Energy Policy and Technology in China

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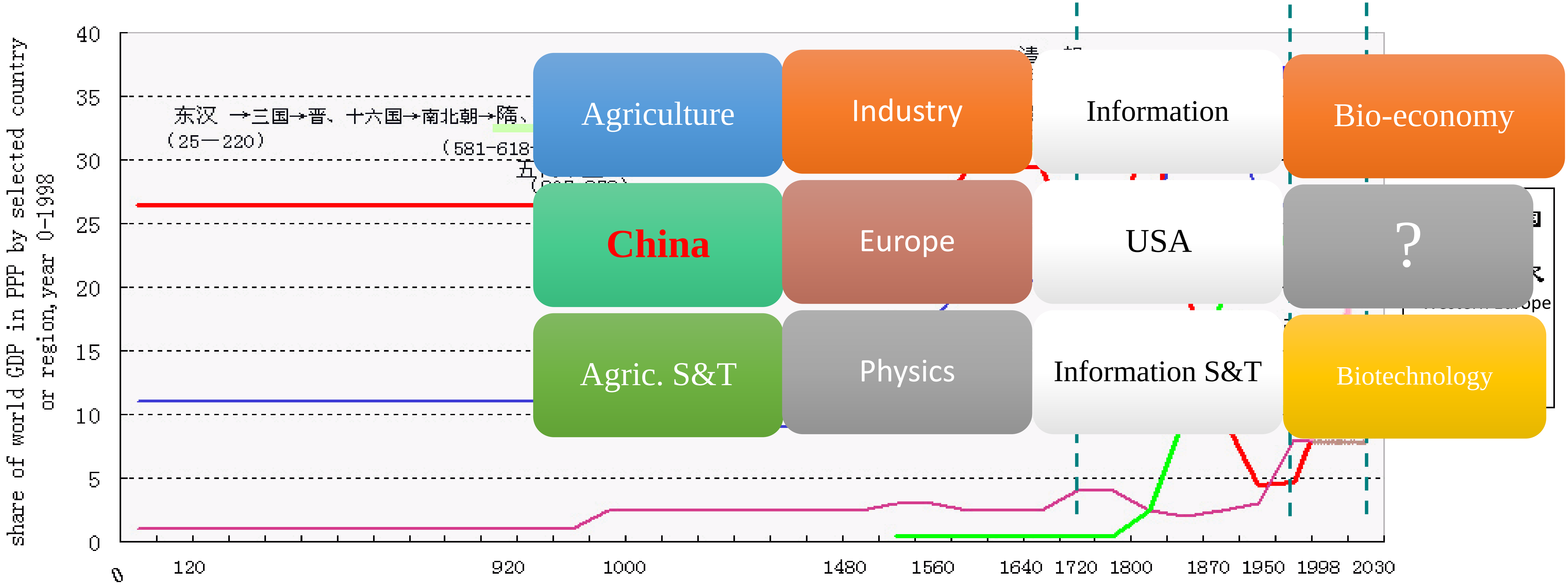
1.1 Review of the Recent 2000 Years

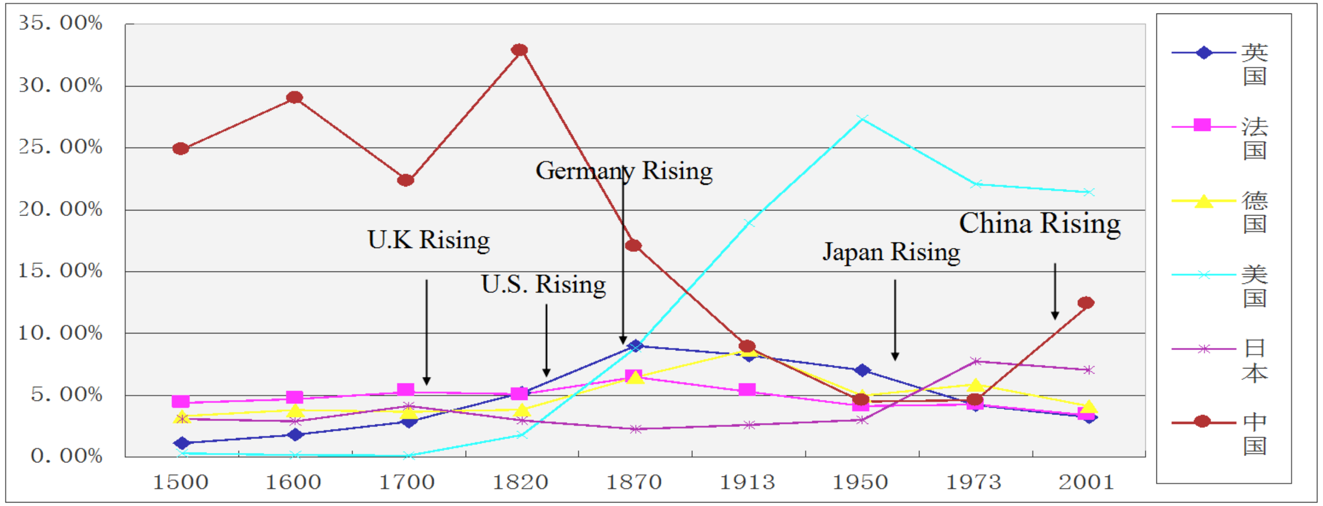
China leading, stagnating, recovering



Agriculture	Industry	Information	Bio-economy
China	Europe	USA	?
Agric. S&T	Physics	Information S&T	Biotechnology

source:Angus Maddison, The World Economy :A Millennial Perspective, OECD, Paris, 2001

1.2 Change in China's GDP Share in the Recent 500 Years (%GDP)

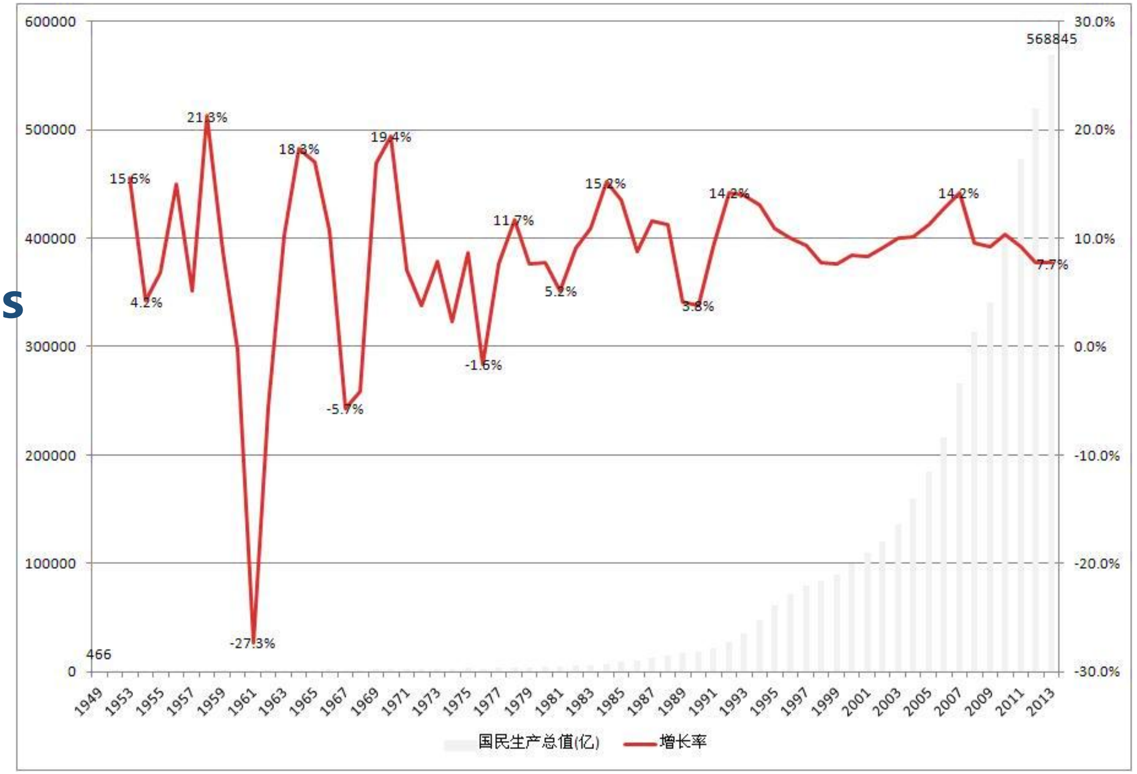


Data source: millennium statistics of world economy, OECD.

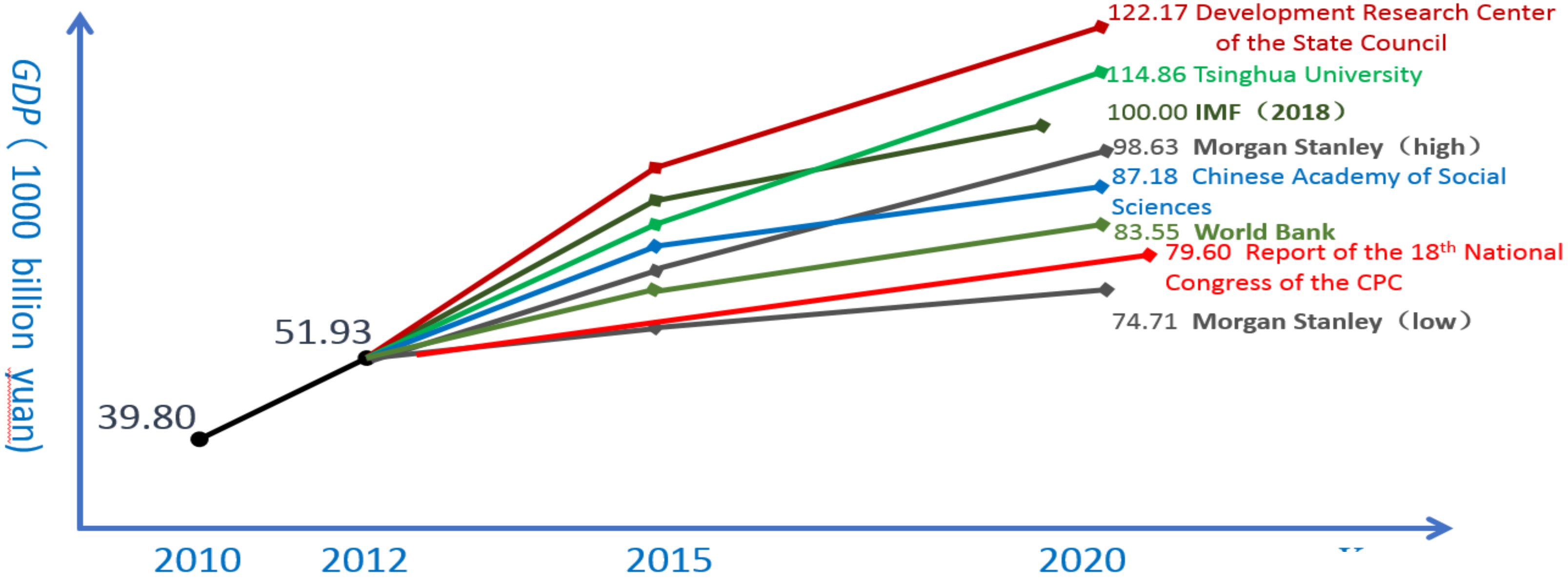
Since China's economic growth constantly declined in 1840, American economy surpassed the U.K in 1872, China in 1898, ranking the first in the world, and the U.K surpassed China in 1938.

1.3 GDP has been increased 1749 times in past 68 years

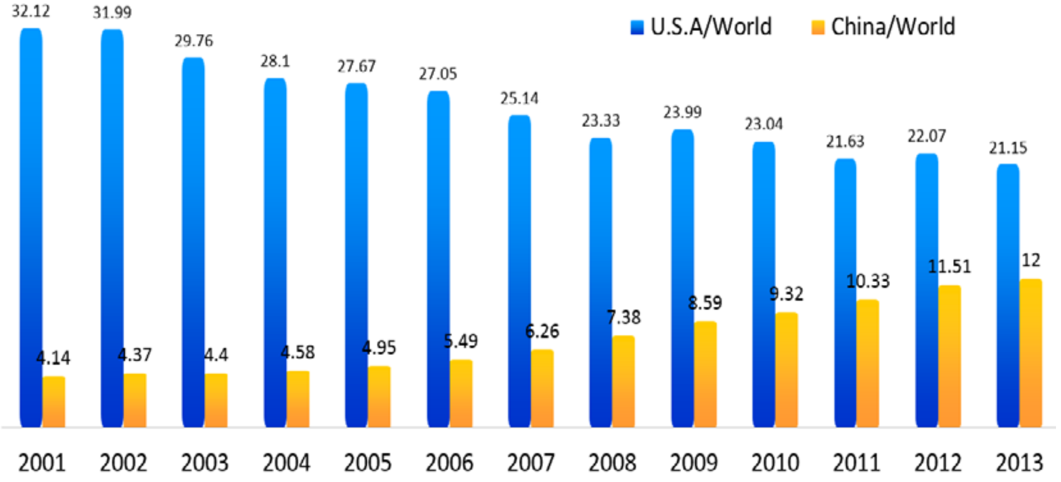
Before the foundation of new China, its economy had not increased for more than 120 years. Since the foundation, the economics growth increases more rapidly than that in history and the international. In the first 29 years, it increased by 5.8%, and in the late 35 years, it increased by 9.8%, creating another Chinese wander in human economy history.



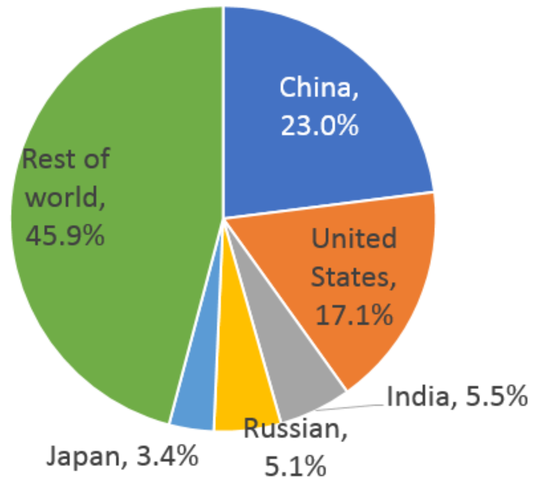
1.4 The Future 20 Years Outlook

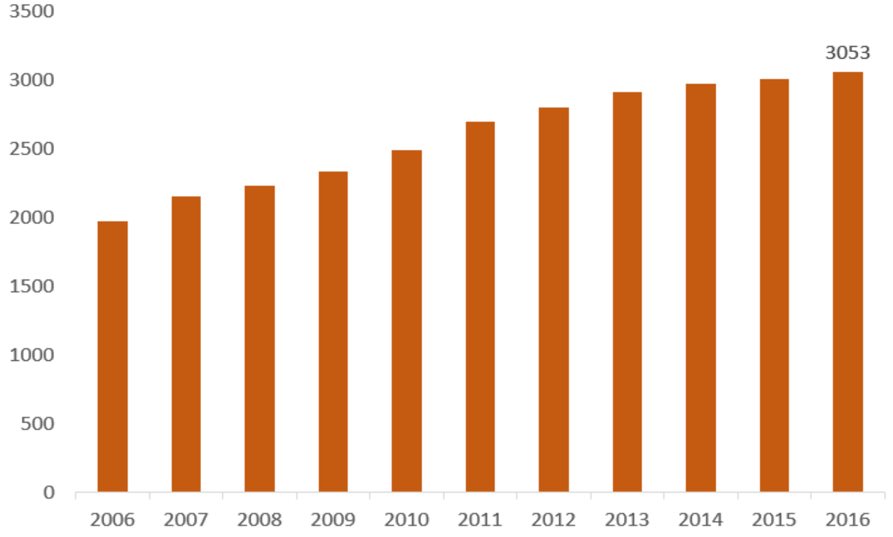


Proportion of China's Economy to World Economy is increasing



2.1 The scale of energy ranks 1st in the world





Primary energy consumption (Million tons oil equivalent)
Data source: BP Statistical Review of World Energy (2017)

2.2 The scale of clean energy ranks 1st in the world

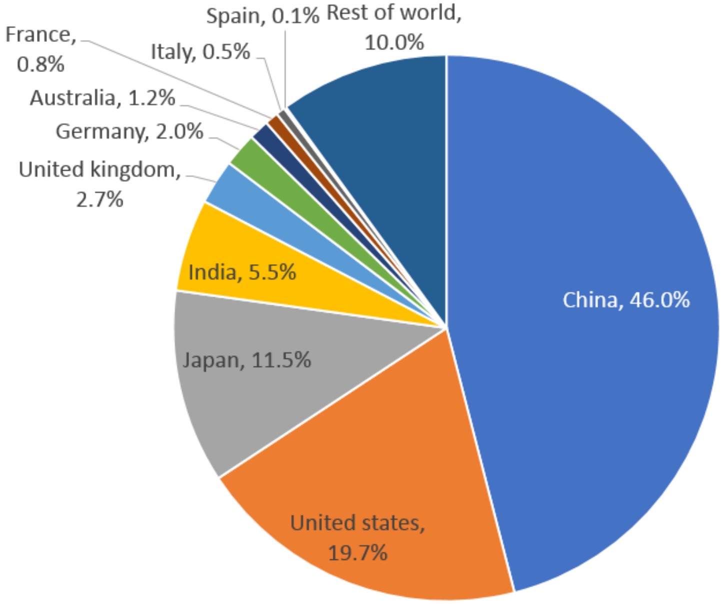
Power	RANKING				
Renewable power (incl. hydro)	CHINA	UNITED STATES	BRAZIL	GERMANY	CANADA
Renewable power (not incl. hydro)	CHINA	UNITED STATES	GERMANY	JAPAN	INDIA
Bio-power generation	UNITED STATES	CHINA	GERMANY	BRAZIL	JAPAN
Hydropower capacity	CHINA	BRAZIL	UNITED STATES	CANADA	RUSSIAN FEDERAT.
Hydropower generation	CHINA	BTAZIL	CANADA	UNITED STATES	RUSSIAN FEDERAT.
Solar PV capacity	CHINA	JAPAN	GERMANY	UNITED STATES	ITALY
Wind power capacity	CHINA	UNITED STATES	GERMANY	INDIA	SPAIN

HEAT	RANKING				
Solar water heating collector capacity	CHINA	UNITED STATES	TURKEY	GERMANY	BRAZIL
Geothermal heat capacity	CHINA	TURKEY	JAPAN	ICELAND	INDIA

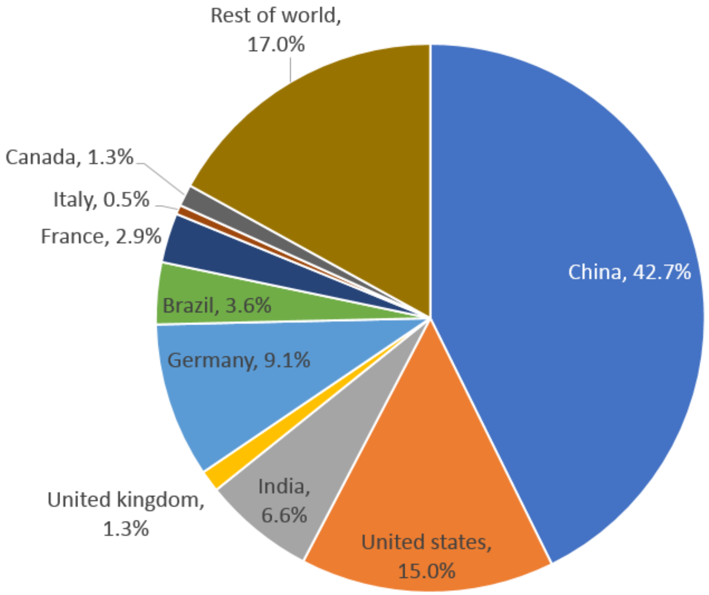
Edited according to RENEWABLES 2017 GLOBAL STATUS REPORT(FEN21)

By the end of 2016, China was home to more than one-quarter of the world’s renewable power capacity.

Solar Power
China accounted for 46% of new capacity



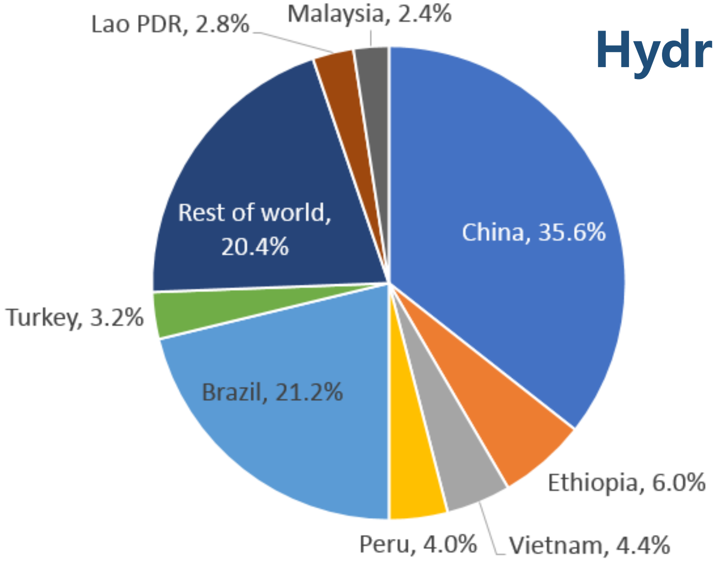
Data source: RENEWABLES 2017 GLOBAL STATUS REPORT(FEN21)



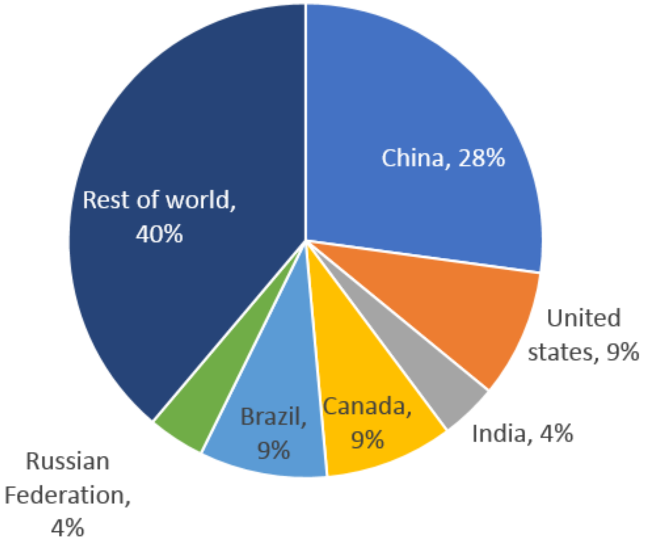
Data source: RENEWABLES 2017 GLOBAL STATUS REPORT(FEN21)

China's newly installed capacity of wind power accounted for 42.7% of the world's total, and cumulative installed capacity accounted for 34.7% of the world's total.

Hydropower

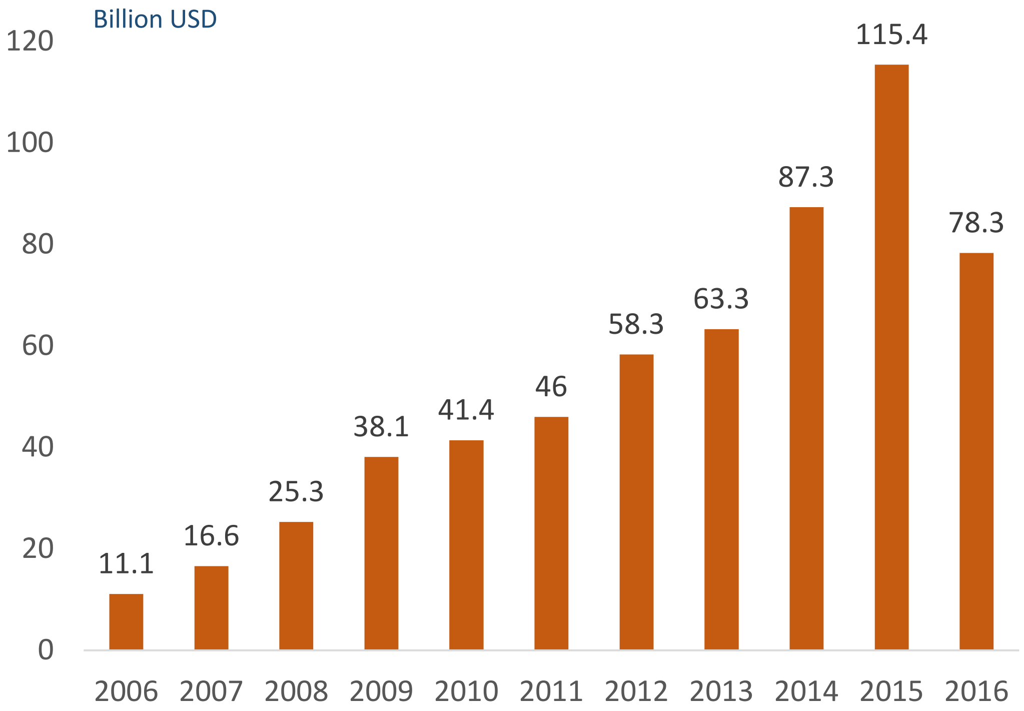


Hydropower Capacity additions (2016)



Hydropower Global Capacity, shares of top 6 countries and rest of world(2016)

2.3 The scale of clean energy investment ranks 1st in the world



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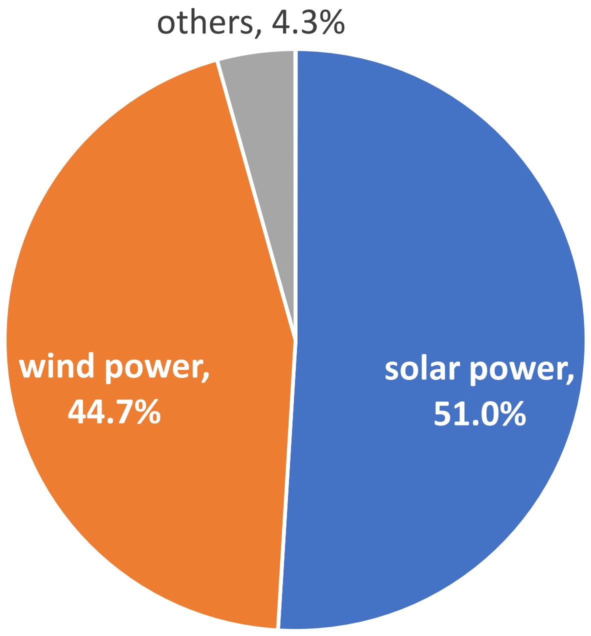
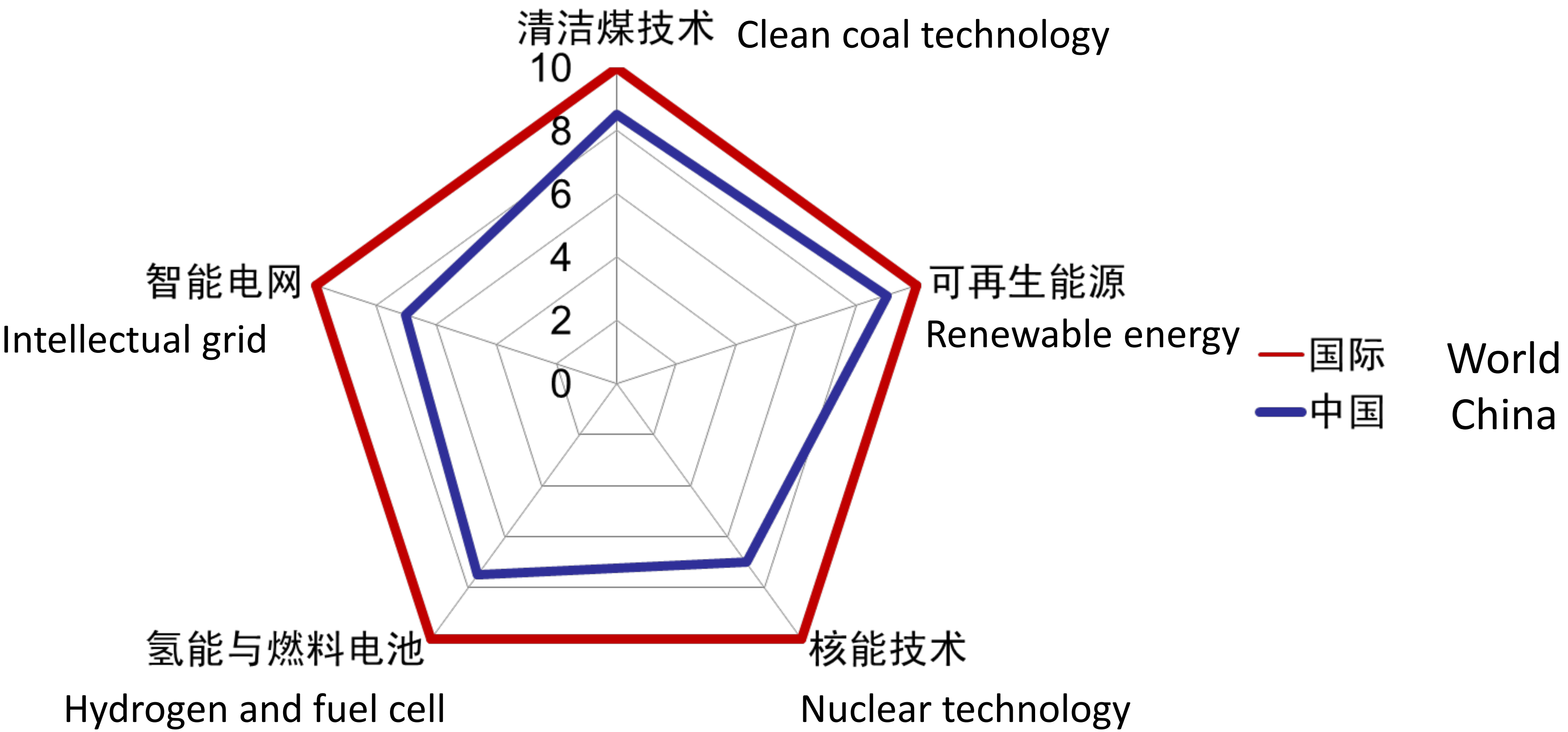
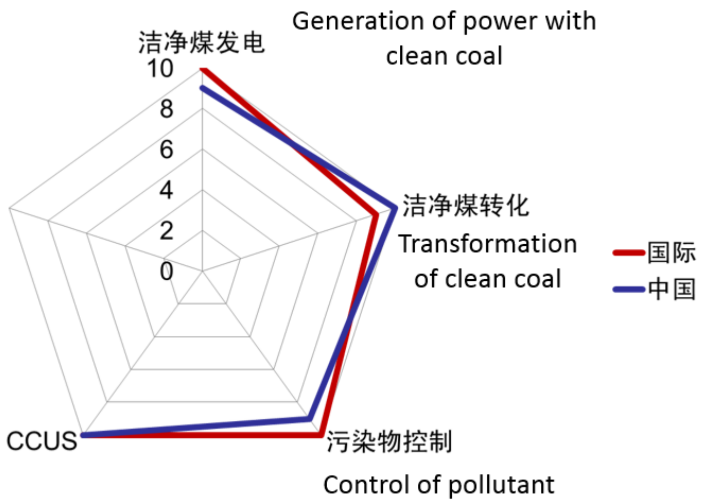


The Structure of New Investment in Renewable Energy by technology in China (2016)

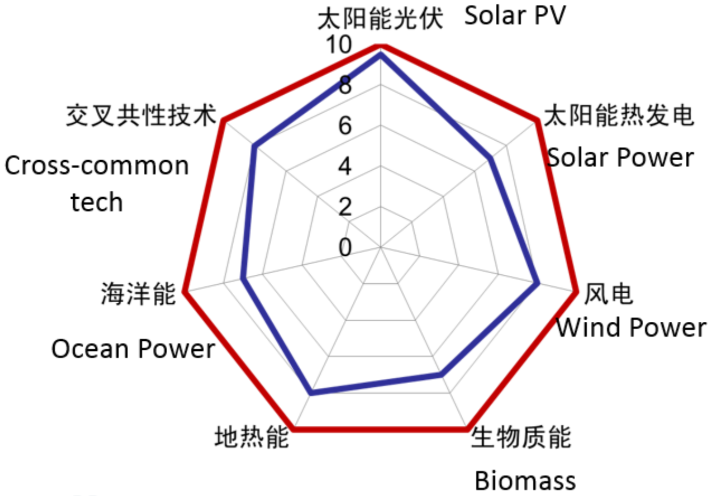
3.1 A clear gap between China and developed countries in energy technology



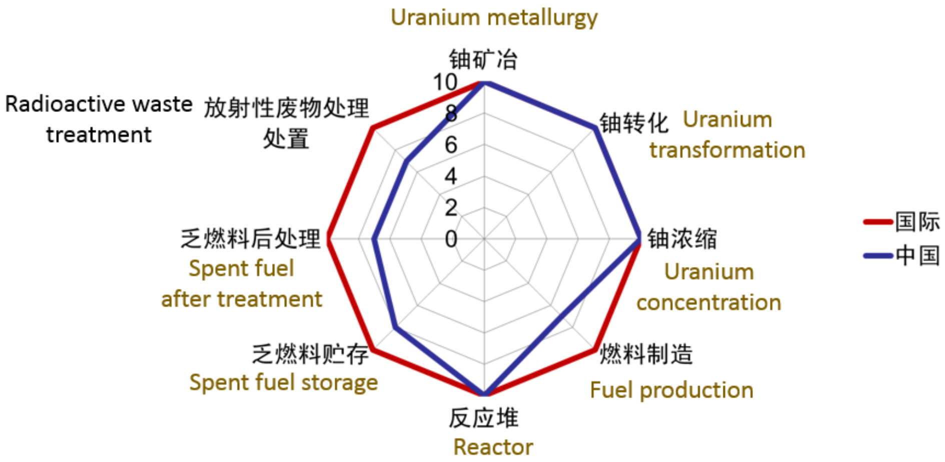
Clean coal tech



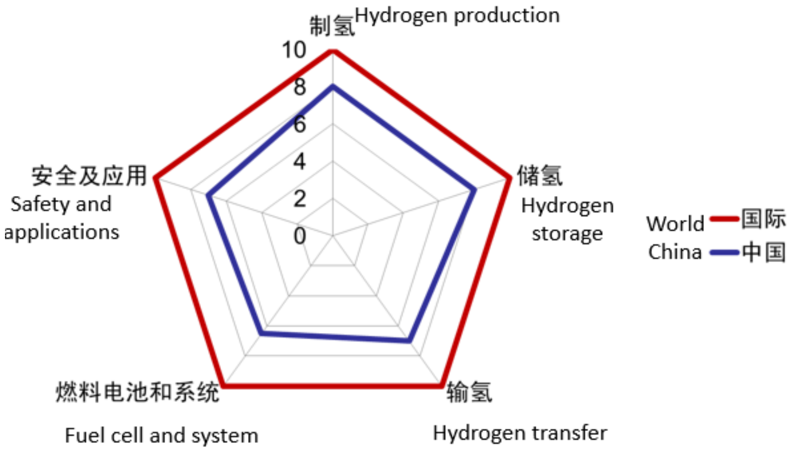
Renewable energy



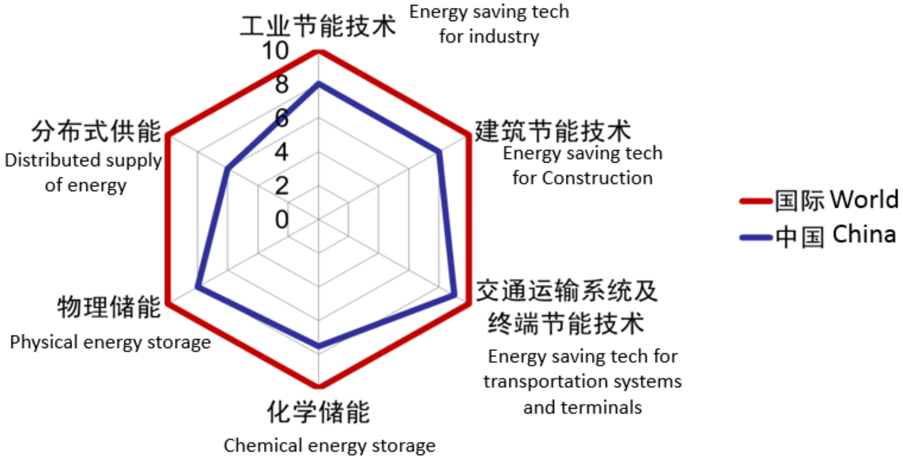
Nuclear tech



Hydrogen & fuel cell



Energy saving, energy storage and distributed supply of energy



3.2 The Key Technology Direction of Future Energy

- Clean, Efficient Utilization of Coal: Clean Coal, Coal-based Polygeneration Technology
- Nuclear Energy Technology: Fast Reactor Technology, High-Temperature Gas-Cooled Reactor Technology
- High-efficiency battery technology and electric vehicles
- Renewable energy technologies: solar energy, wind energy, bioenergy
- New generation hydropower technology and equipment:
- Large-scale energy storage technology: super capacitors, etc.
- 700°C Ultra-supercritical Power Generation Technology
- Building Energy Saving Technology
- High temperature superconducting force application technology

4 China’s energy policy is undergoing transforming

4.1 The problem of insufficient quantity of energy has been basically solved and low quality of energy has become the major challenge.

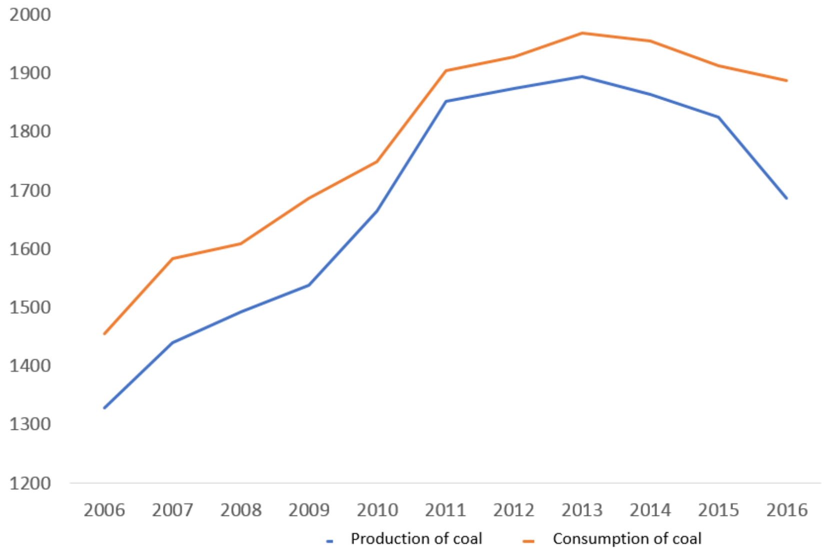
4.2 Optimized structure. The economy is in a period of transformation, the tertiary sector becomes an engine of economic growth, the energy consumption has decreased.

4.3 Environment optimization. Decreased consumption of coal, increased clean energy.

4.4 Developing electric vehicles. Both the production quantity and sales volume ranks 1st in the world.

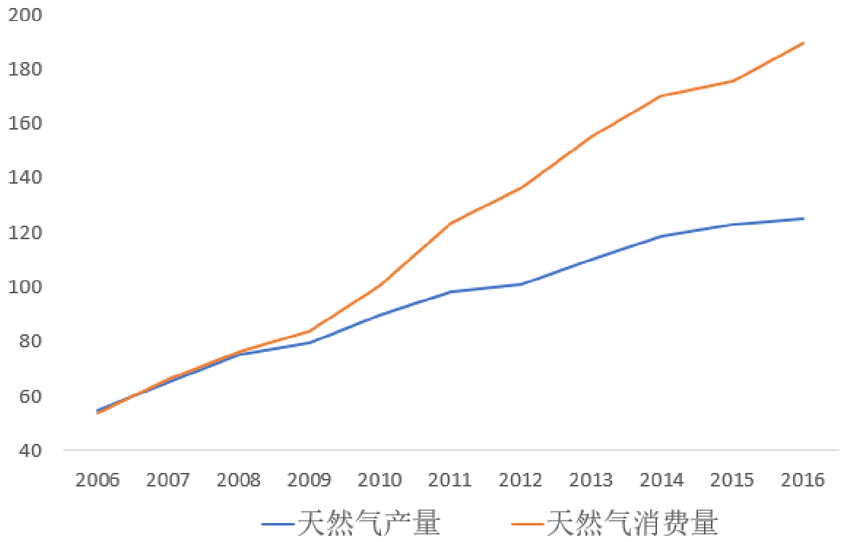
In the "13th Five-Year" plan, China will further adjust the energy structure.

Production and consumption of coal in China show a downward trend(million tons of oil equivalent)

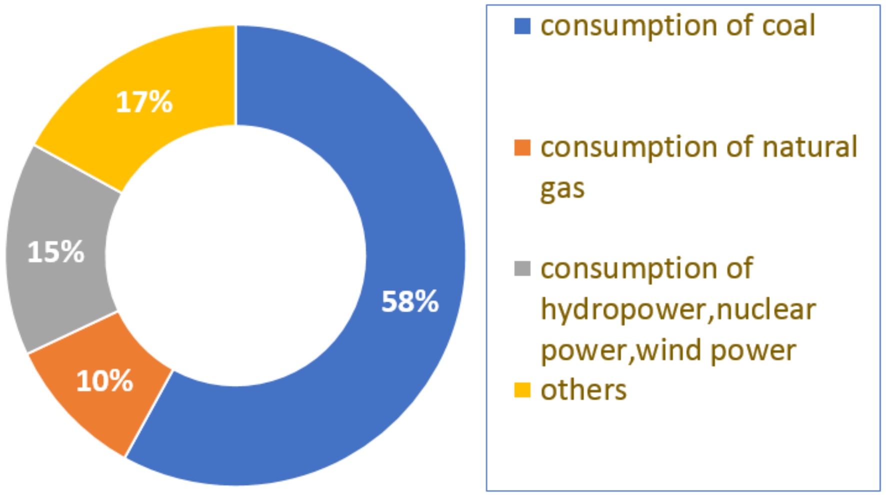


Data source: BP Statistical Review of World Energy (2017)

Production and consumption of natural gas in China show an upward trend(million tons of oil equivalent)



Data source: BP Statistical Review of World Energy (2017)



In 2020, the proportion of non fossil energy consumption increased to more than 15%, the proportion of natural gas consumption reached 10%, and the proportion of coal consumption decreased to less than 58%.

5 Advice on global energy technology foresight and cooperation

5.1 Research on energy policy

5.2 Energy technology foresight

5.3 Energy industry foresight

5.4 Talents foresight in energy sector

5.5 Battery technology foresight

Thank You!

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