

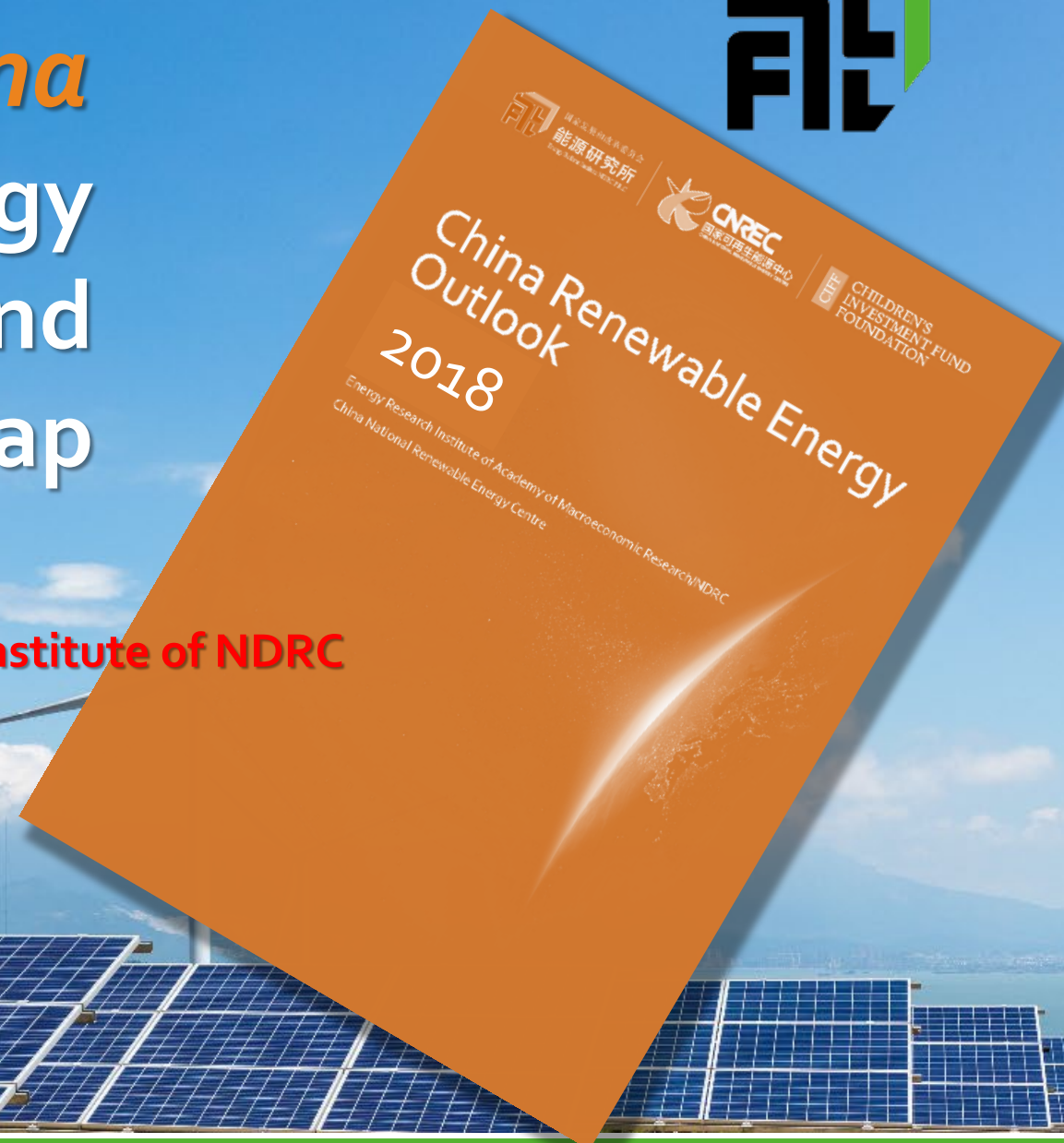
The 2050 energy transition towards a Beautiful China

Thinks for 2050 Cina Energy Transition on Objectives and Road Map

Prof. WANG Zhongying

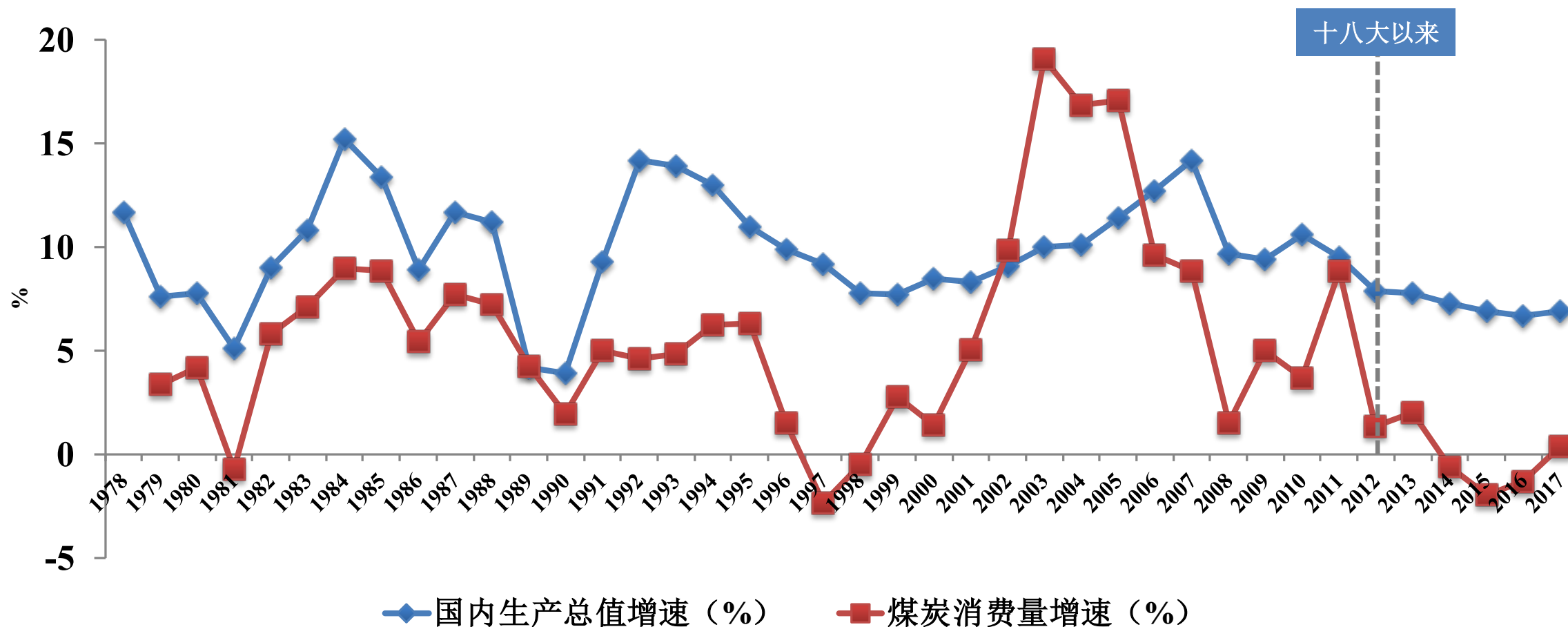
Acting Deputy Director General, Energy Research Institute of NDRC

Director, China National Renewable Energy Centre



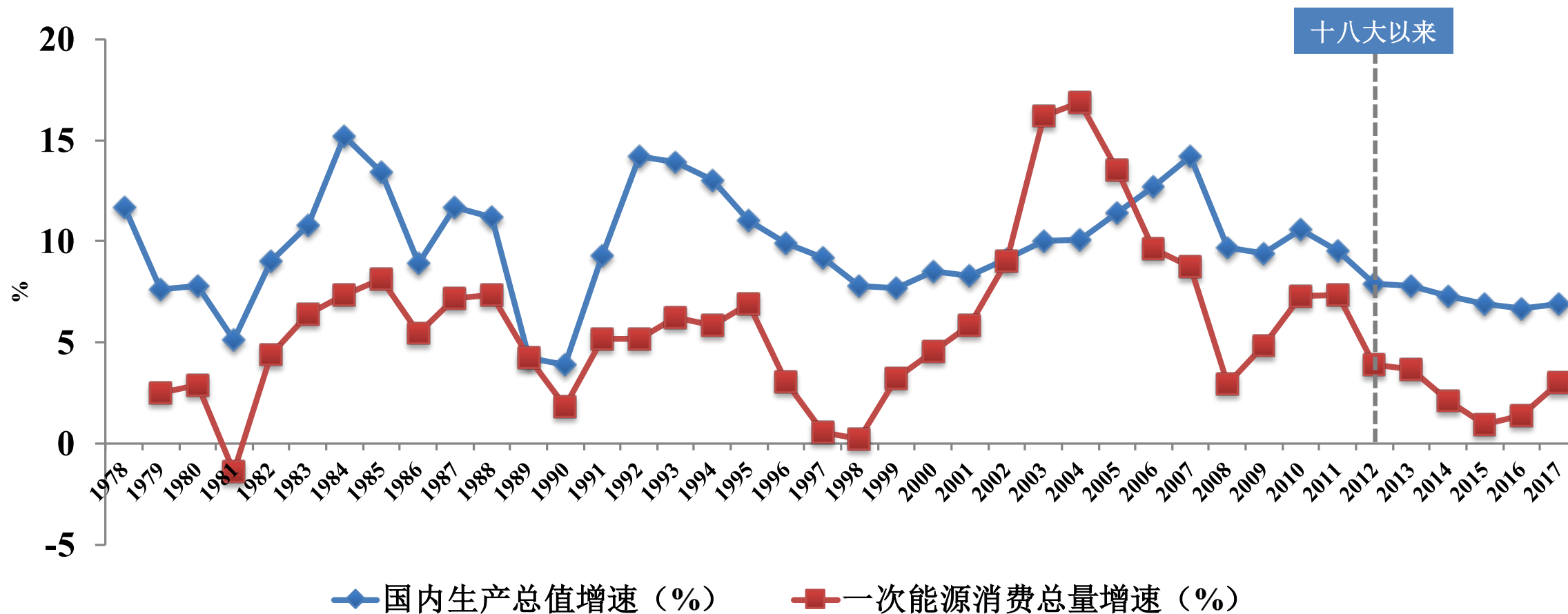


Coal to GDP



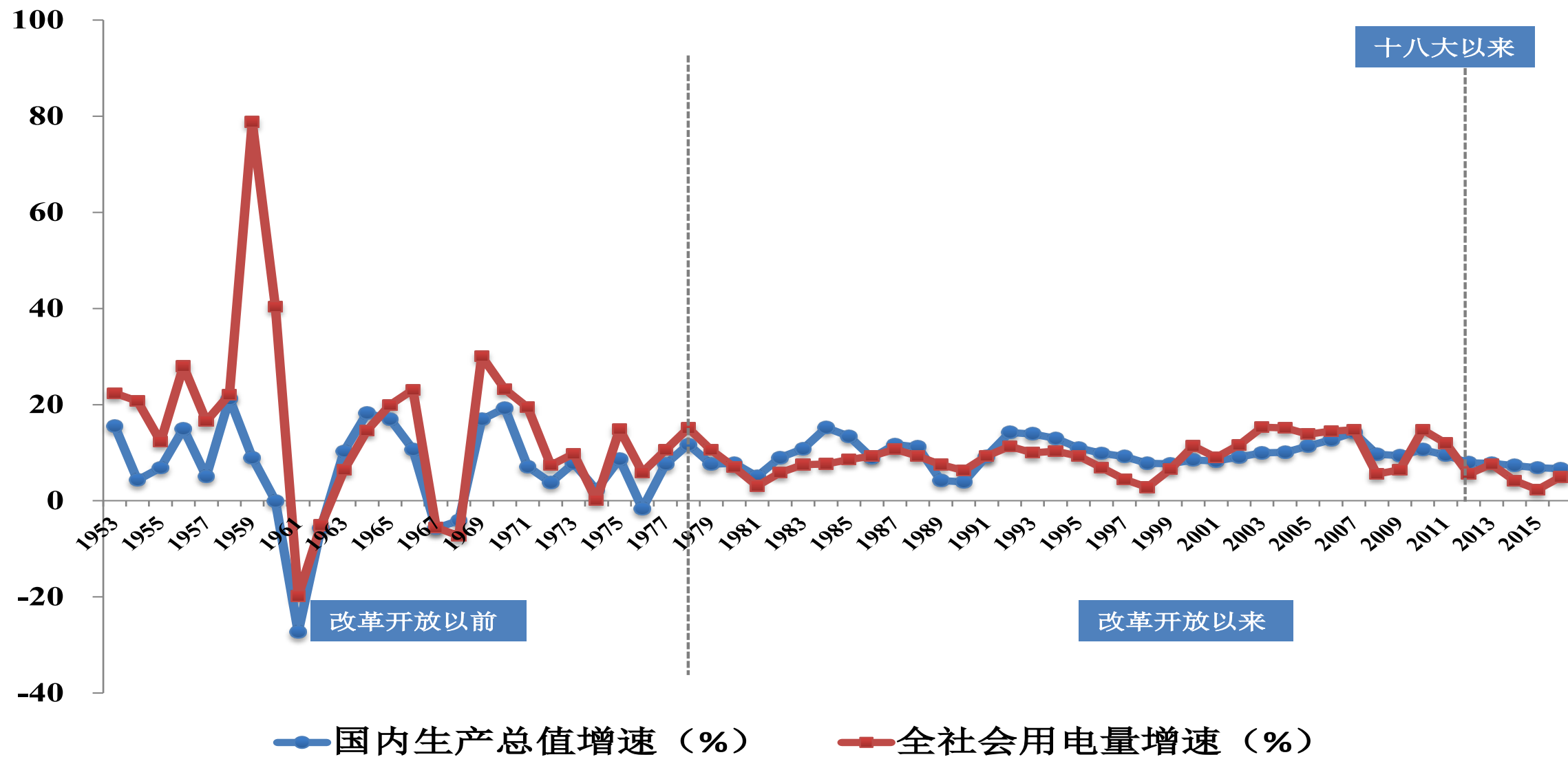


Primary Energy to GDP

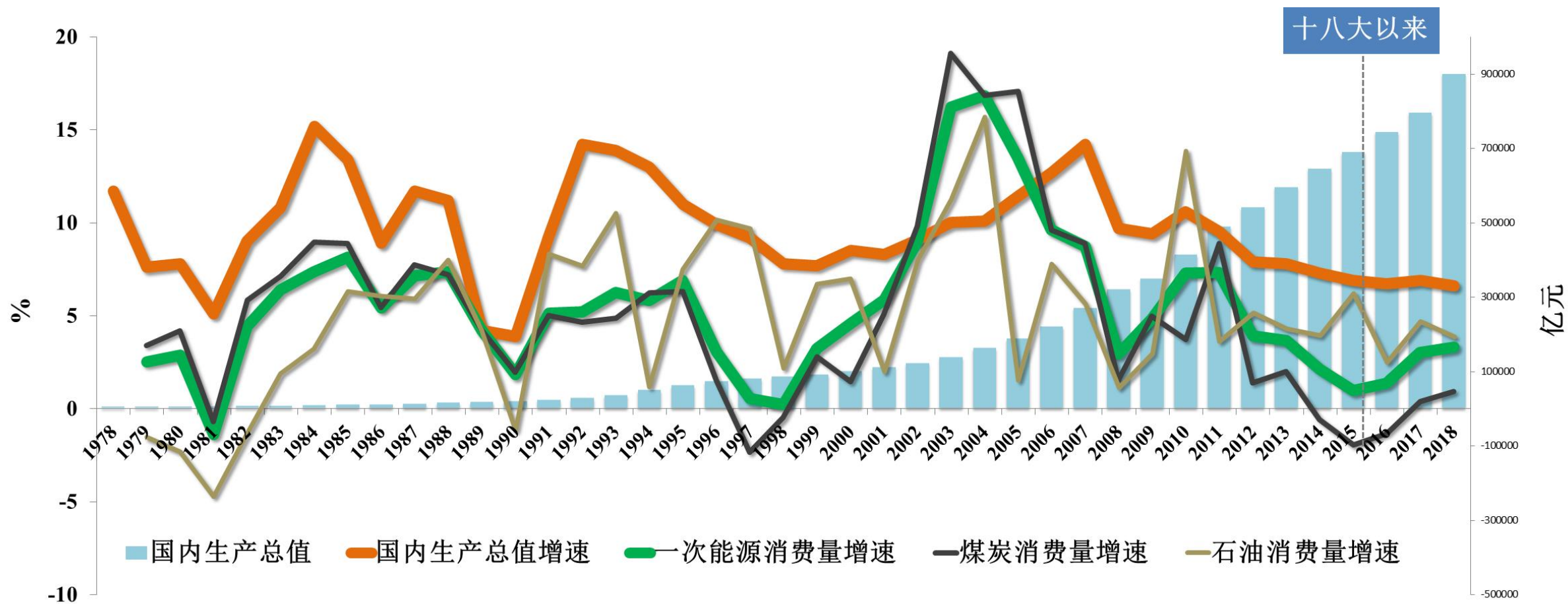




Electricity to GDP

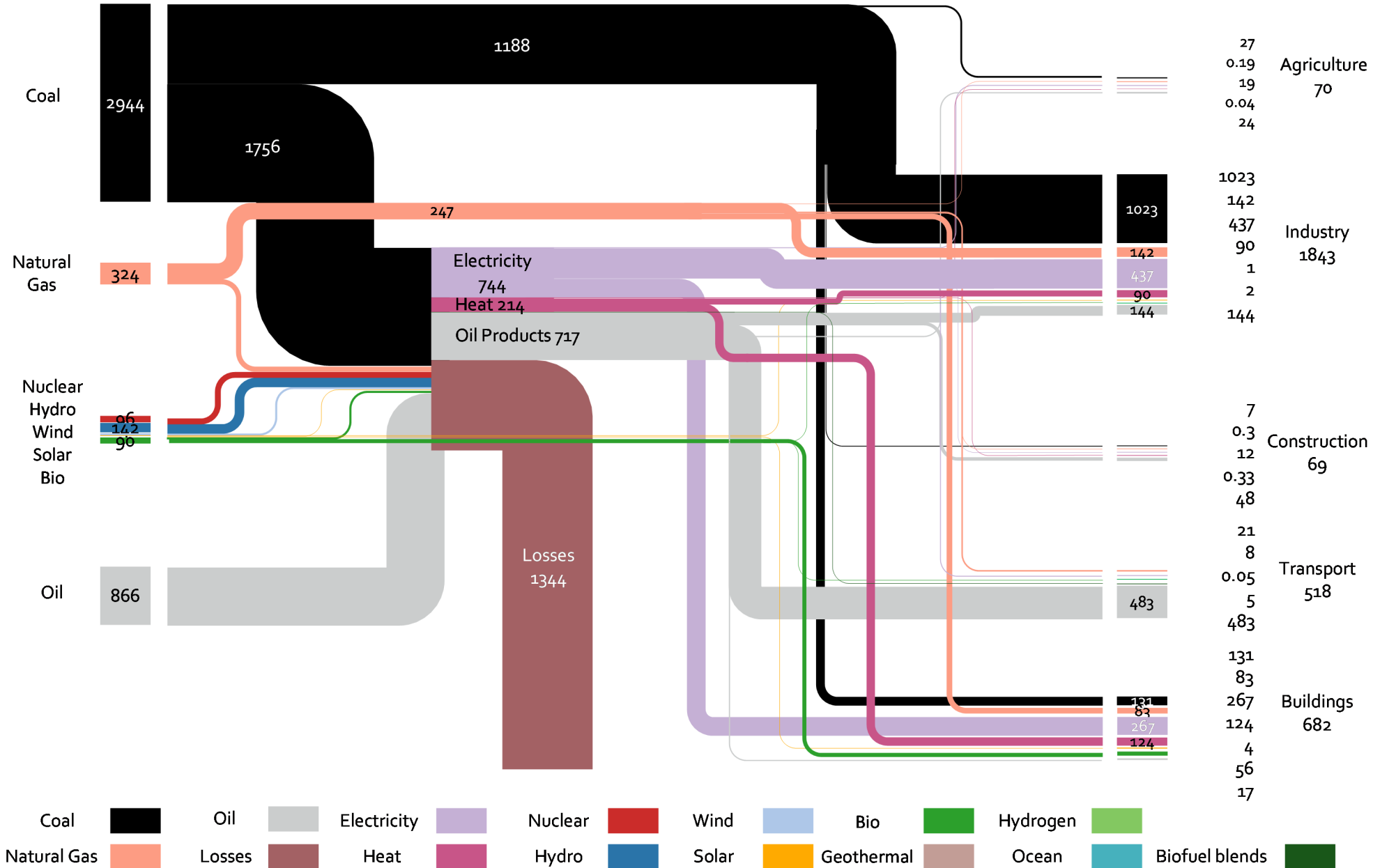


Coal, Oil, Primary to GDP



2017 Energy flow

Dominated by fossil fuels
Coal consumption in power sector and industry sector
Big losses in energy transformation, especially in the power sector
Oil dominates in the transport sector





What are the issues for China energy transition?

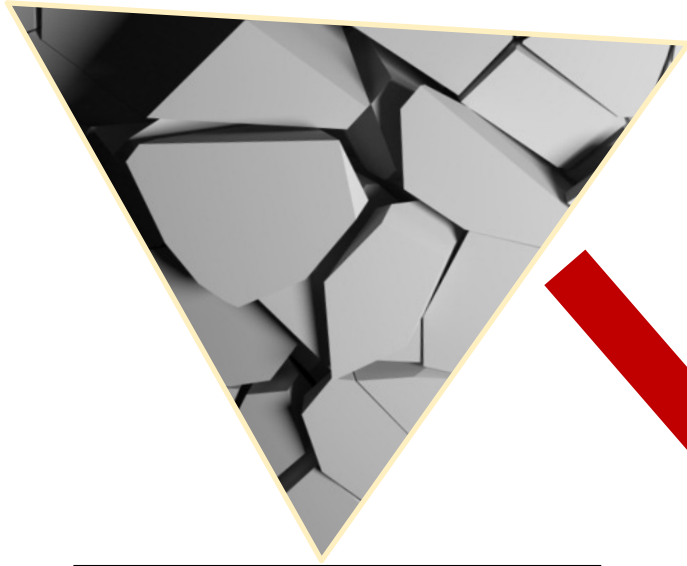
- Coal transition: coal jobs, coal economic and region economic
- Oil transition: same to the coal
- Gas: may be the new coal and new oil?

Social and Economic Sustainable Development Need to Change the Energy Mix from High Carbon to Low Carbon



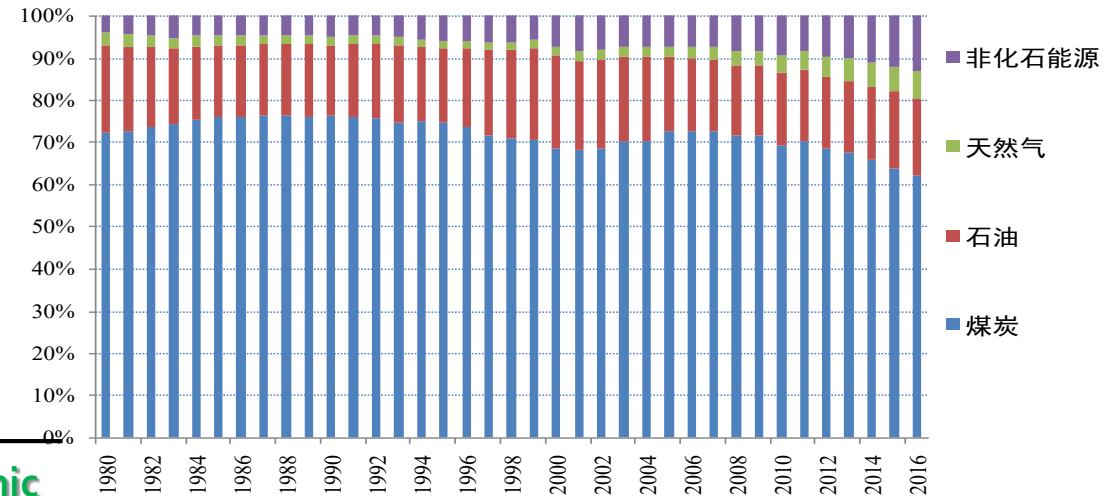
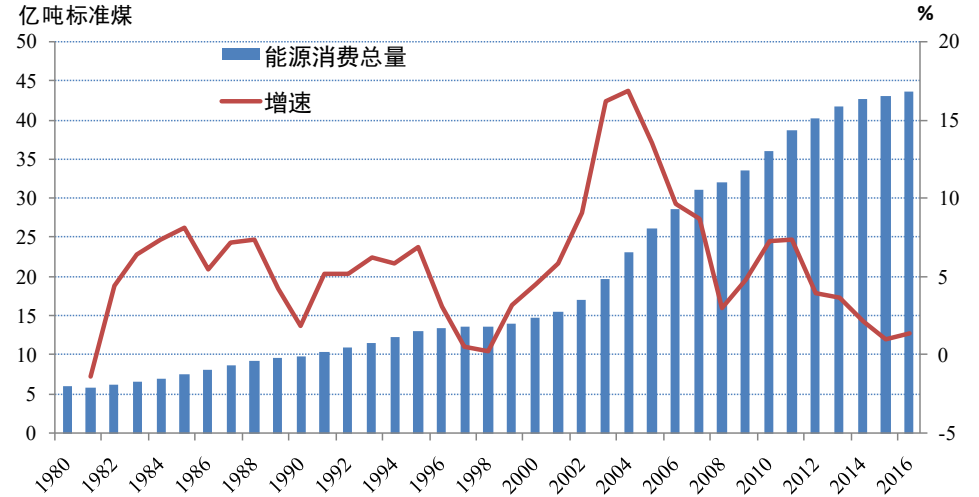
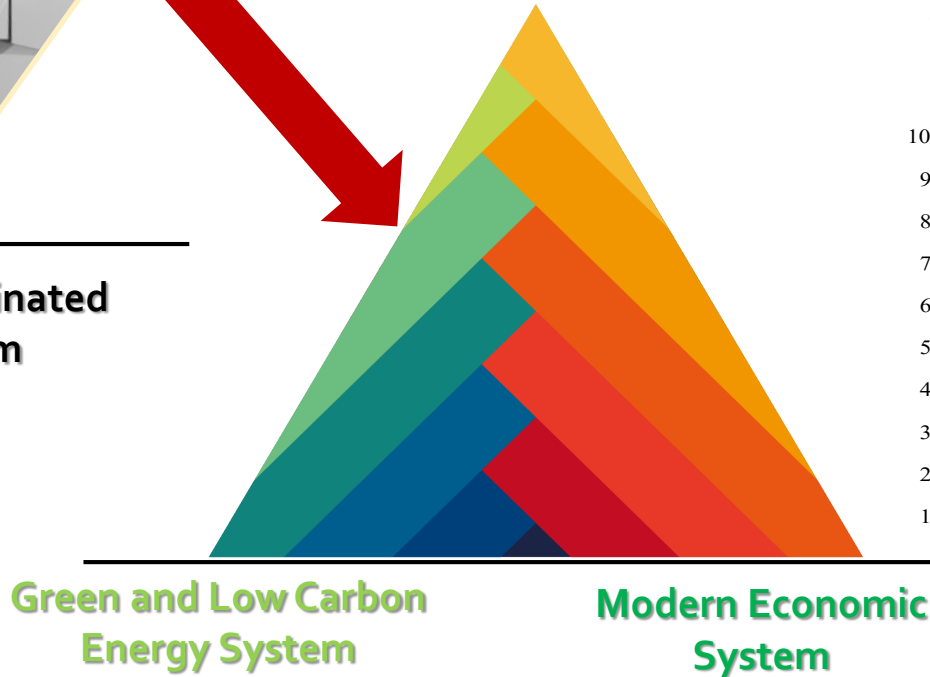
Economic Growth

Eco-Environment



Fossil Energy Dominated Energy System

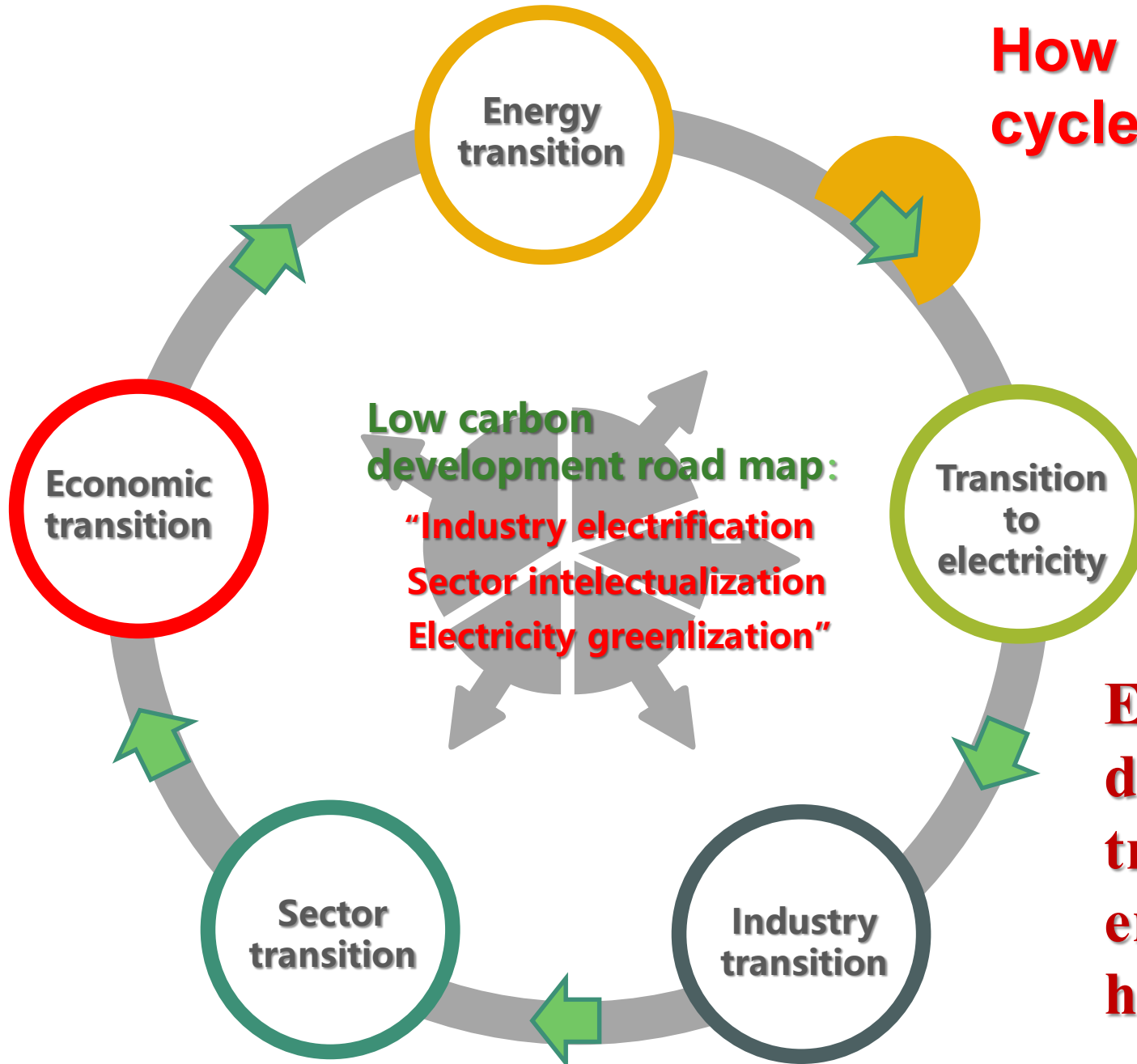
Eco-Civilization Society



数据来源：中国能源统计年鉴



How make the virtuous cycle development?

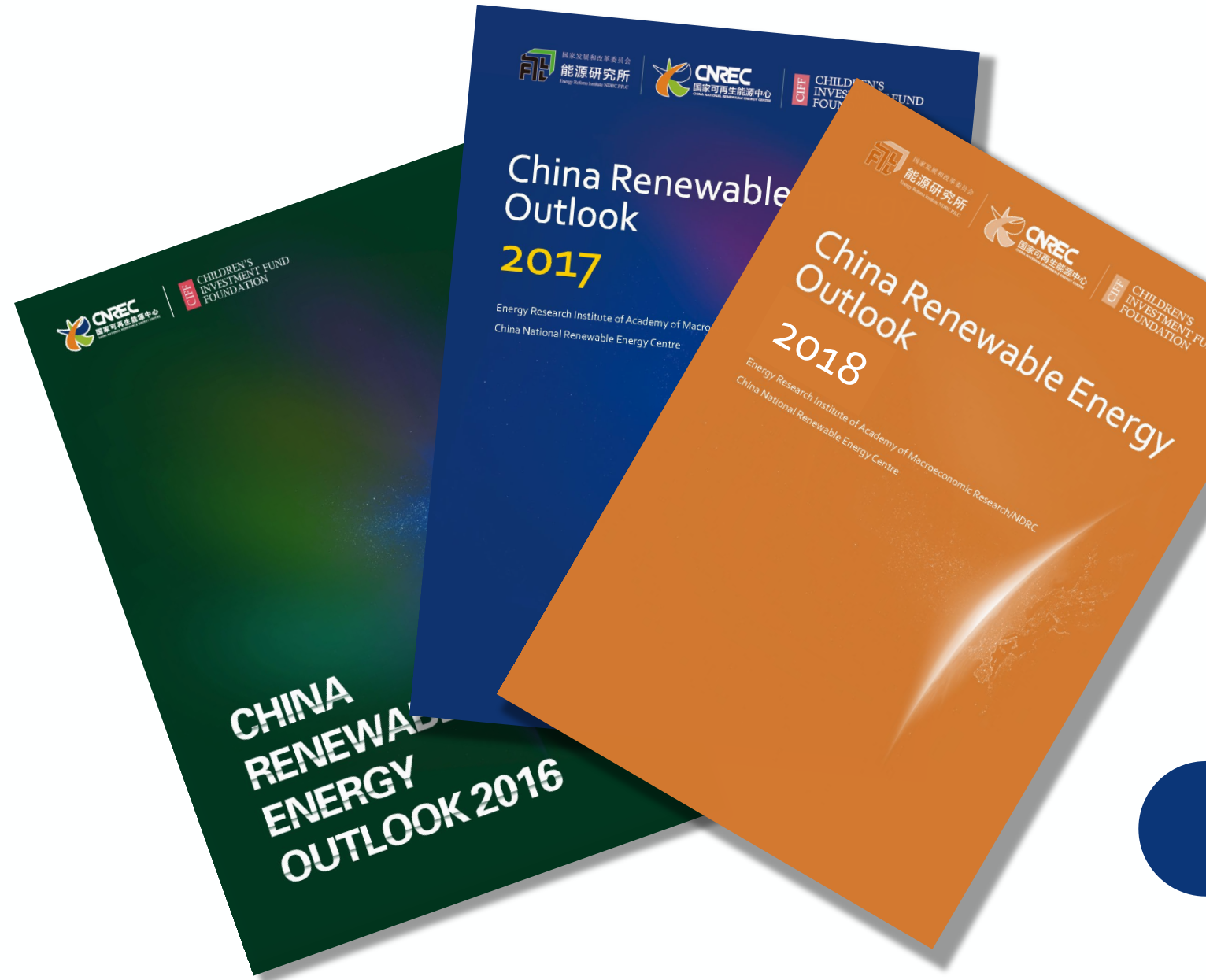


Economic high quality development — Energy transition — Ecological environment — Economic high quality development

China RE Outlook 2018

Annual publication from CNREC

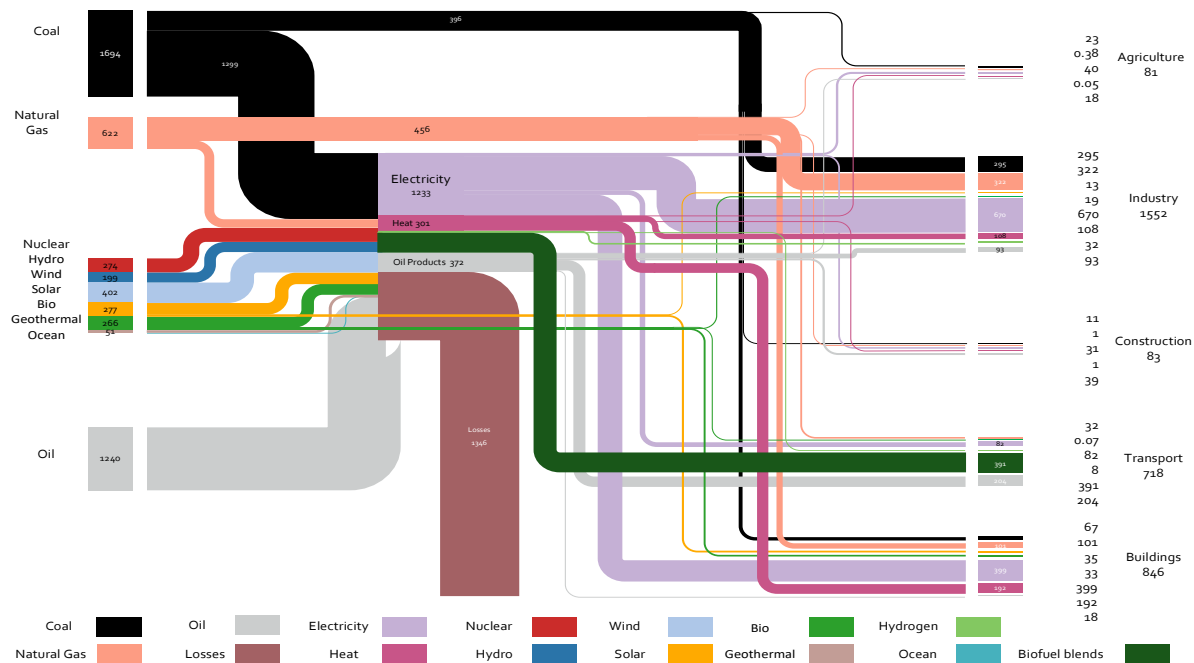
- Status for RE development in China
- Scenarios for China energy system development until 2050
- Energy policy research
- Policy strategy recommendations



2035 Stated Policy

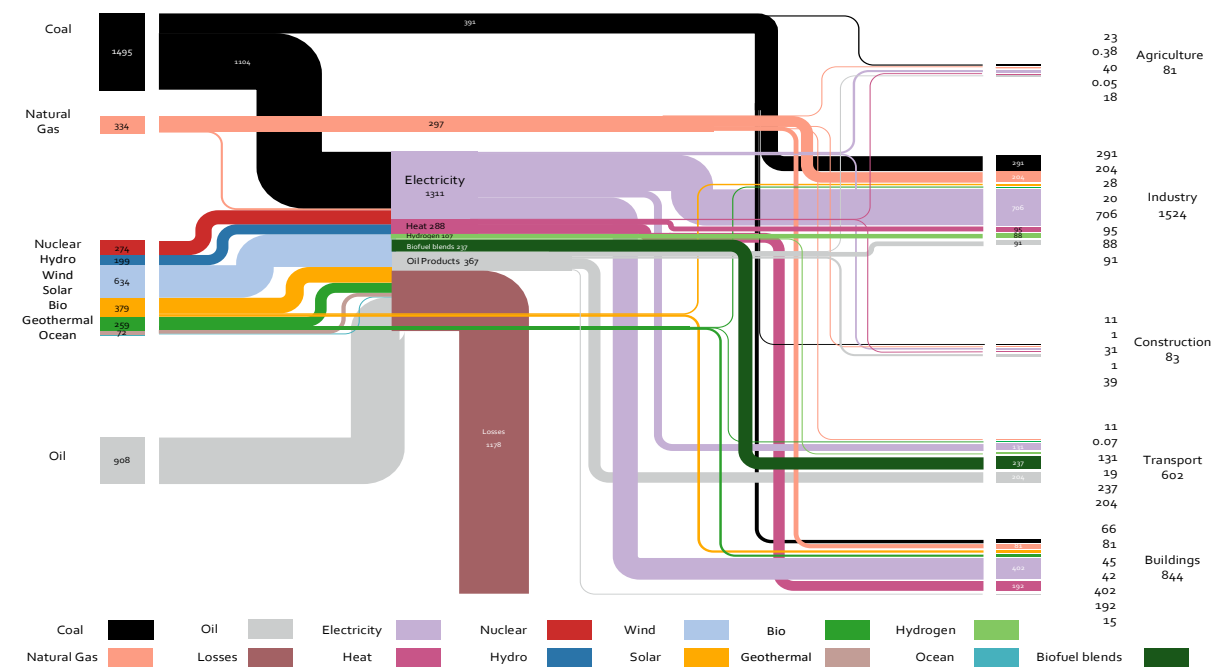


2035 Energy flow chart Stated policies (Mtce)



2035 Below 2 ° C Scenario

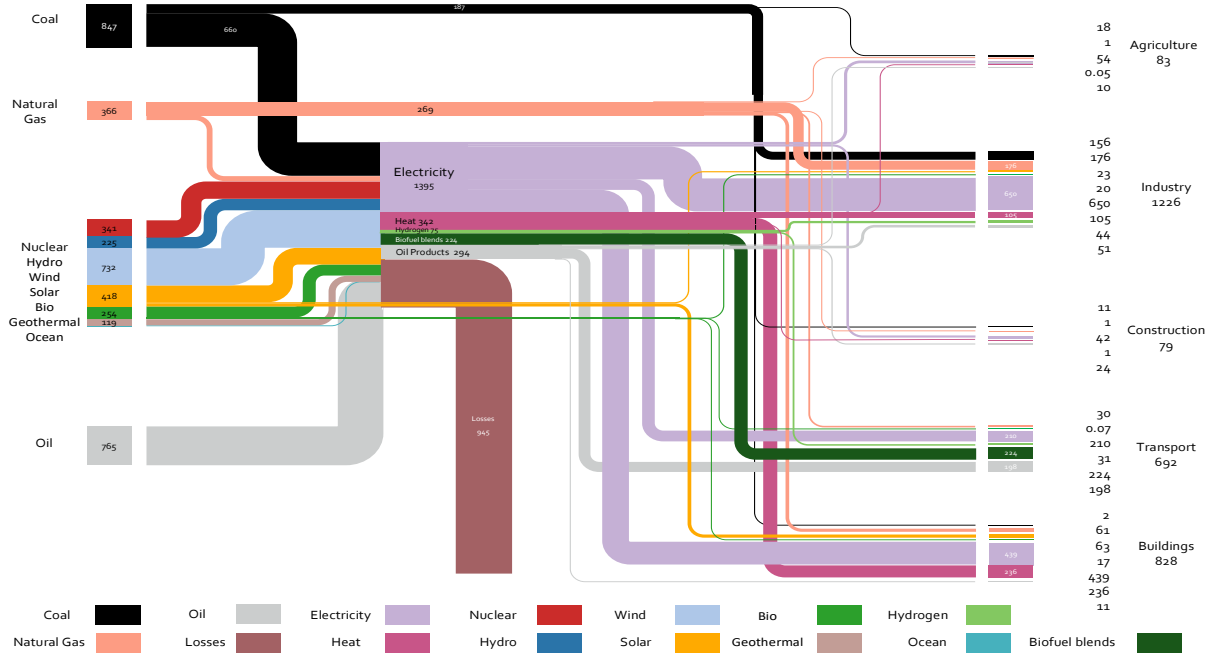
2035 Energy flow chart Below 2°C (Mtce)



2050 Stated Policy

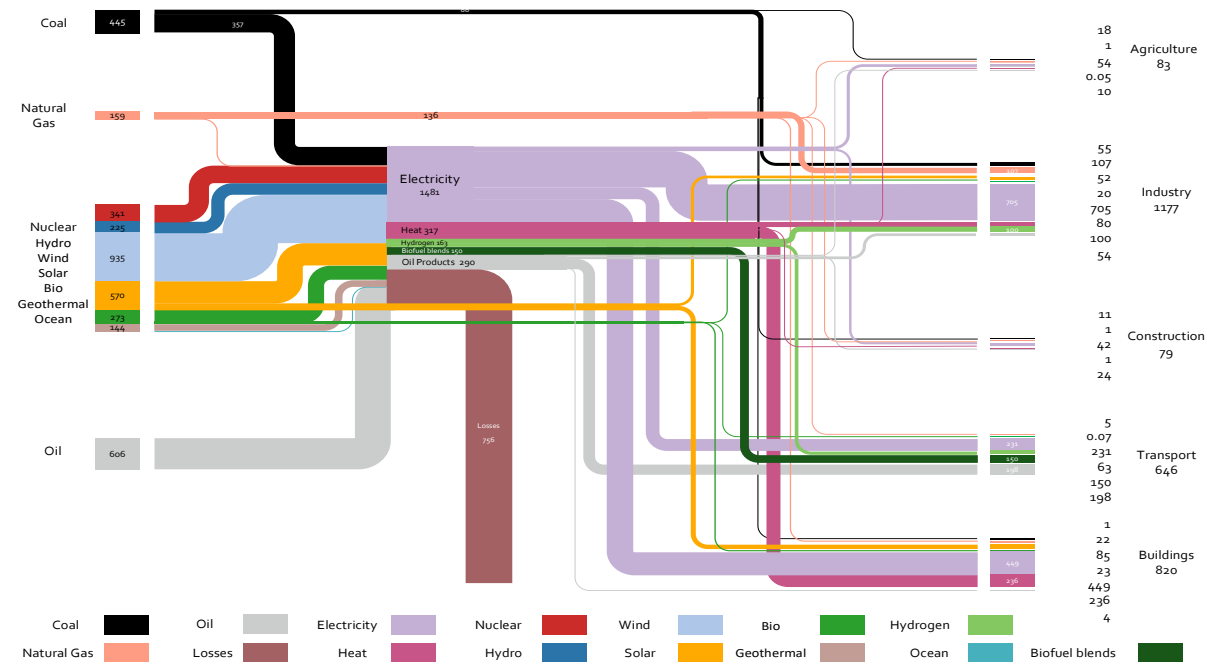


2050 Energy flow chart Stated policies (Mtce)



2050 Below 2 ° C Scenario

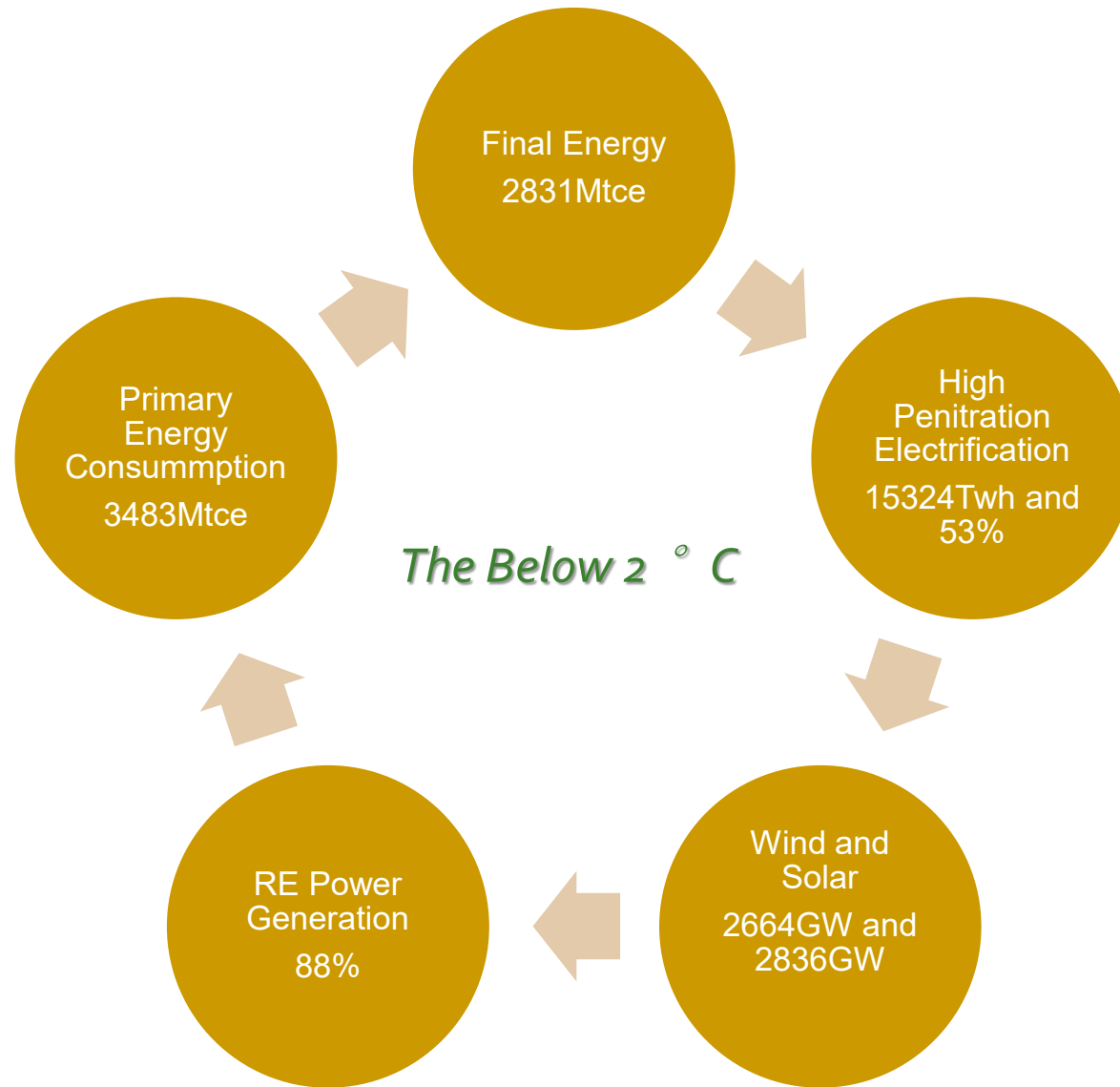
2050 Energy flow chart Below 2°C (Mtce)



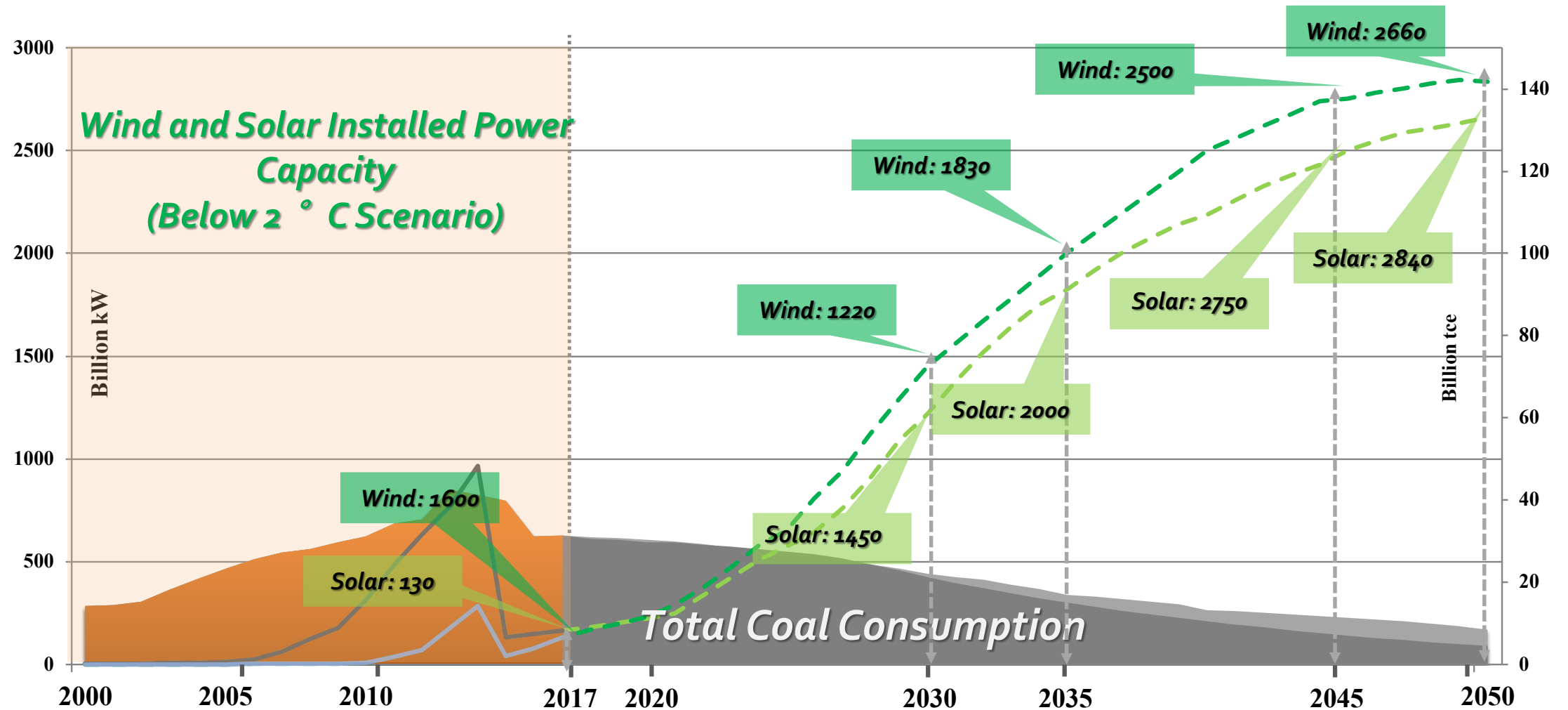


**The Below 2 ° C:
3483Mtce**

**The Stated Policy:
3724Mtce**



Power System Revolution: Wind power and solar power as the backbone



Power system balancing: flexibility is the main key

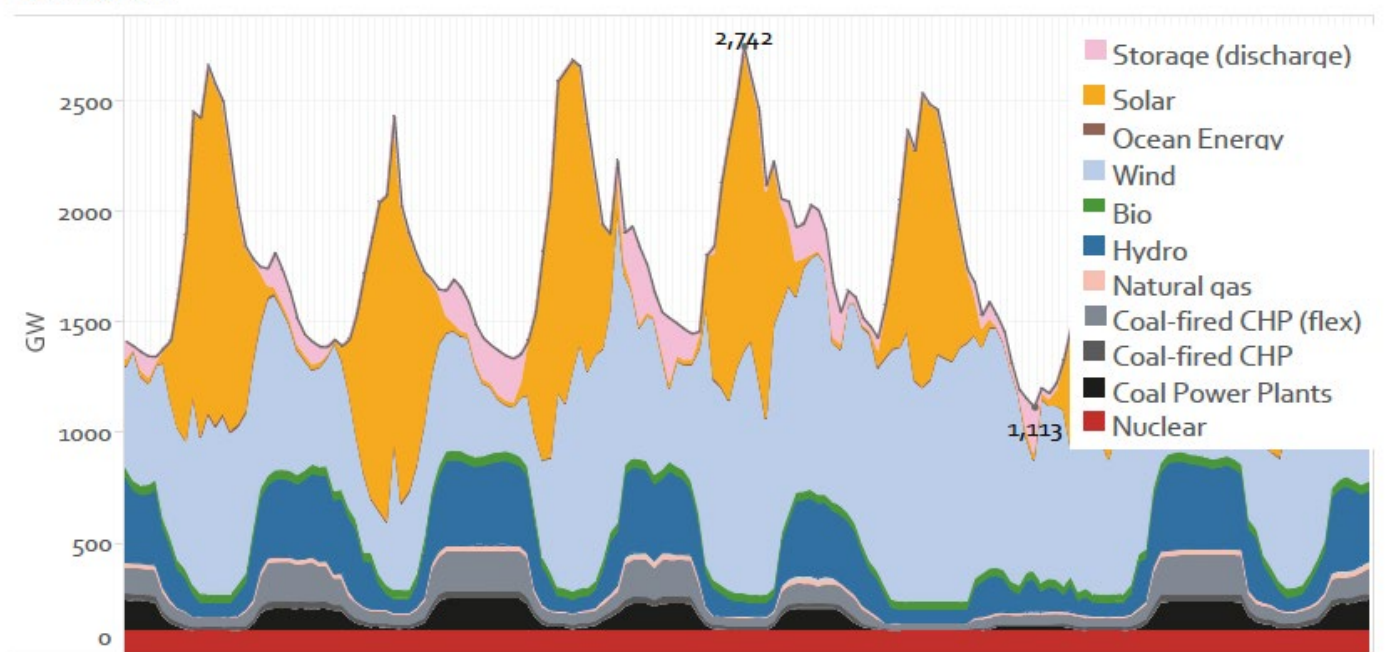
Demand side measures

- Peak load shaving
- Industrial load shifting
- EV smart charging
- EV charging
- Storage loading
- Electricity to heat

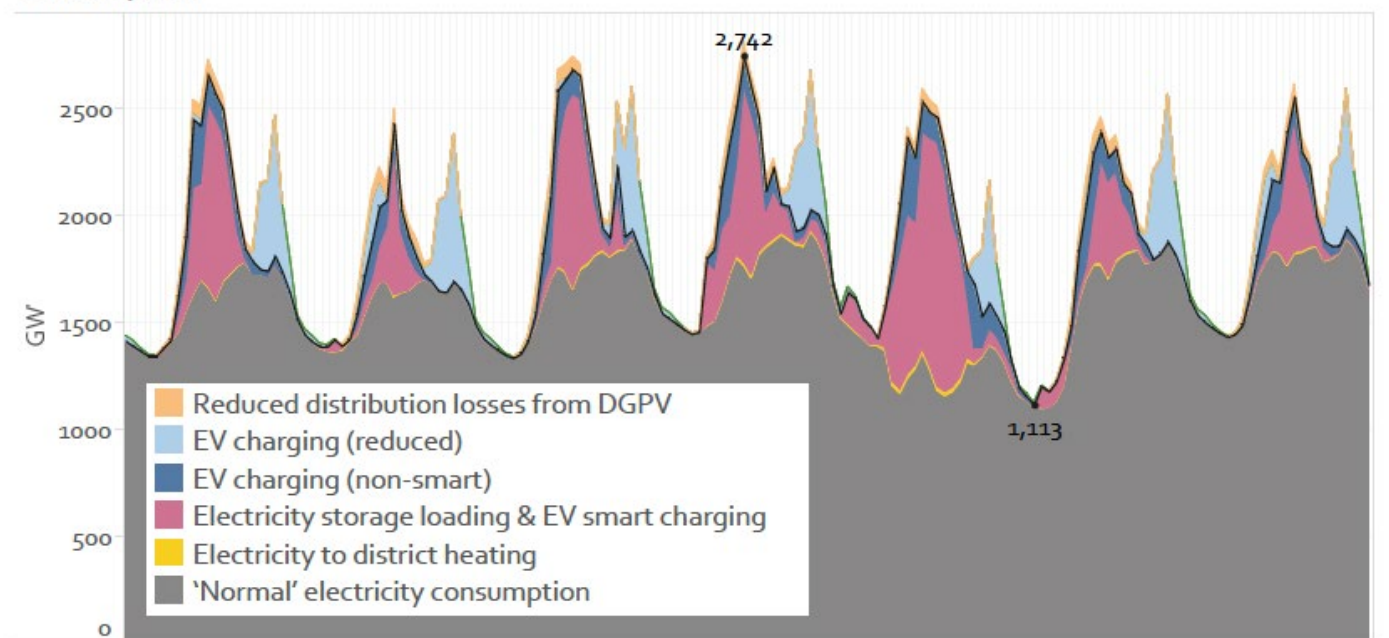
Supply side measures

- Flexible thermal power plants
- Flexible hydro
- Storage discharging
- Market value based VRE remuneration incentives

Generation



Consumption





*Thank you
for your
attention 😊*