LETTER OF INTENT

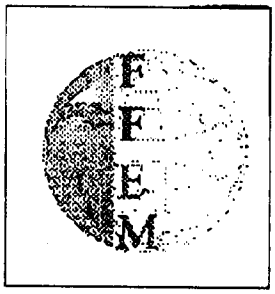
The French Ministry of Foreign Affairs and the Hungarian Ministry of Environment agree to consider the project « Fuel switching and Cogeneration in the Dorog Eromu Kft Power Plant » as an activity implemented jointly between France and Hungary, as part as the pilot-phase of Activities Implemented Jointly (AIJ).

The project description dated 1 March, 2000, will be submitted to the Secretariat of the United Nations Framework Convention on Climate Change by the Fonds Français pour l'Environnement Mondial, the French AIJ focal point.

The follow-up of the project as AIJ is jointly supervised by the Mission Interministerielle de l'Effet de Serre and by the Hungarian Commission of Sustainable Development.

François Pujolas Sous-directeur de l'environnement et des accords économiques sectoriels	Dr. Csaba Nemes Director General Department of Strategic Planning and Cooperation	Dr. Tamás Pálvölgyi UNFCCC National Focal Point
on behalf of the French Ministry of Foreign Affairs Date : Paris, June «27« 2000	on behalf of theHungarian Ministry of Environment Date : Budapest, June 26, 2000	

Enclosure : project description



1 mars 2000

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Evaluation of the Dalkia-Vivendi proposal: Fuel Switching and Cogeneration in the Dorog Eromu Kft Power Plant

A. DESCRIPTION OF THE PROJECT

A.1. General description

Prometheus, the Central European subsidiary of Dalkia-Vivendi, operates a district heating network serving the cities of Dorog and Esztergom. A coal fired cogeneration plant in Dorog supplies heat to the network as well as supplying a small amount of electricity to local users, through Edasz the regional power grid.

Prometheus will modify the coal fired boilers so as to burn gas, and increase the electricity generation capacity of the power plant.

A.2. Type of project

The project involves:

- switching from coal to natural gas
- increasing cogeneration
- energy efficiency through the use of a district heating network.

While the project involves all these elements, Pilot phase status is requested only for the increase in [redacted]ration.

A.3. Participants and institutional arrangements

The project involves 2 economic entities:

- Dorog Eromu Kft power plant, owned by:

Prometheus	86%
Dorog	7%
Esztergom	7%

- Promthavho Kft district heating network, a wholly owned subsidiary of Prometheus.

Prometheus itself is a subsidiary of Dalkia (Vivendi group), owned by:
Dalkia 75%
EBRD 20%
employees and several cities 4,9%.

Prometheus operates the Promthavho Kft district heating network. The Dorog Eromu Kft power plant has its own management and employees, but Prometheus provides technical counsel and financial services to the company.

The power plant sells heat to the district heating network, as well as to 2 nearby industrial plants (pharmaceutical production and charcoal briquette production).

A.4. Cost

The budget cost of this investment is 6 000 000 EURO.

A.5. Technical data

Prometheus has operated the Promthavho Kft district heating network since 1999, and the Dorog Eromu Kft cogeneration plant since July 1997. At that time, the Dorog Eromu Kft plant had a maximum real output of 72 MW thermal and 6 MW electricity (for a rated capacity of 140 MW thermal and 14 MW electricity). The plant consisted of coal fired boilers for steam production, steam turbines for electricity production and exchangers to heat the water in the district heating network.

Dorog sold the Dorog Eromu Kft power plant to Prometheus in 1997 for a symbolic sum (100 000 forint), because the plant was in serious economic difficulties. The ending of a subsidy on coal prices had made this medium size plant uneconomic. Prometheus succeeded in maintaining the plant in operation, thus saving 120 jobs, through a programme which improved management of the plant, and through a small investment which added a 2 MW steam turbine to increase electricity generation capacity.

New Hungarian environmental legislation, which goes into effect at the beginning of 2001, will tighten control on SO_2 and particulate emissions. This will make continued operation of the existing plant impossible. Several possible solutions exist in the face of this new situation, for example:

1. **"Clean coal".** Upgrade the existing coal fired boilers by adding filtration and flue gas desulphurisation equipment. A variant of the scenario would be to install fluid bed burners.
2. **"Fuel switch".** Upgrade the existing coal fired boilers, by installing gas fired burners and related equipment. Under this option, heat prices would remain constant.

3. **"Decentralisation".** This scenario is a variant of the "fuel switch" scenario. With the fall in gas prices in Hungary, it is probable that many clients would choose to terminate connection with the district heat network. As clients disconnected, the network would become less efficient, causing its prices to rise. This would probably begin with individual clients who can install moderately priced wall gas heaters, and would end with the large industrial clients, who would be forced to install large boilers. This scenario could thus lead to both closing of the Dorog Eromu Kft plant and discontinuation of the operation of the Promthavho Kft district heating network. (Note that this scenario, which is far from optimal from an environmental point of view, could become common in Central and Eastern Europe. In fact, many district heating clients across the region are deconnecting from district heating networks.)
4. **"Improved cogeneration".** This scenario is also a variant of the "fuel switch" scenario. In this scenario, in addition to upgrading the existing coal fired boilers to natural gas fuel, new investments would increase the electricity generation capacity of the Dorog Eromu Kft plant. This scenario would permit a reduction in heat prices.

Solution 1 was considered by Prometheus, in order to preserve employment in local coal production, but was rejected for price considerations, due to:

- the complex filtering equipment needed because of the high sulphur content of local coal;
- diseconomies of scale, since flue gas desulphurisation is costly for small and medium size plants such as Dorog Eromu Kft
- high cost of local coal, and legal restrictions that make it impossible to import lower cost, low sulphur coal for use in heat plants.

Solution 2 was considered by Prometheus. While it is technically and economically feasible, this solution was rejected because of the risk that it would lead to Solution 3, that is the closing of the cogeneration plant and the district heating network.

Solution 4 was chosen by Prometheus. It consists in:

- adding a 5 MWe gas turbine, thus increasing the electric power capacity, and increasing the overall efficiency of the plant;
- using the existing boilers as heat exchangers with post combustion of the turbine exhaust gases by natural gas burners;
- installing other necessary equipment for the fuel switch and for modernisation of the power plant;
- using process gas from a nearby pharmaceutical factory to supplement natural gas.

As will be explained below in section E1, the "fuel switch" scenario is used as the baseline.

A.6. Long term viability

The economic and technical viability of the proposed solution result from the following factors:

- the experience of Dalkia in the upgrading and operation of plants of the type which will be built, which although environmentally optimal are technically somewhat more complex than alternative solutions
- increased overall efficiency of the chosen solution, which will permit a 16% reduction in Promthavho Kft heat prices.

The social viability of the proposed project is based on the conservation of 60 jobs at the Dorog Eromu Kft plant. The operation of this plant requires more employees than would be required in the baseline scenario. Furthermore, the proposed solution would lower heat prices for individual users, thus improving their standard of living.

The environmental viability of the project is assured both on the global and local level:

- In terms of GHG emissions, gas fired cogeneration is considered to be one of the environmentally optimal sources of power in Eastern and Central Europe.
- The proposed project would reduce local air pollution well below the level required by new Hungarian environmental regulations.
- The combustion of process gas from the pharmaceutical plant will reduce problematic odors in the city of Dorog.
- Supply of natural gas is assured for the life of the project.

A.7. Location

The project is located in Dorog, in the north of Hungary.

A.8. Useful Life of the Project

The equipment to be installed will have a useful life of 15 years. The equipment will be installed at the beginning of year 2001.

Pilot Phase accreditation is requested for the entire life or the installation. As explained below, this is because the baseline scenario would have operated for substantially the same period.

A.9. Project Assessment Procedure

The project has been evaluated by the Secrétariat of the Fonds Français pour l'Environnment/MOC.

B. GOVERNMENTAL ACCEPTANCE, APPROVAL, OR ENDORSEMENT

B.1. Approval procedures

The project has received the necessary licenses and approval from Hungarian national and local authorities.

The project has not yet been submitted to the Hungarian focal point for the Pilot Phase.

B.2. Comments of the French focal point

This projects illustrates the complexity of baseline determination in many power projects. In any given situation, a number of alternatives exist, with differing technical, economic, financial and risk characteristics. It is often difficult to determine which of these alternatives would really have been put into practice, in the absence of the project under consideration.

The project also illustrates the fact that in many cases, neither existing nor past practices, for example coal fired power generation, can be used to determine a realistic baseline scenario. In particular, the French focal point considers that gas fired heat generation should be considered as a baseline in most cases in Central and Eastern Europe, when coal is abandoned as a fuel.

B.3. Comments of the Hungarian focal point

C. COMPATIBILITY WITH AND SUPPORTIVENESS OF NATIONAL ECONOMIC DEVELOPMENT, SOCIOECONOMIC AND ENVIRONMENT PRIORITIES AND STRATEGIES

The proposed project would more than meet the requirements of Hungary's new air pollution regulations.

D. BENEFITS DERIVED FROM THE ACTIVITIES IMPLEMENTED JOINTLY PROJECT

The proposed project has the following benefits:

- reduced GHG emissions
- 16% reduction in heating cost for district heating clients
- conservation of 60 jobs.

E. CALCULATION OF THE CONTRIBUTION OF ACTIVITIES IMPLEMENTED JOINTLY PROJECTS THAT BRING ABOUT REAL, MEASURABLE AND LONG-TERM ENVIRONMENTAL BENEFITS RELATED TO THE MITIGATION OF CLIMATE CHANGE THAT WOULD NOT HAVE OCCURRED IN THE ABSENCE OF SUCH ACTIVITIES

E.1. Technical data

From the point of view of GHG emissions, the possible technical solutions for the future of the Dorog cogeneration plant, may be classified in the following order (from worst to best):

Clean coal
Decentralisation
Fuel switch
Improved cogeneration

It is considered that "Decentralisation" (deconnection of clients, closing of the cogeneration plant and district heating network) is perhaps the most probable alternative to the project scenario. Nevertheless, this scenario depends on the decision of numerous actors to deconnect from the network and install boilers. It cannot be reliably demonstrated that they would in fact do this. Thus, in order to adopt an ecologically conservative approach, the "Fuel switch" scenario has been used as the project baseline scenario. It should be noted that the project scenario requires a substantially higher investment than the chosen baseline scenario.

Thus, it must be emphasised that the baseline scenario used for the calculation of the reduction of GHG emissions is neither the emissions from the existing coal fired boilers, nor the most probable alternative scenario consisting, in the long term, of the closing of the cogeneration plant, and installation of boilers for heat production by clients. Rather, a conservative approach is used which compares the project to the best (from a GHG emissions point of view) alternative which might conceivably have been put into practice had the project not been carried out.

The baseline scenario that is used thus consists of the following elements:

- installation of gas burners in the cogeneration plant to replace the current coal burners
- purchase of 27 GWh of electricity from the national grid, to replace the 6 MW of additional electricity capacity of the proposed project.

The following table resumes the main technical characteristics of the 4 scenarios under consideration, including the baseline scenario, and the proposed project scenario.

	Existing as well as "clean coal"	"Decentra-lisation"	"Fuel switch" = Baseline scenario	Prometheus project
Fuels used	Coal	Natural gas + process gas + coal (for electricity production in the national grid)		Natural gas + process gas
Heat generation	80 MW in the existing coal fired plant	3 large gas boilers (65 MW total) and many small gas boilers (15 MW total)	80 MW in natural gas and process gas fired boilers, in the cogeneration plant	
Process gas from pharmaceutical plant	Flared off	Burned in boilers		
Electricity	6 MW from coal fuelled cogeneration	all electricity from national grid	- 6 MW from gas fuelled cogeneration - 6 MW from national grid	12 MW from gas fuelled cogeneration

The calculation of the reduction of GHG emissions uses the following data and parameters.

Baseline heat efficiency	80%	
Project overall efficiency	80%	
Baseline heat production	80	MW
Baseline electricity generation	6	MW
Project heat production	80	MW
Project electricity generation	12	MW
Baseline gas consumption	107,50	MW
Project gas consumption	115,00	MW
Process gas supply	6,00	MW
Baseline natural gas percentage	94%	
Project natural gas percentage	95%	
Baseline heat GHG emission factor	241	tCO2/MWh
Baseline electricity GHG emission factor	422	tCO2/MWh
Project overall GHG emission factor	242	tCO2/MWh

Both baseline and project GHG emissions are calculated on the basis of the CO_2 content of the natural gas consumed. The CO_2 content of the process gas is not

counted, since it would be flared off in any case. For the baseline scenario, CO_2 content of electricity from the national grid is based on Hungarian statistics.

The following table resumes the GHG emission reduction calculation.

Year	Annual heat production for 80MW (GWh/year)	Annual electricity production for 12MW (GWh/year)	Project scenario, total for 80MW heat + 12 MW electricity, gas fired cogeneration (tC02)	Baseline scenario for 80MW heat + 6MW electricity, gas fired cogeneration (tC02)	Baseline scenario for 6MW electricity, national grid (tC02)	Baseline scenario, total for 80 MW heat + 6MW electricity from cogeneration + 6MW electricity from national grid (tC02)	Annual reduction = Baseline - project (tCO2)	Accumulated Total reduction (tCO2)
2001	189,0	55,0	58 974	52 126	11 609	63 735	4 761	4 761
2002	189,0	55,0	58 974	52 126	11 609	63 735	4 761	9 523
2003	189,0	55,0	58 974	52 126	11 609	63 735	4 761	14 284
2004	189,0	55,0	58 974	52 126	11 609	63 735	4 761	19 045
2005	189,0	55,0	58 974	52 126	11 609	63 735	4 761	23 807
2006	189,0	55,0	58 974	52 126	11 609	63 735	4 761	28 568
2007	189,0	55,0	58 974	52 126	11 609	63 735	4 761	33 330
2008	189,0	55,0	58 974	52 126	11 609	63 735	4 761	38 091
2009	189,0	55,0	58 974	52 126	11 609	63 735	4 761	42 852
2010	189,0	55,0	58 974	52 126	11 609	63 735	4 761	47 614
2011	189,0	55,0	58 974	52 126	11 609	63 735	4 761	52 375
2012	189,0	55,0	58 974	52 126	11 609	63 735	4 761	57 136
2013	189,0	55,0	58 974	52 126	11 609	63 735	4 761	61 898
2014	189,0	55,0	58 974	52 126	11 609	63 735	4 761	66 659
2015	189,0	55,0	58 974	52 126	11 609	63 735	4 761	71 420
2016	189,0	55,0	58 974	52 126	11 609	63 735	4 761	76 182
2017	189,0	55,0	58 974	52 126	11 609	63 735	4 761	80 943
2018	189,0	55,0	58 974	52 126	11 609	63 735	4 761	85 704
2019	189,0	55,0	58 974	52 126	11 609	63 735	4 761	90 466
2020	189,0	55,0	58 974	52 126	11 609	63 735	4 761	95 227

E.2. Follow up

The following data will be verified annually:

- real heat and electricity sales of the Dorog Eromu Kft plant
- CO_2 content of electricity from the national grid

F. ADDITIONALITY TO FINANCIAL OBLIGATIONS OF PARTIES INCLUDED IN ANNEX II TO THE CONVENTION WITHIN THE FRAMEWORK OF THE FINANCIAL MECHANISM AS WELL AS TO CURRENT OFFICIAL DEVELOPMENT

This project is entirely financed by private capital, and has not benefited from any public aid.

G. CONTRIBUTION TO CAPACITY BUILDING, TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGIES AND KNOW-HOW TO DEVELOPING COUNTRIES

The project will contribute to building Hungarian know-how in the operation of relatively complex cogeneration plants, combining a gas -> steam -> electricity cycle, with a gas turbine driven generator.

Hungarian technicians will be trained in the following areas:

- optimal regulation of the more complex power plant
- operation methods for the gas turbines
- operation methods for the gas burners.

This type of technology is typical of the complex retrofits necessary to continue economically viable operation of existing cogeneration plants and district heating networks. It should be noted that the conservation of these existing infrastructures will have a long term impact on the energy consumption and GHG emissions of Central and Eastern European economies in transition.