

Asian Oil Price Analysis 2: Stabilization of Crude Oil Prices at Reasonable Levels and Market Expectations Running High for Fluctuations Centering on \$20/Barrel

Yoshiki Ogawa, Ph.D.

General Manager, the Second Research Department

Highlighting Points

- Crude oil prices have soared rapidly to \$25/bbl in recent months, beginning to assume a phase of wild fluctuations again due primarily to OPEC's continued production cuts, recovery of the U.S. economy and the mounting tension in Middle East relations.
- Wild fluctuations in crude oil prices are expected to cause delays in plant and equipment investments on a long-term basis, leading to a vicious cycle. The price level expected by the current market to be well-balanced is thought to be around \$20/bbl.
- Oil-producing and oil-consuming countries are urged to aim to establish a market environment and stabilize crude oil prices to be reasonable and meritorious to both parties. It will be essential for the two parties to exchange views frankly at a dialogue scheduled for September between oil producers and consumers.

Opening Remarks

Crude oil prices, which considerably softened to around \$15/bbl after the terrorist attacks against the U.S. last autumn, ceased to fall as OPEC reached agreement with non-OPEC to cut oil production, recovering to the price level of around \$20/bbl by early March of 2002. In subsequent months, however, the crude oil market accelerated its uptrends to reach the \$25/bbl level in recent weeks. Behind these trends are the tension building up in the Middle East such as the Palestinian violence, the Iraqi problem, as well as an increase in oil demand due to the U.S. economic recovery. The world oil market has witnessed repeated

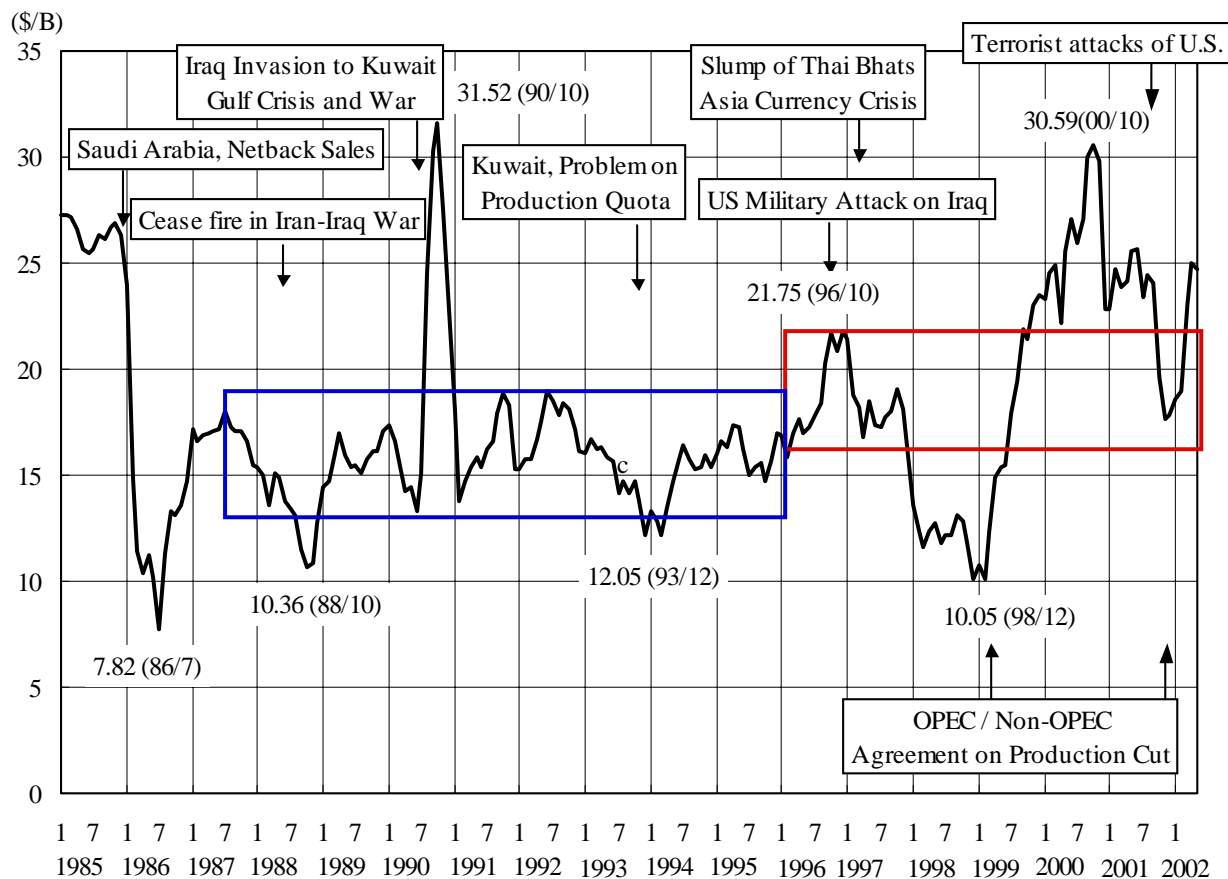
rapid ups and downs in crude oil prices since 1996. Are these fluctuations in crude oil prices desirable to both oil producers and consumers? This report presents our thoughts on what reasonable crude oil price levels should be from the supply stability standpoint.

1. Wild Oil Price Fluctuations Throw Market into Instability

The international crude oil trading entered into an era of the market in the wake of the crash of crude oil prices in 1986. Although OPEC introduced the fixed price system at the end of 1986, with the minimum reference price set at \$18/bbl, the market has always remained bearish as a result of surplus production in excess of 10 million b/d. This prompted OPEC to introduce the formula system in and after the autumn of 1987, under which reference is made to marker crude prices on the spot market, moving into a system relating crude oil prices to market trends. This market-related system took root in such a manner that the crude oil market remained stationary, overcoming the Gulf crisis that took place in 1990 when Iraq invaded Kuwait.

Dubai crude prices wildly fluctuated daily within a range between \$13/bbl and \$19/bbl on the spot market during the period 1987-1995 (see Fig. 1). OPEC no longer could demonstrate its influential power to control crude oil prices at a fixed level as it did in the past. Nevertheless, crude oil prices were somehow contained within a band ranging from \$13/bbl to \$19/bbl over the period of a little less than a decade. Daily crude oil prices were determined by price movements either on the spot market or on the futures trading market of crude oil representing the consumer area such as WTI listed on NYMEX.

In and after 1996, however, crude oil prices came to fluctuate so violently (Fig. 1) that serious problems surfaced. For example, the wild fluctuation in crude oil prices amplified uncertainties about the future, thus making it difficult to decide on plant and equipment investments. Conversely, the delay in plant and equipment investments became one of the factors to cause wild fluctuations in crude oil prices – leading to a vicious cycle. The wild fluctuations in crude oil prices witnessed in and after 1996 cannot be explained by OPEC' independent production cuts alone.

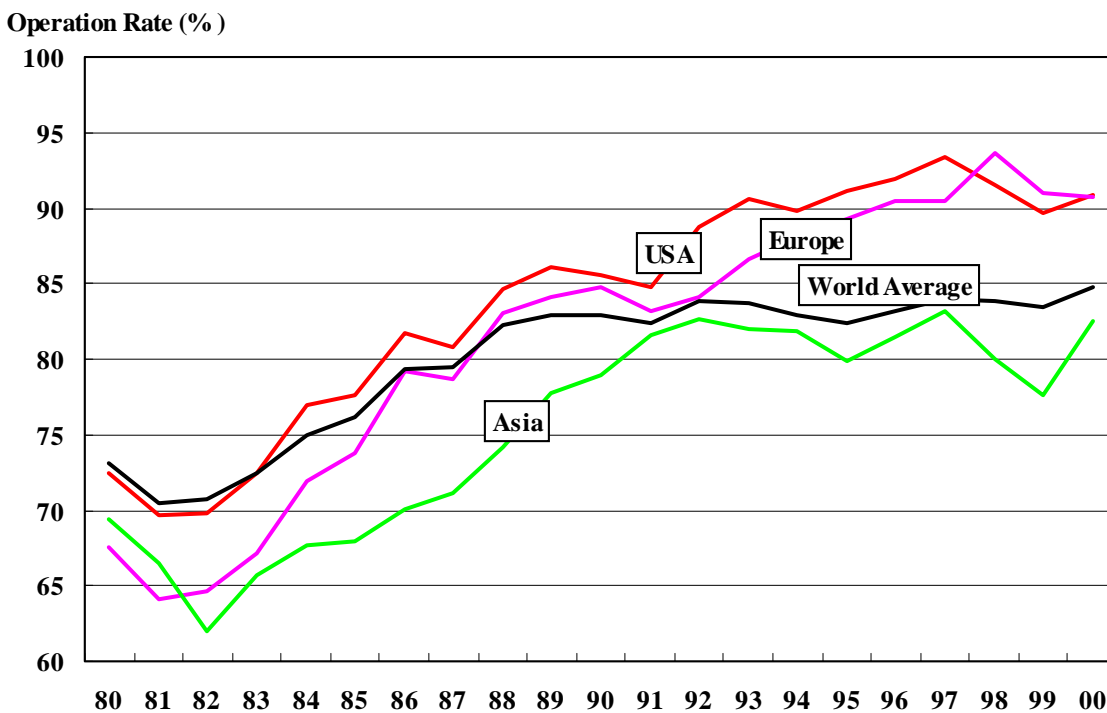


(Note) The figures indicate fluctuations in Dubai crude prices.

Fig. 1 Wild Fluctuations in Crude Oil Prices in and after 1996

Why couldn't OPEC's repeated production increases prevent crude oil prices from soaring in 2000? The fact was that oil products supply tightened sharply in the U.S. due to several factors, including: (a) the freezing cold wave hitting the northeastern part of the U.S. reduced oil inventories to low levels; (b) compulsory introduction of reformed gasoline (under Phase II); (c) shortages of petroleum refining capacities; and (d) provisional demand for oil due to speculative buying on the futures trading market. Behind these course of events were the U.S. and European oil companies' reluctance to actively make new plant and equipment investments, coupled with the oil industry operations to keep oil inventory stocks at low levels in view of uncertainties accompanying price fluctuations and narrowing refining margins.

As shown in Fig. 2, the world average rate of refinery operation dropped to around 70 percent in the first half of the 1980s due to a global decline in oil demand in the wake of the second oil crisis, which recovered to the 80-85 percent level by the end of the 1980s and remained at that level throughout the decade of the 1990s. Meanwhile, the average rate of refinery operation in the U.S. and Europe hovered around less than 70 percent and less than 65 percent, respectively, in the first half of the 1980s, but recovered to the level higher than 80 percent by the middle of the 1980s and went up to more than 90 percent by the middle of the 1990s for both U.S. and European refineries in contrast with Asian refineries, where the average rate of operation leveled off at around 80 percent throughout the decade of the 1990s.

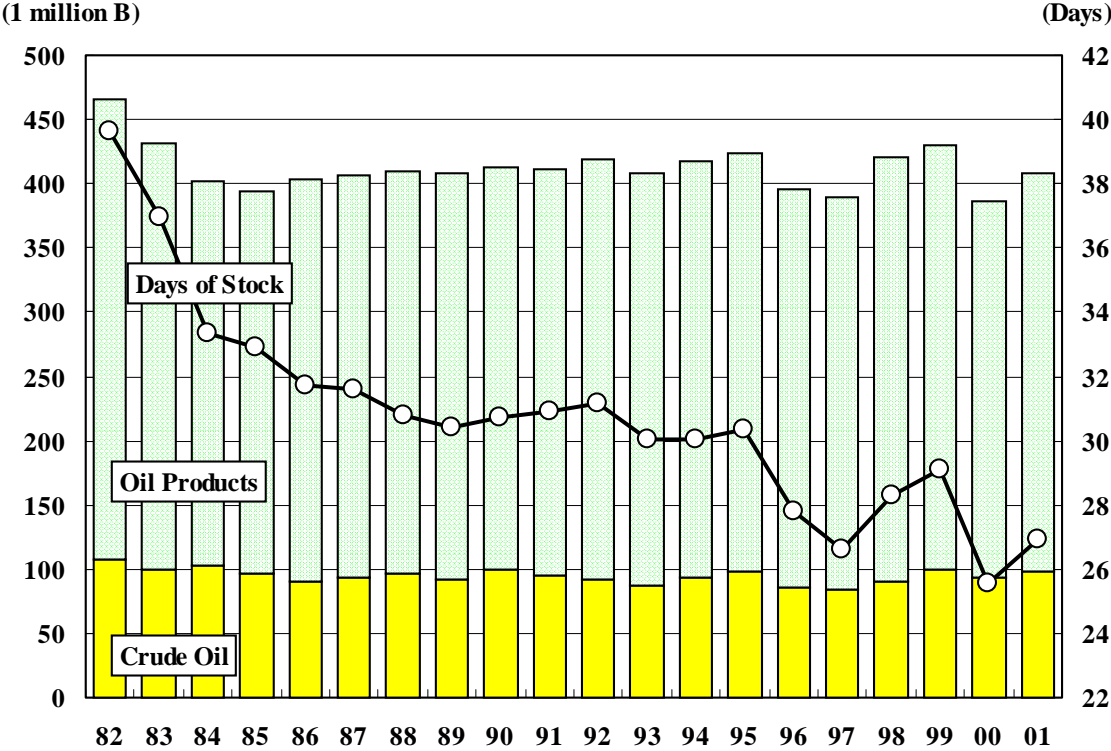


(Source) Made from data on BP, "Statistical Review of World Energy 2001"

Fig. 2 Movements in World Average Rate of Refinery Operation

A phenomenon, similar to the world oil industry’s failure to increase the crude oil processing capacity sufficiently enough to meet increased demand in and after the middle of the 1980s, was witnessed in commercial oil inventories. As shown in Fig. 3, U.S. oil inventories centering on refined products decreased in accordance with a decrease in oil demand in the first half of the 1980s, but these inventories have remained unchanged at

the first half of the 1980s, but these inventories have remained unchanged at around 400 million barrels in and after the middle of the 1980s, with inventories falling below 400 million barrels in 1996-1997 and 2000.



(Source) Made from data on US.DOE/EIA, "Petroleum Supply Annual"

Fig. 3 Decline in Commercial Oil Inventories in U.S. Refineries

When looking at oil inventories in terms of the number of days' supply, however, oil inventories which stood at nearly 40 days' supply in 1982 dropped to around 30 days' supply by the end of the 1980s and further down to the 25-28 days' supply level as oil inventories declined in and after 1996. It is not to be stated that absolute volumes of commercial oil inventories have been drastically reduced, but it should rather be understood that the oil companies failed to increase oil inventories along with an increase in oil demand in and after the second half of the 1980s. In this sense, this is similar to the refiners' failure to increase their crude oil processing capacities. This phenomenon witnessed in the U.S. is also com-

mon to commercial inventories in European refineries. When these inventories are withdrawn as in 1996-1997 and in 2000, while commercial oil inventories in refineries are maintained at extremely low levels, those inventories no longer serve as a buffer against disruptions in supply. This was one of the factors that caused crude oil prices to remain at high levels.

Looking back at crude oil price movements during the six-year period following 1996, it can be said that there prevailed an environment that made it more difficult for OPEC by itself to control oil prices. Firstly, non-OPEC oil-producing countries' move in concert with OPEC is absolutely necessary, and secondly, a number of problems emerged that cannot be addressed by establishing a crude oil production framework alone -- problems such as shortages of petroleum refining capacities, low oil products inventory levels, and overshooting by the oil futures trading market, etc.

2. Oil-consuming countries aiming to maximize oil incomes

Be that as it may, it must not be forgotten that, apart from daily crude oil price movements, the OPEC cartel is giving birth to current price levels today as before. It would not be surprising if crude oil prices nose-dove to less than \$5/bbl, should OPEC member countries commence completely free competition among themselves. In many cases, the full-cycle cost of crude, including exploration expenses and development and production costs, and even reaping some profits, is less than \$5/bbl -- less than \$1/bbl especially in case of Middle Eastern crude [1]. Technological developments in the 1990s reportedly reduced the average cost of North Sea crude to a level far below \$10/bbl [2].

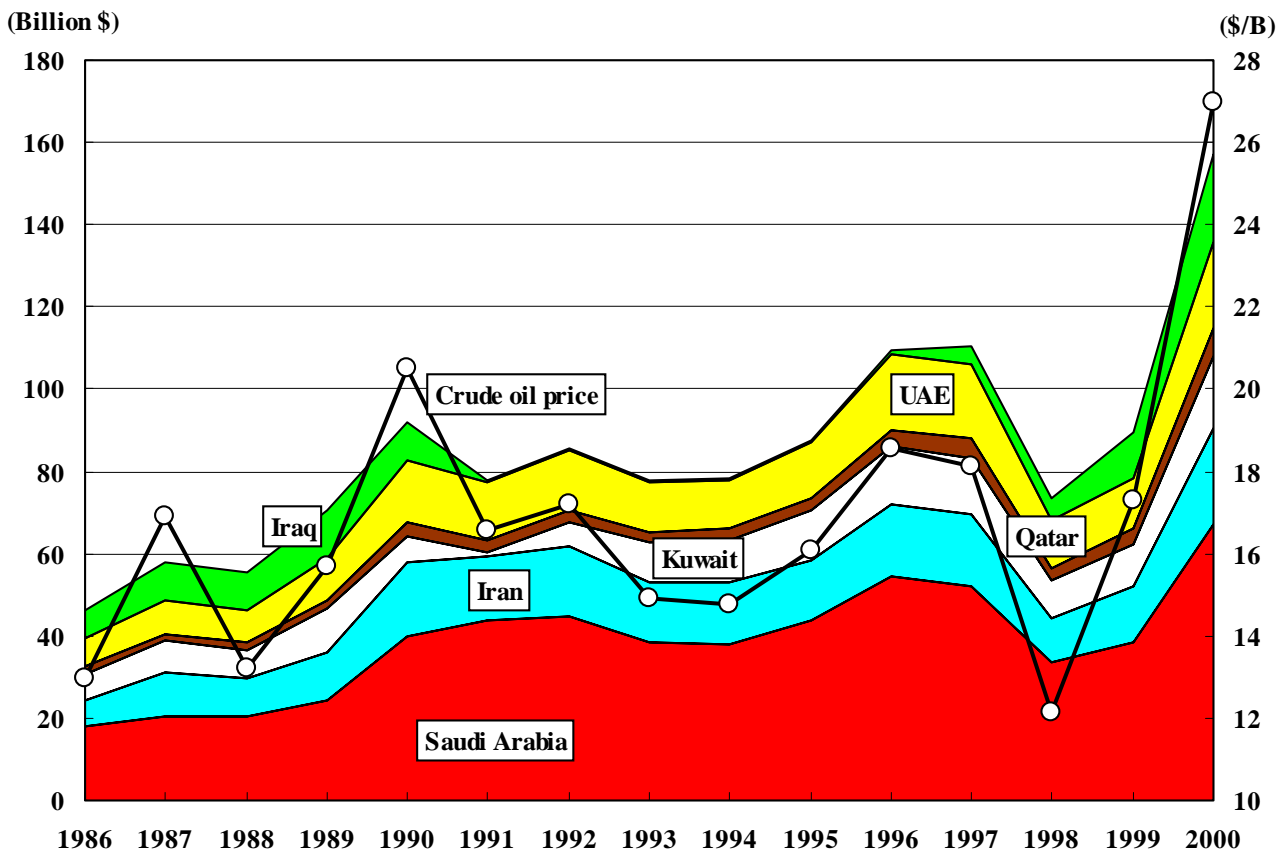
Effects brought about by technological innovations in the middle of the 1990s as well as effects produced by tax systems revised in industrially developed countries and by developing nations' improved conditions for introduction of foreign capital are expected to remain lasting as long as crude oil prices recover the \$15-20/bbl level. Seeing that measures mentioned above are unexpectedly encouraging non-OPEC oil-producing countries to increase crude oil production, even OPEC oil-producing countries in the Middle East are also becoming ambitious in recent months to invite foreign capital into their upstream operations. In fact, the bulk of crude oil being currently produced can be supplied at cost less than \$10/bbl, while

crude oil reserves proved at present are mostly assessed to be recoverable at cost less than \$20/bbl. Non-OPEC countries reportedly begin new oil development projects when crude oil prices reach the \$15/barrel level [3].

Notwithstanding the real cost picture noted above, OPEC member countries endeavor to maintain crude oil prices at high levels by means of production cuts only to maximize their oil incomes in the first place. The price level OPEC aims to maintain for the moment ranges from \$22/bbl to \$28/bbl -- under the current price band system -- with an average price at \$25/bbl. Nevertheless, OPEC is not sticking to maintain that price level in case oil demand shrinks, leading to a mutual downfall or a gradual decline of fortune into nothing. Repeated production increases and exercising the price band system in 2000 suffice to show OPEC's true intention.

Although there exist very few possibilities of crude oil prices plunging sharply at present, it goes without saying that oil-producing countries strengthen their unity in such a way that a hardwood floor will soon be hit, should the crude oil price downtrend gathers strength to reduce it to less than \$10/bbl. This point is made known by the two parties' responses to the crash in crude oil prices at the end of 1998. When the crude oil price plunged to almost below \$15/bbl, the market was alerted to danger, prompting OPEC and non-OPEC to take concerted action after all to keep prices from falling further, as evidenced by their moves made in and after November of last year. This means that there exists a certain price zone at which production cuts by OPEC and non-OPEC on a joint basis are justified. Non-OPEC countries attempt to earn maximum oil incomes by maximizing crude oil production when the crude oil price exceeds the \$20/barrel level, thus shifting its stance from a price maker to a price taker.

Oil-consuming countries, for their part, will be forced to accept such oil-producing countries' attempt to keep crude oil prices at high levels, unless the oil consumers themselves enter into the price zone in which an option can be rationally exercised for non-oil alternative energy sources. The powerful means which oil-consuming countries themselves can exercise are not found in that price zone. At present, it appears that alternative energy sources can exhibit their strength when crude oil prices are \$20/bbl or higher. It can be concluded then that competition is taking place between oil and non-oil energy sources in a fairly high arena -- the OPEC cartel -- in favor of oil.



(Source) Made from data on OPEC Annual Statistics

Fig. 4 Wild Fluctuations in Crude Oil Prices Cause Instability of Oil Incomes

Oil-producing countries' oil incomes came to fluctuate wildly in accordance with fluctuations in crude oil prices, as shown in Fig. 4, since the current formula of relating crude oil prices to market prices was introduced in the wake of the crash in crude oil prices in 1986. The weight attached to oil incomes holds an extremely large share of the oil-producing countries' national budgets, with wild fluctuations in oil incomes having seriously adverse effects on those countries' economic management. It is the oil-producing countries' desire to continue economic management as planned originally each year and certainly do not want to see oil incomes increase or decrease, especially decrease, unexpectedly as a result of wild fluctuations in crude oil prices year after year. Thus, to have crude oil prices change stably only within a certain range is also an objective for oil-producing countries to achieve.

3. Maintaining crude oil prices at high levels not easy task

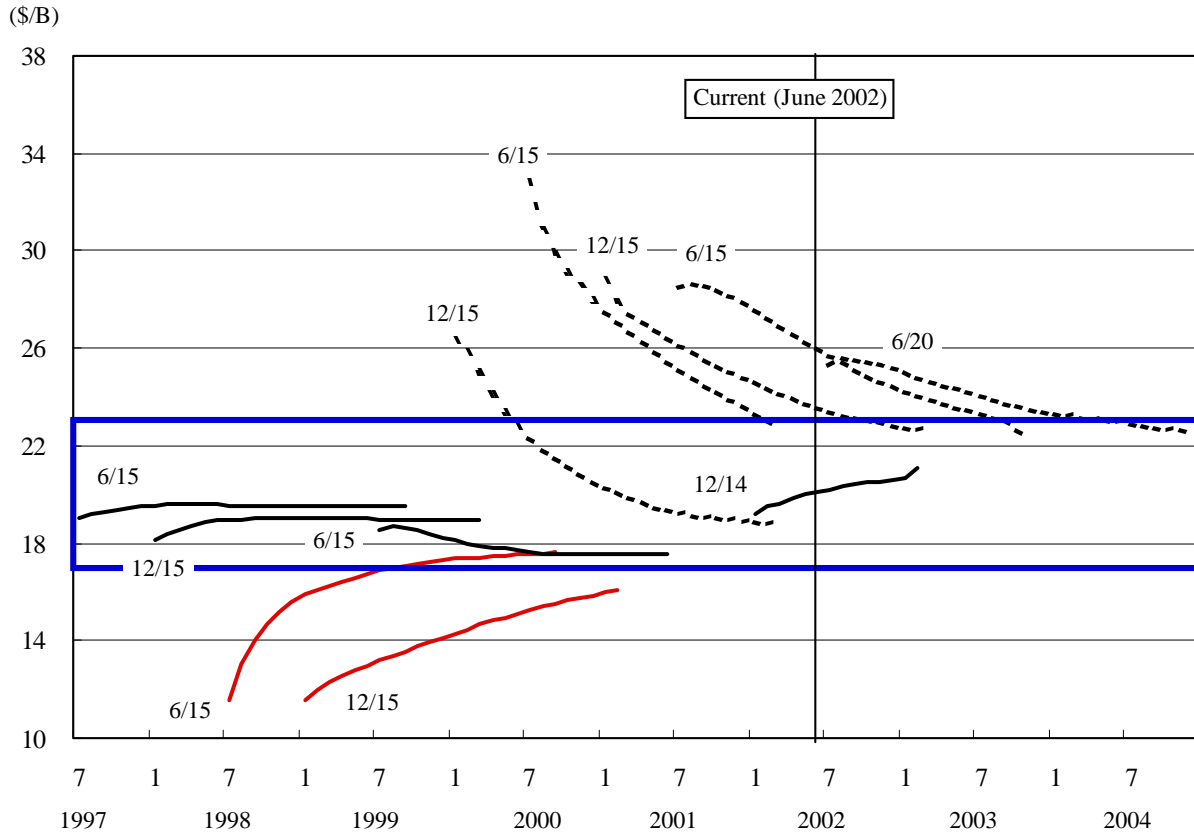
Factors affecting crude oil prices in 2002 are expected to include: (a) prospects for recovery of U.S. and world economies; (b) prospects for concerted action by OPEC and non-OPEC; and especially (c) the especially aggressive military activities being planned by the U.S. against terrorists. Crude oil prices have risen sharply and are temporarily at high levels at present, but judging from an overall standpoint, it appears to be difficult to expect that crude oil prices will recover in 2002 to the level desired by OPEC -- ranging from \$22/bbl to \$28/bbl, averaging out at \$25/bbl. Should OPEC aim to achieve its targeted price level, the task to be tackled by OPEC is not concerted action with non-OPEC but strengthened production cuts to be carried out independently by OPEC itself, enduring bitter criticisms from the world over as in 2000.

Taking into account what was noted above in its totality, it appears difficult to maintain crude oil prices on a long-term basis within the \$22-28/barrel band, with an average at \$25/barrel, as hoped for by OPEC. One reason is that OPEC must strengthen the production-cutting program of its own instead of production cuts in concert with non-OPEC, if OPEC really aims to achieve its objective of maintaining crude oil prices at \$20/barrel or above. It should be remembered that non-OPEC oil-producing countries would aim to attain oil production on a full scale by shifting to a price-taker stance, while steadily promoting new oil development projects.

Oil-consuming countries on their part are expected to step up conversion to alternative energy sources positively, if they realize that crude oil prices will continue to remain at the \$25/barrel level from a long-term perspective. Moreover, another reason is that OPEC member oil-producing countries must endure the worldwide criticism as they did in 2000, in case crude oil prices exceed \$25/barrel and approach the \$30/barrel level.

Crude oil price movements witnessed in futures trading market on NYMEX indicate the understanding of the market that current ups and downs of crude oil prices will only be short-lived, lasting for less than one year, and that prices will return to the \$17-23/bbl range in the not-too-distant future (see Fig. 5). Amidst the wild fluctuations in crude oil prices ranging from \$10/bbl to more than \$30/bbl over the period of six years or so in the past, it can be said that the market has expected to see crude oil prices will finally settle at such a

well-balanced zone. The futures trading market, though posing problems such as over-shooting on a short-term basis, plays a role of indicating the market's expectations, which cannot be seen in the spot trading market.

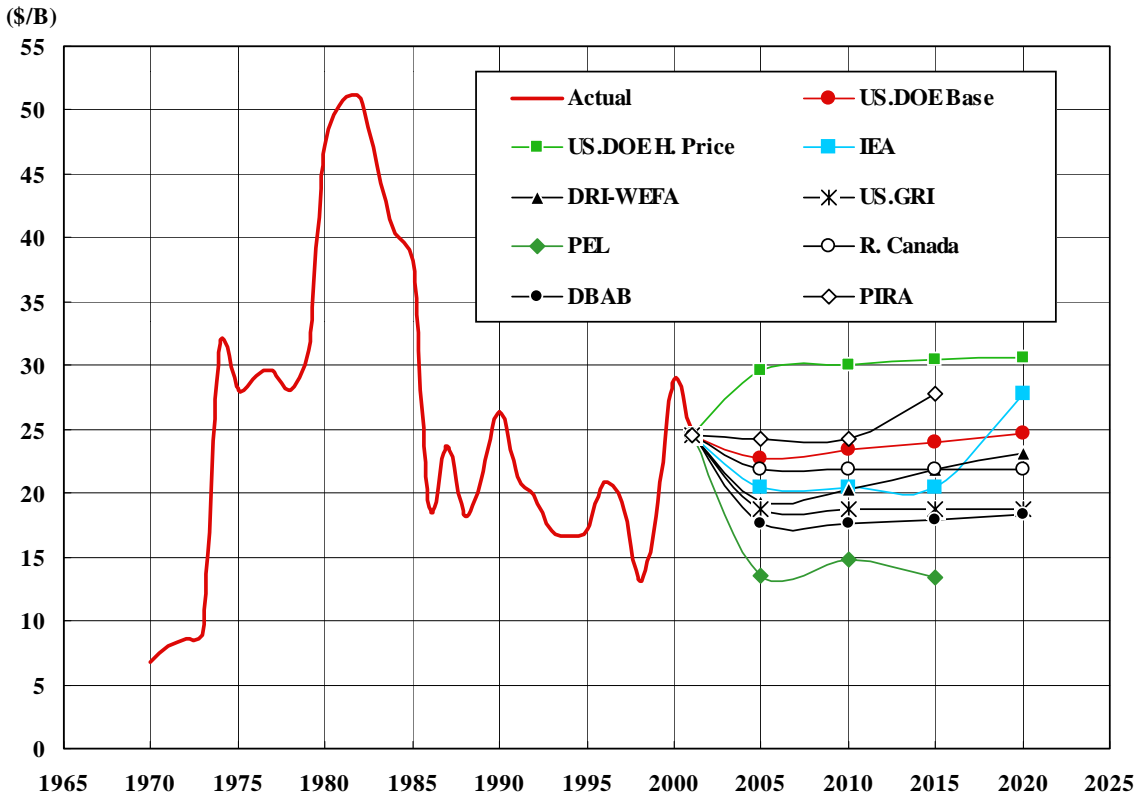


(Note) Prices shown are those for WTI crude.

Fig. 5 Crude Oil Price Range Expected by Futures Trading on NYMEX on Short-Term Basis (1-2 Years Ahead)

At any rate, it is not an easy task to maintain crude oil prices at a level higher than \$25/bbl for an extended period of time. In fact, according to forecasts made by U.S. and European professional organizations in the latter half of 2001, as shown in Fig. 6, many of them project that crude oil prices will remain at around \$20/bbl on average in real terms from a long-term perspective [4]. Behind these projections are the following factors: (a) OPEC's production cuts aimed at maintaining crude oil prices at high levels; (b) development of new non-OPEC crude oil reserves to be encouraged by crude oil prices sustained at a level higher than \$15/bbl; and (c) the existence of oil resources in the Caspian Sea and West Africa, not to

mention abundant resources in the Middle East awaiting eventual development in the final stage.



(Source) Made from data on US.DOE/EIA, "International Energy Outlook 2002"

Fig. 6 Long-term Prospects on Crude Oil Prices up to 2020

Behind the International Energy Agency’s projection that crude oil prices will rise after 2015 was the viewpoint that it would be necessary to develop non-conventional type oil resources after 2015 as oil demand continues to grow, since conventional oil resources will reach their limits, and that an equilibrium point of crude oil prices will be revised upward to around \$30/barrel, if non-conventional type oil resources are to be developed. IEA, however, has decided to procrastinate the timing of crude oil price increases to later years, taking into account the new crude oil reserve assessment results, as presented at the World Petroleum Congress held in 2000.

Among the factors which contributed to projecting that crude oil prices will now continue to remain at \$20/barrel on average from a long-term perspective through 2020 are the remarkable achievements which began to be witnessed in areas centering on the North Sea around 1993 and in subsequent years as a result of the spread of the technological innovation in the area of crude oil exploration, development and production. Remarkable cost reductions due to the progress and the spread of the technological innovation is an important factor which should not be overlooked, when considering crude oil prices, or competitive price levels of energy sources, in the future.

Taking into account both short-term and long-term viewpoints on crude oil prices as noted above, OPEC oil-producing countries' attempt to maintain crude oil prices at the \$22-28/barrel band level, with \$25/barrel on average, on a long-term basis appears difficult for various reasons and it contains some unreasonable elements. In fact, OPEC's attempt to maintain crude oil prices at such unreasonable levels has been abused by oil market players for their own advantage, thereby becoming one factor behind the wild fluctuations in crude oil prices.

4. Establishment of crude oil price target acceptable to both oil-producing and oil-consuming countries

With crude oil prices rising from 1999 into 2000, some sources dare to conclude that OPEC has restored its former influential power. However, it should be noted that there were factors beyond OPEC's control such as non-OPEC's production cuts in concert with OPEC which are necessary to maintain crude oil prices at high levels, shortages of refining capacities, oil inventories at low levels, and futures trading market's excessive response to crude oil price movements. When these factors are taken into account, nothing special had happened in actuality, while the establishment of a crude oil production framework admittedly played a major role in maintaining crude oil prices at a certain band level.

Looking back at wild crude oil price fluctuations over the past six-year period, including what was referred to above, the \$10/bbl level is the floor price, below which neither OPEC nor non-OPEC can tolerate any further downward movement in prices, while the two parties take action toward cutting production as soon as the price dips into a danger zone of \$15/bbl

or less (see Table 1). When the price exceeds \$20/bbl, there is no need for non-OPEC to continue production cuts, at which point they begin to assume profit-taking positions. To maintain crude oil prices at \$20/bbl or higher, independent production cuts by OPEC alone become necessary. Increases in crude oil prices to \$25-30/bbl levels or higher are bound to face loud criticisms from oil-consuming countries.

Table 1 Crude Oil Price Levels (Ranges) vis-à-vis Oil-Producing & Consuming Countries' Responses

Crude oil price level (range), \$/bbl	Oil-producing & oil-consuming countries' responses
\$7-13 (average \$10)	<ul style="list-style-type: none"> ● Lowest level, below which neither OPEC nor non-OPEC want to see oil prices fall. ● At lower prices, OPEC and non-OPEC strengthen unity to defend price level desperately. ● Oil-producing countries' response to crash in oil prices in 1986 and 1998.
\$12-18 (average \$15)	<ul style="list-style-type: none"> ● Concerted action by OPEC and non-OPEC to maintain crude oil prices. ● Alert zone for oil-producing countries (non-OPEC's response in 2001). ● Price level at which non-OPEC is encouraged to begin development of new oil reserves.
\$17-23 (average \$20)	<ul style="list-style-type: none"> ● Price level at which non-OPEC assumes profit-taking positions. ● Russia's move in recent months, non-OPEC's behavior in the past. ● Price level at which non-oil alternative energy sources' entry into energy market begins.
\$22-28 (average \$25)	<ul style="list-style-type: none"> ● Price level that OPEC wants to maintain. ● To maintain the price level, production cuts by OPEC alone is necessary. ● Development of crude oil and non-oil alternative energy sources become activated.
\$27-33 (average \$30)	<ul style="list-style-type: none"> ● Price level at which all oil-consuming countries become united in criticizing high oil prices. ● Animated discussions about releasing oil stockpiles for emergency use. ● Oil-consuming countries' response in 2000 to crude oil prices which remained at high levels

What happened from 1999 into 2000, when crude oil prices remained at high levels at \$25-30/bbl or above? Although the global economic slump was not directly due to an increase in crude oil prices, non-OPEC countries actively increased crude oil production in and after 2000. Especially, Russia's recovery in oil production has been remarkable. OPEC countries' production cuts since January 2002 raised OPEC's surplus production capacities to more than 7 million b/d, reaching a level of one-third its production quota. An increase in oil demand due to the U.S. economic recovery, combined with the heightened tension in the Middle East, involving the Palestinians and Iraq, have recently raised crude oil prices.

Should crude oil prices continue to remain at high levels, however, not only non-OPEC countries' development of new oil reserves, but also the introduction of alternative energy sources will be accelerated. This is to lead to one of factors triggering a phase of crude oil price downtrend.

Keeping its eyes on such wild ups and downs in crude oil prices, time has come for OPEC to finally consider establishing a realistic price band sooner or later. If the price band is set at \$17-23/bbl with an average price at \$20/bbl, lower than the current level by \$5/bbl, a reasonable and comfortable market environment is likely to be established. If OPEC strictly observes its rule of the price band system and carries out production increases and cuts promptly, the possibility of the market making a reverse use of OPEC's action to its own advantage will diminish. Instead, OPEC's development of rational activities is expected to eventually result in raising its own influential power in the oil market.

Recent six years in and after 1996 witnessed repeated fluctuations in crude oil prices, ranging from \$10/barrel to more than \$30/barrel. These fluctuations in crude oil prices are, of course, due primarily to production controls by oil-producing countries centering on OPEC countries, but also due to weakened buffers on the part of oil-consuming countries to a large extent in the form of shortages in refining capacities and low levels of commercial oil inventories. There is another problem that futures trading market's excessive reaction is amplifying wild fluctuations in crude oil prices.

In this context, it can be said that fluctuations in crude oil prices obviously are no longer ascribable to oil-consuming countries' actions alone, when we watch the current situation. If too wild fluctuations in crude oil prices prove to be disadvantageous to both oil-producing and oil-consuming countries, it is believed necessary for the two parties to make efforts in concert with each other to reduce the range of fluctuations to a level acceptable to both parties.

Oil-producing and oil-consuming countries are urged to make joint efforts to reduce the range of crude oil price fluctuations to a reasonable level. At the same time, frank opinions should be exchanged with regard to problems on the part of oil-consuming countries such as the shortages of petroleum refining capacities, industry operations at low oil inventory levels and the oil futures trading market's overshooting, so that efforts can be made toward creating

a market environment which is rational and meritorious to both parties of oil-producing and oil-consuming countries.

(References)

- [1] T. Sauffer, "Indicator of Crude Oil Production Costs: The Gulf versus Non-OPEC Sources," 1993
- [2] JNOC's Planning & Research Dept., "How long will the challenge and increased oil production continue in the North Sea, a matured area?"
- [3] IEA, "World Energy Outlook 2001, Assessing Today's Supplies to Fuel Tomorrow's Growth," 2001
- [4] US.DOE, "International Energy Outlook 2002," 2002

Contact: ieej-info@tky.ieej.or.jp