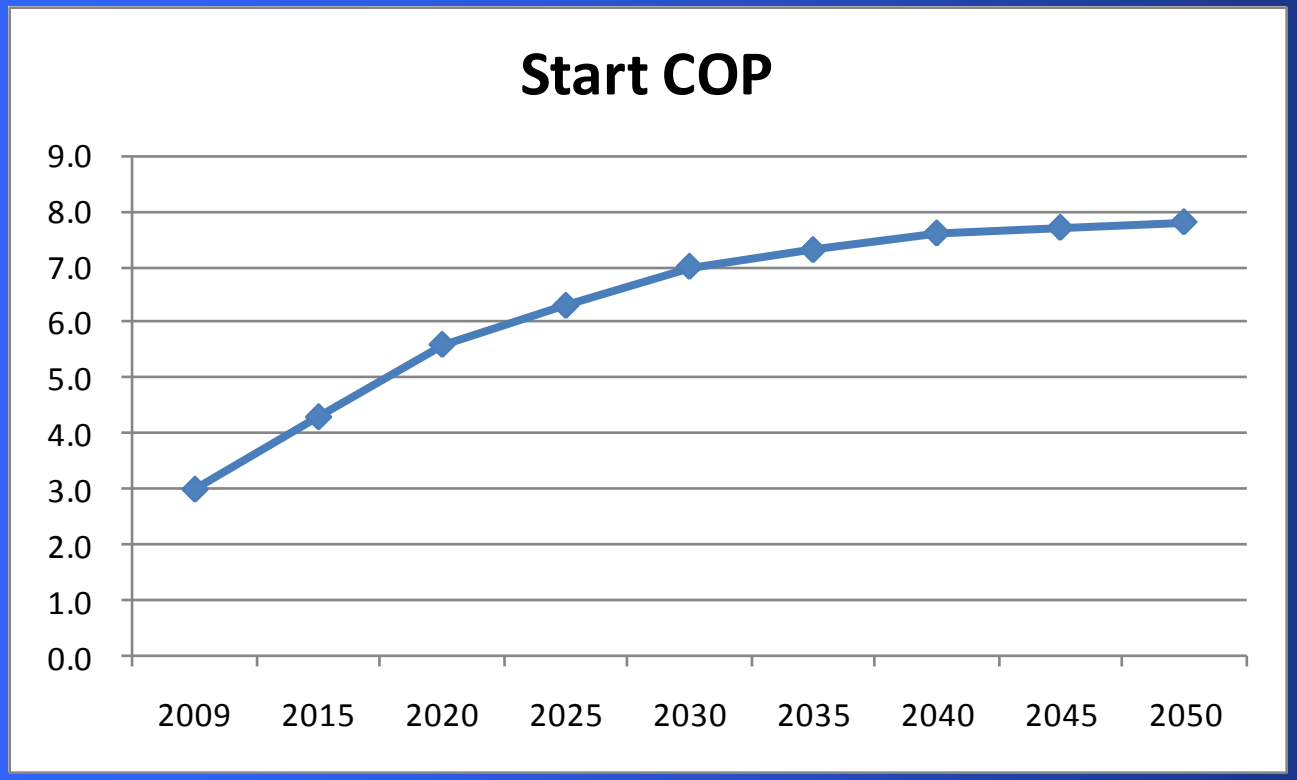
WORLD RESOURCES INSTITUTE


Technology learning curve
Index, 2005=1
1,2
1
0,8
0,6
0,4
0,2
0
2005
2010
2020
2030
2050
Year
Hydrate
Ethanol
IGCC
Fuel Cell IGCC
Hydrogen Car
Poly-Generation
Solar Thermal Power
PV
4th Generation Nuclear
Off shore wind
on shore wind
Biomass Power
Advanced NGCC
Electic Car
Wind 2010
Solar 2010

Policy roadmap: Super high efficiency air conditioner

- Efficiency Standard: COP, MEPS
- Government Planning
- Subsidy



四、影响电动汽车发展的主要制约因素分析

4. Analysis Major Constraints Factors

- 3.3 电动汽车实现经济性的趋势分析 Trend Analysis on EVs

电动汽车与先进汽油和柴油车成本变化趋势分析					
	2006-2010	2011-2015	2016-2020	2021-2025	2026-2030
电动汽车Evs					
电池充满电时总容量kWh	16	24	48	80	112
电力销售价格（元/kWh）	0.48	0.60	0.75	0.94	1.18
单位里程耗电量（kWh/km）	0.18	0.13	0.08	0.08	0.07
单位里程耗电费用（yuan/km）	0.09	0.08	0.06	0.08	0.08
电动汽车燃料成本（yuan/car）	43200	39067	30104	37694	41299
单位电池容量成本(USD/kWh)	750	375	130	75	30
Evs车电池组成本(yuan/car)	80400	60300	41808	40200	22512
电池组寿命（年）	3.6	5	11	22	22
电池组更换次数（set/year)	4.1	2.8	1.4	0.7	0.7
EVs全寿期电池成本（yuan/car）	413256	226728	99503	67938	38045
EVs全寿期电耗和电池总成本（yuan/car）	456456	265795	129607	105632	79345
每年费用（yuan/car）	30430	17720	8640	7042	5290
先进汽油汽车ICE					
汽油销售价格（yuan/liter)	6.6	8.5	10.2	11.0	11.8
柴油销售价格（yuan/liter)	6.4	8.3	9.9	10.6	11.4
单位里程耗汽油（L/km）	0.050	0.039	0.031	0.024	0.020
单位里程耗柴油（L/km）	0.047	0.038	0.030	0.024	0.020
全寿期行驶里程（km)	500000	500000	500000	500000	500000
先进汽油车燃料成本（yuan/car）	165000	167550	158356	133574	117738
先进柴油车燃料成本（yuan/car）	150400	155333	149317	128100	114170
每年费用	11000	11170	10557	8905	7849
比较（Evs车费用－ICE车费用）	291456	98245	-28749	-27941	-38394

五、电动汽车发展技术路线图
5. Electric Car Roadmap

电动汽车发展路线图					
	2006-2010	2011-2015	2016-2020	2021-2025	2026-2030
电动汽车发展目标					
电动汽车拥有量（万辆）	很少量	125	800	5000	9400
电动汽车年销售市场（万辆）	很少量	25	80	500	941
电动汽车技术进步					
最高时速(km/h)	85	120	140		
续航距离(km)	112	130	200	350	400
百公里耗电kWh/100km	16-18	13-14.3	10	8	
电池技术进步					
电池能量密度（Wh/kg，Wh/L）	90－125Wh/kg	150Wh/kg；150Wh/L	225Wh/kg；200Wh/L	500Wh/kg；460Wh/L	700Wh/kg
电池总能量（kWh）	16kWh	24kWh	40-48kWh	80－93kWh	112－124kWh
电池组寿命	1000次	1500次（5.4年）	3000	3800次（13年）	结合超级电容器
电池成本$/kWh(元/kWh)	$750/kWh(5025)	$375/kWh(2513)	$107/kWh(717)	$75/kWh(503)	$30/kWh(201)
充电站技术和建设进程					
充电站发展计划（国网和南网）	新建充电站325个；充电桩1.87万个。	新建充电站4325个；充电桩2.48万个。	新增充电站1万个，充电桩3万个。		
充电站系统建设进程	常规充电（充电桩）设施建设，更换电池方式试点。布局主要在居民小区或大型办公场所停车场。	常规充电为主，快充和更换电池示范。布局主要在机场、火车站、医院、购物中心、加油站等公共场所建快充和更换电池站。	常规充电为主，快充和更换电池为辅，形成充电站网络系统雏形。按电动汽车单次充电行驶里程，考虑充电站的布局和建设。太阳能充电站示范。	完善充电站网络系统。太阳能充电站占有一定市场。先进电网通讯（V2G）技术提高谷电利用率。移动式充电站示范。	完善充电站网络系统。太阳能充电站占有5-10%市场份额。移动式充电站得到应用。

六、电动汽车发展政策路线图建议
6. Suggesting Policy Roadmap

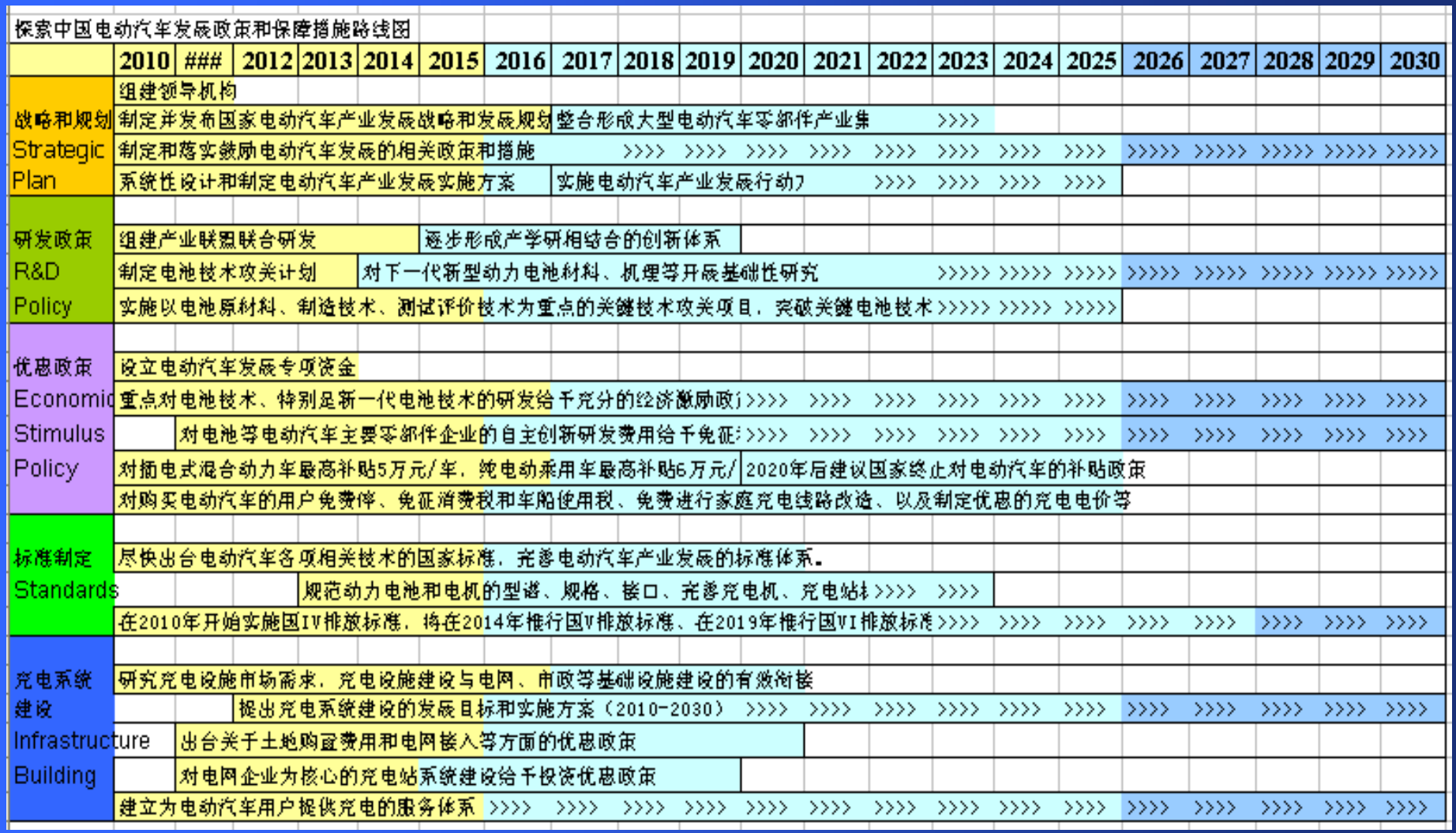
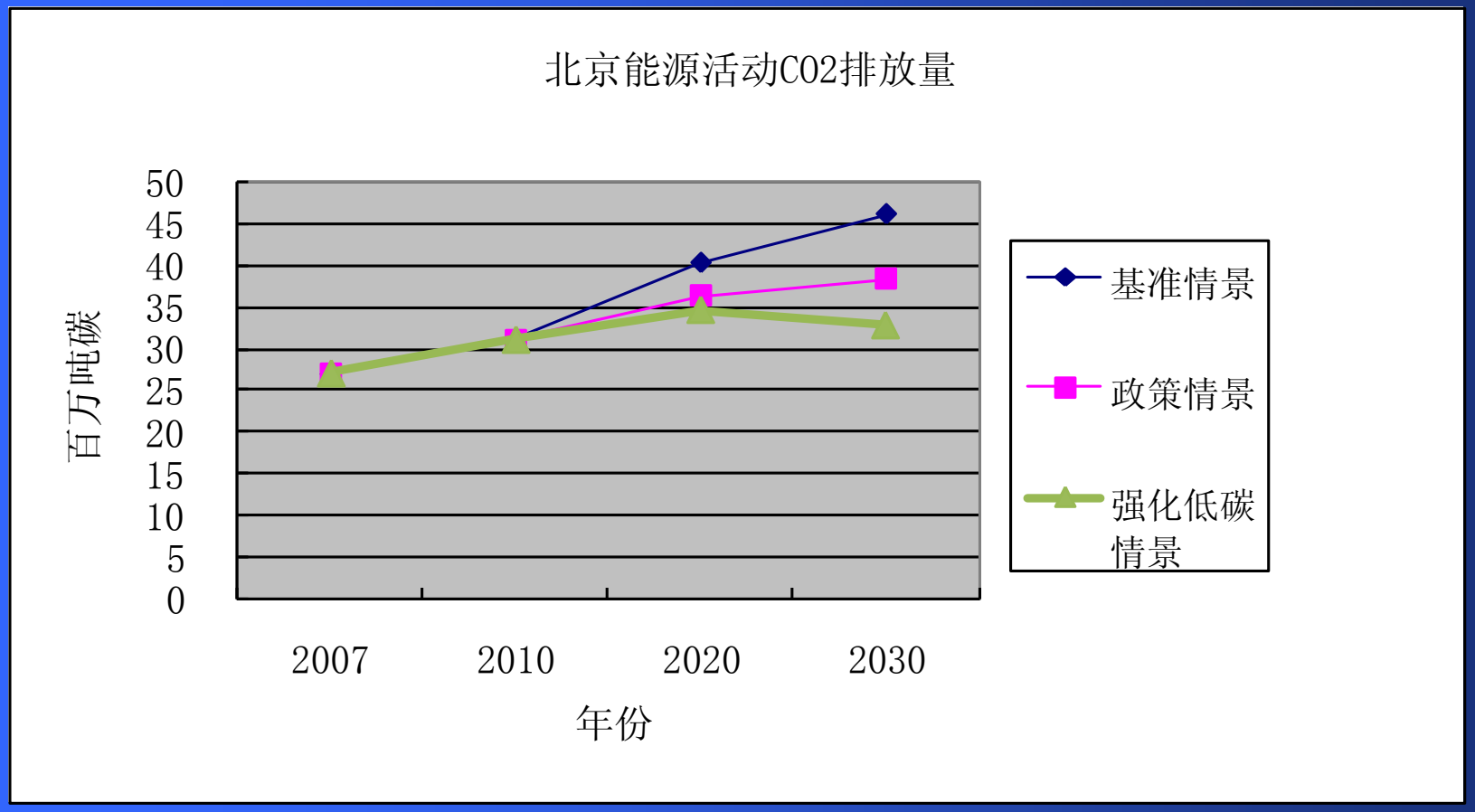


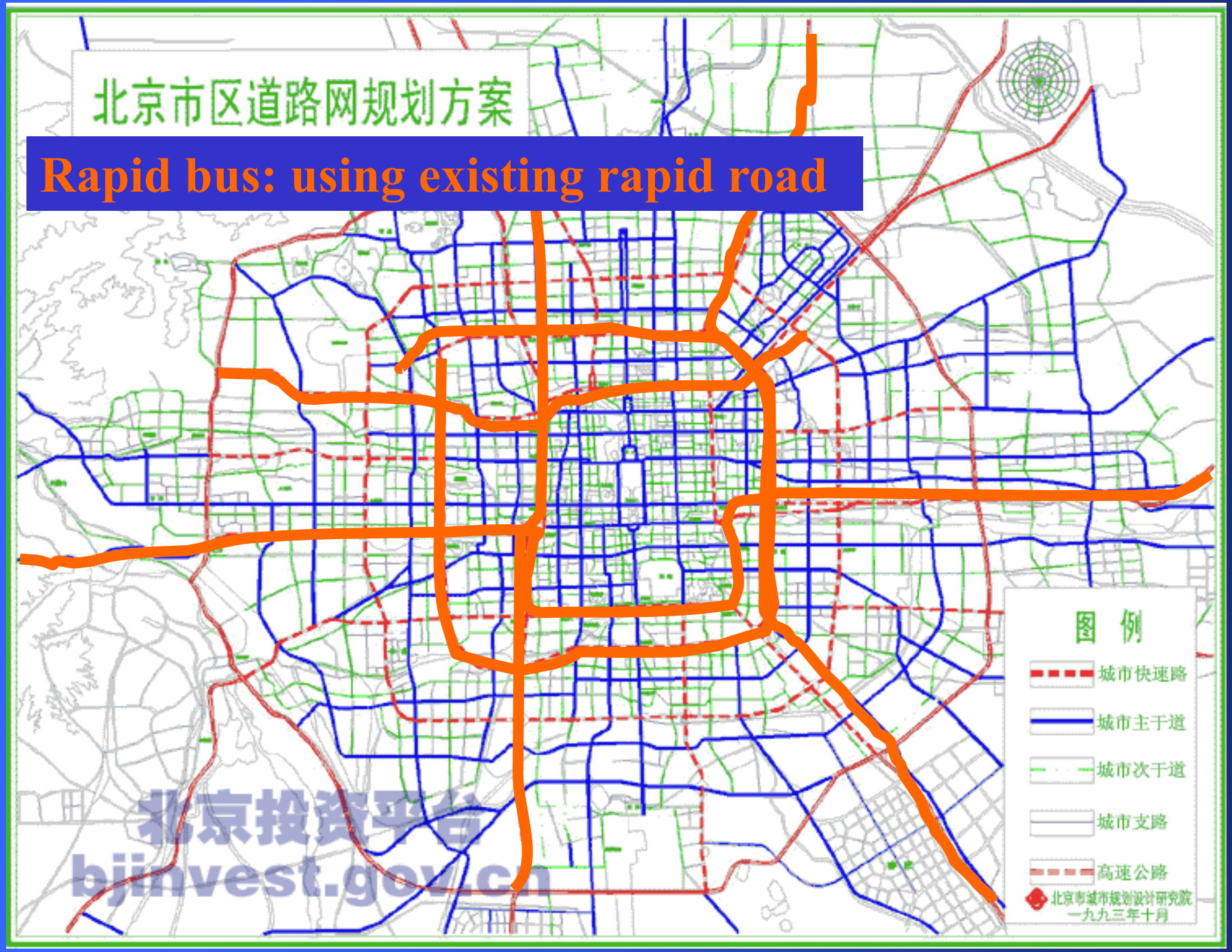
Table 4. Major policies announced recently

Classification	Policies
Administration	Establishing energy conservation and emission reduction steering group chaired by Prime Minister (June 2006); Distributing targets to each province (September 2006)
Overall National Policies	Synthesizing Working Program for Energy Conservation and Emission Reduction (June 2007); Revised Energy Conservation Law (October 2007); Integrated Resource Utilization Guidance (January 2007); Guidance for Accelerating Energy Conservation Service Industry (2008); Guidance Catalog for industry structure change (annual)
Monitoring	Implementation Program of Energy Intensity Per GDP Statistic Index System (Nov. 2007), Implementation Program of Unit Energy Use Per GDP Exam (Nov. 2007), Implementation Program of Unit Energy Use Per GDP Monitoring (Nov. 2007)
Pricing/Financing	Differentiating energy prices for key energy-intensive industries
Standardization	Second catalog of energy efficiency labeling for consumer products (Sep. 2006); Third catalog of energy efficiency labeling for consumer products (January 2008)
Industry	1000 large energy users monitoring program by national government (April 2006); extending provincial large energy user monitoring program (April 2006); closure of small-size industry in energy intensive sectors including cement, steel, non-ferrous, chemistry etc. (June 2006); approval for new projects based on energy efficiency standard (January 2007)
Transport	Light Vehicle Fuel Efficiency Standard (Sep. 2007)
Buildings	11th Five Year Plan for Energy Conservation in Buildings (February 2006); Building Efficiency Standard Implementation (June 2007)
Power generation	Closure of small power plants (January 2007), regulation for newly installed coal-fired power plants to be most advanced power plants

Beijing CO2 emission from energy activities



Stockholm: bicycle is coming back


北京市区道路网规划方案
Rapid bus: using existing rapid road
图 例
城市快速路
城市主干道
城市次干道
城市支路
高速公路
北京市城市规划设计研究院
一九九三年十月
北京投资平台
bjinvest.gov.cn

POWER_BOX by Baosteel

2kW wind
10kW Solar PV

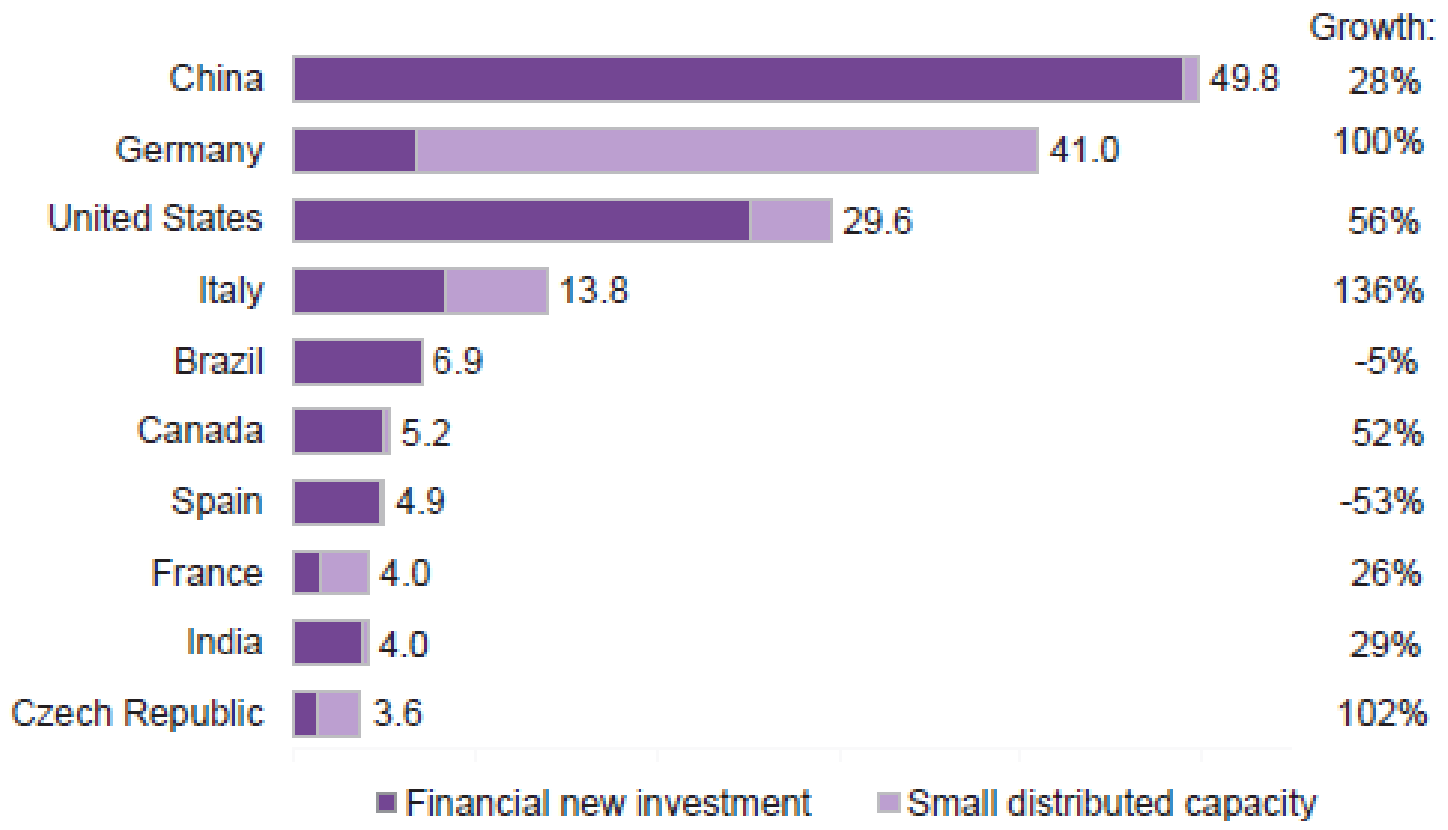
Renewable Energy

- Renewable Energy Planning 2006: wind 30GW, Solar 2GW by 2020
- 2009 Energy Bureau: Wind 80WG
- 2010 Energy Planning: Wind 150 GW, Solar 20GW by 2020

- Now: Wind 200GW to 300GW, Solar 50WG to 80 GW

- Based on the conclusion from Chinese Academy for Engineering, grid in China could adopt these renewable energy power generation in short term.

FIGURE 11: FINANCIAL NEW INVESTMENT AND SMALL DISTRIBUTED CAPACITY IN RENEWABLE ENERGY BY COUNTRY, 2010, AND GROWTH ON 2009, $BN



Natural Gas Scenarios

- In 2010,Natural Gas use 107.2BCM, while 12.2BCM imported.
- In our low carbon scenario: by 2030, 370BCM
- NEA's planning: 260BCM by 2015

Policy Comparison: take China and US as a case

Classification/sector	Policy/ Action	China			United State		
		Content of the policy/action	Quantitative Indicator	Verifiable	Content of the policy/action	Quantitative Indicator	Verifiable
Emission target		By 2020, CO2 intensity decrease 40% to 45% in the base of that in 2005 Non-fossil fuel will be 15% of TPE by 2020	40%-45% 15%	Yes Yes	CO2 intensity decrease 18% from 1990 to 2012 CO2 emission reduction 17% by 2020 compared with that in 2005, 83% by 2050	18% 碳强度下降 17%CO2 排放量下降	Yes Yes
National Law		Renewable energy law Energy conservation law		Published Published	Clean Energy and Security Act Energy Act 2005 National Environment Policy Act Energy Conservation Act	Published Published Published	Yes
National Document		National Program on Climate Change, 2007	Target for 2010	Published			
Carbon Tax							
Energy Tax		Oil consumption tax Coal consumption tax	0.8yuan to 1 yuan/Litter	Yes			
Carbon Trading		中国企业参与CDM			自愿碳贸易：2009年市场为8亿多美元 2009新法案引入了“总量控制与排放交易”排放权交易机制。根据这一机制，美国发电、炼油、	交易量	可核实

National Plan		十一五节能规划：能源强度下降20% 中长期节能规划（2004年公布）:确定了节能目标，2002年到2010年能源强度下降16%， 2020年比2010年下降31.5%， 14种主要高耗能产品确定了能源单耗指标 可再生能源规划：确定了2020年可再生能源发展目标 核电发展规划：到2020年实现装机4000万千瓦	20%，见规划	可核实 可核实 可核实			可核实
Restriction on energy intensive products		减少出口退税，并对56种产品征收出口税	出口税总量	可核实			
Renewable energy	发展目标	根据可再生能源法，2020年可再生能源占一次能源比重达到15%，2005年为6% 可再生能源发展规划，2020年风电装机1-1.5亿千瓦（新的目标），太阳能发电装机2000万千瓦			《2009美国复苏和再投资法案》要求所有的电力公司到2020年其电力供应中要有20%的比例来自于可再生能源和能效改进，其中15%来自风能、太阳能等可再生能源，5%来自能效提高。对于可再生能源电力所占比例无法达到15%的州，可将这一目标降为12%，但能效目标要提到8%	定量目标	可核实

Low Carbon Development Indicators and Policies

Poliy Options									
Level / Sector	**Low Carbon Indicators**	**Value of the indictors**	**Policy Option**	**Policy BAU / 2010**	**Policy Rec. (Actions)**	**Quantifable Index**	**World Leading Practice**	**China Leading Practice**	**GHG Reductions by 2020, mt-CO2**
Transportation									
	CO2 Emission	peak by 2020							
	CO2 Emission per traffic volume	10% lower than that in 2010, 35% lower in 2020							
	Share of Bicycle and walking in total transport	Ultra Large city: 35% of bicycle traffic valume, Medium size city: 40%, small city: 60%							
			Promotion of bicycle and walking with target setting	30.3% by bicycle	easy walking and bicycle using road system	90% road with easy walking and bicycle system	Copenhagen/Stokehol m	Hang Zhou: easy walking	16
					Urban plannning/Compact City Development	have		Beijing: just started	
					transport development target	have		Beijing: just started	
					Public bicycle service	have		Hang Zhou: city bicycle	
	Share of Public	Ultra Large city: 50% of public transport traffic valume, Medium size							

	MRT share	Ultra Large city: 60% of MRT in public transport traffic valume, Medium size city: 40%	Public transport: metro- national planning		Urban plannning/metro planning with residential area	have		Beijing, Shanghai	11
					transport development target				
					Fund raising			Beijing	
					Subsidy			Beijing	
			Program on promotion of public transpot						
			Development of railway system						
	CO2 emission per traffic volume for vehicle	10% lower than that in 2010 by 2015, 35% lower in 2020, 65% lower	Tax examption for compact car/heavy tax for large size engine car						
			Subsidy and development target for diffusion of electric vehicle						
			Subsidy and development target on diffusion of advanced high efficiency vehicle						
			Bio-Fuel: ethanol/bio-diesel						
			Subsidy to promot Bio-fuel	1800yuan/ton	subsidy	600yuan by 2020	EU	China	13
			vehicle fuel tax	Fuel tax: 1yuan/litter	increasing tax rate	tax rate	EU	China	86
			Green taxi fleet	2% of taxi fleet with hybrid and electric car	government target/taxi fee raising	share of hybrid/electric car	New York	Shen Zhen	180
			Public transport: Clean energy bus	2% for bus fleet	government planning/subsidy	have			
	Others		Travel demand reduction: near home service, IT conference, School bus etc.	Policy announced	Policy announced as one of component of national transport policy				

Beijing's clean and high security energy system

- Economy development
- Population
- Building
- Transport
- Renewable energy and CCS

What Beijing is doing now?

- Optimize economy structure: 75% of Tertiary sector in GDP by 2015
- Building: from 2000, implement 65% energy efficiency standard for building, retrofit more than 150million m2 old building. By 2012, 75% energy efficiency standard implement for new buildings.
- Subsidy for energy efficient electric appliances: more than 65% market share by 2011.
- Strong Public transport oriented policies: subsidy for bus ticket(12billion yuan subsidy in 2011). 750km metro by 2015(11 line under construction right now). Rapid bus lane is started to implemented in 2011

What Beijing is doing now?

- Promote bicycle and easy walking system
- Clean bus fleet, early phase out of lower emission standard vehicles(more then 200000 cars in 2012).
- Decrease coal use to be 60% lower by 2015, replaced by natural gas

Population in Beijing

	2000	2005	2010	2015	2020	2025	2030
POP	1363.6	1538	1961.9	2400	2750	2800	2800
Urban	1057.4	1286.1	1686.4	2136	2488.75	2548	2562
Rural	306.2	251.9	275.5	264	261.25	252	238
Urban Rate	77.54%	83.62%	85.96%	89%	91%	91%	92%

Building space in Beijing

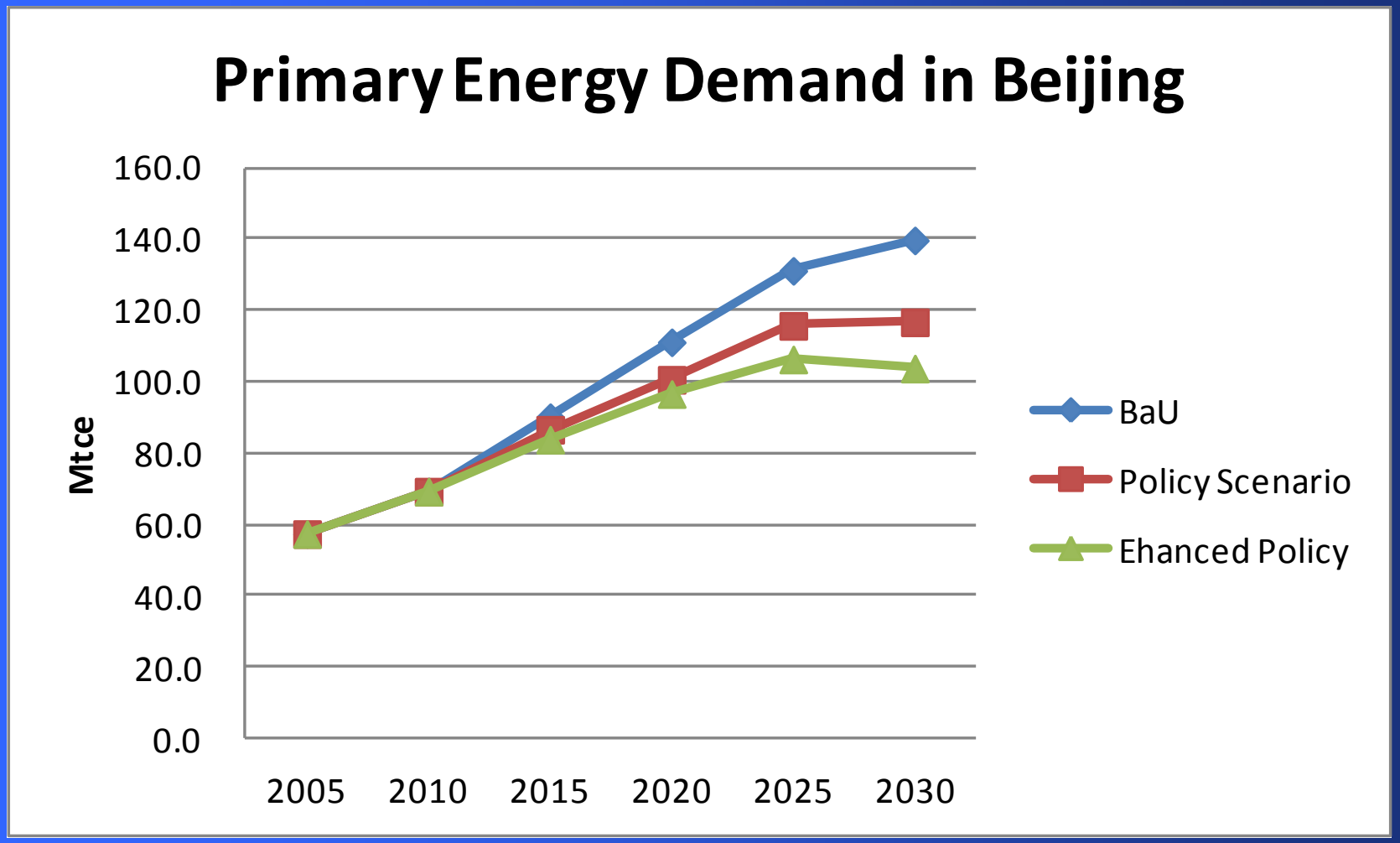
		2005	2010	2015	2020	2025	2030
Total Building Space, 10000m2		53000	64499	86688	113125	128227	133091
Urban HH, 10000m2		30665	39731	53400	69685	78988	81984
Tertiary, 10000m2		22335	24768	33288	43440	49239	51107
Rural							
Urban HH per Capita, m2		23.8	23.6	25	28	31	32

Energy scenario in urban HH

	Unit	2000	2005	2010	2015	2020	2025	2030
Popu	10000	1057.4	1286.1	1686.4	2136.0	2488.8	2548.0	2562.0
Household	10000	379.9	492.0	665.1	861.3	1015.8	1048.6	1067.5
Number Per HH		2.7	2.6	2.5	2.5	2.5	2.4	2.4
Energy	10000tce	388.1	630.2	921.7				
EnergyUsePerHH	tce	1.0	1.3	1.4				
Electricity Use	10^8 kWh	38.5	70.6	95.4	155.6	211.1	239.7	258.6
Electricity UseByHH	kWh	1014.5	1435.7	1434.1	1806.9	2078.0	2285.8	2422.9
Natural Gas	10^8 m3	2.2	5.7	9.9	14.1	17.1	18.2	19.1
NaturalGasUseByHH	m3	56.6	115.0	148.7	163.6	168.5	173.5	178.7
Heat	TJ	1346.4	1991.3	2851.0	3691.9	4354.3	4045.2	3500.5
HeatBYHH	GJ	35440.3	40471	42865.2	42865	42865.2	38578.7	32791.9

Energy scenario in urban HH

	2000	2005	2010	2015	2020	2025	2030
Area	10^8 m2	22335.0	24767.6	33288.3	43440.0	49239.3	51106.9
ElectricityUse	10^8 kWh	200.9	345.3	599.2	781.9	837.1	766.6
ElectricityUse Per 1000M2	10000kWh	9.0	13.9	18.0	18.0	17.0	15.0
Heat		3740.9	8185.2	11001.1	14356.0	14157.2	12783.9
Heat Use Per 1000M2		167.5	330.5	330.5	330.5	287.5	250.1
N.Gas	10^8 m3	19.6	24.9	33.4	43.6	43.0	38.8
N.Gas Use Per 1000M2	10000m3	0.9	1.0	1.0	1.0	0.9	0.8
Coal	10000ton	380.3	269.4	133.2	86.9	78.8	71.1



Peak CO2 emission by 2015, to be a low carbon city by 2030, comparable with Tokyo