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ENERGY RATIONING & THE OIL PRICE CRISIS

The recent tripling of oil prices is causing great hardship to the world's poor. Their situation is likely to worsen in the near future as the increased cost of farm inputs like fertilizer and tractor fuel pushes up the cost of food. Energy rationing can prevent starvation and provide a basis for slowing climate change.

November 2005

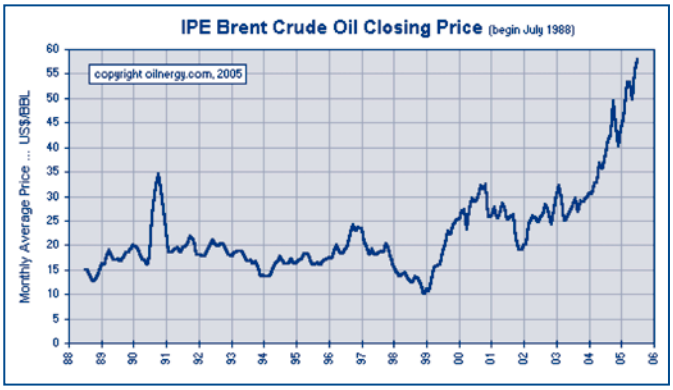
According to the World Bank, higher energy prices can hit the poor twice as hard as those in the highest income group.[1] A study in Yemen found that a $15 rise in the price of a barrel of oil raised the cost of goods which the poor bought by 14.4% whereas the cost of the goods bought by the richest 10% of the population rose by only 7.1%. Even if the price increases faced by the poor elsewhere are not as great as in Yemen, the fact that oil has risen by around $30 must mean that they have lost considerable spending power.

Attempts to protect the poor by subsidising their fuel are proving financially ruinous for many governments and violence has broken out as several schemes have been scrapped. This paper looks at a way in which the poor could be protected if, as oil and gas get scarcer, their cost goes higher and higher over the years ahead.

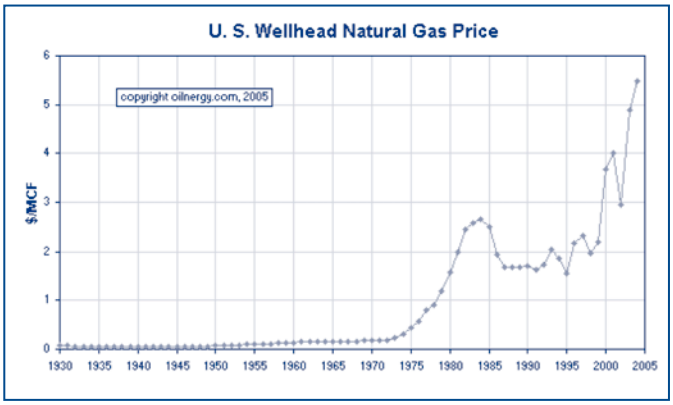
Why are oil and gas prices so high at present?

As graphs 1 and 2 show, the price of crude oil tripled between early 2002 and mid-2005 while natural gas, a lot of which is used for fertilizer production, doubled in price in the US between September 2004 and September 2005, reaching a level six times greater than ten years earlier.

These higher prices are partly because the major energy companies have not invested in building enough refinery capacity to meet the growing level of world demand. World oil production has gone up by 40% in the past 20 years while refinery capacity has only gone up 15%. In particular, the companies have failed to invest in the right type of refinery. The world's output of 'sweet' (that is, easily refined, low-sulphur) oil is declining because the fields from which it comes like those in the North Sea are becoming exhausted. As a result, they have too little of the more complex and expensive refinery capacity needed to process the remaining 'sour' oils.

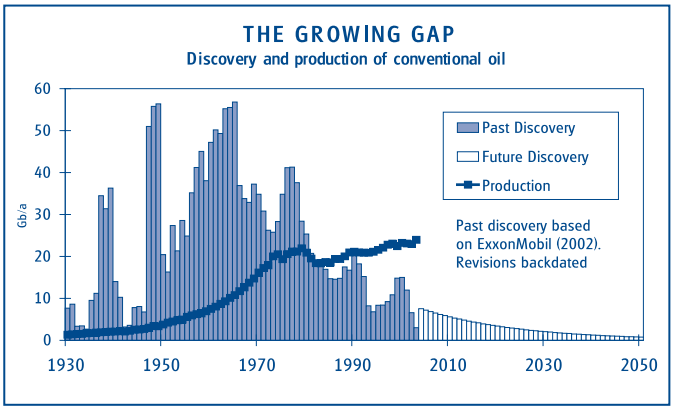


Graph 1: ***The price of oil has been rising since 1999, although the bursting of the dot-com investment bubble caused it to mark time for three years.***



Graph 2: ***US gas prices have followed a similar trend to that of oil. The rise began in 1999, the dot-com bubble-burst knocked them back and they have now resumed their upward trend.***

A second reason for the high prices is that the companies have not been able to find enough new oil and gas fields to replace those becoming exhausted. This is despite the use of increasingly sophisticated exploration techniques. 2003 was the first year in recent times when no new major oil field was discovered. Oil is being pumped out of the ground three times faster than it is being replaced by new oil finds, as Graph 3 shows. As a result, the oil reserves discovered between 1950 and 1980 are being run down.



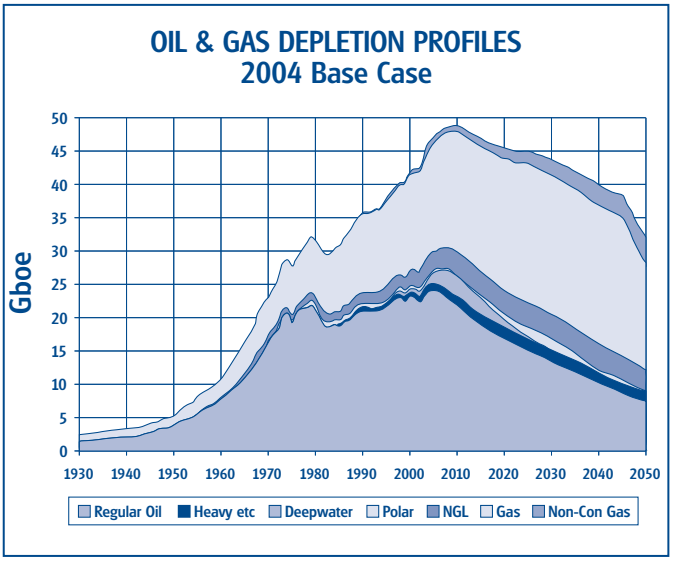
Graph 3: ***Oil is no longer being discovered at anything like the rate it is being used. Source: ASPO***

Why didn't the oil companies invest more in refineries and exploration?

In large part because the prices of oil and gas, which are closely linked, were too low. Until very recently, the companies would not invest in projects which needed an oil price of over $20 to make them profitable. Now, however, as a result of the price increases, they are investing so heavily that the cost of renting drilling rigs has more than doubled.

Will oil prices rise further?

It is almost certain that they will as oil supplies will definitely be restricted for the next few years at least and this will tend to keep prices increasing. As Chris Skrebowski, the editor of the *Petroleum Review*, says "There are not enough large-scale projects in the development pipeline right now to offset declining production in mature oil fields and to meet global demand growth beyond 2007". As for gas, other experts predict that its output will increase only very slowly after about 2010 with the result that the total energy available to the world from the two fuel sources combined will then begin to decline at 2-3% a year. This is shown in Graph 4.



Graph 4: ***The total amount of energy that the world gets from oil and gas will begin to decline after 2010.***

Consequently, unless a deep global economic depression develops, a major war breaks out or a plague like bird flu kills a significant portion of the world's population, the decreasing availability of the two fuels is likely to push their prices up to levels far above those ruling at present. A Texas investment banker and a former energy adviser to President Bush, Matt Simmons, told the BBC in 2004 that a price of $182 might be required to balance supply and demand. Even if a depression does develop and prices fall back, oil may not become any more affordable for many poor people because, as less work will be available for them, their earnings will drop.

Will high oil prices cause

This depends on the attitude taken by the world's central banks. The conventional wisdom is that high energy prices cause the world economy to decline because they are bad for economic growth. That's certainly true in industrialised countries. Their growth slows for at least for a year after the energy rise takes place but then begins to speed up as energy-saving investments start to be made and export orders from countries which have benefitted from the higher prices begin to flow in.

Research[2] in America indicates that for every $10 a barrel rise, the US growth rate falls by 0.4% for about four months. After that, the economy recovers rapidly so that after 18 months the higher energy prices actually boost the growth rate by 0.1%, an effect which lasts for another year and a half. It would therefore take a very big, sudden increase in prices to send the US economy into a recession. If an oil price increase was spread out over a number of years, the investment opportunities it would create would tend to balance the contractions it caused and the growth rate would be largely unaffected.

Higher oil prices affect oil demand and the level of activity in an industrialised economy in three ways:

1. When oil is expensive, people try to use less of it. They may reduce the amount they drive, or reduce the temperature to which they heat their houses. Their minor economies have very little effect on oil consumption.
2. Higher oil prices also mean that consumers have less money to spend on other things. This reduces the amount of oil the economy uses because most of the goods and services the consumers would have bought would have required the use of oil for their production and delivery.
3. If higher oil prices reduce consumer demand very much, some manufacturers and retailers will find that their profits suffer and that they have surplus capacity. They will therefore defer their plans for expansion. This will result in very large energy savings because construction work is energy intensive. Indeed, it has been estimated that around half of all the energy used in a wealthy country is necessitated by projects designed to expand the economy. However, other firms will find that new opportunities open for them, such as supplying equipment for renewable energy projects. It takes a little time for their new projects to be developed so, in the short term, higher energy prices will reduce growth. In the longer term, however, they could even have a positive effect on growth in OECD countries.

Will it be possible to develop alternative sources of energy to fill the gap being left by oil and gas?

The global demand for oil is increasing by just over 2% every year at present. If we regard this increase in demand as adding to the gap being created by the declining supply, the world needs to develop new energy sources each year, every year, equivalent to 4-5 per cent of the world's current oil production, around 1,800 million barrels of oil a year. Then, in 2010, when world gas output ceases to increase by enough each year to meet the growing demand for that, the new energy sources would have to increase the annual rate at which they grew by another 900 million barrels. These amounts are so large that most observers think they are beyond the realm of possibility and they probably are if top-down technologies are used. For example, it has been calculated

a global depression?

Higher energy prices therefore tend to shift spending away from consumption to the production of goods for export (in order to pay the higher cost of energy imports) and to pay for capital investment in energy-saving and energy-producing technologies.

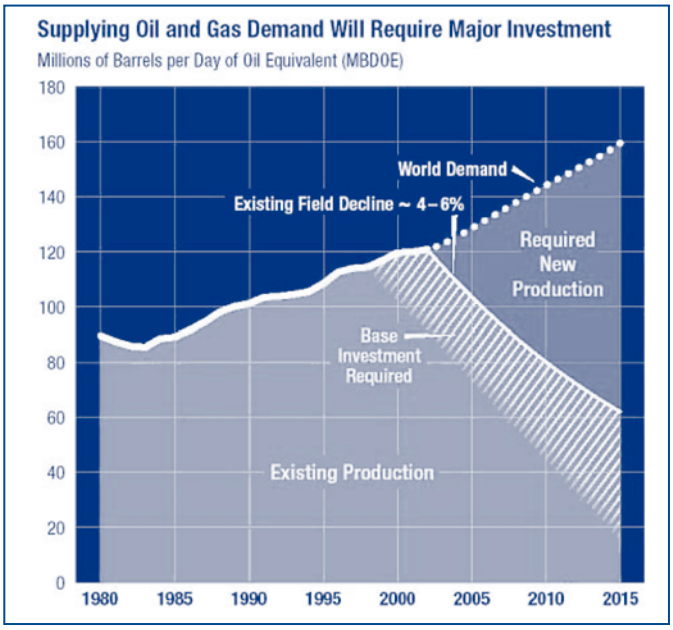
Higher energy prices also add to inflation and it is the likely reaction of the central banks to that inflation which threatens the world economy not the higher prices themselves. Indeed, if the central banks ignored the inflation, it would help the world economy because the inflation would lower the effective interest rate and thus make investments in the new technologies even more attractive.

So the danger is that the central banks will fulfil their mandates and act against the inflation by pushing up interest rates in the way they did when oil prices rose in 1973 and 1979. This would increase business costs (since all businesses use borrowed money) at exactly the same time as firms were having to pay more for their energy and, in some cases, were finding that consumer demand was falling. This would damage many firms and cause them to postpone investment plans, The American study we discussed just now shows that a 0.3% reduction in growth rate was caused by increasing the interest rate in response to a $10 rise in oil prices.

When interest rates are increased, firms not exposed to foreign competition and not suffering from a declining consumer demand increase their prices to pass on the extra interest costs. This is itself inflationary and may cause the central banks to raise interest rates again. Several rounds of this cycle could take place until the economy is so battered and bruised that all capital investment stops and unemployment soars. If this happened in several major countries at the same time, it would cut global energy demand sharply and energy prices would fall and, with no investment going on, the world economy could stay in a depressed state for many years.

There is a serious danger that the central banks of the industrialised world will cause such a depression in the next few months. Not only would this cause great hardship for many millions of people but it would also mean that, with oil and gas cheap again, there would be no incentive to switch to renewable energy or for the oil companies to explore for new sources.

Central bankers must therefore recognise that higher energy prices are necessary to enable the energy companies to develop more expensive sources of fuel, and that, consequently, they must allow the inflation to take its course. They must not choke it off by preventing the higher energy prices being reflected in the prices charged for the goods and services which use fossil energy. Inflation is the only relatively painless way that every price in the global economy can change by a different amount to reflect the new energy price level. The inflation needs to proceed for several years as, initially, firms will put prices up by the amount of their direct fuels costs and they will require further increases when the higher cost of the fuel used in the products they purchase works its way through to them and needs to be passed on. Resisting inflation would essentially be an attempt to maintain the purchasing power of money in terms of the amount of energy it buys. This is obviously an inappropriate response if energy is getting scarcer and/or requires more resources to produce.



Graph 5: ***Even if huge sums are invested, it is unlikely that world output of oil and gas will continue to grow at the same pace as projected demand.***

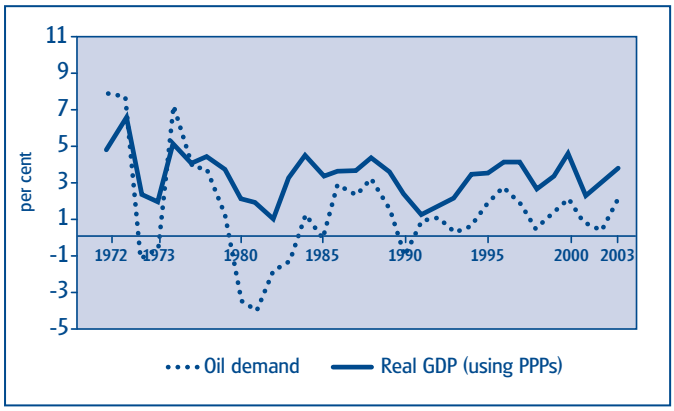
that 6,700 nuclear power stations would have to be built between 2010 and 2040 to enable economic growth to continue and to make up for the declining oil and gas supply. That is five stations each week. Finding the sites for these stations and enough fossil energy to build them would be virtually impossible and, even if the feat was pulled off, there would not be enough uranium to run them. At the present, relatively tiny level of consumption – the world has around 400 nuclear reactors - there is only 100 years' uranium supply. A solution might be to build breeder reactors which produce more fissionable material than they use but most countries that have attempted to develop these commercially -- including the U.S., Britain, Germany and Russia -- have abandoned them. Even if they could be built satisfactorily, they would take even more fossil energy to build than the conventional ones and the fissionable material they would produce would be largely plutonium, the deadliest substance ever made by humans. Because plutonium is so toxic and can be used to make nuclear weapons, plutonium-fuelled reactors present an attractive terrorist target and are an extraordinarily dangerous way to generate electricity.

The only truly sustainable energy sources are those based on the flow of energy from the sun (solar, hydro, wind, wave, biomass) and the gravitational pull of the moon (the tides). These flows are very large in comparison with humankind's use of energy. A hurricane develops more energy over its life than all the people in the world use in a year. Renewable sources can therefore meet all the world's energy needs, both now and in the future. Even with existing technologies, the amount of energy supplied by renewable sources could be 120 times its present level.[3] The problem is to develop these sources quickly enough to fill the gap as it opens up. Many fear that this will prove an impossible task because the sector is so small at present.

What effects will the decline in world oil and gas output have on the global economy?

Energy use is fundamental to everything we do and the present level of global output is only possible because fossil fuels are available to power our production and distribution systems. The IEA graph overleaf shows how closely the rate of increase in the world's output (shown as Real GDP, the dashed line) is linked to increases in oil use, the plain line. As a result, a declining supply of oil and gas will make global economic growth impossible. Indeed, the world economy is almost certain to shrink as, after the easy energy savings have been made, it seems unlikely that the combined contribution from the development of new

sources of energy plus improvements in energy-saving technologies will equal the rate at which oil and gas supplies are shrinking.



Graph 6 shows the very close relationship between the growth in global output, the upper line, and the growth in oil use, the lower one. This indicates that a fall in global oil output will cause the global economy to collapse.

What will the end of economic growth mean?

It threatens the collapse of the global economy. This is because the world's money systems all put their currencies into circulation as debts. When these debts are repaid or interest is paid on them, the money paid to the banks ceases to exist and new debts must be taken on to replace it if trading is to be carried on at the same level. It is not enough for last year's repayments to be replaced by new loans this year. More debt has to be taken on to replace the interest paid on the previous year's borrowings.

The problem with this is that if people, firms and/or governments are not prepared to borrow more this year than they did last, perhaps because they think they have already borrowed enough in relation to their income, there will be too little money in circulation to make trading easy and the national economy involved will go into a recession. Growth, by increasing incomes, makes people happier about borrowing more and provides them with the extra cash flow to make the additional repayments. It is therefore fundamental to the way our money systems are structured.

If economies fail to grow, surplus production capacity as a result of previous years' investments, begins to appear. Companies therefore cut back on further investments. They borrow less, with the result that the money supply, which is based on borrowing, begins to contract. Less money in circulation cuts profits and makes trading more difficult, so further investment cuts are made. In addition, the people who would have worked on the companies' cancelled projects lose their jobs and spend and borrow less too, which also cuts the money supply and the level of economic activity. More jobs are lost, and the economy risks slipping into a spiral of decline.

The solution to this is to replace a money supply which begins to contract whenever loan repayments exceed new borrowings with money that is spent into existence by the state and stays in circulation until it is taken out by being paid back to the government in tax. An economy with such a currency would be very stable and controllable, and well able to cope with the changes that reduced fossil fuel consumption will bring.

The decline of oil and gas output consequently means that all the world's money systems have to be changed. Until that happens, the necessity to keep on growing to avoid an economic collapse will either force energy prices very high or prompt governments to step outside the market and use military force to secure their supplies.

Are higher energy prices a good thing?

Yes, provided that (i) they don't rise so rapidly that they dislocate the global system and (ii) the poor are protected. Higher prices are certainly necessary to bring about important changes in the way we use energy and in the types of energy we use. They shift the balance away from energy- and capital-intensive forms of production towards more labour-intensive ones. They do this by making machinery more expensive to build and to operate, and by greatly increasing the cost of transport and distribution.

To be more concrete, companies that use automated, specialised equipment to make very large quantities of one thing in one place and then need to ship it to markets around the world tend to lose while smaller firms which use rather more labour with a higher level of skill and less specialised equipment to make a wide range of things for their local markets tend to gain. Higher prices also shift the balance away from the centralised supply of energy drawn from fossil sources to local systems supplying energy from local sources. Local energy sources become important again and, just as in the past, instead of energy being taken to wherever in the world is currently a cheap place to manufacture, economic activity will move to wherever there is a reliable supply of competitively-priced energy available for its operations. This has the potential to bring about a shift in political and economic power.

Naturally, the effect of raising energy prices differs from country to country. Those which import a lot of energy will see the rate of consumption growth slow or fall but the recent rise of oil to around the $65 level seems to be benefiting many national economies, at least according to conventional criteria. In a speech in June 2005, Jose Antonio Ocampo, the UN's Under Secretary-General for Economic and Social Affairs, said he expected gross world product (GWP) to grow by 3.25% in 2005 and 3.5% in 2006, its most rapid rate for several years. Developing countries, including those in sub-Saharan Africa, were expected to grow at a rate approaching 6%, he said. Overall, growth in Africa was expected to be higher in 2005-2006 than in 2004.

"Oil prices, as everybody knows, have more than doubled but non-oil commodity prices have increased by more than a quarter in dollar terms and by about 10 per cent in real terms," he continued. "The higher prices have yielded a short-run benefit. The world economy seems to be adjusting to higher oil prices without large adverse effects."

The oil companies which undertook projects which were worthwhile at $20 a barrel are certainly making massive profits at current price levels. However, most of these profits end up in rich countries. Essentially, there are two economic systems in the world – the one to which to which the oil and mining companies belong, a high energy, capital-intensive, globalised one, owned by international investors, and a low-energy, low-capital, localised economy, which is largely locally owned. These two economic systems are in competition with each other and while people in the HEGO (High Energy, Globally-Owned) economy are doing quite well from the higher energy prices, those in the LELO (Low Energy, Locally Owned) economy are doing badly. A worldwide energy rationing system would shift the balance in favour of the latter by limiting the profits made by the fossil energy producers and giving an increased income to those who use least energy instead.

What effect will even higher oil prices have on the poor?

In August 2005, David Mageria of Reuters filed a story[4] headlined "Poor Africans hit hard by rising world oil prices" which said that the cost of fuel was forcing many people to walk long distances to work or school, to go hungry as food prices skyrocketed, and to depend on candles rather than kerosene to light their homes. It was also putting pressure on

forests. "Because of the increase in the price of cooking gas, I have reverted to using firewood and charcoal," Melanie Ndoh, a civil servant and housewife in Cameroon, told Mageria. Similar effects were reported from Latin America in another Reuters story "Central American Poor Struggle as Oil Prices Soar" the following month.

If fossil energy prices do rise further over the coming years, the world's poor, and especially the landless among them, will be even more seriously hurt. Food will become increasingly scarce and expensive because of the large amount of energy required by industrialised agriculture and also because huge areas of land are likely to be taken out of food production to produce energy crops. The situation will almost certainly arise in which the rich – in whatever country they live – will be running their cars using fuels produced by starving the poor. Everything the poor buy will go up in price and there is no guarantee that their incomes will increase in step with the prices they will be asked to pay. Moreover, market prices will deny the poor the energy they need to make themselves more productive in their local economies.

The market economy has been defined by the Australian writer, Ted Trainer, as "an ingenious device for ensuring that when things become scarce only the rich can get them". This will prove true about fossil energy as it becomes scarce unless something is done to prevent it. In times of crisis, even governments with impeccable right-wing credentials do not leave the distribution of scarce, vital commodities to the free market. Instead, they regulate the market by introducing rationing. In an unregulated market, the rich will have plenty of energy and use it, one way or another, to maintain their wealth and political power. Consequently, if the poor are to be protected, energy rationing is needed now, before attitudes harden as the scarcity grows more acute.

How should energy rationing be introduced?

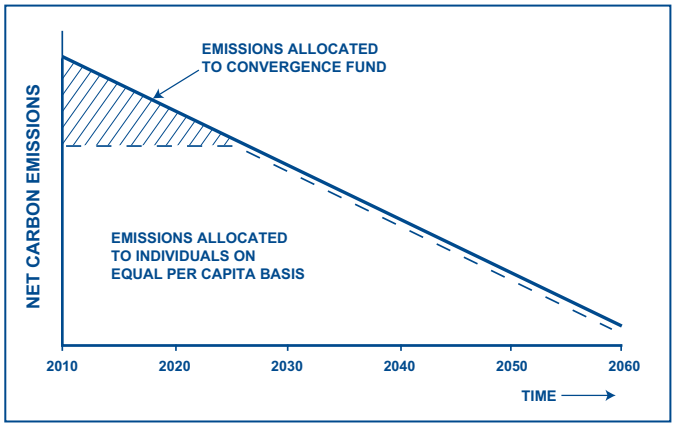
Almost certainly, rationing will be introduced by countries acting individually. However, because much greater benefits would flow to the poor if most nations acted together, once the pioneers have their own systems running they could invite other nations to join them in setting up a fossil fuel buyers' organisation – let's call it a Carbon Club - which would negotiate with the oil and gas producing countries for supplies. The club and the producers would agree a fixed price for whatever amounts of oil and gas could be produced each year and the buyers' club would set up a system to share out the amount of the two fuels purchased among the participating countries. Similar negotiations would be carried out with the coal-producing nations because, even though coal is abundant, its price tends to rise along with that of oil. Moreover, it would be disastrous for the world's climate if the world economy used coal to replace its shrinking supply of oil and gas. Greenhouse gas emissions per unit of delivered energy from coal are very much greater than from the other two fuels.

How would the Carbon Club distribute the oil, coal and gas it has agreed to buy from the producers?

The fairest approach would be for the club to work on the basis that everyone has an equal claim to be able to use the atmosphere as a dump for his or her greenhouse gas emissions. If it took this line, the club would calculate the total amount of greenhouse gases that could be released into the atmosphere while avoiding catastrophic climate change. This amount would place an overall limit on the total carbon content of the fossil fuels that could be burned before the world had reduced its emissions to the point at which they were no longer accumulating in the atmosphere and humanity had consequently ceased to cause the planet to warm.

The annual percentage rate at which global fossil fuel consumption needed to be reduced from its present level would then be calculated. This would set targets for the maximum level of carbon emissions from fossil fuel use for every year. The rate at which these emissions would fall is indicated by the solid line in Graph 7.

How fossil fuel emissions could be shared



Graph 7: ***Under the plan proposed by Feasta, the world's carbon dioxide emissions would be cut back annually as represented by the sloping line. Each year, the entire emissions allocation would be shared equally among the world population except that during the first, say, twenty years, some of the allocation (represented by the hatched area) would be issued by governments to sell to raise funds to make their countries less exposed to the effects of climate change and less dependent on the use of fossil fuels.***

If the world was an equal place, the annual amount for any year would be shared amongst the human population on an equal per capita basis. Every quarter or every year each person in the world would get an individual ration coupon entitling him or her to burn whatever amount of fossil fuel would result in releasing their portion of the allowable weight of greenhouse gas allocated for that year. They would not, of course, be entitled to the fuel itself but their ration coupons would be tradable and those getting them would sell them as will be explained shortly.

However, this system of allocation, while equitable, would not be very fair, as people living in some parts of the world have challenges to overcome before they can live as comfortably on their emissions allocation as people elsewhere. Feasta proposes that for the first, say, twenty years after the introduction of a global rationing system, everyone should get the same allocation each year but at the rate appropriate for year 20. This is represented by the dotted horizontal line on Graph 7. The shaded area above the dotted line is the difference between the total amount of emissions permits available for any particular year and the amount distributed to individuals. These remaining permits would go into a "convergence fund" to be allocated to national governments by the club according to an internationally-agreed, transparent set of criteria.

The national governments would sell their permits to raise funds for projects which enabled their countries to make the transition to lower fossil energy use. For example, countries might be allocated permits because they needed to improve the energy efficiency of their buildings and transport systems, or to take precautions against the increasing storms, drought or rising sea levels brought about by climate change. Or they might qualify for them because they had a greater need than other countries to enable their industries to adopt new, low-energy technologies. Obviously, the size of the convergence fund would fall each year until it ceased altogether in year 20. Thereafter, each individual's emissions allocation would fall annually, so that the total number of permits issued globally kept to the downward dotted line and the target concentration target was met.

How the Carbon Club would operate its energy rationing system

1. The club gets the best international advice on how rapidly greenhouse emissions need to be reduced each year to avoid a damaging change in the world's climate.
2. Oil- and gas-producing countries supply the club with output projections so it can compare the rate of decline required in greenhouse emissions with the rate of decline of oil and gas output and, consequently, with the level of emissions that it would be possible to allow from the coal industry without disrupting the climate. Major coal-producing countries would be required to limit their output to that level. (We discuss on the opposite page whether these countries are likely to accept such an output restriction.)
3. The club then agrees with oil, gas and coal producers the prices at which it will buy all their permitted output. This could rise year by year to make up, in part, for their lost earnings as their permitted output falls.
4. Permits entitling individuals to a share of the emissions from whatever quantity of fossil fuel the world was going to allow itself to produce that year are distributed by the club. Most of these go to individuals but during the convergence period, permits are also issued to national governments to enable them to raise money to make their countries more energy efficient.
5. On receiving their permits, the recipients sell them to banks and post offices, just as if they were a foreign currency. The permits cannot be hoarded as their validity lapses after, perhaps, a year.
6. Companies distributing oil, coal and gas, or requiring these fuels for, say, electricity generation or to make their products, buy enough permits from the banks to cover the emissions from the amount of fuel they want. They then pay the coal mine, or the oil producer, the purchase price agreed by the club plus the necessary number of emissions permits.
7. The club maintains a corps of inspectors to ensure that the oil, gas and coal producers:
   - do not exceed the agreed output,
   - sell their goods at the agreed price, and
   - insist on getting the required number of permits for each purchase.

   The inspectors check the permits just as if they were banknotes and, having reconciled the number with the output figure, send them away for destruction.

Could such a system ever be introduced?

The political reality is that such a system could only be introduced, and, having been introduced, work, if it was in the short-term interests of all the participants as well as their longer term ones. The interests of both energy consumers and energy producers are that the price of fossil energy does not fluctuate so wildly that it causes the global economy to collapse but either remains stable or rises at a predictable and moderate rate. This would be achieved by another part of the rationing package which we have not discussed yet – the introduction of a world currency, the ebcu (**e**missions-**b**acked **c**urrency **u**nit) which would be used to adjust the level of global economic activity so that energy prices were stable in terms of the international currency but could vary in national currency terms.

The new currency would be issued by the club and given to member governments according to the size of their populations, thus enabling some of the heavily-indebted ones to pay off all their international loans. Ebcus would replace the dollar, the pound, the euro and the other reserve currencies for all international trade transactions between club members, including trade in the emissions permits issued by the club.

Their use would remove one of the great distortions in the world economy at present - the ability of the US, and to a much smaller extent, Britain, to pay for their imports in money that both countries have created themselves and then borrow that money back, paying interest on the loan in yet more self-created money. This ability has enabled the US to run a deficit on its balance of payments current account for over twenty years. It is the reason that it is a superpower. America is currently importing $800 billion worth of goods each year, a third of its imports, without having to pay anything for them that took real resources to create. The debts it has run up over the 20 years - $2,484 billion at the end of 2004, equivalent to half the world's savings - may never be paid off. Replacing the dollar with the ebcu would remove this massive US advantage, one which the eurozone is trying very hard to acquire.

Before the ebcu was issued, the club would announce that, if ever the price of emissions permits rose above a certain price, it would offer more permits for sale but remove the ebcus used to pay for them from circulation permanently. As the volume of world trade that it is possible to carry on is determined by the amount of international currency available to finance it, the loss of these ebcu would restrict international business. This, in turn, would reduce global energy use and hence the price being paid for emissions permits.

On the other hand, if the price of emissions permits was tending to fall, the club could either issue fewer permits the following year or it could buy permits on the market itself, thus putting more ebcus into circulation and increasing world energy demand.

It would therefore be a very simple matter to keep the ebcu price of emissions permits at a constant level. This would give stability to the entire world economy. Indeed, as the ebcu price that the fossil energy producers would receive would be fixed too, everyone would always know exactly how many ebcu they were going to have to pay for their energy.

What they wouldn't know is what the price of ebcu would be in terms of their national currencies. These would have a floating exchange rate with the ebcu, one determined by supply and demand. Countries which converted quickly to renewable sources of energy and consequently did not need to buy so many emissions permits, or gave themselves extra to sell, would do well. Their currencies would be strong and they would find that imports were cheap. Other countries would find that it was costing them more and more in national

RESERVES			PRODUCTION		
Country	Share of Global Reserves	Share of Cumulative Reserve	Country	Share of Global Production	Share of Cumulative Production
U.S.A.	25.1	25.1	U.S.A.	26.7	26.7
Russia	15.9	41.0	China	23.3	50.0
China	11.6	52.6	Australia	7.3	57.3
Australia	9.2	61.8	India	7.2	645
India	7.6	69.4	South Africa	5.5	70.0
Germany	6.8	76,2	Russia	5.4	75.4
South Africa	5.6	81,8	Poland	3.2	78.6
Kazakhstan	3.5	85.3	Germany	2.6	81.2
Ukraine	3.5	89.9	Indonesia	2.2	93.4
Poland	1.4	90.2	Ukraine	2.0	85.4
Next 10 Countries	6.9	97.1	Next 10 Countries	9.7	95.1

Table 1: ***Global Rank Ordering of the Ten Leading Countries' Coal Reserves and Production, 1998***

currency terms to buy their imported energy, which would give them a very real incentive to switch to renewable sources of energy too.

Without monetary reform at both national and global levels, the pressures to continue to use more fossil energy – which, given the oil and gas peak can only mean coal - each year to ensure that one's national economy does not collapse would be immense, and probably irresistible. As a result, it would be almost impossible to introduce an effective global fossil fuel rationing and climate emissions-control agreement and, if one was introduced, it would be much more likely to break down.

So, back to the question: would governments agree to the introduction of an energy rationing system along the lines described? There is some chance that they would because the alternative is to do nothing about climate change and to run the risk that the world economy will collapse into a severe depression which could persist for many years.

Why would the coal producers agree to participate?

Coal mining companies would only participate in the scheme if they were compelled to do so by their governments despite the fact that they would receive a guaranteed, fair price for a fixed amount of coal.

The table shows that world coal production is concentrated in very few countries and that China and the US account for over half. The attitude of both governments would therefore be crucial. China could be expected to join the Carbon Club because its people, especially those in rural areas, would gain enormously from selling their allocation of emissions permits and their prosperity would create buoyant markets for its manufacturers.. The same would apply to South Africa, India and Indonesia. But what about the US and the other wealthy countries? Yes, their fossil energy supplies would cost them more, but that is inevitable as a result of energy scarcity anyway and the club arrangement would at least ensure they had a stable business environment and good export markets for their advanced manufactured products. Equally importantly, their unemployment could be kept low.

How could a pioneering country introduce a rationing system by itself?

There is no need for a country to wait for the Carbon Club to be set up. Any government could start issuing emissions ration coupons regularly to its population, the total ration any year adding up to just less than the country's expected CO2 emissions for the year. In each subsequent year, the total emissions ration could be cut by, say, 2%. Recipients would sell their coupons to the banks, which would sell them on to businesses which needed to buy fossil fuels. The competition among businesses for the limited number of permits would give them an increasing value.

Even if other countries did not follow suit, this approach would bring three benefits.

- It would force the country's industry and the public to be more energy efficient. This would stand the country in good stead as the world price of fossil fuels rose over the years. Moreover, the techniques industry developed might find a market overseas, in the way that the encouragement given by the Danish government to its windpower industry has paid off many times in export sales.
- The cost of buying the coupons needed to purchase fossil energy would rise year by year as the size of the total national ration fell. The income from selling coupons would, in effect, provide everyone with a citizen's income which would be of most benefit to the poorest people.
- As the price of fossil energy rose because of the increasing cost of buying the coupons to purchase it, it would become financially attractive to develop renewable sources of energy. As many of these could only be developed at a local level, the benefits would be shared out across the country.

What is likely to happen if these ideas are not adopted?

The biggest immediate danger presented by the current uncontrolled oil market is that energy prices will rise so rapidly that they will provoke an inflation that the central banks cannot ignore and that the higher interest

rates the banks impose will plunge the world economy into a depression. Once the depression has brought investment to a halt and demand has dropped because all the people who would have been working on investment projects have lost their jobs, it will be very difficult to get the world economy working at full capacity again. Such a depression might therefore persist for 10-20 years. Most banks would be in deep trouble and the global financial system might collapse. Living standards would fall everywhere and there would be increased starvation and misery.

If this scenario is avoided and the world economy continues to expand, the prospects are equally gloomy. The price of fossil energy can be expected to rise as the reserves of gas and oil are depleted and hundreds of millions of people could find themselves too poor to buy the energy on which they depend for cooking, lighting and heating. Landless people could also suffer as food became increasingly expensive.

Moreover, if some form of fossil fuel rationing is not introduced internationally to limit humanity's greenhouse gas emissions, the world's climate will continue to deteriorate. Storms will increase in frequency, sea levels rise and rainfall patterns shift, causing crises in most of the world's major cities. If climate-change-related damages continue to grow at the current rate, in 50 years' time they will wipe out each year the equivalent of the world's total annual production.

Conclusion:

The peak in global oil and gas production will bring about a dramatic change in the world economy. The challenge is to shape and direct that change so that its effects are positive for everyone rather than immensely damaging for all but the very rich. The measures which governments and NGOs should be considering must match the scale of that challenge. An energy rationing system that makes the world economy more stable and brings prosperity to poorer lands is one of these measures. Another is changing the way money is issued nationally and internationally. Although both involve major departures from the systems that we know, there is everything to be said for launching the Carbon Club and adopting energy rationing now since, the longer the world delays, the fewer resources it will have share out.

Endnotes

1 "The Impact of Higher Oil Prices on Low Income Countries and on the Poor", United Nations Development Program/World Bank Energy Sector Management Assistance Programme, Report 299, March 2005

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4 The story appeared on Friday, August 26, 2005. It can be found at http://za.today.reuters.com/news/NewsArticle.aspx?type=topNews&storyID=2005-08-26T090109Z_01_ALL632366_RTRIDST_0_OZATP-AFRICA-OIL-20050826.XML

Executive Summary

The package of measures proposed in this paper would help solve several global problems. These are:

Problem 1: High energy prices are hitting the poor. *Solution – give everyone on earth an individual energy ration coupon which they can sell for whatever it is worth when they receive it. When the energy price is high, the value of each ration coupon will be high too, so that they get enough money to buy a minimum amount of energy.*

Problem 2: Some countries are much better placed to manage on limited supplies of fossil energy than others. Giving each person around the world the same energy allowance would be unfair. *Solution: don't give all the energy ration coupons out to individuals during the early years of the system when the allocation would be quite high. Keep some coupons back and put them in a Convergence Fund, to be used by governments to help their countries adapt.*

Problem 3: The earth's climate is warming dangerously. *Solution: reduce the number of energy ration coupons issued year by year until total emissions from energy use are no longer contributing to the greenhouse effect.*

Problem 4: Extra energy is required for economic growth and if a country's economy fails to grow, investment will stop and unemployment soar. *Solution: change the way that the country's national currency is put into circulation so that it does not disappear if firms can't expand. If its government spent its currency into use rather than allowing banks to create it, its people's purchasing power and employment could be maintained even if growth stopped.*

Problem 5: Rich countries with reserve currencies have an unfair advantage on world markets. This would enable them to buy energy ration coupons at less cost than other countries and thus maintain their wealth at others' expense. *Solution: stop national currencies (and the euro) being used for international trade by issuing a new global currency to be used instead.*

Problem 6: Many poor countries are heavily in debt and are having to cut health and educational spending to service their loans. *Solution: get the new international currency into circulation by sharing it out between governments according to the size of their populations. Poor countries could then use the money to pay off their loans.*

Problem 7: Energy prices could go higher and higher for years, causing a continuous inflation. Money could lose its value quickly. *Solution: link the value of the new international currency to something that is in limited supply, such as the energy rations coupons.*