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Edited by Jozef M. Pacyna¹ and Arve B. Berntzen²

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1. Introduction

It has been documented by the results of various international programs/projects that pollutants emitted to the air and water in one region can be transported within air masses or water streams to contaminate the environment in another region. The UN ECE European Monitoring and Evaluation Programme, established within the Long-range Transboundary Air Pollutant Transport (LRTAP) has provided evidence that emissions of sulfur and nitrogen oxides, non-methane volatile hydrocarbons (NM-VOCs), toxic heavy metals and persistent organic pollutants (POPs) emitted to the air mainly in a few major source regions in Europe are being dispersed over the whole continent, reaching remote locations in Northern Europe and even in the Arctic. Other projects, often supported by the international organizations, such as the European Union add to the EMEP results providing information on regional and global source-receptor relationships also for other groups of air pollutants, including greenhouse gases, as well as on long-range transport of various chemicals within river waters to the major European seas.

International cooperation is needed between various countries in order to develop strategies and policies for the reduction of pollution load in Europe. Such cooperation contains various activities, including: 1) joint research projects providing substantiation material on the degree of environmental contamination and its origin, as well as on the consequences of the environmental contamination, 2) preparation and implementation of international agreements on emission reductions on the basis of results from the substantiation works, and 3) finding solutions to socio-economic aspects of pollution reductions in emission regions. As a part of this cooperation Norwegian and Polish authorities and research groups actively participate at all the above defined levels in order to reduce pollution load to the environment in Europe, and particularly in Northern Europe.

During the 1970's and the 1980's the Polish industry has been one of the major polluters of the environment in Europe emitting about 10 % of the total European emissions of sulfur and nitrogen oxides, and non-methane volatile hydrocarbons. A part of Polish emissions to the air has been deposited in southern Norway and under certain meteorological conditions some of these emissions were transported even to the Norwegian Arctic.

Discharges of various chemicals to the Wisla and Odra rivers were often ending in the Baltic Sea. These two rivers contribute the most of nutrients and pollutants entering the Baltic Sea with the river waters. Polish authorities have been signatories of various international agreements in Europe on the reduction of these emissions but national economic restrains very often prevented the successful implementation of these agreements. Therefore, it was crucial to find international solutions that would enable to finance the country efforts to combat the air and water pollution.

During the period from 1971 through 1978 Polish government has borrowed about 18 billion US dollars from 16 countries in loans guaranteed by Western governments. Due to inefficiency of the centrally planned economy system this debt was not discharged and it run up to over 32 billion US dollars in 1991. A deep economic crisis associated with the collapse of a communist system and a great cost of Poland's transformation towards a market economy prevented repayment of that enormous debt. In April 1991 creditor countries of so called Paris Club agreed to reduce the debt by 50 % provided that the rest would be paid up to the year 2010.

This debt agreement also contained a so-called swap clause which opened up for swap arrangements of up to 10% of the remaining public debt. Polish authorities took immediate action to activate the clause in favor of a "debt-for-environment swap" and the establishment of the Polish EcoFund foundation. Norwegian authorities contributed actively by setting up an expert team to assist in the construction of the financial mechanism of the EcoFund. Furthermore, the Norwegian authorities contributed by arranging together with Polish authorities a seminar in Oslo in July, 1991 to present the EcoFund to the creditor countries of the Paris Club and representatives of international financial institutions. Although Norway has postponed a decision whether to join or not, Polish authorities have managed to obtain the eco-conversion support of several Western countries, including the United States, France, Switzerland, Finland, Italy, and recently Sweden. Towards the end of 1997 Norwegian authorities have presented the EcoFund with a donation of 3 million NOK to be used for the reduction of the impact of Polish emissions on the environment within and outside the country.

2. Organization of the Seminar and its objectives

On 25 August, 1998 a Seminar on Measures to Reduce the Pollution of the Environment was organized in connection with the Norwegian donation of 3 million NOK to the EcoFund.

The main objectives of the Seminar were: 1) to exchange information on technological and socio-economic aspects of various measures for emission reductions in Poland, 2) to discuss current (the above mentioned donation to the EcoFund) and future contributions of the Norwegian authorities to successful implementation of emission reduction strategies prepared in Poland and managed daily by the EcoFund, and 3) to discuss potential cooperation in the light of the Kyoto agreement.

It was also intended to discuss the possibilities for the Norwegian industry to contribute to the reduction of pollutant discharges to the air, water, and land in Poland through the transfer of knowledge and technology and possibly by

investment in clean technology for the Polish industry resulting also in lower emissions of pollution to the environment.

The Seminar was organized by the Norwegian Institute for Air Research (NILU), which acts as the Norwegian agent to overlook the donation to the EcoFund, in cooperation with the Orion International Consulting and the Air Emission Control A/S in Oslo. The Agenda of the Seminar is enclosed in Annex 1. The meeting was chaired by Dr. J. M. Pacyna and Mr. A. Berntzen.

Norwegian participants of the Seminar included representatives of the Royal Norwegian Ministry of Foreign Affairs and the Royal Ministry of the Environment, as well as representatives of Norwegian industry, and representatives of institutions involved in granting and carrying out projects in Poland.

Polish participants of the Seminar included representatives of EcoFund with its President, and a representative of the Polish Embassy in Oslo.

A list of participants of the Seminar is enclosed in Annex 2

3. Chairman's report of the meeting discussions

The Seminar was opened by Mr. P. Berg, the Assistant Director of NILU and Dr. J.M. Pacyna, Senior Scientist at NILU with welcome on the behalf of the Seminar organizers. They also presented the scope and objectives of the Seminar described earlier in this document.

EcoFund foundation was presented by Prof. M. Nowicki, the EcoFund President, Dr. M. Wilczynski, the EcoFund Vice-President, and Dr. R. Sulima, the EcoFund project leader of the "Pomorzany" power plant project in Szczecin where the Norwegian donation is being used. Prof. Nowicki, former Minister of the Environment in Poland, described the history, structure, and current financial situation of the Eco-Fund. As already mentioned, the EcoFund has received first funds in 1992.

The Minister of the State Treasury in Poland acts as the Founder of the EcoFund. The foundation has two decision-making bodies: the Supervisory Council and the Management Board. The Council consists of representatives of donor countries and representatives of Poland. This body defines EcoFund general policies, approves the annual financial plan and the annual performance reports of the EcoFund, and appoints the Management Board. The Council has also the authority to decide which projects should be given priority. The Management Board is responsible for the day-to-day management of EcoFund operations. The EcoFund has 25 employees at present.

The basic task of EcoFund is to subsidize undertakings of special importance for environmental protection in Poland, recognized as priorities of the "Ecological State Policy". According to the status, resources of EcoFund may be assigned primarily to five priority sectors. These include:

- abatement of emissions of gases causing changes of global climate,
- limitation of transboundary transport of sulfur and nitrogen oxides emitted in Poland,
- reduction of the Baltic Sea pollution,
- preservation of biodiversity in Poland, and
- effective management of solid wastes (since 1998).

At present, the foundation has about 538 million US dollars at its disposal until 2010. Annual budget is about 30 million US dollars. The total amount of funds paid to the EcoFund during the first five years of the operation as a result of the Polish debt-for-environment swap was more than 100 million US dollars. The second source of the EcoFund income is the interest on capital at the disposal of the foundation. This accounted for more than 10 million of US dollars so far. The administrative costs at the foundation account for 2.8 % of the budget.

More information on the topics presented by Prof. Nowicki is available from Annex 3.

Dr. Wilczynski discribed in more details the projects carried out with the EcoFund support and presented information on project financing criteria and conditions, project selection procedures, negotiations of project agreements, project final evaluation, and project implementation and monitoring. It was pointed out that EcoFund may provide financial support to investment projects (construction of installations or devices designed to the benefit of environmental protection). However, EcoFund does not offer resources for research or monitoring of environmental contamination. The proposals presented for financial support should include both a feasibility study and a business plan.

The EcoFund shall provide financial support only in the form of non-repayable grants which basically encompass 10 to 30 % of a project cost. In highly justified cases, when local governments are investors, the grant may cover up to 50 % of the project cost.

EcoFund's project appraisal and approval procedure is usually a two stage process including "Project Questionnaire" and "Grant Application". The foundation applies a procedure of "solicited and competitive project proposals" by inviting interested organizations/institutions to participate in the nation-wide contests for project support in the defined area.

At the technical completion of the project, the Grantee is obliged to submit a final report concerning the whole of the project, its ultimate cost, and environmental benefits obtained.

Projects supported by EcoFund are usually divided into a number of implementation stages which are financed one by one. The Grantee may receive an advance payment at an amount foreseen in contracts with suppliers.

More details on matters presented by Dr. Wilczynski are included in Annex 4.

Dr. Sulima presented one of the EcoFund projects which was recently accepted for performance with support of the Norwegian donation. The project is on the installation of emission control devices in "Pomorzany" power plant in the city of Szczecin. The aim of the project is to reduce transboundary transport of sulfur and nitrogen oxide emissions. Details on this project are presented in Annex 5.

Two major points were focused in the discussion following the presentations by the EcoFund representatives. The unique feature of EcoFund operations, distinguishing the foundation from other institutions financially supporting environmental protection endeavors in Poland is the fact that grants focus first of all on the purchase of facilities from both Polish companies and firms from donor countries. In this way EcoFund effectively facilitates the transfer of the best foreign technologies onto the Polish market with benefits to both the Polish partner and the partner from a donor country. EcoFund activities warrant promotion of companies from donor countries on the Polish market. In this way these activities result in substantial benefits to Poland and to countries adopting the Polish debt-for-environment swap.

Review of EcoFund activities was carried out by the Organisation for Economic Co-operation and Development (OECD) in Paris in November, 1997. The OECD review gave a very positive evaluation of EcoFund and stated that EcoFund's success is a model for other environmental financing institutions in Poland and other countries in Central and Eastern Europe. It was also stated that EcoFund had acquired a reputation as a center of excellence and its experience had been used by other financing institutions in Poland and abroad.

The representative of the Royal Norwegian Ministry of Foreign Affairs Ambassador O.K. Holthe indicated that there is no change in the Norwegian position on a possible Polish debt-for-environment swap issue. He was, however, impressed by the important role which EcoFund does play, particularly in a view of joint implementation projects between private companies and EcoFund. EcoFund appears to be prepared to participate in these activities with the necessary experience, efficient structure, and highly qualified staff. Ambassador Holthe noted the great interest that Polish participants at the Seminar expressed in a positive eco-conversion of a part of Polish debt in Norway.

Ambassador Holthe also discussed the importance of multinational cooperation in order to solve environmental problems in Central and Eastern Europe. The Baltic Sea clean-up was mentioned as an example for such cooperation with the support of financial institutions, such as the World Bank and the European Bank for Reconstruction and Development (EBRD). Ambassador Holthe excused himself for not having the time to attend the rest of the Seminar, and wished the participants every success.

Implementation of the Kyoto agreements concerning the reduction of greenhouse gas emissions from the 1990 level in the commitment period 2008-2012 is a very important issue in national environmental policies in both Poland and Norway. Poland is expected to reduce its emissions by 6 % while Norway is allowed to increase its emissions by 1 %. Both countries are now defining their strategies and measures to meet the commitment. Mrs. I.J. Wiese, Adviser at the Ministry of

Environment in Norway presented at the Seminar a paper on Norway's follow-up of the Kyoto Protocol. A comprehensive description of the Kyoto Protocol has been presented followed by elaboration on Norwegian measures. Several measures have been outlined including those related to:

- carbon dioxide taxes,
- emission trading, and
- joint implementation projects.

The issue of joint implementation projects was of special interest for the participants of the Seminar. Poland is among the countries cooperating with Norway in joint implementation projects. There is also a cooperation at the Nordic level. In June 1997 Norway signed the Declaration of the Nordic Prime Ministers to cooperate for a sustainable development in the Baltic Sea region. There is a special focus on energy sector in this agreement. Emission trading has been mentioned as a potential future activity. This issue is of interest for Poland and Norway when discussing various options of the Kyoto agreement implementation.

A summary of Mrs. Wiese's presentation is available in Annex 6.

Presentation of the Norwegian Industrial and Regional Development Fund (SND), the Norwegian Environment Fund and the investment funds for Northwest Russia (NWR) and Central and Eastern Europe (CEE) was given by Mr. Jan Thompson, the Director of SND. The SND was established in January, 1993 to promote profitable commercial- and efficient economic business development in Norway. This shall be achieved through providing capital and investigating in activities which contribute towards better utilization of the country resources. Equity investments in Northwest-Russia and East- and Central Europe is one of major business focuses of SND. More information on SND is available in Annex 7.

The Norwegian Environment Fund was established in 1998 and is directed by Mr. Jan Thompson. The major goal of the Fund is to stimulate private and public enterprises in Norway to apply and develop environmentally efficient technologies. Loan is an exclusive instrument of the Fund, which operates at the base capital of 50 million NOK and loan capital allocated over state budget in 1998 is 250 million NOK. Priorities are given to projects directed towards reducing greenhouse gases in Norway. More details about the Norwegian Environment Fund is available from Annex 8.

Finally, the Northwest Russia (NWR) and Central and Eastern Europe (CEE) investment funds have been established to further develop economic cooperation between Norway and the countries in the said regions. They operate at the level of 150 million NOK (NWR) and 70 million NOK (CEE) with additional 30 million NOK as consultancy fund for NWR. More details about NWR and CEE are presented in Annex 9.

The second part of the Seminar included contributions from four Norwegian institutions involved in the research and application of research results in the

reduction of environmental contamination. Two first presentations have dealt with greenhouse gases. Mr. Geir Høiby, Research Director of the Confederation of Norwegian Business and Industry (NHO) presented information on current emissions of carbon dioxide in Norway concluding that more than 52 % of these emissions originate from land and off-shore industry operations and more than 40 % from mobile sources. Major part of this presentation was on measures to reduce these emissions as it is foreseen that the 1990 emissions of greenhouse gases in Norway may increase by about 23 % in the year 2010, while the Kyoto agreement allows for an increase of only 1 %. Regulatory actions, taxes, and emission trading were named as potential measures to reduce these emissions. Emission trading seems to be a very attractive measure although there is still a lack of rules in this matter as well as tradable permits in the country. Introduction of new taxes is also seen as a measure but less attractive than the emission trading.

More information on measures to reduce carbon dioxide emissions in Norway has been presented by Mr. Auke Lont, Managing Director of Naturkraft A/S in Norway. Main question posed in his presentation was whether gas fired power plants can still be an alternative to obtain this reduction in Norway. Measures to reduce emissions, such as taxes, cleaning technologies before and after combustion were discussed together with options for the implementation of the Kyoto protocol in Norway. New less polluting technologies were described including the economic aspects of cleaning the exhaust gases. An interesting comparison of cleaning cost was presented for various technologies, the emission trading measure and joint implementation measures. Mr. Lont's presentation is available in Annex 10.

Mrs. Grazyna Englund, a Scientist at the Norwegian Institute for Water Research (NIVA) presented major research goals and achievements of the Institute in combating the pollution of water in Norway and abroad. NIVA has been cooperating with various Polish institutions since the beginning of the 1990's. Dr. Englund presented major projects carried out jointly by NIVA and Polish institutions suggesting that the experience gained through these projects can be of interest for the EcoFund priority area on the reduction of Baltic Sea contamination. Further information on NIVA's activities is presented in Annex 11.

Dr. Jozef M. Pacyna, a leader of the Fluxes and Ecological Economics (FEE) at the Norwegian Institute for Air Research (NILU) presented a paper on socioeconomic aspects of environmental contamination. Factors affecting management of pollutants generation, use, and release were discussed focusing at the environmental protection strategies and their costs. Various steps of cost-benefit analysis for air pollution policies were described with focus on methods for benefit valuation and control cost estimates. An example of these methods for coastal zones of the Baltic Sea was presented. Finally, economic instruments in pollutants control were outlined. The Pressure-State-Response model was presented as a way of translating results of science to policy decision. It was pointed out that practical applications of various aspects of ecological economics presented by Dr. Pacyna are utilized by NILU through its cooperation with EcoFund. This is in a connection with the fact that NILU acts as the agent for the

Norwegian Royal Ministry of Foreign Affairs concerning the Norwegian donation to EcoFund. More information on Dr. Pacyna's presentation is given in Annex 12.

4. Conclusions from the Seminar

The following conclusions were drawn during the final discussion at the Seminar.

- 1. The results of research carried out in Europe during the last few decades clearly indicate that various pollutants emitted in one country are transported with air masses and can be deposited in another country. Poland is still one of the most polluting countries in Europe with respect to greenhouse gases, acidic compounds, toxic compounds, and photo-oxidants. The country alone is not in a position to reduce the emissions of these gases, although various international agreements on emission reductions expect Poland to comply with the respective reduction quantities. Financial constrains related to the change of Polish economy from centrally planned to market oriented made the implementation of international agreements difficult to perform. Much has been done in Poland in the question of emission reductions. Investments in combating the environmental contamination constitute as much as 7% of the total investments in Poland, which is more than in the Western European countries. However, much more resources are needed in order to bring the atmospheric emission magnitude in the country to the acceptable and internationally agreed levels.
- 2. The debt-for-environment swap and EcoFund have been efficient and successful mechanisms used to help Poland combating pollution problems and to help international society in Europe in decreasing the import of pollution load from Poland. The EcoFund foundation has been very successful in implementing decisions on supporting financially and implementing projects on reduction of pollution emissions to the air, water and land in Poland. The representatives of EcoFund have stressed during the Seminar that participation of Norway in the debt-for-environment swap would substantially contribute to further reduction of emissions of pollutants in Poland and reduction of concentration levels in Europe.
- 3. The EcoFund facilitates the transfer of the best foreign technologies onto the Polish market. The EcoFund participants have indicated at the Seminar that the Norwegian industry may clearly benefit from a Norwegian participation in the debt-for-environment swap. Norwegian companies will be invited together with Polish companies to bid concerning the purchase of any installation for emission control within projects with Norwegian funding through the debt-for-environment swap.
- 4. Participants of the Seminar have stressed that we are now facing the implementation of strategies for emission reductions of some pollutants (e.g. sulfur and nitrogen compounds, photo-oxidants, toxic heavy metals, and persistent organic pollutants) and the agreement on implementation measures for other pollutants (e.g. greenhouse gases) in connection with international agreements/protocols on emission reductions. Norwegian and Polish

authorities may find it very beneficial to discuss various measures in this respect, including joint implementation project and emission trading. The participation of Norway in the debt-for-environment swap, and thus interaction with EcoFund may open practical ways for implementation of any decisions of Norway and Poland concerning the joint actions towards meeting the international agreements/ protocols objectives.

5. The participants of the Seminar concluded that a Norwegian membership in the EcoFund could effectively contribute to a reduction of pollution in and from Poland, open up for interesting joint implementation projects to limit emissions of greenhouse gases and strengthen Norwegian and Polish environmental industries. A Norwegian membership would demonstrate for international cooperation to solve regional and global pollution problems.

Annex 1

Agenda

Norwegian-Polish Seminar on Measures to Reduce the Pollution of the Environment Oslo, 25 August, 1998

Oslo Håndverks- og industriforening Industrisalen (3. etg.) Rosenkrantz gate 7 Oslo

Agenda

09:00 - 09:30	Welcome, Introduction of the Seminar, Presentation of Participants	
09:30 – 10:15	Presentation of EcoFund by Prof. Maciej Nowicki , the EcoFund Director	
10:15 – 10:40	Presentation by Ambassador Ole Kristian Holthe, the Norwegian Ministry of Foreign Affairs	
10:40 - 11:00	Coffee break	
11:00 – 11:30	Kyoto protocol presented by Adviser Inger Johanne Wiese , the Norwegian Ministry of Environment	
11:30 – 12:00	Presentation of the Norwegian State Environmental Fund and the Norwegian Industrial and Regional Development Fund (Division for Eastern Europe) by Director Jan Thompson	
12:00 - 13:15	Lunch (Håndverker-restauranten)	
13:15 – 14:35	Contributions by NHO (Confederation of Norwegian Business and Industry) by Director Geir Høiby Naturkraft A/S by Man. Director Auke Lont NIVA (Norwegian Institute for Water Research) by Dr. Grazyna Englund NILU (Norwegian Institute for Air Research) by Dr. Jozef M. Pacyna	
14:35 – 14:50	Tea break	
14:50 - 15:30	General Discussion	
15:30	End of the Seminar	

Annex 2

Participant list

Norwegian-Polish Seminar on Measures to Reduce the Pollution of the Environment Oslo, 25 August, 1998

Oslo Håndverks- og industriforening Industrisalen (3. etg.) Rosenkrantz gate 7 Oslo

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Annex 3

Principles of EcoFund operations

ECOFUND

POLISH DEBT FOR ENVIRONMENT SWAP

5 years of operation 1992 - 1997

(SUMMARY)

PRINCIPLES OF THE ECOFUND'S OPERATIONS

ORIGIN

The origins of the ECOFUND can be traced back to the year 1991, when the Paris Club, comprising creditor countries of Poland, decided to reduce the Polish debt by 50% provided that the other part of it is repaid by the year 2010. The Polish Government proposed to assign a further 10% of the debt for support of the most urgent undertakings in the field of environmental protection.

That was the first initiative in the world pertaining to the conversion of a part of the state-guaranteed debt for ecological purposes (the so-called debt-for-environment swap). The agreement of all the 16 creditor countries to this proposal would make it possible to assign the sum of over 3 billion dollars to environmental protection in Poland. This would constitute crucial financial support for the efforts to improve the condition of Polish environment, highly degraded due to prolonged negligence in the previous political and economical system.

The Paris Club complied with the Polish suggestion, creating a general possibility to employ the mechanism of the conversion of a part of the debt (up to 10%) for purposes agreed upon in bilateral agreements signed between Poland and the respective creditor countries.

Already in June 1991, the United States Government made a decision concerning the debt-forenvironment swap of 10% of Polish debt (approx. USD 370 million). This created a good basis for establishment of a special institution to manage these funds. Its status and other legal and organisational documents were prepared in co-operation with the Coopers & Lybrand company, so that in April 1992 the Minister of Finance, acting on behalf of the State Treasury, was capable of establishing the ECOFUND, granting it status as an independent, non-profit foundation, and appointing its Supervisory Council.

The first money arrived at the ECOFUND bank account on November 18th 1992. This allowed for the employment of the first three employees, renting office premises, and starting regular activity. Still in 1992, the ECOFUND provided grants to the first five projects for a total of PLN 4.25 mln.

In 1993, the decision of the Polish debt-for-environment swap was made by France and Switzerland. On June 2nd 1993, the agreement was signed with France (conversion of 1% of the debt - approx. FF 280 mln), and on December 17th - the agreement with Switzerland (10% of the debt - CHF 78 mln).

1993 was the first full year of EcoFund operations. That year, the sources of its income, together with operational procedures and the staff structure were formed.

TASKS

The basic task of the ECOFUND is to subsidise undertakings of special importance to environmental protection in Poland, recognised as priorities of the "Ecological State Policy".

According to the statutes, resources of the Foundation may be assigned primarily to five priority sectors. These include the following:

- abatement in emission of gases causing changes of global climate (so-called greenhouse gases);
- limitation of the transboundary transport of sulphur dioxide and nitrogen oxides from the Polish territory;
- limitation of the Baltic Sea pollution;
- preservation of Polish biodiversity;
- effective management of solid waste (since 1998)

In order to reduce emission of greenhouse gases (carbon dioxide, methane and CFCs) the ECOFUND supports the following kinds of undertakings:

- energy saving and improving of energy efficiency;
- promotion of renewable energy sources;
- elimination of methane emission from mines and municipal waste dumps;
- elimination of the use of freones (CFCs) from production processes.

The following activities are supported in the area of abating sulphur dioxide and nitrogen oxides emission:

- elimination of sulphur from fuels;
- new technologies of coal combustion reducing emission of SO₂ and NO_x (fluidised bed boilers, coal gasification);
- replacement of fuel in conventional boilers (with the so-called smoke-free fuel or natural gas);
- construction of installations to eliminate SO₂ and NO_x from exhaust gases.

In order to reduce Baltic Sea pollution, the ECOFUND concentrates its aid on support for sewage treatment plant construction in towns located on the sea-coast, thus impacting coastal water purity.

The foundation also supports construction of sewage treatment plants of considerable importance to the improvement of drinking water quality in the largest urban agglomerations. In that case, support is motivated by the necessity to protect the health of inhabitants of such agglomerations.

In the nature conservation area, the ECOFUND supports actions concerning the following:

- active protection of plant and animal species in danger of extinction;
- protection of the most valuable wetlands against degradation and reclamation of degraded areas;
- restoration of water purity of lakes and rivers, in national and landscape parks;
- construction of the necessary technological and educational infrastructure in national parks;
- promotion of environment-oriented forest management.

It should be noted that recently also **rational waste management** has become a priority in ECOFUND operations. The Foundation will support the most necessary and innovative undertakings connected with utilisation of both municipal and industrial waste, as well as with contaminated land reclamation.

In the area of environmental protection sectors mentioned above, the ECOFUND provides financial support in the form of non-refundable grants only. With the exception of endeavours concerning nature conservation, projects have to be at an investment stage, and have their

documentation complete.

As a rule, ECOFUND grants cover 10-30% of project costs. In exceptional cases of state-funded institutions or local authorities financing a project, the grant may cover up to 50% of the costs concerned. In the nature conservation area, when the ECOFUND partner is a non-profit non-government organisation (NGO), the grant may cover as much as 80% of the total project cost.

The unique feature of ECOFUND operations, distinguishing the foundation from other institutions financially supporting environmental protection endeavours in Poland, is the fact that grants focus above all on the purchase of any necessary facilities from both Polish companies, and firms from donor countries. This way, the ECOFUND operates as an effective mechanism facilitating the transfer of the best foreign technologies onto the Polish market, currently becoming more and more competitive. Purchases made with renowned foreign companies are beneficial to Poland, as well as to donor countries. On the one hand, they allow for the improvement of efficiency and durability of any installations providing protection to Polish environment; on the other hand, they warrant promotion of all such companies from donor countries on the Polish market. Thus, ECOFUND operations are of measurable and substantial profit not only to Poland, but also to countries adopting the Polish debt-for-environment swap.

STRUCTURE

The Minister of the State Treasury acts as the Founder of the ECOFUND.

The Foundation has two decision-making bodies: the Supervisory Council, and the Management Board.

The Council defines the Fund's general policies, approves the annual financial plan, accepts the annual performance reports of the ECOFUND, and appoints and dismisses the Management Board. The Council also approves grants for particular projects.

The Council consists of representatives of Poland, and representatives of donor countries. The President of the Council is appointed by the Minister of Environmental Protection, Natural Resources and Forestry, with the other Council members appointed by the Minister of State Treasury as the Founder.

The Board of the ECOFUND is an authority responsible for the day-to-day management of Fund operations, and for representing the Fund in contact with third parties. It is responsible for the correct selection of applications submitted for approval to the Supervisory Council, and for the correct usage of any grants provided. Prof. Maciej Nowicki is the President of the ECOFUND from the very beginning up to now.

The Office of the Fund conducts the service of the ECOFUND's merits and finances. It has 18 employees.

ECOFUND OPERATIONS IN THE YEARS 1992-1997

INCOME

The basic source of ECOFUND income consists in amounts provided by agreements signed by Poland with the United States, France and Switzerland and Sweden in the area of the debt-for-environment swap. These sums are guaranteed every year in the State Budget Law in the "foreign debt service" section, and are regularly paid into the ECOFUND account from the state budget as the Polish liability to the donor countries.

The first payment was made in November 1992, and amounted to PLN 9.9 mln (equivalent of USD 6.5 mln), as debt repayment to the United States.

In the years 1993-1994, the ECOFUND income from the debt-for-environment swap reached PLN 12-19 mln (equivalent to USD 6.9-8.7 mln). In 1995, the income was more than three times as high. This had been made possible due to the US Government decision to change the scheme of repayment for this part of the Polish debt. Instead of the procedure valid formerly, assuming a considerable increase in repayments following the year 2000, it has been decided that the part of debt assigned for environmental protection purposes would be repaid in even instalments over the entire period of 1995-2010. Since then, payments into the ECOFUND account resulting from the debt-for-environment swap of 10% of the Polish debt to the USA amount to USD 24.2 mln per annum. In September 1997 ECOFUND received additional financial sources due to the debt-swap agreement between Poland and Sweden, concerning 2% of Polish debt (SEK 50 mln). The agreement is valid for 3 years.

Total amounts paid into the ECOFUND account in the years 1992-1997 as a result of the Polish debt-for-environment swap were more than USD 100 mln, that is over 20% of the income planned until the year 2010.

The second source of the ECOFUND incomes is the interest on capital at the disposal of the Foundation. The bank interest brought an approximately total of PLN 32 mln, constituting approx. 11% of the debt-for-environment swap income.

It ought to be underscored that the total administrative costs of the Foundation over the five years period of existence amounted to PLN 8.5 mln, i.e. 2.8% of the available resources. This means that the ECOFUND has assigned 100% of the debt-for-environment-swap income, and 75% of the bank interest to statutory activity purposes, i.e. subsiding environmental endeavours in Poland. Own costs of the Foundation were covered by remaining income from bank interest.

Moreover, one ought to consider that in the course of the 1992-1997 period, the total income of the ECOFUND amounted to more than PLN 300 mln, thus placing the Fund among the largest sources of financing environmental protection in Poland.

PROJECT FINANCING

In the course of the first five years (November 1992 - August 1997), the ECOFUND Board provided grants to 303 environmental protection projects in Poland, for a total amount of approx. PLN 300 mln. It has been estimated that grants were allocated to projects of a total volume of PLN 2,5 billion, i.e. over 15% of costs incurred for environmental protection in Poland over the recent 5 years. Should one consider the fact that the ECOFUND selects projects with great care, subsiding only those of major priority in the nation-wide or even international perspective, a new light is thus shed on the important role of the Foundation in supporting environmental protection in Poland.

Almost 30% of funds have been allocated to the reduction of greenhouse gases emission, about 21% to the reduction of SO_2 and NO_x emission, 36% to the investment projects serving Baltic Sea protection and 13% to the actions in nature protection area.

Nearly 52% of the ECOFUND's money has been accomplished by local governments of towns and communes. These mainly include such municipal facilities as municipal sewage treatment plants with sewer-pipes, and energy-saving projects consisting in heating system modernisation. In such cases, the ECOFUND grants amount up to 30%.

Second important partner of the ECOFUND are industrial plants constructing installations serving environment protection. They received 41,5% of grants. Such projects are new on the Polish market and equipment is imported from donor countries. They are necessary to the environment, although very expensive, which is why the Foundation subsidises the application of pilot installations in Poland, as demonstration projects. In such cases, ECOFUND grants generally amount to 10-20%, occasionally reaching 30%.

Other ECOFUND's partners are state-funded institutions, such as sanatoriums, hospitals, or national parks and non-governmental organisations (ecological and charity ones).

METHODS OF WORK APPLIED AT THE ECOFUND

Very important features of the ECOFUND's strategy as a financial institution are the independence from political pressure and transparency of all procedures using in the process of selection projects and their controlling in implementation phase. The most essential elements of this strategy include the following:

- 1. An explicit definition of the area of operation, within the Foundation may support any significant and good prepared project. Beyond this area, no project may be provided with an ECOFUND grant.
- 2. Employment of the multi-criteria analysis applied to the purpose of an objective estimate of the value of any particular project within the priority areas. This analysis comprises technological, ecological and economic criteria. Moreover, the financial reliability of the investor and of the entire project funding is examined every time.
- 3. Operating not within limits of a passive evaluation of the grant applications submitted, but as an active search for most valuable projects throughout Poland, by frequent organisation of competitions, and by elaborating long-term programmes concerning the particular regions or sectors.

To date, the ECOFUND has conducted the following nation-wide competitions:

- energy saving in municipal heat supply systems (three editions);

- construction of wind power stations (one edition);
- construction of small hydro-power stations (two editions);
- active protection of plant and animal species in danger of extinction (two editions);
- reclamation of the most valuable wetlands (three editions);
- preservation of biodiversity within landscape park area (one edition);
- preservation of wetlands in state-owned forests (one edition).

Moreover, the ECOFUND - in co-operation with the Regional Fund for Environmental Protection in Katowice - organised four editions of the competition for the liquidation of low emission sources, such as small boiler plants or ceramic stoves, in the Upper Silesia region.

Another form of active search for good projects consists in the drafting of proprietary long-term regional or sector programmes, targeting complex solutions to important environmental problems. The public presentation of any such programme by the ECOFUND, accompanied by a declaration of substantial financial support to all the programme tasks concerned, is usually a very strong motivation for the investors to elaborate good projects, meeting stringent Foundation requirements. In the years 1993-1997, the ECOFUND drafted the following programmes:

- elimination of coal combustion in the Old Town area in Cracow,
- water purity protection in the Biebrza river within the Biebrzański National Park area (the biggest wet-land area in the Central Europe),
- total elimination of sewage discharge into the Puck Bay (near Gdańsk and Gdynia),
- improvement of drinking water quality in Cracow, Wrocław and the Upper Silesia Agglomeration,
- restoration of water purity to lakes in the Great Mazurian Lakes region,
- active protection of eagles and other birds of prey in danger of extinction (the programme will be continued until the year 2010),
- active protection in Poland such animals like white and black stork, turtle and domestic species of fishes.

After the grant has been granted, an important element of the ECOFUND strategy is scrupulous control of grant expenditure at the project implementation stage. For this purpose, each project is divided into several stages completed upon approval of both the technical and the financial items of the project. As a rule, the ECOFUND remits the resources to the investor only after a given stage has been fully completed and approved. These resources have to be spent exclusively for covering payments precisely listed in the grant agreement. Any deviation from this principle requires the approval of the Foundation Board, and an attachment to the agreement, which is why at the moment of grant agreement drafting the investor has to present a realistic timetable of project completion with a breakdown by separate tasks, jointly with a specification of costs and the financing sources.

Such methods of co-operating with investors, although requiring much work on behalf of the entire ECOFUND's staff, result in efficient and timely completion of a great majority of projects assisted by the Foundation. This educational role of the ECOFUND is often as important as its role as financial institution.

THE RESULTS

ENVIRONMENTAL BENEFITS

The basic task of the ECOFUND is to support activities aimed at improving the environmental condition in Poland. Thus, any grant-supported project should provide explicit ecological benefits. In accordance with the grant agreement, whenever a project is completed, the investor is obliged to send a final report to the ECOFUND, inclusive of data concerning ecological benefits achieved (and proved by measures). All data is published in Central Statistics Office Annals.

A list containing data concerning the total environmental benefits of projects supported by ECOFUND grants in the years 1992-1997 has been presented below:

In the air protection area, emission of main air pollutants was reduced as follows:

carbon dioxide	1,2 million tonnes (0,5% of Polish emission)
sulphur dioxide	100 thousand tonnes (4% of Polish emission)
dust -	200 thousand tonnes (15% of Polish emission)
nitrogen oxides	5.5 thousand tonnes (0.5% of Polish emission)
methane	9 thousand tonnes (6% of Polish emission)
freones (R11 and R12)	0.5 thousand tonnes (28% of use in Poland)

Actions connected with the liquidation of low emission sources in big city centres and spas turned out to be of particular efficiency. In projects subsidised by the Foundation, more than 800 old and ineffective boiler plants have been liquidated, of a total heating power in excess of 400 MW, as well as more than ten thousand ceramic stoves. On the other hand, the 14 energy-saving projects brought savings in coal usage of approx. 50 thousand tonnes per annum.

In the area of protecting the Baltic Sea against pollution, ECOFUND support made it possible to build or modernise municipal sewage treatment plants in 20 towns located near the sea, and sewage pipes were constructed with sewage collection from 18 other towns to existing or newly constructed plants. As a result, more than 80% of inhabitants of towns located near the open sea are currently using very modern sewage treatment plants.

Moreover, decisions have been made to construct or modernise sewage treatment plants of fundamental importance to water purity in Cracow, Upper Silesia, and Wrocław. These include the following: Rabka (Cracow), Wisła (Upper Silesia), and Nysa and Strzelin (Wrocław).

Total reduction in the load of sewage discharged to rivers and lakes:

BOD-5 22 thousand O₂ per annum Suspended matter 24 thousand tonnes per annum

Total nitrogen 2.3 tonnes per annum

Total phosphorus 2 thousand tonnes per annum

In the nature conservation area, the ecological benefits are considerable as well, although difficult to quantify in numerous cases. The most important include the following:

accomplishment of programmes concerning the active protection of plant and animal species in danger of extinction, such as eagles and other birds of prey, the black and white

- stork, the roller, the black grouse, bats, the mud turtle, as well as native fish species on the verge of extinction;
- orestoration of natural biotopic conditions at 12 nature facilities of particular international importance, covering a total area of over 7,000 hectares,
- construction of 11 sewage treatment plants of fundamental importance to the purity of the Biebrza river waters within the area of the largest National Park in Poland, and construction of 9 municipal sewage treatment plants in other national parks,
- ♦ construction of 10 facilities of environmental education in national parks and natural preserves.

TECHNOLOGY TRANSFER

One of the major aims of the ECOFUND is to support the transfer of best foreign technical and technological environmental solutions from donor countries to Poland.

The import of modern machines, facilities or even entire processing lines from renowned foreign companies is beneficial both to Poland, as well as to countries of origin. It profits Poland to import facilities not produced in our country, mainly because they provide an improvement in efficiency, reliability and durability of the plant where they had been installed. On the other hand, the donor country benefits from exporting initial demo facilities to Poland, since this usually marks the beginning of long-term co-operation with Polish firms, often resulting a launch of production of such facilities in Poland. Thus, the environmental technology transfer stimulated by the ECOFUND is of measurable profit to both parties, thereby fulfilling the so-called win-win concept.

In the years 1993-1996, the ECOFUND subsidised the transfer of more than ten complete, very modern technologies, substantially contributing to environmental protection throughout the country. The most significant cases include the following:

- construction of six fluidized bed boilers at the Turów power plant the second biggest power plant in Poland (Foster & Wheeler, USA);
- hard coal treatment installation (sulphur and ash content removal) at the Staszic mine (Roberts & Schaefer, USA);
- combustion gas treatment technology (simultaneous sulphur and nitrogen oxides removal) at the heat generating plant in Legnica (Nalco Fuel Tech, USA);
- dry flue gas treatment installation (sulphur removal) for three units of the Turów power plant (ABB, Switzerland, Sweden);
- nitrogen oxide removal installation at the Chemical Works in Puławy (Rhone-Poulenc, France);
- nitrogen oxide removal installation for the glass smelting process at the TV colour tube manufacturing plant of Thomson-Polkolor in Piaseczno (Corning, USA);
- automatic remote control system for the district heating system in Opole and other 6 towns (Cegelec, France).

The ECOFUND expenses assigned for purchases to be made at companies from donor countries in the years 1993 - 1996 are following:

		Income	Expenditure to the firms	% of income
	ĐŢ.	(mln PLN)	from donor countries (mln PLN)	
United States		161.51	25.10	15.5
France		12.34	18.93	153.4
Switzerland		10,22	11.10	108.6
TOTAL		184.07	55.13	30.0

In case of France and Switzerland, the aforementioned expenses exceed ECOFUND income from the debt-for-environment swap of those countries. This results chiefly from a more extensive activity of companies from those countries on the Polish market, and their share in many projects, mainly small and medium. American firms are primarily interested in big projects, not extremely frequent in Poland so far.

In course of 5 years of operation, the ECOFUND has financed purchases in approximately 100 foreign companies, and the number of such companies is increasing from fear to year. This proves the continuous concern of the ECOFUND to actively promote the best foreign technologies on the Polish market, thus making the choice of the possible technological solutions act to the benefit of Poland, as well as that of donor countries.

Annex 4

The EcoFund Programme priorities, project selection criteria and procedures of operation

THE ECOFUND PROGRAMME PRIORITIES, PROJECT SELECTION CRITERIA AND PROCEDURES OF OPERATION

I. CONCEPT

In the years 1971-1978 Polish government borrowed about 18 billion US dollars from 16 countries, in loans guaranteed by Western governments. Due to inefficiency of the centrally planned economy system, these debts were not discharged and in 1991 they ran up to over USD 32 billion. A deep economic crisis associated with the collapse of a communist system and great cost of Poland's transformation towards a market economy prevented repayment of that enormous debt. So in April 1991 creditor countries, constituting the so called "Paris Club", agreed to reduce the debt by 50 per cent provided the rest would be paid by the year 2010.

This agreement provides also for a possibility of further 10 per cent of the debt to be cancelled in exchange for purposes as agreed bilaterally with creditor countries. The Polish Government represents constant view that this part of the debt should be earmarked for the environmental protection by means of a mechanism called debt-for-environment swap.

As early as in June of 1991, the Government of the United States approved this proposal. It made it possible to establish the EcoFund as an institution aimed at managing financial resources coming from debt-for-environment swap.

Up to now, Poland has signed relevant agreements with the following countries:

the United States (1991)
Switzerland (1993)
France (1993)
Finland (1990)
10 per cent of the debt;
USD 367 million
USD 52 million
USD 48 million
USD 48 million
USD 14 million

The EcoFund administers the financial resources made available by the first three countries. The agreement with Finland was concluded prior to the agreement with the "Paris Club" and established bilateral mechanism managed by a special Polish-Finnish institution.

II. STRUCTURE

EcoFund is an independent non-profit foundation established by Poland's Minister of Finance in 1992.

The Supervisory Council and the Managing Board are the two decision-making bodies of the EcoFund.

The Supervisory Council consists of representatives of the Polish state administration and the parliament, as well as representatives of governments from countries which have agreed to contribute to the EcoFund.

The Supervisory Council defines the EcoFund general policy (programme priorities, eligibility and project selection criteria, and procedures of awarding Foundation grants), examines and takes final decisions on grants from the EcoFund resources for projects proposed by the Board, and approves reports of the Managing Board of the Foundation concerning the implementation of approved projects.

The EcoFund's Managing Board is the executive body of the Foundation, dealing with the management of the day-to-day activities of the Foundation, and external contacts. The Board is responsible for initial project selection, and for the preparation of applications to be examined by the Foundation Council. The EcoFund Managing Board also monitors expenditure on projects approved and supervises their proper and timely implementation by investors (project sponsors).

In its everyday activities, the Board manages the Offices of the Foundation encompassing four subject priority investment areas ("sectors"), as well as the financial-and-accountancy department. Besides, the Foundation may commission independent experts and consultants for appraisal of particular project proposals as well as for legal and financial advice.

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III. PROGRAMME PRIORITIES

The statutory objective of the EcoFund is to support - by way of grants - particularly important activities in the field of environmental protection in Poland. The proposed projects ought to be consistent with the "National Environmental Policy" as adopted by the Polish Parliament in 1991 and should contribute to Poland's compliance with obligations arising from international conventions and agreements.

Basically, these projects ought to fit into the four areas ("sectors") defined in the Statutes of the Foundation, and considered to be of high priority internationally:

- 1. limiting the greenhouse gases emissions, and the phase-out of substances depleting the ozone layer;
- 2. reducing the transboundary flow of sulphur dioxide and of nitrogen oxides;
- 3. reducing the pollution of the Baltic Sea;
- 4. biodiversity conservation.

In the area of reducing emissions of greenhouse gases the EcoFund may support projects aimed at:

- energy saving;
- promotion of renewable sources of energy;
- elimination of methane emissions;
- CFCs phase-out from industrial processes.

In the sector concerning reduction of SO₂ and NO_X emissions projects addressing the following issues can be supported:

- removal of sulphur from fuels;
- modern technologies in energy generation;
- removal of SO₂ and NO_X from flue gases.

In the area of the Baltic Sea protection against pollution the following projects can be supported:

- construction of sewage treatment plants having significant impact on the Baltic Sea contamination (the so called "hot spots" and/or coastal municipalities);
- construction of sewage treatment plants improving purity of drinking water in the largest urban agglomerations.

In the area of biodiversity conservation the EcoFund may support projects concerning:

- investments aiming at the protection of wetland ecosystems;
- active protection of animal and plant species threatened with extinction;
- technical and educational infrastructures of the national parks;
- afforestation programmes.

Of all the projects which comply with the above programme priorities preference is granted to those representing value-for-money in terms of delivering environmental benefits at least cost and fulfilling at least one of the following specific conditions:

- provide for promotion on the Polish market of innovative environmental technologies from the countries that contribute to the EcoFund (demonstrative installations, pilot projects);
- are of high importance to human health and/or to the society's environmental education.

IV. PROJECT FINANCING CRITERIA AND CONDITIONS

The EcoFund may provide financial support to investment projects (construction of installations or devices designed to the benefit of environmental protection), whereas does not offer such resources for research, or monitoring of environmental contamination. The possibility of receiving financial support for "non-investment" projects may only apply to projects in the biodiversity protection area. The EcoFund may provide financial support to "investment stage" of investment projects (except the nature protection area), which means that pre-investment studies are not eligible for assistance.

The proposals presented ought to be backed up with both a feasibility study and a financial plan.

In case of projects which have both environmental and commercial objectives, the application shall be assessed by the EcoFund under the condition of the applicant presenting a "business plan" encompassing the entire project, as well as a detailed justification for the necessity of receiving non-commercial resources for the implementation of the project's environmental component.

The EcoFund shall provide financial support only in the form of <u>non-repayable grants</u> which basically encompass 10-30 per cent of a project cost. Any applicant wishing to receive an EcoFund grant has to prove a substantial contribution into project implementation from own resources, and present credible plans of receiving financial support from other sources (in the form of grants and/or loans).

In highly justified cases, when <u>local governments</u> (municipal or communal) are investors, the grant may cover up to 50 per cent of a project cost. Also, <u>budgetary entities</u> launching environmental investment projects going beyond their statutory responsibilities may apply for financing encompassing up to 50 per cent of a project cost; in case of nature protection projects providing no guarantee of investment return, the EcoFund share may increase even up to 80 per cent of a project expenditure.

Both <u>companies</u> (state-owned and private, including joint ventures with companies from countries which have joined the Polish debt-for-environment conversion programme) and <u>natural persons</u> involved in business activities can also apply for financial support. Such support may only be approved in cases of the projects fulfilling at least one of the following criteria:

- they cause the elimination or substantial reduction of environmental pollution beyond the local scale;
- they introduce innovative environmentally sound techniques and/or technologies onto the Polish market, coming particularly from countries which have accepted the Polish debt-for-environment swap programme (construction of demonstrative installations);
- they bring about a launch of new production in the area of environmental protection.

Any enterprise applying for the EcoFund grants ought to prove the following:

- a firm financial condition at the given moment, and clear-cut plans for future;
- the innovative nature of the solution proposed in the context of Polish terms, and the possibilities of replicability thereof throughout Poland;
- the inability to launch the project without the financial support of the grant, due to the lack of economic profitability of the investment for the applicant;
- substantial share of own resources committed to the project implementation.

The EcoFund can assign a grant covering up to 20 per cent of the cost to projects fulfilling the above criteria, while in highly justified cases the grant may be extended up to 30 per cent of the total cost.

A <u>public entity</u>, <u>foundation</u>, <u>non-governmental organisation</u> etc., while applying for a grant to support for its own project ought to prove the following:

- recognized achievements in the area which constitutes the EcoFund application subject;
- being the direct project executor;
- being accountable within the scope of adequate financial settlement of works performed.

In case of projects performed by such institutions/non-governmental organisations, and concerning biodiversity conservation, the financial support provided by the Foundation can reach 80 per cent of project costs. In case of projects applying to other priority areas, EcoFund grants may not exceed 50 per cent of the total costs.

The EcoFund can support both new and continued investments.

In case of any new investment, internationally recognized bidding practices for goods, works and services must be used by tenders opened for companies from Poland and countries involved in debt-for-environment swap schemes.

In case of the ongoing investment, the Foundation may either withdraw from the tender requirement (performing an *ex post* analysis of the contractor(s) and supplier(s) selection), or demand the launch of a tender procedure for the project part not yet completed (e.g. for purchase of equipment, or works).

A "Grant Agreement" with the EcoFund may be signed only when the project has been supported with full financial backup, to be proved by way of relevant documentation. This aspect of the project is always thoroughly examined.

In case the grant is allocated, the EcoFund retains the right to verify and propose modifications to the project, as well as to monitor the implementation thereof. Any investor applying for a grant or receiving financial support shall be obliged to provide any necessary data/documents allowing the Foundation staff or subcontracted experts to examine the actual condition of the project planned or implemented.

V. PROJECT SELECTION PROCEDURES

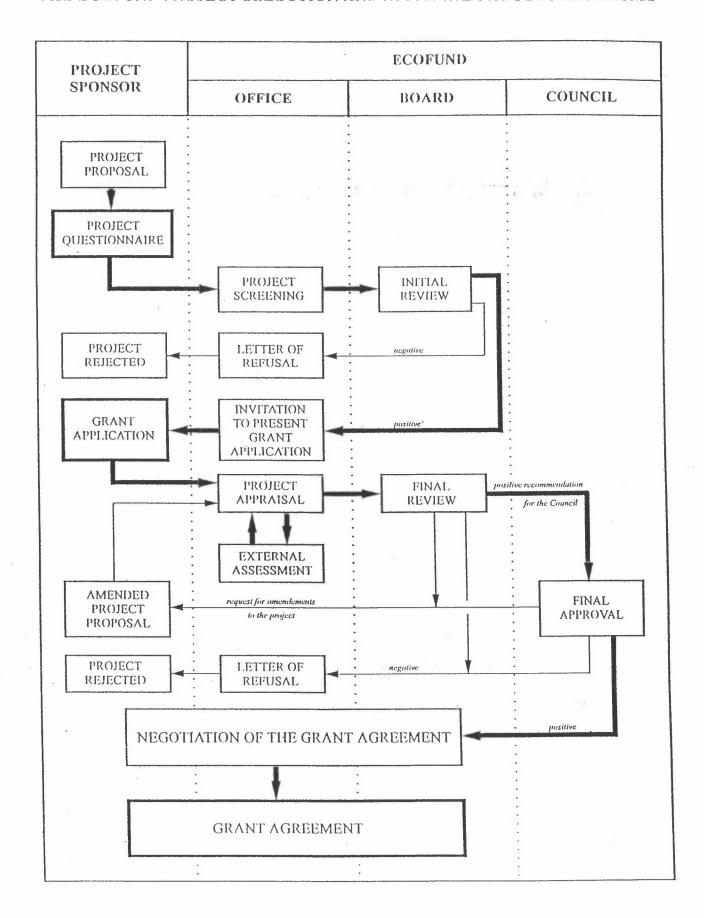
The EcoFund's project appraisal and approval procedure is presented in the chart enclosed. This is usually of a two-stage nature.

The first stage provides for a "Project Questionnaire" to be sent to the Foundation; the form to be used is available at the EcoFund Offices. This questionnaire should contain basic technical data on the project and it's compliance with the EcoFund priorities, environmental benefits expected, and details of contractors and project financing. Following the evaluation of those data by the EcoFund staff a preliminary decision of the Managing Board is made as to the possibility of providing financial support to the project from the Foundation resources.

In case of a positive decision being made, the applicant is invited to present a "Grant Application" prepared in accordance with the EcoFund's guidelines. This application ought to:

- specify the objective(s) of the project proposed, and present the justification thereof,
- contain relevant documentation applying to the technology applied (proposed) and/or to methods of organizing the project implementation, and expected environmental results thereof,

THE ECOFUND PROJECT SELECTION AND APPROVAL PROCEDURE SCHEME



- provide information on the selected or proposed contractors/suppliers and/or the methods of selecting them,
- define a plan of project performance (including the time-schedule), and
- present an economic and financial analysis of the project proving the complete financial coverage thereof in case of the application being approved by the EcoFund.

An application has to be complemented by necessary supporting documentation, in particular feasibility study (business plan in commercial projects) and Environmental Impact Assessment.

The EcoFund also applies procedure of "solicited and competive project proposals" by inviting interested organisations/institutions to participate in the nation-wide contests for project support in the defined area. Project proposals and grant applications in this case should contain all data and information as specified in the invitation for tender.

The application is subject to an appraisal performed by the Foundation staff, and - in case when proposed grant exceeds USD 300 000 - by independent experts/consultants commissioned by the EcoFund. The analyses in question apply to following aspects of the project proposal: technological, environmental, organisational, economic and financial. In co-operation with the applicant, the application may be subject to amendments and/or modifications due to requirements set forward by the Foundation.

Should the appraisal bring a positive result, the Foundation Board shall approve the application, and consequently submits it to the Supervisory Council. In accordance with the Statutes of the EcoFund, the Council shall take the final decision as regards the grant and the amount thereof concerned.

As regards large-scale investments at their initial stage of development (searching for potential financial sources after the completion of the (pre-)feasibility study, but no decision made in relation to technological options and/or any equipment and machinery supplies due), the investor may present a preliminary grant application for financing to be provided to the investment from the EcoFund resources, based upon any estimate figures possessed, as well as on project assumptions. In such cases, the possible positive decision passed by the EcoFund Council is of a provisional nature, and specifies an estimate of the possible grant limits, including a list of any conditions and requirements upon which the ultimate grant decision may depend.

After the aforementioned conditions have been fulfilled and the project has reached a general "maturity" for implementation, the application - described in appropriate detail - is returned (in compliance with the procedure as specified above) to the Foundation Board and Supervisory Council for another approval, the Council making the final grant decision. Basically, the time-span between the initial and secondary project examination performed by the Council should nor exceed one year.

VI. NEGOTIATIONS OF AN GRANT AGREEMENT

Council's positive decision remains in force for six months and authorizes the Managing Board to conclude the "Grant Agreement" with an investor (project sponsor).

During that period, the EcoFund Board holds negotiations with the applicant as regards the contents of the Grant Agreement. The framework agreement defines the basic rights and responsibilities of both the Foundation and the Grantee. In the course of negotiations, the EcoFund pays special attention to the adequate wording and approving of the Enclosures to the Agreement.

<u>Enclosure</u> <u>No.</u> <u>1</u> contains basic data applying to the entire project, the objectives and the planned environmental benefits thereof, as well as the project costs and financing.

Enclosure No. 2 (Procurement Plan) contains a list of the particular components of the project (so called tasks split into tasks components) to be financed by the EcoFund. The execution of the Agreement shall take the form of financial settlement and reimbursement of expenditures for those tasks.

Enclosure No. 3 specifies time-table of financing stages (instalments).

In the course of negotiations, the substantial scope of the project shall be subject to more detailed entries (as compared with the contents of the application) within the area relevant to the grant. It takes the form of defining the list of tasks (and, in case of complex tasks, also of their elements, i.e. of the so-called task components) to be financed by the EcoFund in part or in whole. The level of detail of the aforementioned list ought to be compatible with the <u>future</u> settlement of the grant concerned, provided by way of invoices for works and purchases.

The preparation of enclosures to the "Grant Agreement" may be initiated by both the Board and Office of the Foundation conditionally prior to the final decision of the Supervisory Council. Accordingly, the co-operation of the Foundation with the applicant in terms of developing the application and adjusting the project to the EcoFund's requirements may assume the form of a conditional discussing of the enclosure contents.

The actual signing of the agreement is also dependent on the EcoFund obtaining a guarantee for the full financial coverage of the project from all the planned sources.

Should the Agreement not be signed within a period of six months as of the moment of taking the grant decision, the decision in question shall be subject to <u>cancellation</u> and the possible validating thereof shall require a re-examination of the application by the Supervisory Council.

VII. PROJECT IMPLEMENTATION AND MONITORING

Projects supported by the EcoFund are usually divided into implementation stages which are financed one by one. The Grantee may receive an advance payment at an amount foreseen in contracts with suppliers (up to 50 per cent of the value of the particular project stage in case of nature conservation projects run by NGOs). This is followed by the settling and reimbursing of invoices applying to costs incurred during a given stage. Purchasing the equipment may be reimbursed immediately after delivery.

The complete stage settlement takes place after the Foundation shall have approved the financial settlement and brief progress report presented by the project sponsor, to be accompanied by a document of technical acceptance of tasks (goods and/or works enclosed within a particular stage) confirmed by the investor, or (with respect to larger and technically more complex projects) by the complete set of technical acceptance reports with respect to various fragmentary tasks. The Foundation may wish to control substantial scope of the works performed by an EcoFund representative during an on-site visit. The settlement ought to be finalised within a period of 14 days as of the date of adequate documents having been presented. In case of larger and technically more complex projects, the Foundation shall appoint an expert responsible for evaluating the adequacy of project performance during a particular stage.

. Should the total settlement amount exceed that of the grant instalment, the excessive amount (if approved by the Foundation) shall be considered (deducted) at the next date of settling the subsequent stage of grant payments. Any expenses not approved by the EcoFund shall also be subject to deduction.

In case of any delay in the stage completion and/or settlement, the grant assigned to the investor shall be decreased by the amount of penalty fees calculated per each and every day of delay.

The complete and on-term stage settlement allows for an advance payment to be granted for a subsequent stage of work. The settlement thereof shall be performed in an identical manner.

The EcoFund performs on-site visits and controls of the funded project through Board or Supervisory Council members, Office staff, or consultants working for the Foundation. The objective of the above is to become acquainted with the progress in project performance, or to examine any problems or inconsistencies which may arise in the area, especially in case of any delay in grant settlement.

The Foundation retains the right of terminating the agreement with immediate effect should it be proven that the Grantee is utilizing the resources obtained from the EcoFund in violation of the primary purpose, is carelessly performing the works concerned, or is causing permanent delay. In case of the agreement being terminated for any of the aforementioned reasons, the Grantee shall be obliged to return the entire amount dispersed up to that moment within the framework of the grant, and to make a penalty payment equal to 25 per cent of the total amount.

In case of any major changes in the circumstances of executing the EcoFund-supported project, there is a possibility of a mutually agreed re-negotiation and introduction of the written amendments to the agreement, e.g. with respect to the performance schedule, and as regards the substantial scope of the project, should the concept be supported by a significant increase of the environmental benefits. Generally speaking, however, possible changes may not affect total grant amount.

Since the EcoFund covers only a part of the project costs, it focuses its resources on key elements of a technology applied in the project. The said elements may be financed by the Fund even in 100 per cent (excluding VAT and customs duty).

Apart from a detailed control over the EcoFund grant disbursement by the Grantee, the Fund monitors the overall project performance irrespective of financing sources.

VIII. FINAL EVALUATION

At the technical completion of the project, the Grantee is obliged to submit a final report concerning the whole of project, its ultimate cost and environmental benefits attained. In case of large investment project this report should be complemented after the completion the start up processes.

Endorsement of the final report is subject to positive evaluation by the EcoFund's project manager in terms of the project performance's conformity with the substantial scope of the approved plan, the conformity of expenditure with the contents of the Grant Agreement, and in particular - the conformity of environmental results achieved with the project's objectives and targets.

This evaluation is examined by the EcoFund's Managing Board, that takes formal decision on closing the project. Experience (positive and/or negative) from completed projects is taken into consideration when preparing and/or supervising next projects.

In more general terms semi-annual reports containing detailed information on the implementation of approved projects and general conclusions are prepared by the Board and considered by the Supervisory Council.

The EcoFund, May 1996

Annex 5

Sulphur dioxide and nitrogen oxides emission reduction at the "Pomorzany" power plant in Szczecin W. 10. 900. C

PROJECT NO. 15/I/98

ASSESSMENT DATE: JUNE 17th 1998

TITLE:

SULPHUR DIOXIDE AND NITROGEN OXIDES EMISSION REDUCTION AT THE "POMORZANY"

POWER PLANT IN SZCZECIN

APPLICANT:

"Dolna Odra" Power Plant Complex, Inc.

Karol Pawłowski, M. Sc. Eng.

President

74-115 Nowe Czarnowo Tel. No. (0-91)315 4040

LOCATION:

"Pomorzany" Power Plant, the city of Szczecin

ENVIRONMENTAL

SECTOR:

(I) Reducing the trans-boundary flow of sulphur dioxide and of nitrogen

oxides

CO-ORDINATOR:

Romuald Sulima, Dr Eng., Tel. No. 651 1847

PROJECT DESCRIPTION

1. Justification

1.1 Project Location

The "Pomorzany" power plant is located in the southern part of Szczecin in the Pomorzany district, on the left bank of Western River Oder, in the direct neighbourhood of two landscape parks: the Szczecin, and the Dolina Górnej Odry ("Valley of Upper Oder") Landscape Parks. Moreover, 7 nature conservation reserves are located nearby.

Given its location, the power station in question is the largest north-western-most air pollution emitter in Poland. It is located 10 km from the border with Germany.

1.2 Investor

The "Dolna Odra" Power Plant Complex (ZEDO) consists of 3 power plants: Dolna Odra, Pomorzany, and Szczecin. For a number of years now, ZEDO have been implementing a broad environmental protection programme within the framework of their investment endeavours. These include the following, among others:

- modernisation of power blocks Nos. 1 and 2 at the "Dolna Odra" Power Plant, consisting in the construction of low-emission burners, as well as in a supervision system the operation of which shall improve the block efficiency rating by approximately 10-12%;
- construction of an installation of sulphur removal for power blocks Nos. 1 and 2 at the "Dolna Odra" Power Plant with the lime-and-gypsum treatment method applied, with the waste material fully adaptable for the manufacturing of gypsum panels;
- modernisation of blocks A and B at the "Pomorzany" power station;
- continuous monitoring of dust-and-gas emissions in the vicinity of the "Dolna Odra" Power Plant.

1.3 Reasons for Undertaking Project, and General Project Description

The objective of the project is the abatement of sulphur dioxide and nitrogen oxides emission from boilers installed at the "Pomorzany" power station, one of the chief air pollution sources in Szczecin. The Power Plant currently operates two BENSON steam boilers, each of a capacity of 206 Mg of steam per hour, and with two WP-120 water boilers, 139 MW each. In order to conform with the stringent pollution emission standards, the power station took action aimed at emission abatement. Among others, low-emission burners are to be installed on the WP-120 water boilers. The installation of low-emission burners on the BENSON steam boilers shall not be possible, the reason being the actual boiler type (flow-type), and the structure thereof (burner chamber low). On basis of an analysis of world-wide methods of concurrent treatment of flue gas for sulphur dioxide and nitrogen oxide, a decision to construct a flue gas radiation treatment installation was made for purposes of the two BENSON boilers.

The project provides for the construction of an installation for desulphurisation and denitrification of 270,000 Nm³/h of flue gas, with radiation technology applied. The installation shall allow for the removal of approximately 70% of SO₂ and 80% of NO_x from exhaust gases. Both SO₂ and NO_x shall be removed in an ammonia atmosphere, by treating the flue gas stream with high energy electrons from accelerator. The technology selected is fully sewage- and waste-free, as the final flue gas treatment stage results in a useful product, which may be used as artificial fertiliser (a blend of ammonia sulphate and ammonia nitrate). Research for fertiliser testing has been performed with a positive result by credible scientific institutions: the Academy of Agriculture in Warsaw, and by the Institute for Crops, Fertilising, and Soil Research in Puławy.

A comparison of investment and operational cost data available on the international market of methods of concurrent treatment of SO₂ and NO_x contained in flue gas proves the radiation technology to be currently competitive against wet and regeneration methods. It has been included by the Electric Power Research Institute (EPRI), USA, on the list of the most promising technologies of concurrent SO₂ and NO_x treatment. The implementation of the project is supported by the International Atomic Energy Agency (IAEA) in Vienna, who are providing an additional 40% of the project by purchasing key facilities for the installation.

The installation shall be of a demonstration and training nature, promoting the widespread implementation of the flue gas radiation treatment method.

1.4 Subject of Application for EcoFund Grant

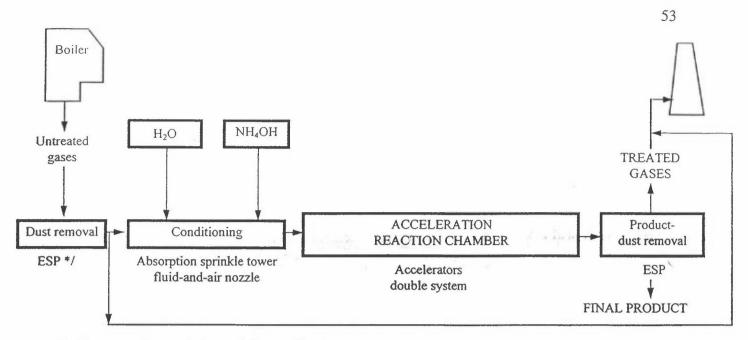
EcoFund resources are to be used to the purpose of purchasing equipment of key importance to operating the installation, such as the reaction chamber, the damper tower, compressors, pumps, auxiliary fan, power switching station.

2. Technical Description

2.1 Process Description

The technological process of treating flue gas for SO₂ and NO_x at the "Pomorzany" Power Station with the electron beam method shall be implemented according to the layout as depicted in Figure 1, within the following technological units:

- flue gas conditioning (cooling and damping) and ammonia dosage unit,
- accelerator unit with reaction chambers,
- filtration and final treatment product collection unit,
- final treatment product storage unit.



*/ Electrostatic precipitator (electro-filter)

Fig.1 Block Technological Flow of Flue Gas Radiation Treatment

It has been assumed that a maximum of 270,000 Nm₃/h of flue gases shall be treated, following the dust removal therefrom in two BENSON boilers. The application of flue gases dedusted in the electro-filter (ESP) guarantees the high quality of the final product.

In the conditioning block, flue gases shall undergo cooling and moistening processes, to 80°C and 11%, respectively. The cooling and moistening process shall be performed with the assistance of water fed by spray nozzles. Moreover, ammonia water prepared in a separate technological unit shall be fed into the conditioning chamber. Following division into two equal streams, the ammonium-containing flue gas stream shall be delivered into reaction chambers to be treated with high-energy electrons from accelerators. Each of the two chambers shall house two accelerators manufactured by the Japanese Nissin. Moving in gas, high-energy electrons initiate reactions leading to the concurrent removal of SO₂ and NO_x. These reactions shall lead to the generation of solid products, i.e. ammonium sulphate and ammonium nitrate, which - following entrapment in the ESP - shall be delivered to product storage facilities. Product storage and distribution shall be performed as a separate and adequately weather-secured storage site. The aforementioned side products constitute a valuable fertiliser, no worse than any nitrogen fertilisers commonly applied in agriculture. All the by-products are to be collected by the "Police" Chemical Plant located in the neighbourhood of the "Pomorzany" power station.

The flue gas radiation treatment installation shall be fully automated. The computer-controlled technological and ecological systems shall allow for automatic weather regulation of technological parameters, depending on changes to the input and output flue gas parameters.

2.2 Contractors, and Contractor Selection Procedures

The installation for concurrent sulphur and nitrogen removal from flue gas shall be constructed by the "Dolna Odra" Power Plant Complex, in close co-operation with the International Atomic Energy Agency in Vienna. Energy Management and Conservation Agency based in Warsaw shall act as the supervision and co-ordination unit for installation design purposes. A part of the contractors have been selected already, in the course of tender procedures held by the International Atomic Energy Agency in Vienna; others shall be selected in the course of tender procedures in Poland, in conformity with the pending Public Procurement Act.

Fundamental data concerning the contractors has been contained in the following table:

N o.	Task	Subject of Procurement	Procure- ment cost (PLN thousand	Planned Date of Comple- tion	Form of Con-tractor Selection	Supplier
1.	Blueprints for the installation of concurrent sulphur and nitrogen removal from flue gas	Drafting the concept, blueprints and design, inclusive of all the necessary elements of agreement	6 102	1999	offers competition	Energy Management Conservation Agency in Warsaw
2.	Accelerators	Design, delivery, assembly supervision, start-up, training	6 585	05.1998	IAEA tender	Sumitomo Corporation, Japan
3.	Preparatory works related to installation construction (shift of the unprocessed water tank, and utility water block)	Construction works, technological assembly	653	09.1998	offers competition	Modeh-polmo, Szczecin
4.	Installation of concurrent sulphur and nitrogen removal from flue gas	ESP for the final product - design, delivery, assembly, start-up, training	6 162	1999	IAEA tender	Skandinavisk Milio Service, Denmark
5.	Construction and assembly works	General installation contract works - pull- down, separators, construction works, assembly of the technological block and power installations	44 890	06.2000	open tender	
6.	Control and metering facilities, and technological and ecological monitoring systems	Design, delivery, assembly, and start-up	5 250	06.2000	IAEA tender	

2.3 Specialist Reviews and Expertise

The project has been approved by the International Atomic Energy Agency in Vienna which had been the deciding factor in the Agency becoming involved in the endeavour. The following documents and studies also contain positive opinions:

- general environmental study drafted by the "Energoprojekt" BSiPE, Inc. of Warsaw, for the "Pomorzany" Power Plant;
- opinion by Professor Franciszek Maciak of the Academy of Agriculture (Warsaw) concerning the agricultural value of flue gas radiation treatment products;
- final report of a Polish-Japanese mission containing a summary of several-year joint research, and the adequacy of radiation technology in industrial application;
- report from a site visit (March 1998) to the flue gas radiation treatment facility at the Chengdu power plant (China). According to a statement by the Investor, the former operation of the aforementioned Chinese facility (similar to that envisaged at the "Pomorzany" power station) "confirms the formerly made assumptions as to operational efficiency, thus justifying the usefulness of the method, given the "Pomorzany" Power Plant conditions.

3. Environmental Benefits

3.1 Expected Environmental Effects

The construction of the installation for sulphur and nitrogen removal from flue gas with the radiation method applied shall enable the achievement of the following environmental effects:

Pollutant	Unit	Unit Actual Quantity		Absolute	Relative Change	
			Quantity	Change	[%]	
sulphur dioxide	tonnes per annum	3,311.00	993.00	2,318.00	70	
nitrogen oxides	tonnes per annum	1,656.00	331.00	1,325.00	80	

Moreover, project implementation shall also bring, regardless of the improvement in the quality of air in town, and within the nearby protected areas, a limitation in the transportation of air pollutants beyond Polish territory (the project applies to the north-western-most emitter in Poland).

3.2 Economic Ratios

The unit cost of concurrent reduction of sulphur dioxide and nitrogen oxides emission, recognising the discounted investment input and operational costs, reaches PLN 33,298 per tonne. The usual analogous ratio for projects concerning pollutants emission abatement in flue gas remains within the range of PLN 5,000 through 80,000.

4. Implementation Schedule

Works concerning investment performance have been initiated in 1995, with an installation blueprint. The final completion of works related thereto has been planned for the second quarter of the year 2000, with the technological start-up to be carried out in December 2000.

The table below shows the investment implementation schedule:

No.	Task	Dates of		Cost	Financial	Sources			
ł		commence-	completion	[PLN	Progress	of Funding			
		ment		thousand]	(%)				
	Tasks in Progress								
1.	Blueprints .	1995	1999	6,102	55	Own funds, bank loan			
2	Purchase of accelerators	12.1997	05.1998	6,585	80	IAEA */			
3.	Preparatory works, including shifting the unprocessed water tank, and utility water block	02.1998	08.1998	3,000	0	Own funds			
2.	Tasks Planned								
1.	Construction of the flue gas sulphur and nitrogen treatment facility, including: - ESP for the final product - construction and assembly works					Own funds, IAEA, Bank loan, EcoFun d			
2.	Control and metering system, and technological and ecological monitoring	08.1998	06.2000	53,963	0	-			
3.	Technological start-up, and facilities for reaching the planned installation capacity		12.2000	10 10 10 10 10 10 10 10 10 10 10 10 10 1		Own funds			
		То	tal:	69,650					

^{*/} International Atomic Energy Agency

5. Capital Costs and Project Funding

The installation cost has been estimated at PLN 69,650,000. The share of own funds shall be obtained from current depreciation, and from generated company income. A part of the investment cost of PLN 45,900,000 shall be funded from resources obtained from the International Atomic Energy Agency in Vienna (grant of PLN 25,340,000), and from PeKaO S.A. Bank (syndicate loan of PLN 20,560,000).

An amount of PLN 12,250,000 is missing for the full coverage of the estimated investment implementation cost; the said amount has been provided for in the application for the EcoFund grant. The aforementioned sources of project funding have been shown in the table below:

Source	Financial resources [PLN]							
of Funding	Used in	Granted	Planned for			Total	Share	
	1995-97	for 1998	1998	1999	2000		[%]	
OWN FUNDS ZEDO	3,378,000	4,122,000		2,000,000	2,000,000	11500000	16.5	
LOANS PeKaO S.A. Bank	-		4,140,000	9,210,000	7,120,000	20560000	29.5	
GRANTS IAEA	5,355,000	-	6,760,000	7,446,000	5,779,000	25340000	36.4	
ECOFUND - grant from the Norwegian Ministry of			1,210,000		7.5	1,210,000	1.7	
Foreign Affairs - debt-for-environment swap	-	å v	540,000	10,500,000		11040000	15.9	
TOTAL:	8,733,000	4,122,000	12650000	29156000	14989000	69650000	100.0	

6. Economic and Financial Project Analysis

6.1 Financial Viability of Applicant

Documents enclosed to the application prove that the Lower Oder Power Station Complex, Inc., reached sales revenues of PLN 916,104,000 and a net profit of PLN 14,455,000. They had increased their revenues 4 times over the years 1996-1997. This growth was accompanied by an increase in costs, albeit of slightly lower dynamics (revenues: 458%, costs: 440%).

The above trends resulted in an improvement in the profitability ratios the 1997 rate of which is satisfactory. The net profitability ratio grew from 0.9% in 1996 to 1.6% in 1997. The Return on Assets ratio grew from 0.2% in 1996 to 1.3% in 1997, whereas the Return on Equity ratio grew from 0.2% to 1.9% in the course of the analogous period.

During the said period, financial liquidity ratios remained unsatisfactory. In 1996, the high and current liquidity ratios reached 1.0 and 0.6, respectively, while in 1997 these ratios underwent a minor improvement, reaching 1.1 and 0.5, respectively. The indebtedness ratios - including the debt on assets rate and the long-term liability rate - were as follows: 25.5% and 16.3% in 1996, and 33.1% and 29% in 1997. The relatively high rate of indebtedness rates - especially the 1997 low rate of long-term loan coverage and low liquidity ratios - give no guarantee of the company obtaining further loans, which is why an EcoFund grant shall be indispensable. It ought to be underscored, however, that the enterprise had submitted documents proving no arrears to the State Treasury.

It shall be difficult, although possible - from high actual depreciation - for the enterprise to generate own funds at the amount as declared in the application.

6.2 Cash Flow Analysis

The project is a non-profit endeavour; the launch thereof by the Investor, given their difficult financial condition, had been made possible only thanks to a long-term contract signed with the Polish Power Grid for electricity purchase from the "Pomorzany" Power Station.

Measurable financial benefit shall consist in the obtaining of revenues from the sales of the final product of flue gas treatment for sulphur and nitrogen (fertiliser blend). At the current stage, however, it shall not be possible to calculate the final product prices; hence the previous table shows only the actual effects of savings due to a reduction of environmental fees, of PLN 1.053.132 per annum.

The operational cost rates have been determined according to the condition preceding project performance on basis of average data quoted for the past three years.

Moreover, the cash flow table recognises the following:

- own funds of PLN 11,500,000 generated from current depreciation and company profits;
- a syndicated loan from the PeKaO S.A. Bank of PLN 20,650,000;
- a grant from IAPA in Vienna of PLN 25,340; and
- the EcoFund grant of PLN 12,250.

The cash flow report drafted for the aforementioned assumptions proves that investment implementation and operation - despite the expected tensions of 2000-2004 - shall feature cash flow synchronisation.

The NPV as calculated is negative, reaching PLN -40,943.33, with an IRR of - 0.5%. The EcoFund grant shall bring an increase of NPV to -32,193,23, and the IRR to -1.4%, respectively.

Annex 6

Transparencies Ministry of Environment

Norway's follow-up of the Kyoto Protocol

Adviser Inger Johanne Wiese

Ministry of Environment

Norwegian -Polish seminar, Oslo

August 25, 1998

Kyoto Protocol

- binding quantitative commitments for emissions of greenhouse gases
- emissions must be reduced by 5,2 % in the industrialised countries in the commitment period 2008-2012 from 1990-level
- differentiated commitments for Annex-1
- no quantitative commitments for developing countries

Comprehensive Approach:

- * includes CO₂, CH₄, N₂O, PFCs, SF6 and HFC
- Sinks are also included ".. direct humaninduced land use change and forestry reforestation and deforestation since activities, limited to afforestation, 1990,...

Flexibility mechanisms

- ◆ Joint Implementation between Annex Icountries
- Clean development mechanism
- + Emissions trading is allowed
- ◆ Implementation mechanisms shall be additional to national measures

The Kyoto Protocol National commitments

Estonia, Latvia, Liechtenstein, Lithuania, Monaco, Romania, Slovakia, Slovenia, +-8%: EU, Bulgaria, Czech Republic, Switzerland

←-7%: USA

→-6%: Canada, Hungary, Japan, Poland

+-5%: Croatia

The Kyoto Protocol National commitments

◆0%: New Zealand, Russian Federation, Ukraine

++1%: Norway

++8%: Australia

++10%: Iceland

Trading

Key objectives of the design:

- ◆ Simple, transparent and credible
- ◆ Minimise transaction costs
- Remain consistent with the environmental objective of the Protocol

Kyoto Protocol

- ◆ The Protocol becomes effective 90 days after
- at least 55 Parties(countries) have ratified the Protocol and
- These Parties must at least account for 55% of the CO2 emissions of the Annex Icountries in 1990.

Projections versus the objective of the Convention

- Kyoto Protocol a first and important step to achieve the objective of the Climate convention
- CO2-emissions are expected to increase by about 50 % at the global level - 1990-2010 (IEA)
- Current ppm 30 % above preindustrial level
- Additional and stricter commitments needed
- Next round for negotiations start in 2005

The Norwegian follow-up

- ◆ April 1998: The Government presented the implementation of the Kyoto Agreement White Paper on the Norwegian and a bill on Green taxes
- implementation of a national climate change ◆ June 1998: The Parliament discussed both documents and provided a broad basis for policy

Norwegian measures

- National system for emissions trading to be outlined
- Pollution Law
- $\sim CO_2$ -taxes and economic support
- Agreements with industries
- Energy efficiency and renewables
- Environmental technology/R&D
- Joint Implementation

National measures

- which covers 60% of national emissions (air flights, domestic sea transp. & supply ships) → A small extention of the CO2-tax system
- ◆ a national system for emissions trading emissions and the process industries which should at least include CO2
- extention to other gases and sectors will be considered

National Measures

- Measures to promote energy efficiency and renewables
- develop plans to limit and reduce emissions Stimulate regional and local authorities to (Local Agenda 21)
- ◆ Agreements with industry and Polluction
- consider measures to strengthen R&D

Norwegian measures

- \bullet CO₂-taxes:
- petroleum production 55 dollars pr. ton of - gasoline and use of oil and gas in CO2
- fuel oil half the rate
- some industries reduced rates
- process industries etc.- exempted

Measures (cont.)

- Energy efficiency and renewables:
- increased economic support in 1998
- tax break for wind, heating pumps and bio.
- strengthen efforts for energy efficency and A White Paper on the Norwegian Energy Policy and an action plan for measures to renewables - expected in 1999

Measures (cont.)

- emissions of greenhouse gases(GHGs): Agreements with industries to reduce
- First agreement with the aluminium industry in June 1997:
- - reduce GHGs by 50 % in the period 1990-2005 and
- by 55 % within 2010

Activities Implemented Jointly

- ◆ Agreement with the World Bank: Projects in Mexico, Poland, Burkina Faso
- ◆ Bilateral agreement with Costa Rica in operation since 1997
- ◆ Bilateral Agreement with the Slovak Republic - project in operation 1998
- Bilateral agreements with China and India projects will come into operation

Activities Implemented Jointly

- Eastern Europe, Russia and developing ◆ Preparing projects in other countries in countries
- ◆ Project on capacity building in South Africa
 - possible future CDM cooperation

Cooperation at the Nordic level

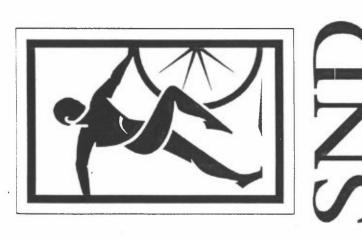
- ◆ Sustainable development in the Nordic and Baltic countries - a special focus on energy
- in June 1997 to cooperate for a sustainable ◆ Declaration of the Nordic Prime Ministers development in the Baltic Sea region
- Research and proposals for a follow up -Baltic Agenda 21, Baltic Ring study

Possible cooperation

- ◆ Cooperation in the energy sector to reduce emissions of GHGs, NOx and SO2:
- improve energy efficiency and increase the use of renewables and natural gas in the new democracies
- contribute to transfer of capital, technology Project based cooperation (JI) will and know-how
- Future: Emissions trading

Annex 7

Transparencies Presentation of the Norwegian Industrial and Regional Development Fund (SND)



The Norwegian Industrial and Regional **Development Fund**

The Objective of the SND

efficient economic business development in Norway SND will promote profitable commercial- and

SND will provide capital and instigate activities to contribute towards:

increased formation of values

innovation

development

better utilisation of the country's resources



The SND's Primary Goal

incentives, and initiate constructive measures leading to SND shall contribute towards increased prosperity in Norwegian trade and industry by offering financial

improved competitiveness and profitability

increased innovation activities and better utilisation of Norway's resources



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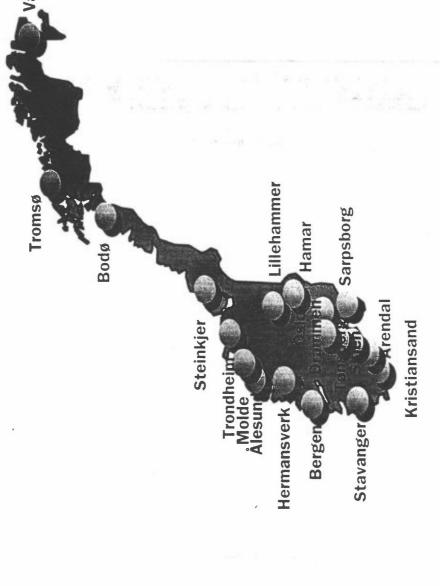
The SND

- was established 1 January 1993, by Parliamentary law based on Public Administration legislation
- is under public administration, with the Ministry of Trade and Industry as 'owner'
- carried out by a number of Norwegian public funding incorporates and continues the activities formerly and development institutions



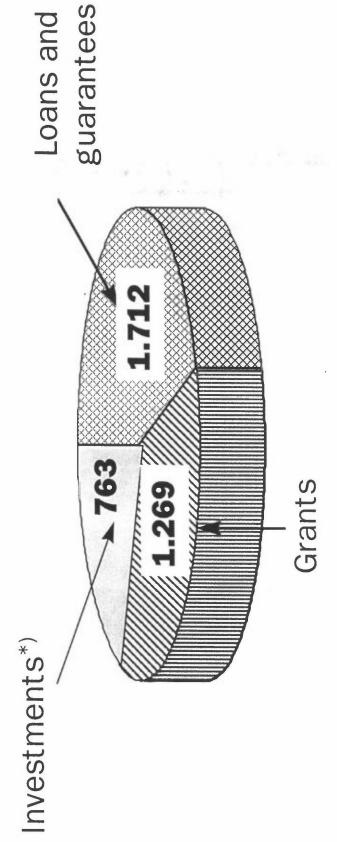
SND - all over the country

(as of May 1998)





Scope of SND's Activities 1998



Totalling: 3.744 Mill. NOK

*) Investments pr. 31.07. includes equity investments from the Equity Investments Division and the investment funds for Russia and Eastern Europe



SND's Business Focus

- Corporate Lending
- Innovation and Development
- Equity Investments in Norway
- Equity Investments in Northwest-Russia and Eastand Central Europe
- Facilitate foreign investments in Norwegian business enterprises - 'Invest in Norway'
- defining framework conditions for the Norwegian business-The SND is an important contributor when and regional policies



Corporate Lending

Lending Schemes:

- Low Risk Loans
- Venture Capital Loans
- Basic Financing of the Fishing Fleet

Guarantees for Operating Credit and Loans

• Grant Schemes:

- Investment- and Business Development Grants (regional)
- Grants for small and medium sized companies in central areas
- Contracting Grants (Fishing Fleet)

Grants for Entrepreneurs





Purpose:

- Operating equipment, buildings, capital reinforcement
- Product-/process development
- SND's share 0-50 %
- Instalments adjusted to the purpose and technical/ financial life span of the project







A formal agreement between a supplier and a public office in order to develop a product, a process or a service to meet a demand not satisfactorily met by existing solutions Purpose: Reinforcing Norwegian companies' ability to service home and abroad, and contribute towards a more efficient the public sector, strengthening their competitiveness at public sector

Funding conditions: normally 1/3 each - the company, the public office and the SND



Industrial Research and Development Contracts (IFU-Contracts)

- An agreement between a supplier (small or medium sized company) and a large customer
- Purpose: to strenghten the ability of small/medium size companies to carry out market oriented research and development, through co-operation with a demanding customer
- Funding conditions: normally 1/3 each the supplier, the customer and the SND
- The role of the customer: to be a demanding customer with good references and market channels

An important aspect of SND's activitites: Setting the Terms...

AS ON S

conditions essential to develop a competitive trade and industry in The SND shall take an active part in raising the awareness of Norway

Target groups:

- Political authorities; centrally, regionally and locally
- Norwegian trade and industry
- → Partners
- → The general public

Resources at our disposal:

- Good knowledge of Norwegian and international trade and industry, and the framework conditions under which they operate
- Keen understanding of the business' development and funding needs, and the overall mechanisms of the capital market
- Proficient in statistics and business analyses



Annex 8

Transparencies SND – Visions

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ENVIRONMENT FUNI THE NORWEGIAN

NOISIN

TO INCREASE THE ECO-EFFICIENY EFFICIENCY IN THE NORWEGIAN AND ENVIRONMENTAL SOCIETY

ENVIRONMENTAL POLICY FOR SUSTAINABLE (PARLIAMENTARY REPORT NO 58 (1996-97) **DEVELOPMENT**)

OBJECTIVE

TO STIMULATE PRIVATE AND PUBLIC ENTERPRISES TO APPLY AND DEVELOP ENVIRONMENTALLY EFFICIENT TECHNOLOGY

TO CONTRIBUTE TO THE FINANCING OF PROJECTS

WHICH DIRECTLY OR INDIRECTLY CONTRIBUTE TO REDUCED EMISSIONS OF GREENHOUSE GASES AND OTHER ENVIRONMENTALLY HARMFUL SUBSTANCES

AND

WHICH WOULD OTHERWISE NOT BE FINANCED IN THE ORDINARY CAPITAL MARKET

INSTRUMENTS

- **EXCLUSIVELY LOANS**
- OTHER INSTRUMENTS OF SND AND OTHER TO BE SEEN IN CONJUNCTION WITH THE GOVERNMENT TECHNOLOGY SUPPORT SCHEMES
- LOANS/SUBORDINATE/VENTURE CAPITAL LOANS TYPE OF LOANS (SECURED LOANS/RISK CAPITAL OR PRODUCT DEVELOPMENT LOANS) TO BE CHARACTERISTICS OF THE PROJECT DECIDED BY SND BASED ON THE

- LOAN CONDITIONS (TO BE FINALLY DECIDED)
- INTEREST RATES: TO BE ADAPTED TO THE PROJECT. TO BE NOTIFIED WITH ESA (EFTA SURVEILLANCE AUTHORITY)
- REPAYMENT PERIOD: DEPENDING ON PROJECT PAYBACK AND TYPE OF INVESTMENT
- RISK PROFILE: AT PRESENT 20%

CAPITAL STRUCTURE

BASE CAPITAL (LOSS FUND): NOK 50 MILL

LOAN CAPITAL ALLOCATED OVER STATE BUDGET IN 1998: NOK 250 MILL LOAN INSTALMENTS TO BE REPAID TO THE NATIONAL TREASURY

COVERED THROUGH THE INTEREST MARGIN MANAGEMENT COSTS OF THE FUND TO BE

GEOGRAPHIC COVERAGE

THE CONTINENTAL SHELF, INCLUDING MAINLAND NORWAY, SVALBARD AND RELEVANT PROJECTS ON BOARD NORWEGIAN SHIPS

ELIGIBLE PROJECTS

EMISSIONS OF GREENHOUSE GASES OR OTHER ENVIRONMENTALLY HARMFUL INDIRECTLY LEAD TO REDUCED PROJECTS WHICH DIRECTLY OR SUBSTANCES

DIRECTED TOWARDS GREENHOUSE GASES PRIORITY TO BE GIVEN TO PROJECTS

EXAMPLES OF RELEVANT PROJECT AREAS:

- ENERGY EFFICIENCY
- SOURCES SUCH AS BIO-FUELS, WIND AND INCREASED USE OF RENEWABLE ENERGY SOLAR POWER
- ENERGY TECHNOLOGIES SUCH AS HYDROGEN, FUEL CELLS AND HEAT PUMPS
- ENERGY RECOVERY / SUBSTITUTION OF FOSSILE FUELS
- WASTE TREATMENT (AVOIDANCE OF METHANE FORMATION; SUBSTITUTION OF FOSSILE FUELS)

Annex 9

Transparencies
SND – Investment funds for Northwest Russia
(NWR) and Central and Eastern Europe (CEE)



DIVISION FOR RUSSIA

AND EASTERN EUROPE

Investment funds for

Northwest Russia (NWR)

and

Central and Eastern Europe (CEE)



GEOGRAPHICAL AREAS

ONWR

Murmansk

Arkhangelsk

Nenets Autonomous Okrug

Republic of Karelia

) CEE

Central and Eastern Europe

The parts of Russia not eligible under the NWR fund

The remaining parts of the former Soviet Union



OBJECTIVE

To further economic co-operation between Norway and

the said regions



FINANCIAL INSTRUMENTS

ONWR

150 million NOK 70 million NOK

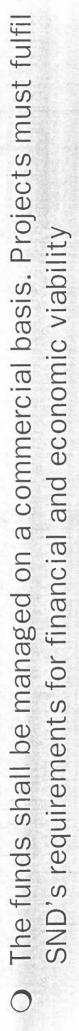
30 million NOK

CEE

O Consultancy fund for NWR



CONDITIONS



- SND's participation in a company should normally not be higher than 35% of the total, and in no case exceed 49%
- The amount invested by SND in one company shall not be superior to 15 million NOK (maximum 30 million NOK for the NWR fund)
- Norwegian investors shall provide at least the same amount as SND at the time when SND makes its investment
- When practical the funds may provide subordinated loans
- The funds may normally not be invested in the following sectors:
- Insurance, shipping, public management, governmental business
- Oil and gas industry



APPLICANTS BY INDUSTRY

Wood and wood products

Processing, preserving and distribution of fish products

Other food and beverages

Information technology

Other industries



CHARACTERISTICS OF VIABLE **PROJECTS**

- Close link between the activity in Norway and the project in Russia/Eastern Europe
- Line of business where the Norwegian partner posesses a high level of competence
- Competent local manager
- Sufficient capital
- "Patient" capital
- A viable business plan, a well worked out project plan and a thorough implementation of the project



LC

SND's CONTRIBUTIONS

- Capital
- Norwegian government entity as partner
- Know-how on establishing business in Eastern Europe
- Network locally and in Norway
- Partner for Norwegian investors
- Active and long-term ownership



SALE OF SND SHARES- "EXIT"

Long-term owner - but not "for ever"

Exit shall be considered, if necessary stipulated in a shareholder agreement before SND makes an investment





Annex 10

Transparencies Naturkraft AS



Gas Fired Power Plants still an alternative in Norway?

A. Lont Naturkraft AS 25th of August 1998



CO₂ emissions in Norway - still possible?

New developments

Kyoto Protocol

. New Technology

Implementation of Kyoto Protocol in Norway

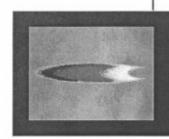


Measures in Norway alternatives

pay CO₂ tax

cleaning after combustion

"cleaning" before combustion



Implementation of Kyoto Protocol in Norway

1. No unilateral CO₂ tax

2. Establish emission trading system

3. Cost efficiency of measures

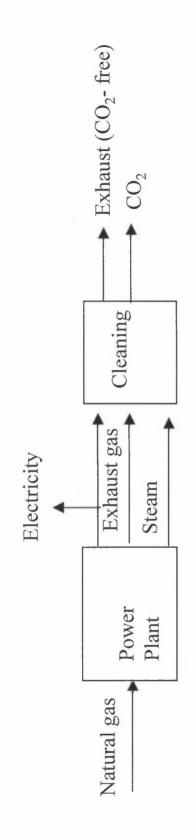
4. Joint implementation

industry exposed to international cost of

industry free to choose how to "clean up"



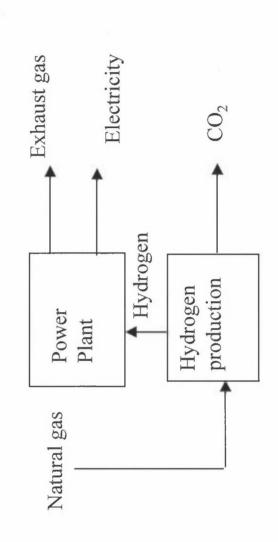
Cleaning Method no. 1: Cleaning after combustion Naturkraft/Statoil



- Naturkraft's Power Plants designed to implement new technology
- Naturkraft develops technology together with Statoil (since fall 97)



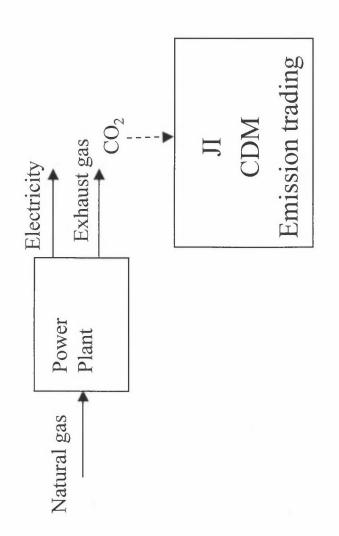
Cleaning Method no. 2: Cleaning before combustion

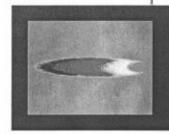


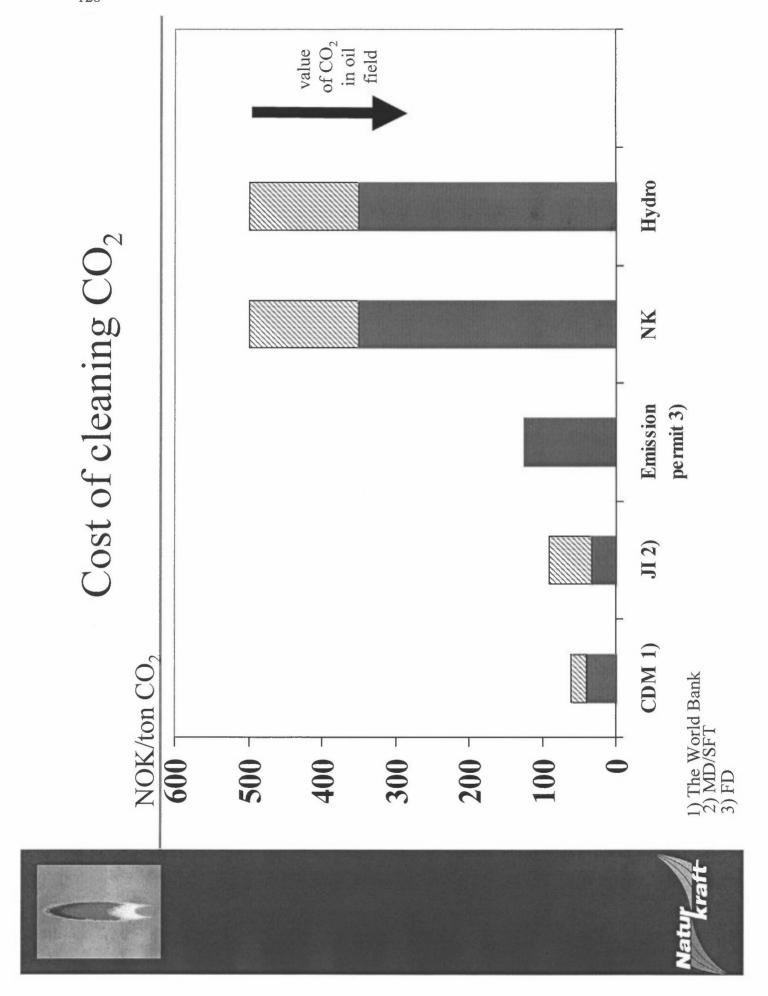
 Naturkraft's Power Plant can be converted to hydrogen technology.



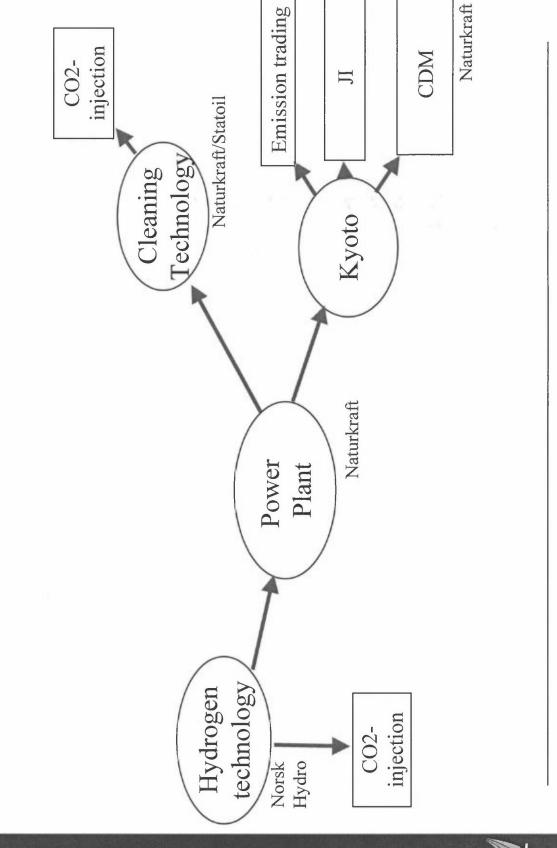
Cleaning Method no. 3: Kyoto Protocol







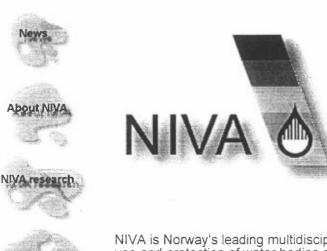
Options for "CO₂ free" electricity





Annex 11

Transparencies Norwegian Institute for Water Research (NIVA)



Norwegian Institute for Water Research



NIVA is Norway's leading multidisciplinary research institute as regards the use and protection of water bodies and water quality.

NIVA provides water management authorities, industry and commerce, and the public with a solid basis for a healthy water management.



NIVA performs research and development, monitoring and feasibility studies, and conveys information about water related issues to interested parties. Site Map

NIVA's organisation



NIVA's main office in Oslo. photo: Bjørn Faafeng web-editor: Bjørn Faafeng technical support: Mai Britt Flaten designer:Petter Emil Wang mail: webmaster@niva.no

NIVA's main office in Oslo comprises the following departments:

- Freshwater
- Marin ecology
- Acid rain
- Environmental technology
- Analysis

We also have three regional offices:

- NIVA-South in Grimstad
- NIVA-West in Bergen
- NIVA-East in Hamar

Two research stations:

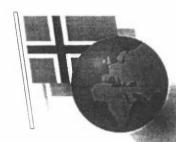
- Marine Research Station Solbergstrand
- Risdalsheia (RAIN and CLIMEX-projects)

NIVA is the main owner of the company Aquaplan-niva in Tromsø.

Programme 1998



Freshwater Ecology



International Activities

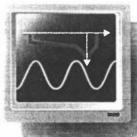


Water Analysis



Long Range Transported Pollution





Environmental Technology

INTERNATIONAL



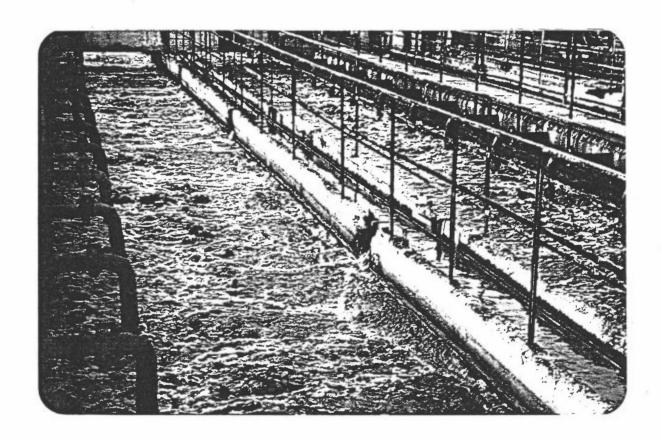
- Aquaculture
- Drinking water supply systems
- Investigation and monitoring of water resources
- Environmental impact assessment (EIA)
- Toxicity testing
- Water resource management
- Marine ecology and coastal zone management
- Treatment of municipal and industrial waste water



Project Title:	Client:	Polish partner	Year	Funding Thous. NOK
Upgrading of existing wastewater treatment plant facilities in Poland	Norwegian Ministry of Environment	CTBK – Municipal Engineering Centre, Warszawa	1991-92	950'
AL:PE Part 1. and Part 2. Acidification of Mountain Lakes: Palaeolimnology and Ecology. Remote Mountain Lakes as Indicators of Air Pollution and Climate Change	Commission of the European Communities, Research Council of Norway	Polish Academy of Sciences, Kraków	1991-93 1993-95	3.000'
Critical loads of acidity to lakes in the Polish Tatra Mountains	Norwegian Ministry of Environment	Institute for Ecology of Industrial Areas, Katowice	1991-96	1.200'
Production and testing of aluminium coagulants from the polymer PAC-Sican project	A/S Polymer	Universities of Olsztyn, Wrocław, WWTP Warszawa, Pulp & Paper – Swiecie	1992-97	400°
Seminar on strategy for water pollution abatement in view of the Norwegian experience	Norwegian Ministry of Environment	Ministry of Environmental Protection, Natural Resources and Forestry	1995	430'
Establishment of scientific contacts within environmental protection between NIVA and Poltegor	Norwegian Pollution Control Authority	Poltegor – The Mining Institute in Wroclaw	1995	30°
Master and action plan for a chosen catchment area in Poland and Strategy for integrated water supply, wastewater treatment and disposal systems in small communities in Poland	Norwegian Pollution Control Authority Centre for International University Co-operation Norwegian Ministry of Environment, Min. of Foreign Affairs	Institute of Environmental Protection (IOS), The Association of the Bystra river catchment (4 communes)	1996-98	1.000'
MOLAR Measuring and modelling of the dynamic response of remote mountain lake ecosystems to environmental change: A programme of Mountain Lake Research	Commission of the European Communities	Polish Academy of Sciences, Kraków	1996-99	2.325'

Upgrading of Wastewater Treatment Plants in Poland

PHASE I





Norwegian Institute for Water Research

aquateam

Norwegian Water Technology Centre AS

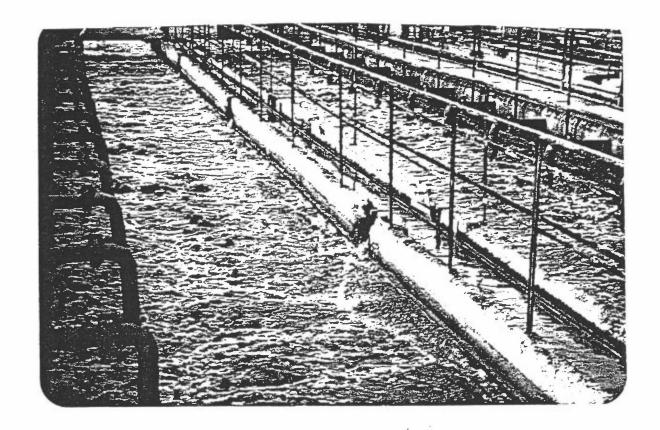


Municipal Engineering Centre, Warsaw

Usprawnianie Funkcjonowania i Wydajności Istniejących Oczyszczalni

w Polsce

FAZA I





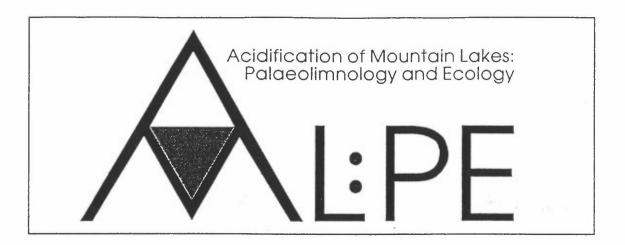
Norweski Instytut Badania Wody

aquateam

Norweskie CentrumTechnologii Wody

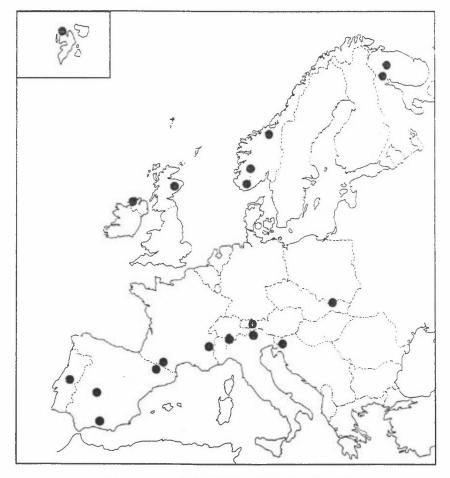


Centrum Techniki Budownictwa Komunalnego Warszawa



AL:PE - Acidification of Mountain Lakes: Palaeolimnology and Ecology

Part 2 - Remote Mountain Lakes as Indicators of Air Pollution and Climate Change



Contract N° EV5V-CT92-0205 CIPD-CT92-5036 and CIPD-CT93-0021

Acid Rain Research

REPORT 44/1997

Critical loads of acidity to lakes in the Polish Tatra Mountains

Final report





Environmental Technology

0-93182

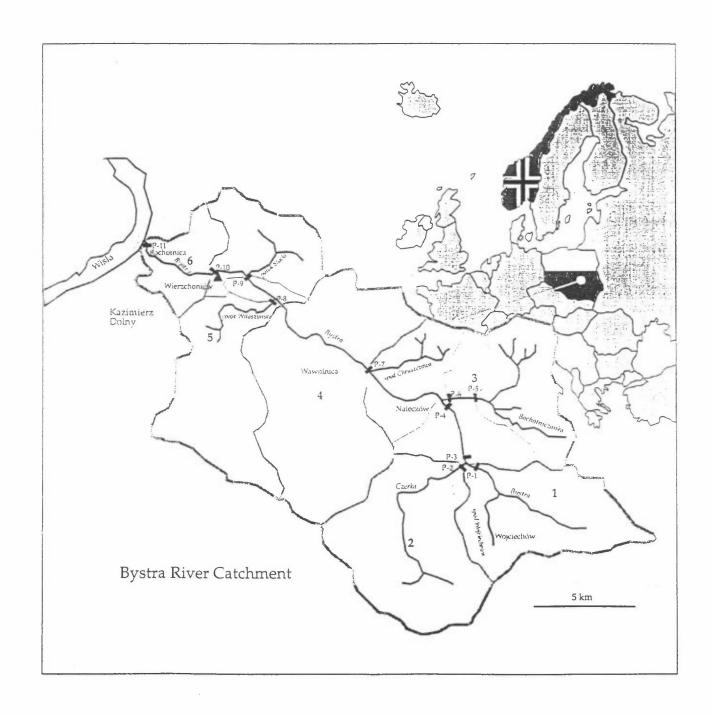
Evaluation of new coagulants for water and wastewater treatment in Poland

Pre-project

INTERIMREPORT LNR 3663-97

Strategy for Integrated Water Supply, Wastewater Treatment and Disposal Systems for Small Communities in Poland

Case study - Master and Action Plans (MaAP) for the Bystra River Catchment



Annex 12

Transparencies Norwegian Institute for Air Research (NILU)





Norwegian-Polish Seminar on Measures to Reduce the Pollution of the Environment Oslo, 25 August, 1998

environmental contamination Socio-economic aspects of

Norwegian Institute for Air Research (NILU) Jozef M. Pacyna Kjeller, Norway Norwegian Institute for Air Research

Process

Emission

Transport dispersion

Transformation deposition

Air quality

Exposure

Quantitative relationships N

Effects

B.SIVERTSEN: SPECIAL2.PPT

(E

pollutants generation, use, and release Factors affecting management of

- Infrastructure / institutional challenges
- Information availability
- Technology development
- Pricing structure
- Provision of personal protective equipment
- Global influences

Environmental protection strategies

- Remediation
- Pollution control
- Pollution prevention
- clean an efficient technologies as long-term solutions to pollution
- integrated pest management (IPM) as a long-term solution to pollution related to the use of POPs in pest control

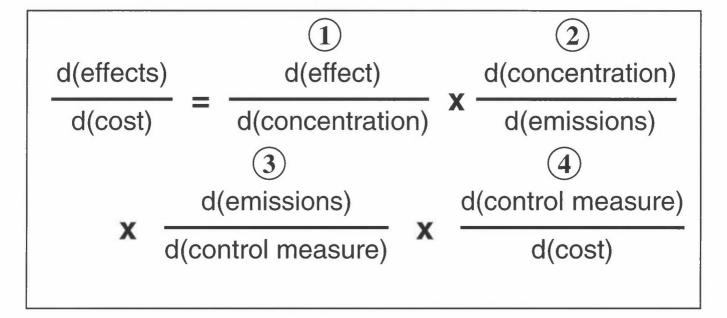
1

Methods of control

- Pre-use methods, e.g. substitution by other, less desirable materials - pesticides
- consumption processes such as that the material in Primary methods, e.g. alternation in production or question is avoided
- Secondary methods, e.g. collection of pollutants before discharge into the environment

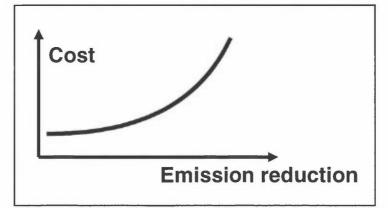
Abatement Strategies

- 1. Evalute present situation
- 2. Plan abatement strategy
- 3. Implement strategy
- 4. Monitor the effect of the strategy

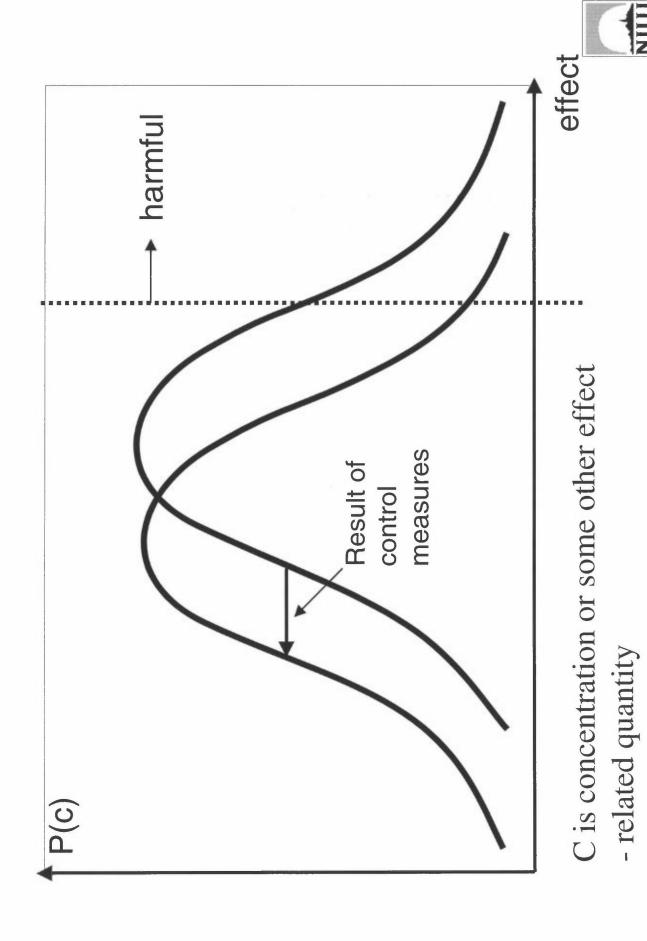


- 1. Dose response
- 2. Atmospheric research
- Result of technological or economical measures
- 4. Cost of a measure as a function of its

efficiency







Ø.HOV: ABATEMENT STRATEGIES 2.ppt

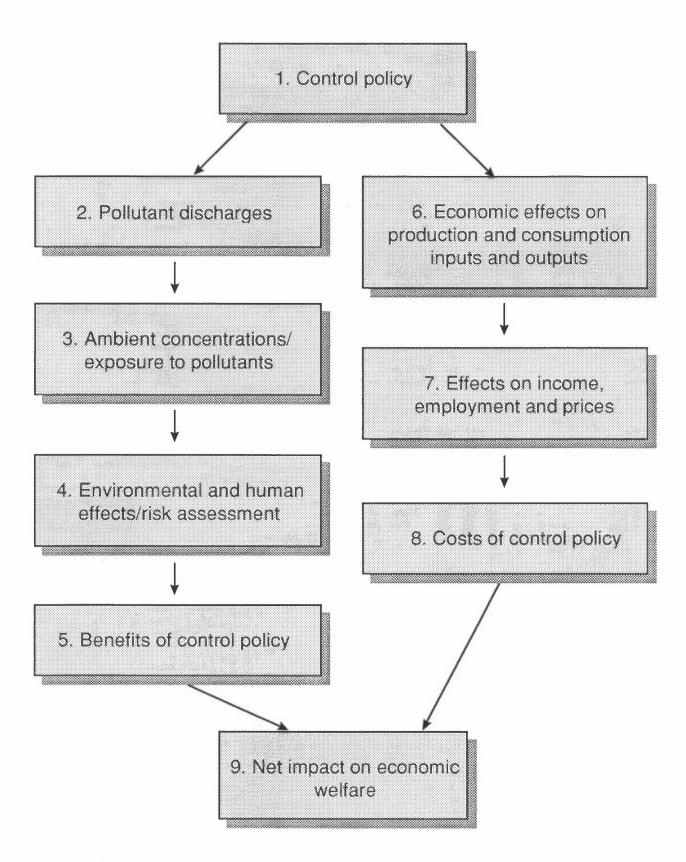
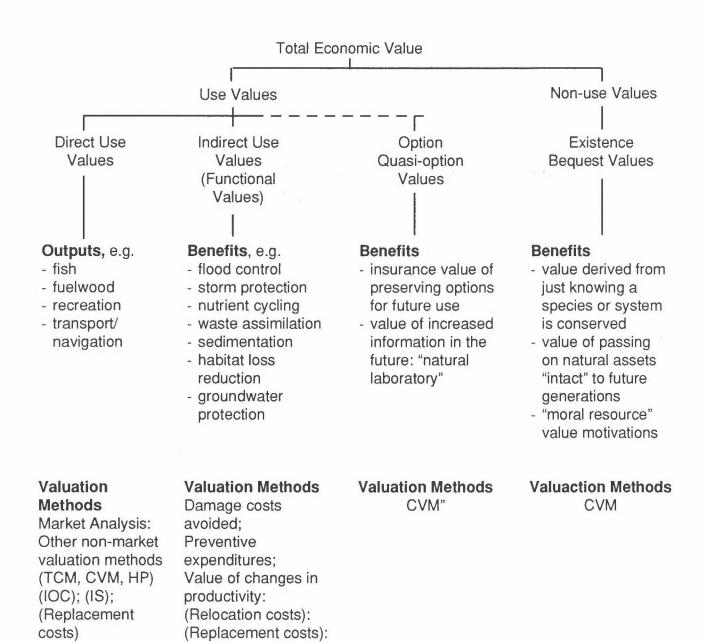


Diagram presenting various steps of cost-benefit analysis of air pollution policies.

Valuing Coastal Zone Benefits



Notes:

Market Analysis: based on market prices

HP = hedonic pricing, based on land/property value data

CVM = contingent valuation method based on social surveys designed to elicit willingness

to pay values

TCM = travel cost method, based on recreationalist expenditure data IOC = indirect opportunity cost approach, based on options foregone

IS = indirect substitute approach

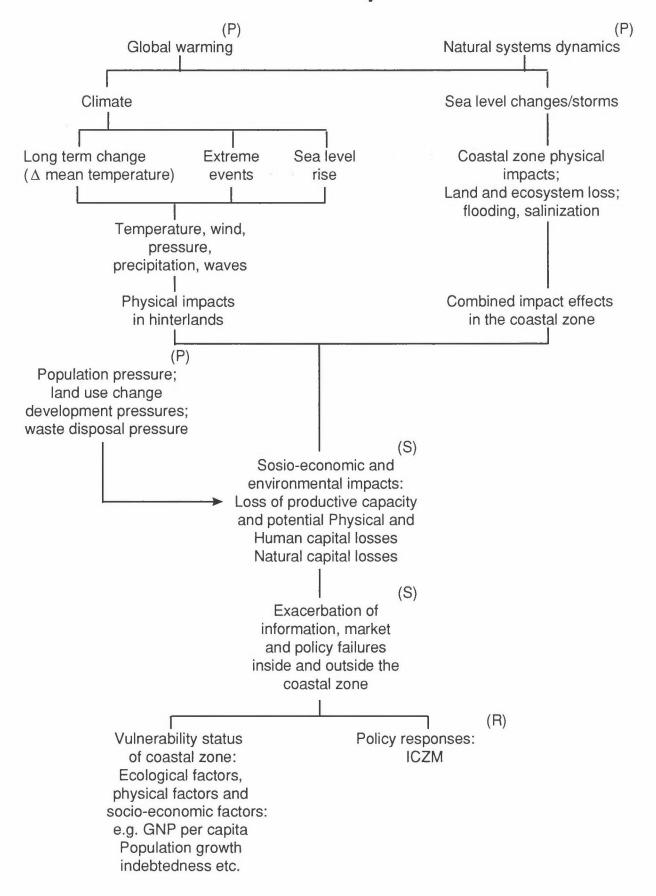
The benefits categories illustrated do not include the "indirect" or "secondary benefits" provided by the coastal zone to the regional economy, i.e. the regional income multiplier effects.

Source: Adapted from Turner (1988) and Barbier (1989).

Economic instruments in pollutants control

- **Charges:**
- Effluent charges
- Product charges
- User charges
- Administrative charges
- Tax differentiation
- Deposit refund systems
- Market creation, incl. emissions trading
- Enforcement incentives, incl. compliance fees

Coastal Zone: Pressure-State-Response Model



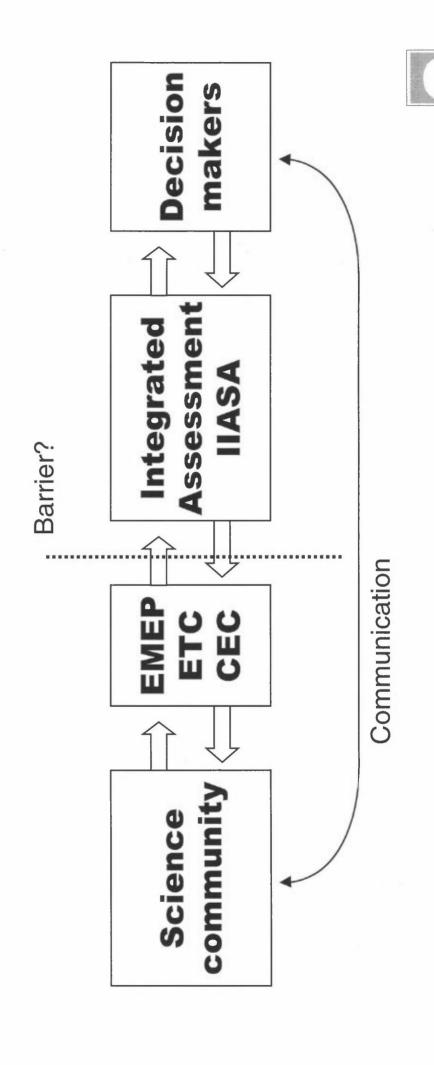
P = pressure; S = state of the economy; R = policy response

NILL

M.HOV: DPSIR.PPT

e.g. Clean Production Regulations, Taxes Public Transport, Information, etc. e.g. Ill health Biodiversity loss Economic Damage Responses Impact The DPSIR Framework e.g. Air, Water, Soil Quality State Pressures Drivers e.g. Polluting e.g. Industry and Emissions Pransport Source: EEA

Science to Policy Decisions Translation of



Ø.HOV: ABATEMENT STRATEGIES 2.ppt

NICO



Norwegian Institute for Air Research (NILU) P.O. Box 100, N-2007 Kjeller – Norway

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KEYWORDS			
Abatement techniques	EcoFund		
ABSTRACT (in Norwegian)			
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