Northeast Asia Petroleum Forum 2009

Outlook of China's Oil Demand for 2020

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October 2009

Tokyo Japan

Outline

Problem of China’s oil demand is very important in China’s energy strategy, which also attracts extensive attention worldwide. The following report will express some opinions for discussion.

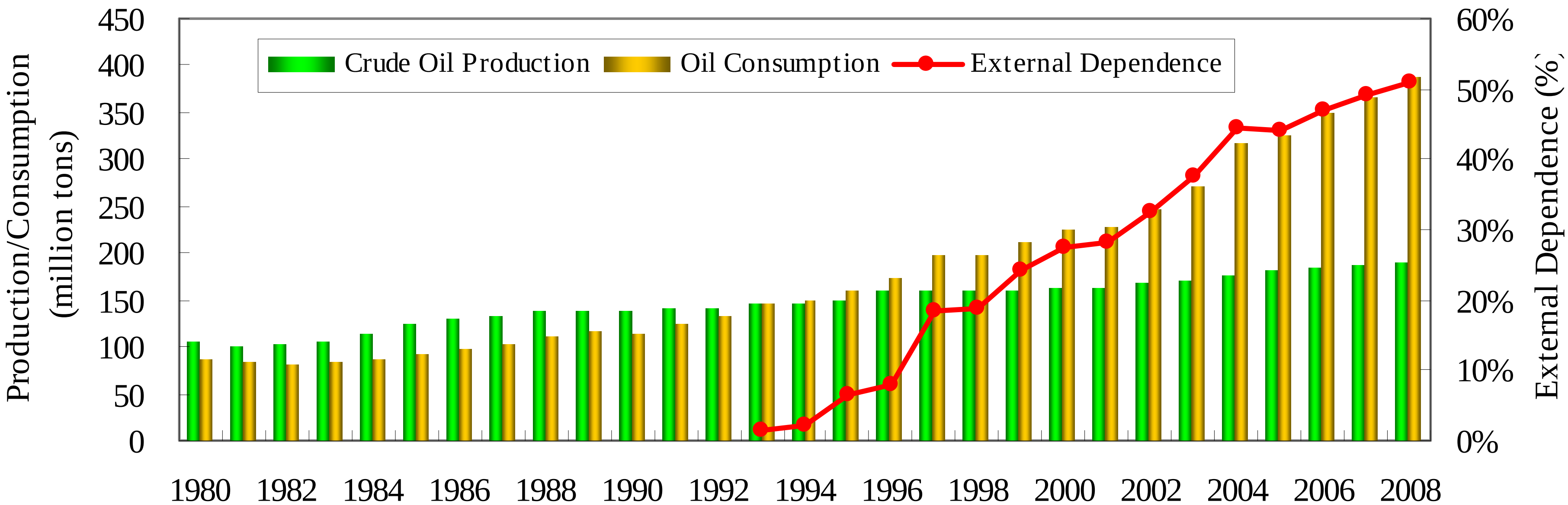
☞ **Ⅰ. Status and Characters of China’s Oil Consumption**

Ⅱ. China’s Oil Demand Outlook before 2020

Ⅲ. Several Considerations

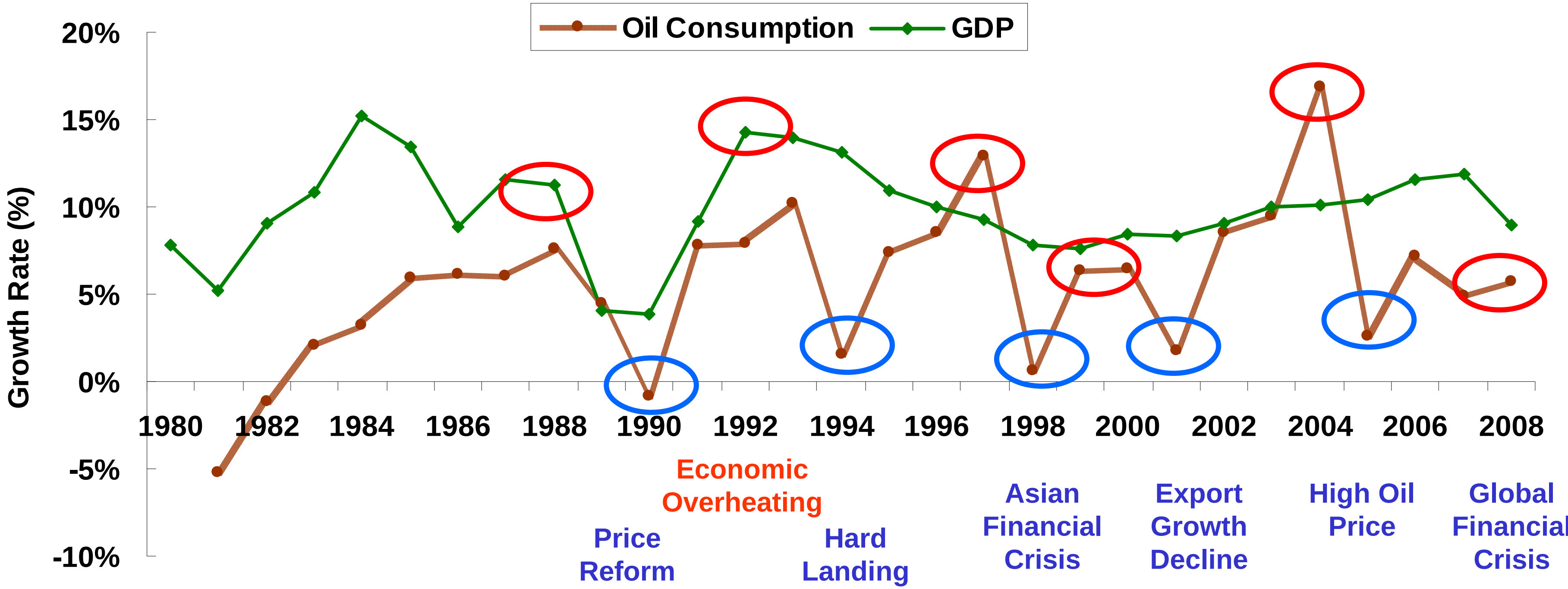
Ⅰ. Status and Characters of China's Oil Consumption

1-1 Oil consumption grows rapidly, external dependence rate is more than 50%.



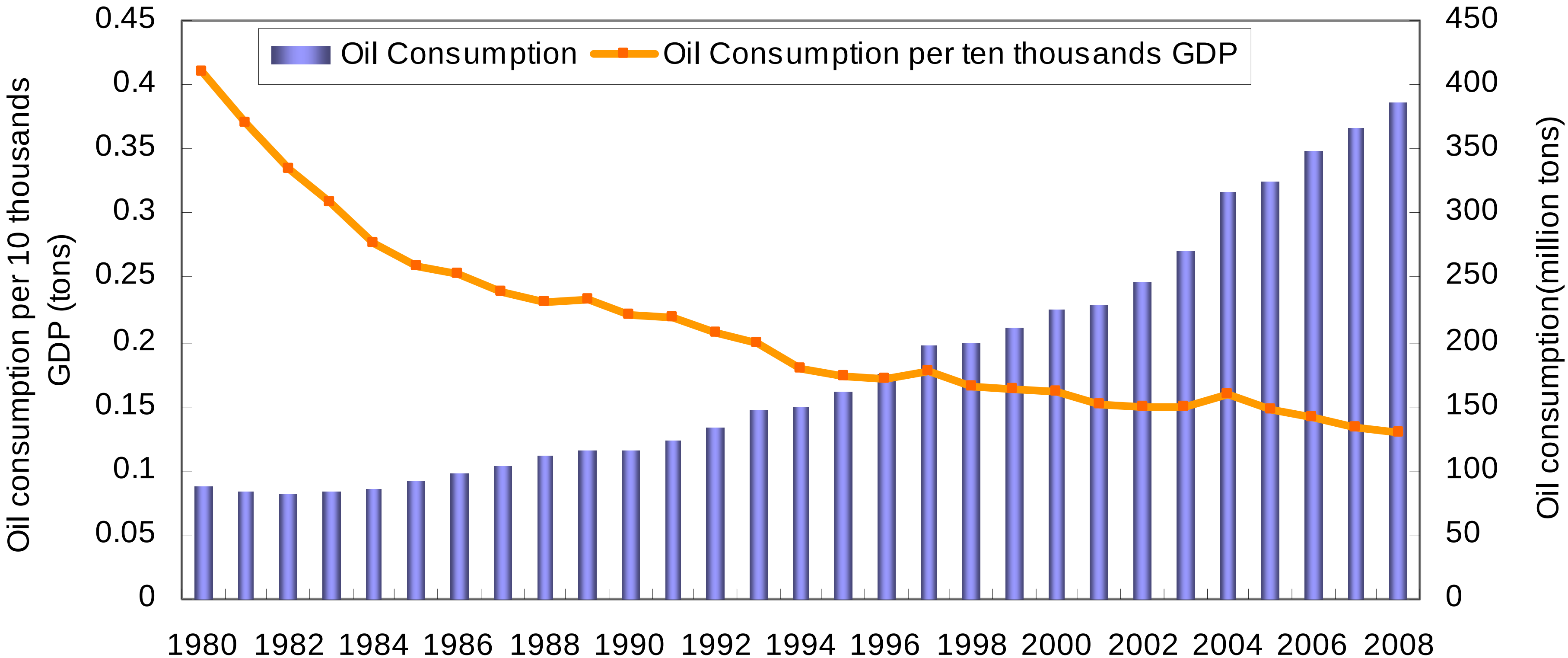
- China's oil consumption has been increasing since the turn of this century, which rises from 225 million tons to 387 million tons during 2000~2008, its annual growth rate is 7%. The ratio of oil consumption to primary energy consumption is 20%.
- During the same periods, China's crude oil production increases at the speed of 1.9% a year, and reaches 189 million tons in 2008.
- China becomes a net oil importer in 1993. Its external dependence rate of oil supply is 27% in 2000, then rises to 51% in 2008.

1-2 Increase of oil consumption is sensitive to economic fluctuation, which changes periodically.



- **Annual growth rate of China's GDP is 10.1% during 2000~2008, elasticity coefficient of oil demand to economic growth is 0.7.**
- **Under influence of China's economic conditions and international environment, China's oil consumption growth has shown character of periodical fluctuation since 1992, and the period is 3-4 years.**

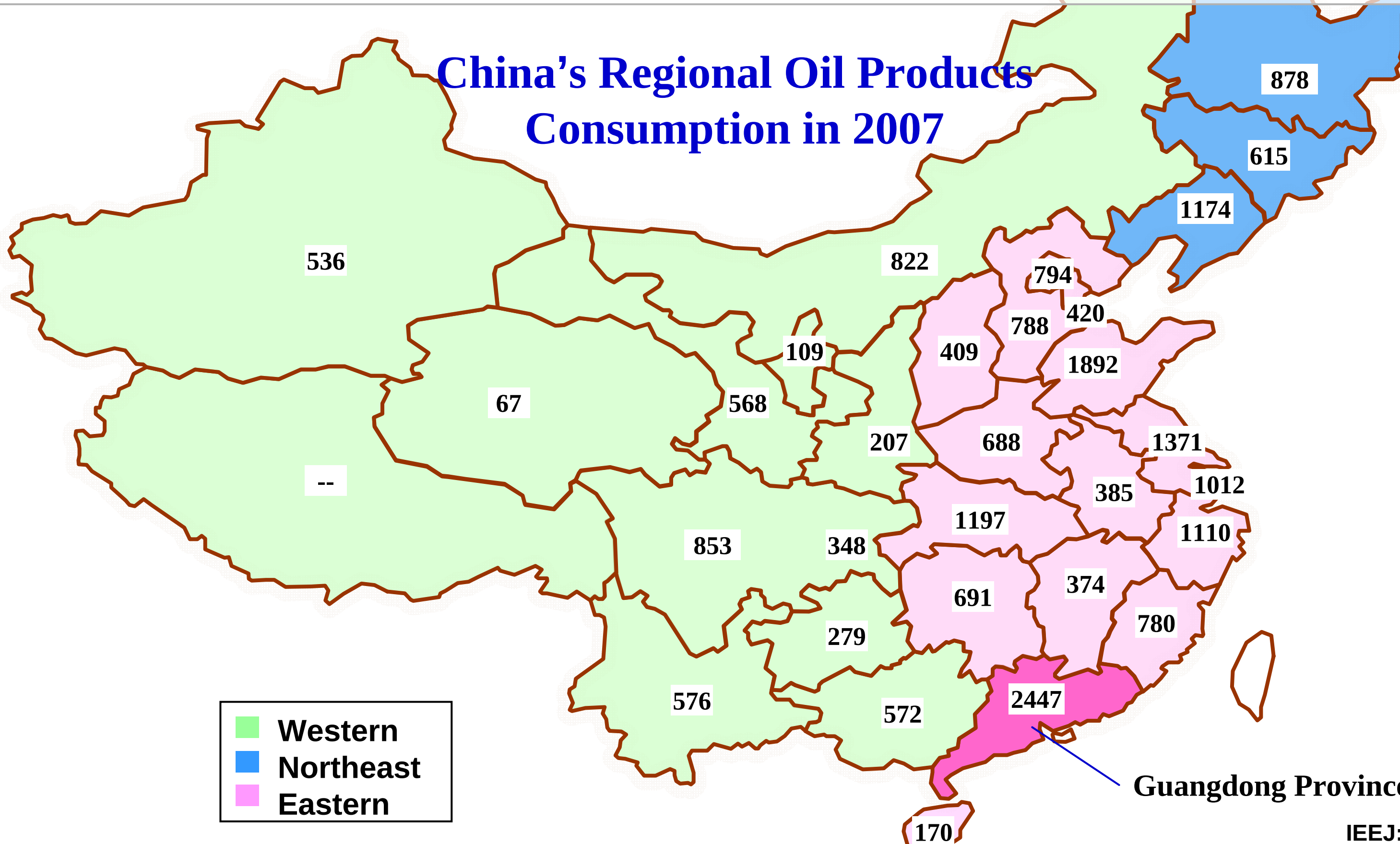
1-3 Efficiency of oil utilization is improving, oil consumption per GDP keeps dropping.



- **Under the impact of energy saving policy, quantity of oil consumption per ten thousands GDP of China trends to decline, which decreases from 0.16 ton to 0.13 ton during 2000~2008.**

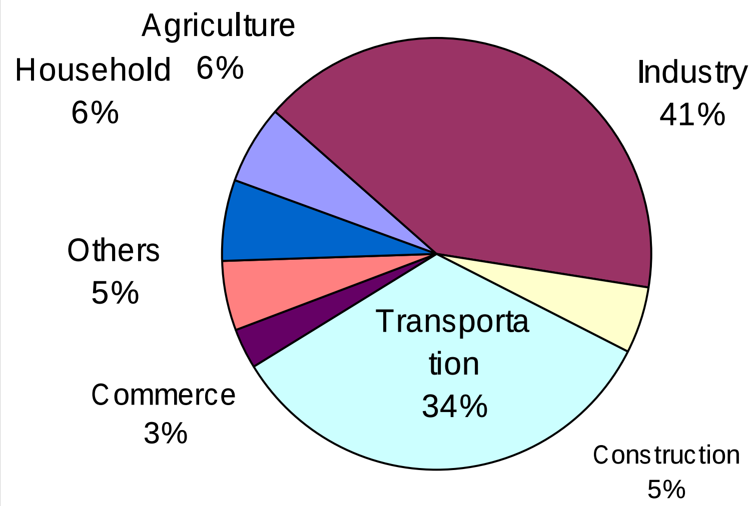
1-4 Oil consumption concentrates in eastern developed region.

- Regional oil consumption of China is different distinctly, oil products consumption in developed eastern and southeast regions takes 66% of the whole country.
- Guangdong's oil products consumption is the largest, which is more than 10% of China's total oil products consumption, and equal to sum of the last ten provinces.
- Consumption of oil products in twelve Midwestern provinces takes only 22% of China's total oil products consumption.



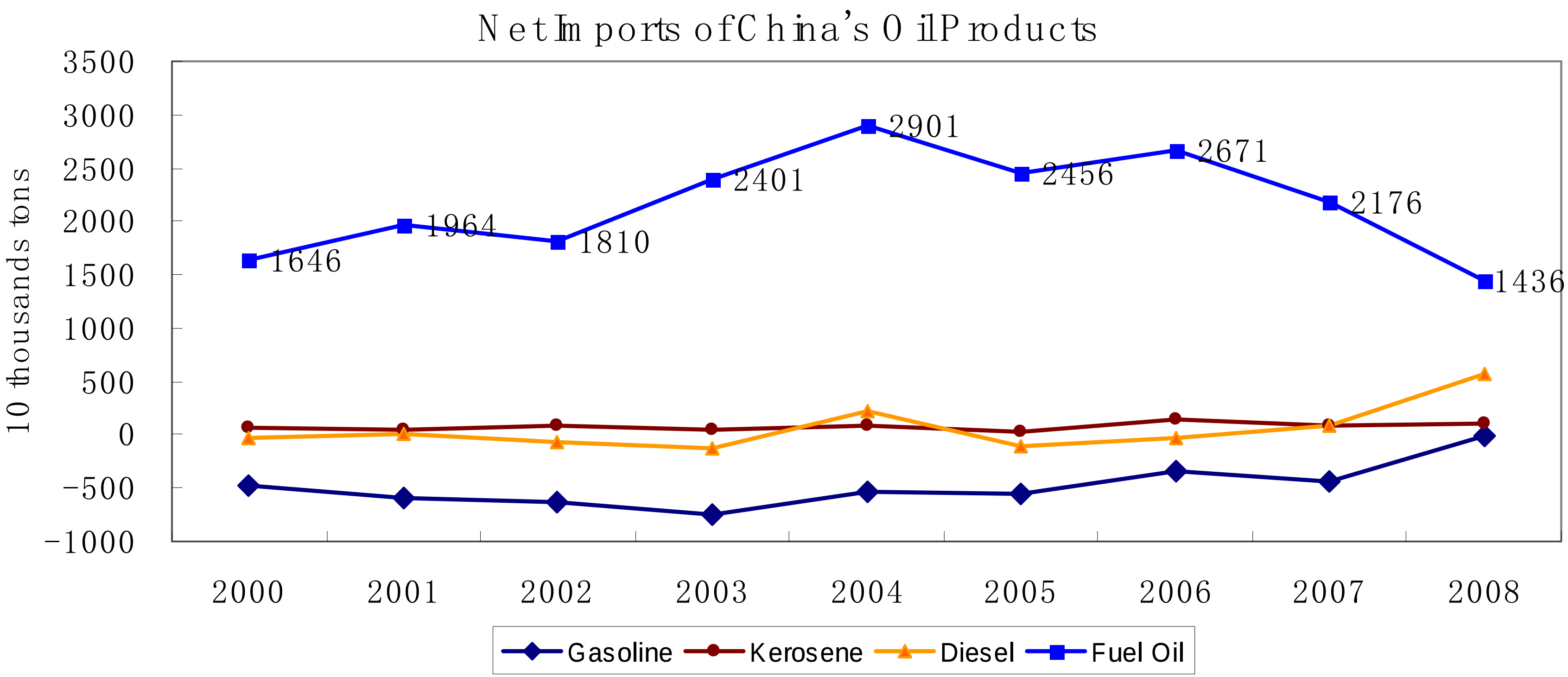
1-5 Industrial structure adjustment changes the structure of oil products consumption, proportion of transportation oil consumption is increasing.

- **Industry Sectors: Industry and transportation are China's main consumers of oil products. Percentage of industry oil consumption decreases from 71% in 1980 to 41% in 2007, and percentage of transportation oi consumption increases from 10% to 34%.**
- **Oil Products: In 1980, percentage of China's gasoline, diesel and fuel oil consumption in oil products is 16%, 27% and 51%, ratio of diesel to gasoline consumption is 1.67. In 2008, percentage of fuel oil drops to 15%, percentage of diesel increases to 55%, and ratio of diesel to gasoline consumption rises to 2.19.**



Products	1980		2000		2008		Changes during 1980~2008		
	Quantity	Proportion	Quantity	Proportion	Quantity	Proportion	Quantity	Proportion	Annual growth rate
Gasoline	999	16%	3505	23%	6343	25%	5344	28%	6.8%
Kerosene	366	6%	870	6%	1280	5%	914	5%	4.6%
Diesel	1663	27%	6774	45%	13886	55%	12222	65%	7.9%
Fuel oil	3074	51%	3873	26%	3664	15%	590	3%	0.6%
Total	6102	-	15022	-	25172	-	19071	-	5.2%

1-6 Gasoline, kerosene and diesel are almost self-sufficient, a lot of fuel oil is imported.



- **As the second largest oil import country, China's import and export of various oil products are different.**
- **Net import of fuel oil is the largest in oil products, which is 14.4 million tons in 2008. Net export of gasoline trends to decrease since 2003, which is only 5 tons in 2008. Import and export of diesel was small, but net diesel export is 5.6 million tons in 2008.**

Outline

Ⅰ. Status and Characters of China's Oil Consumption

☞ Ⅱ. China's Oil Demand Outlook before 2020

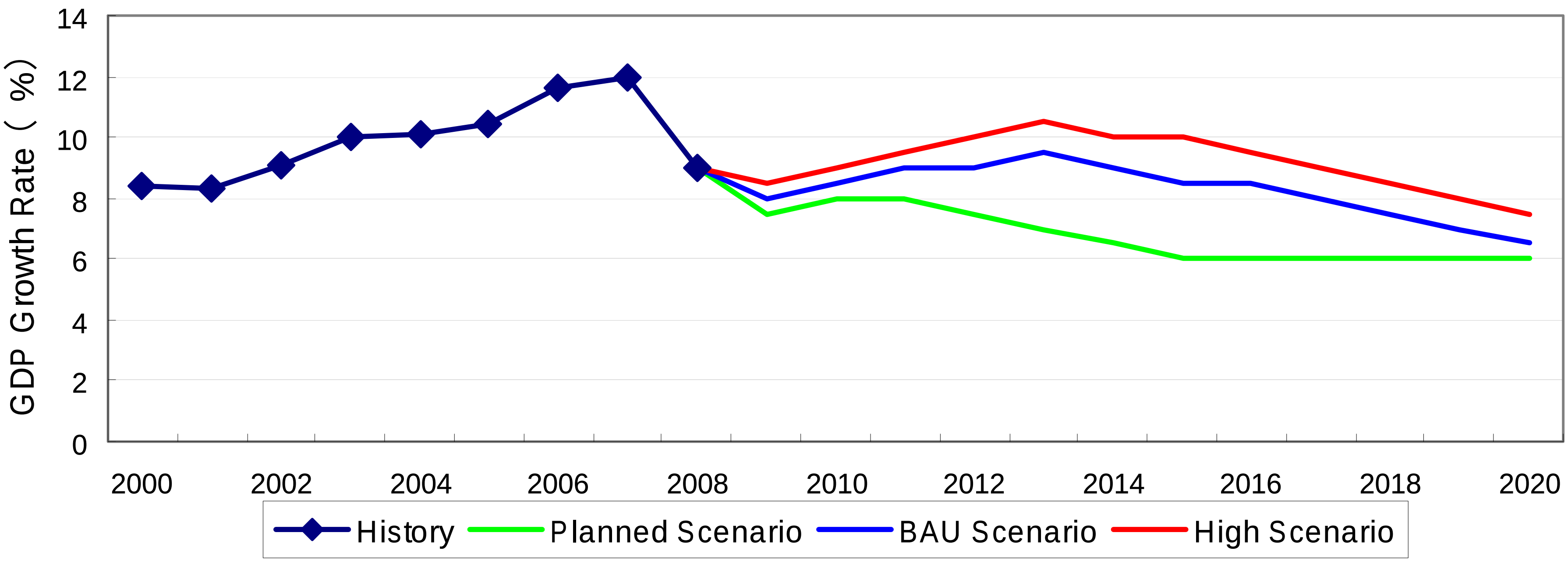
Ⅲ. Several Considerations

Ⅱ. China’s Oil Demand Outlook before 2020

In the next 10 years, China will still be on the process of urbanization and industrialization. It is crucial period for building a moderately prosperous society in all respects. Economic structure, develop mode and consumption pattern will all change profoundly.

China’s oil demand has not reached peak yet based on the analysis of correlative factors, and it will keep increasing in the next decade.

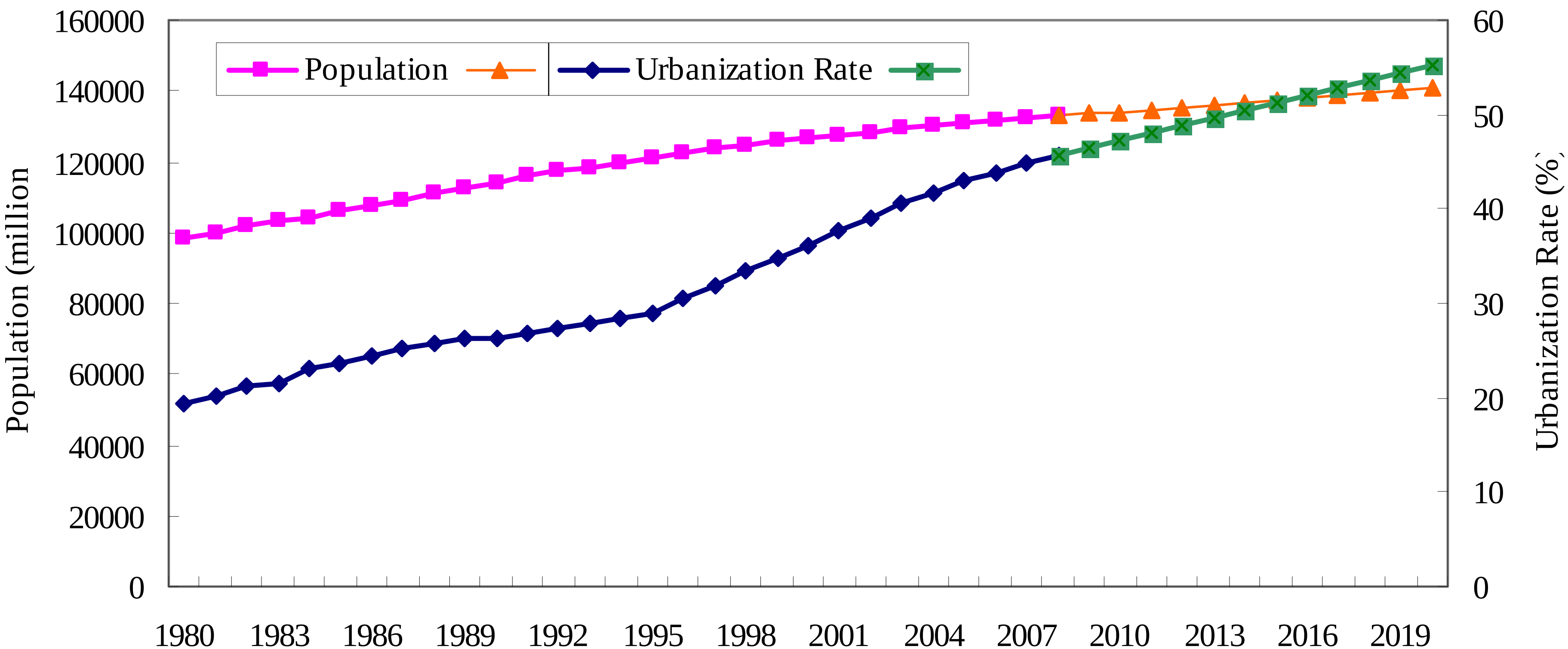
2-1 Economic growth will slow down, but maintain steady and rapid.



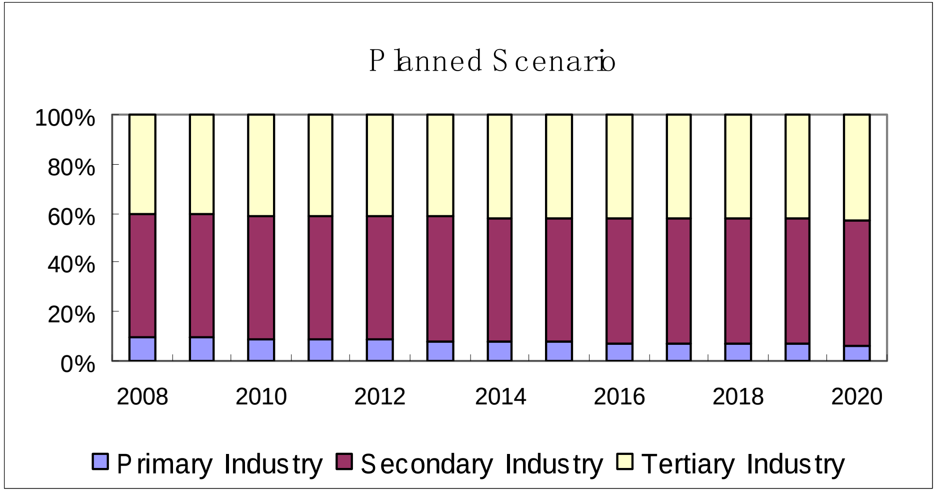
- **Under the impact of global financial crisis, China's GDP growth will still keep the speed of more than 8% in 2009.**
- **China's economic growth is set to be three scenarios in the next ten years. In BAU scenario, China's GDP will increase at the average speed of 9% a year from 2010 to 2015, then 8% a year from 2015 to 2020. In Planned scenario, China's per capita GDP in 2020 will quadruple to 2000, the annual growth rate of GDP is 6.7% from 2008 to 2020. In High scenario, GDP will grow at the average speed of 9.2% a year.**

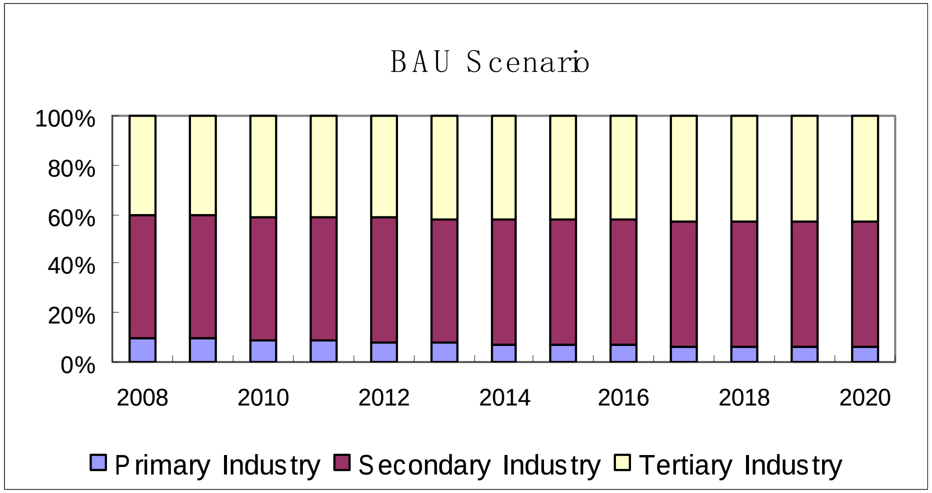
2-2 Urbanization and industrialization will progress steadily.

- **Annual growth rate of China's population is 0.58% during 2000~2008, which is estimated to increase at the average speed of 0.5% per year in the future, and reach 1.4 billion in 2020.**
- **China's urbanization rate rises from 36.2% to 45.7% during 2000~2008. It is expected to increase 0.8 percent a year, and exceed 55% in 2020.**



2-3 Industry will still be primary in economic structure, proportion of secondary industry and tertiary industry will keep rising.

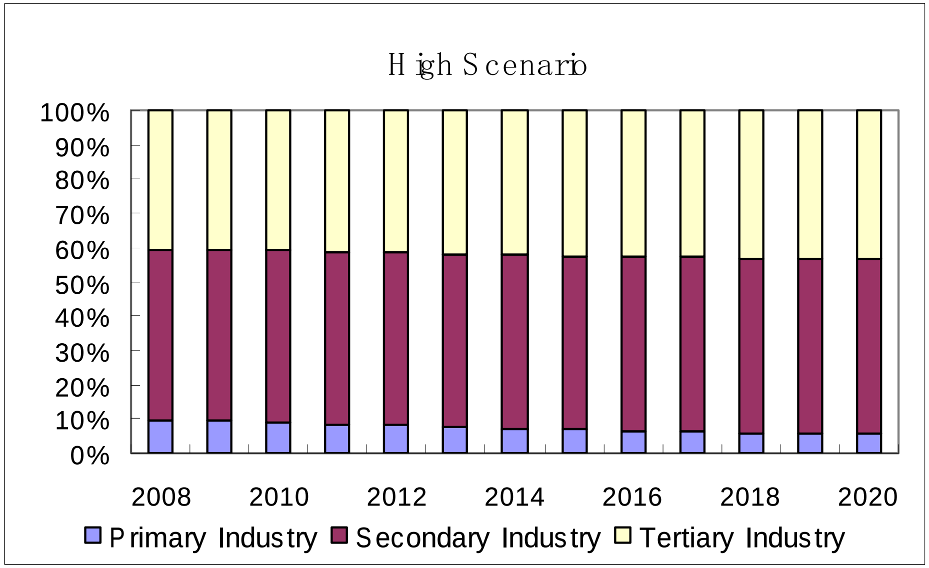




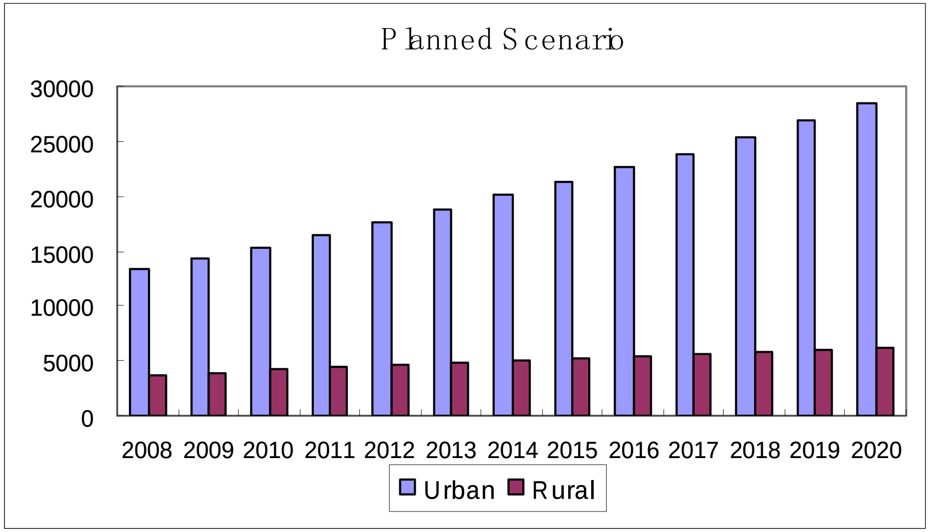
●**Reference scenario: The primary, secondary and tertiary industries will increase by 3.7%, 8.5% and 8.8% respectively during 2008-2020, and percentage will be 5.8%, 51.1% and 43.1% respectively in 2020.**

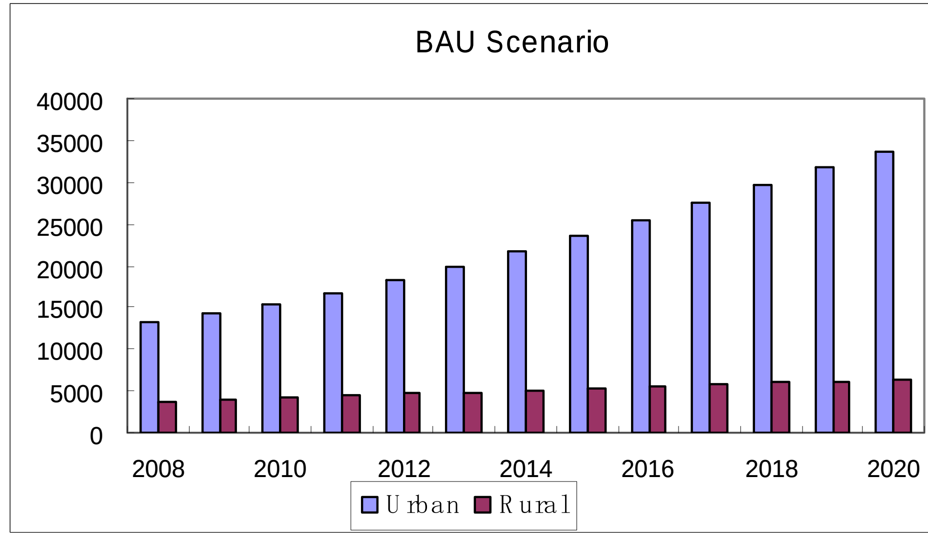
●**High growth scenario: The primary, secondary and tertiary industries will increase by 4.0%, 9.5% and 9.8% respectively during 2008-2020, and percentage will be 5.4%, 51.3% and 43.3% respectively in 2020.**

●**Planned scenario: The primary, secondary and tertiary industries will increase by 3.1%, 6.9% and 7.1% per year respectively during 2008-2020, and percentage will be 6.5%, 50.9% and 42.6% respectively in 2020.**



2-4 Resident income will maintain increasing, and the speed of urban income increase will still be higher than rural.

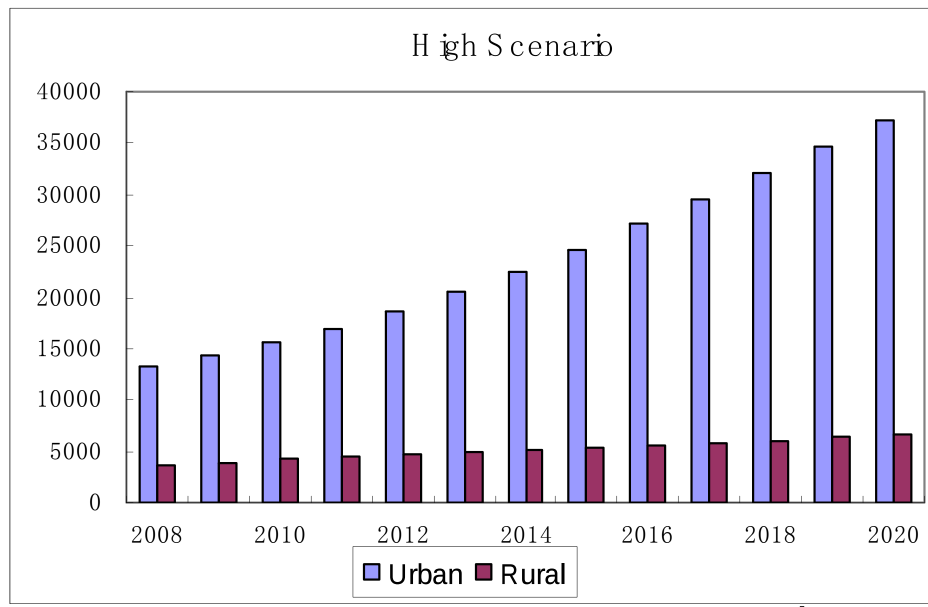




●**Reference scenario**: **During 2008~2020, pure income of rural residents and disposable income of urban residents per capita will increase by 4.7% and 8.0% per year respectively, and will reach ¥6417 and ¥33769 respectively by 2020.**

●**High growth scenario**: **During 2008~2020, pure income of rural residents and disposable income of urban residents per capita will increase by 4.9% and 8.9% respectively, and will reach ¥6577 and ¥37302 respectively by 2020.**

●**Planned scenario**: **During 2008~2020, pure income of rural residents and disposable income of urban residents per capita will increase by 4.3% and 6.5% respectively, and will reach ¥6134 and ¥28433 by 2020.**



2-5 Growth of vehicles will slow down, but the number will triple.

- **Number of China's civil vehicles is 49.8 million in 2008, and it will increase to 155 million in 2020. The annual growth rate is estimated to be 10% from 2008 to 2020, lower than that of 2000~2008.**
- **Number of car ownership per thousand people of China will be more than 100 in 2020, which is still considerably lower than developed countries.**

Unit (10 thousand)	History			Forecasting				Annual Speed	
	1980	2000	2008	Scenario	2010	2015	2020	2000 ~2008	2008 ~2020
Passenger cars	35	854	3850	Planned	5361	8806	11112	20.7%	9.2%
				BAU	5368	9166	13526		11.0%
				High	5375	9405	14965		12.0%
Trucks	130	716	1125	Planned	1250	1546	1844	5.8%	4.2%
				BAU	1253	1601	2015		5.0%
				High	1255	1634	2120		5.4%

2-6 Quantity of passenger and freight traffic will keep increasing, and growth of civil aviation will be the fastest.

- **China's passenger and freight traffic will keep increasing from 2008 to 2020, but the growth will slow down.**
- **Annual growth rate of civil aviation will be 9%, and annual growth rate of highway transportation will be more than 7%, which promotes kerosene and diesel demand.**
- **Railways traffic keeps growing, but improve of electrization will weaken its effect on diesel demand.**

Unit (100 million passenger/ ton-km)	Civil Aviation		Highways		Waterways		Railways	
	Passenger	Freight	Passenger	Freight	Passenger	Freight	Passenger	Freight
1980	40	1	730	764	129	5053	1383	5717
2000	971	50	6657	6129	101	23734	4533	13771
2008	2883	120	12636	12999	75	65218	7779	25112
2010	3250	141	14615	15330	70	66257	8671	27277
2015	5212	213	20097	23923	54	102774	11541	34822
2020	8739	331	28509	35657	47	152997	16004	47895
1998-2008 Annual Speed	14.57%	11.56%	8.34%	9.85%	-3.65%	13.47%	6.98%	7.80%
2008-2020 Annual Speed	9.68%	8.82%	7.02%	8.77%	-3.82%	7.36%	6.20%	5.53%

2-7 Increment of oil demand will be huge, but growth rate will decline.

- **In BAU scenario, China's oil demand will be 621 million tons in 2020, which is 235 million tons larger than 2008. The annual growth rate is 4% during 2008~2020, lower than that of last decades.**
- **China's oil demand is 572 million tons in 2020 under planned scenario, and it is as high as 651 million tons in high scenario .**

Consumption/Demand		Oil	Gasoline	Kerosene	Diesel	Fuel Oil
2000		22439	3505	870	6774	3872
2008		38672	6343	1280	13886	3664
2020	Planned Scenario	57151	11767	2591	21239	3800
	BAU Scenario	62142	12542	2790	21729	3847
	High Scenario	65148	13447	2993	22241	3895
2000~2008 Annual Speed		7.04%	7.70%	4.94%	9.39%	-0.69%
2008~2020 Annual Speed		4.03%	5.85%	6.71%	3.80%	0.41%

Compared with related organizations

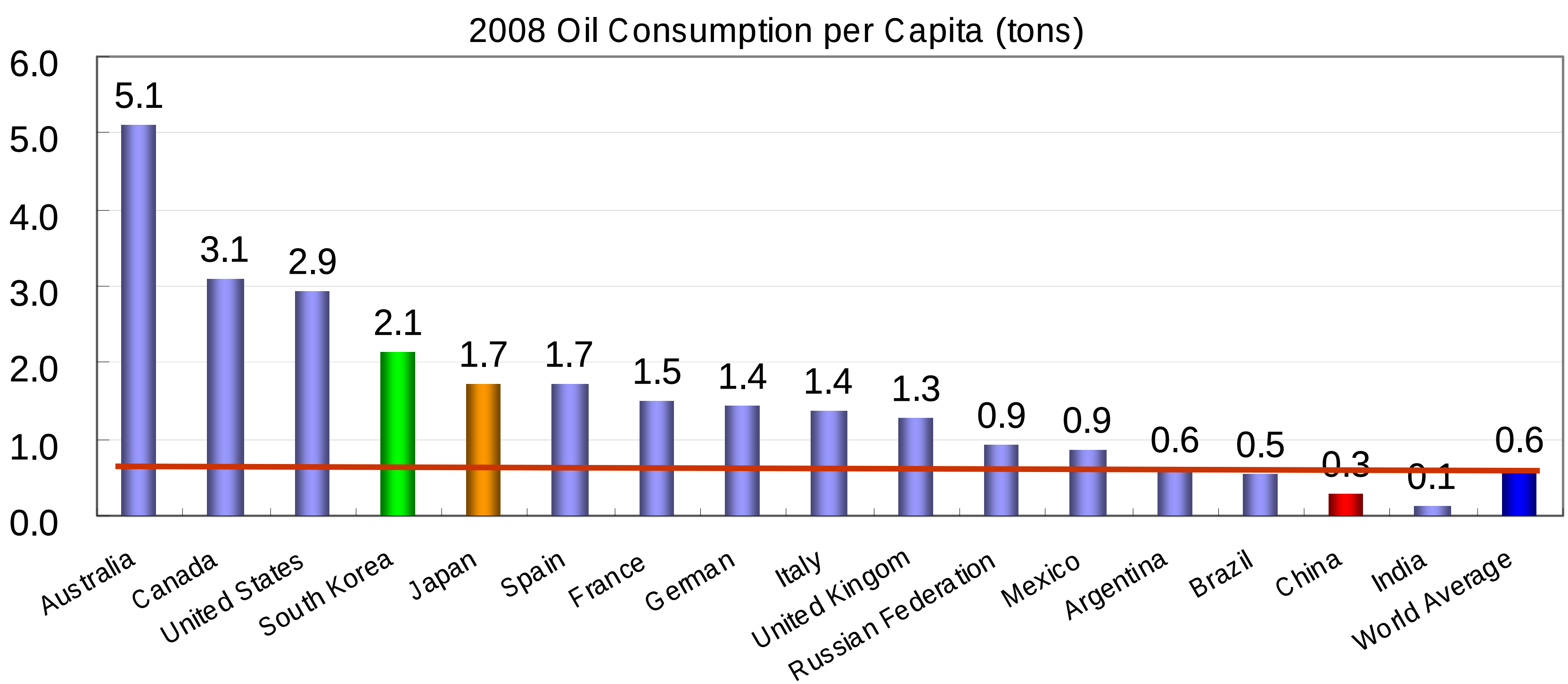
- In IEA's publication of 'World Energy Outlook 2008', China's oil demand in 2020 is estimated to be 639 million tons, and the annual growth rate is about 4.4%.
- EIA expects that China's daily oil demand will be 12 million tons in 2020, which is equal to 605 million tons a year, and the annual growth rate is 3.8%.

Forecasting of China's Oil Demand (million tons)

Organization	IEA	EIA	CNPC - RIET		
			Planned Scenario	BAU Scenario	High Scenario
2015	553	500	498	519	531
2020	639	605	572	621	651

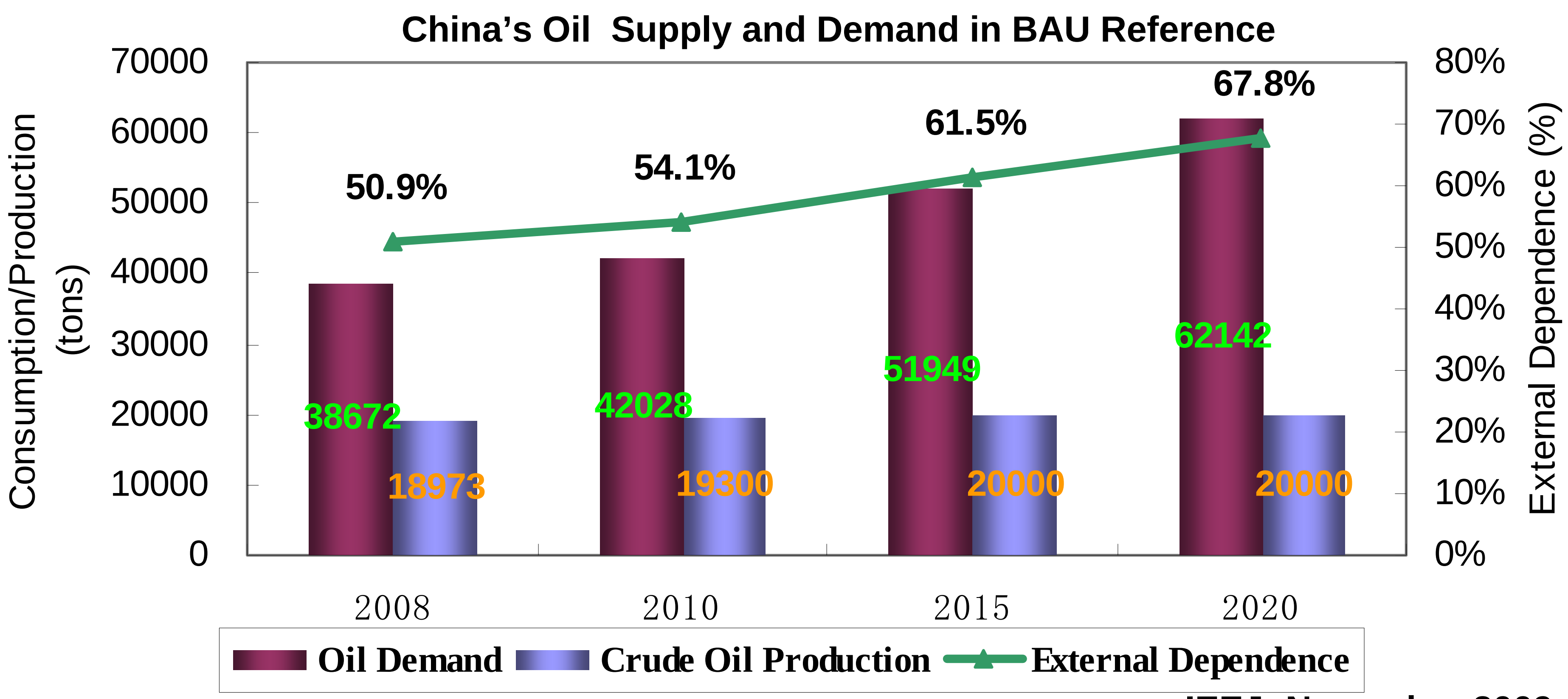
2-8 Aggregate oil demand is large, but quantity per capita is low.

- **China has been the second largest oil consumer since 2002, but its oil consumption per capita is much less than developed countries, even less than half of the world's average level.**
- **In BAU scenario, oil consumption per capita of China will grow from 0.29 ton to 0.46 ton during 2008~2020, but still lower than the world average (0.6 ton).**



2-9 China's external dependence rate of oil supply will be more than 60% in 2020.

- **Based on the assumption of 200 million tons of China's crude oil productivity, China's external dependence rate of oil supply is 68% in 2020 under BAU scenario, 65% in planned scenario, and 69% in high scenario.**



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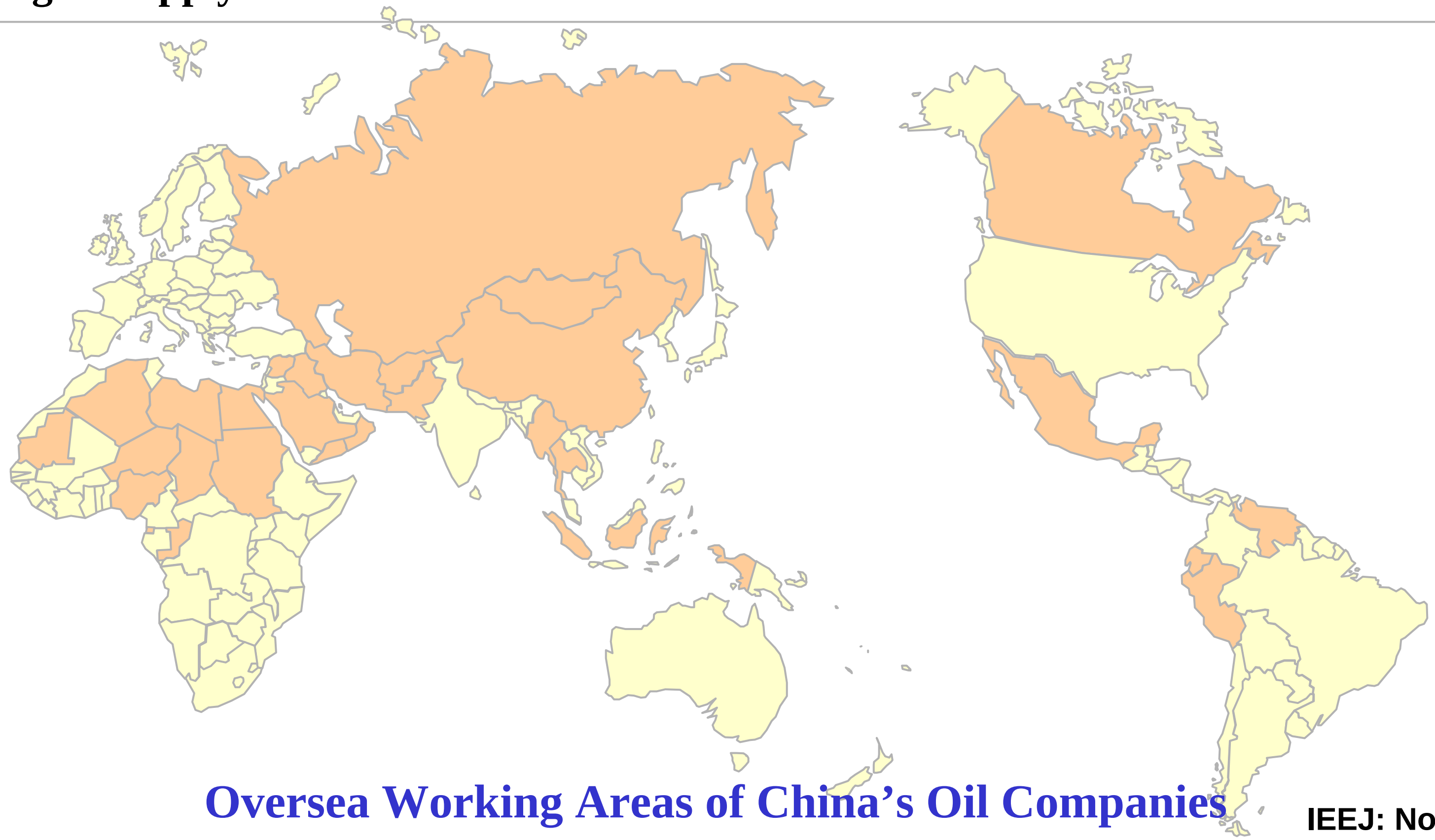
In the next decade, China's oil demand will keep rising with its social and economic development. Oil is still very important in China's energy structure. It is core issue to balance between oil supply and demand for China's energy strategy.

Following the development trend of world's energy industry, China should stick with policies of broadening income sources and reducing expenditure, promote the adjustment of energy structure, change the mode of oil consumption, and build the system of oil supply and demand that conformed with China's actual conditions and sign of times.

3-1 Strengthen domestic exploration and development of oil & gas, establish diverse channels of oil supply through international market.

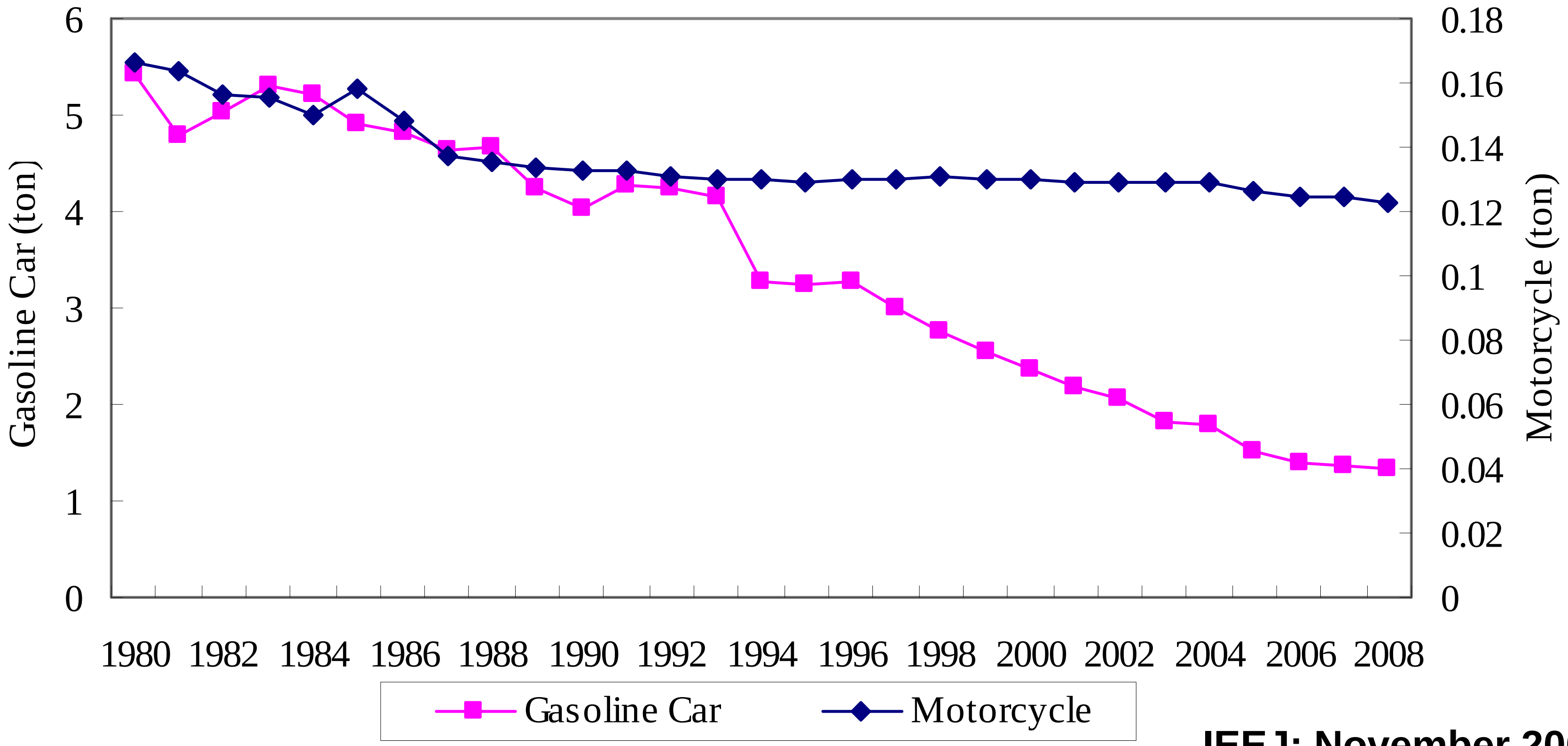
- According to the latest oil & gas resources evaluation, China has a solid foundation to maintain 200 million tons of crude oil production, and its resource of natural gas is rich. Gas production is rising at the speed of double figure in recent years, which is hopeful to keep fast rising in the next decade.
- China should promote oversea oil & gas business cooperation to develop the function of ensuring oil supply in two markets.



Oversea Working Areas of China's Oil Companies

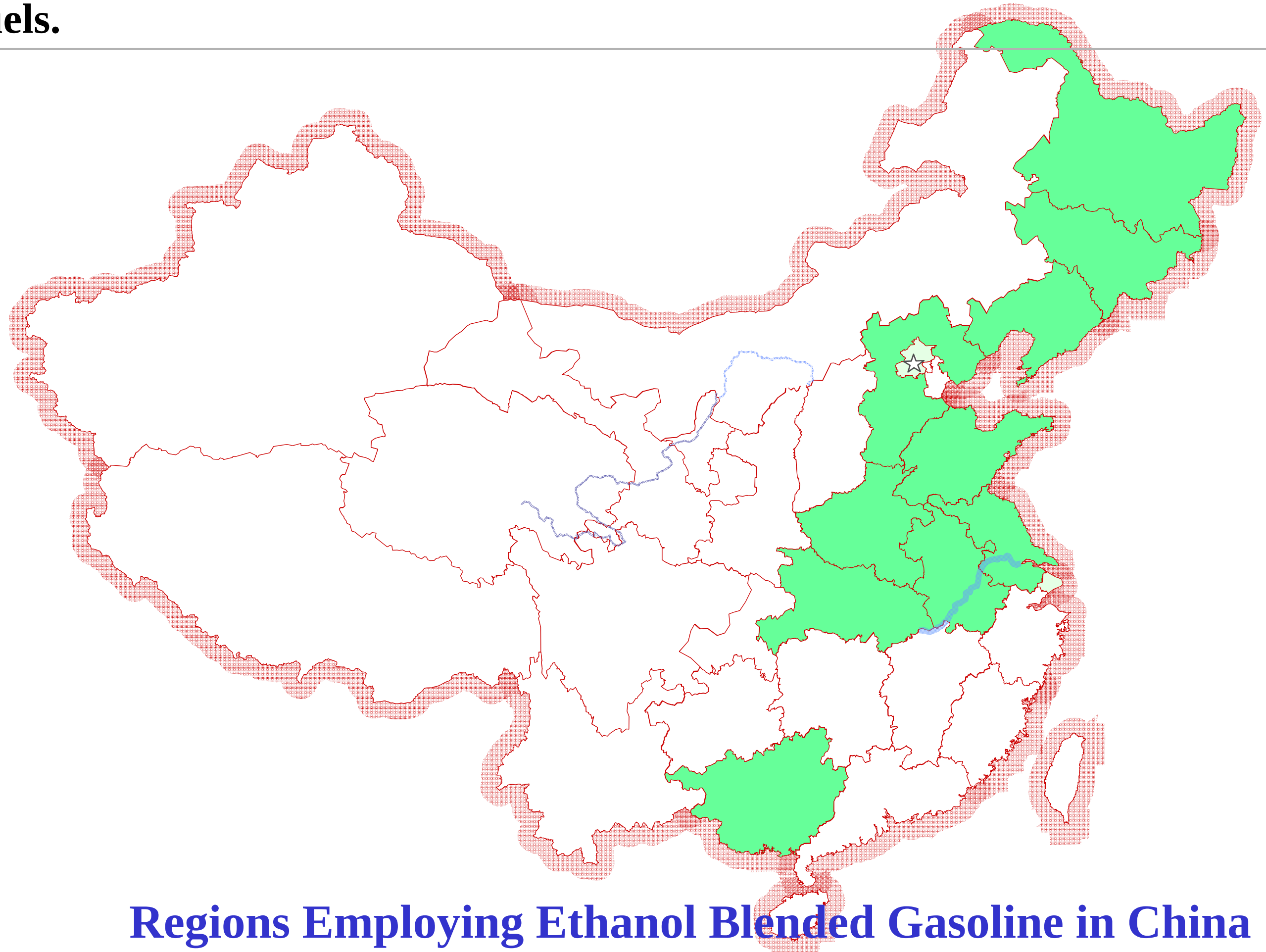
3-2 Save energy to build conservation-oriented economic structure and consumption pattern.

- **According correlation studies, once the proportion of China's tertiary industry increases a percentage point, and proportion of secondary industry drops a percentage point, then energy consumption per ten thousands GDP will decline a percentage point around.**
- **Vehicle takes about 60% of China's oil consumption now. There is of huge potential for saving energy to develop and spread vehicle energy saving, employ clean fuels and energy saving vehicles, and give priority to develop public transport.**



3-3 Develop new energy and alternative energy sources to suffice partial increment of oil demand.

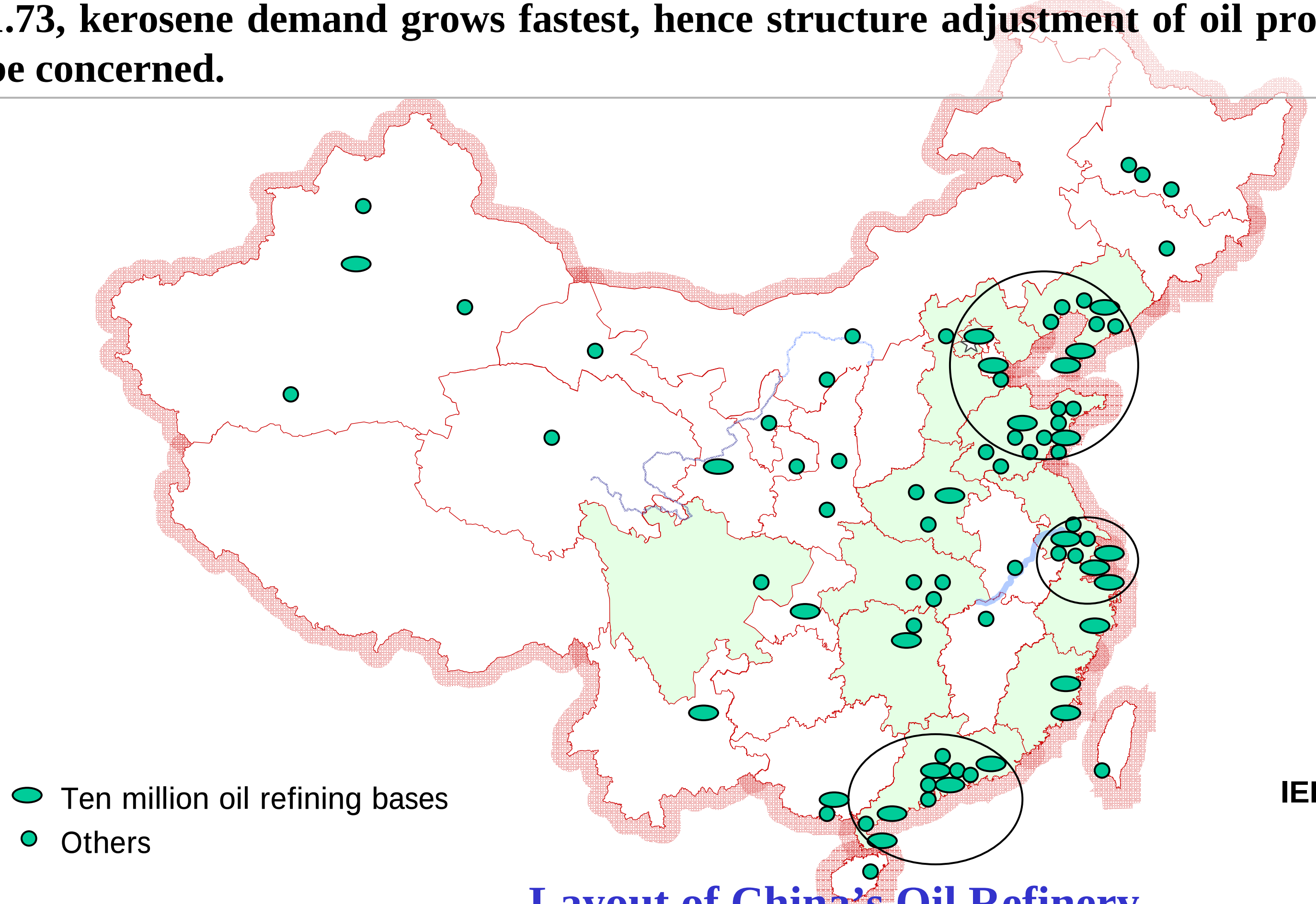
- **China's 'Development Planning of Renewable Energy Sources' proposes that, renewable energy sources should take 15% of its total energy consumption in 2020. Development of biologic liquid fuel such as fuel ethanol and biodiesel will promote saving and substitution of oil fuels.**



Regions Employing Ethanol Blended Gasoline in China

3-4 Optimize layout of oil refining bases, and pay attention to structure adjustment of oil products.

- Characters of China's regional oil consumption can not be changed in short term. It's necessary to improve refining capacity of Yangtze River Delta, Pearl River Delta and Bohai Sea Region for optimizing oil resources.
- The ratio of diesel to gasoline consumption in next ten years will decline from 2.19 to 1.73, kerosene demand grows fastest, hence structure adjustment of oil products should be concerned.



Layout of China's Oil Refinery

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3-5 Accelerate construction of national strategic petroleum reserve system to improve abilities of mitigating risks.

- **China launched the construction of SPR bases in 2003. Accumulated capacity of phase I is 12 million tons now, which is almost equal to the China's crude oil import volume in a month.**
- **Phase II with total size of 26.8 million cubic meters was launched last year, and will be finished in three or four years.**
- **Chinese government is also planning to perfect system of commercial oil products reserves to attract participations of local government and corporations.**

Strategic Petroleum Reserve Bases – Phase I	Size（million cubic meters）	Capacity (million tons)	Hosting Companies
Zhenhai	5.2	3.8	Sinopec
Zhoushan	5.0	3.65	Sinochem
Huangdao	3.2	2.3	Sinopec
Dalian	3.0	2.25	CNPC
Total	**16.4**	**12.0**	

Thanks !

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