

Refining and Petrochemicals

In 2004, refining margins showed a clear improvement that persisted throughout the first three quarters of 2005. This enabled oil companies to post significantly higher earnings for their refining activity in 2004 compared to 2003, with the results of the first half of 2005 confirming this trend. As for petrochemicals, despite a steady rise in the naphtha price, higher cash margins enabled a turnaround in 2004 as well as a clear improvement in oil company financial performance that should continue in 2005, judging by the net income figures reported for the first half-year. Despite this favorable business environment, capital expenditure in refining and petrochemicals remained at a low level, especially investment in new capacity, but a number of projects are being planned for the next five years.

Business Environment

2004 confirms the vigor of the world economy, which is growing at a rate of 5.1% of GDP, one point higher than the previous year, thus continuing a cycle of fast growth that started in 2002. However, this growth remains uneven in terms of geographic distribution; it is mainly localized in the United States and emerging countries, especially China.

Table 1
Variations in the volume of GDP (as a %)

	2002	2003	2004	2005 (f)	2006 (f)
World	3.0	4.0	5.1	4.3	4.3
United States	1.6	2.7	4.2	3.5	3.3
European Union	1.3	1.3	2.5	1.6	2.1
China	8.3	9.5	9.5	9.0	8.2

Source: IMF.

(f): forecast

World economic growth should start to slow in 2005. According to estimates by the IMF, 2006 should confirm this trend except in the European Union, which will remain the least dynamic zone in terms of GDP growth variations. China is expected to continue to post high growth on the order of 8.2%. Uncertainty surrounding the future of Iraq and the ability of producing countries to boost production rapidly as well as persistent oil prices could act as a drag on world economic growth.

Refining

Overall Trends

In this context of high growth, the refining sector is reporting good economic performance figures. Refining margins have reached historically high levels, as oil demand continues to

surge despite elevated petroleum product prices. Although these conditions are favorable for the renewal of investments in new capacity, the latter remains focused primarily on improving the energy efficiency, upgrading products and expansion through debottlenecking at existing refineries.

Consequently, while refining capacity continued to rise at a low rate (+0.8%), reaching 84.6 Mb/day in 2004, the utilization rate increased faster (+2.2%). A situation like this can lead to severe temporary market shortages if an unplanned drop in available capacity occurs.

Trends in Oil Supply and Demand

In 2004, world demand grew faster (+3 Mb/day) than in the previous year. The United States and Asia, especially China, were the main contributors due to their rate of economic growth. They accounted for more than 55% of the increase in world oil demand. According to forecasts, growth in demand should slow in 2005 (83.3 Mb/day, or +1.1 Mb/day over 2004), then rally in 2006 (+1.7 Mb/day).

Table 2
World oil demand, supply and stock changes
(in Mb/day)

	2002	2003	2004	2005 (f)	2006 (f)
World demand	77.7	79.2	82.2	83.3	85.0
Variation [n - (n-1)]	+0.6	+1.5	+3.0	+1.1	+1.7
World supply	76.9	79.7	83.1	84.6*	—
Variation [n - (n-1)]	-0.3	+2.8	+3.4	+1.5	—
Stock changes	-0.7	+0.5	+1.0	—	—

* Average for the first three quarters.

Source: Oil Market Report (IEA).

(f): forecast

The world oil supply rose significantly, from 79.7 Mb/day in 2003 to 83.1 Mb/day in 2004 (+3.4 Mb/day). During the first three quarters of 2005, supply continued to rise, although

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more slowly (+1.5 Mb/day), compared to the same period of 2004.

Refining Capacity

After slowing in 2003, refining capacity was up slightly in 2004 but its advance remained limited, reaching 84.6 Mb/day (+0.7 Mb/day). To cover demand, the utilization rate for refinery infrastructure continued to increase (+2.2% over 2003) to a historical global high of 87.1%.

For about twenty years, the United States has been running a large refining capacity deficit, with demand growing faster than the installation of new capacity. In 2004, this deficit reached a record high: 3.5 Mb/day. At the same time, Europe found itself in a precarious state of equilibrium: refining had been stable for about a decade and demand was showing a low growth curve.

The increase in refining capacity over a number of years in the United States — although not sufficient to meet rising demand — and in Europe can be attributed to the implementation of policies to modernize existing infrastructure and install units to upgrade products. Refiners have been obliged to adapt their infrastructure by adding desulfurization and conversion units, because they must process a larger proportion of heavier, more sulfurous crudes and because demand is growing for light products that must conform to the new specifications. In Europe, strong diesel demand should lead to investments in distillate hydrocracking processes.

At present, the capacity of refineries able to process light products from relatively heavy crudes is virtually at the saturation point. As a result, there is a gasoline deficit in the U.S. and Europe has surplus gasoline capacity while running a middle distillates deficit. The reason for this mismatch between refining infrastructure and demand is that there has been little investment in new capacity for many years.

In the United States, these tensions were aggravated in the second half of 2005, after Hurricanes Rita and Katrina damaged refining infrastructure in the Gulf of Mexico area.

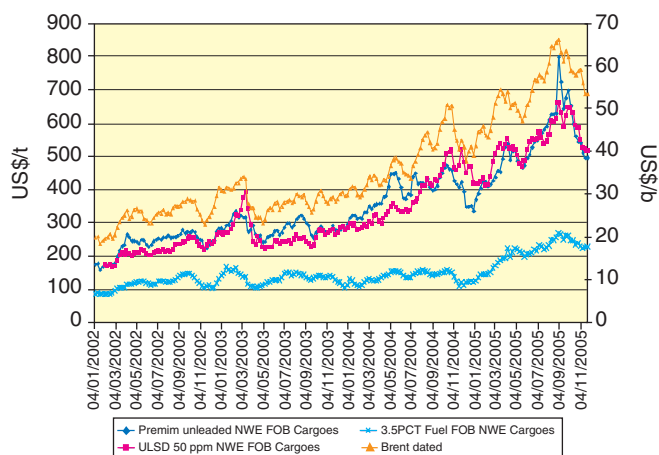
In the Asia/Pacific region, demand has been rising for about fifteen years with a concomitant rise in refining capacity. The acceleration of demand in recent years and the slower rate of new capacity installation that has prevailed since 1999 have led to a growing deficit that reached 1.5 Mb/day in 2004.

Given these tensions between refining capacity and demand — and despite forecasts of a relative lull in the increase in demand — refinery utilization rates stayed high in 2005, exceeding 90% for the three zones mentioned. The rates for the first five months of 2005 were as follows: 92.3% for the U.S., 90.1% for Europe and 98% for the Asia/Pacific zone (first quarter).

Price Trends for Crude and Petroleum Products

In 2004, the price of dated Brent in London and of WTI (1st month) in New York averaged USD 38.27 and 41.49 per barrel, respectively.

Fig. 1 Quotes for Brent (USD/b) and petroleum products (USD/t): Premium unleaded NWE cargoes, ULSD 50 ppm NWE cargoes and FO 3.5 NWE cargoes



Source: Platt's.

For the first three quarters of 2005, these prices reached USD 53.54 and 54.76 per barrel, respectively, reflecting a strong upsurge between the first and third quarter: Brent prices rose from USD 47.50 to 61.54 per barrel, and WTI prices from USD 49.70 to 61.54 per barrel.

In 2004 and 2005, the North West zone saw the price of gasoline and diesel follow the uptrend in crude. The price spread between Brent and petroleum products gradually widened, especially with gasoil in 2004 and 2005. Conversely, and especially from year-end 2003 onwards, the fuel oil price curve diverged from the Brent and light product prices.

Trends in Refining Margins

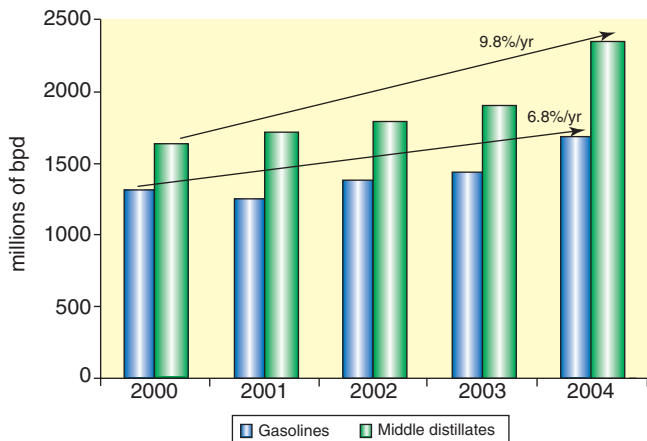
After 2004, which showed a clear improvement over 2003 and 2002, the first three quarters of 2005 saw very high refining margins in the various parts of the world. They actually increased by over 100% between August and September 2005 for Brent and Dubai, while the value of Light Louisiana Sweet (LLS) nearly tripled in value. Cash margins were kept high by certain factors:

- Strong demand for gasoline in the U.S. was sustained by strong economic growth and the fact that refining capacity is not only limited but also must adjust to new motor fuel specifications.

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– Demand for motor fuels is growing fast in emerging countries, especially China, which now consumes its entire refinery output and has become a gasoline importer.

Fig. 2 Demand for motor fuels in China



Source: Oil Market Report (IEA).

– Hurricanes Rita and Katrina had a large impact on U.S. crude processing capacity, almost half of which is located in the Gulf of Mexico where four refineries were damaged (total capacity: 880,000 bpd).

The resulting imbalance between gasoline supply and demand translates into higher prices and margins.

Table 3
Complex refining margins
(Annual average in USD/b)

	1997	1998	1999	2000	2001	2002	2003	2004	2005 (f)**
Brent-cracking (NW Europe)	1.72	1.58	0.70	3.37	2.05	0.75	2.34	3.77	4.71
LLS* cracking (Gulf Coast, US)	0.48	0.50	-0.32	1.29	1.36	0.31	1.12	1.69	5.01
Dubai-hydrocrack. (Singapore)	1.50	0.14	-0.66	0.89	-0.20	-0.56	0.82	3.74	4.03

* Light Louisiana Sweet.

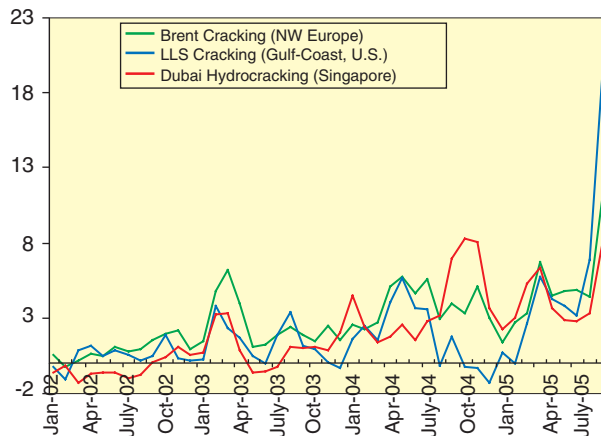
** Averages for the first 9 months of the year.

Source: Oil Market Report (IEA)

(f): forecast

Expressed as monthly averages, margins reached their highest level in September 2005: USD 19.07 per barrel for LLS in the U.S. and \$10.82 per barrel for Brent in the North West Europe zone. In Asia, the Dubai price went up to a lesser extent, nonetheless reaching USD 7.78 per barrel.

Fig. 3 Variations in complex refining margins (in USD/b)



Source: Oil Market Report (IEA).

Mergers and Corporate Earnings

In the refining sector, the most outstanding events took place in the United States where, a few weeks after the announcement that Chevron planned to acquire Unocal at the upstream end of the oil sector, Valero Energy — the third-ranked refiner in the U.S. — made a takeover bid for Premcor. This acquisition consolidated 19 refineries (representing 3.3 Mb/day) in the U.S. and made it the Number One in the country for crude processing capacity, ahead of ExxonMobil (still Number One worldwide) and ConocoPhillips.

Several smaller transactions also took place in Europe:

– The Lithuanian government put 20% of the oil company Mazeikiu Nafta — half of its holdings — up for sale. The company comprises the Mazeikiu refinery, an oil pipeline and the Butinge marine terminal. The government also wished to see a foreign investor buy the shares held by Yukos (53.7%). This transaction has not gone through yet, but a number of companies are interested: the Polish company PKN Orlen and a Russian partner, seeking to make a joint acquisition; Lukoil and its partner ConocoPhillips; the Russian-British firm TNK-BP; the Kazakh company Kazmunaigas with the trading company Vitol as well as the Russian holding company Bazovy Element.

– Aiming to strengthen its presence in Europe, ConocoPhillips has just announced the acquisition of the British holding company Louis Dreyfus Energy as well as Louis Dreyfus Refining and Marketing Ltd. The Wilhelmshaven refinery in Germany and its infrastructure (marine terminal, trucking and rail transport) are included. This acquisition enables ConocoPhillips to boost its processing capacity in Europe by 74%, up from 372,000 to 647,000 bpd.

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– Petrobras and Astra Oil Company recently signed an agreement in principle to create a joint venture for refining and trading in the United States, using the Pasadena refinery (current capacity: 100,000 bpd) as a springboard for development.

Mention should be made of projects that are in the planning but still in the preliminary stage:

- BP wants to get involved in the downstream end of the oil industry in India by setting up a joint venture with Hindustan Petroleum (HPCL), the second largest refining and marketing company in India.
- The Austrian company OEMV, after acquiring Rumania's state company Petrom in 2004, would like to consolidate its presence in the market along the Danube and acquire additional assets representing refining capacity of 500,000 bpd.

With refining margins showing a clear improvement in 2004, oil majors saw their earnings in the refining and distribution sectors rise substantially compared to 2003 (cf. Table 4).

Table 4
Net earnings reported by refining-distribution companies
(in millions of dollars)

	2003	2004	Variations
Total	1653	2768	x 1.7
BP	2318	4722	x 2.0
ENI	660	1200	x 1.8
Repsol-YPF	1354	2026	x 1.5
Shell	3147	6530	x 2.1
Statoil	396	457	x 1.2
Chevron-Texaco	1167	3250	x 2.8
Conoco/Phillips	1272	2743	x 2.2
ExxonMobil	3516	5706	x 1.6

Source: Annual reports and BIP. Figures published in euros were converted to US\$ based on average exchange rates for the periods of 2003 (€1 = \$1.129) and 2004 (€1 = \$1.2435).

Earnings for the first half of 2005 continue to look good for U.S. and European majors, especially because margins improved further during this period.

Despite the results announced by oil majors, the observer is compelled to note that investments in refining infrastructure remain inadequate.

Capital Spending Worldwide in the Refining Industry

In 2004, like in 2003, with margins on the rise, world capex in the refining sector showed a slight increase (+1.6%), primarily generated by spending on maintenance and catalysts/chemicals. Investments stayed flat between 2003 and 2004 at USD 17.0 billion and did not contribute to the installation of new capacity.

Table 5
Capital spending in the refining industry worldwide
(in billions of dollars)

	2002	2003	2004	2005 (f)
Capital expenditure	16.6	17.0	17.0	17.3
Maintenance*	17.7	18.5	19.1	19.6
Catalysts and chemicals	11.7	12.4	12.8	12.8
Total	46.0	47.9	48.9	49.7

* 40% on equipment, 60% on labor and services.

Source: IFP based on data from HPI Market Data

(f): forecast

The bulk of this spending, especially in the United States, Europe and Japan, is still to adapt to product specifications and expand capacity by debottlenecking at existing refineries. Here, the strategy is to improve product quality and boost the competitiveness and reliability of existing production plant.

According to estimates for 2005, capital expenditure should only go up slightly (by USD 0.3 billion). If this is confirmed, 2006 may see an aggravation of the refining bottleneck.

On the other hand, with the recovery of cash margins and profitability, recent months have brought announcements of plans to invest in projects in the refining sector.

Consideration is being given to projects bearing on new refineries in Africa, the Middle East, Asia/Pacific and even the United States. As things now stand, 14 new refineries are to be built in the world by 2009, representing a total capacity of 2.5 Mb/day. Of the new refineries to be built worldwide by the end of the decade, 78% will be located in the Middle East and Asia/Pacific. In addition, there does exist a plan to build a new refinery in the U.S.—the first in 30 years—even if there is some doubt as to whether this project will actually be carried out.

Table 6
New refineries, distillation capacity

		Capacity ('000 bpd)	Completion date
Africa			
Algeria	Adrar (China National Petroleum Corp Sonatrach)	12	2006
	Skikda (Sonatrach)	100	2008
Angola	Lobito (Sonaref – Sonangol and private interests)	200	P
Nigeria	Eket (Sahara Petroleum Exploration)	70	P
Middle East			
Kuwait	Al-Zour (Kuwait National Petroleum Company)	460	2010
Oman	Sohar (Oman Oil)	116	2006
Saudia Arabia	Rabigh (Saudi Aramco (SA) et Sumitomo)	400 (*)	2008
	Yanbu (Saudi Aramco and external partners)	400	P
Asia/Pacific			
China	Daya Bay (CNOOC)	240	2008
	Hainan (Sinopec)	160	2007
	Qingdao (Sinopec and external partners)	200	P
India	Vadinar (Essar)	210	2005
Vietnam	Dung Quat (Petrovietnam)	145	2009
North America			
United States	Yuma, Arizona (Arizona Clean Fuels)	150	2009

Note: P = planned, starting date uncertain.

(*) Capacity not included in the total because the project involves redeveloping the Rabigh refinery.

Source: Petroleum Economist.

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There are no plans to build new refineries in Europe/Eurasia, Central America or South America.

Significant extension projects (0.9 Mb/day) are planned for 12 refineries worldwide in Africa, the Middle East, Asia/Pacific, the United States, South America and Central America. Of these, 47% will be located in the Asia/Pacific area, especially China (265,000 bpd) and India (120,000 bpd). If one includes the condensate refinery project (360,000 bpd) in Bandar Abbas (Iran), they represent total capacity of 1.18 Mb/day. Over 70% of new capacity for global extension projects will be localized in the Middle East and Asia/Pacific regions.

Table 7
Refinery expansions, distillation capacity

		Current capacity ('000 bpd)	Planned	Difference	Completion date
Africa					
Morocco	Mohammedia (Samir)	125	170	45	2006
Sudan	Khartoum (Khartoum Oil Refinery)	70	100	30	2005
	Port Sudan (Port Sudan Refinery)	20	100	80	P
Middle East					
Iran	Bandar Abbas (IOC)	230	320	90	2007
Asia/Pacific					
China	Dalian (CNPC)	140	200	60	2005
	Fujian (Sinopec, ExxonMobil, SA)	80	240	160	P
India	Guangzhou (Sinopec)	155	200	45	2006
	Panipat (IOC)	120	240	120	2006
North America					
United States	Rosemount, Minnesota (FHR – Koch)	280	330	50	2007
	Port Arthur, Texas (Pmcor – Valero)	250	325	75	2006
Central and South America					
Colombia	Cartagena (Ecopetrol)	75	140	65	2006
Mexico	Minatitlan (Pemex)	190	280	90	2008

Note: P = planned, starting date uncertain.

Source: *Petroleum Economist*.

In the future, it would be possible to develop new capacity if certain programs that are still in the preliminary stages are actually implemented. In the Middle East, for instance, the Iranian program calls for adding a condensate refinery and for boosting refining capacities by 400,000 bpd by 2010 at the Abadan, Isfahan, Arak and Lavan refineries. Kuwait plans to build a new refinery by 2010 to replace the Shuaiba refinery, which is scheduled to shut down. In Saudi Arabia, an investment program includes 400,000 bpd at Yanbu and 400,000 bpd for the redevelopment of the Rabigh refinery. Qatar is thinking about building a new refinery (200,000 bpd) on its territory that would start up in 2010.

In Africa, the Algerian state company Sonatrach is planning to team up with CNPC (China) to build a new condensate processing unit in Skikda (5 million tons/yr).

In Asia/Pacific, other projects have been announced, among them a plan to boost capacity at the Jamnagar refinery in India from 660,000 bpd to 1.2 Mb/day in 2009. In Indonesia,

Pertamina has also declared that it will undertake a refinery project with a Chinese partner.

In the United States, Motiva Enterprise — a joint venture formed by Shell Oil and Saudi Refining (Aramco) — plans to add 320,000 bpd of capacity at the Port Arthur refinery, more than doubling existing capacity (235,000 bpd). Similarly, Marathon Oil Corp. is looking to expand its Garyville refinery in Louisiana from 245,000 to 425,000 bpd (+180,000 bpd).

All in all, by 2010, refining capacity of nearly 3.5 mb/d should come onstream (this figure includes projects for new refineries and extensions of existing refineries, but not projects still in the preliminary stages). At the same time, it is thought that demand will increase by about 8-10 Mb/day according to the IEA reference scenario. It is likely that market tensions will persist until 2010, particularly considering that engineering companies may not be able to handle the additional projects.

In the years to come, new capacity will have to process heavier crudes and supply better quality products. This means that investments will have to include conversion products. Some of the projects listed above (Tables 6 et 7) do entail conversion projects:

- Sohar, residue catalytic cracking (25,000 bpd);
- Rabigh, hydrocracking (90,000 bpd);
- Vadinar, residue catalytic cracking (60,000 bpd);
- Mohammedia, hydrocracking (40,000 bpd), viscosity breaking (25,000 bpd);
- Bandar Abbas, hydrocracking (28,000 bpd), visbreaking (25,000 bpd);
- Dalian, catalytic cracking (-), hydrocracking (71,000 bpd);
- Guangzhou, hydrocracking (20,000 bpd);
- Panipat (hydrocracking (-), coking (45,000 bpd);
- Cartagena, catalytic cracking (7,000 bpd), thermal cracking with visbreaking (13,600 bpd);
- Minatitlan, catalytic cracking (42,000 bpd), coking (56,000 bpd), vacuum hydrotreatment of gasoil (41,000 bpd).

According to PEL forecasts concerning world refining capacity between 2004 and 2008, conversion capacity (catalytic cracking, hydrocracking, visbreaking/thermal cracking and coking) is rising significantly faster than distillation capacity. Whereas distillation capacity should see an increase of 3.7% (+3.0 Mb/day) for this period, the conversion capacity should go up by 7.9% (+2.7 Mb/day).

Motor Fuels and Standards

For the next few years, the main target is still to eliminate the sulfur content from motor fuels. In Europe, while Directive 98/70/EC concerning motor fuel quality is being revised,

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Directive 199/32/EC relative to heavy fuels and heating oil is not. By 2009, the sulfur content in all gasoline and diesel fuel sold in Europe will not exceed 10 mg/kg.

Marine heavy fuels are governed by Appendix VI of the MARPOL Convention (International Convention for the Prevention of Pollution from Ships). Effective May 20, 2005, it imposes a sulfur content cap of 4.5% worldwide for ship bunkers and of 1.5% in the so-called “control zones” covering the Baltic Sea, the North Sea and the English Channel.

As for the heavy fuel used at electric power plants, future sulfur dioxide emissions standards (from 800 to 400/200 mg/Nm³) are such that the heavy fuel put on the European market — or at least some percentage of it — must not exceed a sulfur content of 0.55%.

In the United States, the program to eliminate MTBE (methyl tertiary butyl ether) is still underway, and the sulfur content of motor fuels must be reduced to 30 ppm on average for gasoline and to 15 ppm for diesel by 2006.

The development of biofuels for motor vehicles is a prime objective given the need to reduce greenhouse gas emissions and diversify the energy supply while anticipating the high levels of motor fuel consumption expected to prevail in the transport sector in the future. In Europe, Directive 2003/30/EC aims to promote the use of biofuels or other renewable motor fuels in the transport sector. It defines biofuels and sets indicative targets: biofuels should represent 2% (in energy terms) of the market in 2005 and 5.75% by 2010.

Finally, since the beginning of 2005, the European refining industry has been concerned by national plans to allocate annualized CO₂ emissions allowances (for France: 19.2 Mt/yr). These plans are implemented under Directive 2003/87/EC of October 13, 2003, further to EU commitments to reduce GHG emissions within the framework of the Kyoto Protocol, finally ratified in December 2005. This initial phase concerns the period 2005-2007. Evaluations and negotiations are already underway with a view to updating allowances for the following period, starting in 2008, when all GHGs will be taken into account. The legal texts provide for a fine of €40/ton of CO₂ in excess emissions, compared to the current value of €20-25/t on the emissions permit market.

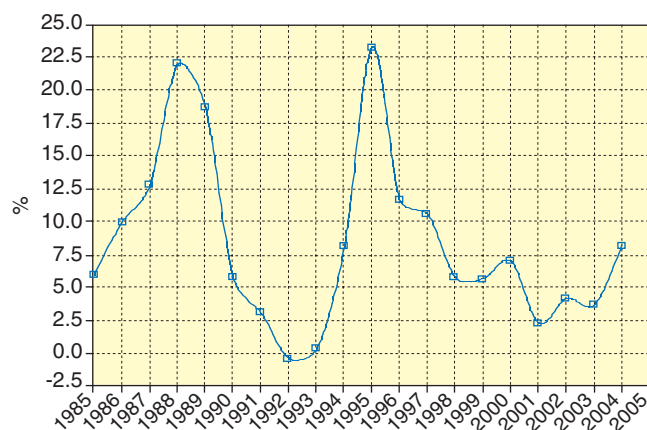
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Business Environment

After a four-year slump, this sector made a comeback in 2004. The petrochemical and chemical sector rallied overall, posting a return on total assets of 6.4% (compared to 2.6% in 2003), its best since 1997.

The chemical divisions of oil companies outperformed the chemical industry by obtaining a return on assets of 8.2% (compared to 5.1% for the latter), substantially higher than the 2003 figure of 3.7%. The low cycle apparently ended in 2004 and growth is expected to continue in 2005, according to the *Petroleum Economist*, with a return on assets in the vicinity of 14%. Europe will not be able to profit from this recovery, owing to the fact that it is more dependent on oil prices.

Fig. 4 Variations in the return-on-assets (as a %) for the petrochemical divisions of key oil majors



Source : *Petroleum Economist*.

In 2004, demand for chemical and petrochemical products climbed substantially, especially in the United States and China, driven by economic growth. This new situation enabled American operators to increase the unit utilization rate, thus resorb their problems of excess production capacity. They were able to adjust their prices to the increase in feedstock and fuel costs. The cost factor for feedstock and energy became less decisive in a business environment characterized by strong demand in growth and restored profit margins.

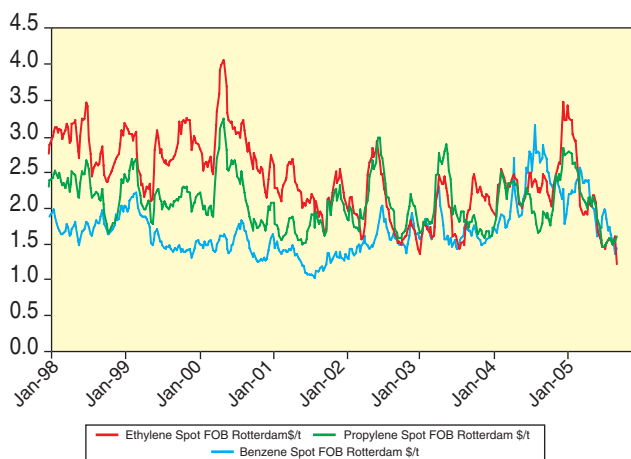
On the export market, U.S. producers benefited both from the increase in the oil price and the depreciation of the dollar against the euro. U.S. petrochemicals are based primarily on ethane, a coproduct of natural gas, unlike Europe, which is based on naphtha, directly tied to the oil price. In this context, exports accounted for half of the increase in U.S. production of petrochemical products. This competitive situation was aggravated by the construction of installations in the Middle East.

For these reasons, business conditions were less favorable for petrochemical activities in Europe, which posted a lower return on assets than U.S. companies: 4.9% versus 5.6%.

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respectively. In 2005, the price of feedstock, especially naphtha, soared from USD 400/t at the beginning of the year to USD 580/t at the start of the last quarter in the North West Europe zone. In 2005, the decrease in the ratio of the price of olefins (ethylene and propylene) and benzene to that of naphtha (Fig. 5) illustrated the penalizing effect of the trend in the feedstock cost.

Fig. 5 Variations in spot prices versus naphtha prices (NW Europe)



Source: Platt's.

Growth in the Chinese petrochemical sector is booming. According to forecasts made by Nexant Chemsystems, ethylene demand will grow at a rate of 7.4%/yr between now and 2015, rising from 6.3 Mt/yr in 2004 to 13.9 Mt/yr in 2015. Demand for polyethylene should also show a substantial increase of 13.0 Mt/yr between 2004 and 2015.

As for the years to come, world demand for petrochemical products should continue to grow, according to Nexant Chemsystems, which predicts that world ethylene demand will increase at a rate of 4.7%/yr for the next five years.

Financial Performance

Under these circumstances, most petrochemical companies reported a significant rise in net income for 2004. The only noteworthy exception is BP, whose loss of USD 900 million in 2004 contrasted with its earnings of USD 568 million in 2003. This loss reflected exceptional expenses for site closures and withdrawals from business activities, on top of higher fixed costs and exchange rate variations.

These results, up considerably in 2004 over 2003, are part of a cycle favorable to petrochemicals, which is reporting large profit margins. The reason that U.S. operators outperformed their European counterparts is that the United States enjoys the favorable business conditions described previously.

Table 8
Net earnings of petrochemical companies (millions of USD)

	2003	2004	Variations
Total	287	816	284%
Chevron-Texaco	69	314	551%
ExxonMobil	1432	3428	394%
Shell	-209	930	/
BP	568	-900	/

Source: Annual reports.

Capital Spending in the Global Petrochemical Industry

In a business environment that has been favorable for some time, capital expenditure remained stable in 2004 at USD 14.9 billion. For the most part, it has been allocated to build a few new installations and to adapt and upgrade existing facilities. Spending only increased in one area: maintenance (+USD 600 million), which is necessary to enhance the reliability, flexibility and profitability of existing units.

Investments are planned in the near future, probably after 2005. According to forecasts, capital expenditure in the petrochemical sector will stagnate again in 2005. Most future investments to expand capacity will be localized in the Middle East and the Asia/Pacific region, especially China.

In China, three complexes (Nankin, Shanghai and Huizhou) representing a total of 2.4 Mt in ethylene production capacity are scheduled to come onstream in 2005-2006. In addition, ExxonMobil, Saudi Aramco and Fujian Petrochemicals are undertaking a project to build a new ethylene steam cracking unit (800,000 t/yr), a polyethylene unit (650,000 t/yr), a polypropylene unit (450,000 t/yr) and an aromatics plant (1 Mt/yr). China will have to invest heavily in petrochemicals in the future to make its industry more competitive, not only to meet growing demand, but also to reorganize and modernize the existing industrial structure, which is currently broken down into a large number of small units.

Investments will also be heavily concentrated in the Middle East, which has a competitive edge over Europe and the United States thanks to its large reserves of low-priced natural gas. According to Nexant Chemsystems, steam cracking capacity in this area should expand by 10% between 2004 and 2005; the goal is to boost ethylene production capacity by 23 Mt/yr by 2010. The projects will be to produce for its preferred export markets, i.e. Asia/Pacific (China), North America and West Europe.

The United States will pursue its current strategy, which excludes any construction of new installations and focuses instead on investments to improve energy efficiency and feedstock flexibility while relying on existing assets and infrastructure.

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Table 9
 Spending in the global petrochemical industry
 (in billions of dollars)

	2002	2003	2004	2005 (f)
Capital investment	15.3	14.9	14.9	14.9
Maintenance*	21.1	22.0	22.7	23.3
Catalysts and chemicals	21.6	21.9	21.8	21.8
Total	58.0	58.8	59.4	60.0

* 40% on equipment, 60% on labor and services

Source: IFP based on data from HPI Market Data

(f): forecast

With greater competition from products from the Middle East and Asia, especially China, the European petrochemical industry is facing problems of competitiveness. It must bear labor, energy and feedstock costs that are heavier than for their rivals. This being the case, Europe will have to reduce production costs by seeking new types of business relationships with its customers, increasing the average size of production units (the latest cracking units to be built in the world are about twice the average size of European crackers), closing units that are insufficiently profitable, optimizing integration with refining and seeking new sources of innovation. To retain an active position, at least in its own zone, then Europe should consider these actions. Otherwise, petrochemical investments will probably continue to concentrate in the two geographical areas which, besides elements giving it a competitive edge, enjoy high growth, a regulatory environment that is not as stringent and the increasing presence of client industries.

Aware of these difficulties and challenges, the European petrochemical sector seems to have entered into a phase of big mergers and acquisitions, as evidenced by the transactions announced during the first half of 2004.

Seeking to divest one-third of its chemical activity, Total created a new concern named Arkema on October 1, 2004, with three business areas: vinyl products, industrial chemicals and performance products. In January 2005, Arkema presented a plan to reorganize its vinyl product activities in France to improve performance on the chlorochemicals segment. This new entity is to become independent starting in 2006.

In 2005, British Petroleum was to proceed with the disposal of all of its petrochemical activities, grouped in Innovene, to another British company, Ineos. This sale, the largest transaction to take place anywhere in the world since 2001, is expected to go through in early 2006. BP has gone farther than indicated last year, when it announced a plan to sell half of its petrochemical branch by disposing of its olefin and derivatives assets by year-end 2005. This makes Ineos the world's fourth largest petrochemical company after

DowChemical, DuPont and BASF. Its sales will go from USD 6 to 30 billion.

Among the assets that BP grouped together in Innovene were two refineries — Grangemouth in Scotland and Lavéra in Marseilles — closely tied to petrochemicals. Together with the olefins and derivatives businesses, these refineries were made part of a separate company.

Shell and BASF announced the sale of their fifty-fifty subsidiary Basell, Europe's Number One in polyolefins, to a group of Russian and Indian investors (Access Industries and the Chatterjee Group) for USD 5.7 billion.

The other major player in polyolefins is the petrochemical company Boréal. Statoil sold its 50% holdings in Boréal to two other shareholders: IPIC (International Petroleum Investment Company, a strategic investment company based in Abu Dhabi) and OMV, which had previously held a 25% interest. After the transaction, IPIC owns 65% of Boréal and OMV 35%. The sale was worth 1 billion euros.

Since further far-reaching changes are needed in the European petrochemical industry to make it more competitive, this wave of reorganizations is probably not over. The big investors on this segment, located in Asia/Pacific (China) and in the Middle East (Saudi Arabia), may have an active role to play in the years to come.

Conclusion

Economic growth continued and even accelerated in 2004, accompanied by a steep increase in world demand for petroleum products, reaching growth of 3.7%, which is double the 2003 figure. The slowdown in growth for 2005, forecast by the IMF on the basis of high oil prices and the threat of persistent risks — “but which, overall, remains on the path to growth” — will impact oil demand, which is expected to see growth slow significantly (1.6%).

Looking at refining margins, 2004 showed the same trends as 2003, but performance levels were more satisfactory in the United States, Europe as well as Asia. Record highs were recorded for the first nine months of 2005, despite the high crude prices, mainly owing to the increase in petroleum prices. In the second half-year, margins rose as a result of the hurricanes in the Gulf of Mexico, which caused great tensions with respect to product demand. Margins gradually rallied, restoring refining sector profitability. Oil company earnings for 2004 were significantly higher than in 2003, and the statistics for the first half of 2005 confirmed this trend.

Despite these favorable business conditions, the level of investments failed to increase; forecasts call for a slight improvement in 2005. Looking ahead to 2010, it is

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anticipated that planned investments will be inadequate to cover the increase in demand. For the most part, capital spending on new refineries will be localized in two regions: the Middle East and Asia/Pacific. In the United States, Europe and Japan, investments will be mainly devoted to the optimization of existing plant. On the other hand, spending on catalysts and maintenance grew to some extent in 2004; here, the objective was to improve the quality of petroleum products and bring them in line with prospective standards.

The long-awaited comeback in the petrochemicals sector finally happened in 2004. The overall return on assets was the

best in years, despite higher feedstock and energy costs. The chemical divisions of oil companies outperformed the chemical industry.

The good performance levels achieved by the petrochemical industry have not yet translated to any significant extent into investments in new capacity. Forecasts predict that, once again in 2005, the status quo will prevail.

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