

Electricity Distribution Pricing Mechanism in China

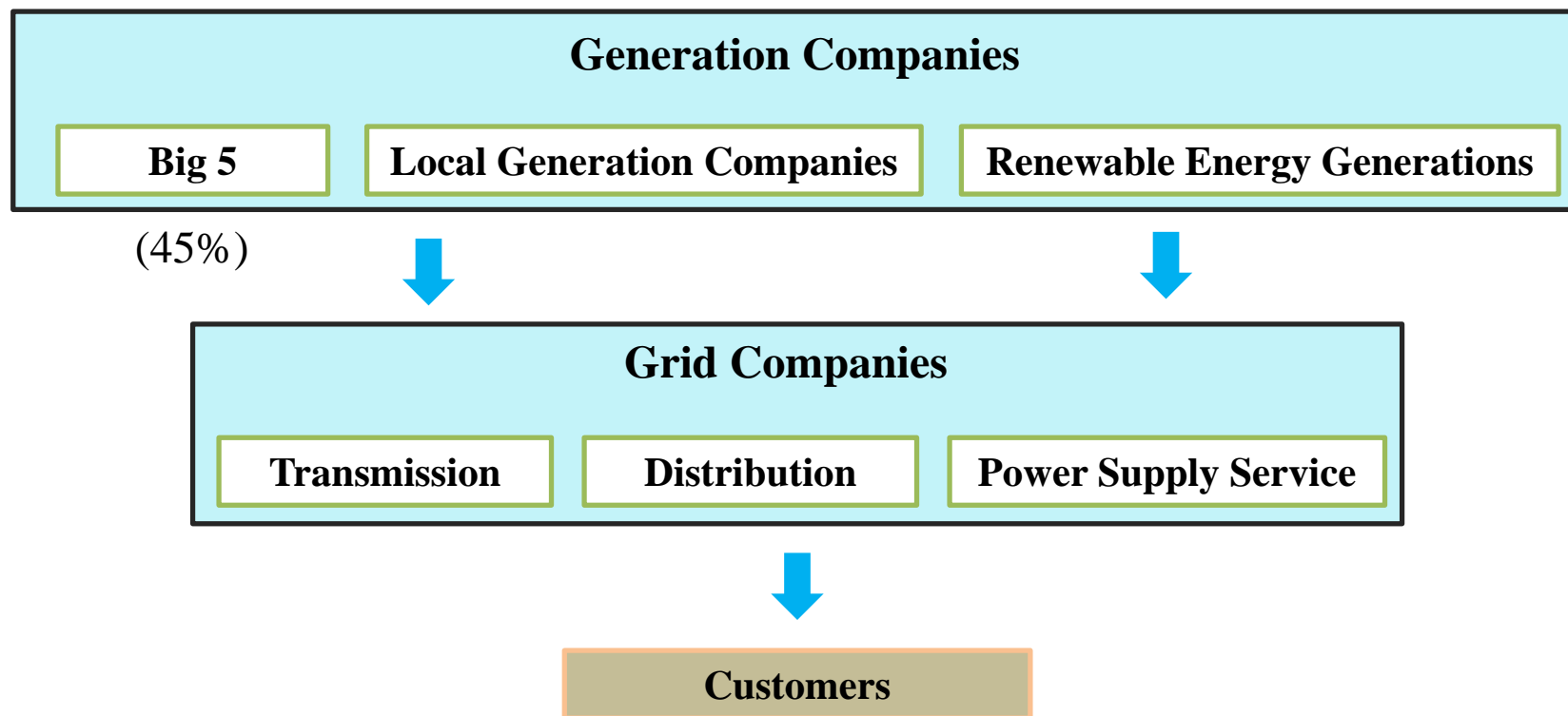
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Power Industry Structure of China



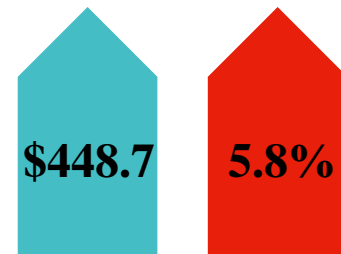
- Grid companies purchase power from generation companies and sell them to customers.

Main Grid Companies in China

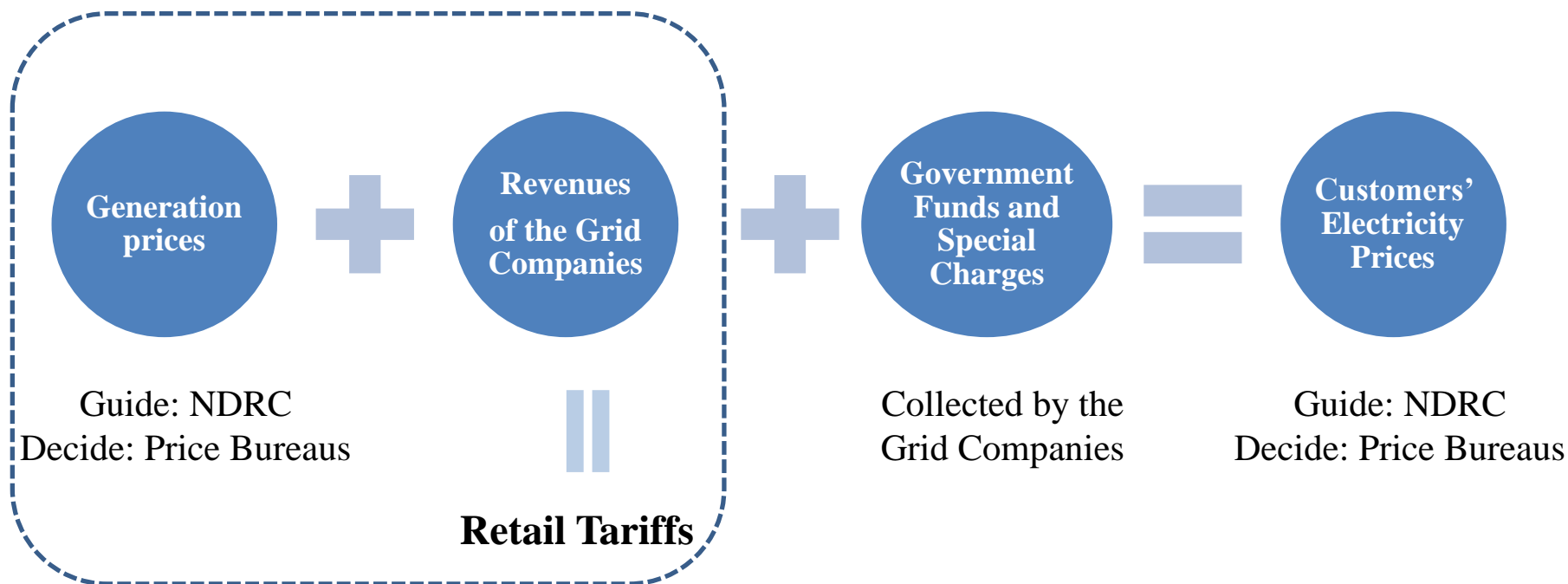
State Grid Corporation of China (SGCC)	China Southern Power Grid (CSG)	Inner Mongolia Power Co.,Ltd (IMPC)
88.0% of China's land area	10.4% of China's land area	1.6% of China's land area
66.0% of total consumed power	15.0% of total consumed power	3.0% of total consumed power

SGCC	+	CSG	=	98.4% of China's land area 81.0% of total consumed power
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- The electricity T&D industry is expected to generate \$448.7 billion in 2015, up 1.7% from 2014.
- Over the five years through 2015, revenue has been growing at an annualized rate of 5.8%.



Price Structure of Power Industry in China



Revenues of the Grid Companies

- = The difference between retail tariffs and generation prices
- ≈ The transmission & distribution (T&D) prices.

- NDRC: the National Development and Reform Commission

Generation Prices

From “one unit, one price” to benchmark price. (yuan/kwh)

Provinces	Generation Type	Benchmark Price
***	Coal-fired	0.3-0.5(Ave:0.419)
***	Hydropower	0.2-0.4(Ave:0.292)
***	Wind Power	0.51-0.61(Ave:0.572)
***	Nuclear Power	0.43
***	Solar Power	0.8-1.1(Ave:1.064)

Customers' Electricity Prices

1USD = 6.68 yuan

Price Catalog (Shanghai, yuan/kwh)

Profession Classification	<1kv	10kv	35kv	110kv
Residential	0.617	0.612		
Industrial / Commercial	0.885	0.860	0.835	0.815
Agricultural	0.660	0.635	0.610	

➤ The prices are decided by the *Price Bureaus* of each province.

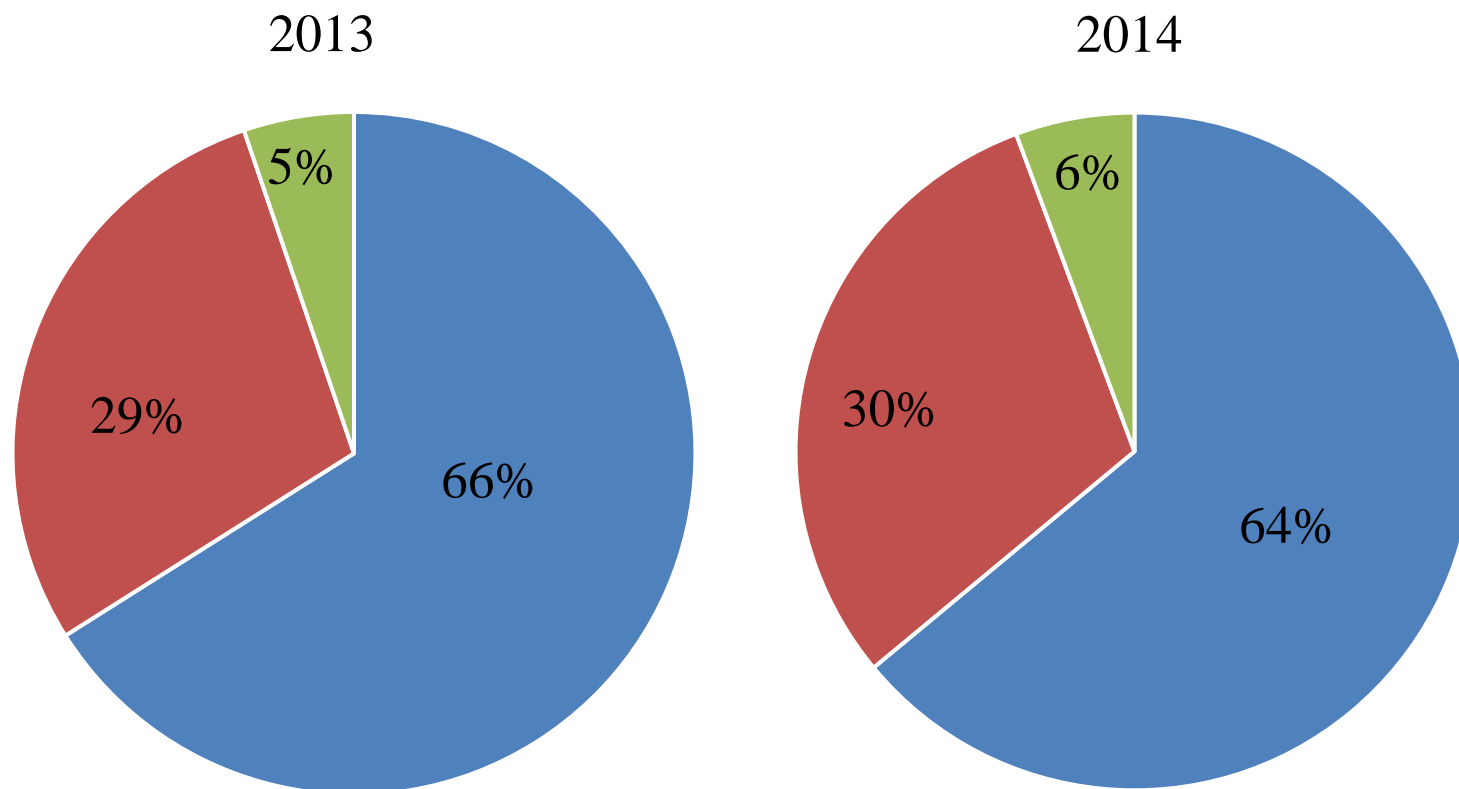
Electricity T&D Price

Difference Between Retail Tariffs and Generation Prices (yuan/kwh)

		SGCC	CSG	IMPC	Average
Tariff differences with network losses	2014	0.21046	0.22597	0.10498	0.20811
	2013	0.19349	0.21476	0.10888	0.1927
	AGR	8.77%	5.22%	-3.59%	8.0%
Tariff differences without network losses	2014	0.18771	0.19965	0.9173	0.18532
	2013	0.16899	0.18655	0.9485	0.16821
	AGR	11.08%	7.02%	-3.3%	10.17%

1USD = 6.68 yuan

T&D price accounts for a significant proportion in customers' electricity price



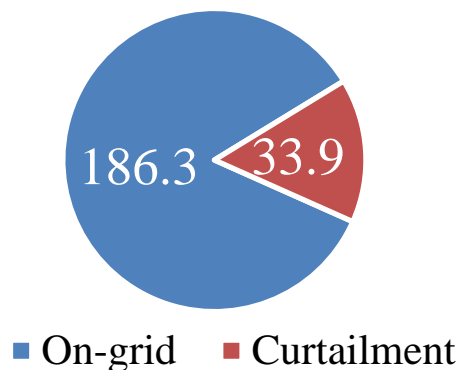
- Generation prices
- T&D Price
- Government Funds and Special Charges

Existing Problems

- **Distorted pricing mechanism:**
 - The price was not decided by market participants but the government.
 - Customers' electricity prices can not reflect the generation costs, so secondary energy (electricity) can not link with primary energy.
 - Difference between retail tariffs and generation prices is not transparent, and it can not reflect the T&D price.
- **The obscure responsibility of grid companies:**
 - Profits and reliability are the main evaluation indicators.
 - Electricity T&D activities are monopolized.
 - The operation efficiency is low.
- **Inefficient utilization of renewable energy:**
 - The wind curtailment is around 15% in 2015.



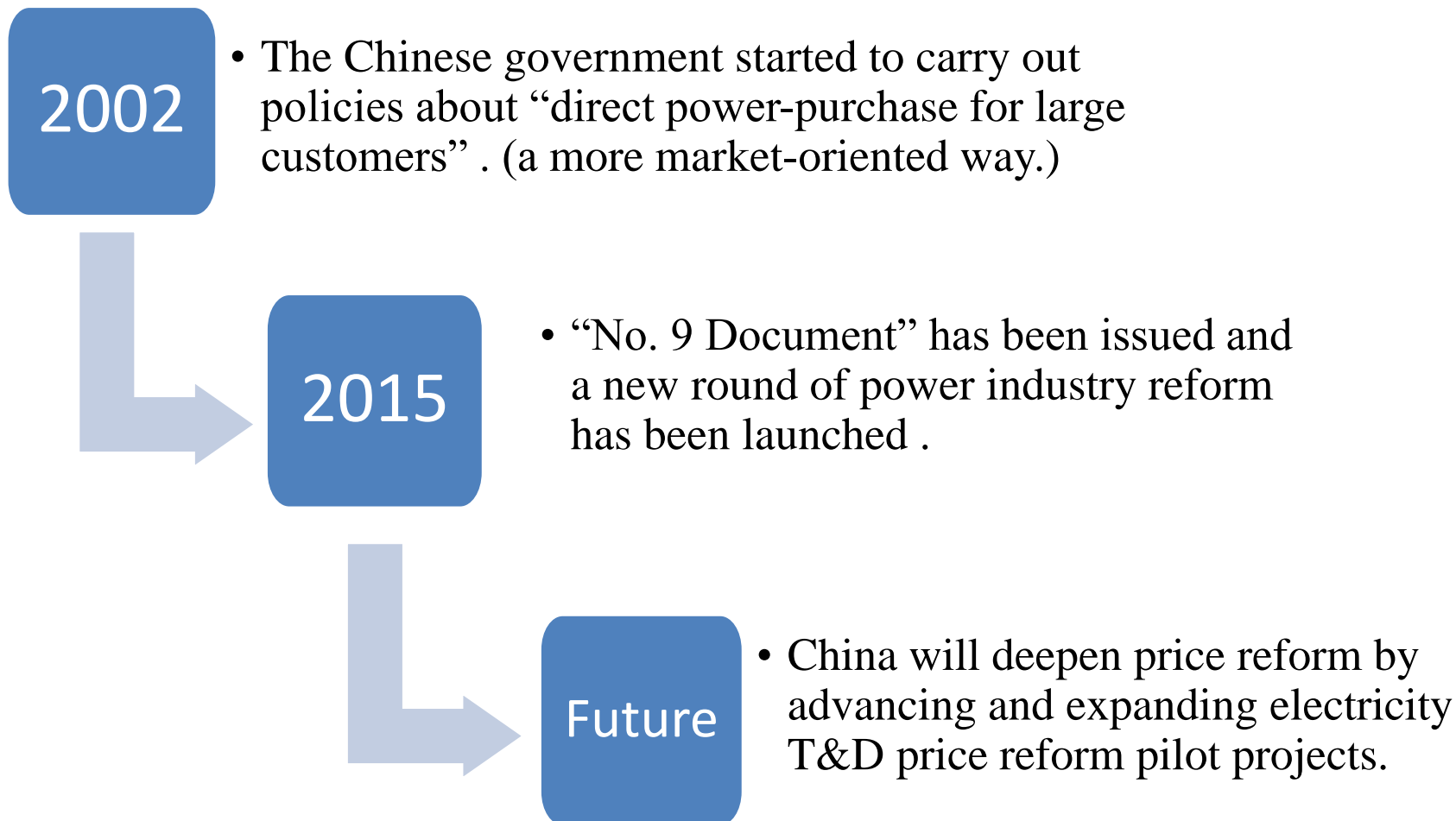
Wind generation in 2015
(Billion kwh)



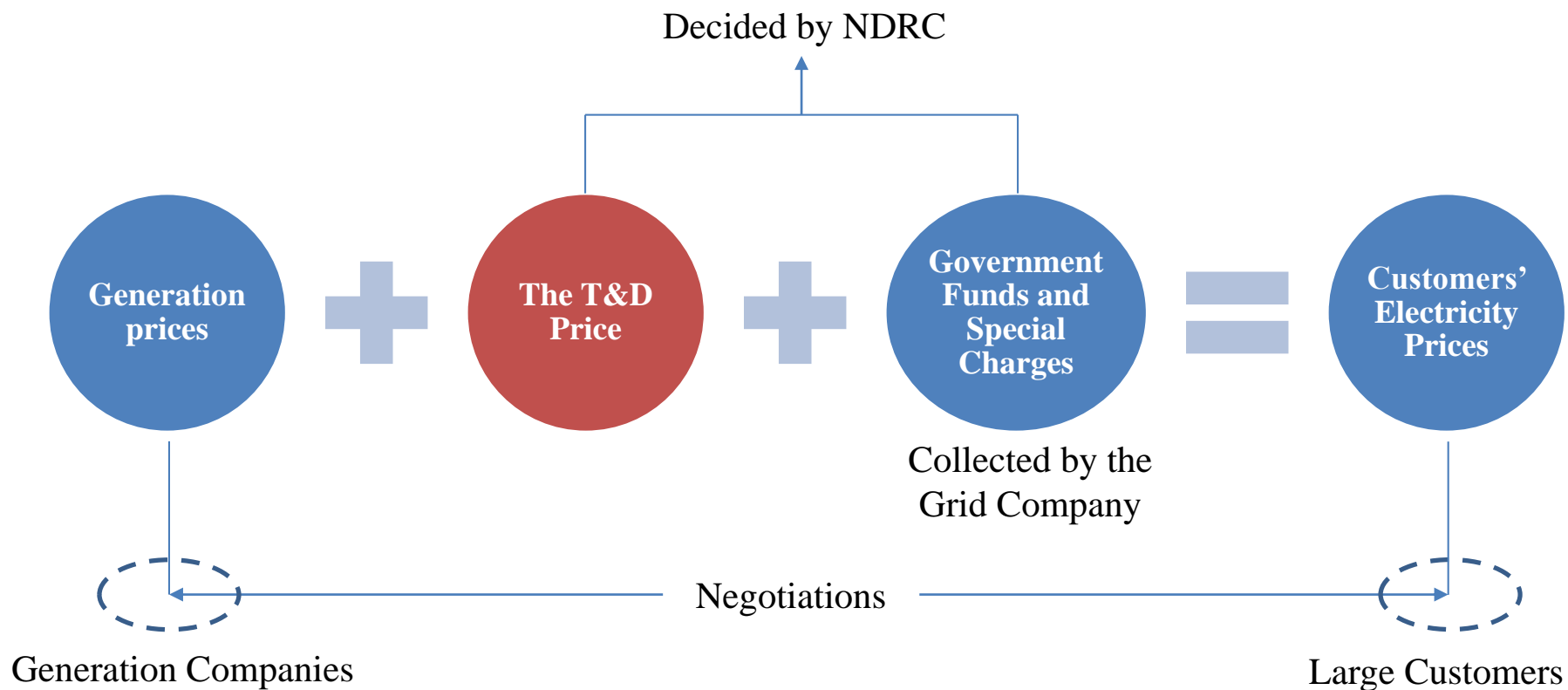
The data comes from *National Energy Administration*.

http://www.nea.gov.cn/2016-02/02/c_135066586.htm

Reforms of Power Industry in China



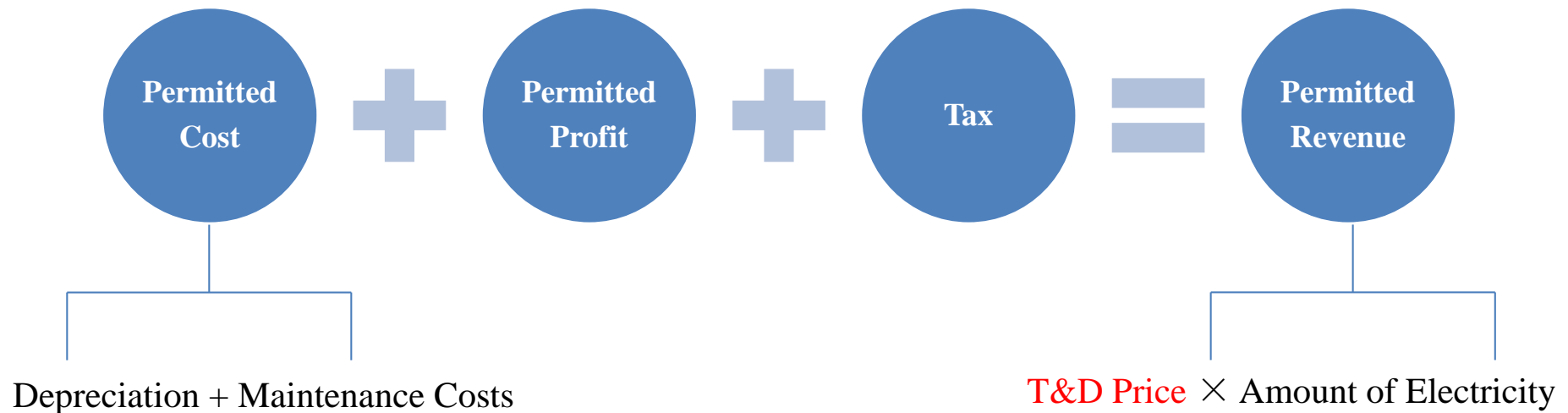
Price Structure After T&D Price Reform



- The generation prices and customers' electricity prices will be decided by the market instead of NDRC.

- NDRC: the National Development and Reform Commission

T&D Price Calculation



- Each voltage level has its own T&D price.
- The reform changes the financial model of grid companies.
- The NDRC oversees grid companies' gross revenue.

- NDRC: the National Development and Reform Commission

T&D Price Reform Results in Shenzhen

T&D Price in Shenzhen (yuan/kwh)

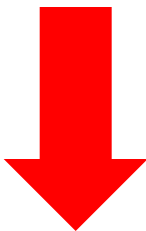
Voltage Level	2015	2016	2017
220kV	0.0541	0.0539	0.0537
110kV	0.0683	0.0682	0.0679
20kV	0.1363	0.1360	0.1354
10kV	0.1805	0.1802	0.1794
Average	0.1435	0.1433	0.1428

➤ For every 1 MWh of electricity

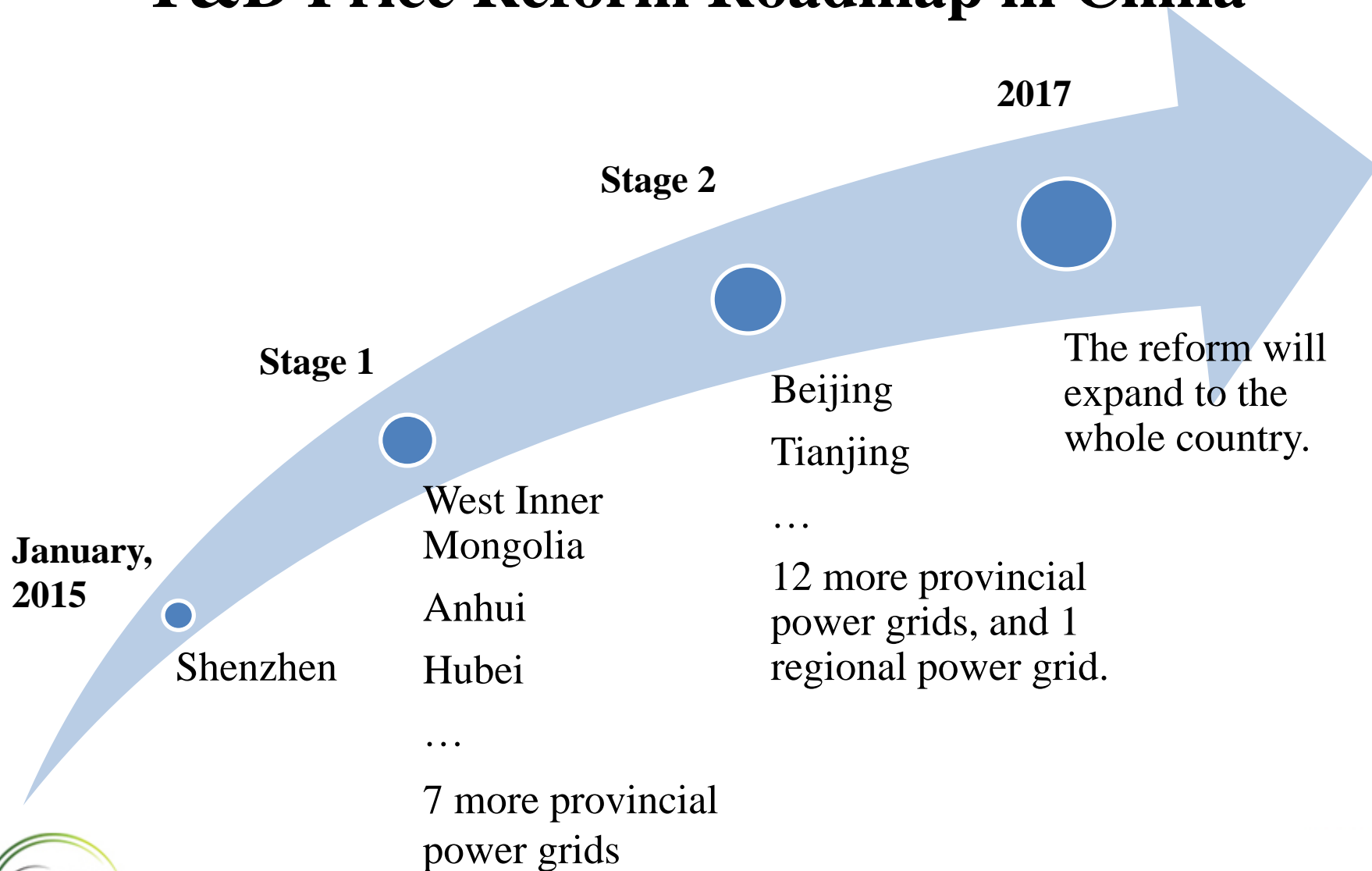
2014, 155.8 yuan

2015, 143.5 yuan (23.5USD)

➤ For 2016 and 2017, the new prices will be 143.3 and 142.8 yuan, respectively.



T&D Price Reform Roadmap in China



Conclusions

- Since the beginning of 2015, a new round of power industry reform has been launched. And T&D price reform is seen as a crucial part.
- Before the reform, grid companies' profits come from the difference between retail tariffs and generation prices. There is no real T&D prices.
- In the pilot provinces, local governments give separate T&D prices for each voltage level based on grid companies' gross revenue.
- In the future, the new T&D pricing system will expand to the whole country.

**Thank you for
your attention!**