

The Global Energy Scene

*By Rt. Hon. Lord David Howell of Guildford**

In surveying the global energy security scene I want to begin with two key concerns – the imperative need for variety and flexibility in energy sources and the huge dangers of over-dependence on single energy sources.

Indeed one could say that they are two sides of the same coin. Let me start with two examples from the 20th Century and three from this new century which are now confronting us in a highly demanding way.

In 1913 Winston Churchill ordered the then gigantic British fleet to switch from coal to oil. Commenting on sources for the new fuel he said ‘safety and certainty in oil lie in variety and variety alone’.

Over sixty years later, in 1974, the entire British economy was brought almost to its knees by over-dependence on domestic coal for its electricity supply.

Apparent self-sufficiency in domestic resources turned into disastrous energy insecurity as the miners withdrew their labour and the power stations came to a halt. For a time electricity to both industry and home consumers had to be rationed on a three day a week basis. Only the almost uncanny ability of British officialdom to cope with such a situation, drawing on distant memories of managing wartime shortages, saved Britain from total catastrophe.

The only immediate way forward which offered itself was to seek more diversity and more flexibility in energy supplies, and very much more innovation and efficiency in energy use, and this we set about doing as rapidly as we could, although it was not nearly fast enough and many of the vital incentives for innovation were lacking.

Are We Repeating Past Mistakes?

Switch to 2006. Where are the obvious global points of over-dependency? Take three: the dangerous over-dependence of the European Union on piped gas from the Russian Federation; the heavy dependence of France on nuclear electricity from its enormous system of Pressurised Water Reactors; the dependence of the entire world on oil, especially the USA, with oil imports higher than ever, (now around 70 percent), and also the ever-rising dependence of the rising Asian powers.

All three “dependencies”, whether of fuel type or source, spell extreme danger and less energy security, not more. This helps explain why even before the 1980s Japan, for example, had begun to move with the utmost expedition away from dependence on oil, dependence on Middle Eastern oil and dependence on one source for the alternative of liquid natural gas or frozen gas. When the 1980s oil price explosion occurred it was Japan that had the greater flexibility and was

*Lord Howell has been President of the BIEE since 2003. He was a member of Parliament, 1966 to 1997, Secretary of State for Energy, 1979-1981 and for Transport in 1981-1983. He has been the House of Lords Opposition spokesman on foreign affairs since 2000. He was one of the Keynote speakers at the opening of the 29th IAEE International Conference, 7-10 June in Potsdam, Ger-

able to handle the crisis with the greatest dexterity, despite being a country without any natural sources of its own at all (except a small amount of coal). It is also important to note that Japan persisted with vigorous energy savings and efficiency innovations even when the great oil price collapse of 1986 occurred, when many other societies and industries simply gave up on energy saving and went thankfully back to cheap oil.

Now, as we tumble into the next energy crisis, the European Union is plainly committing a very similar ‘over-dependency’ error. Collectively the EU states have allowed themselves to drift into extremely precarious over-dependence on supplies of gas from the Russian pipeline empire. I recall Helmut Schmidt long ago re-assuring Margaret Thatcher on this point. ‘My dear Margaret’ he said, slightly patronisingly and taking his pipe out of his mouth, ‘the supplier needs the customer as much as the customer needs the supplier. The Russians have always been reliable suppliers of gas. They will never let us down’.

Events have proved otherwise. It is not just a question of unsettled politics in the Russian Federation. I think that aspect could be overrated. But it is inevitable that the huge Russian monopoly, Gazprom, behaves as monopolies do, not necessarily as states and government do – but simply looking for the best customers and seeing little virtue or profit in maintaining customer loyalty in any particular market. Hence the repeated observations of Gazprom officials that if they cannot get their way in supply patterns for Western Europe they have other customers they can supply in China and elsewhere in Asia. In the blunt but not unrealistic words of Viktor Kristenko, the Russian Energy Minister the other day ‘If dependency is not good, then one needs to move out of this dependency’. Exactly, but is it too late?

Two propositions sum up the situation: The first is that there is no such thing as full energy security. The vision of totally established long-term regular energy supplies, guaranteeing steady, non-fluctuating and utterly reliable supplies of electricity in the electric societies of the future, is a mirage. No such pattern can last. If the attempt is made to establish it, it fails to endure. Events and transformations will always intervene and always undermine any such reassuring systems.

The second proposition is the one already made above. The best kind of security, in as far as it can ever be attained, comes from diversity and the ability to switch between a very wide variety of sources of primary energy and of secondary energy. This proposition applies at the national level, at the industrial level, the business level, at the public facilities level and at the home and domestic level. In every case there has to be variety and there have to be numerous fall-backs. The glory of the electronic age is that it makes the complex management of these patterns of variety infinitely more obtainable and more profitable.

Japanese Lessons; European Follies

The Japanese example is interesting. At the macro level Japan’s energy planners, having learnt the lessons of the oil shocks of the 1970s and 1980s about the essential need for

diversity, are applying the same techniques to the LNG market. Long-term contracts interest them less and less, the more that LNG can be traded like oil in the spot market. What is required is supreme agility at the customer or consumer end to ensure that the full range of resources and possible origins is being constantly reviewed and played upon almost like a musical instrument to ensure overall reliability. Here is a good example of diversity providing security in contrast to over-dependence on single sources providing grotesque insecurity and danger.

Turn back now to the European Union today. The European Commission in Brussels is responding to a classical dangerous position of over-dependence on a single energy source – namely the Russian Federation and more specifically the gas monopoly, Gazprom. The Brussels' instinct is predictable. It is to try and meet the Russian monopoly with a European monopsony or single buyer, and to develop what it calls a common energy policy as far as that is possible – which is in practice not very far at all. The theory is that the single buyer would be able to carry more clout in dealing with the Russian monopoly supplier and somehow enforce Russian liberalisation and opening of Gazprom pipelines to others.

But the practice falls flat on its face. Not only do the different Member States of the European Union, regard secure energy supplies for their citizens as a priority national matter. It turns out that the Russian monopoly has other buyers to turn to, as Gazprom officials have made brutally clear. If the Europeans are not going to behave as good customers and pay the prices asked under the conditions required, then other customers in Asia and other markets in Asia can be supplied instead. In short, the search for energy security in Western Europe has led to frightening insecurity and the prospect the entire Continental system may have reduced pressure or interruption.

Incidentally, this ought not to be too much of a problem for the UK, in contrast to the rest of Europe. The UK now has full market liberalization, it has 7 percent of the world's coal reserves, it has access to almost unlimited gas from Norway and never forget that the UKCS still has plentiful gas and oil resources.

Dangers of Too Much Integration

Even so, like every other oil and gas consuming country the UK cannot be immune from the shocks to a highly integrated world system and it still, lacks adequate gas storage.

This brings us to a further key issue. Across the imperative need for diversity of energy sources at all levels in the energy chain there cuts a new and even more complex trend which works the opposite way and makes the need to plan for fuel diversity ever greater. This is the fact that the informational revolution, just as it has brought the dispersal of power, control and opportunity has also brought a vastly greater degree of interconnectedness – and this applies overwhelmingly in the energy field.

Our markets are now so obviously interconnected that one disaster, sabotage event, revolution or accident in any

one corner of the oil supply network has an immediate effect – in the case of oil usually through a sharp price spike. In gas the same applies, and in frozen gas as well. It needs one accident or terrorist raid in one part of the pipeline network to send prices soaring. Diversity protects the flow but it does not protect the price.

The sheer rapidity of information has transformed everything. First the speed of information vastly increases market information and market response which in turn intensifies volatility in reaction to every occurrence. Second because markets are infinitely more open and informed the entire planetary system is run on tighter margins and this applies particularly in the energy field. Thus the supply and demand balance is permanently tighter than in the pre-information age and the vulnerability to upsets anywhere in the network vastly greater, despite increased strategic stocks. In these circumstances a considerably greater diversity and variety of supply sources would anyway be required to escape the amplified vulnerabilities of such a highly networked system. This would be so even without the terrorist threat which makes all integrated systems vulnerable at their key points.

Searching for Security in Vain

The same thinking is clearly now driving the Chinese as they search for more and more oil imports to feed their super-growth economy. At the outset, as oil import needs rose, Beijing thought mainly in terms of very long contracts and securing access to oil through heavy and detailed agreements with foreign governments, often with the additional motive of irritating the United States of America. In this they had some success “tying up” Sudanese oil supplies, expanding links with Iran, entering into contracts with Venezuela and courting state oil companies in Nigeria, Angola and many other countries.

But it is dawning on the Chinese that this pattern of contracts is not the guarantee of security of supply they might have hoped for. Even China cannot be immune from the laws of diversity and the dangers of over-dependence. In a sellers' market, when oil producers need customers, it all works very well. But in times of crisis and shortage, and in times of political upheaval, even contracts and commercial law go to the wall. Despite all their contracts and long-term arrangements and agreements to take oil at certain prices, the Chinese will find the moment comes that they are as vulnerable as everybody else to the vagaries of world oil markets and the disruptions that can be imposed anywhere in the oil network by upheaval and revolution, whether in the Middle East or elsewhere.

Like Japan, China's best hope for energy security in the future lies in diversity – diversity between suppliers of fossil fuels, including their own internal coal suppliers, diversity of types of primary energy sources, diversity within their own industrial structures within their cities, towns and homes, and above all, highly profitable new technologies for reduced conventional oil dependence. This is where real security, in as far as it can be obtained, really lies. Chinese leaders, led by President Hu Jintao, may zig-zag across the Middle East

and Africa, as well as, of course, Latin America, trying to tie up access to oil, but in the end they will face the same reality. The only security is diversity, combined with market-driven efficiency.

Just now, today, the outlook is not at all good. The Chinese and the Indians have arrived. Gas guzzlers prowl Chelsea. American energy policy is frankly chaotic. If we look to President Bush we get such gems as the statement that ‘If we do not succeed we run the risk of failure!’ – not a very inspiring lead!

Meanwhile, the Middle East is in worse turmoil than ever. Iraq output has collapsed. Iran is highly unstable – again. Terrorism has threatened an increasingly vulnerable and integrated world energy supply system, for example at Ab Qaiq and a dozen other key places. The Saudis may have overstated their cheapest remaining recoverable reserves. Oil refineries are mis-matched, out of date and need replacing. The North Sea province is running down and at the same time we are pumping more carbon into the atmosphere than ever before.

No Simplicities in a New Situation

In short, we are confronted with a deeply serious situation requiring new policies and a new approach. These policies must be rooted in realism not swayed by current fads or theories. The energy conditions have undoubtedly changed fundamentally and the old market approach which was appropriate and right at the time, will no longer do on its own, as we will explain. But nor will the green simplicities. Certainly fossil-based oil can be downgraded in the energy hierarchy and removed from its strategic throne, but there is no way in which it will cease to be an important component of the energy supply balance, as will other fossil fuels in the future, including slightly cleaner gas, very much cleaner frozen gas and a coal treated for clean burning.

The cost ruler must also be put once again across nuclear power generation – to see whether it is really, truly, worth it – and whether anyone other than a government flush with funds (of which there are very few) can ever dare to invest in nuclear power when the pay-back time is so long, the planning and other costs so uncertain, the likelihood of profit so remote. Above all, innovative technologies and new electronic control systems can be combined with plain commonsense about energy use to get far more out of a unit of energy purchased, and to do so far more cheaply, thanks to business innovation and restless, profit-seeking enterprise, than governments and central planners and politicians seem able to grasp.

The transition can and must be driven by economics, and by ever better business models. We can make higher mileage hybrid cars the norm (and the Japanese car makers and their Chinese subsidiaries are already tooling up for a massive expansion of this product). And the huge remaining reserves of coal, both in Northern Europe, in America, in Australasia and in China can be gasified, liquefied and otherwise treated to achieve a cleaner and cleaner carbon-free burn, although costs have yet to be brought down to competitive levels. Plant-derived carbohydrates also have their place, although real costs (and I do not mean costs softened with huge farming subsi-

dies) have yet to be brought down to competitive levels.

But the new emerging pathway for energy is going to be much more complicated than any of this. None of these policy ambitions is going to deliver energy security at the level people have hitherto expected and governments have promised.

Giant integrated energy systems, which is what the closing decades of the 20th century have bequeathed to us, are never going to be fully secure again. Small, micro-generation methods are going to help at the margins but the impact of these will unfold slowly.

So ahead there are going to be accidents, revolutions and piratical acts of government, all of which spell power cuts, blackouts, supply interruptions, disturbing price spikes and increasing climatic extremes, which may or may not be related to the man-made carbon gas emissions of the last century – and which anyway we are told on the highest authority (Sir David King, the UK Government’s chief scientific adviser) it is too late to do anything about in this century, and that the benefits will be in time for our great grandchildren.

This is the energy labyrinth. Can we escape it? The answer is certainly, “yes”. As succeeding chapters will show many of the fears about the energy future are misplaced notably, for instance, that the world is running out of oil and gas.

Escape from the Labyrinth

So where do we start? The idealists of today see a fossil-free, green energy future emerging somehow out of the mists and confusion of the short-term and medium-term landscape. But the realist has to start from certain and basic awkward realities. Viz:

1. We know that, like it or not, and whatever savings are achieved through increased efficiency, energy consumption will increase hugely over the next twenty years. The most conservative estimates confirm a rocketing demand across the planet for more electricity in the ever more electrified societies of the advanced world, plus huge energy demand increases in the awakening giants, China and India, and the rest of the developing world. So regardless of anybody’s policy and regardless of government taxes much more energy will be needed and much more energy will be consumed.
2. We know that, like it or not, oil and gas and coal, the old fossil fuel trio, will still continue to play a big role in the energy supply mix.
3. We know that a new set of policy objectives are needed but that these will have to be supported and enabled by radical changes of attitude inside the minds of every home owner and every manager responsible for energy consuming operations. The energy savings are there but there are no government measures or top down policies that can achieve them.
4. We know that the huge potential growth of the BRIC economies (Brazil, Russia, India, China) simply cannot be based on the same sort of per capita consumption of energy which the citizens of the United States or Europe consider normal and their rightful expectation. So the

really big changes of policy direction will have to take place for the most part in the poorer societies which are struggling to develop. So even in the richer societies politicians will not dare to alienate voters by making some of the changes necessary until events are staring them in the face and shocks are compelling them to act.

When there are increasingly frequent power cuts, when petrol queues form, when gas supplies are interrupted to homes as well as to industry, when all kinds of shortages develop through interruptions to the transport system, then we can expect to see the necessary ripples of hysteria through the media which will enable politicians to move.

When these things happen, when the newspaper headlines shriek, the slow-witted commentators begin to catch up, the ponderous government policy-making machines also catch up and the politicians rush about like headless chickens making hopelessly short-term suggestions and calling for remedies which should have been applied long ago and for which it is now far too late – when this becomes the chaotic landscape, that will be the time to get a hearing for a way forward, out of the labyrinth, which will be attainable, practical, cheap, politically possible, intelligible, appealing and obvious to most people.

The labyrinth is dark. Arguments go round and round and keep coming up against dead ends. But there is an exit

route to be found turning round unlikely corners, and a sunnier landscape ahead then to be traversed. A greater degree of energy reliability and security, although never complete, is an attainable goal in the great global electric society of the future – a world populated by 2030 by eight or nine billion people. No slick policy “answer” can deliver this. Crises will always occur in face of which extreme flexibility and constant attention to diversity of sources, methods and technologies are the only workable response.

A reasonable pattern of arrangements against severe disruption and energy breakdown can be manoeuvred and crafted into shape. Energy in the form of light and warmth and industrial and agricultural power can be delivered at reasonable cost to the cold, the starving, the hungry and those locked in the cycle of poverty and deprivation. It will not all be perfect and smooth. The idealist is not our guide and must not be allowed to lead us down false paths. But nor should the sceptic be our guide either. The social perfectionism of the left cannot be attained, but nor can the scepticism of the right be allowed to prevail, nor yet the ‘oilman’s answer’, which is simply to produce more oil. The best qualities from either side must be drawn to the centre and leavened by moderation and realism. Thus armed we can feel our way through the dark labyrinth and reach out to the sunnier land that lies beyond the exit.



Robert N. McRae (1948-2006)

Bob McCrae was a native of Vancouver, British Columbia, where he attended UBC, obtaining a B.Sc. in honours mathematics in 1970, an M.Sc. in computer science in 1972, and a Ph.D in economics in 1977. His dissertation, completed under the supervision of John Helliwell, was entitled “A Quantitative Analysis of Policies Affecting Canadian Trade in Crude Oil and Natural Gas.”

Bob joined the Economics Department of the University of Calgary in 1977 as an assistant professor but quickly rose to associate and then full professor. His area of specialization was energy economics, with a focus on estimating systems of fuel consumption equations and analyzing the implications of energy policy initiatives. In his early career, he concentrated on Canadian energy policy; but, later, he became known internationally for his work on Asia and Latin America - thus combining his love of travel with his work. Also, he was co-author of one of the first and most respected statistical packages for personal computers, SHAZAM.

His many contributions to Canadian energy analysis are best reflected in his 1989 Canadian Tax Foundation book (with John Helliwell, Mary MacGregor, and Andre Plourde) entitled “Oil and Gas in Canada: The Effects of Domestic Policies and World Events.”

Through his work on energy economics, Bob was actively involved in the Canadian Energy Research Institute, the International Association for Energy Economics, the Canadian Economics Association (where he was a member of the Executive Council from 1994 to 1997), and OLADE (the Latin American Energy Organization — Organización Latinoamericana de Energía).

Despite his ongoing involvement in research, Bob never forgot the other two roles of the well-rounded academic: administration and teaching. As an administrator, he was best known for taking on the position of Head of the Economics Department from 1991-1996, during a period that was particularly crucial for the development of the department as it exists today. But he was also highly respected throughout the university for his participation in many other high-level university bodies – most importantly General Faculties Council.

He will also be remembered with the greatest respect by his students. He was an enthusiastic, knowledgeable, and sympathetic instructor, both at the graduate and undergraduate levels, and was one of the department’s busiest supervisors of graduate theses.

Bob is survived by his wife, Ann, and his children, Scott and Kate. He will be sadly missed by all who knew him.

Christopher J. Bruce and John Helliwell