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

China's NDC and Carbon Market Development

Zhang Xiliang

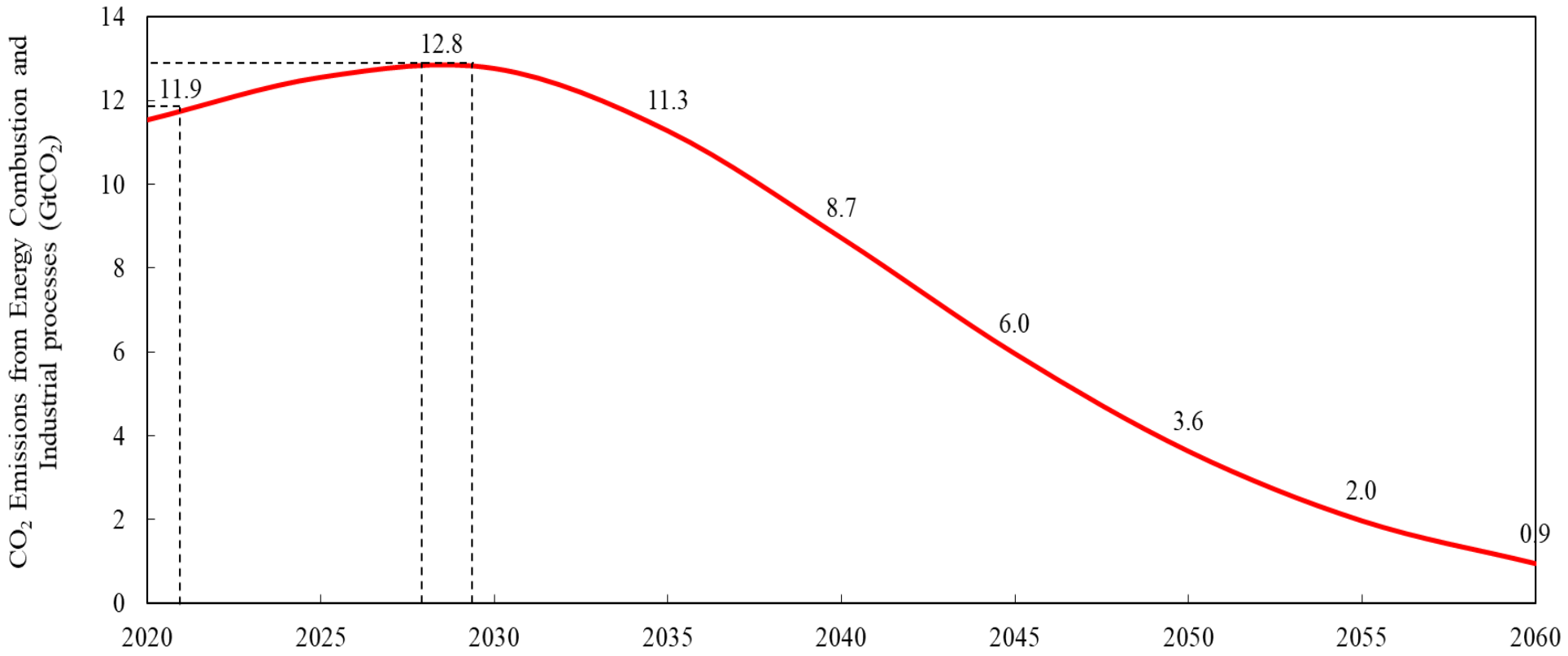
Director, Tsinghua Institute of Energy, Environment and Economy

President, China Carbon Emissions Trading Association

China's climate goals under the current NDC

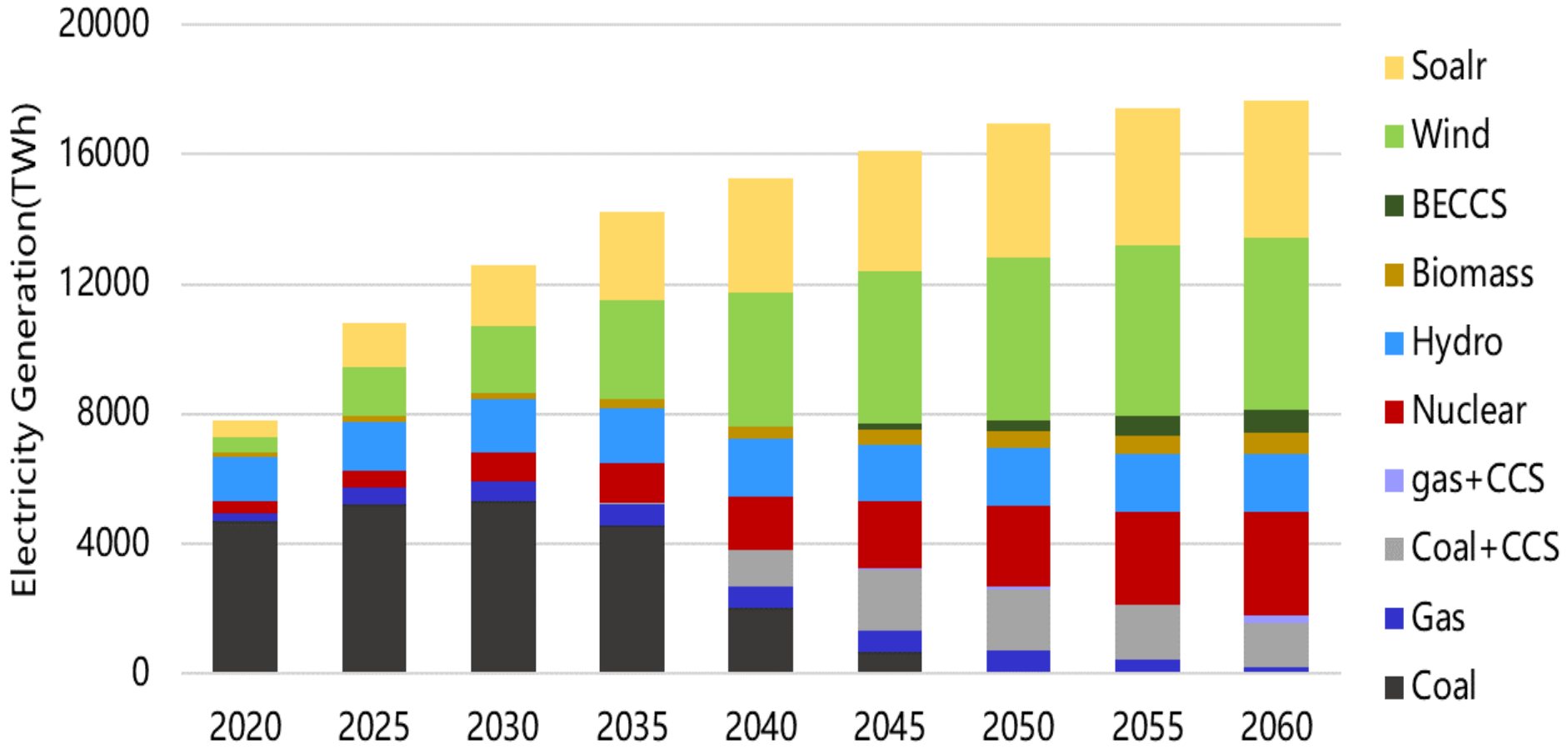
- **Peaking carbon emissions before 2030**
- **Reducing carbon emissions per unit GDP by more than 65% relative to the level of 2005**
- **Increasing the share of non-fossil fuels in total primary energy supply to 25% by 2030**
- **Achieving carbon neutrality before 2060**
- **More than 80% of energy supply shall come from non-fossil fuels before 2060**

A projecton of the energy-related CO_2 emissions by CGEM



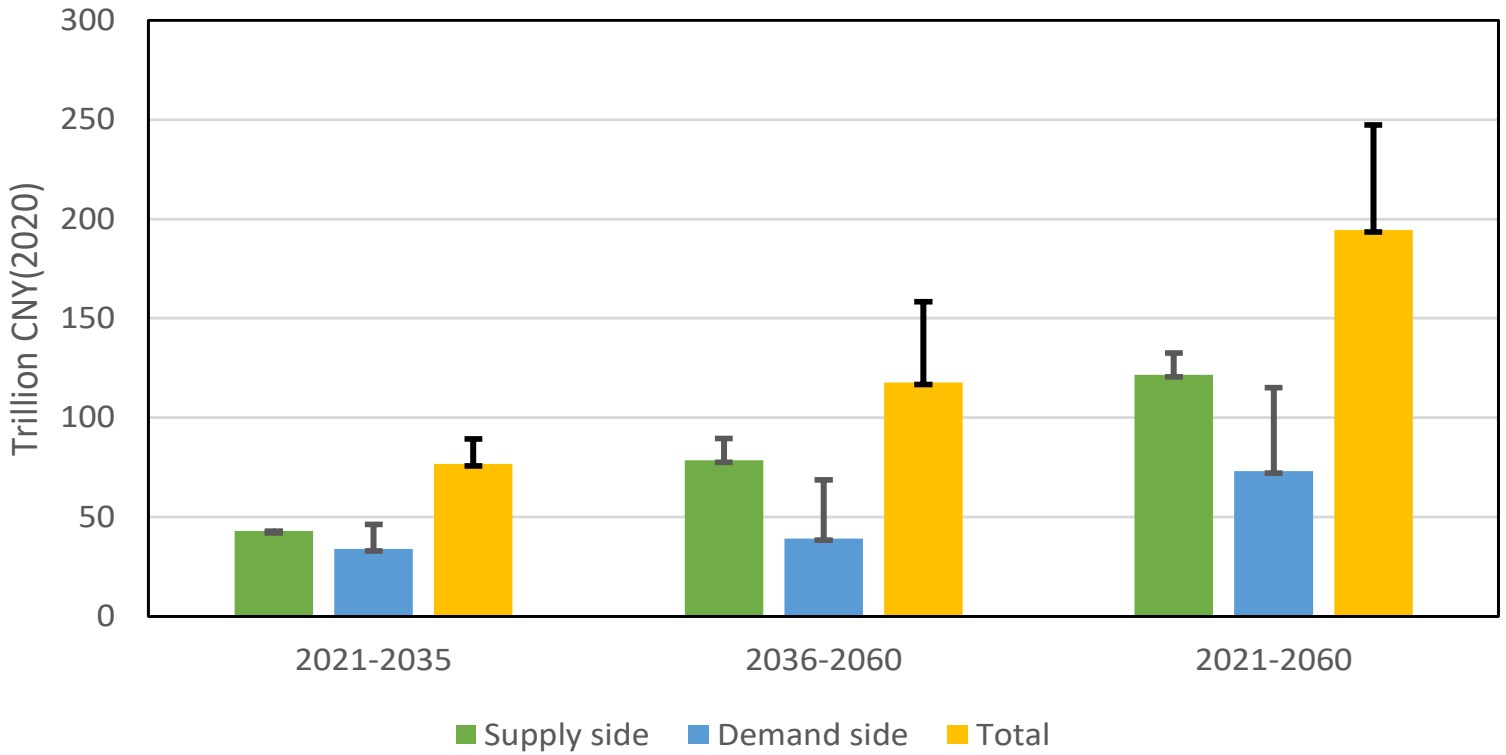
Source: Zhang et al. (2023), *Advances in Climate Change Research*

A projection of China's power generation mix by REPO model



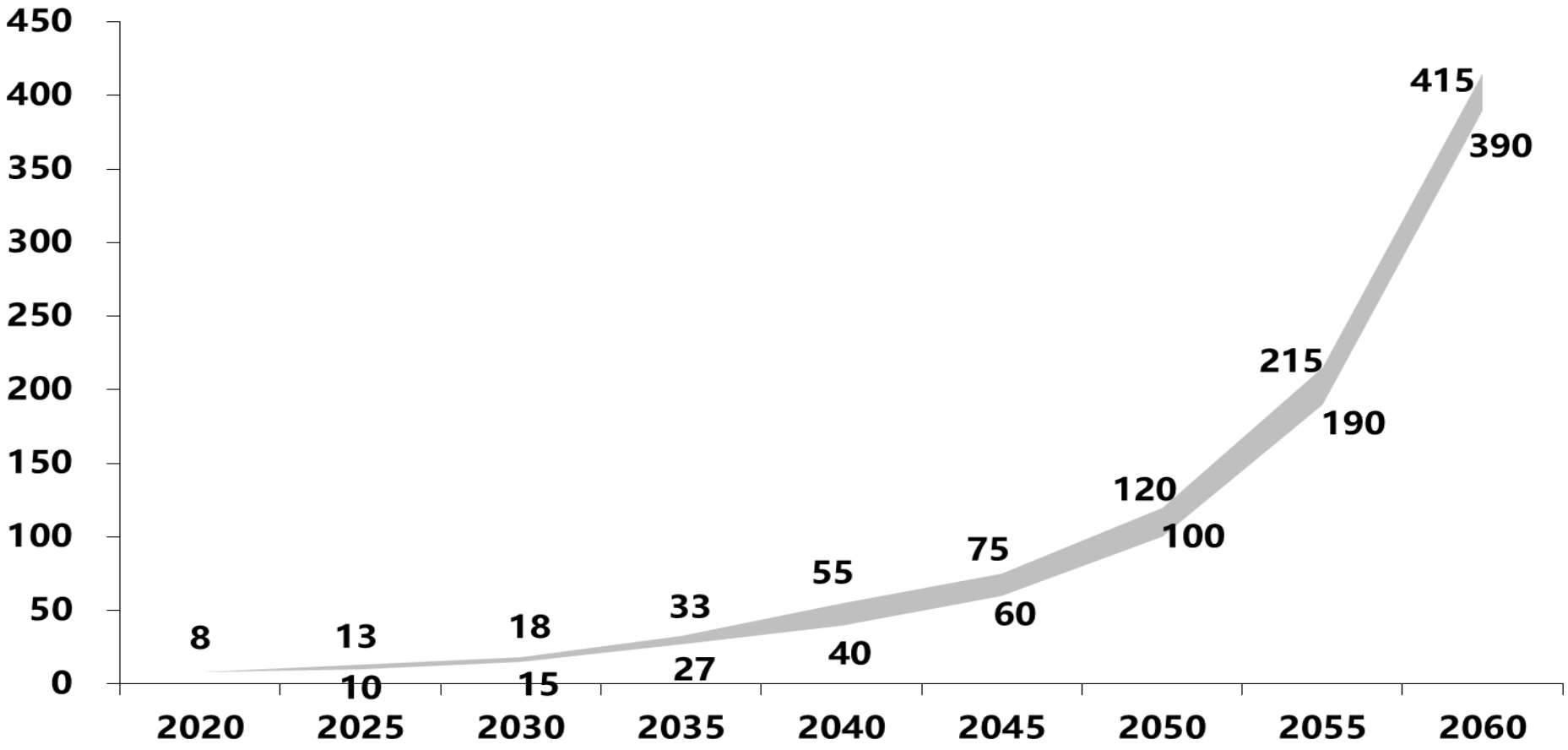
Energy investment needs towards carbon neutrality in China

- Total cumulative energy investment needs from 2021 to 2060 is estimated to be 195-248 trillion CNY, averaging approximately 4.9-6.2 trillion CNY annually.



* Estimated by Tsinghua University

A projection of the carbon prices (US$/ton) by CGEM



Policy measures for achieving the NDC targets

- **General policies**
  - *Energy conservation law*, *Renewable energy law*, etc.
  - NDC
  - Domestic legally binding mitigation targets and stocktaking
  - 1+N policy directives for carbon peaking
- **Policy instruments**
  - Energy efficiency standards
  - Renewable electricity feed-in tariffs and feed-in premium
  - Tax relief for low carbon technology deployment
  - Subsidized interest rate
- ***Carbon Market***

China's national ETS: an overview

- **Coverage**
  - 8 sectors covering the power sector and the main manufacturers
    - **electricity/heat**, **iron & steel, non-ferrous metal, construction material, petrochemical engineering, chemical engineering, and civil aviation**.
- **Threshold for participation**
  - 26000 tons CO_2 emissions per year
  - Number of entities covered: approximately *7500*
- **Total emissions (direct): approximately 70% of China's total energy-related emissions**
- **Cap-setting**
  - Rate-based approach
- **Allowance allocation methods**
  - Primary allocation method: Output-based free allocation
  - Auction is to be encouraged.

Outlook of China's national ETS

- The sectoral coverage is expected to extend to six carbon intensive industry sectors before 2030;
- The stringency of the sectoral benchmarks will be enhanced step by step;
- Auction would be introduced for allowance allocation as early as possible;
- Institutional investors would be allowed to enter the carbon market as early as possible; and
- The program will transit from a rate-based system to a mass-based system.

The voluntary carbon market will provide additional incentives.

- Carbon Capture, Utilization and Storage (CCUS)

  It looks like that CCUS could play a vital role in the decarbonization of such carbon intensive sectors as **power generation**, **cement**, **iron and steel**, and **chemical engineering.**

- Carbon Removals
  - ✓ **BECCS** and **DAC**
- Renewable energies with additionalities
  - ✓ **Solar thermal**, **off-shore wind**, and **biofuels**
- Transport and building sector
- Carbon sinks from forestry and agriculture sector

THANKS !

WWW.3E.TSINGHUA.EDU.CN

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

zhang_xl@tsinghua.edu.cn