

PRIME MINISTER

## ACID RAIN: DRAFT EC LARGE COMBUSTION PLANTS DIRECTIVE

I attach a minute by Mr. Ridley which proposes further steps to improve our record on SO2 emissions and enable a satisfactory compromise to be reached on a new Large Combustion Plants Directive in the EC. You will want to see comments by the Chancellor and the Energy Secretary before coming to a conclusion, but might like to go through the basic papers this weekend.

What it recommends in effect is two additional FGD retrofits by 1998 and a further two or three by about 2005 (although the CEGB reckon a total of only three or perhaps four will be needed). This would allow us to subscribe to the goal of a 70 per cent reduction in emissions by 2005. The scientific evidence of the damage done by SO2 emissions to our own environment are said to have become more conclusive. The cost of retrofitting is estimated in the range £560-670 million in profits (and therefore privatisation proceeds) foregone and £210-250 million in tax foregone - or the equivalent of 0.4 per cent on electricity prices. The judgement is that a clear decision by government now would remove uncertainty about future plans and costs which would otherwise lead buyers to discount they are prepared to pay for the industry on flotation, and thus help privatisation.

C. D. POWELL

10 June 1988

SL3BBU



CONFIDENTIAL

8 June 1988

PRIME MINISTER

**ACID RAIN: DRAFT EC LARGE COMBUSTION PLANTS DIRECTIVE**

The intense pressure on the German Presidency to finalise the long-running Large Combustion Plants directive offers us an unexpected but limited opportunity to secure an acceptable agreement. This comes at a time when pressure is mounting, both on the political and scientific fronts, to take a step forward with our policy. This letter seeks colleagues' agreement to the negotiating line for the Environment Council on 16 July.

The EC Context

The hard line Malcolm Caithness took at the March Council has paid off. Bilateral contacts have since elicited concessions on a number of important issues for the UK. It looks as though agreement on the pollution abatement standards for new plant (one part of the directive) could be within the Council's grasp on 16 June, although there are still issues on which negotiations could founder. But the UK is isolated on the more sensitive issue of reductions in overall emissions from existing plant (the other part of the Directive). We are the only state unable to agree the 1993 and 1998 targets proposed for sulphur dioxide (SO<sub>2</sub>) emissions.

European expectations of progress on the whole directive therefore depend on our willingness to make a further commitment to reduce SO<sub>2</sub> emissions. The Presidency are however willing to negotiate here. They are offering less rigorous UK targets for 1993 and 1998 in return for a strong commitment - a 70% reduction - by 2003. The details are in our paper at Annex 'A'.

Unfortunately we have very little time to reach a decision. If we cannot close an agreement whilst the Germans are under pressure, we shall be left with (and blamed for) a major unresolved draft Directive. The Germans will revert to their hard-line national position and the Commission have an alternative line of attack available through the air pollution framework directive.

Current policy on SO<sub>2</sub>, and pressure to take it forward

In 1984, we set a target of a 30% reduction in total UK SO<sub>2</sub> emissions (on 1980 levels) by the end of the 1990s. As a contribution to this aim, we endorsed CEEB plans in 1986 to retro-fit flue-gas desulphurisation (FGD) to 3 power stations to come on stream between 1993 and 1997. We also required all new power stations to be fitted with low-acid technology, so ensuring a low acid emissions future in the long term. This policy has served us well, but now needs to be reassessed for three reasons:

- a) upward pressure on electricity demand, fuelled by our economic performance, has stopped and threatens to reverse the downward trend in emissions in the short term and delay the long term reductions by prolonging the lives of existing high polluting power stations -figure 1;
- b) the different tests applied to capital investment in the electricity supply industry, following privatisation, will increase the pressure to extend the lives of stations;
- c) the scientific case for securing and, if possible, improving on our planned 30% policy aim has hardened (Annex B).

The Select Committee on the Environment expects to report on 15 June following its inquiry into air pollution policy. The Committee's report is expected to point to the lack of a clear programme to respond to the trends outlined above; and to compare the scale of our current programme unfavourably (when our size and contribution to acid depositions is taken into account) with that of some other states notably the Netherlands, Denmark and Germany. Unless it can be pre-empted by significant progress in the EC negotiations, the Committee's report could therefore touch off a new round of controversy. There is no shortage of influential voices prepared to make this a high profile issue.

#### The Scientific Position

The effects of acid deposition on lakes and soils in Norway was a prominent consideration in the Government's 1986 decision. The results of subsequent research (summarised in Annex B) have (i) established that deleterious effects in certain parts of the UK are more significant than had been thought, notably the Scottish uplands, Wales, Cumbria and the South Pennines; and (ii) confirmed and strengthened the case for ensuring a continued downward trend in emissions. The evidence currently emerging suggests that the recovery of most UK acid waters will depend on a halving of total present sulphur deposition, of which the great bulk comes from our own sources, mostly large combustion plant. This suggests that the Presidency proposal of a 70% reduction in large plant emissions, on a 1980 base, which would produce an approximate halving of current UK emissions, is a desirable long term environmental objective for the UK. The key question is by what date we should aim to meet it, and what price we are prepared to pay.

#### Likely Shape of an Agreement and its Cost

Depending on growth in demand and trends in fuel use, the cost of meeting the Germans' 70% proposal by 2003 could be of the order of £670 - £775 million in lost profits (and £250 - £285 million in tax receipts foregone). If passed on to the consumer, which I would prefer (in accordance with the polluter pays principle) the increase in electricity prices would be no more than ½%, taking effect only in the late 1990s. In my view this is not an excessive cost. As our paper explains, the industry will expect to have to incur a substantial proportion of this anyway - with or without the Directive. There is in any case a good possibility

of negotiating the final EC target down, by offering the Germans a better deal than they expect for 1998 (probably securing other useful concessions in the process).

The strategy for which I seek endorsement would require us to plan for 2 additional FGD retrofits by 1998 and a possible further 2 or 3 by about 2005 (cost £560 - £670 million in profits foregone (£210 - £250 million in tax foregone), or 0.4% on prices. However, we should be ready to accept the German proposal for 2003 if it proves absolutely necessary and our other major concerns are met. In all cases we should aim to have a "force majeure" provision because the Directive's requirements (expressed as percentages, not retrofits) would be binding.

I can add that the CEEB take a more optimistic view of the programme needed to meet the above requirements, and hence their costs. They would expect to be able to deliver my preferred strategy with 3 retrofits, and the bottom line position with 4. It would seem advisable, however, to plan on the basis of the more cautious estimates I gave above.

#### Impact on Electricity Privatisation

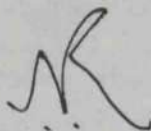
This is a key consideration. It is explored in paragraphs 17 to 19 of Annex A. I am convinced that a presentable deal in the EC will be a help here, not a hindrance. Without such a deal, privatisation will be more complicated. Walter Marshall has made clear to me that we can no longer rely on the "cosy" relationship to secure our policy objectives. If Government is unable to give a clear lead, the markets will form their own view of the inevitable pressures for tighter environmental standards, and the flotation price will be hit anyway.

#### Conclusion and Recommendations

Meeting the Germans on the basis outlined would be a substantial undertaking. But it would be a much better deal than we might have anticipated and it is unlikely that any Presidency other than a German one could deliver on such terms. The benefits to the UK environment are also now better established. Whilst it remains open to us to reject the German advances, this would involve digging in for what would undoubtedly be a difficult campaign with no end in sight, and I do not recommend it. A deal would take most of the steam out of a sensitive issue which, as well as souring relationships with our neighbours, has domestic implications too. It would end the uncertainty which has hung over the heads of industry for several years and which now threatens to complicate electricity privatisation. We would have European endorsement for our position on acid rain.

I therefore recommend that in the Council on 16 June Malcolm Caithness, whilst seeking to minimise the overall burden placed on the UK, should be allowed to negotiate on the basis of paragraph 21 of Annex 'A'. If this does not enable the Presidency to deliver a directive, it should at least give a clear final position amongst the key Member States (and our agreement must be subject to this proviso).

I should be grateful for colleagues' endorsement of the strategy I propose. I am copying this letter to the members of E(A) Committee, to Sir Geoffrey Howe and to Sir Robin Butler and Sir David Hannay.

A handwritten signature in dark ink, appearing to be the initials 'NR' with a stylized flourish.

N R

CONFIDENTIAL

## DRAFT EC LARGE COMBUSTION PLANTS DIRECTIVE

1. Despite an inauspicious start to the Germany Presidency (in particular, their mishandling of the March Environment Council), negotiations on the Directive are now back on the rails. Bilateral contacts between the German Minister, Dr Topfer, and Lord Caithness, and with the Commission, have elicited carefully calculated concessions on a number of important issues for the UK. It looks as though agreement on the pollution abatement standards for new plant (one part of the directive) could be within the Council's grasp on 16 June, although some hard bargaining is still needed and one particular loose end - Spain's request for a derogation - needs to be tied up. But a qualified agreement on new plant will not allow the more sensitive issue of reductions in overall emissions from existing plant (the other part of the Directive) to disappear. Here the UK is isolated as the only state unable to agree the targets proposed for sulphur dioxide (SO<sub>2</sub>) emissions. European expectations of progress on the whole directive therefore effectively depend on the UK's willingness to make a further commitment to reduce SO<sub>2</sub> emissions. The Presidency have however given a clear indication that they are willing to negotiate.
2. The deal which the Presidency is offering us would involve Germany accepting less rigorous 1993 and 1998 UK targets (somewhere between the relaxed figures originally proposed by the Danish Presidency and the German figures) in return for a strong commitment - a 70% reduction - in the third stage (2003). For 1993 and 1998 the reductions likely to be required are substantially less than those for other major Northern European states. (Our relatively low 1993 and 1998 targets, even under the original German proposal, include an allowance for the emission reduction which occurred before the 1980 base year).

3. It may just be possible to push the date for stage 3 back to 2005 but it is extremely unlikely that the Presidency will budge further or lower their figure of 70%. We need to be prepared for both 70% and 2003 to be sticking points within the Community.
4. The science analysis in Annex 'B' suggests that the Presidency's figure of 70% for large plants is in fact a desirable long term environmental objective for UK policy. The key question is whether the target date, and the intermediate steps towards that target, can be viewed as realistic.
5. The key stage to consider is the third stage (2003 or possibly 2005). If we can agree on a figure for this stage, the requirements in stage 2 (1998) fall into place quite readily - as a matter of phasing. Stage 1 (1993) is difficult for technical reasons (there is insufficient lead time to squeeze more out of the present FGD programme by 1993) but our position is reasonably well understood and we should expect to have our target adjusted provided we make a better effort later on - see para 15).

#### Emission forecasts

6. Our best estimate of the trend in S02 emissions, on present policy, to the year 2010 is at fig 1. A low and high forecast, agreed between officials, are included - the first based on the industry's own projections and the second a Department of Energy scenario presenting a more pessimistic case.
7. The forecasts indicate that up to the early 1990s S02 emissions will increase. They then begin to fall with the impact of the retrofit programme and increased imports of low sulphur coal from abroad. We should be able to achieve our target of a 30% reduction in total S02 by 1999. However, the later reductions anticipated as a result of plant retirements will have slipped well beyond 2000. We need to decide what targets and timetable we are prepared to impose

on the industry to achieve our commitment to a low-acid future.

8. The figures which we believe are negotiable, and the extra effort we should expect to have to undertake to meet this are set out in Table 'A'. For simplicity, this "effort" is referred to (and has been costed) as FGD retrofits, although it would be up to the industry to decide whether it would be preferable to retire the plant in question earlier than would otherwise be the case. In such cases, capital requirements would initially be larger, but the longer term cost less.
  
9. To achieve the Presidency's demand for a 70% reduction by 2003 could require the retrofitting (or retirement) of 5 or 6 large power stations (10-12,000 Mw of capacity) in addition to the 3 (6000 Mw) already programmed. The number would reduce to 4 or 5 extra (8,000 or 10,000 Mw) if the target date could be pushed back to 2005, or if a 60% target were negotiable for 2003 (which is much less likely, although this would be a good starting point in negotiation). The CEGB take a more optimistic view of the programme needed to meet these requirements. The contribution they would expect to have to make in order to meet a national requirement for a 70% reduction by 2003 is 4 retrofits; in the case of a 2005 target date or a 60% reduction by 2003 this could be as little as 3 retrofits.

#### Costs

10. The cost of meeting these requirements is set out in Table 'B', on two alternative bases, depending on whether the regulatory requirements for the privatised industry allow the costs of retrofitting to be passed on to the consumer. If the formula does not allow such passing on, then profits and corporation tax receipts are reduced (but see para 11 below). The net present value of these losses in the 5 to 6 retrofit case is of the order of £670 - 775 million in profits foregone and therefore privatisation proceeds foregone (and £250 - 285 million in tax losses); in the 4 to



5 retrofit case, the losses are of the order of £560 -670 million in profits foregone (and £210 -250 million in tax losses). However in neither case would the impact on electricity prices be greater than a  $\frac{1}{2}\%$  increase if the costs are passed on to the consumer which, in accordance with the polluter pays principle, would be desirable. This latter method would also largely satisfy investors that profits would not be affected. On the CEGB scenarios referred to, the costs would be £560 million in lost profits (£210 million in lost tax) or 0.4% on prices for the 4 retrofits case; and £440 million in lost profits (£165 million in lost tax) or 0.3% on prices, for the 3 retrofit case.

11. These costs are by no means small. It should be borne in mind, however that:

a) the necessary retrofits should not all score as a cost of meeting the EC directive: it is anticipated that 1 to 3 of these stations will in any case need to have been brought up to HMIP's new plant standards as part of a major refurbishment. The higher number would apply in the high growth scenario because the latter contains such a wide gap between demand and feasible new build.

b) besides retrofitting, other means are available to generators to reduce SO<sub>2</sub> emissions, for example by burning more low sulphur coal (which, by 2003, will be imported in large quantities to meet the expected high demand for electricity) in existing stations; or by extra imports direct from France (another Channel link would give the equivalent of one full retrofit).

Even on the high scenario, with 6 extra retrofits/retirements, in 2003 a third of the large stations remaining from today will still be unretrofitted.

---

## Proposed negotiating strategy

12. Our assessment of the mood of the Presidency and other members of the Council points to two possible strategies if we are to obtain an agreement. The first (strategy A) is to negotiate with a view to accepting the Presidency's 2003 date for the 70% target, which would buy us a less onerous commitment in stage 2 (possibly a figure we could achieve with the present FGD programme); however, the end price (up to 5 or 6 retrofits/retirements) would be greater than in the second option.
13. Under the latter (strategy B) we could concede a better figure for stage 2 (1998) - possibly the Presidency's own preferred figure (46%, requiring 2 extra retrofits) in return for a later target date for stage 3, ie 2005, or a lower target, e.g. 60% or 65%. This should enable us to limit the total "cost" to 4 or 5 extra retrofits/retirements and would be the most sensible option in planning terms because the environmental benefits would be achieved sooner and the capital expenditure spread fairly well. It would also help resolve the difficulty with stage 1. This strategy is our preferred option.
14. If we are to secure a firm agreement it may, in the end, be necessary to accept the Presidency's 70% by 2003. We should be ready to do so if this is the case, but only on condition that our other major concerns are met in the Directive.
15. This leaves the problem with stage 1 (1993) referred to in paragraph 5. Because of the lead time involved, there is no practical prospect of achieving more with our present retro-fitting programme by 1993 - by which date the FGD at Drax will only be partially on stream. (The consent application for Drax is still under consideration). This real technical constraint is recognised by the Presidency and the Commission, but we should not assume that the Community will allow our 1993 target to be raised to suit our schedule without exacting some tangible extra effort in

the early stages. It may be necessary to accept a tougher target by, say, 1995 which would involve bringing forward the existing programme. Whether this is feasible is not entirely clear. Lord Marshall informed Ministers in March that it would be perfectly feasible to complete the current retro-fitting programme by 1995 instead of 1997. (Indeed, he claimed to be able to do one more retro-fit by 1995 too). We should be prepared, if necessary, to accept an obligation to accelerate the existing timescale subject to technical feasibility. We should avoid conceding this, however, if we can secure our objective through the targets we settle for in stages 2 and 3.

#### Catering for uncertainty

16. The directive will require commitments to fixed emission targets, presented as percentage reductions, and not a set number of retrofits/retirements. (The latter is not a negotiable option, nor is it necessarily desirable as it would reduce flexibility in the future). It is necessary to ensure that we are covered for unavoidable problems such as a delay in bringing new power stations or retrofitted plant on stream, or an unexpected surge in electricity demand, which could cause a temporary breach of what are otherwise binding requirements. Our negotiators have made it clear that a "force majeure" or safeguard provision is an essential part of any package the UK could subscribe to, and we expect to be able to achieve this in return for agreeing to substantial reduction targets. This, together with the Directive's rather complex reporting provisions, allow a significant degree of flexibility.

#### Impact on Electricity Privatisation

17. Clearly any obligation to meet anti-pollution requirements will have an impact on the capital requirements and profitability of the electricity supply industry. What is equally clear, however, is that in the absence of a clear lead from Government the markets will form their own view of

the inevitable pressures for tighter environmental standards and - unless the regulatory arrangements clearly allow the costs to be passed on to the consumer - will discount accordingly the price they are prepared to pay for the industry on floatation. When we met Walter Marshall in March he made it clear that he now saw it for the regulatory authorities to set the requirements within which the industry is to work. We can no longer rely on the "cosy" relationship to secure our policy objectives.

18. We cannot of course be certain that an agreement will put a complete stop to calls for a further acceleration of our programme in the years to come. However, a substantial long-term programme, endorsed in an EC Directive, would be a major stabilising factor for the next decade, giving a much needed confidence on which to base the development of the restructured industry. It is hard to predict the precise course of events if the Directive remains unagreed because of the UK. The Germans, no longer as Presidency, would revert to their hardline position. One option open to the Commission would be to start proceedings under Article 13 if the Framework Directive on combatting air pollution from industrial plants, which imposes a general obligation to make plans to bring existing plant up to new plant standards. It would take a long time for this to get to the European Court of Justice, but the proceedings could loom large at the stage prospectuses are being written. Agreement on the Large Combustion Plants Directive would effectively seal off Article 13 for these plants.
19. The mechanics of spreading the burden of emission reductions fairly throughout the restructured industry will need to be addressed before the prospectuses are written before 1991/2. Existing and planned pollution control legislation should be sufficient to ensure that action needed to meet the Directive will be taken, so there would be no need for provisions in the privatisation legislation. These are not new issues which affect our position in the EC negotiation:

the same principles apply in the context of fulfilling our current FGD programme, and are under discussion between Departments.

#### Conclusions and Recommendations

20. Meeting the Germans on the basis outlined would be a substantial undertaking. But it would be a much better deal than we might have anticipated and it is unlikely that any Presidency other than a German one could deliver on such terms. The benefits to the UK environment are also now better established. Whilst it remains open to us to reject the German advances, this would involve digging in for what would undoubtedly be a difficult campaign with no end in sight. A deal would take most of the steam out of a sensitive issue which, as well as souring relationships with our neighbours, has domestic implications too. It would end the uncertainty which has hung over the heads of industry for several years and which now threatens to complicate electricity privatisation. We would have European endorsement for our position on acid rain.
  
21. It is therefore recommended that in the Council on 16 June, Lord Caithness should seek to minimise the overall burden placed on the UK, and in particular
  - a) if essential in order to secure an acceptable target for stage 1 (1993), be prepared to undertake to accelerate the present FGD programme, subject to technical feasibility, aiming for completion in 1995 rather than 1997;
  
  - b) for stage 2 (1998), be prepared to accept a reduction target of up to 46% (2 retrofits) with appropriate "force majeure" provisions;
  
  - c) for stage 3, press for a later date (eg 2005) or a lower target reduction, but if necessary, and only in the context of an overall satisfactory deal, accept the Presidency's figure of a 70% reduction by 2003.

He should, of course, seek to secure maximum advantage, by means of these concessions, in the related negotiations on new plant standards and on overall NOx reductions; and in particular, should not offer concessions going beyond the line agreed between officials on these issues.

DEPARTMENT OF THE ENVIRONMENT

8 June 1988

## ANNEX B

### ACID RAIN: THE SCIENTIFIC POSITION

#### EFFECTS ON SCANDINAVIA

The effects of acidic deposition on lakes and soils in Norway was a prominent consideration in the Government's 1988 decision. At that time UK depositions in Norway were about comparable with those originating from Norway itself, and somewhat higher than from Poland and East Germany. By 1990 abatement programmes in Scandinavia and West Germany will have raised the percentage deposition in Norway attributable to the UK from about 12-13% to 20%. On a strong UK energy growth scenario UK emissions would remain at this level for much of the decade. In comparison Norway's contribution to depositions on its own soil will have dropped to about 10%.

As a result of the national abatement programmes we would expect some signs of recovery in Norwegian lakes. This is likely to take the form of improvements in lake acidity, and could be quite rapid in catchments with thin soils or bare bedrock. The rate at which these lakes are able to sustain greater biological diversity and to support fish stocks will depend on how soon the acidity of the lakes can be improved to above PH 5.5 or so, and the rate at which concentrations of aluminium dissolved from soils by earlier acidification is reduced. It will therefore depend on emissions not only from the UK but also comparable contributions from Poland and East Germany. In contrast the prediction of the effect of emission reduction is more straightforward for the UK where 80% of the deposited sulphur is of UK origin.

#### EFFECTS ON UK ENVIRONMENT

It is well established that most catchments of the South East of

England, Midlands and North East England are at little risk from acidification even if UK emissions were to continue at their present levels almost indefinitely. Most of the soils in these areas are managed for agricultural purposes and some contain base rich bedrocks well able to neutralise acidified waters. In contrast about a third of Great Britain has soils that are unable to neutralise acid deposition. The most sensitive areas are North Wales, Cumbria, parts of the Pennines and the uplands of Scotland. Here particularly because of high rainfall, total deposition rates of sulphur are much closer to that found in Norway. The soils are sometimes thin, often acid, on poor bedrock with land management often devoted to coniferous forestry. These are all factors which make the catchments in these areas particularly sensitive to acid depositions.

As with Norway the major casualty in the UK sensitive areas has been the loss of fish stocks, with some associated impoverishment of other fauna such as birds. Acidity of surface waters increases as calcium is depleted from the soil and eventually the acidity is sufficient to mobilise aluminium which is toxic to fish in the catchment. Consequently fish stocks decline as the concentration of calcium falls and as the concentration of aluminium rises.

If levels of sulphur emissions were held constant at today's levels the condition of many of the headwaters and lakes in Wales, NW England and the Western Highlands will continue to deteriorate. There is a major international research effort (including the important SWAP joint work between the Royal Society and the Scandinavian Academies of Science) devoted to determining the level of deposition that soils can tolerate before they present a risk to surface waters. Indications are that current deposition levels on the type of soil found in Norway and in UK's sensitive areas are about twice the rate that can be tolerated in the long term. The final 'low acid' target of present policy is therefore likely to show considerable improvements in the lake systems.



The timescale of this recovery will depend on local geology (in particular the weathering rates of local minerals) and local land use practices. However there are encouraging signs from UK sites where declines in deposition rates over the last few years have been amplified by natural changes in rainfall pattern, that the first beneficial responses are rapid and maintained.

In summary the developments in our scientific understanding of the acidification of surface waters have served to underpin the decisions taken earlier by the Government. Firstly there is benefit to be gained by ensuring a continuing downward trend in national emissions of sulphur. Secondly the relatively low levels of sulphur deposition that can be withstood by the more sensitive soils justifies the Government's intention that the long term aim should be a low acid electrical power supply industry.

In terms of an environmental objective, a halving of present deposition would enable the recovery of most UK acid waters. This would suggest that the Presidency proposal of a 70% reduction on 1980 levels would be a desirable long term target for UK policy.

#### WASTE DISPOSAL IMPLICATIONS

The domestic environmental implications of an enhanced FGD retrofitting programme (for example limestone supply and by-product (gypsum) disposal) would be significant. However, as the effect of such a retrofitting programme would be to bring forward the advent of FGD already anticipated through the power station new build programme, the problem would need to be addressed anyway at a later date; the issue is essentially one of timing.

Department of the Environment

6 June 1988

TABLE A

LARGE COMBUSTION PLANTS.

Extra retrofitting/retirement needed to meet "negotiable" targets

m tonnes SO<sub>2</sub>  
(% reduction, 1980 base)

	Emissions with current policy(*)	Presidency opening bid	Strategy A (para. 12)		Strategy B (para. 13)	
			Negotiable target	Extra FGD (cumulative) (+)	Negotiable target	Extra FGD (cumulative) (+)
1980	3.88					
1987	2.99					
1993	3.01-3.04 (21-22%)	2.87 (26%)	3.1 (20%)	-	3.0 (20%)	-
1998	2.30-2.36 (39-41%)	2.10 (46%)	2.1 - 2.6 (33-46%)	0 to 2 stations	2.1 - 2.3 (40 - 46%)	1 to 2 stations
2003	1.99-2.12 (45-49%)	1.16 (70%)	1.16 (70%)	5 to 6 stations	-	-
2005	1.79-1.95 (50-54%)	-	-	-	1.16 (70%)	4 to 5 stations

(\*) Two scenarios are used : the lower based on the industry's projection and the higher a more pessimistic DEN case.

(+) "Extra FGD" simplifies the extra effort required which may be obtained for example by retirements (see para. 8)

## CONFIDENTIAL

Cost of expanding FGD Retrofit Programme

Option 1: Regulation Formula does not allow passing on of FGD costs

No. of Extra Retrofits	Discounted effect on profits £ m		Loss of Corp Tax Receipts £ m. (Discounted @ 8%)	Total £ m	
	Discount Rate			Discount Rate	
	8%	12%		8%	12%
+3	440	350	165	605	515
+4	560	440	210	770	650
+5	670	520	250	920	770
+6	775	595	285	1060	880
+7	870	655	320	1190	975

Option 2: Regulation allows FGD costs to be passed on

No. of Extra Retrofits	Effect on Prices
	% Increase
+3	0.3
+4	0.4
+5	0.4
+6	0.5
+7	0.5

Note: Price increases would take effect from late 1990's.

Fig. 1 Trend in SO2 Emissions

