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# International Energy Biweekly Review

13 December 1978

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13 December 1978

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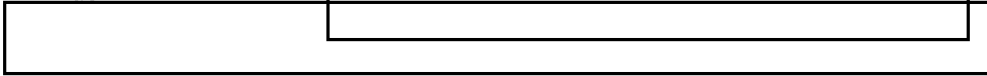


INTERNATIONAL ENERGY BIWEEKLY REVIEW

13 December 1978

Overview ..... 1

Renewed strikes by oil workers caused Iranian oil production to fall to about 1.2 million b/d



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USSR: Oil Problems Worsening ..... 12

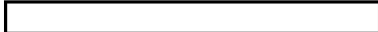
Recently announced plans for 1979 reveal that the annual increase in oil output next year will be about 400,000 b/d, the smallest increase in the past decade and the lowest rate of growth—3.6 percent—ever reached.



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OPEC Countries: Falling Exports, Rising Imports ..... 17

The OPEC current account surplus will plummet in 1978 due to reduced world demand for OPEC oil and escalating import price inflation. As a result, foreign investment by the cartel will slow and foreign borrowing will increase.



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Canada: Status of Joint Petroleum Storage Project ..... 29

Ottawa is supporting efforts to locate 100 million barrels of storage for the US Strategic Petroleum Reserve in eastern Canada.



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East Asia: Oil Development Prospects on the Continental Shelf ..... 32

The first major steps toward revealing the oil potential of the East Asian continental shelf have been taken with China's recent decision to pursue offshore exploration with foreign help and last June's Japan - South Korea exploration agreement.



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[Redacted]

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**Tanker Charter Rates Reach Four-Year Highs** [Redacted] 37

Voyage chartering by shippers building up inventories before the anticipated 1979 OPEC price increase and a large-scale reduction in short-term tanker availability have contributed to the rise in charter rates for crude shipments. [Redacted]

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**USSR: Offshore Oil and Gas Reorganization** [Redacted] ..... 40

Moscow's concern over the slow progress of offshore development of oil and gas has resulted in the centralization of operations. [Redacted]

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[Redacted]

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INTERNATIONAL ENERGY BIWEEKLY REVIEW

Overview

[Redacted]

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Iranian oil production and exports are again down sharply as a result of renewed strikes by oil workers, falling to about 1.2 million b/d and 600,000 b/d, respectively,

[Redacted]

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estimate the cumulative loss in Iranian oil production since late October at about 135 million barrels. [Redacted]

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The emphasis on production during the strikes has held maintenance activity to a minimum since late October. Even if the labor situation soon improves, much work will be needed before productive capacity can be restored to prestrike levels of 6.6 million b/d, [Redacted]

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The strikes have halted Iranian gas exports to the USSR and resulted in dangerously low domestic stocks of kerosene and distillate fuel oil. The National Iranian Oil Company (NIOC) is now trying to make spot purchases of products in the international market. [Redacted]

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Some suppliers of Iranian oil who planned to cancel their *force majeure* notices when liftings began to return to normal in November have now decided to keep these notices in effect. Spot prices have firmed again. [Redacted]

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Nevertheless, Free World oil inventories still appear adequate, at least for several weeks, to cushion consumers against the sharp decline in Iranian oil supplies. Although total Free World output in fourth quarter 1978 will not reach levels expected by international oil companies, increases from other sources, especially Saudi Arabia, will partly offset the Iranian shortfall. [Redacted]

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Still, the oil companies and many oil consumers will be reluctant to draw down inventories given the current uncertainties over Iranian supplies. For example, Ayatollah Khomeini, the leader of the religious opposition, has threatened a cutoff of oil deliveries, if opposition forces gain power, to countries that continue to support the Shah. Thus, companies and consumers will continue to lift as much as they can get elsewhere, even after an OPEC price increase goes into effect in first quarter 1979.

[Redacted]

\* \* \* \* \*

The seven Arab members of OPEC—Saudi Arabia, Kuwait, Algeria, Libya, Iraq, Qatar, and the United Arab Emirates—have an opportunity to discuss informally the oil price issue again this week in Abu Dhabi during a ministerial session of the Organization of Arab Petroleum Exporting Countries (OAPEC). OPEC will convene formally in Abu Dhabi on 16 December when the decision on next year's oil prices will be made. [Redacted]

[Large Redacted Block]

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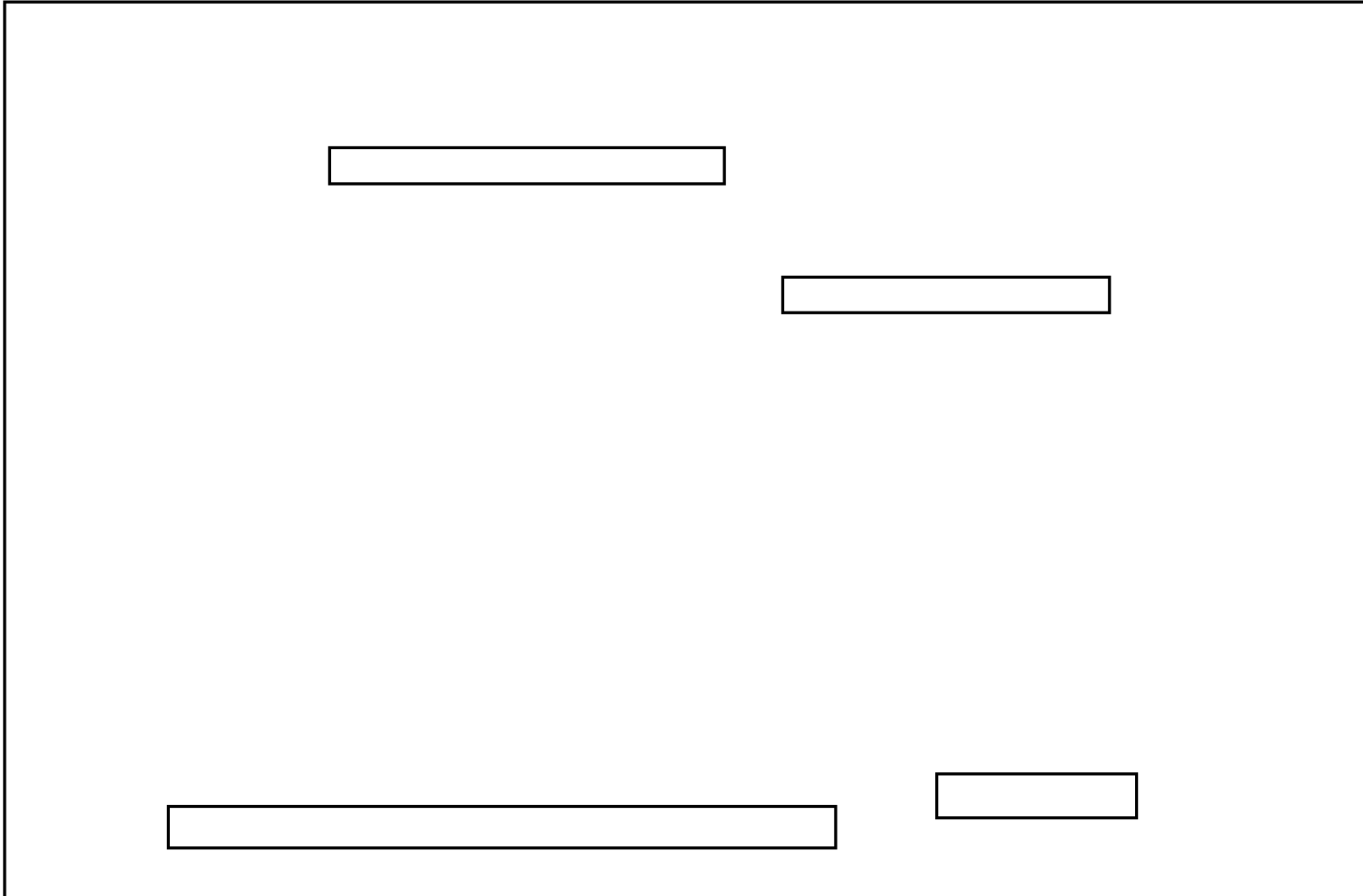
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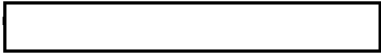
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USSR: OIL PROBLEMS WORSEN



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Recently announced plans for 1979 reveal that the annual increase in oil output next year will be about 400,000 b/d—the smallest absolute increase in the past decade and the lowest rate of growth—3.6 percent—ever recorded. Moreover, this new goal implies that there will be very little growth in average monthly oil yields beyond that achieved in October 1978 and that production will peak soon, perhaps even in 1979. If the Soviets achieve their planned growth in industrial output of 5.7 percent in 1979, the growth in domestic oil consumption will probably exceed the rise in domestic oil output. Less would then be available for export. It is unlikely, however, that the industrial production goal will be met and exports will likely remain at about the 1977-78 level of 3.2 million b/d.



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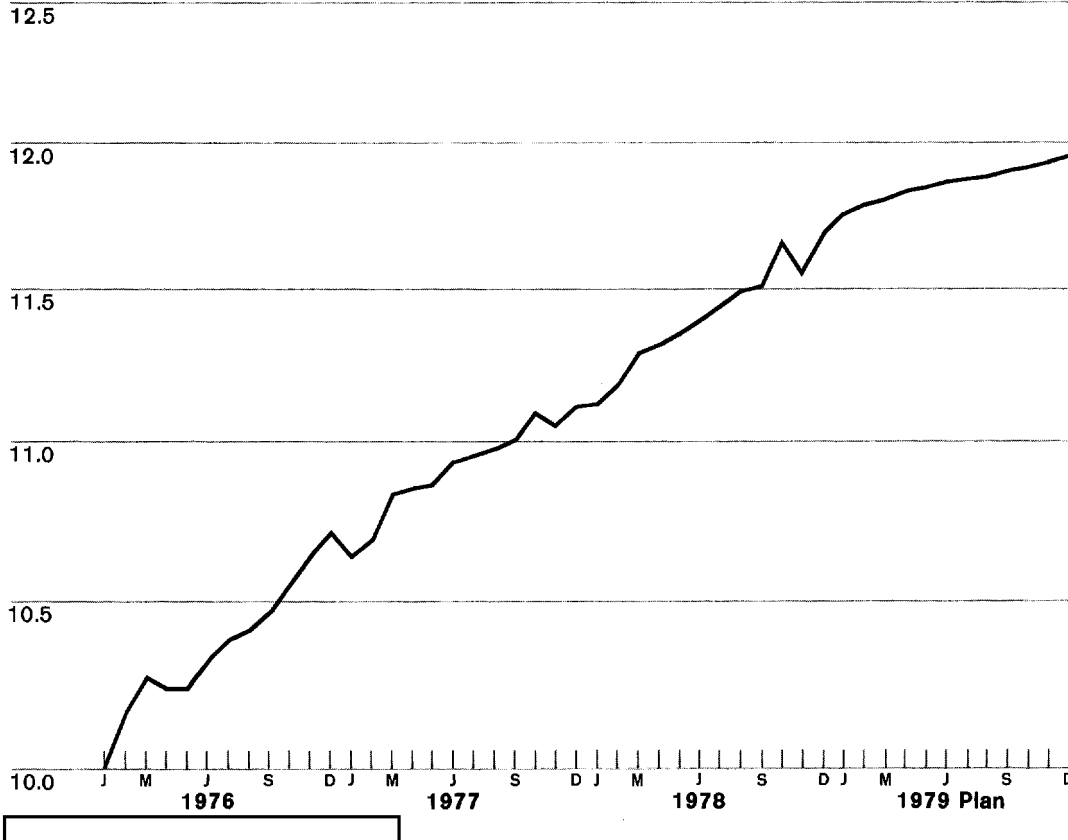
**Production**

Oil production in the current plan period has continued to grow, but at sharply decreasing rates—from 5.9 percent in 1976 to about 4.5 percent in 1978. The average

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**USSR: Crude Oil Production**

Million b/d



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annual increase in output during 1971-75 was 6.8 percent. The 1978 goal was originally set in December 1975 at 11.6 million b/d and revised downward in December 1977 to 11.5 million b/d. Actual output in 1978, based on monthly production data through October, will approximate 11.4 million b/d. The 1979 plan now calls for an output of almost 11.9 million b/d, nearly 3 percent lower than the 12.2 million b/d established in late 1976. The planned increase of about 400,000 b/d would be the smallest absolute rise since 1969 and the lowest rate of growth—3.6 percent—in the period after World War II. The shortfall in 1978 and the further slowdown in growth planned for 1979 reflect the continuing decline in output from the older oil producing areas west of the Urals and the peaking of large West Siberian oilfields earlier than expected.

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The Outlook for West Siberia

West Siberia has provided all of the growth in Soviet oil production in recent years and is the only major region from which output increases can be obtained through the early 1980s. The supergiant Samotlor oilfield has accounted for a large

USSR: Oil Production <sup>1</sup>

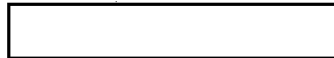
Million b/d

Year	West Siberia					
	Total	Annual Increment	Total	Annual Increment	Samotlor	Annual Increment
1970	7.06		0.63		0.09	
1971	7.54	0.48	0.90	0.27	0.20	0.11
1972	8.01	0.47	1.25	0.35	0.42	0.22
1973	8.58	0.57	1.75	0.50	0.78	0.36
1974	9.18	0.60	2.33	0.58	1.22	0.44
1975	9.82	0.64	2.96	0.63	1.73	0.51
1976	10.39	0.57	3.63	0.67	2.20	0.47
1977	10.92	0.53	4.37	0.74	2.56	0.36
1978 <sup>2</sup>	11.42	0.50	5.04	0.67	2.70	0.14
1979 <sup>3</sup>	11.86	0.44	NA	NA	NA	NA


<sup>1</sup> Including gas condensate.

<sup>2</sup> Estimate.


<sup>3</sup> Plan.



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share of West Siberian and national output growth during the past five to six years, but probably reached peak production this year. Other large, older fields in West Siberia also have reached their peak and some are beginning to decline. 

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In many West Siberian fields, the most productive reservoirs were produced first. Although these reservoirs have not been fully exhausted, most remaining reserves lie in less productive reservoirs and will require much additional drilling. Poor permeability (essentially a measure of the ease with which oil flows) is the central problem. For example, the least intensively worked reservoir at Samotlor is the AV<sub>1</sub>. Permeability is low and test well flows have been correspondingly poor—18 b/d. In comparison, the most intensively worked reservoir—the BV<sub>8</sub>—has high permeability and well flows of 200 b/d. The situation is similar at other giant fields in West Siberia. 

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At the Ust'Balyk field, the oldest giant oilfield in West Siberia's Surgut region, the bulk of production has come from the upper reservoirs, the BS<sub>1</sub>, BS<sub>2-3</sub>, and BS<sub>4</sub>. These reservoirs peaked in 1972, and water cuts of 40 percent have been reached. The BS<sub>10</sub>

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25X1 reservoir, which contains 38 percent of the field's total oil-in-place, holds most of the remaining oil. Permeability in this reservoir, however, is very low and test flow rates amount to only 6 b/d. Problems also were caused by the treatment of the three reservoirs as a single network of producing wells. Production and water flooding were uneven, and additional drilling to produce more oil from the individual reservoirs will be necessary. [REDACTED]

Development of the smaller West Siberian fields to compensate for the leveling off of Samotlor's output is lagging behind plan. Originally, 62 new oilfields were to have been developed during 1976-80 in West Siberia, but the number now has been scaled down to only 22 or 23. Serious infrastructure problems, such as the lack of roads, pipelines, and electric power lines to these distant new fields, have hampered their exploitation and probably have caused the Soviets to reduce development goals. Ten new oilfields were put into operation in 1976-77; eight were to be developed in 1978, leaving only 4 to 5 fields planned for development during 1979-80. [REDACTED]

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#### Domestic Consumption and Exports

The increase in oil production planned for 1979 will not be sufficient to meet both domestic and export needs if the Soviet economy grows as fast as planned. Based on the historical relationship between oil consumption and industrial growth in the USSR, the 5.7 percent growth in the latter planned for 1979 would require about 500,000 b/d of additional oil for domestic consumption, that is, 100,000 b/d more than the planned increase in production. In such an event, the shortfall would likely be taken out of oil exports. It is unlikely, however, that the economy can grow as fast as planned. Industrial growth of about 4 percent is a more realistic outcome in our estimation. Such industrial growth would require oil consumption in 1979 to rise by about 400,000 b/d and enable Moscow to maintain oil exports at about present levels while satisfying domestic oil requirements. [REDACTED]

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25X1 At the Central Committee plenum in November, Brezhnev admitted that no important energy savings had been made. In the 1979 plan, energy production is scheduled to grow at about 1.4 million b/d of oil equivalent, with the largest share slated for natural gas. However, as domestic demands for liquid fuel continue to rise, only limited opportunities appear likely for oil savings. Some substitution of natural gas for oil as a fuel for thermal power plants and some industrial boilers is possible, depending on the extent of the urban gas distribution network. Such savings would result primarily in increased supplies of residual fuel oil, but the petroleum products in short supply are the light distillates—gasoline, jet fuel, diesel fuel. Secondary refining capacity is inadequate to convert larger quantities of residual fuel to the desired light products. [REDACTED]

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### The Gas Alternative

Moscow apparently intends to push gas production harder than originally planned during the next two years to compensate for slower-than-expected growth in oil production. The 1979 gas production target—14.3 trillion cubic feet (tcf)—is an ambitious one, requiring growth next year of about 8.4 percent and an absolute increase of 1.1 tcf, the largest annual rise ever. Gas output in 1978 is running about 7.5 percent above last year and should reach 13.1 tcf for the year, slightly above plan.

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Next year's growth will come primarily from two fields—Urengoy in West Siberia and Orenburg in the southern Urals region. Urengoy with 175 trillion cubic feet of proved plus probable reserves may be the world's largest gas field. It began producing in May of this year and should yield about 0.5 tcf by yearend. Plans called for boosting production by about 0.4 tcf in 1979 but this goal has probably been revised upwards to help meet the higher national targets. At Orenburg, new production capacity recently added could boost 1979 output by as much as 0.5 tcf above this year's level of 1.2 tcf.

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Moscow's 1979 gas target appears unreachable for several reasons. Growth is now concentrated in a single region—Northern Tyumen Oblast—where the physical difficulty of developing new deposits and the transportation distances involved are unprecedented. Second, planning is extremely taut and the failure by other sectors of the economy to provide adequate housing, roads, river transport, railroads, and electric power is hindering the development of new West Siberian fields. These fields are being counted on to offset declines in the older gas producing regions in the Ukraine and North Caucasus. Third, plans for building adequate pipeline capacity are not being met. Even if the pipe can be laid on time, delays in the installation of the necessary compressors will significantly limit pipeline throughput capacity. During 1976-77, for example, only 25 percent of the planned compressor capacity was installed.

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### Beyond 1979

The recently announced plans for 1979 provide a clear indication that the Soviet oil production goal for 1980—12.4 million to 12.8 million b/d—cannot be met. The plan suggests that Soviet oil production will peak soon, perhaps even in 1979. But even if output grows in 1979-80, peak production will be about 12 million b/d and will begin to decline rather sharply two or three years thereafter. The basic reasons for this estimate are:

- Older fields in West Siberia are being produced beyond maximum efficient rates.

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- Development of new smaller fields in West Siberia is lagging badly.
- Output in older major oil producing regions such as the Urals-Volga is declining and the decline will accelerate.
- Drilling requirements to offset depletion are mounting more rapidly than the Soviets can manage.
- Exploratory efforts have been unsuccessful in locating major new oil discoveries that could have a significant effect on oil output through the mid-1980s. [REDACTED]

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The increased emphasis on gas production is likely to boost 1980 output to 15.2 tcf, near the upper end of the five-year-plan target of 14.1 tcf to 15.4 tcf and some 0.4 tcf more than we originally estimated. At this level of production, roughly an additional 200,000 b/d of oil equivalent would become available for domestic consumption and export. Moscow could and probably would use this "surplus" gas in several ways: by substituting gas for oil domestically to the extent technically possible; by exporting more to Eastern Europe to maintain required supplies of energy if oil deliveries cannot be increased; and by selling more to the West to offset a leveling off or potential drop in hard currency oil sales. [REDACTED]

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OPEC COUNTRIES: FALLING EXPORTS, RISING IMPORTS [REDACTED]

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Most OPEC countries have suffered a serious deterioration in their current account positions in 1978 because of reduced world demand for OPEC oil and import price inflation. The rise in import prices has resulted primarily from the depreciation of the dollar against the currencies of the other industrialized countries and secondarily from domestic inflation within supplier countries. As a consequence of these unfavorable developments, most OPEC countries will slow down their foreign investment and increase their foreign borrowing. [REDACTED]

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**Current Account**

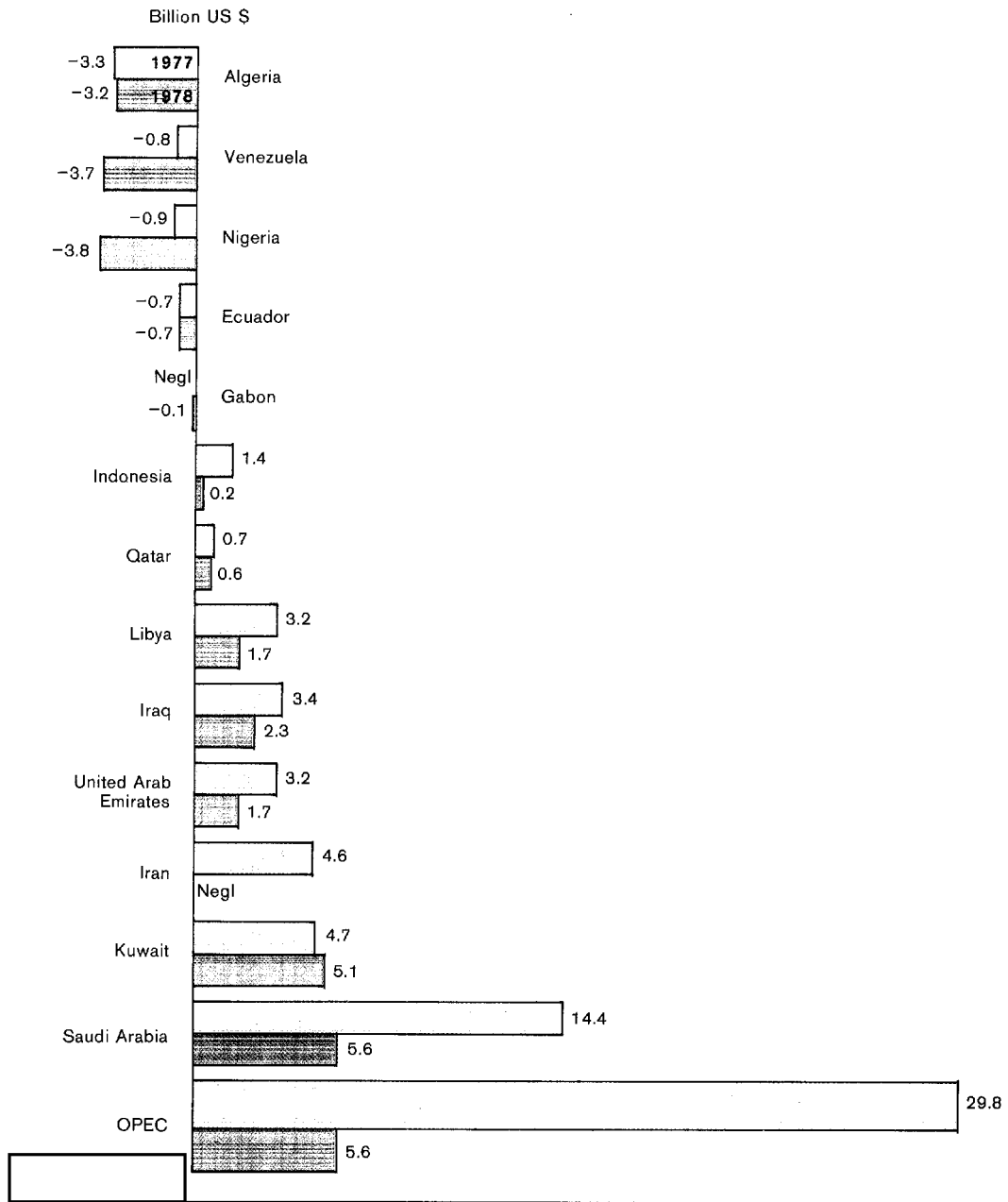
The overall current account surplus of the OPEC countries is expected to drop to less than \$6 billion in 1978, down 80 percent from the 1977 level. The surplus will be roughly \$3 billion in each half of 1978. [REDACTED]

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Saudi Arabia, faced with declining oil export earnings and rising import expenditures, will account for more than 36 percent of the decline in OPEC's surplus

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**OPEC Countries: Estimated Current Account Balances, 1977 and 1978**



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from 1977 to 1978. The same factors plus serious domestic turmoil will move the Iranian current account into balance or even produce a small deficit in 1978 after a \$4.6 billion surplus in 1977. Venezuela and Nigeria will each see their deficits grow by \$2.9 billion. In Venezuela, the primary cause will be rapidly rising import expenditures; in Nigeria, declining oil revenues as well as increased import spending are taking their toll. Among OPEC countries, only Kuwait and Algeria will improve their current account positions this year.

OPEC: Estimated Current Account Balances and Projections, 1977-79<sup>1</sup>

Billion US \$

	TOTAL OPEC									
	1977		1978		1977 Year	1978 Year	1979 Assumed oil prices rise Jan 1979			
	1st Half	2nd Half	1st Half	2nd Half			%	%	%	%
Exports (f.o.b.) .....	72.3	73.7	67.1	73.1	146.0	140.2	144.5	150.9	157.3	163.8
Oil .....	67.5	68.9	61.7	67.6	136.4	120.3	132.3	138.7	145.2	151.6
Nonoil .....	4.8	4.8	5.4	5.4	9.6	10.9	12.2	12.2	12.2	12.2
Imports (f.o.b.) .....	-39.3	-44.8	-46.8	-51.	-34.1	-98.6	-112.7	-113.8	-114.9	-115.9
Trade balance .....	33.0	28.9	20.3	21.3	61.9	41.6	31.8	37.1	42.5	47.8
Net services of private transfers .....	-13.2	-14.1	-15.8	-16.5	-27.3	-32.3	-35.5	-35.6	-35.6	-35.6
Freight and insurance .....	-5.9	-6.7	-6.5	-7.2	-12.6	-13.8	-13.9	-14.0	-14.2	-14.3
Investment income receipts .....	4.3	4.3	4.7	4.7	8.5	9.5	9.6	9.7	9.8	
Other .....	-11.6	-11.6	-14.0	-14.0	-23.3	-23.1	-31.1	-31.1	-31.1	-31.1
Grants .....	-2.1	-2.7	-1.8	-1.8	4.8	-3.4	-3.4	-3.4	-3.4	-3.4
Current account balance .....	17.7	12.1	2.6	3.0	29.8	5.6	-7.2	-1.9	3.5	8.8

<sup>1</sup> Because of rounding, components may not add to totals shown.



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**Oil Exports**

Slack world demand for OPEC oil, partly reflecting growing output from the North Sea, Alaskan North Slope, and Mexico, cut OPEC export earnings sharply in the first three-quarters of 1978. Oil exports of nearly all cartel members skyrocketed in the fourth quarter, however, as liftings increased in anticipation of a January 1979 oil price hike. Total OPEC oil revenues in 1978 will be an estimated \$129 billion, down \$7 billion from record 1977 levels. OPEC's oil exports are projected to drop by 1.6 million b/d in 1978, to 28.0 million b/d.

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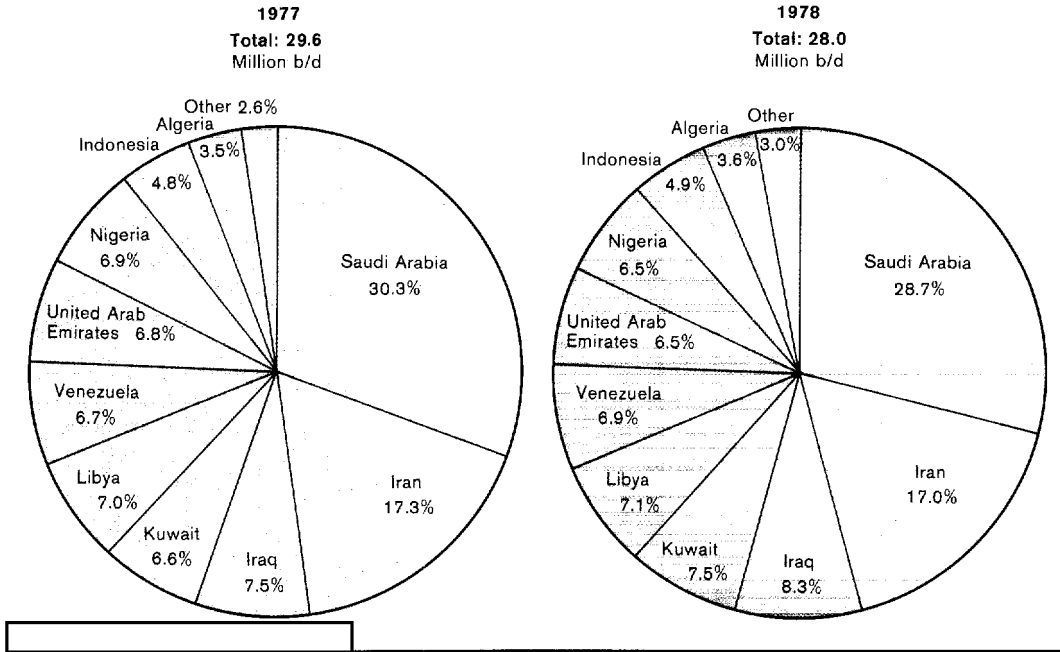
The impact of the softer oil market has varied widely among OPEC countries:

- Saudi Arabian oil export earnings will drop by an estimated \$3.3 billion in 1978.



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**OPEC Countries: Estimated Oil Exports**



- Iran will lose an estimated \$2 billion in oil revenues this year. The oilfield workers' strike in the fourth quarter is a major factor in the Iranian shortfall.
- Nigerian oil revenues will decline \$1.5 billion in 1978 as a result of sluggish first quarter demand for high-quality crude.
- Stepped-up sales will raise the oil export revenues of Iraq, Kuwait, and Qatar above 1977 levels.

There were small changes in the export shares of individual cartel members in 1978. Oil production restrictions—ceilings on production and/or share restrictions on liftings of light crude—have been imposed by Saudi Arabia and the United Arab Emirates. On the other hand, the reduced Iranian oil liftings have resulted in increased exports by some producers, especially Saudi Arabia. Overpricing of crude resulted in slack sales in Kuwait, Ecuador, Algeria, Libya, and Nigeria early in the year; they then adjusted price differentials between their crudes and Saudi benchmark crude, and exports picked up.

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### Nonoil Exports

25X1 The value of OPEC nonoil exports, including reexports, will be \$11 billion in 1978, roughly 8 percent of total export earnings. Increased sales of liquefied natural gas will nearly triple Algerian nonoil exports. Kuwaiti nonoil exports will grow almost 30 percent because of increasing reexports of manufactured goods and, to a lesser extent, growing fertilizer sales. In Indonesia and Venezuela, nonoil exports will grow more slowly. Declining market prices of cocoa and coffee had a large negative impact on Nigerian and Ecuadorian nonoil exports, respectively. The value of nonoil exports from Nigeria will stagnate after increasing by 50 percent in 1977; Ecuadorian nonoil exports will fall in 1978. [REDACTED]

### Imports

In 1978 the value of OPEC imports is expected to rise by 17 percent, to \$99 billion. Both the amount and the causes of import spending growth vary widely among cartel members; some even will experience a decline in the real value of imports:

- Increased development spending will raise imports over 20 percent from 1977 levels in Iraq, Saudi Arabia, the UAE, Qatar, and Venezuela.
- Spiraling import price inflation will cause nearly all of the 15 to 20 percent growth in import expenditures in Indonesia, Kuwait, and Libya this year.
- In Iran, dock worker strikes and internal political unrest hampered import offloading in the fourth quarter of 1978, and imports will be only about 14 percent above the 1977 level.
- Algeria, Ecuador, Gabon, and Nigeria will constrain import spending in 1978 in order to hold down their current account deficits.

25X1 Import prices for OPEC countries rose 14 percent in 1978. They were particularly hard hit by exchange rate changes because oil revenues are collected in dollars. The depreciating dollar accounted for 80 percent of import price inflation; inflation in the developed countries accounted for the remainder. Import volume will only grow 3 percent this year. [REDACTED]

### Service Expenditures

We estimate that combined OPEC deficit on invisibles in 1978 will be \$32 billion, \$5 billion above the 1977 level. Growth in expenditures for freight and insurance,

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foreign technology fees, interest payments on debts, and net private remittances will far exceed the increase in investment income receipts. [redacted]

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For most OPEC countries, freight and insurance costs will remain level. In Saudi Arabia, however, an improved internal transportation network and an easing of port congestion (the latter holds for Iran also) should lower these costs, while Nigeria continues to be plagued by severely congested ports. As a result of the diminishing surplus, investment income receipts for OPEC countries in 1978 will rise less rapidly than in 1977, increasing only \$1 billion. At the same time imports of other services will rise 20 percent on the average. In Gabon, Iran, Kuwait, Qatar, and Saudi Arabia, other service payments will increase more than 20 percent owing to large imports of foreign technology and services for infrastructure development, while Venezuela's expenditures will grow by one-half because of burgeoning payments for debt service and travel. [redacted]

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#### Surplus for Investment

With OPEC's sharp current account dropoff in 1978, its ability to finance capital outlays will diminish. Nonetheless, the investable surplus will contract less rapidly than the current account, due to OPEC's increased borrowings in international capital markets this year. Total loan commitments to OPEC countries in 1978 include \$13 billion in publicly announced syndicated bank loans, [redacted] [redacted] Probably only \$6-\$10 billion worth of these commitments will be drawn upon in 1978. [redacted]

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As in previous years, OPEC countries will use the bulk of their available funds to add to official foreign asset portfolios. New OPEC official foreign investment will



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probably be between \$6 billion and \$10 billion in 1978, down from \$32 billion in 1977. The proportion of surplus OPEC funds placed in short-term assets is likely to increase as OPEC governments adjust their asset portfolio to compensate for increased import costs and the fall-off in oil revenues. A slowdown in private foreign investment from OPEC countries is also likely in 1978. Other uses of surplus funds will include OPEC subscriptions to multilateral aid institutions and amortization of past foreign borrowings, especially by Algeria, Indonesia, Iran, and Venezuela. [redacted]

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### Prospects for 1979

The outlook for the OPEC current account surplus in 1979 will depend primarily on the pricing decision made by the cartel at its regular ministerial meeting in Abu Dhabi this week. OPEC's current account balance in 1979, for example, could fall to a \$7 billion deficit if prices are frozen, or rise as high as a \$9 billion surplus, if a January 15-percent increase is established. The situation in Iran will also be a key factor. [redacted]

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All major components of the OPEC current account are projected to increase in 1979. OPEC oil revenues could range from \$132 billion to \$152 billion depending on the price increase. The volume of oil exports in 1979 is expected to rise by nearly 700,000 b/d from the 1978 level, to about 28.6 million b/d. In any case, oil revenues will comprise more than 90 percent of total export earnings. OPEC imports are anticipated to rise to \$113-\$116 billion in 1979—up some 14 to 18 percent from 1978, reflecting both a 6.5- to 8-percent increase due to import price inflation and a 7- to 9-percent growth in import volumes. The net services deficit will probably increase by 10 percent to \$36 billion reflecting continued growth in development-related services and debt service and slackened growth in investment income. [redacted]

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Without a 1979 oil price increase of at least 10 percent, OPEC as a whole will almost certainly become a net borrower of funds next year. Loan receipts will probably approach \$15 billion as cartel members continue to rely on external financing to deal with balance of payments problems and pay for capital-intensive development projects. Asset accumulations will decline if the current account surplus falls from the already-low 1978 level. [redacted]

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CANADA: STATUS OF JOINT PETROLEUM STORAGE PROJECT [REDACTED]

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Negotiations on storage of a portion of the US strategic petroleum reserve (SPR) in Canada are moving ahead. Ottawa supports efforts to locate a 100-million-barrel storage site in eastern Canada as a means of attracting investment and generating employment in the economically depressed Maritime Provinces. Tax and rental income from the project would supplement strapped provincial budgets. [REDACTED]

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**The Proposal**

The SPR program of the United States calls for storage of 500 million barrels of oil by yearend 1980 as an emergency reserve. A proposal to increase the level to 1 billion barrels by the end of 1982 is under active consideration by the administration. Joint US-Canadian petroleum storage studies were undertaken as a result of discussions held early this year between Prime Minister Trudeau and Vice President Mondale. Initially one of the three 100-million-barrel sites currently proposed is expected to be used but a second site could be added at a later date. [REDACTED]

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Any one of the three could supply a month's emergency supply for eastern United States. Canadian reports identifying issues, sites, and specifications were completed last July. A final US decision on a Canadian site originally expected before yearend has been postponed until mid-1976. [REDACTED]

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Canada has no immediate need for its own emergency oil storage facilities. Current Canadian stocks—128 million barrels—are equivalent to six months' imports. Moreover, recent oil and natural gas discoveries in western Canada can be quickly exploited if the need arises. Still, an option to use part of the storage facility probably would be attractive to Canada. [REDACTED]

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**Proposed Storage Sites**

An international consortium headed by Wabanex, a Canadian company, has proposed adapting an abandoned iron mine on Bell Island near St. John's, Newfoundland. Originally proposed as an emergency storage facility for refineries in eastern Canada, the mine could hold up to 100 million barrels of crude and products. Construction costs for the project which would include a marine terminal and separate storage areas for 10 million barrels of refined products are estimated at roughly \$300 million;\* annual operating costs are forecast at \$5 million. Onsite feasibility studies conducted in late 1975 show that the mine, which extends partially under the sea, is liquid tight. The surrounding water is deep enough to handle supertankers and is

\* All costs are expressed in US dollars.


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Proposed Canadian Sites for US SPR Program

Site Location	Storage Capacity (Million Barrels)	Capital Cost (Million US \$)	Annual Operating Cost (Million US \$)	Distance from New York (nm)	Employment Required for Construction Man-Years		Permanent Employees	Remarks
					Direct	Indirect		
Wabanex, Bell Island, Newfoundland	100	300	5	1,142	1,000	3,000	50	Uses an abandoned iron mine. Requires construction of dock facilities for VLCCs but no dredging. Proposal includes 10 million barrels of oil product storage.
Home Oil, Canso Straits, Nova Scotia	100	375	5	701	200	600	50	Uses solution mining techniques to develop salt dome storage. Requires construction of dock facilities for VLCCs and extensive dredging. Proposal includes no product storage.
Domtar, Kingsville, Nova Scotia	30 (1981) 100 (1984)	290	5	720	200	500	50	Uses solution mining techniques to develop salt dome storage. Existing VLCC docking facilities and onsite temporary storage. Proposal includes 3 million barrels of product storage.



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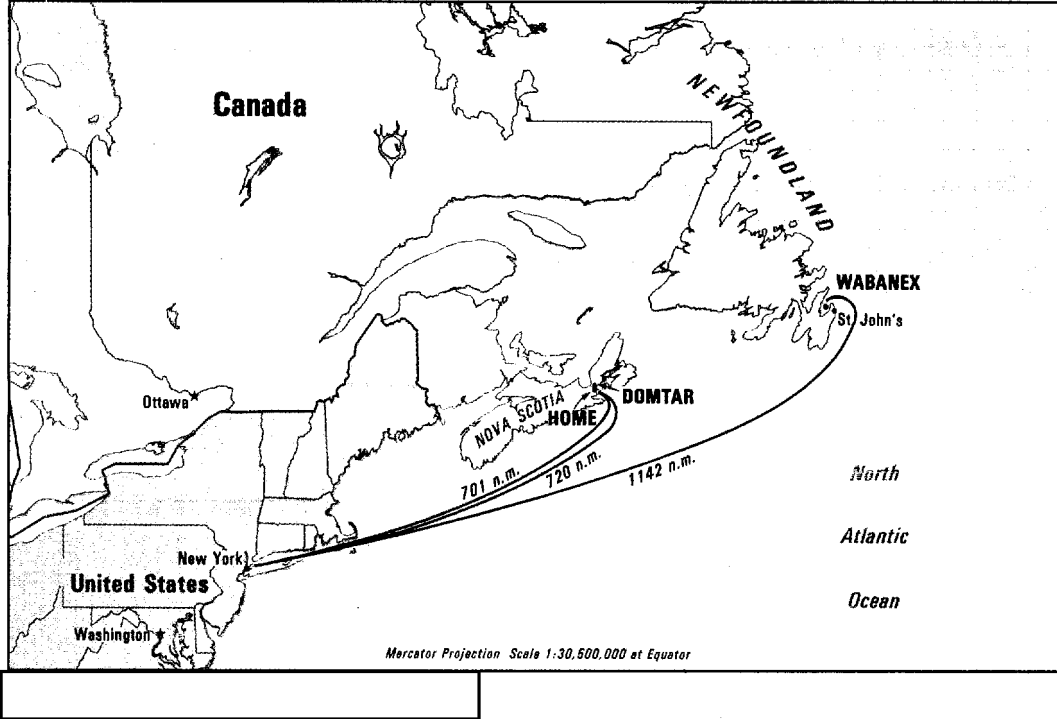
normally ice free 46 weeks a year. Canadian sources estimate potential employment benefits at 1,000 man-years in direct construction and an additional 3,000 man-years in indirect project-related activities. Fifty permanent employees would be required for operation of the completed storage site. 

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Home Oil Company, Ltd., heads a consortium that proposes storing 100 million barrels of crude oil in salt caverns near the Canso Straits, Nova Scotia. This site is 400 nautical miles closer to New York than the Wabanex site. Under the Home proposal, labor-saving solution mining techniques would be used to construct salt dome storage chambers. No oil product storage is planned. Canadian Government officials estimate overall costs at \$375 million. This total is higher than for the Wabanex project because VLCC (very large crude carrier) docking facilities and harbor dredging operations will

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Canada: Potential Strategic Petroleum Reserve Sites



be required. Direct and indirect employment on construction of the project totals 800 man-years, with 50 permanent workers required to operate the facility. [redacted]

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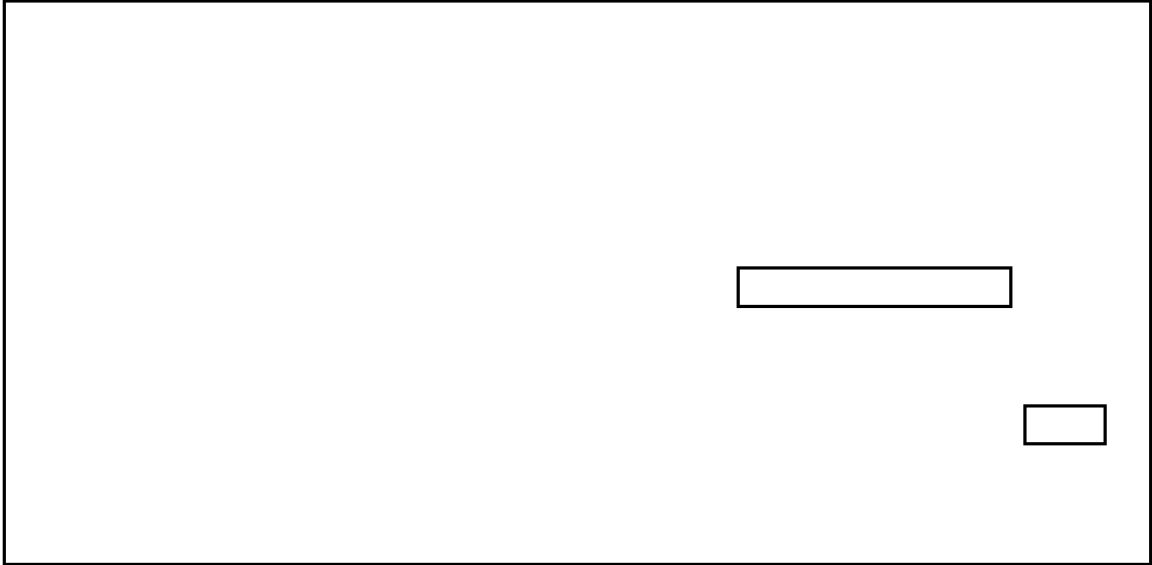
The third proposal, by Domtar Inc., calls for a salt dome facility near Kingsville, Nova Scotia, a few miles north of the Home Oil site. Phased development of the site would allow storage of 30 million barrels by 1981 and 100 million barrels by yearend 1984; costs of construction are estimated at \$290 million. Tanker access would be provided from existing VLCC facilities at Gulf Oil's Point Tupper Refinery nearby. An existing 3-million-barrel storage tank at the refinery, now underutilized, would be available for temporary storage. Some 700 man-years of employment would be provided by construction activities; 50 workers would be required for operation. [redacted]

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**EAST ASIA: OIL DEVELOPMENT PROSPECTS  
ON THE CONTINENTAL SHELF**



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China's recent decision to pursue offshore oil exploration with foreign help and last June's signing of a Japan - South Korea offshore exploration agreement represent the first major steps toward unveiling the oil potential of the East Asian continental shelf. China has been at the center of numerous bilateral jurisdictional disputes that have slowed comprehensive surveying and development of this area. The bed beneath the seas of East and Southeast Asia is one of the most promising oil-bearing areas of the largely unexplored offshore regions in the world.



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**Background**

The countries of East and Southeast Asia exhibited little interest in the continental shelf until 1968, when a UN-sponsored geophysical survey reported that the area contained potentially rich petroleum deposits. Spurred by the results of the survey and rising oil bills, many coastal nations in the region made expansive claims to the neighboring continental shelf and offshore islands; most of these claims overlapped. These states also delineated concession zones and initiated ambitious oil exploration programs.

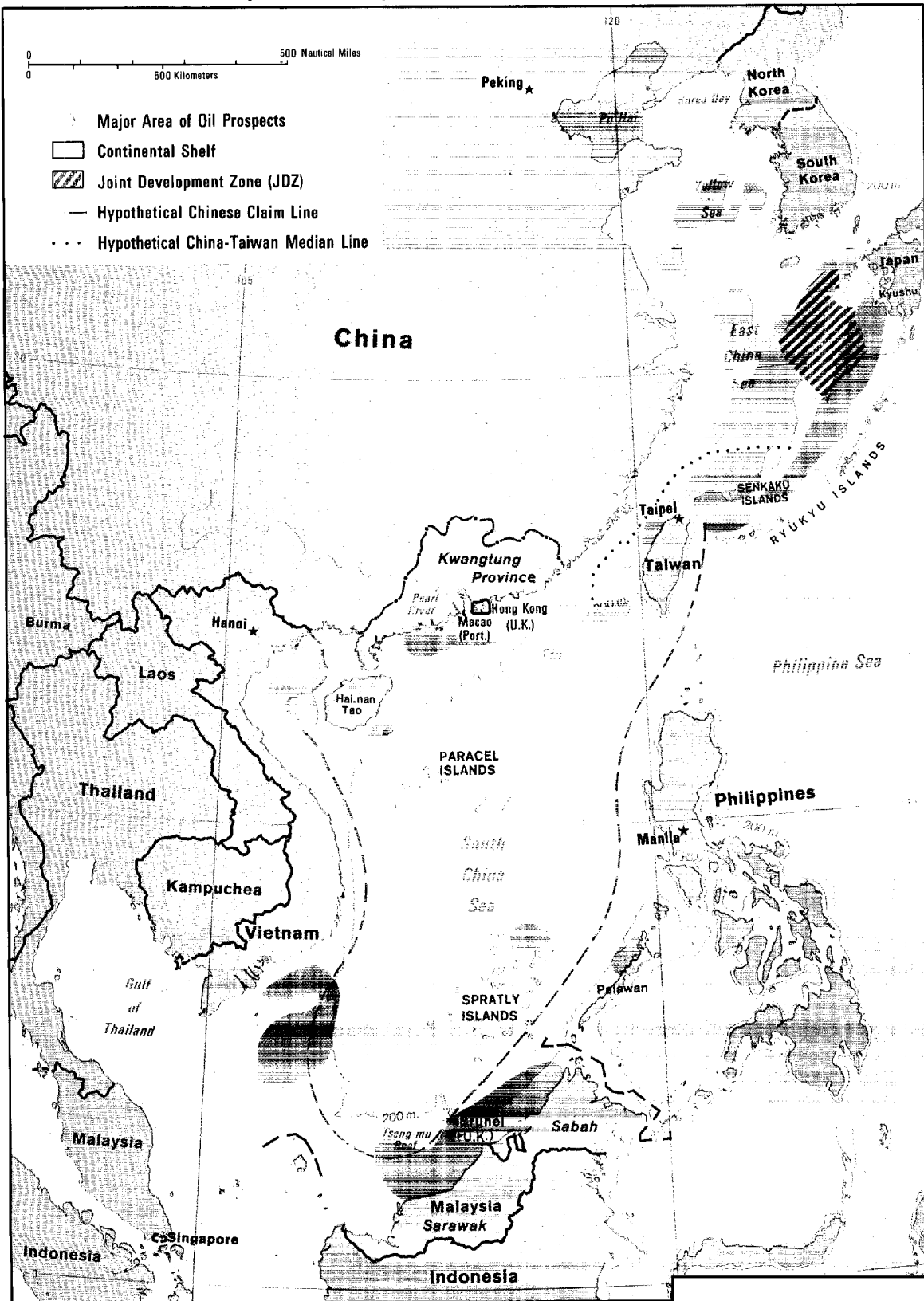


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**Chinese Policies**

In 1970, China reacted to these moves by staking general claims to the seabed and resources of the entire East Asian shelf. Peking also laid claim to the Senkaku Island

### East Asia: Oil Development Prospects on the Continental Shelf



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group in the East China Sea and the numerous island groups, reefs, and shoals in the South China Sea. The PRC's broad-brush claims have entangled it in a number of jurisdictional and territorial disputes of varying intensity: [redacted]

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• With South Korea over a large area of the Yellow and East China Sea continental shelf, in particular an area of the shelf that is to be jointly developed by South Korea and Japan called the Joint Development Zone (JDZ). [redacted]

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• With Japan over the Senkaku Islands and the East China Sea shelf, including the JDZ. [redacted]

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• With the Philippines over part of the Spratly Island group and the surrounding shelf resources. Manila has been aggressively pressing its claims to the Spratlys, especially in the northeast part of the archipelago where the Philippines has expanded its military presence and drilled for oil. [redacted]

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• With Vietnam over the Paracel and Spratly Island groups and surrounding shelf resources. The PRC threw South Vietnamese forces off the Paracels in January 1974, and the islands have since been a sensitive diplomatic issue between Hanoi and Peking. [redacted]

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• With Taiwan over maritime disputes that are an outgrowth of a more deep-seated problem—who is the rightful government of China. [redacted]

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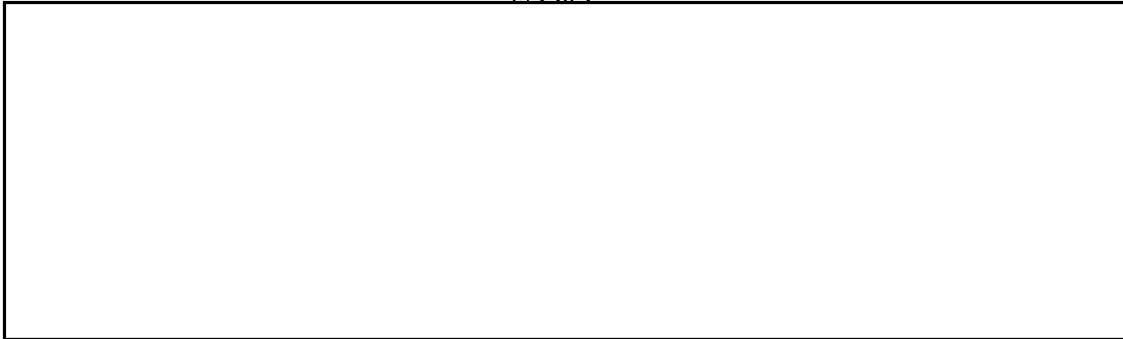
• With Malaysia over the Tseng-mu reef, a series of underwater shoals near the coast of Sarawak described by the Chinese as the southernmost part of China. The Chinese-drawn claim line cuts across Malaysian-awarded offshore concessions just north of the Sarawak offshore oilfields. The disagreement thus far has been limited to private expressions of concern by Malaysia; Peking has voiced no specific objections. [redacted]

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While affirming its own expansive claims, Peking has refused to dignify other countries' claims by going to the negotiating table. At the same time, the PRC has balked at specifying its ambitious maritime claims beyond periodic ambiguous statements. The resultant uncertainty has set back the offshore exploration and development programs of Japan, Taiwan, and South Korea, in particular. Other countries also have had to take Peking's claims into consideration when planning offshore programs. China has not, however, criticized North Korea's declaration of an economic zone in Korea Bay. [redacted]

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During the past year, Peking has contracted for purchases of Western technology and concluded contracts for survey and exploration ships, modern offshore drilling rigs, and support ships that will enable China to extend test drilling to many of the disputed areas. Peking has even discussed participation in offshore development of the South China Sea with US and other foreign oil companies. China and the Japan National Oil Company (JNOC) also reached agreement in principle last July to cooperate in joint oil exploration and development in two undisputed areas—the Po Hai and at the mouth of the Pearl River in South China's Kwangtung Province. 

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These Chinese initiatives signal a reconsideration of the government's adherence to the ideal of self-reliance and a desire to develop promising areas of the shelf as soon as possible. It is not yet clear, however, where China will deploy its newly acquired technology. Foreign oil companies will balk at drilling in disputed areas. China probably feels similarly constrained and will more likely concentrate its drilling in the next few years to close-in locations in Po Hai and along the South China coast rather than in the deep water areas still under dispute. 

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#### Japan and South Korea

After eight years of controversy and debate, Japan and South Korea are going ahead with the joint development of a mutually claimed area offshore the southern Japanese island of Kyushu. The two countries signed a treaty for joint development of the area in January 1974. The Koreans ratified the treaty in 1974, but in Japan the debate continued into 1977 because of the influence of strong opposition by China. It took another year and Japanese passage of special enabling legislation that specifies detailed procedures for implementing the treaty before the exchange of ratification instruments could take place. 

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The two countries will share equally both the costs and the oil or other natural resources discovered. Japan's Ministry of International Trade and Industry estimates ultimate recoverable reserves at about 800 million barrels of crude oil and 9.2 trillion

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cubic feet (1.6 billion barrels oil equivalent) of natural gas. Assuming a 12-year recovery period, the Japanese share of the crude would be some 85,000 b/d, equivalent to about 2 percent of current imports of crude; South Korea's share would amount to about 17 percent of current crude imports. Although questions concerning fishery compensation and environmental pollution must be answered before actual drilling operations begin, participants are looking forward to a startup by next summer. [redacted]

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South Korea appears willing to proceed unilaterally with drilling activity regardless of any possible protests by China. [redacted]

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[redacted] A future Chinese protest could force Japan to choose one of two unpleasant alternatives—decline to participate fully in the joint activity, thereby antagonizing Korea, or proceed with drilling and risk Chinese displeasure. [redacted]

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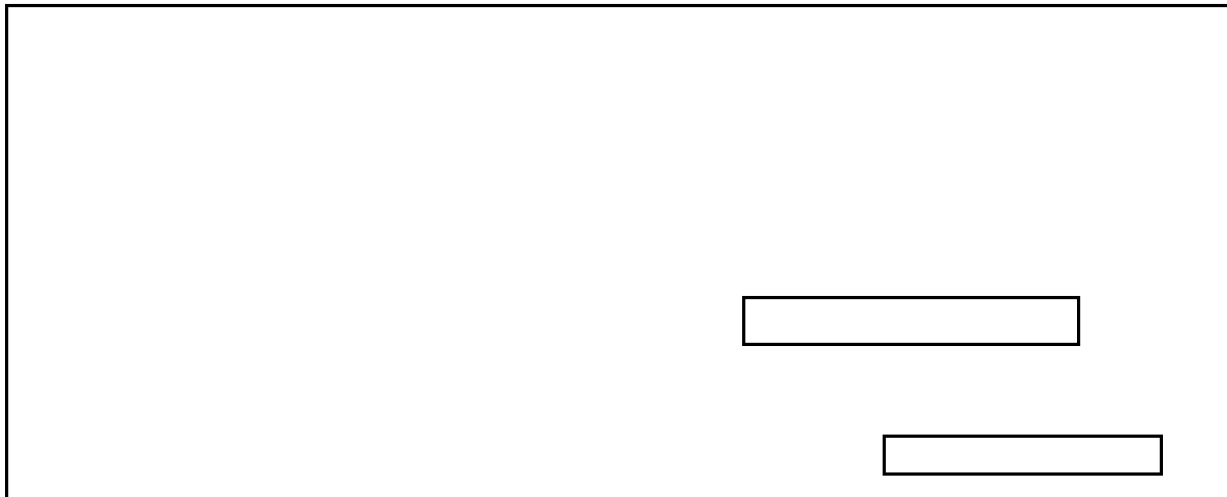
**Exploration and Production**

Because the most promising geological structures lie under disputed waters, little more is known today about the shelf's oil potential than in 1968 when the UN study was released. The most successful exploration activity has occurred near shore in undisputed waters along coastal Sarawak and in China's Po Hai Gulf. [redacted]

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The extensive Malaysian continental shelf just off the coast of Sarawak and Sabah encompasses a large number of sedimentary basins containing small oil-bearing structures. Offshore Sarawak was extensively explored by Shell in the late 1960s, and by 1972 five fields were producing 90,000 b/d. Since then, several commercial exploitable discoveries have been made off Sabah: newly opened fields in Sabah increased Malaysia's production to 180,000 b/d in 1977. [redacted]

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25X1 [REDACTED]

25X1 • Japan so far has refrained from oil exploration in areas of the shelf subject to conflicting jurisdictional claims. [REDACTED]

• The Philippines discovered oil off the coast of Palawan in 1976 and 1977 after a long series of unsuccessful drilling efforts. The discovery stimulated exploration activity, but the process of proving commercial reserves should delay significant production until the early 1980s. [REDACTED]

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• The embryonic Vietnamese offshore exploration program came to a halt with the fall of the Saigon government in 1975. The presence of hydrocarbons is undisputed and Hanoi is seeking foreign assistance, but reserves cannot be quantified until drilling resumes, perhaps in early 1979. [REDACTED]

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[REDACTED]

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#### TANKER CHARTER RATES REACH FOUR-YEAR HIGHS [REDACTED]

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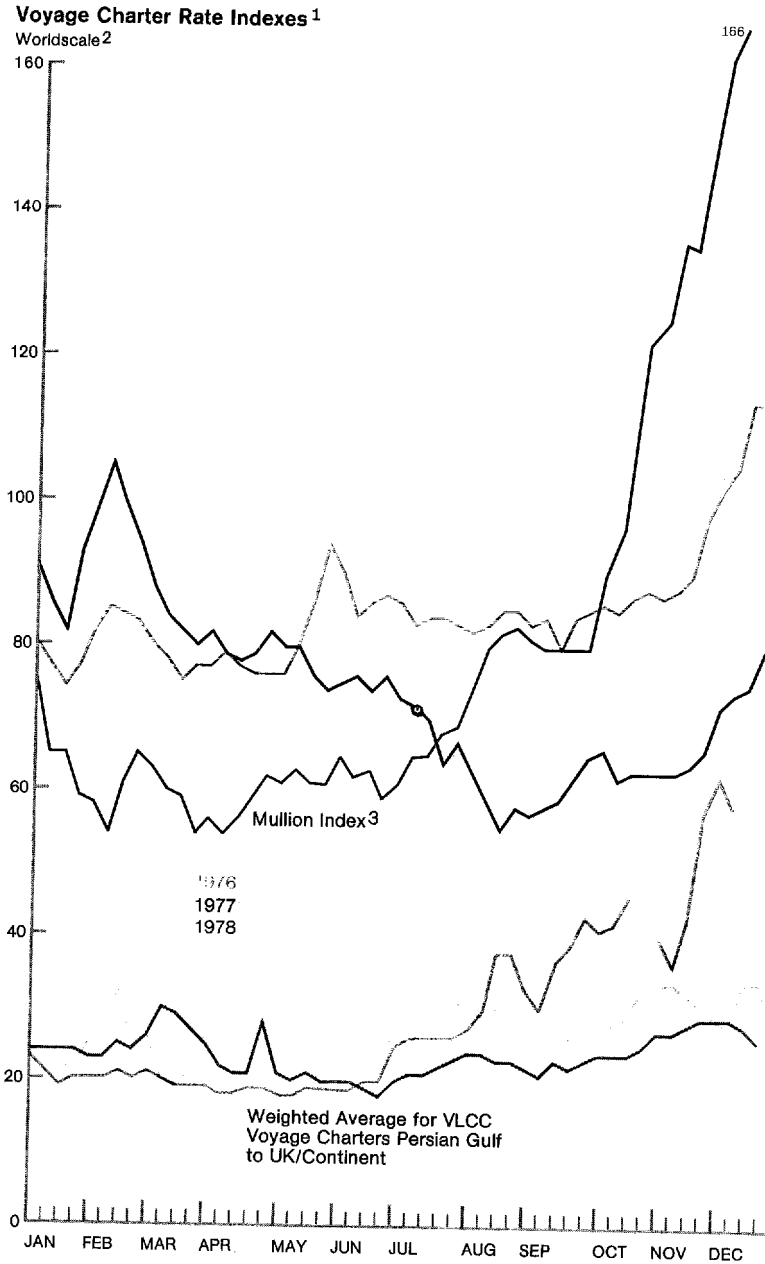
Charter rates for crude oil shipments have risen to their highest levels in more than four years. The high rates reflect both intensified voyage chartering by shippers building up inventories before the anticipated 1979 OPEC price increase and, through July, a large reduction in short-term tanker availability, due to record laying up of tankers. High tanker demand and therefore high charter rates will probably persist even after a decision is made on OPEC prices at the beginning of the year because of stockpiling against the possibility of an extended shortfall of Iranian crude. [REDACTED]

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#### Rate Trends

The Mullion Index—reflecting tanker charter rates worldwide for crude oil—reached Worldscale 166 during the week ending 8 December, three times the 1978 low and the highest level since April 1974. During the previous week, the average rate for very large crude carrier (VLCC) shipments of crude on the key Persian Gulf-European route, which dipped to \$3.25 a ton in May, rose to \$11.26 a ton—the highest

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1. These indexes apply only to charters for the carriage of so-called "dirty" cargoes which include crude oil and heavy petroleum products such as residual fuel oil.

2. A table of oil shipment costs on various trade routes for a standard tanker with fixed parameters (size, speed, fuel consumption, manning requirements, etc.) used on the tanker market to express voyage charter rates.

3. This index reflects all rates available to the compilers (the London tanker brokerage Mullion and Company) for single voyage charters of tankers in all trades agreed to (fixed) during the week in question and all previously fixed single voyage charters still in effect on Friday of that week.



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level since December 1973. The average dropped to \$10.39 a ton last week; at this rate, most VLCC owners are making a substantial profit.

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**Demand Situation**

Worldwide demand for chartered tankers in the first six months of 1978 was below corresponding 1977 levels, largely because of reduced trading. The first indication of a major upturn in demand was the flurry of chartering for voyages from the Persian Gulf to Europe in the first week of August to carry a record 4.3 million tons of crude, up greatly from an average of less than 1.3 million tons in the preceding weeks of 1978.

Chartering also picked up in all other major loading areas. Voyage charter volumes during August through October reached levels not previously achieved during

Worldwide Tanker Voyage Charter Volume

	Thousand Tons			
	1975	1976	1977	1978
First Quarter .....	34,218	61,507	112,502	88,560
January .....	16,119	17,297	34,087	29,499
February .....	10,358	21,698	38,011	30,181
March .....	7,742	22,512	40,404	28,880
Second Quarter .....	39,464	75,974	103,959	94,009
April .....	11,414	22,638	37,440	29,823
May .....	11,664	27,254	33,165	31,123
June .....	16,386	26,082	33,354	33,063
Third Quarter .....	54,936	81,230	98,749	112,809
July .....	17,096	29,559	32,427	32,555
August .....	18,810	27,212	31,145	40,718
September .....	19,030	24,459	35,177	39,536
Fourth Quarter .....	51,630	102,058	100,947	
October .....	15,573	32,510	31,244	43,601
November .....	16,565	33,579	37,921	
December .....	19,492	35,969	21,782	
<b>Total .....</b>	<b>180,249</b>	<b>320,769</b>	<b>416,157</b>	

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that period. Uncertainty generated by the cutback in liftings from Iran caused weekly charter volume from the Gulf to Europe to fall below a million tons at the end of October before picking up briefly when Iranian output rose in late November.

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Chartering volume from other loading areas, such as the Mediterranean and the Caribbean, has been more stable than that out of the Persian Gulf, averaging close to 6



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million tons per week since mid-July. Supplies of available tankers waiting for business did not dry up as early in these areas as they did in the Gulf.

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**Tanker Supply**

Tanker chartering rates have also been strongly influenced by a major drawdown in the short-term supply of tankers waiting for business. Between January and the end

**Short Term Availability of Oil Carrying Tonnage**

	Million DWT					
	31 January	31 July	Change 1/31-7/31	31 August	30 Sept	31 Oct
<b>Total fleet</b> .....	<b>379</b>	<b>375</b>	<b>- 4</b>	<b>375</b>	<b>374</b>	<b>373</b>
Minus tonnage not avail- able on short notice for oil trade .....	58	79	21	76	69	63
Laid-up .....	(38)	(54)	(16)	(51)	(46)	(40)
In dry cargo trade ..	(16)	(21)	(5)	(21)	(19)	(19)
In repair .....	(4)	(4)		(4)	(4)	(4)
Tonnage available on short notice for oil trade ....	321	296	-25	299	305	310
Carrying oil .....	(317)	(295)	(-22)	(298)	(304)	309
Waiting for business. <sup>1</sup> ..	(4)	(1)	(-3)	(1)	(1)	(1)

<sup>1</sup> Includes tankers in areas other than the Persian Gulf.

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of July, oil tanker tonnage available worldwide\* decreased by 25 million dwt and unused operational tanker capacity nearly disappeared. This reduced availability reflected a shrinking in size of the world fleet due to dwindling deliveries of new ships and record scrappings,\*\* the accumulation of an unprecedented 54 million dwt of oil carriers in layup at the end of July, and a 5 million ton increase in tanker capacity serving the dry cargo trades.

Improvements in rate levels after July, however, have brought many ships out of layup. Tonnage availability has also been increased by the transfer of small tankers and combination carriers from the grain trade back to oil. As a result, even with total fleet tonnage diminishing at about a million dwt per month, the operational fleet available for oil movement is probably back to its January 1978 level of 320 million tons. Still, most owners have responded with caution, reactivating ships only when they have had charters booked.

\* Including both tankers engaged in the oil trade and operational tankers waiting for business.

\*\* Scrappings of tankers reached record highs in 1976 and 1977 of 10 million dwt. The total for 1978 as of mid-October was 12.6 million dwt.

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High levels of tanker demand and voyage chartering are likely to persist in early 1979 as buyers continue to stockpile against a possible long-term cutoff of Iranian crude. Nevertheless, with tankers continuing to move out of layup, some easing of charter rates is likely. [REDACTED]

\* \* \* \* \*

USSR: OFFSHORE OIL AND GAS REORGANIZATION [REDACTED]

In a move to speed up exploitation of offshore hydrocarbon resources, Moscow recently established the Main Administration for Exploration and Development of Offshore Oil and Gas Fields, "Glavmorneftegaz," in the Ministry of the Gas Industry. The new organization—80,000 strong—will be responsible for all offshore exploration, construction, drilling, and production activities. These functions previously were fragmented among several ministries. [REDACTED]

The centralization of offshore operations reflects Moscow's concern over slow progress in offshore development. The potential for growth in Soviet oil production beyond the mid-1980s rests largely in the Arctic offshore regions and in deep structures in the Caspian Sea. Timely development of these areas will require effective internal planning and administration of large-scale projects incorporating Western technology, equipment, and services. [REDACTED]

The new administration will be headed by Yuriy Zaytsev, an engineer with a strong technical background in petroleum exploration and production and with administrative experience both in the oil and gas ministries. He served for four years as Chief of the Main Administration for Petroleum Production and for the past five years as Deputy Minister of the Gas Industry, a position he apparently will retain along with his new responsibilities. [REDACTED]

The restructuring of offshore oil and gas responsibilities was in the works for about a year. There apparently was considerable politicking over leadership and organizational subordination. We do not know why Glavmorneftegaz was placed under the gas ministry—which has done no offshore work—rather than the more experienced oil ministry, unless the decision was meant to be a politically motivated vote of confidence for Sabit Orudzhev, Minister of the Gas Industry. There is clearly more Soviet interest in finding offshore oil than gas. [REDACTED]

[REDACTED]

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