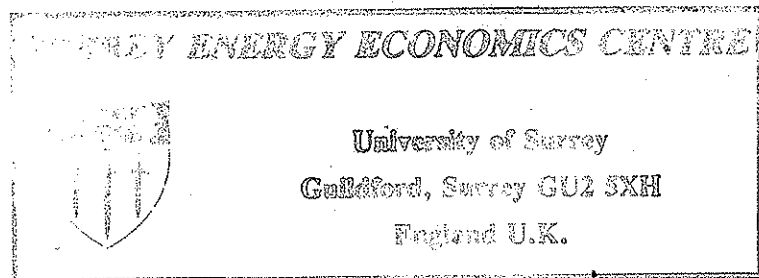


THE OUTLOOK FOR OIL PRICES IN THE MEDIUM TERM

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Foreword

There can be little doubt that the price of oil will remain the single most important influence on economic growth and development at least in the medium term. Increases in oil prices of the magnitude experienced in recent months require difficult adjustments in international economic relations as wealth is transferred on a large scale from importing countries to exporters of oil.

The two papers included in this discussion document represent two very different views of the future course of oil prices. They were originally presented at a seminar in energy economics at the University of Surrey in mid-January and have since been revised in the light of the ensuing discussion. George Ray, Visiting Professor of Economics at Surrey and Senior Research Fellow of the National Institute of Economic and Social Research argues that OPECs power to control prices and production will grow and that because of upward pressures on demand and the difficulties, technological and environmental, faced by substitute energy forms, the 1980s are likely to witness further massive oil price increases. Chris Rowland, Shell Research Fellow at Surrey believes on the contrary that recent price movements reflect changes in the structure of the oil market and will have little effect on the long run price of oil. In a tightly argued paper he highlights such factors as surplus production capacity, economic limits to stockpiling, changes in the spot market and the threat of increased nuclear power availability in the 1990s, which are likely to moderate or even reverse the trend in oil prices.

In presenting these contrasting views to a wider audience we hope to highlight some of the major unresolved issues in the future development of the international energy market as well as to stimulate further discussion and analysis.

David Hawdon
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January 1980

Oil : prospects for the mid-1980s

by

G.F. Ray*

Any assessment of the supply and price outlook for crude oil must start with reasonable assumptions, the most important among them being: normal conditions, excluding wars, political upheavals, etc., in other words, 'business as usual'. However, what is 'business as usual' in the world of oil? Would it be 'normal' to exclude some kind of political upheaval (à la Iran or otherwise) between now and 1985? It would probably be considered unrealistic if some unexpected event - and the list of possibilities could be quite long - did not further complicate the present status quo, complex as it already is, in the oil trade in general and within OPEC in particular.

The posted price of the 'marker' Arabian light crude, which rose modestly from \$1.80 a barrel in 1970 to \$2.47 in 1972, jumped in two instalments to \$11.60 in 1974; by 1978 it was \$13.60, equalling a state sales price of \$12.70. The latter was \$18.-- in the second half of 1979 after events in Iran, and in December, just before OPEC's Caracas meeting, it was raised to \$24.--. The marker price has lost some of its earlier relevance with the introduction of the 'dual' (but in fact rather unregulated) pricing system: the estimated average OPEC price in 1978 was \$13.09, in November 1979 it was almost \$21.--, and it is probably \$27-28 now. Thus the increase during 1979 was about 100 per cent.

These jumpy increases have little to do with inflation or the 'real' price or even the \$ rate, although these are of relevance and also make useful excuses. They have been detailed in order to support some basic features which seem unavoidable when attempting to assess the medium-term future, namely:

- OPEC has so far been efficient, serving its members well. Despite the diverging interests of its members stemming from different situations (reserves, population, political set-up, objectives, etc.) and disagreements (e.g. 'dual' pricing) there is at present every reason to believe that OPEC will be in existence in 1985, possibly enlarged by new members (Mexico is a distinct candidate).

*This is a personal assessment, not necessarily shared by NIESK.

- OPEC has been fixing the price in the past: its members will continue to do so by 1985 too. In 1978 some 90% of crude and refined oil in world trade originated from OPEC. This proportion will not change more than marginally by 1985.
- Within OPEC the dominating force is OAPEC (A for Arab) and within OAPEC the 'hawks' are gradually getting the upper hand. The moderating impact of Saudi Arabia has been weakening - see the dual pricing and the premium charged by others. We expect this at least to remain as it is, but it may possibly worsen (i.e. become more hawkish).
- It follows that OPEC can turn the taps on or off, practically as its interest dictates, in order to keep the market tight. Its members have learnt a number of lessons; it is unlikely that the 1977 oversupply position (leading to significant discounts) will be repeated and they know by now that if the market is there they can earn more money by producing less than by producing more. And 'the market is there'...
- In the given market situation, to which I return below, it appears unlikely that OPEC will be satisfied with adjustments correcting the present price for inflation and/or the rate of the US dollar (which may be dropped as its base trading currency). The period of such 'minor consolation prizes' may be over; the likelihood is more for major increases at unforeseeable intervals, though possibly with minor adjustments in the interim periods.'

Given these basic features of the OPEC side of the market, it is hardly worth going into great detail on other aspects of the energy picture. (Another important aspect not covered here is the financial side: what is going to happen to the large OPEC surpluses? This is a very important point but I am not going into it now.)

Assuming that the limits set at the Tokyo summit are kept by the 'big seven' OECD countries with regard to imports; that West European oil production exceeds 200 million tonnes by 1985 (90 million tonnes in 1978) including the UK (up to more than 130 million tonnes from 53 million tonnes in 1978); that US production can be improved and output elsewhere (Mexico, etc.) also raised - in other words, being optimistic in all these directions - demand for OPEC oil will nevertheless rise because of three factors: higher demand from LDCs, from Eastern Europe (which will probably receive reducing quantities from the USSR), and OPEC's own consumption will also rise.

The easy measures of conserving energy and substituting coal or anything else for oil have generally already been carried out. A lot more can be done in both areas but these measures are either unpopular, affecting people's way of life, or require a long lead time, such as the creation of new energy bases, or fundamentally altering major energy-consuming technologies. What remains in the immediate future is the attempt to reduce energy use by raising prices and taxation. Governments fighting inflation appear to apply these measures rather cautiously and their success is probably limited in any case since final users are locked in their existing equipment, appliances, cars, houses (and habits). Users may go some way towards economising with energy, but not too far. They either cannot, or are not willing to, go further, and would rather pay more. After all, given that inflation affects everything else, energy is still not as excessive in relative terms to the final consumer as it is to any country's import bill.

The substitute energy sources all struggle with difficulties, apart from the long lead times. At the present price of oil of around \$28 a barrel, some of them might be competitive with oil in areas where oil is technically replaceable. but coal usage seems to have limits in general, or requires major investment in those specific areas where it could replace oil (e.g. power stations) and although there is evidence of this happening, at present it is a slow process, still on a small scale.

Nuclear energy is an obvious possibility (where it replaces oil rather than coal) but it takes ten years to commission a plant - if public opinion permits it at all. To produce liquid fuel from oil sands or shale has already been started on a tiny scale and presents enormous environmental problems. Coal gasification is a possibility (it has been going on in Scotland on an experimental scale with technological - though probably not economic - success). To produce liquid fuel from coal is very expensive as yet (only South Africa can afford it - and it has to, for well known reasons).

All other possible methods - including those not listed, such as wind/wave power, tidal schemes, more progressive nuclear projects such as 'fast' or fusion reactors, etc. - are struggling with some combination of three major obstacles: technology, cost, or scale. Their technology is not developed, indeed, some of them have not even progressed beyond the laboratory stage; their estimated investment and running costs are very high; and the problem of scale is a particularly important one: small scale production may be welcome locally (e.g. a windmill supplying a farm) but not have much effect on the general energy position.

Thus, the energy situation around 1985 is unlikely to be very different from that of today. There will be minor shifts among the distribution of primary energy sources, with the share of oil going down, and total energy demand relative to output will be smaller, but total demand will nevertheless grow, as will world demand for oil (slower than energy demand) and demand for OPEC oil (even slower).

It should be made quite clear that by 1985 the productive capacity will exist to satisfy foreseeable (and even somewhat higher) demand for oil. But to have the capacity available and to actually exploit it are two different things: this is where OPEC "market-tightening" operations will come into the picture.

Whilst an energy scarcity to the extent of limiting output to below the likely 2-3 per cent annual growth in the OECD area is not expected (though in case of any really major calamity it could not be avoided) and in this sense the views presented here may be considered relatively optimistic, the expectation concerning price development is much less so. This is because of the monopolistic price-setting power of OPEC.

There will be only two factors limiting the price-maximising effort of OPEC (since no surprises on either the demand or the non-OPEC supply side are expected). First, it will wish to avoid the collapse of the Western economies, which would mean the loss of its market and its financial assets. Second, it will probably follow closely the price and cost relationship between its oil and any possible substitutes (This latter factor is a double-edged sword which may add to the internal controversies in OPEC since if a technological breakthrough occurs or any new energy source appears promising by 1985 those with large reserves may wish to retain the competitiveness of oil, whilst others with a shorter reserve lifetime may have the objective of cashing in whilst the running is still good.)

Given the uncertainties, the forecasts in the following table present three alternative versions for the 'real' change in the price of crude oil, as well as three alternatives for world inflation. (For convenience, these are 'paired' resulting in only three alternatives; more combinations are possible.) The table has been prepared before the December increases and therefore shows a 1960 price that has already been overtaken by events. The steep December 1979 rise has, however, been considered as one of the 'jumps' mentioned above and may therefore not alter the '1985' expectations. The table is in two main parts, showing past prices and forecasts for Arabian light crude and for the OPEC average which has recently started to deviate from the 'marker' Arabian light (the difference now is 16% and this has been retained in the forecast).

US \$ per barrel

	'Arabian light'		OPEC average		UN export prices of manufactures
	Current price ^(a)	Relative price ^(b)	Current price ^(a)	Relative price ^(b)	
1972..	2.47	2.47	2.55	2.55	100
1973..	3.27	2.73	..	..	120
1974..	11.58	7.93	..	..	146
1975..	11.53	7.03	..	..	161
1976..	12.38	7.46	..	..	166
1977..	13.33	7.45	..	..	179
1978..	13.66	6.66	14.08	6.87	205
1978..	12.70	6.20	13.09	6.39	205
1979..	15.97	6.85	18.62	7.99	233
1980..	20.50	8.01	25.40	9.92	256
1985 ^(c) A ..	30.40	8.85	37.50	10.95	343
B ..	40.20	10.70	49.80	13.25	376
C ..	53.10	12.90	65.90	16.00	412
					<i>Annual per cent changes</i>
1972-78 ..	33	18	33	18	12½
1978-80 ..	27	13½	39	25	12
1980-85 A ..	8	2	8	2	6
B ..	14½	6	14½	6	8
C ..	21	10	21	10	10

Source: *Statistical Appendix*, tables 21 and 22; NLSR estimates and calculations.

(a) 1972-78: posted prices, 1978-85: state sale prices.

(b) Relative to export prices of manufactures shown in last column.

(c) A, B and C assume the average annual changes indicated below for relative oil prices, combined with the assumed changes shown in the export prices of manufactured goods.

(From National Institute Economic Review, November 1979, p.40.)

The three forecasts for the change in the real price of crude oil reflect the following views:

- A: A very modest increase of 2% a year; if the above is the right description of the power position of OPEC (which I believe it is), this is an absolute minimum. It would be unrealistic to consider it as more than the lower extreme of the likely range.
- B: 6% annual rise; this I consider the central forecast. Of course, there will be no neat, gradual increase - price rises will come in spurts. (It would not be surprising if a rather long lull came now in the oil market, but it would not make me change these forecasts.)
- C: This is the other extreme - 10% a year relative rise; hawkish, but not impossible.

Although the table shows all this in great detail (perhaps too great), for easier handling here is a summary.

Guide to the forecasts for 1985

The price of Arabian light was \$12.70 a barrel in 1978; it was \$18.-- in November 1979:

if inflation ^(a) is (%) ...	and the oil price relative to inflation rises (%) ...	the current 1985 price of Arabian light crude ^(b) will be (\$ a barrel) about ...	and the OPEC average price (\$ per barrel) about ...
(A) 6	2	30	38
(B) 8	6	40	50
(C) 10	10	53	66

(a) UN export prices (unit values) of manufactured goods.

(b) The OPEC average is about 16% higher in each case.

Oil Prices in the 1980s: an Alternative View

by

C. Rowland*

Commentators on world oil affairs are increasingly taking the view that recent (since late 1978) oil price rises will typify the oil market in the 1980s and beyond. A strong, monopolistic and unified OPEC is forecast to dominate oil supplies in the face of an escalating oil demand, pushing up prices without concern for the effect on the West and unconstrained by competition. These beliefs are questioned in this note, where the difficulties recently experienced in the oil market are seen as short-term problems, as problems of restructuring and reorganising oil trading patterns, and as problems that are not relevant for medium and long term forecasts. This note argues that oil price forecasters should not attach too much importance to recent price rises and should not be misled by (what is only) a temporary chaos. Except for short-term price changes, oil supply and demand are the relevant factors for price determination. The last decade saw some dramatic changes to the considerations entering supply decisions, and the oil market's structure at the end of the decade is very different to the structure at the beginning of the decade. These changes are sketched in the first section which finds that, despite the scale of the structural differences, the consequences for prices are much less radical. An attempt to explain current high prices, by reference to the problems of transition between market structures, is given in the next section. The brief comments on the prospects for the 1980s end the note with an alternative view of the 1985 crude oil price. At one extreme rising real prices pushed up by infrequent jumps is possible; at the other extreme a moderate decline in real oil prices is not ruled out. The projected central scenario though shows considerably less real growth than a more popular view.

The New Considerations Entering Oil Supply Decisions

The key change to world oil affairs that started in 1973/4 and is only partially completed now, was the shift of power and control over

* This is a personal view, intentionally optimistic and provocative.

production rates away from the oil companies to the producing country governments. The overall volume of oil trading was not greatly affected but the channels of trading between producers and consumers were, with much less oil channelled through the companies. This tends to affect the crude oil price by causing a once-and-for-all price increase with little effect on the longer-run trend for oil prices to converge on oil's full resource, replacement cost, value (as quantified in appendix I). The structural shift changes the distribution of supplies, the control of depletion and the main beneficiaries from oil production; but although a new set of considerations have entered decisions in the oil market, long-run prices will tend not to be affected.

As depletion decisions are no longer determined by the companies so depletion decisions are no longer driven by the profit incentive. Instead decisions may be taken on national interest grounds. The popular view is that this will lead to decreased oil supplies but this misses a significant issue. A depletion decision on overall supplies is not needed - maximum economic recovery is undoubtedly desirable - however a decision on whether to produce now or whether to produce later must be made. Moreover it is far from clear that delaying production would enhance the national interest. Oil prices and revenues may rise initially but the strong, longer-run, consequent demand and income contractions in the West would lessen future revenues as well as harming OPEC invested surpluses. OPEC must not only be concerned about the collapse of the West but also about shocking the West. It is even less certain that the producing countries can act together and affect oil supplies. Observing the inability of OPEC to stop the decline in real oil prices from 1974 to 1978 (which was only halted by internal unrest in Iran) and the more recent scramble to raise prices, producing country governments seem reluctant to follow OPEC policies. Compared to the pre-1970s domination of the oil market by the seven majors, current oil supplies appear to be less monopolistic! Even if slower rates of depletion were pursued, this implies a jump in oil prices and not a higher rate of price increase in the future. For if supplies were cut now the surplus capacity in the mid 1980s would tempt producers to raise output, thus undermining any pressure for fast growth in prices. Basing decisions

on national interest arguments may cause a once-and-for-all price rise, but the trend for prices to converge on resource costs is unchanged.

Along with national interest arguments, political considerations have become more prominent in oil depletion decisions. Some of the producing countries have imposed (and will probably continue to impose) destination embargos and refinery limitations for their crudes. While this may create chaos in the short-run, the imposed restrictions are likely to be fairly stable and the oil that is free to move can compensate and alleviate any bottlenecks. So there may be some short-run pressure on prices before the bottlenecks are eased, but longer-run prices will be unchanged. Similarly some OPEC States have shown an increasing desire to further political goals by tampering with output plans. Such tampering might impair field efficiency and raise costs, but since the Middle East price-cost margin is so favourable there should be no impact on prices. Indirectly if supply cutbacks are imposed prices might tend to rise forcing the West into recession before the energy balance is re-equilibrated. Supply cutbacks though affect the producer as well as the consumer. Reduced output would severely and immediately reduce the producer's revenues, and a rapid economic decline would start. In the long-run, as the West seems more favourably placed to cope with changes, a cutback would probably be more detrimental to the producing country. A long-run cutback for political reasons is rather unlikely. The producing countries, though, could easily accommodate shorter temporary cutbacks. Without plans to moderate the impact of a sudden supply shortage the West would be prone to such short political disruptions. Prices might then remain inflated for a number of years. However, the West does seem to be formulating plans (see the stock building argument on page 11). The advent of political considerations in depletion decisions may imply instability in short-term prices, but not a change to the long-run prospects for the price trend.

More recently, religious factors have become important in decisions on depletion - not only because of the ideological changes that are associated with a strict Moslem régime, but also because of any internal unrest that would probably predate a dramatic change of government. The implications for oil supply are at worst only a temporary loss. Even strict Moslem leaders do not appear to despise international trade in principle; they have no objections to oil revenues and will probably be reluctant to delay the production which yields the finance necessary for societal change. This is especially true if political instability increases in the Middle East, as consequent arms requirements can be expensive. Likewise a new régime will be keen to establish its leadership quickly and will be looking for immediate sources of cash. Furthermore the long-term viability of imposing a strict Moslem régime on a country geared to economic progress may be questioned.

These characteristics of the new world oil structure seem unlikely to alter the medium and long-term supply outlook, nor the prospects for price growth. The world oil market has moved from one set of institutional procedures to another set that is radically different. But although the new structure embodies new considerations in oil decision-making, a radically different supply profile is unlikely. However, the changes are dramatic and the process of change itself led to transitional pressure on the demand-supply balance (and on prices).

Problems of Structural Change

In the short-term oil prices may diverge from the dictates of demand-supply balance. This has always been true as it is a consequence of the lags and lead times involved in any energy demand or supply change. During the period when the majors quoted and set prices though, the majors' parent country governments sanctioned price changes and ensured that the trend for slow oil price growth was implemented smoothly. Since 1973/4 this sanctioning power has been lost and price rises have tended to occur discretely and jerkily. This does not alter the long-run price trend.

but actual prices tend to fluctuate much more markedly around the trend. Generally the price instability will be exhibited by movements both above and below long-run prices; recently though there have been temporary pressures to keep prices above the trend.

First, since the shift of production decisions to OPEC countries the international oil companies have become concerned about their long-term access to oil and security of supplies. In this transitional period the companies have been prepared to sacrifice profits in order to keep their operations intact, and have been willing to pay exorbitant prices for oil in an attempt to avoid the decline in their rôle inherent in the new market structure. If a company's oil production division earned (windfall) profits then their profits could have been greater - if it made a loss then the loss could have been reduced - by adapting its size to its new circumstances immediately. Sooner or later though, competitive forces will constrain oil companies to be more concerned about profits. In the long-run companies cannot sacrifice profits and the pressure on prices should ease.

Second, during the transition period there has been a loss of flexibility in oil supplies. Production can no longer be controlled to balance short-term demand movements. Instead the full brunt of equilibrating must be through prices. A cushioning force has been lost and, in an era of dramatic change the OPEC countries have been able to raise prices quite fiercely. The West though, is regaining the flexibility by stockpiling, and once stocks are accumulated the OPEC countries will find short-term price manipulation much harder. That is providing the West is not over-reluctant to destock - an over-reluctance that probably exaggerated the pressure on prices late in 1979. For example, destocking ninety days of net imports would be sufficient to cancel out a supply disruption equivalent to all Iranian oil output for a period of probably up to a year (assuming a 50% minimum working inventory). With proper use of stocks the loss of flexibility is only temporary and the problem should not last.

Third, the past few years have witnessed a lot of pressures on the spot market (and a lot of attention has been devoted to some high spot market prices). So long as companies are concerned about their access to oil they will be willing to average out prices and high spot market prices should be expected. But as averaging out is not in the companies best long-term interests this pressure should ease. Also we have already noted that in the transition period prices perform the bulk of short-term equilibrating. In fact, amongst the different types of prices none are as free to move as the spot market price and so it is this price that is likely to respond most violently. Furthermore the smaller the spot market is, the greater the price response must be. But as the spot market's share of oil trade grows, and as flexibility is achieved elsewhere in stocks, spot prices should stabilize closer to the long-run price trend.

Fourth, there have been some perverse economic effects in the transition to the new structure. For example, the wide disparities in oil prices may have raised the average price. Consider the effects of the extra one million barrels per day produced by Saudi Arabia in the second half of 1979. Usually one would have expected this extra oil to have dampened price increases. However, the bulk of it went to one of the few companies with enough oil for their own needs (the Aramco group), and although the additional oil could have been re-traded, thus increasing supplies and holding prices down, this outcome was not feasible. If Aramco had moved the oil to the spot market the company would have received a much higher price than the price it paid for the oil - inciting charges of profiteering and jeopardising its long-term access to Saudi Arabian crude. Aramco's alternative was to stockpile the additional oil, thus thwarting the moderating price effect. Again this is only a short-term problem, a problem of the transition not of the new structure outlined in the first section.

Prospects and Projections

These are the types of short-term transitional problems that can be blamed for causing high oil prices. But how long will the transition

period persist? Over the next few years the forces of supply and demand suggest a less gloomy outlook for oil prices. Increasing output from Mexico, Norway and the UK should add at least one million barrels per day to supplies. On the demand side US oil consumption does seem to be falling now that real domestic consumer prices have risen, and as recession in the West is imminent an oil glut is likely.

The outlook for the medium term and beyond is not particularly bleak. Oil supplies are only now beginning to show the increased production from fields which were made viable following the 1973/4 price rise. China appears to have accepted large scale offshore oil development and the potential for less conventional oil sources (for example the shale deposits in Venezuela and North America) is huge. Fears that Russia may become a net oil importer in the 1980s seem unfounded since the Soviets have started exporting to Rumania recently. Decontrol of US oil prices should moderate US oil demand by raising domestic prices, and it might even induce extra supplies. The future is likely to see much more gas traded and much more nuclear power, which will offset the dominance of oil (and OPEC) in energy affairs. And although substantial new nuclear is unlikely before the mid 1990s, the threat to OPEC revenues from a large nuclear programme may be enough to moderate OPEC price demands in the 1980s: a large nuclear programme becomes much more socially acceptable in the West if the alternative is subservience to OPEC. The oil importing nations have eventually realised that oil price rises are unlikely to be eroded by inflation; the West is beginning to pursue slower economic growth, and policies are emerging to help the switch to an era of high energy prices and a broader energy mix.

These arguments support projections for an average of crude oil prices as follows:

Growth in nominal OPEC average oil price Anticipated Inflation
Within oil consuming countries
 (% per annum)

	<u>Central Estimate</u>	<u>High Estimate</u>	<u>Low Estimate</u>	
1980	20	20	20	11
1981	8	15	-7	8
1982	7	7	3	7
1983	6	7	5	6
1984	7	7	7	6
1985	7	25	7	6

OPEC AVERAGE OIL PRICE

Projected Nominal Oil Price Projected Real (Deflated to 1980 Prices) Oil Price
 (\$ per barrel, average for year)

	<u>Central Estimate</u>	<u>Range</u>	<u>Central Estimate</u>	<u>Range</u>
1980	25	-	25	-
1985	35	29 to 44	26	21 to 32

It is true that the 1970s saw some dramatic changes in world oil affairs and some dramatic upwards movements in oil prices. However, there is no reason to suppose that a rapid rate of real oil price growth will be associated with the emerging new market structure. Instead recent high oil prices can be explained by the pressures inherent in a period of transition, pressures which should ease once the new system of oil trading is established. In the medium-term and beyond a central projection should show oil prices converging on oil's full resource, replacement cost, value.

APPENDIX I

The full resource, replacement cost, value of oil is roughly reflected by the costs of alternative energy sources:

Energy Production Costs* (1980 \$ per barrel of oil equivalent)

Middle East Oil	0.3	-	1.2
Indigenous Coal (US)	3	-	6
Nuclear Input Break-Even Value**	8	-	13
North Sea Oil	8	-	14
Imported Coal (NW Europe)	9	-	16
Indigenous Coal (NW Europe)	12	-	17
Liquefied Natural Gas Imports	12	-	27
Liquids from Oil Sands	17	-	29
Low Btu Gas from Indigenous Coals (US)	22	-	29
Liquids from Shale	17	-	41
Synthetic Natural Gas from Indigenous Coal (US)	27	-	41
Liquids from Coal (US)	35	-	43
Liquids from Imported Coal (NW Europe)	35	-	51
Biomass (crops grown for fuel) as liquid	35	-	70+
Solar Hot Water (on site, 35 degrees latitude)	58	-	152+

* Excluding taxation, refinery, storage, transmission and distribution costs.

** The fuel input cost required for fossil-fuelled plants to produce electricity at the same cost as nuclear stations.

Source: Shell, "World Energy Prospects", October, 1977, updated by major energy corporations (spring 1979) and inflated into 1980 prices.