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# China's Renewable Energy – Current Situation and Future Perspective

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# 内容 Content



**Policy Framework**

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**Current profile**

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**Plan target**

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**Future perspective**

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# Supporting Policy for Renewable Energy Power in China

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# Feed-in tariff for RE Power

## ➤ Wind

- Onshore :0.49-0.61 CNY/kWh
- offshore: 0.75, 0.85CNY/kWh

## ➤ Bio-power

- 0.75 CNY/kWh for agricultural and forestry residual
- 0.65CNY/kWh for MSW power
- 0.25 CNY/kWh subsidy for biogas power

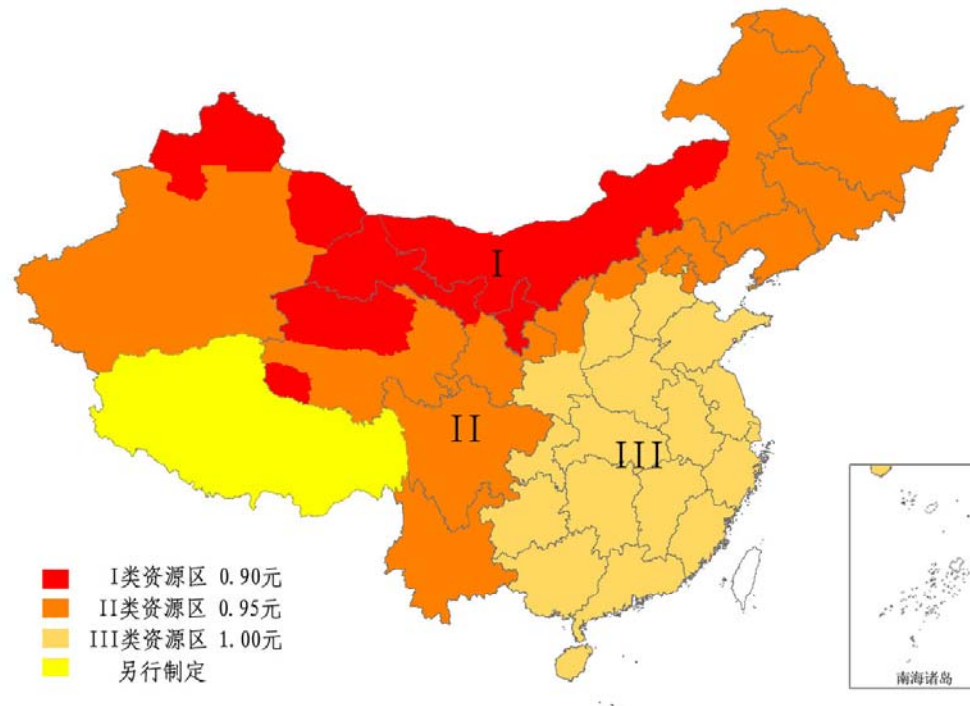


风电的区域固定电价

Wind power Feed-in Tariff (declined since year 2015)

Currency rate: 1 US\$=6.2Chinese RMB

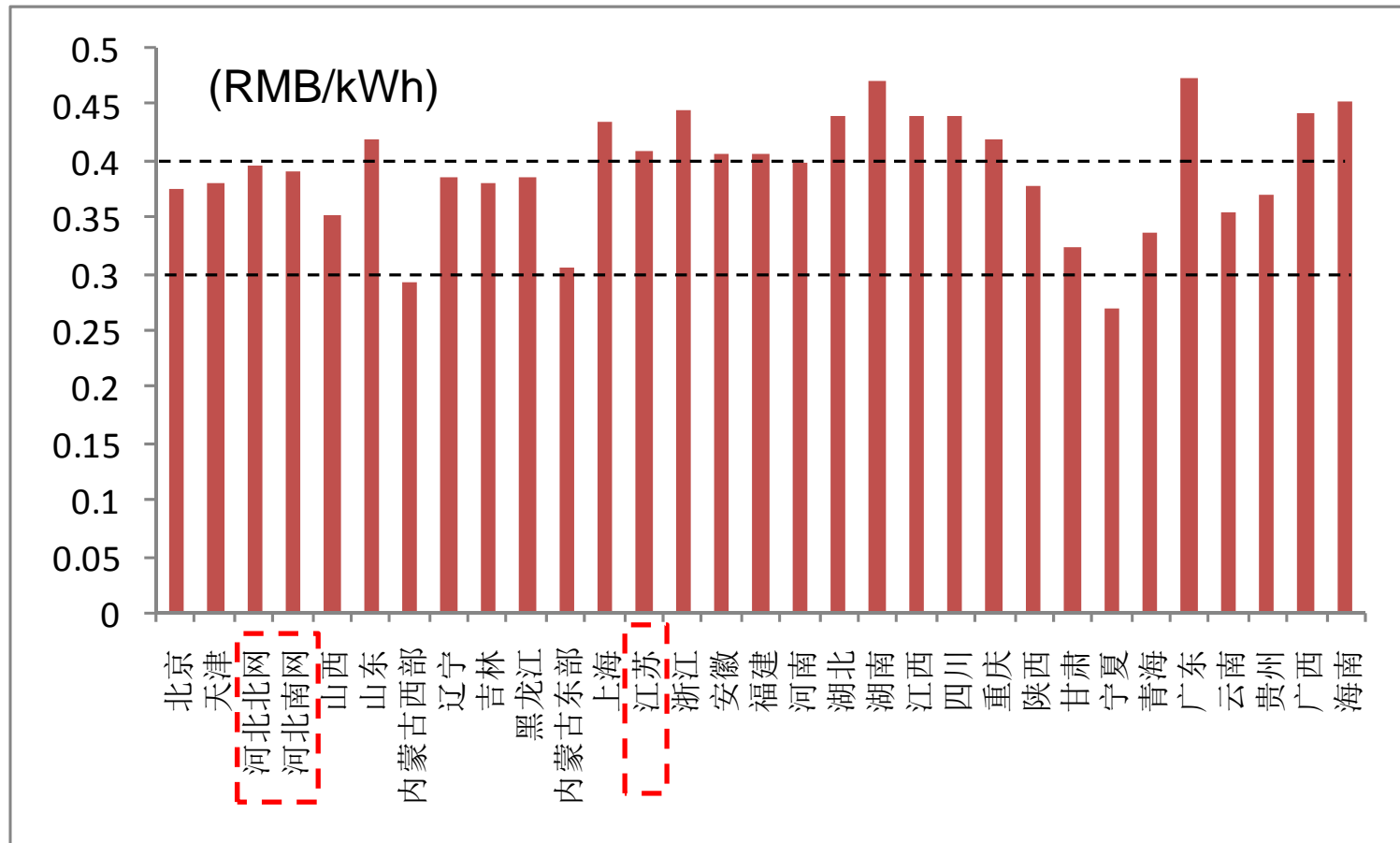
# Feed-in tariff for utility-scale PV



- **Large –scale Solar PV**
  - Regional FIT 0.9, 0.95, 1.0 CNY/kWh
- **Distributed Solar PV**
  - 0.42 CNY/kWh subsidy

Currency rate: 1 US\$=6.2 Chinese RMB

# Feed-in tariff for coal-fired power (Yuan/kWh) by province

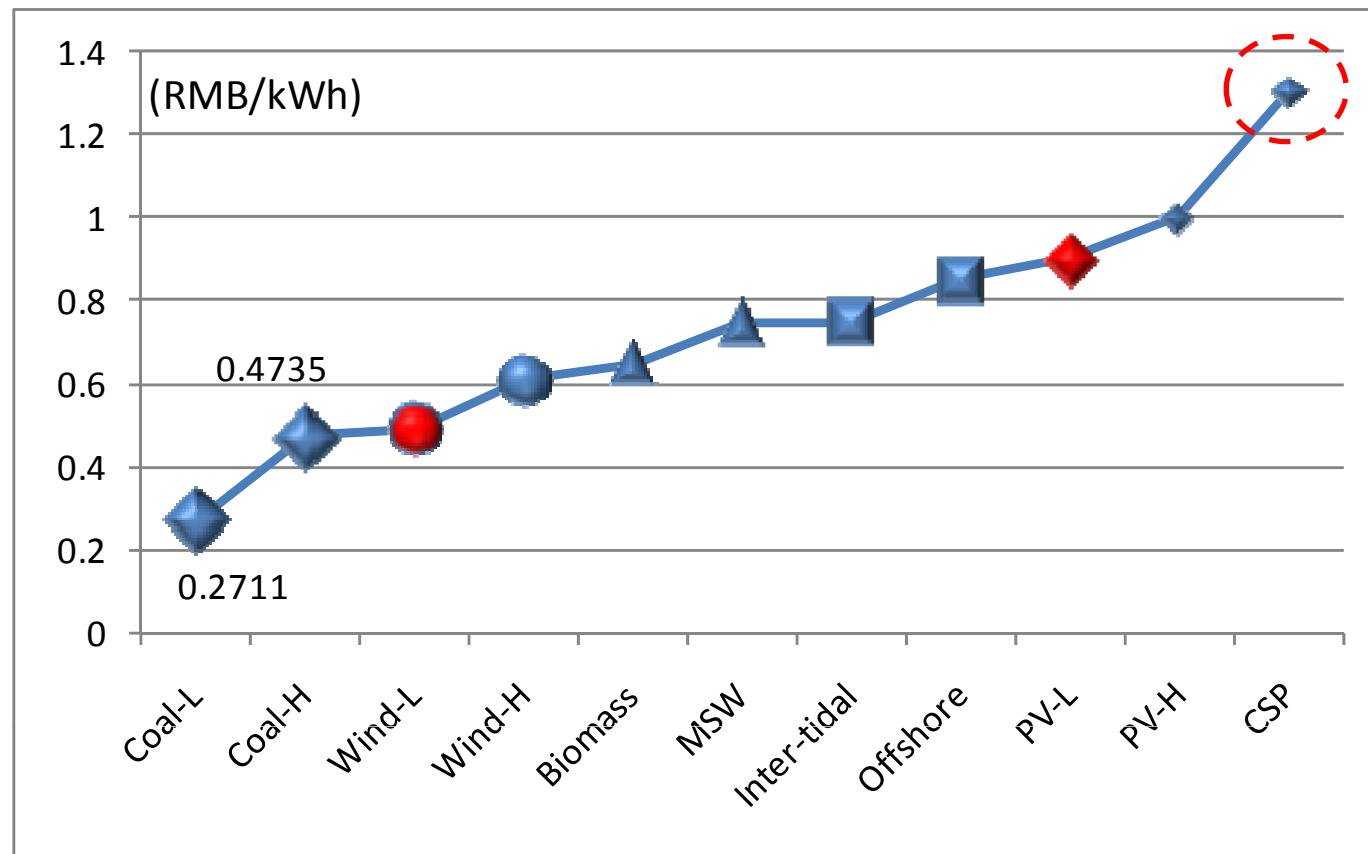


Currency rate: 1 US\$=6.2Chinese RMB

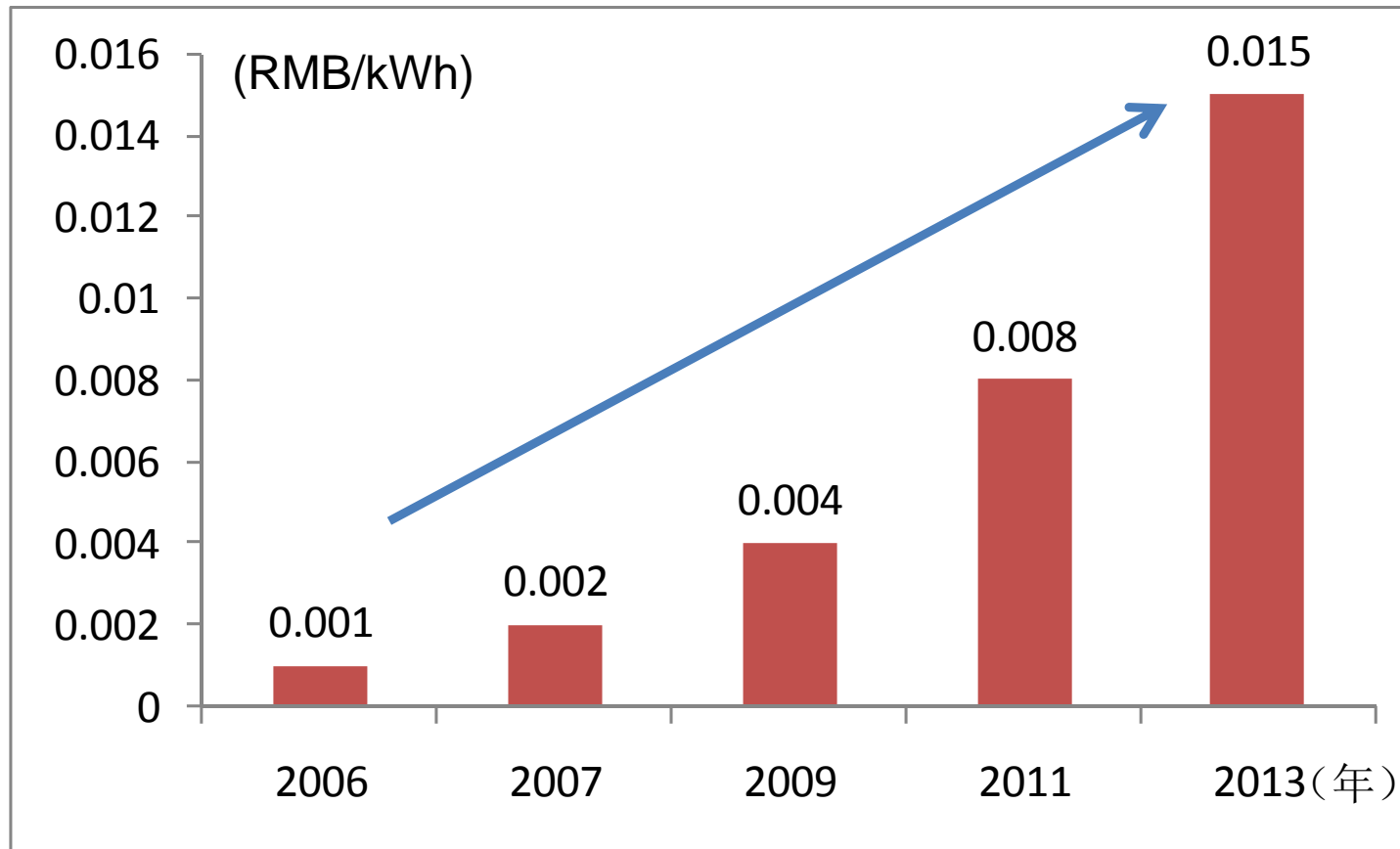
# Feed-in tariff for Renewable Energy Power

Wind: 2 cents decreased from 2009

PV: 10 cents decreased from 2011(selected regions)

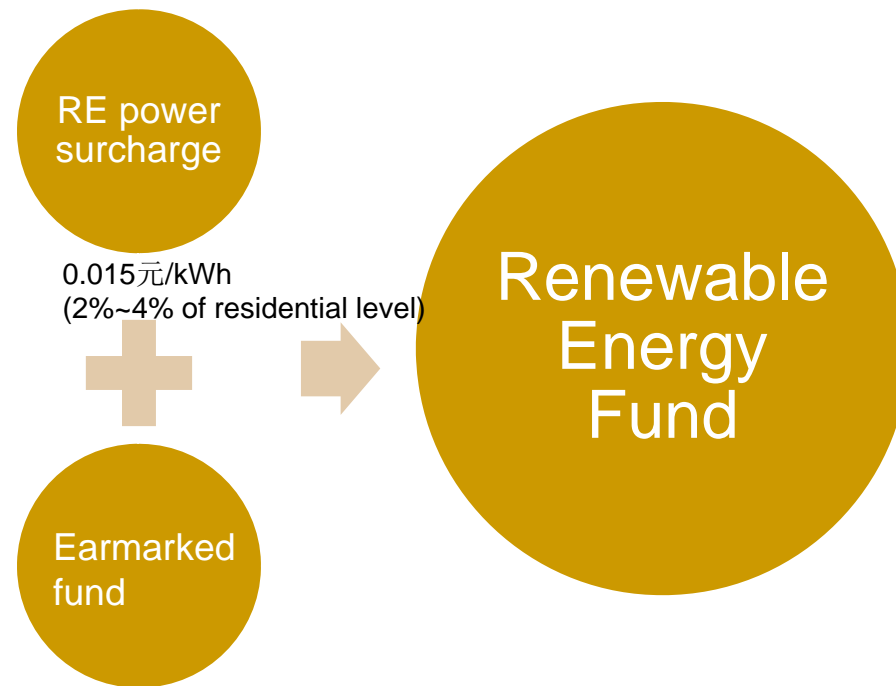


# Renewable Energy Surcharge





# Mechanism to Fund RE Power in China



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# Profile of Renewable Energy Power in China

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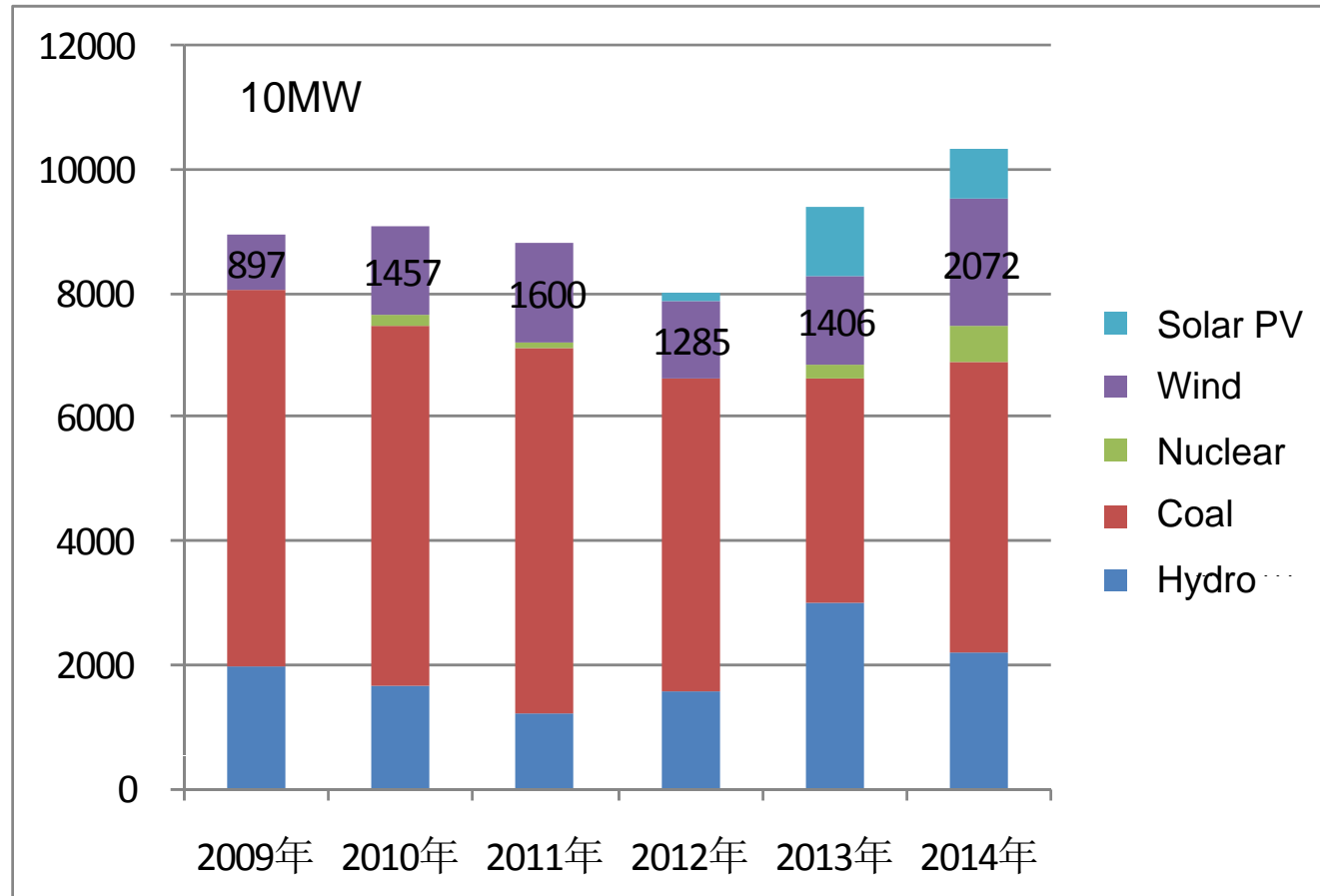
# Resource potential



- Hydro: technical potential 660GW, economically viable 400GW
- Wind: onshore technically viable 2580GW, offshore 510GW
- Solar: 2/3 of the land with sunshine hour over 2200. Best in the world for the western China.
- Biomass: Agro- and forestry residue resource over 400-500 million tce

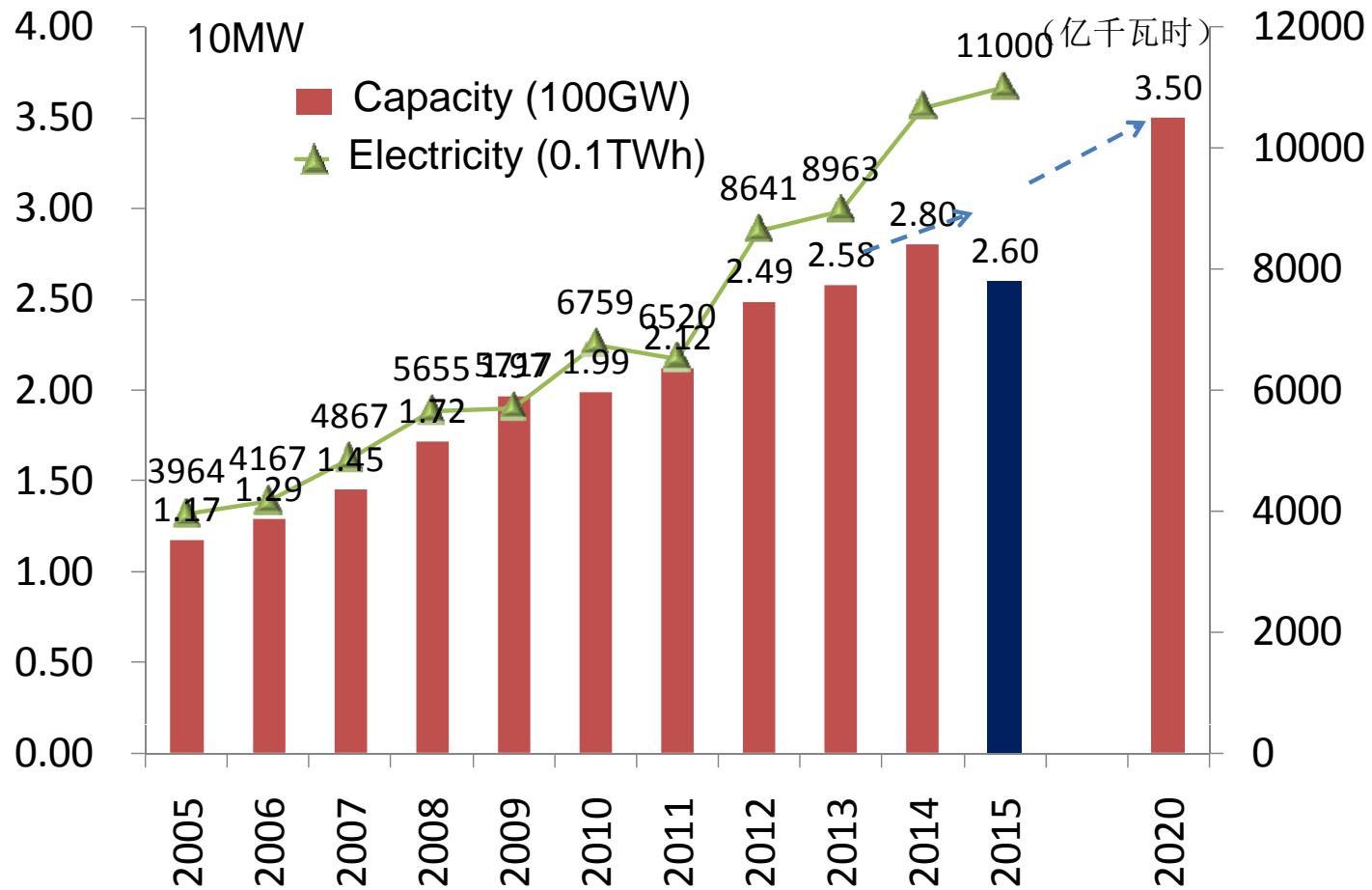
# Newly Added Power Capacity

**Total power capacity 1358GW, hydro 301GW, thermal power 916GW, wind 96GW, solar 28GW (By end of year 2014)**



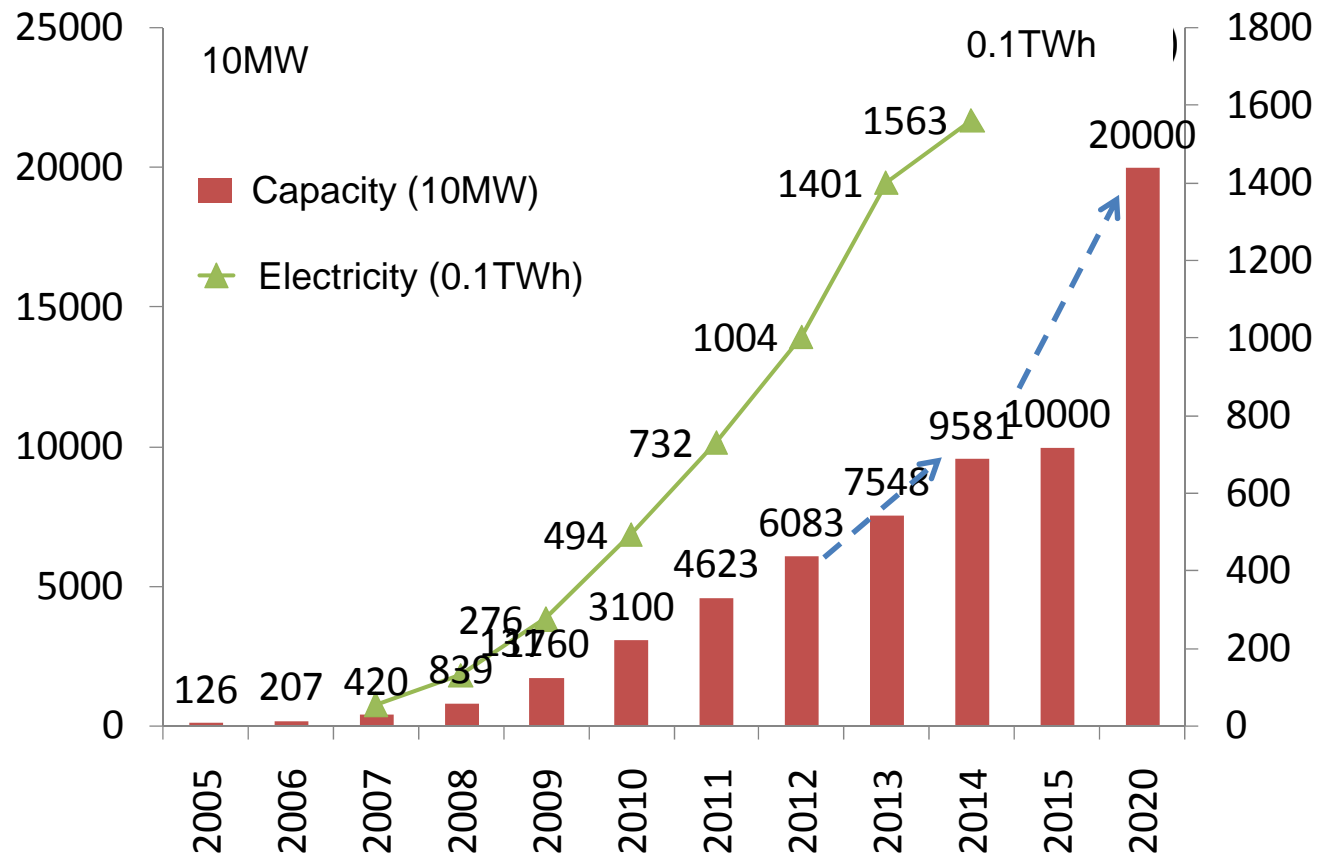
# Hydropower

**Achieve the target by year 2015**

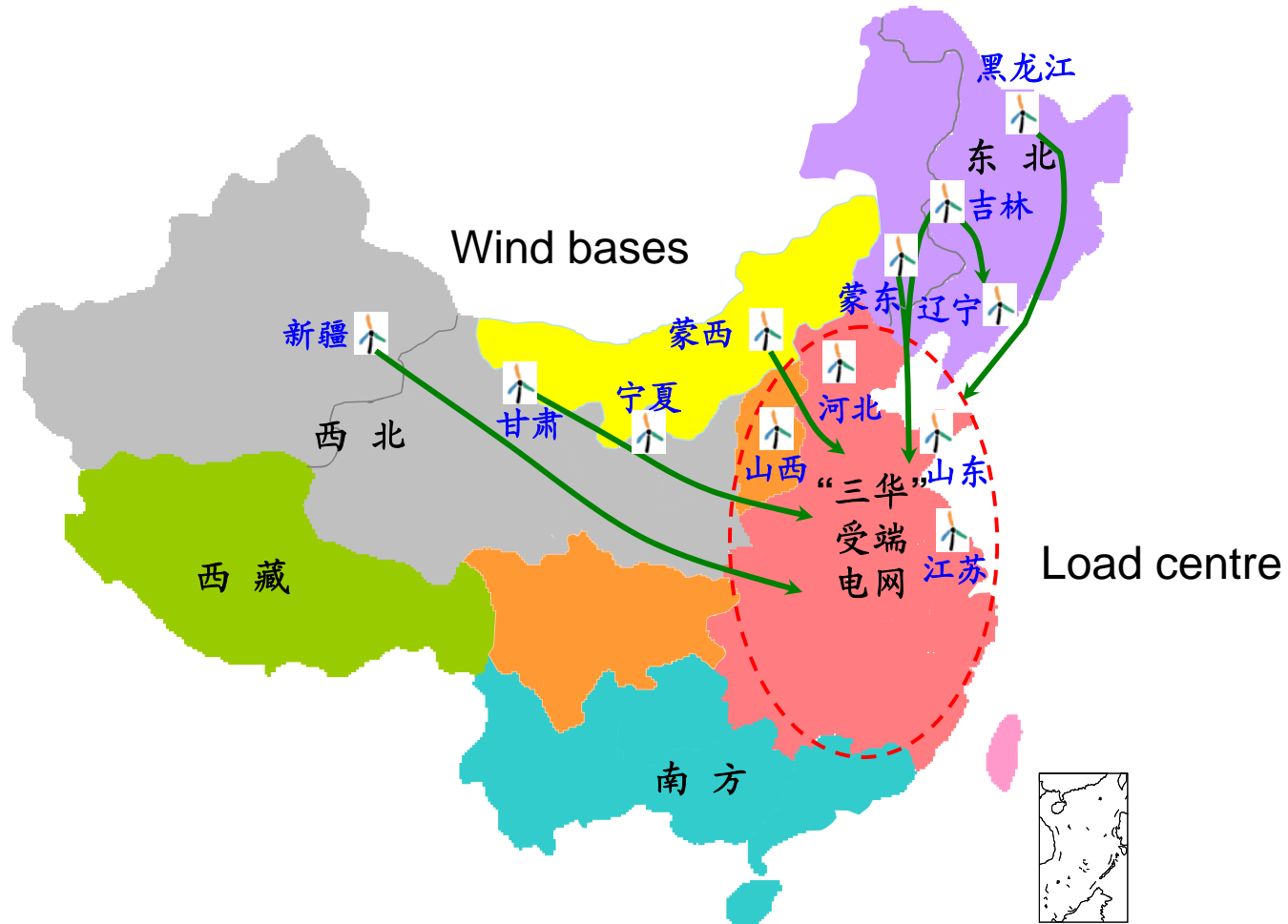


# Wind Power

**Added by 15~20GW annually, achieve the target by year 2015**



# Challenges – accommodation of wind

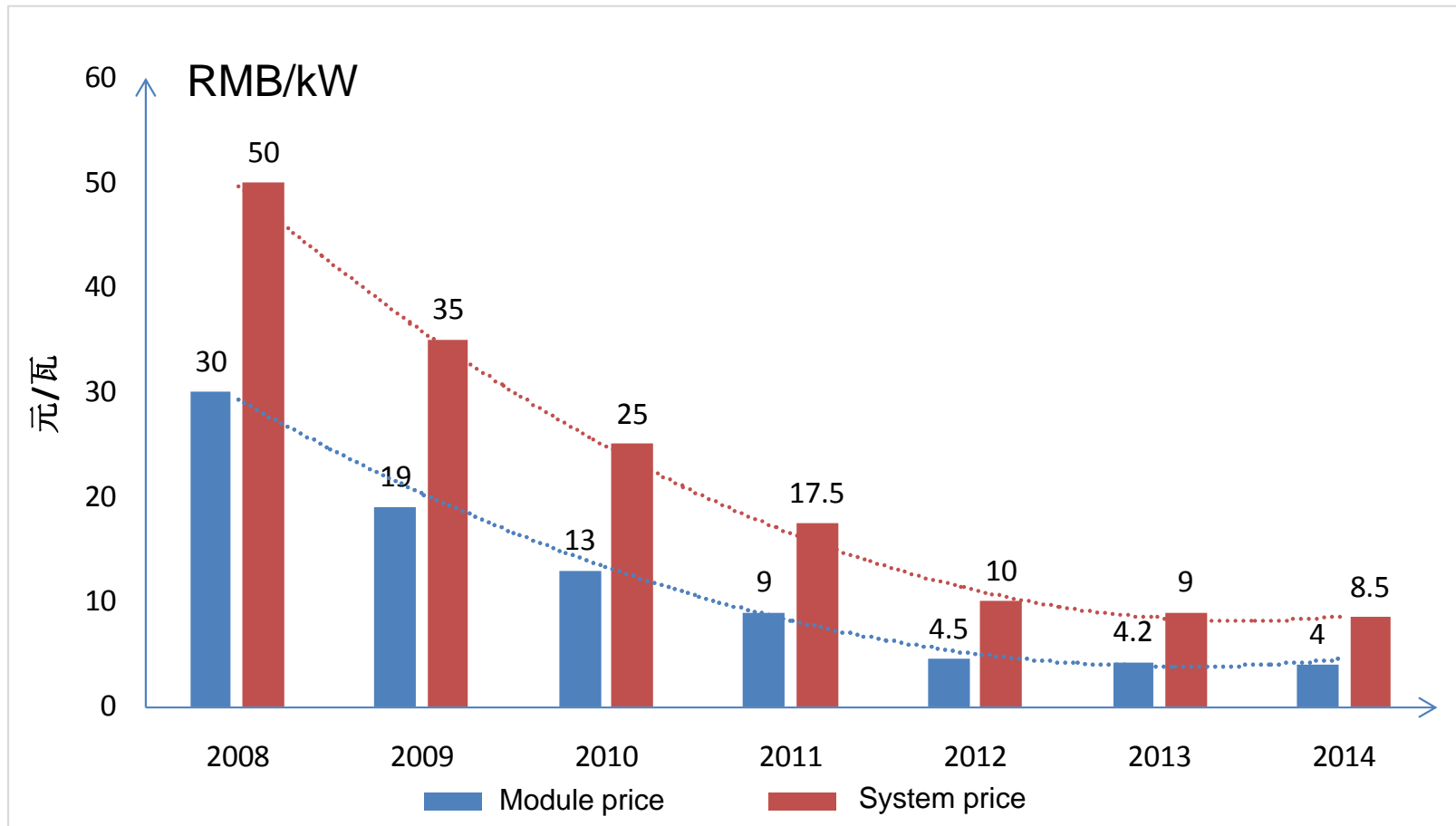


# Wind curtailment in Q1 2015





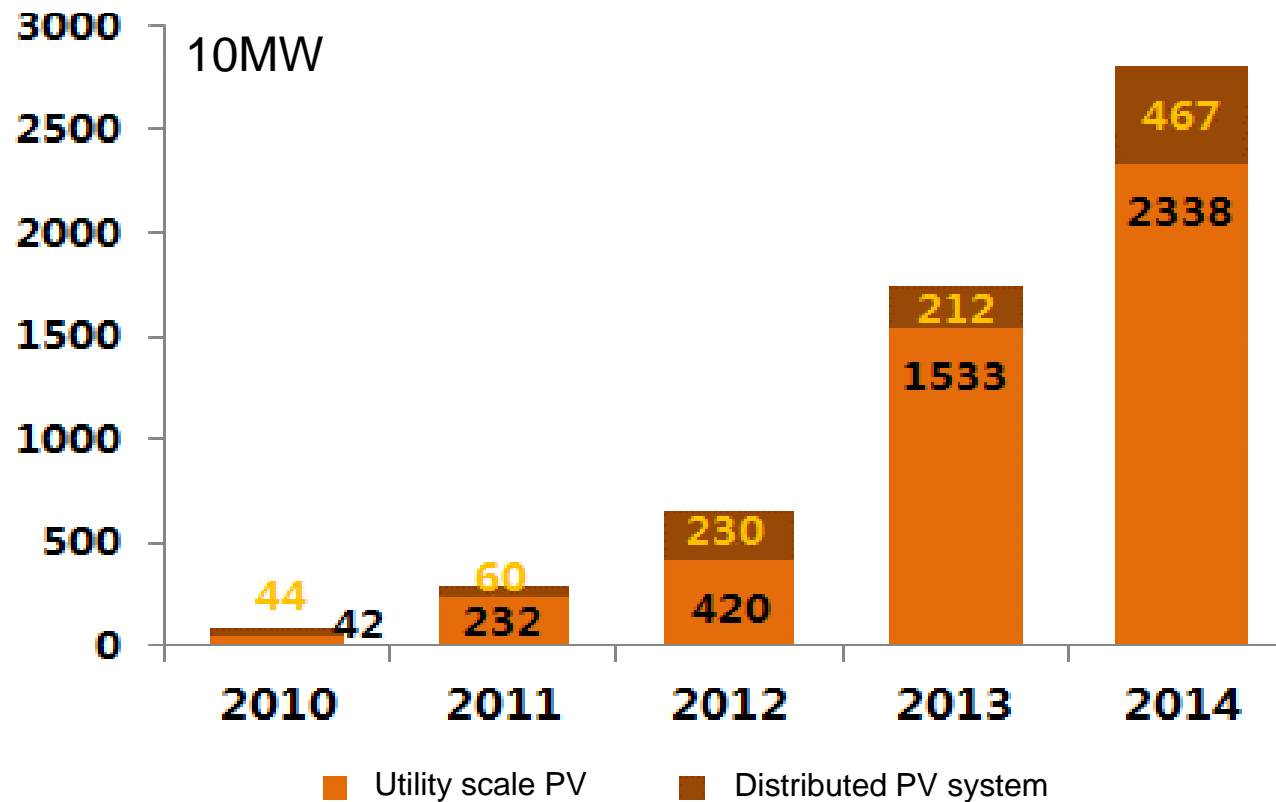
# PV's price



**PV module price decreased by 87% from 2008 to 2014**

# Solar PV

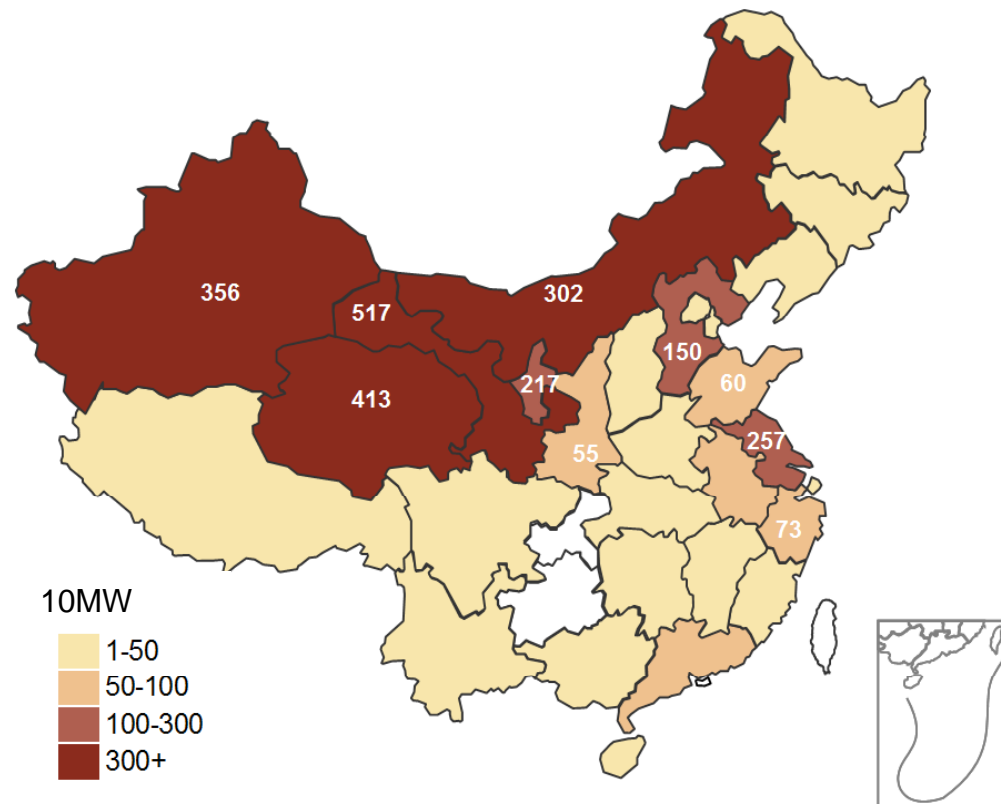
**Increased 10.6GW in year 2014, 2.05GW of which coming from distributed solar PV**



Resource: National Energy Administration, China

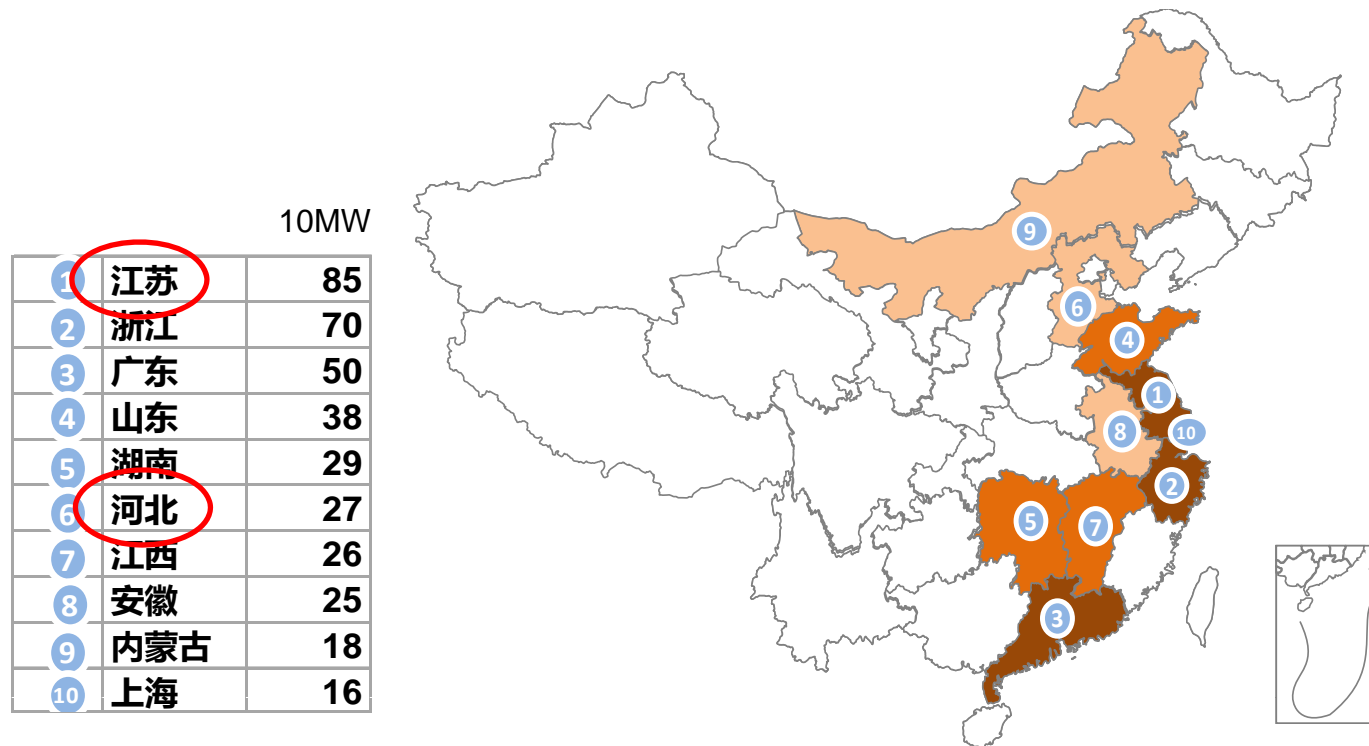
# Solar PV – utility-scale PV stations

**PV stations basically located in western and northern China**



# Solar PV – distributed system

**Distributed PV basically located in the eastern part**

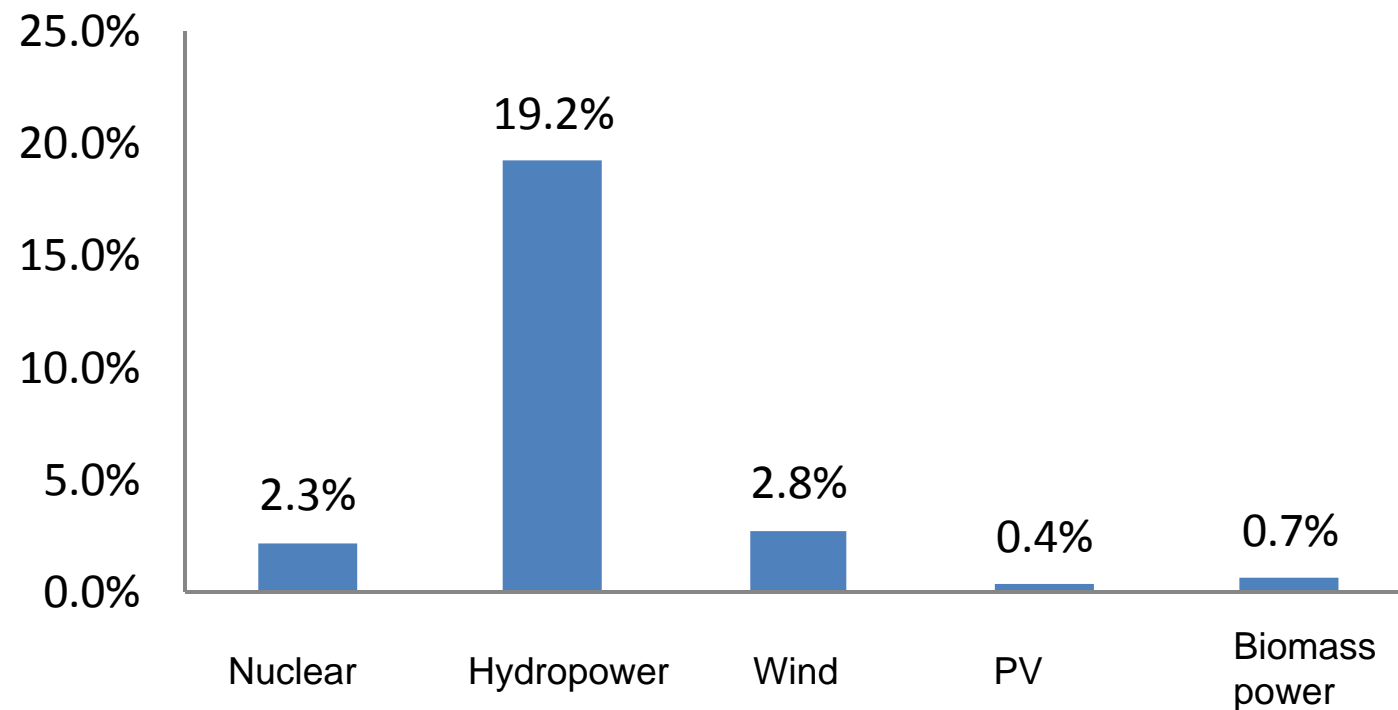


# Biomass energy

- **Total 25 million tce**
- Power capacity – 8.5GW
  - Agro-residue 3.4GW
  - Municipal solid waste 2.1GW
  - Bagasse 1.7GW
  - Biogas 0.3GW
- Gas – 1.5 billion cubic meters
- Briquette / pellet – 6 million tons
- Bio-ethanol: 2.1 million tons
- Bio-diesel: 500,000 tons

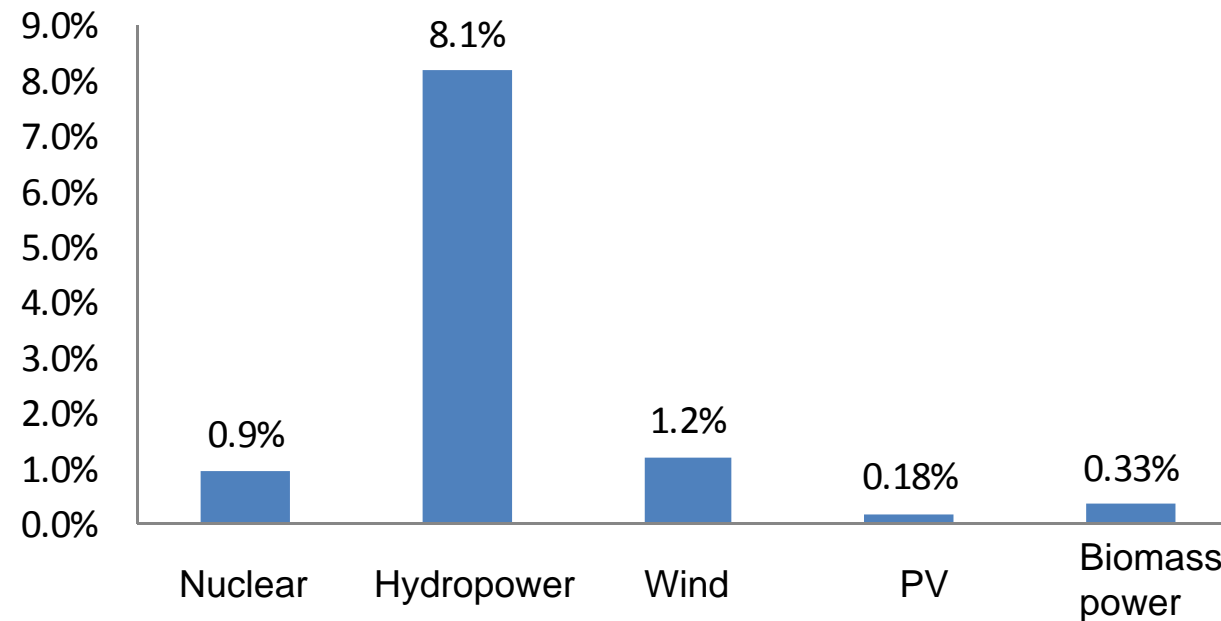


# Ratio of the non-fossil fuel power in the power system ( Year 2014)



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# Ratio of the non-fossil fuel in the energy system (Year 2014)



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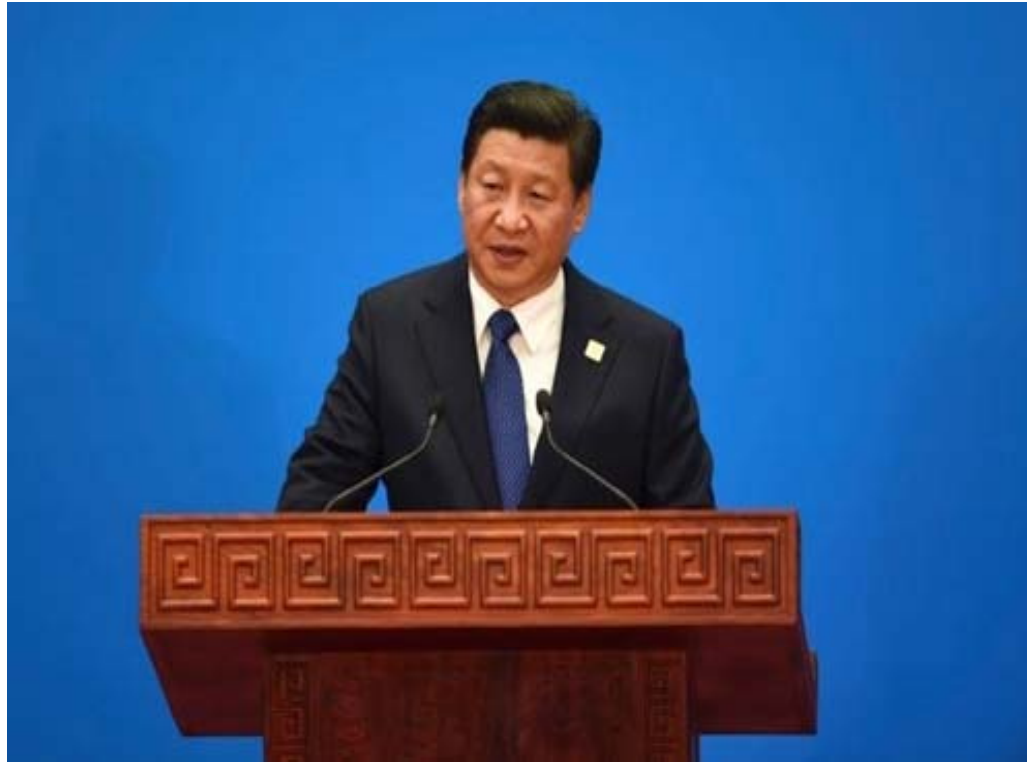
# Future Perspective

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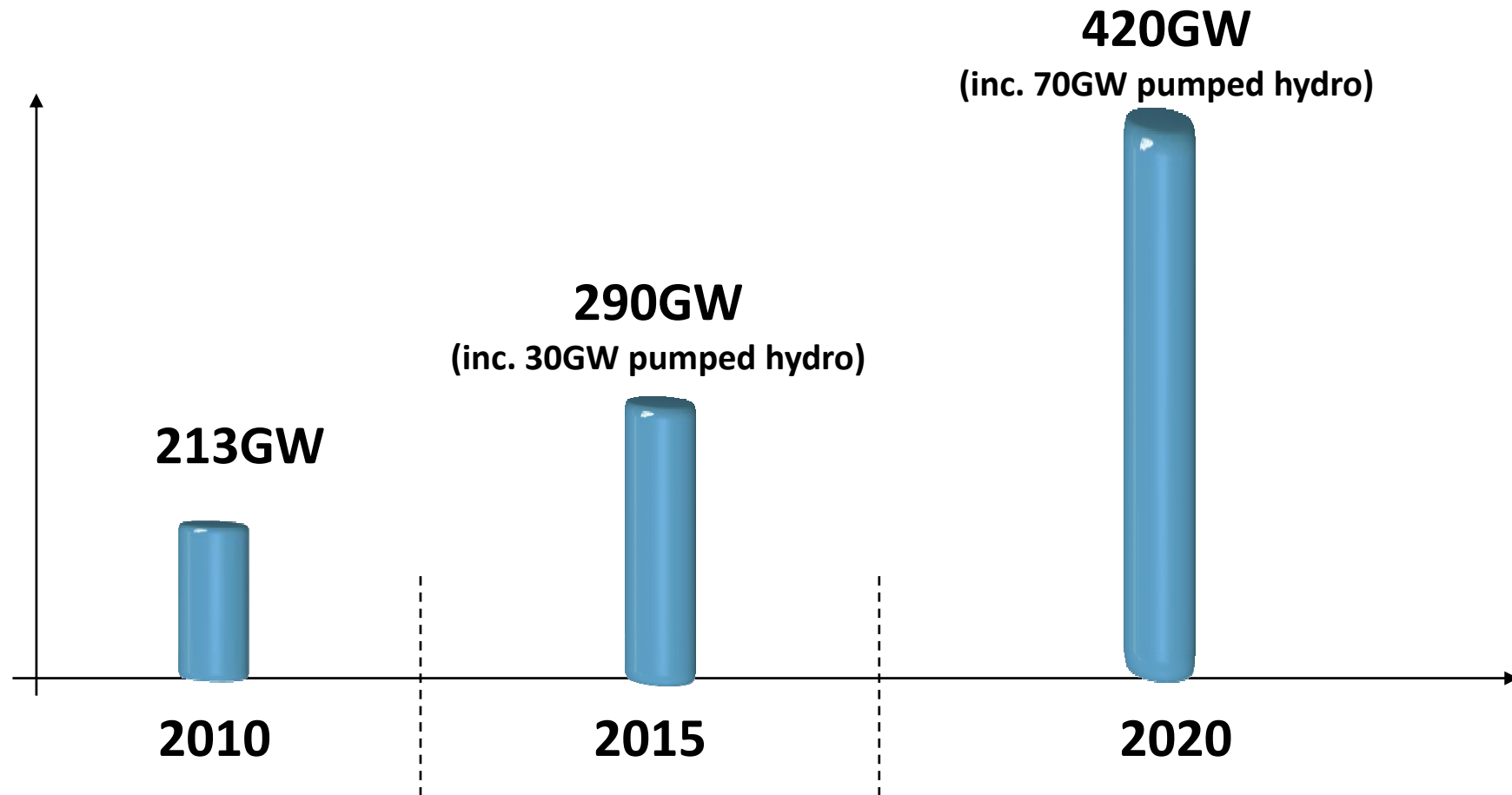
# Non-fossil fuel target by year 2030



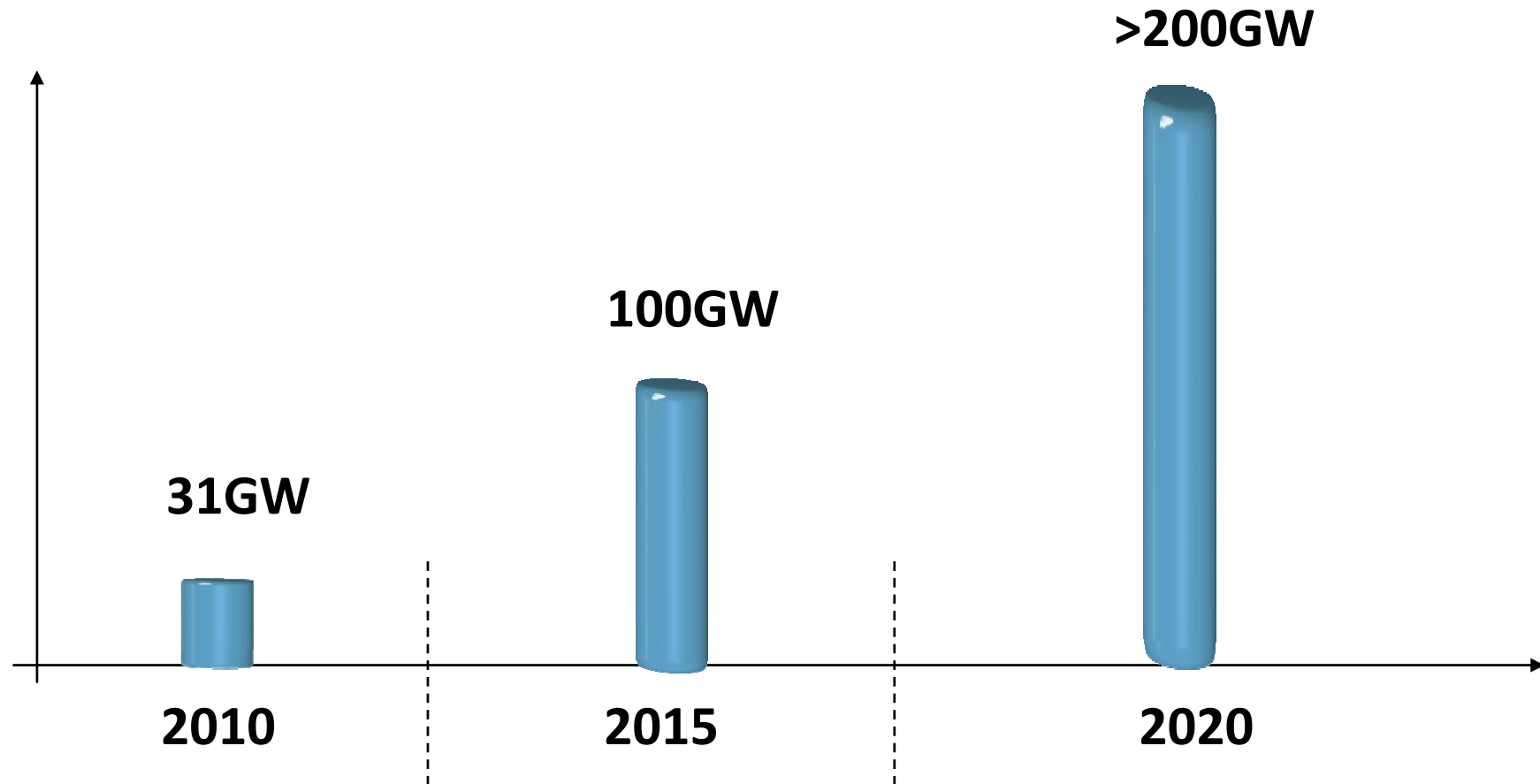
**Announced after the APEC meeting in Nov, 2014:**

**By year 2030, peak carbon emission for China, and non-fossil fuel mix in the final energy consumption will be increased to 20%.**

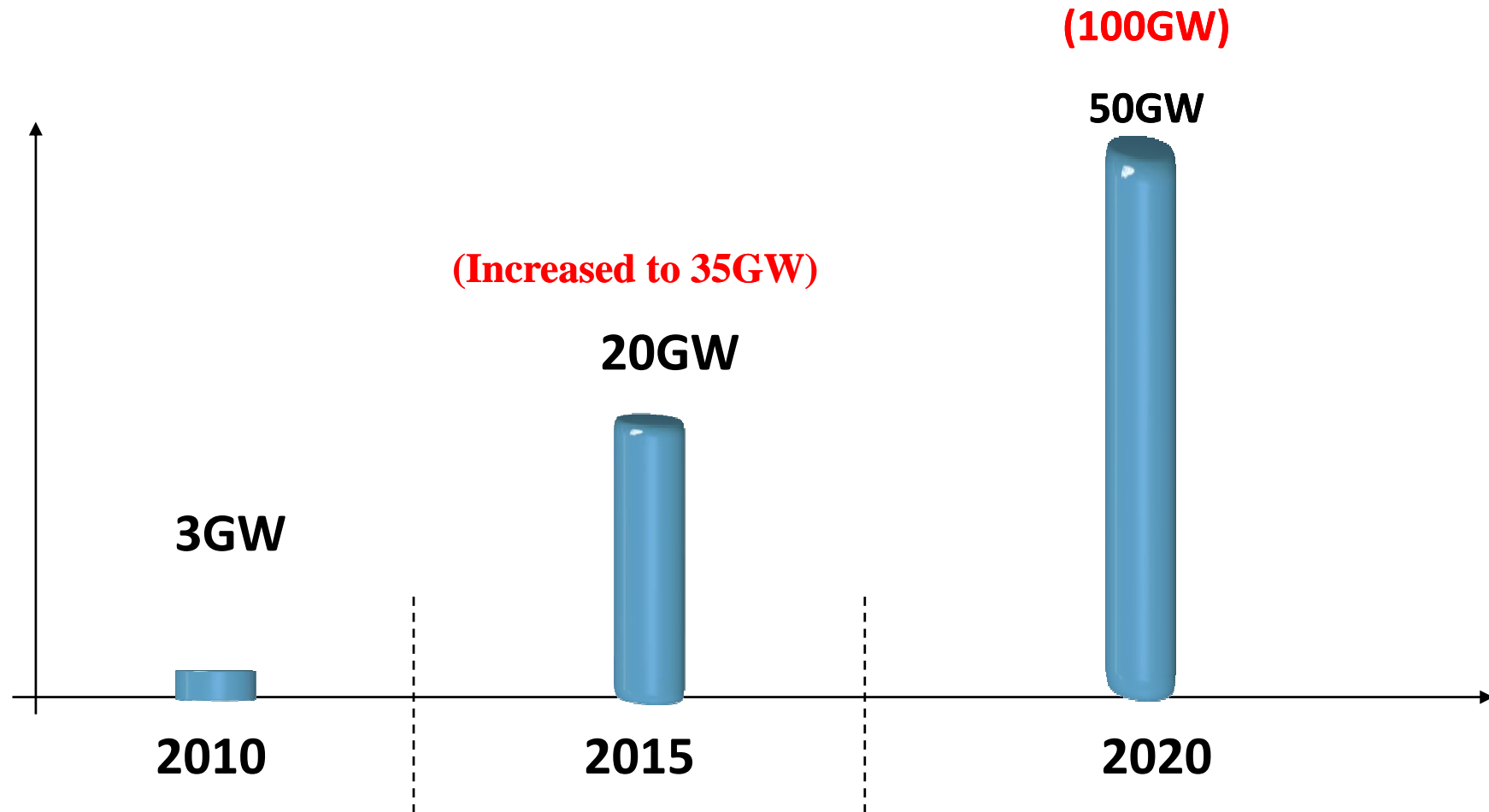
# Hydropower targets



# Wind targets



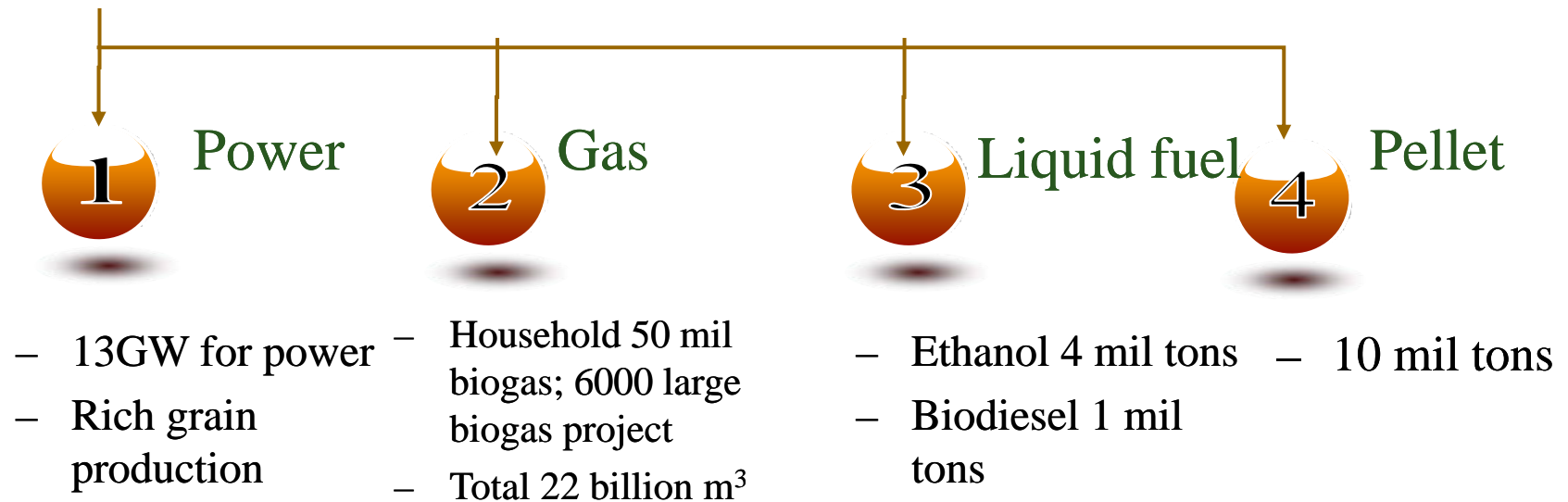
# Solar power targets



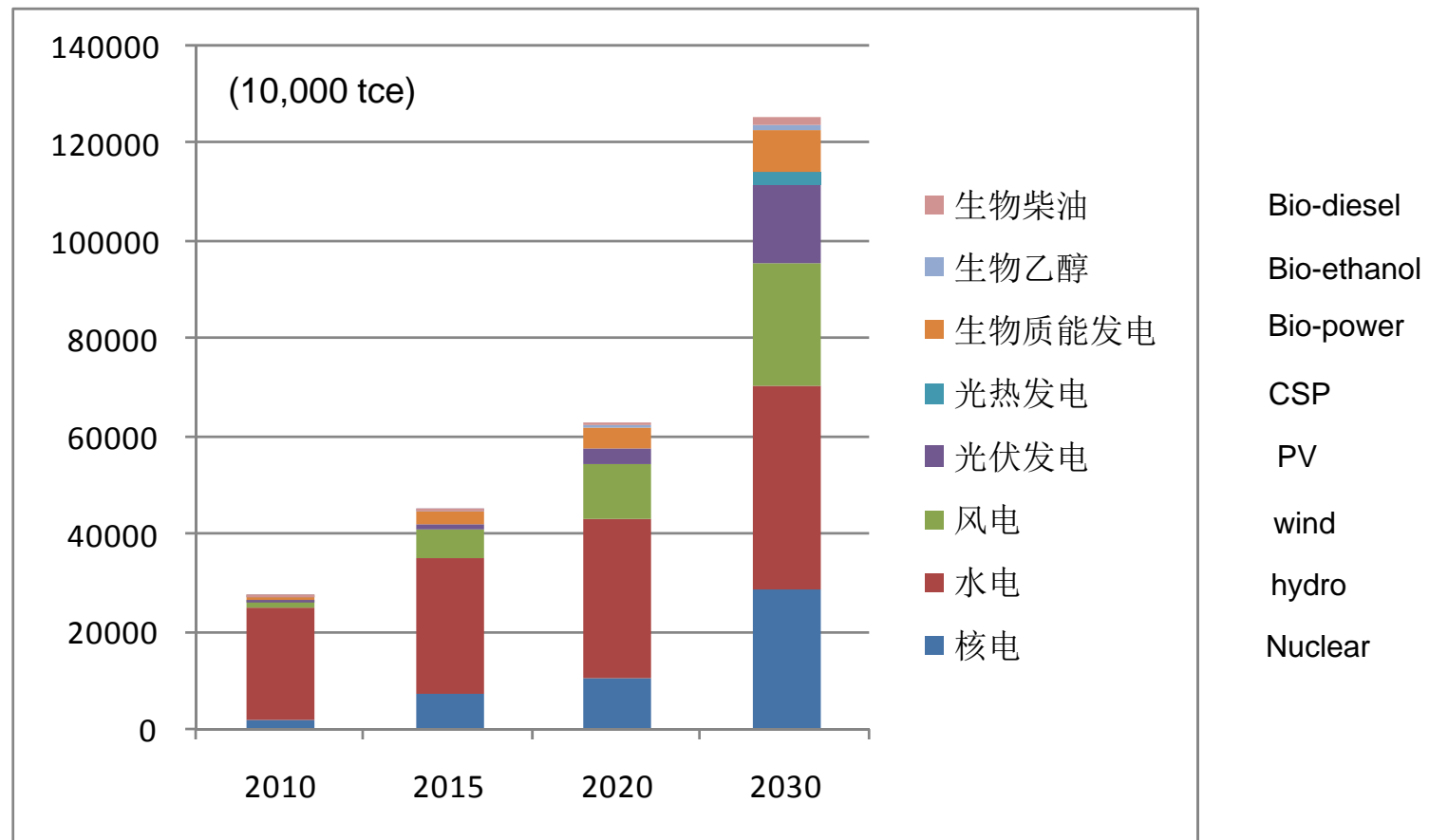
# Biomass Targets for year 2015

Total 50 million Tce for biomass energy supply

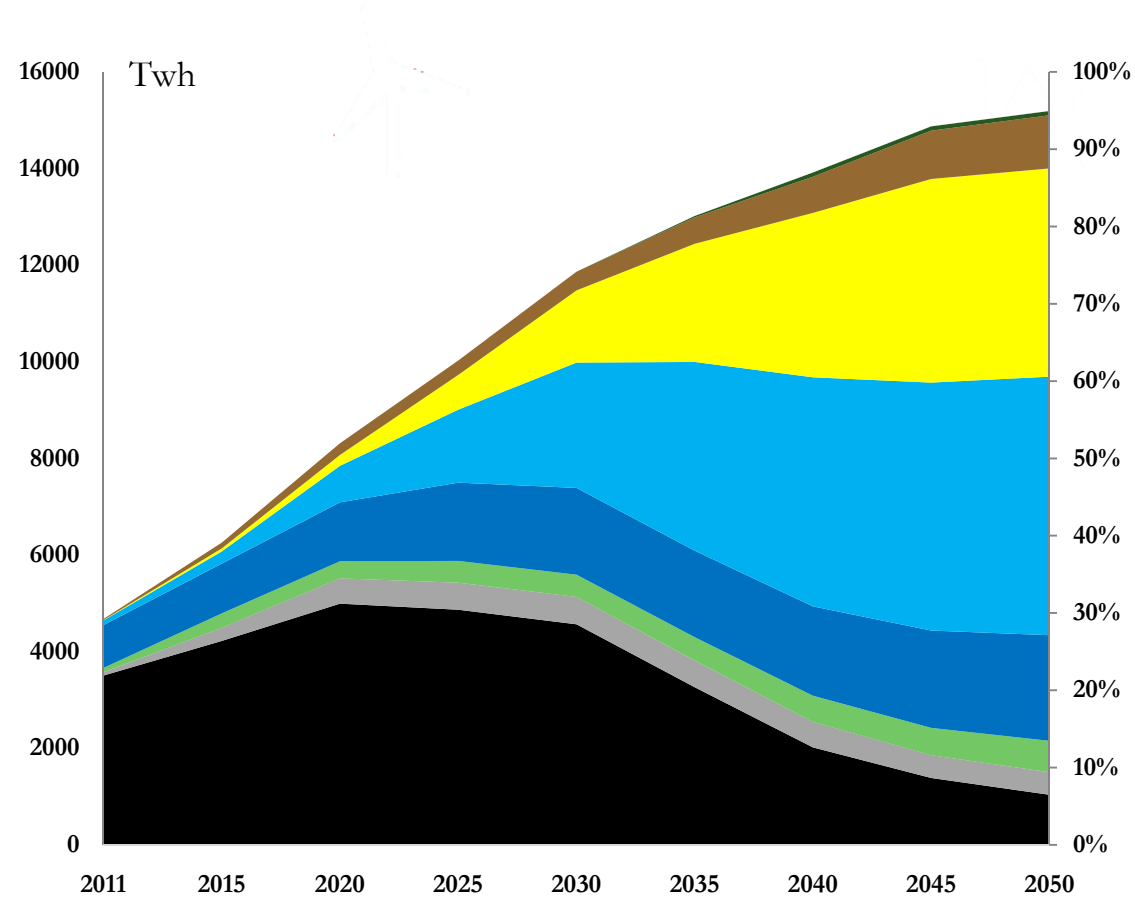
Breakdown



# Future energy contribution – baseline?



# Future energy contribution – high penetration?



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# Summary

- China establish policy framework to support RE development
- Not competitive with fossil-fuel now
- Ambitious future targets for wind and PV
- Depend on more institutional reform and technological breakthrough



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# Thanks for attention!

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