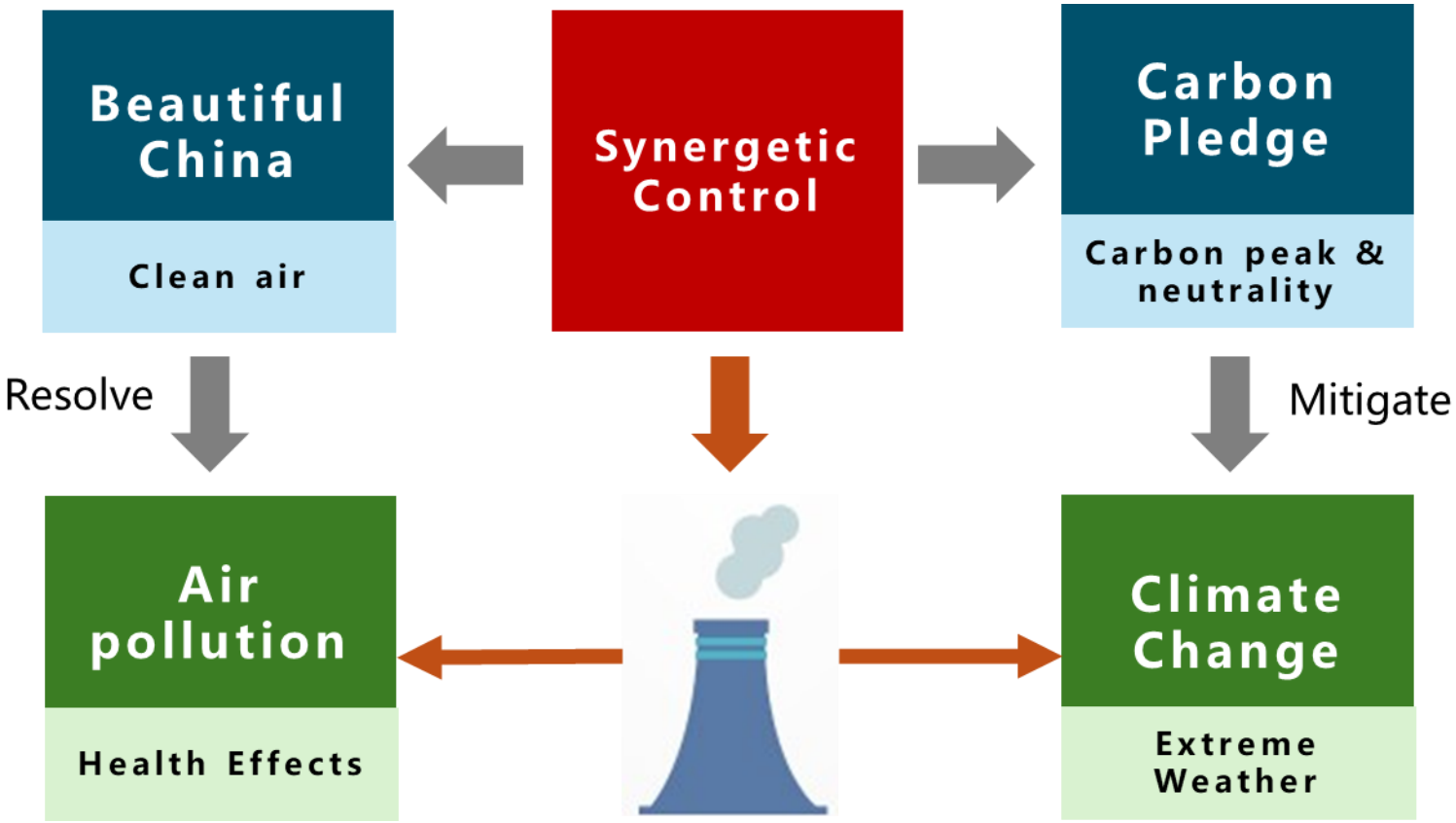
Synergies between air pollution control and GHGs mitigation

Dr. ZHENG Yixuan（郑逸璇）

Director, Office of Air Quality Management
Chinese Academy of Environmental Planning

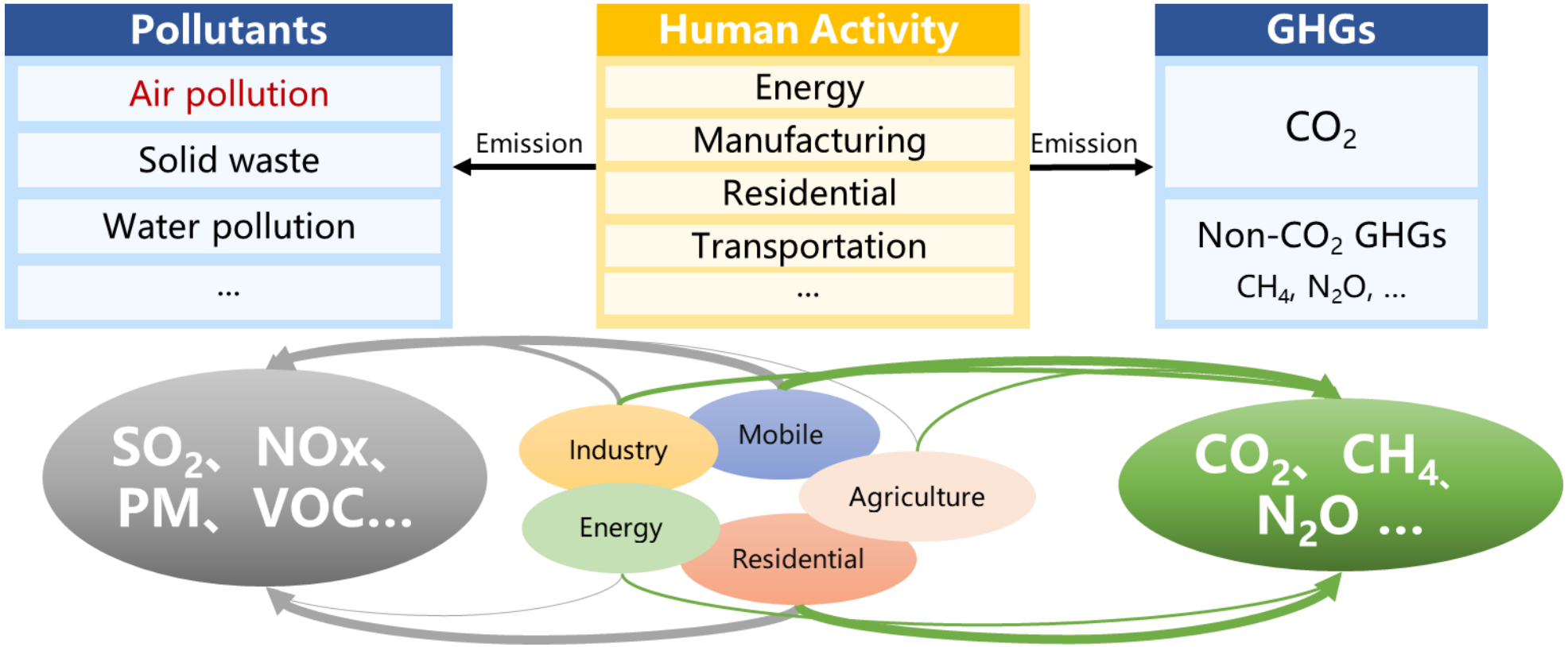
2026.03.12

Pollution-carbon co-control provides new perspective



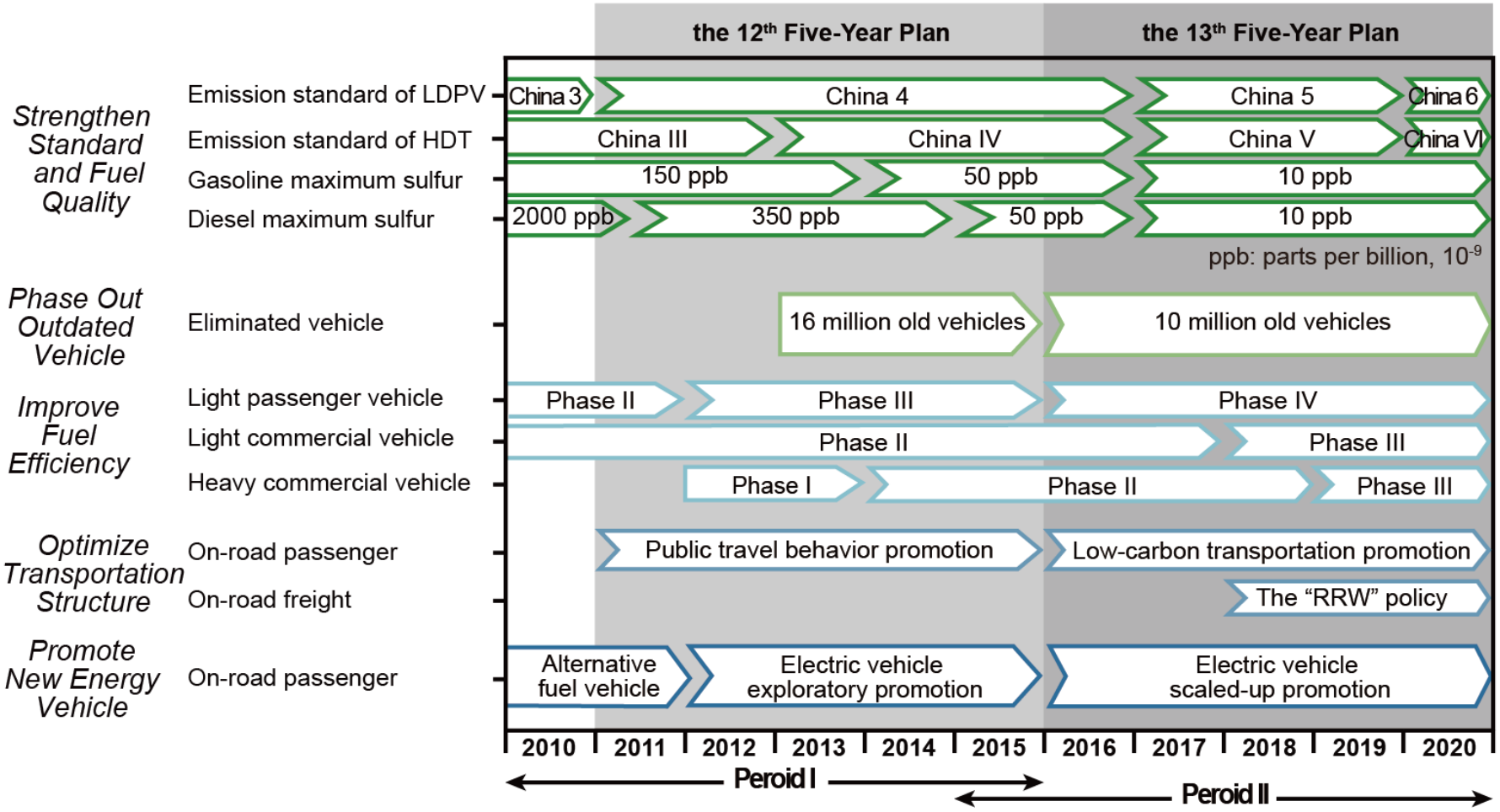
Coordinated efforts to reduce pollution and carbon emissions will serve as the steering wheel leading the green transition of China's economy

Air pollution and CO_2 share same roots

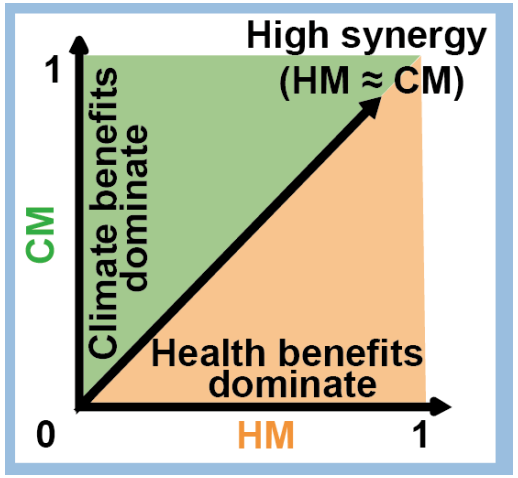


- In China, nearly all SO_2 and NOx emissions, ~50% of VOCs and ~85% of primary $PM_{2.5}$ (excl. fugitive dust) emissions, share same sources with CO_2 emissions.
- **Same emission sources serve as the scientific basis for synergetic control.**

Quantifying synergetic level of measures is important



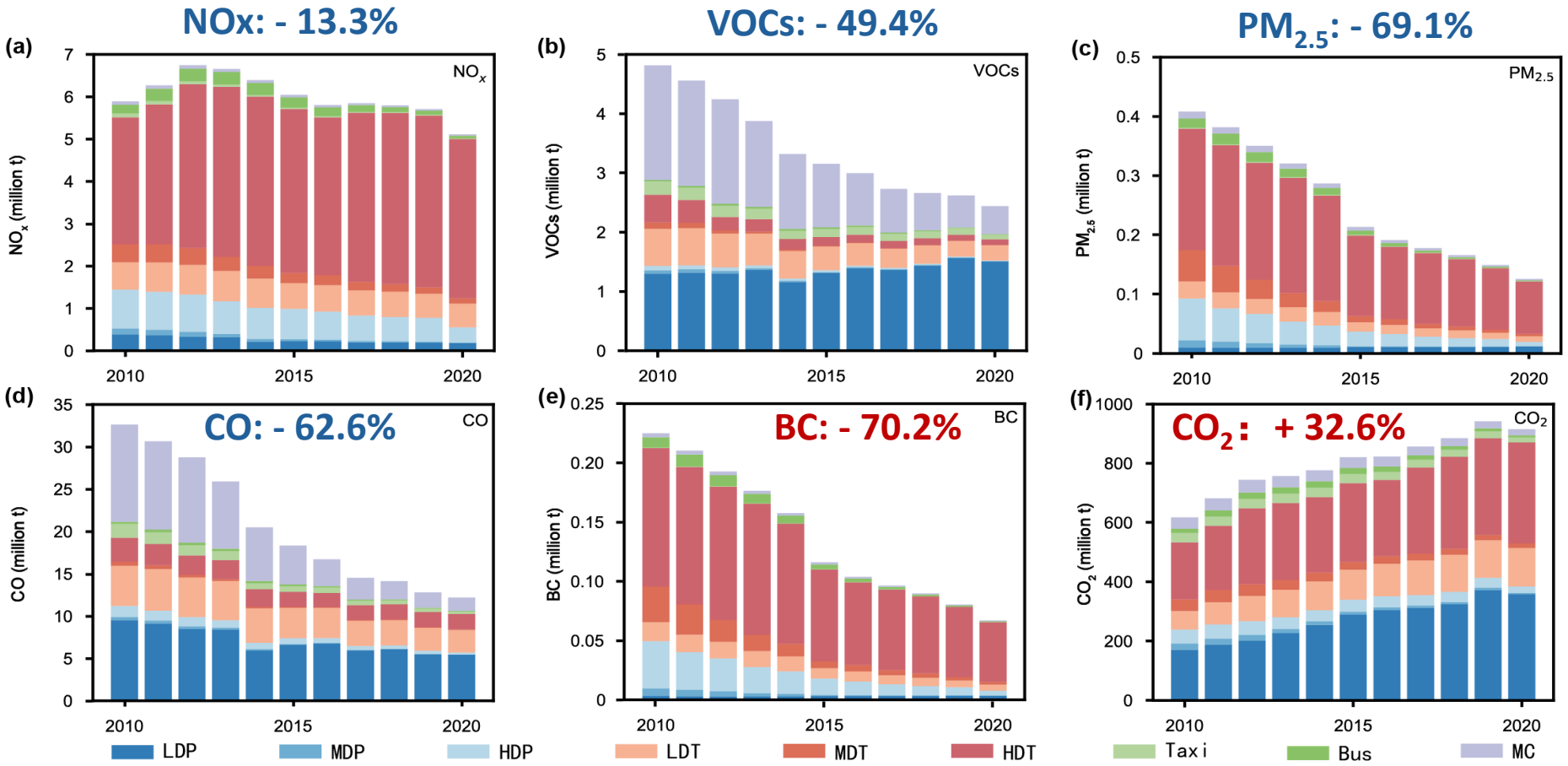
Policy-specific Synergy Index



2 dimensions:

- **AP-related health benefits**
- **GHG abatement**

Trends in China's on-road air pollutant and CO_2 Emissions

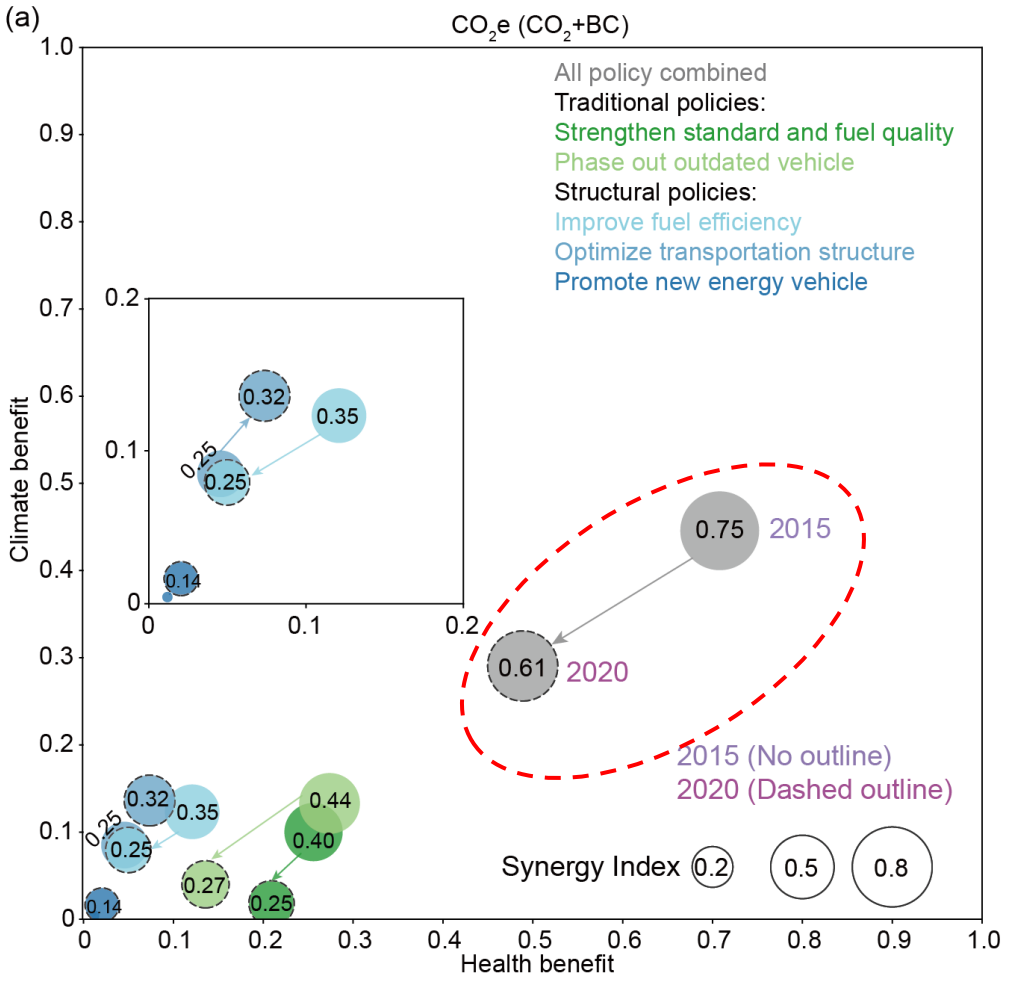


Air pollutants +

CO_2 emissions -

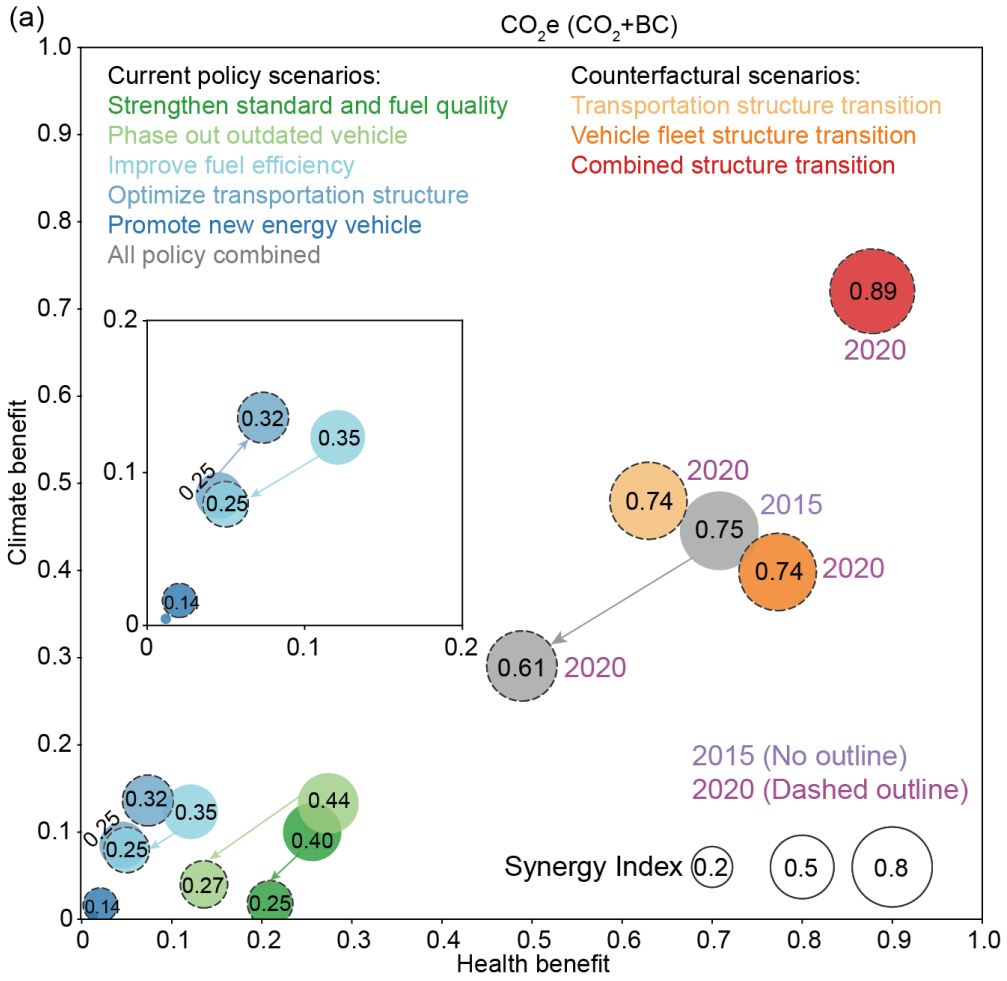
China's have effectively offset the air pollutant emissions from on-road transportation, challenges persist in curbing CO_2 emissions.

Decreasing trends in estimated Synergy Index



- The overall Synergy Index declined by ~20% from 2010-2015 to 2015-2020
- **Traditional policies** drove early synergies but declined over time
- **Structural policies** enhanced synergies but insufficient to offset the declining efficacy of traditional policies

Emerging role of structural transition



- **Strengthening transportation and vehicle fleet structure** in 2020 will substantially enhance overall synergies.
- Optimizing either the **vehicle fleet structure** or the **transportation structure** would both increase the overall Synergy Index approaching the Period I level.
- ***Combined Structure Transition*** **achieves a Synergy Index of 0.89—surpassing even the Period I level—with the highest climate metric and health metric**

Implications

- Co-control of air pollution and GHGs could serve as a **fundamental approach for global environmental governance**
- **Same emission sources** are the scientific basis for pollution-carbon synergetic control
- China’ s on-road transportation emission control policies achieved lower GHG emissions, cleaner air, and substantial public health benefits during 2010-2020, but **their synergies have been weakening**
- **Deep structural transitions** are urgently needed to sustain effective carbon and air-pollution co-control.
- **Scientific tools** for evaluating synergetic levels and optimizing co-control pathways are essential for future policymaking

BAQ 2026
BETTER AIR QUALITY CONFERENCE
11-13 MAR • BANGKOK

CLEAN AIR ASIA · ADB · CLIMATE & CLEAN AIR COALITION · ESCAP · UN environment programme

Thank you for listening!

zhengyx@caep.org.cn