Effects of Oil Price Fall on Energy Policy Formulation in Selected Asian Countries*

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A survey was undertaken under the Technical Assistant Grant provided by the Asian Development Bank for six countries selected from the Asian region. The purpose of the survey was to see energy policy responses to recent changes in oil prices. This paper was prepared on the basis of the survey. Major findings of the survey were: i) recent oil price changes have influenced the economies of both oil exporting and importing countries of the region to a significant degree and ii) a more substantial and permanent changes have been made in energy sector policies and strategies in most countries surveyed in recent years as compared with findings in the previous surveys.

I. Introduction

Two brief surveys on energy plans and strategies of selected developing countries were undertaken previously in two consecutive years after the sharp drop of the oil price; the first during April-June 1986 and the second during August-September 1987.[1]

Objectives of the two surveys were to obtain information on the parameters and goals underlying the countries' energy plans and strategies and policy responses and strategy modifications in response to changes in energy / oil price situation since 1985. The ultimate purpose of the exercises was to produce a consolidated overview for the region, which would help understanding of inter-country differences in energy situation, and in assumption, appro-

*This paper was prepared with financial support of ADB and presented at Mineral and Energy Forum Meeting held in Manila, Philippines, during 26-28 July, 1989.

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[Seoul Journal of Economics 1989, Vol. 2, No. 4]

aches and emphasis pertaining to energy sector goals and issues. This, in turn, could help in evolving shared energy perspectives in the region, and facilitate identification of areas for possible cooperative action among countries.

Important findings of the two previous surveys were as follows: The surveyed countries continued to be concerned with the policy objectives that preoccupied them over the last decade through 1987 and most countries had not made major changes in energy policy and strategies. While policy priorities had shifted temporarily, they were relatively minor and seemed to constitute short-term adjustment rather than a permanent feature. The most obvious policy response of the countries to declining oil prices was the reduction of domestic prices of petroleum products and electricity tariffs. Another major finding of the two surveys was that most surveyed countries had proceeded with extreme caution in re-defining strategies solely on the strength of the sharp price aberrations experienced over two years of low oil prices and policy changes had been in the direction of relaxing earlier commitments to the objectives of energy security, oil displacement, and energy conservation (ADB 1986, 1987).

Above findings from the previous surveys were not unexpected, because two years of time lag since the collapse of oil prices were not long enough for countries to make major adjustments and changes in energy policy. Also, policy makers did not seem to have clear and certain vision on global oil price changes even in the mid-term.

Energy policies have in essence a long-term character. Structural and institutional rigidities exist not only in the production and consumption of energy, but also in formulating policies and strategies. Because of these characteristics, the full effect of oil price changes could be assessed only after a sufficient time lag is allowed.

This paper is a sequel to the two earlier surveys. The objective of this paper is essentially the same as those of the two previous surveys. Because a longer time has passed since the first collapse of oil prices, it is hoped that the effect of oil price swings will be better captured through this survey.

This paper was prepared based on six individual country reports selected from the east and south-east Asian region. The individual country reports and authors of the reports are listed at the end of this paper.

II. Energy Policy Objectives and Parameters

A. Changes/Revisions in Energy Sector Plan

A lapse of three and half years since the first sharp drop of oil prices may be long enough for a country to respond to the price drop on a more permanent basis and to make more durable policy changes than temporary adjustments. It was sought for through the survey if the countries surveyed had made any major changes on energy plans and strategies in official documentation since 1985.

China and Malaysia, both of whom are net oil exporters, have not changed or revised officially the government energy plans since 1986. However, their policy emphasis and strategies seem to have changed in practical terms since the price drop, even though their official energy plan documents have been intact.

Net oil importers, namely, Korea, Taipei, China, and Philippines, on the other hand, have changed or revised their official energy plans recently. Thailand, even though no changes have been made on the existing energy plan, had gone through a mandatory official mid-plan review on the plan by the National Economic and Social Development Board in 1989.

Backgrounds and reasons for the changes / revisions of energy plans and policies vary among countries. It appears that the decline of crude oil prices had direct as well as indirect impacts on the economies of both oil-exporting and importing countries and these impacts had forced or caused changes in energy plans, policy emphasis, and strategies. Of course, the views of policy-makers and planners on perspectives of global oil prices and economic growth have affected changes in energy sector plans.

The most direct impact of the drop of crude oil prices on oil-exporting countries was a reduction of oil-export bill and government revenue and foreign exchange drains, which had a series of indirect impacts on the economy. These impacts have forced the government of oil-exporting countries to change or revise energy policies and strategies. Oil export bill of China, for example, reduced by 52.5 pecent in 1986 over 1985. Since oil export bill is the major source of foreign exchange, the country has adopted the strategy of accelerating development of oil and squeezing domestic consumption of oil to compensate the reduction of oil export bill by increasing oil export. Also the government plans to accelerate coal

development and production to substitute domestic consumption of oil and to increase export. A similar strategy has been adopted in Malaysia, who has faced the same problem as China by the drop of crude oil prices.

The decline of crude oil prices had opposite effects on oil-importing countries, that is, a reduction of oil import bill and an easing of foreign exchange situation, which contributed to the vitalization of the economy and resulted in increases in energy demand. These forces have caused the governments of oil-importing countries to change or revise the energy sector plans and strategies. Representative examples of the case are Korea and Taipei, China.

B. Energy Policy Objectives and Their Priorities

Even though countries surveyed have changed either government's energy plan or policy emphasis and strategies without formal change or revision of the existing energy plans, the base-line philosophy underlying the energy plans and policies did not seem to have changed by the drop and oscillatory movements of oil prices. A secure supply of energy at a low cost to support economic development of the country has remained to be the prime objective of energy policy of both oil-exporting and importing countries throughout the review period.

Other policy objectives and their ranking vary widely among countries and also priority rankings have changed over time in many of the surveyed countries. Table 1 shows priority rankings of energy policy objectives and changes in the rankings over time. The priority rankings of the table are in most cases done by the judgement of national contributors after reviewing the government's plan documents and / or interviewing policymakers and planners.

A care needs to be paid in interpreting the survey results shown in Table 1. Not all the policy objectives listed in the table are independent of each other. Some objectives are interrelated with others and some of the listed objectives are not "objective", but a strategy to achieve other objectives. For example, oil substitution is a strategy of achieving the objective of energy security and lower energy import bill. Oil inventory level is again a strategy to achieve the energy security objective.

The resource-abundant countries such as China and Malaysia continue to attach a high importance to resource exploration and development and more recently to development of oil substitutes,

TABLE 1
RANKING OF OBJECTIVES IN ENERGY PLANS

Policy objective	China		Indonesia		Korea		Malaysia		Philippines		Taipei, China		Thailand	
	A	*B*	*A*	*B*[a]	*A*	*B*	*A*	*B*[b]	*A*	*B*	*A*	*B*	*A*	*B*
Energy self-reliance	1	1	5	–	3	1	1	1	1	1	7	6	4	2
Energy security	–	–	3	–	1	1	3	–	2	2	1	1	2	2
Reduced oil-import dependence	–	–	–	–	2	–	–	–	2	3	2	3	3	–
Oil substitution / diversification	4	6	2	–	2	–	1	1	1	1	3	3	3	1
Oil inventory level	–	11	–	–	1	1	–	–	–	–	6	7	2	–
Lower oil import bill	–	7	–	–	2	–	3	–	4	–	–	–	1	1
Lower energy prices	–	8	4	–	5	–	2	2	3	2	–	–	5	2
Energy conservation	2	3	3	–	1	3	–	2	3	2	4	4	1	2
Maximize energy export	5	10	1	–	–	–	–	–	–	–	–	–	–	–
Rationalization of energy pricing	–	–	–	–	–	–	–	–	–	–	6	5	–	1
Environmental protection & safety	–	9	–	–	–	4	–	3	–	2	5	2	–	–
Others	–	1[c]	–	–	–	2[e]	–	–	–	2[d]	–	–	–	1[f]

Note: a: Information were not available.
b: The author of this paper ranked by review the country report.
c: Energy resource exploration and development. Besides, power generation ranked as 4, energy transport as 5.
d: Participation of private sector in energy projects.
e: Privatization / deregulation.
f: Deregulation of oil prices, privatization of some government's activities, and refining and electricity generation capacity expansion.

mainly of coal in China and of natural gas and hydro-power in Malaysia. Energy conservation and export maximization objectives seem to occupy the second high ranking in both countries. While Malaysia puts the environmental objective at the third rank, China gives a lowest rank to the environmental objective, but third high ranking to energy infrastructure building such as power generation, energy transport, and rural electrification.

The most noticeable changes in energy objectives and priority rankings are manifested in cases of Korea and Taipei, China. The two countries are relatively advanced in economic development and enjoy relatively high income among the six countries surveyed. Both Korea and Taipei, China continue to attach the highest importance to energy security. While Korea considers energy self-reliance and oil inventory level equally important and attaches high ranking to these objectives, Taipei, China puts them at the end of the priority ranking. This difference, however, does not seem to be due to the difference in substance in policy objectives, but due to difference in understanding and interpretation. Korea sees oil inventory level and energy self-reliance as strategies to achieve energy security objective, while Taipei, China seems to consider them as independent objectives.

A few noticeable changes were observed in revised energy plans of both Korea and Taipei, China. First, the environmental and safety objective was upgraded in revised plans, which is not, of course, a direct result of oil price changes, but a natural consequence expected from the successful economic development and improved standard of living. Secondly, oil displacement objective has been downgraded. The reduced oil-import dependence and oil substitution objectives were ranked third in Taipei, China, while they were totally deleted from explicit energy objective list in Korea's recent plan. Oil share in the energy mix of Korea had increased to 47.4 percent in 1988 from 44 percent in 1987 and the share is projected to continue to increase throughout the sixth economic development plan period. The relaxation or deletion of oil displacement objective has, of course, resulted directly from declined oil prices. Thirdly, both countries put the energy conservation objective in the middle of the priority ranking, which used to occupy the highest rank in earlier energy sector plans in Korea.

Philippines and Thailand, both of whom are also net oil importer but in a relatively lower stage of economic development compared to Korea and Taipei, China, place the oil substitution / fuel diversi-

fication objective at the top of priority list. The reason and justification for such ranking is not known clearly for Philippines, but policymakers and planners of Thailand still seem to be preoccupied with the past unhappy experiences and worries that they had during the high oil price era. Energy conservation objective ranks the second in both countries, while Thailand attaches an equal importance to energy pricing and privatization / deregulation of energy sector.

C. Key Parameters Important in Defining Energy Sector Objectives and Targets

The key factor that plays the most significant role in defining energy objectives and targets appeared to be the target GDP level, which is the major factor determining energy requirements of a country. Four out of five responding countries ranked the target GDP level as the most important key parameter (see Table 2). Philippines and Thailand attached the highest importance to crude oil price behavior, which does not disagree with the findings in their ranking of energy objectives discussed in the above. Taipei, China also places the crude oil price behavior on the second from the top. Since the industry sector is generally energy-intensive and a leading sector for the growth of economy of these countries, the share of industry in GDP is considered by most countries as important parameter next to the target GDP level in defining energy objectives and targets.

The importance of other factors and parameters listed in the table such as global oil availability, OPEC share in global oil trade, domestic energy resource endowments, and coal prices is recognized with varying degrees among the countries. Other factors and parameters that are not listed but considered important by the countries are coal availability (Taipei, China), power industry development (China), changing social and economic environments (Korea), state of energy sector and time and budget constraints (Philippines), and exchange rates and costs of foreign credits (Thailand).

III. Perspectives

A. Projected GDP Growth

All the countries surveyed have achieved very high economic

TABLE 2

KEY FACTOR AND ORDER OF IMPORTANCE IN DEFINING ENERGY OBJECTIVES

	China	*Indonesia*[a]	*Korea*	*Malaysia*[b]	*Philippines*	*Taipei, China*	*Thailand*
Crude oil price behavior	5	-	3	-	1	2	1
Global oil availability	7	-	4	-	-	3	-
OPEC share in global oil trade	8	-	3	-	-	5	n.a.*
Target GDP level	1	-	1	-	2	1	1
Share of industry in GDP	2	-	3	-	3	4	n.a.*
Domestic energy resource endowments	4	-	1[c]	-	4	7	1
Coal price	5	-	4	-	-	6[d]	-
Environmental concerns	6	-	2	-	5	-	-
Others	3[e]	-	2[f]	-	6[g]	8[h]	-[i]

Note: a: Indonesian report was not available.
b: No information was shown in the country report.
c: The high order of domestic resource endowments does not mean abundance of resources to be developed, but means that resource endowment situation is extremely poor so that this limitation is most seriously recognized in setting energy plans and targets.
d: Coal availability.
e: Power industry development.
f: Changing social and economic environments.
g: State of energy sector, time constraints, and budget deficit target and constraints.
h: Exchange rate.
i: Exchange rates and costs of foreign credit.
*: n.a. means no ordering is indicated in the country report.

TABLE 3
ACTUAL AND PROJECTED ECONOMIC GROWTH

Year	China	Korea	Malaysia	Philippines	Taipei China	Thailand
1985	12.99	5.4	-1.0	-4.3	4.3	3.5
1986	8.30	12.3	1.2	1.4	10.58	4.5
1987	10.61	12.0	5.1	4.7	11.20	8.4
1988	11.61	12.1	8.1	6.4	7.30	11.0
1989[p]	6.+	8.0	7.3	6.5	6.+	9.3
1990-92[p]	6.0+	7.5	-[a]	6.4	5.8	7.5
1993-95[p]	4.0-6.0	6.0-7.0	-[a]	5.8	5.8	6.2

Note: p: Either "planned" or projected.
a: Medium growth scenario assumes 4 percent growth during 1991-2000.

growth rates. The gross domestic products of four countries, namely, China, Korea, Taipei, China, and Thailand grew at a close to or higher than 10 percent per year from 1986 to 1988. Malaysia and Philippines recorded relatively lower growth performance during the same period. The decline of oil prices should have had the effect of stimulating the economic growth of the former group of countries, while checking the growth of Malaysia. The slow growth of Philippines should have been attributable mainly to social and political reasons.

Most countries envision that the past growth momentum will continue to operate in the near and medium-term, but project the future growth rather conservatively (see Table 3). Malaysia seems to be the most conservative; medium growth scenario assumes annual average growth rate of 4 percent during 1991-2000. Korea and Thailand project relatively high growth of the economy, i.e., over 6 percent per year up to 1995. The growth projection of other countries mostly falls within the range of 5-6 percent during 1990-5. Most countries project that the average growth rate of economic growth beyond 1995 will be lower than that of the previous period.

B. Perspective on the Future of Global Oil Prices

All countries are unanimous in projecting that oil prices will be increasing over time (see Table 4). It appears that most countries surveyed have had more optimistic view on global oil prices as time passes, that is, optimistic for oil importers.

TABLE 4
OIL PRICE PROJECTIONS

Forcast period	China	Korea	Malaysia	Philippines	Taipei China	Thailand
1989-90	$16-$19	$16-$19	n.a.	$16-$19	$13.3	$16.3-$16.7
1991-92	$20-$25	$16-$19	n.a.	$20-$25	$14.0	$17.1-$18.0
1993-94	$20-$25	$20-$25	n.a.	$20-$25	$15.1	$18.9
1995	$26-$30	$20-	n.a.	$20-$25	$16.3	$20.8
2000	$30+	$26-$30	n.a	$20-$25	$20.6	$25.0

In the 1986 survey, projections of global oil prices for the year 1995 ranged between US$25 and $30 per barrel, averaging about $25 per barrel for all the surveyed countries. In the same survey, five countries expected prices to exceed $30 per barrel by the year 2000, four projected of about $30 per barrel.

In the 1987 survey, four countries anticipated that prices would still lie within the $16-$20 price band, while two North Asia countries felt prices would move to the next quintile, $20-$25 per barrel for the forecast period, 1987-90. In the same survey, for the longer term period, 1991-5, all price projection moved a quintile higher: between $20-$25 barrel for four countries, between $22-$35 for Thailand, and from $26 to $30 per barrel for two North Asian countries.

All countries in the current survey expect the prices to remain within $16-$19 price band by next year and start to increase gradually. Three countries, namely, Korea, Philippines, and Thailand project the prices to be within $20-$25 price band from 1993 to 1995, while Taipei, China anticipates the price to be about $16 per barrel in 1995. China projects the prices to be one quintile higher than the projection of other countries after 1995.

C. Projected Share of Industry in GDP

Most countries see the economic growth to be led largely by the industrial / manufacturing sectors. As a consequence, the share of industrial GDP is projected to increase in all countries surveyed except Taipei, China(see Table 5). The share of industiral GDP of Taipei, China reached a peak of 51.2 percent in 1987 and decreased to 50.9 percent in 1988. The Energy Master Plan of the country projects that the share will continue to shrink and reach to about 46

TABLE 5
PROJECTED SHARE OF INDUSTRIAL GDP[a]

Period	China	Korea	Malaysia	Philippines	Taipei China	Thailand
1985	44.6	28.2	19.71	32.26	n.a.	20.7
1986	45.5	29.2	20.93	31.17	50.07	21.7
1987	45.7	30.3	22.46	32.04	51.18	22.7
1988	46.0	30.6	23.95	32.70	50.93	23.0
1989[p]	46.-	30.9	25.34	34.70	50.31	23.4
1990-92[p]	46.-	31.8	n.a.	35.85	49.31	24.1
1993-95[p]	46.+	33.0	n.a.	n.a.	48.10	25.6

Note: a: Percentage of industrial GDP to total GDP.
p: Projected.

percent level by the year 2000. This decrease may be attributable largely to transformation of the economic structure towards service and trade sectors.

Cross country differences in the share of industrial GDP appear to be quite significant. The largest industrial share is recorded throughout the observed and projection period for Taipei, China, followed by China and then by Philippines. Industrial shares of Malaysia and Thailand are lowest among the countries surveyed and Korea stands in the middle. Such cross country differences in the share seem not to reflect real differences in the shares, but seem to be a matter of a measurement problem. China, for example, includes manufacturing and construction sectors in the share, while Korea, Malaysia, and Thailand count manufacturing sector exclusively in the share. What sectors were included in the share is not known for Philippines and Taipei, China.

Except Taipei, China, all other countries project increases in the share at a moderate rate and no significant differences are found in the trend of changes among the countries.

D. Perspective of Energy Demand and Supply

Since 1985, oil prices have exhibited an oscillatory movement, that is, a movement of repeated ups and downs over the years. Yet, the movement has been within a relatively low price band: peak prices during the period has been only about half the peak price of early 1980s. The low oil prices have stimulated economic growth of

oil-importing countries, which has caused increases in the demand for energy in these countries. The shift-ups of energy demand necessarily enforce the counntries to make upward adjustments in energy demand in their plans. All four net oil-importing countries have already made adjustments either in the revised energy sectors plans or in the projections. China and Malaysia, on the other hand, have not made the adjustment in the plans yet.

A) Adjustments in Total Energy Demand

The 1989 Energy Master Plan of Taipei, China projects that total final energy consumption will be larger by 6.1% for 1990, 3.8% for 1995, and 2.4% for the year 2000 over what the 1985 projection made. The Korea's original energy sector plan for 1987-91 anticipated the average annual growth of total energy consumption to be 5.1 percent during the plan period. The 1988 revised plan made an upward adjustment for the growth rate to an average growth rate of 6.9 percent per annum for 1988-91. The upward adjustments of energy consumption of both countries were largely attributed to the shifts in consumption during 1986-8.

In case of Thailand, new projection on energy demand made in April 1989 was drastically different from that made in January 1988. The difference between the two projections was as big as 23.7 percent for 1995 and 28.8 percent for the year 2000. Philippines also made upward adjustments of energy consumption in the plan. Compared with the Medium Term Philippine Development Plan which was published in 1986, the new Philippines Medium Term Energy Plan for 1988-92 released officially in 1989 anticipates 10 percent larger consumption of energy in year 1992 over what had been planned previously.

B) Adjustments in Energy Mix

The change in oil prices in general leads changes in prices of alternative energy sources. Since 1985, oil prices declined relatively more than prices of alternative sources. The decline of the relative price of oil would induce increased consumption of oil in substitution for the alternative fuels and cause to make adjustments of fuel mix in energy plan.

Taipei, China projects that the oil share will continue to decline througout the forecast period so that it will reach to 43 percent level by the year 2000 from 58.6 percent in 1988. This projection is not significantly different from what was projected in 1986. A no-

ticeable change in energy mix in the recent revised plan is a large reduction of nuclear portion: it was projected to be 19.3 percent for the year 2000 in the previous plan, which reduced to 14 percent in the revised plan. The reduced portion is largely to be filled by increases in gas portion. The decrease in nuclear portion in the plan is mainly due to increasing concerns for environmental and safety issues.

Oil dependence of Korea has been increasing from the bottom of 44 percent in 1987 and projected to continue increasing throughout the plan period. The government made an upward adjustment for oil dependence in the revised plan from 46 percent in the original plan to 50 percent for 1991. The increased oil will be consumed largely in substitution for anthracite in the residential sector.

Oil dependence of Thailand had declined from 76 percent in 1984 to less than 65 percent by 1987. The government plan anticipates and plans that the dependence will continue to decline throughout this century. However, an upward adjustment in oil dependence was also made in the 1989 revised projection after the official mid-plan review on the original mid-term plan was undertaken: the oil dependence was projected to be 62 percent for 1992 and 54.8 percent for 2000 in the 1987 report, which was adjusted to be 67.4 percent for 1992 and 57 percent for the year 2000 in the new projection.

Philippines' share of oil in total commercial energy consumption decreased from 65.7 percent in 1985 to 61.2 percent by 1988. The original 1986 energy sector plan projected the share to be 48 percent for 1992, which was adjusted to 57 percent in the revised energy plan.

As such, all the four net oil-importing countries have made upward adjustments in oil dependence in their revised plans. These adjustments were partly attributed to shifts in oil demand in the last few years by the decreased oil prices, but the changed views of policy makers and planners regarding the future of oil prices and its availability should also have affected the adjustments.

IV. Policy Responses to Oil Price Changes and Policy Concerns

The mix of policy responses and policy concerns were very diverse among the countries surveyed. As already discussed, all the four net oil-importing countries have made changes / revisions either explicitly or implicitly in their energy sector plans in re-

sponse to the recent changes in oil prices. Besides, changes in policy objectives and their priority rankings and adjustments of targets for important energy variables and of parameters presented in the two previous sections are all implied policy responses and changes. This section will pick up and discuss only those policy responses of the countries that are considered significant to be mentioned or common to most countries surveyed.

A. Macroeconomic Policy Responses

Since changes in oil prices affect the economies of both net oil-importer and exporters but in opposite directions, macroeconomic policy responses to the price changes of these two groups of countries should differ. All the four net oil-importing countries reported that they had not made any major macroeconomic policy changes responding directly to the recent changes in oil prices. It is likely that the economies of net oil-exporting countries have been affected more heavily and directly by the oil price declines (of course, in the opposite direction) and as a consequence they should have responded and made changes in macroeconomic policies. Unfortunately, however, policy responses of these countries could not be presented in this paper, because of the lack of information at the moment.

The drop of oil prices in 1986 and its oscillatory movements since then should have affected the economies of the net oil-importing countries in a few significant ways: they have affected directly the amount of oil import bill, trade balance and balance-of-payment position, inflationary pressure, and foreign exchange situation. The overall effects of the recent oil price changes on these macroeconomic variables were mentioned to be favorable to the economies of net oil-importing countries, which should have contributed to the recent high growth of the economies of these countries and caused eventually to change their economic development plans and policies. This will be even more true for those net oil importers, where a significant portion of the government's revenue comes from oil imports and marketing or oil imports occupy a large portion of total import of the country.

All the four net oil-importing countries reported that their economies has benefited from the oil price changes since 1986 in terms of the reduction of oil import bill, improvements of trade balance and balance of payment position, easing of foreign exchange situation, and relaxation from the inflationary pressure. In spite of all

these happened, the countries reported that the governments had not made major macroeconomic policy changes in direct response to the oil price changes since 1986. It seems, however, that such responses to the survey should be due to analytical problem. It is difficult or even not possible to analyze for these countries how much of the economic growth and changes in other macroeconomic variables and resultant macroeconomic policy changes that have been experienced by these countries since 1986 have been due to the changes in oil prices. Yet, countries surveyed pointed out certain macroeconomic policy responses of their governments as follows:

Korea: As trade balance of the country turned into surplus in 1986 and the surplus increased in the following two years, which had been due both to large increase in commodity export and reduction of oil import bill, the government decided to dispose a part of foreign exchange for an early reimbursement of external debts and to promote investment abroad by domestic companies. The trade surplus has accompanied expansion of money supply, which has been a direct cause of inflation. The government has adopted a tight monetary and deflationary policy since 1987.

Philippines: The fiscal and monetary policies of the country was framed in 1987 by the first IMF-sponsored adjustment program, which was carried over in the new adjustment program to be lasted until 1992. Thus, the fiscal and monetary policies have been more or less set by the program. Macroeconomic response to the fluctuations of the crude oil price was largely for fine-tuning purposes. To make up for the loss in the government tax revenue by oil price changes, the government entered the domestic and foreign capital markets, which had resulted in pushing up interest rates.

Thailand: The government has not made any major fiscal or monetary policy changes in direct response to the oil price changes, in spite of the fact that the economy has been affected by the oil price changes in a number of ways. The central bank has decided to control commercial bank credit by restricting lending to "nonproductive" sectors. The government recently increased the excise tax in order to capture parts of the windfall gains of petroleum sector.

China: Crude oil is one of the major export products of the country. Oil export bill in 1986 reduced by 52.5 percent over 1985 caused largely by the price drop. The oil export bill in 1988 stayed at almost the same level of 1986. The government has been trying to

expand exports of other commodities to make up the reduced oil export bill. In 1988, the government established the Ministry of Energy by combining four independent Ministries of Electric Industry, Petroleum Industry, Coal Industry, and Nuclear Industry.

Malaysia: With the collapse of oil prices and the resulting economic recession, severe constraints and pressures have placed on foreign exchange and government revenues. As a result, the government decided to substantially trim public investments, especially of the energy sector investment. To compensate the reduction in revenue due to oil price decline, the government also intends to release as much petroleum as possible for export, for which most of the energy projects approved thus far are geared towards the maximum utilization of natural gas for oil substitution.

B. Other Major Policy Responses

A) Domestic Prices of Petroleum Products

It was observed from the two previous surveys that countries generally had effected a reduction in domestic prices of petroleum products as a reaction to the drop in international prices in 1986. China, Malaysia and the Philippines increased domestic retail prices for selected petroleum products as the crude oil prices increased in 1987, while Thailand further reduced the retail prices. Korea and Taipei, China had not moved on domestic retail prices for key products until the middle of 1987, when the crude oil price recovered half of what it lost in 1986.

Korea and Taipei, China seem to be only countries, where retail prices of pertroleum products have further reduced through several steps since reported in the 1987 survey and the reductions were quite substantial in both countries. The percentage change of retail prices ranges from 28% (diesel, regular) to 43% (bunker-c) between May 1987 and the end of 1988 in Korea. The retail prices of regular gasoline and low-sulfur fuel oil reduced by 31 percent and kerosene retail price by 11 percent in Taipei, China during August 1987-September 1988. It seems that the further substantial reductions of retail prices of petroleum products in these two countries could be possible, because the two countries had reflected only a part of the reduced crude oil price to domestic prices in 1976 and their currencies have been appreciated substantially since 1986.

Retail prices of petroleum products had remained unchanged in

Thailand since the downward adjustment was made in 1986 until November 1988, when the prices reduced by about 5 percent on the average.

The price movements in the domestic market of Philippines look somewhat peculiar. As compared with July 1987 prices, the prices rose by 5–10 percent in May 1988 and decreased substantially on May 1, 1989. The reason for this year's decrease in the retail prices are not clearly known, but it seems due to a mix of political objectives and changes in tax structure.

Movements of domestic retail prices of petroleum products in the two net oil-exporting countries were substantially different from those of the net oil importers. Since 1986, the retail prices of petroleum products in Malaysia have remained unchanged, while the prices in China has continued to rise.

B) Changes in Electricity Tariffs

Korea and Taipei, China have cut the electricity tariff rates several times since reported in 1987 survey. Magnitudes of the tariff cuts in both countries were far smaller than those of reductions of petroleum product prices. The tariff cuts in both countries were mainly to relfect reduced generation costs of electricity by the decline of oil prices. Taipei, China, in spite of the cut of the average tariff rate, raised the tariff rate for peak time demand substantially in February this year. While Malaysia had reduced electicity tariff rates by about 12 percent between 1986 and 1988, China raised the rates. Thailand and Philippines did not provide information on electricity tariff.

C) Oil Procurement Strategy

Net oil-importing countries seem to have taken different strategies for oil procurements. Country like Taipei, China seems to continue to put emphasis on secure oil supply, for which oil requirements of the country will be secured through entering into long-term contract with the government of oil producing countries as well as international oil companies, despite of recent supply gluts of oil markets. Korea, Philippines, and Thailand, on the other hand, have relied increasingly on the spot markets. Korea's spot market portion is about 45 percent and the government recently has adopted the oil procurement strategy, by which the country depends oil imports on a few reliable sources to acquire the basic requirements of oil on a fixed-term contract basis and to diversify sources for the rest.

D) Oil Inventory Levels

Net oil-importing countries tend to made a downward adjustment of strategic oil inventory levels. Taipei, China reduced the minimum store fuel level required for oil-fired power plants from 90 days' consumption to 60 days'. Korea also has made a downward adjustment of the oil inventory level from 90 days' consumption of the nation to 60 days'. Legally required inventory level of oil in Thailand is much lower. All licensed oil traders and refiners are required to retain 3 percent of oil products and 4 percent of crude oil as a mandatory reserve, which is equivalent to 11 days and 14 days of consumption respectively.

E) Resource Exploration and Development

Despite of the decline of oil prices and softening of oil markets in recent years, all countries surveyed responded to accelerate exploration and development of energy resources. Current net oil-importing countries promote resource development activities largely for security purposes, while net oil-exporting countries largely for increasing export.

Since Korea and Taipei, China are poorly endowed with domestic resources, both countries emphasize resource development abroad mostly by joint venture. Thailand, on the other hand, emphasized exploration and development of domestic resources, mainly of gas and lignite, for which the government recently has provided incentives for private sector to more actively participate in these activities. The Philippines' new Mid-Term Energy Plan emphasizes the continuation of indigenous energy resource exploration and development, but details of the plan are not known.

China plans to accelerate domestic resource exploration and development to meet increasing domestic demand and to increase export. The country has relatively abundant coal and oil resources. The government has taken various measures and provided incentives to accelerate the exploration and development activities. For example, coastal continental shelves and 10 provinces in the south of China have been opened for foreigners. The government has also adopted some reforming measures such as "contracted policy for 100 million tone of crude oil production," by which the producer is allowed to export or sell at the domestic market at premium prices. The most important factor impeding resource exploration and development of the country seems to be poor infrastructure and lack

of funds.

Resource exploitation strategy of Malaysia includes a comprehensive survey to determine the country's energy resources, utilization of domestic energy resources, especially of hydro and gas, establishment of appropriate depletion rates for oil, and the development of local capability to exploit the country's energy resources. To provide additional incentives for oil and gas exploration, the government provides: i) an increase in the percentage allowed for cost recovery, from 30 percent to 50 percent for crude oil, and from 35 percent to 60 percent for natural gas; ii) changes in the profit split ratios, applied on a sliding scale, with a 50 : 50 split for the first 10,000 barrels per day of crude production, or the 2 TCF of natural gas production and; iii) waiving of all bonus payments.

V. Summary and Conclusions

The collapse of oil price in 1986 and its oscillatory movements at a relatively low level since then have influenced the economies of both oil exporting and importing countries in the Asian region to a significant degree.

The most direct impact of the price drop on oil exporting countries was a reduction of oil-export bill, government revenue and foreign exchange earnings, which had a series of indirect impacts on their economies. The price decline had opposite effects on oil-importing countries, that is, a reduction of oil-import bill and easing of foreign exchange situation, which contributed to the vitalization of the economy and resulted in increases in energy demand. Such effects of the oil price drop had caused the governments of both oil exporting and importing countries to change or revise their energy sector policies and strategies.

Despite the drop of oil prices, resource abundant oil exporting countries continue to attach a high priority in energy sector policy to resource exploration and development, reasons for which are to increase production of oil substitutes such as coal and hydro power for domestic use in order to increase oil export to compensate reduced oil-export bill caused by decrease in oil prices. As expected from the oil price decline, oil displacement and energy conservation policy objectives have been downgraded in most oil-importing countries. Yet, these countries continue to attach a high policy priority to energy security objective.

No significant changes in macroeconomic policies have been made in oil importing countries in direct response to the oil price changes. However, since the price changes have affected the economies of these countries favorably in terms of trade balance and low inflationary pressure and stimulated the growth of the economy, macroeconomic policies of these countries had to be revised. In other words, oil price changes have affected macroeconomic policies of oil importing countries not directly, but indirectly. Oil exporting countries, on the other hand, had to revise their macroeconomic policies in direct response to oil price changes.

In conclusion, more substantial and permanent changes have been made in energy sector policies and strategies in most countries surveyed in recent years as compared with findings of the two previous surveys. This may reflect the fact that policy planners of these countries have become more optimistic for the perspectives on the energy future as reflected in their response to the questionnair on future oil price perspective. Most countries projected lower oil prices than projected in the previous two surveys.

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