

New Climate Change Regime and Low-Carbon Energy System — A Quiet Revolution of Clean Energy in China

YANG Hongwei
Energy Research Institute



国家发展和改革委员会能源研究所

Energy Research Institute National Development And Reform Commission

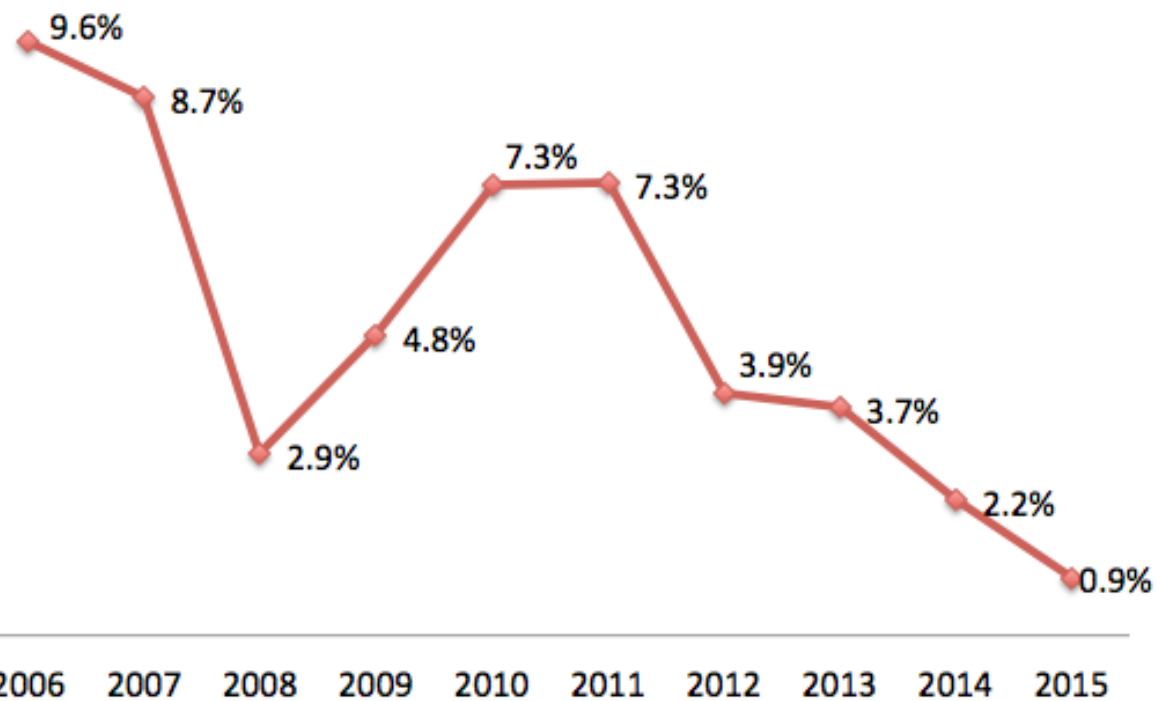
Paris Agreement and INDCs

China's intended nationally determined contributions:

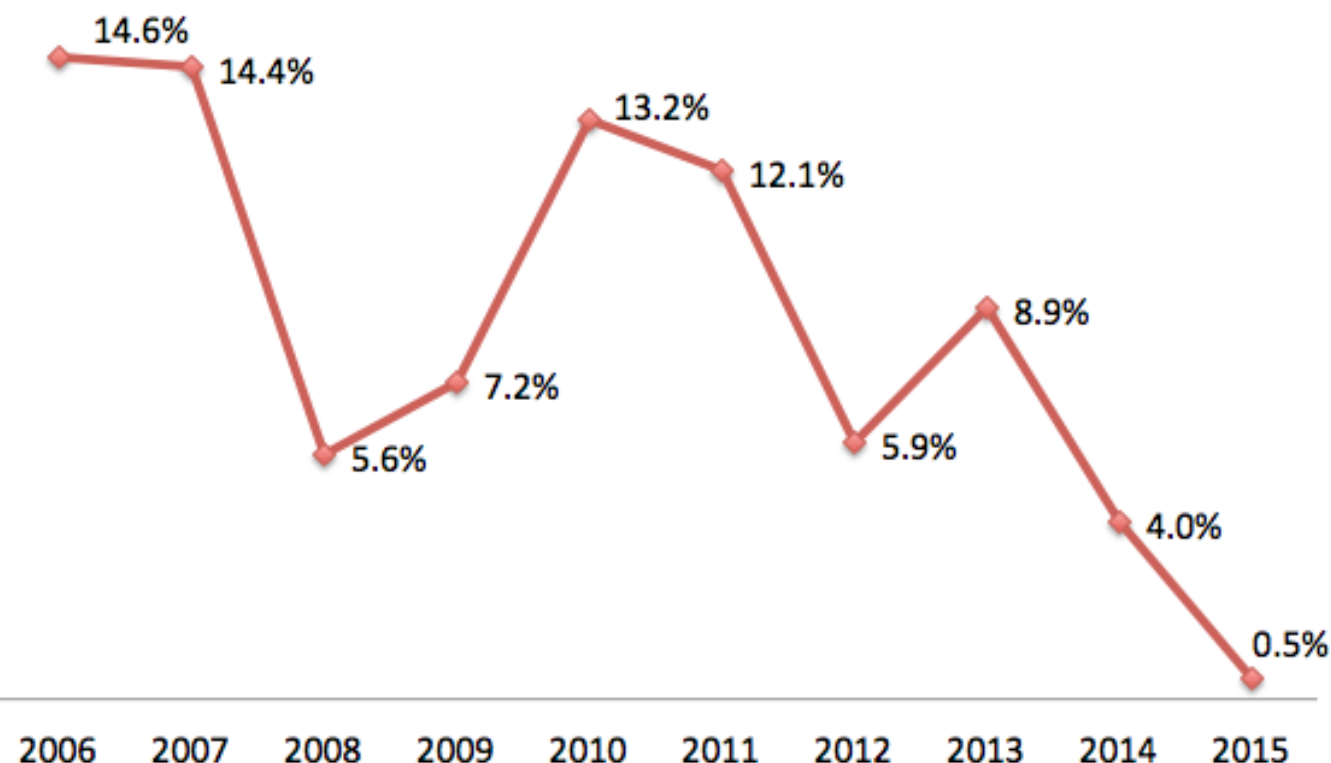
- Peak CO₂ emissions around 2030 and making best efforts to peak early;
- Lower CO₂ emissions per unit of GDP by 60% to 65% from the 2005 level;
- Increase the share of non-fossil fuels in primary energy consumption to around 20%;
- Increase the forest stock volume by around 4.5 billion m³ on the 2005 level.
- Proactively adapt to climate change by enhancing mechanisms and capacities to effectively defend against climate change risks.

Energy consumption is slowing down

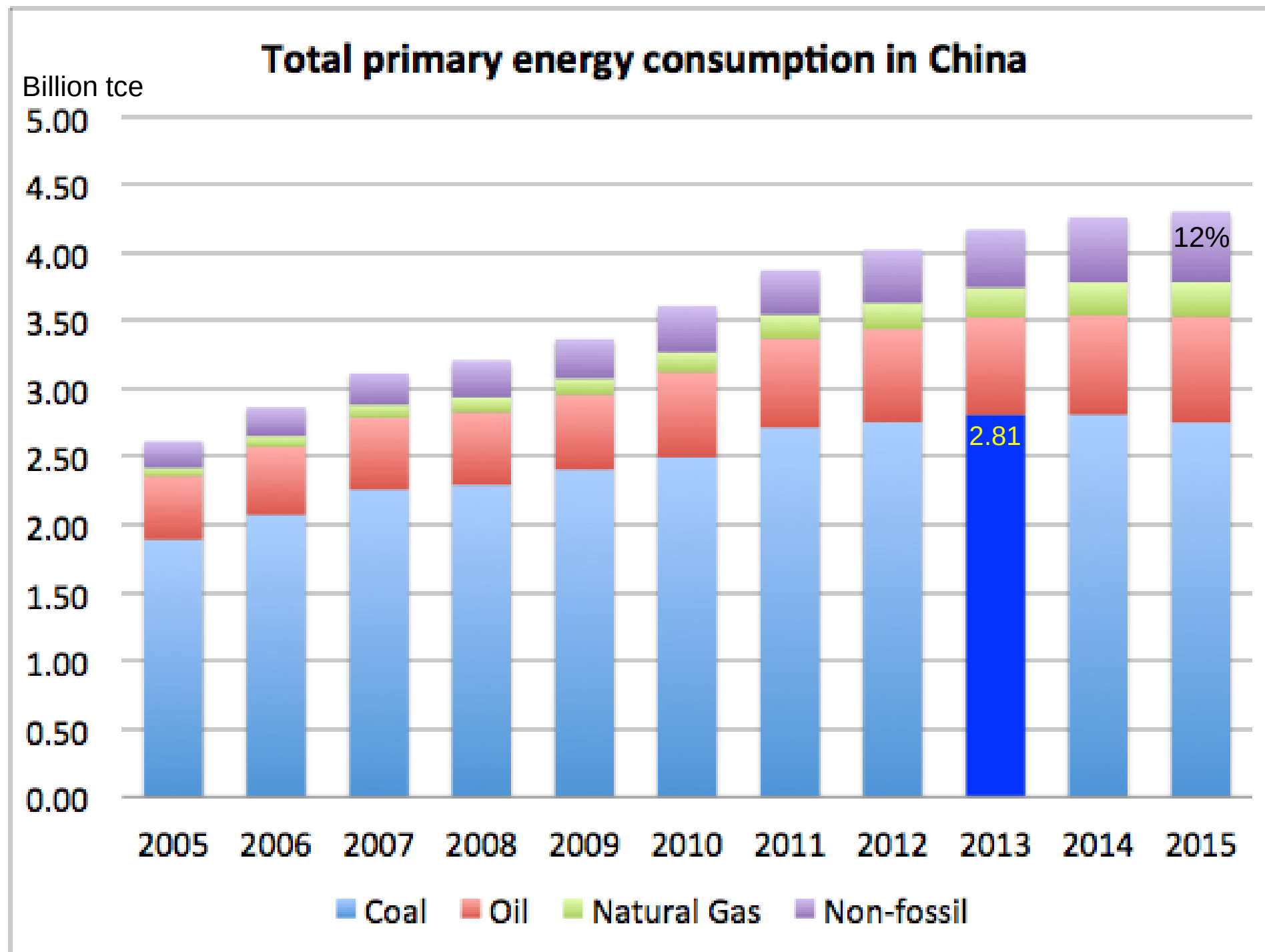
Annual growth rate for total primary energy consumption in China



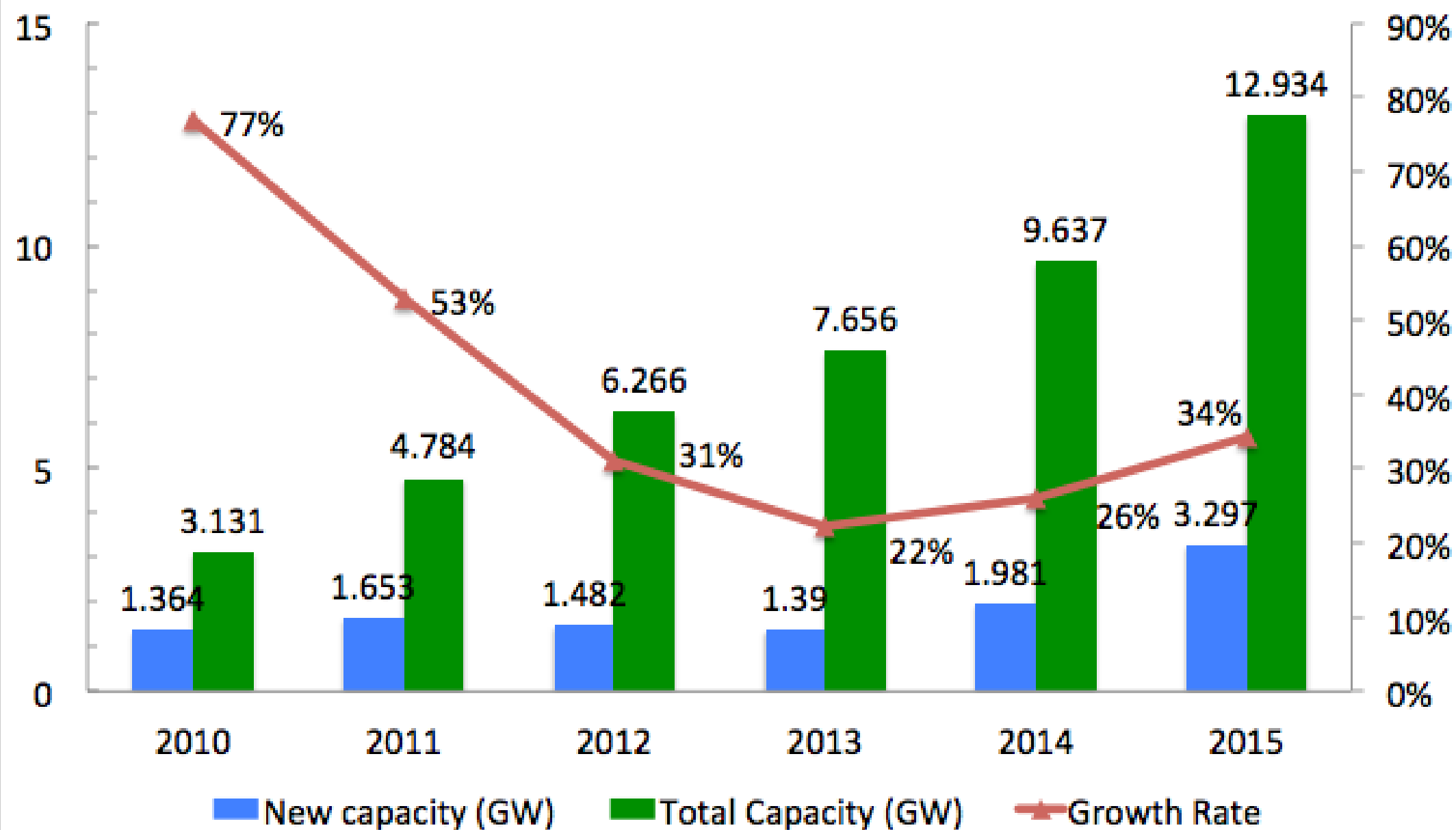
Annual growth rate for electricity consumption in China



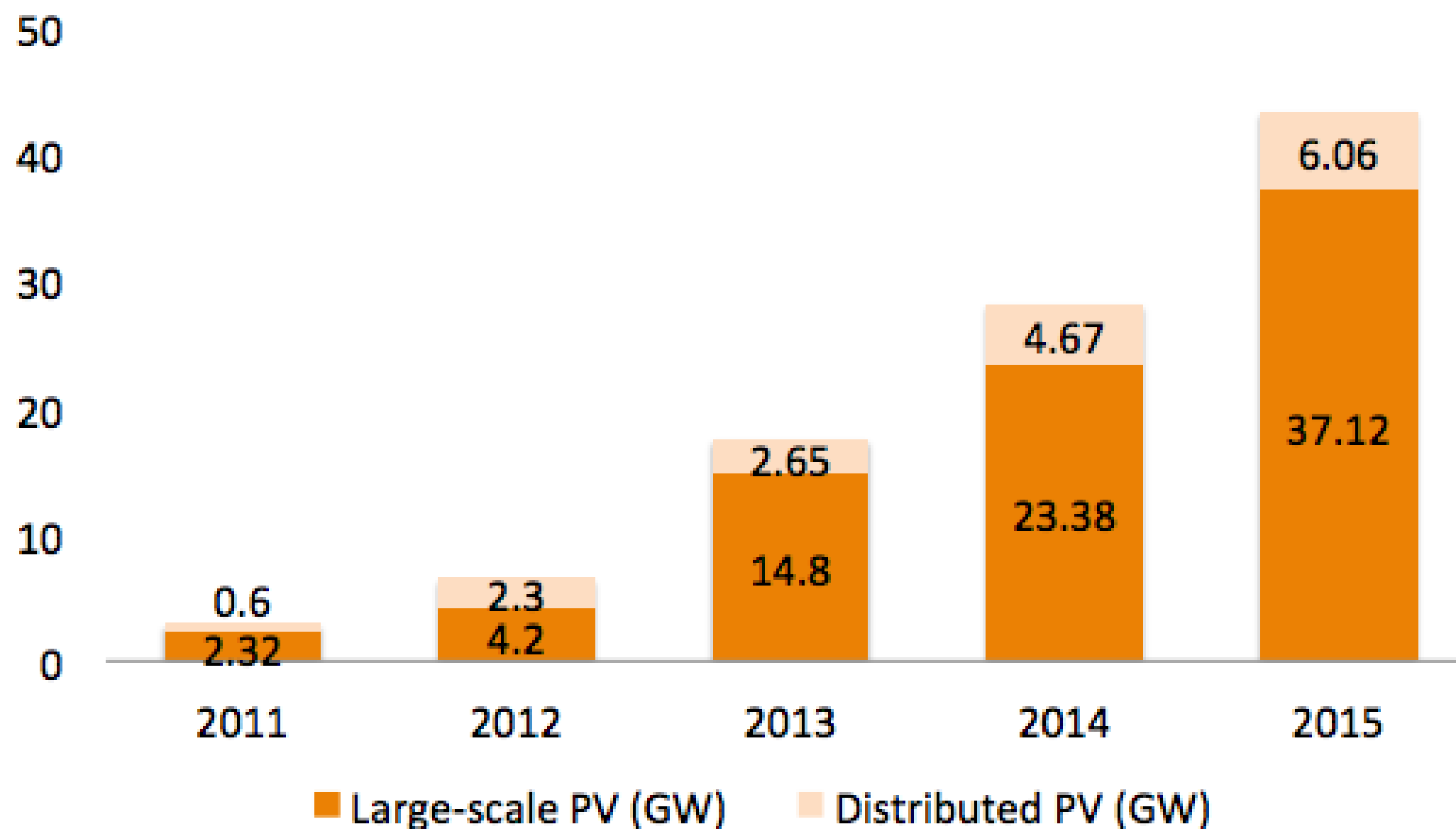
Energy mix optimized: coal consumption peaked, while non-fossil fuels continue to increase



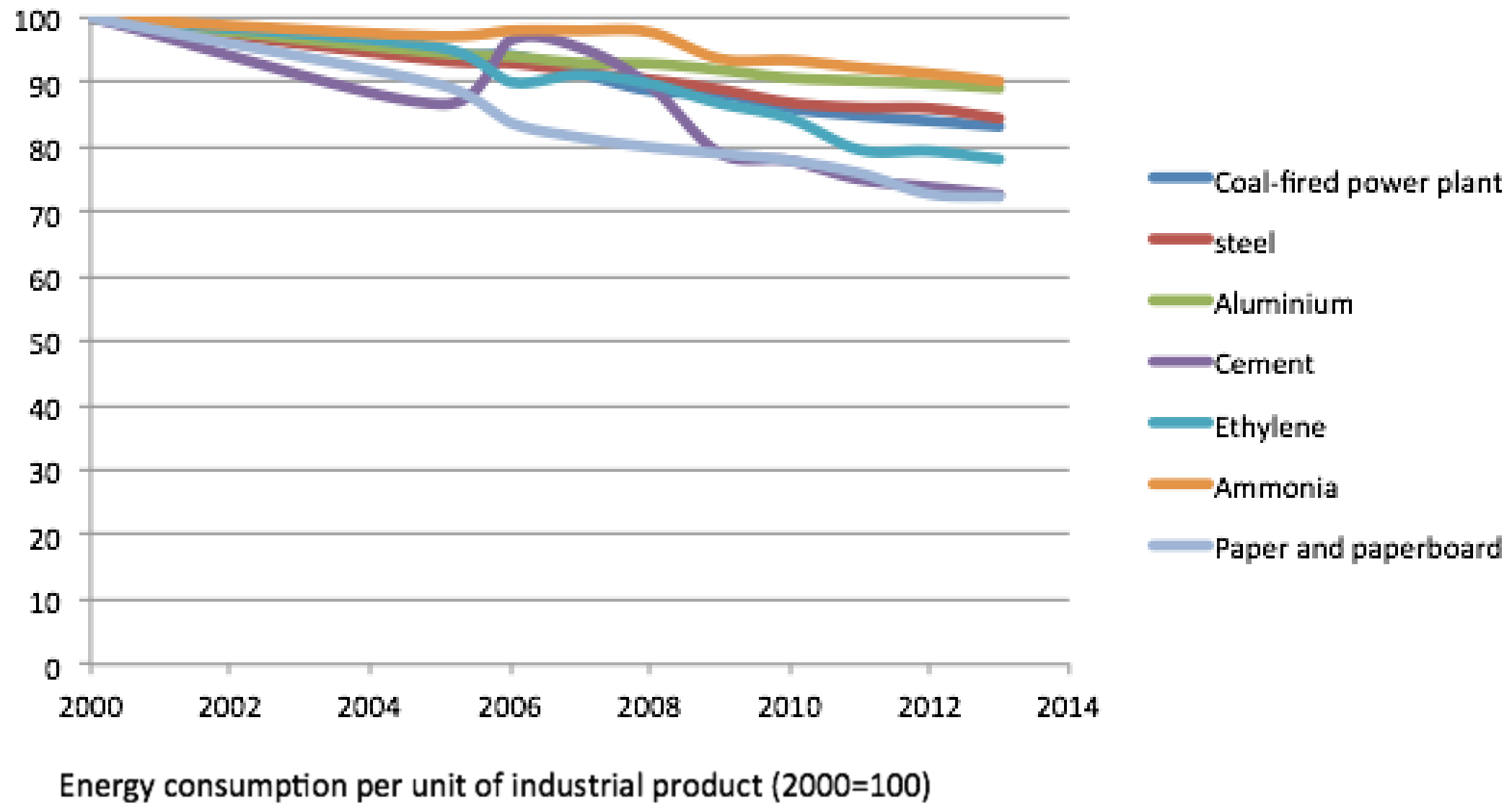
Grid connected wind power capacity in China



Grid connected PV capacity in China

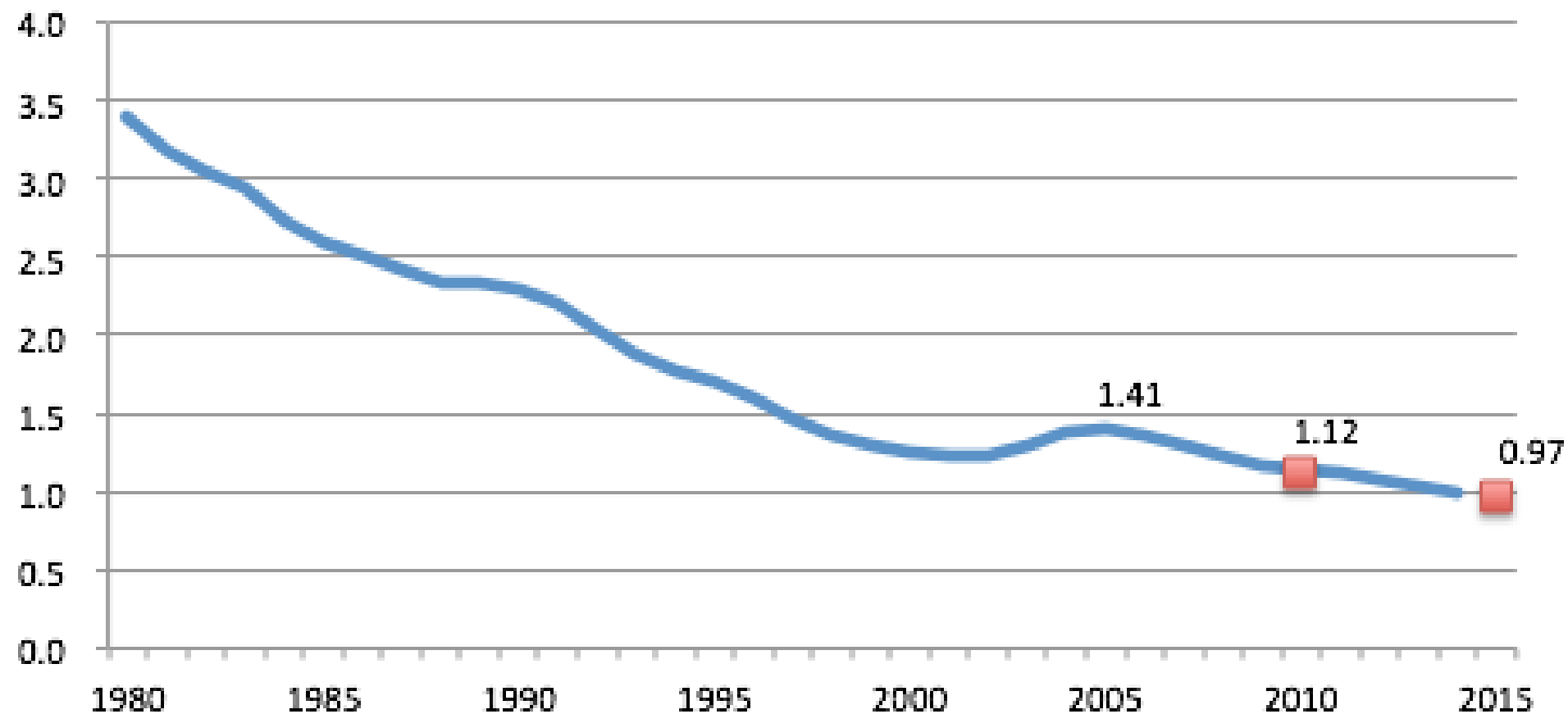


Energy efficiency improvement



Energy productivity significantly improved

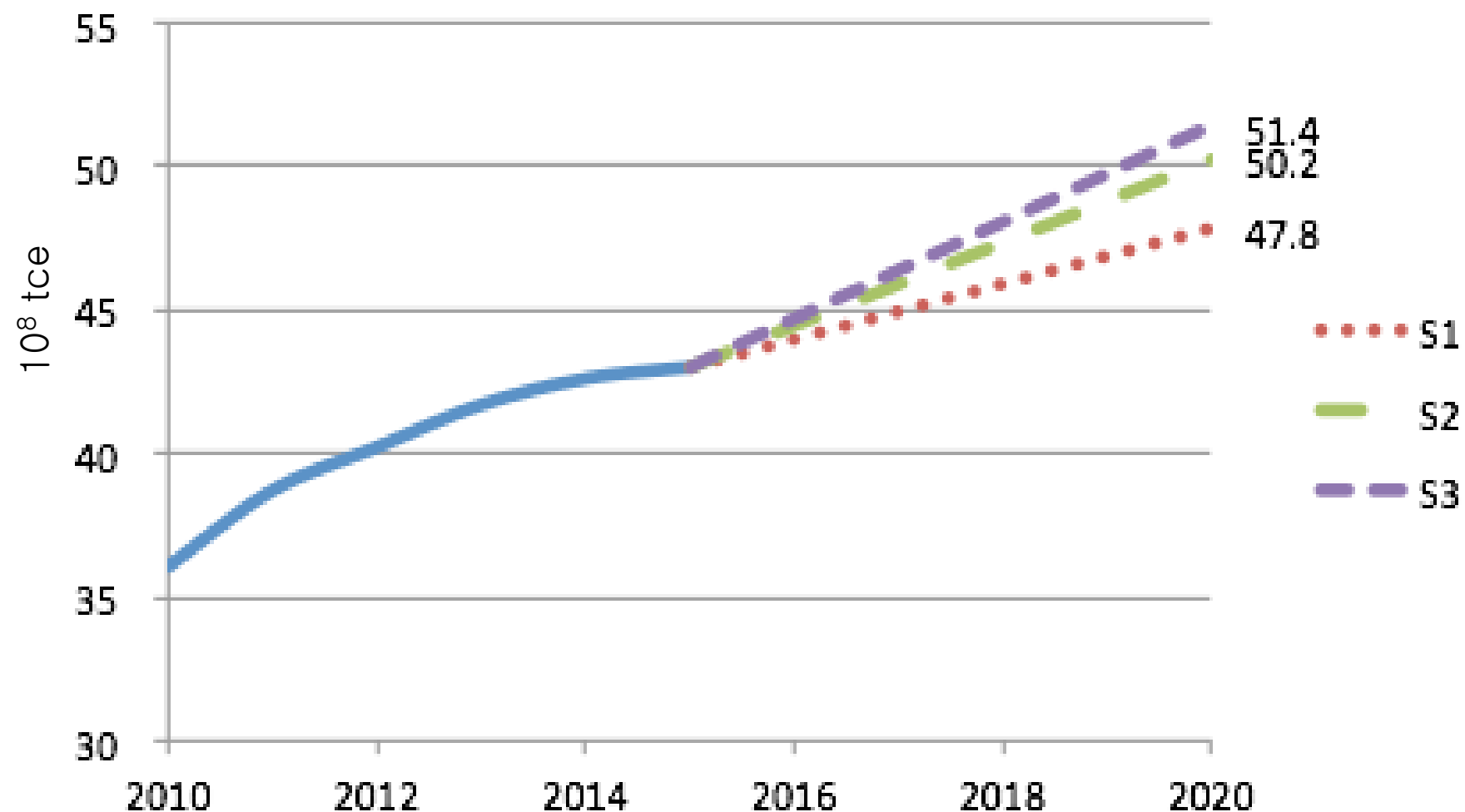
- Basically achieve the 20% reduction target in the 11th FYP
- Achieve the 16% reduction target in the 12th FYP



Energy intensity of GDP from 1978 to 2015 (TCE/10000Yuan, 2005Price)

Energy demand outlook for the 13th FYP

- Uncertainty of energy demand due to various economic prospects, aftermath of global financial turmoil
- Given different targets of energy intensity reduction in 13 FYP (20%、16%、14%), primary energy demand in 2020 would be around 4.8 to 5.1 billion tce



Primary energy demand outlook for the 13th FYP (2016–2020)

Strategy-1: Control both intensity and volume for energy

- CO₂ intensity reduction target: 18% (2020/2015)
- Energy intensity reduction target: 15% (2020/2015)
- Total primary energy consumption: 4.8 billion tce
- Improve entrance threshold for new capacity to avoid new overcapacity
- Enhance de-stocking efforts to improve economic productivity

Strategy-2: Reduce coal consumption

- Coal consumption will be kept within the 2015 level (0 increase) for the 13th FYP
- Resulted from the structural change of industries
- Respond to the environmental requirement of improving air quality
- Key area is to substantially replace distributed coal consumption by natural gas, electricity, recovered residual heat, and renewable energies

Strategy-3: Expedite development of non-fossil fuels

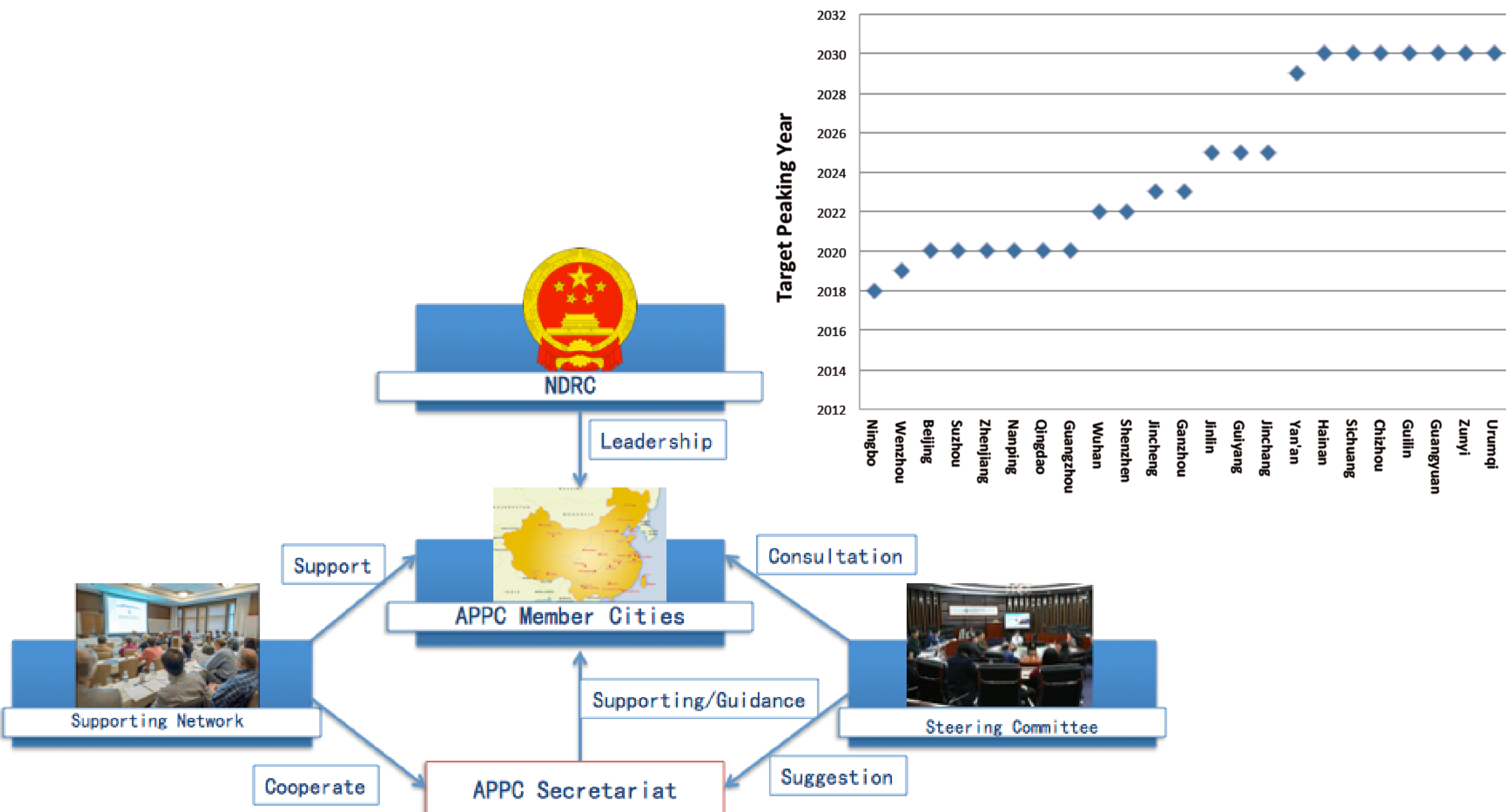
- Improve quality of development of non-fossil fuels
- Reduce cost of development of non-fossil fuels
- Non-fossil fuels share 15% by 2020, and 20% by 2030, in national total primary energy consumption
- Develop smart grid to improve the capability of adaptation to renewable energies
 - ✓ Compensation of multi-energy resources
 - ✓ Combination of resources, grids and storages

Strategy-4: Implement CN-ETS

- Targeted participants: key enterprise (annual energy consumption is 10000 tce or higher)
- Initial: All the key enterprises have reported annual GHG inventories for the most recent 3 years (2013–2015) to the Government (NDRC)
- Normal:
 - ✓ Key enterprises report last year's annual GHG inventories (reviewed by an independent third party such as DOE) by April
 - ✓ Government conducts annual assigned amount of GHG emissions (AAA) clearance by June
 - ✓ Government sets up this year's AAAs to key enterprises by June

Strategy-5: City-centered peaking actions

Alliance of Peaking Pioneer Cities of China (APPC)



<http://appc.ccchina.gov.cn>