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23rd April 2004

Dear Nienke

EDPCR Policy Document March 2004

Thank you for sending us the above consultation document. Friends of the Lake District (FLD) are a registered charity and incorporated company, established in 1934, with the aims of protecting and conserving the landscape of the Lake District and Cumbria. We have around 7000 Members, represent the CPRE in Cumbria, and are Members of the Council for National Parks. As you know, we have made several representations as part of the DPCR process.

FLD welcome the recognition by OFGEM in the Executive Summary that incentives towards efficiency are balanced with those to deliver quality of service and other outputs. Amongst the other outputs we would include maintaining fine landscapes and countryside.

We note that the recent principal guidance from the Secretary of State to the Director General of Water Services for the parallel 2004 periodic review of water price limits (DEFRA March 2004). This refers to two bids by companies for projects involving environmental spending. Both have met with approval. We hope that OFGEM will note this, and again consider more flexibility in spending on environmental improvements.

Para 4.49 We would welcome data being available in future to be able to cross reference the ability of networks to withstand storms and bad weather against whether they are overhead or underground lines, and associated restoration of service times and costs.

Para 4.67 We welcome the statement that reporting on environmental outputs is an important step in managing environmental impacts and support OFGEM's intention to extend environmental reporting. We hope environmental outputs will be linked to appropriate incentives.

Para 4.68 We would like clarification of what environmental impacts associated with distribution losses and distributed generation will already require reporting as stated.

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Para 4.69 If reporting of environmental considerations is already covered by other agencies then there is a need for greater links and cross referencing to annual reports produced by the DNOs so that these data are readily available to the public. The research for FLD by UK CEED (section 11.4, p.146-149) highlights that 40% of DNOs have not been producing environmental reports in recent years and, in any case, landscape and amenity issues are poorly dealt with in environmental reports and are not reported elsewhere. Monitoring by the Electricity Association has focused on things such as greenhouse gases, emissions, fuel mix, environmental management systems, etc. There has been a complete lack of monitoring on landscape and amenity issues. It is our view that environmental/landscape reporting

has a transparency function which needs to be developed, not just developed to the extent to which companies readily support it. Other companies in other sectors are very active environmental reporters. In addition, 'relevant authorities' need to be able to demonstrate that they have fulfilled their duty towards National Parks under Circular 12/96 and AONBs under the CROW Act.

FLD therefore dispute the claims by some DNOs that environmental reporting is already covered and that there is no need for additional reporting. The reporting criteria that FLD would like to see have not been produced by other agencies. These include :-

- Percentage of underground overhead lines in designated landscape areas and by Countryside Character Areas, and changes in these percentages over the next DPCR.
- Amount of money spent on amenity/environmental works during the DPCR period.
- Net reduction in length of lines in designated areas, and Countryside Character Areas.
- Development of a prioritisation system for undergrounding overhead lines based on landscape intrusiveness and impacts on landscape character.
- Specific ways in which DNOs and relevant authorities have met their statutory environmental duties to National Parks and AONBs, and compliance with robust Schedule 9 statements, e.g. consultations, lines placed underground, steps taken to reduce intrusiveness.
- Percentage of rural lines overhead v underground.
- Quality of supply of urban dwellers v rural dwellers.
- Number of faults on overhead lines v underground
- Contents of and compliance with Schedule 9 Statements.

Para 4.71 : We note no reference to landscape issues in the list of issues on which OFGEM proposes to introduce reporting requirements. We do not consider that just reporting details of Schedule 9 Statements and the date of the last review is enough reporting on landscape issues. This will just become a reporting duty with no depth or indication of improvements. We would like to see the list above included. At the very least, duties under Schedule 9, Section 62 (Environment Act 1995) and Section 85 (CRoW Act 2000), require the reporting of demonstrable improvements in visual amenity – an account of the lengths of overhead system, in rural areas, and in designated landscape areas, any changes. We assume the indicators we have listed above will come under the heading of amenity issues.

Para 4.72 : We are disappointed that OFGEM do not intend to introduce financial incentives on any of the output measures. We would hope that if the consumer willingness to pay survey shows a high commitment to say undergrounding, that OFGEM will introduce some form of incentive to reflect this.

Para 4.73 This notes that there will be further discussion on environmental reporting indicators with DNOs and environmental regulators. We hope that OFGEM will also hold discussions with environmental NGOs. ***We would be happy to meet to discuss the issues, or arrange a meeting in London with many of our partner environmental NGOs.***

Para 4.74 We strongly welcome the intention to publicise the reporting indicators and their results annually. Again we hope that OFGEM will involve ourselves and other environmental NGOs in discussion about how to do this. We would like to see this information contained in the annual reports of DNOs and readily available on the Internet.

Para 4.75 : As companies do not appear willing to spend money on amenity undergrounding voluntarily, FLD would welcome any reward system that included specifically addressing this issue to encourage companies to underground lines for amenity reasons, particularly in designated landscape areas.

Para 4.76 : FLD would be very interested to view the information provided by DNOs on the costs of undergrounding. From our own research carried out by UK CEED in 2002 it was clear that relative costs can vary widely according to the voltage level of the line and the location and terrain it travels through. Evidence shows that the cost ratios for specific schemes in each voltage category can differ significantly from the averages used by OFGEM from 'benchmarked' cost exercises and from the Engineering Recommendation P21/5 produced by the Electricity Association. Discussions with the electricity industry suggest the ratio of 1: 2-3 is the usual range for 11kV lines rather than 20 times more expensive as stated in the Electricity Association Environmental report 2003.

If DNOs are basing their projections on the complex scenario of village undergrounding schemes then the costs involved would differ greatly from undergrounding a similar length of line in the open countryside. FLD very much hopes that OFGEM is taking this into account when considering increased undergrounding for amenity reasons.

We eagerly await the results of the willingness to pay consumer survey to see if it will reflect the fact that 89% of consumers find the landscape impacts of overhead lines unacceptable in National Parks and other designated landscape areas.

Paras 5.49 - 5.50 : FLD welcome the potential inclusion of projects with environmental benefits in the Innovation Funding Incentive proposal.

Appendix 4 :

Page 108 : In 'protecting the interests of consumers' OFGEM has a duty to ensure that companies clearly report on the environmental impacts of their work including the visual impact that overhead lines have on the landscape. The "do nothing" approach for environmental outputs is therefore not a feasible option as the interest of consumers in the visual impacts of lines has been clearly identified as a major concern, ie: In phase 1 of the 'willingness to pay survey' 89% of consumers found the landscape impacts of overhead lines unacceptable in National Parks and other designated landscape areas.

Page 108 notes that OFGEM intends to introduce an incentive scheme based on meeting targets based on willingness to pay information. From this we assume that these targets and incentives have not yet been decided upon as they await the results of the second phase of the willingness to pay research. However, page 109 suggests that OFGEM has pre-empted the outcome of the consumer survey research; only including reporting requirements on a limited set of environmental outputs and detailing no incentives.

Page 110 : Questions for developing the RIA: (Page 110 – bullet 7)

OFGEM are still seeking comments on the questions for the RIA, including '*what are the potential costs and benefits of increased investment in undergrounding for visual amenity reasons?*' The research for FLD by UK CEED has much relevant information on costs and benefits (Chapter 2, section 2.4). In order to assist further, we would seek clarification of the kind of information required to develop a full RIA.

The cost data available on the differences between overhead and underground circuits shows significant variations between sources. Although FLD accept that the direct costs of underground supplies are generally greater than those of overhead supply, the ratios can be far more favourable for lower voltage lines, especially those in the open countryside.

In the summary of DNO forecasts it is clear that additional funding will be required for increased undergrounding although the figures suggested greatly vary. East Midlands Electricity propose that in the areas of network performance and environmental improvement, particularly targeting visual amenity only a modest increase to the Base Case will be required. They suggest that demonstrable improvements can be realised by a relatively modest increase in bills (of about £6.90 per domestic customer by 2010, or 2% of the average electricity bill over a 5 year period).

FLD believe that OFGEM must look beyond the average cost ratios and that companies need to become scheme-specific when forecasting costs. These costs must also be set against the benefits of the savings incurred from fewer interruptions from bad weather and damage to overhead lines and the environmental benefits gained from improving the landscape.

Electricity companies often argue that there are reliability issues with underground cables as faults are harder to locate and may take longer to repair. However, in the open countryside where the visual impact of overhead wires is at its greatest, there are clear savings to be made in the long term as the threat of damage to wires from trees or bad weather would be removed.

Improvements in technology can also greatly reduce the cost of placing lines underground. The new 'Cable Fault Sniffer' is speeding up and reducing the costs of finding faults on cable systems and machinery such as the Fockersperger FSP 18 Cable and Pipe laying plough can lay underground cables across difficult terrain very quickly and with a minimum of environmental damage.

In terms of the costs of visual intrusion, it is very difficult to calculate the environmental impact of the electricity network in monetary terms, and therefore little weight can be attached to pure monetary cost – benefit calculations. Decisions based on cost alone do not take into account the whole range of factors that come into play when considering environmental issues. These include effects on ecology, concerns about health, noise pollution, enjoyment of the natural landscape and whether development is sustainable. To ensure sustainable development the electricity industry has a duty to pass on to future generations no less of an opportunity for well-being than enjoyed by the present. This might mean protecting or enhancing the visual appearance of a landscape or at least establishing what is important in the environment and what is acceptable or irreplaceable. FLD argue that freedom from obvious technological paraphernalia is a landscape attribute, which is valuable, relatively scarce, and thus needs to be carefully maintained or enhanced over time. Surveys of the attitude of visitors to the countryside clearly show not only the value the public put on fine landscapes, but also the economic benefits which accrue.

The first stage in developing an undergrounding programme to protect or enhance the landscape is to establish a system of prioritisation to identify the most visually intrusive lines. This will require some initial investment in research and development but is an area of work in which the environmental sector would be willing to offer considerable support. FLD have already begun to develop such a system in collaboration with United Utilities.

In the summary of DNO forecasts several of the companies state that they believe undergrounding should be done on a 'measured basis to derive maximum benefit from least cost'. This reinforces our view that more information is required and a systematic approach needed that gives consideration is given to landscape criteria but also takes into account factors such as fault resilience and whether a line is due for renewal.

In summary, we consider the costs of more investment in undergrounding to be :-

- A short term increase in the capital cost to the consumer if works are not match funded or a new fund established (see our comments in previous consultations on funding).
- The development of a prioritisation system of identifying wires for undergrounding. FLD have already begun work on this.
- Short term inconvenience/disruption for landowners.

The benefits of more investment in undergrounding would include:-

- Having regard to sustainable development by protecting the countryside from intrusions thereby ensuring its quality for future generations.
- Meeting statutory duties towards designated landscapes.
- Enhancing the landscape and countryside, with knock on benefits for the rural economy.
- Wires less susceptible to storm damage.
- Greater lifetime expectancy.
- Greater security of supply.

Page 110 : Distributional effects

Increased undergrounding for visual amenity reasons not only benefits all consumers today by reducing the impact of overhead lines, enhancing the countryside for all to enjoy and improving network resilience, but also benefits consumer generations of the future. By adopting an approach to encourage increased undergrounding OFGEM can ensure that the electricity companies carry out sustainable development and protect or enhance the amenity aspect of the landscape. Surveys show that the most important thing the public value when visiting the countryside is its special qualities and character, and that fine countryside generates significant economic benefits for the rural economy.

The RIA should recognise the fact that people do *not* tend to support undergrounding closest to their houses but in protected landscape areas (as the first tranche of the consumer survey indicates). This might address some of the distributional effects underlying the final points on page 110.

We hope our comments will be useful. If you require further clarification please do not hesitate to contact us.

Yours sincerely,

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Relevant sections from UK CEED 2002 report : The Scope for Undergrounding Electricity Lines

2.4 The costs of visual intrusion

As subsequent chapters will elaborate, there is little dispute that the direct resource costs of undergrounding overhead lines makes it a more expensive option when compared with the equivalent overhead line. This is true for all but the very lowest voltage lines in circumstances highly favourable to cabling. Consequently, electricity companies have generally argued that the undergrounding of rural lines should be the exception and, with the higher voltage lines especially, should only take place for visual amenity reasons where the landscape impacts would be significant. Some environmental groups and environmental economists have argued that decision-makers ought to take into account not just the direct monetary costs of the infrastructure, but also the flows of environmental 'goods' and 'bads' that result from a particular decision. Some would go further to argue that the only way to give environmental factors appropriate weight in decision-making is to give these 'intangibles' a monetary value. Thus the financial costs and benefits of a particular option can be assessed alongside environmental effects, using the same measuring stick.

This section of the report reviews attempts to assess the level of visual intrusion that overhead lines cause. In seeking to do this, a number of factors need to be borne in mind. Firstly, there may be a whole array of factors - including effects on ecology, risks of accidents, concerns about health - which might enter people's cost-benefit calculation. Secondly, although it is likely that people would express a positive 'willingness to pay' for overhead lines to be removed, *it is by no means clear that the aggregate monetary sums expressed would outweigh the additional costs of undergrounding*. Thus, quite aside from the serious methodological difficulties with monetary valuation, environmental groups that believe they have principled reasons for opposing the presence of overhead lines in certain landscapes need to beware of the utilitarian reasoning inherent in the cost-benefit approach. Thirdly, identifying notional monetary values for certain impacts does not conjure up actual money to rectify them; distributional questions remain¹, and are addressed more directly in Chapter 4.

¹ Indeed, distributive judgements and assumptions about property rights underpin the methodologies of environmental valuation techniques

Data on impact perceptions

It is not difficult to collect anecdotes, speeches and articles, which describe the apparently devastating effect that power lines, and transmission towers have on the landscape.² One could look at the number of letters of objection submitted to inquiries into overhead line projects, or the responses to village area appraisals, village design statements, or Conservation Area surveys. A wish to see the removal of overhead wires features frequently in the latter exercises.³ Also connected to the planning process are the environmental impact assessments and less formal analyses that accompany applications for overhead line development. Here the electricity companies may assess the 'zone of visual influence' of the overhead power line, both in terms of the extent of its visibility, and in relation to the value and sensitivity of the landscape that it crosses. Indeed, the industry itself recognises the issue: the Electricity Association (2000, 19) states that electricity transmission 'inevitably results in some damage to, or visual intrusion in, the countryside or built heritage'. Similarly, for the National Grid Company (1999, 19), '(t)here is no arguing with the fact that high voltage lines are visually intrusive'.

As we note in the next chapter, however, there is little data available that captures the overall physical presence of electricity infrastructure in the landscape. Systematic surveys that seek to assess people's perceptions of power lines in certain locations - either near their homes or in wilderness areas - are scarce, and tend to languish in unpublished technical reports (Priestley and Evans 1996, 66). Scarce too are assessments of the way in which the public rank the visual impacts of overhead lines against other sorts of intrusion, such as spoil tips, litter or industrial dereliction.⁴ Scarcest of all are analyses of the public's 'willingness to pay' to see overhead lines removed. A careful literature review building upon the earlier work of UK CEED 1991 has turned up a handful of studies, but it should be emphasised that most of these were conducted in the U.S., and almost all focus entirely on the high voltage transmission system.

Furby *et al.* (1988a) review a number of US studies that looked at public perceptions of electricity transmission lines, but for many of them either the samples were too small or the conclusions and assumptions difficult to substantiate. The most extensive survey they identified was conducted in 1972 by the Response Analysis Corporation (Pohlman 1973) and involved a survey of 1,962 individuals, selected as representative of the US adult population. When asked to indicate the two or three most unattractive things in their neighbourhoods from a list of 14, 12% of respondents picked high voltage power lines and 13% telephone and electricity utility poles. These ranked behind litter and trash (70%), poorly paved streets (49%) and junkyards (48%). Interestingly, this study also reported that the identification of transmission structures as unattractive was most common among urban

² This is not to deny that some people have found attractive aspects to overhead lines, although some of the more vocal have had strong connections with the industry (see discussions in Luckin 1990, p.98, 100-101).

³ Five examples will suffice: in Exmoor, consultations around village enhancement measures generated public support for undergrounding overhead lines: notably in Porlock, where community initiated the scheme in 1991 (3.3.92, report to the Exmoor National Park Committee); consultations for next Exmoor Local Plan revealed 10-15 village communities which would like to see undergrounding of services (pers. comm. 2000); the Peak Park Joint Planning Board reported public support for undergrounding in Castleton, at the conservation area exhibition held in 1983; a survey conducted in the Yorkshire Dales in the late 1990s, in conjunction with the instigation of the Millennium Trust, got positive feedback on village undergrounding; draft Regional Planning Guidance for the North West, para 6.41, identifies 'pylons' as one of a number of 'unattractive urbanising features' that degrades the urban fringe (North West Regional Assembly 2000).

⁴ A proxy might be taken from the deliberations of stakeholder groups and the electricity companies. TXU-Europe (2001, 5) report that their stakeholders identified *inter alia* issues of energy efficiency, pollution and performance improvement as key sustainability issues, not visual intrusion. This is reflected in the focus of the environmental reports of a number of electricity companies that have generation and distribution interests.

residents, followed by suburban residents and then rural residents.⁵ In reviewing existing literature, Priestley and Evans (1996) observe that studies of public reactions to electricity transmission lines tend to find that residents view such lines negatively: that they believe that such lines tend to adversely affect the aesthetic quality of their neighbourhood.

In concluding, Furby *et al.* (1988a) suggest that the very specificity of studies of the environmental impacts of power lines makes the development of general principles very difficult. Certainly, the character and intensity of opposition to power lines and attitudes towards any economic benefits they may bring has varied from place to place (Luckin 1990). This is borne out by Priestley and Evans' (1996) study of the perceived effects of a newly rebuilt high-voltage transmission line located in a suburban residential district in California. They found that health and safety was the most negatively perceived impact of transmission lines, over aesthetic impacts, but also that 'residence in the neighbourhood prior to the construction of the line, opposition to the line at the time of construction and use of the right-of-way occupied by the line' (p.71) were important determinants of responses.

Furby *et al.* (1988a) had been unable to locate any systematic empirical studies of the public's willingness to pay to put power lines underground. The one area that they considered offers greatest scope for useful generalisations, but requiring further research, is the effect of transmission lines on property values. It is certainly a staple of conflict over power line development that people fear an erosion of the value of their property.⁶ Furby *et al.* also considered that these values would be relatively easy to quantify. This surrogate for the costs of environmental degradation is a form of 'hedonic pricing' (Pearce *et al.* 1989) and has been widely discussed among environmental economists. However, this approach is not without methodological and philosophical problems.

The effect of power lines on property values has been a sufficiently important and controversial issue in the US for a number of studies to be conducted. These are also reviewed by Furby *et al.* (1988b). One method used to appraise the impacts of transmission lines on property values is the 'comparative sales approach', based on actual market sales of similar properties, some with and some without the presence of power lines. While this method may give access to the hedonic price of a bundle of environmental 'goods' or 'bads', it cannot separate the effects of visual amenity from other concerns about power lines. Mountain West Research (Fridriksson *et al.* 1982) identified 27 'key' studies and, of these, ten found that transmission lines had no significant effect on land values, ten were inconclusive, and five reported that the effect of power lines on land values was negative.

Mountain West themselves concluded that the majority of these studies were methodologically suspect for one reason or another, except for two. Colwell and Foley (1979) looked at the impact of a 138kV line on property values in two Illinois areas between 1968 and 1978. The selling prices of 200 properties were predicted on the basis of ten variables, and regression analysis demonstrated a statistically significant negative relation between selling price and proximity to the transmission line for properties within 200 feet of the line. The other (Boyer *et al.* 1978) examined over 1000 agricultural property sales in

⁵ This conclusion is contradicted by at least one U.S. study: Hull and Bishop (1988) found that the scenic impact of transmission towers was influenced by the landscape surrounding the tower and that rural landscapes suffered the greatest impact. Their findings were not statistically significant, however.

⁶ In the UK, landowners' representatives have often claimed that the presence of overhead lines can significantly devalue land, especially where the market is most buoyant for land with higher amenity values (CLA Interview, 21.05.01, carried out for UK CEED 1991). The presumption must be that this devaluation is above and beyond what wayleaves or easements pay for. At the Trentham 132kV power line consent review (DTI 2000), objectors claimed that increasing public anxiety about the health risks of electro-magnetic fields had made devaluation of property values much more noticeable.

Canada between 1967 and 1977. Per acre values near transmission lines were found to be 16-29% lower than those of similar properties without their presence.

One topic that has been little explored, but that Furby *et al.* (1988b) suggest warrants further research, is the perception of land values; the subjective factors that affect public attitudes towards transmission lines and can determine perceptions of land value. The hypothesis that if a person considers a power line unsightly he/she will feel that the affected land is worth less than identical land without power lines has yet to be evaluated empirically. Also in need of further work is the discrepancy between 'expert' and 'lay' judgements of property value effects. Existing studies seem to suggest that while lay people generally believe power lines have a significant negative effect, professional appraisers in the US have tended to maintain that there is no effect at all. Moreover, Priestley and Evans (1996, p.73) report that 'the inter-relationships between cognitive (e.g. visibility judgements) and affective processes (e.g. opposition to the transmission line) is a relatively neglected area in environmental psychology'.

As one can see, most research has been conducted in the US, rather in the UK where 'for more than a century and a half ambivalence and opposition to technological change have lain at the heart of ... social life' (Luckin 1990, 1). Such ambivalence is clearly apparent in conflicts over the presence of technological systems in the countryside. Yet careful literature searches conducted for UK CEED 1991 and for this study have unearthed just two British studies of any significance - Goulty 1984 and Willis and Garrod 1997. These are dealt with in turn.

Goulty 1984

Although passed as a PhD thesis in 1984, Goulty's survey was actually carried out between September 1974 and March 1975. Much has changed in the interim - not least electricity privatisation and growing public sensitivity to environmental risks - but the results remain interesting, not least because a survey of this scale is still unusual. The survey was concerned solely with the higher voltage transmission system. Altogether 2,148 questionnaires were mailed to a sample of potential respondents including 600 randomly selected individuals, 400 chairmen and secretaries from amenity societies, 444 from 'geographical groupings', 504 from the land-based professions, and 200 from non land-based professions. 1,200 completed or part-completed questionnaires were returned. The most important findings for the purposes of this study are as follows.⁷

Section 1: General Amenity.

Question 1.1 asked '(w)hen you are out in the country which things do you find to be the greatest eyesore?' 12% said 'pylons', second to 'litter and rubbish' at 29%. When chosen from a restricted list of slag heaps, railway lines, caravan sites, pylons and gas works, pylons (20%) came second to slag heaps.⁸ In answer to Question 1.4, 92% of respondents knew or guessed that underground cables were more expensive than overhead lines.

⁷ Note that the vernacular term 'pylons' is used deliberately by Goulty to describe overhead lines and transmission towers.

⁸ In the consultation exercise for the National Park Management Plan, the Lake District NPA set a closed questionnaire response asking people about their most desired changes, and whether the options put forward were the most appropriate (LDNPA 1998). Removing overhead lines was not one of the most desired changes listed but nor did any significant number of people suggest that it needed to be added.

Section 2: Routing of Overhead Lines.

To Question 2.1, 71% agreed that pylons in country areas were necessary even if they made the countryside less beautiful. In Question 4.2, 42% considered pylons to be a minor problem in their area and a further 12% considered them to be a major problem. Question 2.3 asked what aspects of pylons caused concern: 71% gave an answer relating to the negative effect on visual amenity, and 66% found pylons to be actually visually offensive. When Question 2.5 gave people a choice of 'urban', 'rural', 'suburban' and 'no difference', 64% of respondents found power lines most offensive in rural locations, with just over 25% finding them equally offensive wherever they were. For only 44% of respondents did it change their attitude knowing that pylons were in a protected landscape area; 50% said it made 'no difference' to their opinion.

Section 3: Design of Pylons.

To Question 3.1, 41% thought that the CEBG had 'not much' concern with the appearance and attractiveness of pylons; 36% thought the CEBG were 'somewhat concerned'. In response to Question 3.3, some 61% thought that existing designs could be improved, with the most popular method being making them slimmer with fewer lattice members. On the other hand, to Question 3.5, 63% of respondents thought that a reduced height pylon would be worse: 'too stocky' (22%) or 'less elegant' (10%). When Question 3.7 offered respondents six options of new designs, 48% preferred them to existing designs, with pole types being the most popular. Only about 14% preferred the existing pylon. However the responses to Question 3.10 recorded that 71% of the national sample were against accepting any increases in costs for the new structures over that of the standard pylons. This broad preference for pole-type designs was also found by Priestley and Evans (1996).

Section 4: Ratio of Number to Height of Pylons.

53% of the respondents to Question 4.1 thought there was some advantage in varying the number of pylons per mile, but only 28% of respondents tried to specify a ratio they preferred. Of this smaller section of respondents, 61% were in favour of the minimum 4 pylons per mile. Only 2% of the total survey group considered any increases in costs in varying heights and spacing to be justified.

Section 5: Colour of Pylons.

In reply to Question 5.1, 49% did not even answer the question about what was the most commonly seen colour of pylons - proof perhaps that the pale grey colour effectively blends with its surroundings or that most people do not care enough to notice.

Section 6: Undergrounding Transmission Lines.

Question 6.1 gave respondents some details about the relative and absolute costs of undergrounding, and 48% of the national random sample agreed with the CEBG's policy of generally using overhead lines for electricity transmission. When asked (in Question 6.2) whether they felt that the extra costs of undergrounding would be justified in some circumstances at 132, 275 and 400kV, approximately two thirds of respondents said yes and one third said no, across all three voltages. Younger respondents, 'activists' and the staff of amenity societies were more inclined than the national sample to consider the costs of undergrounding justified. Of landscape architects, over 90% felt that the undergrounding of power lines was sometimes justified.

The next question asked what respondents thought about the ten undergrounding schemes that had (then) already been undertaken by the CEBG and whether the cost (given) was justified in relation to the amenity preserved. This was to apply only to locations that the respondent knew. In eight cases there was a majority in favour of undergrounding. In just

two cases was there a majority against - under the Thames and the Medway - where undergrounding was installed primarily for engineering reasons, not to preserve amenity.

For Question 6.5, 43% of respondents supported the idea of undergrounding all power lines in National Parks: 25% said 'most' of the lines; 25% said 'special cases only', and 7% said that 'none' should be put underground.

Question 6.6 stated that 'if all future 275 and 400kV lines were to be put underground each household would have to pay an approximate additional cost of £1 per year'. 73% found this additional cost acceptable and 21% unacceptable. The younger and better educated, the chairman and secretaries of amenity societies, and 'activists' were the most likely to find this an acceptable idea. However, of the geographical subgroup 'those living more than 10 miles from power lines', 45% were against paying the sum. But, in response to Question 6.7, 76% were prepared to pay some extra cost for some undergrounding of lines.

The main conclusions that one might draw from Goulty's survey is that overhead transmission lines are a significant source of visual disamenity but, as with the U.S. studies, not necessarily the most significant. These effects are felt to be most severe in rural areas, albeit not necessarily made more severe just because an area has been designated as of high value. The Goulty survey suggests that altering the height, design or colour of transmission towers has little effect in improving the appearance of overhead lines: only undergrounding solutions were felt by a majority of people to be worth the expense, although routing solutions fell outside his analysis. What was confirmed by Goulty's analysis is a broad willingness to pay for increased levels of undergrounding, and an acceptance of the higher additional costs incurred for most of the undergrounding schemes developed by the time of the survey.

Willis and Garrod 1997a

In a more recent study, Willis and Garrod set out to place a monetary value on the amenity loss suffered by visitors to canals or waterways caused by public utility network service crossings. This included electricity transmission/distribution lines, telephone posts and wires, and pipeline crossings. As they point out (1997a, p.36), 'the methodology is equally applicable to ... utility networks crossing National Parks, Areas of Outstanding Natural Beauty, or other areas that attract visitors'. A sample survey of visitors to three canalside locations participated in a 'contingent ranking' exercise, in which respondents were asked to rank a number of descriptions of environmental quality improvements on the basis of their preferences for the attributes of the improvement and their 'willingness to pay' the prices attached to the descriptions. This was done by giving respondents four cards, one from each category of intrusion reduction (i.e. from no reduction in service crossings which incurs no cost to the consumer, through to category four, 'high' reduction in service crossings of between 70 and 100%, for which the annual price could vary accordingly from £15 to £25). Respondents were asked to rank the cards in order, from the most to the least preferred option. As well as this exercise, respondents were also asked to indicate on a scale of 1 to 10 the intensity of loss of amenity they experienced from a specified list of externalities. In total, 932 individuals gave usable responses to the survey.

Table 2.3 Awareness of, and relative utility loss from, different environmental externalities along canals

	% of visitors affected	enjoyment detraction points (maximum is 10)	number
pylons and power lines	90.63	5.536	928
other overhead cables	90.17	5.272	926
modern road bridges	88.34	4.628	926
litter and rubbish	99.14	9.222	935
Graffiti	97.96	8.648	932
Pipelines	88.62	4.573	923
poor towpath surfaces	93.09	4.856	926
other waterway users	66.31	2.469	926
Source: Willis and Garrod 1997a, p.38			

In the analysis of perception data, Willis and Garrod (1997a) show that respondents ranked pylons and power lines fourth behind litter, graffiti and poor towpath surfaces as externalities along the canal that affected their enjoyment. When the measures of the scale of that loss of enjoyment are considered, pylons and power lines rise to third in the rankings, but record a much lower score for utility loss than either litter or graffiti. This conclusion, that people do not necessarily find overhead lines the greatest source of visual disamenity reflects the findings of Gouly (1984).

From the contingent ranking survey data, Willis and Garrod calculated that the public had a willingness to pay trade off of £0.04, £0.09 and £0.10 for a 1% reduction in pipe bridges, electricity pylons and lines, and other cable crossings respectively. Taking the analysis further, and multiplying these individual measures by the just over three million households that visited canals in 1995, gives an aggregate willingness to pay for a 1% reduction in pylons of £308,287. A 1% reduction in all three types of service structure is valued at almost £0.75 million per year. Furthermore, assuming a constant rate of decline in marginal willingness to pay, then Willis and Garrod estimate the aggregate w.t.p. to remove all service crossings from inland waterways comes out at £14.53 million for electricity lines, and some £37 million in total for all service crossings. As they note, this level of compensation could be considerably less than the cost of actually removing the service structures⁹. Instead, they propose requiring public utility companies to sponsor other environmental improvements to compensate for the disamenity from service structures - removing rubbish and graffiti is something that they argue would produce greater positive benefits to users.

Willis and Garrod's survey shows some of pitfalls for those expecting willingness to pay studies to generate robust arguments for undergrounding: the aggregate monetary value placed on the disamenity arising from power lines crossing inland waterways may come out much below the financial costs of undergrounding or relocating the lines.¹⁰ But it also

⁹ Especially given the technical difficulties of placing a line under a canal.

¹⁰ Similarly, commentators have been critical of what they see as a tendency in cost-benefit analysis to give greater weight to 'trivial pleasures' experienced by large numbers of people over great losses suffered by a few. In his economic appraisal of

shows the difficulties in treating environmental quality in terms of flows of monetary measures and of the assumption that one set of environmental costs can be substituted by another set of environmental benefits. This could be contested in any particular case. The concern that a cost-benefit approach to environmental management might endorse the gradual erosion of environmental quality (provided that actual or hypothetical monetary compensation could be paid) sparked interest in conceiving of sustainable development in terms of maintaining a physical stock of environmental capital.

two alternative routes for a 132kV line to Skye, Price (1993) produced results that favoured a more remote route through Kinloch-Hourn above the Glen Shiel route, which followed major roads but affected greater numbers of tourists. As Price is at pains to point out, however, this tendency is not inherent to the method.

11.4 Corporate environmental reporting and target-setting

This section presents an empirical analysis of the treatment of landscape and undergrounding issues within corporate environmental management and environmental reporting provisions. Thus, it will seek to understand how far the different companies are treating the visual intrusion of their distribution network as an area of continuous improvement in terms of environmental management and, in particular, to understand how far the companies are keen to set a target for future undergrounding work and place it in the public realm.

First of all, however, it should be acknowledged that not all electricity distribution companies have begun environmental reporting. In their draft environmental action plan, OFGEM (2000a) set out its intention to encourage all companies to report annually on their environmental activities, as a means of achieving greater transparency and consistency of information across companies. This analysis of undergrounding has made similar calls in earlier chapters. However, responses to OFGEM's suggestion encountered ambivalence within the energy sector:

'The study showed strong resistance on the part of the companies to mandatory public environmental reporting requirements ... The companies described the industry as an already "heavily regulated" sector ... Some respondents highlighted the high cost of issuing public environmental reports while others saw environmental reporting as a good opportunity for competition between companies and enjoyed the current freedom to present data when and how they choose' (OFGEM 2001a, para 7.5).

In taking the issue forward, OFGEM decided to continue consulting on a series of Key Performance Indicators for the gas and electricity sectors. It is worth considering whether some measure of 'visual intrusion' could be part of such indicators; an issue dealt with in Section 11.5 below.

There is some statutory impetus for reporting on landscape issues. Circular 12/96 (DoE 1996) states that '(r)elephant authorities will be expected to be able to demonstrate that they have fulfilled this duty (and) to consider whether they could usefully make reference to it in their annual reports' (para 19).

The research carried out for this project is based on a survey of environmental and/or sustainability reports for the UK electricity distribution companies available during summer 2000, with a follow up trawl carried out in February 2002. The prime source of data was the Internet, with some follow up requests by telephone where suitable contact individuals could be identified. About 60% of the electricity distribution companies currently issue environmental reports, and some have been doing so regularly since 1992.¹¹ The table in Appendix 4 tries to summarise the representation of visual intrusion/undergrounding issues in company environmental reporting.

The first observation is that landscape and amenity issues are only a small part of the environmental and social implications that many electricity companies are dealing with. For those companies that also have interests in electricity generation, issues of landscape and amenity arising from electricity distribution can form but a small part of the total analysis. TXU-Europe quite explicitly identify the five 'most significant environmental impacts' as global warming, acid rain, fossil fuel use, waste to landfill and water use, treating the visual

¹¹ Manweb claim to have been the first regional electricity company to publish an annual environmental report, back in 1992 (Manweb 1993).

intrusion from electricity distribution lines as one of a number of 'other issues' (TXU Europe 2000 *Sustainability Report 1999*, www). In reports produced by multi-utilities, the sustainability issues arising from the visual intrusion of electricity lines can also be dwarfed by water supply issues. Companies that report on the environmental performance of domestic and international operations also end up with reduced space for domestic landscape issues.

Restructuring of the industry has also threatened continuity of reporting. In certain instances, where companies have an interest only in electricity distribution they have taken the decision not to produce environmental reports on grounds of expense, taking former reporters (that were part of multi-utility companies) with them. Western Power Distribution's takeover of Infracore, that used to report as part of Hyder, is one such instance. Western Power Distribution just feeds into the Electricity Association's collective reporting, since without a regulatory requirement for environmental reporting the company feels it cannot justify the cost. That is not to say that internally the company may not continue pursuing environmental management objectives. The transfer of Northern Electric and Yorkshire Electricity into the same private hands likewise brought their public environmental reporting to a close at the end of the 1990s.

The changing structure of environmental reporting, while adding greater rigour to the process, can also militate against detailed coverage of visual impact issues. Efforts by some companies to merge environmental, social and economic reporting, and to achieve consistency of style across operational sectors, has squeezed the coverage of each sector in order to produce a manageable document. Topics that do not fit easily into the overall analytical framework - based on targets and measurable performance - receive less consistent coverage as a result. Visual amenity issues arising from overhead lines seem often to fall into this category. Visual amenity also does not feature in the government's headline indicators or targets for sustainable development - the framework adopted by some companies for their sustainability report (e.g. United Utilities 2000).

From the data contained in Appendix 4, one can identify a number of features:

- In most instances, the information given on the visual impact of overhead lines is **explanatory**; acknowledging issues of visual amenity, explaining how the company deals with it, and perhaps also addressing reasons for and against undergrounding. This is often coupled with information that is **illustrative**. Very often a company will highlight examples of positive work it has been doing to improve the visual impact of its distribution system, citing particular undergrounding or line removal projects. No companies produce a complete audit of this work, although some come closer than others.
- A number of companies state their commitment to, and acknowledge the importance of, objective and quantifiable targets. Their stakeholders 'find that the setting of challenging and relevant targets, and the reporting of progress against them, to be one of the most useful ways of gauging companies' environmental performance' (PowerGen plc 2001, 1). But few companies have set targets for undergrounding their existing network. There is target-setting for issues related to electricity distribution, but this tends to cover the control of oil-leakage risks from cables and switchgear, minimising the release of sulphur hexafluoride, reducing bird strikes (where there can be links to UK biodiversity targets), managing and reducing excavation spoil and especially disposal to landfill, also the use of trenchless excavation, or responses to customer queries about risks from electric and magnetic fields. ScottishPower has set 'visual impact targets', but these pertain to measures to improve their *procedures* for line development and management, and to complete specific environmental enhancement *projects*, rather than longer-term targets for system undergrounding.

- A small number of companies (e.g. PowerGen and National Grid Company) produced data in a form by which the general visual presence of their system (lengths of overhead and underground system) can be judged. PowerGen (1999, 33) stated that ‘the figures continue to demonstrate consistent reduction in the length of the overhead line network ...’ – a genuflection to the concept of continual and measurable improvement in the area of visual impact. National Grid (2000, 13) measured net gain and loss of system kilometres on an annual basis. Others have reported – *but not always every year* – on the length of existing overhead lines they had undergrounded or removed. However, this reporting is done on a different basis by different companies: TXU-Europe reported every year on the length of existing overhead line undergrounded through their amenity fund; some set out the village undergrounding schemes they plan to complete (ScottishPower in 1998/1999 and 1999/2000); while others (such as Northern Ireland Electric [NIE]) report on the total amount of undergrounding completed.
- NIE did most to place their achievements in undergrounding within the framework of achieving continuous improvement. In their environmental report (1999, 26-27), NIE set out their case for and against undergrounding, adding ‘(w)e do not plan to put all overhead cables underground’, but they did set a target of undergrounding 20km of overhead line in 1998/99 (which they achieved), and set a target of 30km for 1999/2000.
- Scottish and Southern (2001) set out an interesting procedural objective in the field of visual amenity: Objective for 2001/2002: ‘share operational and investment plans with Amenity Panel’ (2001, 15).
- Outwith their environmental reports, Manweb and Snowdonia NPA made it part of their concordat on National Parks that they regularly publish statements on its performance. Similarly, NGC states that it will ‘review our performance against these commitments and report the findings in our annual Environmental Performance Report’ (Corporate Forum for National Parks 2000, 10).

Of course, environmental reporting can have an ambiguous relationship with practice. One company representative said that they had an open-ended target to underground ‘as much as we can’, although their environment report gave no measure of what this might amount to. Undergrounding carried out routinely in conjunction with asset replacement is not considered a suitably ‘environmental’ topic by some companies. Officers from another company suggested that their reporting of activities on undergrounding was really just a ‘feelgood’ statement, with projects and processes drawn from their overall replacement/refurbishment programme and giving it a distinct profile.

Publishing information on changing system lengths for the overhead and underground parts of the system is clearly important and is a necessary precursor to assessing broad rates of change on an annual basis. This reinforces the conclusions and recommendations made in Chapter 3. Some companies would point out that information for assessing changing system lengths is set out in their annual Quality of Supply Report: it is important that such information is placed in the public realm somewhere. But having the data is only a start point for assessing progress – the next section of the chapter examines how targets for undergrounding might be set.