ADVANCING (I)NDC IMPLEMENTATION AND AMBITION: BRIDGING RESEARCH & PRACTICE
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China's INDC implementation and global analysis

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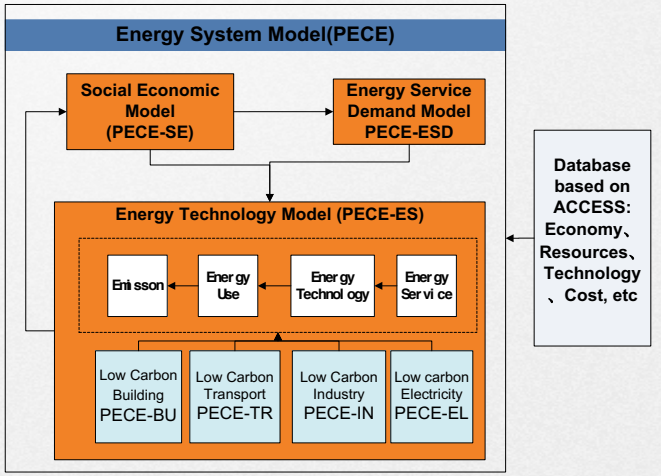
China's NDC

- On 30 June 2015, the Chinese government submitted its Intended Nationally Determined Contribution (INDC):
  - To achieve peak carbon dioxide emissions by approximately 2030, or sooner as best efforts allow;
  - To lower carbon dioxide emissions per unit of GDP by 60% to 65% from 2005 levels by 2030;
  - To increase the share of non-fossil fuels in the primary energy mix to approximately 20% by 2030; and
  - To increase the volume of forest stock by approximately 4.5 billion cubic meters over 2005 levels by 2030, and;
  - To continue to proactively adapt to climate change.

Analytical Framework and Methodology

- Existing Policy Mapping and Evaluation
- Baseline/Current Policy Pathways
- NDC Pathways
- Challenges and Co-Benefits
- International Perspective

- Quantitative + Qualitative
- Literature review: Review and comparing of the existing and ongoing studies, including IPCC database
- Modelling studies based on own capacity

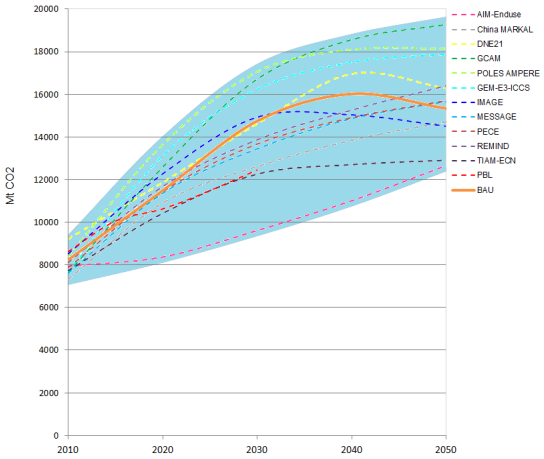


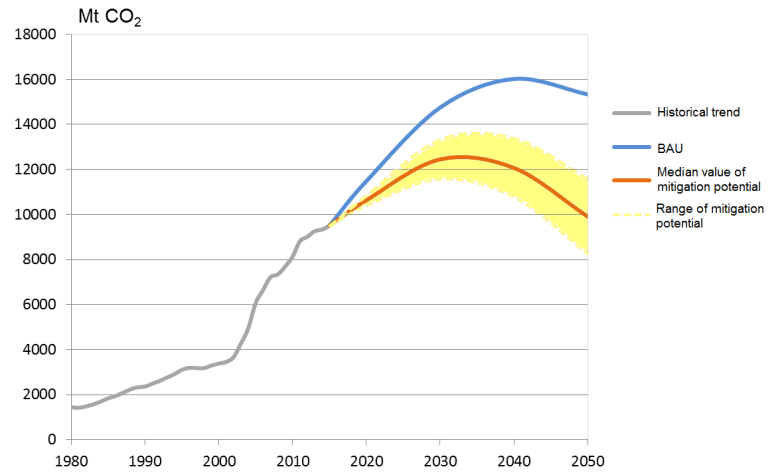
Driving forces: New normal & Innovative development path

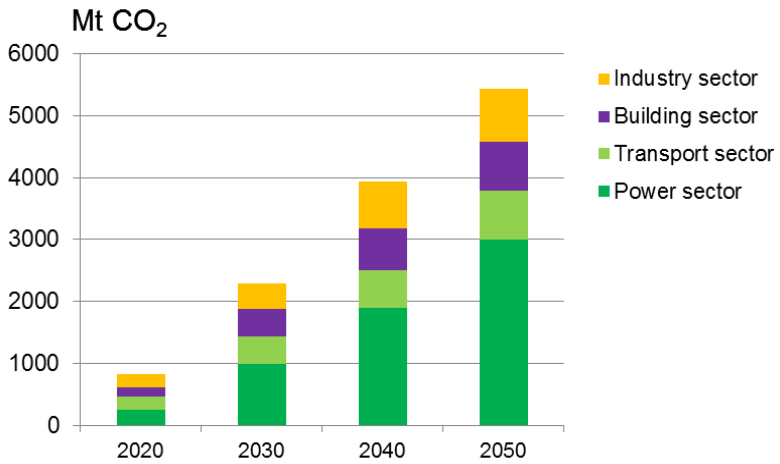
- China is seeking to shift to a 'new normal', a transition that it intends will be powered by an 'innovative development pathway'.
- China is integrating the innovative development pathway into all of its strategic planning and committed to creating the technological, financial, and other conditions necessary to achieve this fundamentally different model of development.

Deviation from BAU are required

- The combination of the enhanced mitigation efforts across different sectors suggests a mean carbon-mitigation potential value of 0.85 GtCO2 in 2020, 2.3 GtCO2 in 2030, and 5.4 GtCO2 in 2050.
- More efforts are needed in order to fully tap the mitigation potential and fully achieve the targets set in China's NDC, especially the non-fossil fuel energy development target.
- Different sectors have varying mitigation potential over time.



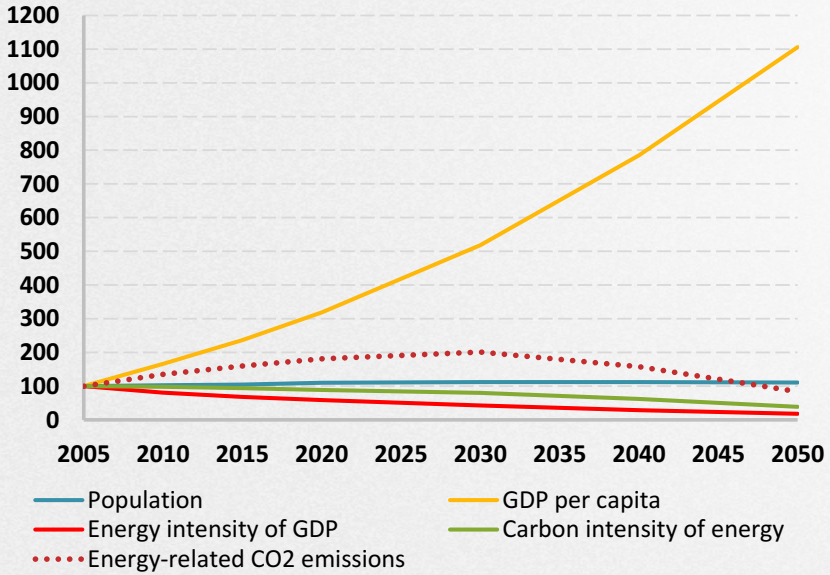


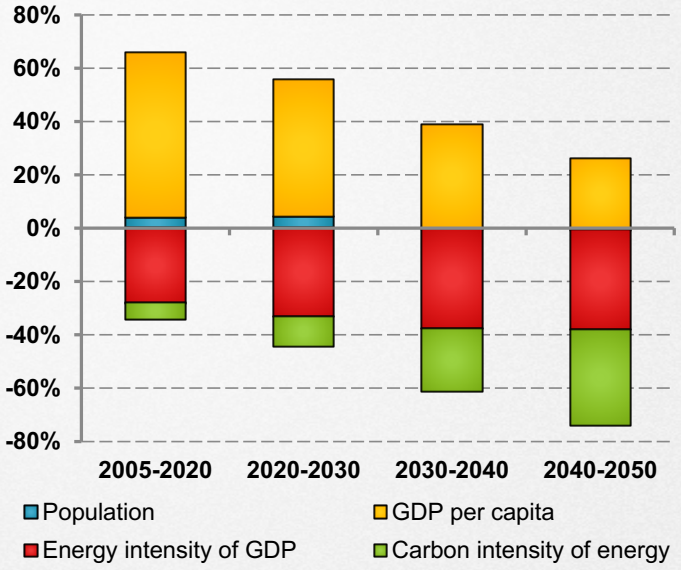


Source: Based on The Strategy Analysis on Climate Change in China model (SACC)

Be a critical vehicle in driving the shift onto the innovative development pathway and towards the 'new normal'

Facilitate the decoupling of economic growth from carbon emissions and could lead to a fundamental restructuring in the country's energy sector.



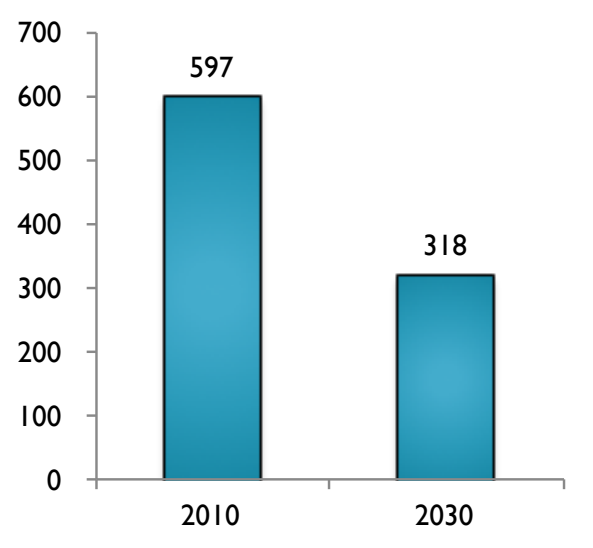


Source: 2005 and 2010 data are from China Statistical Yearbook, China Energy Statistical Yearbook and China's official review of target completion. Data after 2015 are from an NDC scenario from PECE model developed by NCSC and Renmin University of China.

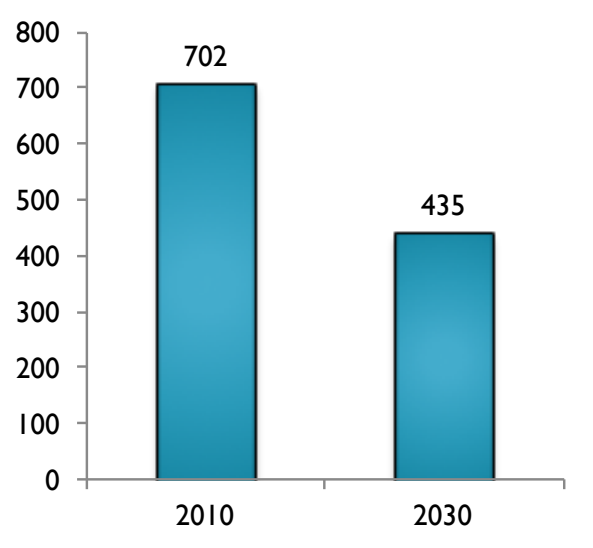
3 important pillars in achieving China's NDC

- In achieving China's NDC, improving energy efficiency, increasing the electrification rate of end-use sectors, reducing energy service demand by structural change and sustainable consumption, as well as decarbonization of the energy system are all expected to play key roles.

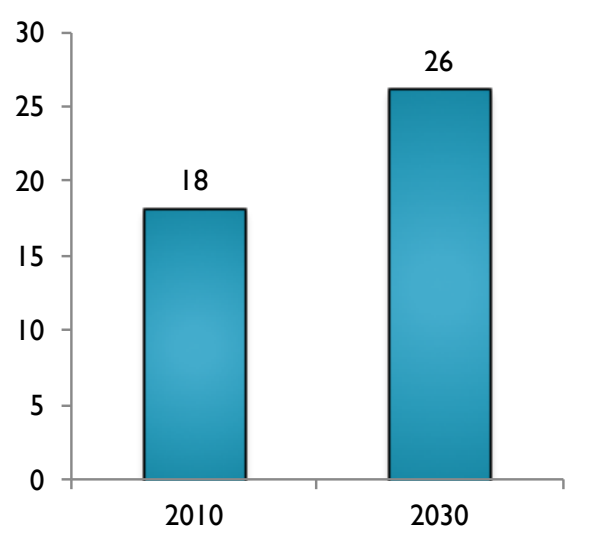
a. Energy efficiency
Energy intensity of GDP
(tonnes of coal equivalent/million USD)



b. Decarbonization of electricity
Electricity emissions intensity
(gCO2/kWh)



c. Electrification of end uses
Share of electricity in total final energy use
(%)

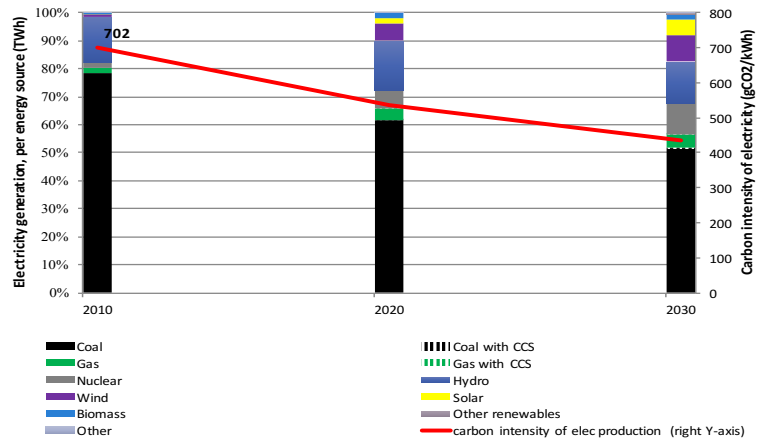


Source: 2010 data are from China Statistical Yearbook. 2030 data are from an NDC scenario from the PECE model developed by NCSC and Renmin University of China.

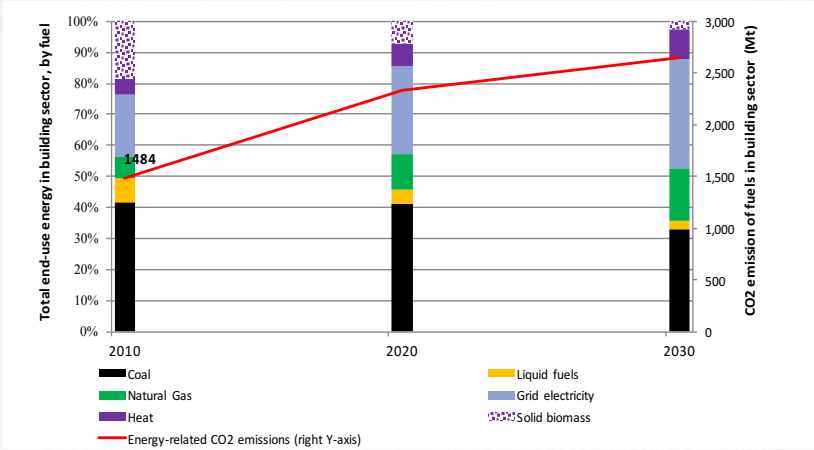
Different sectors play different roles

- Different sectors is expected to play different roles
- Industry peak first around 2020

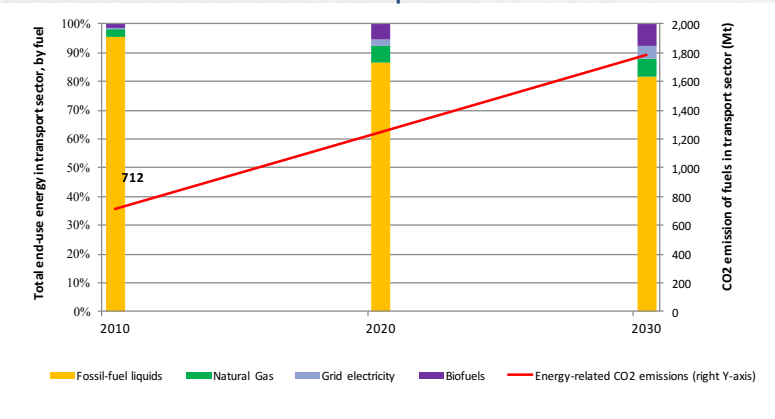
Power



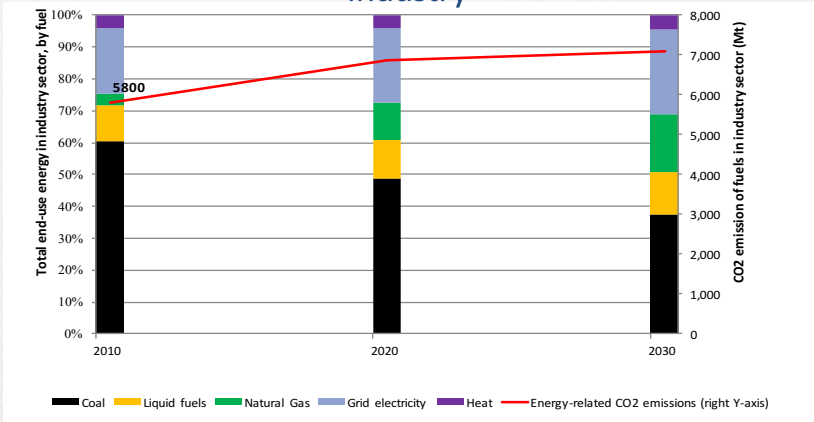
Building



Transport



Industry



Source: NDC scenario from the PECE model developed by NCSC and Renmin University of China.

An overview of domains where detailed policy design and implementation is required

Overarching national strategies	***Implementing proactive national strategies on climate change***, including enacting climate change law, integrating climate change into mainstream social economic strategies and developing long-term strategies and roadmaps for low-carbon development.
	Improving regional strategies on climate change, including decomposing national targets to the local level, development of regional low carbon strategies, promoting advanced regions to peak their emissions early, control of emissions and carbon intensity at the urban development zone level, etc.
	Innovating a low-carbon development growth pattern, such as through low-carbon pilots in provinces, cities and industrial zones.
	Promoting international cooperation on climate change, such as by actively engaging in international cooperation and establishing a Fund for South-South Cooperation on Climate Change.
Energy system changes	***Building a low-carbon energy system***, including the shift away from coal and the development of renewables and nuclear power through policies like phasing out coal in specific regions, emission and energy standards for electricity supply, subsidies and quotas for electricity, reform of the electricity and energy pricing mechanism to take account of carbon scarcity, supply-demand conditions and other environmental costs, etc.
Support for science and technology	***Building an energy-efficient and low-carbon industrial system***, including the promotion of low-carbon industries, control of industrial emissions by, for example, phasing out obsolete capacity, setting key industry investment entry barriers, improving energy efficiency and promoting decarbonization in energy intensive industries, as well as the promotion of recycling systems, etc.
	Enhancing support for science and technology, including strengthening R&D on low-carbon technologies
	Improving statistical and accounting systems for greenhouse gas (GHG) emissions, including regular GHG inventories and reporting requirements at national and provincial levels, carbon emission certification, etc.
Sectoral plans	***Controlling emissions from the building and transportation sectors***, for example through low-carbon urbanization planning, optimized green transportation systems, stricter building codes, improving energy standards for electric devices, promoting distributed renewables, etc.
	Increasing carbon sinks in forests, wetlands and grasslands
	Enhancing overall climate resilience, for example, through infrastructure development and improved assessment and risk management of climate change
Incentives and behavior	***Increasing financial and policy support***, which might include the use of funds, innovative carbon financing mechanisms, preferential taxation policies, green government procurement systems green credit mechanisms, etc.
	Promoting carbon emissions trading markets, building on emissions-trading pilots
	Promoting a low-carbon way of life, by exploring ways in which to support low-carbon choices in daily life
	Increasing broad participation of stakeholders, in order to increase public- and private-sector awareness of low-carbon development

China faces challenges, but more co-benefits

(1) China Will Increase Green Supply, and Invest 1.6 Trillion RMB Annually by 2030

- The new investment on energy efficiency in 12-FYP is expected to will reach 2.7 trillion (constant price of 2010, same as follows), and the one on low carbon energy (natural gas, non-fossil fuel, CCUS etc.) will reach 3.1 trillion, the output of low carbon industry will be about 8.4 trillion RMB.
- It is predicted that the accumulative investment on low carbon development will exceed 41 trillion RMB, among which the energy efficiency and low-carbon energy industry will be about 15.2 trillion and 25.7 trillion RMB respectively, including wind and solar power of 11.3 trillion. The low carbon industry scale will reach more than 23 trillion, as over 16% of GDP by then, and will become the pillar industry of national economy.

(2) China Will Promote Green Innovation, and Create 3 Million New Jobs Annually by 2030

- The employment of China's energy efficiency and low carbon energy industry is expected to 14 million during 12-FYP. New jobs, departments and enterprises are being created, such as carbon finance, carbon audit, carbon inventory, corporate carbon strategy, carbon management contract, carbon asset custody, renewable energy solutions, new energy automobile manufacturers, internet of energy, big data of climate change and so on.
- It is expected that low-carbon employment population will reach 63 million by 2030, and more jobs will appear in low carbon transformation and upgrading of the traditional industries.

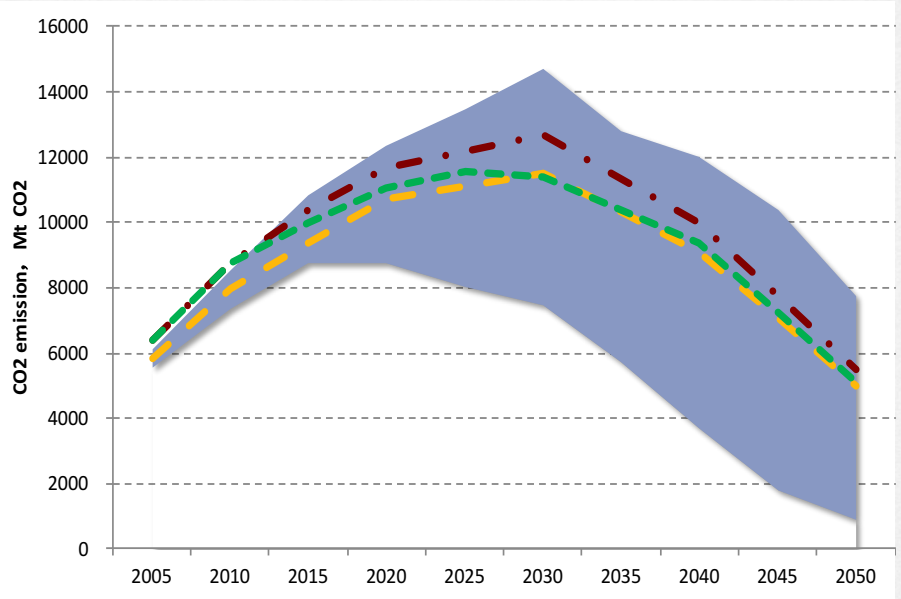
(3) China Will Shape Green Culture, and Reduce Air Pollution by 80% by 2030

- It have co-benefits on air pollution especially. According to the research of Tsinghua University, CO2 emission peak by 2030 will greatly help improving air quality, and SO_2, NOx and $PM_{2.5}$ emissions will correspondingly drop by 78.9%, 77.6% and 83.3% compared to 2010 level, respectively.

Source: the analysis conducted by Dr. Chai Qimin based on IAMC model

Even more significant emission reductions will be required beyond 2030 to meet 2°C

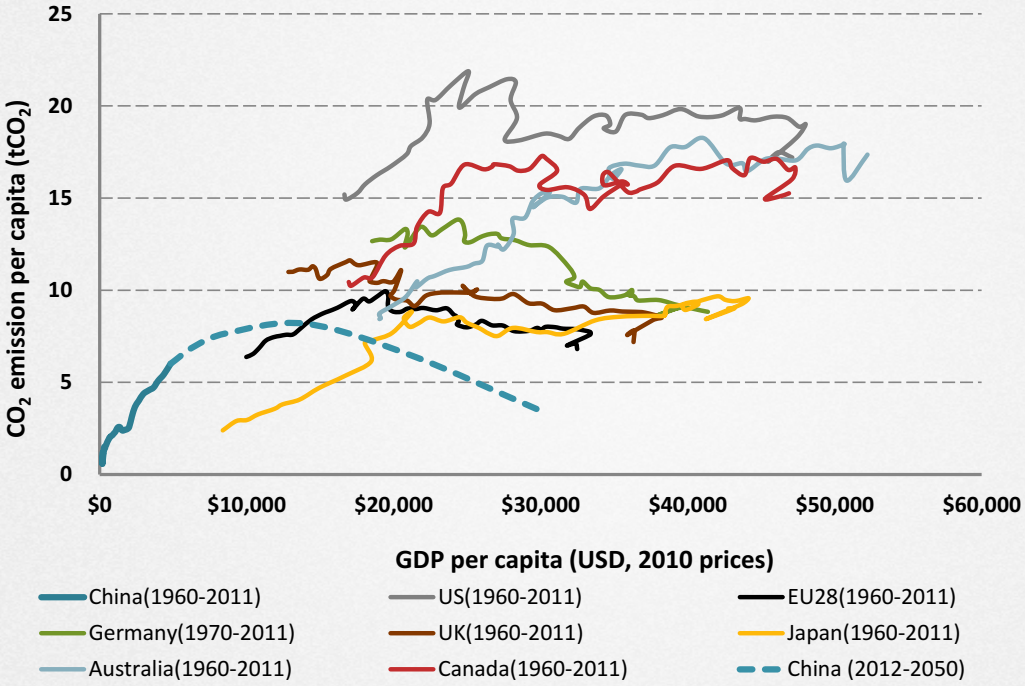
- Successful implementation of the NDC can foster the enabling conditions in the 2020s that will be essential for enhanced mitigation beyond 2030.
- Although challenges and uncertainties remain, China is on track to achieve its NDC goals and has significant potential to further enhance its action.
- China's NDC can also be the basis for the country to develop its long-term, mid-century low emission development strategy.



Note: The purple area represents IPCC AR5 emissions scenarios for China with more than 50% probability of achieving the 2° goal given China's current status. Red and yellow lines indicate China's emissions trends after implementing NDC targets (with and without energy data adjustment following latest economic census). The green lines indicate an enhanced ambition scenario. To ensure comparability with global data, the CO_2 emissions here include energy-related CO_2 emissions plus CO_2 emissions from cement production.

A new example of development that other developing countries could follow

- Successfully moving onto the innovative development pathway can allow China to peak its emissions at a lower GDP per capita and at an earlier stage of development than any developed country has done.
- China's innovative development pathway constitutes a new example of development that other developing countries could follow.



Note: Includes only energy-related CO_2 emissions.
Source: Historical CO_2 emissions data from 1960 to 2012 is from CDIAC. Population and GDP data is from the World Bank. Data after 2012 is calculated based on NDC targets.

Remaining Questions

- **How to understanding the new context and its implications?**
  - New starting points: 13th FYP
  - New development idea: Five development concepts
  - Recent social economic trends: new normal, supply-side reform, etc.
- **How to mainstreaming low carbon strategy?**
  - linkage with other development goals
  - Integrated cost-benefit analysis
  - Co-benefits and trade-offs
- **How the analysis of NDC could feed in China's mid century low emission development strategy?**
  - Interlinkage between long term and short-medium term
  - Post-2030 strategy
- **How to design the balanced and coordinated policy framework?**
  - Role of carbon pricing tools
  - International and regional cooperation strategy

Thank you for your attention!

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