



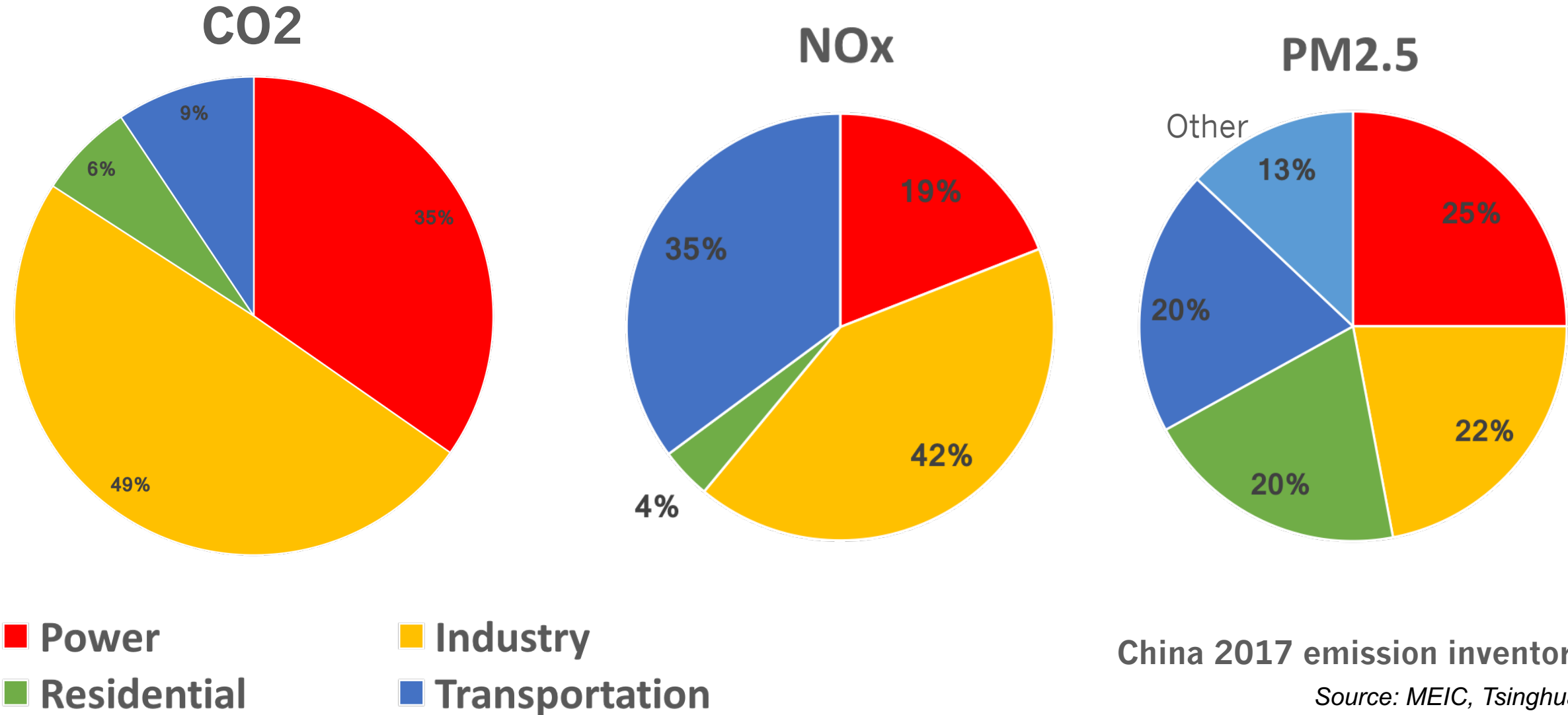
SUSTAINABLE ENERGY, PROSPEROUS FUTURE

Air Quality Task Force Strategy

People-Centered Air Quality Improvement as a Driver of GHG Reductions

This strategy was presented to EF China board in Dec 2020,
and subjects to regular updates.

The sources of CO₂ are also key sources of air pollution



China 2017 emission inventory

Source: MEIC, Tsinghua

(Note: based on air pollution sources inventory category)

Air and Climate Co-Benefits Triggered by PM2.5 — Beijing Example

PM_{2.5} at **800 μg/m³** in 2011, causing public concern

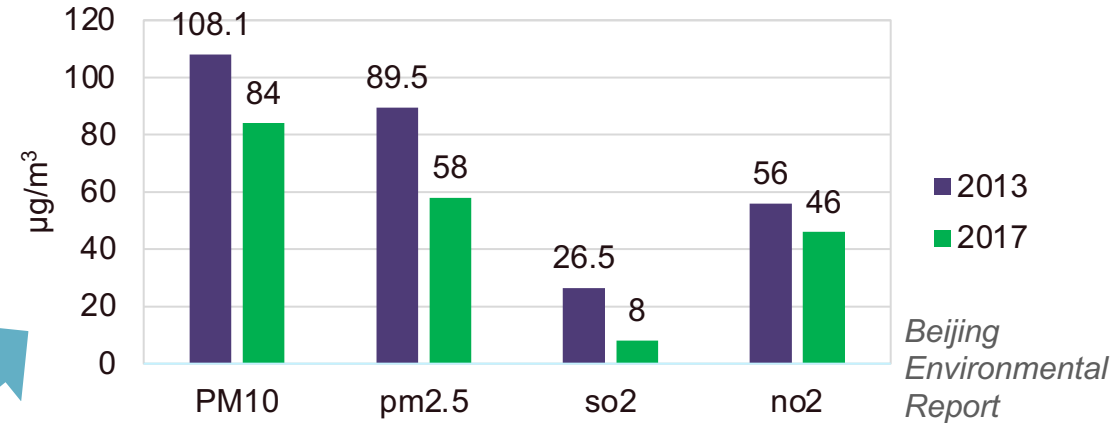


Social & political consensus---**high quality of Life & development**

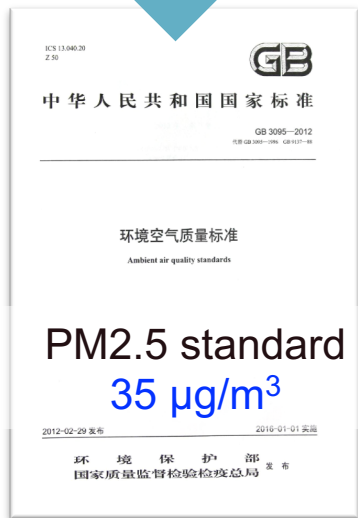
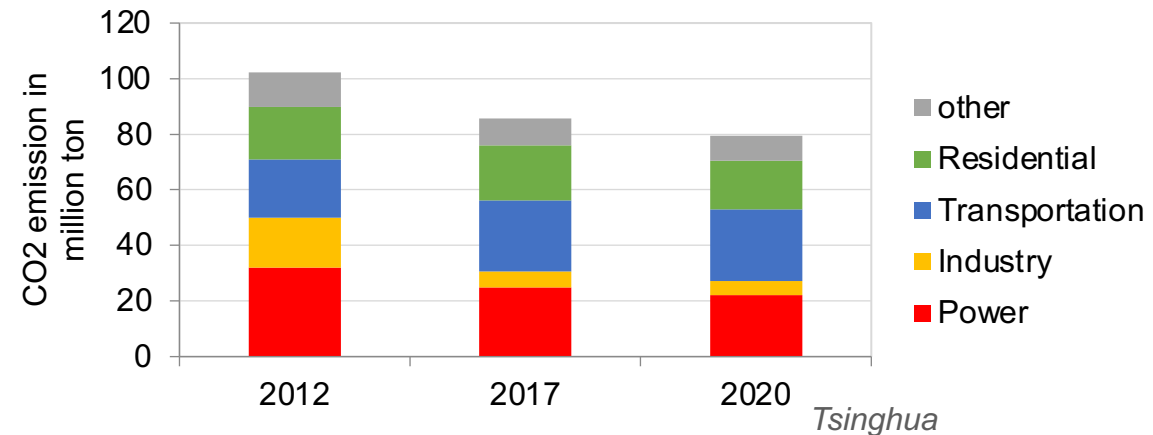
Air Pollution Control Action Plan
(2013-2017)

- 100% coal power plants closed
- 90% polluting enterprises shut down
- 100% old cars disassembled
- Reinforced regulatory framework

Beijing's pollutant concentrations during 2013-2017



20% CO₂ reduction in Beijing due to air quality policies

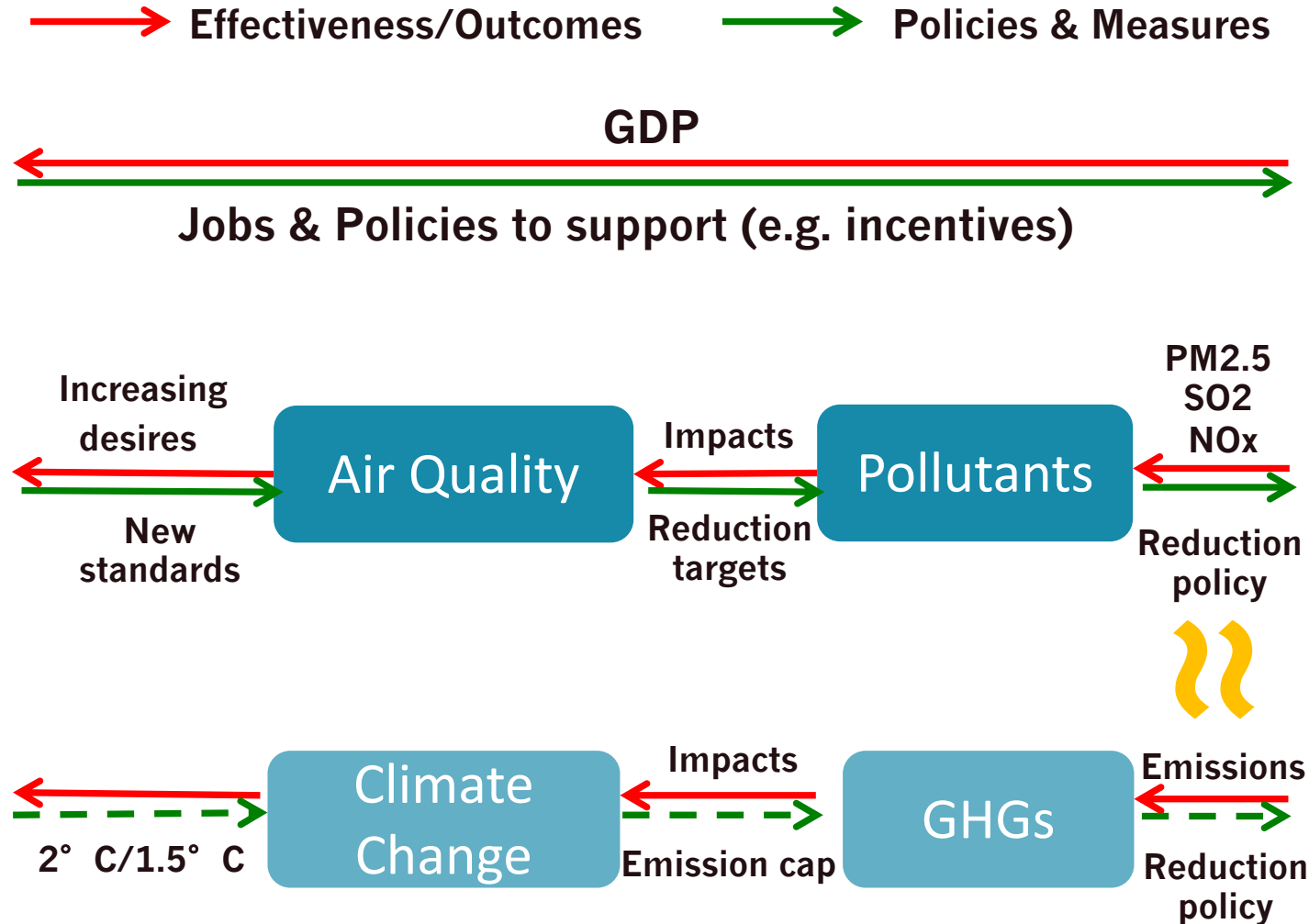


Air Quality Task Force Conceptual Framework

Air Quality as a Driver of GHG Reductions

Fundamental Drivers of Policy (triple goals)

- Sustainable Prosperity
- Demand for
 - 1) Health & Safety
 - 2) Amenity & Services (“Eco-Civilization”)
- Tackle Climate Change



Key Sectors

Energy

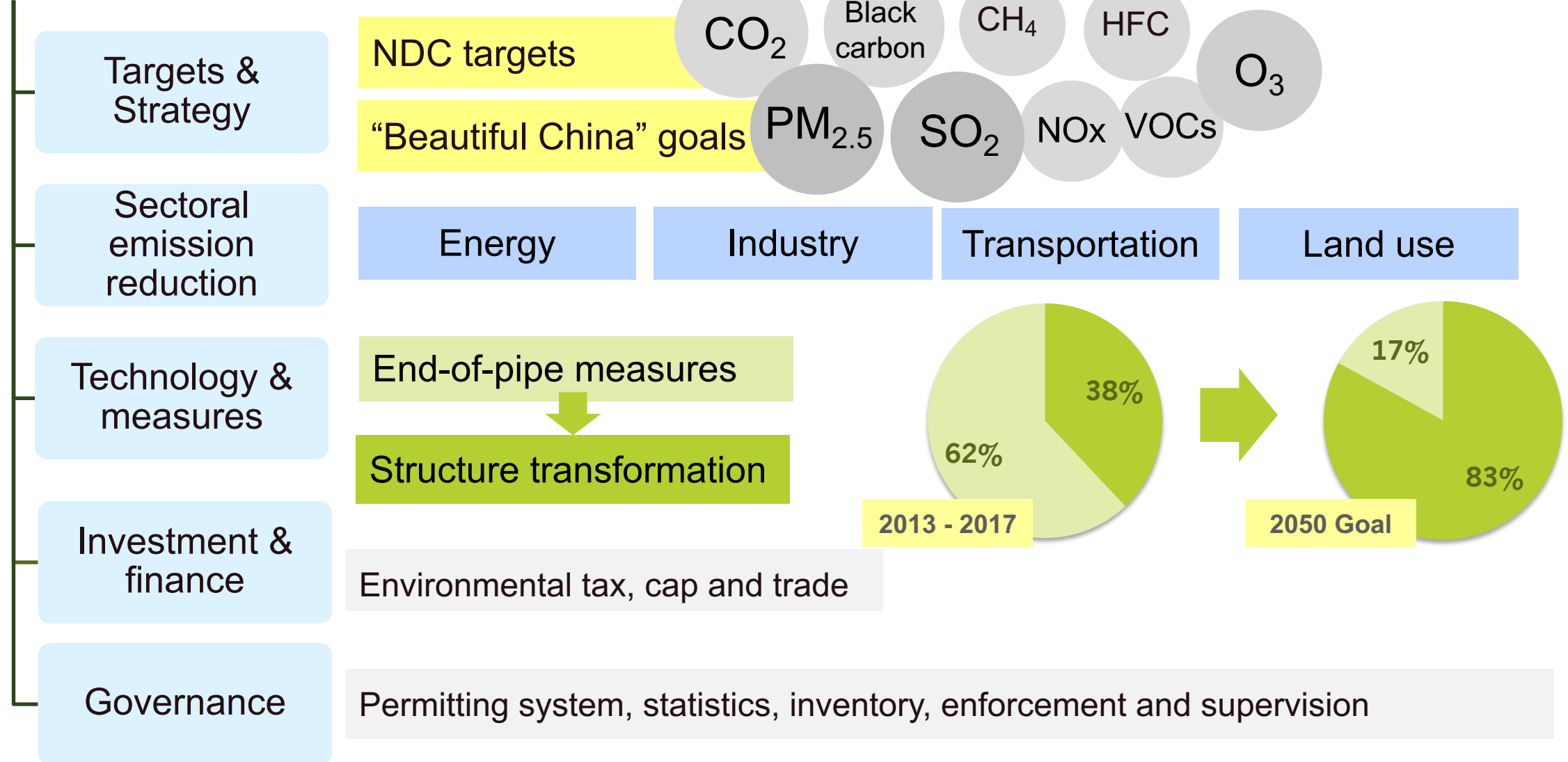
Industry

Transport

Land use

New Trigger 1: Comprehensive AQ and Climate Change Co-management system

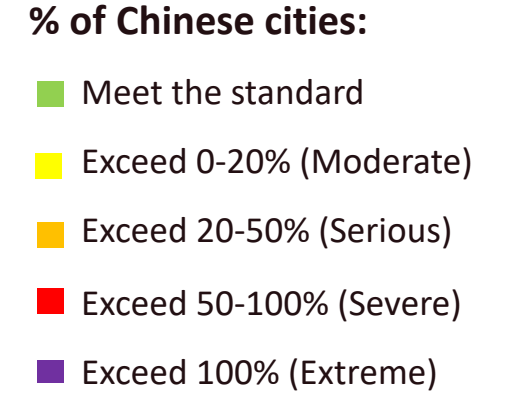
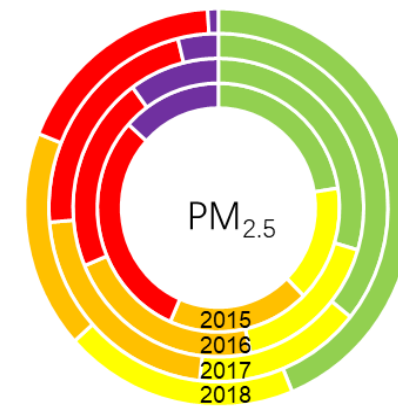
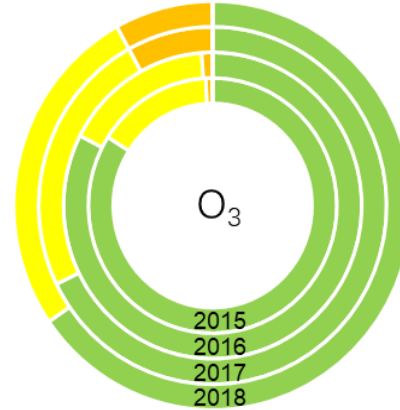
Synergy



New Trigger 2: More GHGs reductions will be triggered by new AQ standards

➤ Full attainment of current standards

- **PM_{2.5}**: Still the primary pollutant
- **O₃**: Getting worse



Source: CAEP, funded by EFC

➤ Tighten up standards

| Pollutant | Averaging time | China | US | WHO | | | Guideline |
|-------------------|----------------|-------|-----|------|------|------|-----------|
| | | | | IT-1 | IT-2 | IT-3 | |
| PM _{2.5} | annual mean | 35 | 12 | 35 | 25 | 15 | 10 |
| | 24 hours | 75 | 35 | 75 | 50 | 35 | 25 |
| O ₃ | 8 hours | 160 | 137 | 160 | | | 100 |

➤ Improve assessment methods

| | China | US |
|------------|--|--|
| Time | annual average | annual and daily average |
| Space | Use arithmetic mean of multiple sites to assess an area or city | Use highest monitoring record from individual monitor station |
| indicators | Mainly PM_{2.5} | PM _{2.5} /O ₃ /PM ₁₀ /NO ₂ ... |

To make changes, there are barriers...but there are also opportunities

- limited ambition to achieve the WHO standard
- Lack of comprehensive co-control

Governance & Policy

- “Ecological Civilization”
- Strong regulatory framework for air quality

- High costs for air quality Improvement
- Middle class expansion
- Rapid urbanization

Economic & Energy

- Economic “New Normal” - high quality
- Better air quality can increase labor force productivity and reduce health care costs in an aging society

- High pollution concentrations in disadvantaged communities

Social

- Strong demand for better air quality
- Moderately prosperous society

Turn the pandemic into an opportunity for a healthy and resilient future



Strong demand for better public health

- More localized studies on human health for stringent air quality standard and faster attainment
- Strong actions on environment and public health improvement
- Investments in health sector to support green growth

Green economic stimulus policies

- Opportunities for sectoral upgrading and infrastructure development:
 - **Energy:** promote clean energy infrastructure in disadvantaged areas
 - **Industry:** phase out high polluting industries
 - **Transportation:** hasten transition from road to rail freight transportation

Air Quality Task Force Vision

Fulfill the demand for high quality of life by pursuing world-class air quality in China, to achieve:

- Climate safety: $1.5^{\circ}\text{C} / 2^{\circ}\text{C}$
- “Beautiful China” PM2.5 goal: $10\mu\text{g}/\text{m}^3$
- Sustainable economic development

Goal: Stricter Standards---Faster Improvement---More GHGs Reductions

| Year | PM _{2.5} | | | | | | Ozone | | | | | CO ₂ | |
|------|-------------------|-----|----|-----|----------|-----|----------|-----|-----|-----|-----------|----------------------|------------------|
| | Standard | JJJ | BJ | YRD | National | GBA | Standard | JJJ | YRD | PRD | National | National million ton | Compared to 2005 |
| 2018 | 35 | 60 | 51 | 44 | 39 (43%) | 31 | 160 | 199 | 165 | 160 | 151 (65%) | 10434 | 170% |
| 2020 | 35 | 51 | 38 | 39 | 33 (60%) | 28 | 160 | 180 | 152 | 148 | 138 (69%) | 10440 | 173% |
| 2025 | 25 | 40 | 28 | 30 | 22 (80%) | 21 | 160 | 176 | 146 | 142 | 135 (78%) | 9500 | 155% |
| 2030 | 15 | 31 | 23 | 24 | 17 (95%) | 15 | 140 | 149 | 123 | 120 | 110 (95%) | 7200 | 117% |
| 2040 | 10 | 22 | 16 | 19 | 12 (88%) | 10 | 120 | 125 | 105 | 100 | 100 (95%) | 4500 | 74% |
| 2050 | 5 | 10 | 10 | 8 | 7 (74%) | 6 | 100 | 100 | 90 | 80 | 89 (95%) | 600 | 10% |

Source: EFC & Tsinghua; percentages indicate cities meeting that standard.

Theory of Change

Inputs/activities

Standards

- Air quality criteria, standards, and assessment

Sources

- Energy
- Industry
- Transportation
- Land use
- City & Rural

People

- Enhance awareness
- Innovative policy and governance

Venues

- MEE
- NHC
- Government-affiliated think tanks

- State Council
- MEE
- NDRC
- MIIT
- MOT
- MNR
- MOHURD
- MOF
- Governments

- MEE research departments
- NGOs, private sector and the public

Key outcomes

- World-class AQ standard
- AQ criteria
- Assessment

- 14th FYP
- “Beautiful China” strategy
- Sectoral emission control
- City/rural AQ attainment

- Stronger demand for better air quality and public health

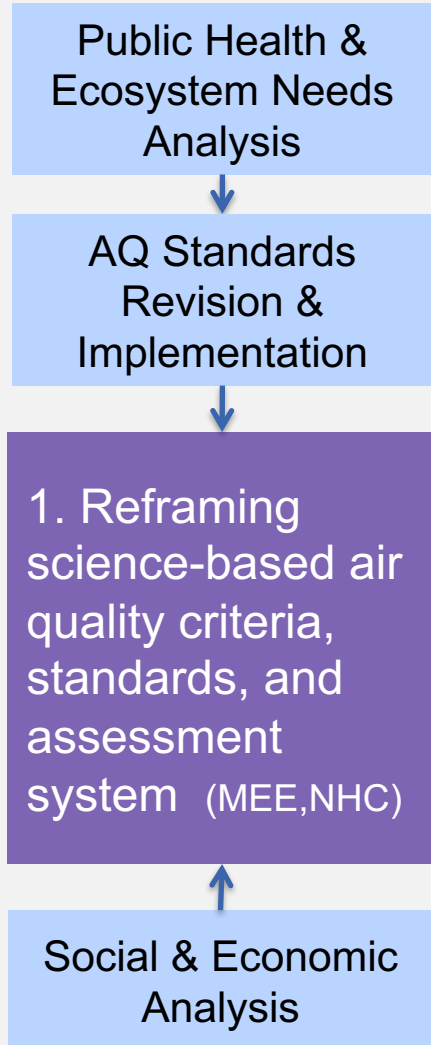
Impacts

Humans' High Quality of Life:

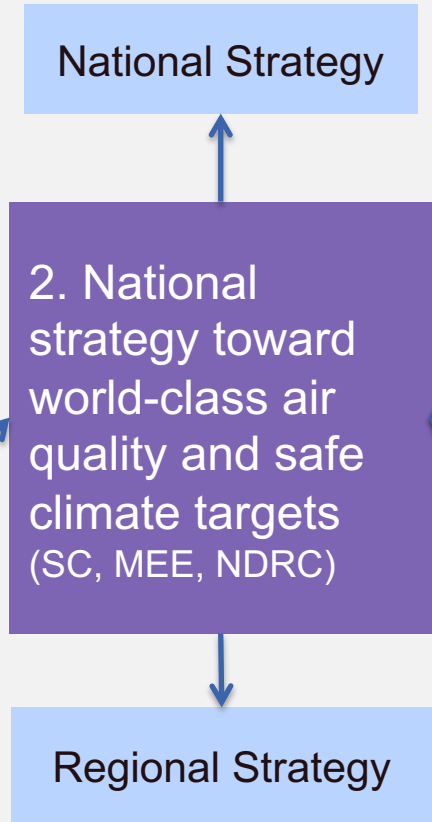
- World-Class Air Quality
- Climate Safety
- Sustainable Economic Development

Logic Model

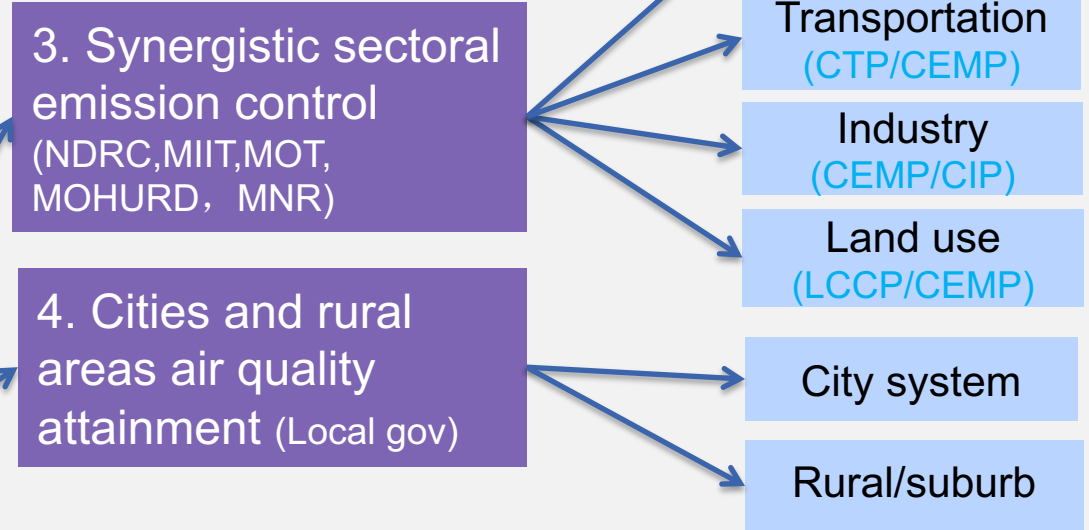
Scientific recognition



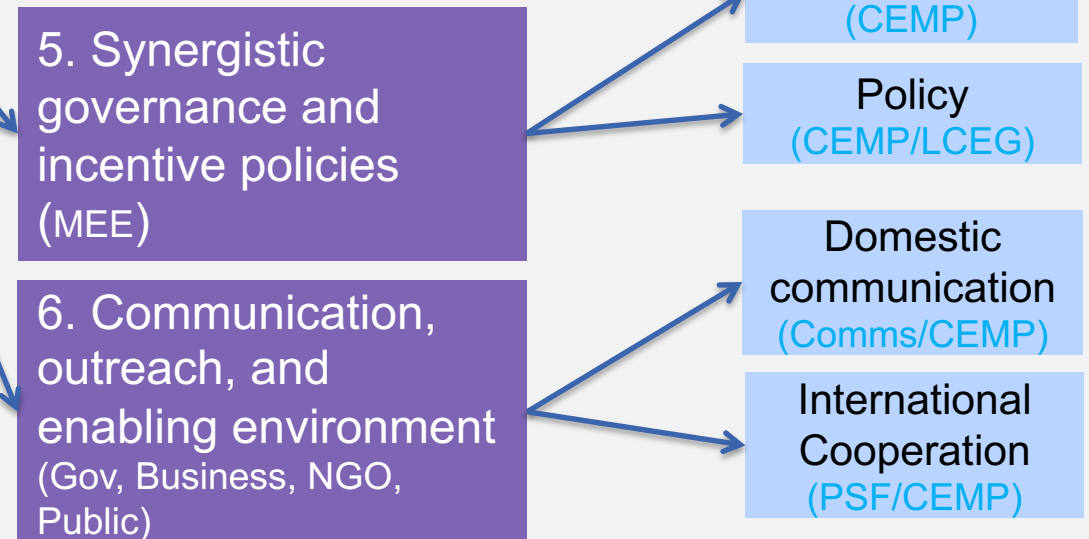
Top Line design



Synergistic emission reduction measures and technologies



Supporting measures



Initiative 1: Reframing **science-based** air quality **standards** system

Major tactics

- Promote public health and ecosystem needs analysis
- Support **social and economic impacts** analysis
- Support studies to help MEE accelerate its process of **establishing AQ criteria** and **conducting AQ standard revision**

Key outcomes by 2025

- Standard: PM_{2.5} limit updated to **25 µg/m³ by 2022, 10 µg/m³ as criteria**
- More ambitious goals: **20%+ PM_{2.5} reduction**, and **ozone as an indicator** into 14th FYP
- Local **Value of Statistical Life (VSL)** identified to project health benefits

Initiative 2: **National strategy** toward air quality and climate change **co-control**

Major tactics

- Develop **national air quality and climate change co-control strategy** and **roadmap** to achieve medium- and long-term goals e.g., “Beautiful China”
- Allocate **sectoral/provincial emission reductions** based on air quality targets
- Develop co-management strategy and planning in **key regions**

Key outcomes by 2025

- **Co-management targets and guidance** on GHGs developed and included in China’s national policies
- **Sectoral emission reduction targets** clearly defined and allocated in key sectors
- **Beijing-Tianjin-Hebei, Greater Bay Area, & Yangtze River Delta regions co-management plans** developed and implemented

Initiative 3: Key sectoral emission control

Major tactics

- Optimize energy structure to **phase out coal**
- Adjust transport structure to **reduce oil consumption**
- Control **coal/petrochemical-related industries** to control ozone, and reduce PM, CO₂ and non-CO₂ GHG
- Optimize land use structure by implementing **nature-based solutions**

Key outcomes by 2025

- Coal cap policy/phase out disaggregated coal
- Limit vehicle fuel consumption increase
- Reduce industrial coal consumption
- Reuse rate of agricultural stalks reach 85%

Initiative 4: Cities and rural areas air quality improvement

Major tactics

- Promote **air quality attainment planning** in all non-attainment cities and achieving higher goal for top runner cities, with integrated carbon targets and co-management measures
- Improve rural air quality and pursue environmental equity to phase out **disaggregated coal, scattered industries**, and reduce **agriculture emission** e.g., NH₃ and CH₄

Key outcomes by 2025

- **Cities: 100% PM_{2.5} attainment** plans developed, with **80% and 44%** of cities meeting more stringent **35 μg/m³ and 25 μg/m³** targets, respectively;
- **Rural: PM_{2.5} and SO₂** reduced by 30%
- Multi-pollutants co-management measures and tools demonstrated in non-attainment cities
- Disaggregated coal phased out in plain areas; scattered industries phased out

Initiative 5: Innovative **governance, policy, and technologies**

Major tactics

- Design and improve a core **regulatory framework** —a permit system to integrate GHGs
- Promote innovative **co-management policies, e.g., cost-benefit analysis** (to evaluate health and climate benefits), cap & trade, taxes, fees and funds
- Develop **innovative technologies** and tools

Key outcomes by 2025

- Include GHGs in pollutant emission **inventory, statistics, and permit** systems
- Establish a **best available control technology** (BACT) system focusing on NOx and VOCs control
- Improve **inspection and enforcement** mechanisms with application of new technology such as big data, low-cost sensors, remote sensing, and A.I.

Initiative 6: Communication, outreach, and enabling environment

Major tactics

- Enhance domestic communication between **Chinese government officials, research institutes, NGOs, business sectors, and the public.**
- Support **international cooperation** and experience-sharing
- Assist Chinese government to enhance **capacity building**

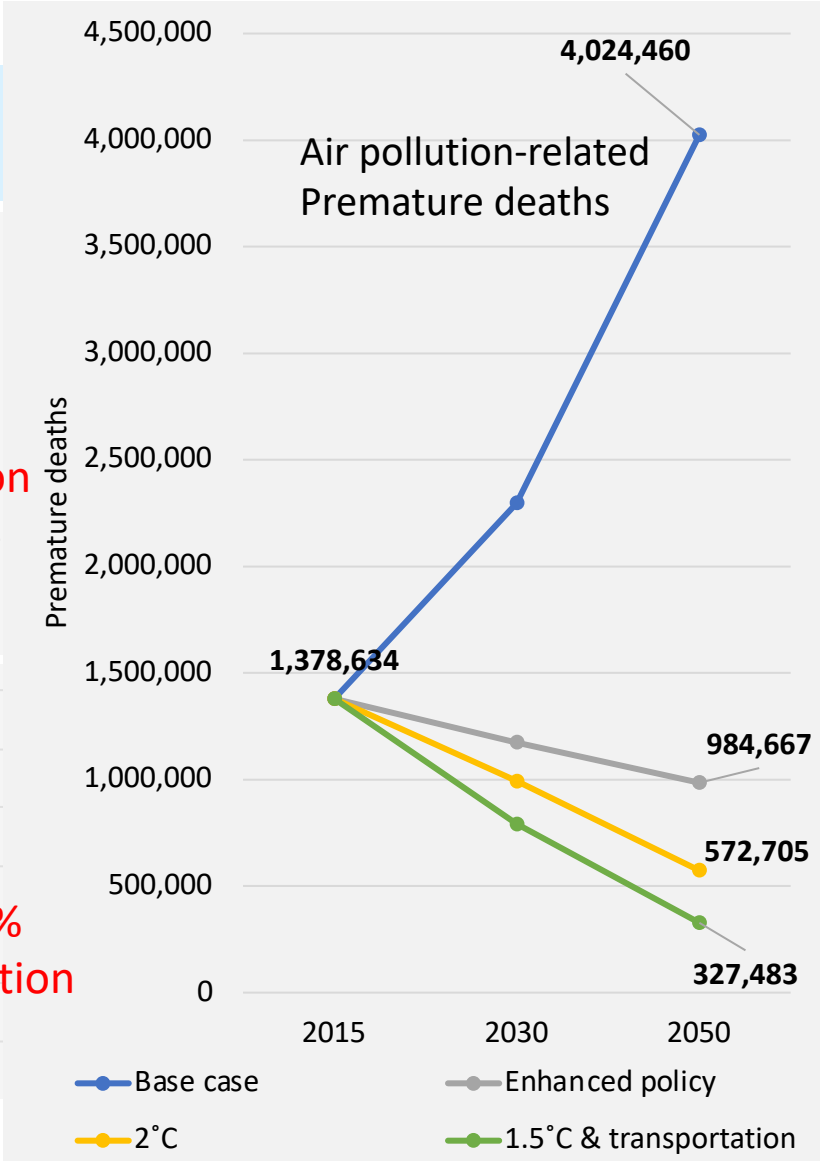
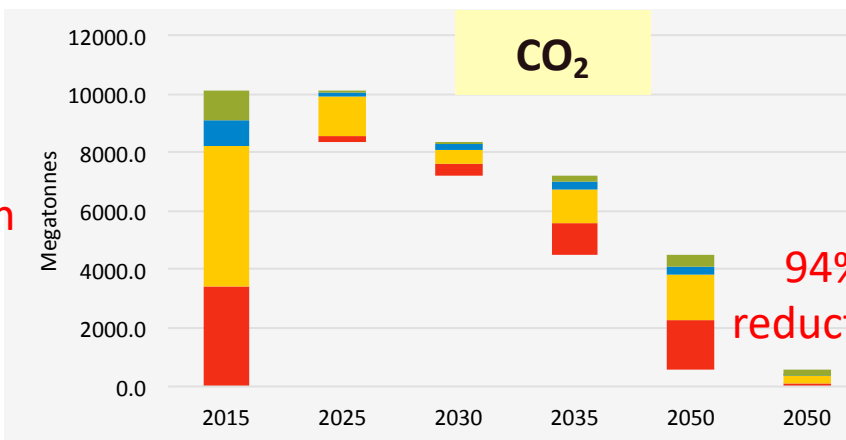
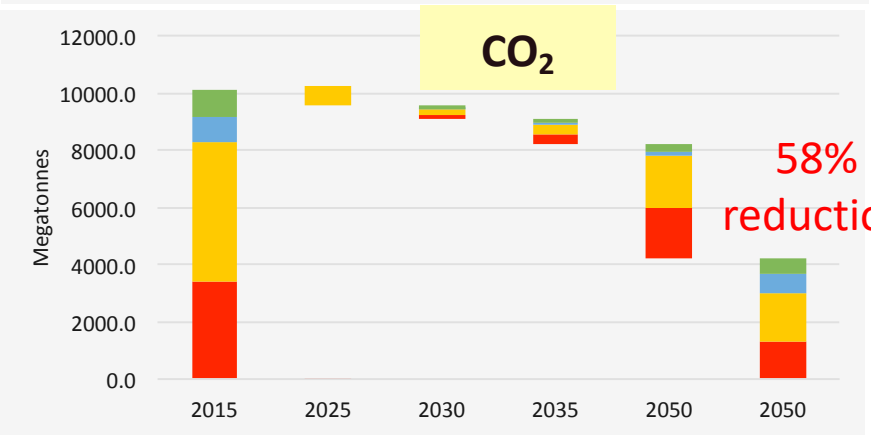
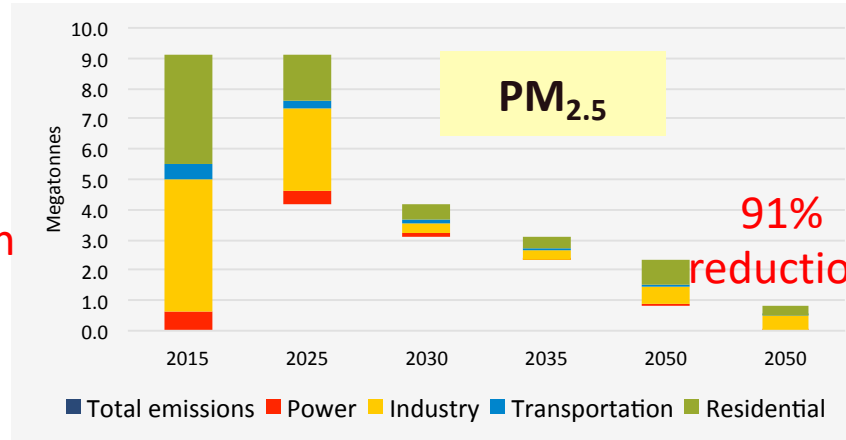
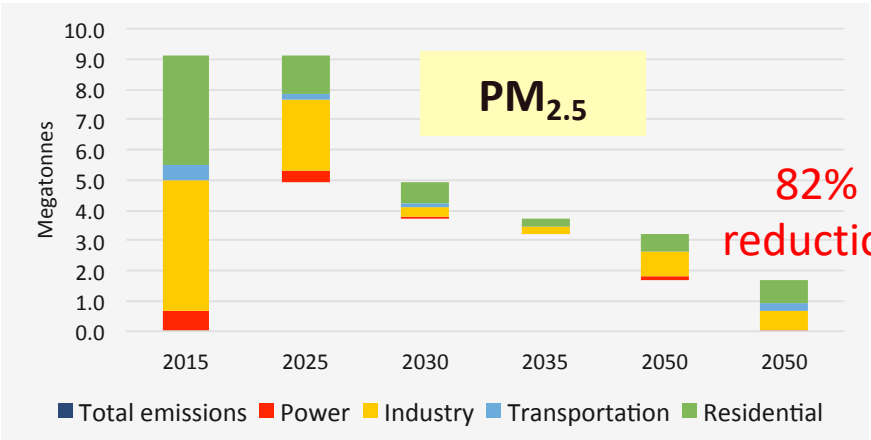
Key outcomes by 2025

- Governments: develop co-management and advanced air quality management experience
- Public: **> 80%** of people in key cities show willingness to tighten air quality standards
- Domestic NGO cooperation and engagement is deepened
- International cooperation on AQ field **in BRI and TRACKII** fields is deepened

Better Air Quality for the People will bring Safer Climate for the World

15 $\mu\text{g}/\text{m}^3$ (WHO IT-III) --- 2°C with 58% reduction of CO₂

10 $\mu\text{g}/\text{m}^3$ (WHO Guideline) --- 1.5°C with 94% reduction of CO₂



Thank you!
[For better air quality and a climate safe planet]

