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Memorandum

TO: Elexon

FROM: Graham Shuttleworth

SUBJECT: Economic Reasons to Favour F-Factors

DATE: 1 November 2002

1.1. Background

The TLFMG has reviewed both proposed forms of risk mitigation – "F-factor" and "Beta-phasing" - and has decided (for the moment) to proceed only with alternatives that include Beta-phasing. The main reason for this choice is the TLFMG's perception that the F-factor is "hopelessly complex" (to quote one TLFMG member). We have drafted a set of possible BSC amendments to overcome this perception. Moreover, there are good economic arguments to suggest that F-factors would not only provide the degree of stability needed for long-term investment, but also offer additional, short- and long-term efficiency gains over Beta-phasing, which the TLFMG does not seem to have taken into account. This note sets out these economic reasons to favour F-Factors over Beta-phasing.

1.2. Economic Arguments

The key property of the F-factor approach is the preservation of full economic signals at the margin, such that generators and consumers who participate in the scheme experience any enhanced incentives immediately, instead of only gradually, over the period of phasing. That means that any economic benefits offered by the scheme will be greater, as they will be available sooner.

In addition, the F-factor approach would offer additional benefits if it could be extended to new entrants, as a way of reducing uncertainty over their future TLFs. (This scheme would reduce the cost of capital, but would also strengthen incentives to locate in areas where TLFs are currently advantageous, but would become less so after construction of new generation.) The proposal to phase in the new TLFs offers no such protection in the long run. Ofgem announced on Thursday 17 October that NGC would be required to offer connected parties "financially firm" transmission rights, indicating a desire on Ofgem's part to reduce

uncertainty over the availability of network access "several years ahead".[1] The F-factor approach would further contribute to reducing uncertainty over the cost of network access.

1.3. Potential Loss of Benefits from Beta-Phasing

Under Beta-phasing, and with the choice between P75 and P82 still open, it is difficult to know exactly what the impact will be, but we can suppose it would be simply proportional to the effect. We therefore compared the benefits of three scenarios:

1. P75 (ie, P75 and similar marginal TLF variants, with or without F-factors)
2. P75 with Beta-phasing over 9 years from 2004
3. P82
4. P82 with Beta-phasing over 4 years from 2004

We make the following assumptions:

1. P75 achieves this benefit in full;
2. P75 with Beta-phasing achieves an annual benefit that is reduced in proportion to the Beta-phasing;
3. P82 achieves half the annual benefit of P75;
4. P82 with Beta-phasing achieves half this annual benefit, reduced in proportion to Beta-phasing.

The following calculations use NERA's cost benefit analysis, updated in the light of comments from TLFMG members.

1.3.1. Short-run despatch costs

In the current context, the maximum short-run impact of the new marginal TLFs on generation costs is likely to be small - less than £1 million per annum. The NPVs in 2002 of the short-run benefits, scaled and phased as necessary, are as follows:

1. P75: £6.41 million
2. P75 beta: £3.55 million
3. P82: £3.20 million
4. P82 beta: £2.62 million

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[1] Ofgem press release R70, ***New Scheme To Improve And Develop Electricity Network***, 17 October 2002.

Therefore, use of beta-phasing would reduce short-term benefits by about £3 million for P75 and £0.6 million for P82. One can also note that adopting P82 beta, in order to mitigate risks, involves a substantial loss of benefit against P75 (under which risks could be mitigated by f-factors) – just under £4 million.

1.3.2. Effect on future decisions on location of generation plant

We can make a similar comparison of the 10 year NPVs for long-term decisions. The net benefit we attribute to these cases is:

1. P75: £22.94 million
2. P75 beta: £18.49 million
3. P82: £11.47 million
4. P82 beta: £11.07 million

Therefore, use of beta-phasing would reduce long-term benefits of plant relocation by about £4.5 million for P75 and £0.4 million for P82. One can also note that adopting P82 beta, in order to mitigate risks, involves a substantial loss of benefit against P75 (under which risks could be mitigated by f-factors) – of nearly £23 million.

1.3.3. Longer term relocation of demand

The demand side benefit from reducing losses is so small (£100,000-200,000 before allowing for the cost of the overall reduction in demand) that we do not anticipate any great loss of benefits from Beta-phasing. In fact, the proposed application of F-factors to demand would spread the benefits/costs over all BMUs within a GSP Group, in proportion to load. When there is more than one BMU within a GSP Group, the result will be similar (though not identical) to Beta-phasing. As far as demand goes, the F-factor approach offers and advantage over Beta-phasing only when individual consumers (eg those connected to a GSP on the national grid) incur an individual fixed allowance (F-factor).

1.4. Summary of Effects

Table 1 shows the calculations described above for P75, with and without Beta-phasing, in terms of a net present value in 2002 (at a 6% social discount rate). The NPV sums benefits over the 10-year period following implementation (ie 2004-2013). As shown in the bottom row, the loss of benefits due to Beta-phasing is £7.30 million over the first 10 years of application.

Table 1: Loss of Benefits from 10-Year Beta Phasing of P75

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	NPV	Annual Benefits										
Short-term generation costs												
Maximum Impact	6.41	0.00	0.90	0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94	0.95
Scaled impact	3.55	0.00	0.10	0.20	0.30	0.41	0.51	0.62	0.72	0.83	0.94	0.95
Loss of benefit	2.86	0.00	0.80	0.71	0.61	0.51	0.41	0.31	0.21	0.10	0.00	0.00
Relocation of Plant												
Maximum Impact	22.94	0.00	0.38	0.75	1.12	1.48	1.83	3.42	4.97	6.50	7.99	9.46
Scaled impact	18.49	0.00	0.04	0.17	0.37	0.66	1.02	2.28	3.87	5.78	7.99	9.46
Loss of benefit	4.45	0.00	0.34	0.59	0.75	0.82	0.81	1.14	1.11	0.72	0.00	0.00
Total Loss of Benefit	7.30	0.00	1.14	1.29	1.36	1.33	1.22	1.45	1.31	0.83	0.00	0.00

Table 2 shows the same calculations for P82 and P82 with Beta-phasing over 4 years. P82 achieves lower benefits anyway, so the loss of benefits from Beta-phasing is £1 million.

Table 2: Loss of Benefits from 5-Year Beta Phasing

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
	NPV	Annual Benefits										
Short-term generation costs												
Maximum Impact	3.20	0.00	0.45	0.45	0.46	0.46	0.46	0.46	0.47	0.47	0.47	0.47
Scaled impact	2.62	0.00	0.11	0.23	0.34	0.46	0.46	0.46	0.47	0.47	0.47	0.47
Loss of benefit	0.58	0.00	0.34	0.23	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Relocation of Plant												
Maximum Impact	11.47	0.00	0.19	0.38	0.56	0.74	0.91	1.71	2.49	3.25	4.00	4.73
Scaled impact	11.07	0.00	0.05	0.19	0.42	0.74	0.91	1.71	2.49	3.25	4.00	4.73
Loss of benefit	0.40	0.00	0.14	0.19	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Loss of Benefit	0.98	0.00	0.48	0.42	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The adoption of F-factors might make P75 or some lower cost variant more acceptable and less risky to market participants. Hence, the two tables should be considered in conjunction.

Offsetting these gains from using the F-factor is the extra cost of applying the F-factor scheme instead of Beta-phasing. We do not believe that the costs of implementation would wipe out the potential benefits, having seen preliminary figures from Logica. Moreover, this brief calculation does not allow for any additional benefits that would accrue from the F-factor's ability to reduce risks facing new entrants more than Beta-phasing.

1.5. Conclusion

This analysis considers only the change in benefits associated with different risk mitigation schemes. We have not considered the costs of implementation or the net benefit of any particular scheme. However, our calculations show that F-factors are preferred to Beta-phasing under both the proposed schemes for loss allocation.