Electricity regulation and electricity market reform in China

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• Background introduction
• Electricity regulation and market reform
• Electricity pricing mechanism
  ➢ Price structure
  ➢ Reforms
    • Differential electricity pricing policy
    • Pricing linkage mechanism between coal and electricity
    • Direct purchase of electricity from generators to major consumers
• Background introduction
  ➢ Electricity consumption
  ➢ Electricity installed capacity
Total electricity consumption, TWh

Source: CEIC
Total electricity installed capacity

Source: CEIC, CEC.
• Electricity regulation and market reform
  ➢ Before 2002
  ➢ 2002-2005
  ➢ 2006-2013
• Before 2002
  ➢ Ownership
  ➢ Restructure

Ministry of Electric Power Industry

State Power Corporation of China (SPCC)

State Economic and Trade Commission (SETC)
• 2002-2005
  ➢ Mandate No.5
    • Separating generating companies and grid companies
    • Separating transmission and distribution
    • Ridding grid companies of their subsidiary businesses
    • Bidding market for power generators
• 2002-2005

➢ Restructure

State Power Corporation of China (SPCC)

Five generating companies ➔ Two grid companies ➔ A number of service companies ➔ Electricity customers
• 2002-2005

 Regulatory institutions

- State Council
  - State Electricity Regulation Commission (SERC)
  - NDRC
    - Energy Bureau
    - Pricing Bureau
  - Energy Leading Group
  - SASAC
  - SEPA
• 2002-2005

**Achievements**
- Industry restructuring
- Independent regulatory agency
- Pilot market

**Shortcomings**
- Power grid company
- Authority of NDRC
- Lack of competitive market
• 2006-2012
  ➢ Price reform
  ➢ Renewable energy
  ➢ Energy efficiency
  ➢ Energy security
  ➢ Ridding grid companies of their subsidiary businesses

• 2013
  ➢ SERC --> Energy Bureau
Electricity Pricing Mechanism

• Price structure
   On-grid tariff
   Sale price
    • Retail price
    • Wholesale price

• Reforms
   Differential electricity pricing policy
   Pricing linkage mechanism between coal and electricity
- Electricity price structure

- Power plants
  - Grid companies
    - Electricity customers
  - On-grid tariff
    - Transmission and distribution fees
    - Sale price

- Coal, regional
- Nuclear, 0.43
- Wind power, 0.51-0.61
- Solar PV, 1/1.15

Unit: CNY/kWh
Source: NDRC
• Sale price
  ➢ Retail price
  ➢ Wholesale price
Electricity retail price in Beijing in 2011

Unit: CNY/kWh

Voltage level

- < 1KV: Residential
  - Voltage level: 0.4883, Agricultural: 0.5835
  - Major industrial: 0.6587, General industrial and commercial: 0.8145

- 1-10KV: Residential
  - Voltage level: 0.4783, Agricultural: 0.5685
  - Major industrial: 0.6587, General industrial and commercial: 0.7995

- 20KV: Residential
  - Voltage level: 0.4783, Agricultural: 0.5615
  - Major industrial: 0.6487, General industrial and commercial: 0.7925

- 35KV: Residential
  - Voltage level: 0.4783, Agricultural: 0.5535
  - Major industrial: 0.6387, General industrial and commercial: 0.7845

- 110KV: Residential
  - Voltage level: 0.4783
  - Major industrial: 0.6187, General industrial and commercial: 0.7695

- ≥ 220KV: Residential
  - Voltage level: 0.4783
  - Major industrial: 0.5987, General industrial and commercial: 0.7545

Source: NDRC
• Surcharges
  ➢ Grid construction in rural areas
  ➢ Utility construction in urban areas
  ➢ Hydro power plant construction and immigrant
  ➢ Renewable energy
Differential electricity pricing policy

- NDRC (2004)
- Multi goals
- Central government and local government
- Administrative orders and market tools
Pricing linkage mechanism between coal and electricity
Pricing linkage mechanism between coal and electricity

- 6 months
- Accumulative price fluctuation: 5%
- Cost taken by the plants: 10%
Coal producers

Coal-fired power plants

Power grid

End users

Transportation

Coal producers

Coal-fired power plants

Power grid

End users

Resource tax

Windfall tax

Subsidy

Subsidy

Integration
• Market-determined price
• Comparative market

• Electricity consumption: 4692 TWh
• Direct purchase: 8.2 TWh
• 0.17%

Source: Ye Ze, 2013.

• Why it happened?
• What can we learn?
• How to improve it?
• Less charge of transmission and distribution fees
• Less market power

1. Application
2. Provincial government
3. Central government
• How to solve it?
  ➢ Administrative constrains (access, price)
  ➢ Trading platform
  ➢ Separating the dispatch center from the grid company
  ➢ Clearing the transmission and distribution fees