



Nuclear Energy in a Competitive Market: The UK Experience

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Had you asked anyone a few years ago whether the UK nuclear industry could be privatised then a resounding “no” would have been the answer. Other, that is, than for the voices of a few nuclear diehards such as myself and some of my colleagues. At the time all the rest of the UK electricity supply industry was sold off, nuclear had been firmly relegated to the state-owned second division. This was just too difficult a situation to maintain.

On 14 July 1996, British Energy (BE) was floated at a partly paid offering price of 100 pence per share. And as of 1 September 1997, shares were being traded at 172 pence per share. By Friday 5 September they had moved up strongly to above 200 pence per share. That most sceptical group of people — the UK investors — put their hands into their pockets and their money on the table, thus selling BE off into the private sector. Since then British Energy shares significantly outperformed the FTSE All Share Index in a year of strong performance.

British Energy

British Energy is one of the UK's largest electricity generators with around 21% market share. It operates Britain's eight most modern nuclear power stations. Through its subsidiaries Nuclear Electric and Scottish Nuclear, the British Energy group has experience in nuclear generation going back over 40 years. The group operates profitably and safely in a competitive market and in one of the world's most tightly regulated industries. Its turnover exceeds £1.8 billion and its market capitalisation is over £1.7 billion with significant cash resources. British Energy is unique. Following

its formation and flotation in 1996 it became the world's only privately owned wholly nuclear generator.

Origins

British Energy has its origins in two publicly owned organisations, the Central Electricity Generating Board (CEGB) and the South of Scotland Electricity Board (SSEB), which supplied most of the UK's electricity for almost 40 years. In 1989 Britain's non-nuclear power stations were privatised. Four major generating companies were formed — National Power, PowerGen, Scottish Power and Hydro-Electric — and most of the transmission infrastructure was placed in the hands of the National Grid Company. The UK government's original intent had been to privatise the entire electricity industry including the nuclear generating stations but at the 11th hour it was decided that — due to factors including the uncertainty of nuclear costs, particularly decommissioning and waste management — the nuclear power stations would remain state owned. Two new companies were then formed to operate the UK's nuclear power plant: Nuclear Electric in England and Wales and Scottish Nuclear in Scotland.

Over the next five years, Nuclear Electric and Scottish Nuclear embarked on a process of commercialisation, increasing output and decreasing costs while continuing to improve already excellent safety records. Sizewell B was completed on time and to budget. Hands-on experience was gained on Stage 1 decommissioning through the successful defuelling of the Berkeley and Hunterston A Magnox reactors. The 'safestore' concept for

completing decommissioning was developed and costed and fixed price contracts were established for much of the back-end of the fuel cycle.

Although Nuclear Electric and Scottish Nuclear had not been privatised they now had to compete in the liberalised electricity market. They were directly exposed to the turbulence and competitive pressures of the newly introduced England and Wales pool system, a competitive wholesale market.

An important factor in the change process was that year on year, both Nuclear Electric and Scottish Nuclear published audited annual results to demonstrate that the true costs of nuclear power generation were understood and were being well managed. Usually annual reports and accounts are among the most highly edited and boring documents that any of us have to read but I believe that the Nuclear Electric and Scottish Nuclear reports were quite different. Here, for the first time, were the costs of nuclear power generation and the provisions for waste management and decommissioning set out for everyone to see, analyse and comment upon: open and honest communications brought into the public arena.

Commercialisation was a success. The issues which had previously prevented the nuclear power stations from being privatised had been addressed. And so, in 1995 when the UK government published its review of the nuclear industry, it decided that while the older Magnox stations should remain in public ownership under a new company called Magnox Electric, the modern nuclear power stations should be privatised. British Energy was floated in 1996 and took into the private sector the eight most modern UK nuclear plants, ie. the seven AGRs and the Sizewell B PWR. At the same time, the nuclear levy paid to these eight stations was discontinued. Privatisation of British Energy therefore had three benefits: the price of electricity to customers was reduced, the government received the proceeds from the sale, and the company was freed from the shackles of state ownership. Quite significantly, no less than 98% of British Energy employees have taken up shares in the company.

Results

Since 1992, British Energy has increased output by 64%, reduced unit costs by 35%, raised productivity by over 100%, increased operating profit from a loss of £286 million to a profit of £307 million and improved the load factor of its AGRs from 59% to 79%.

Electricity in England and Wales is sold through a competitive wholesale market system, called

the pool. British Energy is a price taker and exposed to pool price fluctuations. It already has a well developed hedging strategy through the use of Contracts for Differences and by direct sales to larger customers. As a purely nuclear generator not only does British Energy have to operate safely and cheaply but it also has to be highly innovative in its electricity trading activities in order to manage the risks to its revenue.

Load factors have been improved by reducing outage times and increasing the period between inspection outages from two to three years. Sizewell B, its state of the art 1200 MWe PWR, has immediately demonstrated world class performance with a first outage of only 55 days. Productivity has been increased and at the same time, safety standards have been enhanced by the introduction of Total Quality Management and Business Process Re-engineering throughout the group. Net capacity has been increased as a result of a successful plant modification programme at the AGR stations. Revenue from electricity sales has been enhanced by scheduling outages to coincide with periods of low demand.

Safety

Safety is a business imperative: if we are not safe, quite simply we do not run. A key lesson from the British Energy experience is that hand in hand with the group's improved commercial performance over the past few years has been the improvement in its safety performance. The quality of British Energy's safety management skills is indicated by the fact that no incident above Level 1 on the seven-point International Nuclear Events Scale has occurred at any of its stations in the past six years. Other highlights are as follows:

- Group accident frequency rate for industrial accidents has been halved since 1991.
- In 1996 alone, six British Energy stations received Gold Awards from the Royal Society for the Prevention of Accidents (RoSPA) reflecting their continuing improvement in industrial safety. For one of the stations this was the sixth successive Gold award.
- One of the group companies received the prestigious RoSPA electricity sector award and also recently became the first workplace to win a Gold Award for Scotland's 'Health at Work' scheme.

British Energy's power stations also operate under strict environmental legislation. It has developed effective strategies for managing radioactive waste in all its forms and also its power station discharges.

Values

Commercial success and enhanced safety performance come from studying and improving the process. A key factor in all of this is the commitment, knowledge and attitude of British Energy's staff. To this end, the British Energy group has enshrined the factors which it believes are essential to its continued success in a set of "Corporate values". These values were developed by the staff and are central to British Energy's pursuit of excellence in all aspects of its business. These values are:

- Safety first.
- Profit through progress.
- Openness.
- Respect and recognition.
- Professional and personal integrity.

These simple words encapsulate what British Energy stands for and I commend them to you. Whether it is "Safety first" or "Profit through progress", staff involvement and sign-on is vital.

It's easy as a management team to set targets, but finding the formula to deliver them is more elusive. So some years ago the managers asked their staff for help. They explained the commercial imperative driving the business: getting costs down and output up whilst maintaining safety as the number one priority. "Gainshare" was born. This is a reward scheme, developed by staff. The principles are straightforward. For every £3 added to the bottom line over and above the corporate target, £2 goes to the company and £1 to the staff. The measures are simple and everyone can relate to these — extra generation, reductions in departmental revenue costs — factored by demanding safety, quality and excellence targets.

I believe that Gainshare has played and will continue to play a fundamental role in achieving British Energy's performance targets. Another motivator was recently introduced: share options for all staff. Again, this puts the focus of each and every employee on helping to improve the business and so enhance the share price. Both the Gainshare and Share Option schemes share a common thread: all staff participate and British Energy recognises and rewards the contribution made by each and every member of the organisation.

Another crucial dimension in achieving excellence is setting the right targets. It's not enough just to do better than last year. It is vital to look around the world, to seek out best practice and benchmark against others, and to draw upon the benefits of the WANO and INPO initiatives.

Diversification

Current UK market conditions — including electricity prices, coupled with the availability of cheap gas and over-supply of electricity capacity — mean that for the foreseeable future, new nuclear build is just not economic in the UK. Existing nuclear plant built before the high inflation of the 1980s, and by now substantially written down in value, is economic but new nuclear build currently is not. However, almost paradoxically the most vociferous opponents of nuclear power — the green lobby — are having to rethink the way they see the future. Almost everyone now recognises the untold damage that uncontrolled burning of fossil fuel can do to the global environment. The greenhouse effect and acid rain are now seen to threaten planet Earth in a way which makes concerns about nuclear power pale into insignificance. And with this awareness is coming a recognition that whereas the costs of nuclear fully recognise the costs of waste management, those for fossil generation do not.

Worldwide there is a growing recognition that this must be redressed by making the polluter pay through some instrument such as a carbon tax. When this happens the economic balance between nuclear and fossil generation will change. The time for nuclear will come again. That means that we in the nuclear industry must have a vision and this vision must be firmly based on safety, care for the environment and commercial success. By building on the successful operation of existing nuclear assets, we can show the way ahead based on a balanced portfolio of fuel mix, recognising the relative roles of nuclear power to provide baseload and fossil generation to supply load following so that each type of generation is used to its maximum advantage.

British Energy's strategy is to achieve long term earnings growth by expanding its operations in the UK and internationally, in both nuclear and conventional energy sectors. It actively seeks partnerships with other utilities, financial institutions and fuel suppliers in the UK and overseas and it offers a number of distinctive benefits. British Energy's record of improving the performance of power stations, both financially and with respect to safety, is outstanding. The group has proved its ability to operate successfully in a privatised electricity market.