

Green Growth and Structural Transformation Opportunities for China's Forest Sector

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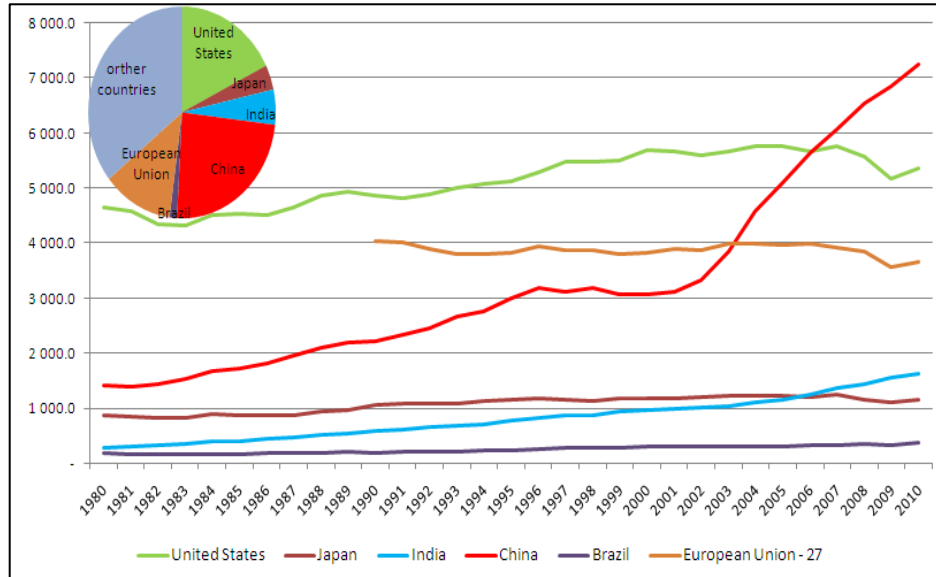
Content

- Green Growth became mainstream development principle in China
- WB&DRC comprehensive review
- Opportunities and Challenges for Forest Sector
- Policy options

Existing Model of Growth: Characteristics

- High Carbon, High Pollution and Low Productivity
- Largest Carbon Emitter since 2006
 - Could continue to rise until 2030 (LC Scenario)
- Air and Water Pollution worsening

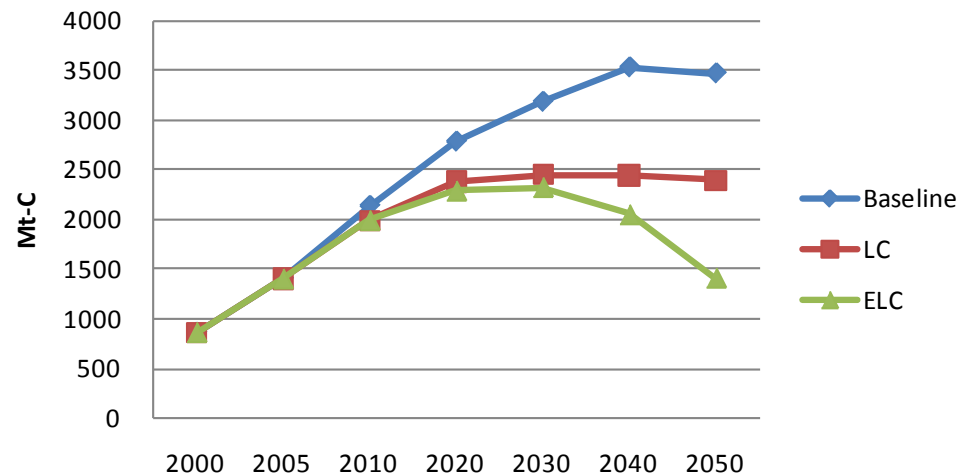
Carbon Emission Scenarios



In 2006, China surpassed US to be the number one emitter of CO₂. Currently China emits ¼ of the world total CO₂.

Based on recent simulations, business as usual scenario is that total emission from China could reach 35 billion t in 2040-2050. Low carbon scenario (per China's Copenhagen Commitment) indicates emission will peak at 2030 then decline. Extremely low carbon (ELC) Scenario indicates China's emission could stop growing before 2030. ELC seems to be getting government leaders' interest now. (Source: Jiang Kejun 2011)

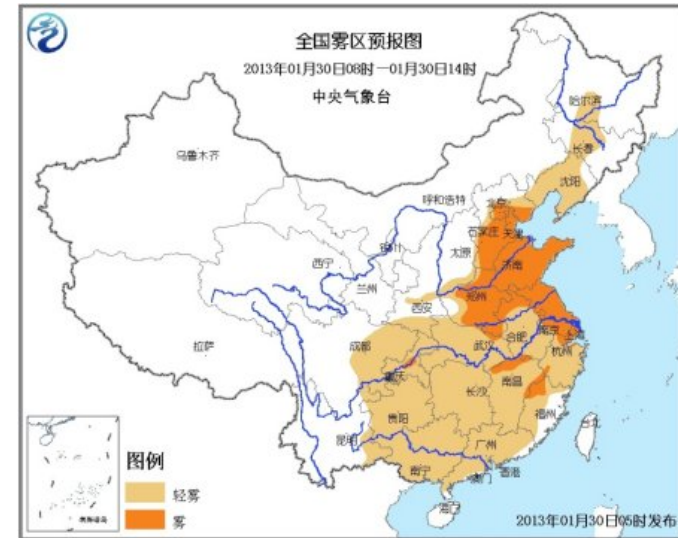
CO₂ Emission in China



Domestic Pollution

- This year's smog instance in the first 6 months covered 1/5 of China's territory, highlighting the peak of environmental challenges facing the developing economy
- Beijing became the “capital of smog”
- Measures to reduce pollution have largely been unsuccessful.

Smog in Beijing,
Jan 11, 2013
(PM 2.5: 340-
460, peak was
990 $\mu\text{g}/\text{m}^3$)



Damage Estimates

- New York Times (04/02/2013) on Air Pollution in China:
 - 1.2 million premature deaths in 2010 in China due to outdoor air pollution. 40% world total (3.2 mil).
 - (equivalent to 25 million years of statistical life)
 - Pollution due to particulates: No 4 killer of life in China in 2010, behind unsafe food, high blood pressure, and smoking of cigarette.
 - By year 2050, air pollution will be No. 1 reason for environmentally caused deaths.
- Damages in 2013 could be several times larger
- WB&DRC (2012): Environmental Cost in China 2009

Total economic damage due to environmental depletion and degradation amounted to 9% of Gross National Income of China in 2009, higher than other BRICs nations such as India and Brazil, and significantly higher than leading developed nations

Environmental depletion and degradation, all number are % of GNI	2009 value	"Greener" value, reachable by 2030	Net improvement
Energy depletion	2.9	1.9	1.0
Mineral depletion	0.2	0.2	--
PM ₁₀ health damage	2.8	0.1	2.7
Air pollution material damage	0.5	0.1	0.4
Water pollution health damage	0.5	0.1	0.4
Soil nutrient depletion	1.0	0.1	0.9
Carbon dioxide damage	1.1	0.2	0.9
Total depletion & degradation	9.0	2.7	6.3

Cost of Climate Change to China

- China is a large continental country, susceptible to climate risk
- WB Research (Blankespoor, et al, 2012)
 - One of the four countries suffering the most cost of sea level rise
- Significant impacts on agriculture (Chen et al 2013)
 - More acute distribution of rainfall
 - Crop yield damage (corn and soy, down by 2-5% to 8-22%)

In addition: Some recent observations

- Even the Low Carbon (LC) Scenario is not feasible to the world
 - LC scenario relates to two items:
 - China's Copenhagen Commitment (40-45% CO₂ Intensity per unit GDP down 2005-2020)
 - Fair Allocation Principle (equal contribution based on per capita historical emission)
- Fang et al (2009), Ding et al (2009)
 - The remaining room for CO₂ emission is too small
 - Fair allocation and remaining allowable emission are not compatible
- Green Paradox
 - Air pollution reveals a fact that pollution control needs to be at the airshed level
 - Similar argument applied to carbon emission reduction
 - A global joint effort program on carbon reduction is more understood

World Bank and DRC: China 2030

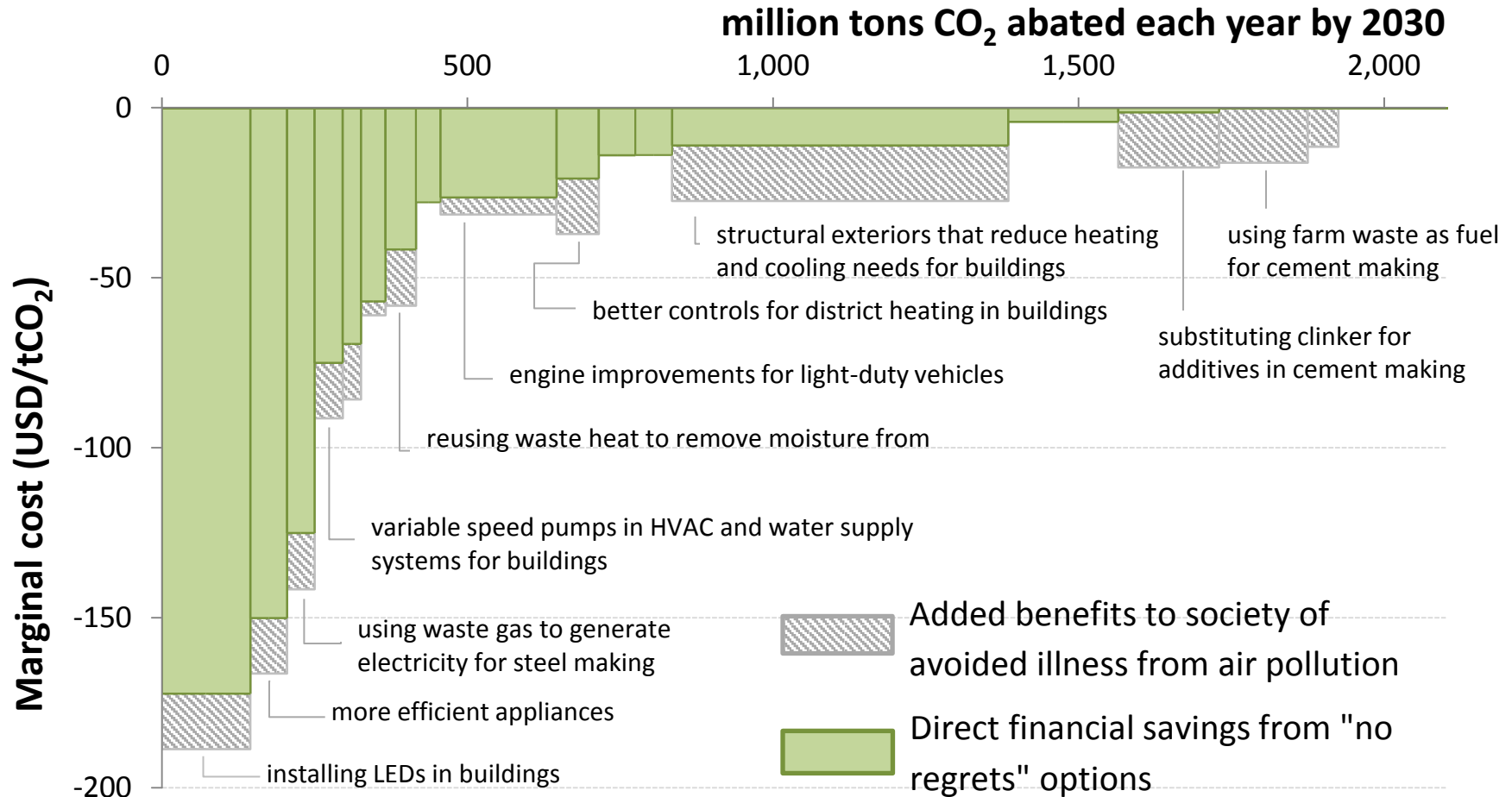
- Existing model of growth is no longer sustainable
- Structural transformation is needed, but with tremendous challenges
 - Getting the price right
 - Getting the institutions right
 - Getting the policy instruments right
- There are also important opportunities
 - Going green is a source of growth
 - China is positioned to reap benefits of green innovation

Reaping the Benefit of Green Growth

- China is already the world largest exporter of innovative technological products in wind and solar power
- There are many “no-regret” measures to green growth
- Becoming leader in green technologies is beneficial to China’s economic growth, but also provides tremendous public good to the world economy

Realizing economy-wide efficiencies:

Numerous no-regrets options exist that can save energy and trim production costs for industry, contributing to growth.



Source, Carter Branden and WB&DRC 2012

Where is forest sector?

- Despite progresses in forest tenure reform, forest expansion
- Forest sector role in climate strategy, green growth remain murky
 - Existing afforestation plan equivalent to 8% CO₂ reduction, in climate strategy? What's more?
- Existing industrial policies suppressed commercial forest
 - Substitution of iron, coal, concrete, etc. for timber
 - Huge subsidy remains for these heavy industries
 - 1% GDP (RMB 500 billion) annually

Substitution Reversal

- Equivalent to RMB 120 /Mu for all forestland (RMB 180/mu for all commercial timber forestland)
- If timber volume per unit of forestland increase by 1/3
- Annually forest growth up by 120 million M3
- Let's say 60 million m3 more timber appeared at domestic market, if used for house construction
- 1 million new wooden houses by Tibetan standard
 - 1.6 billion t concrete, 0.5 billion t iron for housing construction
 - Reduced by 0.32 billion t concrete, 0.1 billion t iron
- Reduced CO2 emissions by ????
 - 1 billion ton

Forest based bioenergy?

- A CGE Simulation
- Triple forest biofuel in China (to 3%)
- CO₂ down by ~3%
- GDP up by 0.15%
- Forest Investment up by 28%
- Forest Employment up by 20%

Exiting Progresses

- National leaders calling for re-estimation of CO₂ emission path
- Pilots of Cap-and Trade in Carbon in 7 provinces
- Intensive studies of environmental taxes, carbon taxes
- These will make forest sector more competitive

Forest Tenure Reform

- Improved forest management
- Enhanced rural livelihood, reduced poverty and inequality
 - Added 21 million full time job
- Reduced pressure on tropical forest resources, allowing opportunity for adoption of REDD+
- A model of institutional reform underpinning successful REDD+

Remaining Tasks

- Strengthening forest tenure reform by
 - Removing constraining forest policy
 - Logging regulation
 - Reevaluating forest protection policy
 - Expanding household forest management
- Establishing enabling policy and regulatory system
 - Removing subsidy to heavy industries
 - Direct subsidy to forest production
 - Supporting R&D and promoting forest based economy
 - Housing\biofuel\food
- State forest reform

Thank You!