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ENVIRONMENTAL ASPECTS OF LINKS BETWEEN POWER SYSTEMS PLANNERS AND DECISION MAKERS IN THE ENERGY AREA

Working Group
37.13

December 1995

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CIGRÉ REPORT WG 37.13

"Environmental Aspects of Links between Power System Planners and Decision Makers in the Energy Area"

SUMMARY

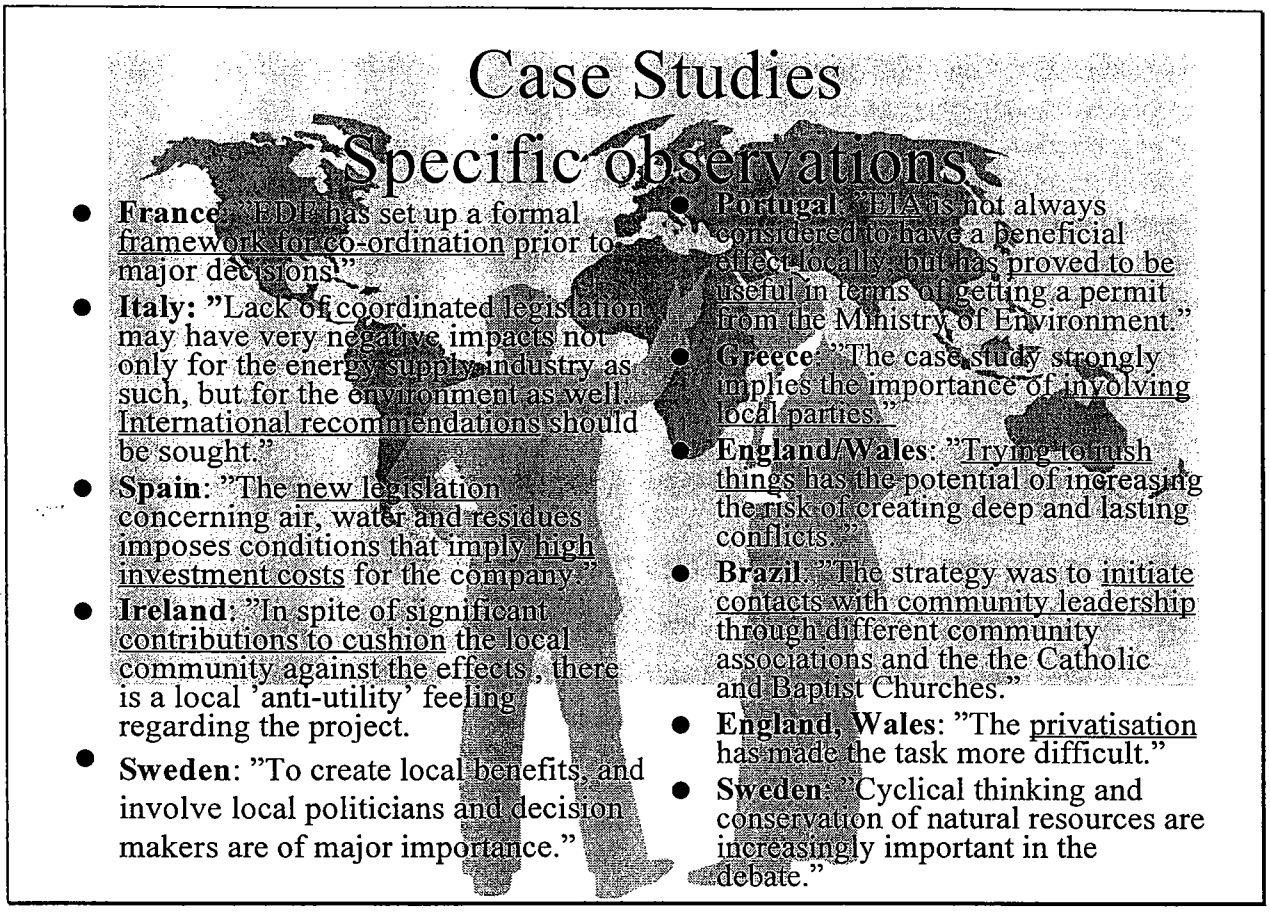
The necessary skills for the communication of environmental issues do not differ significantly from the skills necessary for communicating the benefits of a project as such. There is, however, a trend towards greater involvement of local officials, authorities and the general public in site or route selections and in cost benefit assessment. One-way communication and public information are being replaced by dialogue, more and more often within the framework of an Environmental Impact Assessment.

While it seems clear that in the past, lack of involvement has led to great difficulties for project promoters, it is still too early to judge the success of this increased involvement. Even though the applicant has paid much attention to informing and communicating the environmental impact to media, the general public, authorities and representative groups, attitudes to the project have often remained highly polarised. This demonstrates that however well planned the communicative process may be, any project requires a strong and sustainable political support as well as a good application in accordance with existing legal frameworks.

This is the conclusion of Cigré WG37.13 "Environmental Aspects of Links between Power System Planners and Decision Makers in the Energy Area". The task of the group has been to compile and analyse international experience of communicating environmental issues between decision makers, the general public and power system planners. Contributions to the work have been provided by members from 15 countries (France, USA, England, Brazil, Portugal, South Africa, Korea, Finland, Canada, Spain, Australia, Italy. Ireland, Greece and Sweden). The report primarily draws conclusions from recent transmission and electricity generation projects.

The report does not focus upon the necessity of communication as such, or whether communication actually is desired, but rather addresses means to improve the communicative process and where experiences gained have showed interesting or encouraging results.

The application procedures, and the way an application is treated, differ substantially from country to country. Therefor the communicative issues in general differ as well as the possible ways to improve communication as such. Some specific conclusions, mainly regarding the communication of environmental issues, have been extracted directly from observations made and experiences gained in the case studies provided by the contributing members.



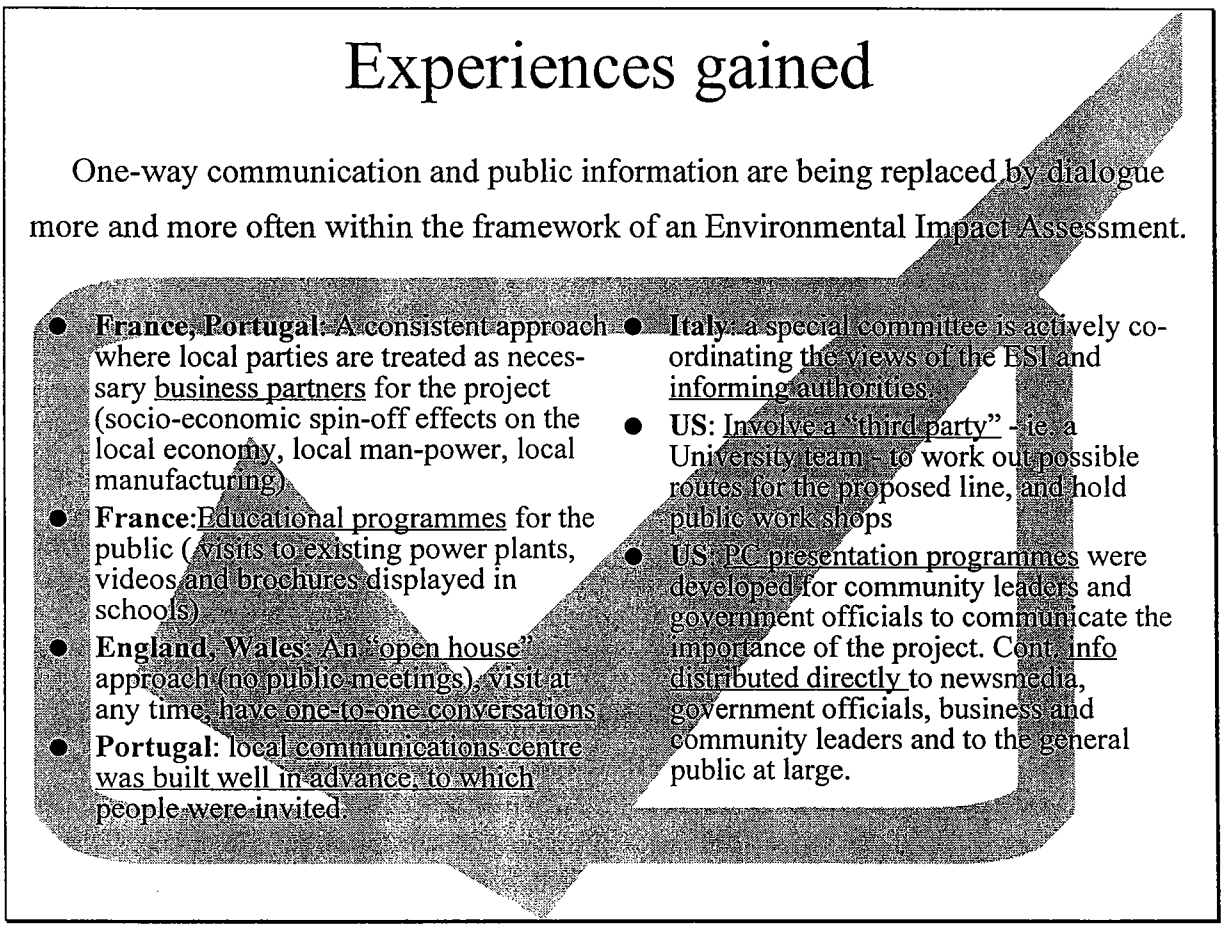
Trends

There is a growing internationalisation in the area, in terms of legislation and in the arguments deployed by organised objector groups. Revised legislation is also causing increasing difficulties in connection with the siting of energy projects and increasing environmental costs. Greater efforts are being made to communicate with the public. The assessment process though, adds a higher degree of certainty in showing the necessity of a new power plant or transmission line project.

Companies tend to embark on increasingly detailed Environmental Impact Assessments at an early stage of the project. A carefully considered EIA that has been well prepared by the applicant/utility at an early stage of the project can serve to make the dialogue between the designer on the one hand and the authorities and general public on the other more constructive. The dialogue and the consultations regarding the scope of the EIA which is becoming a requirement will help.

Communication skills and conflict management

Public opposition is the strongest where the influence of any project is most obvious and the perceived benefits the least. This is often a problem in the case of transmission lines which offer no obvious benefits to local inhabitants along the route. Inevitably though, there will be cases where differences between an applicant, local interests and amenity environmental bodies cannot be resolved. In these cases, the project may be subject to political enquiry or legal procedures.



Efforts to inform the public are continuously increasing. It is increasingly important that the information process incorporates a dialogue taking into consideration the need for special information for each target group. Simultaneously, it is just as important to receive information on, for example, local values and to identify issues of current debate.

Building up confidence is a resource and time consuming process which can be destroyed quickly. Areas in which communication skills and conflict management tend to become increasingly important are:

- Mass media have a great impact on public opinion. Good relations with the media are desirable but difficult to obtain.

- Organised opposition groups are of special concern to the project developer. Organised opposition groups generally have a large influence on the debate, and in forming a political and public view on the project.

- Negative opinion and conflicts regarding environmental issues can be avoided or reduced and the decision making process and application assessment procedure will run more smoothly if consultation with and information to all parties concerned is done at an early stage. Influential people and groups should be identified, consulted and informed continuously.

- It is important to provide correct information to the general public. It is equally important to recognise the view of the general public and to treat them with respect and straight forwardness. However, experience show that it is vital to maintain the initiative in the communicative process.

- It is important to identify conflicts that can be solved through information where possible. Conflicts that cannot be solved may however in some cases be balanced against project benefits such as by developing local benefits through partnership with municipality and local industry.

It is important to monitor developments and trends in environmental legislation in order to predict future requirements. Long-term planning in the power industry based on potential new environmental requirements provides a basis for influencing political decisions and new legislation. This includes achieving good relations with local and regional authorities and regular dialogue with identified decision makers and key advisors. However, in many countries no such long term environment work exists.

1. INTRODUCTION

This report compiles the experience of the members of WG 37.13 on the communication of environmental issues in connection with the siting of and permit processing for energy plants and transmission lines. The aim has been to identify initiatives to improve performance and to succeed in the communicative process. It may also be regarded as an extension of WG 37.09's work on "Links between Power System Planners and Decision Makers in the Energy Area" (appendix 2).

The report is based on actual case studies. To some extent, replies from the members of the working group to a questionnaire has been used to scan trends and country-specific issues on e.g. legislation. The questionnaire was prepared by the secretariat. A total of 12 individual case studies, plus an additional country-specific study, have been compiled together with the responses to the questionnaire. When reading the report, it is important to remember that the answers compiled do not necessarily represent the country, but rather views based on the experience of individuals or companies. We have tried to recognise trends, differences and similarities in the environmental work associated with the siting of energy production plants or power lines and, where possible, to draw general conclusions.

The members of WG 37.13 are:

Mr. Astolfi	France	Mr. Maliszewski	USA
Mr. Casazza	USA	Mr. Mihaileanu	Romania
Mr. Collins	United Kingdom	Mr. Murphy	Canada
Mr. Englund (convener)	Sweden	Mr. Papazoglou	Greece
Mrs. Fornari de Ary Pires	Brazil	Mr. Pelegry	Spain
Mr. Goncalves	Portugal	Mr. Rollinson	Australia
Mr. Hepburn	South Africa	Mr. Salvaderi	Italy
Mr. Härkönen	Finland	Mr. Smith	Ireland
Mr. Ho Jung	Korea	Mr. Töcksberg	Sweden

2. GENERAL OBSERVATIONS REGARDING THE ENVIRONMENTAL THINKING OF COMPANIES

Environmental issues play a significant role in the thinking and policy making of many energy companies. To identify the relative importance compared with other issues, a limited survey was carried out within the working group. To the question on how important the environment is to energy companies, among other factors to be considered, the siting of energy installations can be classified as "rather important". However, for instance in the choice between energy sources, environmental factors tend to play a more decisive role. Generally it is regarded as being important to take environmental factors into consideration at an early stage of the planning in order to provide for information and explanations, and thereby gaining acceptance from as many of the parties concerned as possible. There is a trend towards companies embarking on increasingly detailed Environmental Impact Assessments at an early stage of the project.

Good contact with central and local politicians and authorities as well as the general public are a basic precondition for a successful project. Useful contacts with politicians and authorities benefit from long-term effort and planning.

The following general observations were made

- Overhead transmission lines generally tend to provoke more massive objection, due to a significant visual impact in connection with very limited benefits to those affected. Severe delays, more than 10 years, have in many cases been experienced as a result of public opposition.

- Worries about electric and magnetic fields (EMF) when planning and building transmission lines, are causing conflicts and adverse local opinion in many countries.

- The emphasis on environmental assessment and planning is moving away from environmental control to integrated resource planning taking account of environmental impacts. Methods by which environmental costs (i.e. externalities) and issues can be brought to the forefront of system planning and siting studies are being explored. These can be examined on a level playing field with economic and other costs.

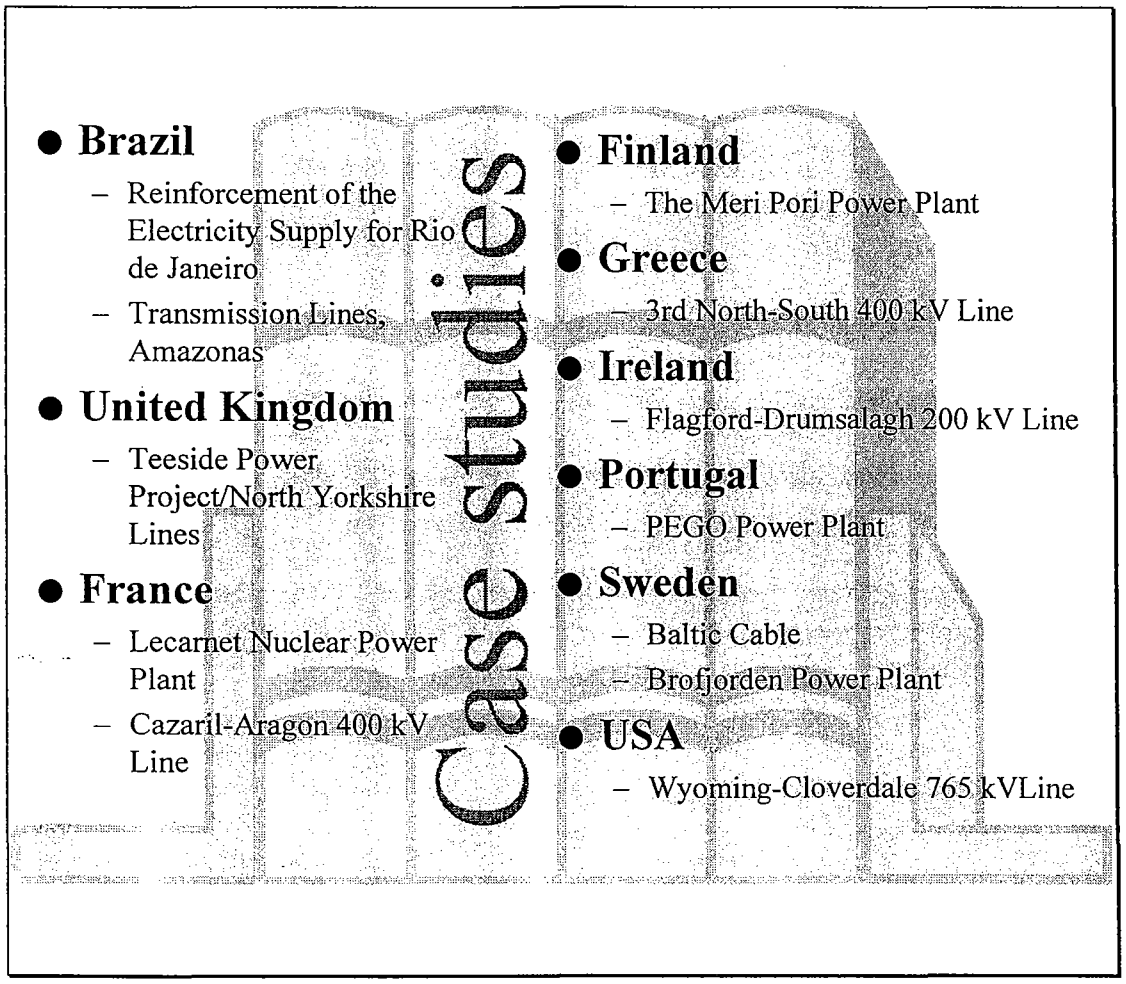
- It is useful to monitor carefully trends in environmental legislation in order to gain a clear view of the future development of requirements. This makes it easier to gain acceptance and the necessary permits.

- There is increasing concern on the part of the electricity supply industry to communicate the actual costs for the desired protection of the environment. Public opinion and the authorities concerned must realise that these entail significant costs, and ensure, with suitable incentives, that the desired solutions can be carried out without exposing the electricity supply industry to excessive costs. The situation is particularly important in singular

environmental permit applications, like transmission lines and the associated electromagnetic fields.

- The problem of carbon dioxide is nowadays taken more seriously. The fact that regional and global, and not only local, environmental issues are discussed during siting discussions and permit processing is a trend that is also being followed by many countries.

Several interesting and country-specific observations are found in the case studies, presented in the appendix 4.



A few of these country-specific observations are presented in the following:

- Experience from EDF (France) indicates that, apart from in very specific areas, environmental criteria are generally not instrumental in rejecting potential sites but may be used as strong ranking factors in reviewing possible sites and selecting the most suitable one.

  Over time the strengthening of regulations in respect of air quality will prompt the design and implementation of costly gaseous pollutant abatement systems deSO_x or deNO_x or resorting to so called "clean technologies" with fluidized beds, gas turbine, IGCC and suchlike.

  The experience of serious difficulties encountered in obtaining routes for new transmission lines has prompted the French government and EDF to set up a formal framework for co-ordination prior to major decisions. However it is too early to state whether these provisions will ease the completion such projects.

- There is a growing concern in Italy that the environmental legislation on the national level, is forcing the utilities to go for expensive and sometimes ineffective measures. A recent seminar where all the major players were present, identified the need for a global approach to the environmental issues. The lack of coordinated legislation may have very negative impacts not only for the energy supply industry as such, but for the environment as well.

- In Spain it is at present difficult to find locations for the construction of new power plants because of local opinion on environmental impact. The new legislation concerning air, water and residues imposes conditions that imply high investment costs for the company.

- In Romania, electric utilities, as well as the politicians and authorities, would give higher ranking to sources and technologies less harmful to the environment if economic restrictions were not sever and the obligations to burn domestic low-grade lignite were not prevalent.

- In England and Wales, problems have been experienced with both new projects and existing lines. On new projects, in one case the process has taken from 1990 when the consultations started until 1995, when the second public inquiry was held and consent has not yet been granted. While other projects have not been as lengthy, the experience is that new lines are difficult to obtain. There have also been challenges and inquiries or hearings on existing lines.

  The privatisation of the industry has also made the task more difficult. Although the independent transmission company (NGC) has a statutory duty to develop the system and facilitate competition, the public often sees it first as a private and profit making company, where it used to see it as a public service.

3. BUILDING UP CONFIDENCE

Gaining the acceptance of all parties involved in a project at an early stage is important if siting, permit processing and environmental assessment processing are to be expedited. If there is a history of confidence in the company among local people and authorities, it is easier to gain acceptance for a project.

However, building up confidence is a tedious and time-consuming activity, which can unfortunately be broken very quickly. For example. in Ireland, the process of gaining acceptance among local people for the 220 kV line project was made difficult by the decision of the Electricity Supply Board (ESB) to close a 15 MW power plant burning locally-produced coal. Although ESB has made a significant contribution to local development efforts to cushion the local community against the worst effects of the closure, and despite the high regard in which ESB is held in most parts of Ireland, there is now local "anti-ESB" feeling which is making acceptance of the transmission line more difficult.

In much the same way Electricidad de Portugal's (EDP) previous approach to dealing with siting permits has proved to be inadequate in at least one recent case. The traditional approach of negotiating compensation for individuals was not adapted to the situation in the field, primarily because the siting methodology was only based on technical factors. Environmental and socio-economic and cultural factors were not considered adequately. Social sectors that would be in favour of the project were not stimulated to give their contribution, in particular those that could be influenced by the company's local agents. Environmental Impact Assessment methodology was not considered to have a beneficial effect. However an attempt to use it for the particular site proved useful in terms of getting a permit from the Ministry of Environment.

The Greek case study strongly implies the importance of involving local parties. The case study deals with the construction of a small section to complete a new transmission line. All necessary official and legal steps were carried out in an appropriate manner and without unexpected delays. The project also developed without any major public objections until in a late stage, when massive opposition started, causing severe delays. The project is still five years later not decided upon. Attempts were made to restart construction, but the resistance of the public effectively forced the case back to the courts.

Discussions aimed at gaining support for a project among the general public, municipalities and local authorities must be given time. Trying to rush things has the potential of increasing the risk of creating deep and lasting conflicts. In particular, the National Grid Company, responsible for transmission in England and Wales, has found that in a market led electricity supply industry, need can be a difficult argument to win with the public: ie, the old national need argument was more easily received. In England and Wales the National Grid Company have started a project by providing information about NGC's activities to key groups, politicians, trendsetters, teachers etc. in order to build up the confidence

on a long-term basis with regard to both existing and new assets. Providing information to schools is particularly important for the long term.

In order to deal with the rights-of-way for a transmission line project in a densely populated area in Brazil, a working group was formed comprising economists, biologists, journalists, social workers and system operating workers. The strategy of the group was to initiate contacts with community leadership through different community associations as well as direct contacts with the Catholic and Baptist Churches.

A trend in some countries is that county administrations and local authorities will be given greater freedom of action as far as environmental decisions, environmental assessment and siting matters are concerned, when Agenda 21 (from the Rio de Janeiro conference in 1992) is converted into local and regional programmes. In Sweden this process has already been initiated. And it will be even more important for power companies to enjoy practical and well-functioning cooperation with regional and local bodies.

4. IDENTIFICATION OF ENVIRONMENTAL ISSUES

The increased interest in environmental issues has resulted in growing awareness and greater involvement. The importance of identifying environmental issues at an early stage of a project is emphasized by several WG 37.13 members. There is also agreement on the fact that Environmental Impact Assessment (EIA) is a useful instrument, often a requirement, facilitating permit processing and is of great assistance to a developer in presenting the project to the general public. A basic precondition for this is that it is carried out well and clearly.

The EIA process enables environmental issues to be taken into consideration at an early stage of the project in the formulation of policy, planning and project design. The Environmental Impact Statement (EIS) enables decision making on whether the environmental impact of an activity can be accepted or not during permit application processing. The EIA work should result in the identification of the optimum environmentally acceptable solutions.

Many countries appear to have an environmental legislation in which EIA is a legal tool that is used both in communications with the general public and authorities, and in permit applications.

The Environmental Assessment Directive of the European Union has been transposed into the laws of the European countries. Other countries, represented by the WG 37.13 members, have a legislation on EIA with a similar content. It should, however, be pointed out that many companies have been using EIAs (or similar) for many years before they became a legal requirement.

A brief summary on the environmental legislation of the countries concerned, including the decision making process, etc, is given in appendix 3, as described in the replies to the questionnaire.

Local environmental impact is difficult to quantify, and therefore also difficult to compensate. Aspects that can be decided on are, for example, measurement and follow-up programmes for the environment and appeal inquiries.

Agreements, on measures to reduce impact on the countryside, that are paid for by the applicant, such as the liming of surface water and land have proved to be of benefit in order to reach a higher degree of acceptance.

5. CONFLICTS AND TRENDS

In order for a developer to be successful with a project proposal, it is desirable to remove the conflicts that can be avoided by means of information. There will however, always be conflicts where values are set off against each other. This is often very obvious when the benefit of the project is set against the local loss of values related to the countryside and the environment. It may be a different situation if on a local level there are environmental or other kinds of benefits directly to be derived from a project.

One trend, as indicated in the WG 37.13 questionnaire, seems to be that the general public has the lowest level of acceptance for coal, nuclear power and overhead transmission lines. The electricity producers, on the other hand, have a different view which indicates that these areas constitute the greatest risk of conflict. For further details, see the appendix 5.

The general view, which is given particular emphasis in several of the case studies, is that there are more difficulties involved in transmission line projects

than power station projects. This tends to be the result of the significantly larger number of parties affected, the lack of an obvious benefit to the areas crossed, but has also been caused by extremely well-organised objector groups,. On the other hand opposition to power station projects in existing industrial areas tends to be limited to environmental pressure groups who object on matters of principle such as the stabilisation of CO_2 emissions or the dangers of acid rain. This indicates that the opposition is stronger where the impact is most obvious and the benefits received are least.

Cyclical thinking and the conservation of natural resources are new aspects of Swedish debate on environmental issues which will make the prospects for condensing plants and the use of fossil fuels politically difficult. By constantly carrying out social and environmental analyses, experience indicates that it is easier to gain acceptance for the project (size, fuel, techniques, environmental ambitions)

Long-term planning in the energy sector calls for the anticipation of future environmental developments. As part of the activities with this purpose in mind, IVO (Finland), has conducted an annual public opinion poll on energy issues since the 80s. The results from the most recent years indicate a clearly declining trend in the popularity of coal as an energy source. This development has certainly not escaped the attention of the politicians who are involved in making energy policy decisions. In the future, it will probably be even more difficult to gain acceptance for coal-fired plants in Finland.

6. COMMUNICATION OF ENVIRONMENTAL ISSUES

There is a wide variety of target groups for information when communicating the project as such. Another issue is that when communicating environmental issues, the knowledge about those issues may vary strongly. Usually the groups are not specialists on environmental issues but have a wide range of knowledge and backgrounds. It is very important to be able to distribute correct and clear information to everyone concerned. On the other hand, the information must not be one-way. It is just as important to receive information on, for example, local values and to identify issues of current debate.

Many projects have been terminated or were severely delayed[1] because public opinion against them has been too strong. The consultative process - which in this context primarily means those activities which precede or are carried out over and above the formal permit application process - is crucial in gaining acceptance for a project. In consultation with both authorities on different levels and the general public, the greatest advantage is to be gained from contact at a very early stage and an open attitude, especially on environmental issues. One approach which has been successful in e.g. Sweden, is to establish a consultative

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[1] Supported by UNIPEDE report "International Cooperation; Strengthening And Better Use Of The International Interconnections", and by the case studies of this report.

group with representatives from the most important interested parties. In addition to municipalities and authorities, these may include the general public, professional and industrial organisations, and other companies with some form of connection with the activities in question.

In some cases the opinion is led by one or a few professional spokesmen who can be very difficult to deal with. In the USA, lawyers may be hired to stop or delay the projects.

The fact that it is important to engage the services of influential people and groups at an early stage of the consultative process is confirmed by responses in several of the questionnaires. Politicians and officials on a municipal, regional and national level who can influence the project on a direct or indirect level should be identified and informed, possibly throughout the application process. Coming elections should be studied, for example, to establish whether any controversial issues are likely to be taken up and decided on. It is a fact that politicians do not want to take sensitive decisions in an election year that could result in negative publicity. (NIMEY, Not in my Election Year)

Finnish experience of the coal-fired Meri-Pori Power Plant procured by Imatran Voima OY (IVO) shows that local opposition can in some cases be inspired by the personal opinions of a few key individuals in the local and county administrations. In the case of the Meri-Pori plant, IVO's own activities in connection with public relations helped to prevent the formation of a more concerted opposition on the regional and national levels. The case study also demonstrates the importance of continuous communication between power producers and administrative bodies at all levels.

Swedish experience of consultation is that it does not always function in the way intended. The reason for this may be that opposing interests are not voiced until a later stage and are not taken up directly in consultation. Other difficulties could be that too many detailed questions are taken up or that not enough time was allowed for sorting them into order of priority.

There is also an expected benefit in allowing a larger proportion of the communicative issues to be carried out by an impartial "third-party" entity. Both France and USA report this as an interesting solution to create objective communication. In the French case, local government representatives - in collaboration with the utility - will thus be commissioned to set up a Liaison Committee intended to prepare the broad outline and the general direction of the site selection process as well as the contents of the studies, and to monitor the results. The committee is composed of elected representatives of local and regional communities, members of socio-professional organisations, members of associations dedicated to protection of the environment, and independent experts.

In the US, University teams are being used for the evaluation of possible different routeings of transmission lines, as well as holding public work shops.

The way in which mass media cover the project can be expected to have a strong effect on acceptance, and good relations with journalists may be important. In the case of the Meri-Pori plant, a special study was made on regional media communication concerning the project. The results showed that the largest regional newspaper had taken the most balanced attitude towards the power plant. The smaller papers had given more coverage to the views of the man in the street, resulting in a more critical overall attitude.

The experience of ESB in Ireland is that national television can have a great impact on public opinion and that this is the most difficult of the mass media to deal with.

7. EXPERIENCES GAINED

The application procedures, and the way an application is treated, differ substantially from country to country. Therefore the communicative issues in general differ as well as the possible ways to improve communication as such. Some specific conclusions mainly regarding communication on environmental issues, has been extracted directly from the experiences gained in the case studies provided by the contributing members.

A specific aspect to the communication issue is the quality of the communication between electricity supply industries (ESI) and the national authorities, in particular during the preparation of new laws. In some instances there is a growing concern that national legislation, not least regarding environmental matters, may progress out of phase with international legislation. In Italy for instance, a special committee is now actively working to co-ordinate the views of the ESI and to communicate and inform authorities.

In all cases, the importance of involving local authorities and local opinion actively at an early stage is stressed. The communication of local benefits as a result of the project is considered important, as well as the importance of a consistent approach where local parties are treated as necessary business partners for the project.

The experience of EDF (France) is that a sound communication and information policy should not rely on contradictory debates, nor stem from disputes. Instead, a sustained policy has been chosen, based on both a continuous information to elected representatives, including those involved in major decisions, as well as educational information for the general public. The educational programmes for the public, which include topics such as visits to existing power plants, videos and brochures displayed in schools and information centres, or information through media is of primary importance. Specifically, attention is paid to the local benefits of any project, e.g. socio-economic spin off effects on the local economy, local manpower, local manufacturing, etc.

From several cases it seems clear that public meetings are not the appropriate way of achieving good communication. Instead an "open house" approach, enabling people to visit and have one-to-one conversations may be the best approach. This has been the experience of the National Grid Company. On the other hand, public meetings arranged by EDP were successful. In fact, the education of large segments of the local population through public meetings and seminars on the technology concerned, were found to be important although visits paid to other - similar - plants proved to be of prime relevance. The involvement of local utility personnel, associated with more friendly characteristics of the population of the hinterland proved to be fundamental. In parallel with these public meetings, a local communication centre was built well in advance, to which people were invited.

Another approach to creating objective information is to involve a "third party" - specifically American Electric Power used a University team - to work out possible routes for the proposed line, as well as holding public work shops to share their findings. Also, PC presentation programmes were developed for community leaders and government officials to communicate the importance of the project. Several discussion papers were prepared in order to demonstrate the importance of the project and the economical impact in the affected states. All these were distributed directly to news-media, government officials, business and community leaders and to the general public at large.

As can be extracted from the case studies and from the experiences of the WG 37.13, the necessary skills for the communication of environmental issues does not differ significantly from the skills necessary for communicating the benefits of a project as such. From the case studies, it may be seen though, that there is a trend towards greater involvement of local officials, authorities and the general public in site or route selections and in cost benefit assessment. One-way communication and public information are being replaced by dialogue more and more often within the framework of an Environmental Impact Assessment.

Even though the case studies sometimes out line fairly straight forward permit processes where the applicant has paid much attention to informing and communicating to media, the general public, authorities and representative groups, attitudes to the project have often remained highly polarised. While it seems clear that in the past, lack of involvement have led to great difficulties for project promotors, it is still too early to judge the success of this increased involvement. Even though all members of the WG 37.13 recognise the importance of environmental communication, and several examples exist on how the EIA process is used to actually improve the communicative process, this fact reflects that however well planned the communicative process may be, any project benefits froma strong and sustainable political support apart from a well performed application process in accordance with existing legal frameworks and requirements.

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APPENDICES

1. WG 37.13 Terms of references and objectives

2. WG 37.09 Summary

3. Legislation on Environmental Impact Assessment

4. Case Studies

5. Acceptance for Electricity Generation and Transmission Techniques

6. Emission Control : A Short Outline and Some Results

CIGRE WG 37.13

"ENVIRONMENTAL ASPECTS ON LINKS BETWEEN POWER SYSTEM PLANNERS AND DECISION MAKERS IN THE ENERGY AREA" - TERMS OF REFERENCE AND ACTION PLAN -

Objective

CIGRE WG 37.13 shall through exchange of experiences and analyses suggest measures in order to further improve the communication on environmental issues between Decision Makers and the General Public on one hand and Power System Planners on the other.

Terms of reference

CIGRE WG 37.13 is a continuation of WG 37.09, which focused on the general communication between Decision Makers and Power System Planners.

CIGRE WG 37.13 shall through exchange of experiences and analyses suggest measures in order to further improve the communication on environmental issues between Decision Makers and the General Public on one hand and Power System Planners on the other.

WG 37.13 primarily focuses on the interrelation between the environment on one hand and generation and transmission of electric power on the other. Problems such as NIMBY ("Not In My Back Yard") shall also be discussed.

The analysis will be limited only to the experience gained by the members of the WG in specific projects.

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Approval by SC Chairman

(Fax approval 1994-04-19)

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G. Manzoni Date

WG 37.09 Summary

OBSERVATIONS

- Lack of similarity in the political processes, and the influence of authorities in the planning process.
- The ownership of electricity utilities and of the transmission line networks varies.
- The right to invest, decide on electricity prices and other aspects of electricity supply varies to a great extent.
- The term "Energy Policy Makers" has different meanings in different countries.
- The scene is changing rapidly.
- It is necessary to establish a balance between energy, economy and environment.
- Planning and siting are becoming more and more complicated.
- It is necessary to improve the dialogue between policy decision makers, the authorities and the general public.
- Different partners in the dialogue have different perspectives
  - Long term: Power System Planners
  - Short term: Energy (Policy) Decision Makers.
- Different interests on national and regional levels (e.g. NIMBY).
- It is becoming increasingly important to justify new projects together with a strong tendency on the part of the authorities and the general public in order to promote energy conservation.

GENERAL CONCLUSIONS

- The general conclusion of the WG 37.09 group is that there is a need to improve the dialogue between power system planners on the one hand and the energy (policy) decision makers, as well as the authorities and the general public, on the other .
- This applies regardless of how the planning system is organised in the different countries.

WAYS OF IMPROVING THE DIALOGUE IN THE PLANNING PROCESS

- Show trust and openness.

- Take the initiative, do not wait for others to act.

- Since we are dealing with multi-disciplinary issues, this means
  - new tasks for engineers,
  - new competence is needed in our industry

In the contest of the planning process this means
- Try a two-phase process.
- Improve and simplify.

- To establish a dialogue, not a monologue
  - Person to person, e.g. "Open house"
  - Use common language

- Take help from oganisations and own employees to communicate
  - Professional organization, e.g. of engineers
  - Power industry's organisations
  - Universities
  - Employees of the company/utility.

- Introduce training programmes (both general and specific) for,
  - Utilities/engineers
  - Authorities
  - Policy makers
  - General public

- Contribute to local development

WAYS OF IMPROVING THE DIALOGUE - PREPAREDNESS

- Identify decision makers and how they actually arrive at their decisions.

- Develop a set of alternatives instead of one single recommendation.

- Be prepared to respond quickly to changing conditions or a different set of players.

- Recognise the importance of the various political motivations that are involved.

- Develop a full comprehension of the regulatory system and the role it plays as a substitute for market forces (i.e. where the environmental/social/political criteria are included).

- Recognise that at times attempts will be made to have the electric power system meet social objectives (and/or additional environmental goals).

Legislation on Environmental Impact Assessment

Brazil

The environmental legislation was established 1986, and since then the Brazilian society has been more aware about environmental subjects. Power plants larger than 10 MW and transmission lines with voltages higher than 230 kV now must submit EIA to the environmental agency. In the last five years EIA has become an accepted and mandatory practice for licensing. Quality for current EIA is still unsatisfactory. Utilities are beginning, in different degrees, to establish procedures aiming at incorporation of social and environmental aspects in power plant planning, siting, design, construction and operation.

Environmental permits are required by licensing agencies since 1986. Environmental guidelines were included in the 1988 Constitution. There are legal instruments that can be used by society to avoid or correct environmental damages. Siting of nuclear plants must be approved by Congress, as well as projects that affect Indian group or environmentally protected areas. Legislation is being enacted on audits and watershed planning as regards multiple uses. Standards on air and water quality emission have been established.

Public hearing are held in the end of the first phase of the licensing process (in the end of the planning/beginning of the project). Citizens and NGOs can use legal instruments to appeal against licensing decisions.

Canada

Ontario Hydro, which is one of the largest public utilities in Canada, adheres to numerous legislative requirements to ensure alternatives to projects, and alternate ways of implementing projects are examined and evaluated in planning and siting activities. For many projects, both federal (Canadian) and provincial (Ontario) legislational requirements must be fulfilled (e.g. Environmental Assessment Act, Canadian Environmental Assessment Act.). Projects can not commence until an environmental assessment study is prepared and approved, and relative permits are obtained.

For Ontario Hydro, project approvals are generally obtained via 4 venues: Individual Environmental Assessments (EA's), Class E.A.'s, Procedural Exemptions, and Exemption Orders. Individual EA's are required for major undertakings such as a new station. Class EA's are used for small scale projects where the effects are predictable and easily mitigated. The Class EA's outline a study process for the evaluation of such projects; this process

includes preparation of an environmental report outlining environmental concerns. Procedural Exemptions also outline a study process for evaluation (reporting/review procedure) of small scale projects. Exemption orders are prepared for undertakings where environmental effects are deemed insignificant.

In-house policies, guidelines and procedures related to site selection are also adhered to. "Environmental Management System" documents were recently drafted to provide a framework for the integration and management of the environmental function in the engineering and construction areas of the corporation. These guides provide a reference for environmental policies, performance measures, procedures and commitments that should underpin all activities carried out by the company.

Several changes to environmental legislation have occurred over the last few years. The recently approved Canadian Environmental Assessment Act includes a provision that cumulative environmental effects must be considered in planning and assessment studies. In the past, only site-specific, direct effects were evaluated for siting projects.

The environmental Bill of Rights gives the public the right to challenge decisions pertaining to project approval. It also empowers employees of a company to report on any mishaps or non-compliance without fear of retaliation from his/her employer.

England

The privatisation and reorganisation of the electricity industry in England and Wales and the number of new generating stations led to the need for the first new major transmission developments since the Super Grid was completed in the early 1970's. The National Grid Company therefore had to re-examine its approach to transmission developments and deal with strident opposition to some of these developments. Also, these projects required the first environmental statements for high voltage transmission lines in England and Wales.

Environmental issues are very significant with transmission developments in particular overhead lines. Environmental statements need to be produced in most cases for high voltage transmission lines.

For power lines Environmental Assessments are a major tool in their siting. With linear developments the consideration of alternatives is important and the environmental assessments are used to identify and choose the preferred option(s).

The responsibility for granting consent for new power lines rests with the Secretary of State for Trade and Industry. The Local Authorities have a major say and statutory environmental bodies must be consulted. The Local

Authority can cause a public inquiry to be held as can the weight of public opinion.

Finland

The Act on Environmental Impact Assessment Procedure was passed in the Finnish Parliament in May 1994. The Act defines an EIA process as an essential prerequisite for granting any permits under other environmental legislation. In certain respect, the act is more comprehensive in scope than the EU's directive on EIA.

The Environmental Permit Procedures Act, which came into force in 1992, combines the processing of the permit applications under the Adjoining Properties Act, the Public Health Act, the Air Pollution Control Act and the Waste Act. Now it is only necessary to submit one application for the Environmental Permit. The Water Rights Court permit remains outside the combined permit processing. The environmental acceptability of power transmission projects is inspected by the statements of competent authorities under the Redemption Permit process.

According to the Nuclear Energy Act, a decision by the Government and the Parliament´s approval are necessary preconditions for further licensing of a nuclear power plant. The environmental permit for fossil fuelled power plants with fuel input exceeding 50 MW is granted by the County Council. The applicant, the parties concerned, the local government and the public authorities are entitled to appeal. The redemption permits in power transmission projects are issued by the Government.

France

In France, most of the regulations underlying the location, construction, and commissioning of French power plants have been in force since the beginning of the 60s or 70s. No significant review has been made of these regulations during the past few years. However, the Ministries responsible for Environment and Industry are currently preparing for a national debate on energy. This could result in a modification of the licensing procedure for power plants (notably nuclear units) with, for instance, a change in the division of power between "local" and "national" authorities as well as greater involvement in decision making on the part of the general public.

The implementation of a power plant scheme requires a large number of prior authorizations which, depending on their goals and degree of importance, are issued either at national or local level. The authorization for a nuclear power plant in respect of siting, nuclear safety and protection against ionising radiation is signed by members of the Government. Authorization in respect of construction, water intake and emissions is granted by the local authorities.

The granting of all types of authorization required in connection with fossil-fuelled power plants is decentralized to local authority level.

A decision to grant authorization in connection with siting, construction and the operation of power plants may be appealed against by a party to a case. This includes individuals and organizations.

Ireland

At present, in addition to planning permission a power plant requires an air emission license, an effluent discharge license and a waste disposal permit. These licenses and permits are all issued by the local authority. Since 1989, an Environmental Impact Statement is required by law for all power plant projects. The applicant or a third party is entitled to appeal via the Planning Appeals Board against a planning permit decision. Any decision may be challenged in court.

All decisions, with the exception of a planning permit, are to be transferred to the newly established Environmental Protection Agency. The Environmental Protection Agency Act of 1992 introduces the concept of Integrated Pollution Control Licensing. Local authorities will no longer be allowed to refuse planning permission on environmental grounds, and appeals against planning decisions on environmental grounds will not be allowed. This new system is expected to run up against teething problems. The effect of recent and proposed changes in the legislation will be to introduce consistency and certainty when dealing with permit applications for, for example, power plants.

Korea

The Air Pollution Act has been made more stringent and is now strictly applied in the EIA. The direction of the changes and their consequences for the remainder of the environmental legislation are similar to those of Sweden.

The Government makes the decisions in connection with permit processing. Appeals can be made by residents who live near the power plants and by environmentalist groups.

Portugal

The Portuguese authorities are carrying out studies on the extension of EIA to cover integrated power system plans. The government grants a license to erect a plant or a transmission line. On the basis of the EIA law, the general public are allowed to study the plans and express an opinion on them. For larger schemes, public meetings are organized by official bodies as part of the EIA procedure.

Romania

A number of environmental regulations have been introduced since 1990. The Environmental Permit (EP) was introduced as a technical legal document necessary for new investments. The new regulations also include Environmental Impact Assessment Studies, the procedure for carrying them out and what the studies have to include. In the case of existing facilities, an instrument referred to as Environmental Authorization (EA) has been introduced. This kind of authorization is granted on the basis of an Environmental Impact Assessment Analysis.

Decisions on the EP or EA are made by the District Environmental Agency or, in the case of very important facilities, by the Water, Forestry and Environmental Protection Ministry. Procedures for appeal do not formally exist. The general public and ecological organizations have to make their appeals to the District Environmental Agency before their decision.

Spain

Among the legislative projects still going through the approval process is the Hydrologic Plan, which will establish the priorities for the use of water. This is a very important question in Spain, as water is a scarce resource.

Spanish legislation does not detail the content or methodology of the EIA, but the Ministry of Public Works is elaborating a guide for the EIA. Specifically, guidelines have been published for the elaboration of the EIA for Large Dams.

The mandate for authorization relating to electricity generating installations belongs to the Central Administrative Authority, the Ministry of Industry and Energy. The information in the required EIA should be facilitated to the autonomous community and local authorities and has to be made public.

Sweden

Protection of the external environment is regulated primarily by the Natural Resources Act and the Environmental Protection Act. These Acts (and several other environmental Acts) contain demands to the effect that an Environmental Impact Assessment (EIA) shall be prepared in conjunction with a permit application for a plant. The EIA shall be drawn up by the party applying for the permit. As yet, there are no established demands concerning how detailed an EIA shall be, or how it is to be arranged or presented. The layout and content of an EIA shall be dictated by the nature and extent of the activities concerned. It is the responsibility of the authority assessing the application to determine whether the EIA is adequate or needs to be complemented.

A Draft Environmental Code has been submitted to the Swedish Government, the purpose of which is to gather legislation on health protection and the environment. The idea is that in the Code the permit application procedures should be based, to a far greater extent than in the existing Environmental Protection Act, on Government powers or on the powers of an authority appointed by the Government to issue general provisions. These provisions will hopefully reduce the need to stipulate permit application procedures, especially where small-scale operations are concerned.

At present, decisions based on the Natural Resources Act are taken by the Government and are not subject to appeal. Decisions based on the Environment Protection Act are taken by the National Franchise Board. Decisions can be appealed against by the Environment Protection Board, the applicant or a party to a case. Local authorities and local employee associations are also entitled to appeal. Voluntary organizations (environmental groups, etc.) do not have the right to appeal. In practice they have become entitled to represent a party to a case.

USA

The siting and certification process for new generation and transmission facilities is primarily a matter that comes under the jurisdiction of each State, but also requires Federal approval for those permits that are under federal jurisdiction - for example, water discharge or air emission permits, or that involve disturbing areas under federal control, such as navigable rivers, federal lands, etc. Most states require that utilities file applications to secure siting and certification of the need for the generation and/or the transmission project. The evidentiary hearing process provides an opportunity for all interested parties to actively participate in the approval process before the regulatory body that will render a decision.

In addition to the siting and certification process, all generation and transmission projects will require numerous other permits - numbering over 50 for a generating facility - covering a wide variety of matters which come under local, state or federal jurisdictions. These cover such matters as water discharge, air emission, waste storage, numerable construction permits, etc.

As part of the filing requirements, the applicant is generally required to prepare a comprehensive Environmental Impact Assessment (EIA) which describes in detail all aspects of the project, including its economic, social and environmental impacts.

To identify in advance the public concerns regarding a proposed power supply project, the utility will initiate advance discussions with all parties that may have an interest in the projects. This will take the form of workshops, conferences, or other processes, all intended to acquire public input at sufficiently early stage of the planning process. The results of the collaborative processes are an essential ingredient in the planning of the project, in particular regarding the specific location of transmission facilities, and is an essential ingredient in the overall siting and certification process.

CASE STUDIES

BRAZIL	**- Reinforcement of the electricity supply to the city of Rio de Janeiro and...** **- Transmission lines in the Amazon Region:**
FINLAND	**- the Meri Pori Power Plant**
FRANCE	**- the LECARNET Nuclear Power Plant Project** **- the CAZARIL-ARAGON 400 kV Line Project**
UNITED KINGDOM	**- Recent experience of the National Grid Company (PLC) in England and Wales**
GREECE	**- the 3rd North-to-South 400 kV Line Project**
IRELAND	**- the Flagford - Drumsallagh 220 kV Line Project**
PORTUGAL	**- the PEGO Power Plant**
SWEDEN	**- Baltic Cable** **- the Brofjorden Power Plant**
USA	**- Wyoming-Cloverdale 765 kV Line**
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ITALY	**- High Voltage Transmission Lines and the Environment: The Italian situation** **- An Initiative of the Italian Electrotechnical Committee, The New Environment Committee**

BRAZIL - Reinforce of the electricity supply to the city of Rio de Janeiro and surrounding areas by the settlement of Sâo José Power Station along with 500 kV and 128 kV transmission lines

BACKGROUND

This present case refers to the settlement of Sâo José Power Station and a group of transmission lines of 500 kV and 138 kV (the settlement begun in the beginning of 1987) that are necessary to the electricity supply to the city of Rio de Janeiro and its surrounding areas, called "Great Rio". The Sâo José substation is siting in the peripherals municipalities, characterized to be one of the most violent urban area of Brazil and identified for its social conditions of poverty and lack of basic infrastructure. The 500 kV and 138 kV transmission lines that link Sâo José substation to the existing power supply system crosses the same peripheral regions where the substation was settled.

Along with this initiative a process for expropriation of 250,000 m^2 and Right-Of-Ways of 40 to 60 meters approximately, were necessary to release a density populated area causing the displacement of 3900 people. Normally, expropriation of areas for governmental purpose is formulated by Federal Decree, a powerful instrument with no place for further negotiations. Because of the last minute siting change and because of the acknowledgment that considerable public resistance would be aimed to this project a shifting in the approach was made deriving to a community participatory negotiation.

In the activities of having the substation and the transmission lines settled, the expropriation process focused mainly on the low-income dwellings, where plots were appropriated without any legal property ownership or land tenure (title, deed or legally recognized and registered document). For this reason land replacement was given in terms of financial compensation.

NEGOTIATING PROCESS - THE ADOPTED STRATEGIES

To deal with the liberation of the area for the substation and later for transmission lines, a working group was created congregating economists, biologists, journalists, social workers and system operating technicians. The strategy of the group was to initiate contracts with community leaderships through Community Association and the Catholic and Baptist Churches. For the purpose of the project, the community leaderships played an important role of mediating the negotiation between the regional utility and local population. To assure liability to this process the group came to an agreement with the community in which all demands and complains

would be accepted by the utility and that local labor force would be involved in the construction of the substation and lines.

With the acceptance of the projects by community leaderships a survey of the population was taken up, characterizing the dwellings and identifying their occupants. Also there was an analyses to identify the legal situation of the dwellings. In the category of direct affected population all households were included no matter they had property ownership or not. The population that lives outside the project site were included in the project although considered to be indirectly affected.

In order to start the project and to mitigate the effects provoked by a dismantling in the patterns of social organization a strategy of social compensation was adopted. As a result a debate with the community leaderships, representatives of the Catholic and Baptist Churches and local teachers was promoted and a decision to construct a Community Center for assistance of population was generated.

To foster the project other formal agreements with public agencies were established aiming on social assistance and health care. Eventually, the debate come out with the following structure for the center:

- covered gymnasium
- football pitch
- classrooms
- medical center
- refectory
- male and female lavatories
- playground yard.

THE RESULT

Having resettled over 3900 households (the resettlement process finished in the beginning of 1988) the participatory process are expected to fulfill people expectations and it is regarded to have occurred in a very mild way, basically because accounted for:

- recovery of the assets
- legal cost recovering
- legal support at governmental level
- interaction between property owners and tenants
- financial support for demolition transport and layoff.

Concerning the Community Center the results could have been better if the construction period hadn't taken four years (the center was inaugurated in end of 1993), particularly because of present Brazilian political and financial problem. Furthermore, the Center is not yet legally transferred to the community, generating a patronized situation in which the costs of no inherent activities are recovered by the power supply utility.

REFERENCE

Eletrobras/CPTA/UFRJ 1992), "Análise das experiencias participativas do setor eletrico"- Rio de Janeiro, Brasil.

BRAZIL - Transmission lines in the Amazon Region: Impacts on the vegetation and interference with indigenous population

BACKGROUND

The transmission lines construction in the Amazon Region started at the end of the seventies. The 500 kV transmission lines that interconnect Tucurui hydroelectric plants in Tocantins river in the Amazon forest to the Northeast Region, are considered to have a strong impact on vegetation and indigenous community culture.

The first interconnection circuit was put into service in 1979 connecting the city of Belem, capital of the State of Parà in the Amazon Region to Sobradinho hydroelectric plant in the Northeast Region. Later, this circuit was interconnected to Tucurui hydroelectric plant, in order to bring the energy generated in that plant to the system. The system's expansion began in 1986 with the construction of the second circuit, adding energy to the city of São Luiz in the Northeast Region. At present the regional power sector's utility is planning to set up a third circuit parallel to the first two ones.

To begin the construction of Tucurui first circuit a 100 meters corridor had to be deforested by the regional power sector's utility to avoid the risk of having the high trees falling down. This is the most polemic point in the construction phase. The chemical product thereby applied to control vegetation growth was a toxic element that led to greater demands and fears by the direct affected population, generating heavy criticism in the scientific community. Since then, environmental studies continued along with the avoidance of non toxic elements during the construction of the second circuit.

Basically though, environmental impact studies had always been left out from these projects as there were no environmental legislation at that time to halt this unnecessary devastation of the forest. For that reason the construction of the first line was not provided with an Environmental Impact Assessment. According to recent Brazilian environmental law all transmission lines with voltages above 230 kV have to be licensed by Government Agency.

The interference with Indians is another great problem caused by the Tucurui power system. Two important Indian territories, the Krikati group and the Parakatege-Gaviãgo group, were crossed by the two circuits.

COMMUNICATION PROCEDURES AND DIALOGUE

During the construction of the first circuit direct negotiation with the target population (those living in the vicinity, including Indians) was unusual. The main aspect concerned to this was that the Indians were not regarded independent citizens in Brazil and are placed under government protection of Fundação Nacional of Indio (FUNAI), which is the body that acts as their guardian. At that time the permission for the transmission line to pass through the Indian territory was given by FUNAI. Presently this permission is given by the National Congress. Construction of the first circuit was therefore paralysed as there wasn't the mentioned permission. The solution was to implement dialogue with the Indians and FUNAI which involved a formal agreement to provide some financial compensation to the Indians, particularly the distribution of goods, like equipment, artesian well, weir, school and infirmary.

THE RESULT

According to the second circuit environmental impact report, the cleaning of the right of way for the first circuit by the use of toxic elements had caused impact on bio-diversity and it seems likely to have contributed to havoc various animals species with high scientifical and economic values. For that reason, future projects using toxic elements were prohibited.

Other important conclusion on the environmental impact due to the set up of new network lines refers to alien interference on the Indians territory which would modify their culture as well their political organization. This policies have resulted in an inadequate use of the money by the Indian community while creating an unsatisfactory economic destination based on wrong demands which were not compatible with the Indian culture.

At present Brazilian electrical sector has a basic principle not to interfere with Indian territory. If this is impossible, negotiations are to be established prior to the construction of any electric network. The negotiations would involve all the parts concerned with the project in a succession of decision making groups, at national level, regional level and local level.

The monetary payment is now accomplished by a social compensation that considers the preservation of community values, such as their physical welfare and self-sustained environment.

REFERENCE

Eletrobras/CPTA/UFRJ (1192, "Alaàlise das experiencias participativas do setor elétrico" - Rio de Janeiro, Brasil

FINLAND - The Meri Pori Power Plant

BACKGROUND

When new nuclear power was out-ruled in the Finnish energy policy after the Chernobyl accident, a new coal fired power plant was the only feasible alternative for base-load power production. The Government finally decided that the new power plant should be built at Pori. No environmental assessments were made before the siting decision.

At the time of the siting decision the general climate is energy politics was not very much against coal. However, during the project coal has gradually become a more and more unpopular fuel in the general discussion. This development has had its implications to the environmental permitting process, too.

ANALYSIS OF THE COMMUNICATION ACTIVITIES IN THE MERI-PORI CASE

Objective:

The objectives of the communication activities were to enhance the general acceptability of the power plant among the local public and to facilitate smooth permitting process.

Intended recipients:

- Local public
- Media
- Representative groups (forestry and agricultural associations)
- Competent authorities (county government and local authorities)

The message:

The main message was that the power plant will be equipped with best available environmental technologies and the plant will have only a marginal impact on the local and regional environmental quality.

Means of Communication:

- Information meetings with authorities and representative groups
- press conferences and press communications
- active participation in public meetings arranges by local representative groups

Response received:

The attitudes towards the plant were highly polarised among the local public: some people supported the project and other objected. The information activities did not have any great effect on the local opinion pattern. Fierce oppositions is often based on values and feelings that cannot be influenced with technical or economical rationale.

Success in Achieving the Objective

In case of the power plant itself the communication activities towards the local public were rather successful. No public appeals were made against the environmental permit decisions. However, IVO made an appeal against the County Council's unfounded decision on air pollution control.

In case of the disposal site the information activities were perhaps initiated too late. The environmental permitting process was delayed by appeals of the local opponents.

In all, the power plant could be built and commissioned in schedule. The environmental permitting processes were not as smooth as they could have been.

FRANCE - The LECARNET nuclear power plant project

No case studies of topical interest could stem from recent EDF experiences as concerns arrangement of new power generation units. However, EDF approach to communication and public participation in such cases can be highlighted by the example of the selection of a suitable site for a nuclear power station in western France, carried out in the middle of the 80s.

BACKGROUND

In the middle of the 70s, EDF undertook the construction of a large number of nuclear power stations to substitute most of its coal and oil fired units. Such a program prompted the French electrical utility to implement a whole site selection process all over the country together with a wide-scale public information policy. Very strong resistance was encountered in a few regions, but especially in French Brittany, where a suitable site was needed to optimize the regional generation/consumption balance. The first two sites, selected by EDF following a technical, economical and environmental approach, were heavily questioned by local residents and elected representatives, and finally ruled out by the Government. Negotiations with local and regional bodies however concurred on the selection of a new site, named LeCarnet, the construction of which could be undertaken in the forthcoming years.

INFORMATION OF ELECTED REPRESENTATIVES AND POPULATIONS

The feedback experience of long-standing proceedings for nuclear power stations, undertaken in France in the early 70s, leads EDF to consider that a sound communication and information policy should not compulsorily rely on contradictory debates, nor stem from disputes. On the contrary, much more effective is a sustained policy based on both continuous information of elected representatives, including their involvement in major decisions, and educational information of the public. In this respect, the site selection process for LeCarnet NPP project is a topical example of such a concerted approach.

In actual fact, following the decision to give up with the preliminary NPP projects anticipated by EDF in the western regions of France, the government ordered the electrical utility in 1981 to undertake new comparative studies to select more suitable sites in the said area, in close connection with the local and regional representatives.

To this extent, the local government representative (Prefet) was commissioned to set up a Liaison Committee intended to prepare in collaboration with EDF, the board outline and the major trends of the site selection process as well as the contents of the studies, and to follow up the chain of the results. This committee was composed of elected representatives of local and regional communities (mayors, councilors...), members of socio-professional organizations, members of associations dedicated to protection of the environment, an independent experts.

The comparative studies carried out by EDF and assessed by the Liaison Committee resulted in the selection of two new potential sites, which were submitted for approval to the Government, and to the vote of the communities concerned. Proceedings finally concurred in 1982 on the selection of the site named LeCarnet, located in the estuary of the river Loire, about 30 km from the town of Nantes.

Following this agreement, EDF was allowed to start further studies so as to prepare the applications for the "declaration of public interest" of the site, including in particular the detailed Environmental Impact Assessment. In 1983, a local Information Committee was set up to take over from the former Liaison Committee, so as to go on discussing with EDF. This new Committee was also intended to serve as a relay for the information of the public, the main queries of which were as follows:

- socio-economic spin-offs of the project (impulse to local economy, involvement of local manpower in the works, impact on the local industrial fabric, etc...)
- nuclear safety and protection of the environment
- educational information on nuclear power plants.

RESULTS

The involvement of the Information Committee was instrumental in the preparation of the application file for the "declaration of public interest", mainly as concerns the contents of the EIA with had to be submitted to the surrounding populations in the course of a public inquiry, and due to such a concerted approach the proceedings successfully ended in 1988.

In addition to the action of the Committee, it is likely that the educational information program implemented by EDF for the public, based on visits of existing power plants, videos and brochures displayed in schools and information centers, or information though the media has also been of prominent importance.

CONCLUSION

Due to the slow down of the electrical demand in France, the construction of the NPP has not been commenced, and such a delay in starting the works may have moderated the favourable opinions around the site.

Nevertheless, EDF consider that the impulse and dynamics generated by a strong involvement of local representatives and decision makers since the early stages of the project will remain a decisive asset for the forthcoming years, and serve as a sound example for the future.

FRANCE - the CAZARIL-ARAGON 400 kV line project

BACKGROUND

Owing to the weakness of the interconnection between the French electrical network and that of the Iberian Peninsula, due consideration has been given since the early 70s to the reinforcement of the High Voltage transmission lines linking France to Spain. In depth studies thus resulted in a French/Spanish agreement, reached in 1982, whereby a new central interconnection line should be arranged between the two countries. The project consists of a 400 kV double-circuit overhead line, planned to be routed from the French substation Cazaril (south-west part of the country) to the Spanish substation Aragon, near Zaragozza. The length of the line on the French side is about 55 km. This note summarizes the ups and downs of the project, the construction of which has not been commenced in France.

PRELIMINARY PROCEEDINGS AND PUBLIC OPINION

Despite the international background of such an interconnection project, applications for construction permits must be handled separately in the different countries, in compliance with their proper regulations. However, even though regulatory requirements may differ on each side, mainly as concerns involvement of the population in decision making, impediments to the construction are quite the same and raise similar objections i.e. effects of electromagnetic-fields, visual impact, not benefit for local populations etc. Consequently careful attention was paid to a consistent approach to environmental impact issues and to settlement of sound common arguments.

On the French side, preliminary proceedings faced EDF with strong resistance from local populations and from organizations dedicated to protection of the environment, which prompted the company to carry out a wide range of variant on the foreseeable route and layout of the line, and undergo endless discussions and negotiations with the concerned elected representatives and local residents. Arbitration by the Prime Minister was finally required, in close connection with the relevant Spanish governmental authorities, to reach a settlement on principle on the overall layout of the line and its boarder crossing route (1984). which enabled EDF to apply for the "declaration of public interest".

DECLARATION OF PUBLIC INTEREST AND SUBSEQUENT AUTHORIZATIONS

In France, the "declaration of public interest" of a transmission line or a power plant is a major regulatory decision, intended, prior to the issue of the construction permit, to approve the broad outline of the project and to sanction a common consent on its collective utility. Such declaration may grant the applicant with rights to expropriate if necessary, or rights of way on private land. The major document included in the application file is the Environmental Impact Assessment, which is submitted for approval to proper local and government authorities, and for comments to the population concerned in the course of a public inquiry. Along with the formal proceeding, a public communication program is usually arranged by EDF, which includes as necessary discussions with population and organizations concerned, public meetings, information by media, brochures etc.

It took 4 years to obtain the declaration of public interest of the French section of the transmission line, and all through this period, EDF was prompted to consider a wide number of variants for the proposed route, in reply to comments and objections raised by the local residents and their representatives which mainly highlighted the following arguments:

- the line is only intended to export electricity towards Spain and is thus of no interest for local residents and communities

- construction of the line is decided at governmental level and local residents are faced with accomplished fact

- the huge visual impact on landscape will result in unacceptable loss of tourism resources.

It took three additional years to obtain the subsequent authorizations (construction permits, rights of way ...) needed to commence the works, and although the final route could be considered as an acceptable compromise, opposition to the project remained very strong. It must be pointed out that during this period, as well as the foregoing, EDF was faced with difficulties in communication with local population and representatives, due to early strong involvement of governmental authorities in the project which appeared as distorting the local debate.

From 1991 onwards, whilst EDF seemed in position to commence the works, new developments gave a definite contentious and political turn to the project. In actual fact, the construction permit appealed against by many organizations was suspended in 1991 by a Regional Court, the decision of which was repealed in 1994 by the Council of

State. This last supreme judgment definitively states that, even though the line is mainly dedicated to export toward Spain, the legality and the public interest of the project are not questionable. However, despite such a legal clearance, the French Government recently stated that the opportunity to undertake the construction of the line should reconsidered.

CONCLUSION

It is impossible by now to anticipate whether the construction of the Cazaril-Aragon line will be undertaken, but if so, regulatory proceedings and discussions with all the parties involved would have lasted more than 15 years. Owing to the efforts made by EDF, deficiencies in communication or in impact assessment studies should not be put forward to explain the current failure, nor illegal proceedings, and it appear that only a strong political will on both French and Spanish side could overcome opponents pressure and bring the project to a successful conclusion.

GREECE - the 3rd North-to-South 400 kV Line Project

BACKGROUND

This is a 400 kV double-circuit line - yet unfinished, 486 km in total length, required urgently to reinforce electricity supply in southern mainland Greece and in particular in the prefecture of Attica. It's construction started back in 1986, and the 484.5 km were ready in 1990. The remaining 1.5 km, including 7 towers, have still not been constructed because of public opposition to the project (due to environmental concerns).

CASE STUDY

Back in 1985, when the line was designed and the construction project was approved, no Environmental Impact Statement (EIS) was required by Greek law and none was written at the time. In that time, no housing existed on the route of the line - which included the region of Kryoneri near Athens. For the construction of the line passing through Kryoneri (1.5-km length) the agreement of the Ministries of agriculture as well as of environment, urban planning and public works was obtained in 1988.

In late 1988 a law was issued in Greece requiring EIS for every project that can have environmental consequences.

In July 1989 city plans were extended to include the region of Kryoneri. The city planning did not exclude the right-of-way (ROW) of

a. environment, urban planning and public works,
b. industry, research and technology,
c. agriculture, and
d. economics issued a common decision permitting construction and operation of the line, and specifying the locations of the towers, the land acquisition (ROW) and the permissible minimum distances of buildings from the line.

Meanwhile the region of Kryoneri had been inhabited. But, until that time no objections had been raised by the community of Kryoneri for the plans to construct the line through their region.

Then, trouble started. In late May 1990, the community of Kryoneri submitted a petition to the Council of the State (CoS: highest court of appeals) in order to annul the project. This petition mentioned as reasons for the motion the E-M field-effects on humans, the visual impact to the environment, and the losses in property value. This petition was rejected by the CoS (decision: 2586/1992). There were

some more petitions (6-8-90 and 19-11-91) with the same aim. But, they, too, were rejected by the CoS. The district court of Athens ordered the expulsion of the owners from the acquired land. However, the resistance of the public to the project was stiff and the project was halted.

In July 1994 the Public Power Corporation (PPC) of Greece put together an EIS, for the part of the line to be constructed through Kryoneri, and submitted it, according to the law, to the Ministry of environment, urban planing and public works. According to the new legislation on EIS mentioned earlier, the Ministry can voice objections or set special requirements within 60 days from receipt of EIS. After this time, if no objections were stated, the EIS is considered approved. This, PPC considers it's EIS already approved.

On the 21st of Nov. 1994, PPC attempted to restart construction, but, the resistance of the public was dynamic and the case went back to the courts.

NEED FOR A NEW STRATEGY?

An analysis for this case is in order, so that useful conclusions can be drawn for future cases.

- Was there a lack of proper communication initiatives?
- Was the case unique, due to the new environmental legislation enforced only after the start of the project?
- What would be the best course of action by PPC from now on?

Recent experience of the National Grid Company (PLC) (Responsible for high voltage transmission in England and Wales)

INTRODUCTION

This note is an update on the experience of the Teesside Power Project/North Yorkshire Lines Project in the north-east of England. The previous version was provided for Cigré WG 37.09. This note also explains some of the initiatives the National Grid Company is taking in an effort to improve public acceptance and public understanding of electricity transmission.

TEESSIDE POWER PROJECT/NORTH YORKSHIRE LINES

The National Grid Company, as one of the successor companies to the CEGB, came into existence as a company in 1989 and was privatised in 1990. One of its key responsibilities is to facilitate competition in the new electricity market in England and Wales. The largest transmission reinforcement requirement arose in the north-east of England. An independent power station was constructed on Teesside (near Middlesbrough). Teesside Power Project, involving Enron (US) and Regional Electricity Companies embarked on a new power station project, a CCGT plant of 1875 MW. This triggered the need for substantial line development in the immediate area and also further south through North Yorkshire involving the construction in all of about 90 kilometers of overhead line. The expansion of the Anglo-Scottish Interconnector also depends on the reinforcement work. The power station and the immediate short connection into the National Grid received consent from the Secretary of State for Energy, together with some of the transmission reinforcement, but the rest of the transmission work still requires consent.

NGC is required to consult the local planning authorities. However, in addition to this it was decided also to consult local communities. The aim of this was to facilitate the gaining of the necessary consents for the project. As expected, the project was very contentious and unless the National Grid Company conceded to a considerable amount of undergrounding it was clear that public objection and also opposition from the local authorities would lead to a public inquiry. However, there were other realistic aims of the public consultation process, in particular to meet the expectations of the communities for information, to try to bridge the gap and explain why undergrounding was not acceptable (worldwide electricity utilities use predominantly overhead lines at high voltage) and also to give the opportunity for other routeing options to be explored. (This process did actually produce another routeing option for which consent was sought).

The transmission line proposals aroused considerable and vehement opposition. The local authorities and members of Parliament, like the local communities affected by the proposals, all opposed to the overhead line routeing options and requested substantial sections to be undergrounded. Formal consent applications for alternative overhead line route options with supporting environmental statements were made by NGC in September 1991. The local media gave considerable coverage and the local press strongly opposed the work. Owing to this opposition, the Secretary of State for Energy called a public inquiry into these proposals to commence on 19 May 1992. The inquiry sat for 53 working days and finished on 5 November 1992.

The Secretary of State for Trade and Industry published his findings from the inquiry on 12 May 1994. This concluded that subject to the obtaining of wayleaves (agreements with landowners) that most of the connection could be made overhead. One section of 1½ kilometers will need to be underground. Two other sections totalling about 12 kilometers, will require alternative overhead line routes (although overhead line connections are not guaranteed in these cases). Since then a further public inquiry has been held into the consent applications for the two sections of line ended on 28 April 1995. A decision is not expected until the autumn.

COMMENTS

The environmental assessment process itself is a good discipline for obtaining the correct system option for consent applications as well as providing an assessment of the effects and the steps which the company believes should be made to mitigate the effects of a development. The formal process itself is not a means of wide dissemination. Communication to wider groups needs to be done by face-to-face contact.

The decision on how wide to make the consultation depends on the case in question. NGC's experience is that in some cases widespread public meetings are not required. It depends on the density of population of the area, its scenic attractiveness etc. This is a difficult judgement to make of course.

From previous projects it was clear that public meetings were not the appropriate way of achieving good communication. An "open house" approach, enabling people to visit at any time during an evening and have one-to-one conversations, proved the best approach.

NGC faced a particular difficulty with the issue of need. The electricity supply industry is market led. Decisions on new generation, and their location, rest with the generating companies, and it is NGC's responsibility to provide the necessary connections to the National Grid, thereby facilitating competition. The previous "national need" argument and central planning has been superseded. In this case the transmission lines are required to transmit the power south, away from the areas where the transmission lines are required.

Despite the efforts at consultation and information provision, the two sides became polarised over the main issues of need, "private profit", undergrounding and EMF. An opposition group REVOLT (Rural England Versus Overhead Line Transmission) provided the focus for objection. Some members of the public cross examined NGC on highly technical issues, as did other national objectors, on EMF.

The local media have also adopted the issue as a cause, as have local Members of Parliament.

NGC has also looked at the way it was performing in the whole area of consents for new power lines but also with its relationship with grantors (those who grant wayleaves) and communities as regards existing transmission lines. The conclusion ~~we~~ reached was that an initiative was required to increase public acceptance of transmission, to balance the negative messages which were coming out from some local authority and planning bodies on transmission lines by explaining the benefits of electricity and also help people to understand what is involved in electricity transmission. This is done in various ways including through existing programmes to provide information to schools. In particular NGC has embarked upon a programme of events at its substations around the country to inform local communities and business leaders about who it is, what it does, and some of the amenity issues arising, such as why we have overhead lines versus underground cables and EMF. This is a modest programme but the intention is to extend it.

IRELAND - the Flagford - Drumsallagh 220 kV Line Project

BACKGROUND

ESB National Grid, the business unit responsible for power transmission throughout the Republic of Ireland, proposes to construct a 220 kV double-circuit line, 94 km in length, to reinforce electricity supply to the North-west of Ireland. In the light of experience with ESB's last 220 kV line project in the mid-1980's, it was recognised that there would be considerable public resistance to this project. The line traverses four separate counties, and since applications for planning permission are dealt with on a county by county basis, four separate planning applications and Environmental Impact Statements are required.

INITIAL CONSULTATIONS

An internal ESB working group including personnel from System Planning, Line Design and Construction, Regional Transmission Management, Legal Services and Public Affair was established. Following extensive consultation and dialogue with the planning officials of the four county councils concerned, a line routing was agreed. Presentations were also made to elected councillors in the four counties; serious resistance was encountered in one, Leitrim, which includes the greater part of the line length. This resistance was based largely on visual impact and its perceived effects on tourism, the fact that "the line brings no benefit to Leitrim."

ANALYSIS OF THE COMMUNICATION INITIATIVES

Objective: The objective of the communications exercise is

- to facilitate obtaining planning permission from the County Councils,
- to facilitate the pursuit of any appeal to An Bórd Pleanála (the national planning appeals board)
- to facilitate obtaining wayleaves.

Intended Recipients;

- Ordinary members of the public who have no pre-conceived strongly-held opinions,
- Influential representative groups,
- Members of the County Councils.

The Message: The message to be communicated is, in essence,

- The transmission line is essential to ensure satisfactory electricity supply over a wide area in the North-west of Ireland, which is essential for the development of the region.
- ESB, as a good corporate citizen, will endeavour to minimise any adverse impact.
- Tourism should not be affected adversely, because the line route has been carefully selected, and because tourism elsewhere in Europe (e.g. Switzerland) is not affected by similar and bigger lines.
- Fears about adverse effects on health are unjustified.
- Farmers will not suffer any loss as a result of the line crossing their land.

Means of Communication: A wide range of means of communication has been used:

- Meetings with County Councillors
- Briefings for local journalists
- Meetings with representative groups
- Public meetings
- Information leaflets.

For the future, local information displays will be used instead of public meetings.

Response Received: The general response received is that

- The transmission line is unwelcome, largely because of visual impact on the landscape.
- It is not needed to ensure a satisfactory supply of electricity.
- It will hinder the development of the region, because of its adverse impact on tourism, rather than facilitate development.

Success in Achieving the Objective: It is to soon to say whether the communications exercise will be successful or not. The public meetings, were found to be of limited value as a means of communicating with the general public due to the disruptive tactics of the objectors. It is planned to use public information displays, staffed by ESB experts, as an alternative to the public meetings in the future.

PORTUGAL - The PEGO Power Plant

INTRODUCTION

Unit 1 of the second imported coal fired plant started its commercial operation at the PEGO site in the 29th March, 1993. EDP managers, the project team and their guests which included ministers, local authorities, suppliers and subcontractors, proudly commemorated the event. Everyone seemed to have forgotten the enormous difficulties EDP had to overcome to guarantee, 6 to 7 years earlier, the public acceptance to the PEGO project.

Pego Power Plant is located near the main Portuguese rivers. Initially, it was planned to a coastal location near Viano do Castelo, 250 km North of Pego, and later on to another location in the region of Figueira da Foz, about 100 km Northeast. To build the plant in any of those sites was not possible, although for the latter EDP managed to get the necessary environmental permit.

This paper summarises the main reasons found to justify the public resistance in those two sites and the changes EDP introduced later in order to guarantee that Pego would become a successful case of acceptance by the population concerned.

UNDERSTANDING THE RESISTANCE FACTORS

Public resistance to the coal power plant project in the beginning of the 80's can be justified by the convergence of a number of factors

- The Social and Political situation of the country.
- Lack of public education of the use of coal.
- Concurrent interests on the use of land.
- EDP traditional attitude.
- No consideration of environmental and socio-economic factors.

Portugal was then still suffering the political and social consequences of the difficult transition from a country ruled by a 50 years old centralized autocratic regime to a democratic one. The public was not educated in the use of coal and assumed a very reluctant position to accept technical and scientific information. Conflicts towards alternative uses of land, namely tourism in Viana do Castelo and industrial and agricultural in Figueira da Foz have been managed by the opposing lobbies by using public feelings of rejection.

EDP's attitude do deal with the situation has proved to be inadequate. The traditional approach of negotiating compensations to individuals was not adjusted to the situation in the field. Siting methodology used so far was only based in technical factors. Environment and socioeconomic and cultural factors were not considered. Social sectors that would be in favour of the project were not stimulated to give their contribution, in particular those that could be influenced by the company's local agents.

Environmental Impact Assessment methodology was not considered to have a beneficial effect. However attempt to use it in the Figueira da Foz site proved at least that in could be useful in terms of getting a permit from the Ministry of Environment. Unfortunately when the permit was granted the social conditions have deteriorated to an irreversible extent.

A COMPREHENSIVE APPROACH TOWARDS PUBLIC ACCEPTANCE

When the decision was taken to search for other siting option PEGO was only one page of the Site Portfolio of the former EDP Nuclear Siting Department. Extensive internal debates on the most convenient approach to PEGO took in due consideration that a new unsuccessful case would put EDP in a delicate situation in what concerns the need for power in the beginning of the 90's.

The selected operational mode considered among other things the need to

- identify clearly the influential persons and target groups
- define the appropriate message to each one
- use mainly the local EDP personnel for message dissemination
- develop an appropriate Environmental Impact Assessment procedure to be submitted to the authorities
- educate large segments of the local population through public meetings and seminars on the technology concerned
- organize a large number of tours to operating EDP power stations, specially coal fired ones
- discuss the appropriate mechanisms to incorporate population needs in the project development
- interact with group leaders

- pay special attention the region media
- compromise the authorities in the explanation to people of the terms and conditions of the consent, namely in the environmental area
- sign convenants on the appropriate cooperation with the municipalities of the region of interest to the project
- built well in advance a local communication center and invite the population to visit it
- show a cooperative-like profile.

The results obtained were quite successful. Public meetings were found to be important, but visits payed to other plants proved to be of prime relevance. Also the involvement of the local EDP personnel associated with more friendly characteristics of the population of the hinterland proved to be fundamental.

It is difficult to say that this recipe will be recommended to other situations but the PEGO experience essentially shows that a commitment to incorporate environmental and socio-economical features earlier in the siting process can be one essential key to acceptability.

SWEDEN - Baltic Cable

BACKGROUND

Baltic Cable is a limited Swedish company established to own and operate an electricity connection between Sweden and Germany, Baltic Cable. The Government has granted a franchise in accordance with the Electricity Act to lay an electricity cable beneath the Baltic Sea in accordance with the company's application.

The link will be the longest and most powerful of its kind in the world. It will include a rectifier station in each country, a 12 km long overhead power line near the station in Malmö and a 240 km long cable beneath the Baltic Sea. The overhead line will be carried by single-legged steel pylons with an average height of 40 m and a distance between the pylons of 320 m.

PUBLIC OPINION

The overhead line attracted considerable attention, especially from the general public and neighbouring residents, and formed the basis for resistance. The criticism focused on visual and acoustic interference and concern about EMF risks. The opponents of the scheme also criticised the decision process and the actions of the authorities. They considered it alarming that the company had failed to inform private landowners and other members of the general public until almost a year after the first contact had been made with the County Administration, and that consultation had not functioned properly with regard to involving interested parties.

Among the leading opponents were a large number of well-known and well educated people with strong political connections.

MEANS OF COMMUNICATION

- Consultation with the county administration and local authorities the traditional way or finding out the best alternative route.
- Information via the press.
- Public meeting - no landowners came, the resistance was total.
- Visits to landowners one by one trying to negotiate individually - The landowners refused to speak to them.
- The opponents arranged their own public meetings, informed the mass media and schools and distribution of leaflets.

THE RESULT

Despite the resistance there were no delays in the permit application process. The Government granted the franchise to Baltic Cable after an overall assessment of the various interests (energy policy, economy and environment) and among the conditions set was that the number of existing overhead lines should be reduced by cabling. For each new overhead pylon that was erected, two existing pylons should be dismantled.

In the chosen route alternative, the local authority and landowners that had displayed the greatest resistance were avoided.

SWEDEN - the Brofjorden Power Plant

BACKGROUND

The aim of the project was that the Brofjorden plant should be fired by residual fuel oil from an existing refinery situated on the Swedish West Coast in the municipality of Lysekil.

In 1989, Vattenfall submitted its formal application to the Government under the terms of the Natural Resources Act. It was followed in 1990 by an application under the Environmental Protection Act. Vattenfall, however, decided not to build the Brofjorden plant and withdrew its applications in 1992, with the motivation that the project is not economically viable at present.

THE ENVIRONMENTAL ASSESSMENT PROCESS

The main questions discussed in connection with the environmental assessment were the following:

- whether the heat in the cooling water should be recovered
- whether additional electricity is really necessary
- should further emissions be permitted in the already heavily loaded area
- the fact that there was no health impact assessment in the Environmental Impact Assessment
- whether neighbouring municipalities should be permanent bodies for referral
- there were no plans for waste product processing.

PUBLIC OPINION

There was no strongly critical local reaction against the project. All parties concerned were well aware of the serious environmental situation on the West Coast and that the problems being experienced by the existing oil refinery should be dealt with. However, there was disagreement about what forms of environmental impact could be accepted and how the knowledge on environmental problems should be used to influence power production.

MEANS OF COMMUNICATION

- Consultation with local authorities, the County administration, the Environmental Protection Board, and other important Government authorities.

- Consultation groups with participants from the utility, officials and politicians from the local authority, the County administration etc, were formed to discuss environmental questions.

- Information to the media and local inhabitants was distributed via a local information office.

- Public meetings.

THE RESULT

The communication questions were handled quite well and Vattenfall developed a very good relation with the local authorities.

One main question that came up in the discussion was the uncertainty of the Governmental energy politics, mainly the decision to phase out the nuclear power. This caused a certain vagueness in the project objective and information from Vattenfall.

The Franchise Board was negative to the project because of the CO_2 emissions and the fact that the excess heat from the process would not be recovered and used, for example, for district heating. The County Administration was also negative to the project. The resistance was connected with the localisation on the West Coast, where the environmental situation will not allow further emissions of an acidic nature.

There is good reason to assume that the Government would probably have granted a permit in accordance with the Natural Resources Act, despite the fact that the Franchise Board rejected the scheme, if only the electricity demand situation had been clearer.

USA - Wyoming-Cloverdale 765-kV Line

BACKGROUND

In 1989, American Electric Power (AEP) System proposed a transmission reinforcement project to meet the projected requirement of the system. This project, which is now scheduled for service about 1999-2000, consists of 115 miles of 765-kV line and related substation upgrades.

The 765-kV line, between the Wyoming Station in the State of West Virginia and the Cloverdale Station on the State of Virginia, will establish a much needed transmission reinforcement linking the major generating sources in AEP with the major load centers in the southeastern portion of AEP. In addition, the project will also provide the necessary transmission capacity for projected power transfers between AEP and its neighboring systems located to the east and southeast.

The 765-kV overhead line will traverse two states and U.S. government-owned forests. In addition to the need to obtain certification from the States of West Virginia and Virginia, there is a need to obtain federal environmental permits for the construction of the proposed line.

MEANS OF COMMUNICATION

- When this project was first initiated, the company held news conferences in all the major communities affected by the line to discuss in detail the purpose of the project, its general location, and its physical characteristics. Follow-up conferences have been scheduled as needed to report on significant developments.

- The company contracted with the Virginia Polytechnic Institute and the West Virginia University to jointly study in detail the environmental characteristics of the area being traversed by the project and to outline several possible corridors for the proposed 765-kV line of the basis of minimizing environmental impact.

- The company held meetings with local and state governmental and regulatory officials to discuss all aspects of the project.

- To facilitate the discussion of the need for the projects, a simulation program to demonstrate the need for the project was developed. The computer model uses a lap-top computer and is designed to provide answers, in a clear and graphical fashion, to questions as to the need and benefits of the project. This simulation was used in an effective way to help government

officials and community leaders to understand, in a non-technical basis, the importance of the project.

- Public information workshops were held in the affected communities throughout West Virginia and Virginia to address any questions and concerns about the proposed project. In addition, the University team, which was developing the database to aid in the identification of possible routes for the proposed line, held public workshops to share their findings with the general public and to seek public input.

- To assist policymakers, business and community leaders and the general public to understand the need for the project, the company prepared several discussion papers. Specifically, a paper was prepared to demonstrate the role of the project in providing reliable electrical service to the communities in West Virginia and Virginia. In addition, a paper was prepared to demonstrate impact of the proposed line to the economy in the affected states. These papers were widely distributed of the news media, government officials, business and community leaders and the public at large.

THE RESULT

- Certification hearings were held in Virginia in 1992-1993. All parties to the case were provided the opportunity to present testimony. A favorable Administrative Law Judge decision has been rendered to the full Commission. However, the Virginia Commission has not acted as yet.

- The U.S. National Forest Service is now in the process of conducting the investigations necessary to prepare an Environmental Impact Statement for that portion of the project that will traverse federal lands. This process is still ongoing and is not expected to be completed until some time in 1995.

- The certification proceedings in the State of West Virginia are expected to be initiated during 1995 and will probably carry over into 1996.

- Since this project still has several regulatory hurdles to overcome, it is not clear whether the company's communication efforts will be successful.

High Voltage Transmission Lines and the Environment: The Italian situation

Contribution by: Luigi Salvaderi, ENEL Spa
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This brief report tries to put in evidence on one side the impact that one particular "environmental issue" has on the Electric Supply Industry (ESI) in Italy and, on the other side, how the communication between the industry and the others concerned parties could help to solve the related problems in connection with the siting and permission obtaining process.

The issue under examination is the potential impact on the environment of the HV lines, basically, and covers the following points:

a) Noise and radio interference due to the corona effect
b) Biologic effects of
   b.1. electric fields
   b.2. magnetic fields
c) Lands occupation and "damage" to the landscape

Both the issues a) and b.1) are "voltage related", the issue b.2) is "current related".

The issue a) has been well studied in the past and the design measures (bundled conductors, suitable clamps) are a consolidated practice. Presently in Italy the more constraining issues for the ESI are b) and c).

In the previous work of the CIGRE WG 37.09 "Links between Power System Planners and Decision Makers in the Energy Policy Area", amongst other conclusions it was stated that:

i) power systems must be treated as a multidisciplinary issue
ii) the ESI must take the initiative
iii) openness and trust are to be shown
iv) the involvement of professional societies can be useful.

This framework can be found in a recent (February 1994) initiative of the Italian Association of Electrical and Electronics Engineers (AEI) and of the Italian Electrotechnical Committee (CEI), which organized in Rome a one-day seminar on "Electric lines and environment: technical and legislative issues". The Seminar was introduced by a key-note speech by Prof. L. Paris, a well worldwide

known expert in the field and President of the Italian CIGRE Committee.

All the players took part to the seminar, namely the ESI (ENEL, Spa, Autoproducers, Municipalities, as well as the Railways which operates various lines), the concerned Ministries (Industry, Environment, Health), Scientific Associations and Universities.

Concerning more specifically the issue a) "Land occupation and the potential damage of the landscape", in Italy, a Decree (DPR 27.4.92) rules the procedures for obtaining the authorization of all the lines with voltage higher than 150 kV and length than 15 km, subject to Evaluation of Environmental Impact (in Italian, VIA).

Concerning the land occupation, it has been underlined that the compact 132 - 150 kV lines projects are already used and their extension to 380 kV system of has been anticipated. The utilization of grounded cables for 132 - 150 kV distribution as well as 380 kV transmission lines does not seem applicable both for economic (the costs are respectively 10 and 20 times higher than the ones with overhead conductors) and technical reasons (need of reactive power beyond small distances).

The future adoption of interactive projects - with a related huge utilization of computing tools - should on one side allow the prospective reconstruction on the landscape and, on the other, be utilized as a potential "solution data bank" by the Authorities in charge of assessing the VIA.

Correspondingly, the message to be diffused both to the public opinion and to the authorities is that the related new costs that the ESI should sustain for such innovative procedures, should be adequately understood and "quantified" through adequate incentives.

Coming to the issue "Biologic effect of the electric (b.1) and magnetic (b.2) fields", a recent legislation (Decree of the President of the Council of Ministers DPCM 23.4.1992) has on one side introduced many difficulties for the ESI and on the other contains, according not only to ESI but also to AEI and CEI, many incoherencies,.

Basically, such Decree in one article (art 4) introduces limits for the electric (5 kV/m) and magnetic (100 microT) fields for areas where the populations are expected to spend a considerable portion of their daily life while in another (Art. 5) imposes distances from lines conductors (f.i: > 28 m for 380 kV) which would entail values of

electric and magnetic fields in the order respectively 1/5 and 1/20 lower than the ones of the previous article 4.

In conclusion, Art. 5 is well more restrictive than Art. 4. The incoherence may have been triggered by "pressures" of the public opinion on the politicians, who did not take accurately into account the technical aspects of the issue. A link between the ESI and the Authorities could have explained better the technical implications and could have provided for suitable initiatives.

The impact of the said Art. 5 on the ESI would be, in the absence of a suitable modification, huge both in terms of economics as well as in terms of land availability for future building.

Generally speaking both the electric and the magnetic fields depend not only on the distance from the lines but also on the geometric position of the phase conductors. Standards based only on the distance have therefore a poor meaning.

As far as the electric field is concerned, on one side the values normally found near the HV lines are considerably low and on the other the screening effect of building, fences, threes etc is considerable.

The major concern is the effect of magnetic fields. On one side the distance limit proposed (Art. 5) would entail only a moderate reduction from the average value of 10 microT (which can be found today in many cases) to no more than 3.5 microT (against the value of 100 microT of the said Art. 4). In any case, it would be better that a limit would be established directly in term of magnetic (instead of through the limit on the distance), leaving to the designer the chance possibility to find a more suitable and economic solution to comply with the standard.

On the other hand, there has been a general consensus on the fact that the results of reviews performed by international bodies do not establish any "statistical" relationship between the values of electric/magnetic fields and the potential development of cancer.

The first and general message to the seminar was the need of a global approach since many aspects, some contrasting each other, are present in the environmental issue. Just the lack of such coordinated efforts may have entailed, in the described example, a biased legislation, very negative not only for the ESI but also for the environment to be protected!

The technical expertise of the ESI should be, and is, full available for a fruitful cooperation with the concerned Authorities.

On the other side, the "protection" of the environment has a cost: the public opinion must realize that and the concerned authorities must find a way to ensure, with suitable incentives, the solution that are technically possible.

An Initiative of the Italian Electrotechnical Committee (CEI): the new ENVIRONMENT Committee

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In the report "A Case study, HV transmission lines & environment: the Italian situation" it was evidenced on one side the impact that one particular "environmental issue" has on the Electric Supply Industry (ESI) in Italy and, on the other hand, how the communication (or, better, a lack of it) between the industry and the others concerned parties - particularly the public authorities during the preparation of laws - could negatively affect the ESI.

In particular the example was described concerning the issue "Biologic effect of the electric and magnetic fields": in Italy, a recent legislation (Decree of the President of the Council of Ministers DPCM 23.4 1992) has on one side introduced many difficulties for the ESI, and on the other contains, according the ESI, many incoherencies mainly as far as the magnetic field is concerned.

In the report it was stressed that the technical expertise of the ESI should be fully available, for a fruitful cooperation, with the concerned Authorities.

In this regard, an innovative move was taken in Italy by the Presidency of CEI, the Italian Electrotechnical Commission, on September 23, 1994. After a meeting of representatives of CEI, the Electric Industry, the concerned Authorities, a new CEI Committee "Environment" was created having the task of coordinating the activities of the others CEI Committees as far as the Impact of the electric appliances and plants on the environment is concerned. In particular, the Committee Members will work as experts in the State Administrations (Ministries of the Industry, Health and Environment) concerned.

The intention of the move is to go beyond the "traditional" attitude. In fact, so far mainly the "traditional" electric safety as been approached by the existing CEI Committees, which always adequately supported the issuing of laws and standards in "traditional" meaning. On the other hand, the activity has been not fully adequate as far as the relationships with the "environment" issues is concerned. The result, as in the mentioned situation of the electromagnetic fields, can be a "bad law" that may have been triggered by "pressures" of the public opinion on the politicians, who did not take accurately into account the technical aspects of the issue.

The move of CEI should eliminate the lack of links ESI-Authorities.

The specific tasks of the new Committee are:

- To examine the activities of the other CEI Committees and the problems related to the effects produced on the housing, external, working environment by the electric products, plants and related services;

- To rationally support the existing and under study legislation;

- To coordinate the CEI participation to the Ministerial Committees during preparation of laws concerning "environmental issues";

- To act as an interface with the corresponding bodies of IED (International), CENELEC (European).

The Members of the new "Environment" CEI Committee will be 20, 5 out of which coming by the Ministries of Environment, Industry, National Health.

The new Committee was officially appointed on November 7, 1994 and will have its first meeting on December.

It is worthwhile to underline that this initiative is clearly in the framework of the recommendations of the previous work of the CIGRE WG 37.09 "Links between Power System Planners and Decision Makers in the Energy Policy Area", namely:

i) power systems must be treated as a multidisciplinary issue
ii) the ESI must take the initiative
iii) openness and trust are to be shown
iv) the involvement of professional societies can be useful.

Acceptance for Electricity Generation and Transmission Techniques

In the questionnaire, the members of WG 37.13 were asked how energy producers, authorities, politicians and the general public react to different types of fuel, energy installations and transmission lines. It should be noted that the answers do not pretend to indicate the position taken by the country or company on the particular issue in question, but merely focus on the opinions held by the WG 37.13 members.

On a scale ranked from 1 to 5, 1 represented poor acceptance and 5 a high level of acceptance. Exactly how the answers were divided up is indicated in Fig. 1. A comparison between the mean values of how energy producers, politicians, authorities and the general public experience the various factors is shown in Fig. 2.

	Energy producers*					Politicians**					Authorities					General Public				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Coal			III	IIIII	II	II	II	II	III	I	I	I	IIIII	II		IIII	II	III	I	
Oil		IIIIII	II	I		II	IIIII	I	I		II	IIIII	I	I		I	IIIII	II	I	
Hydro power			II	IIII	III		I	I	IIII	II			I	IIIIII	I	I	I		IIIII	II
Nuclear power	I		I	IIIII	II	IIII	I	II	I		II	IIII		III		IIII	II		II	
Natural gas		I	III	III	III			II	IIII	IIII		I	I	IIII	IIII			I	III	IIIII
Wind power	IIII	IIII	II					III	II	IIII		I	I	IIII	IIII				IIIII	IIII
Biofuel	IIII	II	IIII				I	III	I	IIII	I		II	III	III			II	III	IIII
Municipal solid waste incineration	III	IIII	III			II	II	III	I	II	II	I	III	II	II	III	I	II	III	
Power transmission lines (overhead)	I			III	IIIIII		I	IIIIIII	I	I		III	IIIII	II		IIII	IIIII	II		
Power cables (underground)	IIII	IIII	III					III	IIII	IIII			III	III	IIIII				IIII	IIIIII
Combined power and heat plants		I	III	II	IIII			I	IIII	IIII				III	IIIIII			II	IIII	III
Condensing plants				IIII	IIIII		II	IIII	III			I	IIII	III	I	II	I	IIII	I	I

* This refers more to low or high priority ranking.
** This refers primarily to politicians/political parties in leading positions.

Fig. 1 Distribution of replies.

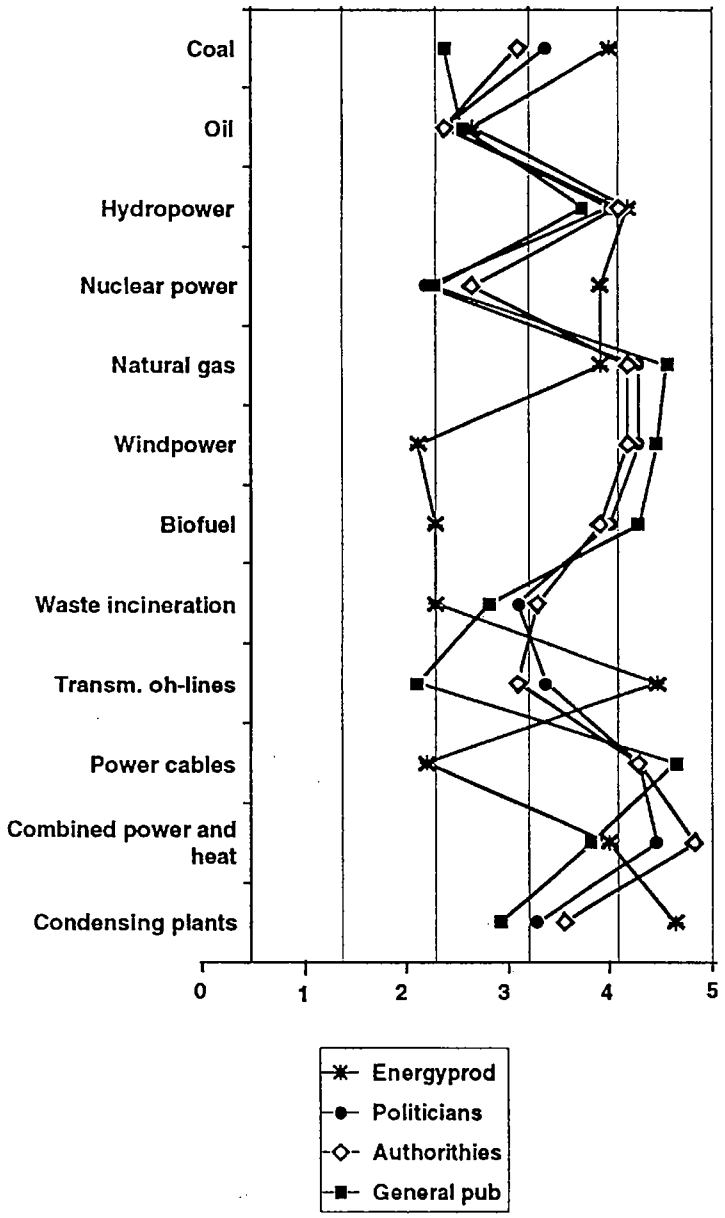

Fig. 2 Mean values of answers divided between energy producers, politicians, authorities and the general public.

Comments

Romania is of the opinion that a column is missing for media, since "media" are having different perception as the "general public" (even if the first ones are supposed to represent the latter ones). The USA mention that the opinions of financiers are becoming increasingly important.

General conclusions

- The answers give a relatively unanimous picture, particularly as regards oil but also for coal.

- The acceptance priority of nuclear power varies a lot in the replies. It seems as if nuclear power is either fully accepted or not accepted at all.

- Energy producers give low priority to wind power and bio-fuel, whereas others, and in particular the general public, have a high acceptance level for them.

- Overhead power lines, which primarily have a visual impact on the environment, have a high priority among energy producers and a low acceptance among the general public. Power cables, on the other hand, have a low priority with energy producers and a high acceptance with the general public. The authorities and politicians also have a higher level of acceptance for power cables than for overhead power lines. However, several replies refer to the strong economic factors that determine the choice between power cables and overhead power lines.

- Natural gas has a high level of acceptance and priority from all parties, which is explained by the low emissions standards of SOx and NOx. Lower emissions of carbon dioxide are also important. From the point of view of the power companies, other factors such as shorter lead and lower investment costs times may be important.

Conclusions specifically related to countries

- General attitude to hydro power is very positive. However, any new hydro power developments tend to arouse heavy discussions (Finland).

- In Sweden the general attitude to hydro power also is positive, but the remaining large rivers are protected by law and this prevents any new hydro power installations.

- Energy producers in Ireland do not accept nuclear power because of high cost and associated risks. There is no remaining potential for new large hydro developments in Ireland.

- Environmental considerations are not afforded a high level of consideration among leading politicians unless forced by public opinion (ESB, Ireland)

- In the case of ESB Ireland, the general public should really be considered under two categories: environmental pressure groups and others. Environmental pressure groups would tend to favour renewables such as wind and wave power, and high efficiency or CHP plants rather than condensing plants (ESB Ireland).

- Municipal waste is not considered as an interesting energy source as such. However, if also the waste management aspects is taken into account, the attitude of politicians and authorities might be more positive. (Finland)

- In Sweden it is becoming increasingly difficult to gain acceptance for condensing plants, which could depend on a long experience of district heating and combined power and heat plants.

- There is a low acceptance in the immediate vicinity of power lines. As regards power cables (underground) while these are generally said to be more acceptable they may well not be to the landowner (UK).

- The Swedish Government granted franchise to Baltic Cable after an overall assessment of various interests and among the conditions set was that the number of existing overhead lines should be reduced by cabling. For each new overhead pylon that was erected, two existing pylons should be dismantled.

- KEPCO (Korea) desires to build more nuclear power plants together with pumped storage power plants because of economic reasons and the diversification of fuel. However, KEPCO has been facing serious opposition from the general public and environmentalists for the nuclear and pumped storage power plants.

Acceptance in other environmental issues

In the questionnaire, the WG 37.13 members were also asked to what extent and in what way certain other environmental issues of current interest were considered in connection with siting and permit processing.

Fig. 3 shows how the answers were divided. 1 represents little consideration and 5 great consideration. A comparison between the mean values for how the energy producers, politicians, authorities and the general public experience the various factors is shown in Fig. 4.

	Energy producers					Politicians					Authorities					General Public				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Carbon dioxide		II	II	IIIIII				II	IIIIII	I		I	I	IIIIII	I	I	I	II	IIII	I
Other emissions (SO_x) NO_x, etc)				IIIIIII	II		I		IIII	IIII			I	III	IIIII			II	II	IIIII
Cyclic principle	II	II	II	III		III	I	III	II		III	I	II	I	II	III		IIII	I	I
Emission "bubble" principle	I	I	III	II	II	I	I	IIII	I	II		II	III	II	I	II	II	III	II	
Electric and magnetic fields in connection with transmission lines		III	II	IIII	II		III	III	II	III		II	I	IIIII	II		II	II	III	IIII

Fig. 3 Distribution of replies.

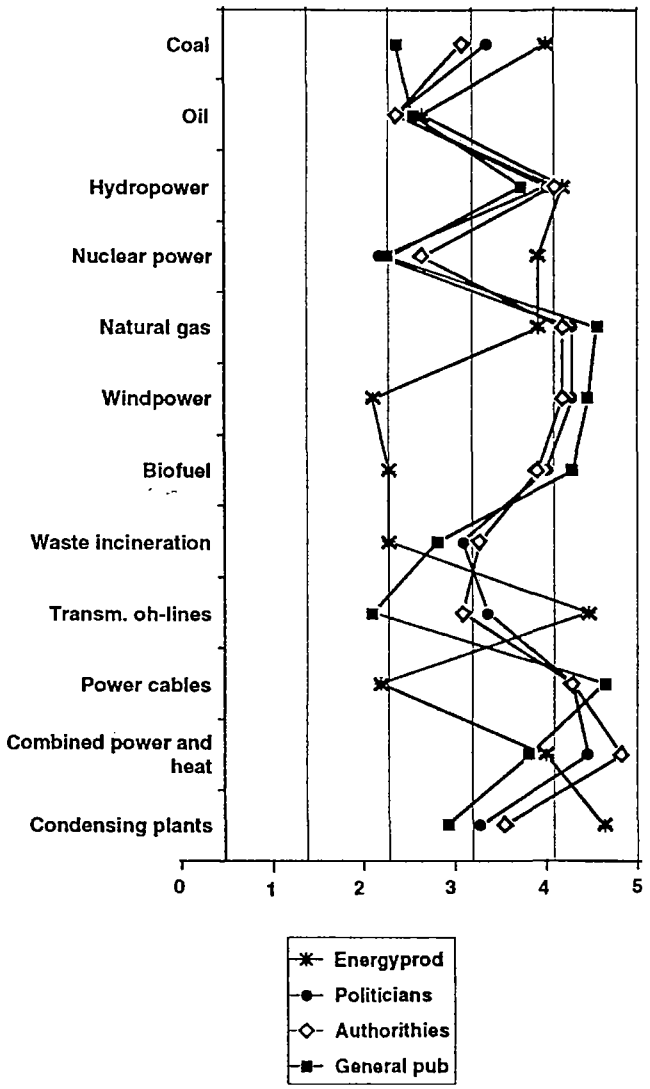

Fig. 4 Mean values of answers divided between energy producers, politicians, authorities and the general public.

General conclusions

- Here, the answers follow a more symmetrical pattern. Greater consideration to emissions with more of a local impact, for example SOx and NOx, less consideration to cyclical thinking and greater distribution when it comes to questions on electrical and magnetic fields and the emission bubble principle. It is clear that the intensive discussion that is going on in certain countries on electromagnetic fields has still not had a full impact in all parts of the world.

Conclusions specifically related to countries

- The Finnish case study concerning the coal-fired Meri-Pori Power Plant deals with the air pollution problem. In Finland, the power

industry is of the opinion that the air pollution issues, e.g. acid rain, have to be solved on the same scale as the problems appear, i.e. internationally or nationally, and in no case locally. This approach has also been adopted in the legislation. Although local conditions can still constitute sufficient reason to set individual emission targets, relatively strong arguments are needed in order to depart from the general principles.

- In both the Swedish example with Brofjorden Power Plant (waste oil-fired) and the Meri-Pori Power Plant, the local opinion is that the local and regional environmental effects would be too great if the plant were to be constructed. These opinions where shared neither by the central administrations or the companies. In this case, information and communication (national) between the parties is very important in order to avoid misunderstandings and to be able to advance further with the process.

Emission control: a short outline and some results

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The World Energy Conference Committee on "Performance of Thermal Generating Plants", chaired by Mr. J. Adam, Black & Veatch US, has faced the issue of the impact of emission control legislation on the production cost worldwide.

A report was prepared for the last World Energy Conference of Madrid [1]. In the report a complete description of the standards adopted in the various countries was given and it was discussed how to comply fuel switch, scrubbing of a mixture of the two are used worldwide and the strategical-economic reasons in the background.

As far as the scrubbing option it is concerned, quantitative figures have been obtained and given of the cost effect of FGC and SCR needed to comply, for various generating units in Germany, Japan, Italy and US. The effect of the emission control on the production cost will be quite significant. With the caution imposed by the fact that international comparisons are difficult since standards, fuel price projections, underlying financial hypotheses and monetary exchange rates are different, FGD and SCR appear to alter the overall cost about of 8% to 23%, depending on utility-specific or country-specific situations.

The report [1] discusses also extensively the "market based" approach, adopted by US for a two phased SO_2 emission control instead of setting emission requirements as made in Europe with the EU Directive 88/609/EC in force since November 1988.

This approach should allow the utility to decide how and where the reductions will be made, determining flexible, highly utility specific compliance strategies. Rights to emit SO_2 are obtained through "emission credits" or "allowances" which can be sold, transferred or banked. Allowances should be traded through Chicago Board of Trade (CBOT).

The results of the emission trading so far reported are:

i) the Environment Protection Agency (EPA) made two Auctions to stimulate the market: in 1993 and 1994 Auctions 150,000 and 176,000 allowances were respectively sold

ii) compliance costs witnessed in the market are actually running lower under the trading system than originally expected due to increased competition among the options for reducing emissions

iii) emission are dropping even below the mandate limits

iv) the program is not working as effectively as it could since the trading is limited, probably for two reasons:

   a) many buyers have until 2000 to reduce emissions
   b) state and federal regulators have not yet decided whether allowance purchase cost can be passed on to the ratepayers.

The reaction from the environmental community has been mixed. There have been objections to some of the transactions from environmentalist groups in the purchasing company's location, but they have not been strong enough to hinder the market.

The subject presents strong interrelationships among various players and issues: utility planners, regulators, customers, environmental groups, job defence/creation.

Reference

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