OFFICIAL ENERGY FORECASTS

The following is a resumé of a critique of the Department of Energy's forecasting methodology which I wrote for Friends of the Earth.

Great emphasis is placed on official energy forecasts as a justification for energy policies, especially the expansion of energy supply, as was seen at the Windscale Inquiry, at the Vale of Belvoir Inquiry and in David Howell's statement to the Select Committe on Energy justifying the Government's new nuclear programme. Yet the precedent of the House of Lords ruling on road traffic forecasts means that questionning of official forecasts will carry almost no weight at public inquiries. The energy forecasts must therefore be questioned now as a matter of urgency.

The Department of Energy's methodology is set out in Energy Paper 29, entitled "Energy Forecasting Methodology". This is an extremely unreadable document, largely because major parts of the methodology and assumptions are omitted, while the fact that they are being omitted is never made clear. The same parts of the methodology are described in different places, so that the reader is left turning from page to page looking for the missing information, while confused by impressive sounding phrases such as "substitution coefficients" and "equilibrium level [for fuel use] determined by the relative cost and price structure", which are never defined. It is therefore completely impossible to repeat the calculations or to match the methodology with the extremely scanty figures published in official forecasts.

The basis of the forecasts is simple in the extreme. The economy is divided into five sectors. The Iron and Steel Sector forecasts are obtained from the Department of Industry and nothing is said about how they are obtained. The Transport Sector forecasts are obtained by taking the Department of Transport's road traffic forecasts, together with assumptions on vehicle fuel consumption. The other three sectors are forecast by performing simple linear regressions of annual useful energy on the following quantities:

Domestic Sector: 1954 to 1973 figures for Consumer Expenditure per household and proportion with central heating,
Other Industry Sector: 1960 to 1973 figures for the Index of Manufacturing Production,
Other Consumers Sector: 1954 to 1973 figures for GDP.

(Yes, these are extrapolations of pre-1973 data; figures since the oil crisis seem to be totally ignored.) Assumptions must then be made about what these quantities do in the future. The GDP growth assumptions are published after a fashion, but nothing is made public about any of the other quantities, despite the fact that a major factor in the reduction of energy demand from the 1978 forecasts to the most recent (1979) forecasts was that "The economic assumptions have been modified to show a larger component coming from the service sector ...". Adding the sectors determines the total (useful) energy demand, which, apart from the Transport Sector, does not depend on fuel prices, nor indeed on anything else apart from the above assumptions, even though the extrapolations are based on a period when energy prices were stable or falling.

The total energy demand is then modified downwards by "conservation adjustments". These are pure assumptions, made without referring to any analysis or mentioning any particular conservation measures. Much is made in official statements of the fact that the energy forecasts include an allowance for conservation, but some kind of adjustment would have been necessary anyway because of the difference between extrapolations of pre-1973 data and actual energy consumption since 1973.

Next - and this is crucial - unrestricted electricity demand is forecast separately from the other fuels, mostly using the same kind of simple linear extrapolations of pre-1973 data as before. Unrestricted electricity appears, although this is not clear, to be exempt from the conservation adjustments. The other fuels are allocated to the remaining demand, but the fuel allocation process is weird, mostly unexplained and therefore incomprehensible. It depends in some way on the assumed future relative prices of fuels, which are too sensitive to be made public.

The assumptions for average annual growth in GDP to the year 2000 used in recent forecasts are consistently quoted in publications as "about 2%" and "just under 3%". From cross-examination at the Vale of Belvoir Inquiry we learn that the actual 1979 assumptions were 2% and 2.7%. Some detective work with drawing board and millimeter ruler on a graph in Energy Paper 29 yields, on the other hand, 1.8% and 2.9%, which give rise to a range of GDP figures 1.65 times as wide in the year 2000. If the latter figures are in fact the ones used in the 1978 forecasts, this might explain why the range of forecasts was narrower in 1979, making them appear more accurate.

The Department insists that their GDP growth assumptions are merely "particular illustrative parameters", which are "not intended to have a statistical significance in terms of probability distributions", but their habit of producing each year a pair of forecasts and then using such language as "... total primary fuel requirements are estimated in the range 445-510 mtce", means that the forecasts are generally misinterpreted as the ends of a confidence interval. It would seem that the Department wants to have it both ways.

Although the forecasts are called "forecasts" or "projections", it is not at all clear that they are intended to be forecasts in the statistical sense of the word. If the forecasts are intended to be probabilistic forecasts, then uncertainties should be quoted but are not. In fact the clearest picture which emerges is that they are intended neither as probabilistic forecasts nor as Government policy but as scenarios, "intended to provide a broad quantitative framework for the consideration of possible energy futures and policy choices". However, the amount of detail of these scenarios which is published obviously means that this consideration of policy choices is intended to take place within the Department. The published 1978 and 1979 forecasts only go up to the year 2000, which is totally inadequate for the energy policy decisions which have to be made.

Practically no attention is paid in the methodology to energy use or to policy options which might affect it. The energy demand model gets only 2½ pages and the "conservation adjustments" another 2½, contrasting dramatically with the complexities of the nationalised industry models. The use of extrapolations means that it is virtually impossible to incorporate into the forecasts the accumulation of knowledge since 1973 concerning possible end-use efficiency improvements. Neither is there any discussion of combined heat and power, nor of the vitally important subject of North Sea oil depletion policy, which is "exogenous to the studies".

Finally, the fact that the forecasts are based on extrapolations of pre-1973 data means that they look increasingly dubious the farther we get from 1973. The fact that the 1980 forecasts are now eight months overdue may be reflection of this.

If anyone would like a copy of the full critique (50 pages) for the cost of photocopying, then contact me via Glasgow Friends of the Earth, 16 Newton Terrace, G3 7PJ. I expect to be able to keep the cost including postage down to £1.50.

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