
# Overview of Progress on the Asian Modeling Exercise

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EMF 24 Working Group Meeting
October 25-27, 2010
Washington, DC

# Acknowledgements

Asia Modeling Exercise

- Our thanks to the following organizations for their funding:

The CPO Project

EMF

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

EPRI ELECTRIC POWER RESEARCH INSTITUTE

ERI www.eri.org.cn

KEI 한국환경정책·평가연구원

NIES

Pacific Northwest NATIONAL LABORATORY

清华大学能源环境经济研究所 INSTITUTE of ENERGY, ENVIRONMENT and ECONOMY TSINGHUA UNIVERSITY

- This is an open process and we welcome funding from other interested parties.

# Goal of the exercise


**To better articulate the role of Asia in addressing climate change.**

To do this, we have designed a small set of coordinated scenarios and will focus our analysis of those scenarios on Asia.

# Schedule

Asia Modeling Exercise

- First Meeting:
  - When: September 17-18, 2009
  - Where: Tsukuba, Japan
  - Objective:
    - Review Existing Asian Scenarios Work
    - Plan a New Scenario Exercise

- Second Meeting:
  - When: March 23-25, 2010
  - Where: Beijing, China
  - Objective:
    - Preliminary model comparison
    - Refine the Scenario Exercise

# Schedule


- Third Meeting:
  - When: September 13-15, 2010
  - Where: Seoul, Korea
  - Objective:
    - Detailed model comparison through subgroups
    - Discussion of the next steps in the exercise
- Fourth Meeting:
  - When: Spring 2011
  - Where: Somewhere in Asia
- Final Product:
  - Special Issue of a Journal (2011)


# Update on the Third Meeting

# Participants


- **62 People Attended the Third Meeting**
  - Representing Australia, China, Europe, India, Japan, Korea, Nepal, Thailand, USA

- **28 Participating Models**
  - AIM-CGE, AIM-Enduse, China MARKAL, DNE21+, ENVISAGE, ENV-Linkages-KEI, EPPA, GCAM, GCAM-IIM, GEM-E3, GRAPE, GTEM, IAMC, IMAGE, IPAC, iPETS, MARIA-23, MERGE, MESSAGE, Nepal MARKAL, PECE, POLES, REMIND, SGM, Thailand MARKAL, TIAM-World, TIAM-TIMES/VTT, WITCH

# Meeting Goals

Asia Modeling Exercise

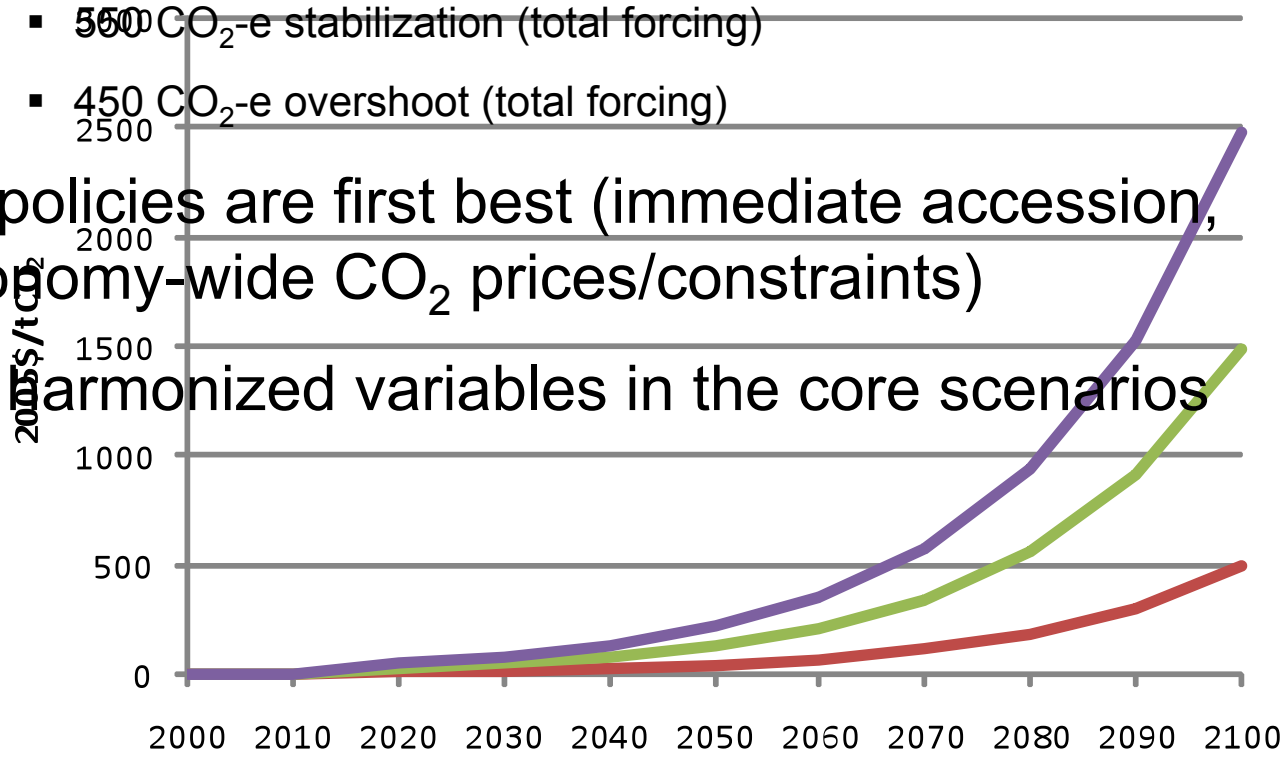
- **Detailed Model Comparison through Subgroups**
  - Modelers submitted data from a baseline and a few representative policy scenarios prior to the meeting
  - 7 subgroups were established to focus on different aspects of the results

- **Discussion of the Next Steps of the Exercise**
  - We discussed modifications to the analysis for the final meeting and the special issue of the journal that we will produce

# Exercise Design

Asia Modeling Exercise

- Six Core Scenarios:
  - Baseline
  - 3 $CO_2$ price paths
  - 2 Stabilization paths (global models only)
    - 550 $CO_2$-e stabilization (total forcing)
    - 450 $CO_2$-e overshoot (total forcing)
- All policies are first best (immediate accession, economy-wide $CO_2$ prices/constraints)
- No harmonized variables in the core scenarios



# Subgroups

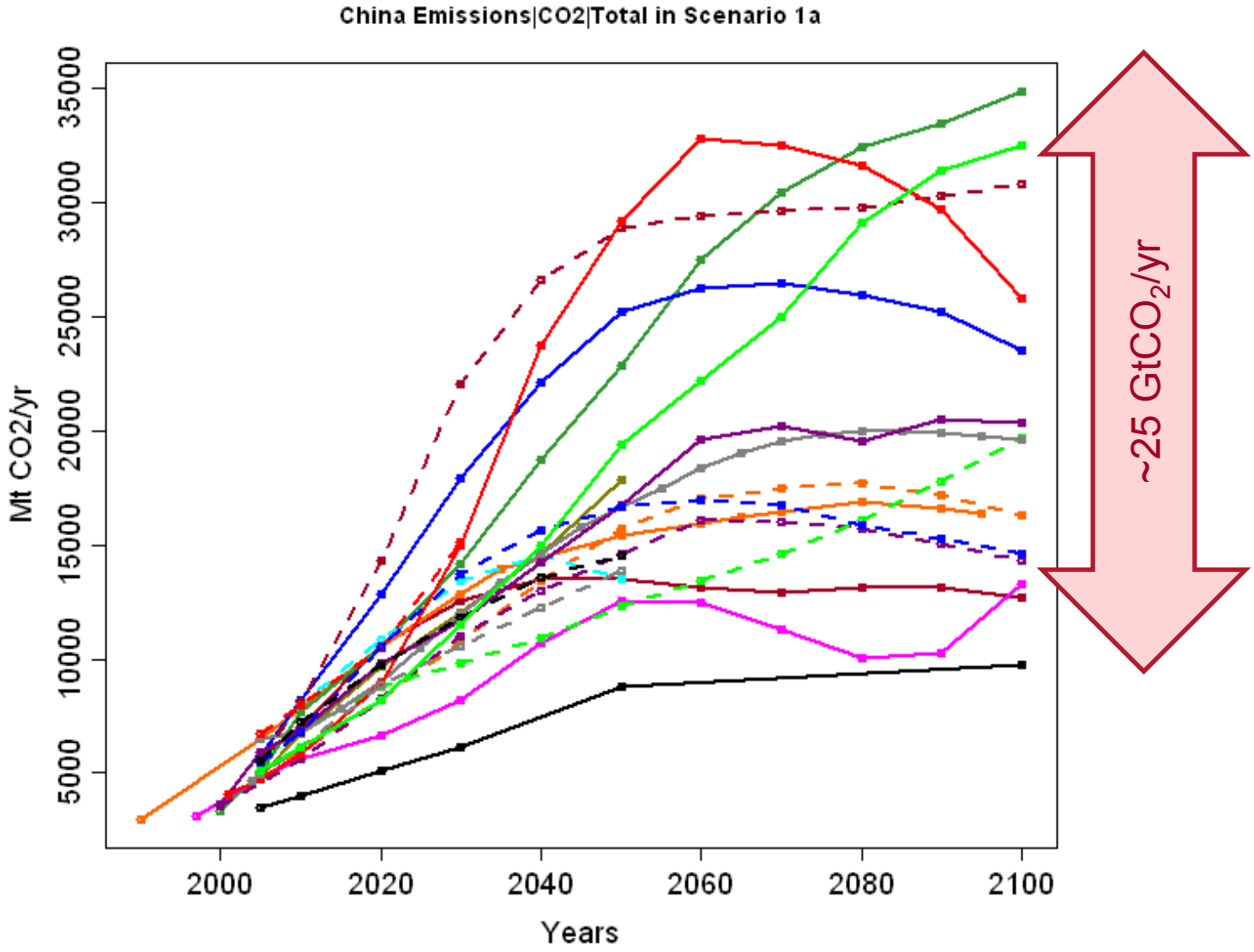
Asia Modeling Exercise

- We expect the subgroups to focus on a more in depth exploration of the core scenarios, rather than generating new scenarios

- Current subgroup topics:
  - Base Year Data
  - Baseline Scenarios
  - Urban/Rural development
  - Comparability
  - Technology and Technical Change
  - National Policies and Measures
  - Low Carbon Societies

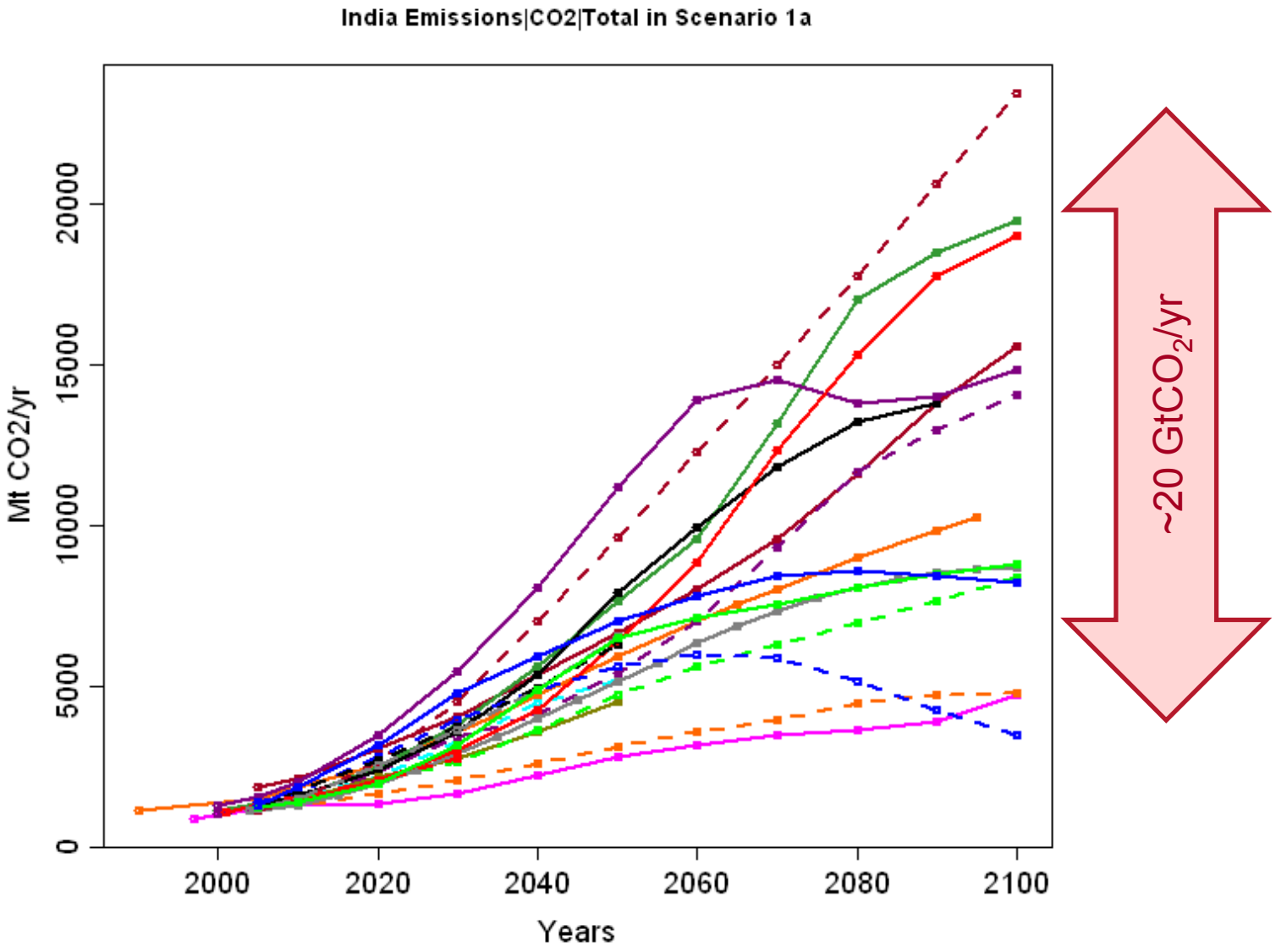
# $CO_2$ Emissions: China Region

Asia Modeling Exercise



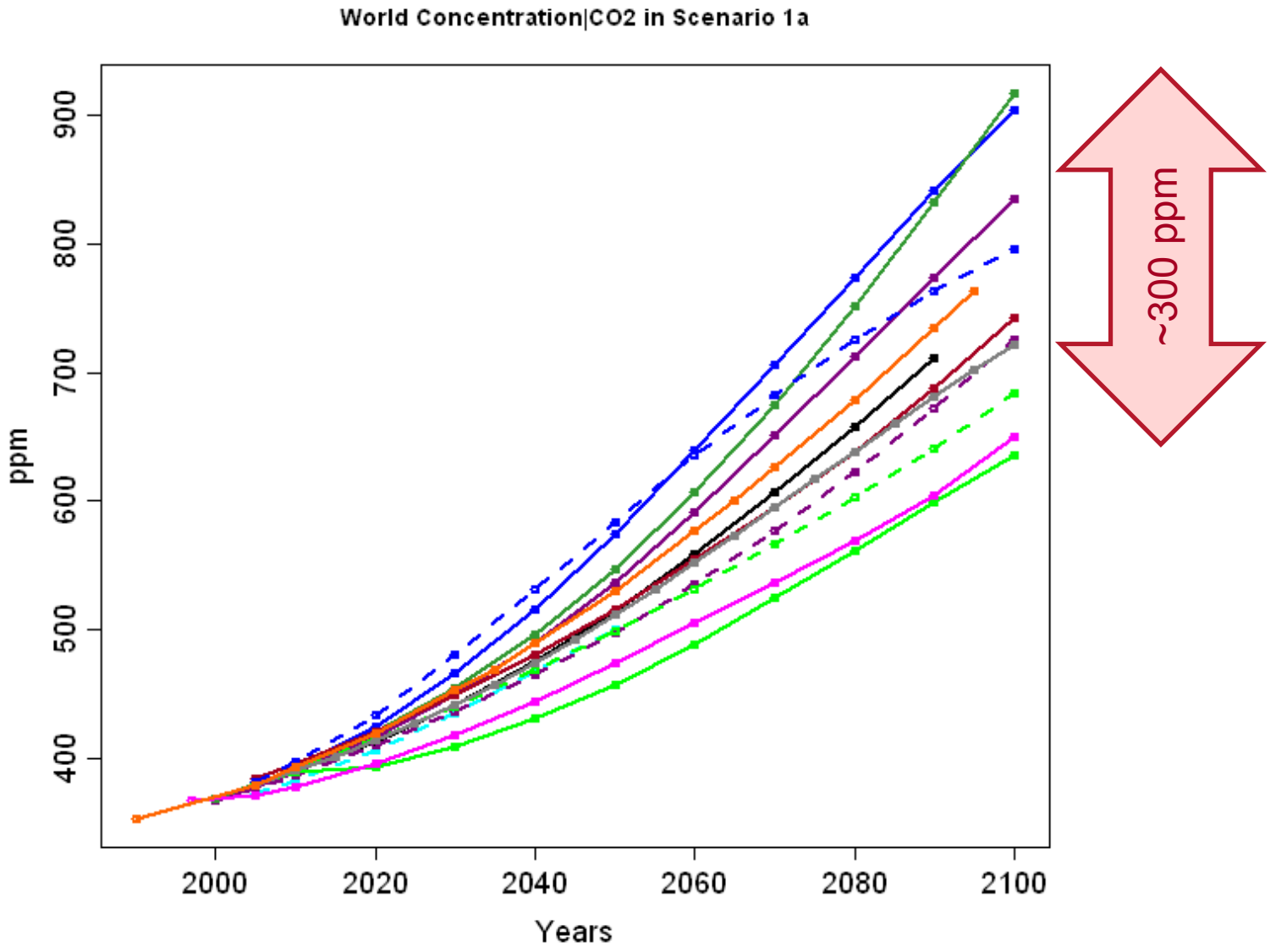
# $CO_2$ Emissions: India

Asia Modeling Exercise



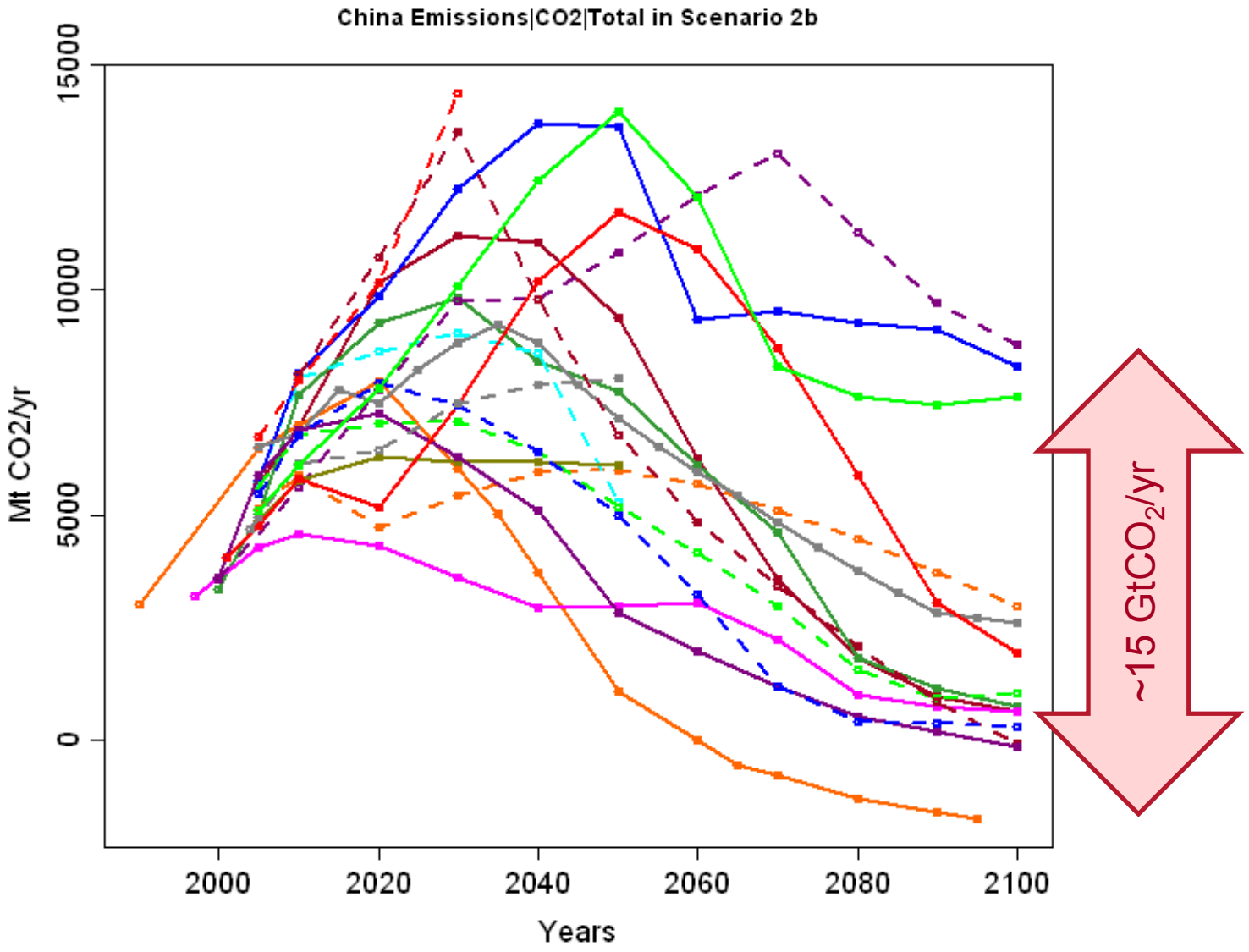
# $CO_2$ Concentration

Asia Modeling Exercise

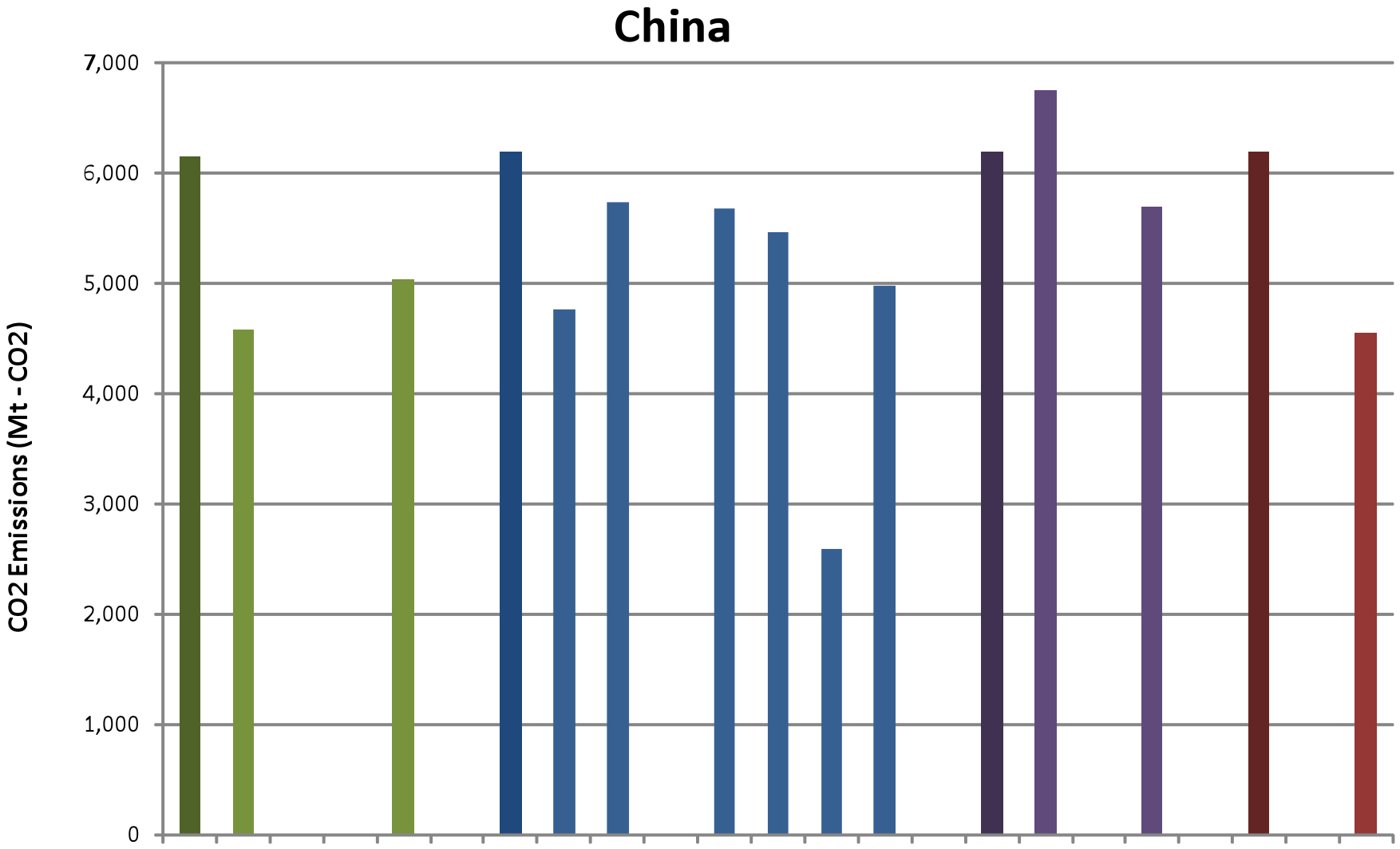


# $CO_2$ Emissions: China Region

Asia Modeling Exercise

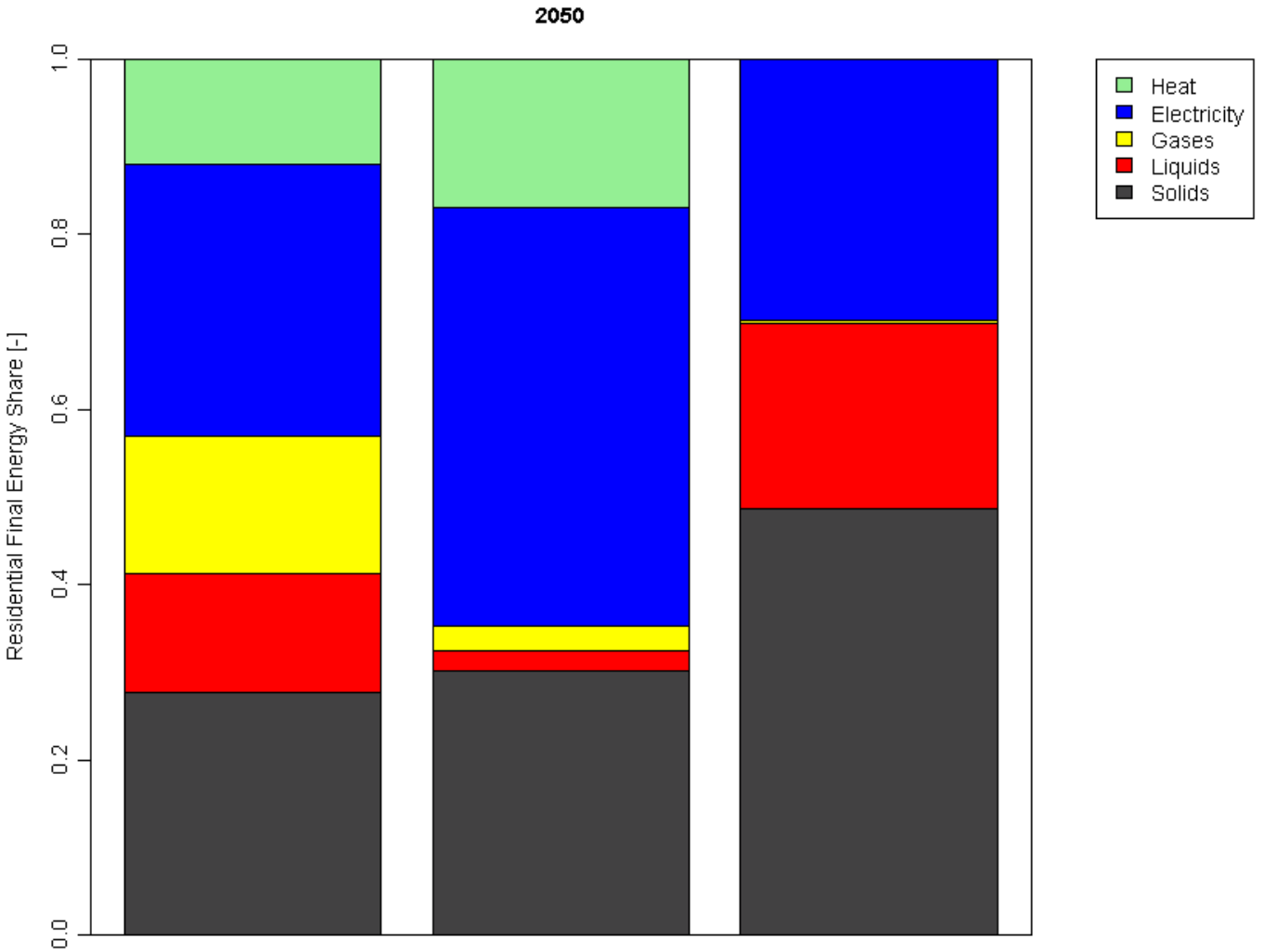



# Base Year Data


China
CO2 Emissions (Mt - CO2)
7,000
6,000
5,000
4,000
3,000
2,000
1,000
0

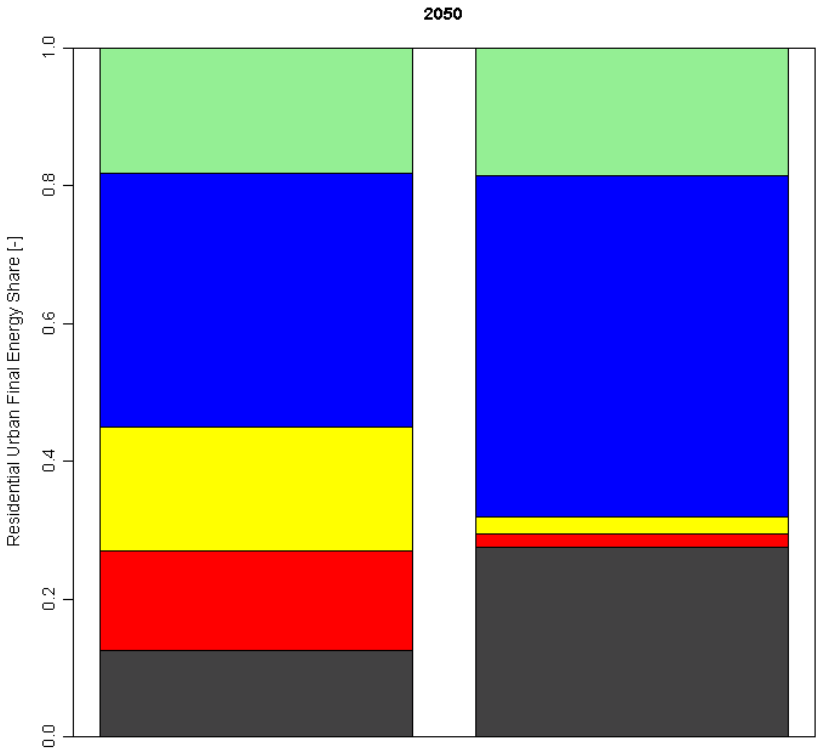

# Urban & Rural Development

# Final Energy in China (2050)

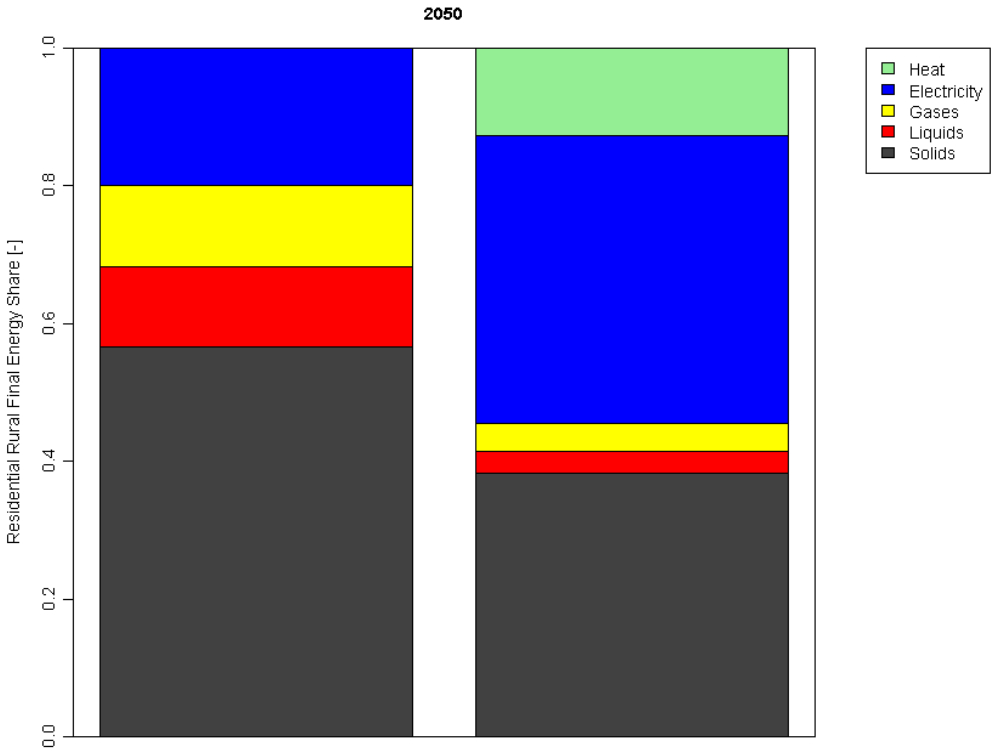


# Final Energy in China (2050)

## Urban

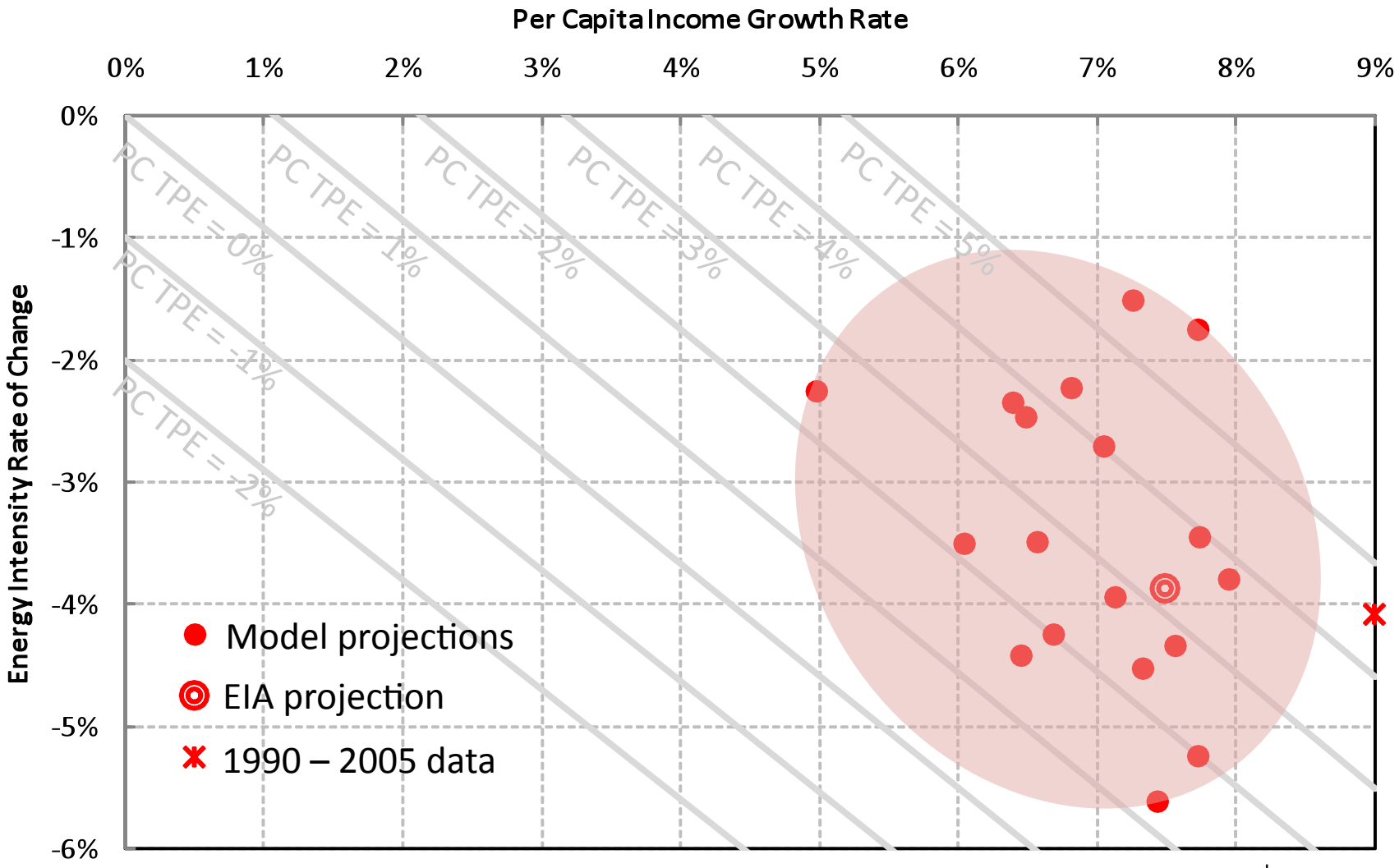



## Rural




# Baseline Scenarios

# Average Growth Rates in China 2005 – 2020





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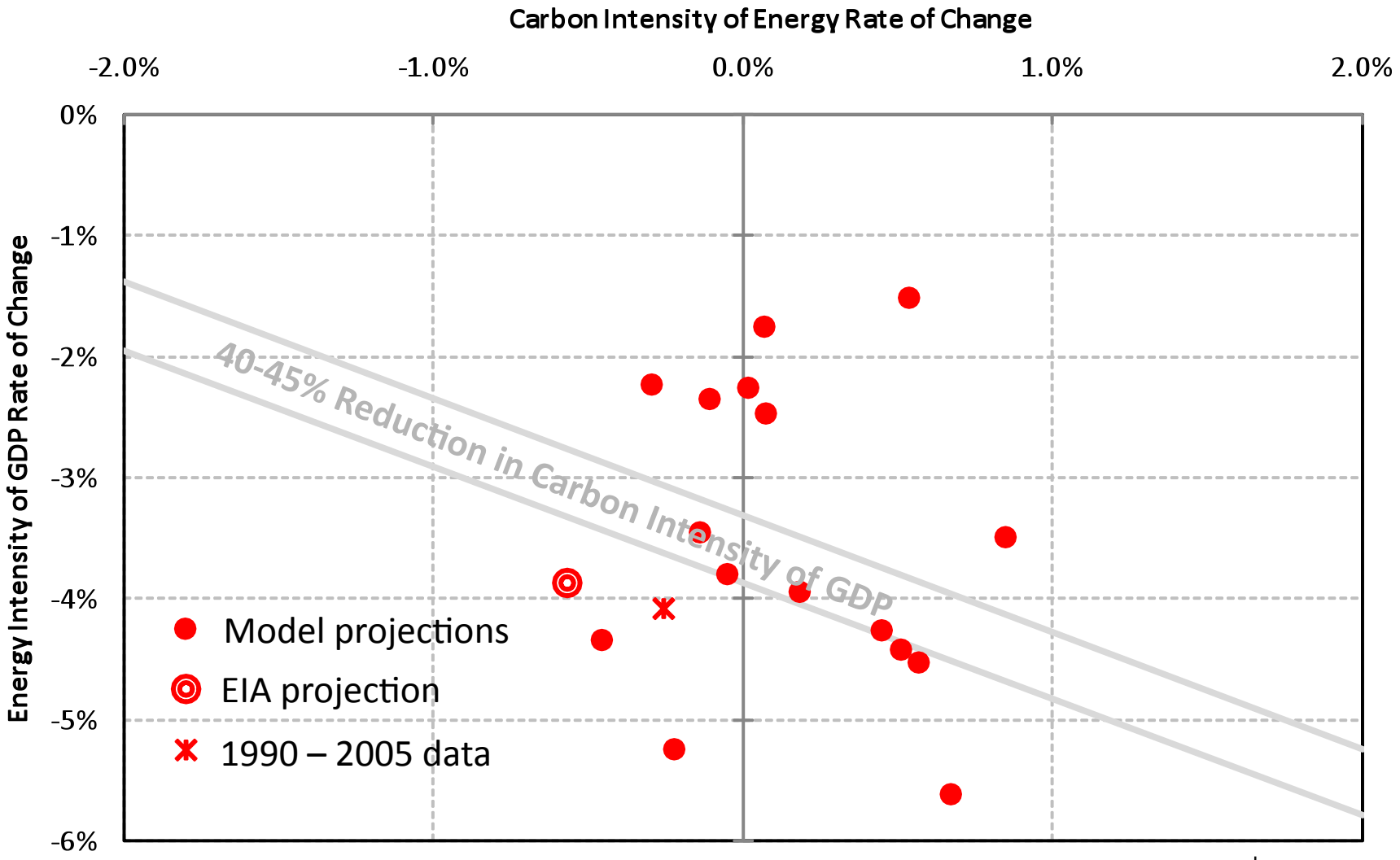
# Carbon Intensity of GDP in China 2005 – 2020





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# Low Carbon Societies

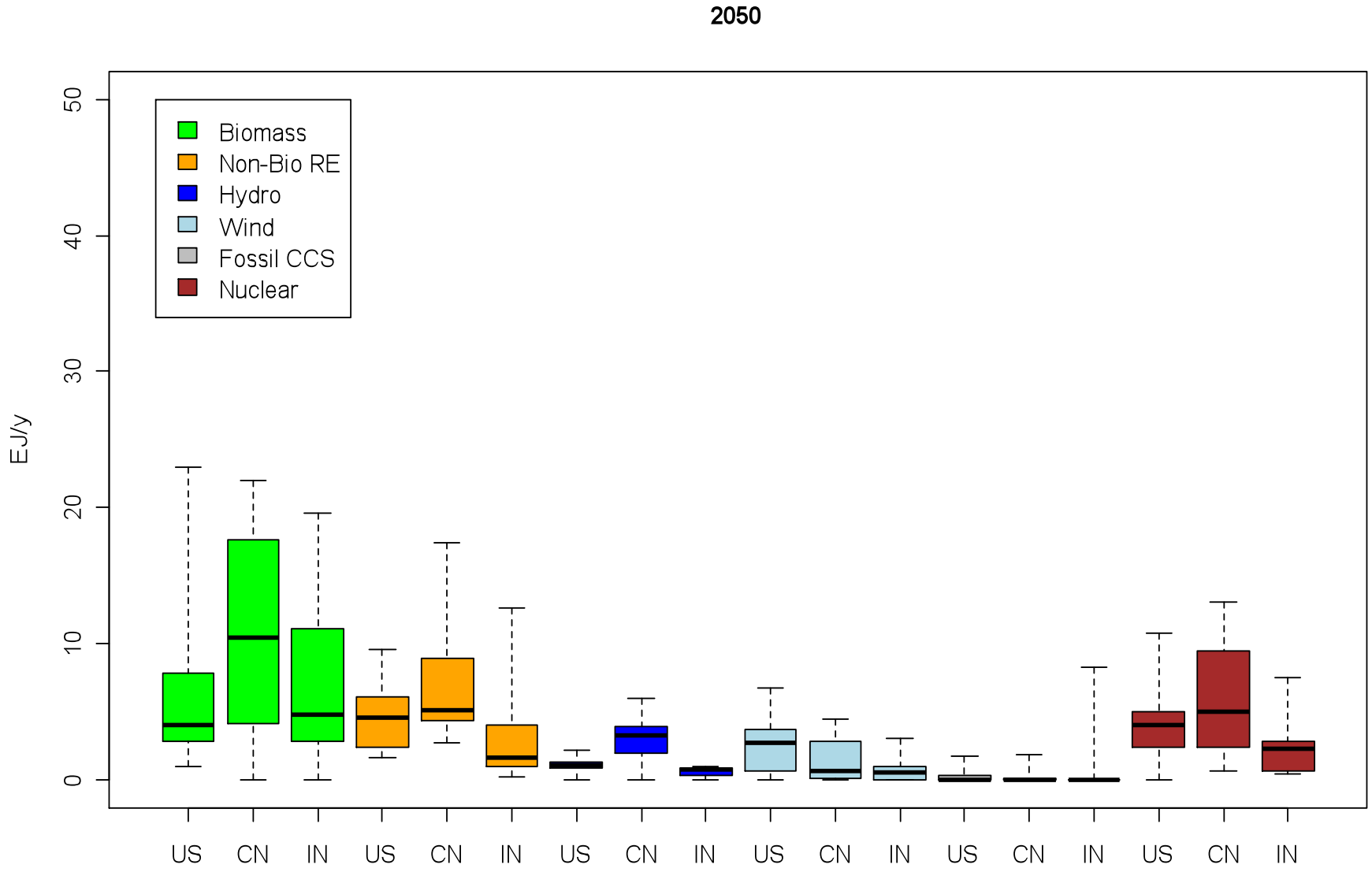
# Low Carbon Societies

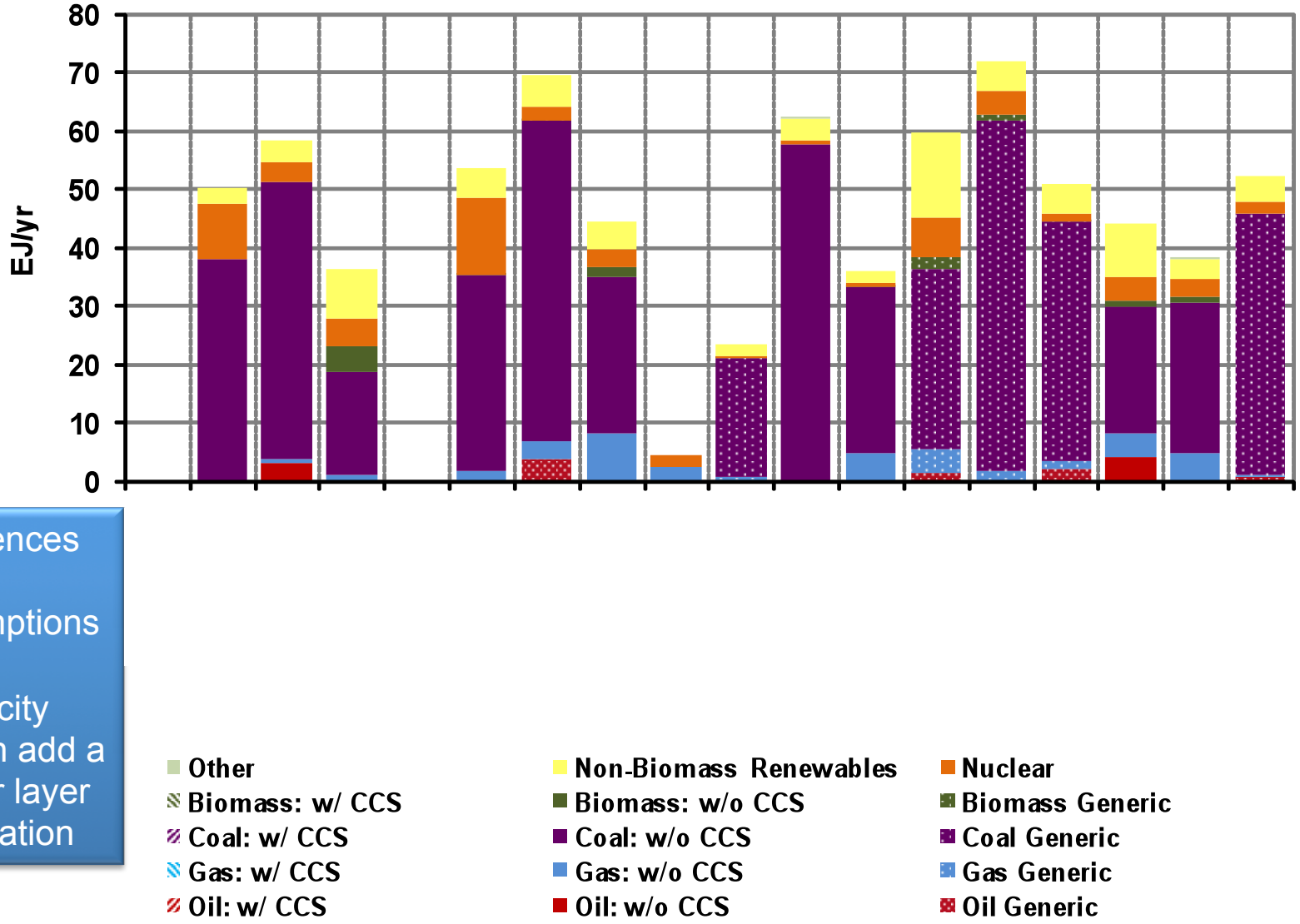

- Presentations from teams in Japan, India, Korea, China, Nepal, Thailand

- Discussed ways to achieve a LCS, including technology and policy roadmaps
  - These roadmaps often started with a sectoral analysis of mitigation potential
  - They also include discussion of co-benefits of technology/policy


# Technology

# Baselines (Scenario 1a)

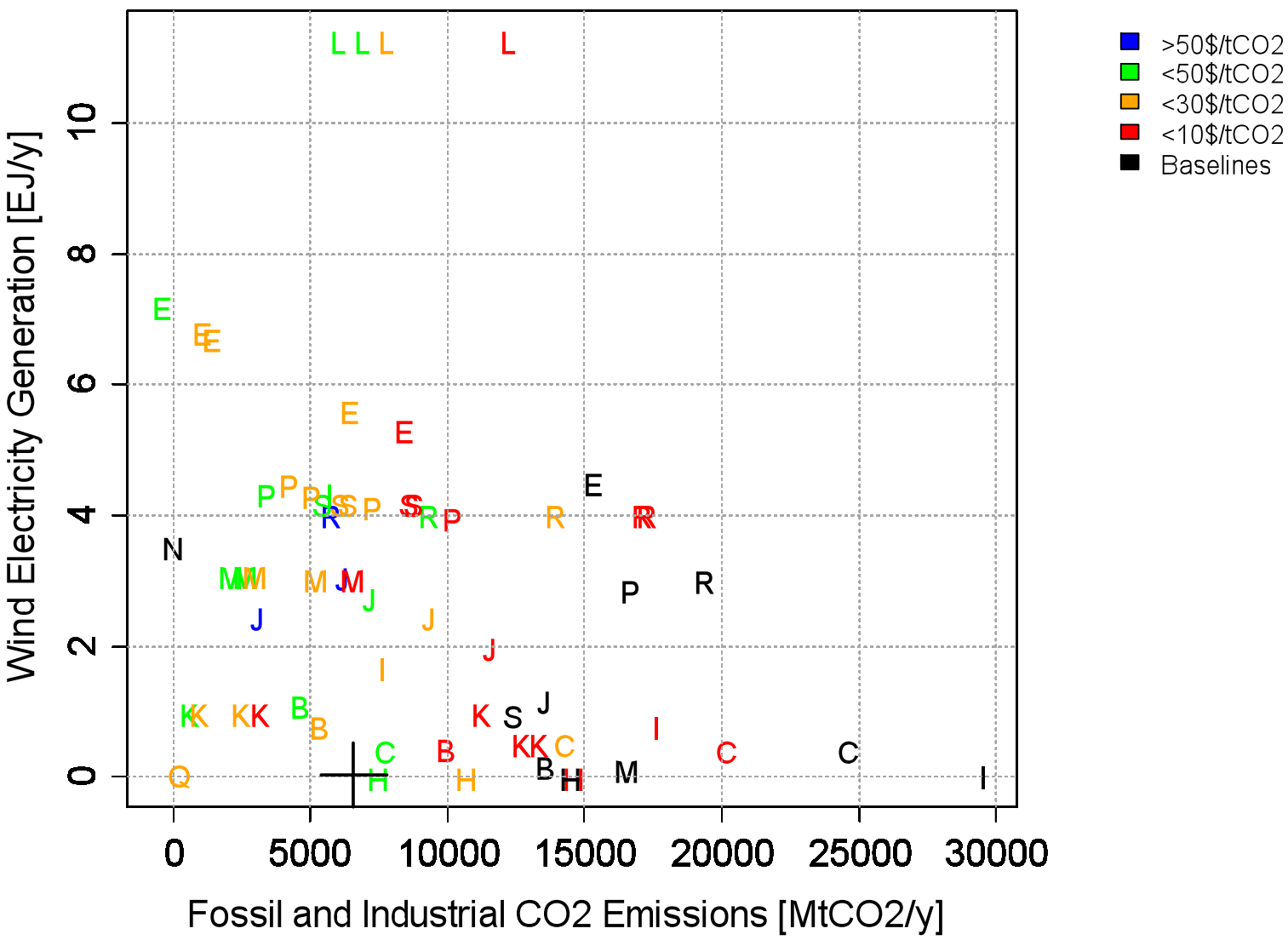





Differences in assumptions about electricity growth add a further layer of variation

## China Electricity 2050: No Policy

# China Wind 2050




# Comparability

# $30 Tax: Change until 2050

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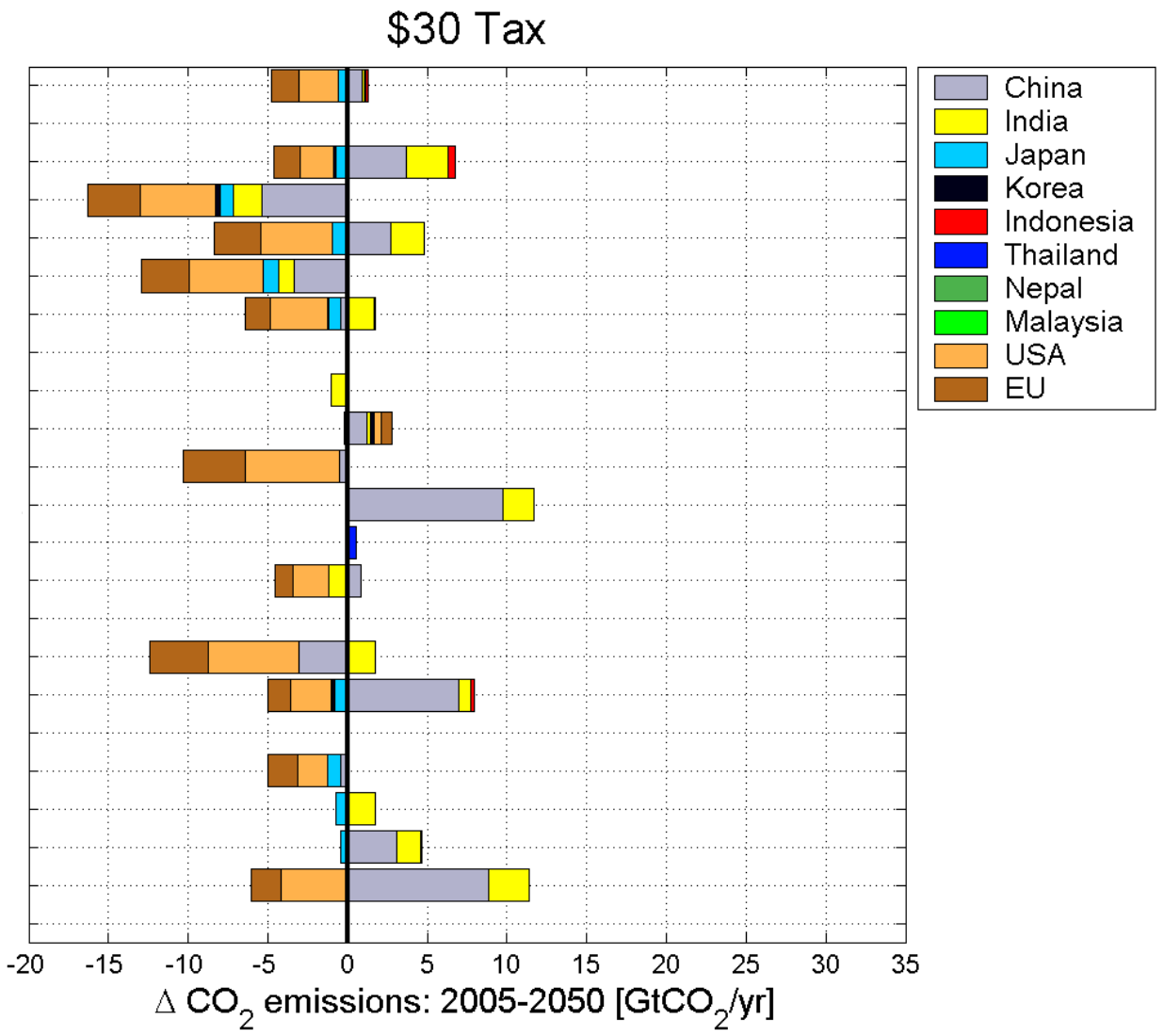
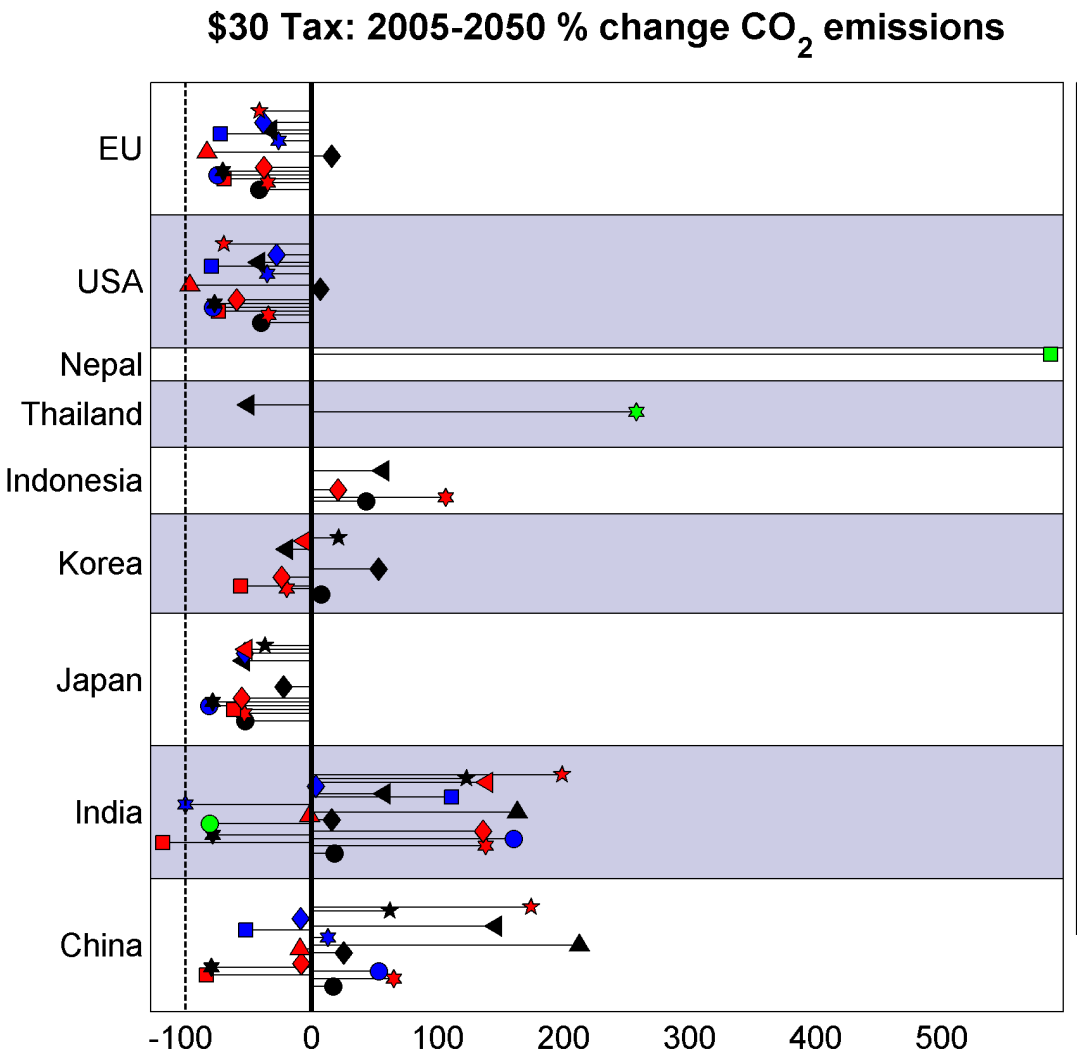
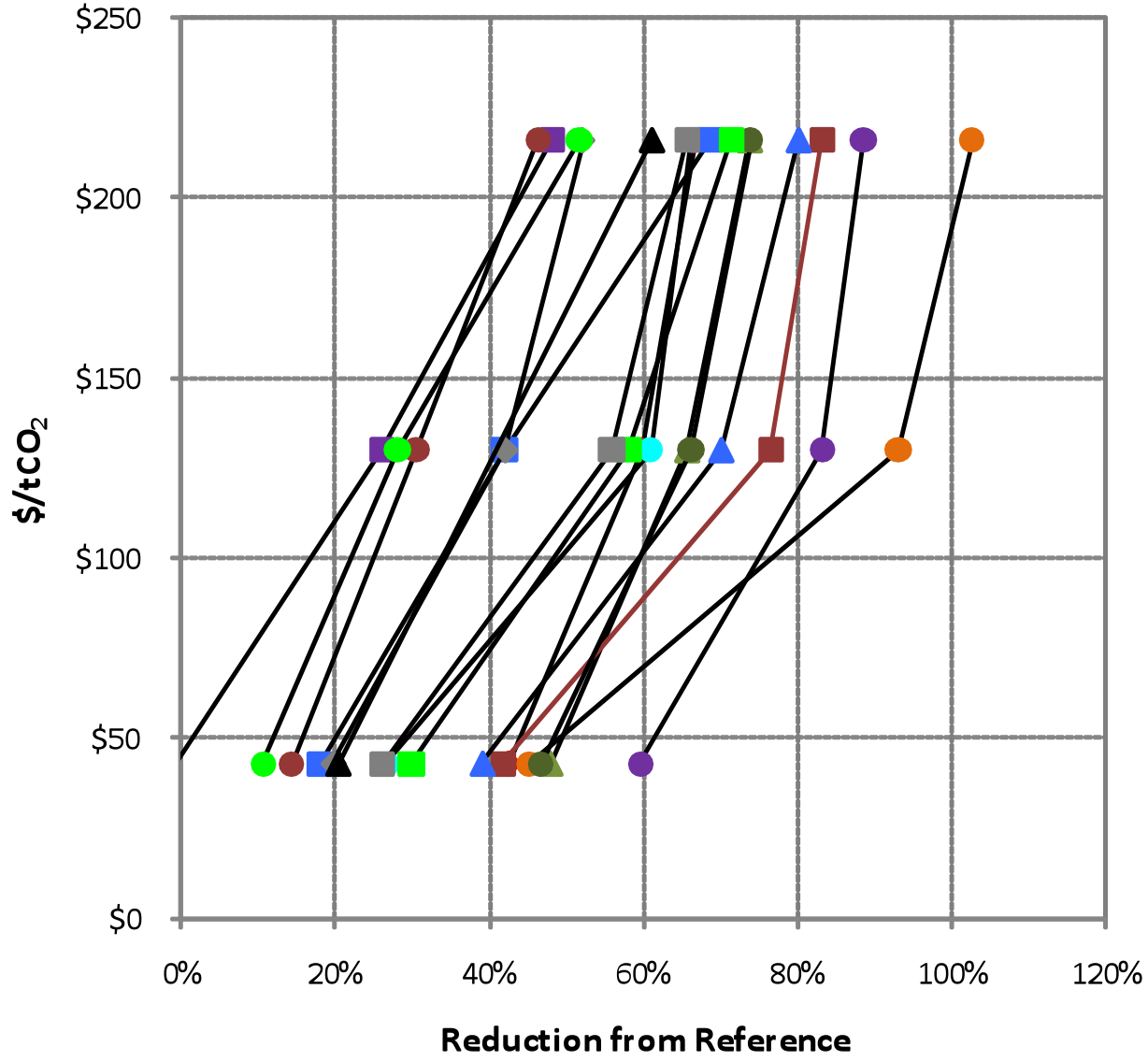


# $30 Tax: 2050 change relative to 2005

Asia Modeling Exercise



# China MAC Curve: 2050



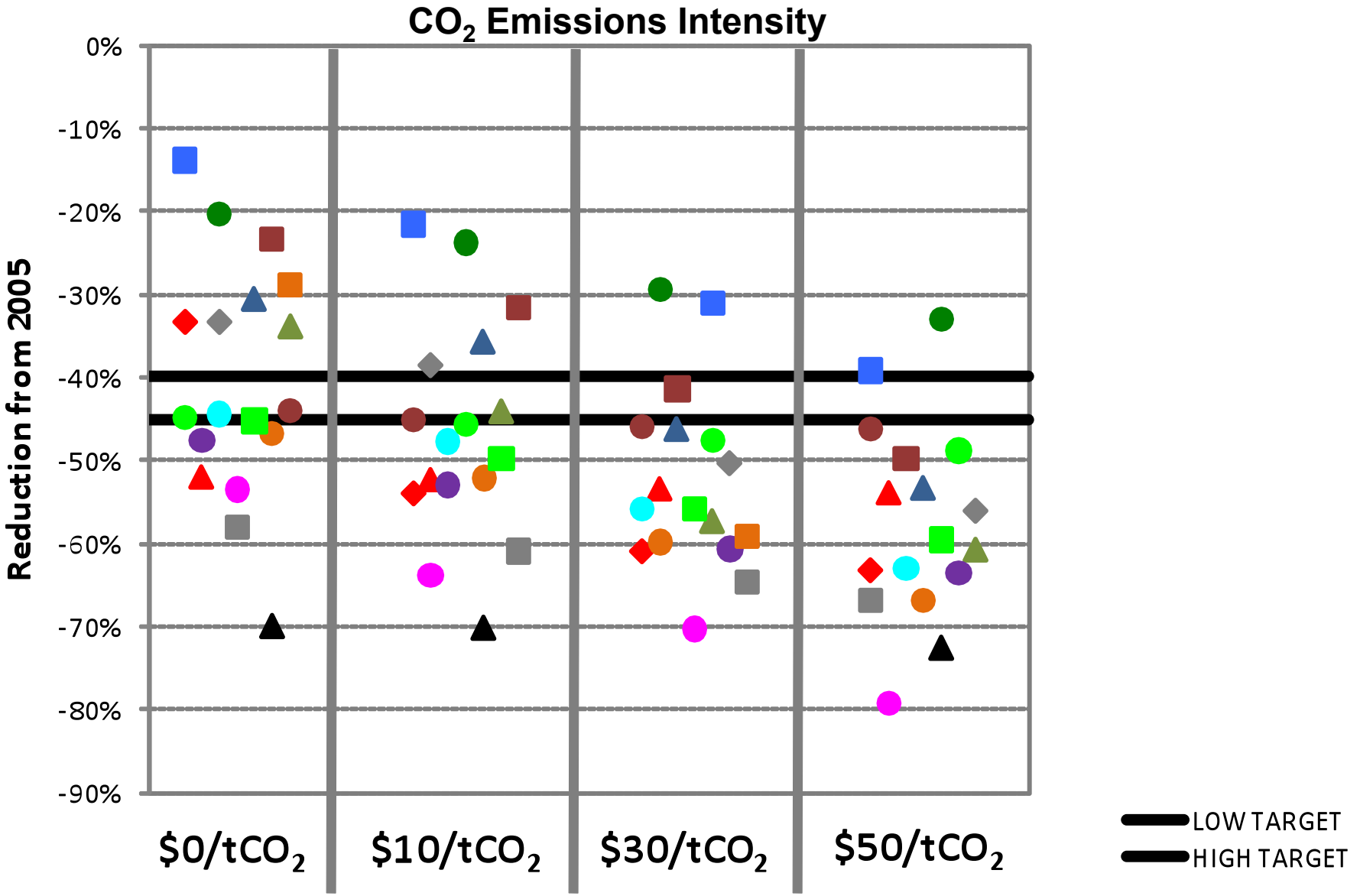

# National Policies & Measures

# China

Asia Modeling Exercise

**China will endeavor to lower its carbon dioxide emissions per unit of GDP by 40-45% by 2020 compared to the 2005 level, increase the share of non-fossil fuels in primary energy consumption to around 15% by 2020 and increase forest coverage by 40 million hectares and forest stock volume by 1.3 billion cubic meters by 2020 from the 2005 levels.**

# China


$CO_2$ Emissions Intensity
Reduction from 2005
0%
-10%
-20%
-30%
-40%
-50%
-60%
-70%
-80%
-90%
$0/tCO_2$
$10/tCO_2$
$30/tCO_2$
$50/tCO_2$
LOW TARGET
HIGH TARGET

# The Special Issue


- Format:
  - 1 Overview of the Exercise
  - Subgroup Overviews
  - A Series Individual Modeling Team Papers

- Timing:
  - Abstracts due prior to the next meeting
  - At the meeting, modelers will present an overview of their paper
  - Papers due several weeks after the meeting
  - Journal completed in Fall 2011


# DISCUSSION