
CHAPTER 10

**The Soviet Bloc and World
Energy Markets**

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The Soviet Bloc and World Energy Markets

One important theme in the debate over the Soviet Union's energy future has been the potential impact on the west of a decline in Soviet oil production. The prospect of such a decline has been greeted with the apprehension that it could cause the Council for Mutual Economic Assistance (CMEA) as a whole, or even the U.S.S.R. itself, to become a net oil importer. Many have argued that, by increasing demand, net oil imports by the countries of the CMEA could initiate additional competition on world markets and further push up the price of oil. OTA's analysis indicates that this is improbable. A more likely eventuality is that CMEA's net exports will decline. This would have repercussions for the countries of both the Western alliance and the Eastern bloc. Such an outcome would certainly place strains on the economies of the U.S.S.R. and Eastern Europe, strains which would have both domestic and foreign policy consequences.

This chapter addresses the question of the likelihood and implications for both the East and West of the CMEA's changing its position as a net energy exporter. Informed discussion of the probability and consequences of the Soviet bloc's importing or exporting less oil is hampered by a number of complicating factors, foremost among them the enormous range between plausible best and worst case oil production scenarios extending 5 and 10 years into the future. But oil production is not the only important variable. Oil is obviously important to Soviet and East European energy balances, but it is only part of a far larger energy picture. Future prospects—for energy self-sufficiency or dependence—will be determined by total energy production and consumption in all energy sectors. Thus, the continued abil-

ity of the U.S.S.R. to fill most of the energy needs of Eastern Europe on favorable terms and to earn large amounts of hard currency by exporting energy to the west will rest on a complex array of factors. These include the volume and mix of total CMEA energy production and consumption (the latter strongly correlated in the past with economic growth rates and also dependent on the success of conservation programs); and perhaps most important, on the degree to which other fuels—i.e., gas—can be substituted for oil.

Given the range of outcomes possible for each of these variables, attempting to make firm predictions on this subject is futile. OTA has instead chosen to devise and analyze a scenario which will illuminate likely prospects for the present decade. This scenario is constructed from the foregoing material. Chapters 2 through 5 of this study culminate in sector-by-sector projections of reasonable levels of Soviet energy production for 1985 and 1990; chapter 8 employs these projections to construct plausible best and worst case energy production, consumption, export, and hard currency import scenarios for the U. S. S. R.; and chapter 9 consists of a similar exercise for six East European countries. The present chapter combines these separate analyses into one that focuses on the CMEA as a whole.

Although previous chapters have presented both best and worst case scenarios, here only one "midrange," outcome is considered. OTA's decision to employ a midrange scenario in the analysis is based on the expectation that, while extreme developments are of course possible, the most probable outcome will lie between them. For either extreme possibility to materialize, a

large number of parameters must simultaneously exhibit either "best" or "worst" characteristics. This is improbable if for no other reason than that political events are likely to intervene to prevent extreme consequences. If, for instance, the most optimistic energy production targets were fulfilled, planners might reallocate investment away from the energy sector. On the other hand, if a num-

ber of worst case developments occurred simultaneously, the U.S.S.R. could well be forced to any of a number of drastic actions—e.g., military adventurism, economic reform, or massive Western imports. Neither of these extremes illuminates the more likely intermediate outcome. A far more informative discussion can, therefore, result from consideration of a medium case.

CMEA ENERGY TRADE: A MIDRANGE SCENARIO FOR 1985

From the perspective of the Soviet bloc, the future of CMEA participation on world energy markets will be determined not simply by production in each energy sector, but by a number of other factors as well. These apply to the countries of Eastern Europe as well as to the U.S.S.R. and include overall levels of economic growth (which affect rates of growth of energy consumption), the degree of substitution among fuels, and levels of debt and hard currency requirements. If, for instance, the worst possible conditions prevail in the U. S. S. R.—i.e., energy production in all sectors falls far short of targets; and oil is replaced with gas to only a limited extent—the Soviet Union may itself experience an oil deficit. Beyond a certain point, however, hard currency constraints will almost certainly preclude Soviet purchases of oil on the world market. Instead, there may be no alternative but to cut back on economic growth and energy consumption.

On the other hand, if the Soviet economy continues to grow comparatively slowly (about 1.6 percent), and domestic demand for oil can be kept down, the U.S.S.R. might be able to maintain oil exports even in the face of declining growth in oil production. Moreover, to the extent that gas can replace oil as an export to the West, the criticality of oil in Soviet hard currency exports will decline, and the key question for the U.S.S.R. will become not whether it can maintain its oil exports, but whether it can continue to earn hard currency as a net energy exporter.

Chapters 8 and 9 show the enormous range of outcomes in the Soviet and East European energy balances which are possible from different combinations of assumptions regarding economic growth, the growth in energy demand, and domestic energy production. These scenario outcomes are summarized, in terms of net hard currency energy balances, in table 76. In each case it is assumed that Soviet energy exports to Eastern Europe (the CMEA-6) remain as planned for 1981-85 (in other words, about 118 million tons of oil equivalency (mtoe) annually, or about 18 percent above the average annual level in 1976-80). Soviet exports

Table 76.—CMEA-Seven Net Hard Currency Energy Exports, 1979 and 1985

	1979	1985		
	(Esti- mated)	Worst case	Mid- range	Best case
<i>Net hard currency energy exports (mtoe)</i>				
U.S.S.R.	83	(38)	92	212
CMEA-6.	4	(70)	(33)	10
CMEA-7	87	(108)	59	222
<i>Change in net hard currency energy exports (mtoe)</i>				
U.S.S.R.		(121)	9	129
CMEA-6.		(74)	(37)	6
CMEA-7		(195)	(28)	135

SOURCE Chs. 8 and 9

to other CMEA countries (notably Cuba) are assumed to reach about 11 mtoe annually, a rate slightly higher than in 1976-80. The total of assumed Soviet energy exports to CMEA countries (129 mtoe), as well as the 1979 level of Soviet energy imports from outside CMEA (9 mtoe), is netted out of the figures shown in table 76.

As the table indicates, CMEA was a net exporter of energy in 1979, the last year for which reliable estimates are available, of roughly 87 mtoe. By 1985, under OTA's worst and best case scenarios, the net hard currency energy balance for CMEA could range from a deficit of 108 mtoe to a surplus of 222 mtoe. As noted earlier, a much more likely outcome would fall between these two extremes and the analysis which follows concentrates on the midrange scenario.

In this case, Soviet gross national product (GNP) is assumed to increase at 2.4 percent annually, and midrange estimates are used for the income elasticity of Soviet energy demand and for Soviet energy production (see ch. 8, tables 53-55). The midrange assumptions for Eastern Europe include GNP growth comparable to that achieved in the late 1970's (about 2.9 percent annually), combined with a lower income elasticity of energy demand and favorable developments in domestic energy production (see ch. 9, tables 70-72).

Given these midrange assumptions, the Soviet Union in 1985 would be in a position to export a slightly greater amount of energy (net) than in 1979, about 92 mtoe. Eastern Europe, on the other hand, would change from being a net exporter of energy outside the CMEA of 4 mtoe in 1979, to a net importer of energy for hard currency of 33 mtoe by 1985. Overall, CMEA would remain a net energy exporter (59 mtoe), but it would be offering 28 mtoe less to the world market in 1985 than it was in 1979.

The impacts of this midrange situation for the West and for the Soviet bloc itself are equally important. The relevant question for

Western nations is twofold. First, what are the implications of this outcome for world oil markets; and second, what are its implications for the volume and composition of the U.S.S.R.'s energy exports to the West? The issues faced by Eastern nations have to do with their hard currency situations and with the implications of Soviet energy export decisions for the economies of Eastern Europe.

CMEA IMPACT ON WORLD OIL MARKETS

From the point of view of the West, any assessment of the likely impact of the CMEA on world energy markets must take into account the worldwide availability of petroleum during the 1980's. OTA has elsewhere provided a basis for estimates of world oil production.¹ Table 77, which is based on this work, shows that between 1980 and 1990 world oil production, excluding that produced by the U.S.S.R. and other centrally planned economies, is unlikely to rise significantly.

Such predictions are complicated by the fact that a number of oil-producing countries do not produce at full capacity. If the capability of these "swing" nations is considered, the capacity for oil production is increased² by as much as 500 million metric tons (mmt). The rather conservative estimates³ of excess capacity in table 77 show that world oil production could be significantly increased in this decade if Iraq, Kuwait, Libya, Iran, and Saudi Arabia (which alone accounts for over half of the excess capacity shown in table 77) so wished.

A variety of economic and political factors—the price and demand for oil, and the

¹ See Office of Technology Assessment, *World Petroleum Availability, 1980-2000*, October 1980.

² See Department of Energy, *International Energy Evaluation Systems*, VI, Sept. 1, 1978.

³ See Congressional Budget Office, *The World Oil Market in the 1980's, Implications for the United States*, May 1980. The estimates for excess capacity are 300 mmt higher for both 1985 and 1990 than those in this chapter.

Table 77.—World Oil Supply—Noncentrally Planned Economies, 1985 and 1990
(million metric tons to nearest 25 mmt)

	1980	1985	1990
OPEC medium production	1,350	1,600	1,650
Non-OPEC LDC's ^a	1,625	375-450	375-500
Developed countries		650-775	550-750
World production	2,975	2,625-2,825	2,575-2,900
Excess capability of OPEC swing countries over production	775	550	500
World capacity ^c	3,750	3,175-3,375	3,075-3,400
Capacity above 1980 levels	775	200-400	100-425

SOURCES ^a1980 estimate— Monthly *Energy Review* May 1981 DOE, 1988 and 1990 projections are mean figures in *World Petroleum A* availability 1980-2000 OTA October 1980 with 1990 figures obtained through interpolation
^b1980 estimates Monthly *Energy Review* May 1981 DOE 1985 and 1990 projections are from *World Petroleum Availability* 1980-2000 OTA October 1980
^cExcluding centrally planned economies

international and domestic political situations of the “swing” countries—will affect decisions to use excess production capacity. Barring intensified political instability in the Middle East, the pressure of growing world demand would likely result in an increase in the capacity utilization level of the OPEC “swing” producers. This could mean that in 1985 and 1990, there would be an additional 200 to 400 mmt and 100 to 425 mmt respectively of oil available in the world market from noncentrally planned economies. This would more than compensate for even the worst case Soviet production declines.

But while these additional supplies are possible, it would be a mistake to count on them. It is by no means clear that demand is the most important stimulus for increased capacity. The most important limits are political, and, as recent events in Iran have shown, cannot be forecasted. Even if this were not the case, experience following OPEC oil price increases in 1979-80 has

shown the limitations of demand forecasting models which rely on historical price elasticities. At present, oil demand has slackened and further production cutbacks have been announced.

To the extent that these uncertainties allow reasonable projections, however, it is clear that the outcome described in OTA's midrange scenario would likely have only a negligible impact on the supply-demand balance in world energy markets. A decline of net CMEA exports of 28 mtoe would equal only about one percent of estimated petroleum production capacity in the non-Communist world in 1985, as reflected in table 77.

THE VOLUME AND COMPOSITION OF ENERGY EXPORTS TO THE WEST

Table 78 shows that under midrange assumptions the Soviet Union could entirely cover Eastern Europe's incremental energy needs if it chose to do so, and still have some energy left to export for hard currency. The issue, however, is not just one of aggregate energy balances. It is also important for the CMEA countries to ensure that energy is supplied in volume and form appropriate to meet local demand. Thus, an important consideration for both energy producers and consumers is the composition of incremental 1985 supplies.

In 1979, the Soviet Union exported an estimated 83 mtoe to countries outside Eastern Europe. Of this, 60 mtoe (more than 70 percent) was oil and oil products; 16 mtoe was gas; and 7 mtoe was coal. But while in 1979 oil exports clearly dominated CMEA net energy exports, by 1985 the situation may change. Although it is difficult to anticipate the precise contribution of each energy sector to Soviet incremental energy production or exports, it is clear that even under best case conditions oil production in the U.S.S.R. is unlikely to increase rapidly enough to carry the primary weight of incremental energy exports. Likewise, OTA ex-

Table 78.—Possible Composition of Soviet Net Energy Exports

	1979	1985 Midrange		
	(Esti- mated)	Oil = 50 percent	Oil= 40 percent	Oil = 30 percent
	(million tons of oil equivalent)			
Net export	83	92	92	92
Oil	(60)	(46)	(37)	(28)
Coal	(7)	(7)	(7)	(7)
Required gas and electricity exports	16	39	48	57
Estimated present capacity for gas exports to West		(29)	(29)	(29)
Required Increase in gas export MTOE capacity if no electricity exports		10	19	28
(bcm equivalent)	12	23	34	

SOURCE Office of Technology Assessment

pects that by 1985, coal production will at best rise little above 1980 levels. Gas production, however, is projected to increase substantially. The only remaining energy sector which is growing rapidly is electricity produced from nuclear and hydropower. This suggests that gas, in conjunction with electric power, must supply the preponderance of additional energy available both for export and for internal substitution.

Chapter 2 demonstrates clearly that the U.S.S.R. can produce as much gas as it needs, provided it can be moved and utilized. This raises two issues, the feasibility of replacing oil with gas in hard currency-exports, and the prospects for internal substitution of gas for oil.

The countries of Western Europe have made it clear that they are willing, indeed eager, to import substantially greater quan-

ties of Soviet gas. Table 78 shows the level of Soviet gas exports to the West in 1985 necessary to maintain net energy exports of 92 mtoe. This table assumes that coal exports are maintained at estimated 1979 levels and that oil exports fall, alternatively, to 50, 40, and 30 percent of total net energy exports.

These calculations raise important questions concerning the logistics of such sales. At present, there is limited pipeline capacity in place to support additional gas exports. In 1980, the excess capacity of the Orenburg pipeline (after meeting annual commitments to Eastern Europe of 15.5 bcm) was 12 to 13 bcm. During that year an additional 23 bcm of gas were exported to the West. Present pipeline capacity could therefore support 23 + 13 bcm = 36 bcm of natural gas exports to the West. This is equivalent to 29 mtoe/yr. When this figure is subtracted from indicated required gas exports (see table 78), it appears that by 1985 additional gas export pipeline of from 12 to 34 bcm might have to be constructed—if oil exports do decline within the indicated range and to the extent that the export shortfall is not made up by sales of electricity.

According to the U.S. Defense Intelligence Agency, two new lines are already under construction, and altogether six to seven are contemplated during the present Five Year Plan (FYP) period, including the controversial pipeline which will carry West Siberian gas to Western Europe. Four of these pipelines should be available for supporting growth in domestic gas consumption.⁴ The West Siberian export pipeline, discussed in chapter 12, is scheduled to support from 40 to 70 bcm of additional gas exports to Western Europe, but whether it will be completed by 1985 remains an open question.

The second important issue is the ability of the Soviet Union to substitute other types of energy for oil. Current Soviet plans reflect

⁴Statement of Major General Richard X. Larkin, Deputy Director, Defense Intelligence Agency, before the Joint Economic Committee, Subcommittee on International Trade, Finance, and Security Economics, Sept. 3, 1981.

a high level of optimism in this area. The targets for rapidly increasing gas production in the next 5 years imply a good measure of domestic substitution. The capability of the CMEA to maintain net oil exports—or avoid the need to import more oil—will depend on its success in substituting gas and non-oil-fired electric power for domestic oil consumption. In other words, the greater the success of energy policies promoting substitution, the more oil will be available for export in 1985. Some idea of the sensitivity of the CMEA export position to substitution can be gained from considering the consequences of the U.S.S.R.'s achieving a rather limited level of substitution.

OTA has amassed very little hard data on substitution of gas for oil, but it seems reasonable to assume that while complete substitution is unlikely, 20 percent may be attainable. For purposes of illustration, OTA has assumed that gas is substituted for 20 percent of Soviet oil consumption. This level of substitution is equivalent to 6.8 percent of total U.S.S.R. energy consumption—87 mtoe or 1.75 mbdoe. Complete substitution of oil would imply a major effort—displacing 439 mtoe (almost 9 mbd of oil). But since the U.S.S.R. uses oil extensively to generate electricity, and since ECE data for 1980 show that both the U.S.S.R. and Eastern Europe depended on oil as a source of energy to a much lesser extent than did many Western nations,⁵ there would seem to be fair potential for substitution on the order of 20 percent.

Under these circumstances, roughly 40 mmt less oil would be available for export. In this case, the Soviet Union could probably meet the projected incremental East European energy import needs (about 33 mtoe) with oil exports. However, the U.S.S.R. would have only about 10 mtoe of oil above 1980 levels available for export to countries outside the CMEA. In other words, the U.S.S.R. could actually have as much as 70

⁵United Nations, Economic Commission for Europe, *Economic Bulletin for Europe*, June 1981, p. 162. In 1980, Soviet dependence on liquid fuel was 38 percent of total energy consumption. East European dependence was 25 percent.

mtoe of oil for export if a substantial degree of domestic substitution were possible. Assuming continued exports to Eastern Europe at 1980 levels and low levels of substitution, domestic oil demand would preclude an expansion of energy exports in the form of oil.

In sum, the U.S.S.R.'s great gas potential could allow it to compensate on world energy markets for stagnating or even declining oil production. For this to occur, gas will have to replace oil to a certain extent in domestic consumption, but more importantly it will have to become much more prominent as a hard currency export. Since the countries of Western Europe are already eager to import more Soviet gas, and since this gas is widely regarded as replacing rather than supplementing current Soviet oil deliveries, such an outcome need not present problems for the West. It is contingent, however, on the successful and timely completion of sufficient pipeline capacity to transport the gas.

THE HARD CURRENCY POSITION OF THE CMEA

Under the midrange conditions of moderate GNP growth, energy production and consumption posited here, it does not appear that the U.S.S.R. itself will face a hard-currency crisis by 1985. Indeed, under the midrange scenario, the analysis in chapter 8 shows that the Soviets would be in a position, in terms of the aggregate energy balance, to possibly increase the amount of energy they export for hard currency at roughly 1979-80 levels and, given favorable terms of trade developments, continue to expand hard currency imports at a respectable rate.

The U.S.S.R. cannot be considered in isolation from Eastern Europe, however. The energy position of the entire CMEA-7 will set the parameters for the Soviet leadership. The situation facing the bloc as a whole is rather less sanguine. The midrange case shows a drop in net energy exports for hard-currency of 28 mtoe. Where this burden falls

will be determined by Soviet policy makers. The “energy squeeze” could conceivably be borne by the U.S.S.R. itself in an effort to ameliorate Eastern Europe’s economic problems; it could be shared; or the U.S.S.R. could leave the CMEA-6 to purchase energy—most likely in the form of oil—on world

If the Soviets were to make up the entire 1985 shortfall of Eastern Europe (33 mtoe), hard currency pressures on these countries would be reduced. They would not be eliminated because presumably Eastern Europe would have to divert increasing amounts of relatively high-quality exportable away from the West and towards the Soviet market, as payment for stepped-up Soviet energy deliveries. But such a policy would also reduce Soviet energy deliveries to the world market by one-third, and as chapter 8 suggests, would seriously erode Soviet hard currency import growth.

On the other hand, if the net East European hard currency energy balance deteriorates through the purchase of 37 mtoe (see table 76), it will be extremely difficult for most of these nations to pay for imports. Romania will be particularly hard pressed. As chapter 9 points out, Romania alone may be responsible for one-third of all energy imported by Eastern Europe in 1985. Romanian energy imports, moreover, are expected to triple between 1979 and 1985. Changes in Poland’s energy situation could also affect the overall position of the group—Poland is the only East European country with a chance of remaining an energy exporter through the decade.

Assuming for purposes of illustration that incremental East European net hard currency energy requirements reached 37 mtoe in 1985, and that they were met entirely with imports of oil from the world market (priced at \$36/barrel), hard currency requirements for the region would increase by almost \$10 billion annually. Because one or two of these countries are likely to remain net energy exporters, an even greater burden would actually fall on the others, particularly

Romania. Romania would be forced to use from one-half to three-quarters of its export earnings to pay for oil imports—a situation which is neither feasible nor likely. (Use of 25 percent of export earnings to finance oil imports is considered a reasonable hard currency “breakpoint.”)

There are, of course, a number of developments which might ease the hard currency constraints on Eastern Europe. Poland could improve its hard currency position if oil consumption could be held at 1980 levels, and if coal and electricity were used to meet additional energy needs. Even more beneficial from the perspective of the CMEA as a group would be measures taken by Romania, the nation most dependent on oil, to meet all of its incremental energy needs by importing gas instead. This would considerably improve Romania’s hard currency situation, since gas is currently priced at half the cost of oil per Btu. The overall situation of the CMEA-6 could, furthermore, be ameliorated by conservation and improvements in energy efficiency. Even in the absence of such measures it is unlikely that Eastern Europe will be able to rapidly increase purchases of energy (particularly oil) from outside the CMEA. If energy demand should increase in line with high consumption scenarios, it is far likelier that economic growth will slow and energy demand consequently fall. Hard currency constraints thus reduce the probability of a sudden increase in oil purchases on world markets by Eastern Europe.

SOVIET ENERGY AND EASTERN EUROPE

This exercise has shown that under mid-range conditions for GNP growth, energy production, and substitution, the CMEA as a group is not likely to become a net energy importer by 1985. Increases in aggregate Soviet energy production will overall offset rising Eastern European energy requirements. Soviet leaders are thus faced with a tradeoff between supplying cheap energy to the Eastern alliance and potential hard cur-

rency earnings through energy exports to the West.

As chapter 9 has pointed out, the critical linkage between Soviet energy exports and East European energy supplies cannot be overemphasized, and since prospects for expanded energy production in East Europe are dim, the U.S.S.R. is certain to continue as an important supplier. Thus, while oil sales to Western Europe are obviously attractive to the U. S. S. R., it is fully cognizant of the risks to itself should Eastern Europe be faced with economic chaos. When East European countries suffered shortfalls in oil imports from Iran and Iraq in 1980, the Soviet Union expanded its own exports to its allies—at the expense of hard-currency-earning sales to Western Europe. (It must be noted, however, that given the rising world

market price of oil, the U.S.S.R. can maintain its hard currency earnings while exporting less oil.)

But the extent to which the U.S.S.R. will be willing to continue this assistance remains to be seen. In late summer 1981, Romania requested increased Soviet deliveries of both oil and gas. The U.S.S.R. had already offered to export additional gas to Romania—in return for Romanian participation in gas pipeline, nuclear power, and iron ore mining projects. As of this writing, it is not known whether Romania has accepted these terms or whether the U.S.S.R.'s willingness to supply additional energy will extend to oil. It might be expected that the U.S.S.R. will encourage its allies to import incremental energy supplies wherever possible in the form of gas.

CMEA ENERGY TRADE IN 1990

World oil production in 1990 is likely to be only slightly higher than that for 1985—reaching a maximum of 2,900 mmt (compared to 2,825 mmt for 1985). If the excess capacity of the swing producers is taken into consideration, world production capacity for 1990 could reach 3,400 mmt (v. 3,375 for 1985) (see table 77.)

This production differential is enormous. When the range of scenarios constructed for Soviet energy trade in chapter 8 are taken into account, the range of 1990 possibilities widens even further, significantly beyond those postulated for 1985. Chapter 9 shows too that a similarly wide range of possibilities exists for the CMEA as a whole. Under worst case conditions, the Soviet Union by 1990 could become a net hard currency energy importer (ch. 8: table 60), and Eastern Europe would have *incremental* net hard currency energy import requirements well in excess of contemplated Soviet energy exports in 1981-85 (ch. 9: table 73). On the other hand, if-optimistic assumptions are used as

the basis for calculation, the U.S.S.R. would be in a position to expand its hard currency energy exports over 1979-80 levels, and Eastern Europe would remain a net hard currency exporter of energy.

This tremendous range of possibilities makes the construction of a midrange scenario for 1990 an extremely tenuous exercise—and one of little utility. What can be said with some degree of certainty, however, is that the same constraints operating on energy trade outcomes for 1985 will be relevant in 1990. Regardless of whether the U.S.S.R. is able to reach its energy production targets, levels of Soviet economic growth, the degree to which gas and electricity are substituted for oil, and the ability of Eastern Europe to hold down oil imports will all influence CMEA incremental oil import needs. The message here is that a variety of factors, amenable at least in part to policy direction, could significantly ameliorate or aggravate the CMEA's oil import/export situation.

CONCLUSIONS

Regardless of whether the Soviet Union is able to meet its own energy production targets, a variety of additional factors will significantly influence its ability to maintain its status as an energy exporting nation. Those factors include the degree to which economic growth proceeds at a moderate or low (rather than a higher) level, and the ability of Eastern Europe (particularly Poland and Romania) to hold down demand for imported oil, but the most crucial are the ability of the U.S.S.R. to substitute gas for oil in domestic consumption and the rate of construction of new pipelines for gas exports to the West. The ability of the CMEA to develop an energy policy which results in the better case conditions for substitution, demand, and economic growth will be as important as its ability to meet production targets in determining the degree to which CMEA's net hard currency energy balance will deteriorate.

The formulation of such policy will confront the U.S.S.R. with difficult choices involving tradeoffs which will inevitably be most difficult if worst case conditions develop. The most obvious example here is the trade-off of hard currency earned through oil exports to the West against supplying subsidized energy to Eastern Europe. There are also costs involved in decisions over gas exports, where the primary problem is not production, but rather transportation of the gas both to Eastern and Western Europe and within the U. S. S. R.. To the extent that the Soviet bloc is able to increase its domestic use of gas, nuclear power, and other energy sources, it frees oil for export to the West. The development of gas and other energy sources, however, requires considerable investment and economic adjustment. While expansion of gas production and consumption is an attractive option, it is not a costless alternative,

Should it become necessary for Eastern Europe to increase its purchases of oil on the

world market, these nations will be faced with decisions about the reliability of supply similar to those that must be made by policymakers in the industrial West. One approach, consistent with past patterns of energy imports to the CMEA, would be to strengthen special relationships with a few key Middle East oil producers like Iran and Iraq, perhaps through an expansion of barter trade. The difficulty here is that this policy would increase CMEA vulnerability to interruptions in supply by one of these key suppliers. Indeed, the Iranian revolution has already demonstrated precisely such vulnerability. Thus, while the "special relationship" option may appear just as attractive to CMEA leaders as it has to certain Western policy makers intent upon building bilateral ties with producer countries, it offers no easy solution. Even military occupation of an oil producing nation would not necessarily eliminate such supply uncertainties—the ongoing costs of a military solution are clearly high, albeit difficult to measure precisely, and oil supplies could be highly vulnerable to sabotage.

In the final analysis, oil and energy import problems must be viewed as critical threads in the fabric of CMEA economic viability. If the U.S.S.R. and Eastern Europe together find it increasingly difficult to produce energy needed for both internal consumption and export earnings, it will be more difficult to sustain a growing economy. While constrained energy supplies are commonly assumed to lead directly to increased purchases in the international market, OTA's analysis makes it clear that the domestic economic impacts of such problems are extremely important. In fact, if the worst conditions materialized and the CMEA faced an oil deficit, hard currency constraints would almost certainly preclude large purchases on world markets and, therefore, the most likely immediate impact would be to reduce levels of economic growth and domestic consumption.

In short, a growing CMEA energy crisis would signify difficult and long-term economic and social adjustment—as has been the case in the West. Energy must be viewed as one of a number of critical policy factors which could either severely constrain or greatly enhance the economic and political viability of the Soviet bloc. Shortfalls or surpluses in Soviet oil are probably more significant from the perspective of the domestic economic adjustments that they will engender within CMEA than in their implications for the nature of CMEA participation in world energy markets.

The significance of this analysis for U.S. policy makers, of course, rests on the question of the maximum possible oil import needs of the CMEA relative to projected world oil production in the decade ahead. Assuming that the most likely future for

the CMEA lies somewhere between the extremes sketched in chapters 8 and 9, through 1985, at least, it appears that if moderate conditions of production, substitution and economic growth prevail, the CMEA as a bloc will not become a net energy importer. The U.S.S.R. could meet all incremental East European oil needs by reducing its energy exports to the West—if it chose to do so—although this would have a significant impact on Soviet hard currency import capacity. Regardless of which policy the Soviets pursue, the decline in net CMEA energy balances available for hard currency export by 1985 would probably have a far less significant effect on world energy markets (amounting to roughly 1 percent of expected non-Communist oil production capacity) than on the economies of the Soviet Union and its East European allies.