

China's Modeling Activities from IPAC in 2022-2023

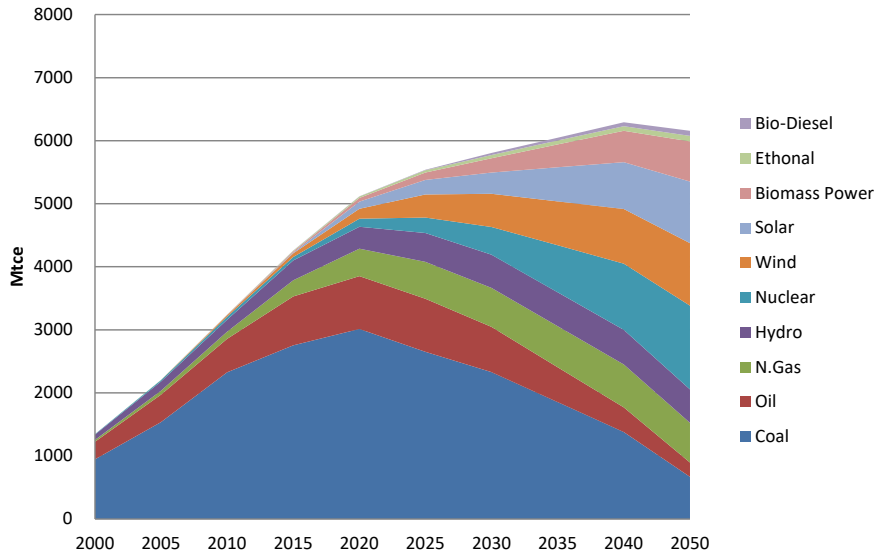
Hu Xiulian, Jiang Kejun

Energy Research Institute

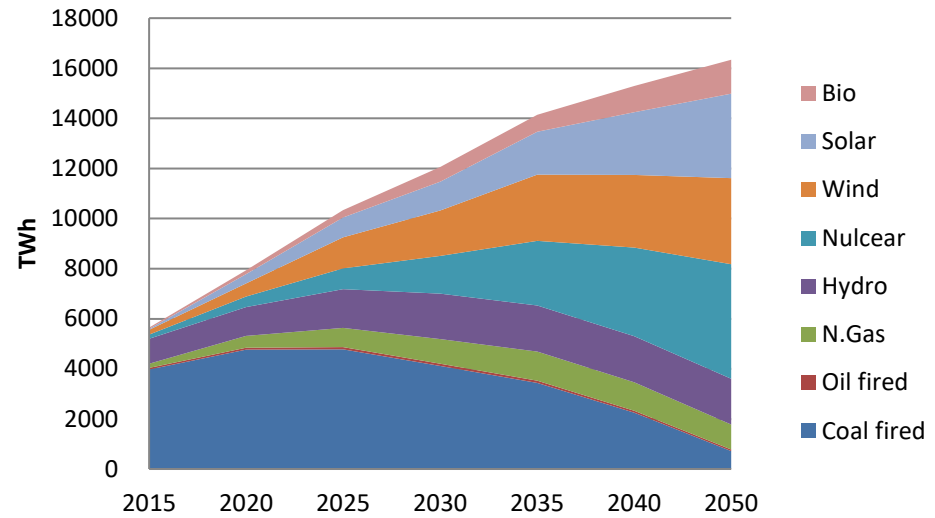
Recent studies by IPAC

- **SLCP/SLCF scenarios**
- **Low natural gas scenarios**
- **High security of power supply pattern in 2050**
- **Green hydrogen in China**
- **Green hydrogen based ammonia in China**

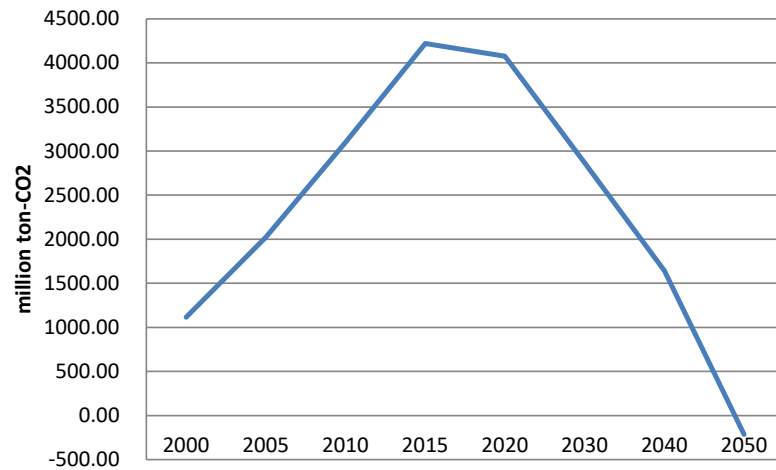
Primary Energy Demand



Power Generation

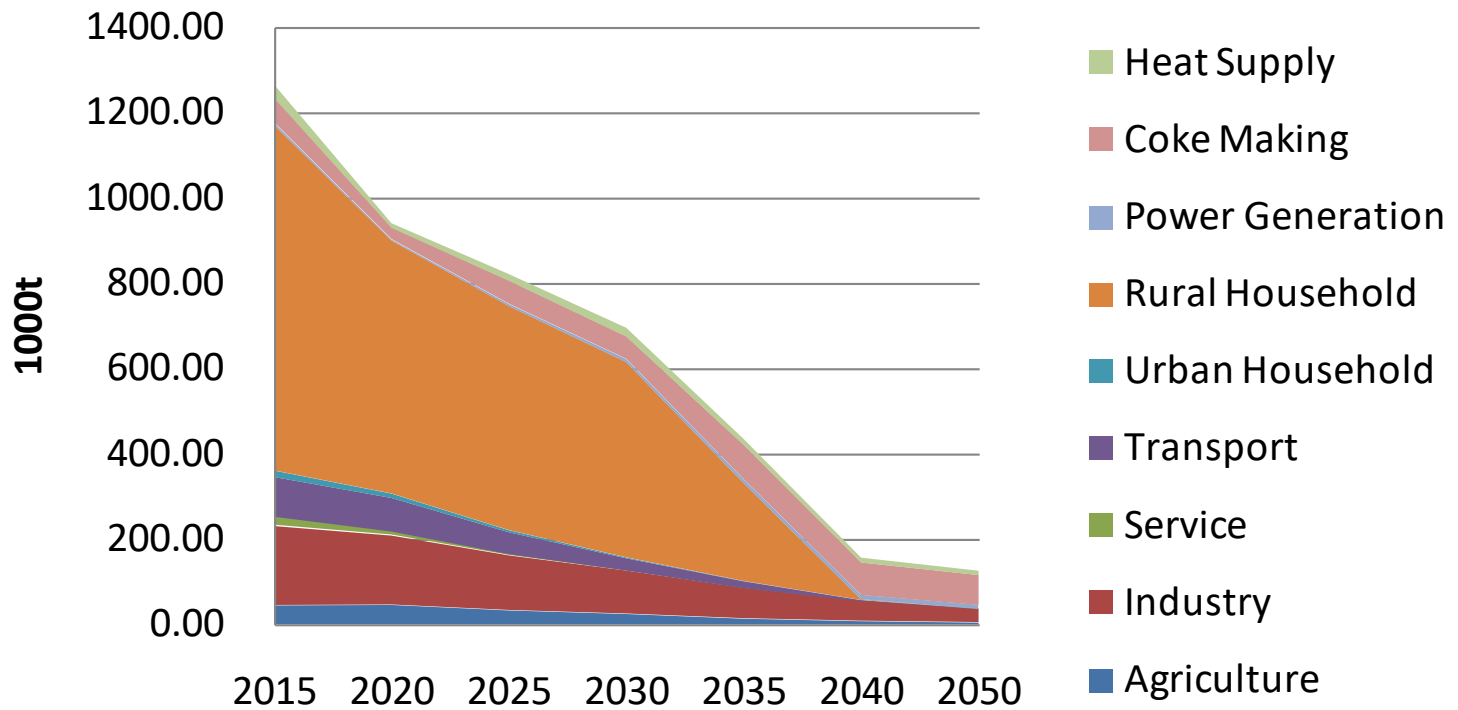


CO2 emission in power sector



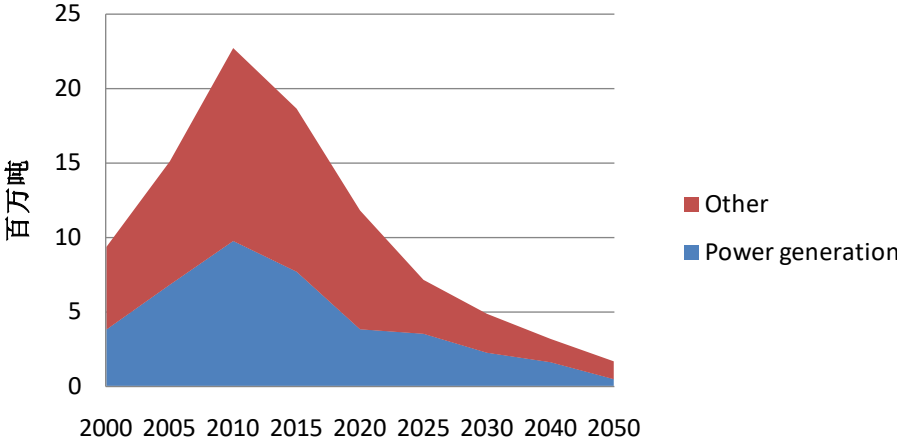
BC Emission

黑炭排放

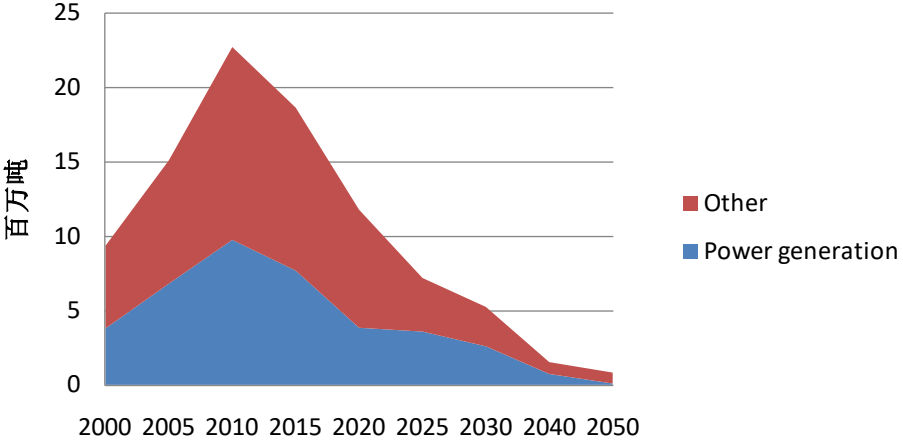


Nox Emission

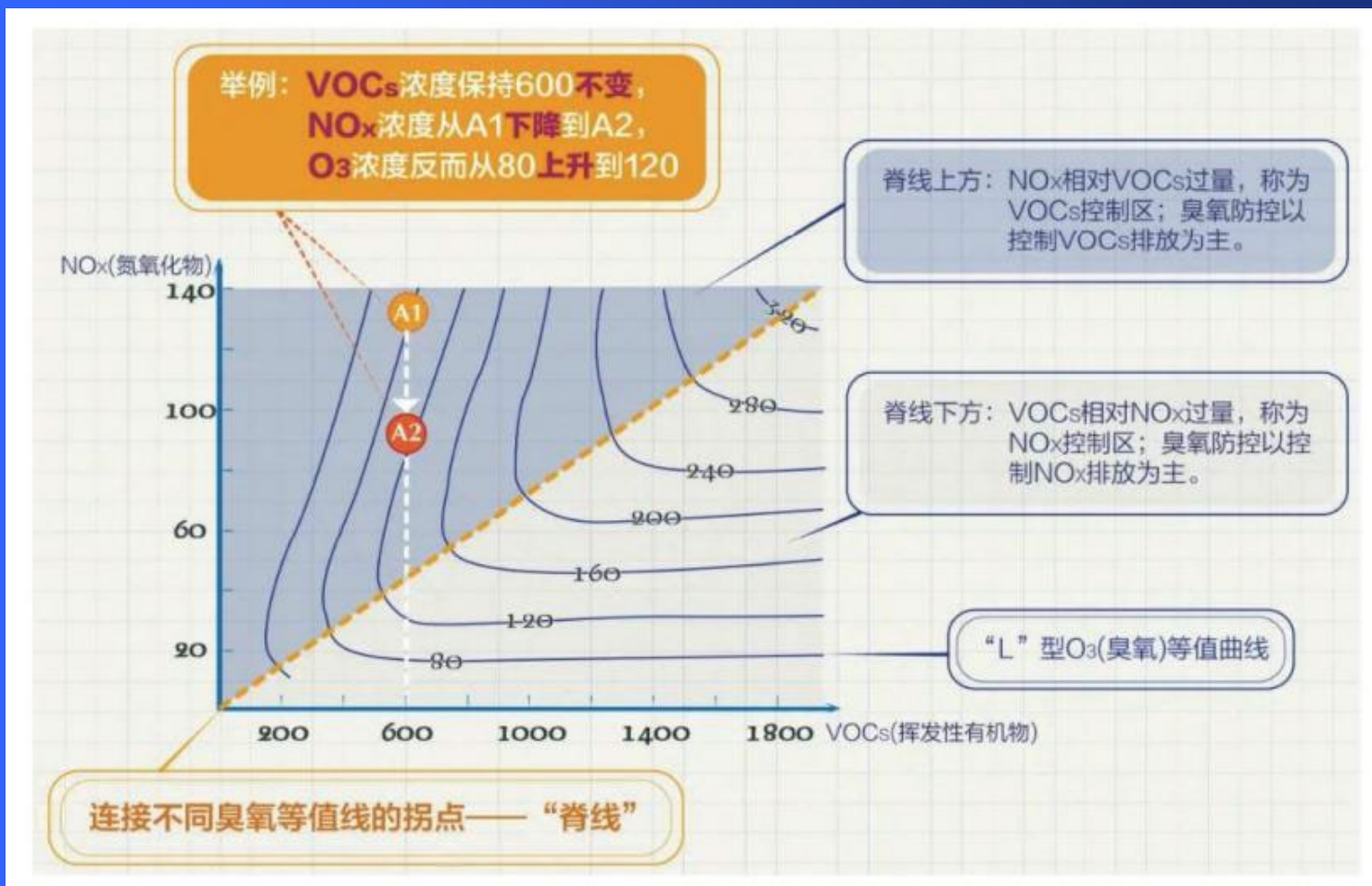
NOX排放



NOX排放：低排放情景



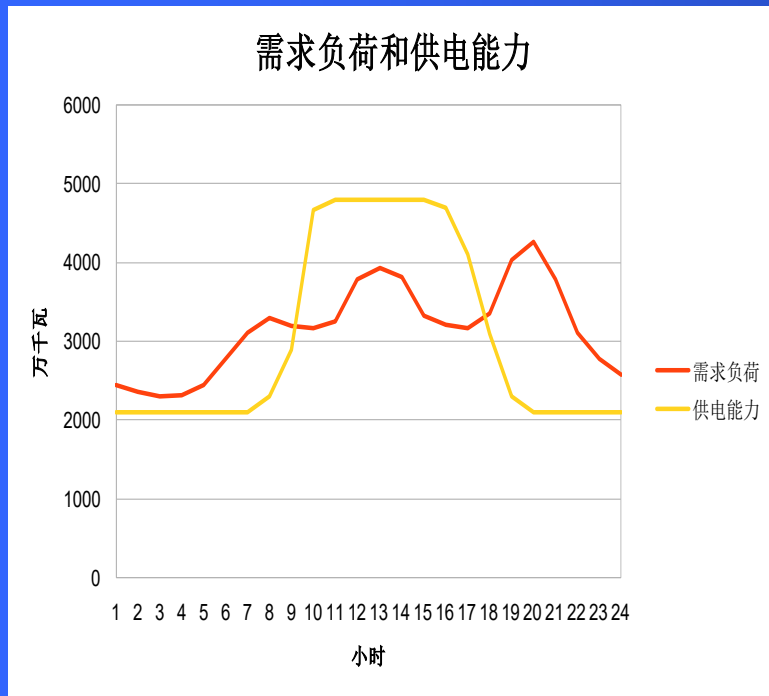
O₃, Nox and VOC



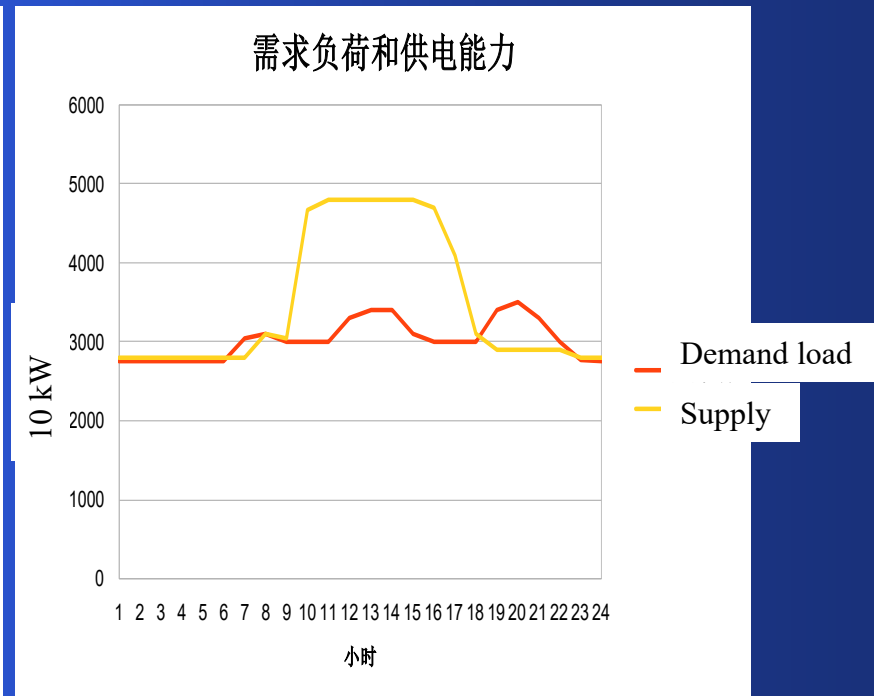
O₃ concentration

Pollution concentration ($\mu\text{g}/\text{m}^3$)	MDA8				
	2015	2020	2030	2040	2050
Beijing-Tianjin-Hebei	154.9	136.7	102.2	91.2	81
Yangtz River delta	118.3	95.4	66.4	58.6	51.1
Zhujiang River Delta	163.5	132	93.1	81.1	71.1
Sichuan-Chongqng	130.2	99.6	69.6	61.3	54
Fengwei	123.2	100.7	73.9	65.7	58

Power supply and demand load curve in Beijing for selected two days

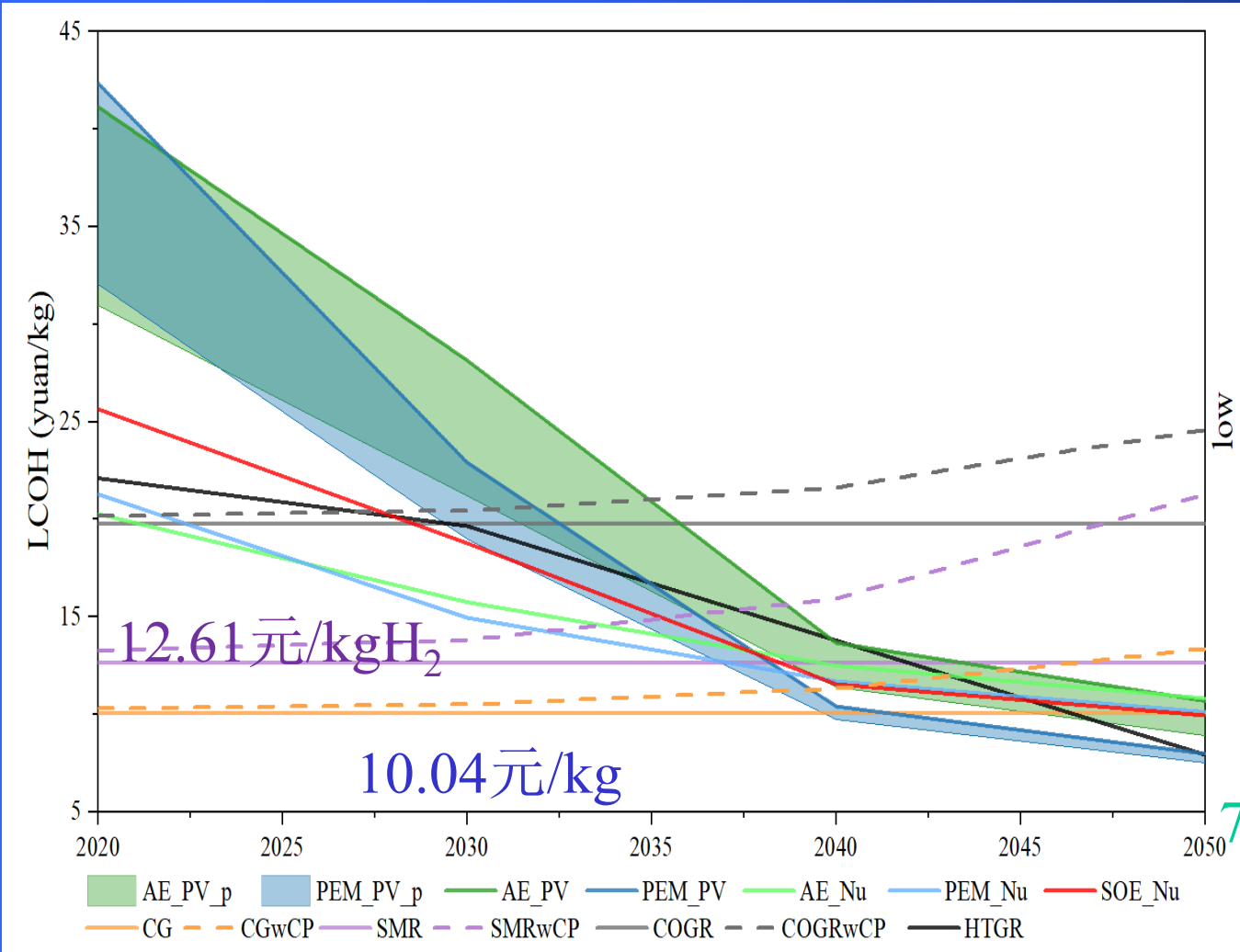


Summer day
Without pricing signal



Summer day
With pricing signal

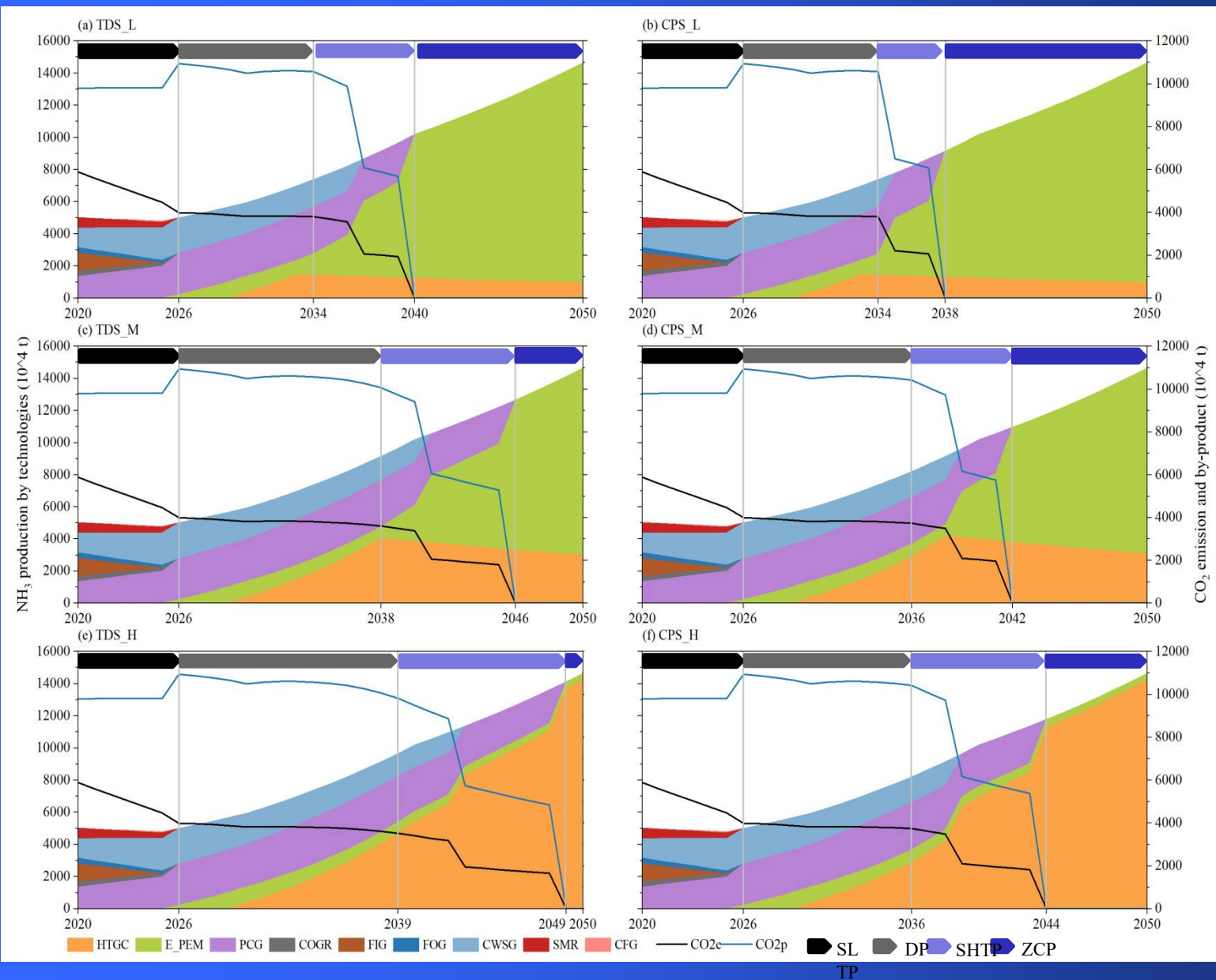
LCOH of hydrogen production technologies in China



7.93yuan/kgH₂

7.96-7.51元/kgH₂

Source: Pianpian Xiang et al., Evaluation on LCOH of conventional technology, energy storage coupled solar PV electrolysis, and HTGR in China, 2023, under review

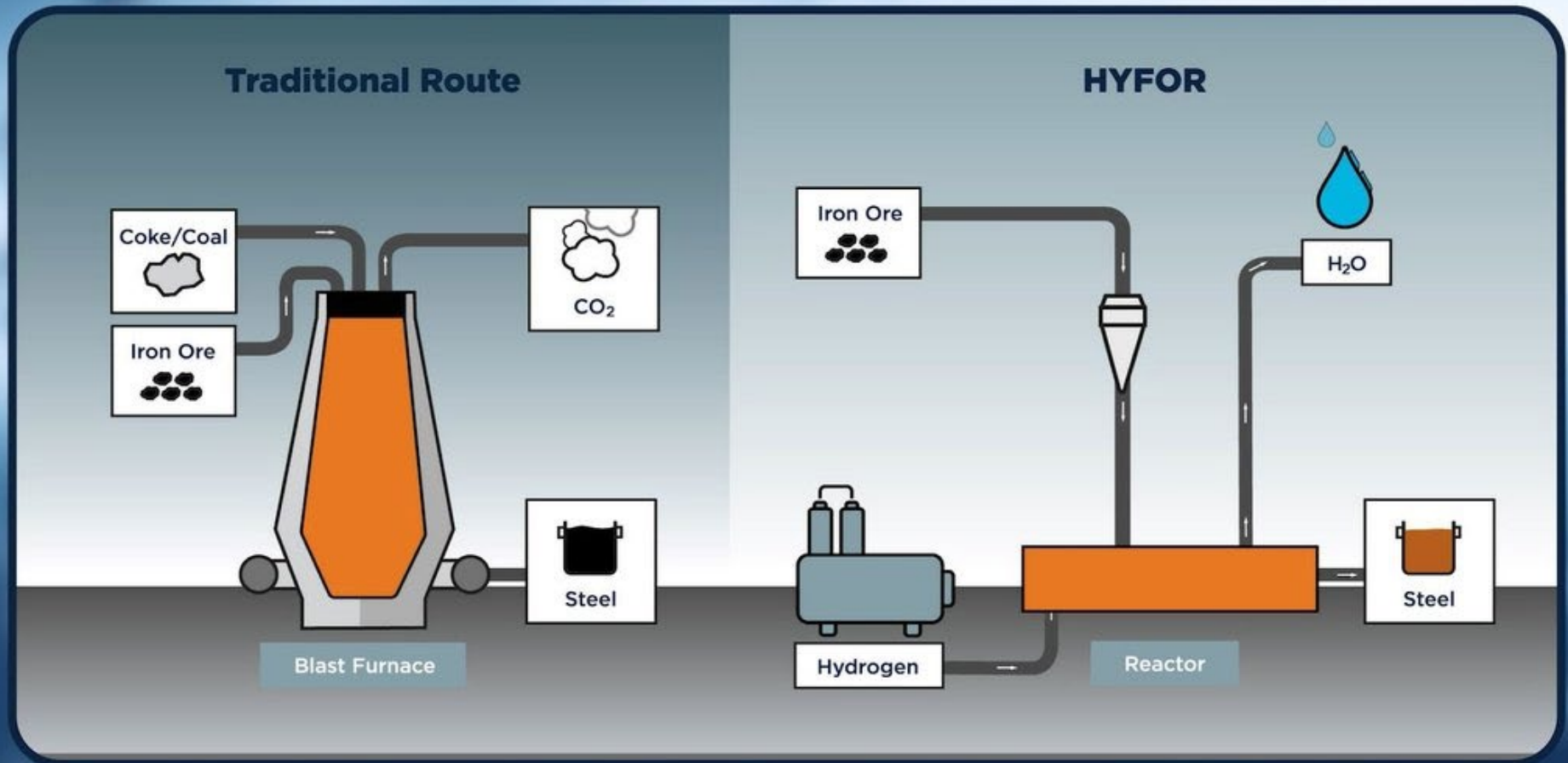


Ammonia manufacture zero-carbon pathways with various PV LCOE

Significant Transition in Industry Sectors and Transport: Hydrogen Based Process

- **Steel making**
- **Ammonia**
- **Benzene**
- **Ethylene**
- **Methanol**
- **Clinker**
- **Heavy Duty transport and air plane**

Steel making transition



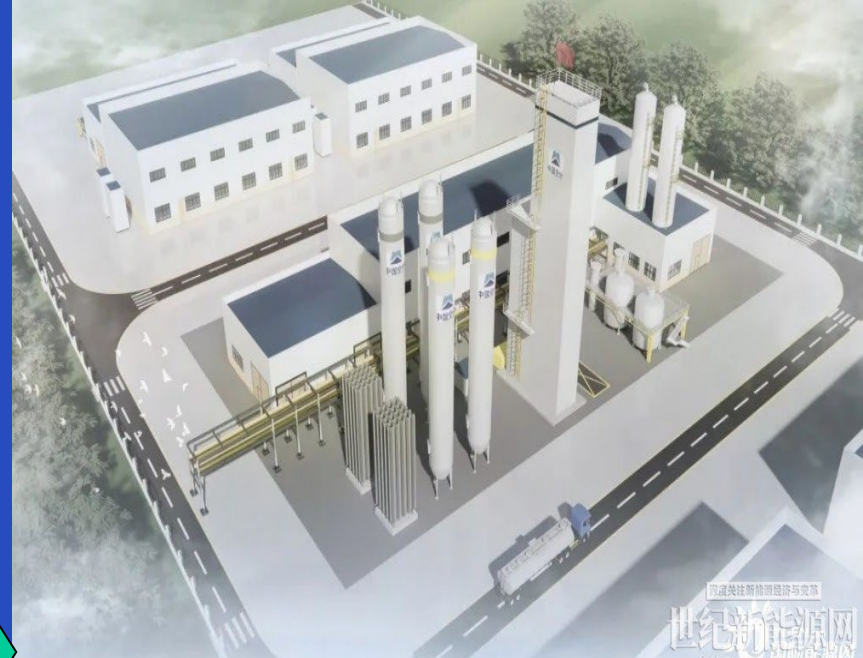




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From traditional ammonia to hydrogen based ammonia



世纪新能源网
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深度关注新能源经济与变革

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No soil agriculture



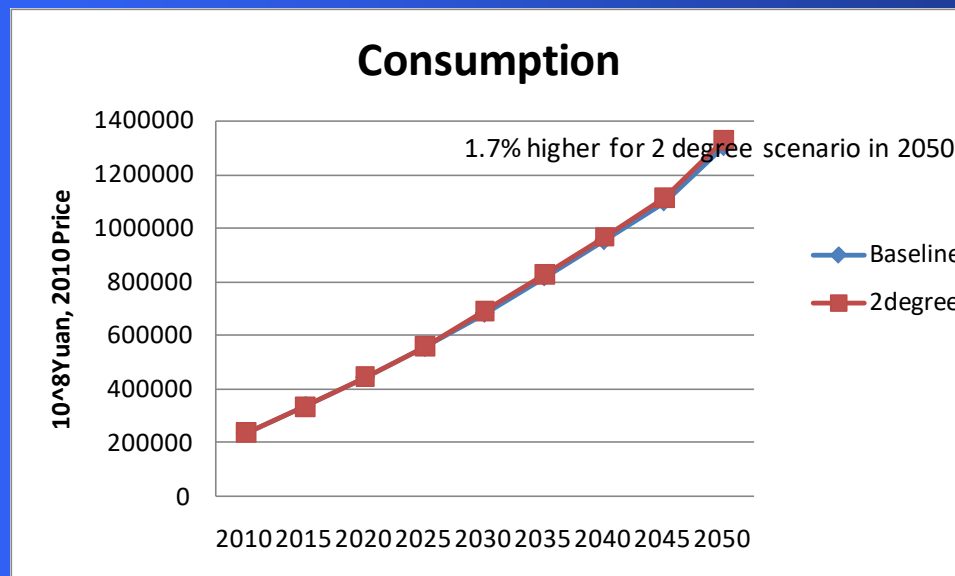
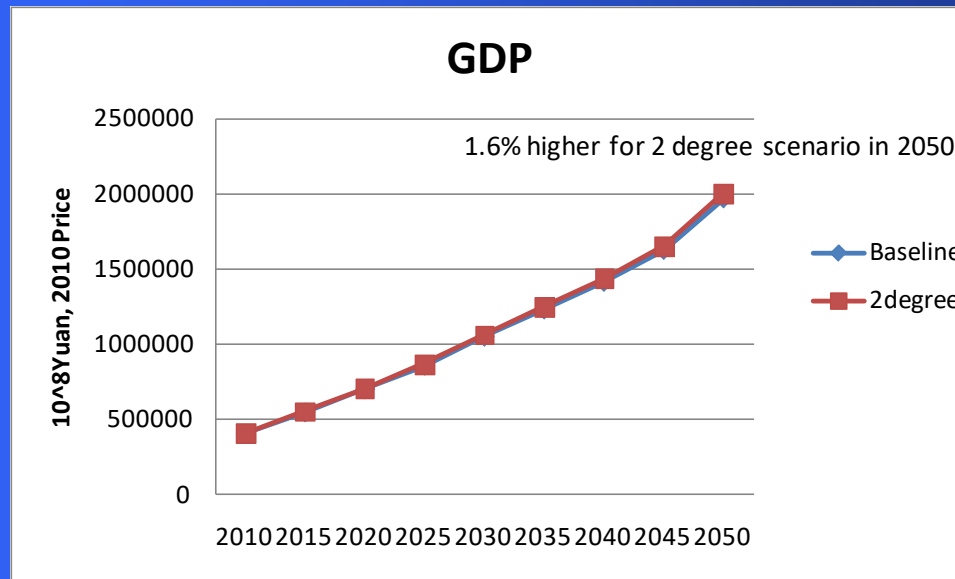
No soil agriculture



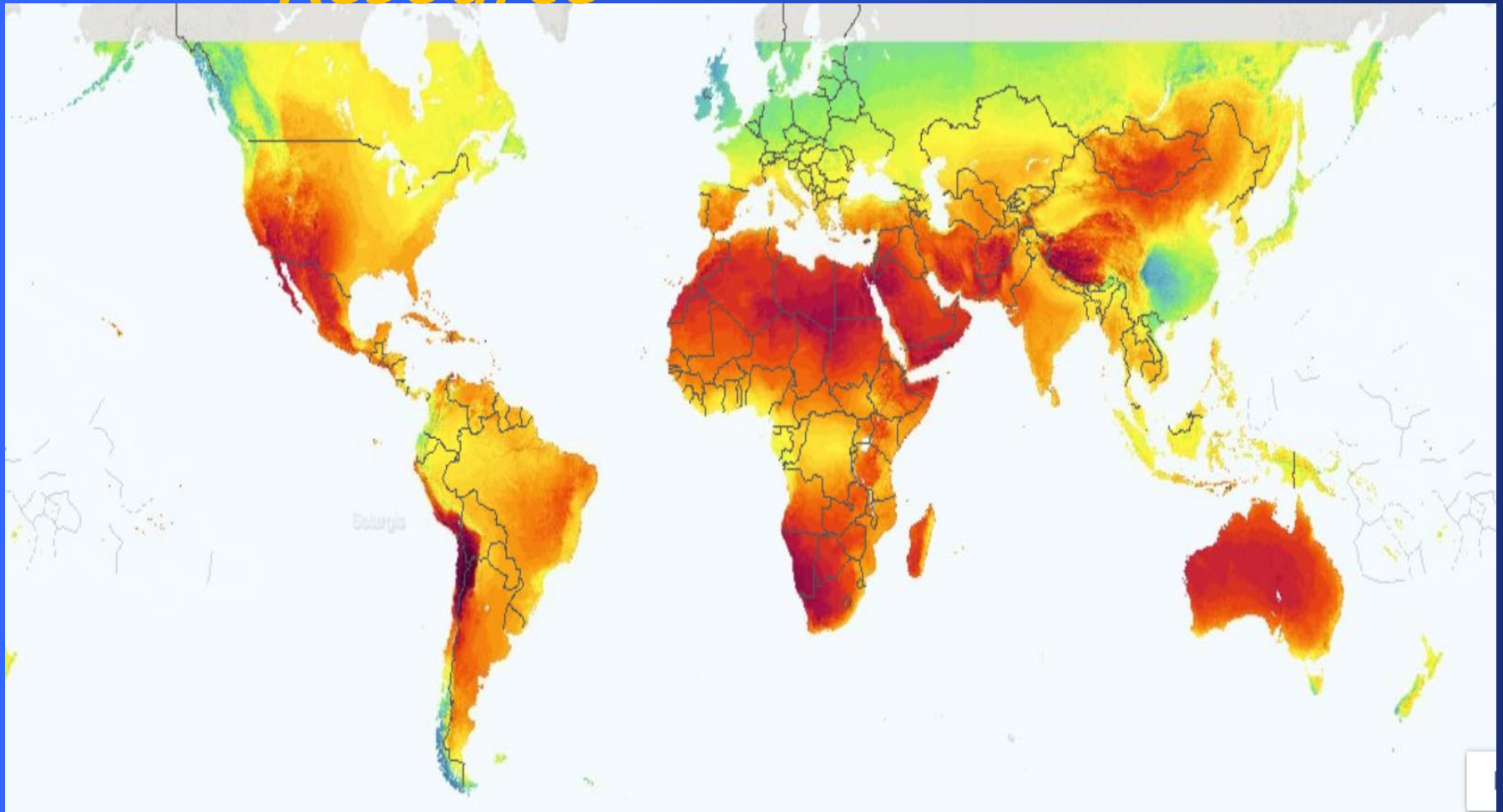
No soil agriculture



Mitigation Would Increase GDP!



Global Solar Resource



Thanks !