

IEEJ: November 2009

**Northeast Asia Petroleum Forum 2009**

Current Status and Challenges of  
Korea's Oil Industry



***OH. KANG HYUN***  
***Chairman of***  
***Korea Petroleum Association***  
***[www.oil.or.kr](http://www.oil.or.kr)***

# Contents

**I. Current Status**

**II. Significance of Korea's oil  
industry**

**III. Challenges and Goals**

# I. Current Status

## Korea's Key Energy Index

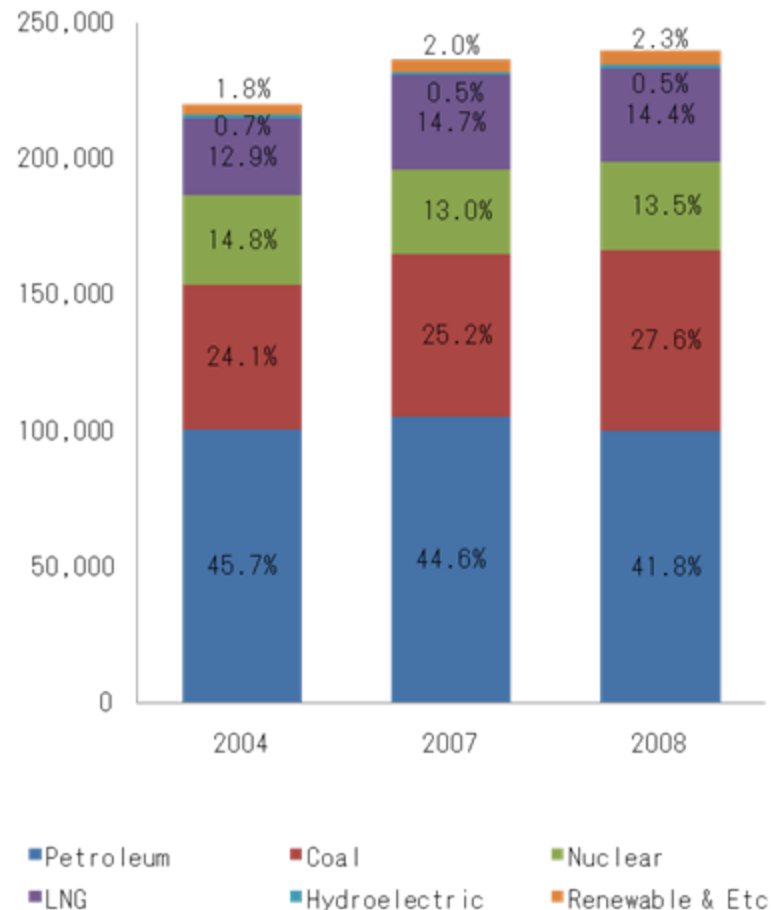
	Unit	2004	2005	2006	2007	2008
GDP Growth Rate	%	4.7	4.0	5.0	5.0	2.5
Primary Energy Consumption	1,000 TOE	220,238	228,622	233,400	236,500	239,800
(Growth)	%	2.4	3.8	2.1	4.1	1.4
Energy Import	Million \$	49,600	66,697	85,570	94,980	141,480
(Growth)	%	32.0	34.5	28.3	11.0	49.0
Dependence on Foreign Energy	%	96.7	96.8	96.8	96.5	96.4
Petroleum Import	Million \$	38,274	52,322	67,990	60,320	85,860
(Growth)	%	27.1	36.7	29.9	-11.3	42.3
% of Energy Among Total Import	%	17.2	20.0	22.0	26.6	32.5

# Energy Consumption

## Primary Energy Consumption

(Unit : 1,000 TOE)

	2004	2005	2006	2007	2008
Petroleum	100,638	101,526	101,500	105,500	100,200
Coal	53,127	54,788	56,680	59,700	66,100
Nuclear	32,679	36,695	36,700	30,700	32,400
LNG	28,351	30,355	30,400	34,700	34,500
Hydroelectric	1,465	1,297	1,300	1,100	1,200
Renewable & Etc	3,977	3,961	4,000	4,800	5,400
<b>Total</b>	<b>220,237</b>	<b>228,622</b>	<b>230,580</b>	<b>236,500</b>	<b>239,800</b>

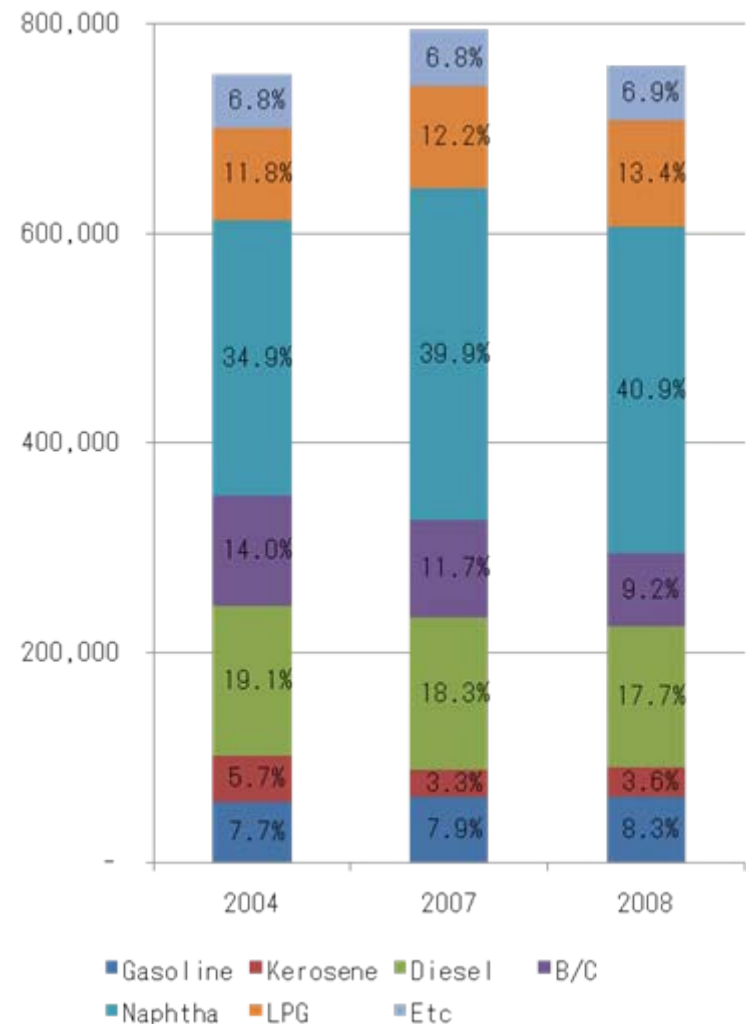


# Energy Consumption

## Petroleum Consumption by Type

(Unit : 1,000 BBL)

	2004	2005	2006	2007	2008
Gasoline	58,151	59,561	59,874	62,500	62,937
Kerosene	43,090	39,392	31,450	26,172	27,659
Diesel	143,799	142,529	142,433	145,327	134,513
B/C	104,977	100,513	96,892	92,809	69,996
Naphtha	262,871	273,250	287,003	316,858	311,368
LPG	88,432	91,668	93,451	97,143	101,881
Etc	51,009	54,167	54,417	54,136	52,286
<b>Total</b>	<b>752,328</b>	<b>761,080</b>	<b>765,520</b>	<b>794,945</b>	<b>760,641</b>



# Crude Oil Import

(Unit: million Bbl, million \$, \$/B)

Crude Oil Import	2005		2006		2007		2008		2009 2 <sup>nd</sup> Half		2009(E)	
		Growth		Growth		Growth		Growth		Growth (*)		Growth
Quantity	843.2	2.1	888.8	5.4	872.5	△ 1.8	864.9	△ 0.9	424.2	△ 2.2	850.0	△ 1.1
Value	42,604	42.6	55,846	31.1	60,571	8.4	84,995	40.5	21,035	△ 52.7	51,066	△ 39.9

(\*) compared to 1<sup>st</sup> half of 2008

- **Import Amount**

- ✓ 865 mil. BBL in 2008 → 850 mil. BBL in 2009(E)

- ✓ 85 bil. \$ in 2008 → 51 bil. \$ in 2009(E)

- **Source of Import**

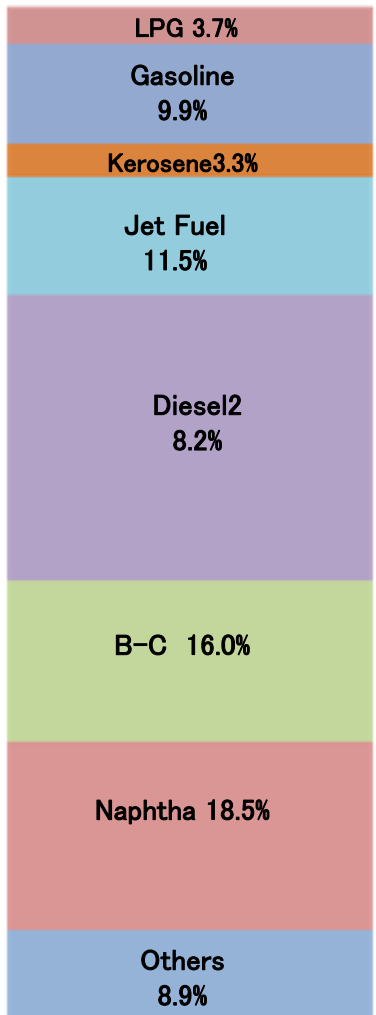
- ✓ Middle East 86.3%, Asia 12.5%, Africa 1.1%

- ✓ Heavy dependence on the Middle East (Saudi Arabia 30.4%, UAE 18.3%, Kuwait 12.1%)

# Production/Consumption

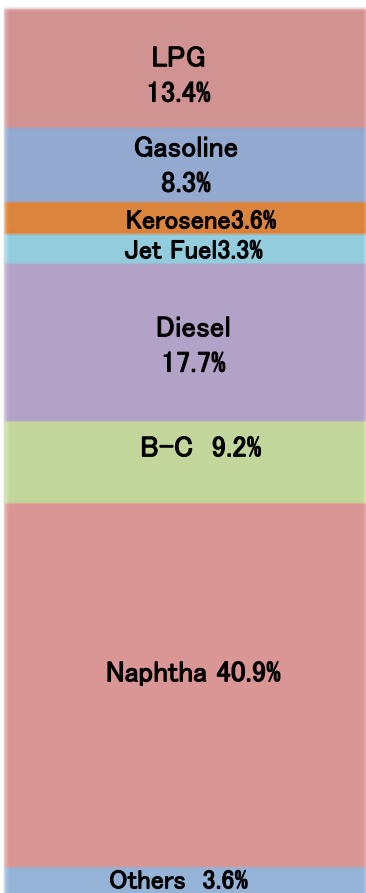
## Production

938.7 MM bbl



## Consumption

760.6 MM bbl



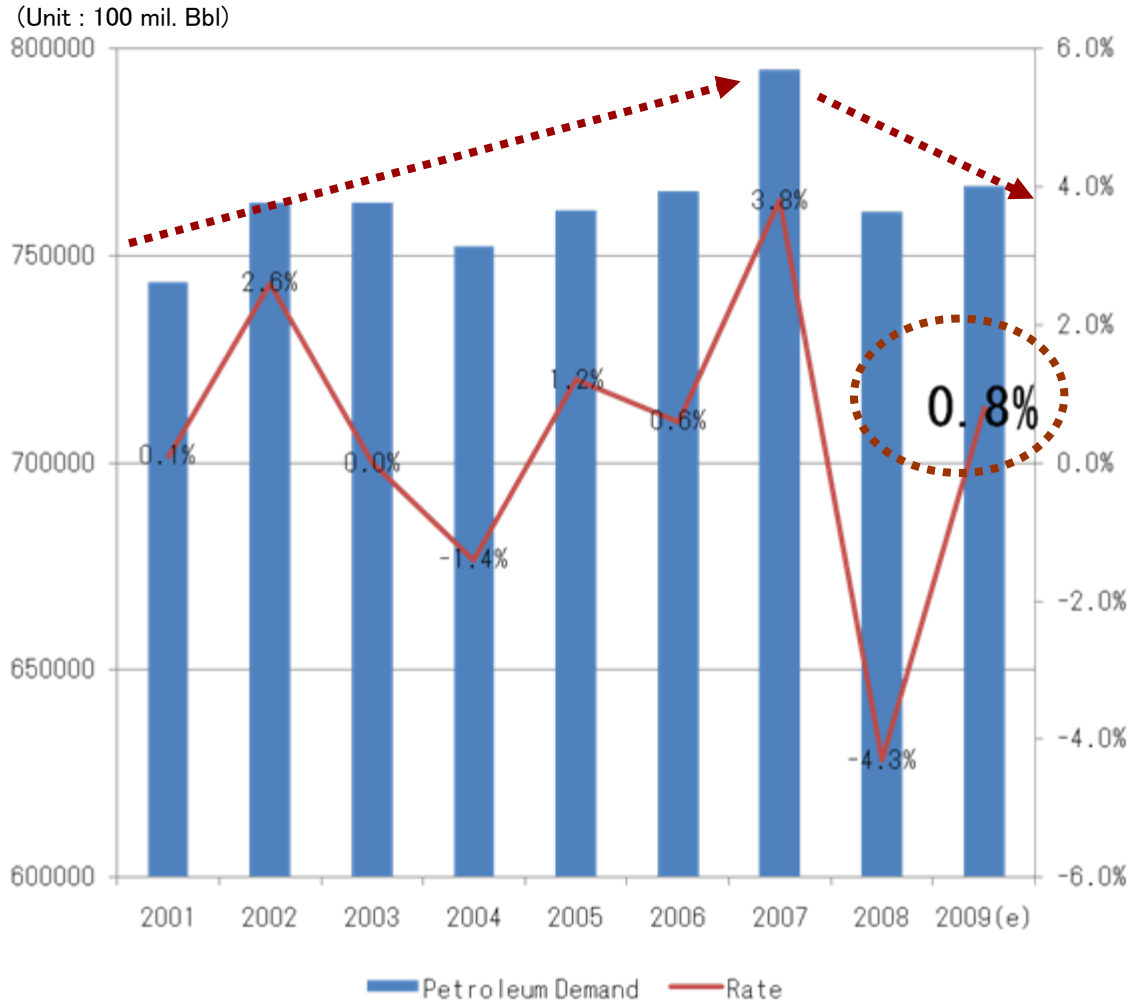
• Only 80% of production is consumed locally. Overproduction (20% of total production) is exported.

• Domestic market is currently an oligopolistic market. However competition is on the rise as a result of overproduction.

Source: PEDSIS of KNOC(2008)

# Domestic Petroleum Demand Forecast (2009)

Despite an average growth rate of +1.0% for the last 7 years, due to global recession, demand for petroleum fell by 4.3% in 2008. It is expected to grow by 0.8% in 2009 (767 million BBL).



- Higher demand in the public and industrial sector as a result of economic stimulus policy
- Lower demand in residential, commercial, transportation sector due to weak consumption
- Increasing demand for gasoline, B-C and naptha.



## Korea's emergence as a global giant in petroleum in only half a century



Korea's  
Current  
Status

Import: **5<sup>th</sup>** in the world(2,823 Thou. b/d)

Refining Capacity: **6<sup>th</sup>** in the world(2,905 Thou. b/d)

Consumption: **7<sup>th</sup>** in the world(2,371 Thou. b/d)

## II. Significance of Korea's Oil Industry

---

No. of  
firms related to oil



No. of persons employed  
by oil & related  
industries



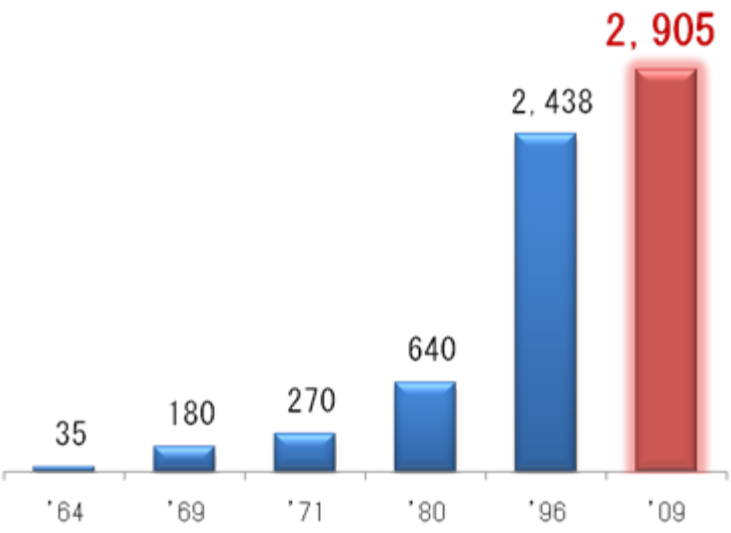
Value added generated  
by oil & related  
industries



# Remarkable Growth

In 1964, domestic refining industry started with a capacity of 35 Thou. B/D.

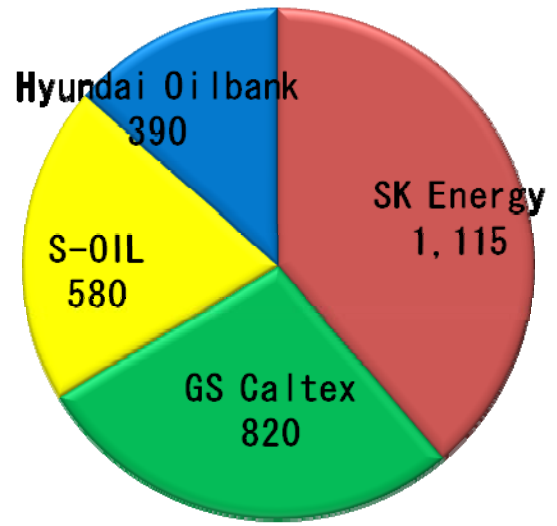
Korea's Refining Capacity (1,000 b/d)



In 2009, Korea ranked world 6<sup>th</sup> in refining capacity.

⇒ 83-fold increase over the past 45 years

Refining Capacity by Company (1,000 b/d)

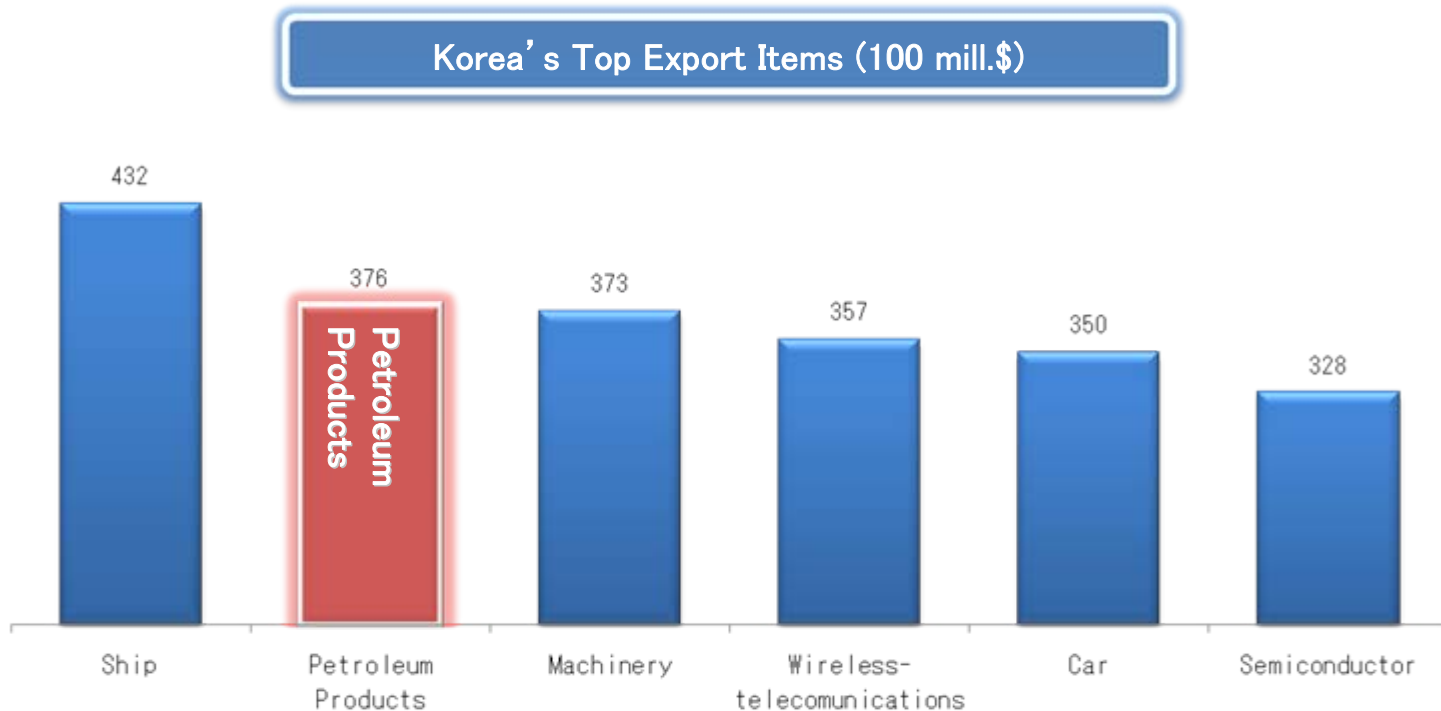


Total : 2,905 Thou. b/d

Source: Data for refining capacity by company is from first half of 2009

# An Export-Oriented Industry

- Petroleum products ranked second among Korea's top export items in 2008
- Oil industry has transformed into an export-oriented industry (Export ratio: 60%)
- Increasing contribution to Korea's GDP (1991 : 4.8% → 2008 : 11.5%)
- Improving Korea's trade balance : Offset 45% of crude oil import cost



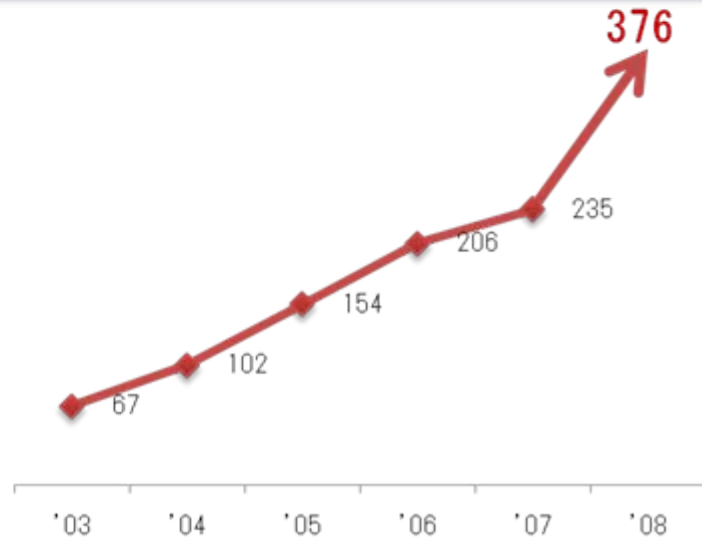
# Petroleum Products Export

(Unit: million Bbl, million \$, \$/B)

Export	2005		2006		2007		2008		2009 1 <sup>st</sup> half		2009(E)	
		Growth		Growth		Growth		Growth		Growth (*)		Growth
Quantity	262.6	11.5	289.1	10.1	292.1	1	333.8	14.3	161.2	9.5	324.4	△2.2
Value	15,362	51.1	20,601	34.1	23,446	13.8	36,967	57.7	9,432	△47.8	21,945	△40.6

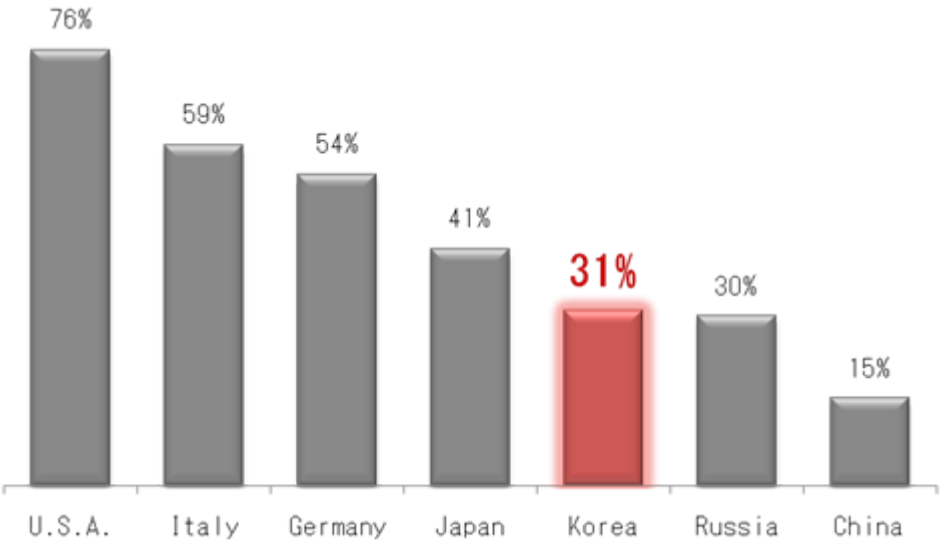
(\*) compared to 1<sup>st</sup> half of 2008

Export Value of Petroleum Products (100 mil. \$)



# Expanding Investment

Upgrading Ratio of Major Countries(%)



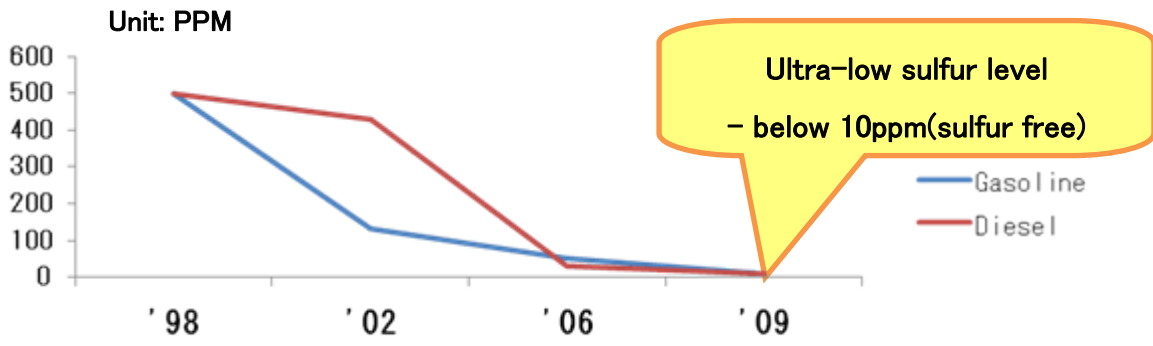
- Korea's upgrading ratio standing at 30.5%
- Continuing to invest in upgrading projects in par with global leaders
- Committed to invest 11 tril. KRW by 2011

Company	BusinessSectors	Details	Amount
SKEnergy	Refining	Upgrading Facilities	150 billion won
	Renewable Energy	Secondary Cell	80 billion won
GS Caltex	Refining	UpgradingFacilities	300 billion won
	Renewable Energy	Fuel Cell	120 billion won
S-OIL	Petrochemical	Facilities	140 billion won
Hyundai Oilbank	Refining	UpgradingFacilities	210 billion won
	Petrochemical	BTXFacilities	150 billion won

Source : Oil & Gas Journal databook (2008.1)

# Notable Improvements in Quality/Environment

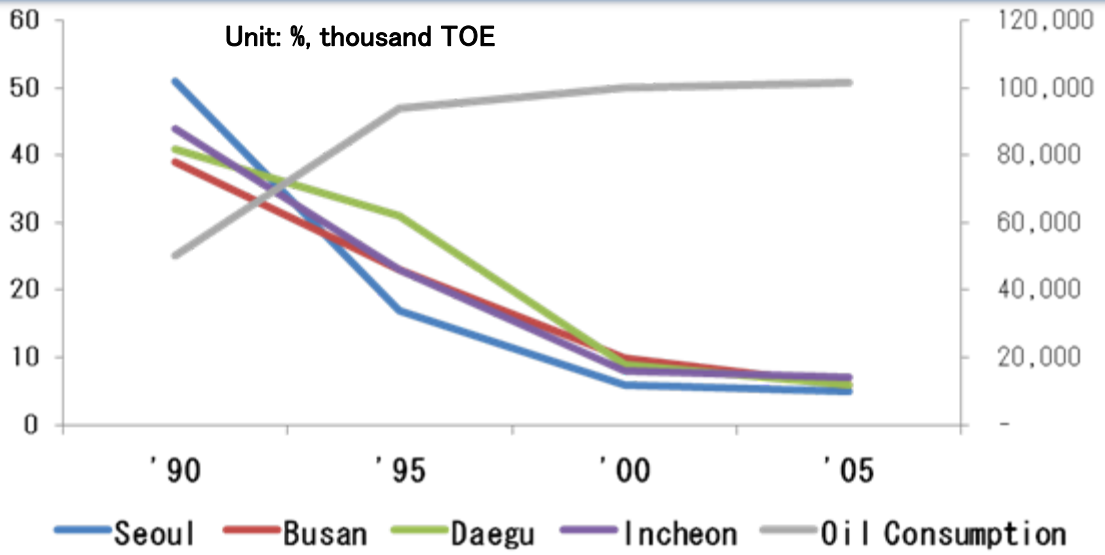
## Sulfur in Petroleum Products



Drastic sulfur reduction in fuel oil

- ✓ Compliance with US's gasoline and Europe's diesel standards
- ✓ Japan is the only country to meet both US and EU's standards in Asia

## Sulfurous Acid Gas Density and Oil Consumption in Major Korean Cities



While oil consumption has doubled, gas density has dropped by 90% during the same period ('90~'05).

### Cutthroat Competition

- Global refining capacity is expected to increase by 24% by 2015
- Asia accounts for 83% of the expansion plan

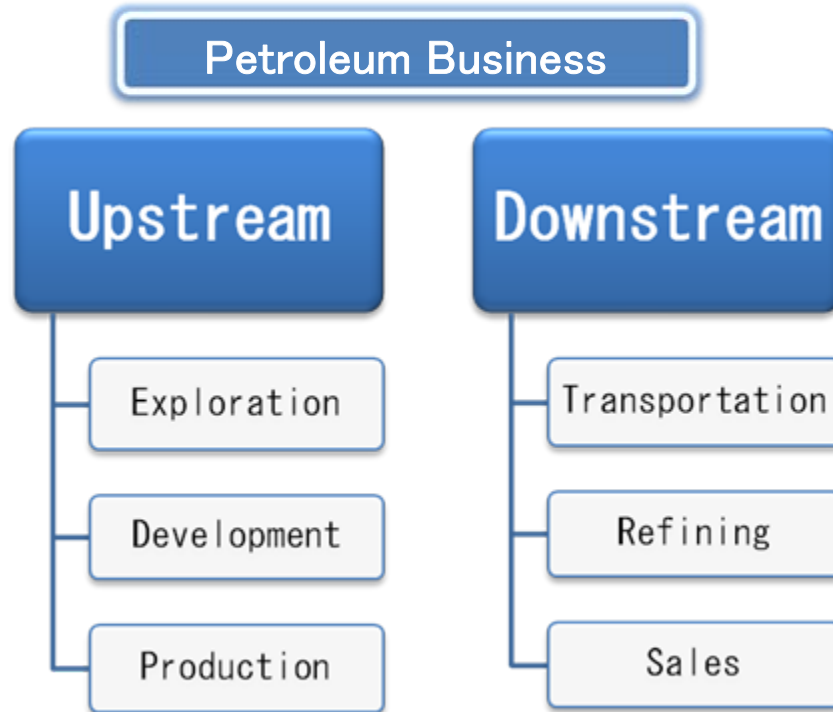
### Environmental Regulations

- Post-Kyoto agreement negotiations are underway
- Stronger emphasis on CO<sub>2</sub> reduction
- Higher standards on fuel quality

### Profitability Decline

- Diminishing demand
- Higher demand for new/renewable energy
- Shrinking refining margins





- To enhance profitability and competitiveness, local refineries, currently relying on downstream-centered business, are strongly required to enlarge their E&P business.
- Asset value of oil & gas fields have dropped due to the current economic downturn. Hence, a good opportunity to invest in E&P.

## Environmental Regulations

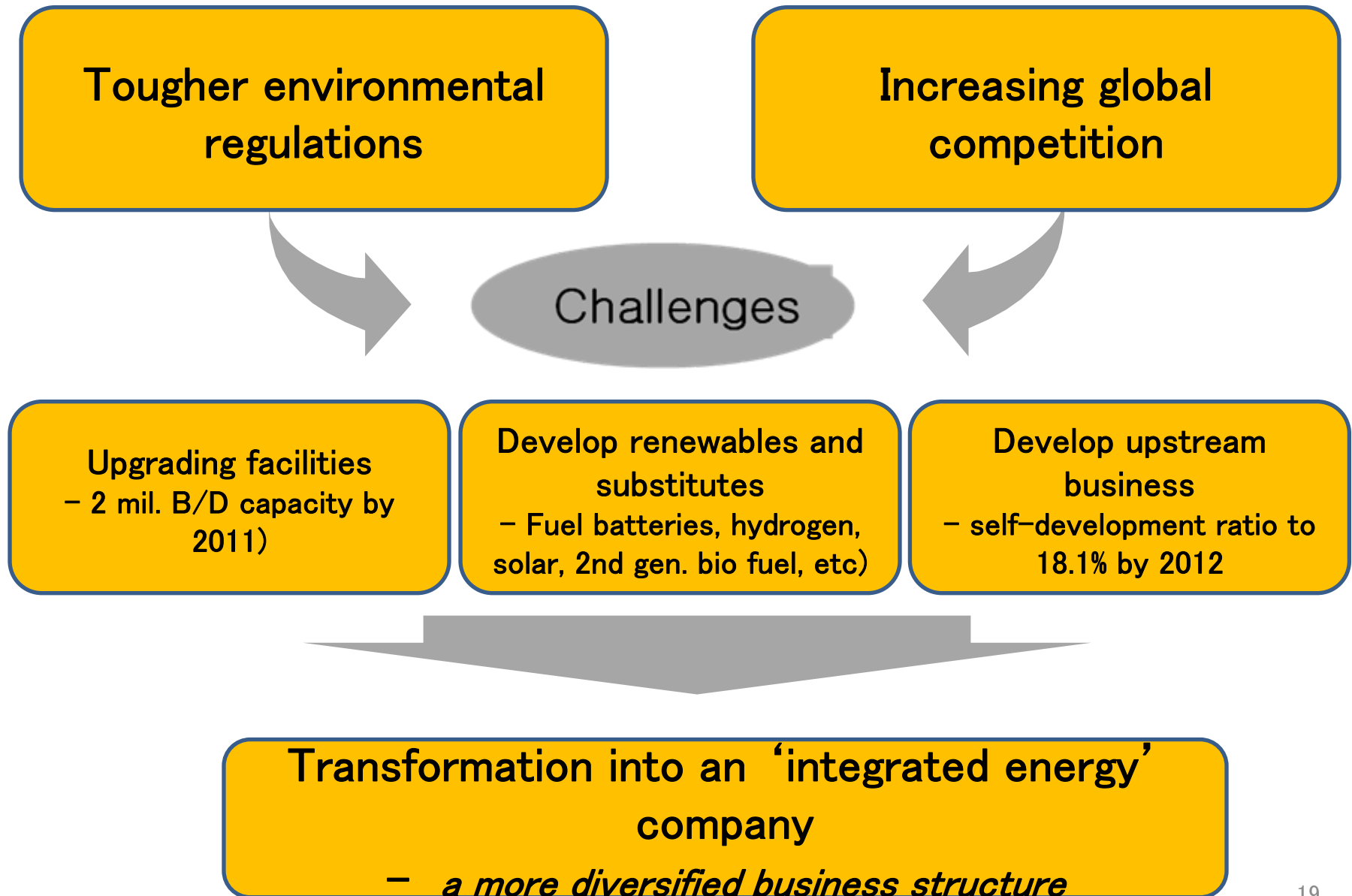
- External

- Post-Kyoto protocol negotiations underway (by Dec., 2009)
  - Emission reduction targets: 25~40% reduction from 90 for advanced countries, 15~30% reduction from BAU for developing countries)

- Internal

- Green growth policies
- Air pollutant limitation system for Seoul and metropolitan area (‘07~’ 12)
- Stricter standards on auto fuel quality (‘09~)
- Tougher regulations on air pollutant emission (‘10~)

# Challenges of domestic oil industry



## Greater Potential

- World economic power shifting into NE Asia
- China, Japan and Korea's share of global GDP: 17%
- China, Japan and Korea's share of global oil consumption: 20%

## Low presence in the international market

- Asian premium in the Middle East crude oil market
- Low-profile in energy-related financing

## Areas for enhanced cooperation

- Increased petroleum product trade, crude oil and LNG cargo swaps
- Joint use of stockpiling facilities for crude oil and LNG
- Joint efforts in energy-efficient technology and renewables development
- Green-growth strategy and policies e.g. environmental measures

# Thank You

*Korea Petroleum  
Association  
[www.oil.or.kr](http://www.oil.or.kr)*