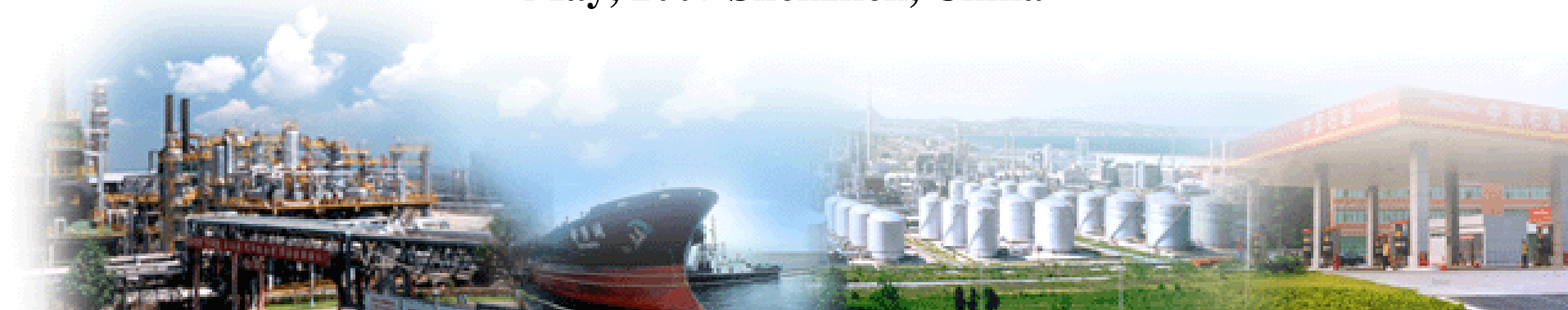




Ethylene development & raw material supply outlook of CNPC

CNPC Planning & Engineering Institute

May, 2007 Shenzhen, China



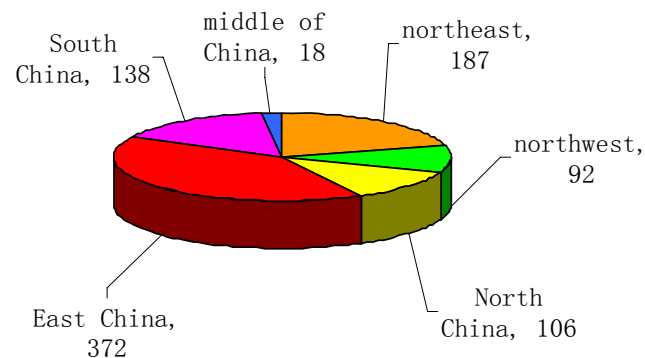
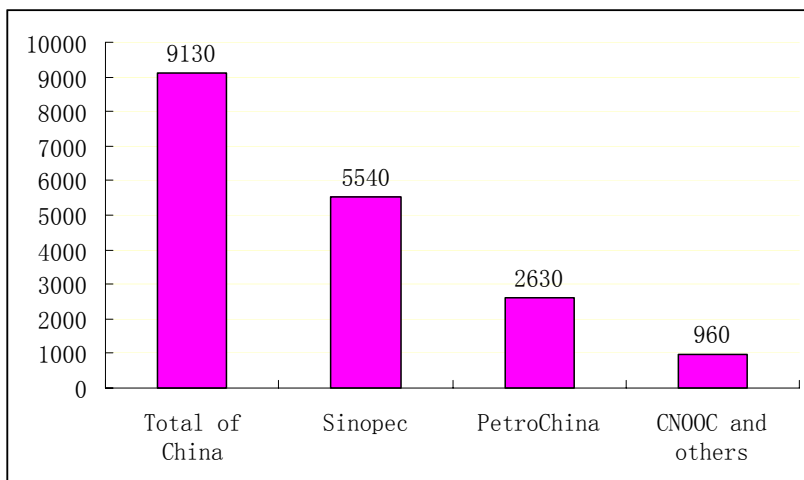
Content

- 1 The situation of ethylene industry development and raw material supply in China**
- 2 Planning of ethylene development and raw material supply of CNPC**
- 3 Optimization and protective measures of the raw material for ethylene of CNPC**

1 The situation of ethylene industry development and raw material supply in China

1) The development situation of ethylene industry in China

At present, there are 20 companies, 22 sets of plants, producing ethylene in China, with total capacity of 9,130kt/a in 2006. Twelve of all the plants belong to SINOPEC, eight belong to CNPC and two belong to CNOOC and other companies.

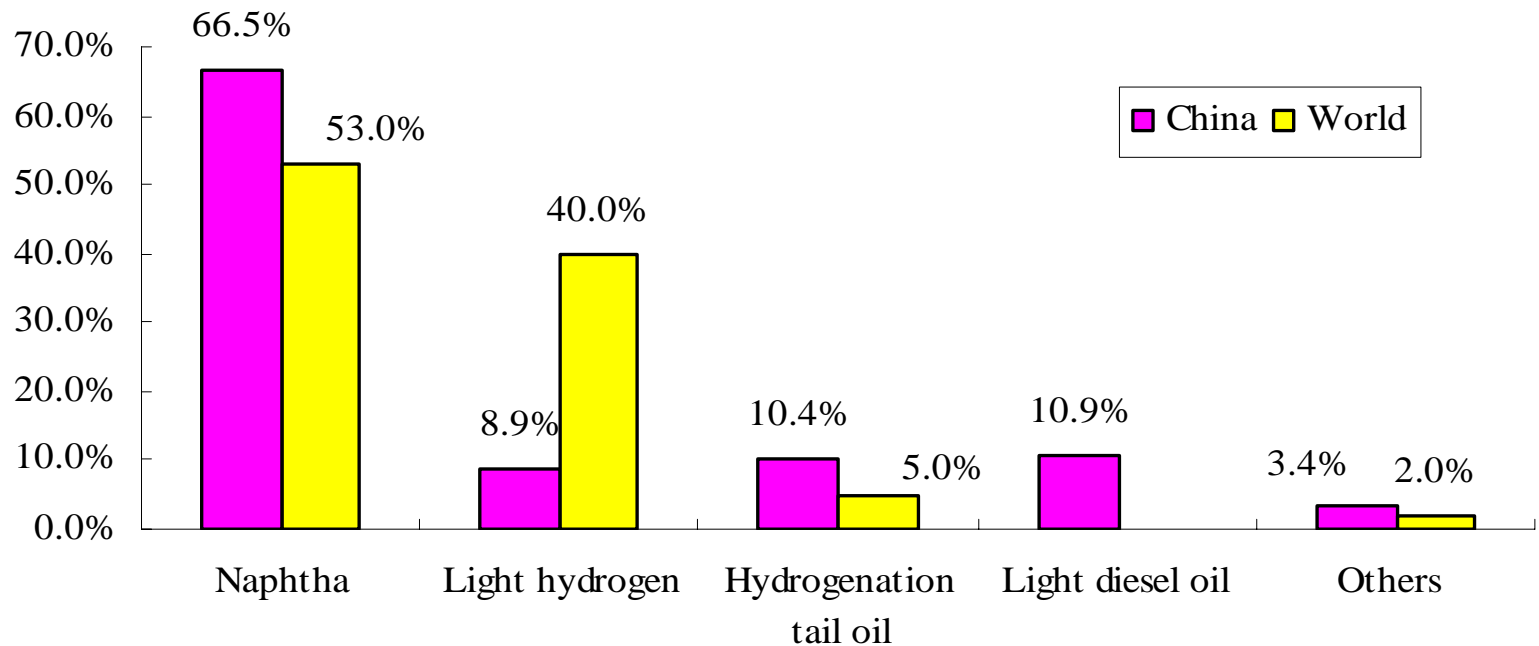


Capacity for ethylene and its distribution in China (kt/a)

1 The situation of ethylene industry development and raw material supply in China

1) The development situation of ethylene industry in China

Contrast to the raw material structure of the world, the raw material for ethylene in China mainly comes from refineries and is too heavy. In addition, the raw material includes some diesel oil, a little light hydrocarbon and no ethane. At present, the yield of ethylene is about 30.85%.

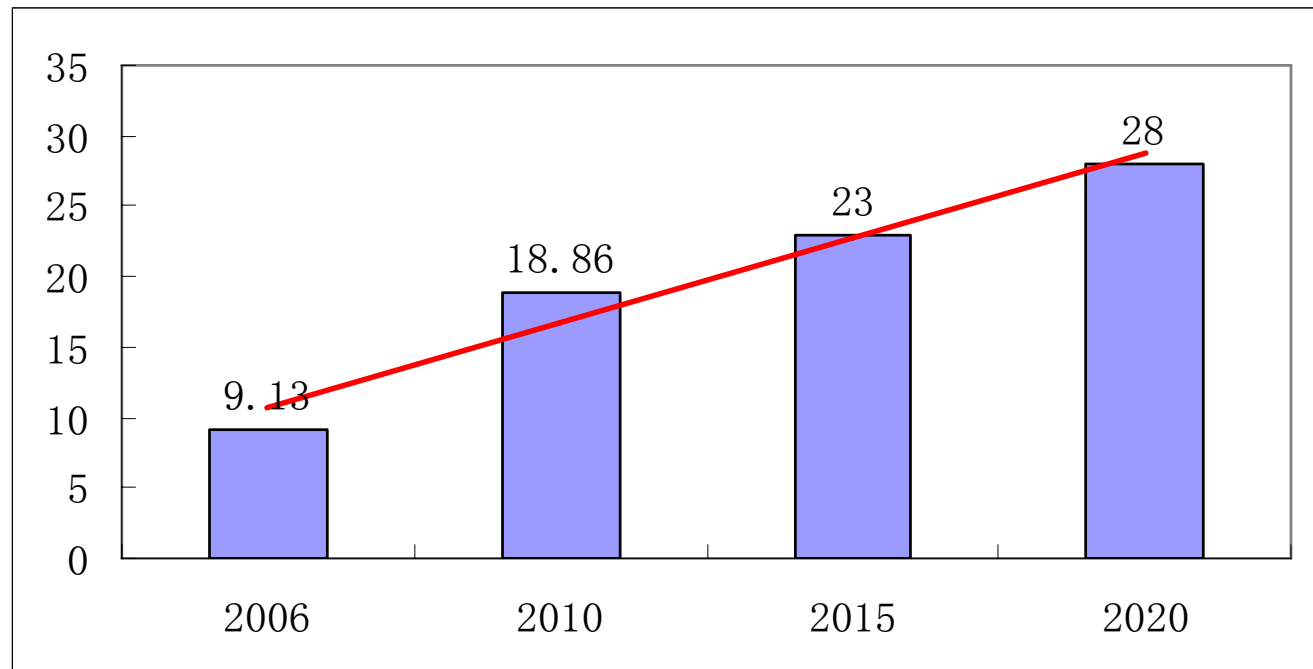


Comparison of ethylene raw material between China and the world in 2006

1 The situation of ethylene industry development and raw material supply in China

2) The situation of future development

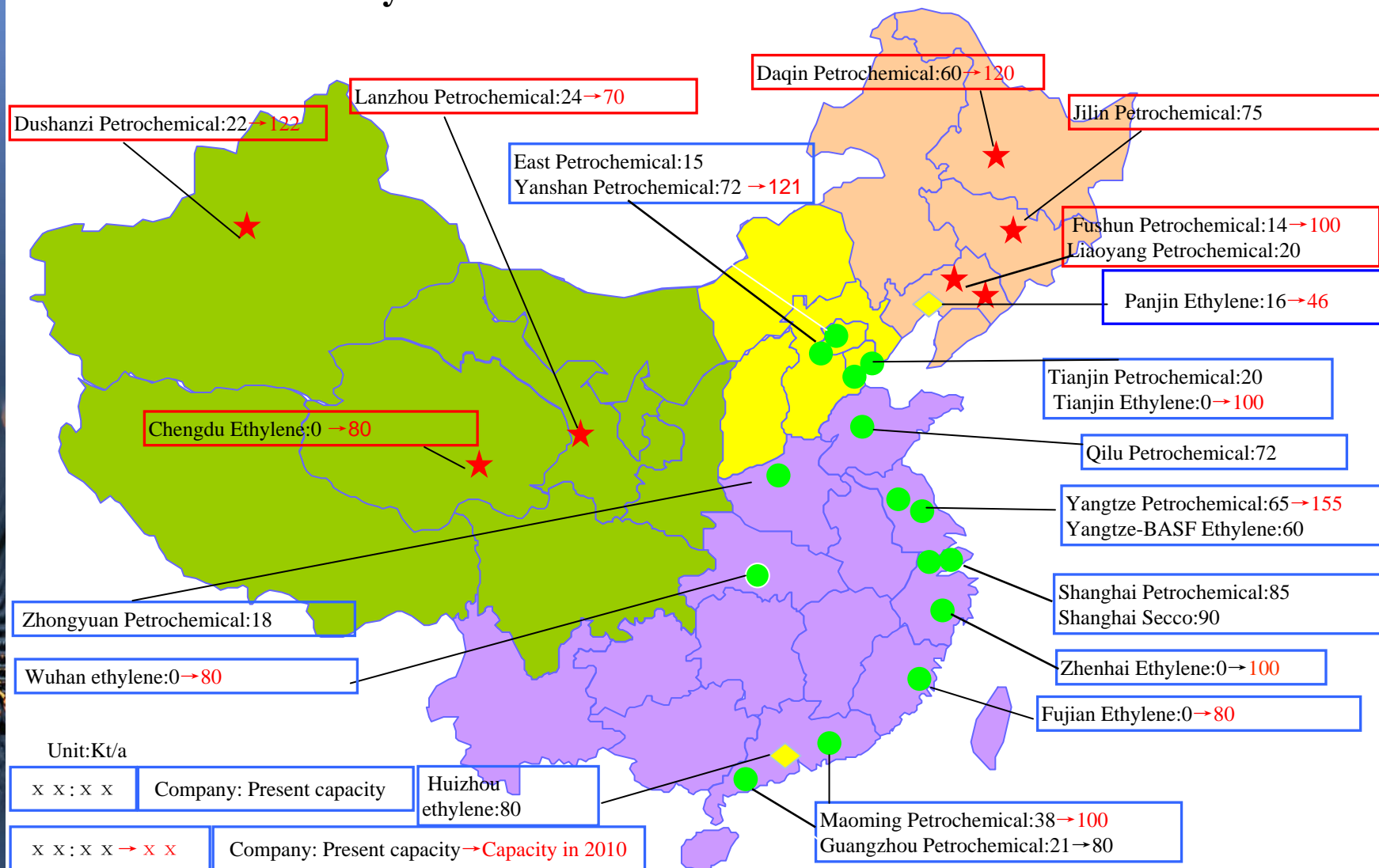
According to the plan, the capacity for ethylene will reach 18.85Mt/a in 2010; According to 60%~70% of the total need, the capacity for ethylene in 2015 and 2020 will be 23Mt/a and 28Mt/a respectively.



The situation of future development (Mt/a)

1 The situation of ethylene industry development and raw material supply in China

The ethylene distribution in China in 2010



1 The situation of ethylene industry development and raw material supply in China

3) The situation of raw material supply

- According to the development of ethylene, the demand for ethylene raw material in 2010、 2015 and 2020 will reach 61Mt、 75Mt and 91Mt respectively.
- Because the ethylene raw material will come from refineries in future, so naphtha and other secondary operation products will be the mainly used material for ethylene and the problem of heavy hydrocarbon will still last.
- Basing on the region (such as north east and northwest) balance, mutual supply and the optimization of internal raw material supply will be the main measures for the ethylene companies to ensure the supply of ethylene raw material.
- It is also essential to import some material. In 2010, the total import (including the material for aromatic hydrocarbon) for light oil will be more than 6Mt.

2 Planning of ethylene development and raw material supply of CNPC

1) plants and capacities

CNPC owns 8 sets of plants producing ethylene, the total capacity is 2.63 Mt/a. In the first quarter of 2007, the total production of ethylene was 650kt.

Capacity of CNPC for ethylene in 2006(kt)

Facilities	Design	In 2006	The first quarter of 2007
Daqing Petrochemical	480	600	147.6
Jilin Petrochemical(I)	115	150	35
Jilin Petrochemical(II)	300	700	181.2
Fushun Petrochemical	140	140	44.2
Liaoyang Petrochemical	88	120	32
Dushanzi Petrochemical	160	220	64.8
Lanzhou Petrochemical(I)	160	240	48.7
Lanzhou Petrochemical(II)		460	95.8
Total		2630	649.2

2 Planning of ethylene development and raw material supply of CNPC

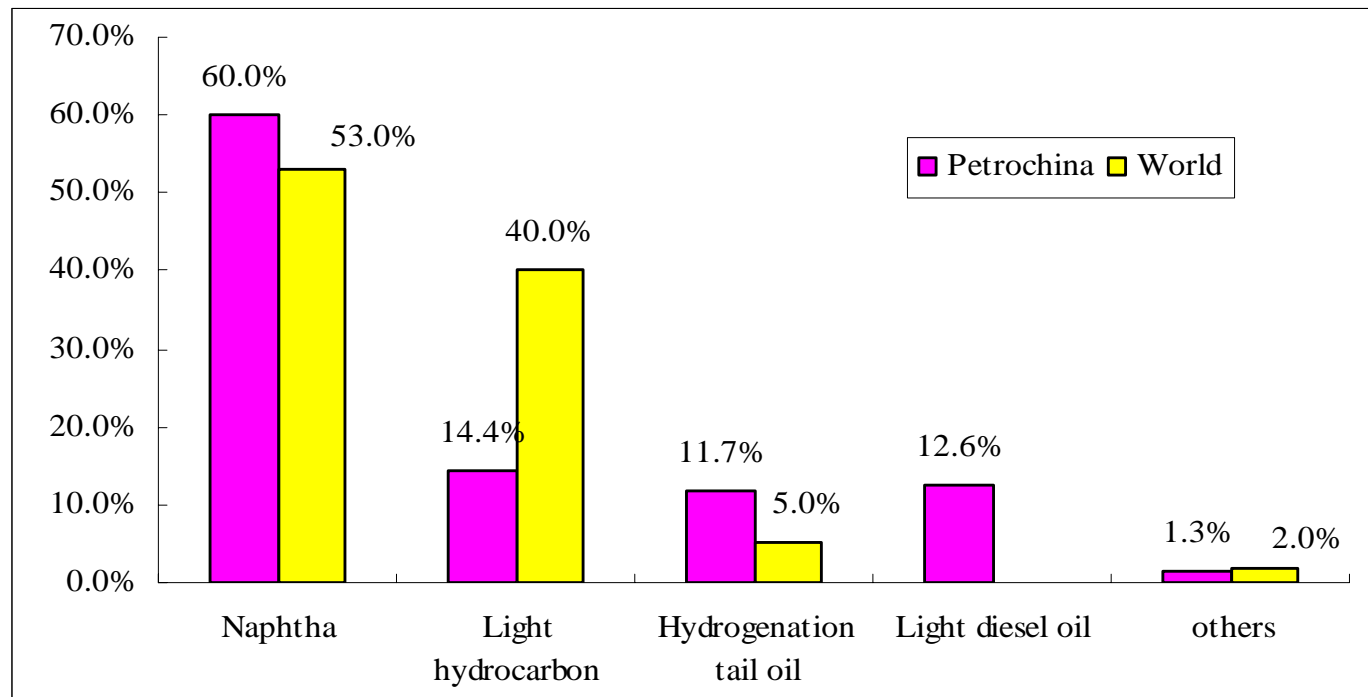
2) Situation of raw material supply

Raw material supply of CNPC in the first quarter of 2007(kt)

Facilities	Light diesel oil	naphtha	Hydrogenation tail oil	Light hydrocarbon	Light hydrocarbon of refineries	others	total
Daqing Petrochemical		160.6	82.3	217.9			460.8
Jilin Petrochemical(I)	122.5	149.7					272.2
Jilin Petrochemical(II)	79	244.8	139.8		19.7		483.2
Fushun Petrochemical		67.7				28.5	96.2
Liaoyang Petrochemical		107.6	11.8	27	1.1		147.4
Dushanzi Petrochemical		100.1	17.8	19	13		150
Lanzhou Petrochemical(I)		141.8		7.2	3.3		152.2
Lanzhou Petrochemical(II)	69.4	315.4			0.8		385.6
Total	270.9	1287.6	251.7	271.2	37.9	28.5	2147.7

2 Planning of ethylene development and raw material supply of CNPC

2) Situation of raw material supply



Raw material structure of ethylene of CNPC in the first quarter of 2007

2 Planning of ethylene development and raw material supply of CNPC

3) Plan of ethylene and imagination about its raw material supply

- By 2010, CNPC will have completed the construction and capacity expanding of ethylene of Dushanzi, Sichuan, Fushun and Daqing petrochemical, the total capacity of ethylene will reach 6Mt/a and average capacity of ethylene will reach 6000kt/a respectively.**
- According to the 25% of the domestic need of ethylene, CNPC's capacity of ethylene will reach 8Mt/a by 2015 and 10Mt/a by 2020.**

2 Planning of ethylene development and raw material supply of CNPC

3) Plan of ethylene and imagination about its raw material supply

CNPC's capacity of ethylene in 2010(kt)

Facilities	Capacity of 2006	Capacity of 2010
Daqing Petrochemical	600	1,200
Jilin Petrochemical(I)	150	150
Jilin Petrochemical(II)	700	700
Fushun Petrochemical	140	1,000
Liaoyang Petrochemical	120	200
Dushanzi Petrochemical	220	1,220
Lanzhou Petrochemical(I)	240	240
Lanzhou Petrochemical(II)	460	460
Sichuan Petrochemical		800
Total	2,630	6,000

2 Planning of ethylene development and raw material supply of CNPC

3) Plan of ethylene and imagination about its raw material supply

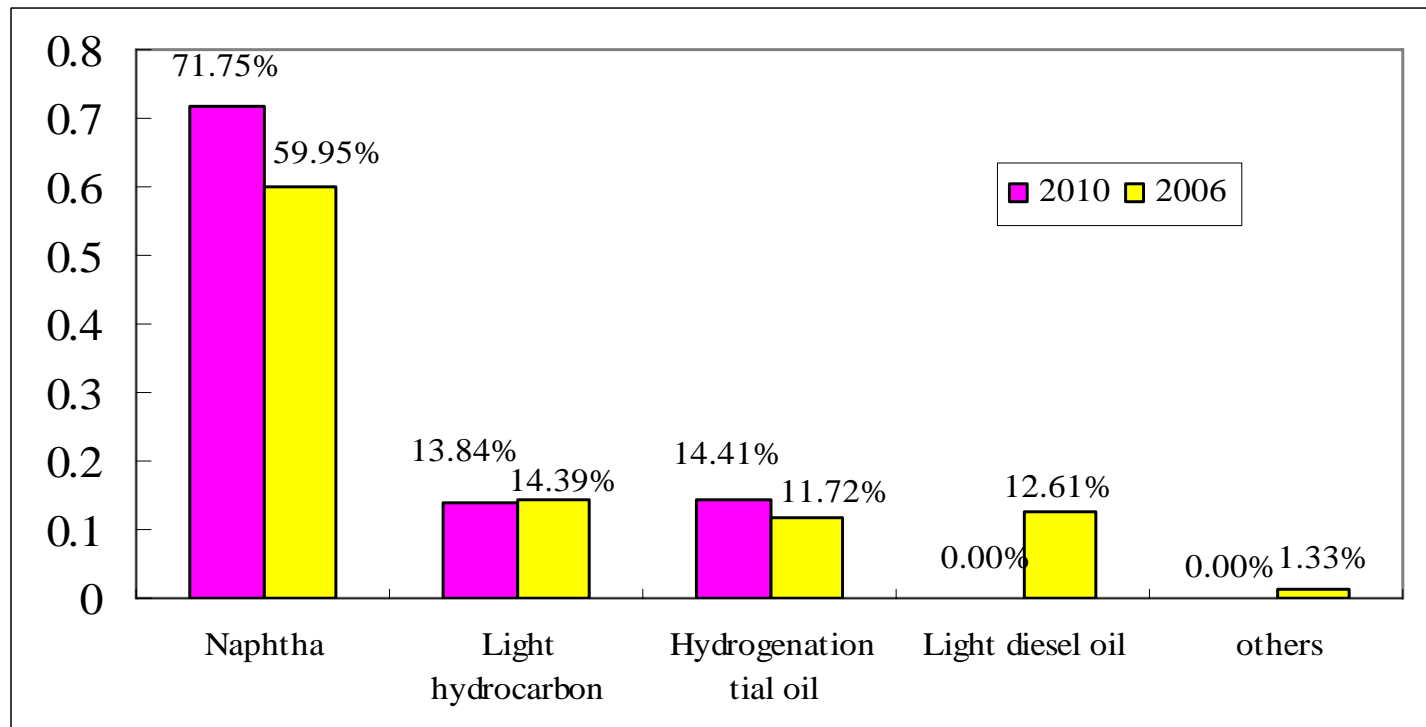
The imagination about ethylene's raw material of CNPC in 2010

Companies	Self-production			Mutual supply		Total
	Naphtha	Light hydrocarbon from refineries	Hydrogenation tail oil	Surrounding companies	Oil field	
Daqing Petrochemical	100	20	70	60	95	345
Jilin Petrochemical	130	15	50	65		260
Fushun Petrochemical	180	30	60	50		320
Liaoyang petrochemical	70					70
Lanzhou Petrochemical	160	10	0	20	35	225
Dushanzi Petrochemical	290	20	70		15	395
Sichuan Petrochemical	180	20	20	40		260
Total	1110	115	270	235	145	1875

2 Planning of ethylene development and raw material supply of CNPC

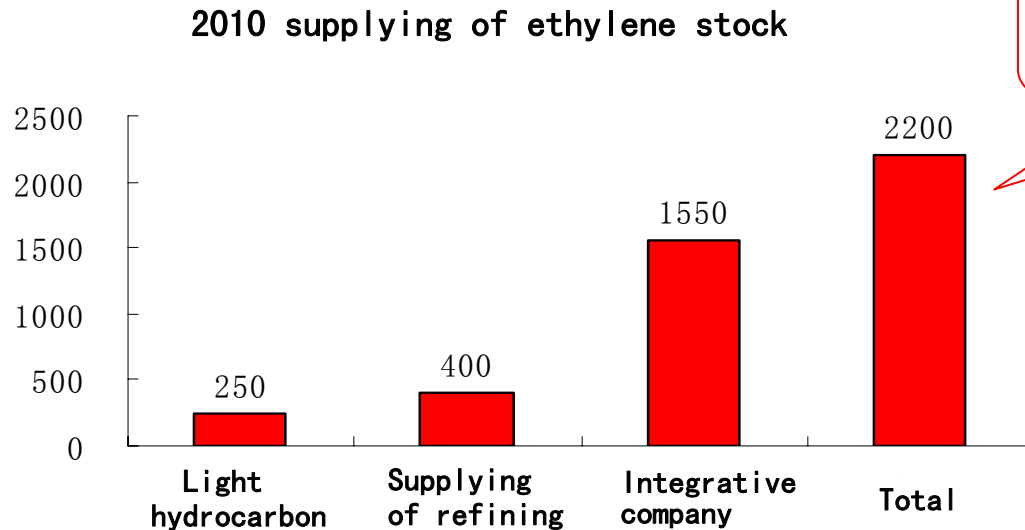
3) Plan of ethylene and imagination about its raw material supply

Ethylene's raw material structure of CNPC in 2010



3、 CNPC ethylene stocks optimizing and measurement of securing

1) Trends of ethylene feed stock supplying as a whole



the gross of stock satisfy requirement of ethylene development

- 2010 integrative company self-supplying feed stocks are 1550×10^4 t, which don't satisfy requirement of ethylene development. So we should fully using resources of non-integrative companies and light hydrocarbon in oil fields.
- Resources are optimized in regions and efficiency of using resources is enhanced.

3、 CNPC ethylene stocks optimizing and measurement of securing

2) Principles of optimizing ethylene stocks as a whole

- On condition that ensure refined oil quality upgrading, integrative refining and chemical factories should maximum produce ethylene stocks. Optimizing aim is to using little light diesel oil possibly.**
- Resources of non-integrative refining and chemical factories should supply to adjacent ethylene plants.**
- Increasing exploiting fields light hydrocarbon, replacing some fuel with LPG of refineries, which make ethylene feed stocks become light.**

3、 CNPC ethylene stocks optimizing and measurement of securing

2)Optimizing ethylene stock project in six ethylene plants

- Daqing ethylene plant: using Daqing refining resources and oil field light hydrocarbon.**
- Jilin ethylene plant: using Harbin and Qianguo resources, shortage section come from Liaoning province, which will replace of some diesel oil.**
- Fushun ethylene plant: Using margin resources of Liaoyang petroleum chemical limited Jinzhou and Jinxi resources.**
- DuShanzi ethylene plant: Using light hydrocarbon of Xijiang oil fields, margin sections supply to Lanzhou ethylene plant.**
- Lanzhou ethylene plant: Using resources of Urumchi petroleum chemical, Tuha and Xinjiang oil fields, and exploited maximum, which will replace of some diesel oil.**
- Sichuan ethylene plant: Using resources of Urumchi petroleum chemical and Yumen refinery.**

3、 CNPC ethylene stocks optimizing and measurement of securing

3) Measurement of securing ethylene feed stock in future

- Applying integrative refining and chemical ,development of future ethylene industry should base on refining, ensure supplying 75% feed stock.**
- In order to satisfy requirement of advanced ethylene stocks, we should exploit overseas resources and markets and look for stocks in the world.**
 - In 2010, Middle East naphtha net export will exceed 4.1×10^4 t.**
 - Middle Asia and Russia are rich in light hydrocarbon resource, however, it's utilization ratio is lower. Using their light resource to satisfy the requirement of optimizing ethylene stock.**
- Waking out and build large-scale ethylene plants in resourceful zones or circumjacent countries, this stratagem will offset ethylene stock of China, and broaden overseas spaces of CNPC.**

Thank you!

Baowen Sun
sunbaowen@CNPC.com.cn

tel: 861082383164
fax: 861082383181