Pathways to a low carbon energy system / China

Ma Linwei

Department of Energy and Power Engineering, Tsinghua University

2019-06-12
China’s ERCE (energy-related CO₂ emissions)

- 9.23 Gt at 2017, occupying 27.6% of the world total
- Increased by 3.2% annually in 2006-2016
- Closely related to dynamic economic growth – investment driven!

China’s ERCE (1965-2017, BP statistics)

- Reform and Opening-up
- Accelerated industrialization
- Financial crisis
- Overcapacity!
China’s energy system: responsibility of EREC

Half for fuel use!

2/3 for factory!

45% for structure
China’s policy will & target of ERCE

- **2005~2020**
  - Eliminating poverty and defending the blue sky
  - 40-45% reduction of carbon intensity (EREC per GDP), 15% non-fossil energy

- **2005~2030/2035**
  - 2030: carbon peak, 60-65% reduction of carbon intensity, 20% non-fossil energy
  - 2035: a modern society and beautiful China

- **2030/2035~2050**
  - A great power for sustainable development
  - 50% non-fossil energy, total amount of EREC under control
Pathways to a low carbon energy system

- The first is to form energy-saving production and lifestyle
  - Really high resource utilization efficiency, truly energy-saving buildings and transportation
- The second is to avoid the waste of construction energy services
  - Careful system planning and integration to avoid waste of production capacity in the process
- The third is to ensure technical efficiency and the development of non-fossil energy

2020
Coal peak

2030
CO₂ peak & Oil peak
A modern & beautiful China

2040
TPEC peak & NG peak

2050
Low GHG emissions
A great power for sustainable development
Power system plays a key role in this transition

- Factories, buildings and transportation are becoming more and more electrified, and the pressure of carbon emissions is more and more concentrated in the power sector.
- The uncertainty in the future lies first in the level of power demand, secondly in the scale of low-carbon power installed and the innovation progress of coal-fired power.
- The grid configuration of high-proportion renewable energy is also uncertain. A more effective solution may lie in cross-sectoral & cross-regional integration rather than relying solely on batteries.
Summary

- China’s EREC is closely related to the dynamic economic growth, and capital investment has a significant impact on EREC growth.

- China has a clear political will to achieve peak carbon and low GHG emissions. The main problem is how to make reasonable energy choices among many uncertainties:
  - The main difficulty lies in how to create the most energy-saving production and lifestyle in human history, while realizing modern China, beautiful China and powerful China.
  - The second difficulty lies in the elaborate system planning and integration in the process to avoid waste of production capacity.
  - The last one is the timely adoption of energy efficiency and low carbon technologies.
Thanks!
malinwei@tsinghua.edu.cn

My WeChat

Wechat Subscription