Development of the long term target of emission mitigation for China

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Long term target to be developed

- 2 degree target not yet officially agreed, as it is not a direct conclusion by scientific consensus, but political suggestion
- Although China will support a positive long term target, which meets Article 2 requirement, achievable, and fair
- Half decrease by 2050 will face serious debates, need more scientific, economic and social study

Approaches to set up long term target

- Target first approach, as two degree, and “double 50” first, than the achievability, and quota distribution
- Action first approach, what we can do the most from now,
- Integration of these two approaches, and action first approach more important

Learning and doing

- Long term target first approach may help to initiate political willingness in many countries
- If near term targets or action plans match the long term target ?
- If not, the solemnness and effectiveness of the target becomes suspicious
- Immediate challenge of distribution of quota, if long target set up
- China will not agree “double 50” before important subjects become clear
- Long term target, including “double 50”, could be used for techno-economic analysis

Pay more attention on near term actions

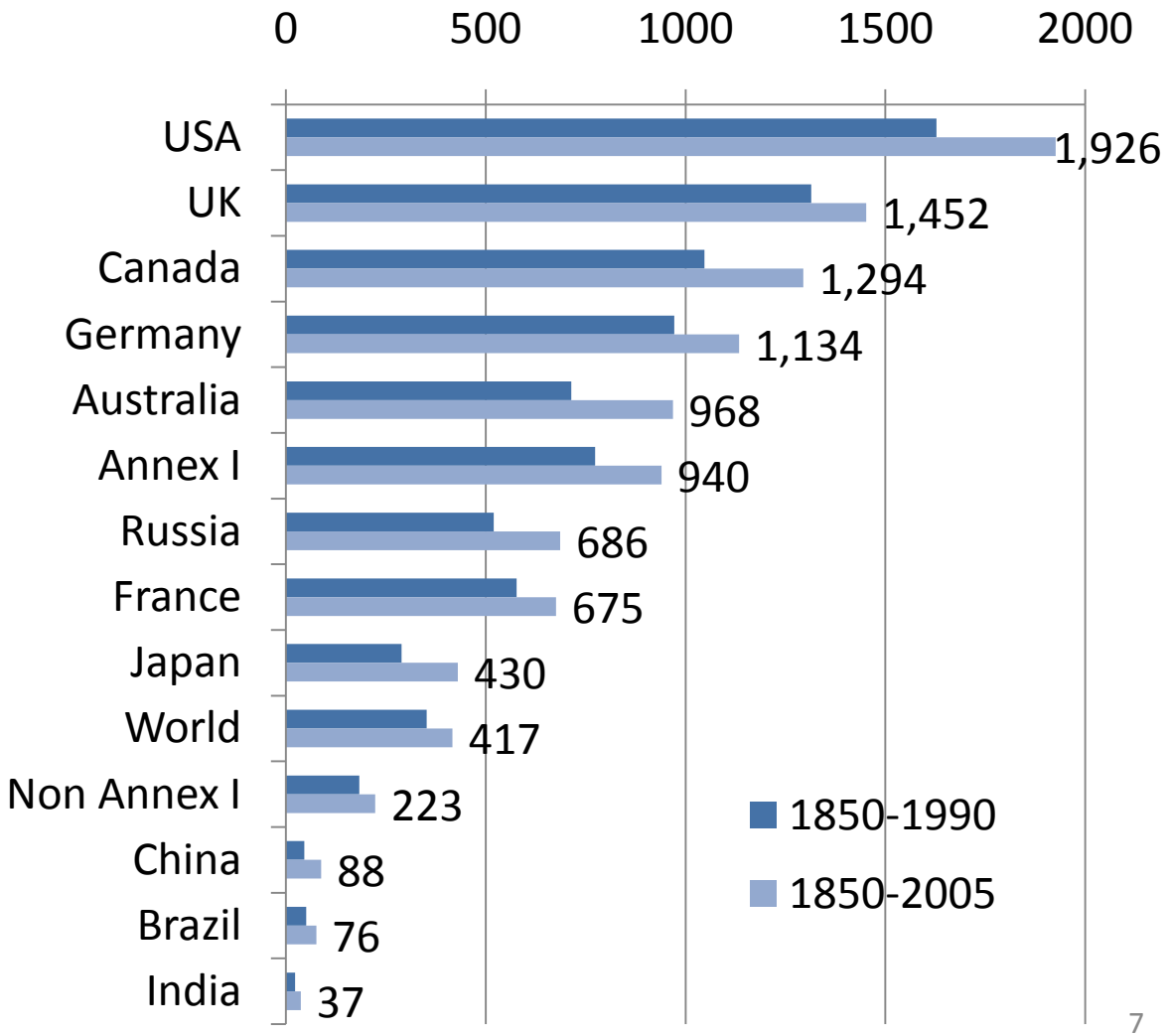
- Action is more important than word
- Need urgent technology innovation and system changes for quick mitigation
- Key technologies and change of consumption are very crucial
- Globalization will narrow the gap between major economies, in terms of major technology and products
- But if the system did not change, developing countries would be hard to leapfrog

Mitigation responsibility

- Global warming is a serious and global challenge
- Need revolutionary change in all the fields
- Technical measures not enough
- Price system change (including carbon tax) can help, but not sufficient
- leads to more inequity, poorer have less access to energy service
- Common and (still) differentiated responsibility
- Deep binding target to developed countries necessary

Accumulated emission per capita quite different

If the target of half emission by 2050 should be achieved, Accumulated per capita emission from 1850-2050 will be only 560 tons of carbon

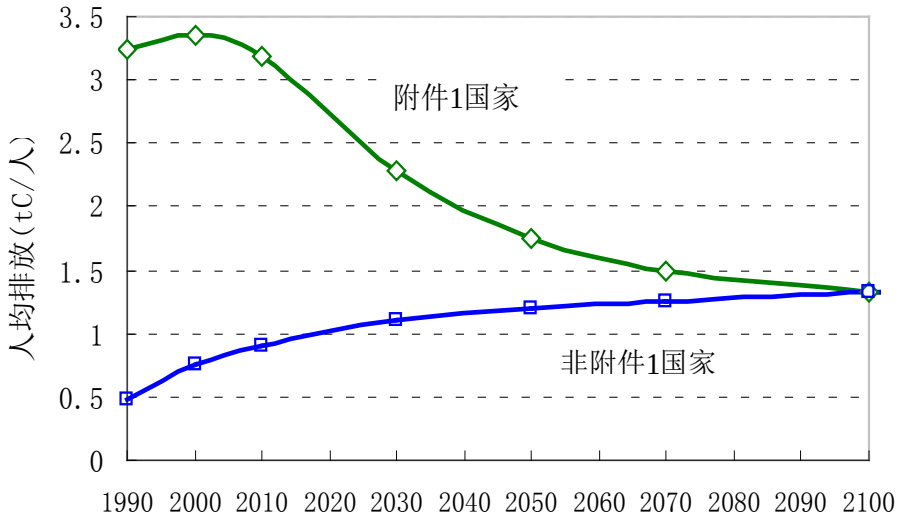


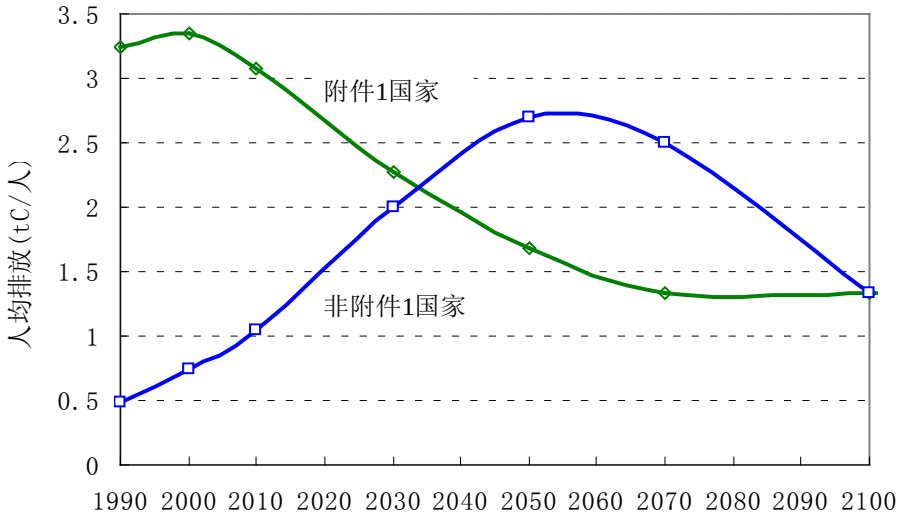
Emission per capita is the basis for equity

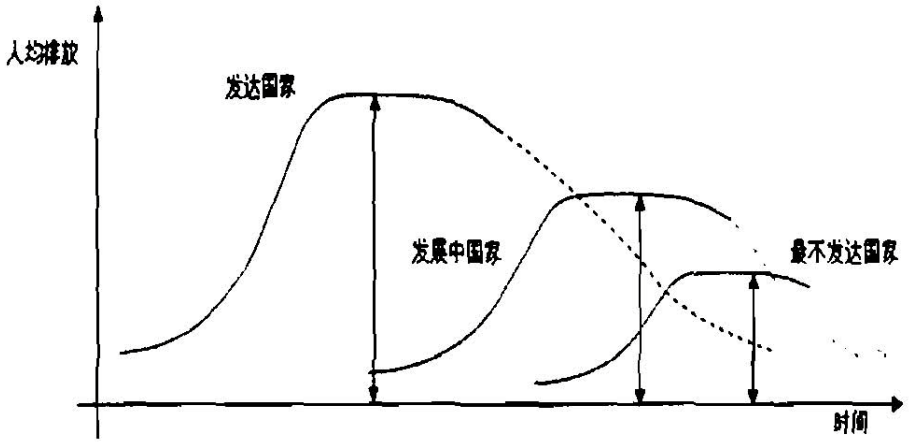
(data for 2005 by JEEI)

COUNTRY	TOTAL EMISSION	EMISSION PER CAPITA
OECD	3566	3.06
EU(27)	1096	2.24
USA	1599	5.39
CHINA	1386	1.06
S.KOREA	122	2.54
INDIA	325	0.297
WORLD	7280	1.14

Different pathways to convergence







Per capita emission from 2005-2050 under 2050-50% and Annex1 -80% target

	Annex1	Non Annex1	World average
1850-2005	940	223	417
2005-2050	266	107	137
1850-2050	1206	330	560

- Per capita carbon emission from Annex1 country will still be 2.5 times than the developing countries, even though they decrease 80% by 2050

Major factors driving GHG emission of China

- Economic growth
- High growth rate of GDP is expected, as a national target
- 8% annual rate possible for another decade or two
- GDP growth continues up to 2050
- Chinese government will try to keep growth rate relatively high
- Push the energy consumption increase continuously

Great potential for increasing energy consumption

- Per capita energy consumption only 1.5 tons of coal equivalent, about one third of that consumed by Japanese
- Car ownership per 100 person only less than 2.7% in 2008, (35 million family cars),
- Car production and sales rank the first in the world this year, total sales will over 12 million
- Living space per capita increase 1 square meter per year in last ten years
- Only 46% of people living in urban area, more than 10 million people move to urban annually

Consumption in unsustainable pattern

- Extravagant consumption still is the direction driven by market
- China is becoming No.1 market of many luxurious commodities
- Difficult struggle of government on proper area of apartment of buildings: 90 square meters' standard versus preference of developers

Structure change very likely

- To keep growth high needs structural change
- Chinese government calls for structural change
- Increase the domestic demand, instead of export reliance and heavy investment
- Heavy industry expansion could be maturated soon
- Energy growth rate may declined significantly
- While investment rate increases significantly, due to combating financial crisis
- High uncertainty of structural change at this time

Towards the green development approach

- Social target: develop an environmental friendly, and resources conserving society
- “Energy conservation first” energy policy
- Increase low carbon energy supply
- Speed up the development of renewables
- Technology development for future alternatives
- Study and be prepared on CCS

Energy conservation first

- National binding target of 2006-2010: the 20% energy intensity decrease within 5 years, 3 times quicker than the world average
- Target will be achieved, similar target will be set for next 5 years' plans
- Responsibility system of quantified target of efficiency has been established for all provinces, cities, counties and enterprises
- Energy conservation law, and relevant regulation system established
- Economic incentive system established
- Standards, labeling system improved

Expiring low efficient production capacity for energy conservation

- From 2006 to June 2009, 7467of low efficient power generators expired, with capacity of 54.07 Gw. Efficiency of power generation improved 9.5% within 3 years
- From 2006 to end of 2008 expired
  - Iron blast furnaces of 60.59 million tons
  - Steel making capacity of 52.07 million tons
  - Cement furnaces of 177 million tons
  - Small oil refinery capacity of 10 million tons, ets.
- Energy saved in industry sector more than 200 million tces in 2008, comparing with 2005

Build up energy conserving system for consumption

- New standard of energy efficiency for buildings, 50% improvement
  - Implementing rate up to 98% in design phase
  - Implementing rate reach 82% in practical construction, a 30 percentage points improvement in 2 years
- New policy of transport system development:
- Public transport first : buses, BRT, Subway, light track system, instead of car mass transport
- Tax and financial policy to encourage high efficient cars and new energy vehicles, and discourage big cars.
- Railway priority policy for inter city system: high speed train up to 350km/hour

Law, regulation, and social mobilization

- Revised Energy Conservation Law, specify not only targets, but also responsibilities of government, enterprises and common people
- Renewable Energy Law under revision, pushing ambitious action on renewable development, with legal responsibilities
- Regulation system developed
- Institutional capacity building , education media spreading, training, local action plan,etc

Very uneasy to achieve the 20% decrease target

- Economic expansion conflicts to achieve the energy conservation target
- Great inertia of economic system which heavily relays on export and investment
- Less attention by local officials, when economic growth slower down, and energy over supplied
- Still need more hard work to ensure the target can be achieved by 2010, as heavy industry rebounds
- Government may be reluctant to support another 20% as the target for the next 5 years

Change is not enough

- City expansion still copy the old style, lead to more traffic needs and congestion
- New technology spread slowly, such as hybrid car or electric cars
- Renewables not sufficient to match demand, coal still expansion

Develop low carbon energy resources

- Nuclear power: biggest market in China
  - More than 70 Gw new nuclear power plants to be constructed and commissioned before end of 2020
- Natural gas production tripled by 2020
- Another 150 Gw hydro power to be built up by 2020
- Wind power capacity doubles annually for last 3 years
- Will becomes biggest wind power country in the world soon, target for 2020 may up to 120-150 GW.
- All the renewables are under development, some are well applied, such as solar water heater, biogas, etc.

High cost and limitation by grid

- Wind power and solar PV still more expansive comparing with the coal power
- Cost learning curve to be proved yet
- Challenge to grid to connect wind and solar power
- Technology difficulties for long distant transmission of wind and solar power
- Utilization on site technology not maturate

Further technology innovation for low carbon

- Many technology not yet available, or competitive
- Clean coal technology: IGCC, poly-generation, and CCS
- Advanced nuclear: rapid breeder reactor, fusion
- Second generation of bio-ethanol, etc

Something certain

- Carbon intensity decrease significantly
- Growth rate of energy consumption decreases
- Coal shares less from the total, with more from natural gas, nuclear, hydro and other renewables
- Per capita energy consumption and GHG emission will not exceed that in developed countries
- GHG emission peak before 2050, may be 2040, or earlier, and decline after

Major uncertainties

- Peak level of GHG emission of China, mainly depending on energy demand of next decades, and availability of clean energy
- Peak time of GHG emission of China, not earlier than 2030
- Renewables' roles, cost, scale (such as 1000 Gw of wind, and of solar power)
- What will happen in the future in developed countries