



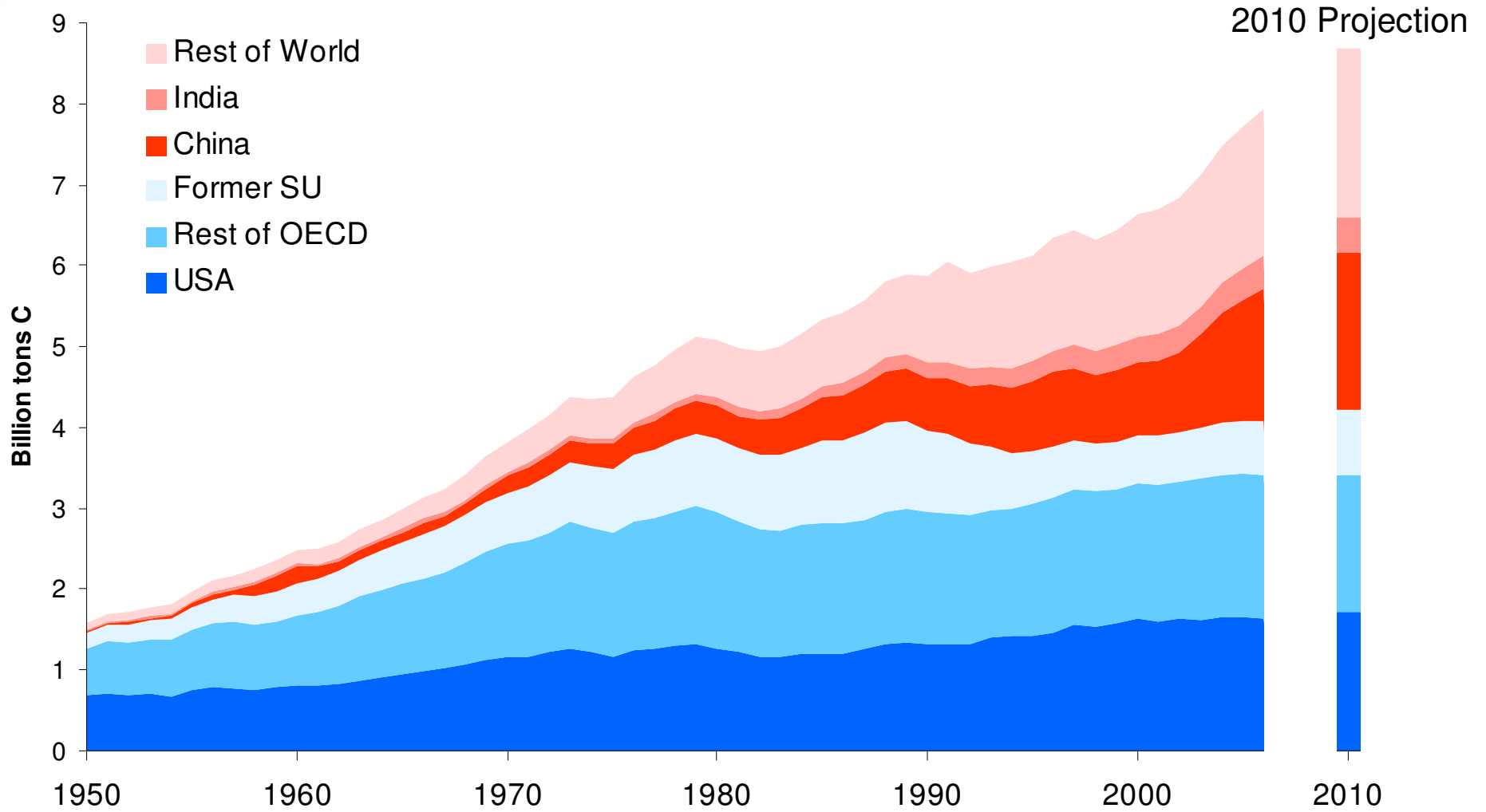
Modeling Developing Country Emissions

Geoffrey J. Blanford, EPRI
Global Climate Change Seminar

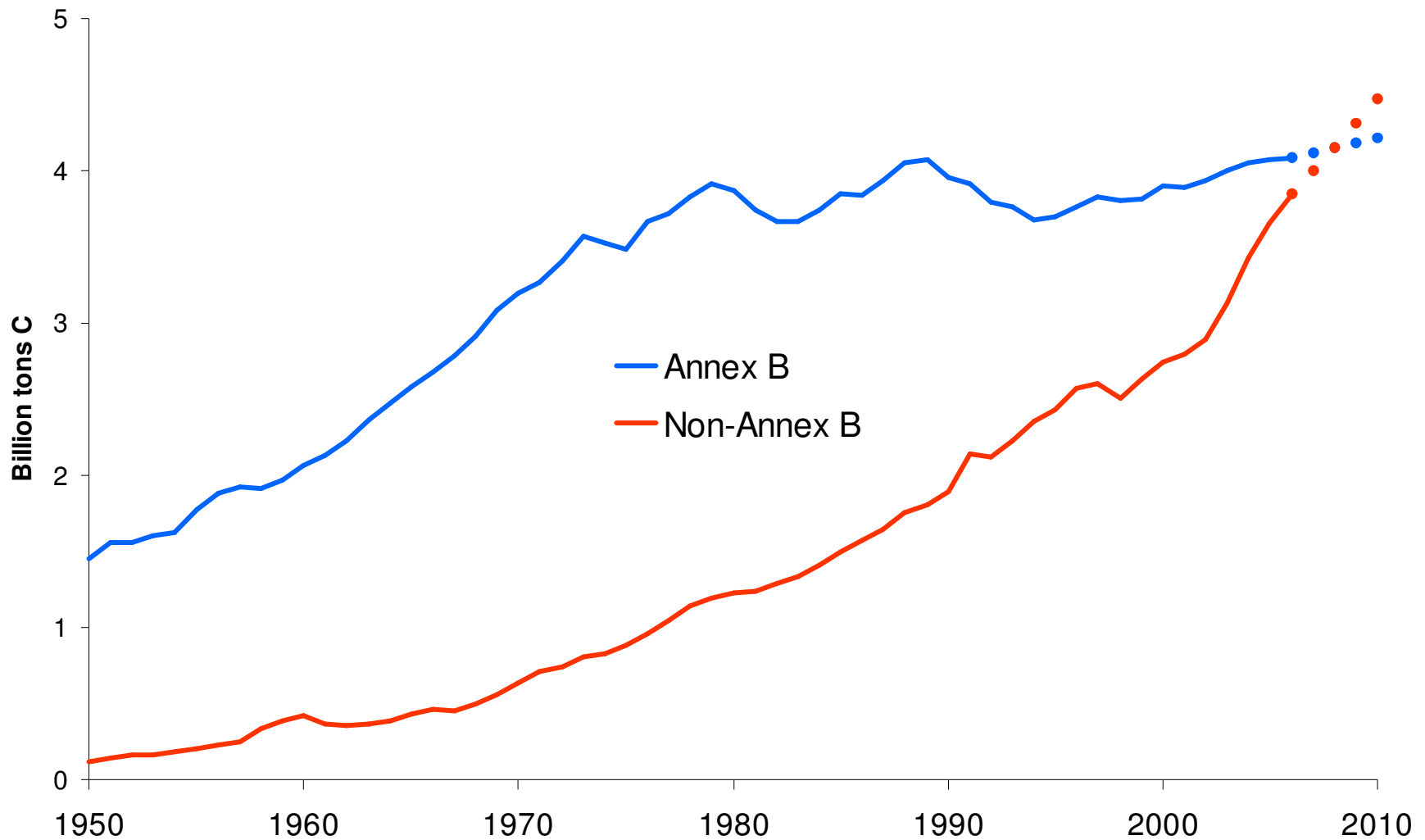
May 21, 2008
Washington, DC



Global CO₂ Emissions: Changing of the Guard



Non-Annex B Emissions will surpass Annex B before 2010



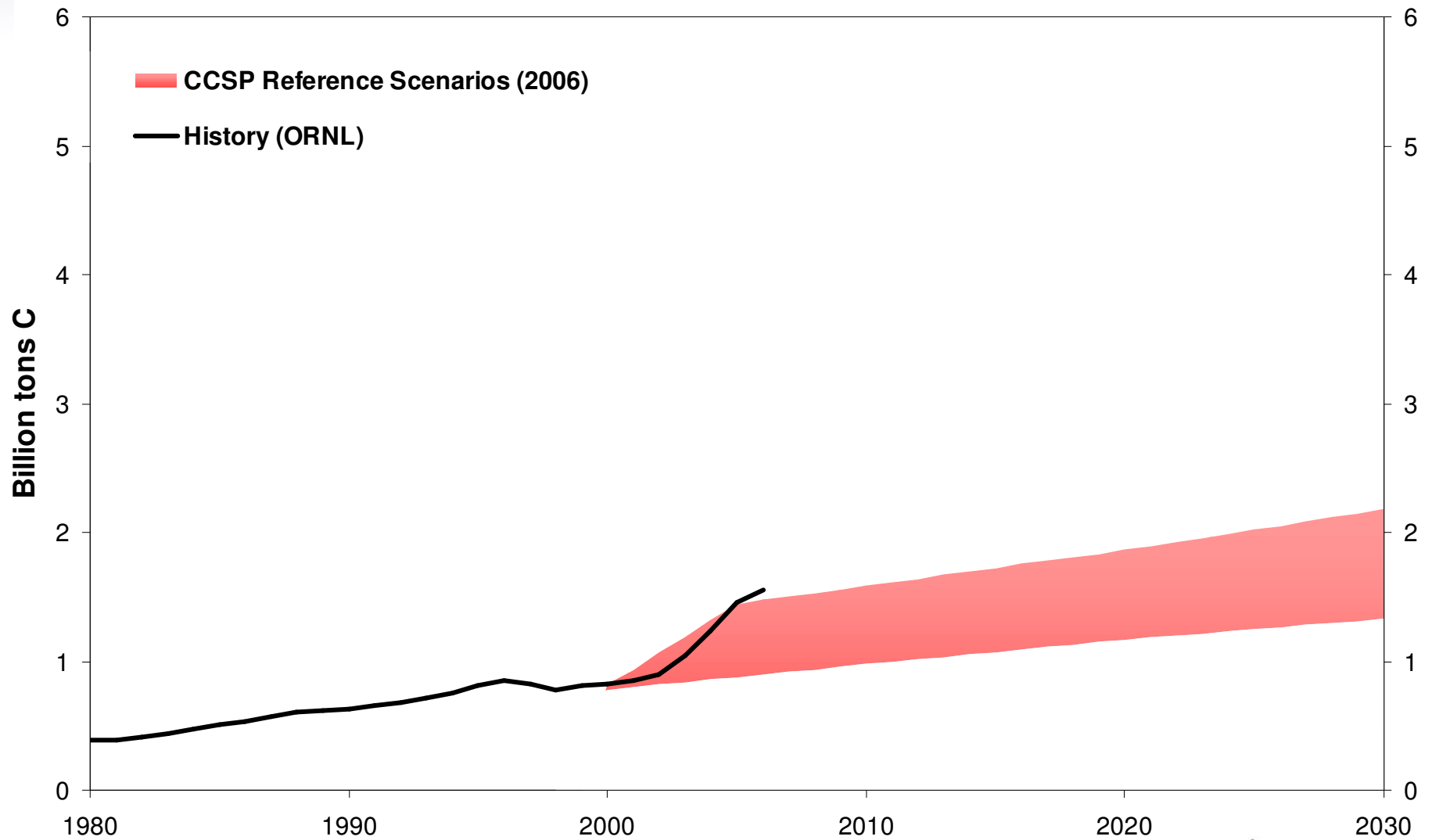
Reading the Data on Developing Countries

- Rapid growth in energy use and emissions
- China is the major player, both in rate and scale:
 - 618 GW installed capacity in 2006
 - 106 GW newly installed

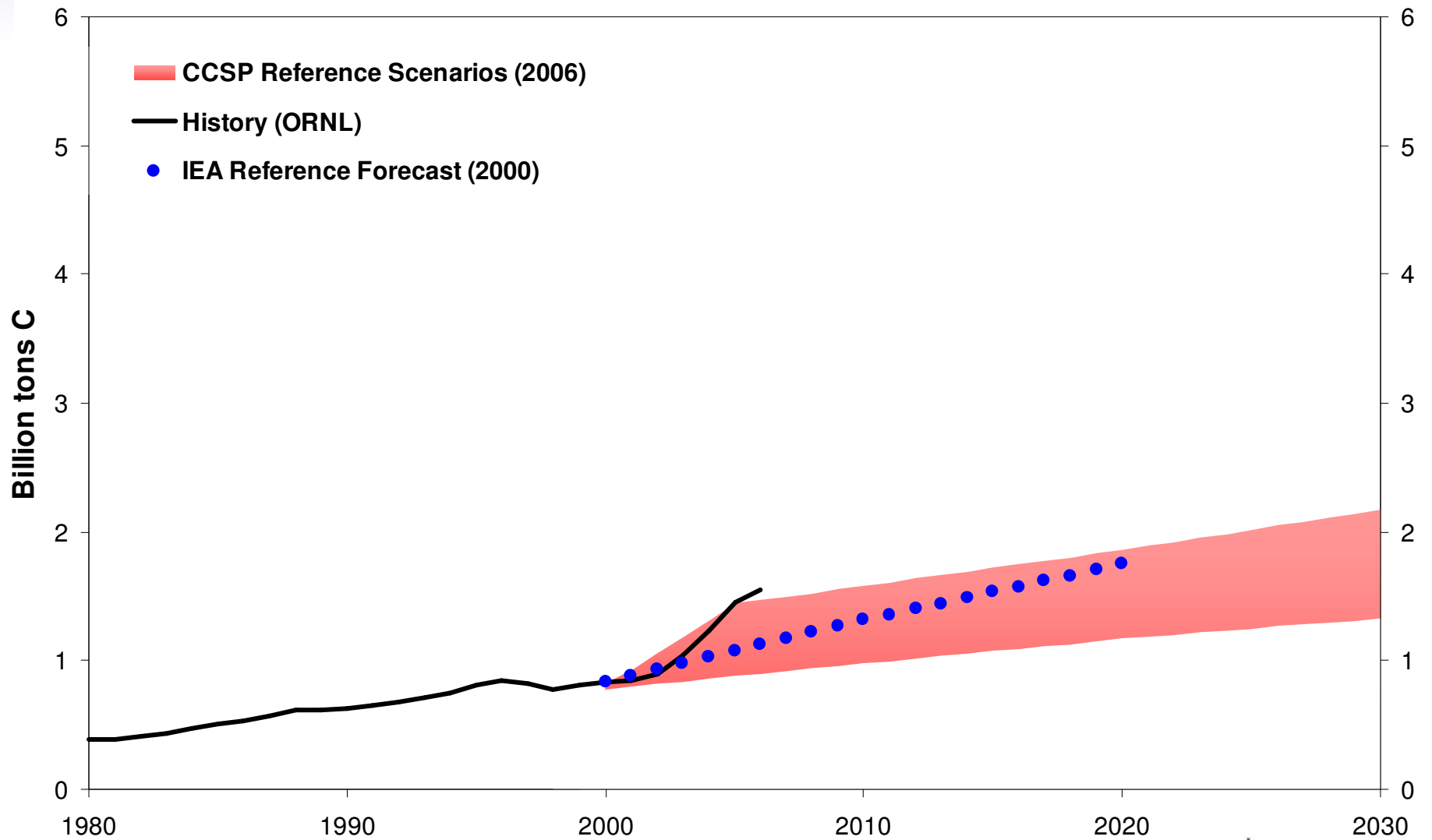
source: J. Kejun (2007)

- Have modeling scenarios caught up?
- What are the implications for global stabilization goals?

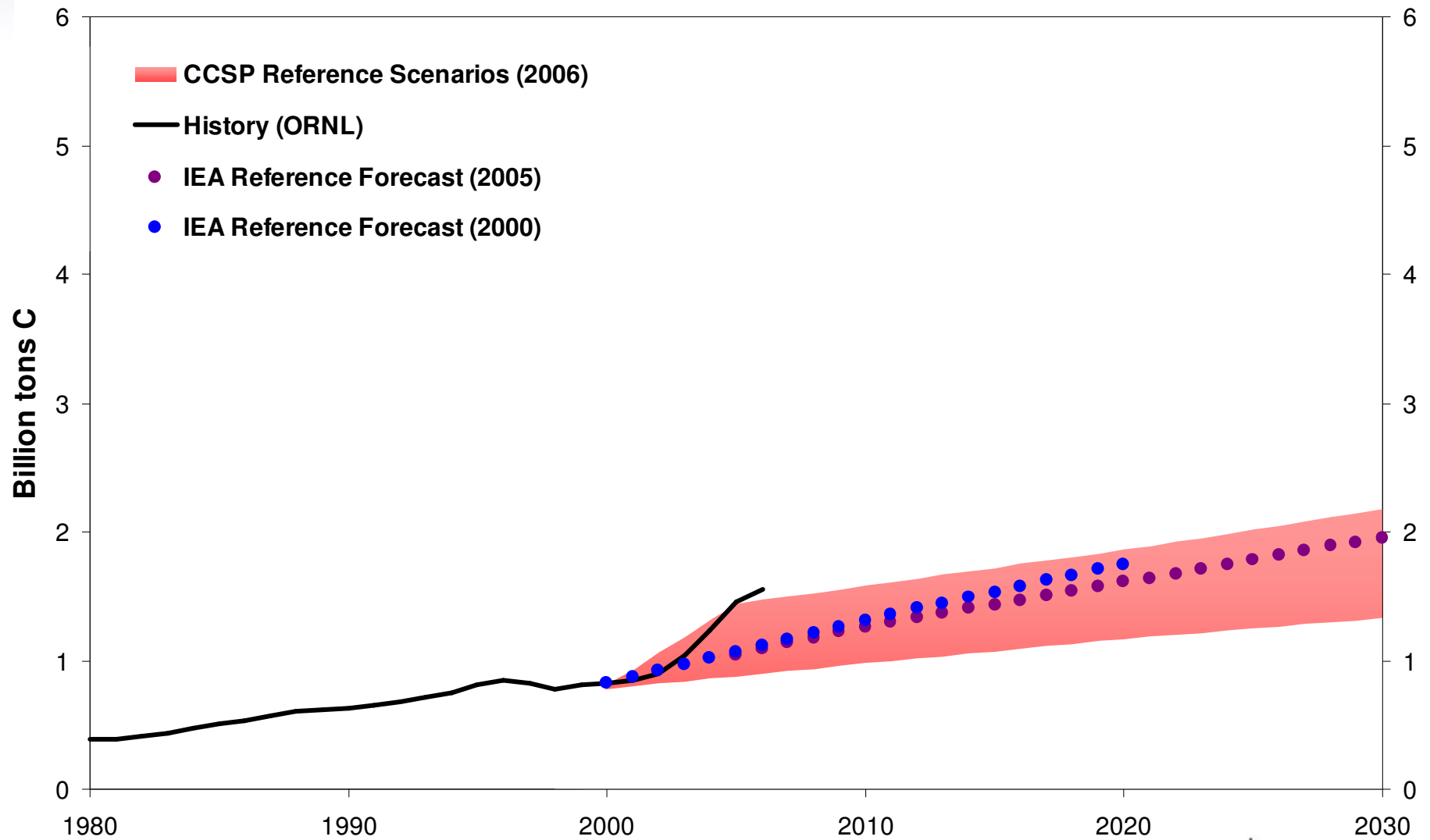
Energy-related CO₂ emissions in China



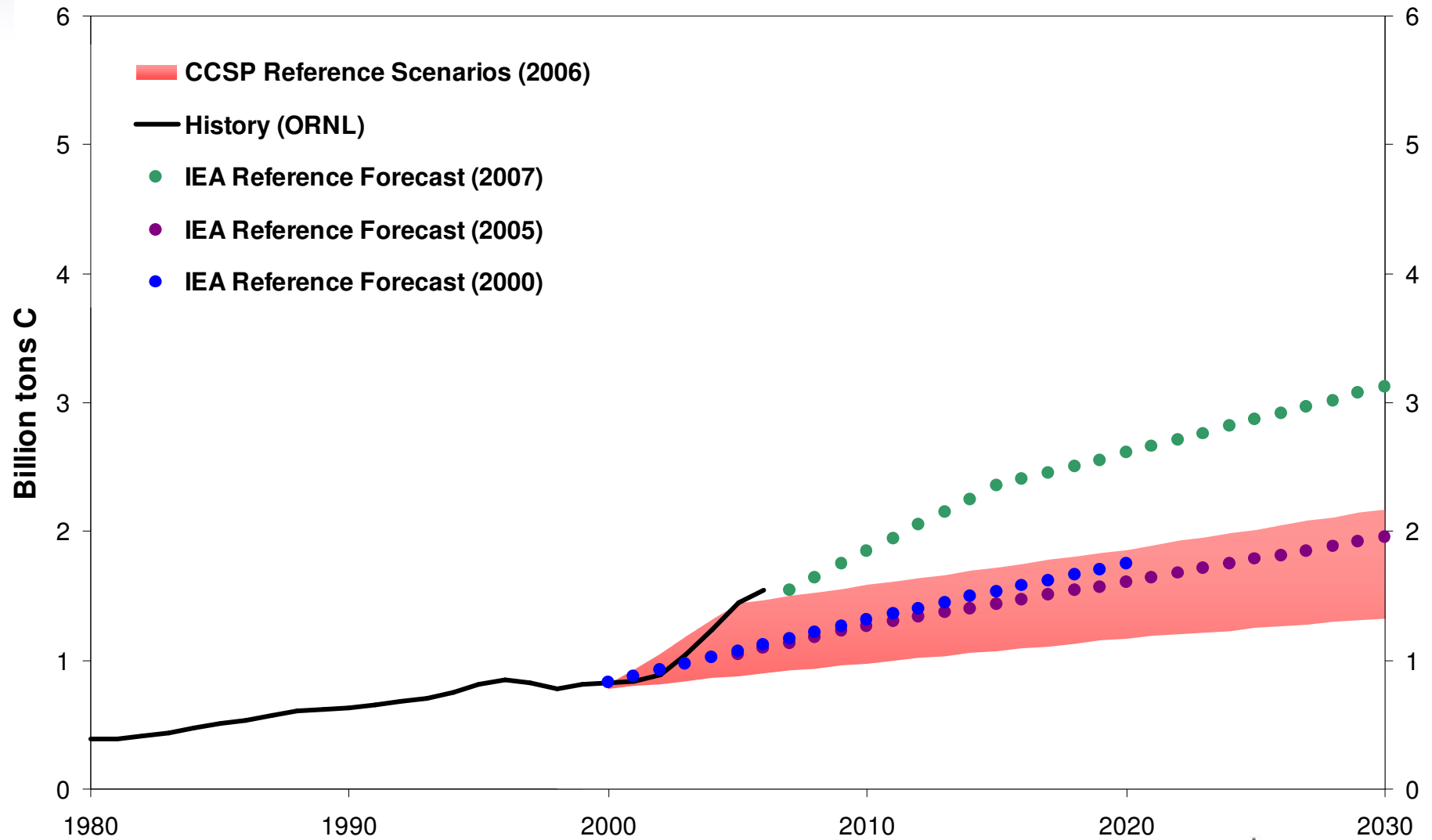
Energy-related CO₂ emissions in China



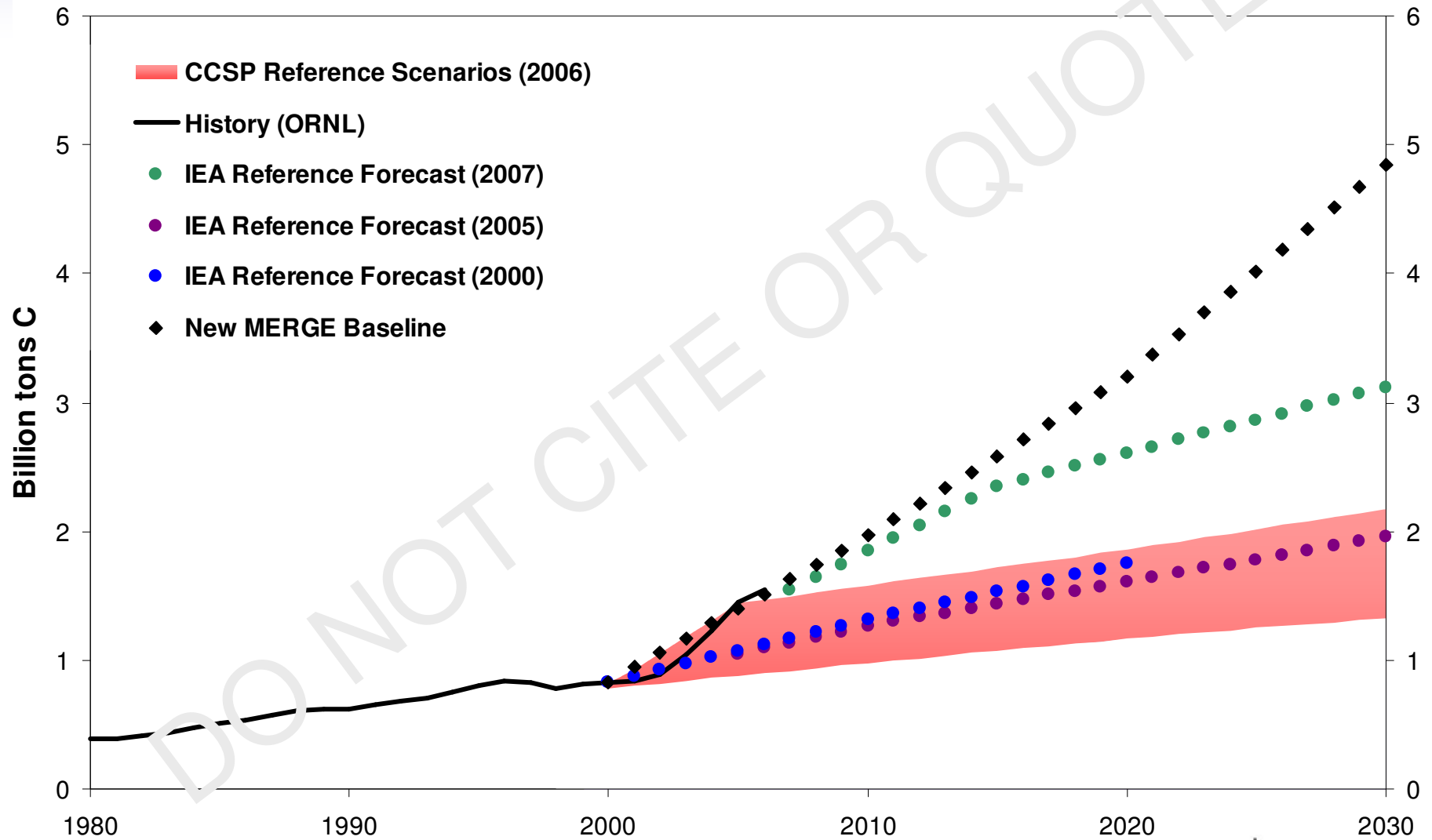
Energy-related CO₂ emissions in China



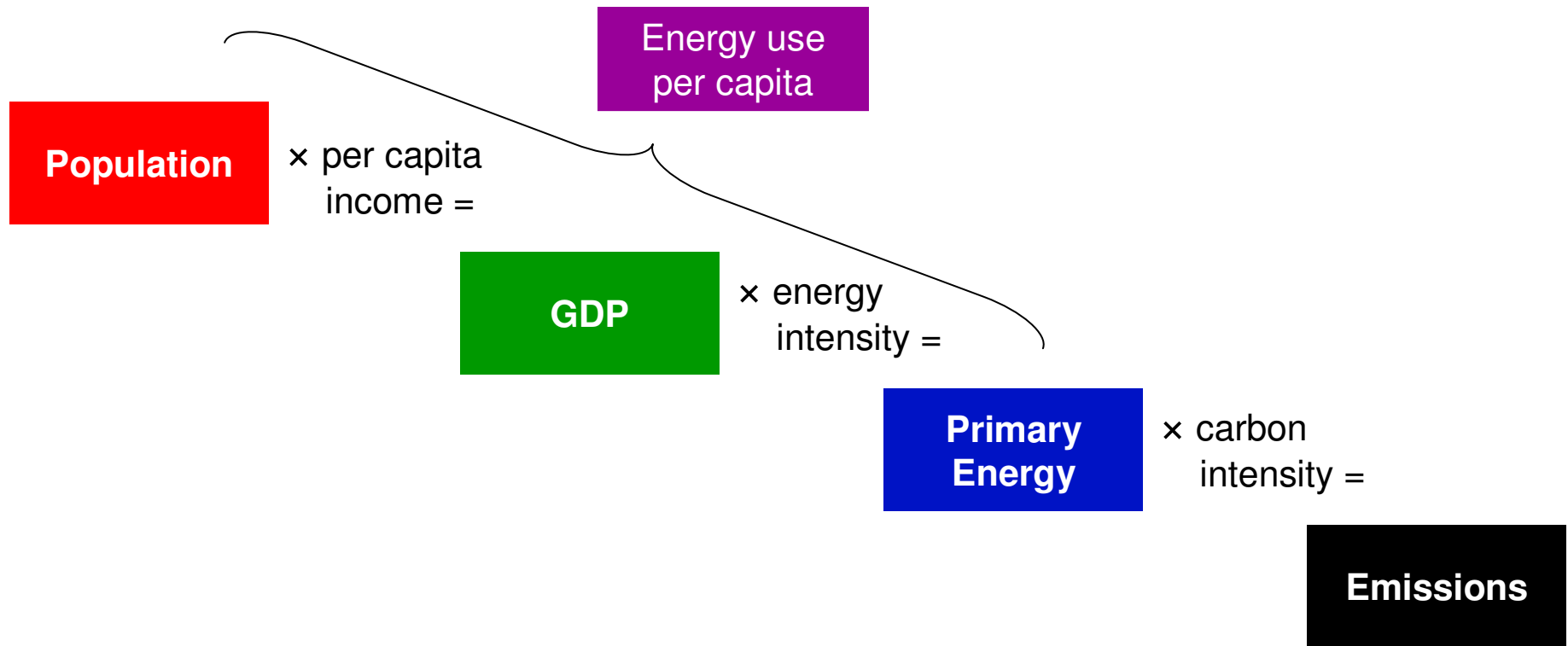
Energy-related CO₂ emissions in China



Energy-related CO₂ emissions in China

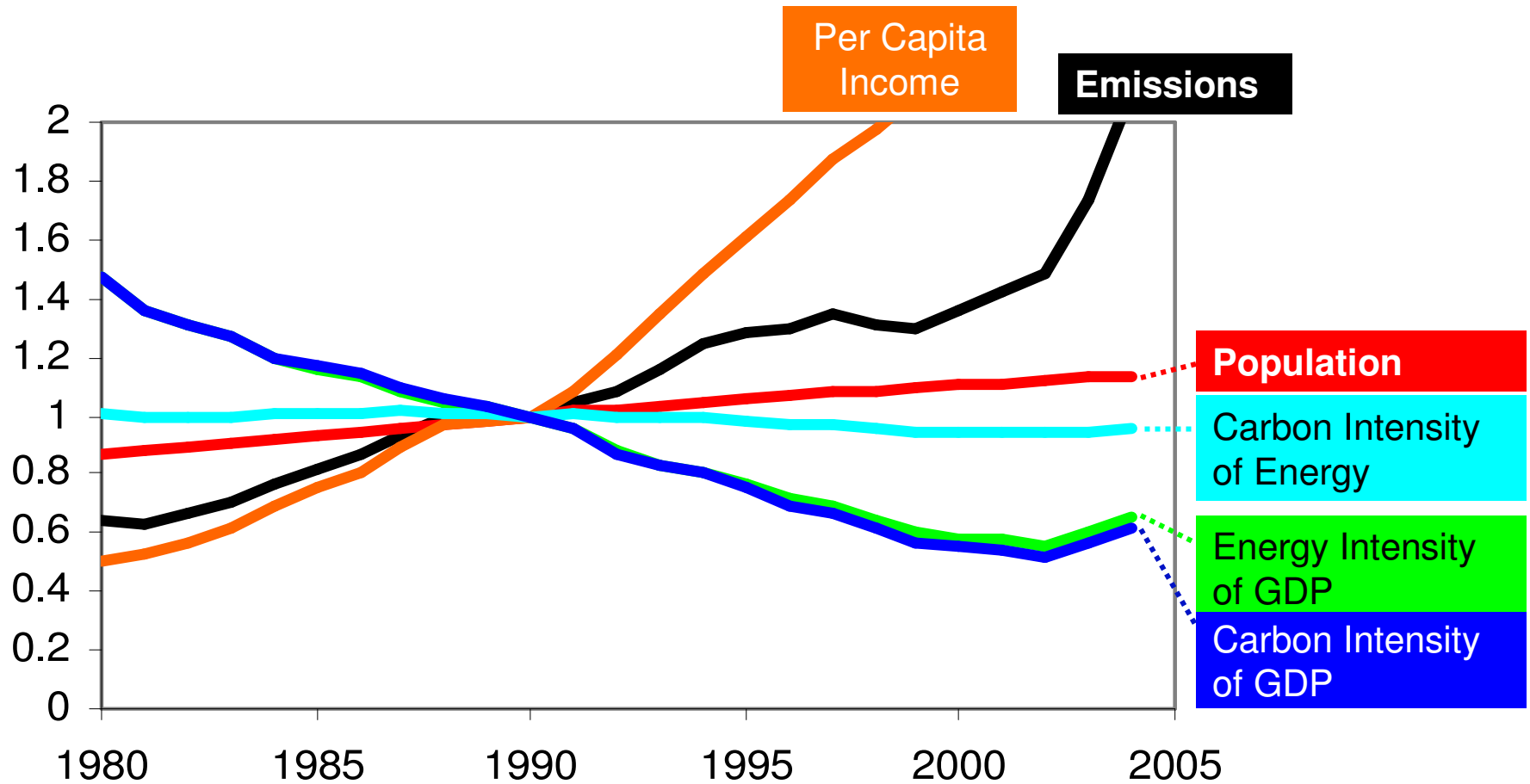


Modeling the Kaya Identity

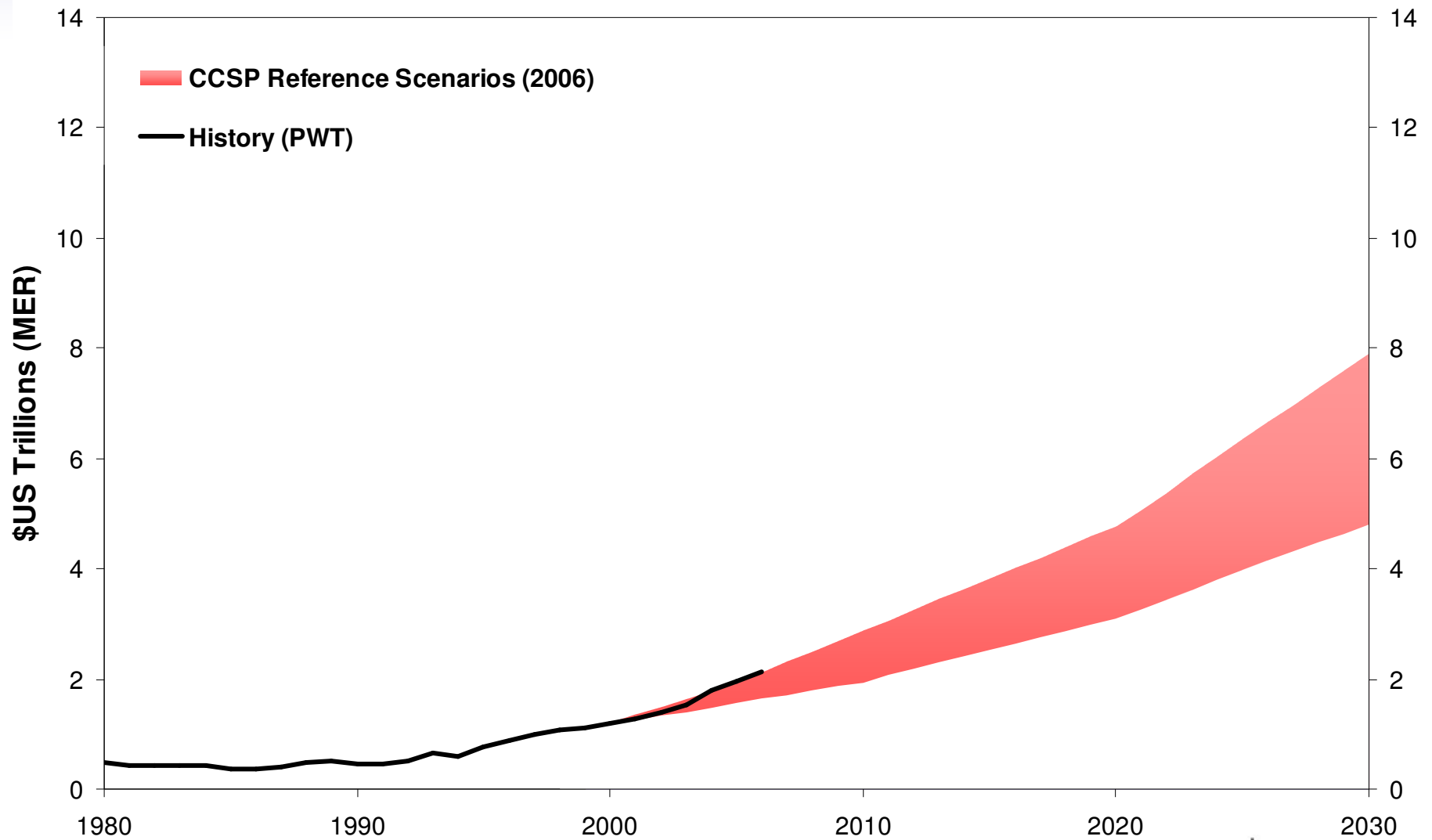


The Kaya Identity in China

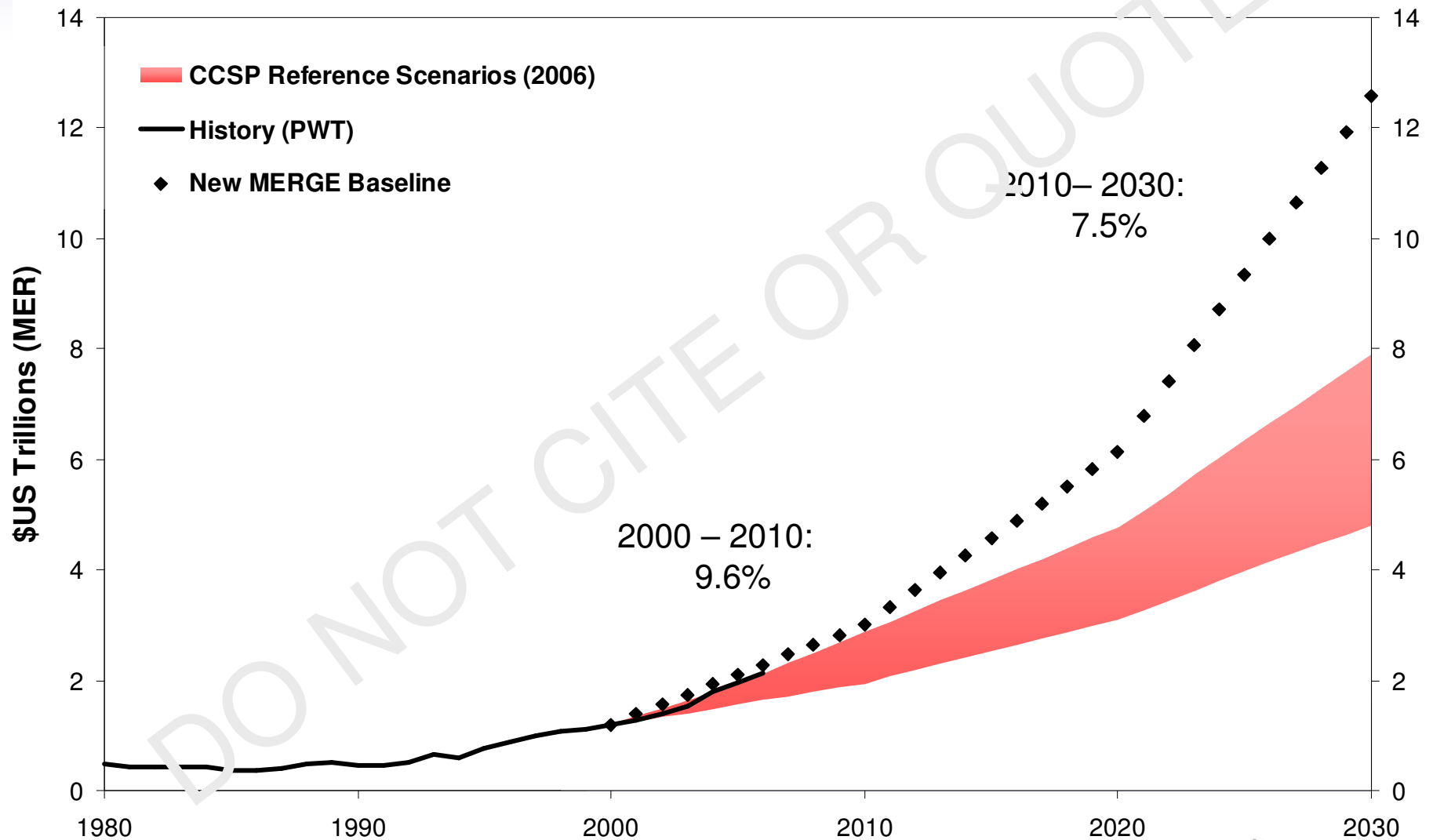
source: G. Marland (2008)



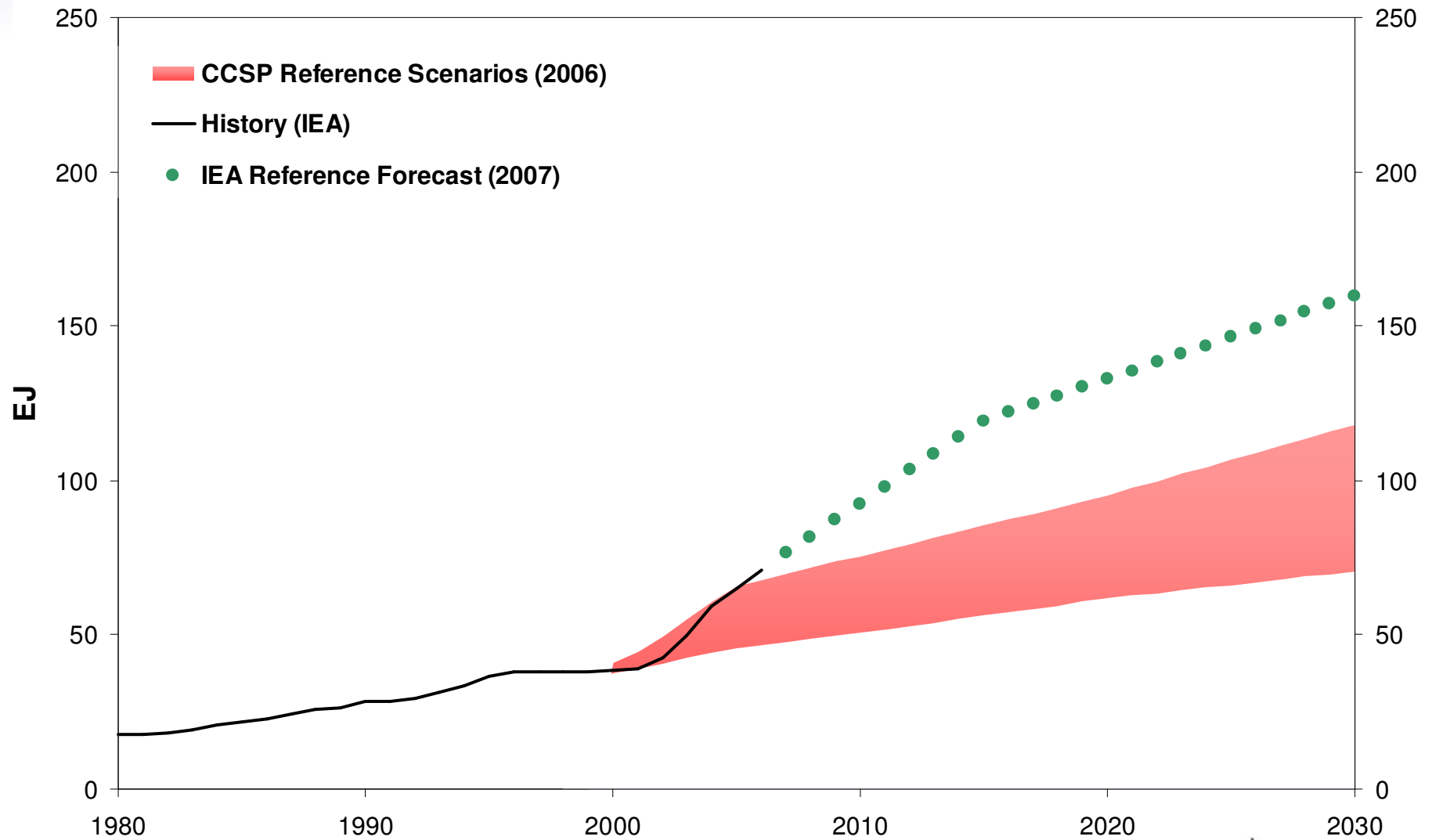
Gross Domestic Product (GDP) in China



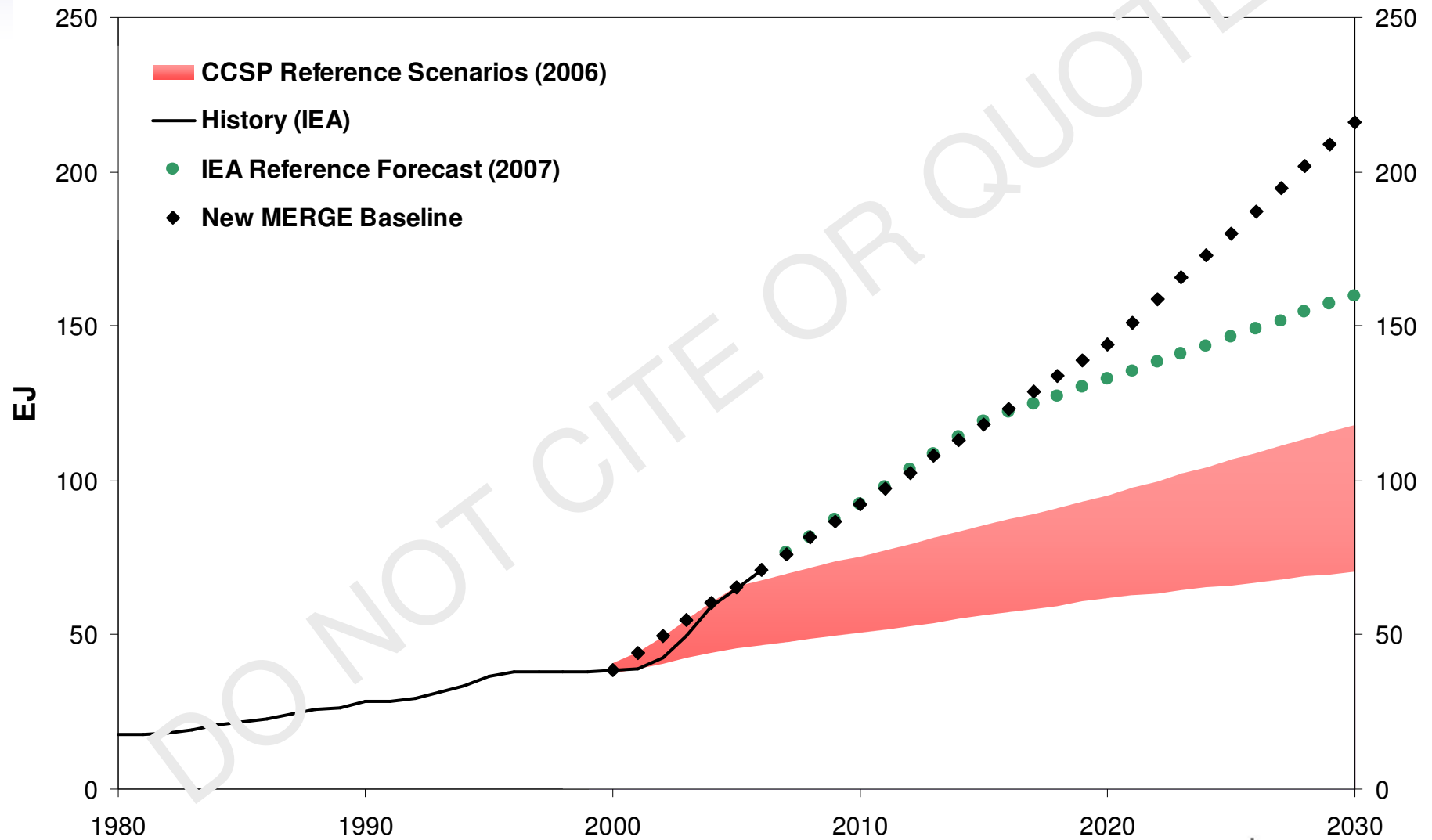
Gross Domestic Product (GDP) in China



Total Primary Energy in China



Total Primary Energy in China



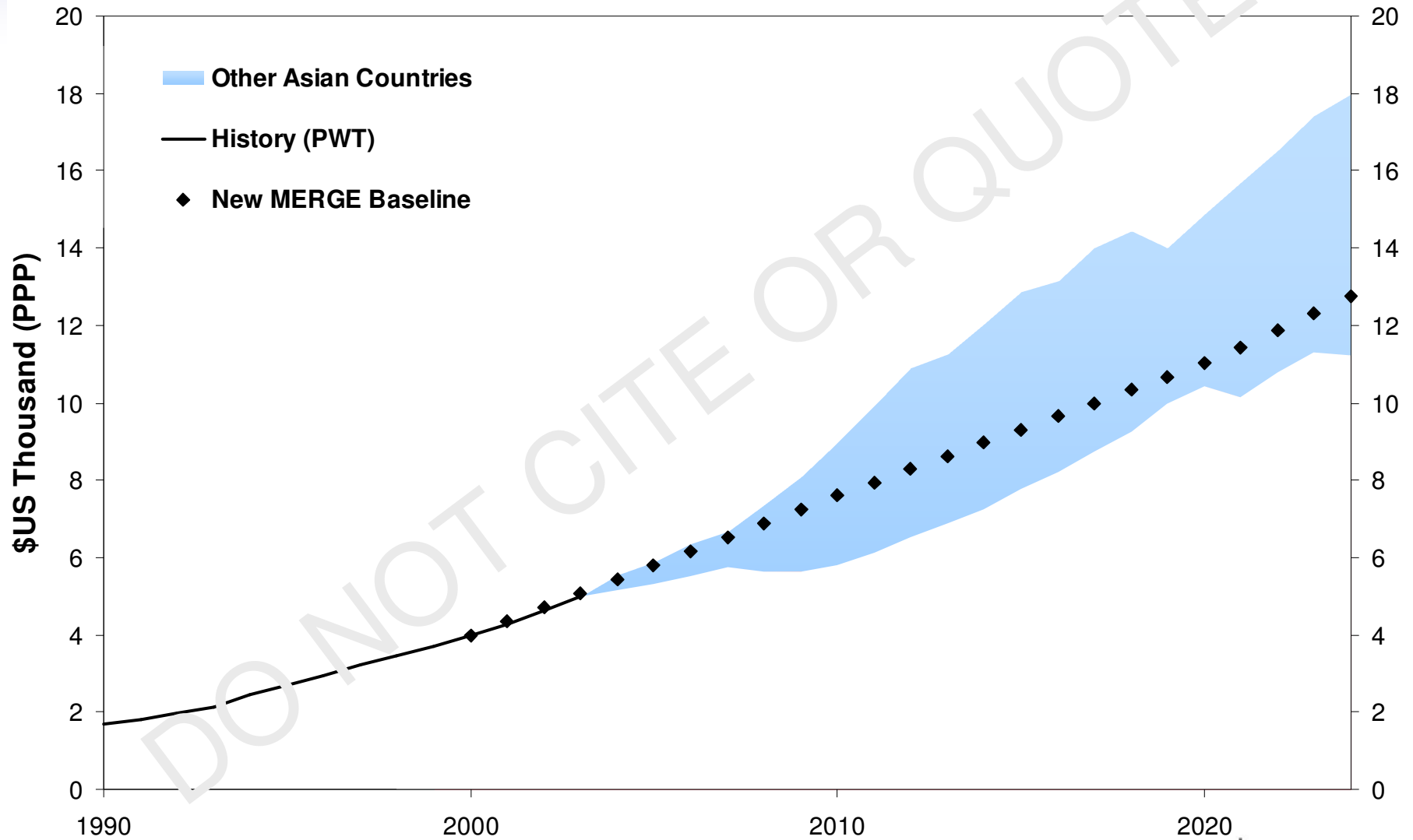
Comparison to Asian Experience

- China's per capita income in 2003:
\$5,000 (year 2000 \$US PPP)

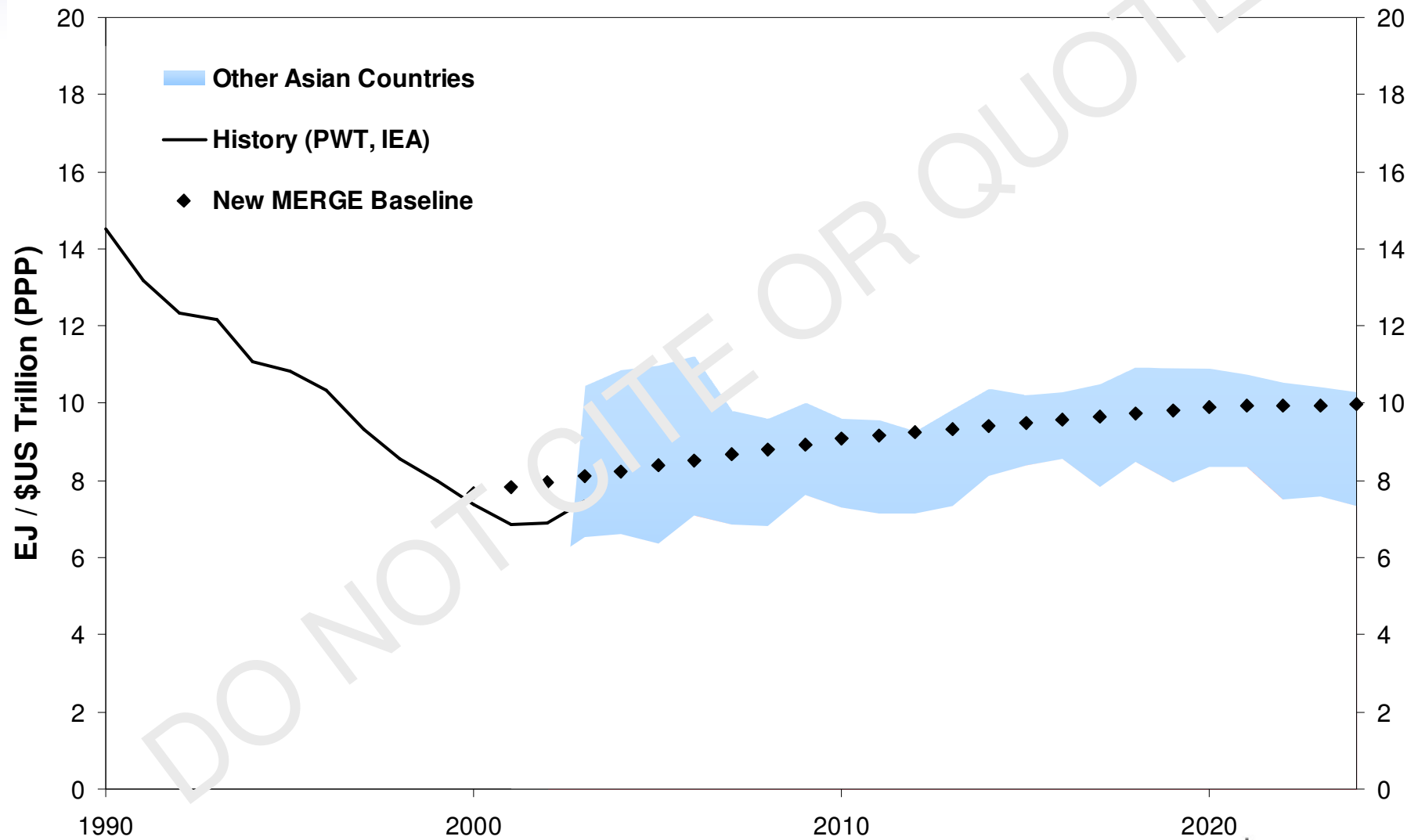
- 7 Asian countries are wealthier than China:

	Year of \$5,000 income level	2003 Income
Hong Kong	1978	\$29,600
Singapore	1967	\$27,000
Japan	1961	\$24,000
Taiwan	1977	\$19,900
Korea	1982	\$17,600
Malaysia	1980	\$12,100
Thailand	1992	\$7,700

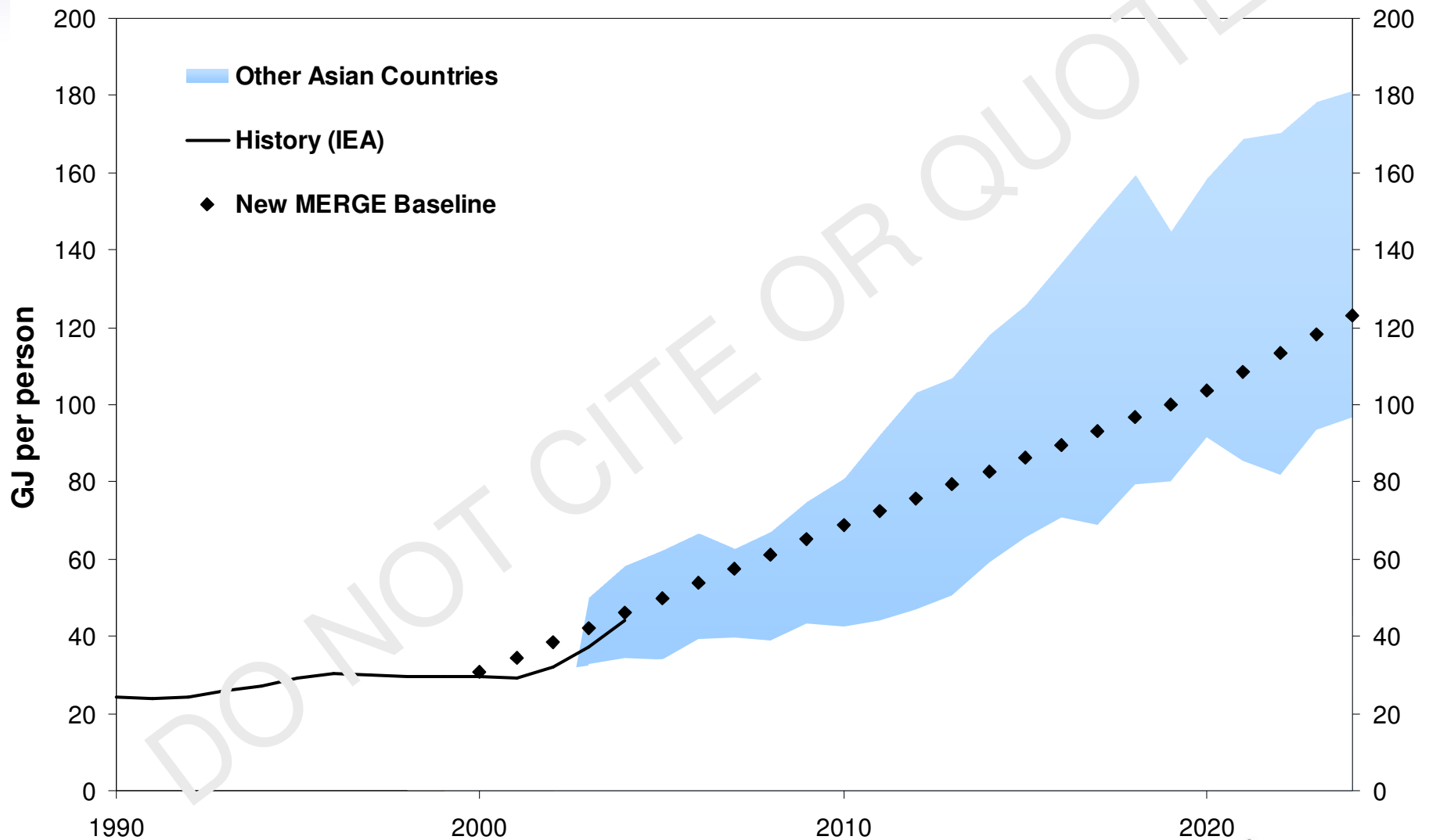
Per Capita Income Projection for China



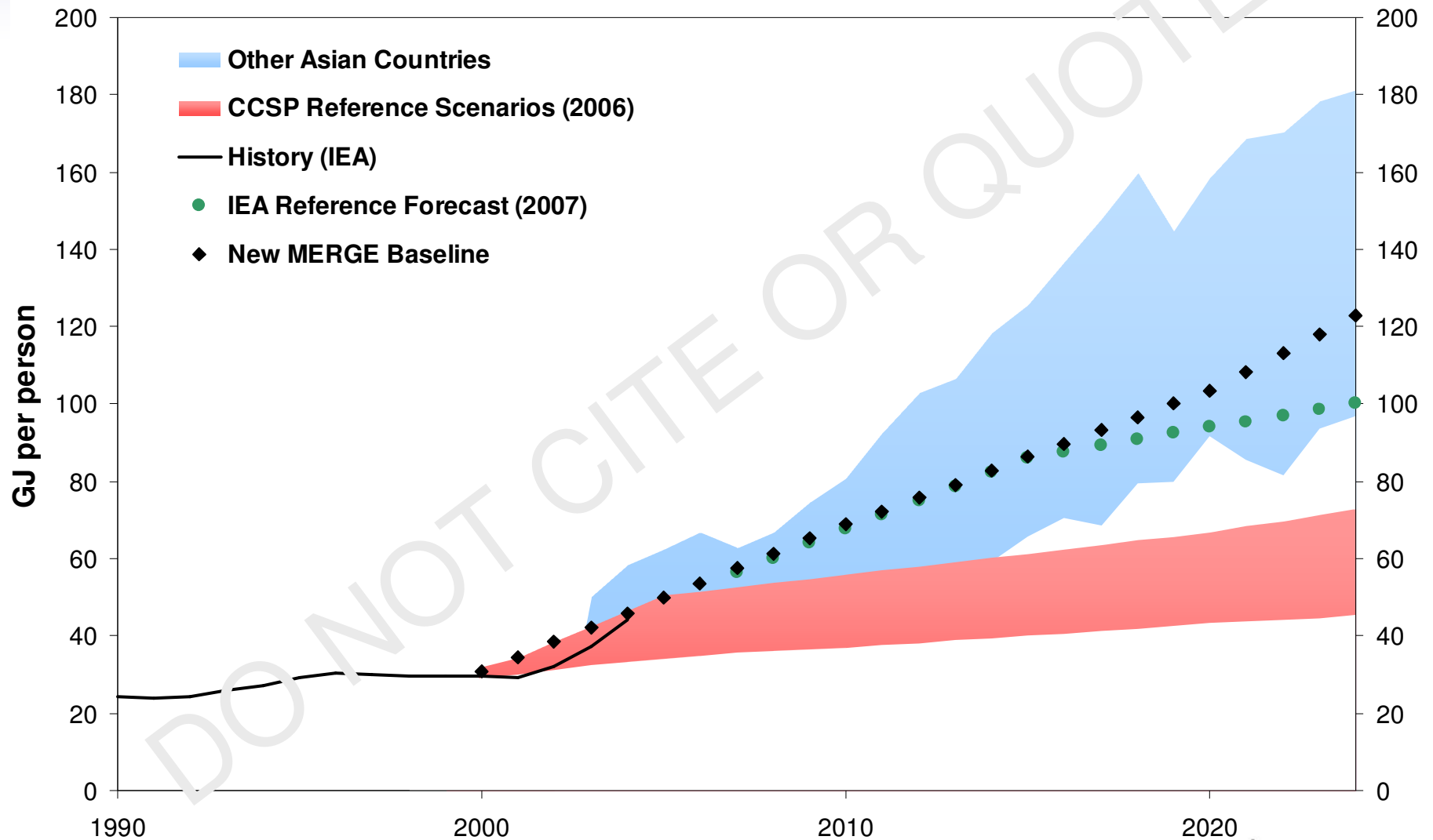
Energy Intensity Projections for China



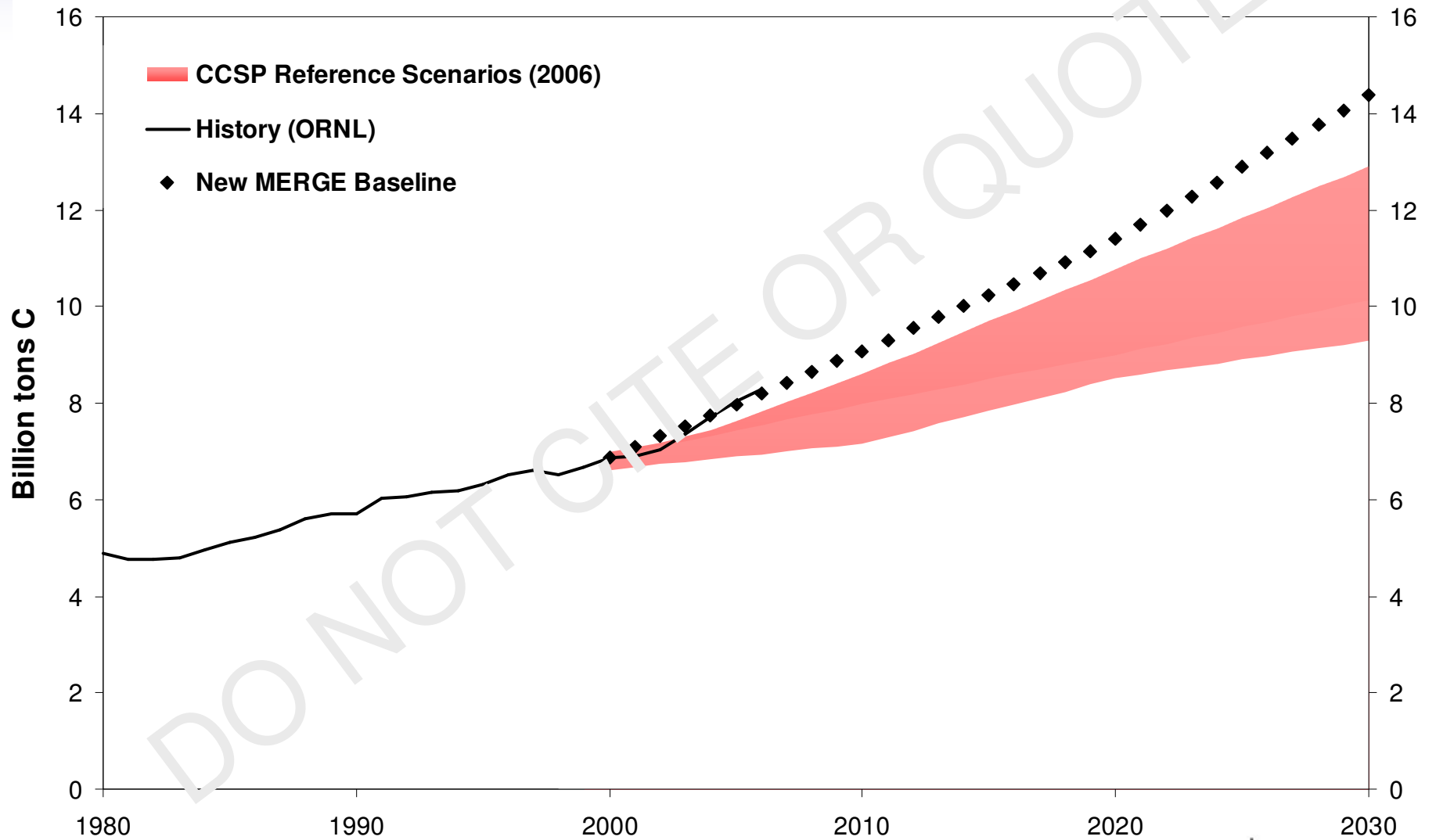
Per Capita Energy Use Projections for China



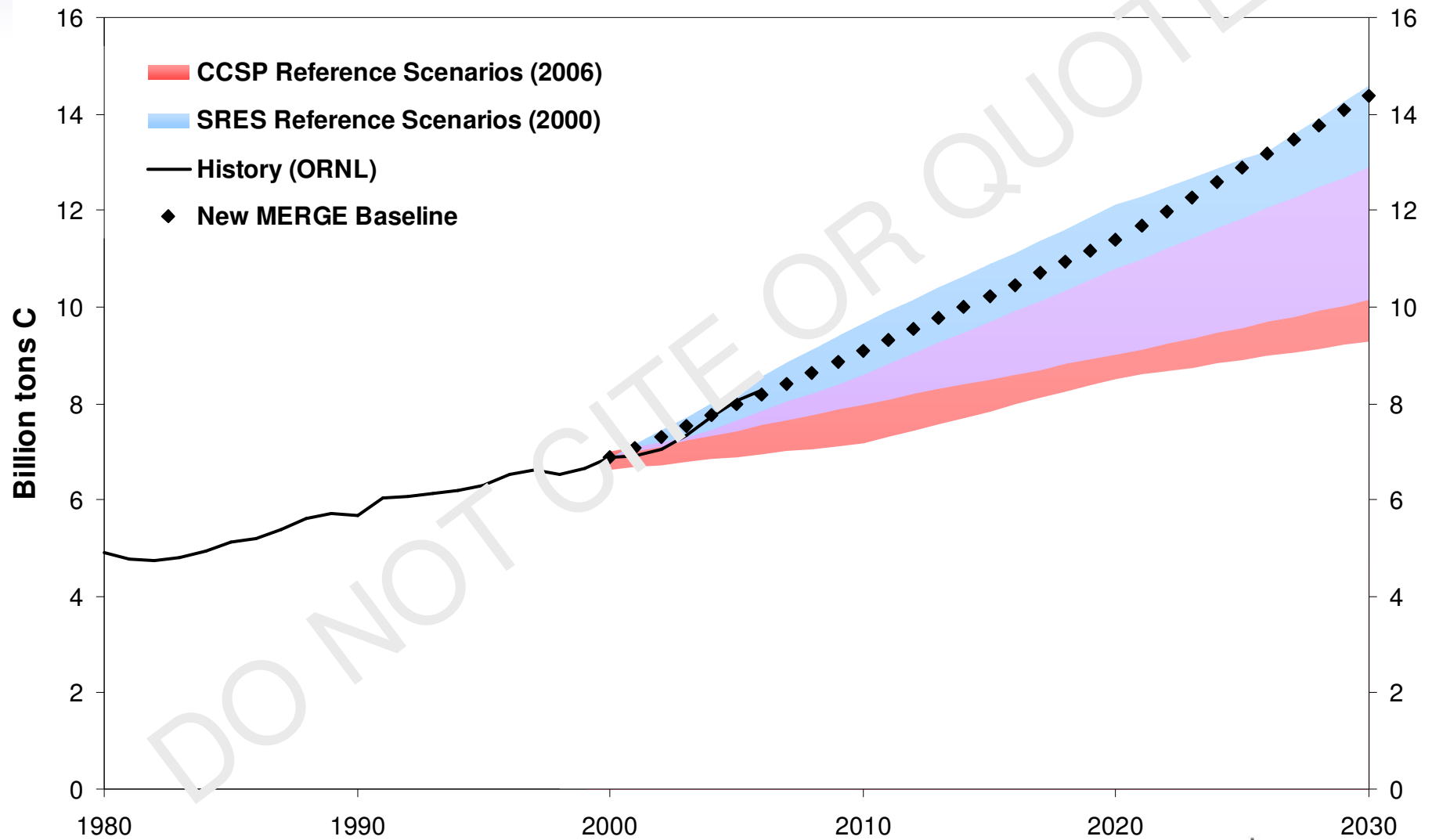
Per Capita Energy Use Projections for China



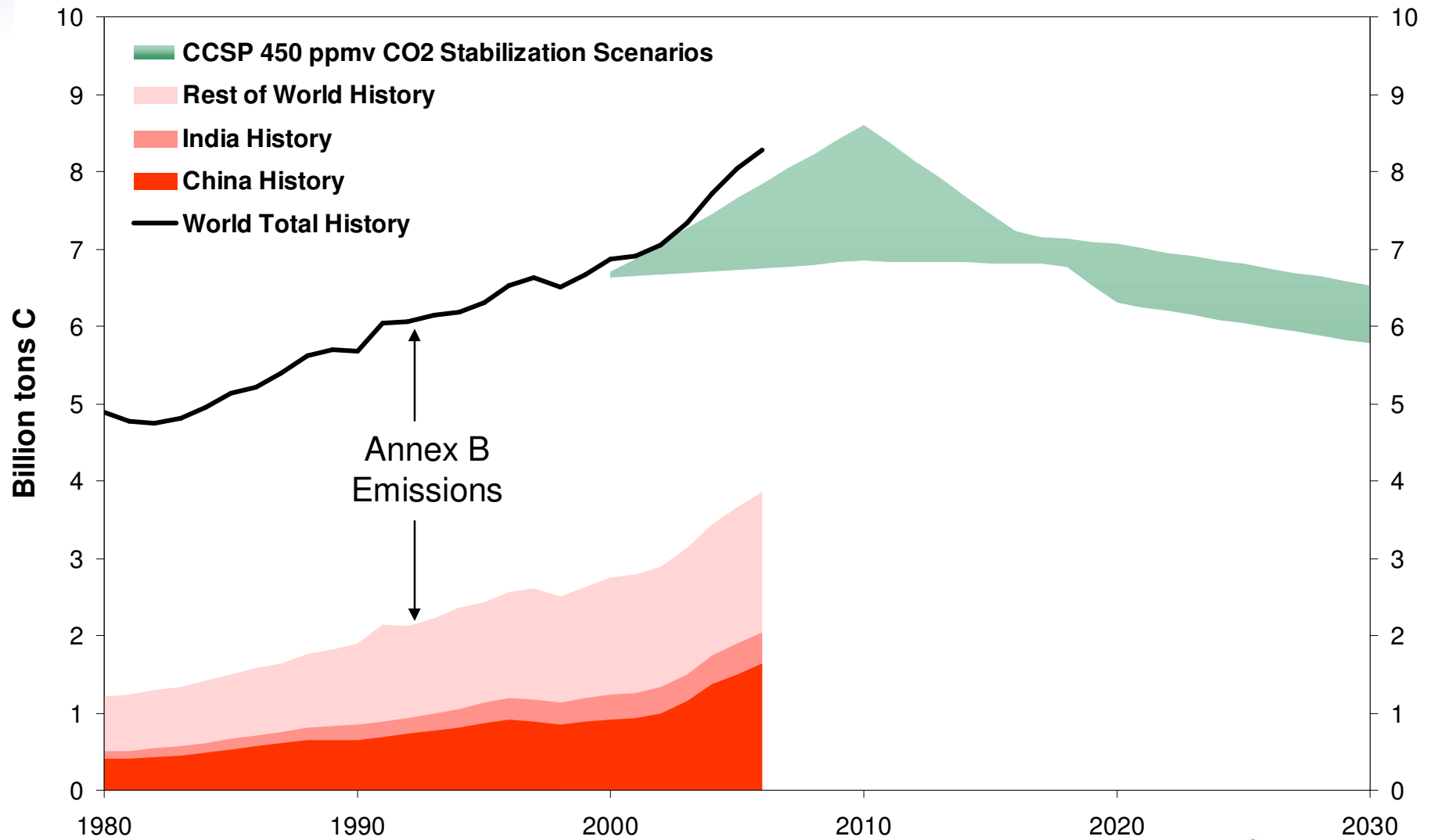
Global CO₂ Emissions



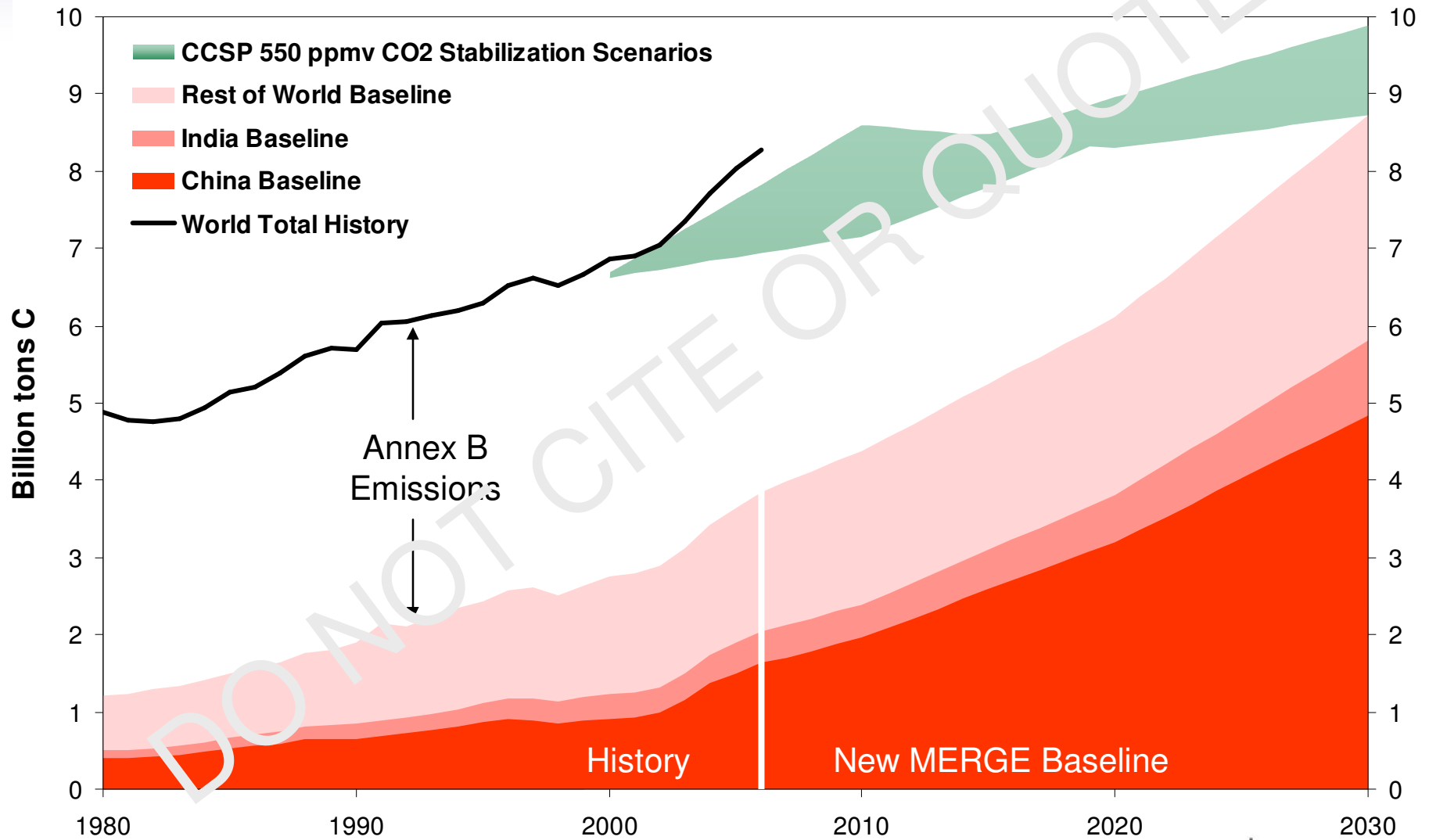
Global CO₂ Emissions



Is 450 (CO₂ only) Feasible?



Is 550 (CO₂ only) Feasible?



Conclusions

- There is considerable uncertainty about future growth...
- ... but, the scenario shown here is plausible, consistent with current observations and historical experience
- If developing countries continue to grow along this baseline path, aggressive stabilization targets quickly become impossible to meet (without overshoot)
- Annex B countries must find a way to engage China