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Asia-Pacific  
Economic Cooperation

## *China's Energy Challenges and Energy Efficiency in China's Energy Future*

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- 1 Background**
- 2 Key Challenge and Target
- 3 Main Tasks and Implementation Scheme
- 4 Conclusions

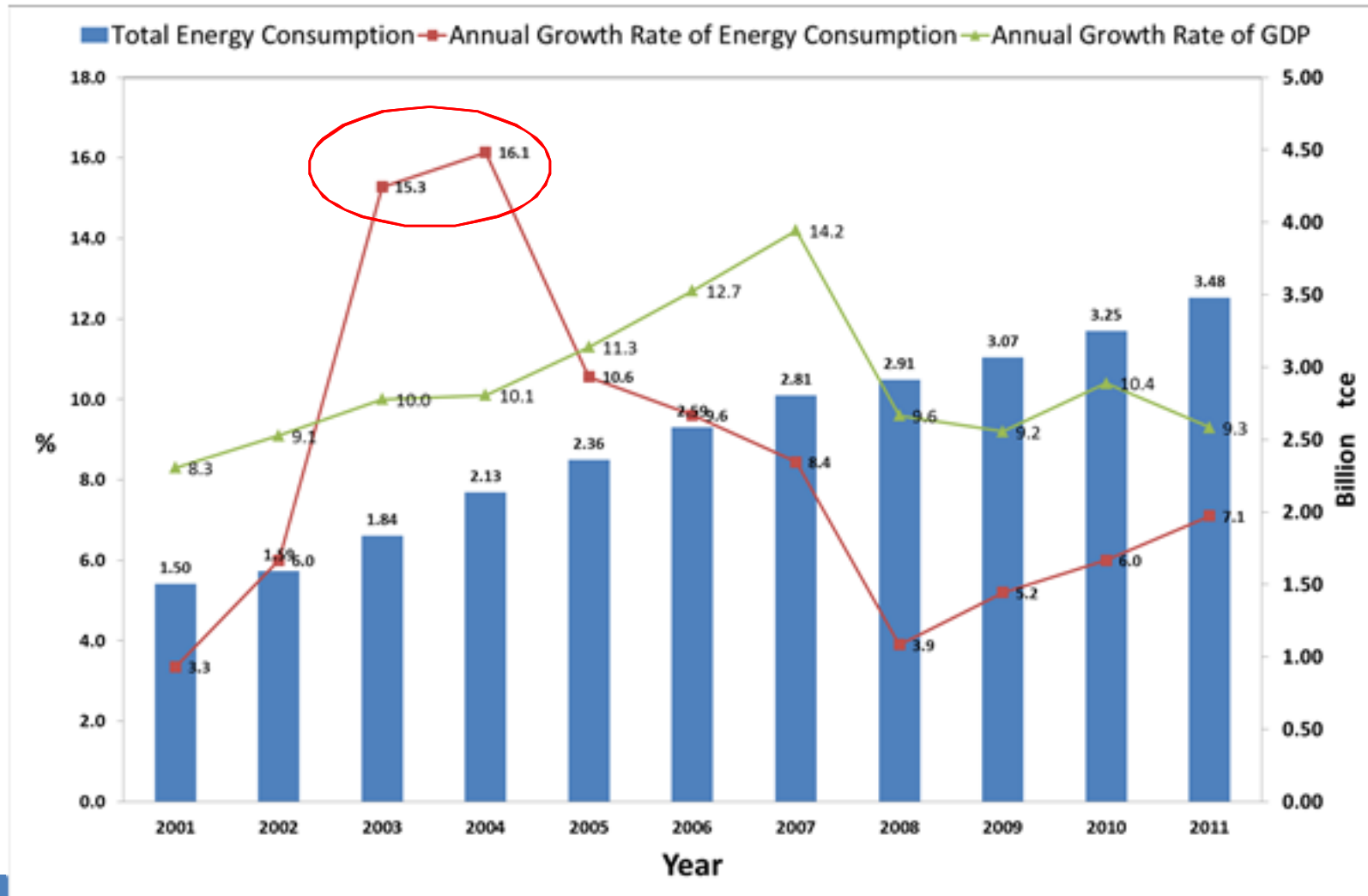


# The total energy consumption in China



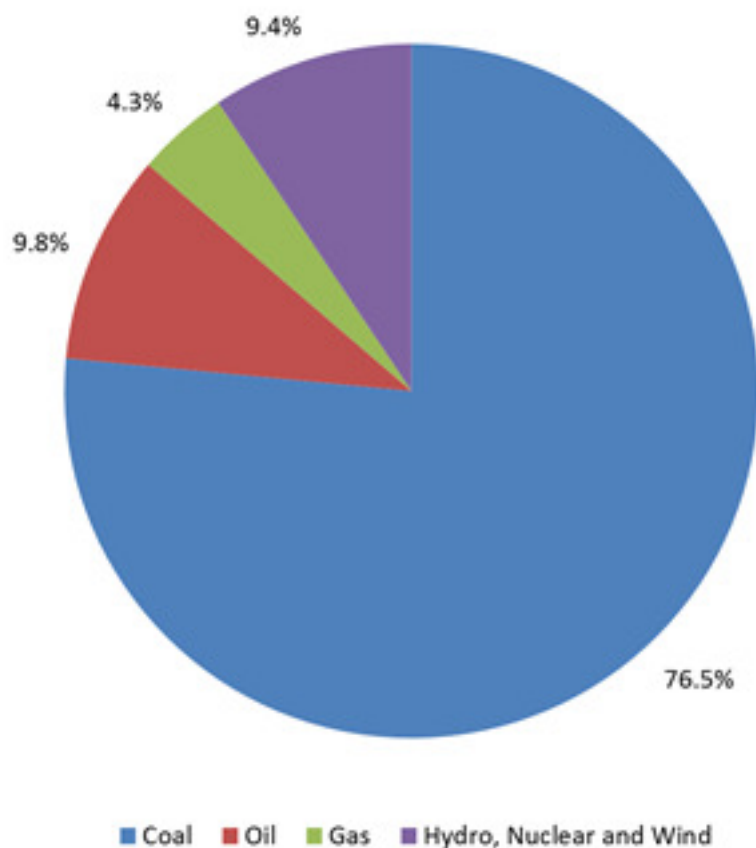
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- In 2011, China consumed 3.4 billion tce, almost 1/5 of global TPES.

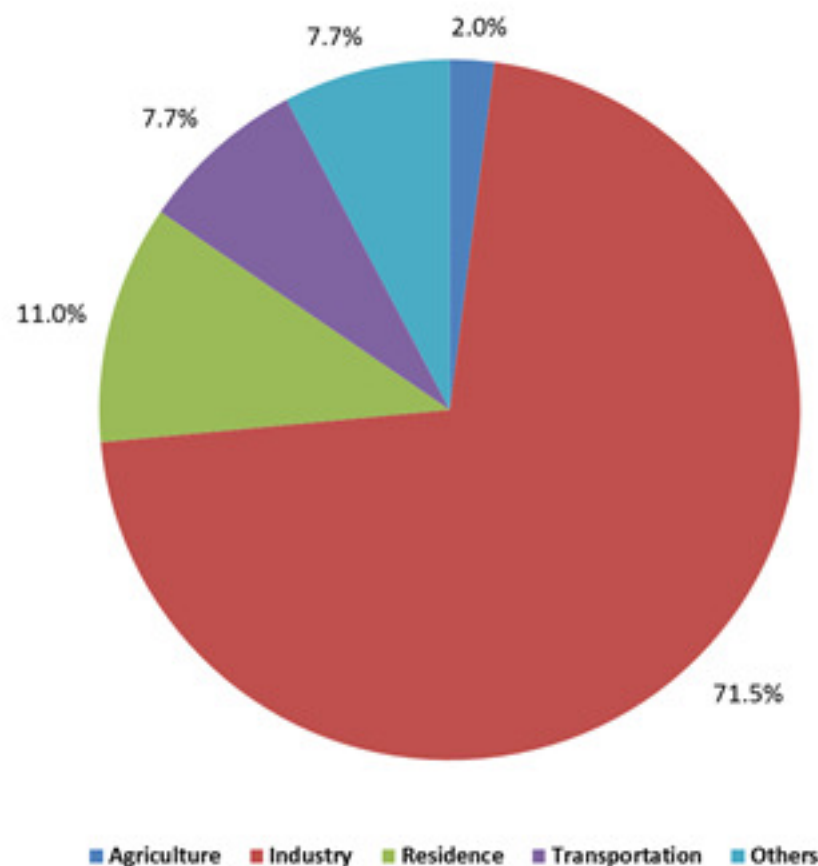


# The energy structure in China

### Energy Supply



### Sectoral Energy Consumption



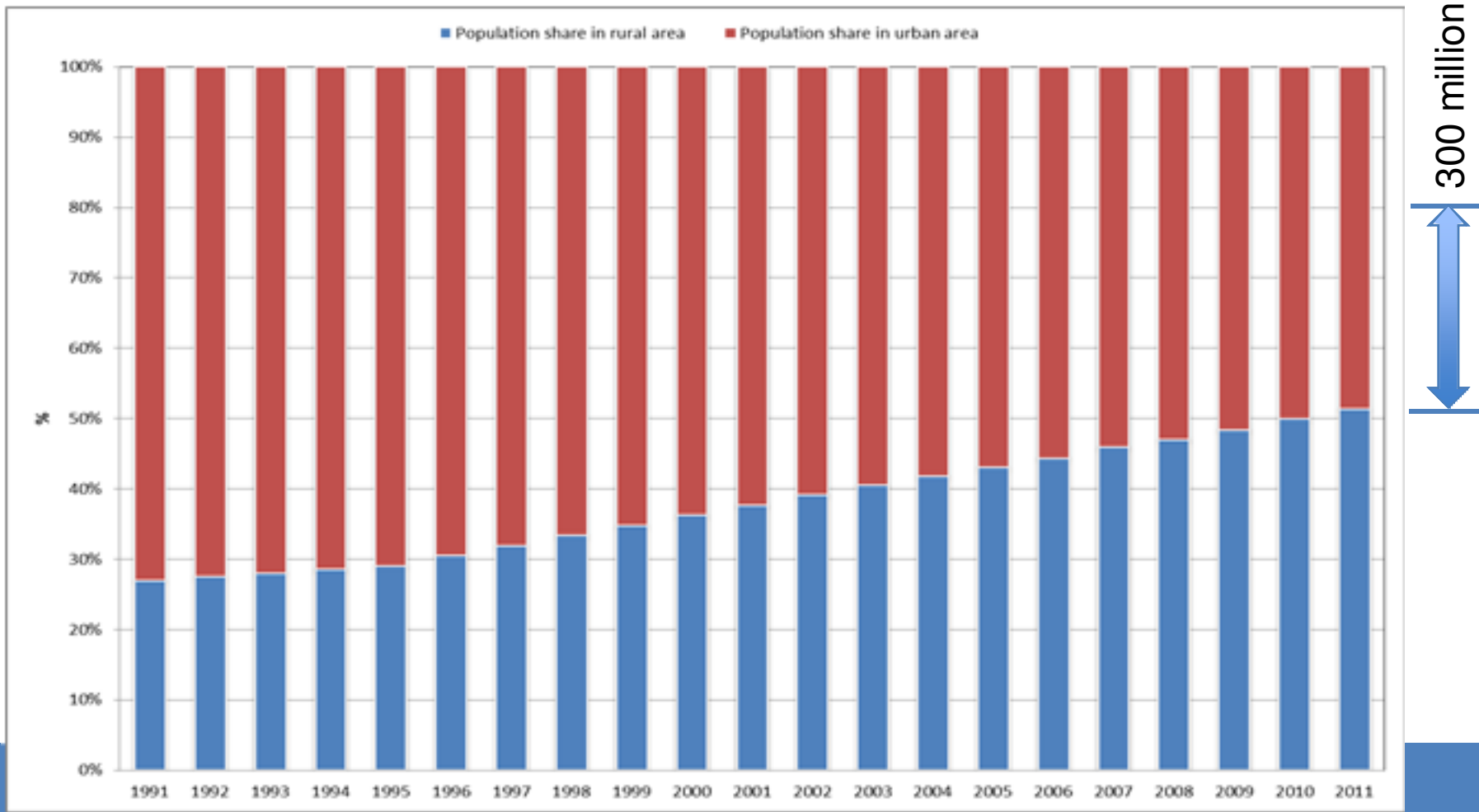
# Drivers of energy demand:

## Industrialization

- In 2010, China produced 627 million tons of crude steel, more than 40% of the worldwide production
- In 2010, China produced 1.9 billion tons of cement, more than 60% of the worldwide production
- In 2010, more than 180 million of new vehicles were sold in China. It is the highest sales in history
- In 2011, China produced 100 million LCD TVs and 320 million PCs. More than 82% of global household appliances in 35 product groups were made in China.
- In 2011, exported air conditioners, refrigerators/freezers, washing machines, and TV/monitors from China occupied 47% of worldwide export.

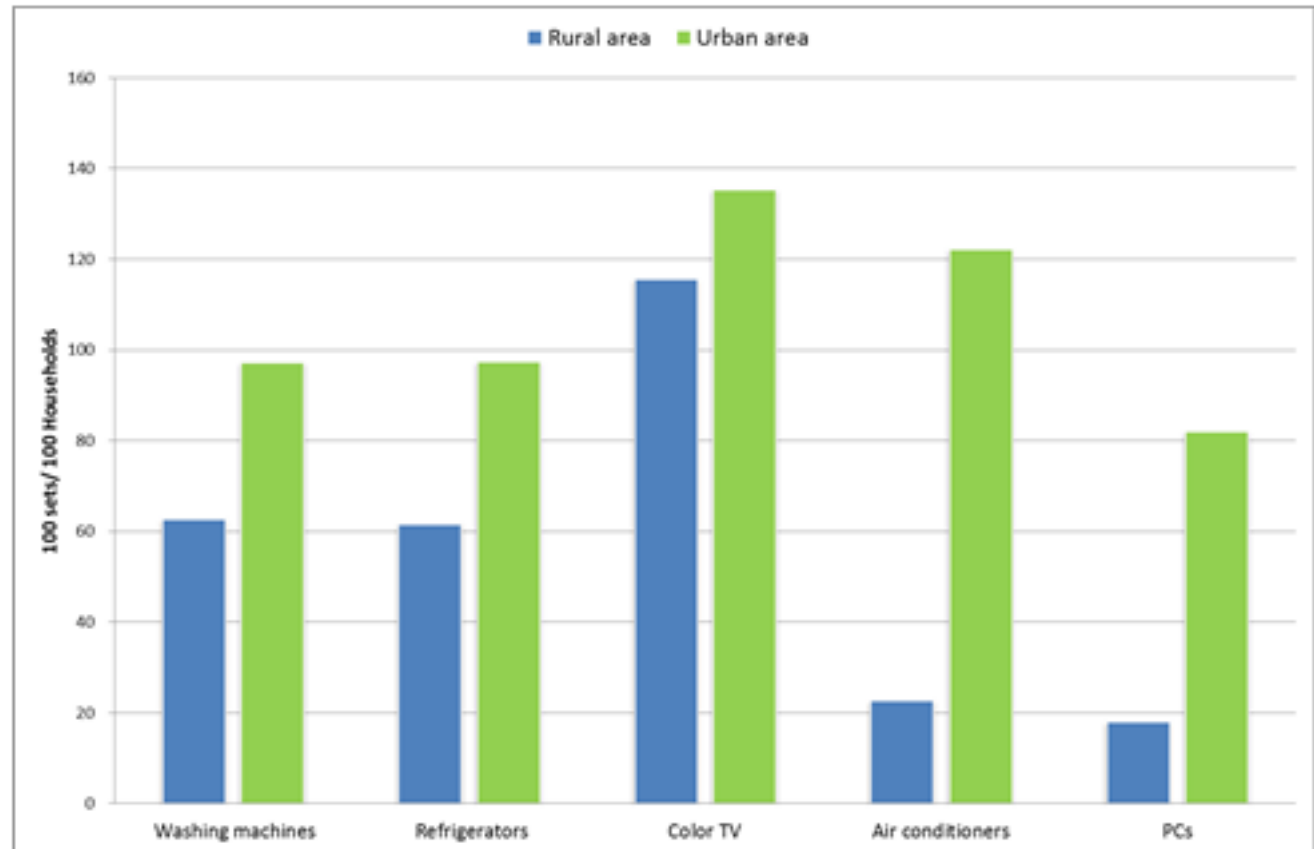
# Drivers of energy demand: Urbanization

- In the past 20 years, the percent of population in urban area increased more than 1% every year in China.



# Drivers of energy demand: Urbanization

Country (2011)	Car Holdings (cars/1000 persons)
USA	812
Germany	634
Japan	589
South Korea	379
Russia	271
Brazil	259
South Africa [2009]	162
China	83



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# Key Challenges



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## Limited energy resources

- Oil and gas reserves is only 6% of average level of the world

## Limited environmental capacity

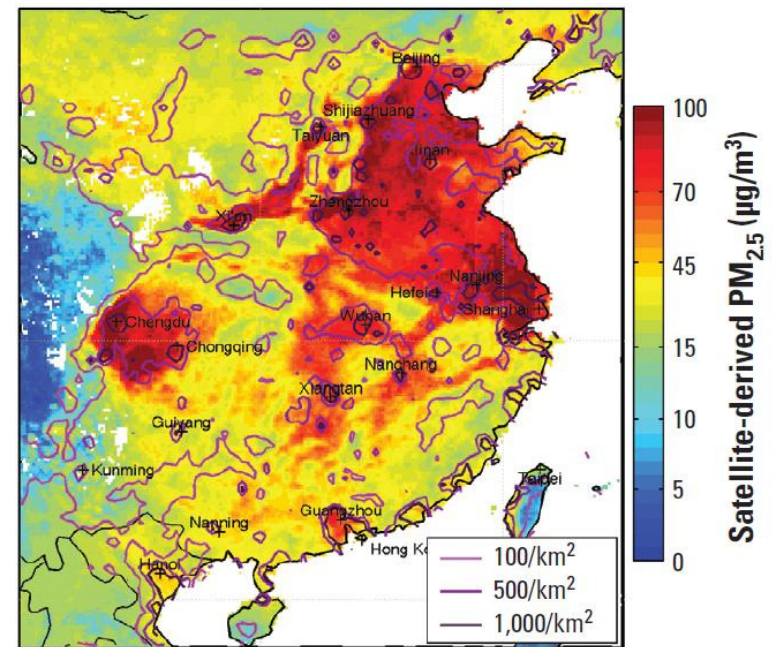
- Serious air pollution, water pollution and soil pollution: Fog Haze in Beijing!

## Low energy efficiency

- Energy consumption per GDP is the twice of the average level of the world

## Assurance of energy security

- In 2010, more than 57% of oil is imported



# Importance of Energy Efficiency in China

- In 2011, GDP per capita in China is only No. 144 in the world and 1/9 of USA
- China's GDP is anticipated to be doubled in 2020 than it in 2010
- Resources and environment are the two main constrained factors for China's economic and social development
- The only choice of China: **Energy efficiency & Energy Conservation**
- Since 1980s, improvement of energy efficiency has been selected as the basic policy for China's energy strategy

# Turning point of energy efficiency in China – 11th FYP

- **During 2006 - 2010 (11<sup>th</sup> Five-Year Plan period)**
  - A mandatory target for energy efficiency improvement of 20% was brought forward (actual 19.1%)
  - Annual economic growth rate of 11.2% with energy consumption growth rate of 6.6%
  - Total energy savings: 630 million tce
  - Improvement of energy efficiency in key sectors
    - Thermal power: 10.0 %
    - Steel: 12.1 %
    - Cement: 28.6 %

# Key Targets of 2011 – 2015 (12th Five-Year Plan period)

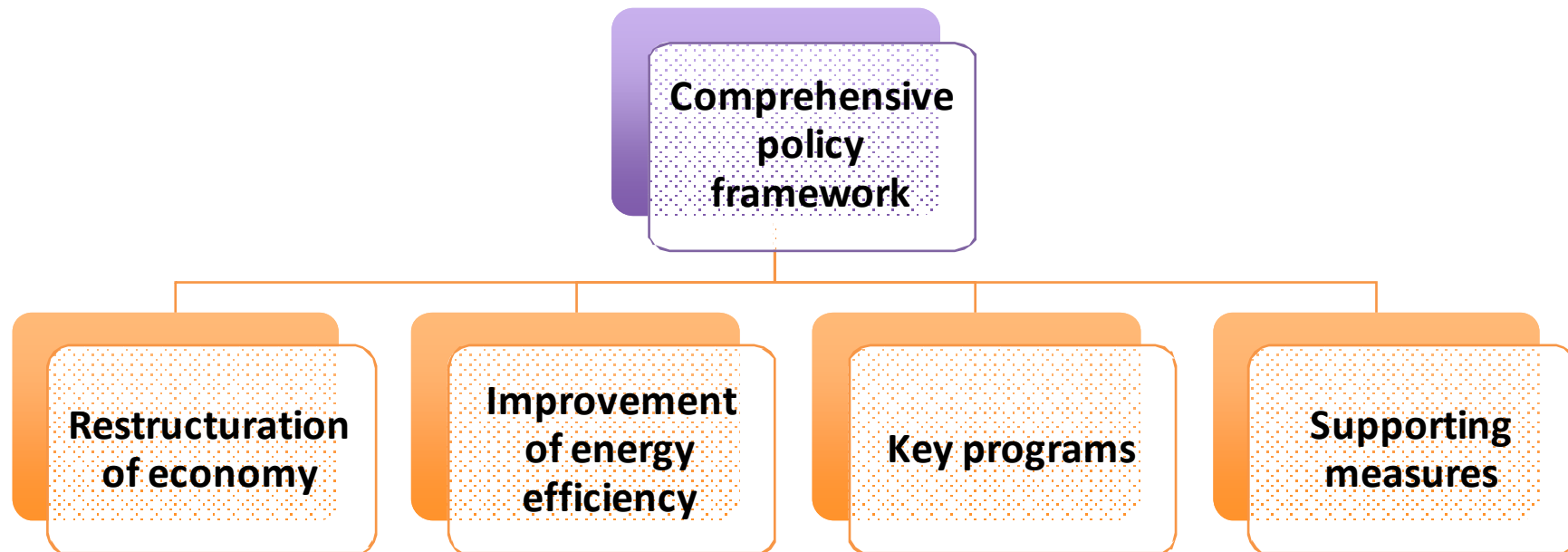
Metrics	Targets
Reduction of energy intensity (tce/GDP)	[16%]
Energy savings (tce)	670 million
Reduction of energy intensity of industries (tce/industrial added value)	[21%]
Energy consumption of unit output (thermal power, steel, cement, aluminum, copper refinery etc.)	International advanced level
Energy efficiency of new equipment (Fans, pumps, air compressors, transformers)	International/national advanced level
Energy efficiency of new appliances (ACs, refrigerators, washing machines, motors)	International leading level

# Content

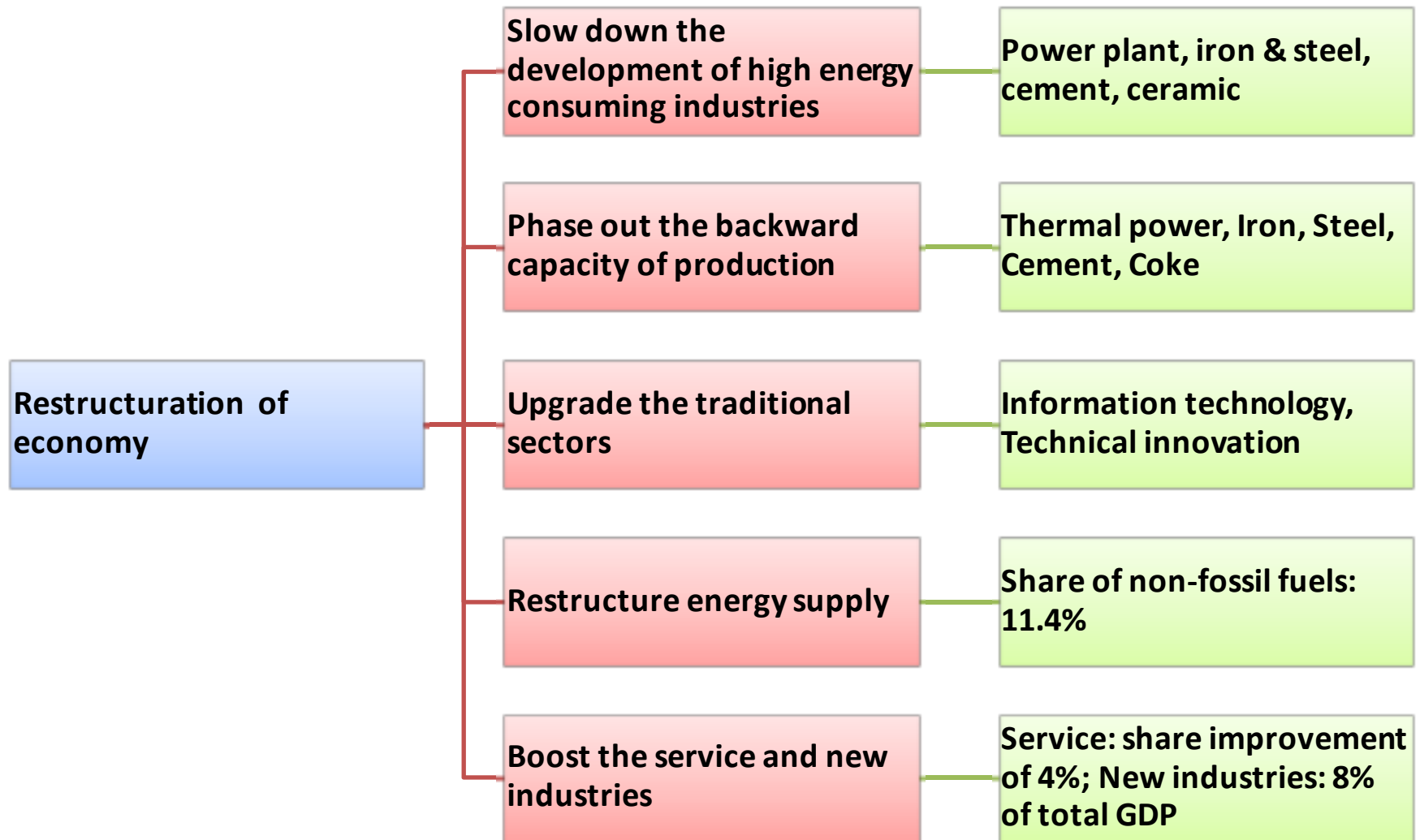
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# Working framework of energy efficiency & energy conservations during 12<sup>th</sup> FYP



# Restructuration of economy



# Highlights

- **Plan of phasing-out:**
  - **Small-capacity thermal power plant: 20 million KW**
  - **Capacity of iron production: 48 million tons**
  - **Capacity of steel production: 48 million tons**
  - **Capacity of cement production: 370 million tons**
  - **Capacity of coke production: 42 million tons**
  - **Incandescent lamp with power more than 60 W: 600 million**
- **Energy conservation assessment of new projects**
- **Export control of high energy-consuming products**



# Improvement of energy efficiency

Improvement  
of energy  
efficiency

- Industry
- Building
- Transportation
- Agriculture
- Commerce and household
- Public institution

# Highlights

- **Industry**
  - Power sector, coal mining, iron & steel, nonferrous metals, oil and petrochemical, chemical engineering, building materials
- **Building**
  - Improvement of mandatory energy efficiency standard of new building
  - Retrofitting of existed building
- **Commerce and household**
  - Reduction of standby power
- **Public institution**
  - 2000 models of efficient public organization

# Key programs

**Total investment: RMB 2366 billion**

**Energy savings: 300 million tce**

**Energy saving  
retrofitting  
program**

**Efficient  
products  
incentive  
program**

**Energy  
performance  
contracting  
promotion  
program**

**Efficient  
technology  
industrializati  
on and  
demonstratio  
n program**

**Capacity  
building  
program**

# Highlights (1)

- **Energy saving retrofitting program**

Area	Potential of energy savings
Boiler (furnaces) and CHP	75 million tce
Motor system	80 billion kWh
Energy system optimization	46 million tce
Waste heat and pressure recovery	57 million tce
Conservation and alternatives of petroleum	11.2 million tce
Building	6 million tce
Transportation	1 million tce
Green lighting	21 million tce

# Highlights (2)

Programs	Targets
Efficient products incentive program	Products: Lighting, appliances, cars, unit AC, motors: Improvement of energy efficiency: 10% Objective of market share: 50%
Energy performance contracting promotion program	ESCOs: more than 2,000 Output value of energy efficiency services: RMB 300 billion Employees: 500 thousand
Efficient technology industrialization and demonstration program	Key energy saving technologies: 30 items Energy savings: 15 million tce
Capacity building program	Online energy consumption monitoring platform, Database and communication system of energy consumption

# Supporting measures

**Key  
Measures**

- **1. National strategy of green & low-carbon development**
- **2. Appraisal and check**
- **3. Energy management**
- **4. Regulations and standards**
- **5. Investment scheme**
- **6. Economic policy**
- **7. Market mechanism**
- **8. Technical innovation and promotion**
- **9. Monitoring and capacity building**
- **10. Public action**



# Highlights (1)

- **Energy Management**
  - 10 thousand enterprises action plan for energy conservation and low carbon
  - Energy benchmarking
  - Energy manager scheme
- **Standards**
  - 50 mandatory norms of energy consumption of unit output
  - 40 mandatory energy efficiency standards for energy-using products
  - Energy Management System guidelines for industrial sectors
  - Standards for energy saving products and equipment

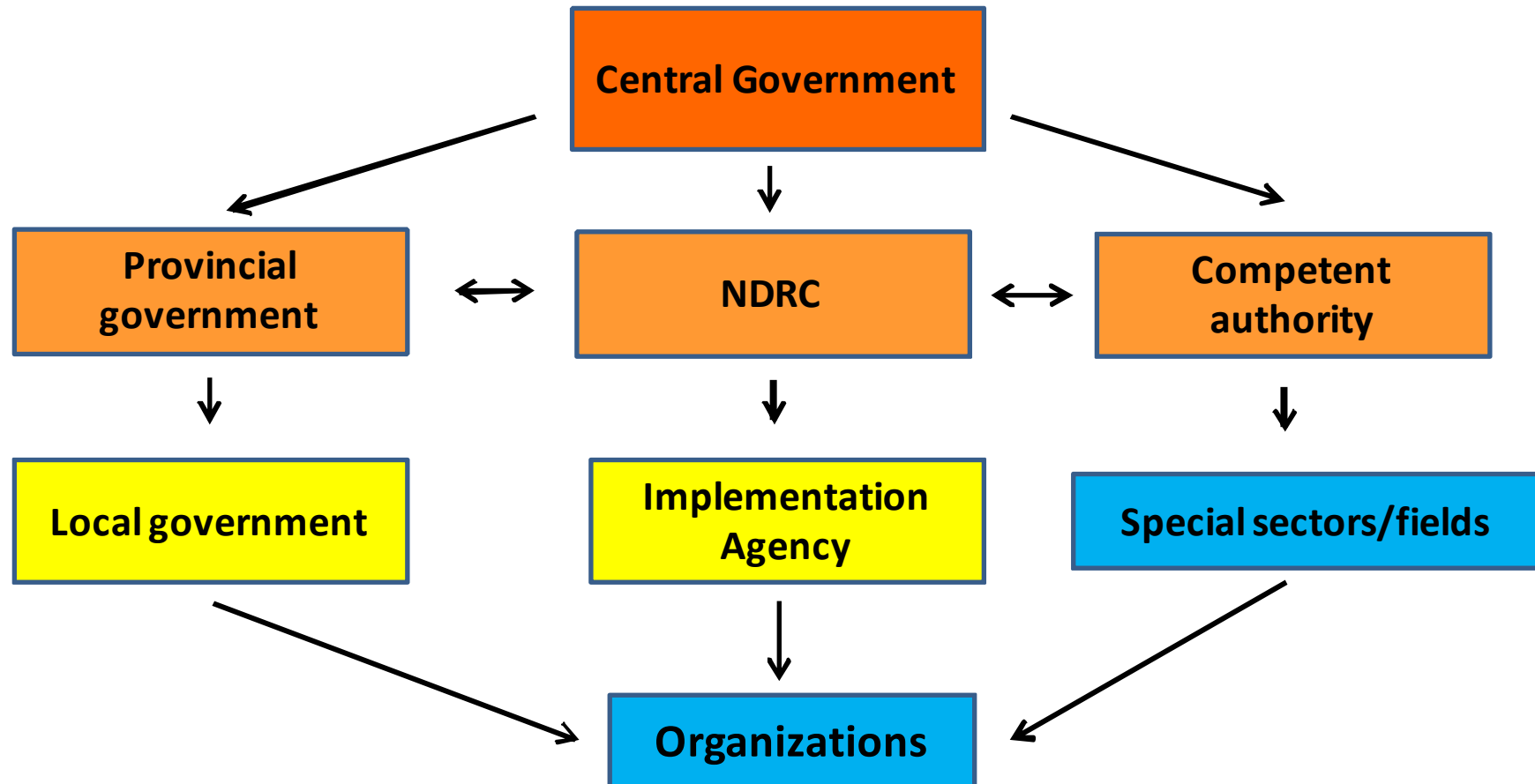


# Highlights (2)

- **Investment scheme**
  - Public financial incentives for efficient products and energy performance contracting projects
- **Economic policy**
  - Public procurement of efficient products
  - Tax preference for energy conservation business
- **Market mechanism**
  - Energy labeling program
  - Energy saving product certification
  - Leading efficient program
  - Demand side management



# Implementation scheme



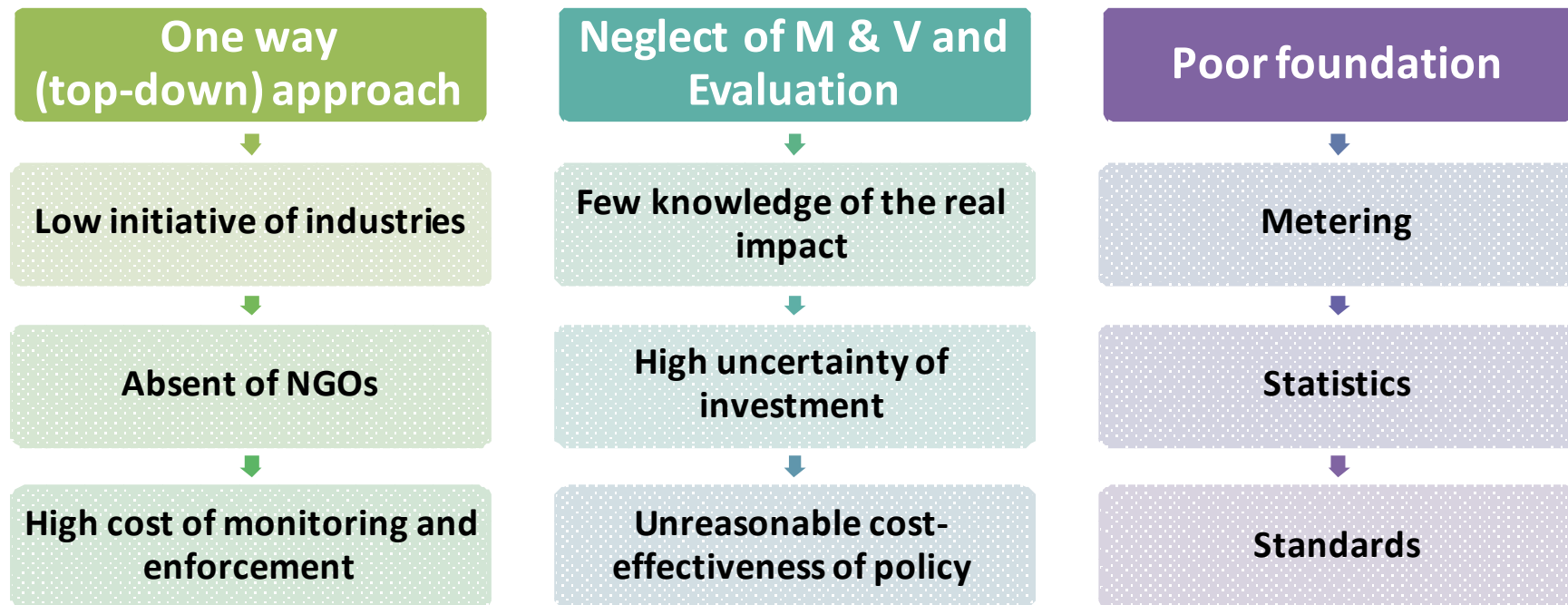
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# Conclusions

- China has established a **comprehensive** and **systemic** policy framework for energy efficiency and energy conservation
- But some key barriers in implementation:



**Thank you for your attention!**



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