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Falling Soviet Oil Production: No Quick Fixes

An Intelligence Assessment

CIA HISTORICAL REVIEW PROGRAM
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August 1991

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Falling Soviet Oil Production: No Quick Fixes

An Intelligence Assessment

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Falling Soviet Oil Production: No Quick Fixes

Key Judgments

Information available as of 23 August 1991 was used in this report.

Since peaking in 1987, Soviet oil production has slumped; it dropped slowly for a time and then plunged 6 percent in 1990. The decline continued into 1991, prompting President Gorbachev to convene an urgent meeting of the Cabinet of Ministers. A program designed to move the industry in the direction of decentralization and marketization was adopted, but little has been done to implement it. We judge that the measures enacted so far—which emphasize modest decentralization of decisionmaking—will not achieve the leadership's goal of stabilizing the rapidly deepening oil crisis. Rather, oil production will probably decline 9 to 11 percent this year to between 10.1 and 10.4 million barrels per day, the lowest level since 1975. Large-scale labor unrest in the oil sector or supporting industries could push oil output even lower.

Even with the decline that is likely to occur in 1991, oil production should be enough to satisfy traditional domestic allocations and provide substantial hard currency earnings. Local shortages of specific refined oil products, however, will probably intensify because the center and republic authorities will have less oil at their disposal. Moreover, the anticipated decline in production, combined with continued high rates of domestic consumption, will cut Soviet oil exports, reducing hard currency earnings and increasing the chances that the USSR will have to seek rescheduling of its debt. Lower exports will also reduce the USSR's importance on the international market. Soviet exports currently account for less than 5 percent of non-USSR oil demand, and oil traders have already factored steadily declining Soviet exports into their calculations. As a result, the anticipated fall in exports should not cause a substantial rise in the world price of oil.

Barring a decision to abandon economic reform and reintroduce strong central control over the economy, we expect the Soviets to address the fall in oil production by a combination of administrative measures to deal with specific crises and continued measures to decentralize control and strengthen the financial independence of production enterprises. Efforts to decentralize and clear obstacles to Western joint ventures have been under way since spring. Successful implemention of the measures could pave the way for a slower decline in 1992 or 1993. If, however, Moscow tries to "storm" out of the decline with a massive investment program and a reassertion of rigid central control, the consequences for oil production could be disastrous for the remainder of the decade.

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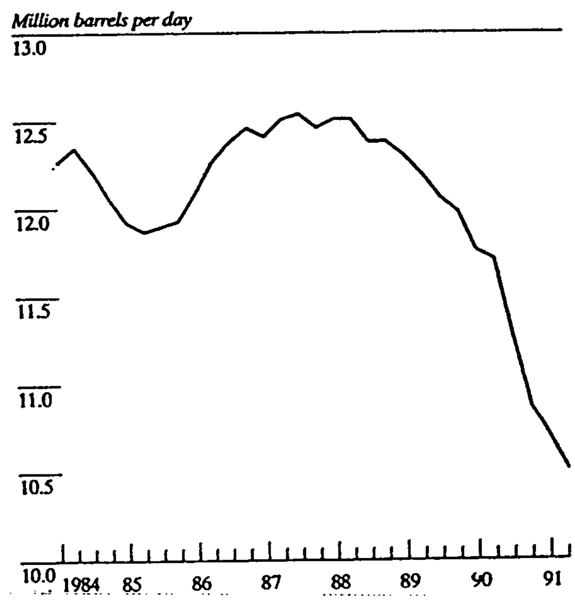
An Industry in Trouble

Since peaking at 12.54 million barrels per day (b/d) in the third quarter of 1987, Soviet oil production has been experiencing a worsening slump (see figure). Output has declined continuously since the fourth quarter of 1988 and dropped sharply in 1990, when production fell 6 percent. Although maturing fields, technological backwardness, and investment constraints made some falloff inevitable, the sharp drop in 1990 was largely the result of the economy's overall decline, political turmoil, and confusion caused by a poorly conceived and executed plan of reform in the oil sector.

USSR: Oil Production, Quarterly [a]



[a] Including natural gas liquids.

Maturing Oilfields and Lagging Technology. During the first few decades that followed World War II, the Soviets were blessed with an abundance of large, prolific, and easily exploited oilfields that supported a dramatic rise in oil production. When the days of easy oil ended in the 1980s, however, the Soviets found themselves face-to-face with problems that had taken the international oil industry 40 years to solve. As older fields matured and entered into decline, advanced methods were required to increase the amount of oil that could be recovered, and producers needed more modern equipment capable of withstanding the increasingly corrosive conditions within the wells that resulted from Soviet production practices. In addition, prospective new regions posed serious engineering challenges—either in the handling of the oil itself, or in operating in harsh environments—that were beyond Soviet capabilities then and, [ ] remain so today:

- The Soviets are at least 10 years away from being able to conduct significant oil production operations by themselves in promising offshore arctic regions such as the Barents, Kara, and Chukchi Seas.
- Soviet equipment and operating practices are inadequate to handle the very deep, high pressure, high temperature, and highly corrosive conditions encountered in the North Caspian Basin.

The widening gap between capabilities and requirements has left Moscow with a choice of either accepting an accelerating decline from natural causes or striking out in entirely new directions.

Myopic past policies—especially the emphasis on high rates of current production at the expense of total recovery—have compounded the Soviets' problems. Moreover, in order to maximize output in the near term, the Soviets concentrated on rapidly exploiting existing resources at the expense of exploring for new sources. They also neglected major improvements in their exploration and production technology and the development of production methods tailored to specific fields and wells.

The standard Soviet procedure of injecting water into the reservoirs from the start of field development to force oil out at the highest possible rate has had an especially pernicious effect on production (see inset). The early watering out of fields subjected to waterflooding requires switching wells that flow freely from the pressure in the reservoir to artificial lift systems—pumps, gas lift—sooner than normal. The changeover increases the demand for equipment and raises future maintenance requirements. Years of neglect of the oil equipment industry, however, have left it incapable of keeping up with this heavy burden. Production of such key items as pumps and drill bits has declined each year since 1986, and Soviet oil equipment has been of low quality and poor reliability.

Soviet water injection practices also have caused a corrosion problem that threatens major portions of the existing production infrastructure. The high level of water recovered with the oil attacks metal components of the wells, artificial lift equipment, gathering lines, and treatment facilities, increasing the demand for spare parts and maintenance. In 1990, oil officials reported 46,300 pipeline breaks, leaks, and accidents—resulting in known losses of over $110 million worth of oil at current world prices—and the problem reportedly continues to grow worse.

Impact of Political Disarray. Political turmoil has not only complicated the oil industry's technological problems, but also frustrated the center's efforts to counter them. For example, the RSFSR and Kazakhstan, the republics with the largest oil resources, have blocked the central government's joint-venture negotiations while opening their own. Similarly, during 1990 the Baltic republics and Belorussia called home the construction brigades that had been building housing for West Siberian oil workers. In late April 1991, demonstrators in the Tatar region of the Volga-Urals protested the shipment of oil from the Tatar

Soviet Waterflooding Practices and Requirements for Electric Submersible Pumps

Soviet oil production practices have combined with a low level of technological advance and the deterioration of the oil equipment industry to create problems that are beyond short-term Soviet capabilities to solve:

- *Water injection and natural encroachment have raised the water cut—the percentage of water in the oil water mixture recovered from a well—to 76 percent in 1989. To produce 12.14 million b/d of oil that year, the Soviets had to raise a staggering 51 million b/d of total liquid.*

- *The only way to raise this much liquid from aging fields is with artificial lift—including pumps and gas lift—which accounted for over three-fourths of Soviet oil recovery in 1989. However, Soviet pumps have low capacities and high failure rates compared with Western equipment. The electric submersible pump (ESP)—the workhorse of Soviet recovery—lifts half as much as its Western counterpart and fails about three times as often, creating a rapidly increasing demand for pump maintenance and new pumps. In 1990 over 140,000 maintenance interventions were required in West Siberia to change pumps.*

- *Continued Soviet reliance on indiscriminate waterflooding compounds the reliability problem by raising the amount of water run through the pumps. In addition, the Soviet practice of injecting untreated water into the reservoir makes the corrosion problem even worse, shortening pump life further. Despite the increasing demand for pumps, however, the Soviet oil equipment industry is unable to keep up with requirements. It has produced fewer ESPs each year since 1986, in spite of state orders for annual production increases.*

Autonomous Republic, and in May the Soviet press reported the sabotage of a small number of wells in the region.

Impact of Partial Reforms and Policy Errors. The disarray resulting from the incomplete nature of Gorbachev's reforms has also contributed to the oil industry's troubles. For example, equipment makers, released from the requirement of selling all their production to customers assigned by central planners, have refused to make deliveries to oil production enterprises unless they were compensated in hard currency. Production enterprises, for their part, have often proved unprepared to assume responsibility for a host of decisions resulting from decentralization. As a result, existing supply links have snapped and chains of command have broken down.

Blunders in economic policy, reflecting the attempt to satisfy short-term needs at the expense of long-term objectives, have also been significant factors in the oil industry's recent poor performance. Two years ago, for example, in proposing its 1990 budget, the center hoped to reduce its rapidly growing budget deficit through sharp cuts in centrally financed investment in the energy sector. The center slashed investment in the industry from 15.8 billion rubles to 7 billion rubles. Republics and enterprises were unable to make up the difference, and overall investment declined by almost 11 percent to 14.1 billion rubles. The result was a 10.7-percent drop in drilling.

According to Soviet officials, the oil industry needed to bring on line 1.9 million b/d of new production to offset depletion last year. By our estimates, however, the 36 million meters drilled in 1990 brought only 1.17 million b/d of new production on line. Because of the timelag between investment and production, moreover, the 1990 investment cuts continue to cause production difficulties in 1991.

In early 1991, in an effort to increase hard currency revenue, the center also barred international barter deals involving oil or oil products, hoping thereby to force the few enterprises with surplus oil to pay a 40-percent export tax. The ban on barter—which has subsequently been lifted—and the high export tax—which has been rolled back to 10 percent—removed much of the enterprises' incentive to produce above plan. A similar tax, applied to oil production joint ventures, has already caused at least one Western firm to consider pulling out of one of the Soviets' few concluded deals.

In 1991, while doubling some crude oil prices and tripling others—depending on the degree of difficulty of recovery—the center continued to try to squeeze as much revenue out of the oil industry as it could. The introduction of new accounting procedures—which divided crude oil revenues among the center (37.5 percent), republic (37.5 percent), and enterprises (25 percent)—left the enterprises with fewer rubles per ton of output than before and kept them on the brink of insolvency. Worker morale—previously buoyed by promises of increased prices—was dealt a serious blow.

Recent Initiatives

By January 1991 Gorbachev was sufficiently alarmed over the oil crisis to make it the main item of discussion at the first meeting of the new Cabinet of Ministers. A program to slow the fall in oil production reportedly was adopted a few weeks later. Although no details of the program have been published, subsequent statements by President Gorbachev and oil industry officials indicated that it was designed to address the oil industry's troubles through decentralization and the introduction of market measures, including:

- Transformation of the oil production enterprises into independent leasing contractors.
- Gradual introduction of world prices for crude oil and natural gas and gradual replacement of the state order system by delivery contracts between producers and customers.
- Legislation allowing oil producers to suspend deliveries to republics or enterprises that did not fulfill their contracts to the oil industry for equipment, supplies, or construction.

Little was done, however, to implement these policies because of the center's deep-seated reluctance to give up control of the sector. Instead, when the West

Siberian oil workers, who produce about two-thirds of Soviet oil, raised the threat of a strike if their living conditions were not improved and supply shortages were not remedied, central government officials attempted to defuse this situation with more traditional methods. In early May oil industry officials were ordered to divert $60 million in hard currency, originally dedicated to the purchase of high-priority spare parts, to the purchase of meat for the oil workers, [redacted] Oil industry officials reportedly are trying to borrow $200-500 million to purchase urgently needed oil pumps and other equipment.

As the threats of a strike continued through the spring and the decline in output accelerated, the center began to move in the direction of reform. On 16 May, Gorbachev enhanced enterprise autonomy when he decreed that production enterprises could sell 10 percent of their production on the open market after meeting their export quota. This measure alone probably will not provide the enterprises with all the financial resources they need to carry out their own production operations and to satisfy the demands of the labor force, but it is an improvement over previous plans whereby enterprises received a share of oil earnings only after the sector as a whole met its production quota. Early indications are that the decree may be having some effect. The Tyumen' Commodity Exchange in West Siberia reported it had 10-15 million tons of oil—approximately 10 days of West Siberian production—available for trading on 5 June, according to the Soviet press.

Near-Term Outlook

Despite the many problems oil producers face, the Soviets still have an outside chance of making this year's state order of 10.6 million b/d, especially if republic authorities can restore worker morale and provide enterprises with the financial resources to secure reliable sources of equipment and services in the wake of the failed August coup. The large number of wells shut in (drilled but not producing) because they lack well-completion assemblies or maintenance—as many as one-third of the wells in some fields, according to [redacted] provides the industry with a sizable reserve of production potential that could be brought on line relatively quickly—compared with drilling new wells—if the workers were motivated and equipment were available. Bringing these wells on line will not address the long-term problems of the industry, but it could stabilize production this year.

We believe it more likely, however, that oil production will fall to an annual average of between 10.4 and 10.1 million b/d. The rate of decline these figures imply—some 9 to 11 percent—is roughly the same as during the early months of 1991, as compared with the same period of 1990. We believe a number of factors argue for a continuation through 1991 of this rate of decline. The general economic decline and ethnic strife probably will continue to disrupt deliveries of equipment and supplies to the industry. The coal miners' strikes in March and April, which involved one-fifth of the nation's coal mines, reduced steel output and will continue to have a negative impact on oil production as steel shortages ripple through the oil equipment industry. Declines in the production of cable, cement, and building materials, as well as bottlenecks in the transportation and distribution systems, will also compound the industry's problems. In addition, worker discontent will persist and continue to result in low productivity. The discontent and distrust of the workers is deep seated, and they will probably adopt a wait-and-see attitude toward any central or republic reform effort.

The downside risks for the industry are great. Growing unrest among the oil workers and workers in key supporting industries raises the possibility of work stoppages or strikes that could lead to more dramatic declines in oil output. Because the oil workers are subject to more KGB infiltration than any work force in the USSR, according to [redacted] and because they are dispersed over such a large geographical area, it is doubtful they could execute a strike of the scale and duration of the spring strikes by the coal miners. More likely than industrywide strikes are activities such as localized strikes, slowdowns, output reductions, and "working to the rule" by using strict enforcement of environmental regulations to shut down pipelines and oil treatment facilities. The potential effects of such actions are not trivial, and oil output could be seriously disrupted. For example, we estimate that, were the oil workers in West Siberia to suspend maintenance activity alone, production would fall by at least 140,000 b/d after only three days, 560,000 b/d by 30 days, and over 1 million b/d by two months, based on the Soviet well-repair data.

Strikes in key supporting industries—especially oil equipment, steel, and transportation—also could deal a crippling blow to an oil sector already starved for equipment. By late 1990, a year relatively free of strike activity, over 3,000 wells were shut in for lack of equipment, costing the USSR over 200,000 b/d at average well flow rates.

Implications

If the oil industry keeps production in 1991 between 10.1 and 10.4 million b/d, the USSR should have sufficient oil to satisfy domestic demand and still export about 1.8 million b/d of crude oil and oil products in the fourth quarter. However, tightening supplies will leave the leadership little room to maneuver to address the sectoral and local shortages that normally plague the Soviet economy. Lower export levels, coupled with expected lower prices, will also undermine the USSR's trade account and international financial standing, leaving it increasingly dependent on Western economic assistance.

Domestic Economy. Given the continuation of the central government's current economic policies, we expect Soviet GNP to decline this year by 10 to 15 percent and, under some scenarios, the economic decline could be greater still. The combined effects of lower demand associated with the expected fall in Soviet GNP and the decline in oil production will cause Soviet apparent domestic oil consumption [1]—8.4 million b/d in 1990—to average between 8.0 and 8.4 million b/d this year. It is unlikely, however, that apparent consumption will fall as sharply as either GNP or production because:

- In general, most experts agree that, in a recession, energy consumption does not fall as rapidly as GNP.

[1] Apparent consumption is production plus imports minus exports. Actual consumption would include inventory and stockpile changes that are unavailable for the Soviet Union.

- In the USSR, in particular, the distribution of oil products remains a function of state allocation rather than market mechanisms. Because oil products have a recognized value within and outside the Soviet economy, firms that have reduced their economic activities are not likely to turn back any "excess" oil but, instead, will hoard or barter it.

- Moscow has traditionally absorbed the bulk of a production drop by cutting exports rather than domestic consumption—for example, production fell over 6 percent from 1989 to 1990, but consumption dropped only 1 percent.

Although the system of distribution through state allocation does not promote efficient oil use, it does enable the government to cut consumption by fiat, should it choose to boost exports at the expense of the domestic economy. The probability that any government will actually exercise such an option, however, appears remote because, at present, domestic needs appear to be taking precedence over exports. Published Soviet documents indicate that, despite anticipating a 5- to 7-percent drop in production in 1991, Moscow planned for the delivery of the same amount of crude oil to domestic refiners as in 1990, and former Prime Minister Pavlov reiterated the importance of domestic supplies in early June by stating that his government would not cut domestic oil allocations to support exports because such cuts would aggravate the country's troubled economy. Domestic needs will continue to receive high priority after the August coup as republic officials seek to deliver on promises to improve the economy. Indeed, it is possible that apparent consumption could go up if the leadership decided to try to improve the performance of key economic sectors, such as agriculture or transportation, by providing them with additional allotments of fuel, or if it decided to build up stocks.

Although this year's production should be enough to satisfy overall domestic needs, local shortages of specific refined products will probably intensify. Governments have less oil at their disposal to provide relief to areas afflicted by sudden shortages, and problems in the refining and distribution sectors are creating their own set of difficulties. Squeezed between higher prices for crude oil and fixed prices for products, Soviet refiners have already begun to refuse to produce items, such as diesel engine lubricants, with low profit margins. Distributors, sensing growing concern about tightening supplies, have been refusing long-term delivery contracts in favor of spot sales.

Foreign Trade. Lower volumes of exported oil and likely lower prices will undermine Moscow's trade account and ability to secure commercial credit and place the Soviets in a position of growing dependence on Western aid. Soviet oil exports—including reexports—are likely to fall to between 2.0 million b/d and 2.3 million b/d for 1991, a drop of 28 to 37 percent from last year's level. Exports could be substantially lower if production is interrupted by industry strikes or if ethnic strife leads to a disruption in supplies of oilfield equipment. Such occurrences—especially if world prices remain soft—could markedly reduce hard currency earnings and increase the chances, already substantial, that the USSR would have to seek a rescheduling of its debt.

Smaller exports will reduce the USSR's importance to the world oil market. The USSR supplied roughly 5 percent of non-USSR world demand in 1990, and its share should drop to about 3.5 percent this year.[2] Oil traders [ ] have already factored steadily declining Soviet exports into their calculations with the result that world oil prices should not be affected significantly by the anticipated decline.

On the other hand, exports could be higher if reforms cut back state orders for oil for domestic use to allow for increased foreign sales. President Gorbachev's 16 May decree—which apparently will allow all oil enterprises to market up to 10 percent of their oil outside state channels once they meet compulsory export deliveries—could increase unofficial exports to significant levels.

Prospects for the Longer Term: Slowing the Decline or Collapse?

Barring the scenarios mentioned in our discussion of the downside production risks, the Soviets should have sufficient oil in 1991 for most domestic needs and for sizable, if greatly reduced, foreign sales. The USSR, however, is fast approaching a day of reckoning with regard to oil's role in its economy. Unless the leaderships of the various political levels take action to cure the underlying problems of the oil sector, or to reduce oil consumption substantially, the USSR may cease to be an oil exporter by the mid-1990s.

Narrowing Options. Financial constraints have narrowed the Soviets' options for stemming the decline in oil production. The center realized as early as the production drop of 1984 that its capabilities were falling increasingly short of its planned goals. Its response then was to emphasize short-run maximization of output by drilling more wells and deploying more oil workers in existing fields, injecting more water into the reservoirs, and turning out ever larger quantities of low-quality equipment—rather than by decentralizing and marketizing to improve the efficiency of the oil industry and to modernize its equipment base.

Moscow's strategy pushed output to a peak annual production of 12.5 million b/d in 1987, but at an enormous and unsustainable cost. Oil industry investment, measured in 1984 rubles, rose from 7.5 billion rubles in 1980 to 15.8 billion rubles in 1989—consuming over 18 percent of all industrial investment. Plans for 1990 called for investment to be higher still—17 billion rubles—although the sector actually received only 14.1 billion rubles.

Competing demands from other sectors and the decline of the economy preclude the continuation of an oil production strategy that relies on massive increases in investment. The solution to the oil problem in the 1990s will require the overhaul of the oil equipment and supporting industries—such as machine building, metallurgy, instrument making, and others—as well as the introduction of new incentives and approaches in the oil industry itself. Such changes cannot be accomplished under the central command system.

[ ]

Reforming the Industry. Political leaders, including Soviet President Gorbachev, Prime Minister Pavlov, and Russian President Yel'tsin, as well as leading oil industry officials, appear to recognize the necessity of further industry reform and an expanded role for Western firms. Achieving these goals—as well as resolving other contentious issues involving ownership and control of oil and distribution of oil revenue—figures prominently in the discussions among the center and the republics participating in the "nine-plus-one" talks (see inset). According to several Soviet officials, a comprehensive oil law that will delineate the rights and responsibilities of all parties—including Western investors—is now being drafted for submission to the Supreme Soviet in September

Reforms to expand the limited rights of the enterprises and local governments to dispose of a share of output without regard to quotas established by the center could do much to improve the living conditions of the workers and ease worker discontent. The ability to earn and dispose of hard currency would also increase the enterprises' access to oil equipment makers worldwide and facilitate forming joint ventures with Western firms.

Continued progress in clearing the way for Western production ventures would do much to improve the prospects for oil production. Although the Soviets would have to give up a portion of the oil produced to the Western partner, Western production ventures are the only way for the Soviets to employ and to learn modern methods of recovery their oil industry needs to face the future. Three joint-venture deals have been closed—reservoir fracturing in West Siberia by [redacted], redrilling several West Siberian fields by [redacted], and developing three small fields in the Timan-Pechora Basin by [redacted]—and progress has been reported in several others. Several of the smaller deals involving specific services could help individual production enterprises almost immediately, but many of the larger ventures under discussion will not have a direct impact on oil production until the middle-to-late 1990s. However, because successful deals would allow the Soviets to concentrate their own resources on projects not covered by joint ventures, they could result in more immediate boosts to oil output.

The Struggle Over Oil

Over the past two years, the center, the republics, local organs, and the production enterprises have fought a "war of laws" over oil. Each participant has sought to maximize its share of revenue while avoiding as much as possible the responsibility for bearing the industry's costs. During 1990, however, a modus vivendi began to develop that may furnish a starting point for negotiation under the center-republic accord of 23 April. Under the terms of this emerging agreement between oil-producing republics and the center:

- *The republics would receive, at a minimum, "ownership" of the oil in the ground, which would give them the right to a royalty but not necessarily control over the recovery of the oil.*

- *In established areas, where oil extraction has been controlled by existing production associations nominally subordinate to the central oil ministry, subordination may shift to the republics if they receive full ownership of the oil and control of production.*

- *In new areas where other organizations, such as the USSR Ministry of Geology, the RSFSR State Committee for Resources, and the governments of Tatarstan and Sakhalin Oblast, have been trying to form joint ventures with Western firms, the central government would have authority to license such organizations.*

- *Crude oil pipelines might remain under central control for the forseeable future. Every economic reform plan, including the Shatalin plan, has left crude oil transport in the hands of the center.*

- *The center probably would continue to set broad oil export policy and guidelines but delegate licensing authority to the republics.*

- *The distribution of petroleum products would become a republic function.*

If the Soviets can implement economic reforms and enlist the help of Western firms, then chances of slowing the decline in 1992 or 1993 are good. A growing share of Soviet production potential—up to one-third in some fields—is becoming tied up in the stock of wells shut in because they lack completion assemblies and maintenance. If the right equipment and services—Western or Soviet—could be acquired, these wells could be brought into production fairly rapidly and ease the pressures on Soviet drillers.

Reducing Consumption. Although the focus of Soviet energy planners and policymakers remains on production, the Soviets also have options on the consumption side of the energy equation. In addition to mandating cuts in consumption, the authorities could introduce real market prices, an act that would alter the Soviet energy landscape beyond recognition. Higher real prices probably would not only cut energy demand across the board, but also would result in greater competition among fuels—such as furnace oil, natural gas, and coal in the heat and electrical power generation sectors—that would lead to greater interfuel substitution and more efficient use of all energy supplies.

Freeing energy prices completely, however, poses dangers to an already weakened economy. Prices would jump to world levels almost immediately, increasing both inflationary and recessionary pressures. Moreover, unless the center or some other political organ retained the ability to regulate exports, oil would probably hemorrhage from the country in search of hard currency. Even with the current strict licensing requirements, the KGB has publicly claimed credit for intercepting over 3.5 million barrels that were being smuggled out of the country

The "Storming" Option. In contrast to the politically tough but real options for boosting production and curtailing consumption, any attempt to stabilize oil output by adopting the storming strategy—a centrally directed campaign to increase output rapidly, regardless of the cost—used to stem previous declines will, in our view, be ineffective (see inset). Although no Soviet officials have recently argued openly for such a course, statements by former Prime Minister Pavlov on the need for massive increases in central investment for heavy industry and comments by Deputy Chairman of the USSR State Committee for Fuel and Energy Margulov about the creation of an "energy superministry" suggest that at least some senior officials have not lost faith in the ability of the center to work miracles. As the memories of the costs of the storming campaign fade and the production decline continues, the appeal of a massive, centrally directed effort to stem the decline could grow among some factions of the leadership.

The cost of attempting such a program today, however, would be prohibitive. Even if funds could be mobilized, worker discontent and the center's lessened control over the equipment plants and their suppliers would cause the Soviet economy to respond far less effectively to commands for a crash effort than it did in 1985. Moreover, storming, with its emphasis on output at all costs, would perpetuate and magnify the inefficiencies that currently undermine Soviet production efforts.

The Storming Strategy of the Mid-1980s

The Soviets reversed a decline in oil production that started in 1984 and continued into 1985 by:

- *Increasing drilling, especially of wells in already producing fields.*
- *Embarking on a massive maintenance effort that returned between 2,000 and 7,000 shut-in wells to production.*
- *Accelerating the installation of artificial lift equipment, especially gas-lift systems and electric submersible pumps, in older fields.*
- *Airlifting drilling and maintenance crews from other regions to West Siberia to perform the additional labor required.*

These measures allowed the Soviets to push output from 11.9 million b/d in 1985 to 12.5 million b/d in 1987. This 5-percent production gain, however, required a 50-percent increase in investment between 1984 and 1987.

Barring a decision to abandon economic reform and return to strong central control over the economy, we expect the Soviets to address the fall in oil production by a combination of administrative measures to deal with the crisis of the moment, such as a food or tool shortage, and continued reform measures that will decentralize control and strengthen the financial independence of the production enterprises. The Soviets will also step up efforts to attract Western joint-venture partners. Finally, in an effort to stem the continuing decline in exports resulting from falling production and profligate domestic consumption, the leadership may decide to implement real prices for energy—which would be a giant step toward moving the USSR to a market economy.