

# REVIEW AND PROSPECTS OF KOREA PETROLEUM MARKET

***Korea Petroleum Association***

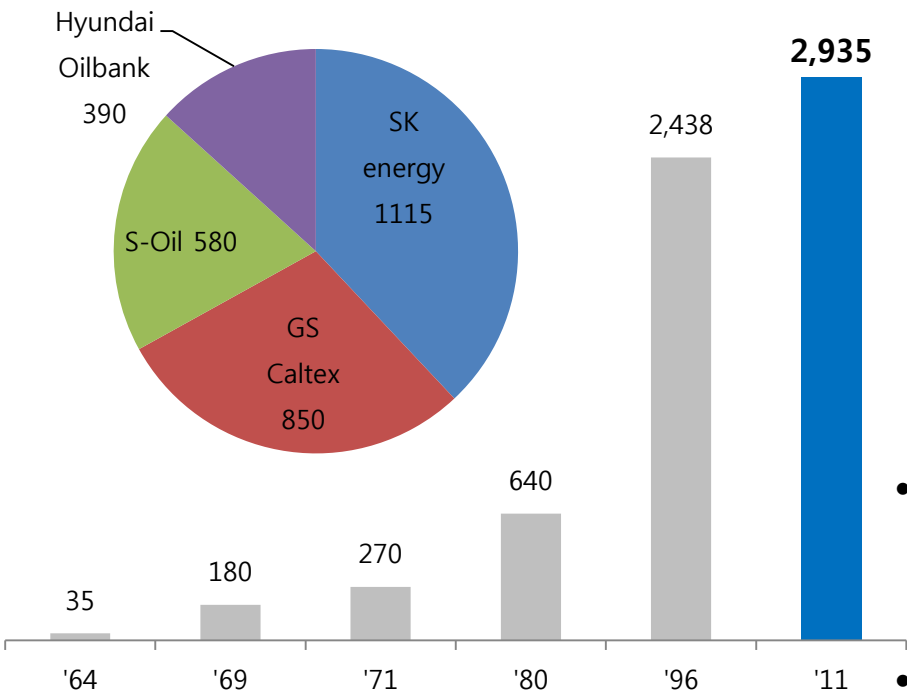
***[www.oil.or.kr](http://www.oil.or.kr)***

***2011.10.18***

# Current Status of the Oil Industry in Korea

**1964**, Beginning of the oil industry  
(Refining capacity 35,000 B/D)

Development of refining capacity (1000b/d)



Growing as an oil industry power

- World's **7<sup>th</sup>** Refining Capacity:  
(2,712,000b/d)
- **9<sup>th</sup>** oil consuming country in the world  
(2,384,000b/d)

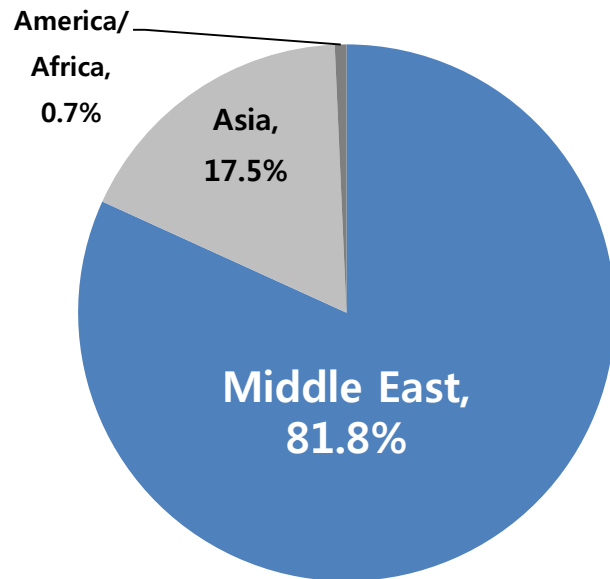
2010, refining capacity 2,935,000 b/d

⇒ **84**-fold increase over 47 yrs

BP Statistical Review of World Energy June 2011

# Oil Import

Oil imports – **872.42 mil bbl** (2,390,000B/D)

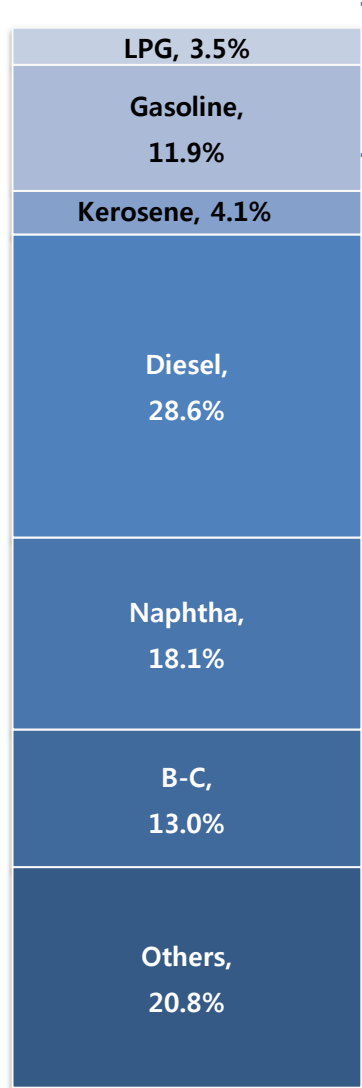


- **Middle Eastern oil reliance : 81.8%**  
Saudi Arabia 31.7%, UAE 12.1%, Kuwait 11.8%
- **ME - Significant oil reserves : 61.0%**  
Eurasia 11.6%, Africa 9.5%, North America 5.6%
- **Transportation efficiency**  
duration : ME 20~25 days  
Africa and America 30~40 days

# Production & consumption of petroleum products

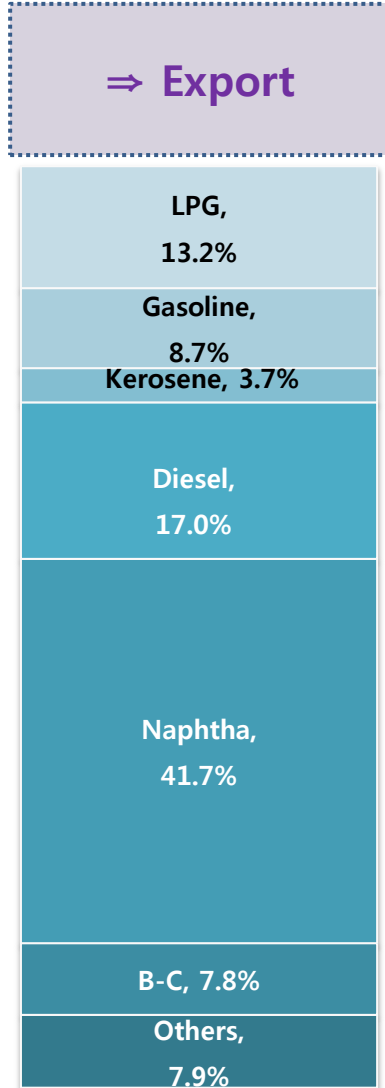
## Production

938.93 mil bbl



## Consumption

794.52 mil bbl



**Oversupply  
20%**

**⇒ Export**

- Oversupply in domestic market  
⇒ **High competition**  
**Profitability worsen**  
**Concentration on export market**
- **LPG : Import reliance 66%**
- **50% of Diesel production is exported**
- **Excellent Petrochemical industry**
- **Naphtha consumption : 42% of total petroleum consumption**

# Supply and Demand flow chart(2010)

## Crude oil Import

872 mil Bbl(2,390,000B/D),  
Amount 68.7bil\$

※ Daily operation capacity : 2,935,000Bbl

**Products  
Production**  
939milBbl  
(2,570,000B/D)

**Products  
Import**  
277milBbl  
(760,000B/D)  
20.9bil\$

**Supply**  
1,218milBbl  
(3.34mil B/D)

**Demand**  
1,186milBbl  
(3.25mil B/D)

**Domestic  
Consumption**  
7.95milBbl  
(2.18mil B/D)

**Products  
Export**  
342milBbl  
(940,000 B/D)  
29.9bil\$

**International  
Bunkering**  
49milBbl  
(140,000B/D)  
3.9bil\$

**Net income of oil (Crude oil import + product  
import - product export- international bunkering)**  
758milBbl(2.07,milB/D), 55.8bil\$

# Crude oil import(2010)

[Crude oil import] 872milBbl(4.5% ↑), 68.7bil\$(18bil\$ ↑)

- An increase in domestic demand and export of oil product according to economic recovery inside and outside of the country creates increased refinery production

The amount of crude oil imported shows an increase of 4.5% compared with the previous year.

- Crude oil imports by country are in the order of Saudi Arabia, UAE, Kuwait, Iran, Qatar, and Iraq.

## < Crude oil Import country rank by quantity & amount >

	<b>Saudi Arabia</b>	<b>UAE</b>	<b>Kuwait</b>	<b>Iran</b>	<b>Qatar</b>	<b>Iraq</b>	<b>Total</b>
Total(1000b)	276,787	105,656	103,079	72,605	64,362	59,956	872,415
Daily(1000b)	758	289	282	199	176	164	2,390
Ratio(%)	31.7	12.1	11.8	8.3	7.4	6.9	100.0
Increase(%)	8.6	△7.8	3.0	△10.8	19.9	△4.1	4.5
Amount(mil\$)	21,870	8,417	8,049	5,616	5,069	4,647	68,684

## < Regional crude oil import >

	<b>ME</b>	<b>Asia</b>	<b>Africa</b>	<b>America</b>	<b>Total</b>
Quantity(mil b)	713.647	152,354	4,592	1,823	872,415
Ratio %	81.8%	17.5%	0.5%	0.2%	100%

# Petroleum products demand (2010) : 1,186milb(2.7% ↑ , 325milb)

[Domestic consumption] 795milb(2.1% ↑ , 218milb/d)

- Consumption by oil type is in the order of Naphtha, Diesel, Gasoline, B-C and Kerosene

< Consumption by oil type >

	Naphtha	Diesel	Gasoline	B-C	Kerosene	Total
Total(1,000b)	331,674	134,730	68,931	62,157	29,385	794,517
Daily(1,000b)	909	369	189	170	81	2,177
Ratio(%)	41.7	17.0	8.7	7.8	3.7	100.0
Increase(%)	2.8	1.8	4.6	△5.9	13.1	2.1

- Consumption by sector is in order : Industry, Transportation, Household & commercial, power

<Consumption by sector >

	Industry	Transport	Household/ commercial	Power	Others	Total
Total(1,000b)	442,069	263,664	54,904	19,530	14,350	794,517
Daily(1,000b)	1,211	722	150	54	39	2,177
Ratio(%)	55.6	33.2	6.9	2.5	1.8	100.0
Increase(%)	1.6	2.1	5.8	△10.5	25.1	2.1

# Demand of Petroleum products (2010)

[Export] 342milb(3.3% ↑, 940,000b/d), 29.9bil\$(7.3bil\$ ↑)

- Export by products is in the order of Diesel, Jet Fuel, Gasoline, Naphtha, B-C, Asphalt

< Export by products : Quantity & Amount >

	Diesel	Jet Fuel	Gasoline	Naphtha	B-C	Asphalt	Total
Total(1,000b)	130,761	71,449	39,338	32,111	25,565	18,531	341,784
Daily(1,000b)	358	196	108	88	70	51	936
Ratio(%)	38.3	20.9	11.5	9.4	7.5	5.4	100.0
Increase(%)	4.2	2.3	△2.1	20.9	0.7	16.9	3.3
Amount(mil\$)	11,755	6,384	3,479	2,579	1,890	1,412	29,899

- Export by country : China, Japan, Singapore, Indonesia and U.S.A.

< Export by country : Quantity & Amount>

	China	Japan	Singapore	Indonesia	USA	Hongkong	Total
Total(1,000b)	76,736	40,607	40,546	37,429	36,674	19,209	341,784
Daily(1,000b)	210	111	111	103	100	53	936
Ratio(%)	22.5	11.9	11.9	11.0	10.7	5.6	100.0
Increase(%)	14.1	33.6	△38.7	124.7	53.1	△17.6	3.3
Amount(mil\$)	6,330	3,363	3,572	3,313	3,298	1,725	29,899

source : MKE, Statistics of Energy industry(11.6) ※ Export by region : Asia 75%, America 17%, Europe 6%, Africa 1.8%, Middle East 0.7%



# Demand of Petroleum products (2010)

[International Bunkering] 49milb(8.5% ↑, 140,000b/d), 3.9bil\$(1bil\$ ↑)

- Demand by oil type : B-C, Jet Fuel, Diesel

< International Bunkering: Quantity/Amount >

	B-C	Jet Fuel	Diesel	B-A	Total
Total(1,000b)	37,401	7,933	3,493	513	49,341
Daily(1,000b)	102	22	10	1	135
Ratio(%)	75.8	16.1	7.1	1.0	100.0
Increase(%)	6.8	17.6	4.1	40.9	8.5
Amount(mil\$)	2,796	741	330	48	3,915

source : Ministry of Knowledge Economy('11.2)

# Supply of Petroleum products (2010)- 1,216milb(3.0% ↑, 3.33milb/d)

[Production] 9.39milb(2.9% ↑, 2.57milb/d)

- Producing by oil type is in the order of Diesel, Naphtha, B-C, Gasoline, Jet-Fuel

< Production by oil type: Quantity >

	Diesel	Naphtha	B-C	Gasoline	Jet-Fuel	Kerosene	LPG	Total
Total(1,000b)	268,392	169,721	122,501	111,811	105,781	38,681	32,631	938,926
Daily(1,000b)	735	465	336	306	290	106	89	2,572
Ratio(%)	28.6	18.1	13.0	11.9	11.3	4.1	3.5	100.0
Increase(%)	2.6	6.7	1.1	2.9	3.1	19.0	△7.1	2.9

source : Ministry of Knowledge Economy('11.2)

# Supply of Petroleum products (2010)

[Import] 2.77milb(3.2% ↑, 0.76milb/d), 20.9bil\$(6bil\$ ↑)

- Import by oil type is in the order of Naphtha, LPG, B-C, Diesel, Kerosene

< Imports by oil type: Quantity & Amount >

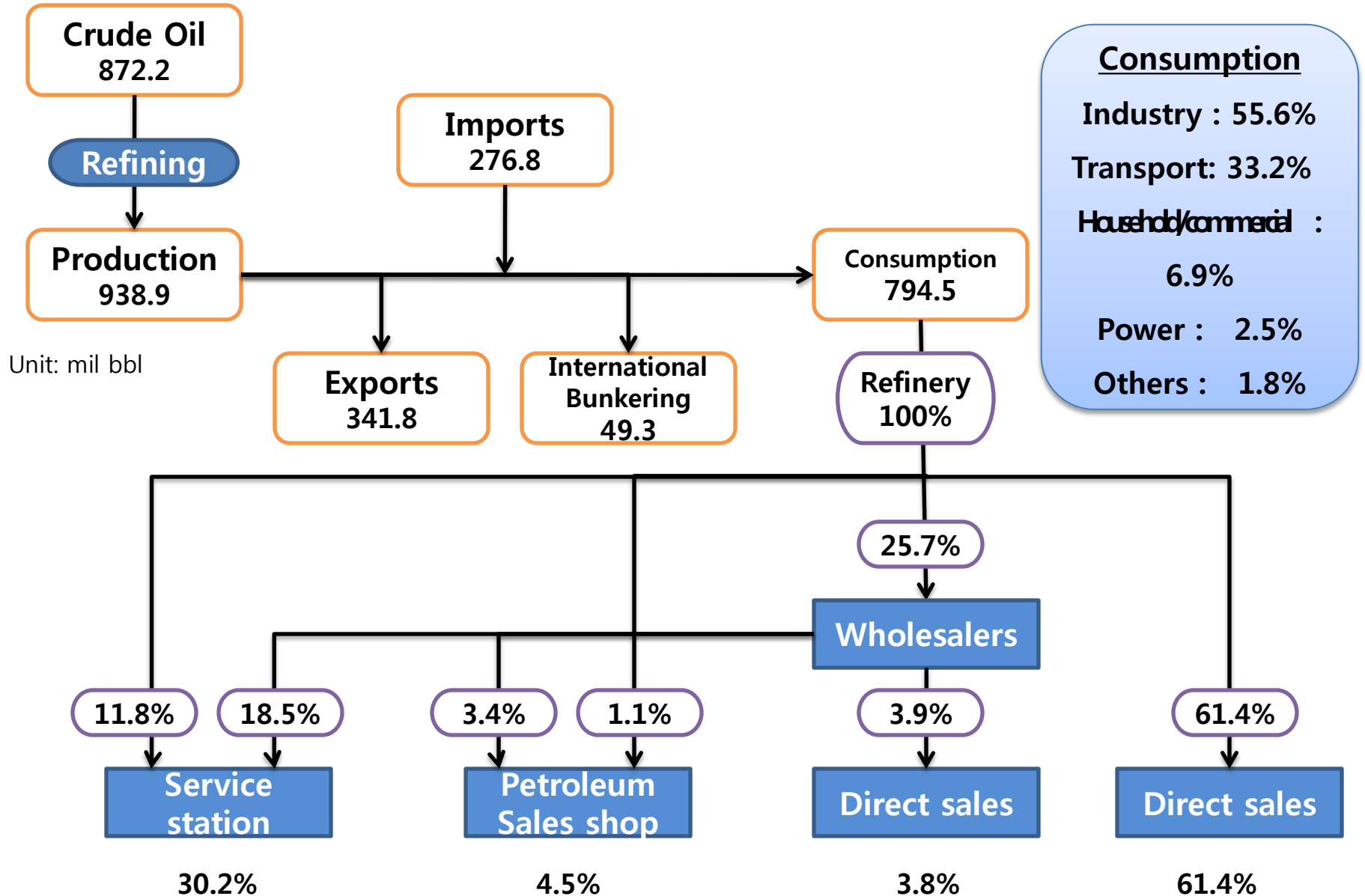
	Naphtha	LPG	B-C	Diesel	Kerosene	Total
Total(1,000b)	188,600	69,629	17,478	758	331	276,849
Daily(1,000b)	517	191	48	2	1	758
Ratio(%)	68.1	25.2	6.3	0.3	0.1	100.0
Increase(%)	4.3	5.2	△11.9	△9.3	386.8	3.2
Amount(mil\$)	15,167	4,296	1,295	71	34	20,869

- Import by countries in the order of UAE, Saudi, India, Kuwait, Qatar

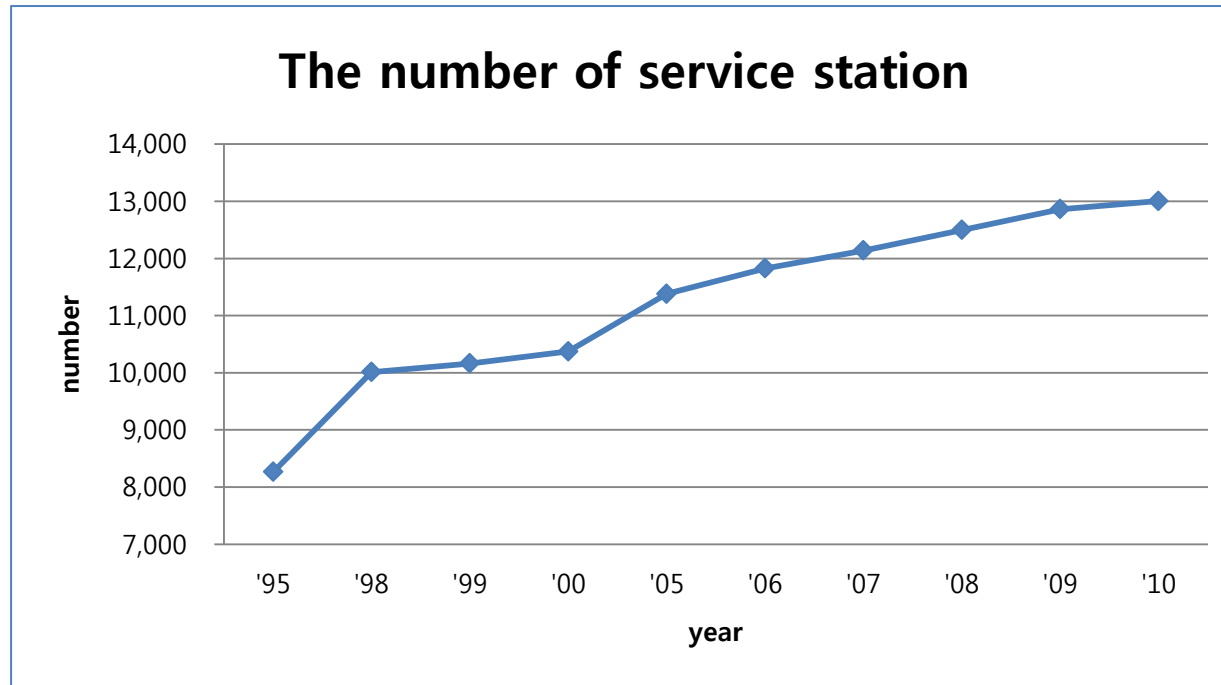
< Imports by Country : Quantity & Amount >

	UAE	Saudi Arabia	India	Kuwait	Qatar	Malaysia	Total
Total(1,000b)	45,765	41,825	37,858	28,872	26,711	20,444	276,849
Daily(1,000b)	125	115	104	79	73	56	758
Ratio(%)	16.5	15.1	13.7	10.4	9.6	7.4	100.0
Increase(%)	16.4	△8.5	2.0	△8.0	112.3	38.9	3.2
Amount(mil\$)	3,345	3,139	3,059	2,116	1,896	1,479	20,869

# Distribution channel(2010)



# The number of service station



year	'95	'98	'99	'00	'05	'06	'07	'08	'09	'10
number	8,266	10,012	10,162	10,373	11,382	11,827	12,139	12,498	12,862	13,003

Source : Korea oil station association

- **Stable supply of oil** - even during oil crises

- ✓ Contribute to stabilized oil supply during the world oil crisis
  - Oil crisis in early of '80, '91 Gulf war, '01 Iraqi war
- ✓ Supply with cheaper price (compare with international price) as scheduled, despite of high oil prices

- **Oil stockpile - Stabilization of national energy supply**

## Gov&Company Quotas

(Unit : day)

	Stockpiling quotas		
	Crude Oil	Product	Total
Gov	87.6	13.0	100.6
Com	39.3	46.7	86.0
Total	133.3	58.0	191.3

**Gov : 100.6 days**

**Company(Refineries) : 86.0 days**

**G + C = 191.3days**

※ IEA stockpile requirement 90days (G+C)

source : MKE, Statistics of Energy industry('11.6)

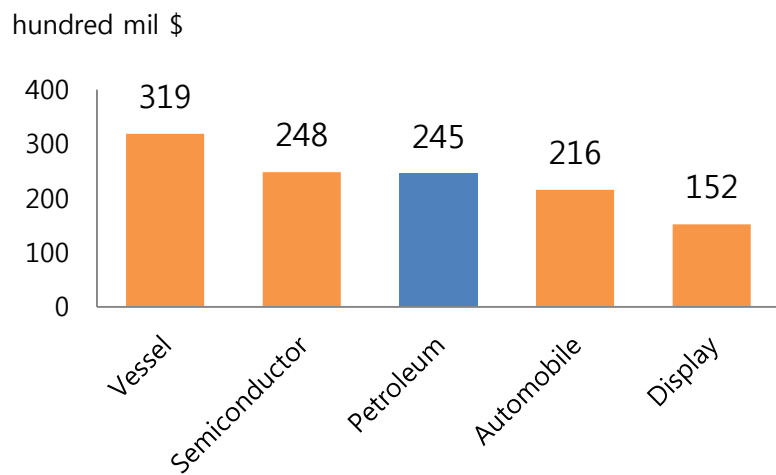
# Products Exports

Trends of Products Export



Source : KNOC, MKE

National leading Export item('11 the 1 half )

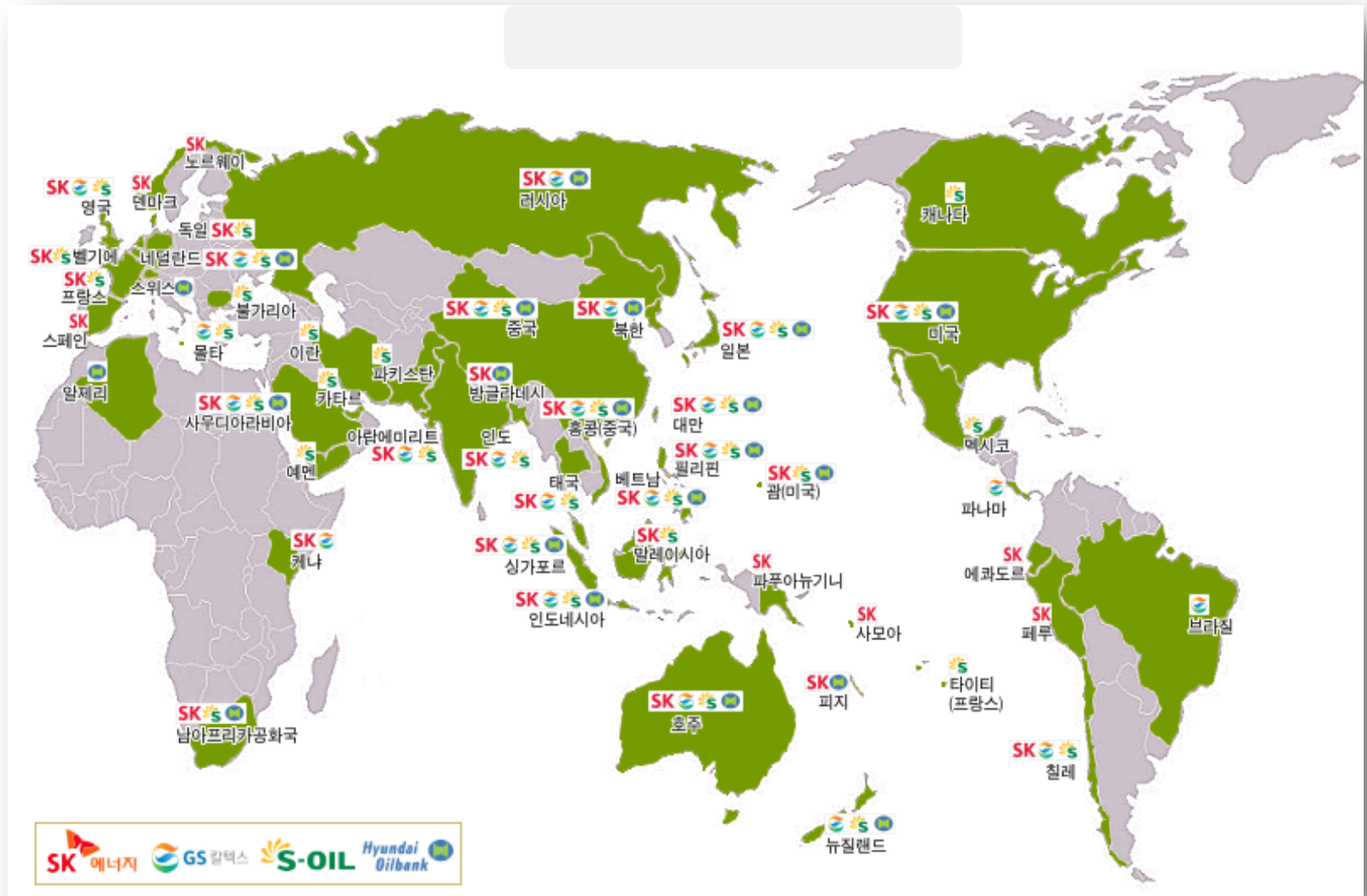


Source : Ministry of Knowledge Economy

- Oil product export **29.9 billion dollars**(2010)
  - Year 2010 - The 2<sup>nd</sup> highest ever after '08 (37 bil\$), (app. **60%** of turnover exported)
  - Exceeded 20 billion dollars for 5 consecutive years
- Representing the **3<sup>rd</sup>** major export item of Korea (as of the first half of 2011)
  - Nation's leading exporting item - improve current account balance and contribute to export
  - **Oil products are one of the major export items along with semiconductors, cars and ships.**
- Exported to about **60** countries around the world ('08-'10)

# Export to the world

60 countries over the world





# Petroleum Export ratio of the total sales

- Export rate edged up to 60% , transformed to export oriented sector from domestic market.

(unit : 10bilKRW, %)

	2004	2005	2006	2007	2008	2009	2010
Domestic	2,584	3,108	3,452	3,697	4,945	3,852	4,837
Export	2,401	2,995	3,600	4,242	6,848	5,169	6,239
Others	82	83	12	15			
Total	5,067	6,186	7,064	7,953	11,793	9,021	11,076
<b>Ratio</b>	<b>47.4%</b>	<b>48.4%</b>	<b>51.0%</b>	<b>53.3%</b>	<b>58.1%</b>	<b>57.3%</b>	<b>56.3%</b>

source : Annual report of refineries

# Oil products rate among total export & contribution to GDP growth

- Drastic increase of the oil products among total exports in Korea
  - Increase of 3.4 times over 19 years (1.9% in 1991→ 6.4% in 2010)
- Continuous upward trends in terms of contribution to GDP.
  - The amount of oil product exports increased 22 times in 2010 compared with 1991
  - The turnover of oil refining companies as a proportion of total GDP rising from 4.8% (1991)→9.4% (2010)
- Exports of oil product assume 56.4% of turnover

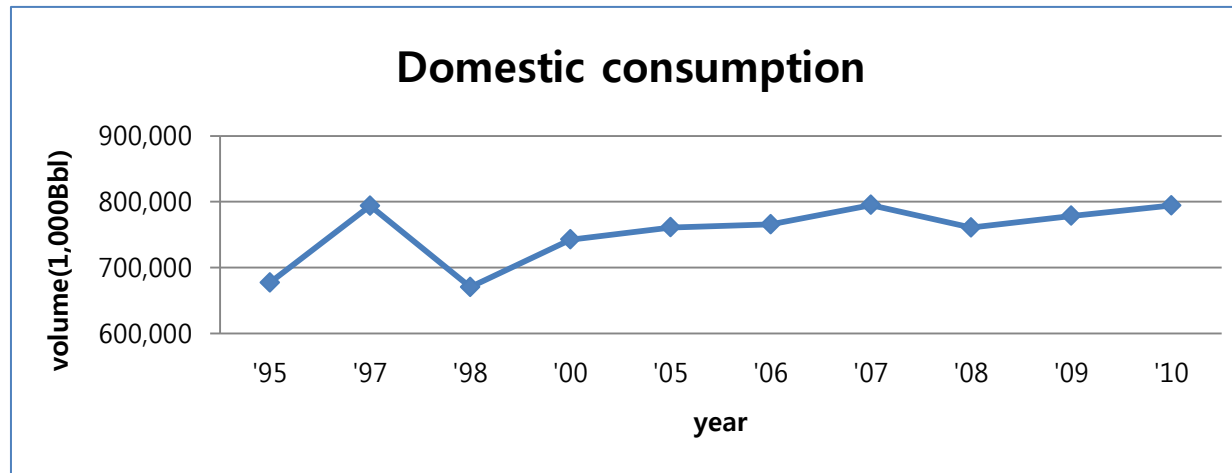
## < Oil products rate among total export & sales vol. of refining sector in GDP >

	Oil products Export (A) (mil\$)	Total export (B) (mil\$)	(%) (A/B)	Refineries Sales (C) (100milKRW)	GDP (D) (100milKRW)	(%) (C/D)
'91	1,340	71,870	1.9%	107,859	2,260,076	4.8%
'00	9,381	172,268	5.4%	434,931	5,786,645	7.5%
'04	10,173	253,845	4.0%	506,736	8,268,927	6.1%
'06	20,602	325,465	6.3%	706,444	9,087,438	7.8%
'07	23,481	371,489	6.3%	795,396	9,750,130	8.2%
'08	37,034	422,007	8.8%	1,179,288	10,264,518	11.5%
'09	22,724	363,534	6.3%	902,087	10,650,368	8.5%
'10	29,899	466,384	6.4%	1,107,597	11,728,034	9.4%

Source : BOK, KITA, KNOC, FSS

# Prospects on demand for oil products(2010~2015)

## The flow of domestic consumption



year	'95	'97	'98	'00	'05	'06	'07	'08	'09	'10
volume	677,210	793,899	670,278	742,557	761,080	765,520	794,945	760,641	778,480	794,278

## The outlook of primary petroleum product demand

- Primary petroleum product demand is forecast to record annual average growth of 0.9% during the forecast period(2010~2015) and reach 832.9 million barrels in 2015.
  - As a result of steady economic growth and a rise in income levels, demand for petroleum products will likely increase, mainly demand for industrial raw materials and transport. The fuel replacement trend will likely continue in the future.

## Oil demand forecast(2010~2015)

(unit:1,000bbl, %)

	Primary oil consumption	Industry	Transport	Residential /commercial /public	Transformation
2010	794,517	442,068 (55.6)	263,636 (33.2)	62,306 (7.8)	26,507 (3.3)
2011	801,688	449,932 (56.1)	264,583 (33.0)	61,406 (7.7)	25,767 (3.2)
2012	811,525	457,399 (56.4)	269,561 (33.2)	59,130 (7.3)	25,434 (3.1)
2013	821,451	466,098 (56.7)	273,707 (33.3)	57,745 (7.0)	23,900 (2.9)
2014	827,182	472,354 (57.1)	276,867 (33.5)	56,522 (6.8)	21,439 (2.6)
2015	832,857	476,204 (57.2)	279,859 (33.6)	55,392 (6.7)	21,401 (2.6)
Annual average(%) ('10~'15)	0.9%	1.5	1.2	-2.3	-4.2

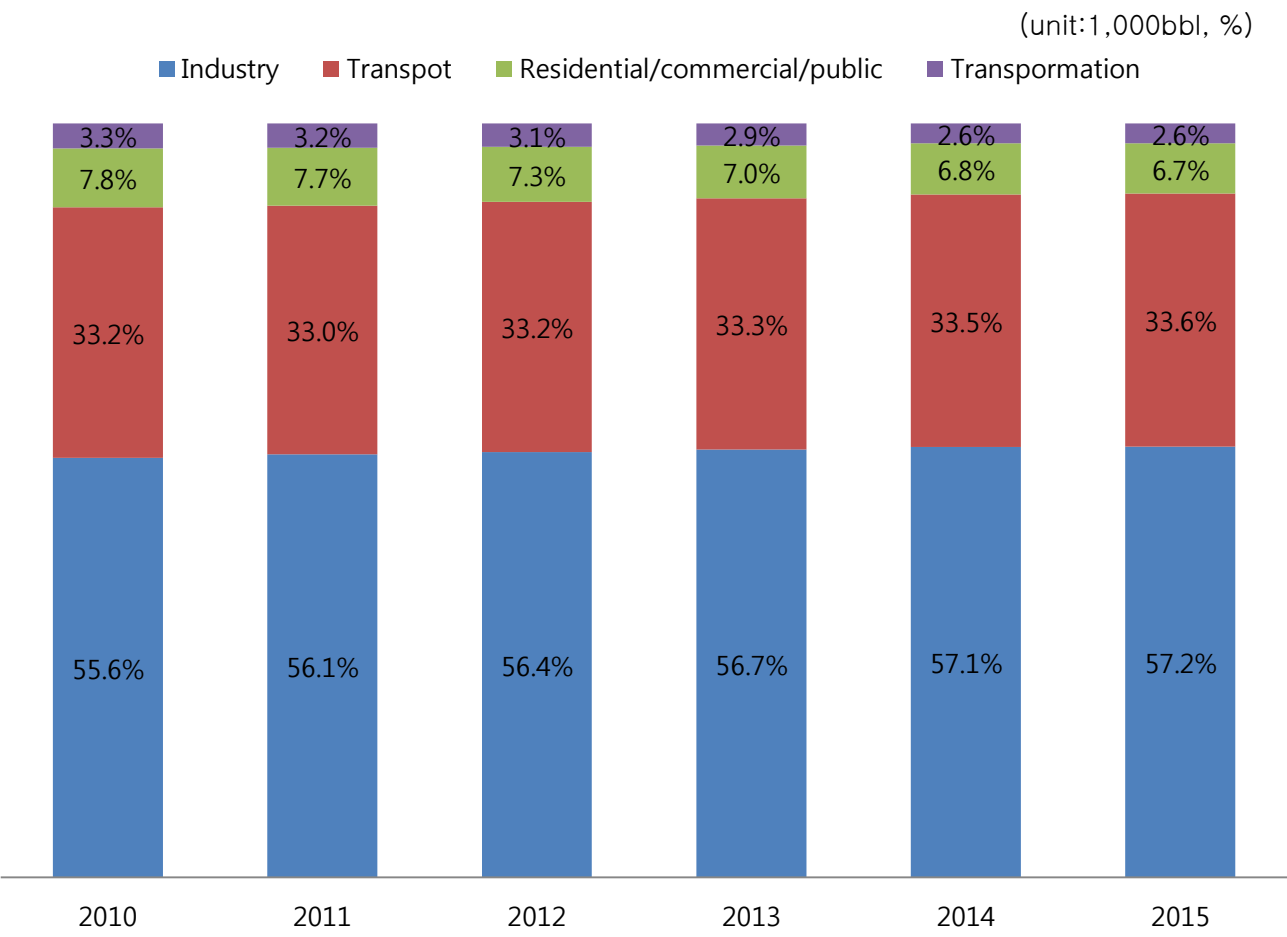
Source : KEEI

Values in parenthesis refer to the share of primary oil consumption taken up by each sector

### Demand forecast by sector

- **Industry** : Oil demand in the industrial sector is forecast to lead a rise in oil consumption, posting annual average growth of 1.5%. The share of total oil demand taken up by oil demand in the industrial sector is expected to gradually rise to reach 57.2% of total oil demand in 2015.
- **Transport** : The transport sector is forecast to mark an annual average increase rate of 1.2% during the forecast period. It is projected that consumption of gasoline and jet fuel will rise quickly in tandem with an increase in automobile sales and overseas travel, triggered by a rise in oil prices, is expected to witness steady growth.
- **Residential/Business/Public** : This sector is projected to record an annual average decrease of 2.3% owing to accelerated heating fuel replacement due to high oil prices.
- **Transformation** : Oil demand for power generation is forecast to record an annual average decrease of 4.2% as a result of increased on LNG power generation.

Outlook on share taken up by each sector(2010~2015)



## Demand outlook per key product

### Outlook on key petroleum product demand(2010~2015)

(unit: 1,000bbl, %)

	<b>Gasoline</b>	<b>Diesel for transport</b>	<b>Kero&amp;Diesel</b>	<b>Heavy oil</b>	<b>LPG</b>	<b>Naphtha</b>
2010	68,925 (8.7)	104,848 (13.2)	59,215 (7.5)	65,548 (8.3)	105,170 (13.2)	331,674 (41.7)
2011	68,794 (8.6)	105,384 (13.1)	56,592 (7.1)	62,411 (7.8)	104,439 (13.0)	340,675 (42.5)
2012	70,512 (8.7)	106,750 (13.2)	54,829 (6.8)	62,084 (7.7)	105,346 (13.0)	348,802 (43.0)
2013	71,579 (8.7)	108,032 (13.2)	53,866 (6.6)	60,544 (7.4)	106,098 (12.9)	356,494 (43.4)
2014	72,297 (8.7)	108,695 (13.1)	52,990 (6.4)	58,353 (7.1)	106,796 (12.9)	361,715 (43.7)
2015	72,661 (8.7)	109,535 (13.2)	52,046 (6.2)	58,530 (7.0)	107,365 (12.9)	364,980 (43.8)
Annual Average(%) (‘10~‘15)	1.1	0.9	-2.5	-2.2	0.4	1.9

Source : KEEI

Values in parenthesis refer to the share of primary oil consumption taken up by each sector

### Demand outlook per key product

- **Gasoline** : Gasoline will likely indicate a temporary drop in 2011 owing to high oil prices and base effects but is expected to steadily rise. It is forecast to post annual average growth of 1.1% during the forecast period.
- **Diesel for transportation** : This is projected to post an annual average increase of a mere 0.9%, attributable to a slowdown in the level of increase in freight and personal transport, despite economic growth.
- **Kerosene/diesel** : Excluding diesel for transport is projected to witness an annual average drop of 2.5% in tandem with decreased roles as energy sources for heating.
- **Heavy oil** : Heavy oil is forecast to mark an annual average decrease rate of 2.2% during the forecast period, triggered by a continuous downward trend in demand, mainly in the commercial sector, despite a rise in demand for transport.



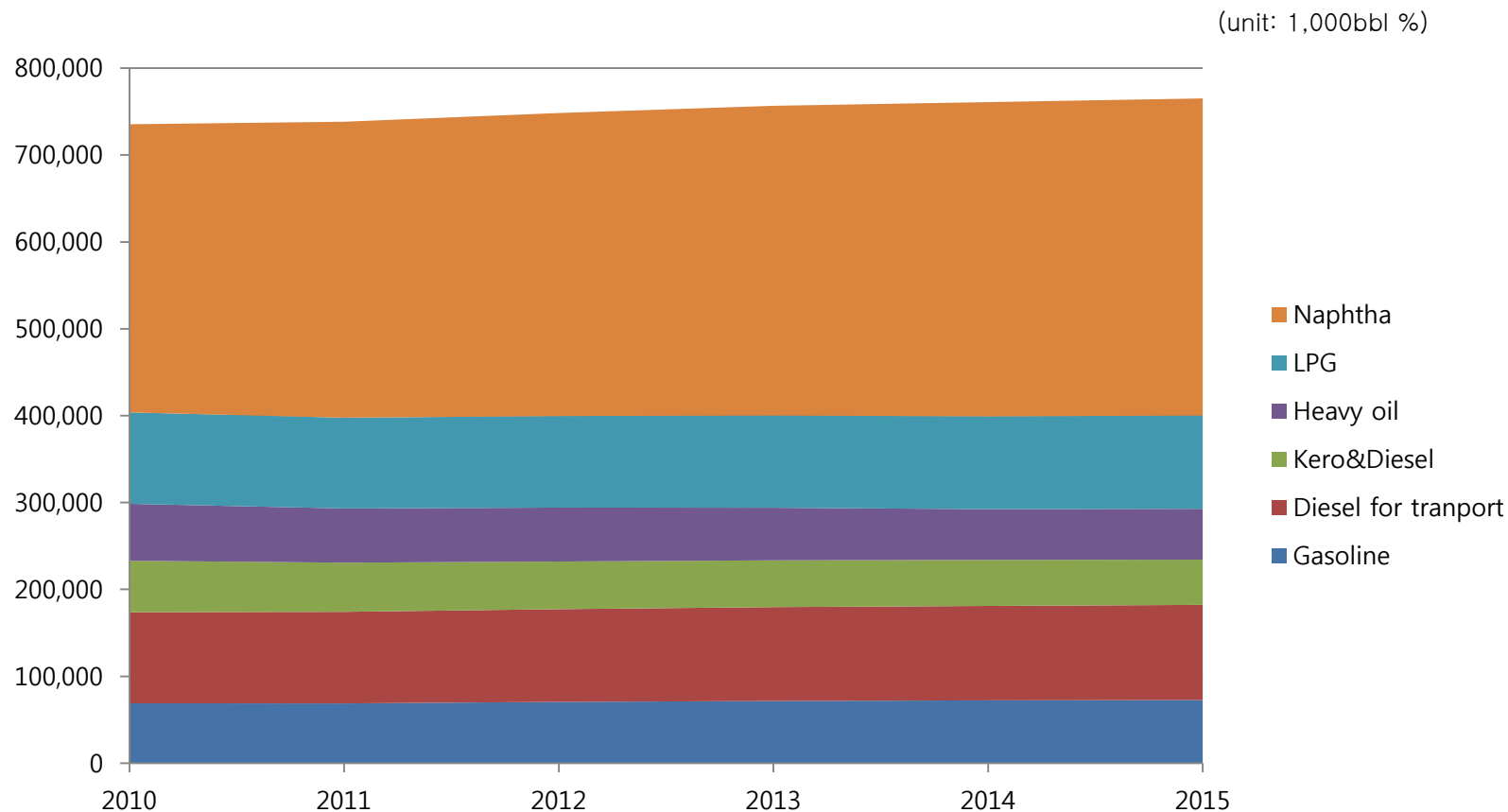
### Demand outlook per key product

- **LPG** : LPG is forecast to post an annual average increase of no more than 0.4% during the forecast period. Demand for naphtha replacement temporarily soared but will likely recover to the previous level amid continued rise in demand for transport and continued drop in demand for heating and cooking.
- **Naphtha** : Profit structure improvements and increased production are forecast for the domestic petrochemical industry in tandem with a delay in the new construction and expansion of facilities in the Middle East and China. However, China, which accounts for more than half of Korea's petrochemical industry exports, in changing its economic policy to focus on stability rather than growth. In addition, recovery of ethylene demand in Europe and US is taking place at a slow pace. Such uncertainties in relation to demand is leading to forecast that the naphtha demand increase rate will record an annual average 1.9% which is a substantial drop from before.

# Prospects on demand for oil products(2010~2015)

## Demand forecast by oil products

### Consumption trends and outlook for each key petroleum product(2010~2015)



감사합니다  
谢谢  
ありがとうございます  
Спасибо

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