



**Northeast Asia Petroleum Forum 2009**

**The outlook of refined oil product supply and demand  
in China and the influence to market of  
northeast Asia**

**China Petroleum Planning & Engineering Institute**

**27/10/2009**



## **I、 Current situation and characteristic analysis of China refined oil product market**

**II、 Financial crisis influence to refined oil product market in China**

**III、 The forecast of refined oil product supply and demand in China**

**IV、 China influence to refined oil product market in northeast Asia**

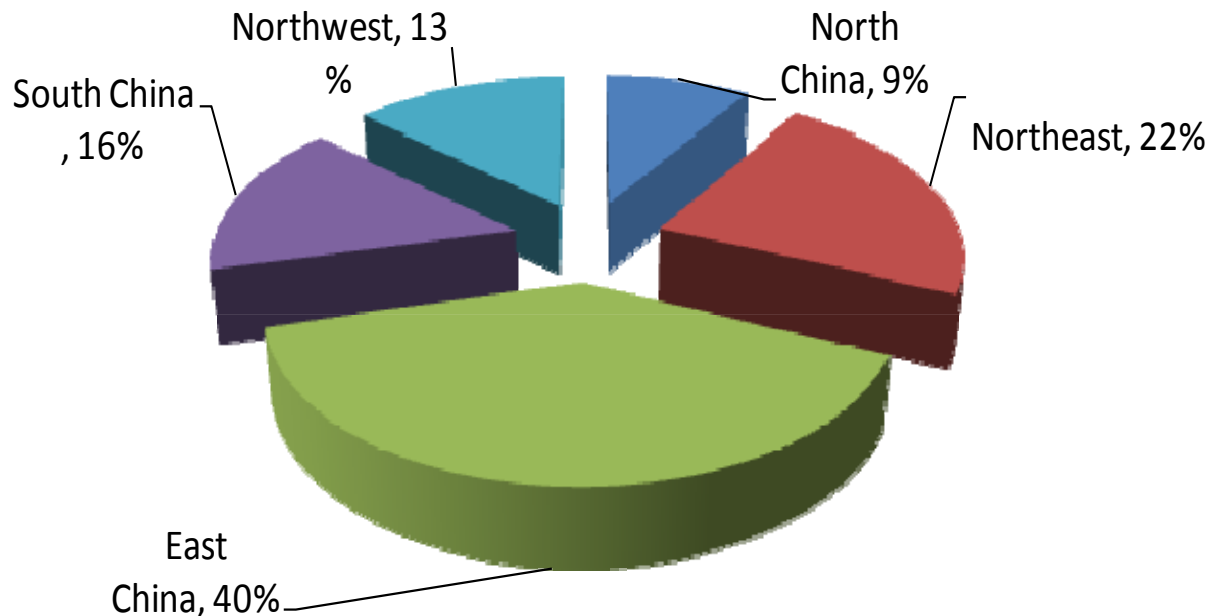
## Current situation and characteristic analysis of China refined oil product market

### ◆ Oil refining capacity improved steadily in recent years in China

➤ Refining capacity reached 430 million t/y in China 2008, and had increased 140 million ton during the last 5 years. These refineries are mainly distributed in northwest , northeast ,coastal and along the Yangzi River of China.

➤ There are 12 refineries which capacity are over 10 million t/y, such as Dalian, Dalian Xitai, Zhenhai, Maoming, Qilu and Shanghai Refinery .

Refining capacity region layout in China



## Current situation and characteristic analysis of China refined oil product market

### ◆ refined oil product output kept a rapid growth in China

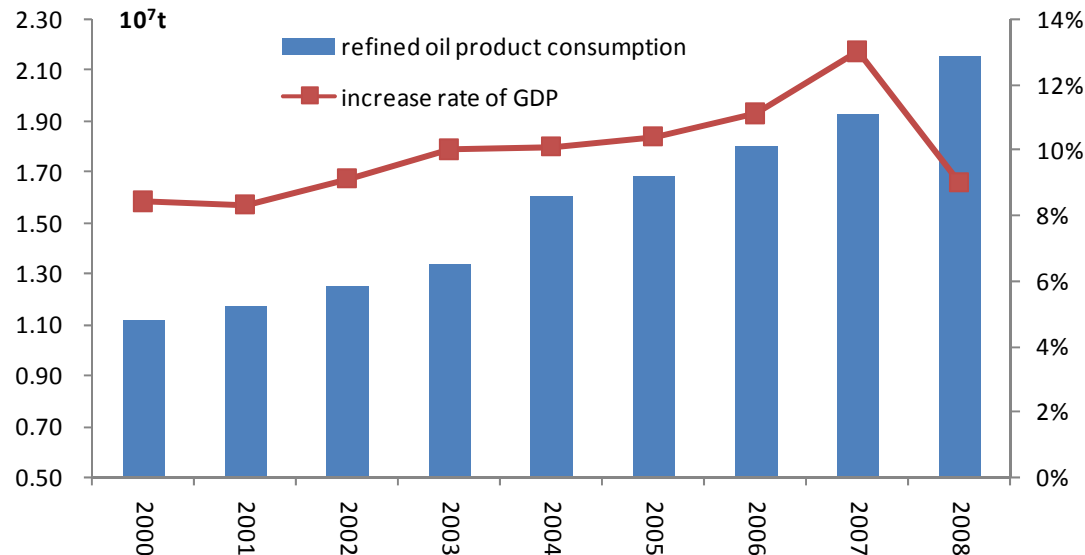
- The output of crude oil reached 190 million ton in 2008, and 179 million ton was imported. The output of the three major products, gasoline, kerosene, diesel oil, was increased from  $12087 \times 10^4 \text{t}$  in 2000 to  $20837 \times 10^4 \text{t}$  in 2008. Average annual increasing rate reached 7%.
- Sinopec and CNPC are two major companies in mainland of China, the output of the two companies reached  $18705 \times 10^4 \text{t}$  in 2008, about 90% total output.

refined oil product output of main oil companies in 2008 of (10<sup>4</sup>t)

China company	capacity	output
Sinopec	20400	10825
Petrochina	13750	7880
local refineries	9000	2132
total	43150	20837

## Current situation and characteristic analysis of China refined oil product market

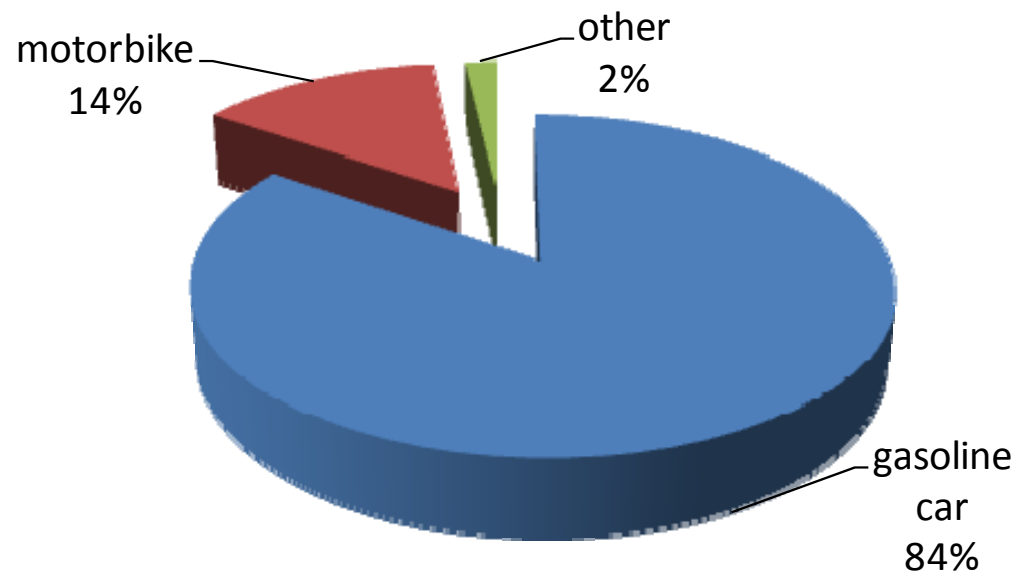
- ◆ **Rapid economic increase in China led to refined oil product consumption in bloom, demand increasing rate was higher than that of output**
  - Chinese economy kept about 10% increase annually during past several year. refined oil product consumption had a solid increase foundation.
  - The refined oil product consumption increased from  $11149 \times 10^4$  t in 2000 to  $21508 \times 10^4$  t in 2008. Annual average increasing rate was 8.6%, which was 1.6 percent points higher than the production growth.
  - refined oil product is mainly used by car, aircraft and agricultural machines. They are key driving power for consumption increase in China.



## Current situation and characteristic analysis of China refined oil product market

### ◆ Car and motorbike driving gasoline consumption increase in China

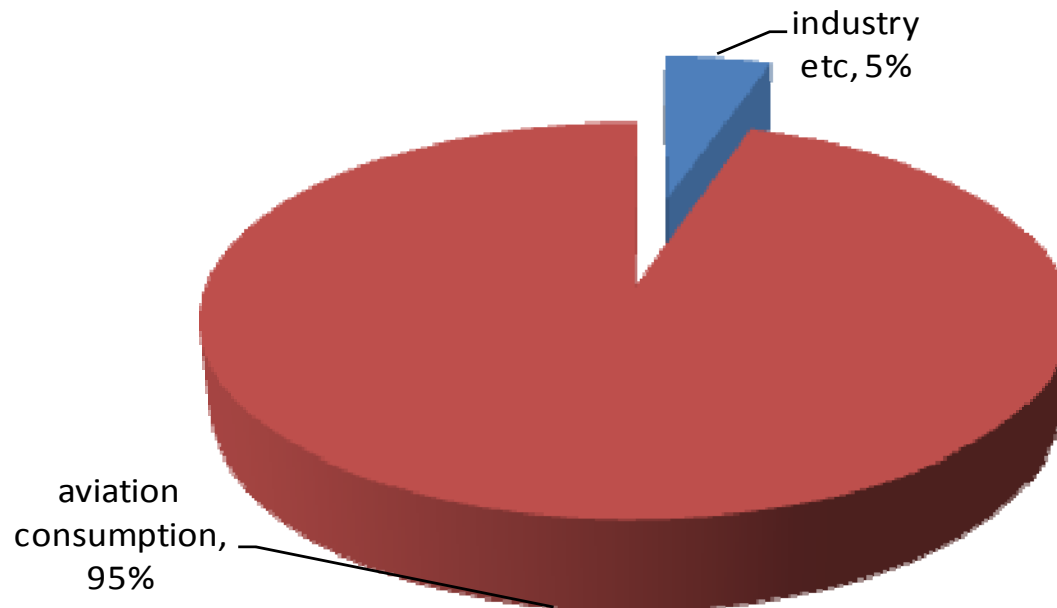
- The vehicle , esp. the rapid increasing private cars lead to gasoline consumption blooming, from  $3505 \times 10^4 \text{t}$  in 2000 to  $6343 \times 10^4 \text{t}$  in 2008, with an annual average growth rate of 7.7%.
- Gasoline consumption is mainly used for car and motorbike in China, which is 98% of all gasoline consumption.



## Current situation and characteristic analysis of China refined oil product market

### ◆ Aviation kerosene consumption kept a rapid growth

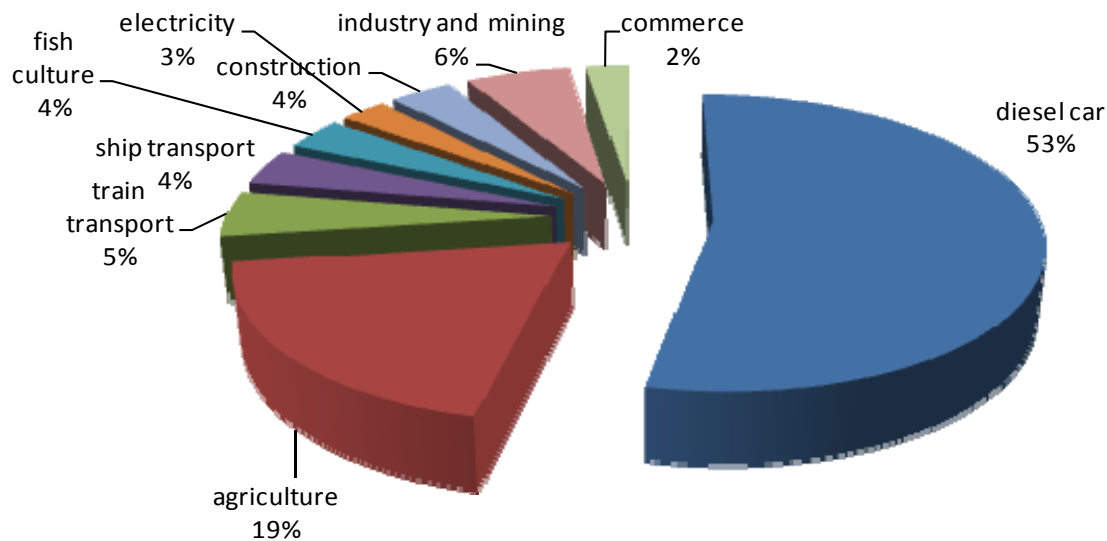
- Kerosene is mainly used in aviation and some other industries. Aviation kerosene occupies about 95% of all kerosene consumption.
- For the increasing of foreign trades and business traveling, aviation industry developed rapidly. The aviation kerosene consumption increased from  $870 \times 10^4 \text{t}$  in 2000 to  $1280 \times 10^4 \text{t}$  in 2008, with an average annual increase rate of 4.9%.



## Current situation and characteristic analysis of China refined oil product market

### ◆ Automobile and agriculture are main driving power for diesel consumption

- Diesel oil consumption increased from  $6774 \times 10^4 \text{t}$  in 2000 to  $13886 \times 10^4 \text{t}$  in 2008, with an average annual increase rate of 9.4%.
- In 2008, Diesel used by automobile industry reached 53%. The portion of agriculture declined. The others, e.g. construction and mining etc, were similar, since more nature gas was used.





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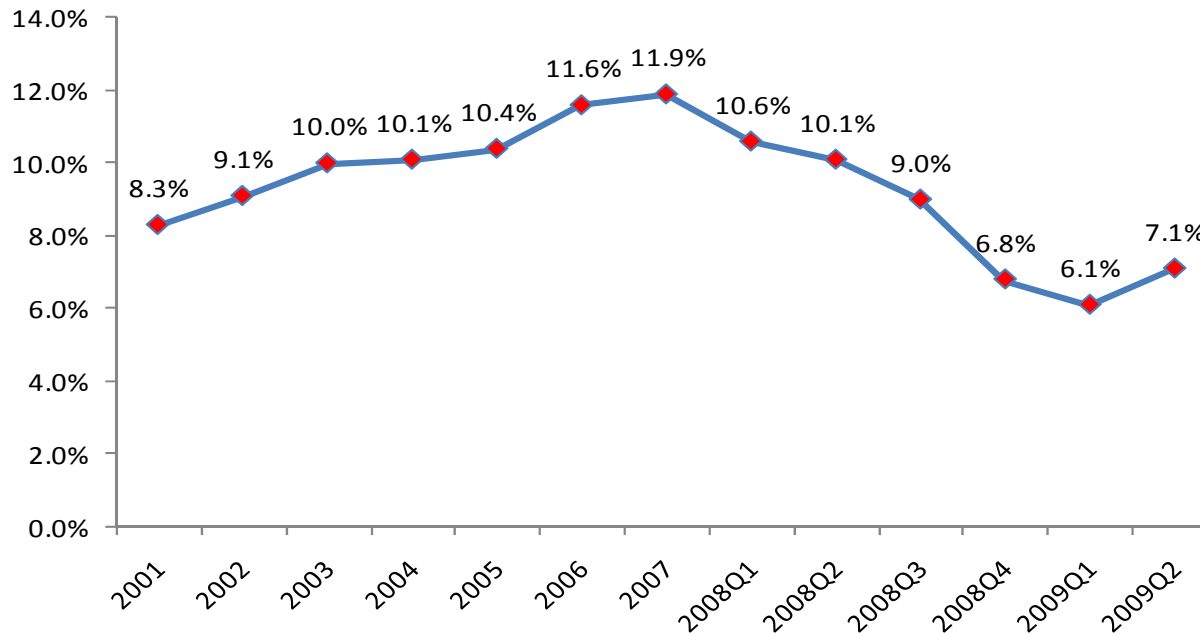
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## Financial crisis influence to refined oil product market in China

- ◆ **Influenced by financial crisis, China economy entering an adjustment stage**
- **Economic development slowed down obviously in the third and fourth quarter of 2008, the growth rate gradually declining to 9% and 6.8% respectively. Export also began to decline in Nov. 2008 compared to that in the same period of last year. Exterior demand decreasing was the main reason for China economy entering into adjustment stage.**
- **Under both stimulus of increasing fixed assets investment and lax stance fiscal policy, China domestic economy revive again. However private investment and foreign trade aren't followed at once. The economy prospect in near future is still not very clear.**





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## Financial crisis influence to refined oil product market in China

### ◆ The market of diesel declining, kerosene warming up, gasoline steady increasing in China

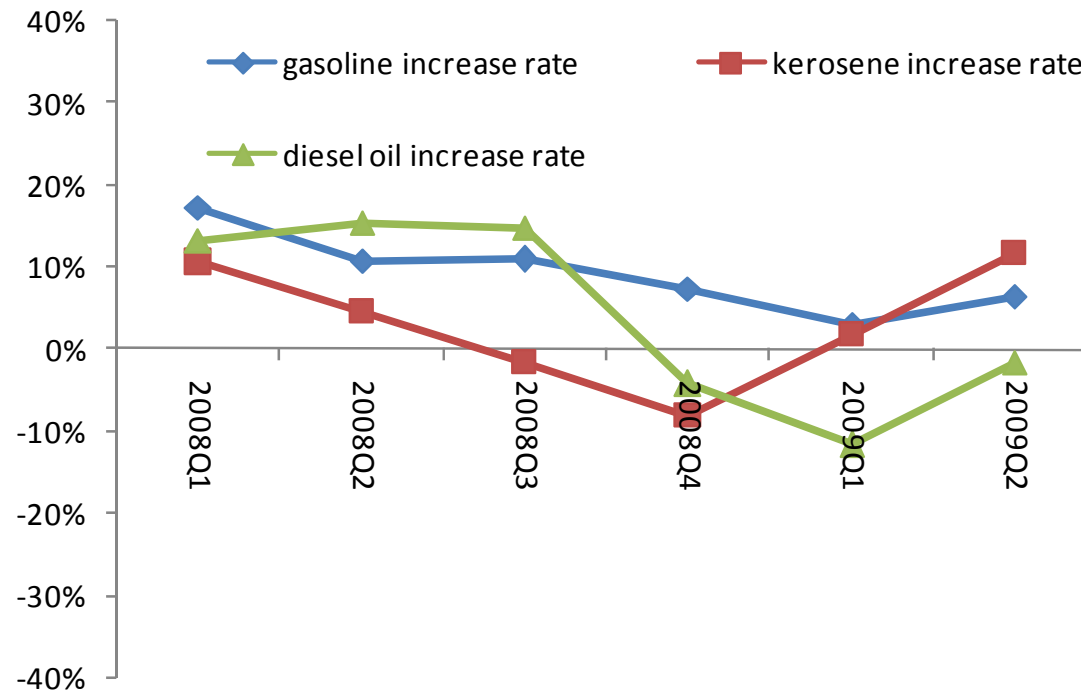
- As production of many export-oriented companies being stopped or reduced, the diesel oil consumption declined substantially in the business like mining and power generation. Transportation activities ( esp. port & road) shrank a lot. Domestic diesel oil consumption had been in negative growth in 3 seasons.
- However, for sustainable citizen consuming capacity and ongoing active commercial and traveling activities, kerosene consumption warmed up fast after gloomy days.



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## Financial crisis influence to refined oil product market in China

- Under the government favorable policy for purchasing small car, no more than 1.6L, growth rate of car sale reached 18% in first half of 2009, driving the gasoline consumption increase slightly.



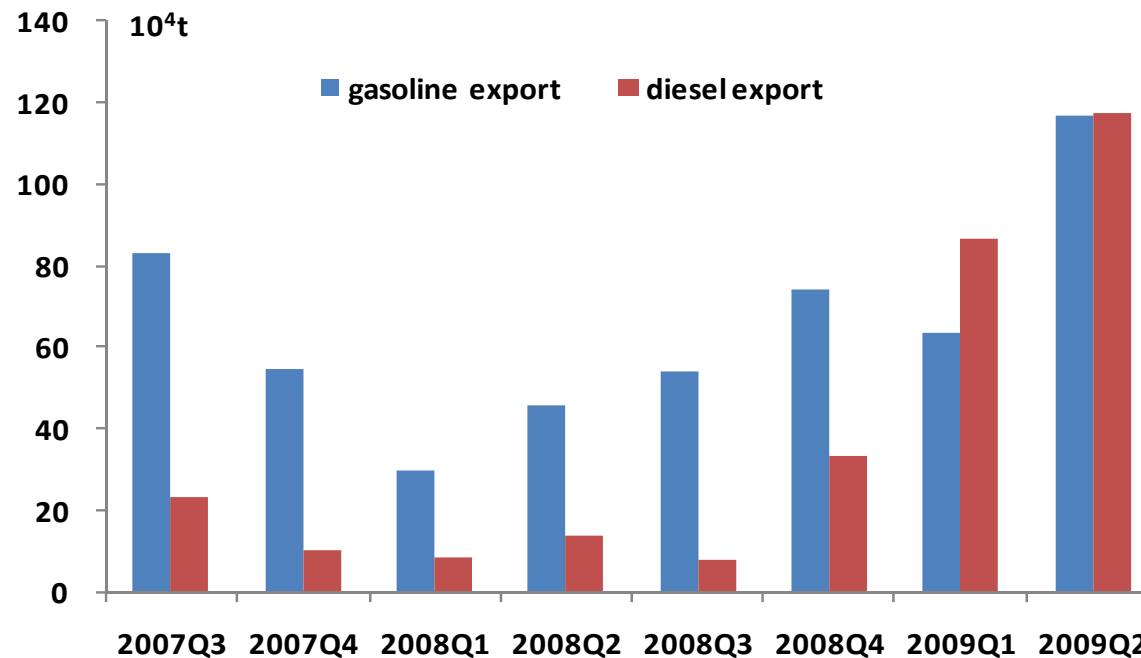


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## Financial crisis influence to refined oil product market in China

### ◆ Financial crisis encourages refined oil product export

- Since the fourth quarter of 2008, China refined oil product export increased obviously, influenced by domestic consumption declining. Export of gasoline and diesel oil in first half of 2009 increased several times, compared to that in the same period of last year.

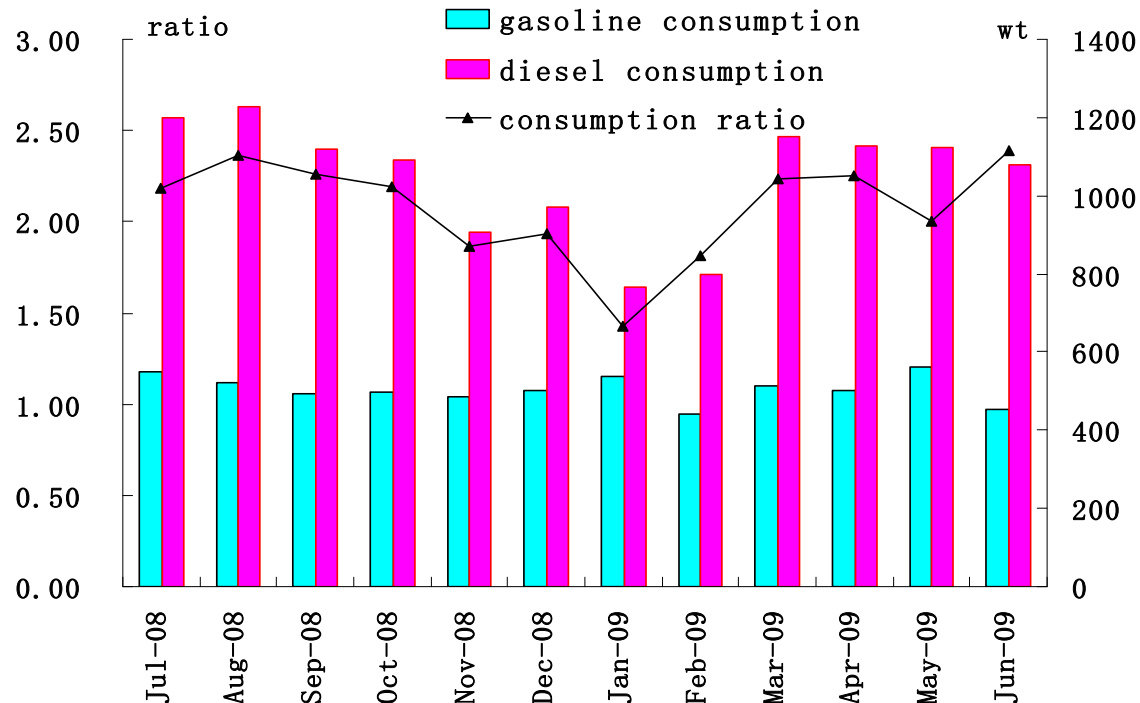




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## Financial crisis influence to refined oil product market in China

- ◆ Influenced by financial crisis, the consumption ratio of diesel to gasoline fell to historic low.
- In recent years, the consumption ratio of diesel to gasoline increased from 1.93:1 in 2000 to a peak 2.22:1 in 2007. Financial crisis lowered the ratio to 2.18:1 in 2008, and the lowest level appeared in 01/2009 , with a ratio of 1.4:1 .





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## Financial crisis influence to refined oil product market in China

- ◆ **Compared with gasoline, China diesel oil consumption may be gloomy for long, short term rebounding is also possible**
- **Financial crisis will influence refined oil product consumption structure , increasing gasoline consumption steadily while decreasing diesel oil consumption continuously, leading to the ratio of diesel to gasoline going down in a future.**
- **In the first half of 2009, government paid more attentions on the infrastructures and key projects. The diesel-gasoline ratio rebounded obviously, however we should get a closer look on how long will the effect last.**

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## The forecast of refined oil product supply and demand in China

### ◆ Sustainable Economic Growth in Future China

- Financial crisis has exerted negative effects on China economy in recent two years, but industrialization hasn't finished in China. Urbanization is at a low level, and potential development space is still very large. China economy will keep sustainable growth.
- According to Chinese government forecast, GDP will still keep an average annual increase rate of about 8% from 2009 to 2015, in which industry proportion will rise from 42.9% in 2008 to 44% in 2015.



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## The forecast of refined oil product supply and demand in China

### ◆ China Car industry developing better than expected

- Car sales reached 9.42 million in 2008 in China. Average annual increase rate was 16.8% during the past 5 years. China became one of main car consumers in the world. Car reserving amount reached 57 million in the end of 2008, which was 2.4 times of that in 2003.
- At the beginning of “eleventh five years”, China set a target of “the 10% annual growth rate of car industry; demand rising up to 8.5 million, about 40 cars/thousand persons in 2010”. The target was achieved 3 years in advance.

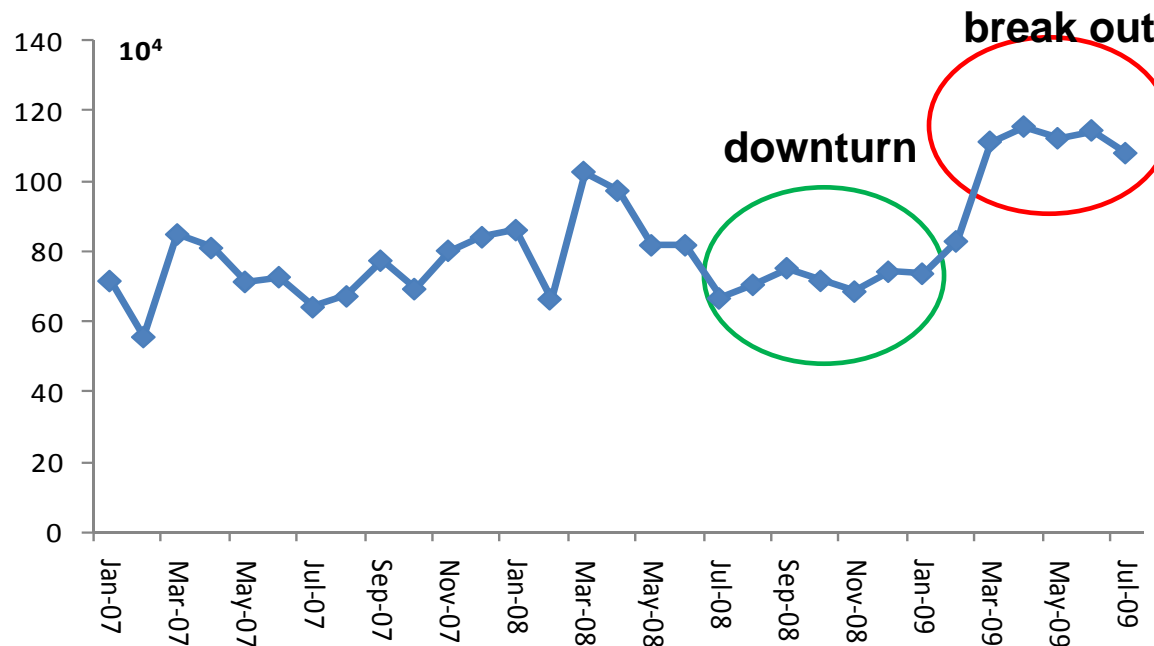
#### The car sales and reserving amount change in recent years

	2003	2004	2005	2006	2007	2008	Annual increase rate
Car sales amount (ten thousand)	433	508	580	718	878	942	16.8%
Car reserving amount (million)	24	29	34	41	49	57	19.0%
reserve amount per thousand persons	19	22	26	31	37	43	18.3%

# The forecast of refined oil product supply and demand in China

## ◆ More favorable policy issued during financial crisis

- Financial crisis caused car market depression in a short time in late of 2008 and early of 2009 in China. In several months, car selling amounts grew negatively compared to the same period of last year.
- In 2009, more favorable policies for car market are issued, such as halving car purchasing tax, selling vehicles in villages and allowance for old cars disposal. The potential car purchasing demand was induced by the polices and car sales bloom explosively in several months, reaching the highest point.

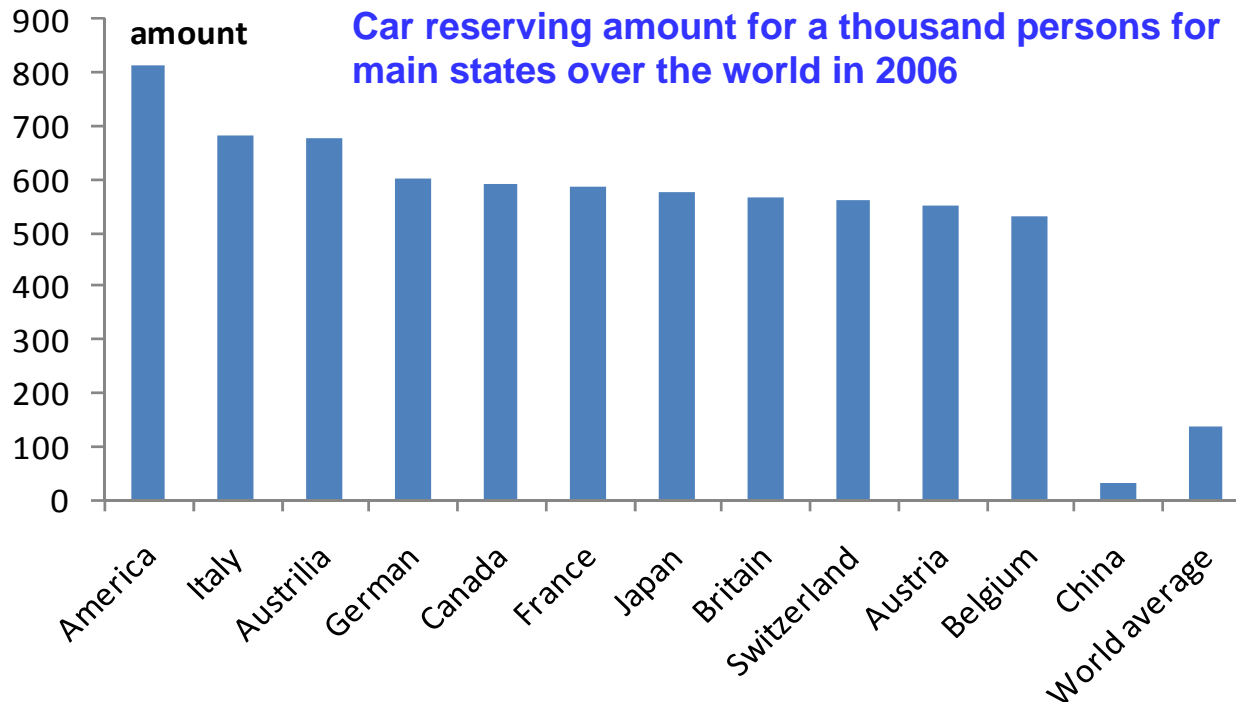




# The forecast of refined oil product supply and demand in China

## ◆ Car sales will keep sustainable growth in China

➤ For car reserving amount per thousand persons of the major car consuming countries in 2006, America reached 815, the highest level of the world, while China just reached 31, existing a big gap compared to the worldwide average amount 139. It implies a large development potential in future China.



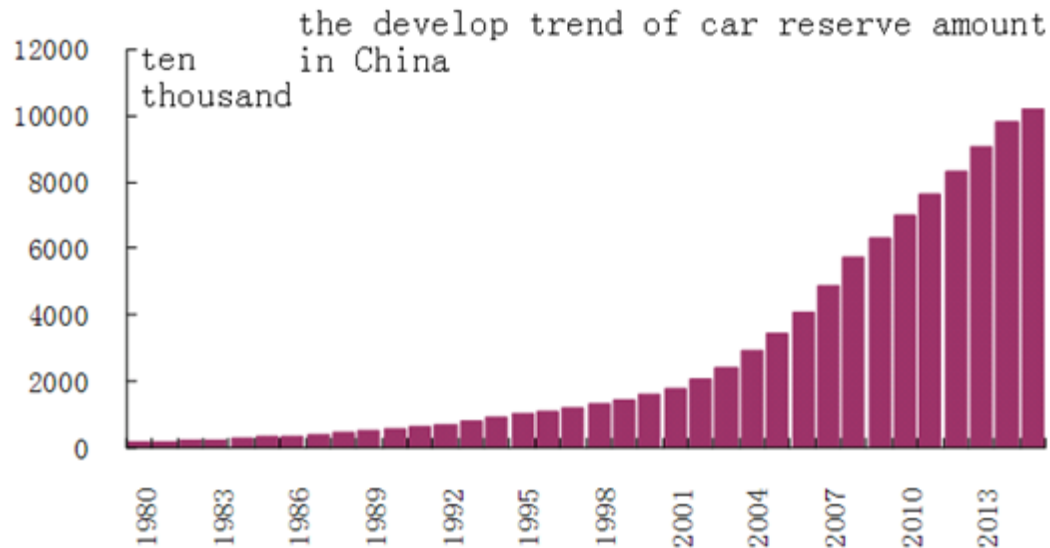


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## The forecast of refined oil product supply and demand in China

### ◆ Car sales will drive the car reserving amount keep increasing

- GDP per Capita & population are two main factors considered in future car reserving amount estimation. In general, car reserving amount per capita develops in S-shape, growth speeding up gradually at first, growth slowing down after reaching the top, and the amount reaching a saturation finally.
- It is forecasted by China authority that car reserving amount will reach a saturation in 2050, and the saturation number will be about 200 per thousand person.
- According to a comprehensive estimation, car reserving amount will reach 118 million in 2015 in China.





## The forecast of refined oil product supply and demand in China

### ◆ Gasoline demand of saloon car gradually going up

- China urbanization process will go on, income per capita increases steadily, and saloon car will strive for small and low oil consumption. The car demanding of residents will not be change.
- Gasoline powered saloon car will gradually enter into family, which will be the main power in increasing car sales.
- Based on data reference, such as urbanization rate and income per capita, it is estimated that average annual increasing rate would be 12% from 2010 to 2015. Sales amount in 2015 is estimated at 18 million. Car reserving amount will increase from 42.3 million in 2008 to 92 million in 2015.

#### Forecast of gasoline car sales in 2010 and 2015 (10<sup>4</sup>)

Year	2008	2010	2015
Gasoline car	735	1020	1800
Among above: saloon car	514	770	1400
saloon car percentage	70%	75%	78%



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## The forecast of refined oil product supply and demand in China

### ◆ Gasoline demand will keep 5% average annual increase from 2010 to 2015.

➤ For enforcing national energy control policy and implementing petrol taxes, the saloon car sales will be about 78% of the total gasoline car sales while the reserving percentage will be 70% of the total , in 2015.

➤ According to automobile experts and the economic fuel-burning standard (for mini van and saloon car) ,it is forecasted that fuel consumption for a car of every 100 km will reduce 15% in 2012, and 20% in 2015 compared to that in 2008.

➤ Based on the stated above, it is forecasted that gasoline demand will reach about 73 million tons in 2010 and 93.5 million tons in 2015.

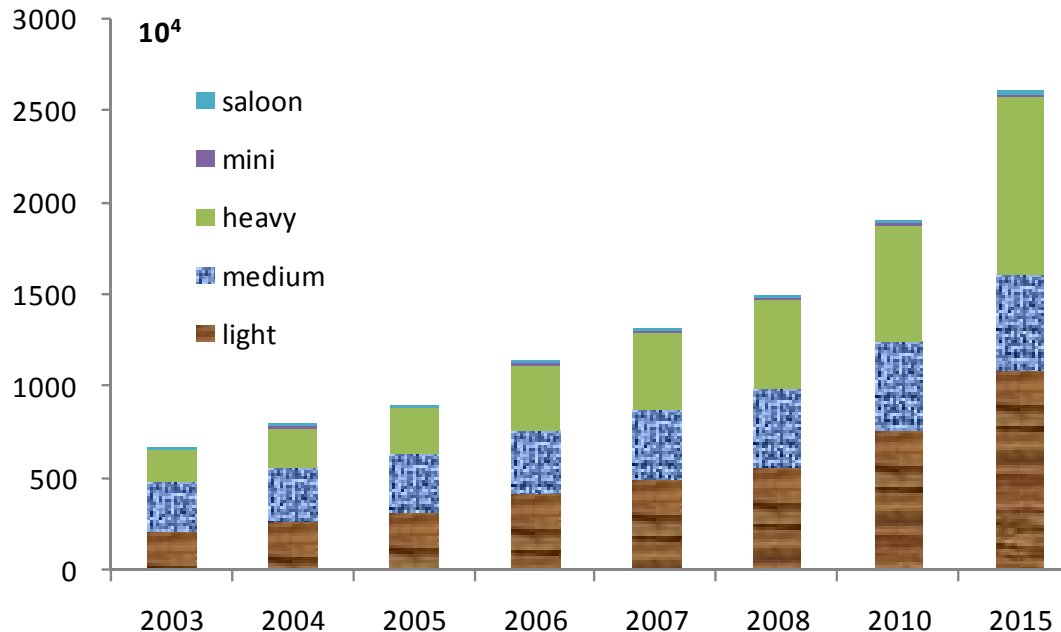


# The forecast of refined oil product supply and demand in China

## ◆ Increasing demand of light and heavy diesel vehicle will drive reserving amount of diesel vehicle continuously go up

- Industrialization process will drive logistics and transportation in prosperity. Trucks of China are obviously developing towards heavy and light type, and passenger vehicles are developing towards large and middle type, travel passenger type and public traffic type. The tendency is gradually increasing diesel oil consumption by passenger vehicles and trucks.
- It is forecasted that sales of diesel vehicles will grow at an annual average rate of 9% between 2010 and 2015, reaching  $440 \times 10^4$  in 2015.

the reserve amount forecast of various diesel oil powered cars





## The forecast of refined oil product supply and demand in China

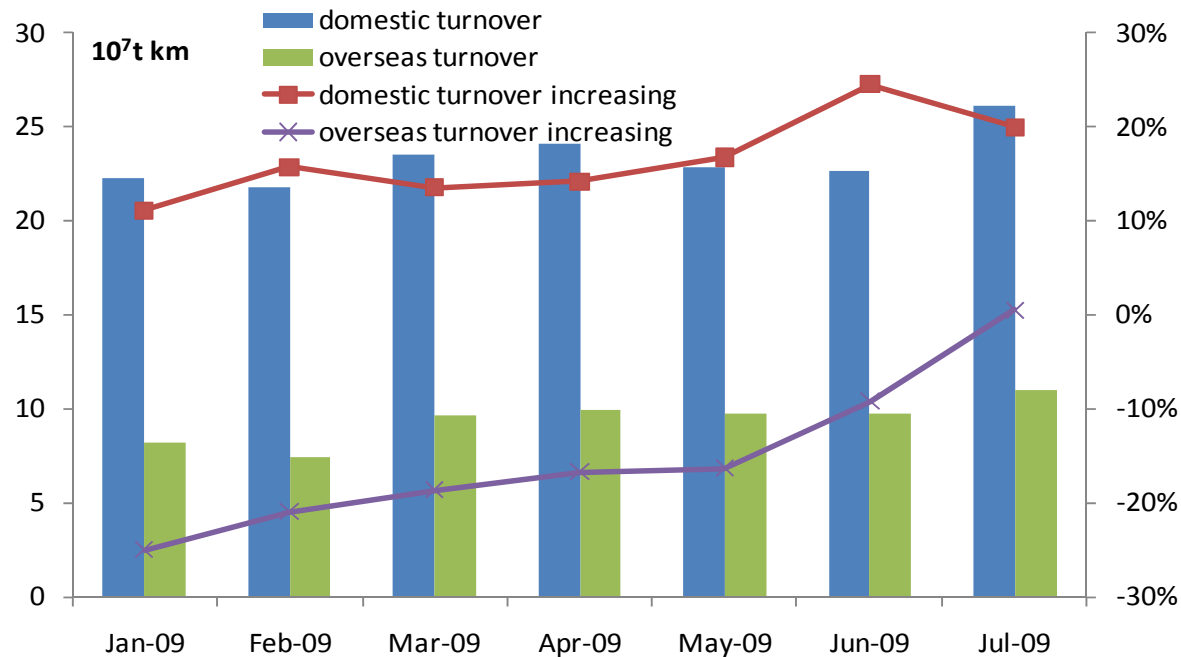
### ◆ Diesel oil demand will keep 3.9% average annual growth from 2010 to 2015

- Driven by rapid development of logistics and auto industry , automobile diesel oil demand will keep a steady increase in 20 years. But its growth is not as steady as gasoline, because the frequency of using commercial vehicle is mainly influenced by investment and industrial development level.
- Government kept strengthening allowance to farm machines in recent years in China, mechanization level of agriculture reached 44.2% in 2008, rising 1.7 percent compared to that in 2007. It is forecasted that oil consumption in agriculture would keep lower-increase tendency year by year before 2015.
- After financial crisis, China economic structure will be changed. Diesel oil consumption will accelerate to decline in high energy consumption fields, which will restrain the diesel oil demand increase in a certain degree.
- Considering all above analysis, it is forecasted that average diesel annual increase will be about 3.9%, and diesel demand will reach 148 million tons in 2010 and 179 million tons in 2015.

# The forecast of refined oil product supply and demand in China

## ◆ Kerosene average annual demand increases 10.7% between 2010-2015

- Financial crisis made a negative effect on aviation kerosene demand, however civil aviation quickly warmed up again in first half of 2009, and turnover amount increased 3.8% compared to that in the same period of last year.
- Domestic aviation obviously preceded overseas aviation. The total aviation kerosene consumption increased 7% compared to that in the same period of last year.



## The forecast of refined oil product supply and demand in China

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➤ **Sustainable economy growth in future China and world economy recovery will accelerate aviation development in China. Therefore, it is estimated the average annual increase rate of the kerosene demand in aviation might reach 10.7%. It will reach 15 million tons in 2010 and 25 million tons in 2015.**

## The forecast of refined oil product supply and demand in China

### ◆ Refining capacity growing leads to output increasing of refined oil product from 2010 to 2015 in China.

- Based on the development plan of petrochemical industry, refining capacity will keep steady increase before 2015. A number of new refineries will be built, as well as some of existing refineries will be expanded.
- Although the refinery shall meet the increasing demand of petrochemical feed stock, the production ratio of diesel to gasoline won't decline obviously.
- Based on domestic refinery capacity estimation, domestic gasoline output will keep increasing between 2009 and 2015, and will reach 89.5 million tons in 2015, with an average annual increasing rate of about 5%, which is basically equal to demand increasing rate.
- The output of diesel oil will keep increasing and it will reach  $18200 \times 10^4 \text{t}$  in 2015, with an average annual increasing rate of about 4.1%, which is 0.2% higher than demand increasing rate.
- Industry structure upgrade will lower down the consumption ratio of diesel to gasoline. Surplus light-end of diesel fraction will be used for producing aviation kerosene, and the output of kerosene will reach  $1600 \times 10^4 \text{t}$  in 2010 and  $2600 \times 10^4 \text{t}$  in 2015, between which the average annual increasing rate will be 10.2%.

## The forecast of refined oil product supply and demand in China

◆ The balance between production and consumption will be kept between 2010-2015 and temperate imports and exports will be needed to compensate the balance

- refined oil product supply will turn from a little insufficiency presently to basic balance between 2010 -2015. Different supply- demand balance problems of various refined oil product types can be solved by adjusting production. Domestic production can basically meet increasing demand.
- In the economic integration process of northeast Asia, import and export activities, as adjustment methods, will exist in special period and in complementary oil types, keeping a stable supply-demand market in northeast Asia.

Forecast of inland refined oil product supply and demand balance(10<sup>4</sup>t)

balance	gasoline	kerosene	Diesel oil
2008	5	-115	-562
2010	-287	100	87
2015	-400	100	300

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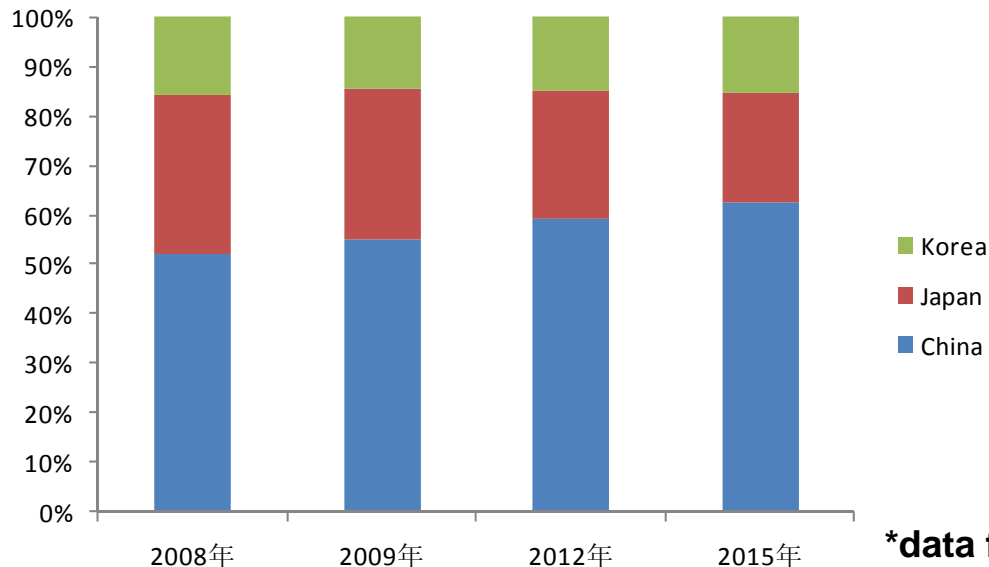


# China influence to refined oil product market in northeast Asia

## —supply and demand

◆ refined oil product proportion of China is gradually increasing in northeast Asia, increasing the output of northeast Asia slightly.

- Between 2010-2015, some delayed projects will gradually start up again in China, and the output of refined oil product will increase steadily. China proportion will grow from 52% in 2008 to 63% in 2015 among the three countries of northeast Asia.
- Between 2010-2015, the total output of refined oil product will increase slightly at an average annual rate of 2.2% in northeast Asia. Among the total, the proportion of Japan will decline from 32% in 2008 to 22% in 2015, and Korea will still keep a proportion of 15%.



\*data from CERA



## China influence to refined oil product market in northeast Asia —supply and demand

### ◆ Development space exists in automobile market of China and Korea, laying foundation for market growth in northeast Asia.

- China is in primary developing stage in Car industry, and it still has great development potential in future.
- Car reserving amount per thousand persons is high in Korea. It reached 328 in 2006, but gap still existed compared to developed countries. It still has development space in future.
- Car reserving amount per thousand persons reached 594 in 2006 in Japan, at almost saturation level. From Dec. 2008, car reserving amount begun to decline in Japan.





# China influence to refined oil product market in northeast Asia

## —supply and demand

### ◆ Industrialization and aviation development of China will promote refined oil product demand in northeast Asia.

- Chinese industrious proportion in GDP will reach peak between 2012-2015. The diesel oil demand for non-vehicle usage will keep increasing. Industrialization had been achieved between 1970-1989 in Korea and between 1970-1975 in Japan. Diesel demand increased slowly at present in Korea and showed a downtrend in recent years in Japan.
- After improving income per capita in China, kerosene demand in aviation industry will grow rapidly. Although Korean aviation market is relative small, kerosene demand is likely to resume 2% annual increase along with tour business development. The kerosene demand will still decline in Japan. There will be a long way to go to resume, since its export-oriented economy and domestic demand coming back slowly.



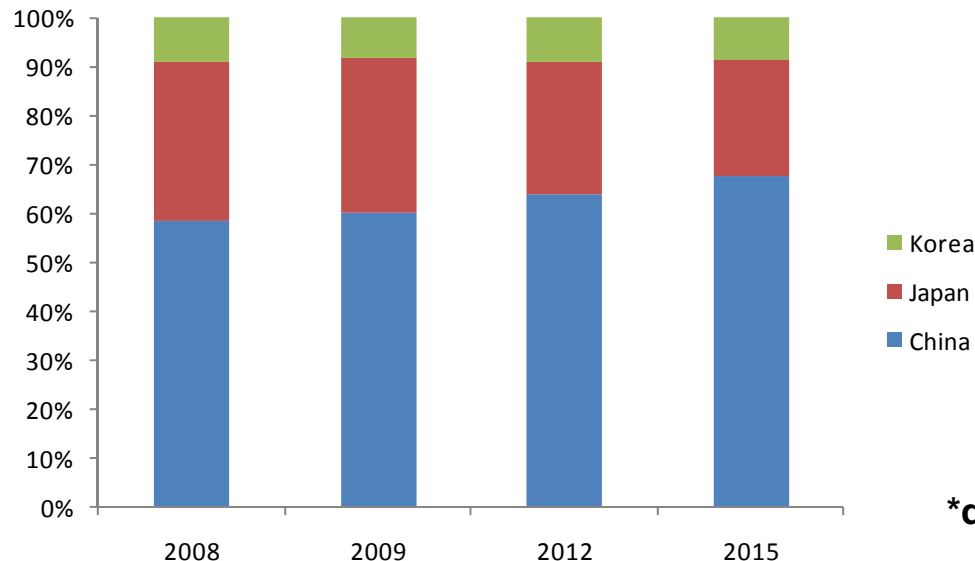
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# China influence to refined oil product market in northeast Asia

## —supply and demand

### ◆ China and Korea proportion will increase while Japan proportion will decrease in refined oil product demand structure

- Judging from the changing economic structure and industry developing tendency in the three countries of northeast Asia, it is forecasted that refined oil product demand will keep 4%~5% average annual increase in China and 2%~3% increase in Korea from 2009 to 2015. China and Korea will occupy about 68% and 9% of the total demand of the three countries in northeast Asia in 2015.
- refined oil product demand in Japan will show an average annual decrease of 2.6%, and the proportion will reduce to 24% of the three countries in northeast Asia.



\*data from CERA



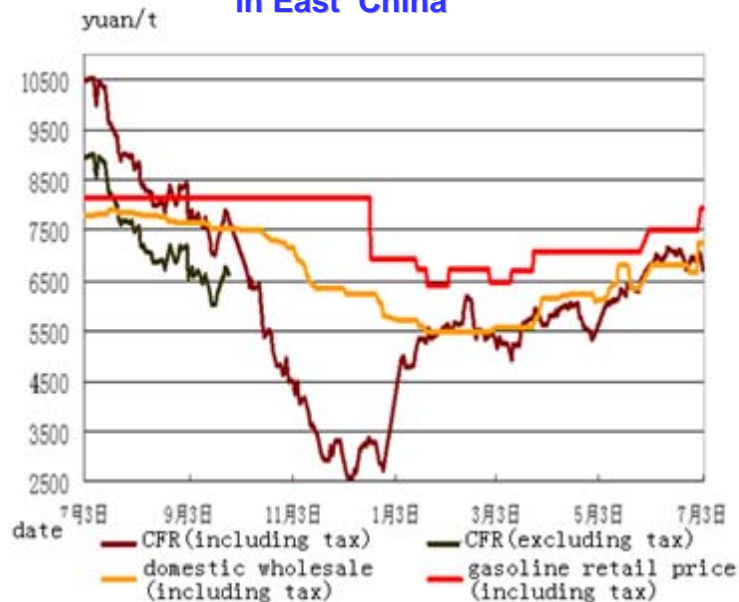
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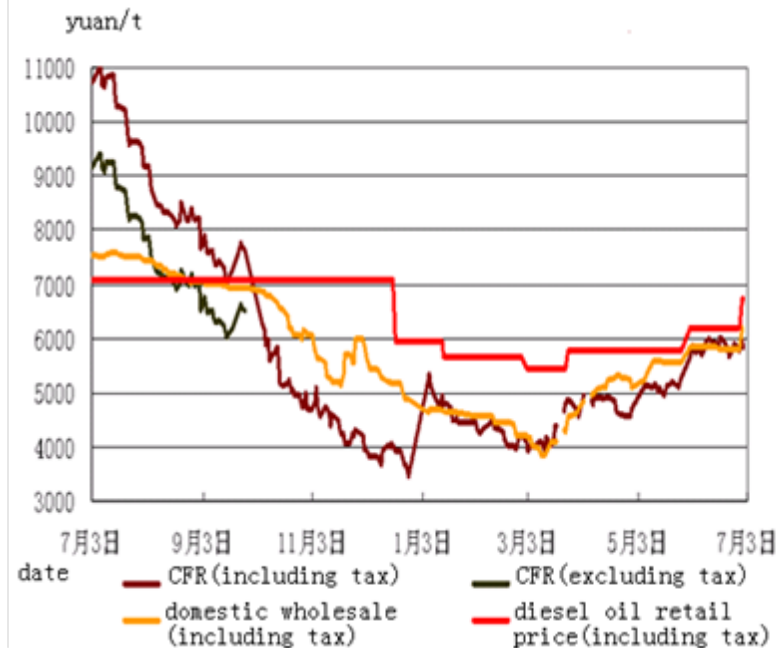
## —supply and demand

- ◆ **China has rectified refined oil product pricing policy since financial crisis, opening a window for import.**
- **In China, adjustment of refined oil product price lagged to international market price before 2009. China imported refined oil product only when domestic supply is not enough, while enterprises show very low interest in import.**
- **Since China implement new price and tax mechanism for refined oil product in early 2009, relationship between refined oil product prices of import, wholesale, retail were basically rationalized, which opened a window for importing refined oil product from northeast Asia. But domestic resource is abundant at present, therefore import is not much.**

gasoline CFR compared to wholesale price  
in East China



diesel oil CFR compared to wholesale price  
in East China





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## China influence to refined oil product market in northeast Asia —supply and demand

- ◆ **Financial crisis substantially reduced the amount of exporting diesel oil from Japan and Korea to China but kerosene was not influenced.**
- **China is basically self-satisfied in gasoline for long times, but kerosene and diesel oil are insufficient.**
- **Financial crisis made little influence on importing kerosene, however great on importing diesel oil. In first half of 2009, the importing diesel is  $105 \times 10^4$ t, that is 73% decline compared to the same period of last year.**

China's importing amount of different types of refined oil product in first half of 2009 ( $10^4$ t)

Date	gasoline	kerosene	diesel oil
First half of 2008	84	319	385
First half of 2009	4	301	105
Compared with the same period last year (%)	-95%	-6%	-73%



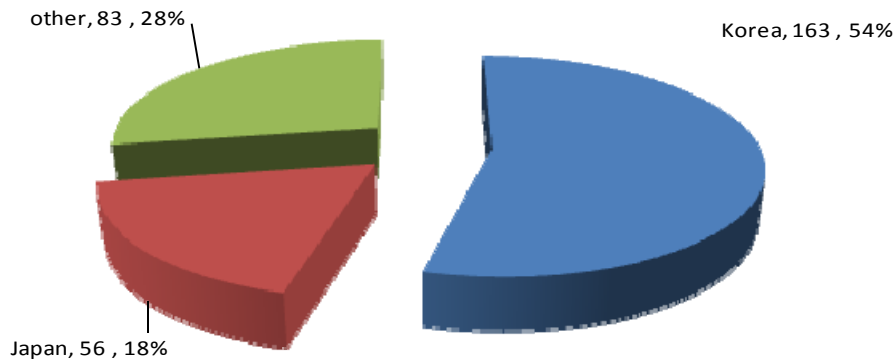
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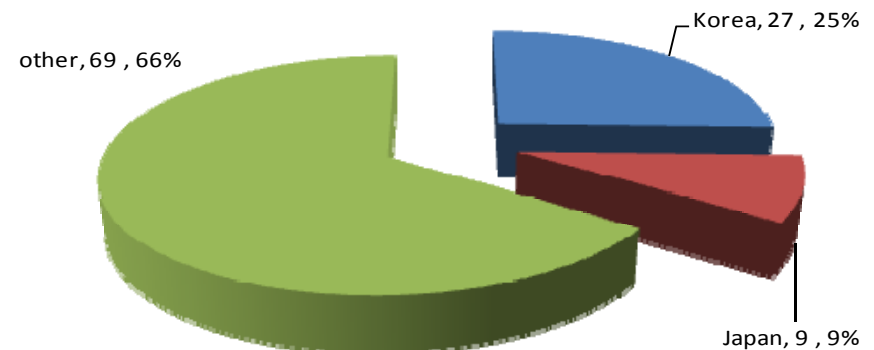
## —supply and demand

- Korea and Japan are countries from which China mainly imports kerosene and diesel oil . Kerosene import from Korea and Japan was 72% of all import volume in first half 2009. The import kept the same as that in 2008.
- Diesel oil import from Korea and Japan was 34% of all import volume in first half of 2009 , reducing 13% compared to that in 2008.
- For periodical economic adjustment, it is forecasted diesel oil import will keep declining in 1~2 years in China. It's not easy for northeast Asia countries exporting diesel oil to China.

kerosene import countries distributing in first half of 2009



diesel import countries distributing in first half of 2009





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# China influence to refined oil product market in northeast Asia

## —supply and demand

◆ The national standards of refined oil product are gradually upgraded because government pay more attention to cleaning fossil fuel. China will push standard IV gradually after 2011. The quality of importing products will be gradually upgraded, too, and importing types will be expanded continuously. In this case, more developed refineries may have more advantages on Chinese market.

Quality change of gasoline in China

Coming into effect Date	01/01/2000	06/12/2006		China standard IV
	Standard No.	GB17930-2006		
Corresponding effluent standard	Europe I	China standard II	China standard III	
Sulfur content, %(m/m),not more than	0.1	0.05	0.015	0.005
Benzene content, %(v/v),not more than	2.5	2.5	1	1
Alkene content, %(v/v),not more than	35	35	30	25
Arene content, %(v/v), not more than	40	40	40	60(Alkene+Arroma)

Quality change of diesel oil in China

Coming into effect Date	01/01/2002	01/10/2003	China standard IV
	Standard No.	GB/T19147-2003	
Corresponding effluent standard	Europe I	Europe II	
Sulfur content,% (m/m),not more than	0.2	0.05	0.005
cetane value,not less than	45	49/46/45	51/49/47



## China influence to refined oil product market in northeast Asia —reserving

### ◆ Reserve plan of refined oil product in China is good for market stabilization

- China had begun to implement oil reserving strategy in 2005, and in 2009 government declared that China would start the multi-reserving plan. The reserve will not be only crude oil, also including others, such as gasoline and diesel oil.



## China influence to refined oil product market in northeast Asia —futures market

- ◆ **Reforming the price mechanism of Chinese refined oil product is good for establishing futures market, but there is still a long way to go**
  - **Opening refined oil product market is a necessary condition for establishing refined oil product futures market.**
  - **China is gradually opening the refined oil product market, and there are six steps as follow.**

Before 1998	State planning management, priced only by government
06/1998~06/2000	Agree with international oil price, accompanied with government adjustment
06/2000~10/2001	Controllable floating price according to international refined oil product market
11/2001to 1/2007	Development and Reform Commission makes the standard retail price, floating degree is 8%
02/2007 to 12/2008	Priced according to the cost
Since 2009	Indirectly integrated with the price of international crude oil market



***THANK YOU!***

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