Climate change and other environmental issues including health

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Electric vehicles' health and climate benefits in China and India (09/2019 – 08/2021)

- Transport sector model (AIM/Enduse?)
  - Simulating the vehicle fleet under different scenarios in India and China
- GAINS model
  - Estimating future air pollutants emissions towards 2050
- CMAQ model
  - Simulate annual average $PM_{2.5}$ and ozone concentrations in China and India
- IMED/HEL model
  - Quantify the health and economic effects of ambient air pollution caused by $PM_{2.5}$ and ozone pollution
- IMED/CGE model
  - Simulate the macroeconomic impacts
- Cost-benefit analysis (CBA)
  - CBA of EV development in GHG reduction, air quality improvement and human health.
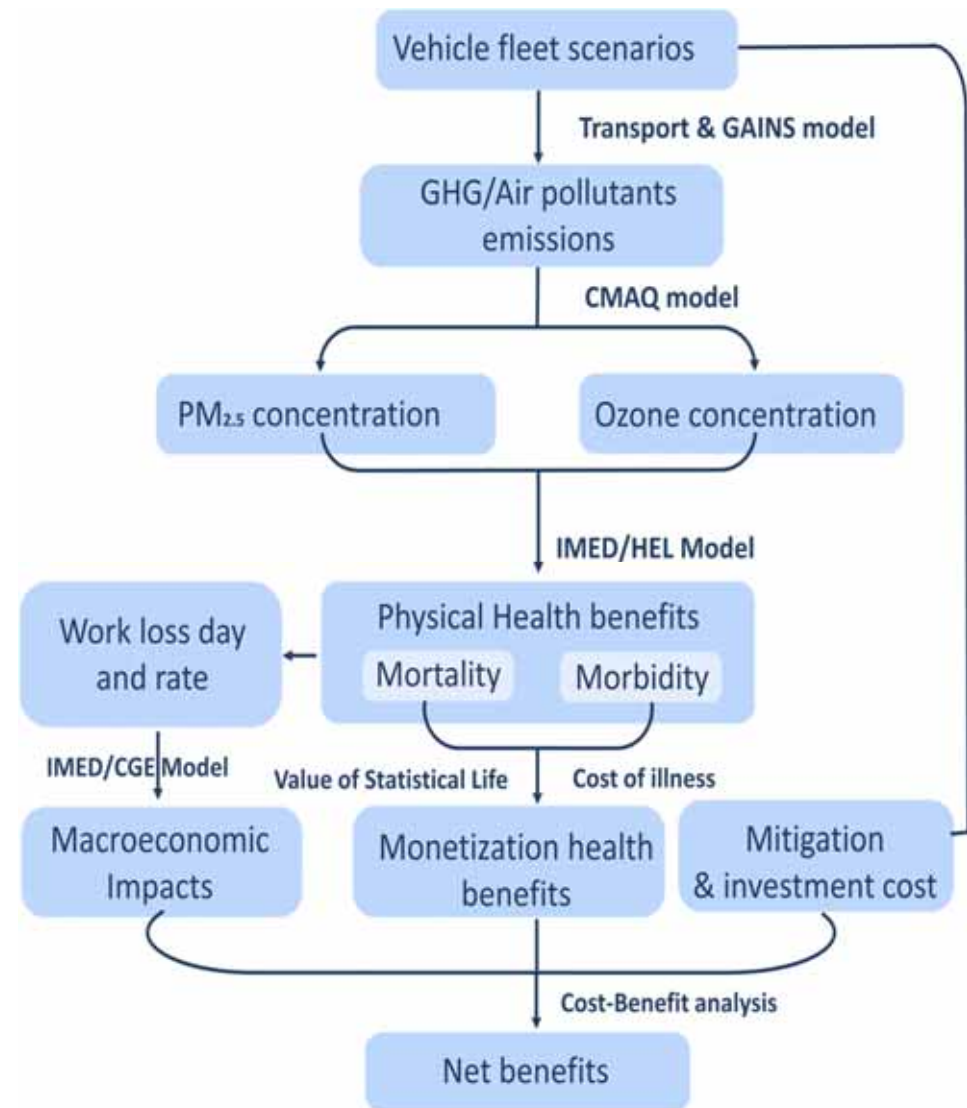
Health co-benefits of climate change mitigation at the national and global levels (1-2 years)

- Emissions pathways under 1.5-degree target until 2100
- Air chemistry transport model
  - Simulate annual average $PM_{2.5}$ and ozone concentrations in national and global level.
- IMED/HEL model
  - Quantify the health and economic effects of ambient air pollution caused by $PM_{2.5}$ and ozone pollution
- IMED/CGE model
  - Simulate the macroeconomic impacts
- Cost-benefit analysis (CBA)
  - CBA of climate mitigation in GHG reduction, air quality improvement and human health.
  - Could be expanded to SEA countries
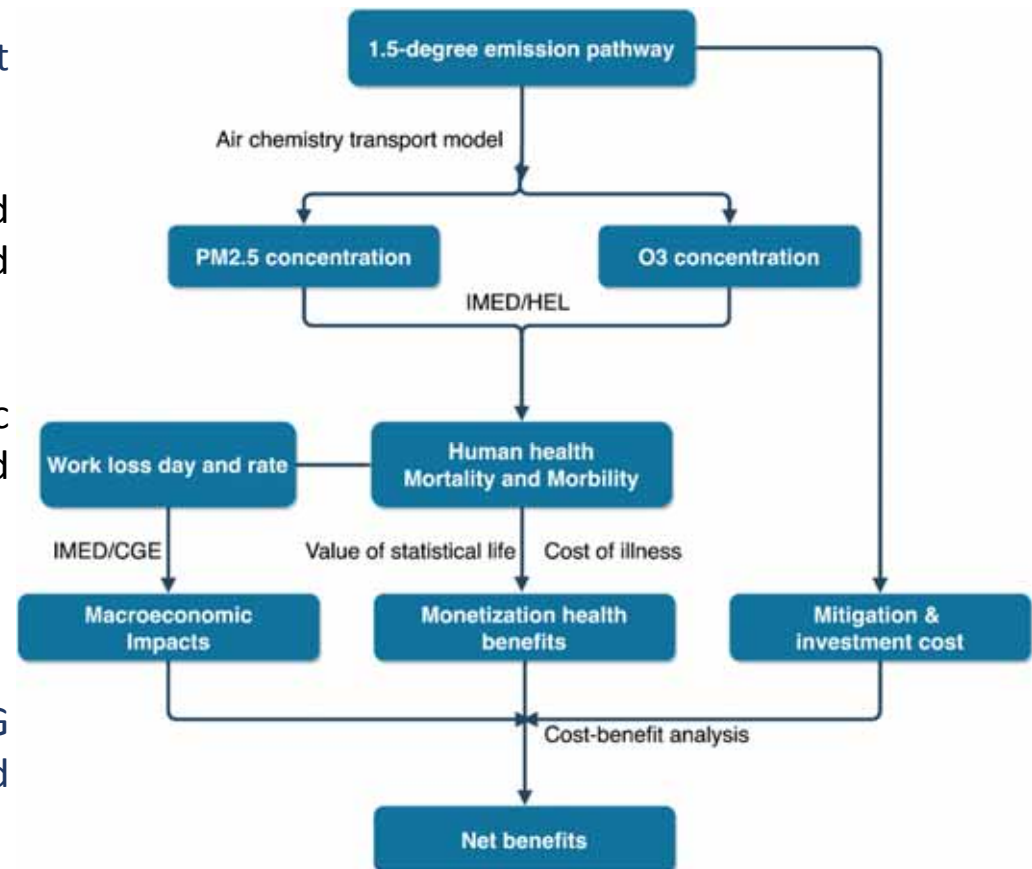
Environmental target of Guangdong-Hong Kong-Macao Greater Bay plan

Target   Intensifying joint multi-pollutant of $PM_{2.5}$ and O_3

World class Bay Area

| San Francisco	Tokyo Bay	New York Bay	Shenzhen
$PM_{2.5} < 12$ μg/m³ 8h-$O_3 < 137$ μg/m³	$PM_{2.5} < 15$ μg/m³ 8h-$O_3 < 60$ ppb	$PM_{2.5} < 12$ μg/m³ 8h-$O_3 < 137$ μg/m³	WHO-II? WHO-I?

How to Cope with the Triple Challenges of Energy Growth, Environmental Pollution and Climate Change in Asia (2-3 Years)

Four Objectives

- Achieving the **near-zero** carbon emission target
- Achieving the international level of **air quality** in the Great Bay Area by 2025-2030
- Developing energy-saving & environmental friendly industries to 5-10% of GDP by 2025-2030.
- Achieving the international level of clean energy structure by 2030

Outcomes

- Energy consumption, pollutants and carbon emissions
- Future industry and economic situation
- Policy Measures
- Energy technology innovation roadmap
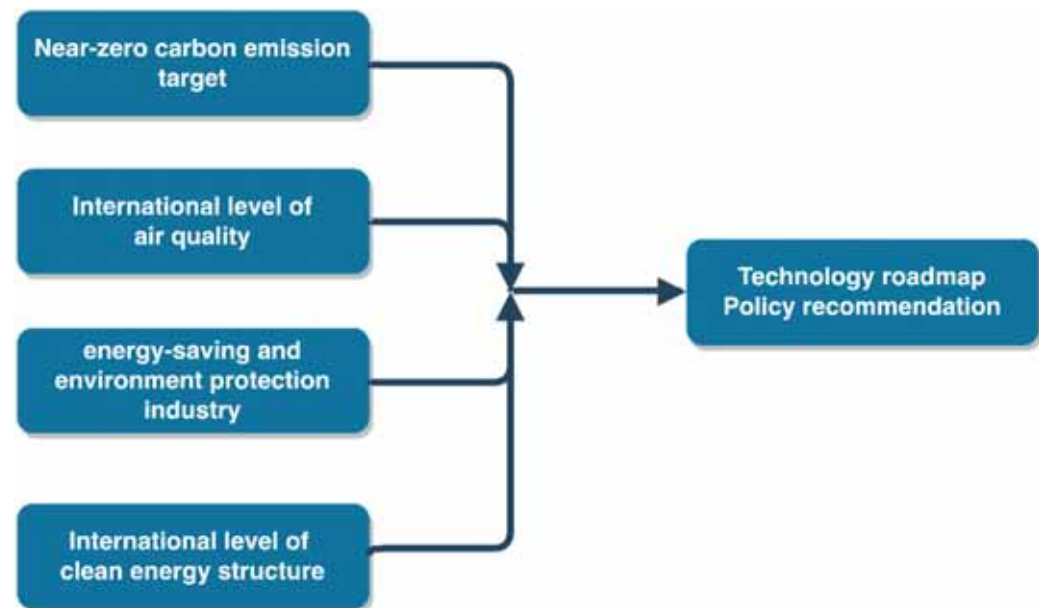
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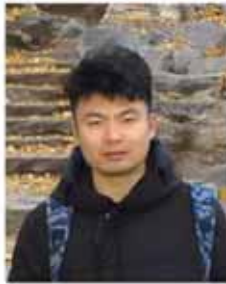
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