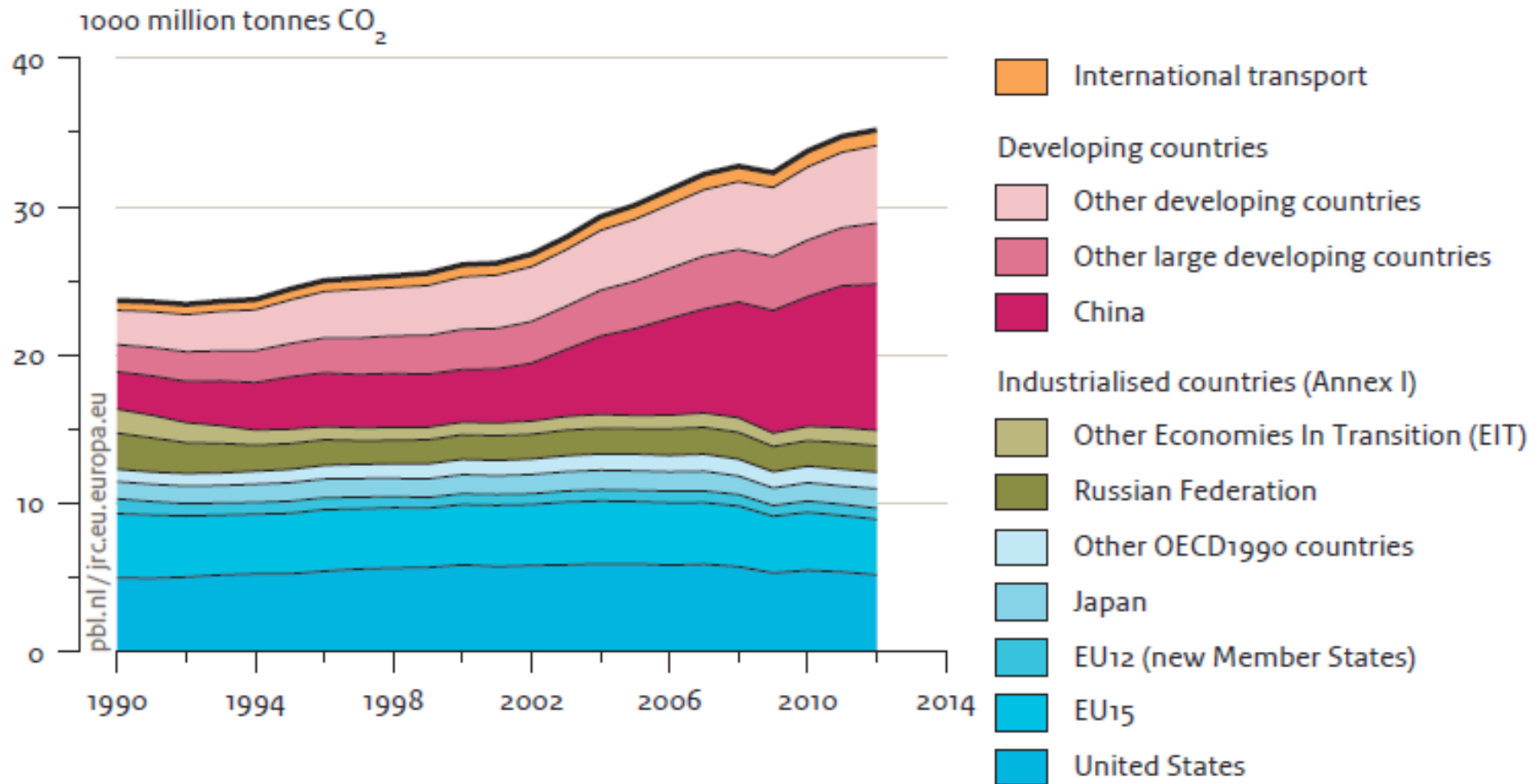


**Mitigation Policies and Actions in China and
A Policy Roadmap for China's Energy and CO₂ Emission**

HE Chenmin
Energy Research Institute, China
25 Aug 2014

Global CO₂ emission from energy and cement manufacture



Climate Change Policies

- National Program on Climate Change, 2007
- Low Carbon Pilot Cities and Provinces, 2010, 2012
- Emission Trading Pilot Cities and Provinces, 2011
- Carbon Intensity Target in 12th Five Year Plan

Progress of Regional Pilot Programs

- In July 2011, the National Development and Reform Commission (NDRC) issued a circular on [carbon trading pilot programs](#) in seven provinces and cities, which will be launched in 2013 before the development of a nationwide carbon market by 2015.
 - Beijing, Shanghai, Tianjin, Chongqing, Guangdong, Hubei, Shenzhen

Region	Launched Date	NO of covered enterprises	Compliance Percentage
Shenzhen	2013.6.18	Industry : 635 Building : 197	99.4%
Shanghai	2013.11.26	191	100%
Beijing	2013.11.28	435	Not published
Guangdong	2013.12.19	182	98.9%
Tianjin	2013.12.26	114	96.5%
Hubei	2014.4.2	138	-
Chongqing	2014.6.19	242	-

National ETS Preparation

- Establishment of national voluntary emission trading system
- Establishment of national register system
- First 10 sectional GHG emission verification and report guidelines
- Conduct GHG emission reporting in major enterprises and institutions
- China Environmental Trading Institutions Cooperation
(中国环境交易机构合作联盟)
- Well prepared in legislation
- Together with other carbon pricing methods
 - Carbon market and carbon tax

Policies and Actions for Addressing Climate Change

- Improving Management Systems and Working Mechanisms
 - Carbon intensity target in 12th FYP was decomposed to all provinces
 - A target responsibility assessment system for local government
- Strengthening Strategic Studies and Plan Formulation
 - the overall target, phased tasks, implementation methods and safeguarding measures of low-carbon development by 2020, 2030 and 2050
 - National Plan for Addressing Climate Change (2013-2020)
 - Provincial Plans
- Promoting Legislation on Climate Change
 - have set up a leading group for drafting laws on addressing climate change
 - some respective laws have been issued, such as methods in Shanxi and Qinghai province and management in Shenzhen special economic zone

Policies and Actions for Addressing Climate Change

- Work Division Scheme for the Work Plan for Controlling Greenhouse Gas Emissions during the 12th Five-Year Plan Period
- Issued a series of policy papers on addressing climate change, improve China's policy system in this regard:
 - the Action Plan for Addressing Climate Change in Industry (2012-2020)
 - the National Plan for the Development of Science and Technology on Climate Change during the 12th Five-Year Plan Period
 - the Interim Measures on Low-carbon Products Certification Management
 - the Plans for Energy Development during the 12th Five-Year Plan Period
 - the Plans for the Development of Energy-Efficient and Environmental-Protection Industries during the 12th Five-Year Plan Period
 - the Suggestions on Speeding up the Development of Energy-Efficient and Environmental-Protection Industries
 - the Industrial Energy Efficiency during the 12th Five-Year Plan Period
 - the 2013 Implementation Plans for Industrial Energy Efficiency and Green Development
 - the Action Plan for Green Architecture
 - the National Eco-system Protection during the 12th Five-Year Plan Period

Relevant Policies

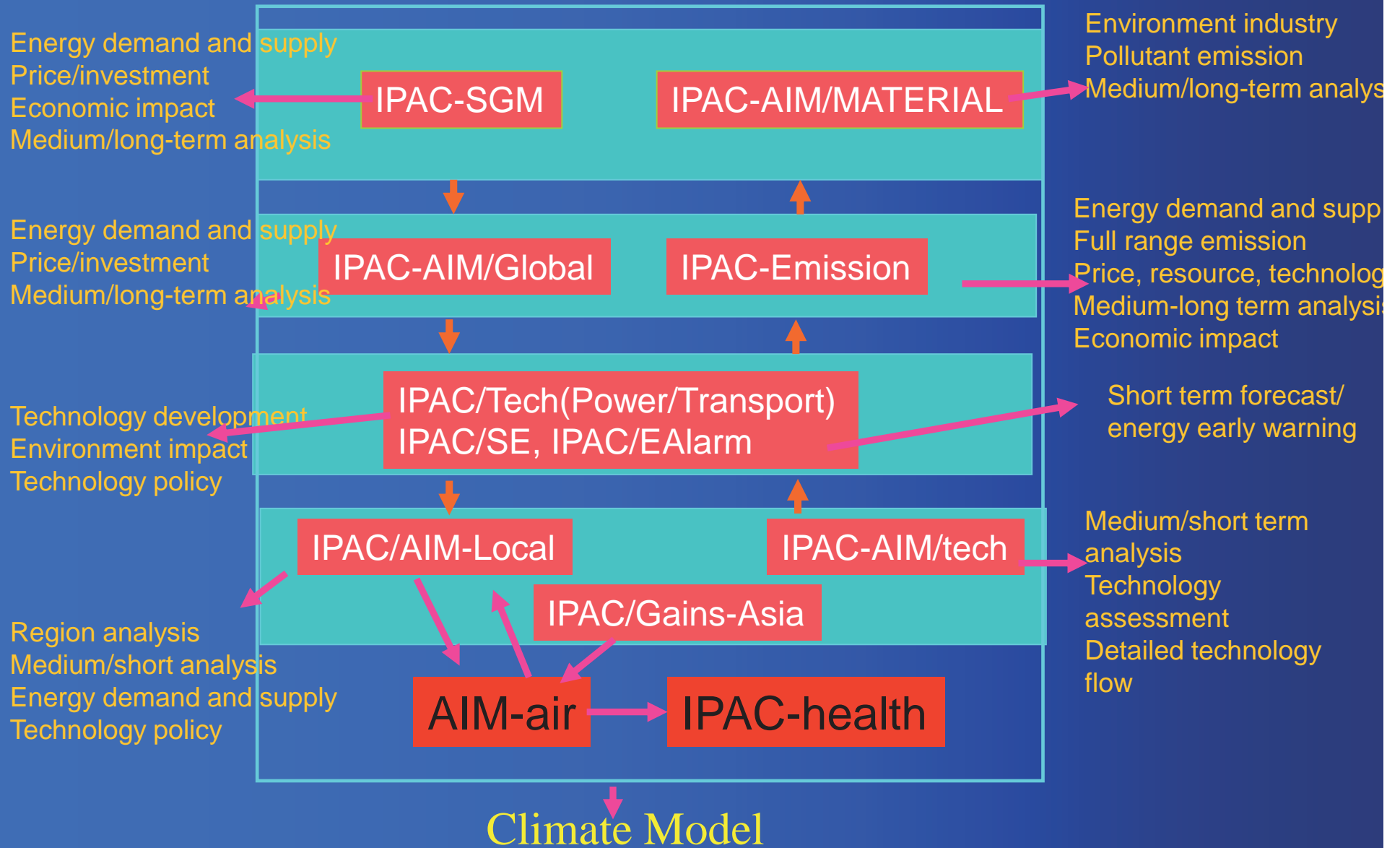
- **Economic structure** optimization policies
 - NDRC's industry policies
 - Investment control
 - Carbon tax/other taxes: within 12th Five Year
 - Emission trading: domestic, and international
- **Energy Conservation** policies (start from 2005, very strong)
- **Energy structure**
 - Clean utilization of fossil fuel: Natural gas (Shale gas etc.)
 - Renewable energy 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
- **Energy efficiency** policies
 - 12th FYP target: to the local government
 - Sector policies: including construction and transport
 - Improving energy efficiency standard and labeling scheme
 - Expanding energy conservative technologies and products
- Increasing forest carbon sinks
- Other GHG control: agriculture, non-CO₂
- **Environment policies: air pollution control**



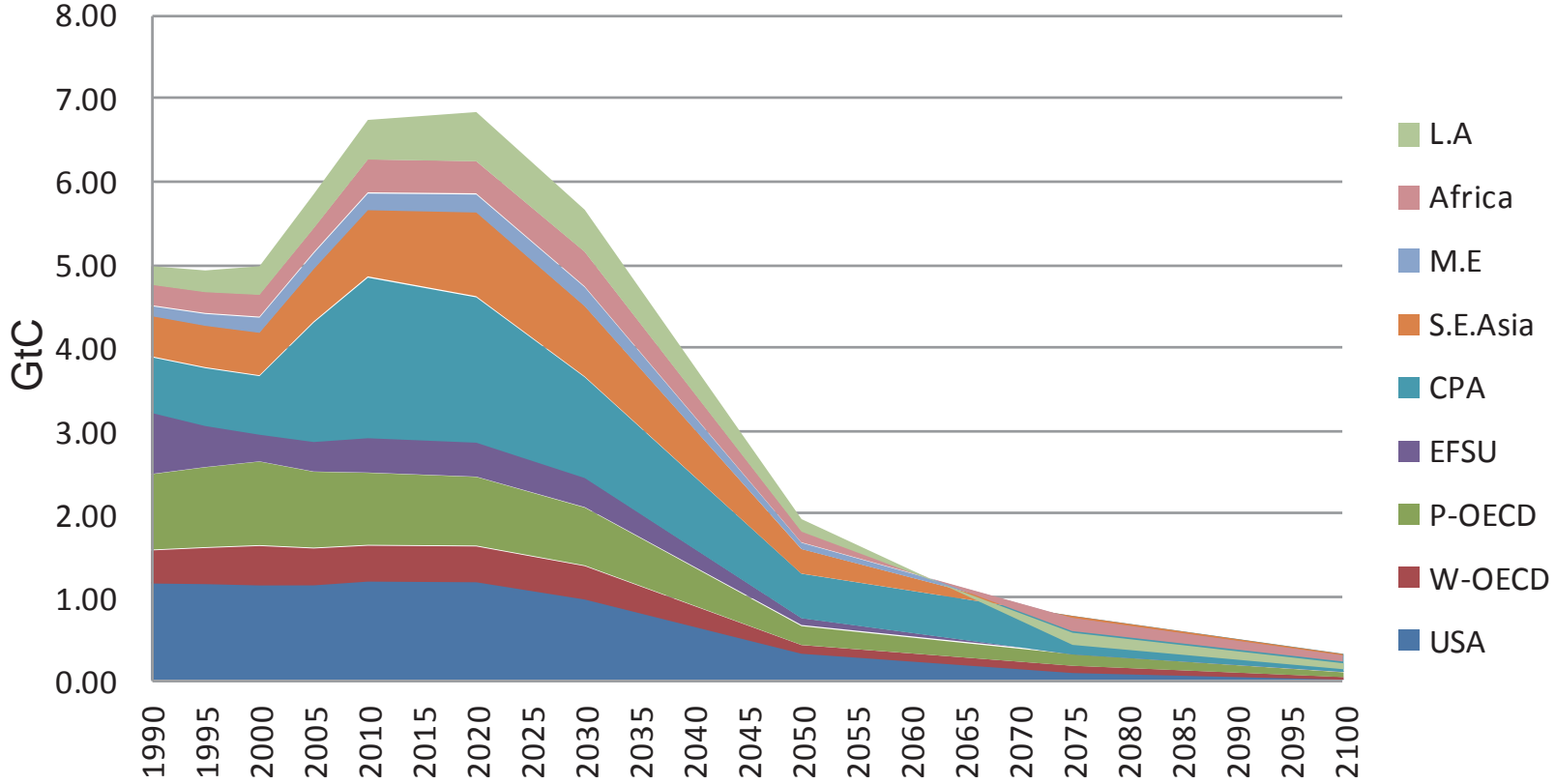
What's the future of China's low carbon policy: key factors

- 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
- Can we pay for it? Cost and benefit

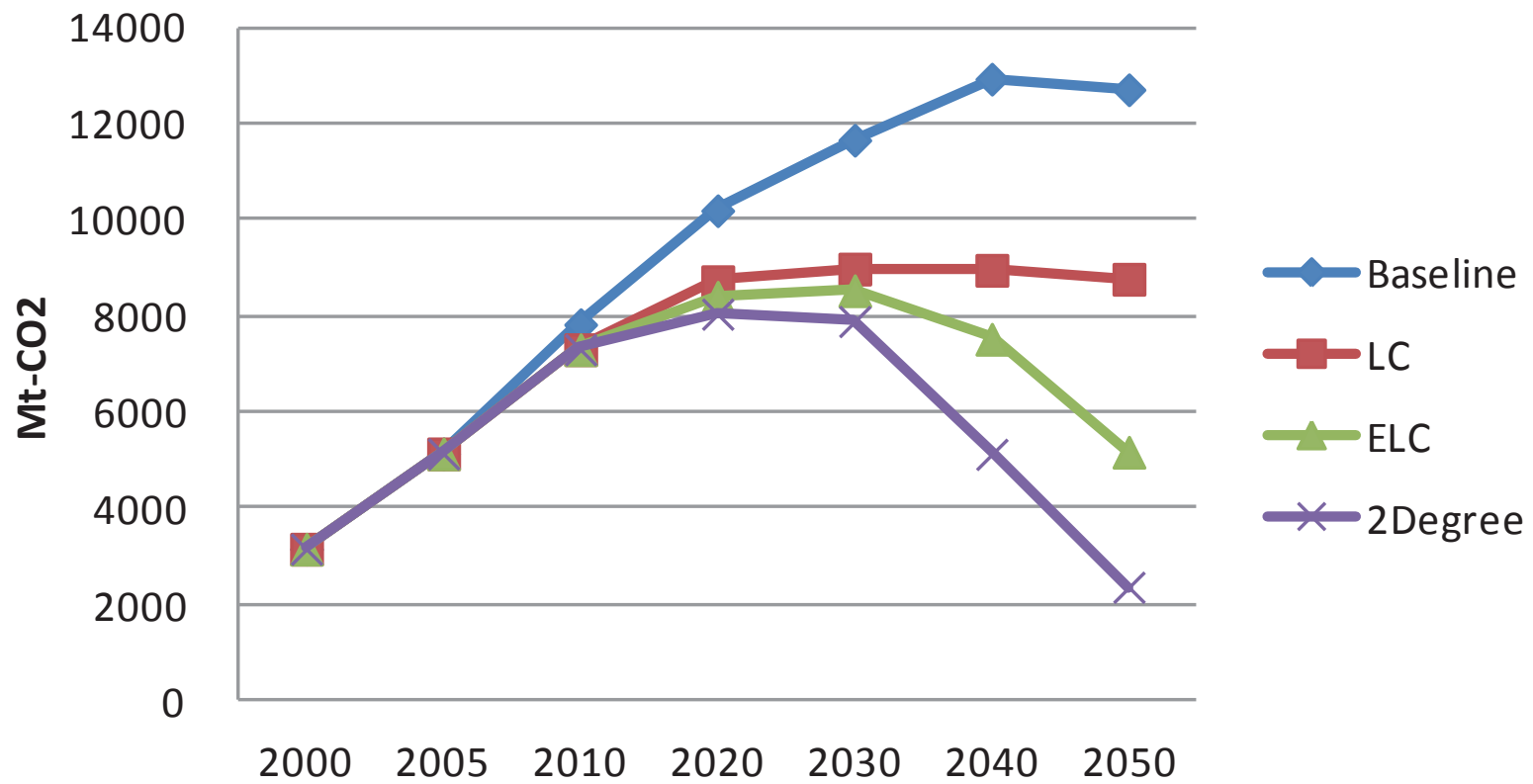
Framework of Integrated Policy Model for China (IPAC)



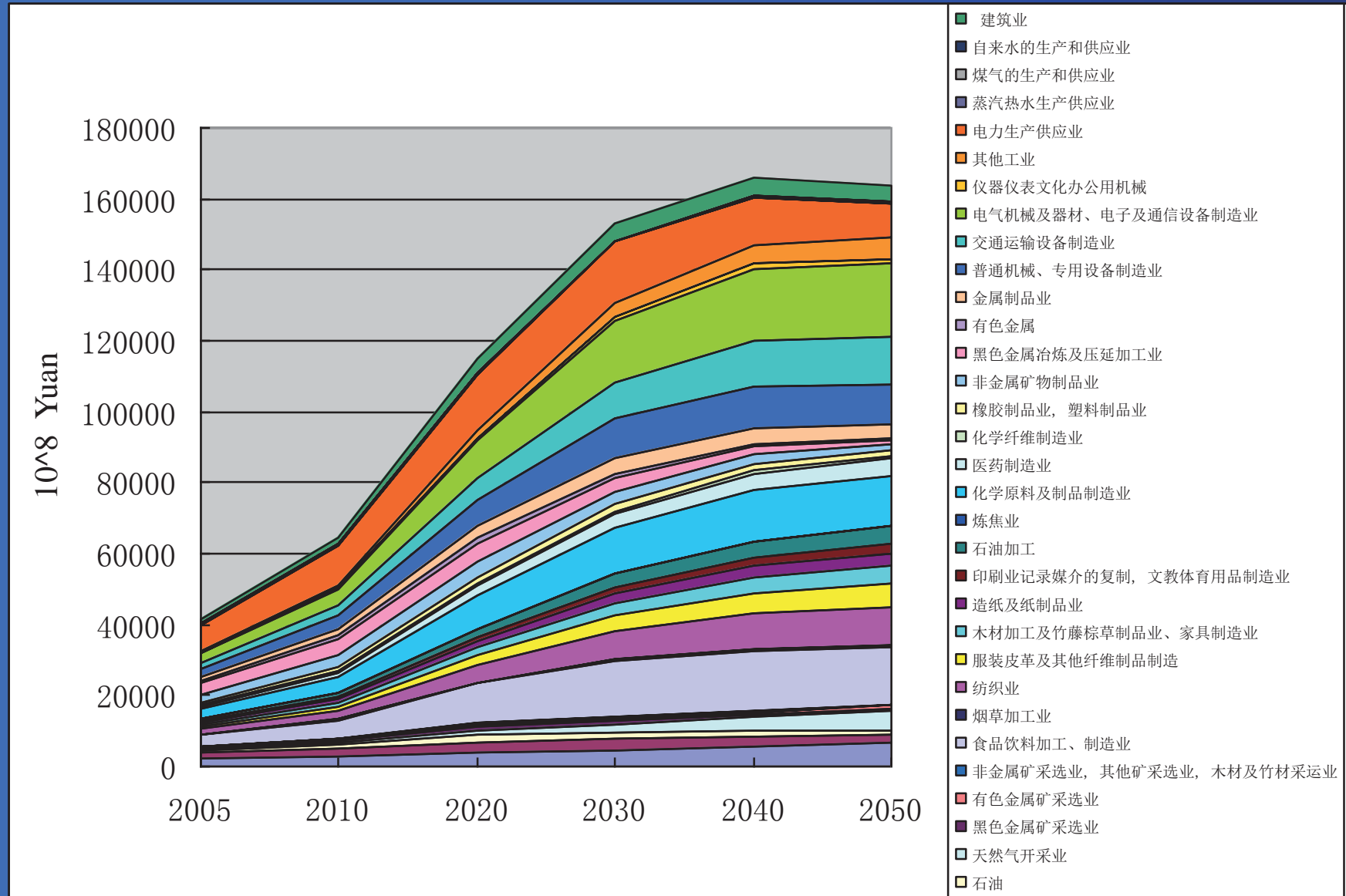
Global Emission



CO2 Emission in China



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

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
- In 2014, NDRC announced that the NG supply capacity should be 400 BCM (fight for 420 BCM) by 2020

Renewable Energy

- Renewable Energy Planning 2006: wind 30GW, Solar 2GW by 2020
- 2009 Energy Bureau: Wind 80GW
- 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.

GLOBAL NEW INVESTMENT IN RENEWABLE ENERGY BY REGION, 2004–13 (\$BN)



Frankfurt School
FS-UNEP Collaborating Centre
for Climate & Sustainable Energy Finance

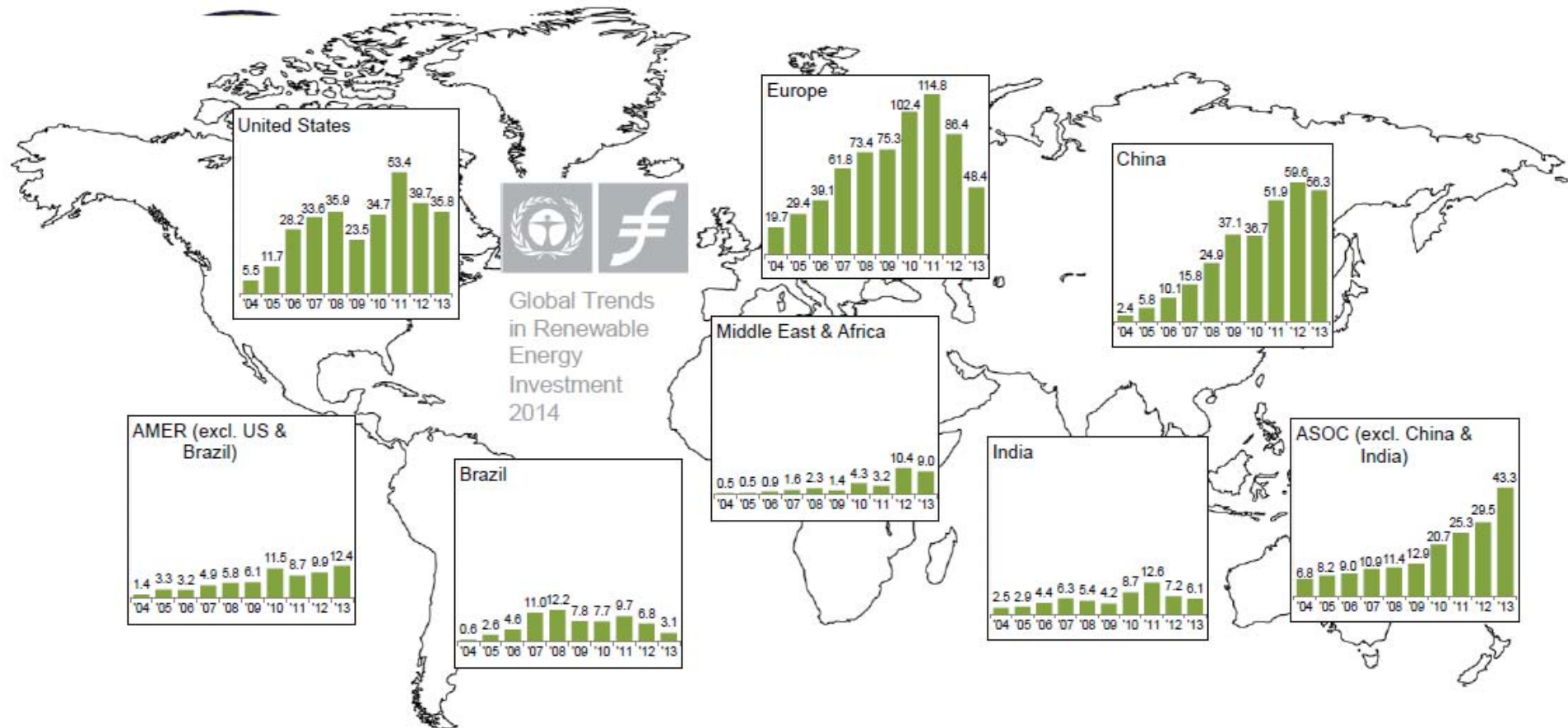


Figure 4. Renewable Power Capacities in World, EU-28, BRICS, and Top Six Countries, 2013

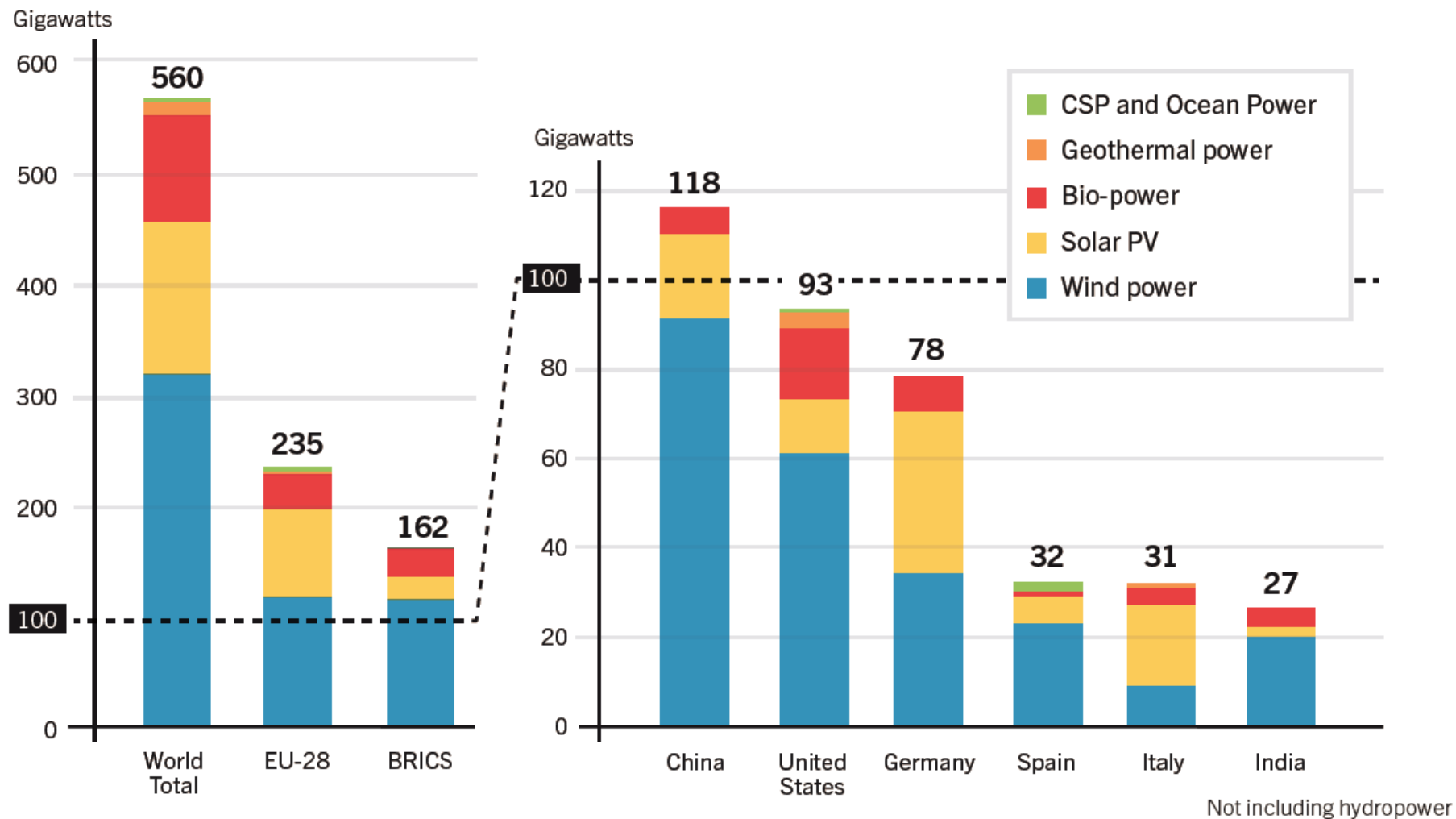


Figure 11. Hydropower Capacity and Additions, Top Six Countries for Capacity Added, 2013

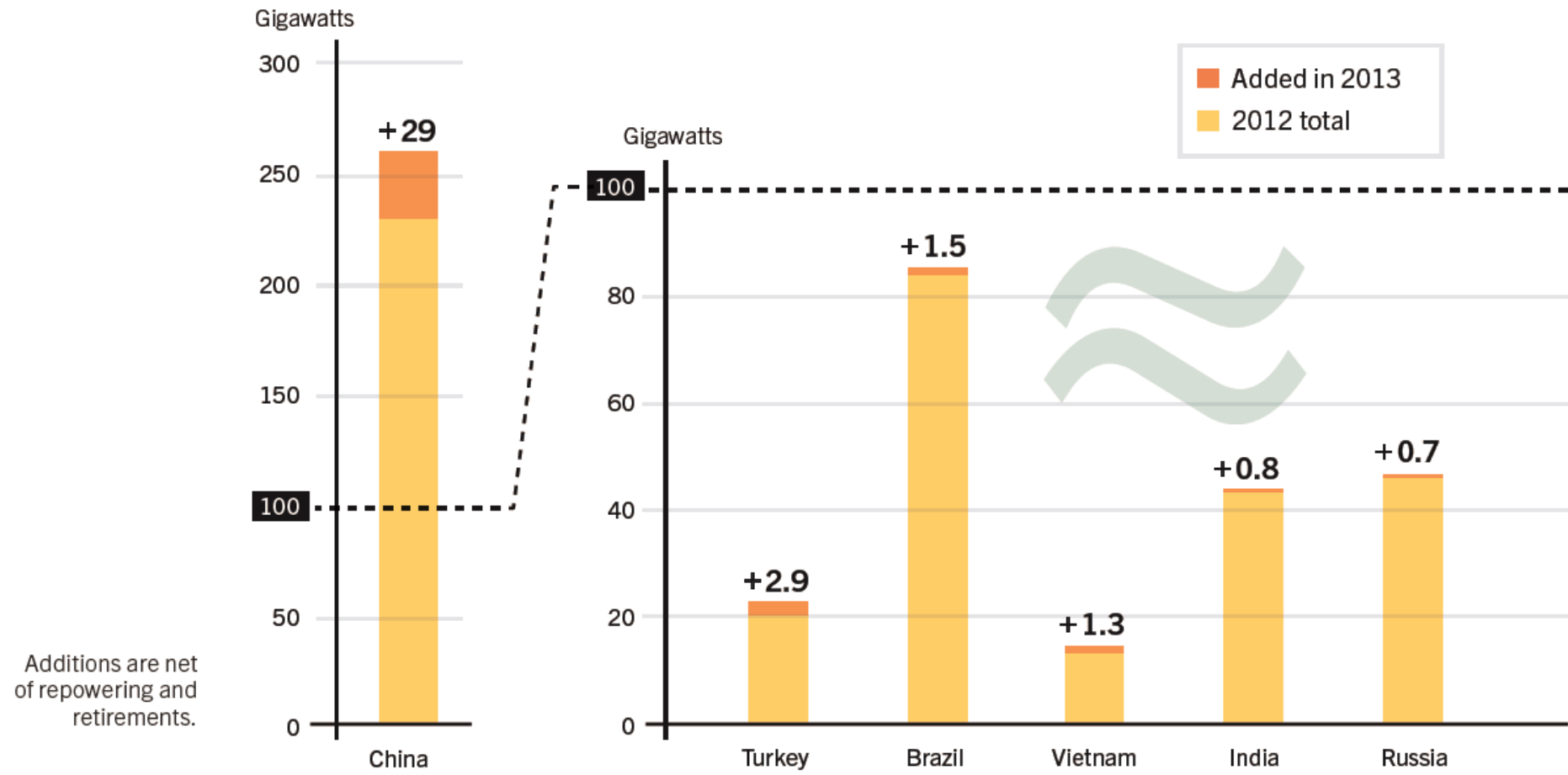


Figure 13. Solar PV Capacity and Additions, Top 10 Countries, 2013

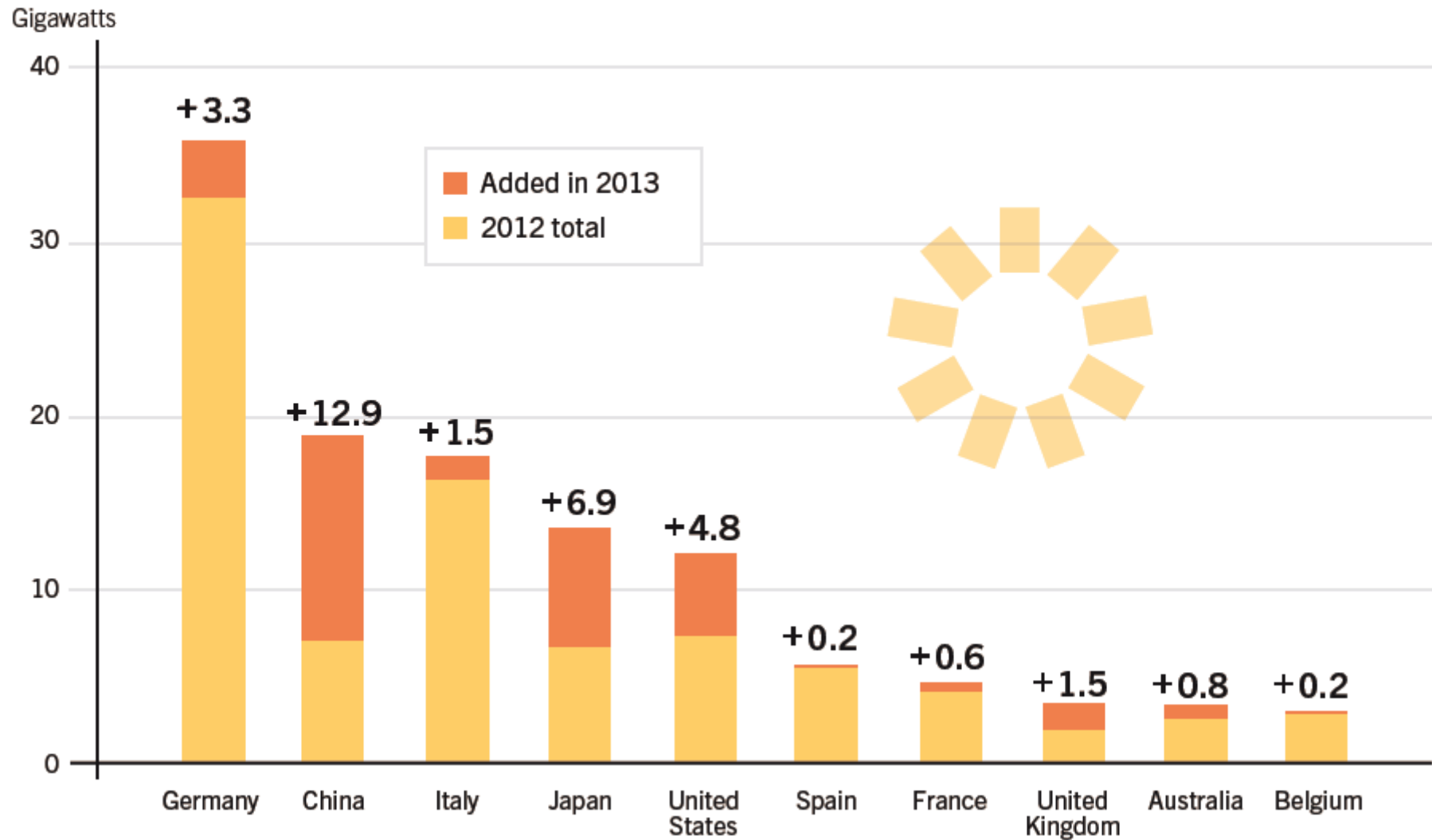


Figure 16. Solar Water Heating Collectors Global Capacity, Shares of Top 10 Countries, 2012

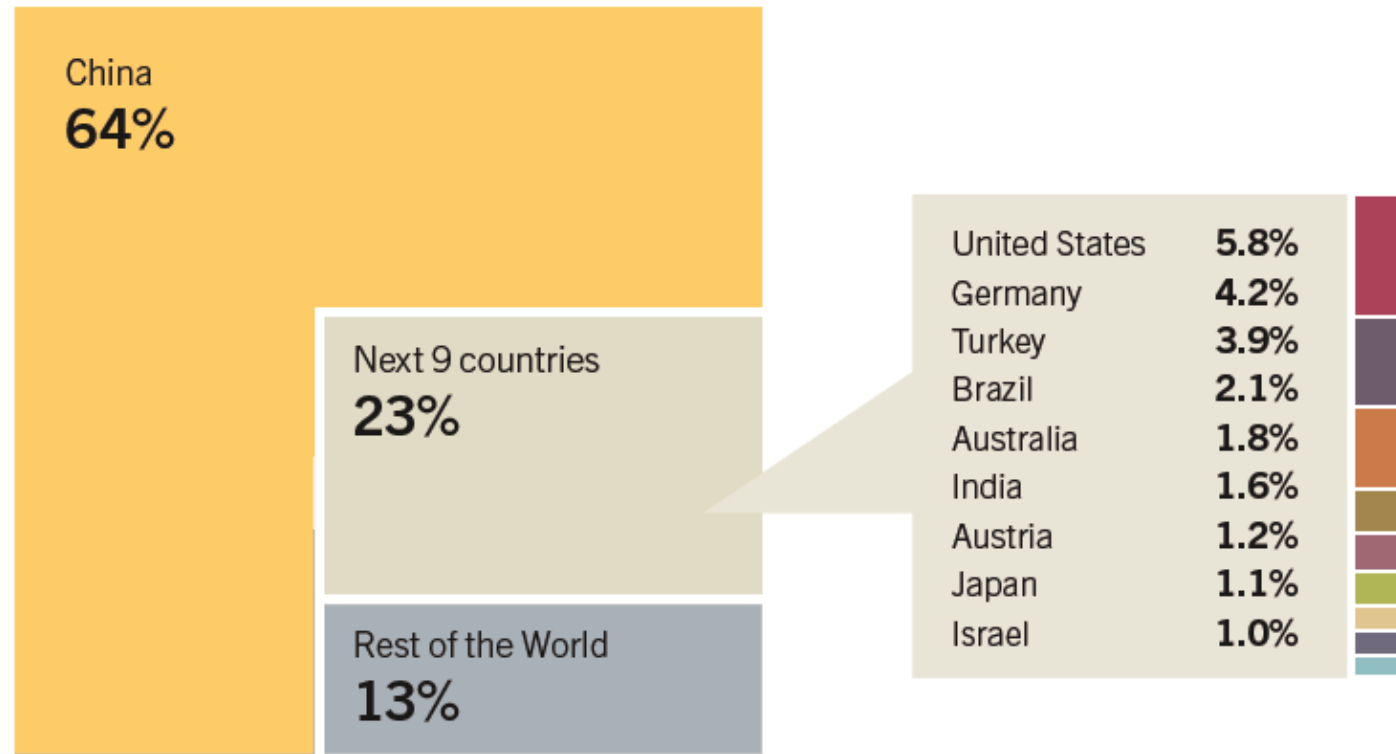
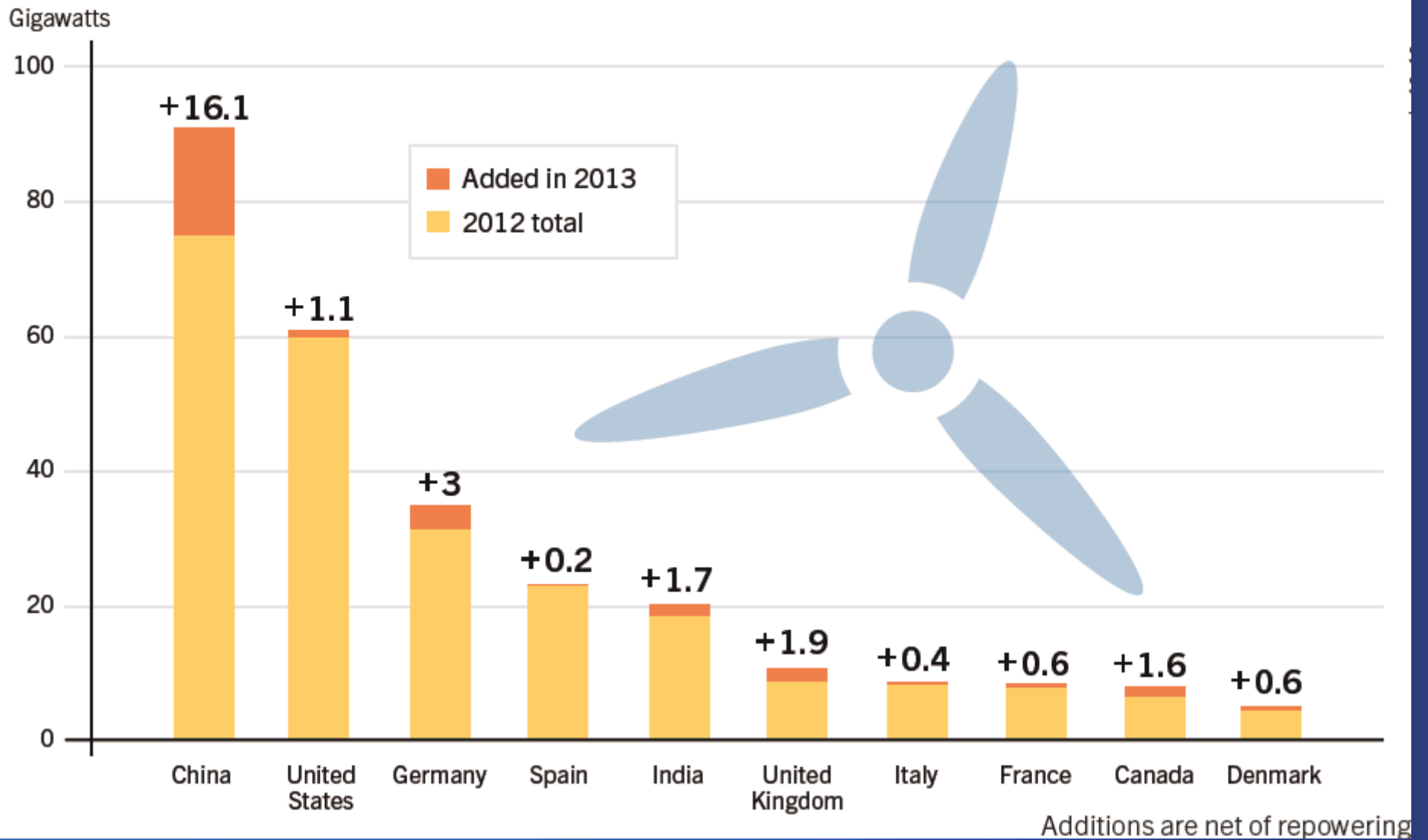


Figure 20. Wind Power Capacity and Additions, Top 10 Countries, 2013



Additions are net of repowering



POWER_BOX by Baosteel

2kW wind

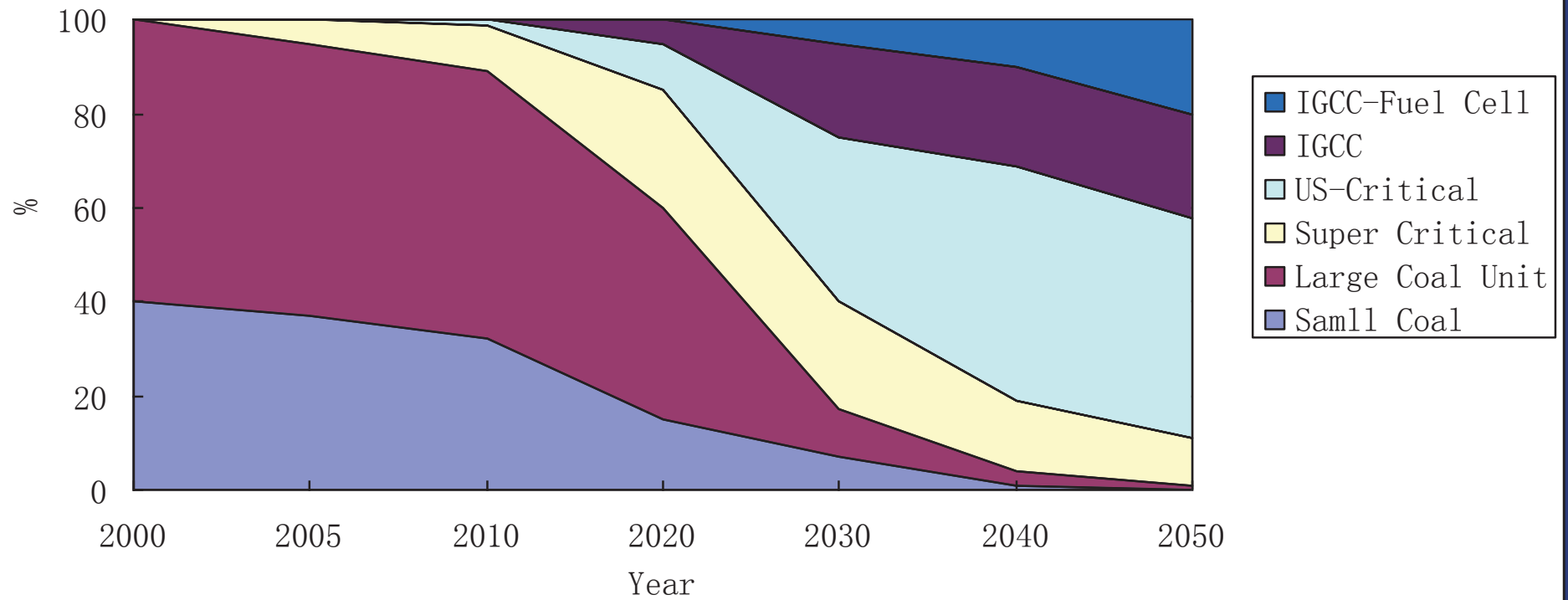
10kW Solar PV

1.5m/s

Physical process



CCS future



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 engine size of family cars, liter		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%

Stockholm: bicycle is coming back



Solar Energy

Low Carbon House in 2050: comfortable and energy saving

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

Solar energy for hot water and space heating

普及率: 20-60% (目前 6%)

Energy monitor system (Electric Appliance)

Super High Efficiency Air-Con

COP = 8, 普及率 100%

Standby energy use

降低1/3, 普及率100%

Planting on top

High efficiency lighting [LED]

减少50%照明需求, 普及率 100%

High insulation system

减少 60% 采暖需求, 普及率70%

Fuel cell

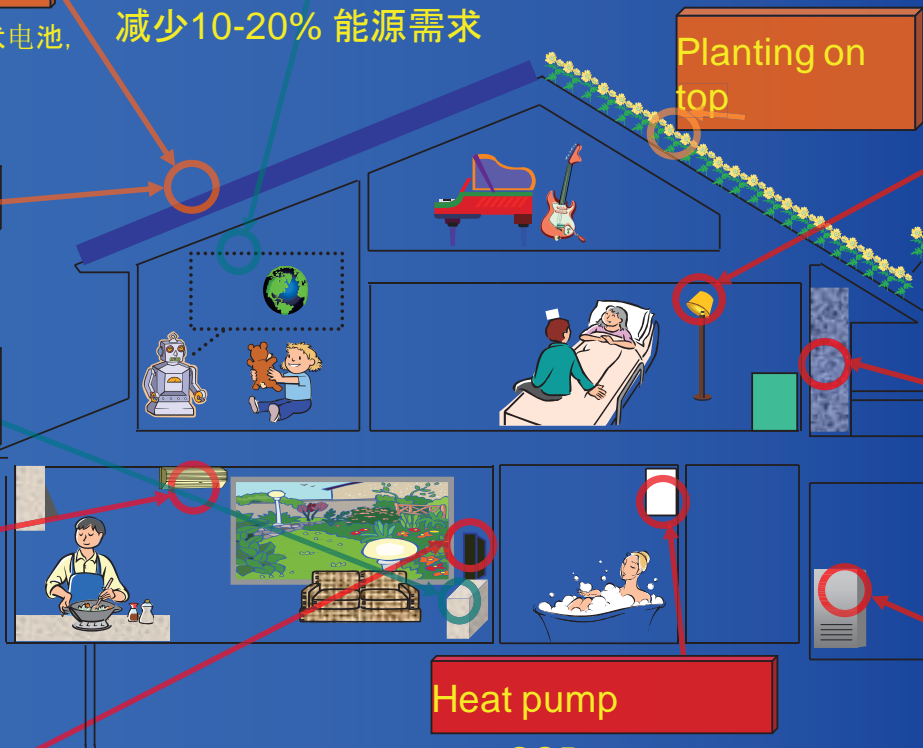
普及率 0-20%

Heat pump

COP = 5 普及率 30-70%

Public information
Public consumption change

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



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办中银京东卡

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乐华 (ROWA) LED23C310A 23英寸 LED液晶电视 USB+HDMI 液晶显 Y999.00



“LED平板电视机”

品牌: 京东方

夏普 (

长虹 (

价格: 0-2199

品类: LED背

排序: 相关度 销量

库存: 全国 仅显示

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台灯 (10)

氛围照明 (13)

吸顶灯 (76)

应急灯/手电 (2)

五金电器 (2)

吊灯 (58)

落地灯 (7)

五金家装 (40)

改装配件 (84)

家装建材 (97)

礼品 (9)

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“灯泡” 找到1068件相关商品

品牌: 飞利浦 (Philips)

格润莱特

翰源

麦辉 (MAWUI)

莱威光电 (LIONWAY)

欧司

蒙特丽

亮朵

倍利

价格: 0-69 70-199 200-499 500-1199 1200以上

排序: 相关度 销量 价格 评论数 上架时间

库存: 全国 仅显示有货

商品类型: 全部 京东配送 第



- 礼品
- 运动器械
- 显示全部分类

推广商品



爆款

¥6.9
原价: ¥55.0

60000人收藏, 70000人购买,
80000人安装!

¥6.90



买五送一

满五送一 亮昀美LED灯泡e14尖泡蜡



买五送一



亮昀美LED灯泡E27 LED灯具节能灯大螺口球泡光源QPJ014 3W白光 3W单品买五送

¥5.80 直降

★★★★★ 已有10077人评价

北京有货



3W

云科技 芯照明



佛山照明 LED灯泡 3W超炫E27暖白光球泡 2支装

¥30.00 直降

★★★★★ 已有3205人评价

北京有货



¥6.9

参考价: ¥55.0



V瓦特沃LED灯泡球泡E27大螺口led光源 3W 3W贴片正白 3W (继续狂欢 3W 6.9)

¥6.90 直降

★★★★★ 已有1181人评价

北京有货



佛山照明 LED灯泡 3W透明全柱E14暖白光尖泡 5支装

¥109.00 直降

★★★★★ 已有547人评价

北京有货



限量
1000套



VNC3W经济型天花灯LED一体化背景射灯 BB4/B05/B06/B09/C08 高光暖白光BB4

¥9.90 直降

★★★★★ 已有1276人评价



劲爆
特价

航空铝制散热器 LED 3W 正白 E27球泡



尚仕达 LED节能灯泡 超高亮led球泡光源 3w/5w/7w e27螺口灯 lamp 3W球泡-JDC1

¥5.70 直降

★★★★★ 已有490人评价



全民
百货



佛山照明 LED灯泡 3W透明全柱E14暖白光蜡尾尖泡 5支装

¥115.00 直降

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佛山照明 LED灯泡 7W超炫银E27暖白光球泡 2支装

¥76.00 直降

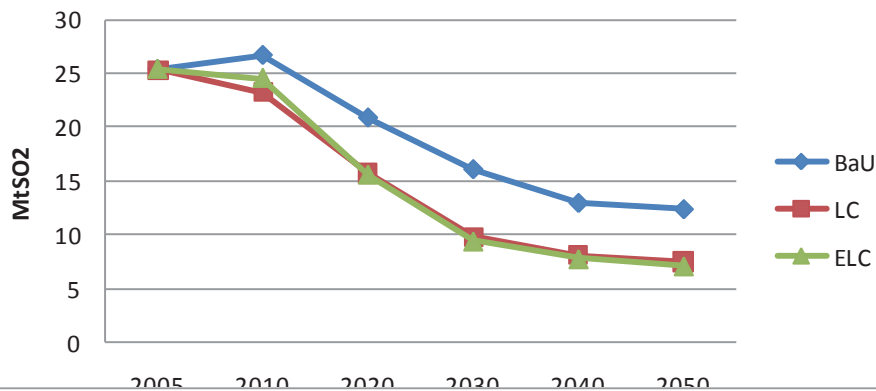
★★★★★ 已有450人评价

返回顶部

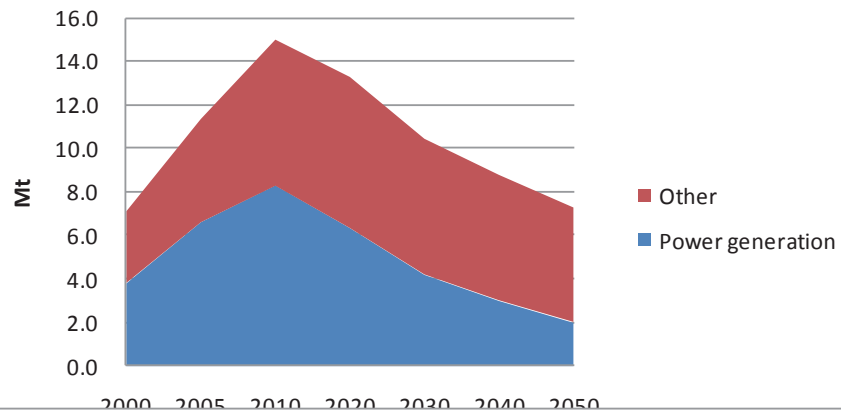




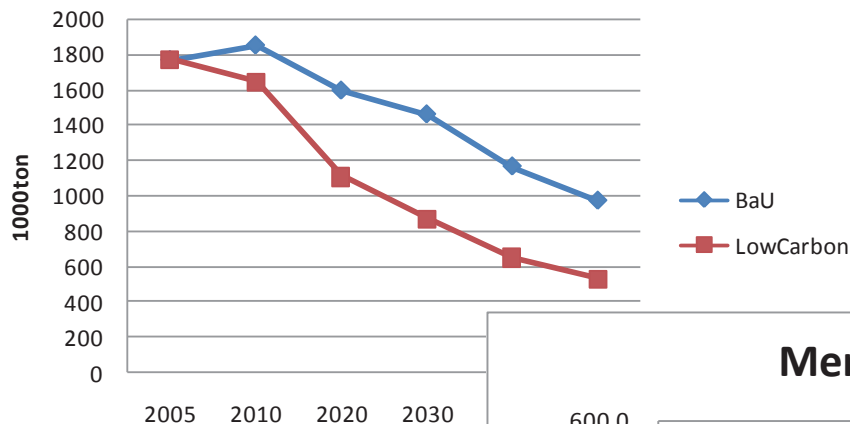
SO2 Emission



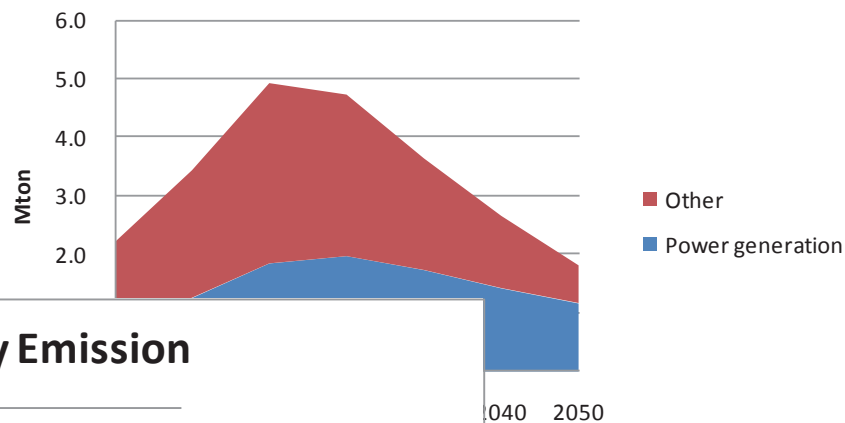
NOx Emission in China, ELC scenario



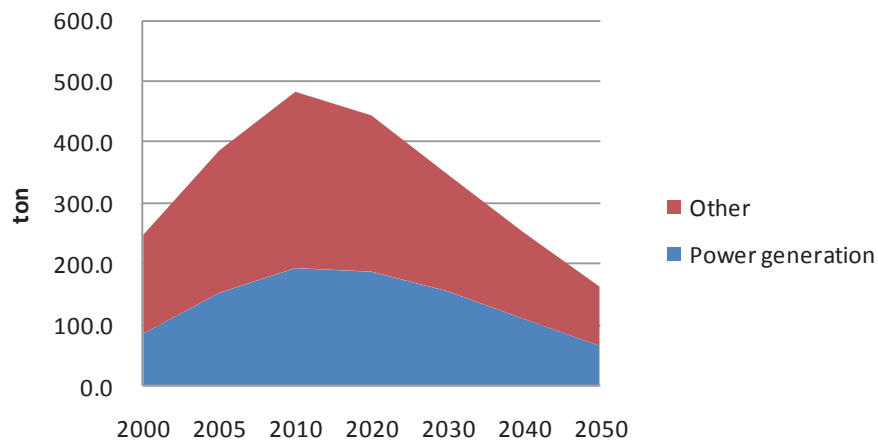
Black Carbon Emission in China



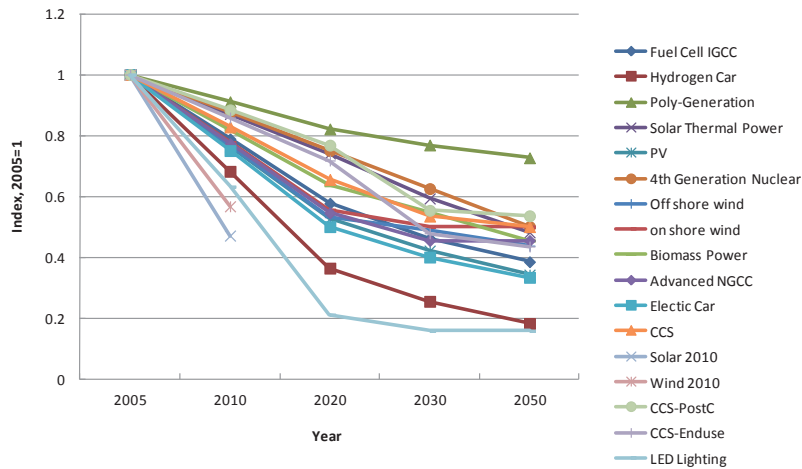
PM2.5 Emission



Mercury Emission



Technology learning curve



荣威E50的长/宽/高分别为3569/1551/1540mm, 其定位为A00级紧凑型车。



Price: US\$38000

Subsidy: US\$15000(Shanghai), no need to apply number plate(cost US\$10000)

US\$18000(Beijing), no need to apply number plate(By Oct. 2012, 1.1 million people apply for 20000 number plates per month),



By 2020, Wind 200GW to 250GW, Solar 50WG

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
 - 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
- 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

Thank you !

hecm@eri.org.cn