

Evolution and Revolution – Oil Markets in Europe and the FSU

By Peter Davies and Paul Weston*

Introduction

In the early 1990s, Europe and the Former Soviet Union (FSU) held out the prospect of exciting developments for energy markets. The European Energy Charter promised to be the dawn of a new era, heralding co-operation, investment, and integration. It hasn't quite worked out that way, but the story is an interesting one nonetheless, and an important area for oil economists to understand.

The title of this paper, "Evolution and Revolution" - slow change and fast change - reflects, in our view, the regional oil market developments of the 1990s. And our thesis is that, looking forward, we will see a certain amount of role reversal. Western Europe has been evolving, but could see revolutionary change over the next decade. The FSU has been in revolution, but could, with luck, move forward into a more stable evolutionary paradigm.

The paper is organised in two sections. Section 1 concentrates on recent historical trends (1990-1997), while Section 2 focuses on future prospects, key policy issues and uncertainties. Analysis of Europe is, wherever possible, subdivided to cover the 'mature' economies of Western Europe separately from 'transitional' Central Europe, which has had its own distinct characteristics.¹ Where helpful, an additional separation of South West from North West Europe is used to point up divergent trends. Unless otherwise referenced, all data is sourced from the BP Statistical Review of World Energy 1998.

Oil Market Developments Since 1990

Despite having less than 2% of the world's proved oil reserves, Europe's importance in world oil markets can hardly be underestimated. It accounted, in 1997, for over 20% of total consumption and almost 10% of total production. Furthermore, the North Sea² (which, since 1976, has accounted for the bulk of European production), has been critical, both in terms of driving the volume growth in non-OPEC production, and providing a technological lead - a proving ground for new, and often revolutionary, extraction and management techniques.

The FSU is no less an important player. It too has a relatively low share of world oil reserves (a little over 6%), while accounting for over 10% of total production. The region's share of world consumption, at 6% in 1997, was low by historic standards, but when at its peak in the early 1980s, the share was 15%. Although the region's star was much diminished in the early 1990s with economic collapse, the potential for consumption growth remains strong, as does that for production - centred predominantly on the Caspian.

The decade so far has been marked by a contrast of extremes. While consumption in Western Europe has been

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See footnotes at end of text.

steadily evolving, production has been soaring with the North Sea at the cutting technological edge. Economic transition in Central Europe led first to a sharp decline in oil consumption, but new growth is beginning to emerge as reforms bear fruit. The FSU on the other hand, still looks to have some way to go before its own transition is complete. Having witnessed substantial decline in both consumption and production since 1990, there are signs that the corner has been turned - but only just.

Western Europe

With its predominantly mature economic structure, one might have expected the 1990s to be a period of relative calm for oil markets in Western Europe. Indeed, the consumption story turns out to be just that - slow evolution. But the story for production has been quite the reverse.

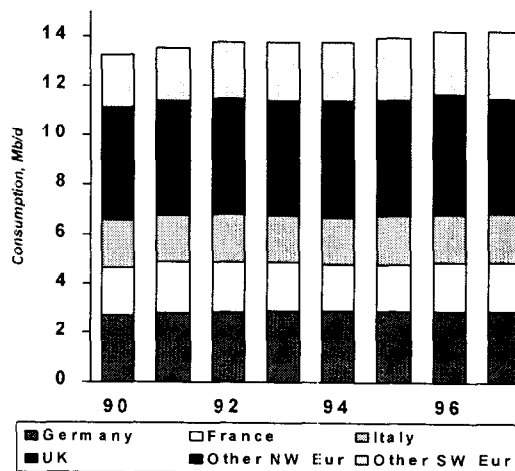
Consumption

Over the period 1990 - 1997, oil consumption in Western Europe rose by 7.3% from 13.3 to 14.2 million barrels a day (Mb/d). At just over 1%, the average annual growth rate was rather slower than the 1965-96 average (2.1%), but something of a turnaround from the average 0.7% per annum decline seen in the 1980s.

On a per capita basis, oil demand within Western Europe has been, if anything, on a gradually rising trend since 1990, although at 1.5 tonnes/person in 1996, it remains less than half the level found in the United States (3.1 tonnes/person). Oil intensity (the ratio of oil consumption to GDP) has fallen by nearly 4% since 1990 in the European Union (EU), from 109 tonnes/1990 M ECU in 1990 to 105 in 1997, implying greater aggregate efficiency in the use of oil.

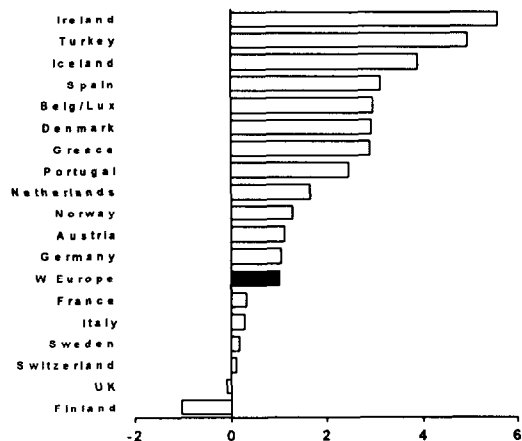
The headline figures conceal though some striking national differences. The Republic of Ireland, buoyed by very strong economic growth, has seen oil consumption rise by over 5% a year on average, while the United Kingdom (UK), and more so Finland, saw oil use actually decline. Growth in South West Europe was on the whole faster than the North, some 2% per annum against 0.5%, with Spain, Greece and Turkey standing out as fast growing and relatively large markets.

Chart 1
Oil Consumption, Western Europe



Source: BP Statistical Review

Chart 2
Oil Consumption by country, percentage change per annum, 1990-97



Source: BP Statistical Review

Consumption growth in the major North West European economies has been slow for a combination of reasons:

- Economic growth, while higher than the 1980s, has been low relative to the Southern economies;
- There has been a marked shift towards consumption of natural gas in place of fuel oil in the powergen sector, and heating oil in the domestic sector;
- And finally, in the transportation sector, as a result of fiscal incentives, there has been a shift away from gasoline towards more efficient diesel. Ironically though, the pendulum appears now to be swinging back as a result of the same environmental concerns which provided the fiscal imperative in the first place.

The transportation sector merits further examination, not only because of its importance to overall oil demand, but because of the nature of the changes which have taken place in the 1990s. While the 1980s was clearly the decade of gasoline, the 1990s look to have marked a decisive move toward the middle of the barrel. Total European middle distillate consumption rose by 12% over the period 1990 - 1997, while gasoline demand rose by just 0.6%. The contrast with the last decade could hardly be starker, with gasoline consumption growing by over 11%, while middle distillate consumption struggled to rise by 0.8%. As a proportion of total European consumption, the middle distillate share grew to 41% between 1990 and 1997, while that for gasoline fell to below a quarter (24.4%) - its lowest level since 1987. In fact, 1990 looks to have marked gasoline's peak (at 25.5%), with market share falling steadily ever since.

The headline growth of middle distillates itself though conceals an important trend: the growth of diesel fuel's share of the middle distillate market. OPAL data reveal that, although demand for home heating oil (HHO) in the EU rose by almost 5% between 1990 and 1997, demand for diesel fuel grew by over 26%. From a near 50:50 split at the beginning of the decade, by 1997 the balance had shifted decisively toward diesel fuel, commanding 56% of the middle distillate market.

Chart 3
Diesel vs Gasoline demand in the European Union

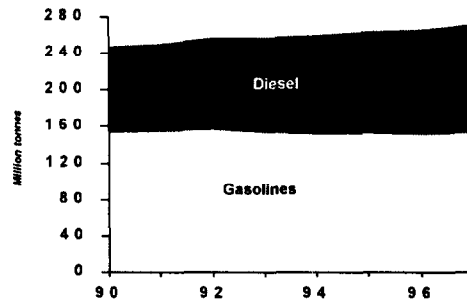
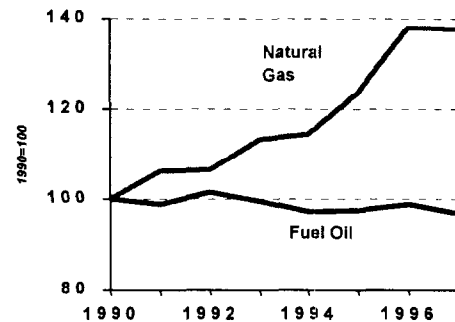


Chart 4
Natural Gas vs Fuel Oil demand in Western Europe



Source: BP Statistical Review

It is, of course, Western Europe which is driving the middle distillate growth. Demand in the region rose by over 15% between 1990 and 1997. Gasoline demand, in contrast, grew by just over 1%. What a recent study carried out for the European Commission by DRI³ refers to as the "dieselisation of the car parc" is further limiting the potential for gasoline demand growth. They report that, since 1990, diesel cars have risen from around 15% of Western Europe's new car sales to 22% last year.

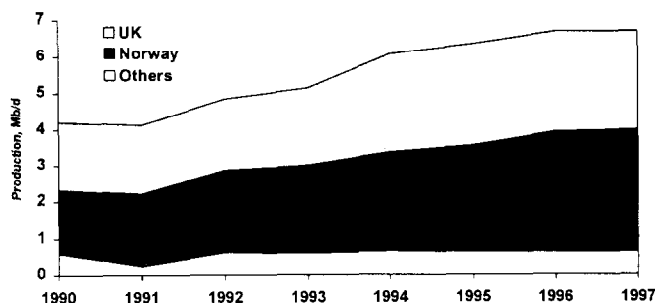
Production

At the same time as Western Europe was seeing relatively slow demand growth, oil production has grown by more than 50% since 1990 to reach 6.7 Mb/d in 1997. While an increase of this magnitude would justify a paper all of its own, suffice it to say that there has been a 'revolution'. The North Sea has not fallen into decline as some had expected. Rather it has surged; driven by technology, cost cutting, and assisted by supportive fiscal regimes.

Western Europe's production is, of course, dominated by the two North Sea producing countries, UK and Norway, who accounted for over 90% of total production in 1997. And the degree of concentration has increased since 1990, when the combined UK/Norway share of total production was 80%. Norway took over from the UK as the largest individual West European producer in 1991, and has maintained its position with 50% of Western European production in 1997.

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Chart 5
Oil Production, Western Europe

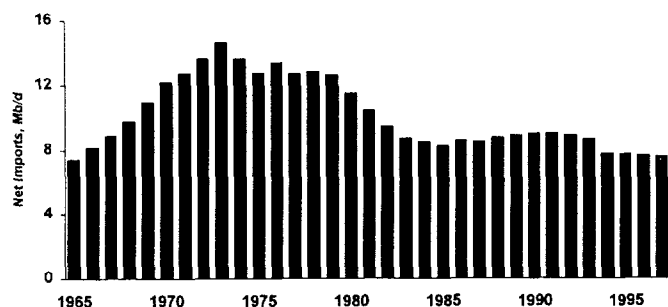


Source: BP Statistical Review

Trade

With 'revolutionary' increases in production, and slowly evolving consumption, the implications for trade are obvious. Western Europe's oil imports have fallen sharply, to their lowest levels since the 1960s, and North Sea crudes are now regular sources of supply for North American markets.

Chart 6
Net Oil Imports, Western Europe



Source: BP Statistical Review

At 7.6 Mb/d in 1997, Western Europe's net oil imports were at their lowest levels for over 30 years, and 1.5 Mb/d down on 1990. Trade flows over time are difficult to track because of data inconsistencies (unidentified sources and destinations), but in 1997, the major export flow from Western Europe was to North America, where the US took just under half of total crude exports and almost a third of total product exports; Canada took a further 39% of crude exports. Other major product customers included Central Europe and Africa, accounting for 25% and 21% respectively. Western Europe's main source of crude imports was, unsurprisingly, the Middle East, accounting for 47% of the total. North Africa (21%) and the FSU (17%) were also important suppliers. For product imports, the main source was the FSU - accounting for 33% of the total, followed by North Africa (21%) and the US (13%).

Western Europe's refined barrel is currently surplus light products, while its demand barrel is deficit in middle distillates. Surplus gasoline is largely traded into North America (which needs more gasoline than it can produce), while middle distillates are imported mainly from the FSU

(which has a large surplus), and to a lesser extent, the Middle East.

Central Europe

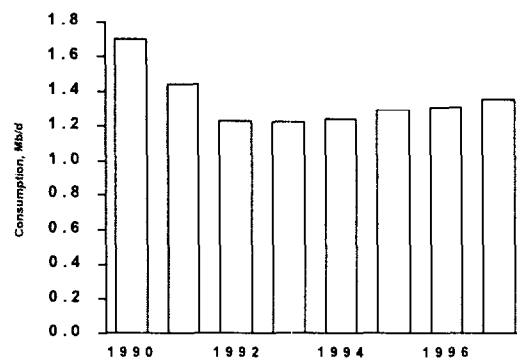
The story as far as Central Europe goes in the 1990s has been one of transition. At varying speeds, the economies of the region have adopted Western-style market reforms, and while this has led to an inevitable period of disruption, the seeds of reform are now beginning to bear fruit.

Consumption

With the partial exception of Poland (the region's largest consumer), the initial 1990s consumption picture was one of significant decline. Total oil consumption fell by more than 25% between 1990 and 1993, when the region's economic difficulties were at a peak. More recently, most of the economies have stabilised, and a selective recovery appears now to be underway, with aggregate oil demand rising in each of the last four years. Polish consumption has grown consistently since 1993; the pattern has been more volatile in the other economies within the region. The overall fall in demand between 1990 and 1997 remains over 20% though, from a level of almost 1.7 Mb/d to 1.3 Mb/d. Per capita, after averaging 0.71 tonnes/person during the 1980s, the rate fell to a low of 0.48 in 1992, but has since moved back above 0.5 (to 0.51 in 1996). Although much less efficient in terms of oil use than Western Europe (368 tonnes/1990 M ECU in 1995), significant strides are being made toward improving oil intensity.

In terms of product, Central Europe saw declines in consumption across the board, although fuel oil was particularly hard hit, registering a decline of over 37%. Middle distillate consumption fell by almost 20%, while gasoline demand held up somewhat, falling by just 4% over the period. As a consequence, its share of total product demand rose from 22% to 27%.

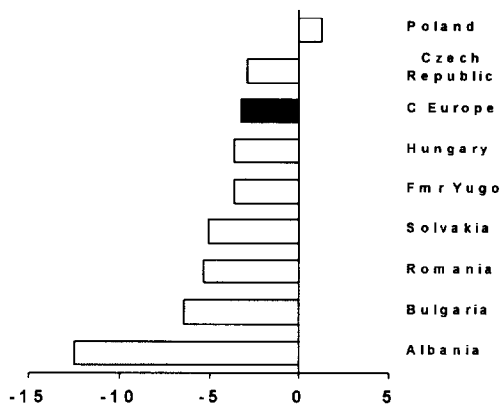
Chart 7
Oil Consumption, Central Europe



Source: BP Statistical Review

Recent strength has been concentrated in the transportation sector. Industrial demand has, on the whole, remained weak, although experience varies by country depending, for example, on the accessibility of natural gas, previous dependence on domestic lignite, etc. But having passed relatively quickly through a transition phase, the story looks likely to be progressive growth as the economies seek to catch up with their Western counterparts - and the tendency is greater the farther West one goes.

Chart 8
Oil Consumption by country, percentage change per annum, 1990-97



Source: BP Statistical Review

Production

Central European production is minute by comparison with its Western counterpart. At just 260 thousand barrels a day (Kb/d) in 1997, it was only 1/25th the level of production in Western Europe. Like the West though, that production is concentrated, over half accounted for by a single country - Romania. Regional production has been declining very gently since its peak in 1977 (492 Kb/d).

Trade

For Central Europe, the major source of imported crude in 1997, not surprisingly, was the FSU (accounting for almost 58% of the total). The main alternative source was the Middle East, accounting for just over 30%. For products, while the Middle East's share was 22%, most of the remainder came from Western Europe. The dominant export customer for Central Europe's refined products was Western Europe, taking almost 75%.

After the collapse of the Council for Mutual Economic Assistance (CMEA) trade arrangements in January 1991, Central European countries who had relied upon cheap Soviet energy imports, often down the Druzhba pipeline, were forced to pay 'market' prices and so began to explore the possibility of using other sources. While total imports were hit during the early part of the decade because of recession and economic restructuring, it is notable that imports from Russia/FSU suffered the most - accounting for just under 40% of crude imports in 1993 compared with nearly 65% in 1990 (and over 73% in 1985). For products the extent of the move away from the traditional supplier was even more marked: accounting for almost 80% of imports in 1990, by 1993 Russia/FSU supplied only 11%. Since 1993 though, Russia has made some effort to regain market share, and for crude at least, these efforts have borne fruit.

Former Soviet Union

In the FSU, the 1990s have witnessed momentous change in oil markets, just as we have seen radical upheaval in both the political and economic environment.

Consumption

Oil consumption in the FSU fell by more than 50% over the period from 8.4 to 4 Mb/d. While the heaviest decline occurred in 1993 (almost 20%), the fall in 1996 was still around 10%. Indeed, so large has been the decline that, when looking at the picture for total world demand in the period 1990 to 1993, one can easily be forgiven for thinking that world demand was basically flat. Exclude the drop in the FSU and you get a very different picture with world oil demand surging by around 2% a year.⁴ 1997 may prove to be the turning point though, marking the first year since 1990 of consumption growth. While the rise was small in itself (just over 1%), it does appear to re-establish the trend recovery which looked to be under threat in 1996.

On a per capita basis, consumption more than halved from Western European levels (1.45 tonnes/person) in 1990 to less than 0.7 tonnes/person in 1996. After year on year reductions in oil intensity during the 1980s, the rate surged in 1992 (back, in fact, to 1981 levels) as the economy collapsed. With the manufacturing sector beginning to invest in more fuel-efficient machinery, the intensity measure has since fallen back sharply again - but at nearly 600 tonnes/1990 M ECU, it remains far in excess of European levels.

While as a share of total primary energy demand oil in Europe remained very stable over the period 1990 to 1997 (at 41-42%), in contrast the FSU has seen a significant erosion of oil's importance as an energy source. Oil's share of total primary energy demand fell from 30% in 1990 to 22% in 1997, its place largely being taken by gas which expanded from 43% to 50%.

Production

Having fallen by almost 40% between 1990 and 1996, FSU oil production at last looked to have turned around in 1997. 1997's rise of just under 0.2 Mb/d (2.6%), while small in itself, is significant in being the first increase since 1987 - when output peaked at 12.6 Mb/d. The collapse of the Soviet economy hit the oil production sector hard: new national boundaries cut upstream operators off from their equipment suppliers; state trading networks disappeared; management was in turmoil over privatisation; and companies simply lacked cash flow and capital to support production.⁵ Foreign investment meanwhile proved to be small in total in light of legal uncertainties, lack of export licences and payments arrears.

The aggregate data though hide somewhat the divergent experiences of the individual republics. Output from Kazakhstan, for instance, turned up in 1995, and recorded a strong increase (over 12%) in 1997. Kazakhstan now accounts for 7% of total FSU production, against 5% in 1990. Output has been growing in Uzbekistan - which now accounts for 3% of total FSU production - since 1992, while growth is yet to re-emerge at all in Azerbaijan; 1997 output there was 0.6% down on 1996. Russia itself, now accounting for some 84% of total FSU production (down from 90% in 1990), saw growth of just under 2%.

Initial evidence for 1998, however, indicates that 1997 was something of a false dawn. In face of lower international oil prices, Russian production is reported to have fallen back again. Exports, however, seem to have been maintained and possibly even increased as a result of the desire to maintain access to 'hard cash'.

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Oil Markets in Europe and the FSU (continued from page 7)

Chart 9

FSU Consumption, year-on-year change

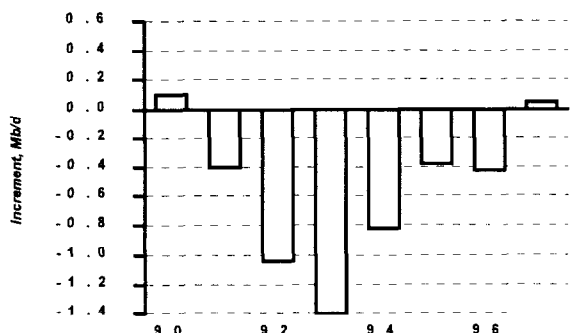


Chart 10

FSU Production, year-on-year change

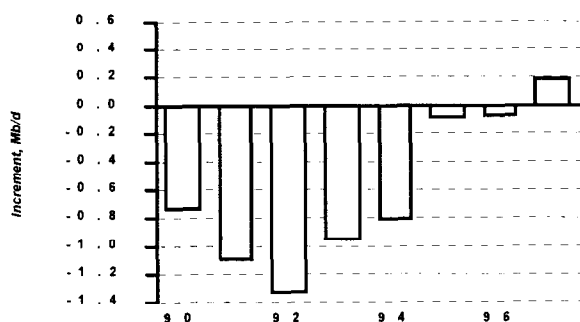
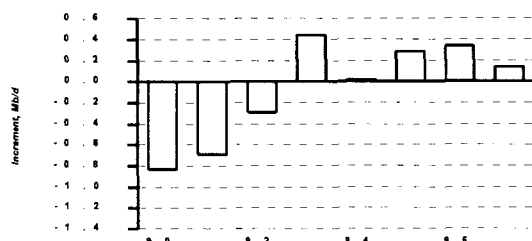


Chart 11

FSU Net Exports, year-on-year change



Source: BP Statistical Review

Trade Flows

In the 1980s, the level of FSU net exports averaged 3.9 Mb/d. While the early 1990s saw both oil production and consumption in decline, production was hardest hit, resulting in the net export position worsening significantly. In 1992, it had fallen to levels not seen since 1970 (2.2 Mb/d). The situation has since improved - back to 3.4 Mb/d in 1997. Exports of crude oil are predominantly to Western Europe and Central Europe, accounting for 88% of the total (60% and 28% respectively). Almost 44% of product exports are destined for Western Europe, but a substantial chunk of almost 35% of the total are unidentifiable.

One particularly interesting feature of the early 1990s was the change to intra-FSU trade flows. Before the break-up of the Soviet Union, as the dominant producer of crude oil, Russia was the major source of nearly all the region's foreign

oil exports. It was also the supplier of oil to most of the other republics - at that stage as part of domestic trade at prices that were low in international terms.

In 1992, the Russian government, faced with a decline in production, and a continued need to earn hard currency abroad, sought to mitigate the problem by attempting to receive full payment for their oil in hard currency. As this proved impossible to achieve, deliveries to the former Soviet republics were reduced. While crude and product exports abroad rose by 7%, and domestic consumption fell by 14%, deliveries to the former Soviet republics fell by 29%. Economic problems in the former republics have undoubtedly played a part in depressing oil demand, but Russia's priorities were clear - to be paid; and to be paid in hard currency. Exports to the republics have since fallen further still - to around a quarter of their 1991 level in 1995.

Future Trends and Forces for Change

At first glance, it might appear self-evident that Central Europe and particularly the FSU are the regions where forces for future change will be most intense. Having fallen to rock-bottom, there is really only one way to go for these economies, and good progress, particularly in Central Europe is already beginning to show through (the FSU is another matter - deep political and financial problems are still in need of resolution). Economic development always has, and probably always will, imply a greater demand for energy. And while, as in Western Europe, some sectors will turn to gas as the primary source of that growth, oil will not be left behind. Increased transportation use (e.g., car ownership, miles driven, etc.) will be a key driver, and oil is, and will likely remain so for some considerable time yet, the dominant fuel in the transport sector.

We should not though lose sight of the forces for change in Western Europe. While the outlook for production is probably rather unexciting (with the possible exception of new techniques which are likely to continue to be pioneered in the North Sea in an effort to extend the life of reserves), and economic growth prospects suggest relatively slow growth of oil demand (other things equal), there are some key challenges ahead for European oil markets, including: the Kyoto protocol and its potentially dramatic effect on fossil fuel consumption; supply security and the prospects for regional oil market integration; and North Sea decline. We examine some of the issues below.

Western Europe

It is now becoming widely believed that, after evolving to major producer status in the 1990s, the North Sea is approaching its peak. While such predictions have been made on a number of occasions in the past, the evidence is now growing that peak production for the UK is in sight, especially following recent well-publicised reductions in exploration spending. In Norway, the issue is less the geology or the exploration economics, rather it is a policy led event driven by concerns over overheating within the domestic economy, and an intent to restrict production in line with OPEC attempts to limit the world's current overproduction of oil. Estimates suggest that decline will probably set in at some point between 2000 and 2005, with the UK peaking before Norway. However, production looks likely to tail off rather gradually as enhanced subsea technology allows greater recovery, and access to previously inaccessible areas. It will

also be a function of fiscal terms.

As a testament to the triumph of technology over depletion, it is worth mentioning that forecasts have for some years tended to push out the peak with each year's revision. The latest EIA⁶ long-term forecast, for example, shows output peaking later, and at higher volumes (+1 Mb/d) than their last forecast made just a year ago.

But if it is widely accepted that production is set to mature, it is less widely acknowledged that Western Europe faces the prospect of revolutionary change on the demand side. Environmental considerations are becoming a major force for change in Europe - both in terms of clean air, and global warming. Mainstream forecasts already project Western Europe as the slowest growing region in the world over the next decade, and that is without the assumption of new demand restricting policies. (The EIA "reference case" forecast, for example, puts the average annual increase at just 0.3% between 1995 and 2020, to leave total demand up a meagre 1.3 Mb/d).

Table 1
EIA "Reference Case" Forecasts for Consumption and Production, Western Europe

Mb/d	2000	2010	2020
Consumption	14.3	14.9	15.4
Production	8.2	7.5	6.3

In terms of product demand, the recent decline in the relative price advantage enjoyed by diesel over gasoline, along with growing concerns expressed over particulate pollution and clean air, is likely to trim future middle distillate demand growth. The share of diesel in new car sales appears to be stabilising, but DRI, for example, still expect growth of 2.7% per annum between 1996 and 2001, while gasoline grows at only 0.7%. Diesel is furthermore expected, this year, to replace gasoline as the fuel with the largest share of the European transport fuel market.

As and when North Sea production declines, Western Europe's net import requirements will clearly grow if demand continues to rise. The main source of future incremental supplies may be the FSU, and especially the Caspian - the EIA expect it to increase its share from 14% in 1995 to over 20% in 2020. Reliance on supplies from the Persian Gulf will increase, but probably only modestly (the EIA suggest a rise from 29% to 31%), an outcome rather at odds with widespread perceptions that Europe will come to depend more and more on potentially unstable Middle Eastern countries for its oil. While this is still potentially true of the long term, it really does appear to be a very distant prospect.

North Sea Issues

If declining production in the North Sea is probable, the rate of decline remains a key uncertainty as we look forward. A cloud on the horizon as far as UK production is concerned is the imminent governmental review of the North Sea taxation regime. Industry leaders have already voiced concerns that any increase in the burden of taxation risks making future developments in the North Sea unprofitable (and thereby perversely lowering the government's total tax take), particularly in the current low oil price climate.

Meanwhile Norwegian production policies are under review. The issue was at first the country's economic situ-

ation - Norway has what many countries would regard as an enviable problem; it is generating too much oil revenue. Indeed, the government has recently highlighted what it sees as the risks of economic overheating (not to mention sectoral imbalance) and has taken steps to reduce the pace of oil industry investment. Now though, with prices having collapsed, the issue has turned to state determined production cuts as part of wider industry restraint (for example, Norway's participation in the Riyadh Agreement). It is, for the moment, unclear how these short-term issues might affect production over the next decade, but genuine reductions in investment would be certain to have some longer-term ramifications

Security of Supply

While supply security is widely taken for granted these days by final consumers, it is still an issue which generates concern, particularly amongst politicians, to whom the dictum of 'keeping the lights on' remains a powerful influence. Supply security has remained a key tenet of European Union energy policy despite increasing availability. Energy markets as a whole have become far more open and market oriented, and the degree of consequent integration has led to a situation where it would be almost inconceivable for a single European country to be forced by the actions of another country to go without oil. Even for Europe as a whole, fears over supply security appear groundless. The world's major oil producers have progressively realised over the last two decades that their interests are best served by maintaining adequate supplies of oil at moderate prices. Physical disruption is no longer seen as a rational policy option. Meanwhile others such as Odell (1998)⁷, for example, point to the progressive integration of Turkey which is seen as becoming central to the potential expansion of Middle East/European hydrocarbon trade.

The Impact of Kyoto

By far the biggest uncertainty facing Western Europe though is the environmental imperative. While ultimate ratification of the protocol agreed in Kyoto in December 1997 remains in the balance, its implications are sufficiently far-reaching to warrant serious consideration sooner rather than later. The target for the OECD as a whole is, by 2008-12, to reduce greenhouse gas emissions by 7% below 1990 levels. For the EU, the target is slightly higher at 8%, and there is a determination, at the highest political levels, to meet such targets. For economies which have seen oil demand grow by over 1% a year over the last decade, this kind of reduction would clearly imply a paradigm shift.

As many observers, most recently the Centre for Global Energy Studies (CGES)⁸, have pointed out:

"It is all very well to talk of reductions in emissions from the 1990 levels but, by the time the targets must be met, the world will have moved on and the actual reduction required will have to take into account the twenty years of energy demand growth that would have taken place in the intervening years under a 'business-as-usual' scenario."

The CGES go on to calculate that, if the Kyoto reductions are achieved through pro-rata cuts in the consumption of all three fossil fuels, and assuming oil would have continued to hold its ground as a share of total energy consumption without

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Oil Markets in Europe and the FSU (continued from page 9)

Kyoto, then OECD oil demand in 2010 would have to be some 5 Mb/d below the level prevailing in 1996, i.e., a reduction of more than 13% from *current* demand. While it is most unlikely that the burden of reduction will fall equally on oil, gas and coal (coal must be a favourite for sharper cuts given its relative polluting capacity), the CGES provide a further illustration of the potential magnitude of the change required by calculating the price increase necessary to induce such a dramatic shift in consumption behaviour. With a long-run price elasticity estimated at -0.7 for OECD oil demand, they point out that oil prices would have to rise by 41%, *in real terms*, to generate the required 29% demand reduction.

In other words, such targets are extremely challenging. If met, they would represent a major structural change to oil demand. Nevertheless, European governments have begun to assess policies to meet such targets. In the UK for example, the Marshall Committee on Economic Instruments and the Industrial Use of Energy has been established to consult and recommend measures to reduce industrial greenhouse gas emissions. It is specifically assessing emission trading schemes and an industrial energy tax. Other European governments are also assessing policy options.

Tied in to the Kyoto debate, is the question of future car use in European cities. There is a growing consensus that something must be done to limit access by motor vehicles to European city centres, because of the twin problems of pollution and congestion. The *Financial Times*⁹ recently reported on a project initiated by Athens, Barcelona, Florence, Lisbon, Oxford and Stockholm (the Alternative Traffic in Towns - Alter - project) to give exclusive city centre entry rights to zero or low-emission vehicles over the next ten years. Governments have so far taken a fairly haphazard approach - implementing ad-hoc bans for example, but a more structured, integrated approach, probably involving some form of charging regime, or even outright prohibition, must be on the cards at some stage. The UK government has recently issued a White Paper¹⁰ to consider options for a radical change in transport policy, none of which involve promoting the use of motor cars.

Central Europe/FSU

Having successfully emerged from their transition periods, the economies of Central Europe look set for a period of 'catch-up' growth in oil demand. Their potential has been recognised by forecasters, who expect oil demand growth in Central Europe to be stronger than any other region outside of the developing world over the next two decades. (The EIA's "reference case" forecast is for annual demand growth of 2.9% between 1995 and 2020, allowing consumption to precisely double. In an alternative higher economic growth scenario, the EIA suggest that demand growth could be as high as 4.2% a year). While the region will not be immune to the shifting pattern of energy usage (oil to gas) seen in recent years in the West, demand pull is likely to come particularly strongly from the transportation sector.

With little indigenous production, Central Europe's demand growth must be met by growing net imports. The trend away from energy supply ties with the FSU will probably continue as the region seeks to diversify its sources, importing more oil principally from Western Europe.

Table 2
EIA "Reference Case" Forecasts for Consumption and Production,
Central Europe and FSU

Mb/d	2000	2010	2020
Central Europe			
Consumption	1.5	1.9	2.6
Production	0.3	0.4	0.4
FSU			
Consumption	4.4	5.9	7.5
Production	7.5	12.1	13.2

The future for the FSU is much harder to call. Resource rich, and with a considerable amount of economic catching-up to do, prospects for both oil production and demand should be exciting indeed. But while the region is now almost certainly past its low point (just), the political, economic and financial situation remains sufficiently unsettled to make any forecasts highly uncertain. On balance, oil demand will grow - but only relatively slowly and by less than GDP. Natural gas will gain an increasing hold on the static energy sector, confining oil growth predominantly to transportation. Oil use in the industrial sector will almost certainly decline, given the potential for efficiency improvement and the expected decline in traditional heavy industrial output despite positive overall economic growth.

But if the consumption story is merely evolution, it is production which potentially offers the revolution. With estimates¹¹ of proven oil reserves in the Caspian region varying between 15 and 40 billion barrels, the FSU looks set to regain its status as the primary non-OPEC producer (now as a region rather than a nation), which it lost to the US in 1993. And much of the region remains unexplored or underexplored, so the likelihood of additional reserves being found is high. By 2010, it has been estimated that Caspian oil production could reach 3.9 Mb/d, with 2.3 Mb/d available for export.

The potential for Russian oil production is also substantial - if domestic investment laws can be clarified. Despite considerable interest, both among Western and domestic investors, direct investment has been limited so far because of the risks and uncertainties involved. Nevertheless, we have begun to see Western companies make equity investments in Russian producers (for example, BP and Sidanco), and these are expected to bear fruit in the coming decade.

With prospective FSU oil production set to outstrip home consumption growth, the FSU is set to significantly increase its net exports. EIA estimates show net exports more than doubling between 1995 and 2020, to reach 5.6 Mb/d. The EIA projects FSU dependence on Western Europe as a customer diminishing somewhat though, to 43% by 2020, as China, Industrialised Asia, and even North America could become important customers, although this depends greatly upon the future availability of transportation infrastructure.

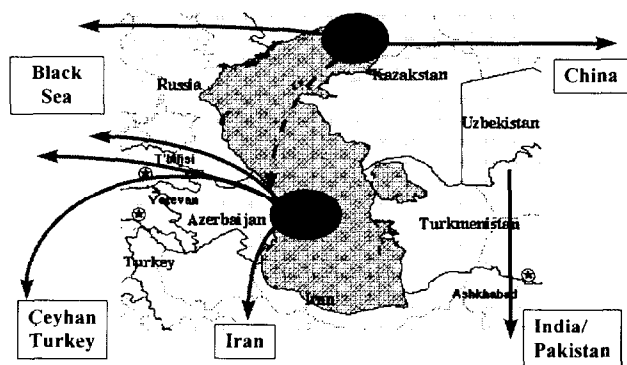
One of the key uncertainties when looking forward for the FSU is the issue of Caspian export routes. Although Caspian oil, in small quantities, is already able to flow through pipelines into and through Russia, future development will require additional routes, to the West and possibly even to the East. Commercial, economic and political realities point to an eventual set of multiple pipelines transiting different countries and supplying different markets.

Four broad options suggest themselves, each with its own set of potential difficulties:

- Through the Bosphorus. In this case oil goes initially to a Black Sea port in one of a number of ways (e.g., through Russia from Azerbaijan and Kazakhstan and through Georgia directly from Azerbaijan) and is then shipped to the Mediterranean¹² through the Bosphorus. Transit of the Bosphorus is a highly contentious political and environmental issue, and such an approach is likely to take oil to a market where there is already adequate supply;
- From Azerbaijan via Georgia to Turkey (Çeyhan). A longer and therefore more expensive pipeline route, again taking oil to an oversupplied market;
- Send it South. The most commercial export route, swapping into the refineries of Northern Iran in place of Iranian crude and taking Iranian crude from Khargh Island. A further expansion would be the construction of a dedicated export pipeline through Iran to the Persian Gulf coast for export to Asian markets;
- Send it East - to either China or India/Pakistan. The Chinese route directly from Kazakhstan would be very long. The India/Pakistan option would most likely require transit of Afghanistan, a route which will, in all probability, remain out of the question for the foreseeable future.

Investment is currently underway in the Azerbaijan-Georgia pipeline for export into and through the Black Sea. Meanwhile, indications from the Azeri authorities are already pointing to a preference for the Turkish option for the first main export pipeline. This has been supported by statements from the U.S. Administration, but has yet to translate into a commercial project. No firm decisions have yet been made.

Chart 12
Possible Caspian Export Routes



Conclusions

The 1990s so far have seen a combination of evolution and revolution in the oil markets of Europe and the FSU: evolution in mature Western European consuming markets; a revolutionary surge in North Sea production; transition in Central Europe; revolutionary collapse and stabilisation in the FSU.

The next decade offers a rather different picture. With environmental concerns emerging as a key policy driver, there is a real prospect of a revolutionary shift in Western European oil consumption. Western European - North Sea -

oil production is moving out of its revolutionary growth phase and looks set to move towards, first a peak, and later an evolutionary decline. Fiscal regimes will be key determinants of the pace of that decline. But the North Sea looks set to have a continuing impact on the rest of the world. The leading edge technological and managerial advances of the last decade are now being shared and adopted elsewhere and are impacting global oil production. The possibility also remains for Western Europe to lead the world in the development of the 'low carbon economy', although this potential is currently still far from proven.

Central Europe has set off on the catch-up road, and the likelihood is that several countries from that region will, over the next decade, begin to resemble their Western counterparts. But again in contrast to the last decade, Russia looks set to evolve: if political, economic and financial conditions are stable, there is a reasonable likelihood of moderate growth in both oil consumption and oil production and rising net oil exports. This leaves the Caspian with the prospect of a new revolutionary era for oil production and rising exports of oil to the world's consuming markets.

The geographical balance of evolution and revolution looks set to reverse.

Footnotes

¹ Full details of how geographical regions have been defined for the purposes of this paper can be found in the Annex.

² Defined here as the United Kingdom and Norway.

³ *Europe in 2001: Economic Analysis and Forecasts*, DRI (for European Commission Directorate General for Energy DGXVII), January 1998.

⁴ A similar point was made recently in a speech by Matthew R. Simmons of Simmons & Company International at The Office of The Comptroller Of The Currency Senior Management Conference, Houston, Texas, 10 March 1998.

⁵ For a more detailed survey of Russian oil production, see CERA Private Report, *The Shock is Over: Why Russian Oil Output has Stabilized*, January 1998.

⁶ *International Energy Outlook 1998*, Energy Information Administration, April 1998

⁷ Odell, Peter R (1998), *Energy: Resources and Choices*, from *The New Europe: Economy, Society and Environment*, edited by David Pinder.

⁸ *CGES Global Oil Report* (March - April 1998), Volume 9, Issue 2, Page 21.

⁹ *Financial Times*, 29 April 1998, Page 2.

¹⁰ *A New Deal for Transport: Better for Everyone* The Government's White Paper on the Future of Transport. Department of Environment, Transport and the Regions (DETR), July 1998.

¹¹ All estimates in this paragraph are taken from "Caspian Oil and Gas: The Supply Potential of Central Asia and Transcaucasia", IEA, May 1998.

¹² Some of the oil will be consumed in the Black Sea region.

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Annex

Geographical Definitions

North West Europe

Austria
Belgium
Denmark
Finland
France
Germany
Iceland
Republic of Ireland
Turkey
Luxembourg
Netherlands
Norway
Sweden
Switzerland
United Kingdom

South West Europe

Cyprus
Gibraltar
Greece
Italy
Malta
Portugal
Spain

Western Europe:

North West Europe + South West Europe

Central Europe:

Albania
Bulgaria
Czech Republic
Hungary
Poland
Romania

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Technical Progress Versus Energy Requirements

Organized by the Association des Economistes de l'Energie

Affiliate of the International Association for Energy Economics

Paris, France • 30 September - 1 October, 1999

Preliminary Program

Decisive Factors of Technical Progress in the Energy Sector

- Relationship between energy and growth
- Anticipating scarcity
- Role of the political environment (environmental constraints, deregulation, geopolitics, etc.)
- Role of energy policies
- Role of taxation
- Role of research
- Role of corporate strategies

Technical Progress and the Structure of Energy Systems

- Emergence of decentralized systems
- Criteria for upgrading local energies
- Impact of the financial and information technology revolutions
- Liberalization and research and development policies of energy suppliers
- From energy to the energy service

Technical Progress at the Service of Sustainable Growth

- Technical progress in the different supply sources (the nuclear option, clean coal versus environmental constraints, the supply of nonconventional hydrocarbons, etc.)
- Development conditions for renewable energies
- Transport policy options
- Urban planning and architecture options
- Technical innovation and energy efficiency in a competitive world
- Technology transfer incentives (joint application, tradable permits, etc.)

Technical Progress, Energy Modeling and Outlook

- Advantages and limitations of the different forms of modeling (sectorial, global, etc.)
- Endogenization of technical progress in energy/economy models
- Integration of technical progress in long term scenarios.
- Convergence of energy markets

The symposium will be divided into four sessions, each lasting between 1-1/2 and 3 hours and composed of papers and/or a round table session, and poster sessions. The speakers will be selected on the basis of responses to the call for papers or on invitation. Papers will be general in scope (review of major trends, the various future consequences of technical progress), or descriptive and more specific (a supply source, a supply or demand sector). Specific papers could be given on subjects such as: What is technical progress? Technical progress and democracy, and the role of Europe.

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