
An Overview of the "13th Five-Year" Energy Conservation Policy in China

Zhao Tianyi

Dalian University of Technology, China

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Outline

- General situation of energy conservation since “ 11th Five-Year “ (1.1-1.9)
- "13th Five-Year" national energy policy(2.1-2.7)
- Promotion mechanism of energy conservation technology(3.1-3.3)
- Tendency of energy conservation technology development(4)

History of energy conservation policy (1.1 of 4)

Evolution of energy conservation in China

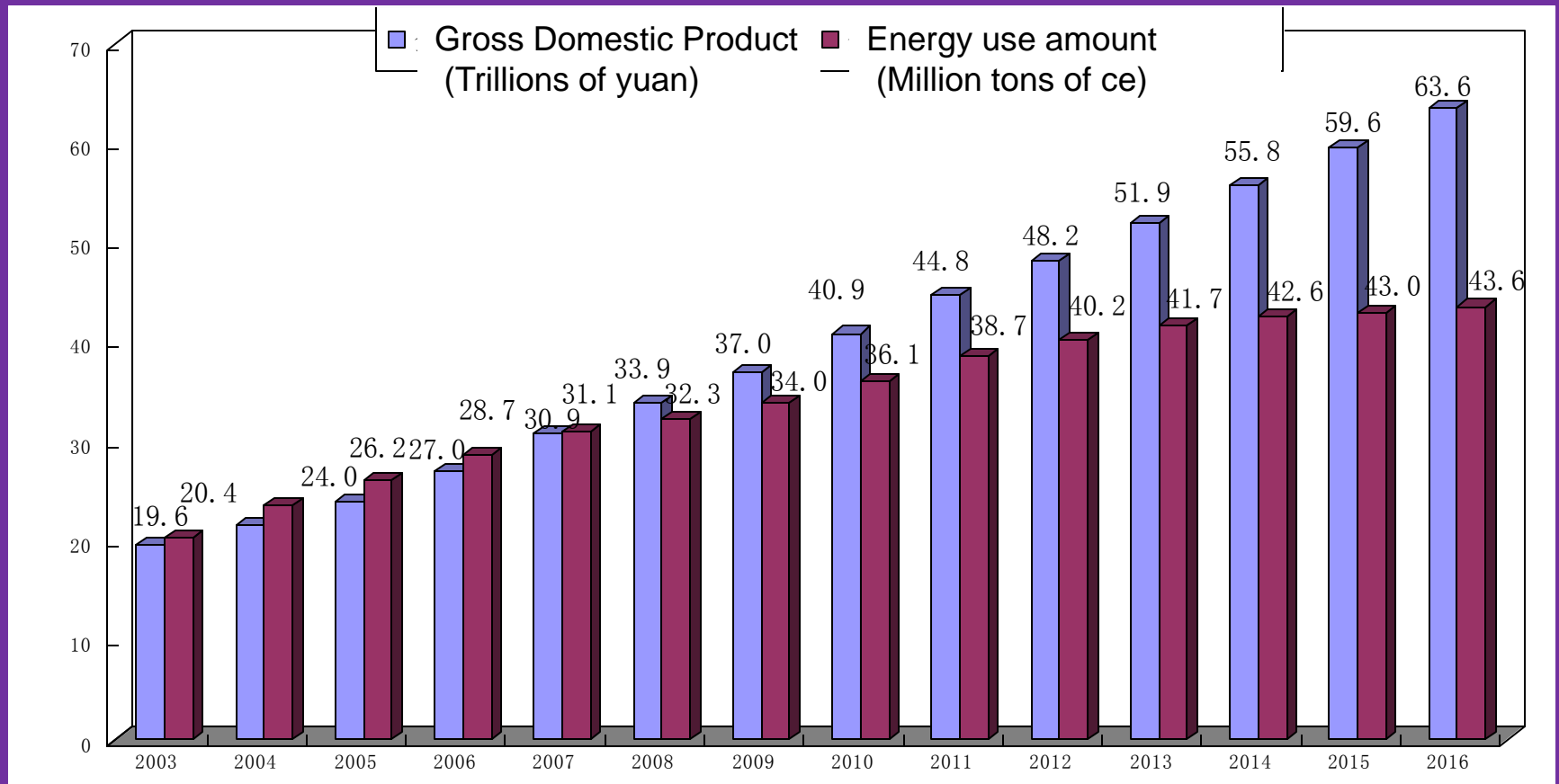


➤ The Three Stages

- ✓ **1980s:** Developing and economize simultaneously, saving is priority
- ✓ **11th Five-Year(2006-2010):** Saving priority and improving energy efficiency
- ✓ **12th Five-Year and Later(2011-):** Total energy consumption control, carbon emission peak control, response to climate change

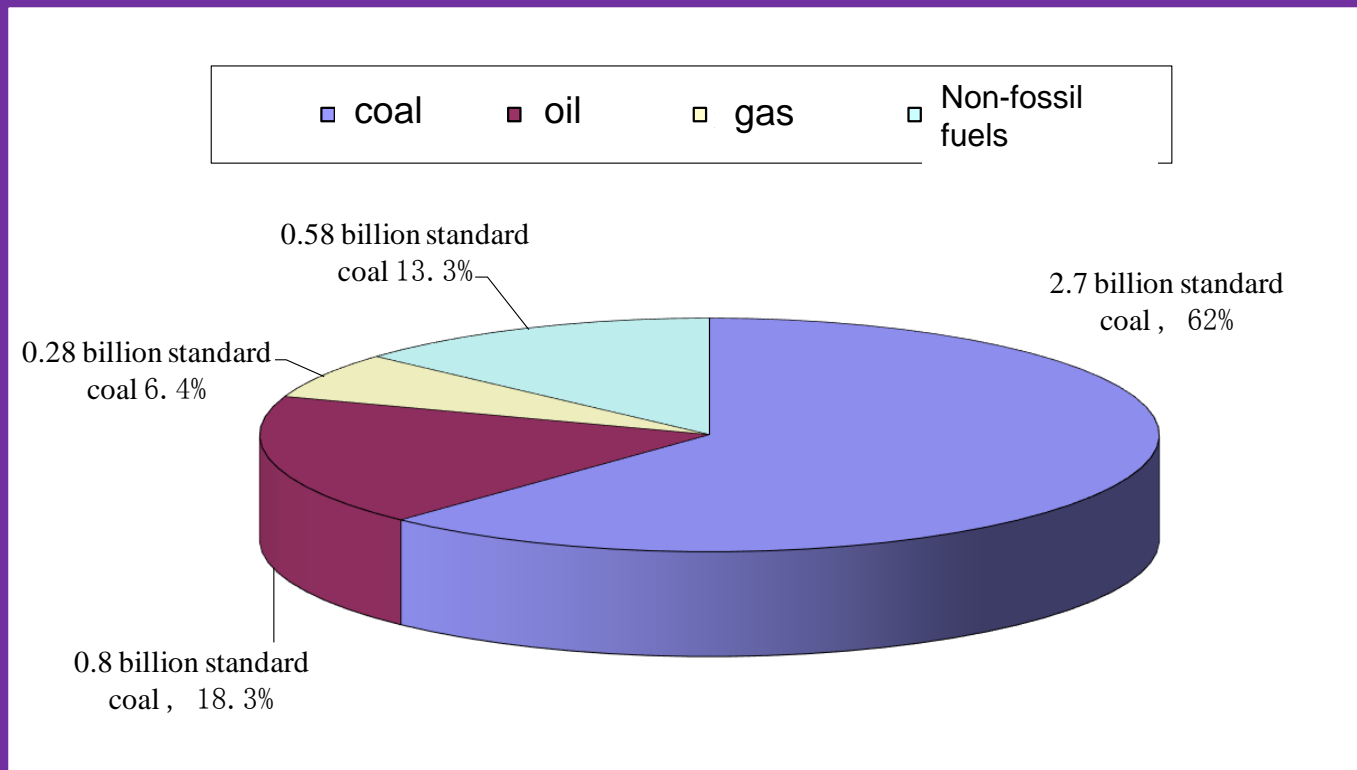
General Situation of energy use in China (1.2 of 4)

- **Large amount and large increment:** China's total energy consumption is 43.6 million tons of standard coal, accounting for about 23% of worldwide energy consumption at 2016

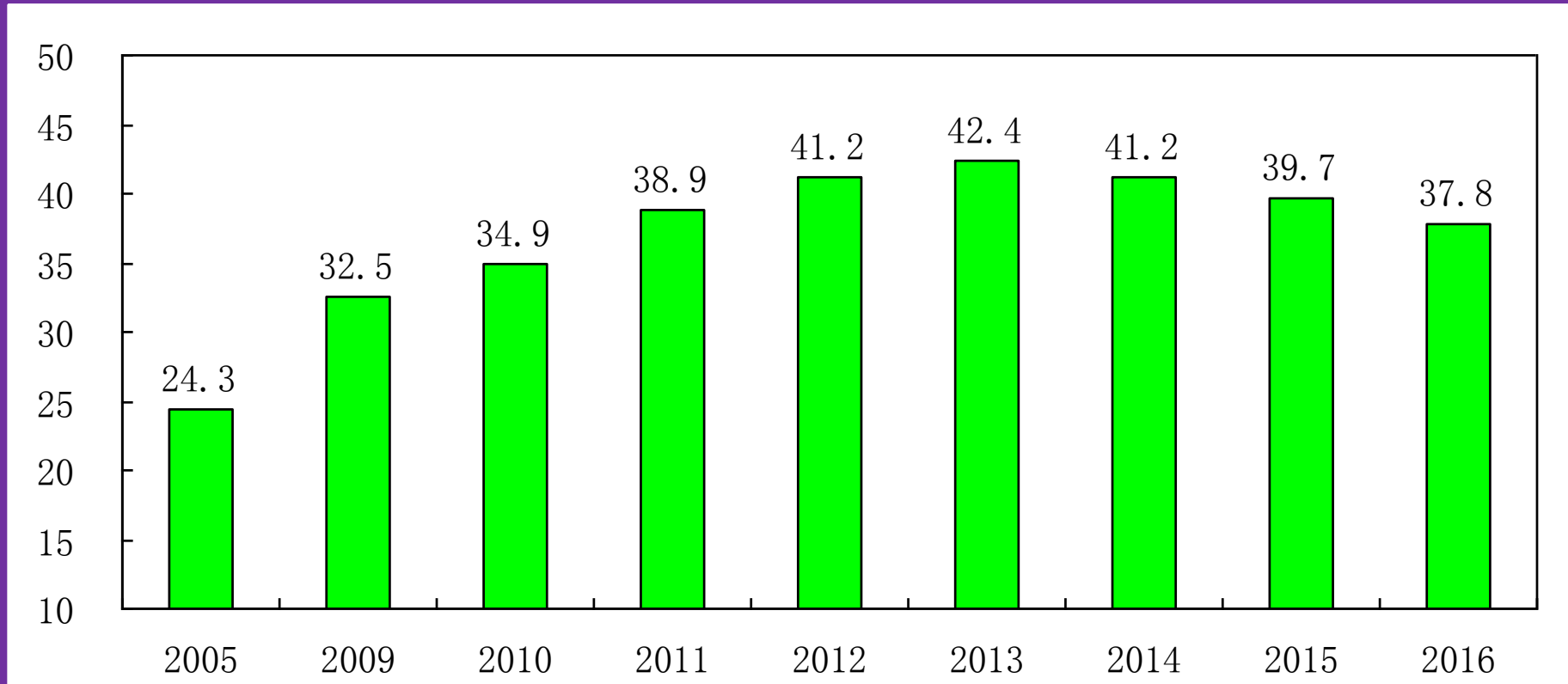


General situation of energy use structure in China (1.3 of 4)

- Coal based, non fossil energy growing rapidly
- ✓ In 2016, the national coal consumption was 37.8 million tons, accounting for 62% of the total energy using of China, accounting for 50% of worldwide coal consumption



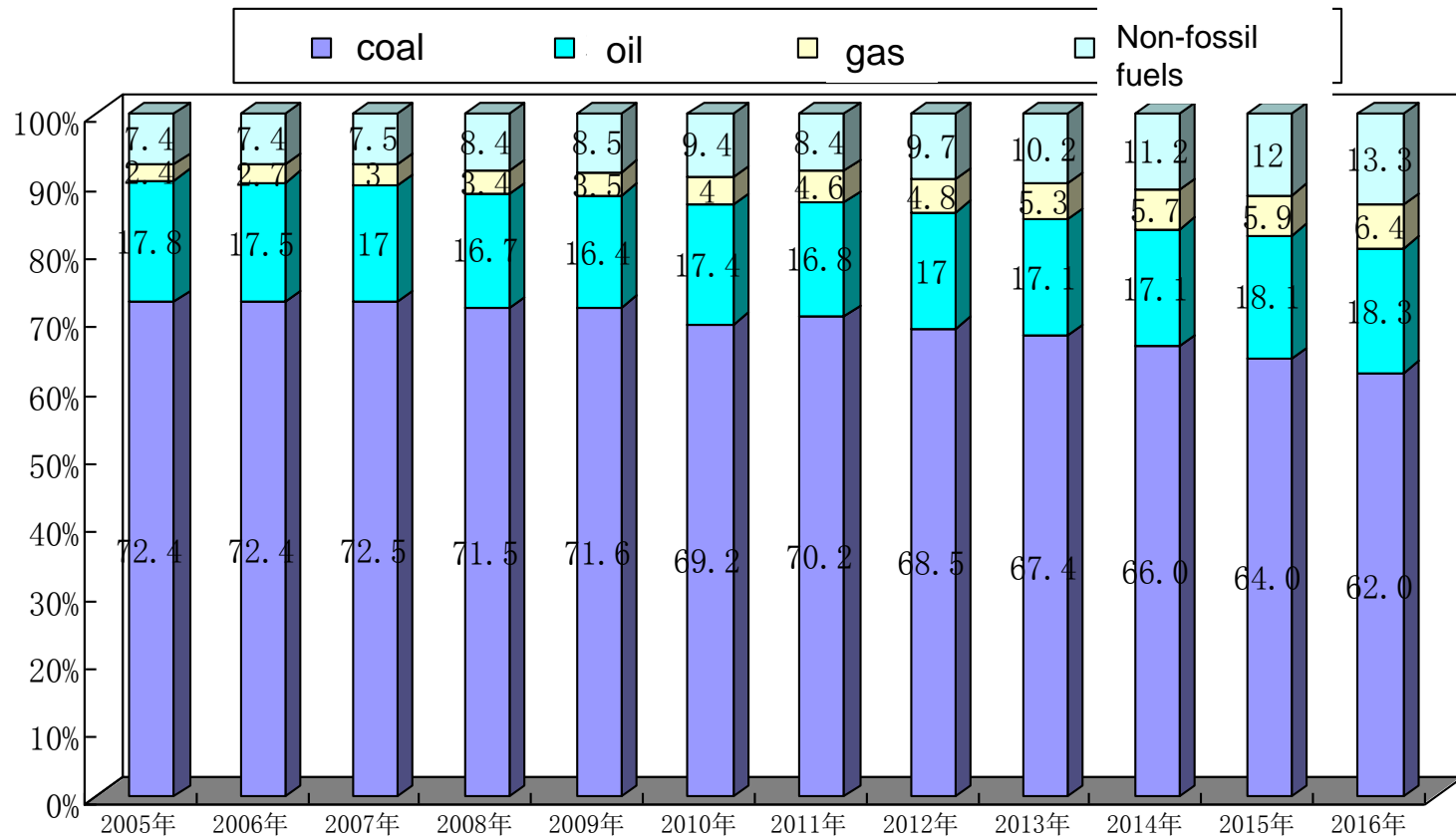
Coal consumption (hundreds of millions of tons) (1.4 of 4)



In 2016, the national coal consumption decreased by 1.9 million tons (4.7%) than in 2015, by 4.6 million tons than in 2013, Negative growth for three consecutive years

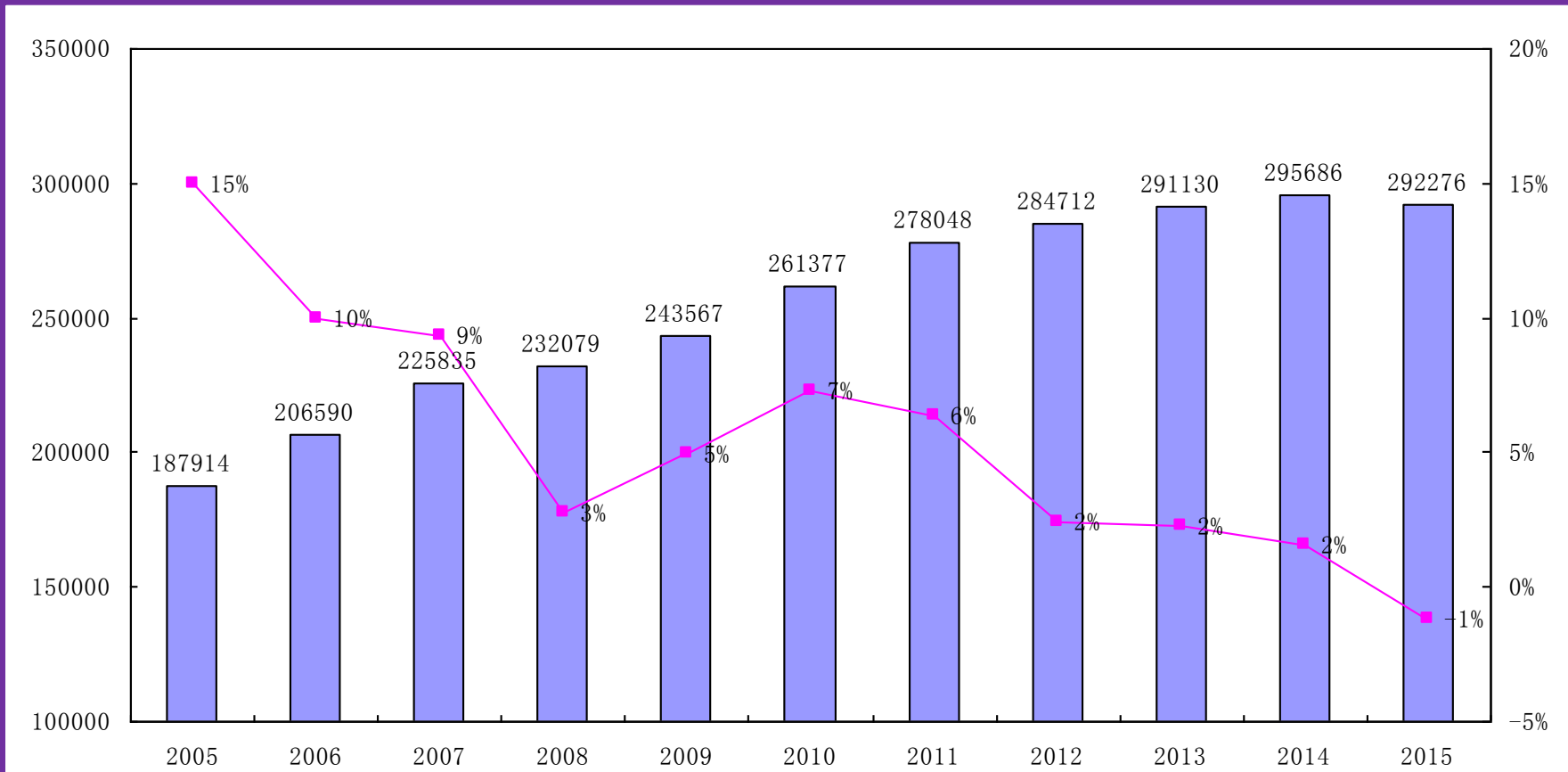
Increasing Trend of Non-fossil fuels (1.5 of 4)

✓ In 2016, China's non fossil energy consumption accounts for 13.3% of the total energy consumption with average annual growth rate has reached 10.5% since 11th Five-Year



Energy consumption in industrial fields (1.6 of 4)

- Energy in industry area is the main part but has slow growth. Meantime energy in building and transportation area has rigid growth

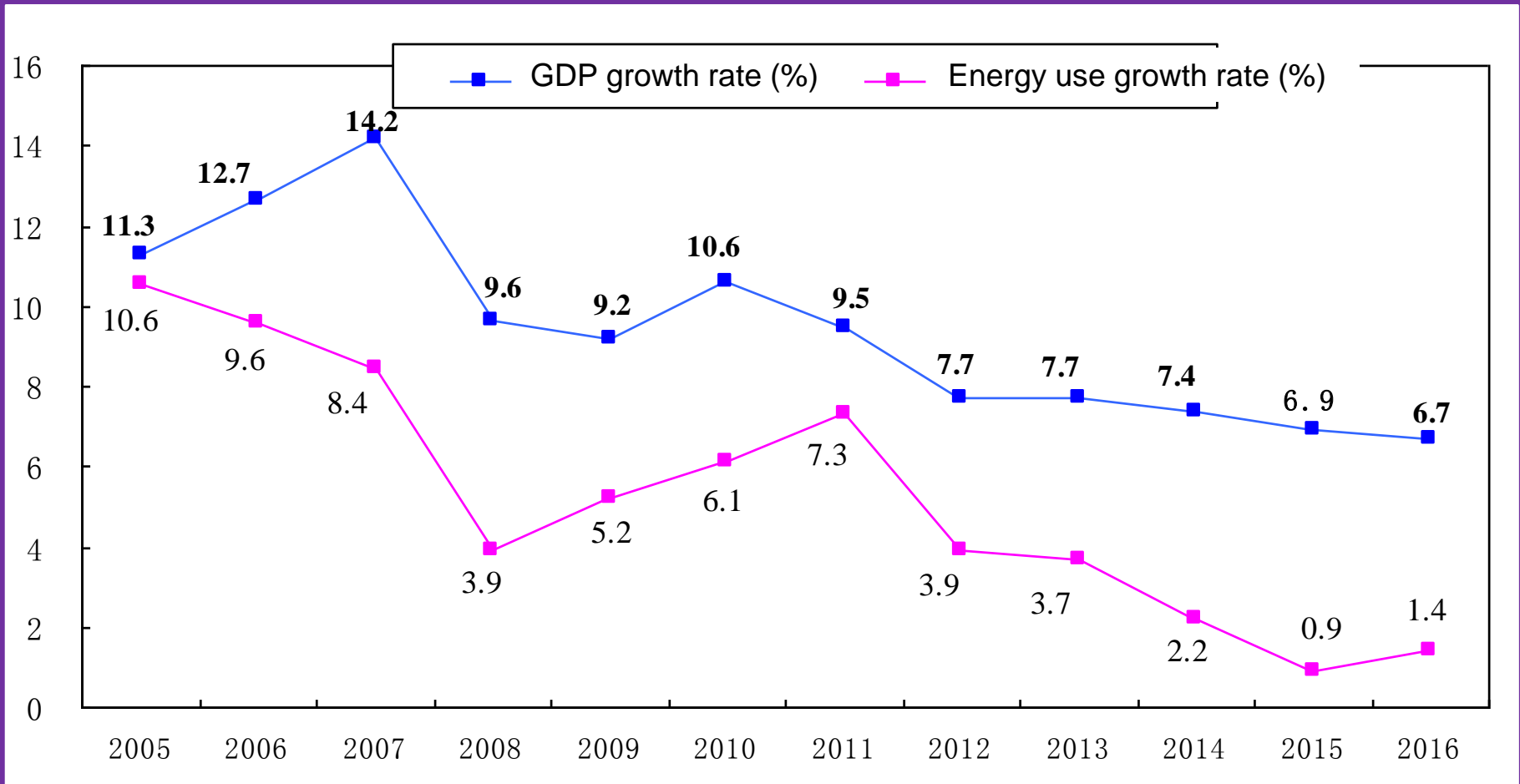


Industrial energy consumption and growth rate
(ten thousand tons of standard coal) in China during 2005 to 2015

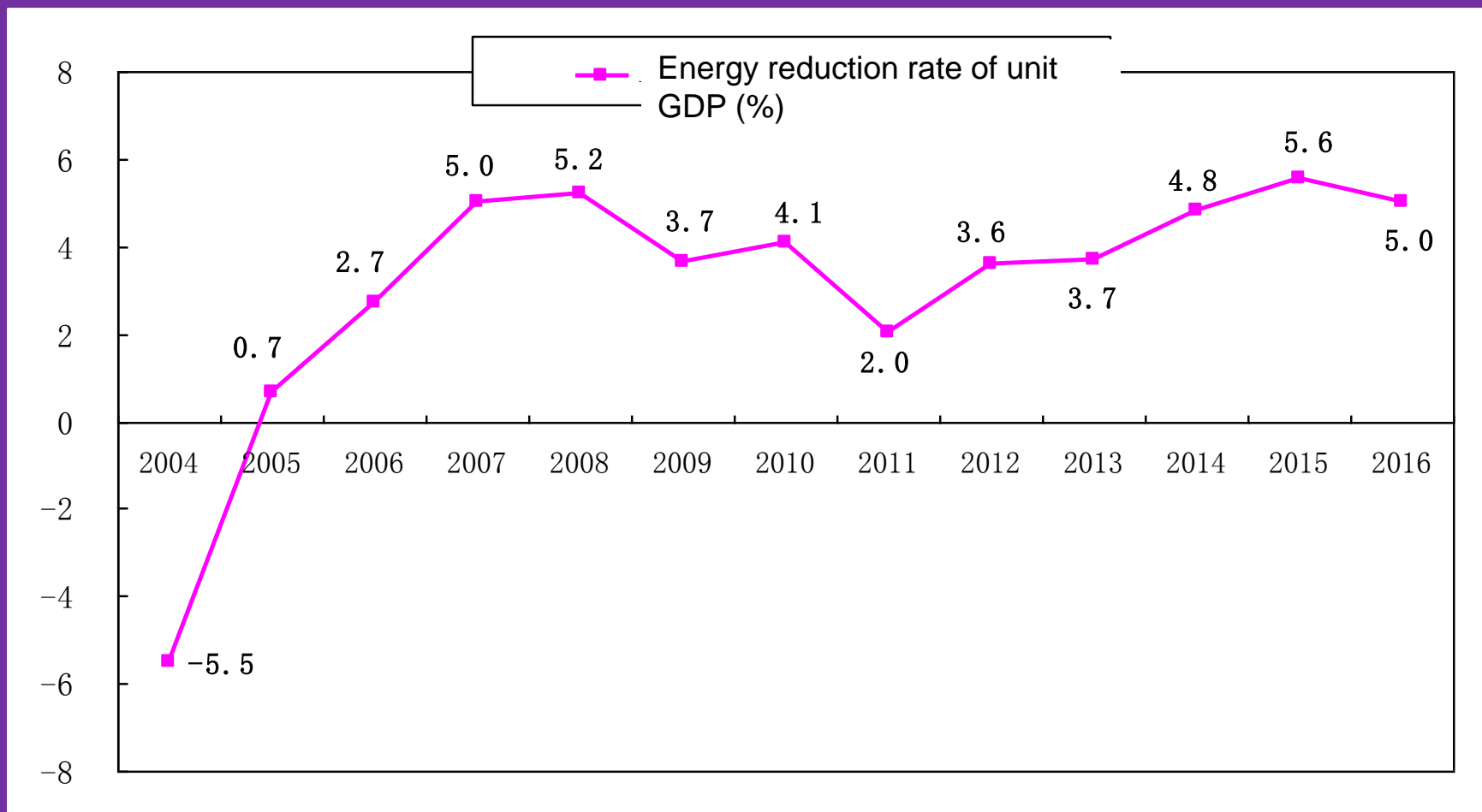
Efficiency of energy conservation since 11th Five-Year (1.7 of 4)

	Energy consumption growth rate (%)	GDP growth rate (%)	Energy conservation amount (100 million ce)	CO₂ displacement (100 million tons)
2006-2010	6.6	11.2	7.1	16.4
2011-2015	3.6	7.8	8.6	19.5
2016	1.4	6.7	2.3	5.0
2006-2016	4.8	9.3	18.0	40.8

China's GDP and energy consumption growth (1.8 of 4)



Energy reduction rate of unit GDP for 2004-2016 (1.9 of 4)



New requirements of National Government on Energy Conservation for 13th five year plan (2.1 of 4)

- “13th Five-Year” plan “Outline”(issued at March,16, 2016) put forward to following points related to energy conservation
 - Establish the concept of green development, implementing the action plan for the whole people's energy saving, establishing and perfecting the initial distribution system of energy use
 - Innovating compensable use, budget management, investment and financing mechanism
 - Cultivating and developing the trading market and carrying out contract energy management
 - National unit GDP energy consumption reduced by 15% and total national energy consumption in 2020 is controlled within 50 million tons of standard coal

New policy of "double control" of total energy consumption and intensity for 13th five year plan (2.2 of 4)

The scheme of "13th Five-Year" comprehensive energy conservation work plan (No.[2016]74) issued at Jan, 5, 2017 by the State Council

"13th Five-Year" national energy action plan and energy conservation environmental protection industry development planning(13 ministries and commissions, such as the national development and Reform Commission)

The strategy of energy production and energy consumption revolution (2016-2030)

Key products and service directories of strategic emerging industries(2016-2030)

Industrial green development plan (2016-2020)(Ministry of Industry and Information Technology)

Building energy conservation and green building development plan "in 13th Five-Year" (Ministry of Housing and Urban-Rural Development)

The transportation of energy conservation and environmental protection "13th Five-Year" development plan (Ministry of Transport)

Public agencies to save energy resources "13th Five-Year" planning(State authority affairs administration, National Development and Reform Commission)

The scheme of “13th Five-Year” comprehensive energy-conservation emission reduction work (2.3 of 4)

- **Overall requirements and objectives:** The energy consumption of unit GDP decreased by 15% and the total energy consumption was less than 50 million tons by 2020
- **Optimizing industry and energy structure:** Upgrading the traditional industry, accelerating the development of new industries, optimize the energy structure
- **Energy conservation in key areas:** Industry, construction, transportation, trade, agricultural and rural areas, public institutions, key energy use units and key energy use equipment
- **Energy conservation key project:** Energy saving capacity of about 3 million tons of standard coal
- **Construction of technical support and service system :** R & D demonstration and extension, system integration application and perfect innovation platform
- **Supporting policies:** Price charge, fiscal and tax incentive, green financial system
- **Market mechanism:** Market trading mechanism, contract energy management, green identification authentication, electricity demand side management

The scheme of "13th Five-Year" comprehensive energy-saving emission reduction work (2.4 of 4)

Part7:Strengthening the technical support and service system construction of energy saving and emission reduction

28. Speeding up the development and demonstration of common key technologies	<p>Integrate the integration of scientific and technological resources</p> <hr/> <p>Development of new technology equipment and industrialization</p> <hr/> <p>Advanced technology with outstanding synergy and popularization of system solution</p> <hr/>
29. Integrated application of energy saving and emission reduction technology system	<p>Promoting energy consumption and energy conservation for regional energy use units</p> <hr/> <p>Internet plus smarter energy, promote energy storage, distributed energy, smart electricity</p> <hr/> <p>Promote the optimization and upgrading of boiler, motor, heating systems</p> <hr/>
30. Improving the innovation platform and service system of energy saving and emission reduction	<p>Establishing the technology evaluation system and innovative integrated service platform and service mechanism</p> <hr/> <p>Setting up a platform for exchange and transformation of energy saving scientific and technology</p> <hr/> <p>Publishing technology catalogue and technology extension mechanism</p> <hr/>

The total energy consumption and intensity of dual control target of regions and the main industry energy conservation index in 13th Five-Year (2.5 of 4)

Selected region for example	Energy intensity reduction target (%)	2015 total energy consumption (10 thousand tons ce)	Energy increment control target till 2020 (10 thousand tons ce)	
Beijing	17	6853	800	
Shanghai	17	11387	970	
Liaoning	15	21667	3550	
Hainan	10	1938	660	
Energy saving index of main industry process (Energy consumption in unit industry reduction ratio is 18%)	unit	2015 level	2020 target value	reduction rate (%)
Coal consumption in thermal power supply	g ce /kWh	315	306	2.9
Comprehensive energy of steel production	kg ce/ton	572	560	2.1
Comprehensive energy consumption in oil refining	kg oe/ton	65	63	3.1
Comprehensive energy consumption of paper and paperboard production	kg ce/ton	530	480	9.4

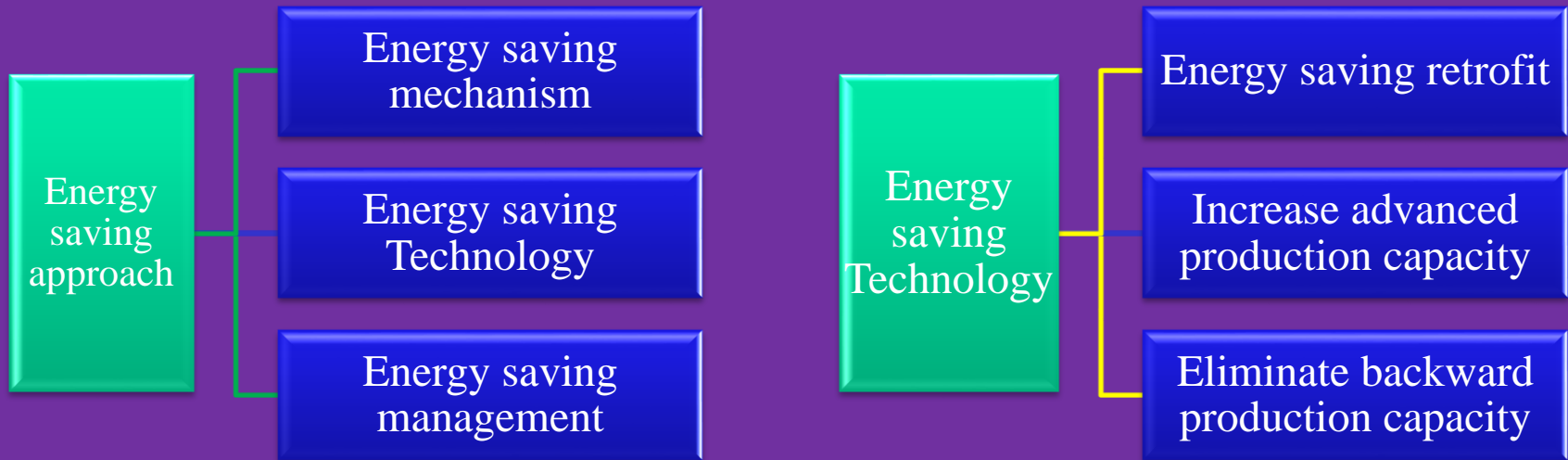
Energy saving index on Building and Transportation process in 13th Five-Year (2.6 of 4)

Building Area	unit	2015 level	2020 target value	growth rate (%)
Accumulative area of energy-saving reconstruction of existing residential buildings	100 million square meters	12.5	17.5	40
Accumulative area of energy-saving reconstruction of existing urban public buildings	100 million square meters	1	2	100
Implementation rate of new green buildings in cities and towns	%	20	50	150
Transportation Area	unit	2015 level	2020 target value	reduction rate (%)
Comprehensive energy consumption of railway unit transport volume	ton ce /Millions of converted ton	4.71	4.47	5.37
Energy consumption decline rate of unit transport turnover rate of operating vehicles/ships				6.5/6
Energy consumption of transport turnover in civil aviation units	kg ce/ton kilometer	0.433	<0.415	>4.33
Average fuel consumption of new production passenger car	l/100 kilometer	6.9	5	38

Energy saving index on Public Institution and Terminal Energy Use Equipment in 13th Five-Year (2.7 of 4)

Public Institution	unit	2015 level	2020 target value	reduction rate (%)
Energy consumption per unit area of public institutions	kg ce/m ²	20.6	18.5	10
Per capita energy consumption of public institutions	kg ce/capita	370.7	330	11
Terminal Energy Use Equipment	unit	2015 level	2020 target value	growth rate (%)
Efficiency of coal fired industrial boilers	%	70	75	7.1
Efficiency of motor system	%	70	75	7.1
Primary energy efficiency volume air compressor market proportion (<55kW)	%	15	30	100
Primary energy efficiency volume air compressor market proportion (55kW to 220kW)	%	8	13	62.5
Primary energy efficiency volume air compressor market proportion (>220kW)	%	5	8	60
Two level energy efficiency (or higher) room air conditioner market proportion	%	22.6	50	120
Two level energy efficiency (or higher) freezer market proportion	%	98.3	99	0.7
Two level energy efficiency (or higher) gas water heater market proportion	%	93.7	98	4.6
Primary energy efficiency power transformer market proportion	%	0.1	10	9900

Extension mechanism of energy saving technology (3.1 of 4)



- The energy consumption of GDP in the national unit has fallen by 18.4% and realizing energy saving of 8.6 million tons of standard coal during 2011-2015
- To complete the task of “13th Five-Year” unit of GDP energy consumption decreased by 15% (**more than 8 million tons of standard coal energy saving**), **more than 50% saving amount** will be achieved by energy saving technology

Analysis of 218 energy saving technologies of seventh batch selected catalogues (3.2 of 4)

218 energy saving technologies	Classification by Industry Area	Steel industry, 32, 14.7%
		Cement industry, 13, 6%
		Petrochemical industry, 78, 35.7%
		Non-ferrous metals, 38, 17.4%
		Power industry, 20, 9.2%
		General industry, 37, 17%
	Classification by Technique Type	Process energy saving, 100, 45.9%
		Waste heat recovery, 26, 11.9%
		General techniques, 16, 7.3%
		Systematic techniques, 4, 1.8%
		Information-based techniques, 25, 11.5%
		General area techniques, 37, 17%
		Other techniques, 10, 4.6%
	Classification by Technology Maturity	Frontier technologies, 82, 37.6%
		Promoted technologies, 90, 41.3%
		Proven technologies, 46, 21.1%

Analysis of 95 key development energy saving technologies out of 218 (3.3 of 4)

➤ According to the energy saving potential and the energy saving amount as the standard, a total of 95 key technologies are identified in each industry and field

✓ The proportion of the total number of technologies: 43.6%

✓ Maximum energy saving potential ratio: 80.3%

✓ The proportion of technologies having the potential to realize the total target amount of energy saving: 81.2%

Tendency of energy conservation technology development of the "13th Five-Year" (4 of 4)

Systematic technologies with the combination of energy efficient scheme on life cycle planning / design / construction / equipment / technique / management

Overall solutions regarding region/urban town/district/unit as integration consideration

The roadmap of energy saving technology is from extensive to fine, intelligent and developed for the benefit of all

Breakthroughs of new materials and new technologies

Deep utilization of residual heat energy technologies

The integration development of renewable energy utilization

Thank you for your attention

Zhao Tianyi

Institute of Building Energy

Dalian University of Technology, China

Email: zhaotianyi@dlut.edu.cn