

# RENEWABLE ENERGY DEVELOPMENT IN CHINA

Li Junfeng  
NCSC and CREIA  
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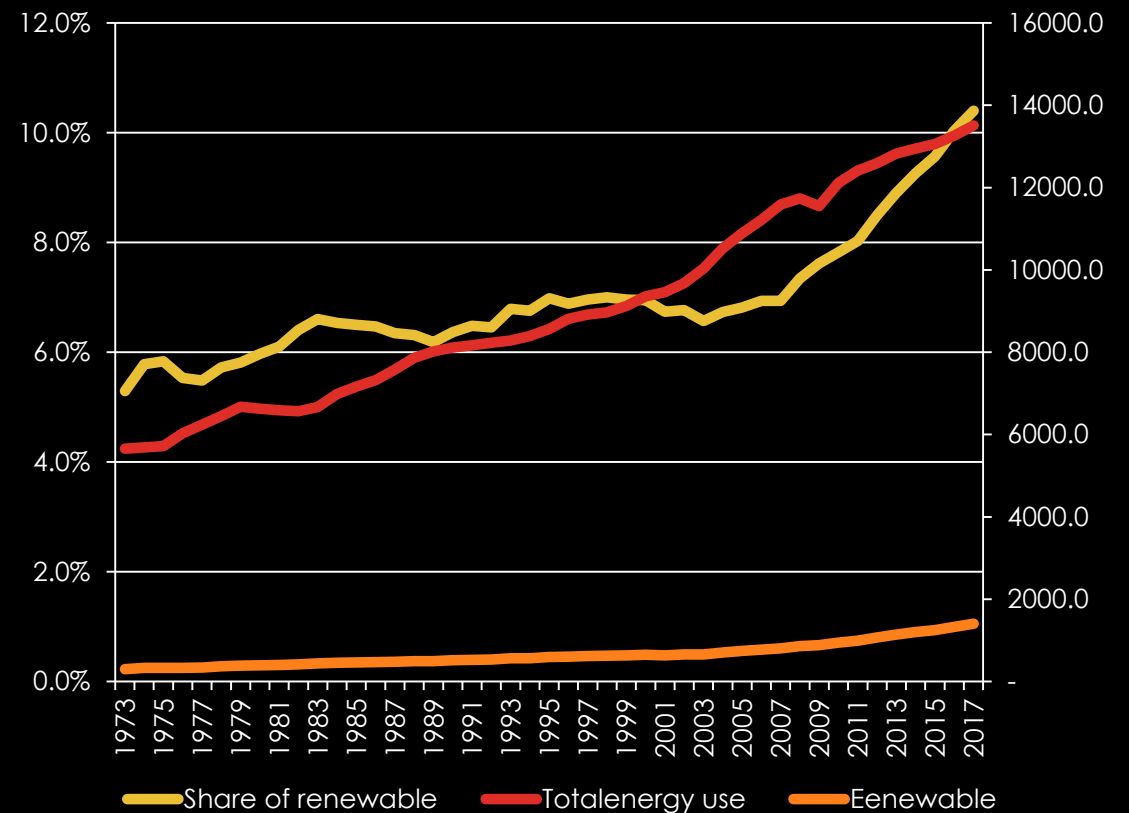
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# DEVELOPMENT REVIEW

Renewable energy started to be paid attention since 1973, after 45 year development, renewable energy has plied important roles both in the energy security and sustainable development, especially for climate change.

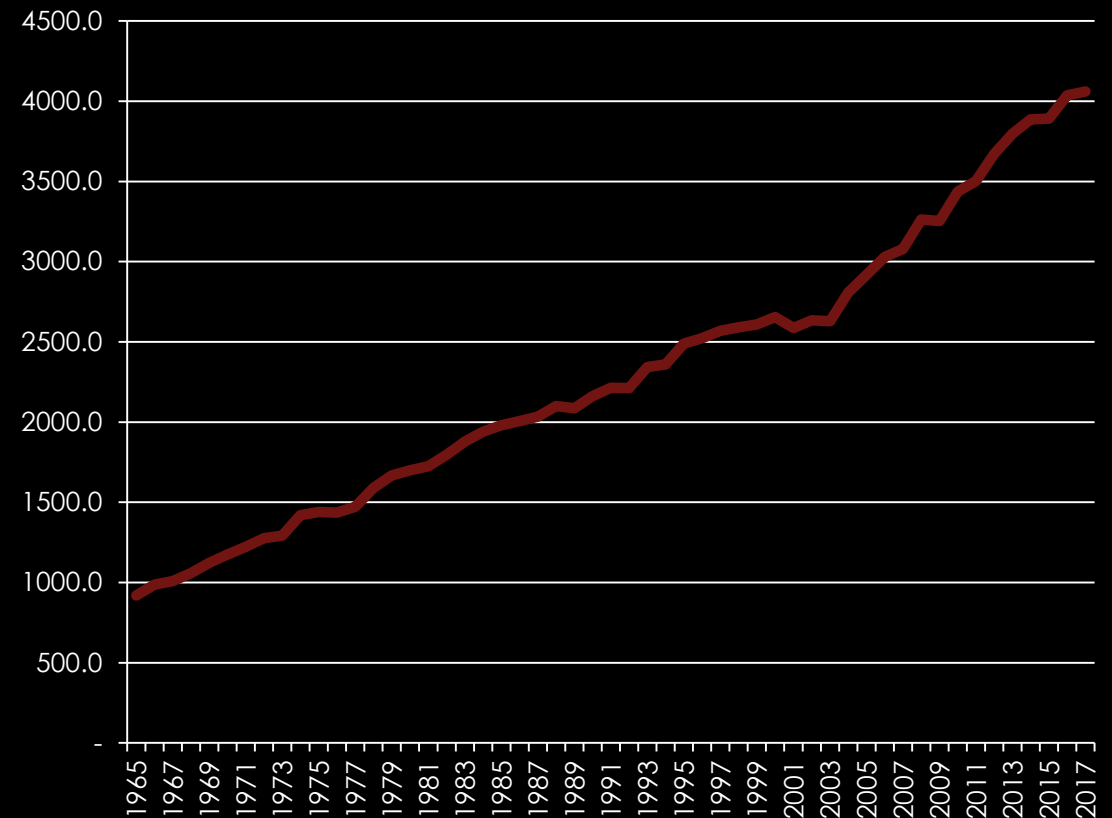
# OVERVIEW

- Since 1973, share of renewable energy increased from 5% to over 10%, doubling of the share in total energy consumption
- And the total amount of renewable supply increased from 300 to about 1400 million tons of oil equivalent



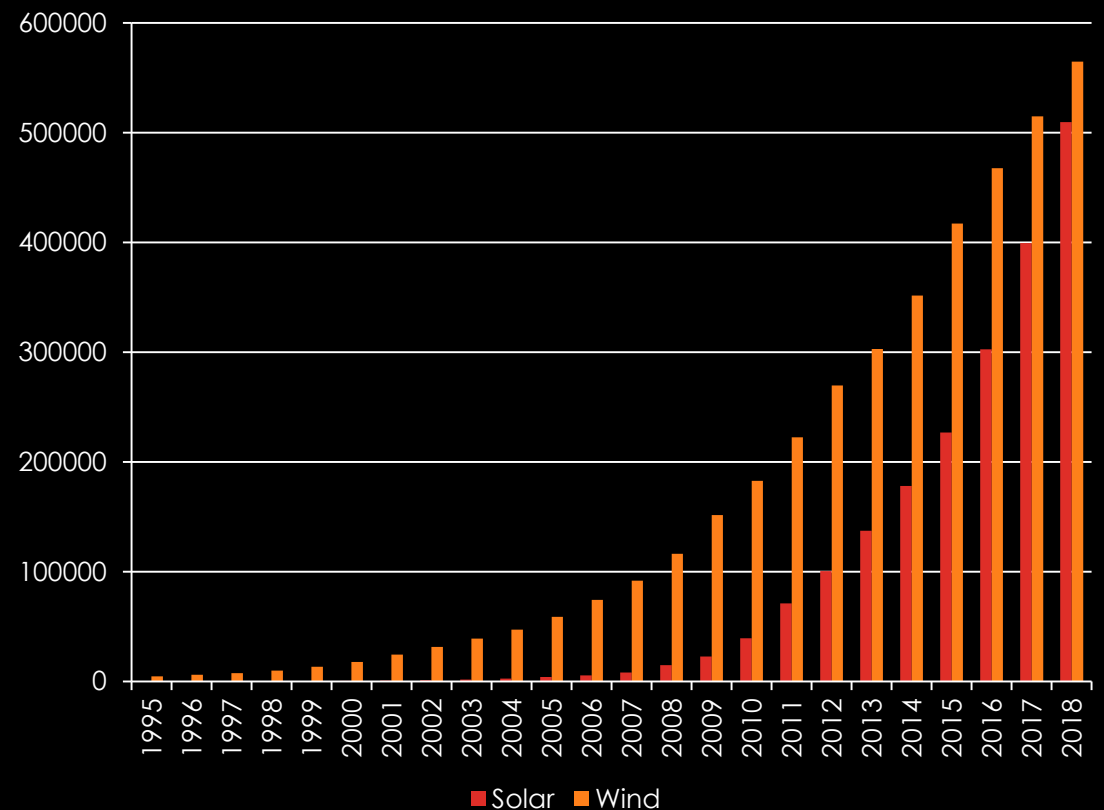
# HYDROPOWER

- Since 1973 hydropower generation increased from 909 TWHs to about 4000 TWHs
- Share of hydropower in the total energy use increased to about 7%



# WIND AND SOLAR

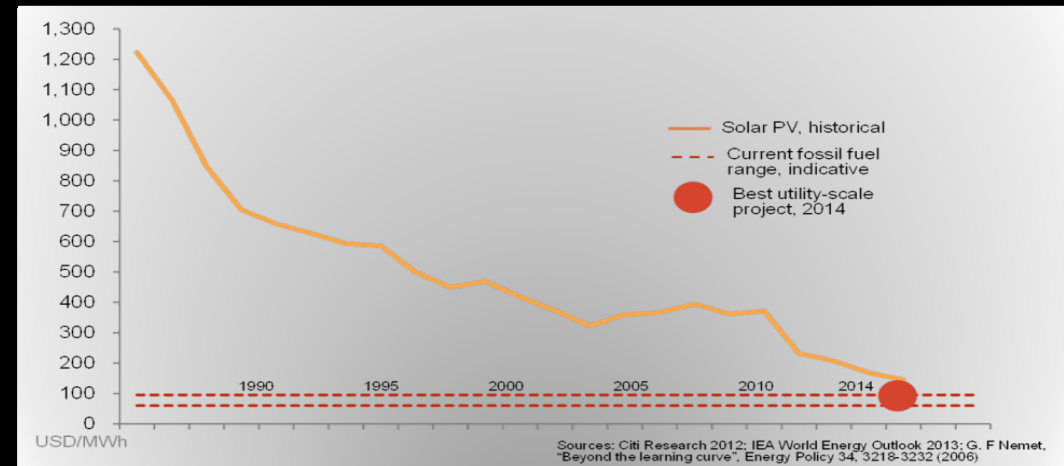
- By the end of 2018, both wind and solar power installation were over 500 GW, of which Wind with 550GW and solar with 510 GW
- The total installation of wind and solar reached the total installation of hydropower





# COST REDUCTION OF RENEWABLES

- The cost of all of the renewable energy were reduced, especially the solar power
- The generation cost of solar PV has reached less then 2 to 3 dollar cents of kWh
- In the most of the case solar is the lowest cost power generation options





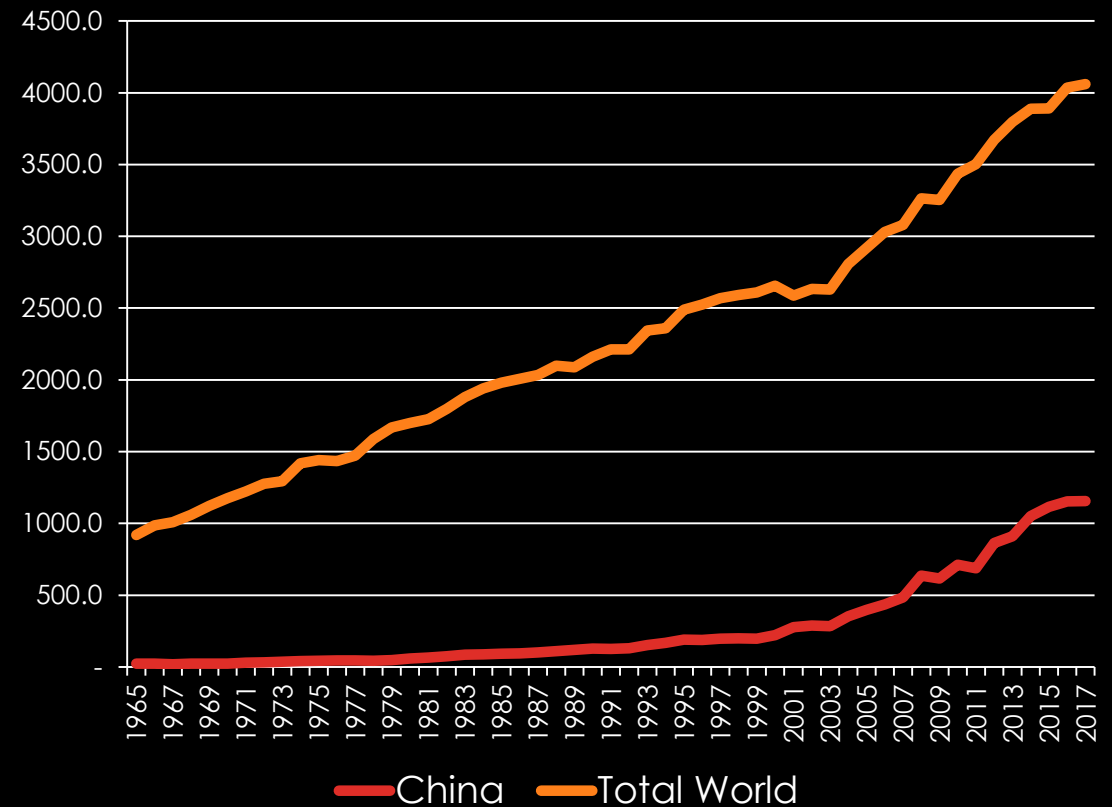
# REVIEW OF RENEWABLE ENERGY DEVELOPMENT IN CHINA

Renewable energy is one of active sectors in China, both hydro, wind and solar reached the top in the world



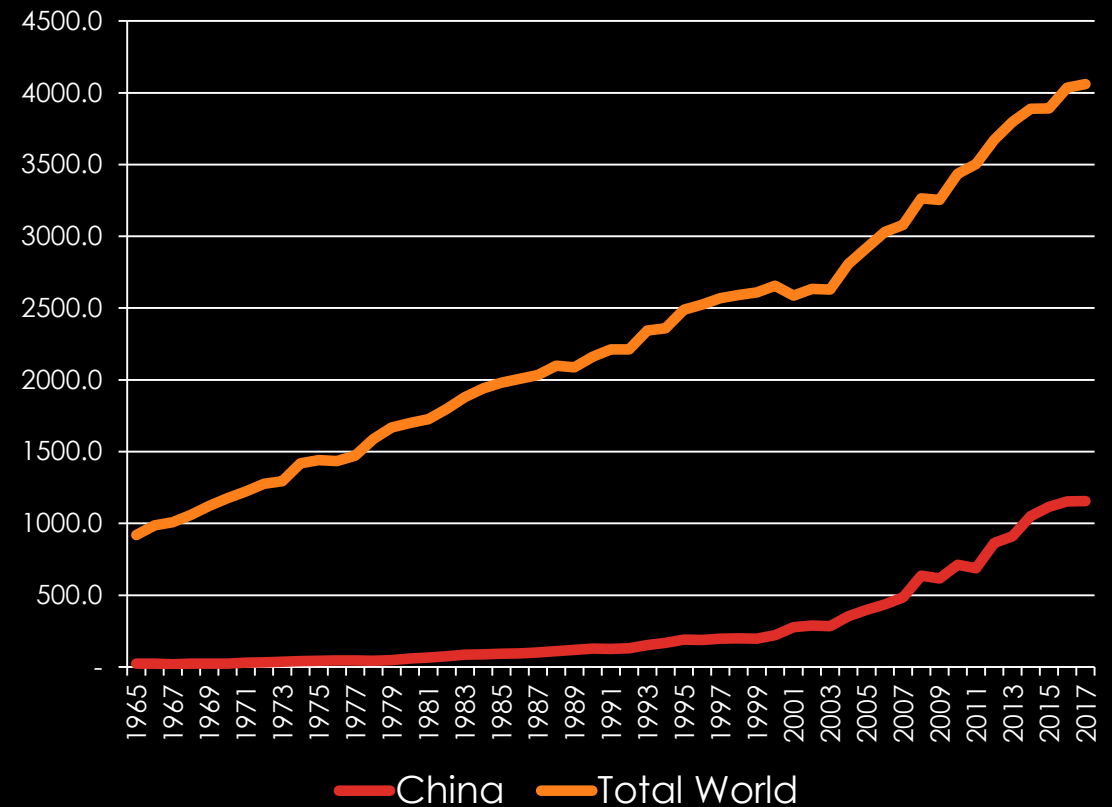
# HYDROPOWER

- In the end of 2017, total hydropower generation in was reached about 1200 TWHs, which takes about 30% of total world hydro power
- It is more than the total power generation of Japan



# WIND AND SOLER

- By the end of 2018, the total installation of wind and solar PV installation both had been increased to about 190 GW, all of them takes about 1/3 of the world installations
- The power generation of solar and the wind reached about 500TWHs, which is about of half of total power generation of Japan





# DEVELOPMENT OUTLOOK IN CHINA

# DRIVING FORCE

- Improve energy mix
- Ensure Energy Security
- Protect the environment
- Fight Against Climate Change
- Promote Sustainable Development

# GOALS

- By 2020,
  - Non-fossil energy in primary energy consumption reaches 15%. To be completed.
  - The share of natural gas accounts for no less than 10%. To be completed.
  - Coal accounts for no more than 60%. Completed.
- By 2030,
  - Non-fossil energy in primary energy consumption reaches 20%.
  - Carbon dioxide peak is basically realized.
- By 2050,
  - Non-fossil energy in primary energy consumption accounts for more than 50%.
  - Non-fossil energy power generation reaches 80%.
  - Carbon dioxide back to 2005 or 2010 levels.

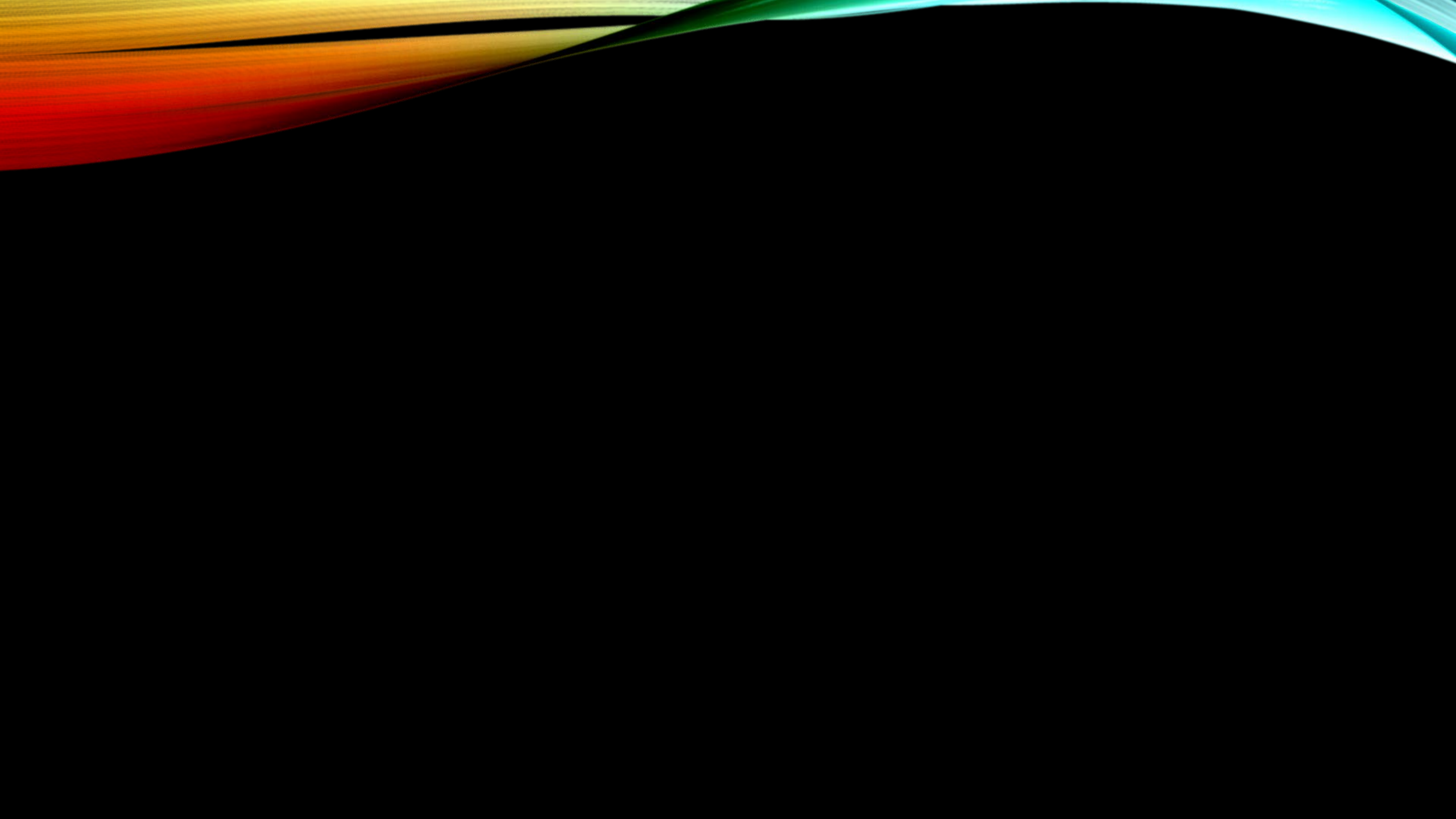




# GOALS

- By 2020
  - Hydro 350 GW
  - Solar 250 GW (110)
  - Wind 230 GW (200)
- By 2030
  - Hydro 400 GW
  - Solar 800-1000 GW
  - Wind 400-500 GW
- By 2050
  - Hydro 450 GW
  - Solar more than 2000 GW
  - Wind more than 1000 GW





# ACTIONS

- In 2020, the Chinese government will submit its strategy for ultra-low emissions by 2050 to the international community.
- The National Energy(NEA) Administration has promoted an energy transition centered on electricity.
- The State Grid has experimented to supply power 100 percent generated by renewable energy.
- The Chinese Academy of Sciences has begun to work on a new power system which focuses on renewable energy.
- China has set out to establish a national carbon market to promote emission reduction through market mechanism.
- The NEA has introduced a quota system to promote the development of renewable energy.
- China is vigorously promoting the development of a new generation of nuclear power technology so that nuclear power can contribute more to energy transition and climate change combat.
- The development of electric vehicles, fuel cells, and hydrogen technologies could accelerate energy transition in future.

# UNCERTAINTY

- The troika of the global energy transition is energy security, environmental protection and climate change.
- After the US withdrew from the Paris Agreement, the troika of energy transition lost one carriage.
- If conventional pollutants from fossil fuels can also be reduced to acceptable levels, energy security will be the only driving force behind the energy transition.
- China' s commitment:
  - Internationally, to 100 percent realize the intended nationally determined contributions.
  - Domestically,
    - To lower PM2.5 to 35PPM by 2030
    - To initially build a developed country by 2035 and keep the PM2.5 below 35PPM
    - To initially build a modernized country by 2050 and keep the PM2.5 around 10/15/20?

# THANKS FOR YOUR ATTENTION!

Tel: +86 10 63909290  
Fax: +86 10 63909213  
Email: [lijf@ncsc.org.cn](mailto:lijf@ncsc.org.cn)

