

# China's Electricity Industry Reform: Economics and Institutions

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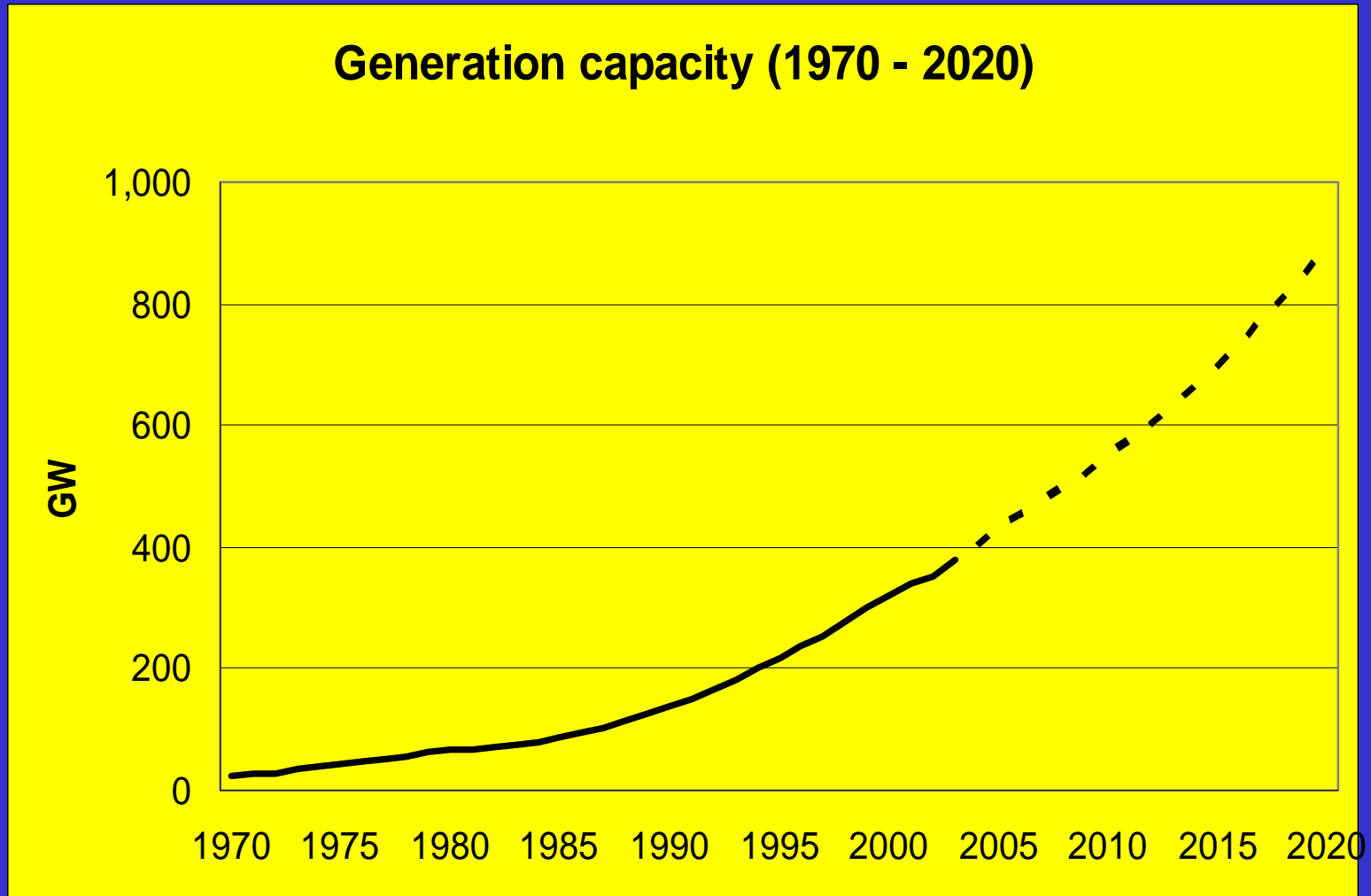
# Outline

1. Industry Overview
2. Industry Reforms and results
3. Reform Challenges

# 1. Overview

- Industry in steady growth over 50 years
  - 11.5% annual growth rate
  - 2.4 GW capacity in 1953, 377 GW in 2002
- Challenges to industry development
  - Capacity expansion and financing
    - Low per capita level of development (0.29kw)
    - 5 – 6% annual growth rate until 2020
  - Economic efficiency improvement
  - Sustainability

# Overview - capacity

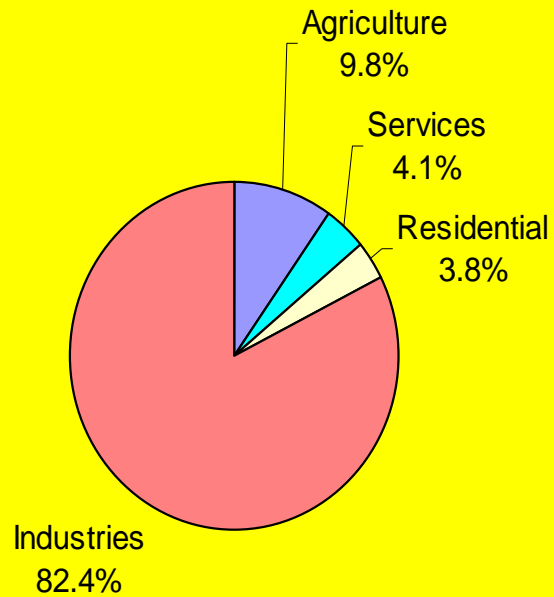


# Overview - electricity grids

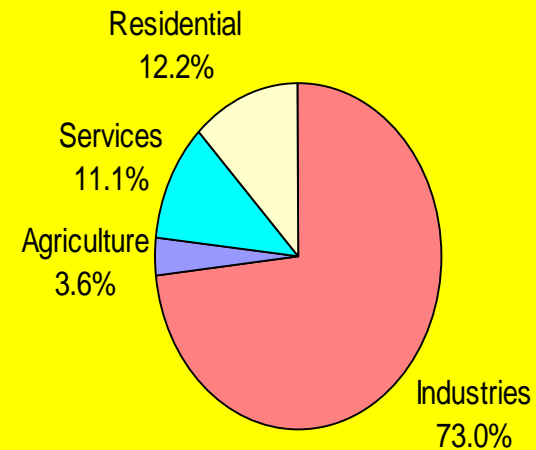


# Overview - consumption

1980

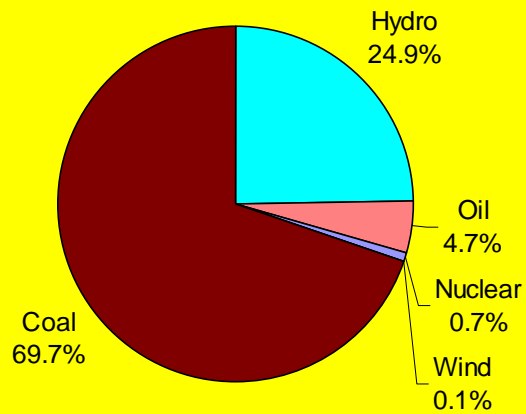


2002

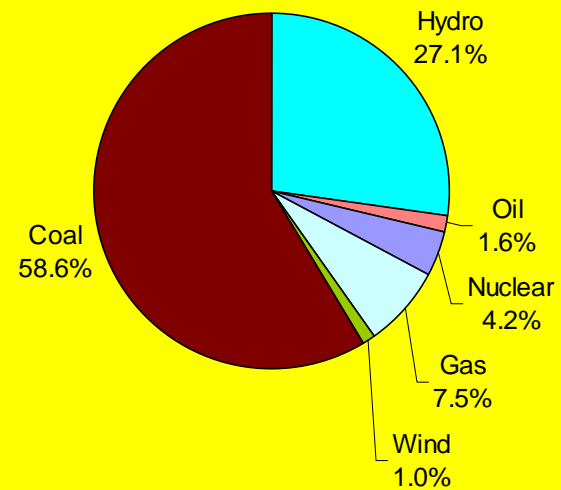


# Overview – fuel structure

2000



2020



## 2. Industry Reforms and results

- Basic objectives
  - Raise capital to expand the system
  - Blend planning with market to improve economic efficiency
- Three Stages
  - 1986 – 1996
  - 1997 – 2001
  - 2002 –
- Results
  - Good news: capital available
  - Bad news: inefficient hybrid of planning and market

# Reforms - stages

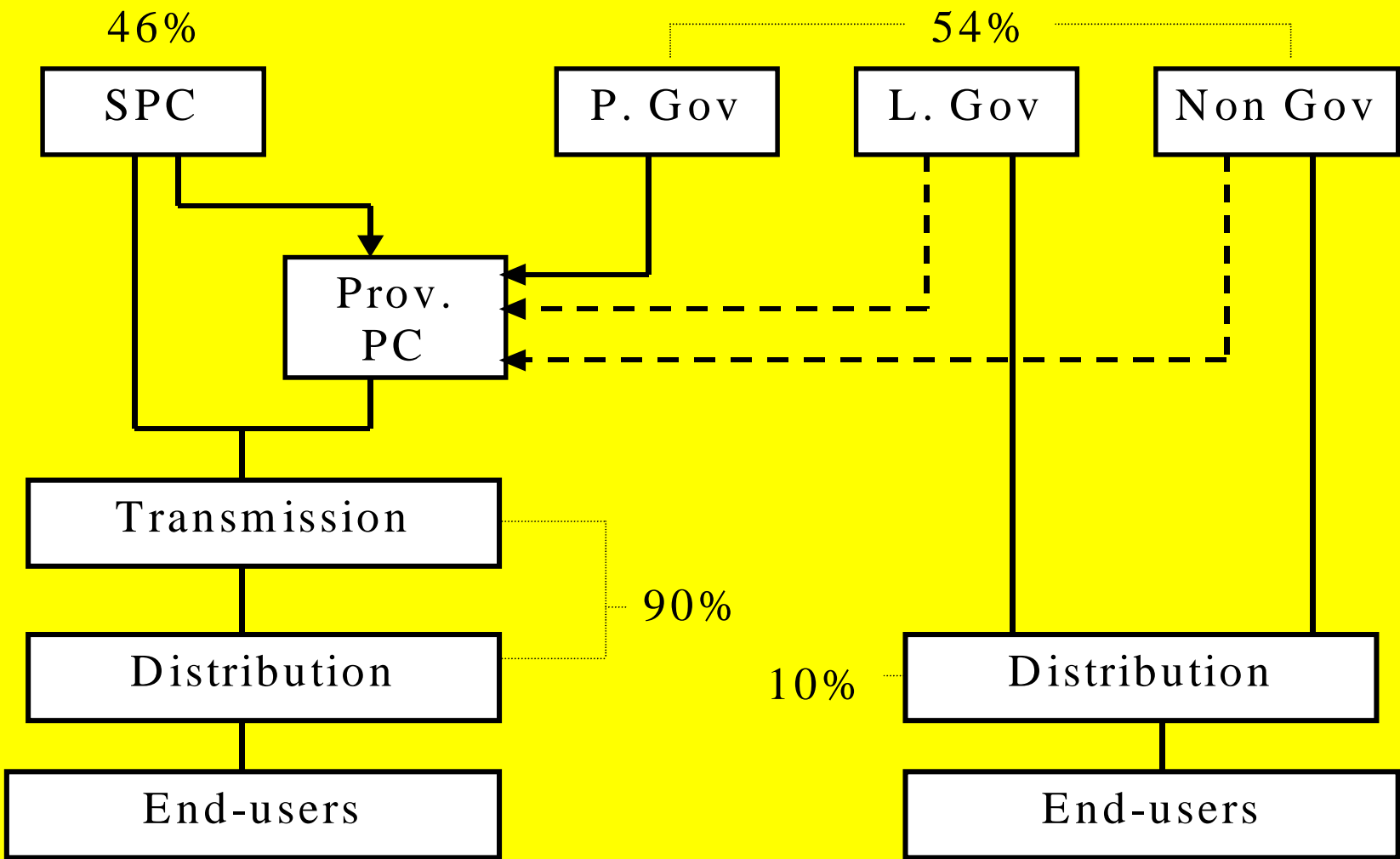
- 1<sup>st</sup> Stage: Reform to raise capital (1986 –1996)
  - Problem: Lack of capacity
    - Open-up of generation to non-central gov. investors
    - Guaranteed rate of return
    - Tariff hikes to raise power construction fund
    - Tax rebate to strengthen utility companies
- 2<sup>nd</sup> Stage: Reform to improve efficiency (1997-2001)
  - Problem: Government involvement; slack market
    - Separation between government and business
    - Corporatization of public power companies
    - Experiment of wholesale mkt competition in 6 provinces

# Reforms – stages (cont.)

- 3<sup>rd</sup> Stage: Reform to break monopoly (2002 - )
  - Problem: industry monopoly; regional monopoly
    - De-integrate generation and transmission (December 2002)
    - Independent regulation (State Electricity Regulatory Commission created in 2003)
    - Competitive wholesale market (Experiment in Northeast grid since January 2004)
    - Wholesale tariff reform (Being studied)
    - National grid connection under construction

# 1<sup>st</sup> Stage Impact – system reorganization

## Generation



# 1<sup>st</sup> State Impact – high tariffs

## National Average Retail Tariffs

	1996	2000	Increase %
Power sales (TWh)	714	905	26.7
Revenue (\$ million)	25821	35171	36.2
Fee collections (\$ million)	2951	2450	-17.0
Average retail tariffs (cent/KWh)	4.06	4.82	18.6
large industries	3.87	4.77	23.2
other industries	4.72	6.29	33.3
agricultural production	3.65	4.24	16.2
poor area ag irrigation	1.50	2.04	36.5
services	6.84	8.44	23.3
residential	3.62	4.85	33.9
non-residential lighting	5.20	6.96	33.6
cross provincial sales	8.11	2.09	-74.2
wholesale to ind. distributors	3.41	4.25	24.6

# 1<sup>st</sup> Stage Results – investment financing

- Success
  - Raised \$20 billion per year
  - Diversified source of financing
- 1996 – 2000 new capital investment (\$70.4bil)

Central government:	44.6%
Local government:	19.4%
Enterprises:	13.1%
Foreign investment	17.4%
Other:	5.6%
- Reasons for success
  - Huge domestic savings
  - Government ability to mobilize resources, and control the economy

## 2<sup>nd</sup> Stage Result – efficiency improvement

- Government withdraw: little impact
  - State's control of investment, pricing and dispatching intact
  - Traditional institutions of central planning not changed
  - Both reflect difficulties of broader economic transition
- Market experiment: little impact
  - Small scale
  - Tight market, full dispatch

# 3. Reform challenges

- Continued huge capacity need
  - 2004 shortage estimated at 35 GW
  - \$120 billion needed for 2006 – 2010
- Conflicting combo of central planning and market competition
- Institutions incompatible with markets
  - Dominant position of governments
  - Powerless regulatory commission
  - Lack of independence of “firms”
  - Weak rule of law
- Broader market reform
  - Lack of functioning financial market
- Unresolved philosophical question: Government or market?