Sawdust 2000

Project Design Document

Version 3 – 2005 01 05

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Abbreviations

Annex B countries	Emssion capped industrialised countries and economies in transition listed in Annex B - Kyoto Protocol.
Annex I countries	Industrialised countries and economies in transition listed in Annex I of the UNFCC.
AIJ	Activities Implemented Jointly. In the first UNFCC Conference of Parties (COP 1) in Berlin 1995 a pilot phase for bilateral GHG mitigation projects was created with the name Activities Implemented Jointly. During the AIJ phase experience shall be established, but without allowing carbon credit transfer between countries.
AAU	Assigned Amount Unit is tradable units of the Assigned Amount of an Annex B country as issued pursuant to the rules of article 17 of the Kyoto Protocol, expressed as one metric ton of CO2.
ARCE	Romanian Agency for Energy Conservation
Baseline	A description of the most likely future development in the considered GHG emission or sequestrating system without the JI or CDM project.
BAU	Buisness As Usual. The BAU scenario describes the future development of the existing fossil fuel based district heating sytem if it was continued to be in operation.
Btu (btu)	British Thermal Unit (1 Btu = 1055 Joules)
CDE	Carbon Dioxide Equivalent
CDM	Clean Development Mechanism
CEECs	Central and East European Countries
CER	Certified Emission Reduction
CH_4	Methane
CO_2	Carbon Dioxide
DEPA	Danish Evironmental Protection Agency
DERSA	Danish Emission Reduction System Administration
DH	District Heating
EPI	Enviromental Protection Inspectorate (Romanian facility with 48 county offices)
ERU	Emission Reduction Unit describes the technical term for GHG emission reduction output of JI - Project according to the Kyoto Protocol.
EU-NARD	National Agency for Regional Development - European Union
EUR	Euro (currency European Union)
Gcal	Giga-calorie (1.0 Gcal = 4.187 GJ)
GES	Gross Energy Supply (total energy demand of DH system including losses boiler system, distribution pipe network, under buildings and in buildings).
GHG	Greenhouse Gasses
GWP	Global Warming Potential
Host Contry	Country in which the JI or CDM project is implemented
IPCC	Intergovernmetal Panel on Climate Change
JI	Joint implementation Porject according to Article 6 - Kyoto Protocol.
kWh	Kilowatt hour (1.0 KWh = 3,600,000 Joule)
Leakage	The net change of anthropogeni GHG emission which occur outside the project boundary.
MDP	Romanian Ministry of Development and Prognosis
MOU	Memorandum of Understanding between countries
MP	Monitoring Plan
MWh	Megawatt hour (1.0 MWh = 3,600,000,000 Joule)
N_2O	Nitrous Oxide
NED	Net Energy Demand (energy demand in buildings, excluding losses in basements).
PCF	Prototype Carbon Fund of the World Bank
PDD	Project Design Document
ROL	Romanian Lei (currency)
RSFESD	Romanian Special Fund for Energy System Development
SINK	A procees, activity or mechanism, which removes anthropogenic GHG from the atmosphere.
STEP	Swiss Thermal Energy Project in Bauzau and Pascani (Romania)
UNFCC	United Nations Framework Convention on Climate Change

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1. Description of the Sawdust 2000 - Project

1.1 Introduction

The key components of this project are listed below (not in order of priority). The aim of the project is to develop district heating systems in five towns which are all based on the utilisation of sawdust or other wood waste products (biomasses).

1) Renewable energy

2) CO_2 neutral energy

3) Utilisation of local energy resources

4) Reduction of the environmental impact caused by illegal dumping of wood waste from the sawmill industry and the wood processing industry.

5) Development of new business areas

6) Improvement of the social standard

7) Stable heat consumer energy price, which for some years will not be affected by development of world market fuel prices.

8) State, county or municipality subsidising of heat consumer energy prices can be reduced and in some years perhaps even removed.

This PDD briefly outlines the basis for the project in relation to technical issues and the corresponding investment budget.

1.2 Projects Characteristics

Characteristics of the existing DH systems are presented in the table below

Component	Unit	Vlahita	Gheorgheni	Huedin	Vatra Dornei			Intorsura Buzaului
Existing thermal sources		CTI and substion	CTII	CTII	CTI	CTII	CTIII	CT
Total heat output capacity of existing boiler system	MW	6,00	6,80	4,65	6,98	6,98	6,98	9,86
Existing heat output capacity, specified	W/m^2	83,25	85,11	154,21	248,18	178,18		174,96
Supply of hot water for space heating	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Supply of hot water for production of hot potable water	Yes/No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of heated apartments	No. flats	716	410	270	310	531	80	701
Number of block of flats connected to network	No	44	17	24	27	34	4	40
Number of individual buildings (dwellings) connected to network	No		16					
Number of individual buildings connected to network	No	19	17				1	11
Total heated floor surface apartments	m^2	60.741	52.860	26.557	28.125	39.174	2.710	56.355
Total heated surface individual buildings (dwellings)	m^2		3.060					
Total heated floor surface individual buildings	m^2	11.333	23.977	3.596				
Total number of persons living in apartments	No. person	2.148	1.230	797	746	3.222	200	1.759
Total number of persons living in individual buildings (dwellings)	No. person		58					
Person per apartment	No. person	3,0	3,0	3,0	2,4	6,1	2,5	2,5
Heated floor surface in apartments per person	m^2/person	28,3	43,0	33,3	37,7	12,2	13,6	32,0
Heated floor surface per apartment	m^2/apartment	84,8	128,9	98,4	90,7	73,8	33,9	80,4
Total length of existing distribution pipe network	km	2,0	2,5	1,2	0,9	1,2	0,9	1,5

Table 1: Project Characteristics

Overall Investment budget for each town

Investment Components	Intorsura Buzaului	Vlahita	Gheorgheni	Huedin	Vatra Dornei
	2001 - 2003	2001 - 2003	2001 - 2003	2001 - 2003	2001 - 2003
Sawdust fired boiler system	1.162.517	824.255	824.255	854.792	1.430.126
Additional equipment (boiler installation)	96.164	82.979	82.978	49.413	587.611
DH Piping components	246.425	260.210	257.612	179.384	774.701
DH pipe mounting	134.350	189.433	129.622	88.354	469.523
Consumer connection units	327.493	214.749	254.911	122.342	425.058
Mounting of Heat exchanger units	20.301	12.944,90	23.676	10.685	22.661,00
Replacement of heat pipes under building	81.205	49.787	59.745	80.137	82.372
Rehabilitation of existing building	140.274	69.076	80.822		12.508
New boiler plant building (inclusive sawdust storage)	50.548	77.682	297.562	196.570	290.916
Step-down transformer and connection to grid	21.370	17.702	27.660	15.602	29.946
Tractor, Wagons and Front end loader	48.082	30.901	31.920	26.922	43.164
Buffer storage/storage	100.000	54.586	86.186	33.369	
Public buildings - network and inst	120.547				
Stand-by boiler					215.820
Heat installations in block of flats	10.685				
Unforeseen expenses					33.527
V.A.T (only local and RSFESD donations)	164.478	100.432	110.326	77.915	
Import tax					
Total	2.724.439	1.984.737	2.267.275	1.735.485	4.417.933

Table 2: overall investment budget in EURO.

Overall Investment budget divided in financing sources

Investment Components	TOTAL	LOCAL	EU/MDP	RSFESD	DEPA
	2001 - 2003	2001 - 2003	2001 - 2003	2001 - 2003	2001 - 2003
Sawdust fired boiler system	5.095.946		3.447.436		1.648.510
Additional equipment (boiler installation)	899.146		733.189		165.957
DH Piping components	1.718.332	129.687		1.588.645	
DH pipe mounting	1.011.282	522.529	256.606	213.106	19.041
Heat exchanger units	1.344.551		547.400		797.151
Mounting of Heat exchanger units	90.268	45.032		45.236	
Replacement of heat pipes under building	353.246	150.224	51.842	151.180	
Rehabilitation of existing building	302.679	23.987	69.075	209.617	
New boiler plant building (inclusive sawdust storage)	913.278	180.244	443.476	289.558	
Step-down transformer and connection to grid	112.280	17.702	78.976	15.602	
Tractor, Wagons and Front end loader	180.989			180.989	
Buffer storage/storage	274.141	20.291	139.725	114.125	
Public buildings - network and inst	120.547		120.547		
Stand-by boiler	215.820		215.820		
Heat installations in block of flats	10.685		10.685		
Unforeseen expenses	33.527	33.527			
V.A.T (only local and RSFESD donations)	453.151	129.472		323.679	
Total (EUR)	13.129.868	1.252.695	6.114.778	3.131.736	2.630.659

Table 3: Overall investment budget divided after the project investors

1.3 Purpose and Background

1.3.1 The starting point

This project is based upon cooperation between ARCE and DEPA, with involvement from the Environmental Protection Inspectorates in the different counties.

Shortly after the revolution DEPA has been involved in developing and co-financing of a large number of projects in Romania with Neamt County as the specific target area. Projects typically involving local Romanian co-financing and also co-financing from different EU programs have been on DEPA's agenda.

When travelling in Neamt County it is obvious that the sawmill and wood processing activities is not only a benefit for the area. Sawdust, bark and wood waste are found stockpiled everywhere. This illegal depositing activity is causing a considerable environmental impact on the nature.

In 1998 DEPA financed a project aimed at mapping the quantities of sawdust and other wood waste resources illegally dumped in Neamt County. The findings from this projects indicate annual illegally dumping accounts for 56,000 tons of sawdust residues in the nature (forest areas or dump at sites near sawmills). Therefore, large quantities of valuable and easy accessible biomass resources are used for nothing, this occurs even though gas and especially oil prices are considered sky high compared to the local economical capabilities. In the same project a suitable location for a pilot project was also identified. The objective with the pilot project was to demonstrate that sawdust and wood waste could easily be transferred from being an environmental problem into a valuable energy resource.

The village Tasca (Neamt County) located near the cement factory Moldocim was selected as the site for implementation of the pilot project. The arguments for choosing Tasca was:

- Existing district heating system was available.
- Large quantities of sawdust- and wood waste resources were available close to Tasca.
- Strong commitment at the local town hall level and at the County Council level was registered.
- Privatisation of Moldocim was ongoing and it was announced that the heat supply from the factory to the Tasca Village would be stopped by the end of year 1999.

1.3.2 The Pilot Project in Tasca

In 1998 an agreement between the municipality of Tasca, Neamt County authorities and DEPA was signed establishing the basis for implementation of the pilot project in Tasca based upon a considerable grant from DEPA. Grue & Hornstrup Consulting Engineers obtained in August 1998 the assignment as consultants responsible for design, tendering and implementation of the project on the behalf of DEPA. Tendering based upon international tendering procedures (World Bank tender dossiers) was performed at the beginning of year 1999 and the entire project was implemented during the summer 1999. Before the heating season 1999-2000 the entire project was commissioned which included new boiler plant, district heating network, heat consumer connection units and replacement of existing pipes under buildings with new pipes. Since September year 1999 the new biomass based DH system in Tasca has supplied heat to the inhabitants in Tasca for space heating and for production of domestic hot water.

1.3.3 Spreading the experience from Tasca and selecting new projects

Already before commissioning the Tasca project several towns has indicated their interest for implementation of similar technology and on the day of the official opening in Tasca a huge interest was shown. Since the official opening in Tasca a large number of delegations have visited the Tasca biomass boiler plant and the objective as a Pilot Project has indeed been fulfilled. Even today the fact is that no week will pass in Tasca without a visit from somewhere in Romania.

As the need for similar projects elsewhere in Romania was evident, both to reduce the environmental impact caused by the uncontrolled dumping of sawdust as well as to upgrade the energy sector, DEPA launched an identification project. The objective was to investigate a number of towns in which projects based upon the same objectives and technology like in Tasca could be implemented.

The project in Tasca was as mentioned before initiated from an environmental viewpoint. As DEPA at that time was a department under the Danish Ministry of Energy and Environment the Energy Agency in Denmark, the Danish Energy Agency has monitored the project when speaking about the Tasca project and when seeking for more projects a direct involvement from the Energy Agency in Denmark was established.

A similar co-operation was established in Romania involving ARCE in developing the project and to identify suitable sites. The environmental viewpoint was however not lost as the EPA's in the different counties have been directly involved in mapping the sawdust- and other wood waste resources.

The result of the efforts was that twelve sites have been surveyed of which five towns have been selected for future implementation by ARCE and DEPA in a joint evaluation process.

The fact that only five sites have been selected shall not be seen as an indication of what was feasible to develop. Instead it only reflects a selection of a limited number of towns in which the conditions for fast project implementation existed at that moment. Implementation of projects in this part of the Romanian energy sector is representing big perspectives for the future and can be the basis for new business areas in Romania.

The Sawdust 2000 has been approved by the following organisations

1) the towns involved,
2) the Romanian Ministry of Industry,
3) the Romanian Agency for Energy Conservation (ARCE),
4) the Danish Environmental Projection Agency (DEPA).

The total investment budget for implementation is 13,129,869 Euro, out of which approx. 80% was secured by funding from the town hall budgets, grants from the Romanian Special Fund for Energy System Development (RSFESD) under ARCE and a combined grant from the EU Phare 2001 Program and the MDP regional development activities.

Further DEPA has approved to grant funds for the technical assistance conducted by Grue & Hornstrup Consulting Engineers A/S as a supplement to the total investment budget.

According to the original time schedule publication of tender dossiers should be in the earliy spring of year 2002, signing of contracts early autumn 2002, implementation and commissioning the DH systems (boiler plants, distribution pipe networks, replacement of heating pipes under buildings, mounting of consumer connection units etc.) before the heating season 2002/2003.

However, the Danish financing support was based on the precondition that a CO_2 trading agreement between Romania and Denmark would be signed, which was not possible to complete in year 2002. In this respect the project has been postponed until the beginning of year 2003 when a MoU and a project agreement was signed by Romania and Denmark.

1.3.4 Location of the towns involved

The towns involved are spread over the northern part of Romania with focus on the forest areas where sawdust and wood waste is available within a short distance from the boiler plants.

The project involves the following locations:

1)	Vlahita	Harghita County
2)	Gheorgheni	Harghita County
3)	Vatra Dornei	Suceava County
4)	Huedin	Cluj County
5)	Intorsura Buzaului	Covasna County

The locations of the towns are indicated on a map of Romania:

1.4 Technical description

The project approach is from a technical point of view identical in all towns and is also very close to what is already implemented in Tasca.

In Vlahita the existing boiler system utilised natural gas while oil was used in the other four towns (Gheorgheni, Huedin, Intorsura Buzaului and Vatra Dornei). In all five towns the existing boiler systems consist of heat only boilers for production of hot water for space heating and for production of domestic hot water.

The technical rehabilitation concept includes the following key elements:

1) Implementation of new automatically controlled biomass boiler systems including, pushrod out-feeding system in the sawdust storage, biomass boiler with step grate, flue gas cleaning system (multi cyclone, bag filter unit), water treatment facilities, main supply pump units, fire protection system, expansion systems, steel chimney

2) Implementation of a new two track pre-insulated district heating network pipe system connecting the boiler house with all consumers. This is substituting old worn-out four track pipe systems.

3) Implementation of consumer connection units in each building including mixing loops and plate heat exchangers for decentralised production of hot potable water.

4) Replacement of existing heating pipes under buildings with new heating pipes to avoid heat losses from leaking pipes.

5) Construction of new boiler house (Gheorgheni, Vatra Dornei) or renovation of existing boiler plant buildings (Vlahita, Huedin and Intorsura Buzaului).

6) Construction of sawdust storage in connection with boiler plant buildings and new buffer storage buildings for storing of sawdust for the winter season.

7) Purchasing of logistic equipment like tractors, wagons and front end loaders for each town for collection and handling of sawdust and other wood waste resources.

1.4.1 Pipe network modifications and introduction of consumer connection units

Today hot water from the existing boiler plants is distributed to heat consumers by a district heating pipe network constructed after the four-track principle with one supply and one return pipe for space heating purposes, one supply pipe for hot potable water and one pipe for re-circulating the hot potable water.

Hot potable water is produced at the boiler plant and the district heating pipe network is laid down in concrete channels with very poor pipe insulation or in some places no insulation at all.

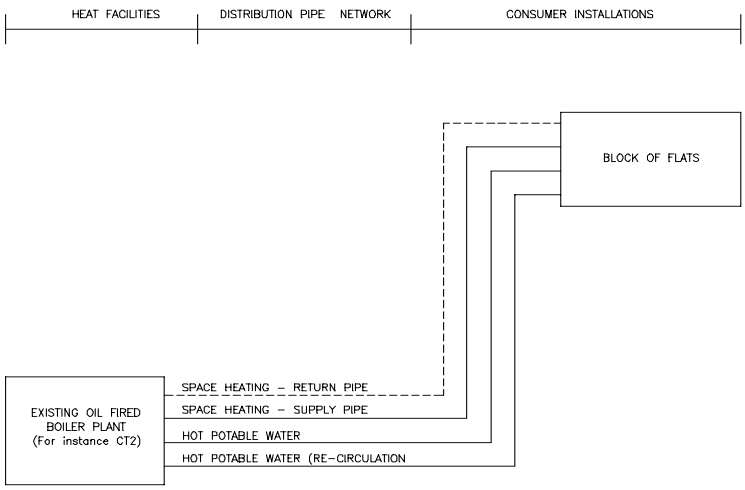


Fig. 1: Existing four track heat supply system

The project comprise replacement of the four-track pipe system with a two-track pipe system, which is the normal standard technology applied in Western Europe.

I.e. the principles for the future DH system will be like the sketch below:

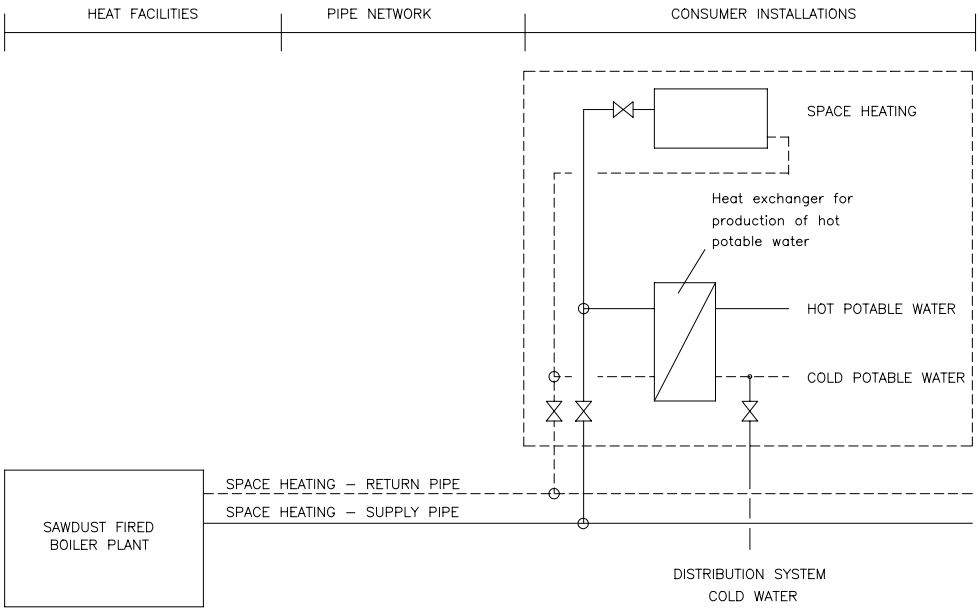


Fig. 2: Two track pipe system to be implemented under this project

By utilizing the two-track concept the comfort level for the consumers will be improved.

The existing pipe distribution system was based upon a philosophy of centralized control with almost everything including heat supply. For example if the outdoor temperature in two days has been over 10 °C) the heat supply for space heating would be shut down or the supply temperature would be adjusted at the boiler plant with reference to the outdoor

temperature. This means that the individual heat consumer did not decide the indoor climate conditions. The supply of hot potable water could also be stopped from the boiler plant. The advantage of the four-track pipe system was that the heat loss in the summer time might be reduced by only supplying hot potable water by a pipe system with smaller pipe dimensions, which decreased heat losses. However, during wintertime all four pipes (two for space heating and two for hot potable water) should be in operation, which increases the heat losses.

From an investment point of view there is a balance between lower pipe costs for a two-track pipe system including the additional costs of heat exchangers for decentralised production of hot potable water in block of flats compared with more expensive four-track pipe system.

The four-track system described is universal in all of Romania and in most Central and East European Countries. If sufficient heat for spacing heating and hot potable water was provided the heat consumer comfort level will be fulfilled and as good as what is possible with the two-track pipe system. Looking upon the incentives for optimising (minimising) the heat consumption the four track pipe systems do not create may options in the individual block of flat, especially not when valves on the space heaters have been blocked for years. The lack of adjusting possibilities at the heat systems in buildings combined with the fact that payment for heat and hot potable water is based upon a flat rate per square meter when speaking about space heating and payment for each person living in the flat when speaking about hot potable water. Is not introduced any heat saving initiatives.

Introduction of two-track pipe system combined with heat exchanger units for decentralised production of hot potable water it will become a local decision in the individual block of flat when the space heating installations will be closed down during spring and when it will be opened again in the autumn. The new DH system combined with installation of heat meters for measuring of the heat consumption of each block of flat will introduce, incentives for energy saving at block level.

To optimise heat installation for space heating purposes equipment like radiators should be equipped with modern thermostatically valves and heat metering should be performed at apartment level. However, the owner of apartments can seldom finance thermostatically valves or installation of heat meters. Donor requirements do not allow financing of technical equipment for private owned apartments.

The question could be raised if it is necessary to upgrade the entire distribution pipe system with new pre-insulated pipes. According to investigation of the sites it is obvious that luxury investments are not introduced. Basically speaking the existing distribution pipe systems are often well designed and have also been well installed years ago. However, the consequence of missing maintenance in decades is that the systems from a normal West European point of view years ago has passed the expected lifetime. Generally speaking the distribution pipe systems are not able to provide the heat consumers with a decent service level.

Figure 1: Existing corroded district-hearting pipe from Tasca.

Figure 2: Looking into a concrete pipe channel in Tasca containing earlier insulated district heating pipes

The question is if a two-track pipe system combined with decentralised consumer connection units in block of flats has advantages compared to a four-track pipe system with smaller pipe dimensions and centralised production of hot potable water in the boiler plant.

Two Track Pipe Network (one supply and one return pipe for space heating) in the town of Huedin

A	B	C	D	E	F	G	H	I	J
Function of Pipe Network	**Temperature of supply water in pipe network**	**Temperature of return water in pipe network**	**Length of supply pipe network**	**Length of retun pipe network**	**Dimension of pipe network (supply/retun)**	**Total heat losses pipe network (supply/return)**	**Number of operation hours per year**	**Total annual heat losses pipe network (supply/return)**	**Total annual heat losses pipe network (supply/return)**
								I = G x H	**J = I / (D + E)**
	Celsius Degree	**Celsius Degree**	**meter**	**meter**	**DN**	**Watt**	**hours/year**	**kWh/year**	**kWh/year/meter**
Distribution of hot water for space heating and hot potable water	70	50	1.184,8	1.184,8	DN50 - DN200	45.286	8.760	396.702	167,4

Four Track Pipe Network (one supply and one return pipe for space heating) in the town of Huedin									
A	B	C	D	E	F	G	H	I	J
Function of Pipe Network	**Temperature of supply water in pipe network**	**Temperature of return water in pipe network**	**Length of supply pipe network**	**Length of retun pipe network**	**Dimension of pipe network (supply/retun)**	**Total heat losses pipe network (supply/return)**	**Number of operation hours per year**	**Total annual heat losses pipe network (supply/return)**	**Total annual heat losses pipe network (supply/return)**
								I = G x H	**J = I / (D + E)**
	Celsius Degree	**Celsius Degree**	**meter**	**meter**	**DN**	**Watt**	**hours/year**	**kWh/year**	**kWh/year/meter**
Distribution of hot water for space heating	Average temperature of 45		1.184,8	1.184,8	DN40 - DN150	27.639	4.183	115.614	48,8
Distribution of hot potable water	65	50	1.184,8	1.184,8	DN40 - 125	34.824	8.760	305.059	128,7
									177,5

Table 4: Heat losses form two and four track pipe systems - the Huedin data utilised as example

Heat losses from two-track- and four-track pipe systems in the town of Huedin:

The above comparison of two-track pipe system and four-track pipe system is based on the actual distribution pipe network in Huedin. Estimating the heat losses from the four-track pipe network an annual average temperature of 45 °C for the supply and return pipe system for space heating purposes has been estimated. This is based upon temperature control after with reference to the outdoor temperature.

The investment cost of install a two-track pipe system or a four-track pipe system in Huedin have been estimated in order to illustrate the financial aspects of the two pipe systems.

Investment cost of implementing two-track- or four-track pipe system in Huedin:

Investment Component (excluding V.A.T. - costum duties - import taxes)	Unit	Price
Two Track Pipe System		
Piping components (distribution of hot water for space heating and hot potable water)	EUR	179.384
Installation of piping components (distribution of hot water for space heating and hot potable water)	EUR	88.354
Consumer connection units in each building (including installation)	EUR	130.585
Replacement of pipes under buildings for hot water for space heating and hot potable water	EUR	80.137
Total two track pipe system	**EUR**	**478.460**
Four Track Pipe System		
Piping components (distribution of hot water for space heating)	EUR	105.006
Installation of piping components (distribution of hot water for space heating)	EUR	63.011
Piping components (distribution of hot potable water)	EUR	89.704
Installation of piping components (distribution of hot potable water)	EUR	28.497
Two heat exchanger units mounted in boiler plant building	EUR	44.000
One accumulaiton tank for hot potable water (5000 litres) mounted in boiler plant building	EUR	15.000
Installation of heat exchanger units and accumulation tank (pipes, control valves etc.)	EUR	19.000
Control loops in each building (cooling of space heating water)	EUR	45.000
Replacement of pipes under buildings for hot water for space heating and hot potable water	EUR	90.137
Total four track pipe system	**EUR**	**499.355**

Table 5: Investment costs for two- and four track systems in Huedin

All distribution pipe networks in the project have been designed by using the computer pipe design program (LicHeat) aiming to optimise the pipe dimensions. One result of the design activities is that the pipes chosen for the project have a smaller diameter than former Romania design practice.

Besides modern pump units equipped with variable speed drives and automatically controlled differential pressure control systems will introduce considerable savings when speaking about electricity consumption. This is additionally to the energy savings achieved by installation of a new modern pipe network.

Drawings showing the extent and principles of the new distribution pipe networks are presented in the Annexes.

1.4.2 Replacement of existing heating pipes under buildings

One of the characteristics in all five towns and probably all over Romania is that the distribution pipes and the internal heat supply pipes are located in basements under block of flats.

Basements under buildings can be difficult to access and often sewer pipes, water pipes and heating pipes are leaking. The same information can be obtained reading documentation from the Swiss STEP project or focussing on the experience obtained during the Tasca project.

In the project it is mandatory to replace the leaking existing pipes under buildings (with basement or without basement) and to install new pre-insulated heating pipes with proper pipe insulation.

1.4.3 New biomass storages, buffer storage and boiler plants

Substituting liquid oil and gas with biomass will introduce the need for storage facilities as the where transportation of biomass in winter season may be difficult and sometimes impossible.

The design of all boiler plants include a storage for sawdust, woodchips or bark with a storage capacity corresponding to three to four days of maximum load of the biomass boiler system. In this way the heat supply can be maintained also during shorter period where the roads could be blocked by snow.

Town	Future boiler plant with sawdust storage	Buffer storage	Distance between new boiler plant and buffer storage
Intorsura Buzaului	Existing boiler plant building (concrete- and steel construction) will be renovated	New sawdust buffer storage	500 meters
Huedin	New boiler plant building (concrete) will be erected	New sawdust buffer storage	500 meters
Vatra Dornei	New boiler plant building (concrete construction) will be erected	New sawdust buffer storage	Next to the new boiler plant
Vlahita	Existing substation will be renovated to become new boiler plant building (concrete building)	New sawdust buffer storage	300 meters
Gheorgheni	New boiler plant building (concrete construction) will be erected	New sawdust buffer storage	Next to the new boiler plant

Table 6: Brief overview over the construction principles utilized for boiler houses and sawdust storage facilities

Beside the biomass storage included in the design of the boiler plants buffer storage buildings will be erected near the new boiler plants or in the outskirts of the towns. The buffer storage shall secure easy access to fuel for the daily operation during the winter season and at the same time allow continuous delivery of sawdust from sawmills during the summer season even though the heat demand is low.

In the five towns the existing boiler plants are located in areas with block of flats and in Vatra Dornei the design of the new boiler plant is aimed to meet the heat demand of several existing substation stations. In all five towns it has been investigated how and in what area the new boiler plants can be located and constructed in the most optimal way.

This to find the most optimal choice between a centralised location of the boiler plant and at the same time to take into consideration that introduction of biomasses will increase the traffic caused by fuel transportation and possible nuisances caused by spreading of dust in domestic areas. Transportation of biomasses and the possibilities for future extension of the boiler houses have been the key factors when the location of the new boiler plants has been decided.

The design of the boiler plants and sawdust storage facilities are presented the annexes.

1.4.4 New biomass boiler systems

The cornerstone in the project is to introduce boiler technology making it possible to utilise wet biomasses as fuel. In this respect wet biomasses like sawdust, wood chips, bark etc. with a water content up to 55% are considered.

It may seem strange that a country like Romania and also other CEECs with huge biomass recourses are not utilising these resources, while import of expensive natural gas and oil has been ongoing for years.

The only explanation identified during the project is that the little more sophisticated boiler technology necessary to combust wet biomass has not been available as a domestic product on the Romanian market and that West European equipment in general terms are considered too expensive for public owned utility companies in Romania. What makes this problem even more serious is the consumer's ability to pay for public services like heat, water, sewer services and electricity which generally is poor in Romania today. The fact that the services provided by public utilities often are at a low level, is also reducing the willingness to pay substantially. A vicious circle has been created where actual economical conditions in Romania only can be changed trough a grant-supported projects like the sawdust project.

To illustrate the existing boiler technology please have look at the picture below.

Fig. 3: The existing boiler in Gheorgheni. Who will dare to predict the efficiency

The biomass boiler technology selected for the project can be considered as the market standard in West European countries, which include boilers constructed with a combustion chamber with lined with heat resistant brickwork and a inclined step grate on which the biomass fuel is supplied automatically. On the top of the step grate the water is evaporating, hereafter the gasses in the wood waste are extracted and last the dry wood waste is burned.

The flue gas cleaning systems consist of multi cyclones and bag filter units and the flue gasses are finally discharged through a self-supporting steel stack. Ash from the combustion process is automatically transported into a closed ash container and ash will either be dumped at a landfill or spread as fertilizer in the forest.

The biomass boiler systems will be automatically operated, not because it is mandatory to save manpower but because it is necessary to secure an optimal operation of the combusting processes. As the biomasses are not a homogeneous material the primary and secondary combustion air supply needs to be continuously controlled with reference to the O_2 content in the flue gas. The combustion air control together with automatic fuel supply from the fuel storage and differential pressure control installations can only be operated efficiently using modern control technology. Another reason for utilising control systems is the boiler safety loops, which calls for automatic control systems.

The new boiler systems comprise technical systems for treatment of replenishment water and automatic fire fighting installations to be released in case of back burning in the stoker system.

The new biomass boiler systems will not use fossil fuels like oil or natural gas when the new biomass boilers are put into operation or during start and stop situations. The first time the biomass boiler systems are put into operation a piece of paper will be lighted to firing up the dry wood material on the grate, and similar methodology will be used in the future if needed.

1.4.5 Project boundaries

Project boundaries are from a GHG emission reduction point of view achieved by:

1) Substituting natural gas and liquid oil by a renewable energy resource in form of wood waste more specific sawdust residues from local sawmills.

2) Reduction of the methane emission from anaerobic digestion of wood residues caused by illegal dumping of sawdust and other wood waste fraction from wood processing industry in the areas where the towns involved are located.

In the baseline study the boundaries are discussed in more detail.

1.5 Problems and barriers addressed by the project and befits achieved

Implementation of the project addresses a number of problems and a number of benefits are achieved through the solutions introduced. The most important are listed below however the order doesn't represent any ranking of the arguments.

1.5.1 Renewable energy introduced and fossil fuels substituted

In this project renewable energy is introduced in a broader rage in Romania with a corresponding reduction in the energy import to Romania.

Assuming the project is fully implemented the below quantities of natural gas and liquid oil in the five (5) towns are foreseen to be substituted with biomass resources.

Town	Fuel	Unit	Annual Fuel Consumption				
			1997	1998	1999	2000	2001
Vlahita	Natural Gas	Nm3	953.835	975.582	1.003.420	892.830	599.210
Gheorgheni	Liquid oil	tons/year	1.181	1.298	858	601	855
Huedin	Liquid oil	tons/year	315	450	320	300	300
Intorsura Buzaului	Liquid oil	tons/year	965	940	772	611	489
Vatra Dornei	Liquid oil	tons/year	1.589	1.666	1.112	914	-

Table 7: Fossil fuels substituted – the figures are presenting the actual fuel consumption over the years mentioned.

Implementation of the project will decrease import with the quantities of fuel mentioned to benefit the Romanian economy.

1.5.2 GHG emission reduction

The assessment of the GHG emission reduction effect is described in the Baseline Study version 3 – 2005 01 05.

1.5.3 Heat selling price

For all towns the heat consumer price has been calculated based upon the precondition that the project will be implemented within the budget drafted. In this budget approx. 10 % of the investment is financed from the local budget and 90% from grants and trade with Emission Reductions.

The heat-selling price mentioned below includes all operation and maintenance costs and it is assumed that the local investment shall be recovered over a 10 years period with an internal rate of return (IRR) at 8%. The key figures from this calculation are presented in the following table.

Subject	Units	INTORSURA BUZAULUI	VLAHITA	GHEORGHENI	HUEDIN	VATRA DORNEI	TOTAL
Annual heat sale	Gcal/year	13.358	9.040	8.747	4.976	23.291	59.413
Heat price IRR = 8%	Euro/Gcal	7,41	7,90	8,35	10,40	8,97	
Heat price IRR = 8%	Euro/Mwh	6,37	6,79	7,18	8,94	7,71	

Table 8: Heat consumer prices

Other alternatives are evaluated in Project Identification Reports.

1.5.4 Social aspects

Implementation of the project will benefit a major part of the inhabitants in the five towns under the project. In all towns the existing DH systems are in bad condition and some of the DH systems are often out of function or in the best case operation is unstable causing serious problems and discomfort for the inhabitants.

The characteristic of the DH systems when speaking about the number of apartments and inhabitants affected by the project is illustrated below:

Component	Unit	Vlahita	Gheorgheni	Huedin	Vatra Dornei			Intorsura Buzaului	Total
Number of heated apartments	No. flats	716	410	270	310	531	80	701	3.018
Number of block of flats connected to network	No	44	17	24	27	34	4	40	190
Number of individual buildings (dwellings) connected to network	No	-	16	-	-	-	-	-	16
Number of individual buildings connected to network	No	19	17	-	-	-	1	11	48
Total number of persons living in apartments	No. person	2.148	1.230	797	746	3.222	200	1.759	10.102
Total number of persons living in individual buildings (dwellings)	No. person	-	58,0	-	-	-	-	-	58

Table 9: Social aspects

1.5.5 New business areas

Utilisation of wood waste resources introduces new business opportunities in Romania. Today wood waste are only utilised to a very limited extend in Romania and the potential for extending this business is huge.

In the official Danish energy statistics biomasses and renewable energy resources are representing an essential element. From this statistics the following key figures of utilisation of renewable in Denmark can be extracted:

- In the Danish district heating production 36% is based upon biomasses and waste incineration.
- In the primary energy production wood waste represents approx. 20,500 TJ / 5,700 GWh on annual basis. This shall be compared with an annual energy production at approx. 300 TJ in the project, similar to 1.5% of the Danish wood waste based energy production.

Comparing those figures with the fact that the forest area in Denmark is approx. 5,200 km^2 and the forest area in Romania is approx. 64,000 km^2 it is obvious that the potential for further development in Romania is huge. This potential business development is not only involving heat production but also processing of wood waste, handling and transportation of wood waste, which in Denmark is a large business area even the wood waste potential is less than 10% of what the total forest area is representing in Romania.

1.6 Time schedule

The identification of the project was launched in December 1999 and practically stated early year 2000. The financing of the project was established by support from different financial sources with equal importance for the project financing, which means lack of funding from for instance MDP/EU or the Danish side will lead to a collapse of the entire project. In November year 2002 was that 80 % of the investment budget has been approved, but the Danish contribution is secured now that the CO_2 trading agreement between Romania and Denmark was established and signed. The funding provided by the EU-Phare program and MDP has been obtained including a very strong support from the EU Delegation in Bucharest. The financial support from the MDP/EU Phare program is equal to approx. 45 % of the total investment costs of which the EU Phare program finance 75 % and the Romanian national budget finances 25 %.

The ultimate time schedule is therefore:

1) Signing of a common agreement between all donors in the autumn year 2003.
2) Signing of contracts for supply of pre-insulated piping components early September to be financed by the RSFESD budget for year 2003. RSFESD funding is part on the Romanian national budget.
3) Signing of supply contracts before the end of July 2003
4) Construction works will take place from June - September year 2003
5) Heat supply at the end of year 2004
6) Final commissioning and taking over at the beginning of year 2004.
7) Warrantee period year 2004

It is essential to understand that when a budget has been approved by the Romanian government and made a part of the national budget there is no possibility to postpone the spending the funds allocated. There are no backdoors i.e. if the time schedule drafted above will not prevail the RSFESD funding is lost and it is considered impossible to continue or restart the project. Besides it is also essential to remember that first construction works has been executed before the signing of the CO_2 trading agreement between Romania and

Denmark was signed. Time limits for spending the Romanian funds allocated for the project simply forced the project partners to believe in the signing of the CO_2 trading agreement, and to execute Romanian funded construction works in year 2002 and year 2003.

2. Key qualitative criteria in the PDD

2.1 Memorandum of Understanding

The MoU between Romania and Denmark was official signed on the 28 January year 2003 according to the principles of the Kyoto Protocol.

2.2 Project Agreement (Letter of Approval)

The aim of the project agreement is to secure that funds generated by the CO_2 trading between Romania and Denmark would be used for financing part of the project investment costs. The project agreement contains the host country's approval of the project as a JI-Project and also implementation of the JI-project.

The project agreement was official signed on the 7 March year 2003 by representatives from the Romanian Ministry of Waters and Environmental Protection and the Danish Ministry of Environment.

Before signing the project agreement was also forwarded to the UNFCCC for comments.

2.3 Project Additionality

The project fulfils the JI-mechanism criteria concerning Additionality when implementation of the project would not occur in the absent of funds from a CO_2 trading agreement between Romania and Denmark.

For financing and implementation of the project all financing sources have had the same importance for fulfilment of the financing scheme for the project. This means that if one financing source would not be available the other financing sources would withdrawal their financial support. Before launching tender dossiers to be financed by other investors the Danish Ministry of Environment have to issue an official letter stating that the part of the investment costs to be covered by funds from the CO_2 trading agreement is secured.

2.4 Substantial development

2.4.1 Sustainability (resources and social)

Evidence on the sustainability of the project has already been proven under earlier paragraphs (please see paragraph 1.3.2, 1.4.4 and 2.3).

The environmental improvements concerning reduction of GHG emission or emission of dust particles to the atmosphere is evident and the quantity of CO_2 emission reduction is presented in the baseline study paragraph named net emission reductions. The project has a high degree of sustainability when GHG emission reduction will prevail as long as the biomass boiler plants are in operation. The five towns under the project are located in areas with large forest areas and a high concentration of wood processing industries like sawmills and forestry. In this respect the quantity of wood residues available as biomass fuel is sufficient to meet fuel demands of the new boiler plants even though a recession in the wood processing industry sector should occur. Another aspect is the conservative assumptions made when estimating the GHG emission reductions generated by the project. Assuming the new biomass boiler plants will be closed down standby boiler systems in Vlahita, Gheorgheni, Vatra Dornei and Intorsura Buzaului will be put into operation using fossil fuels, which will generate GHG emissions. However, high fossil fuel prices and future high fossil fuel prices will limit the operation of fossil fuel boilers when economical advantages

will encourage mayors the secure sustainable operation of the new biomass systems. Each new biomass boiler systems comprise a package of spare parts for four years (besides the warranty period) of operation, which limits mechanical defects to close down the new boiler systems.

2.4.2 Environmental sustainability

The environmental sustainability in terms of environmental benefits comprises reduction of wood residues dumped in the nature, GHG emission reduction from the Romanian DH sector, reduction of risk related to pollution of ground water etc.

In order to illustrate the quantity of wood residues available for utilisation as fuel by the new DH systems under the project some of the potential suppliers of wood residues are listed in paragraph 6 (Annexes). The GHG emission reduction achieved by implementing the project is presented in the Baseline Study (Version 3 – 2005 01 05).

2.4.3 Economic sustainability

Outcome from the economic analyses from different economical scenarios conducted during the development of the project are presented below.

2.4.3.1 Alternatives analysed

To establish a deeper understanding of the economical advantages and disadvantages by using biomasses several alternatives have been analysed aiming to evaluate the economical viability of the project looking upon it from different viewpoints.

The different alternatives are briefly described below:

1. In Alternative One (1), the project is analysed assuming that financing scheme will be identical with the budget in paragraph 2.4.4, with a grant covering 90 % of the total investment cost and local contribution is covering 10 % of the total investment cost. Will it be possible to deliver heat at a price level, which does not exceed the official consumer price approved by the state office of competition and still recover the 10% local financing?

2. In Alternative Two, the actual sawdust (biomass) alternative is compared with similar DH systems based on natural gas and oil. The objective is to evaluate if the sawdust alternative is competitive. In the sawdust alternative a grant covering 30% of the total investment cost is foreseen and that the remaining part of the investment budget is covered by local funds. In the natural gas and light liquid fuel alternative, no grant is foreseen. I.e. a JI - Project approach compared to a normal project approach.

2.4.3.2 Methods used to analyse the alternatives

The methods used for the financial assessment of the alternatives drawn up in the chapter above are presented in the following:

1. For both calculations a 10 years planning horizon has been used.

2. For both alternatives the actual and relevant investment, operation and maintenance costs has been included.

3. The basic sales price and the quantity of heat sold are also identical for the alternatives.

4. The basic sales price applied for all scenarios is the heat consumer price of approx. 230,000 ROL/Gcal (heat season 1999-2000) corresponding to 11.42 Euro/Gcal. This price is determined at the state office of competition in Romania. If the actual production price is higher than this maximum consumer price in Romania, the difference is covered by a subsidy. Compared to West European market price for heat prices the heat price is very low and therefore also other heat sale prices are analysed.

5. Two main discounting methods for assessment of investments, as far as the evaluation of the financial feasibility is concerned, are used. This is the a) net-present–value method (NPV) and b) the internal-rate–of-return (IRR) method.

2.4.4 Results from the Economical Analysis - Alternative One

Reference	Subject	Unit	Vatra Dornei	Gheorgheni	Vlahita	Huedin	Intorsura Buzaului
	Total investment	Euro	4.418.904	2.267.266	1.984.738	1.735.485	2.724.439
	Own financing	Euro	441.793	197.425	179.721	139.426	294.329
	Grant financing	Euro	3.977.111	2.069.845	1.805.017	1.596.059	2.430.110
	Loan financing	Euro	-	-	-	-	-
	Total O & M costs	Euro/year	143.526	43.768	44.772	31.071	55.406
	Sales quantity	Gcal/year	23.291	8.747	9.040	4.976	13.358
A	Basic heat sales price	Euro/Gcal	11,42	12,70	12,70	11,63	11,63
B	NPV at DR 8%	Euro	383.955	256.789	292.802	41.279	379.591
C	IRR	%	29%	39%	47%	15%	39%
D	Heat sales price (NPV=0, IRR=8%)	Euro/Gcal	8,97	8,35	7,90	10,40	7,41
E	Heat sales price (NPV=0, IRR=8%)	ROL/Gcal	180.705	151.222	143.072	205.753	146.599
F	Heat sales price (IRR=16%)	Euro/Gcal	9,88	9,40	8,85	11,73	8,46
G	Heat sales price (IRR=16%)	ROL/Gcal	199.037	170.238	160.277	232.066	167.372
H	Heat sellig price at break even	Euro/Gcal	6,2	5,0	5,0	6,2	4,1
I	Heat sellig price at break even	ROL/Gcal	124	90.550	90.550	124	80.055

Table 10: Results derived from calculating alternative One.

In this calculation, a price similar to the maximum consumer price authorized by the state office of competition is used (Reference A). The corresponding NPV at 8.0 % discount rate and the IRR for the scenario are shown under Reference B and Reference C.

Reference D and Reference E shows the heat selling prices at which the net present value of the specific alternative will be zero (IRR=8%). This can be viewed as the minimum total sales price for making a feasible project. For higher prices than the prices in Reference D and Reference E, the scenario is acceptable.

Reference F and Reference G is highlighting the heat selling price at which the internal rate of return for the is 16%. For the prices of Reference F and Reference G (or higher prices), the scenario has a quite good financial feasibility.

If assumed that the total investment will be financed by 10% local financing and 90 % grants it has been analysed at what heat selling price the revenues will equalise the operation and maintenance costs. The result from this exercise is shown under reference H and I

2.4.5 Results from of Financial Analysis - Alternative Two

To be able to compare the fuel alternatives, an investment appraisal for an oil and natural gas alternative has been conducted. In absolute figures, the oil investment costs and the natural gas investment costs are lower than the sawdust investment. However, the operation and maintenance costs are significantly higher for the Oil Alternative and the Natural gas Alternative caused by higher fuel prices. The figures, you will find in the below table.

Two calculations are performed. The result from the first calculation you will find in the below table. Here the sales revenues are assumed to be the same as for the Alternative One (Base price = 11.42 Euro/Gcal). In the second calculation, the sales price is raised to a level where the internal rate of return (IRR) will reach 16 % for the Sawdust Alternative.

2.4.5.1 Results from the first calculation – Alternative Two:

Subject		Vatra Dornei	Gheorghni	Vlahita	Huedin	Intorsura Buzaului
	Unit			**Natural gas alternetive**		
Investment costs	Euro	3.376.542	2.267.266	1.118.157	1.144.467	1.929.973
Grant (30 %)	Euro	-	680.180	-	-	-
Annual O & M costs	Euro/year	332.014	43.768	118.312	66.028	158.374
Annual sales revenue	Euro/year	265.916	111.089	114.807	57.855	155.292
NPV at 8 %	Euro	(3.822.502)	(1.132.873)	(1.141.800)	(1.199.610)	(1.950.769)
IRR	%	NO	NO	NO	NO	NO
Subject	**Unit**			**Oil alternetive**		
Investment costs	Euro	3.376.542	1.176.986	1.118.157	1.144.467	1.929.973
Grant (30 %)	Euro	-	-	-	-	-
Annual O & M costs	Euro/year	761.482	287.534	291.294	158.721	403.885
Annual sales revenue	Euro/year	265.916	111.089	114.807	57.855	155.292
NPV at 8 %	Euro	(6.720.070)	(2.367.437)	(2.308.894)	(1.825.005)	(3.607.207)
IRR	%	NO	NO	NO	NO	NO
Subject	**Unit**			**Sawdust alternetive**		
Investment costs	Euro	111	1.176.986	1.984.738	1.735.485	2.724.439
Grant (30 %)	Euro	1.325.671	-	595.421	520.645	817.332
Annual O & M costs	Euro/year	143.526	116.816	44.772	31.071	55.406
Annual sales revenue	Euro/year	265.916	111.089	114.807	57.855	155.292
NPV at 8 %	Euro	(2.267.485)	(1.215.622)	(916.794)	(1.034.134)	(1.233.187)
IRR	%	NO	NO	NO	NO	NO

Table 11: Results derived from the first of two calculations made under alternative two.

2.4.5.2 Results from the second calculation – Alternative Two

In the second calculation, the sales price is raised to a level where the internal rate of return (IRR) will reach 16 % for the Sawdust Alternative.

Alternative 2

Subject		Vatra Dornei	Gheorghni	Vlahita	Huedin	Intorsura Buzaului
	Unit		**Natural gas alternetive**			
Investment costs	Euro	3.376.542	2.267.266	1.118.157	1.144.467	1.929.973
Grant (30 %)	Euro	-	680.180	-	-	-
Annual O & M costs	Euro/year	332.014	43.768	118.312	66.028	158.374
Annual sales revenue	Euro/year	749.981	354.266	316.853	268.731	428.785
NPV at 8 %	Euro	(555.598)	507.810	221.376	223.147	(105.541)
IRR	%	4%	16%	13%	13%	7%
Subject	**Unit**		**Oil alternetive**			
Investment costs	Euro	3.376.542	1.176.986	1.118.157	1.144.467	1.929.973
Grant (30 %)	Euro	-	-	-	-	-
Annual O & M costs	Euro/year	761.482	287.534	291.294	158.721	403.885
Annual sales revenue	Euro/year	749.981	354.266	316.853	268.731	428.785
NPV at 8 %	Euro	(3.453.166)	(726.754)	(945.718)	(402.248)	(1.761.979)
IRR	%	NO	NO	NO	NO	NO
Subject	**Unit**		**Sawdust alternetive**			
Investment costs	Euro	4.418.904	1.176.986	1.984.738	1.735.485	2.724.439
Grant (30 %)	Euro	1.325.671	-	595.421	520.645	817.332
Annual O & M costs	Euro/year	143.526	116.816	44.772	31.071	55.406
Annual sales revenue	Euro/year	749.981	354.266	316.853	268.731	428.785
NPV at 8 %	Euro	999.127	425.061	446.382	388.623	612.040
IRR	%	16%	17%	16%	16%	16%
Heat selling price making theSawdust alternaive come out with IRR= 16%	EURO/MWh	27,70	34,82	30,14	46,40	27,60

Table 12 Results derived from the second of two calculations made under alternative Two.

As mentioned above the calculations in this alternative is based upon the precondition that a biomass based district heating alternative will have the opportunity to obtain some kind of grant support this may be in form of support as a JI - Project or as grant maybe from the RSFESD or other relevant partners. Under this assumption the Heat selling price has been calculated under which the Sawdust alternative is coming out with an IRR = 16%.

This heat price you will find in Table 12. When this heat selling priced then is utilized to analyse the Gas and Oil alternatives the NPV and IRR values shown in Table 12 are found. Analysing the alternatives in this way is also showing the Sawdust/biomass alternative as the most beneficial.

In all analyses an 8.0 % interest rate is utilised when discounting the investment

2.5 Environmental impacts

2.5.1 Environmental impact assessment and transboundary impact assessment

During development of the project contact to the Romanian authorities has been taken to clarify the requirements concerning environmental impact assessments and transboundary impact assessment. The environmental requirements to be fulfilled according to Romanian legislation comprise environmental impact assessment and not transboundary impact assessment. The environmental impact assessment comprises two individual environmental impact assessments conducted by the Romanian environmental authorities (local EPAs) as described in the below. Copies of the environmental approvals are included in the paragraph 6 (Annexes).

Environmental Approval (Acord De Mediu): Feasibility studies for all sites under the JI project were developed and submitted to the local EPAs for Environmental Approval of each site under the project activity. The Environmental Approval for each site has been issued by the local EPA's in the different counties.

Environmental Permit (Autorizatie De Mediu): After the physical works are/were completed at each site and the new DH systems are commissioned, the local EPAs will conduct an environmental assessment of the new boiler plants and issue Environmental Permits accordingly.

The Environmental Approval (Acord De Mediu) for all five sites has been issued by the relevant EPAs. All Environmental Permits are expected to be obtained in the near future. The issue dates for the Approvals and Permits are listed in the table below.

Town	EPA Issuing the environmental approval	Environmental approval (Acord De Mediu)	Environmental Permit (Autorizatie De Mediu)
Intorsura Buzaului	EPA - Sfintu Gheorghe	2001 10 19	Pending Commissioning
Huedin	EPA – Cluj	2001 07 04	2004 06 14
Vatra Dornei	EPA – Suceava	2000 08 29	2004 08 04
Vlahita	EPA – Miercurea Cuic	2000 04 29	Pending Commissioning
Gheorgheni	EPA – Miercurea Cuic	2000 06 30	Pending Commissioning

Table 13: Issue dates of environmental approvals and permits

2.5.2 Other environmental aspects

Implementation of the project will improvement air quality when existing fossil fired boiler systems in the five towns will be replaced by new biomass boiler systems.

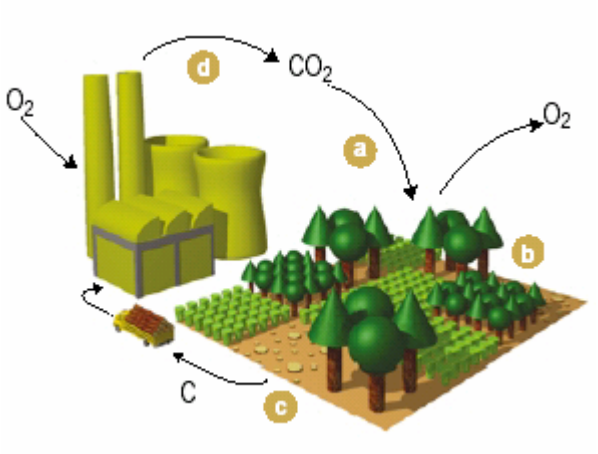


Figure 3: Illustration of the recycling of carbon as biomass accumulates in energy crops and forest and is consumed in a biomass boiler plant. a: CO_2 is captured by the growing crops and forests, b: oxygen (O_2) is released and carbon (C) is stored in the biomass of the plants, c: carbon in the harvested biomass/wood residue is transported to the biomass boiler plant, d: the biomass boiler plant burns the biomass releasing the CO_2 captured by the plants back to the atmosphere. Considering the process cycle as a whole, there are no net CO_2 emissions from burning the biomasses (wood residues).

Wood residues like sawdust, woodchips and bark are considered to be CO_2 neutral, which will decrease the GHG emission. The new biomass boiler systems will be equipped with flue gas cleaning technology (multi cyclone and bag filter units) for cleaning the air for particles with weight down to 40 mg/Nm^3 at 6,0 % O_2.

The environmental improvements concerning reduction of GHG emission or emission of dust particles to the atmosphere is evident and the quantity of GHG emission reduction is presented in the baseline study paragraph named net emission reductions.

Annual monitoring reports will be elaborated and verified by an independent entity according to the Kyoto Protocol and any changes in GHG emission reduction will be reported (monitoring plan). After the new biomass boiler systems are put into operation local EPAs will frequently perform inspection to see if emission limits are met.

The project is based on utilisation of wood residues which are normally dumped in piles in forest or sawmill areas as mentioned. The local EPAs have been involved in the identification of wood residues dumped illegal in the five areas and the quantities of wood residues to become fuel in the future. Assuming the project would not be implemented the number of illegal wood stockpiles in different areas would increase.

The consequences of implementing the project will in terms of environmental aspects lead to significant improvement of the environment in the five towns when speaking of reducing the dumping of wood residues in forest areas and air quality. In the baseline study (baseline IV) the annual quantity of wood residues removed from the nature has been estimated based on several conservative assumptions.

Town	Wood residues removed/combusted Tons/year	Ash from combustion of wood residues Tons/year
Vlahita	8003.3	40 – 80
Gheorgheni	6965.2	35 – 70
Huedin	3499.3	18 – 35
Intorsura Buzaului	7425.8	37 – 75
Vatra Dornei	8867.8	44 - 89
Total	34,761.8	174 - 349

Table 14

Taking into consideration that the project is an environmental project the following text focuses on other environmental aspect beside GHG emission reduction. Combustion of wood residues in biomass boiler systems generates ash, which can be estimated from 0.5 % to 1.0 % of the quantity of wood residues entering the biomass boiler system.

Ash from the combustion of wood residues contains soil and sand equal to approx. 1 – 4 % of the quantity of wood residues entering the biomass boiler.

According to investigations ash has a pH-value above 12 and on average coniferous trees processed into wood residues will contain approx. 43.6 % of not decomposable matters (mostly sand). On average, ash contains 16.8 % of unburned matters. Ash contains significant quantities of calcium, potassium, magnesium and some phosphorus. In addition spore elements like copper, iron, manganese and sodium are also well represented. The ash does also contain heavy metals like lead and cadmium. On average, ash (from combustion of coniferous wood chips) dried in a furnace, contain 1.4 % of phosphorus, 13 % of calcium and 1.7 % of magnesium.

Investigations proved that ash in average contain approx. 800 PPM (parts per million) of zinc, 100 PPM of lead, 15 PPM of cobalt, and 8 PPM of cadmium. According to investigations, it is recommended to use ash from biomass fired boiler plants as fertiliser in the forestry to secure that heavy metals will not be subject to human food chains. According to comparisons of ash with fertiliser (for trading), the content of minerals in one ton of ash (dried in a furnace) is equal to approx. 200 kg fertiliser for trading.

Ash could be spread in young coniferous forests after the first or second clean cutting of the forest, it is likely that minerals with high solubility can be washed out. Spreading of ash could be performed by a special wagon for spreading of lime. Another experiment proves that ash can be use for prevention of weevil, but with less effect compared to prevention of weevils based on chemical preparations. In each of the five towns storing of ash at dump yards is also possible.

In the five towns the environmental impact on the local environmental comprises reduction of GHG emission and reduction of illegal dumping of sawdust in the nature. The GHG emission reduction generated by implementing the project is described in the Baseline Study. The quantity of sawdust not dumped in the nature and instead combusted in the new biomass based DH systems is presented in paragraph 6 (Annexes - Potential suppliers of wood residues).

2.5.3 Risks Related to Sawdust Supply

Local authorities like inspectorates and governmental institutions monitor exploitation of forest areas and wood processing annually. Since the revolution in 1989 exploitation of forest areas and sawmill activities have increased dramatically while afforestation is slowly increasing.

Several laws have been imposed to force forest owners and forest contractors to secure afforestation but no static material describing the affect of the new laws has been identified. The current level of afforestation is not sufficient but authorities believe production of sawdust will not decrease for years. No prognoses describing development in the wood processing industry during the crediting period for trading of GHGs under the project has not been identified, but local authorities believe production of sawdust will continue.

Sawdust resources dumped in big piles (up to more than 10,000 tons) have been identified close to towns under the project and according to information dumping of sawdust is expected to continue for years.

2.5.4 Social impacts

Implementation of the project will have a social impacts in the five towns like raising the comfort level in buildings, introduction of new business areas, introduction of lower heat prices or reduction of subsidises needed to decrease the heat selling price.

Today the poor standard of the existing DH systems provides insufficient heat supply to dwellings and public buildings. This means the temperature in dwellings and in public buildings often is much below what is considered to be an acceptable comfort level. (minimum 20 °C inside rooms – winter season).

Today high prices of fossil fuels (natural gas and oil) generate discontinuously heat supply when heat consumers cannot pay for heating of their dwelling and municipality budgets for payment of fuel to DH systems is limited.

The new DH systems will enable continuously and sufficient heat supply to buildings in the five (5) towns, which means the comfort level in approx. 3000 apartments and more than 50 public buildings will be increased to a level considered to be acceptable.

The new DH systems to be implemented will need significant quantities of wood residues from local forestry and wood processing companies, and according information the wood residues can be collected for free. However, development of a market for selling of wood residues in Romania is foreseen, which means new jobs will be created within different sectors related to production-, selling-, transportation of wood residues.

2.5.5 Monitoring of environmental and social impacts

Environmental Impacts

Monitoring of the environmental impacts from the project comprise monitoring activities like emission measurements and inspection of the quantities of wood residues not dumped in the nature. When the final impact assessment has been completed the owner of the new biomass boiler plant will receive an environmental approval from the local EPA including requirements related to monitoring procedures. Today the local EPA will decide the frequency of monitoring of for instance emission of pollutants from boiler plants, industrial facilities etc.

The local EPAs elaborate environmental reports describing environmental aspects like air quality, water quality, waste management, dumping of waste etc., which in the future probably will include the projects environmental impact on its surroundings.

However, the local EPAs will continue to conduct inspection of wood residues produced by the wood processing industry and forestry, which will generate information about the quantities of wood residues not dumped in the nature. The local EPAs will every third month during the entire crediting period conduct inspection of the monitoring procedures conducted by the operational staff at the new biomass boiler plants. From former biomass projects in Romania it is known that local EPAs would like to monitor new boiler technologies because it is also new to them. In this respect it is assumed that the EPAs will continue this approach after commissioning of the project.

Social Impacts
No plans has been elaborated to monitor the social impact of the project but it is obvious that low heat consumer prices generated by the project will increase the comfort level in buildings when demands for space heating and for hot potable water can be fulfilled by after the implementation of the project.

Future monitoring of the social impact will be conducted when speaking about higher comfort level in buildings when monitoring of fuel consumptions (new boiler plants), heat productions (new boiler plants) and heat consumptions (dwellings, public buildings etc.) will be conducted monthly.

Another social impact generated by the project will be lower heat consumer prices, which hopefully will increase heat consumer's purchasing power a little.

3. Public Comments

3.1 National Guarantees

Different stakeholders involved in the project have provided different kind of guarantees to the project from the first phase of developing in year 2002 until today. Stakeholder commitment to the project can be expressed by description of the national guarantees available today.

Stakeholder	National Guarantee
Romanian Ministry of development and Prognosis	The MDP has approved to finance part of the project by EU/MDP funds under the Phare-2001 program. **Financing Memorandum Phare RO.0108.03.04.01** **Project Title MDP/EU:** Development of heating systems based on the use of biomass in five touristic areas
European Union	The MDP has approved to finance part of the project by EU/MDP funds under the Phare-2001 program. **Financing Memorandum Phare RO.0108.03.04.01** **Project Title MDP/EU:** Development of heating systems based on the use of biomass in five touristic areas
Romanian Special Fund for Energy System Development	In year 2000 RSFSD approved to finance part of the project equal to an amount of EUR 480,000. In year 2001 RSFSD approved to continue its financing of the project with EUR 1,900.000, which was used for purchasing of pre-insulated pipe district heating components and storage facilities.
Danish Ministry of Environment - DEPA	In year 2001 the DEPA has financed the project development phase. In year 2002 DEPA would finance part the project investment costs according to the original financing scheme if a CO_2 trading agreement would be established between Romania and Denmark.

Table 15: Guarantees

3.2 Invitation of stakeholders

Consultation of Local Stakeholders:

Stakeholders in the five towns have been invited to review the project within areas like environment, economic, sustainability, design, quality of life, comfort in buildings etc. In some of the five towns the project has been publicised in city halls and in local newspapers during year 2002 and year 2003.

Stakeholders addressed comprise municipalities, Non Governmental Organisations (NGO) and other local stakeholders. The municipalities have expressed their support to the project in letter of intents and during their participation in the project. NGO's will be contacted directly, while the public will be addressed by announcement in newspapers during a time period for two weeks.

However, any stakeholder is invited to submit any support to the project or objections against the project at any time.

Consultation of Stakeholders in Denmark:

Consultation of stakeholders in Denmark was performed from the 18 October to the middle of December 2002 by a public hearing of the project at the Danish Ministry of Environment's website. One comment was submitted (see stakeholder report paragraph 6) presenting issues already known by the project team.

A Stakeholder Consultation Report is included in paragraph 6 presenting a Letter of Support from each town under the project. The Letters of Support were elaborated after consultation of stakeholders was completed and signed by municipalities and local NGOs.

3.3 Utilisation of existing procedures for public consultation in host country

Public consultation in the five towns under the project is completed and the outcome is detailed in the Stakeholder Consultation Report (Annex VIII).

4. Crediting Period

The crediting period describes the number of years (time period) over which GHG emission reduction generated by the project can be claimed. It shall be emphasised that the defined emission baselines in the Baseline Study must not be adjusted or revised during the crediting period. The project is a Joint Implementation Project (JI – Project) where the crediting period is defined in relation to the time period from year 2004 to year 2017 when credits from GHG trading can be transferred to the host country's national registry administrated by the Supervisory Committee.

However, the project is a JI – Project with a crediting period from year 2004 to year 2017, which differ from the definition mentioned before.

Crediting Period – Sawdust 2000 - Project

First year of crediting period	:	Year 2004 (From January year 2004 to January year 2005)
Last year of crediting period	:	Year 2017 (From January year 2016 to the end December year 2017)

The crediting period has been established according agreement between the Romanian Ministry of Water and Environmental Protection and DEPA.

5. Monitoring Plan

The MP for the project has been elaborated as a separate document due to used of the MP by the different operators of the new DH systems in the five towns under the project. The MP addressing this PDD and the related Baseline Study is named:

Sawdust 2000 – Project Implementation – Monitoring Plan – Version 3 – 2003 12 03

The MP for the project is enclosed to this PDD.

The objective of the MP is to provide a practical framework for collection and management of performance data in order to monitor and verify the GHG emission reduction generated by the Joint Implementation. The project comprises establishment of new biomass based DH systems in the five Romanian towns Vlahita, Gheorgheni, Huedin, Vatra Dornei and Intorsura Buzaului.

Verification is defined as periodic auditing by a third party, assessment of the generated GHG reductions and compliance with JI-project criterions.

The MP shall define a standard for the project performance in terms of GHG emission reduction and compliance with relevant Joint Implementation project monitoring criteria stipulated in the Manual for project developers for Joint Implementation and Clean Development Mechanism projects and the Kyoto Protocol. The MP shall after its validation be an integrated part of the contractual agreement for CO_2 trading between the Romanian government and the Danish government.

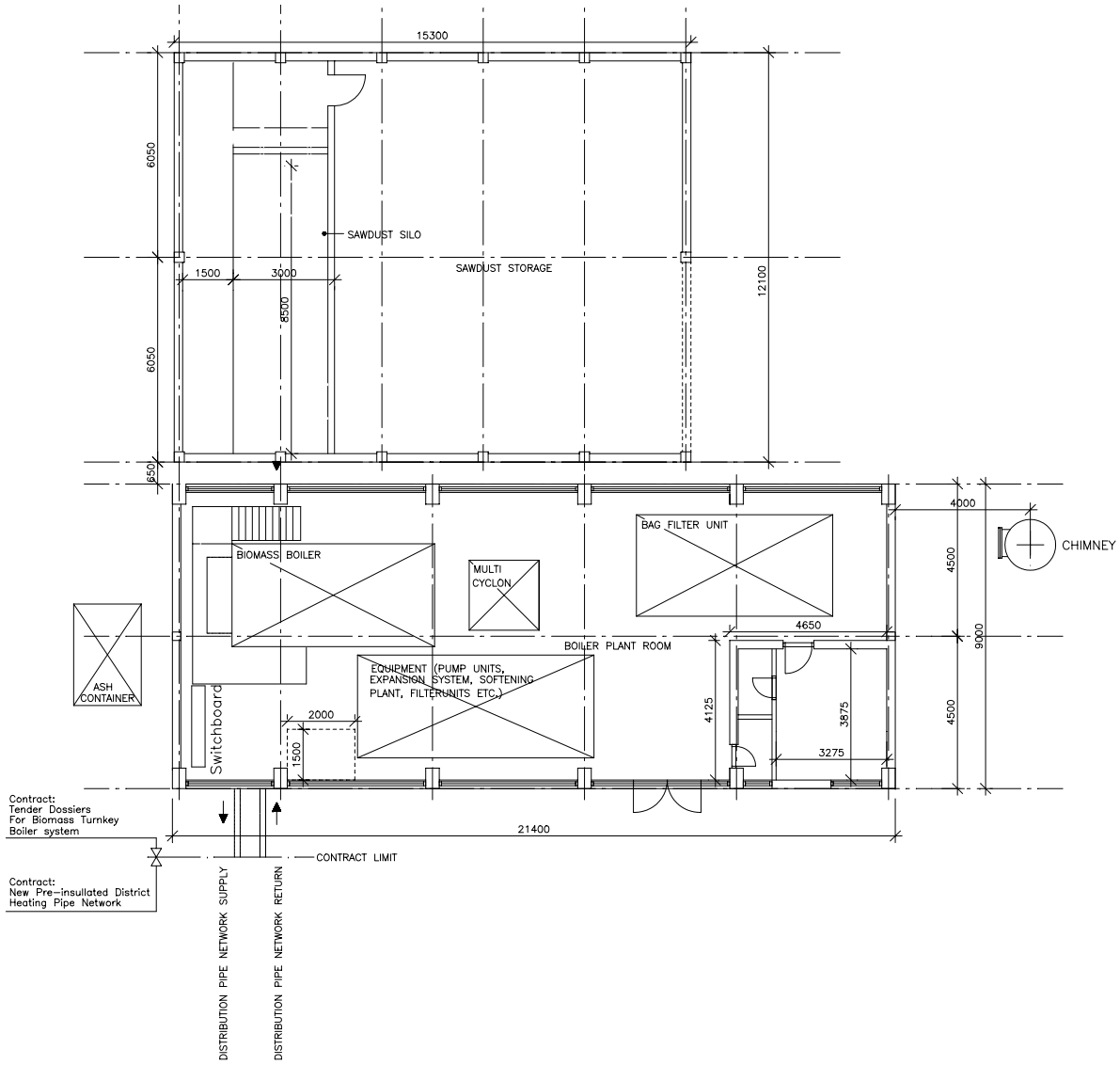
This MP presents guidelines and information about the structure of the JI - project, which may be used by an independent verifier when monitoring and verifying the GHG reductions generated by the project. The proposed data monitoring methodologies and relevant operational issues are guidelines, which allow an independent verifier to develop suitable monitoring and verification procedures.

6. Annexes

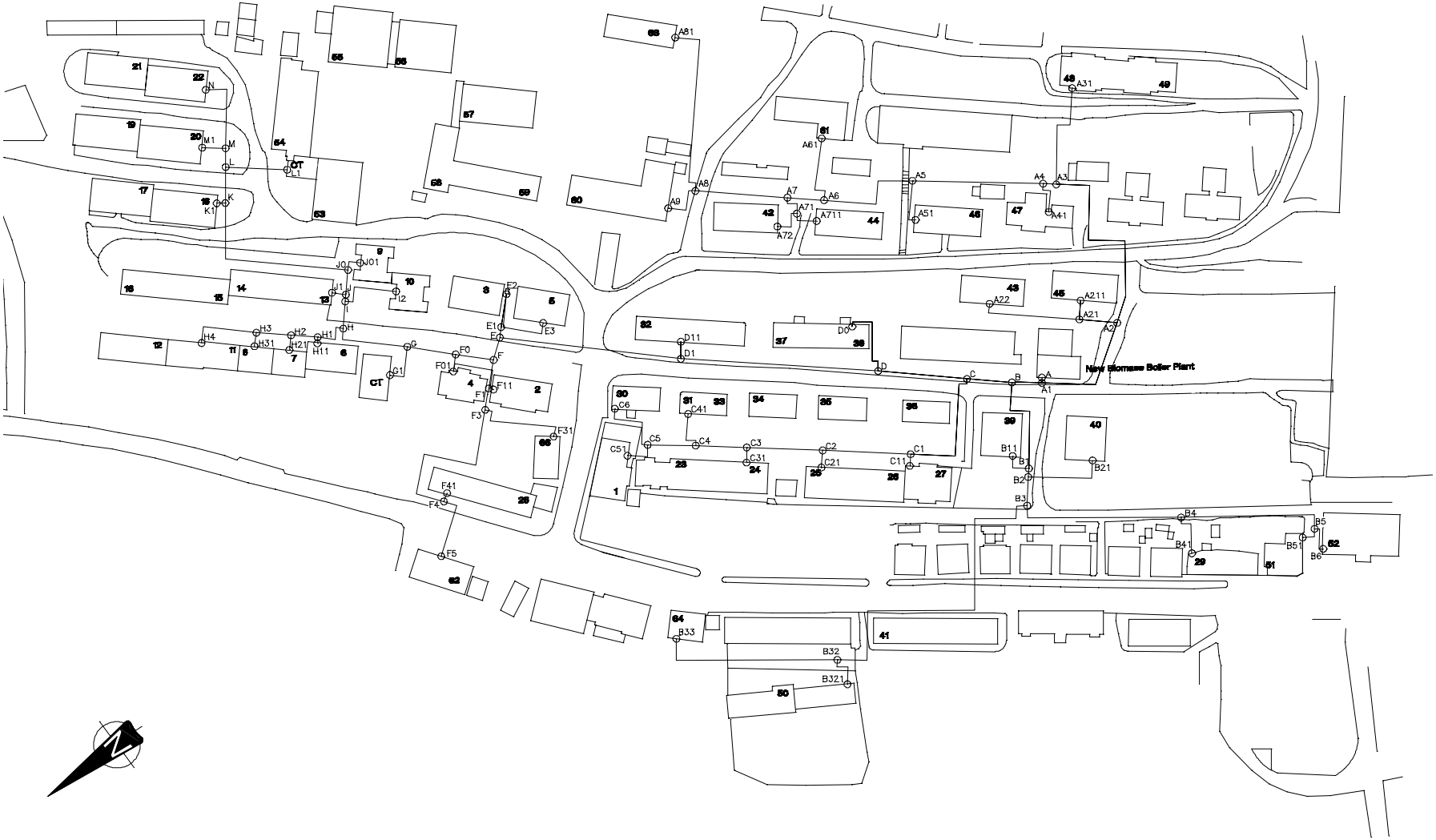
The annexes contain miniature copies of the drawings with the new DH distribution pipe network and for the new boiler plants in the five towns.

6.1 Annex I Drawing distribution pipe network and boiler plant in Vlahita

VLAHITA – BIOMASS BOILER PLANT

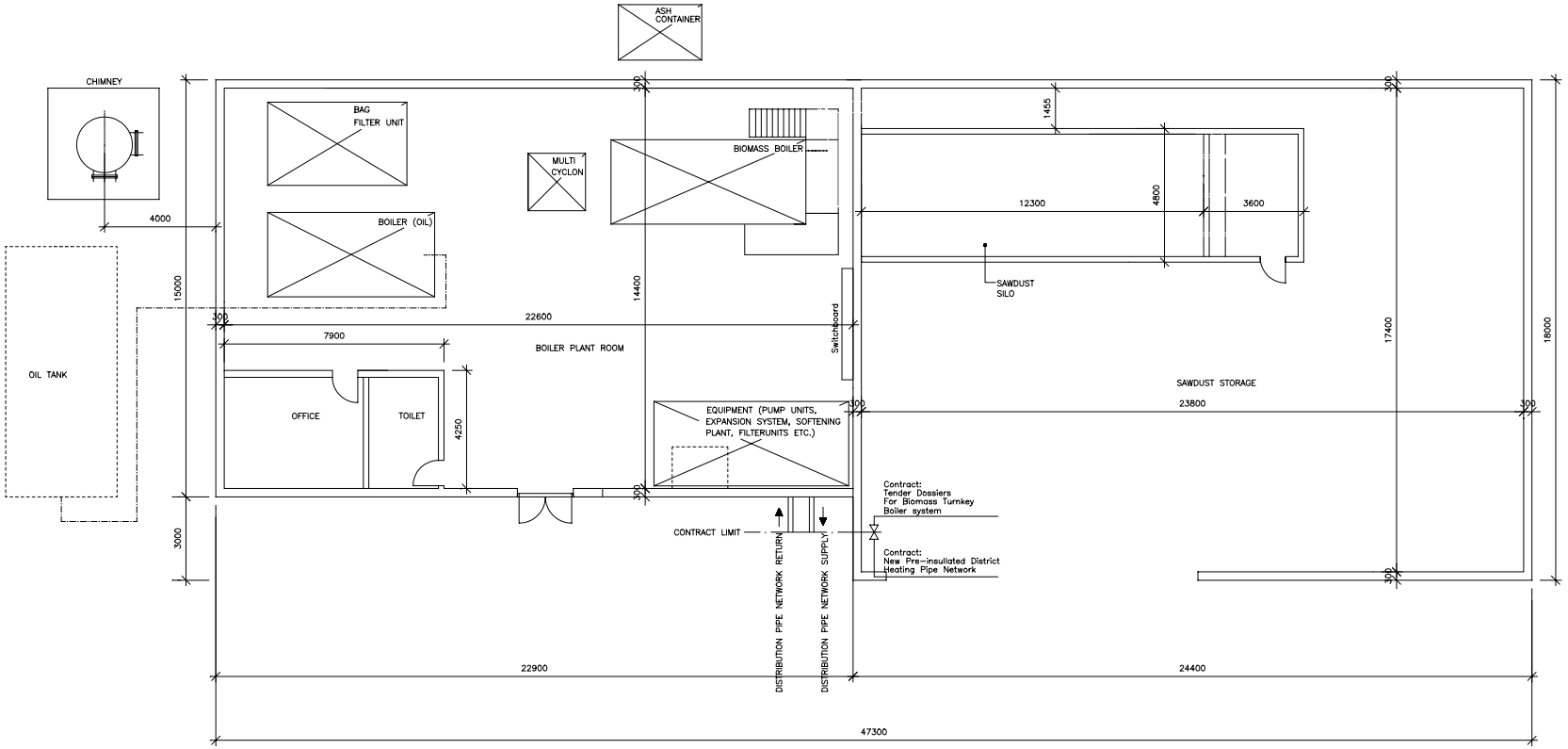


VLAHITA – NEW DISTRIBUTION PIPE NETWORK



6.2 Annex II Drawing distribution pipe network and boiler plant in Gheorgheni

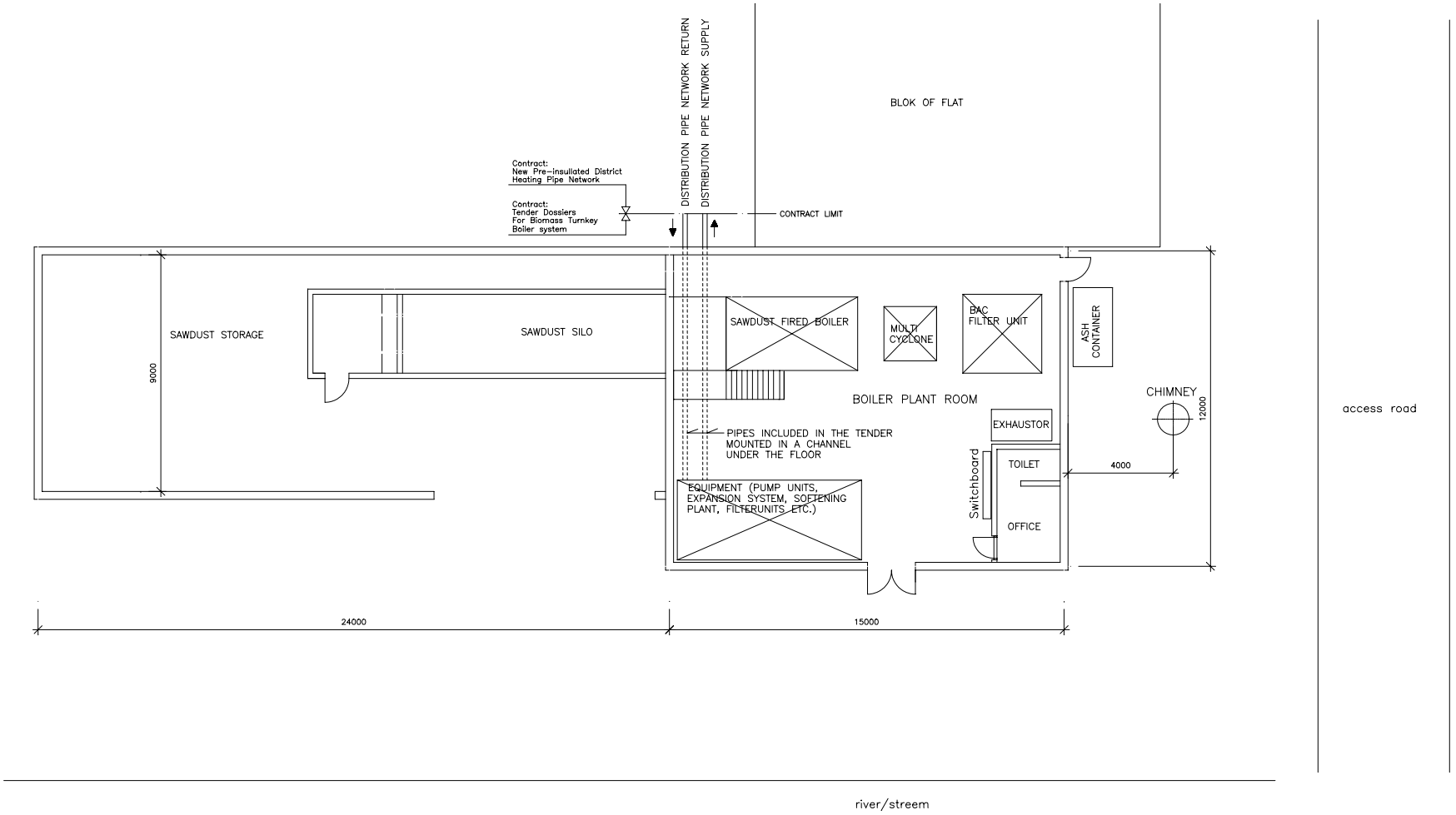
GHEORGHENI – BIOMASS BOILER PLANT



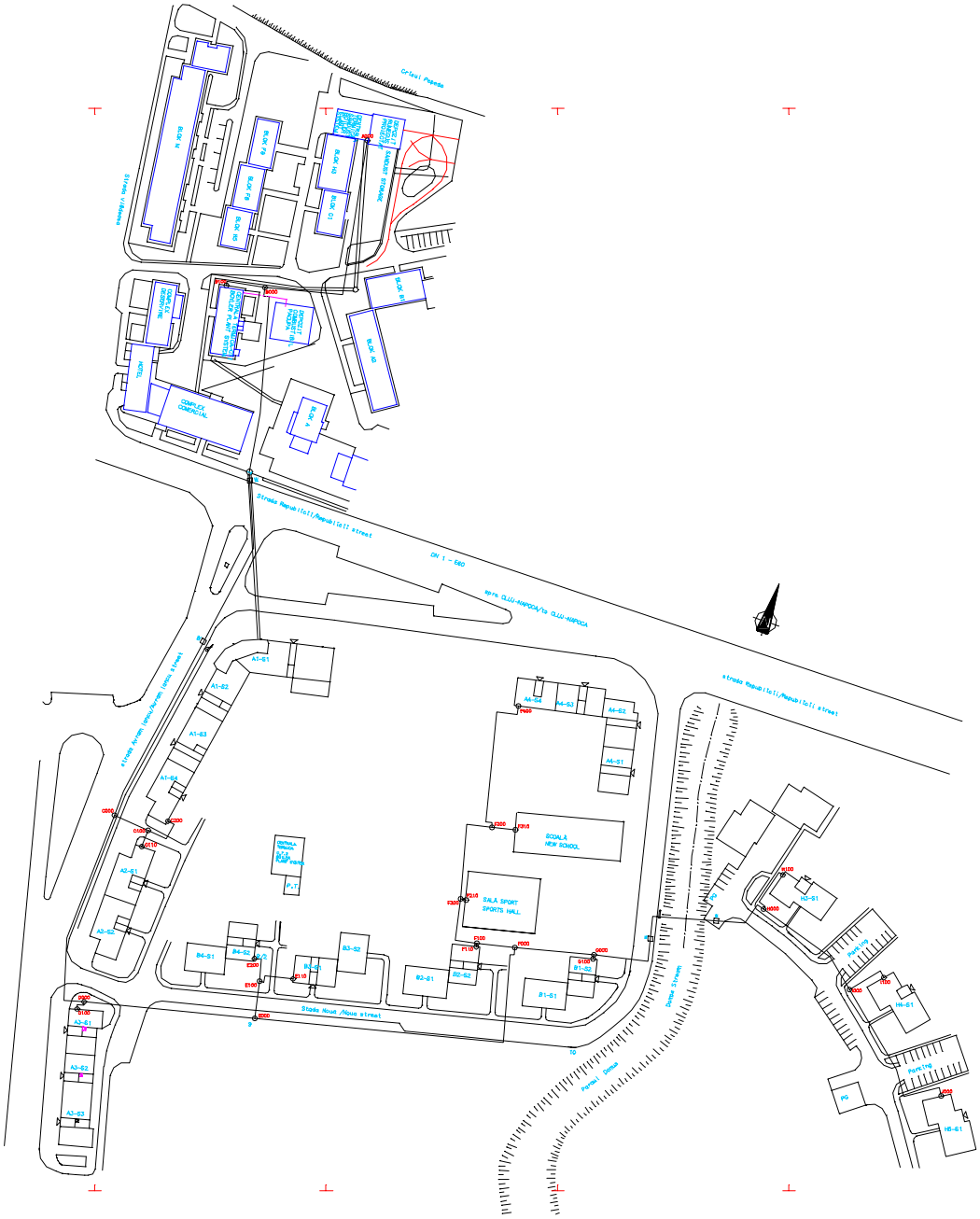
GHEORGHENI – NEW DISTRIBUTION PIPE NETWORK

6.3 Annex III Drawing distribution pipe network and boiler plant in Huedin

HUEDIN – BIOMASS BOILER PLANT

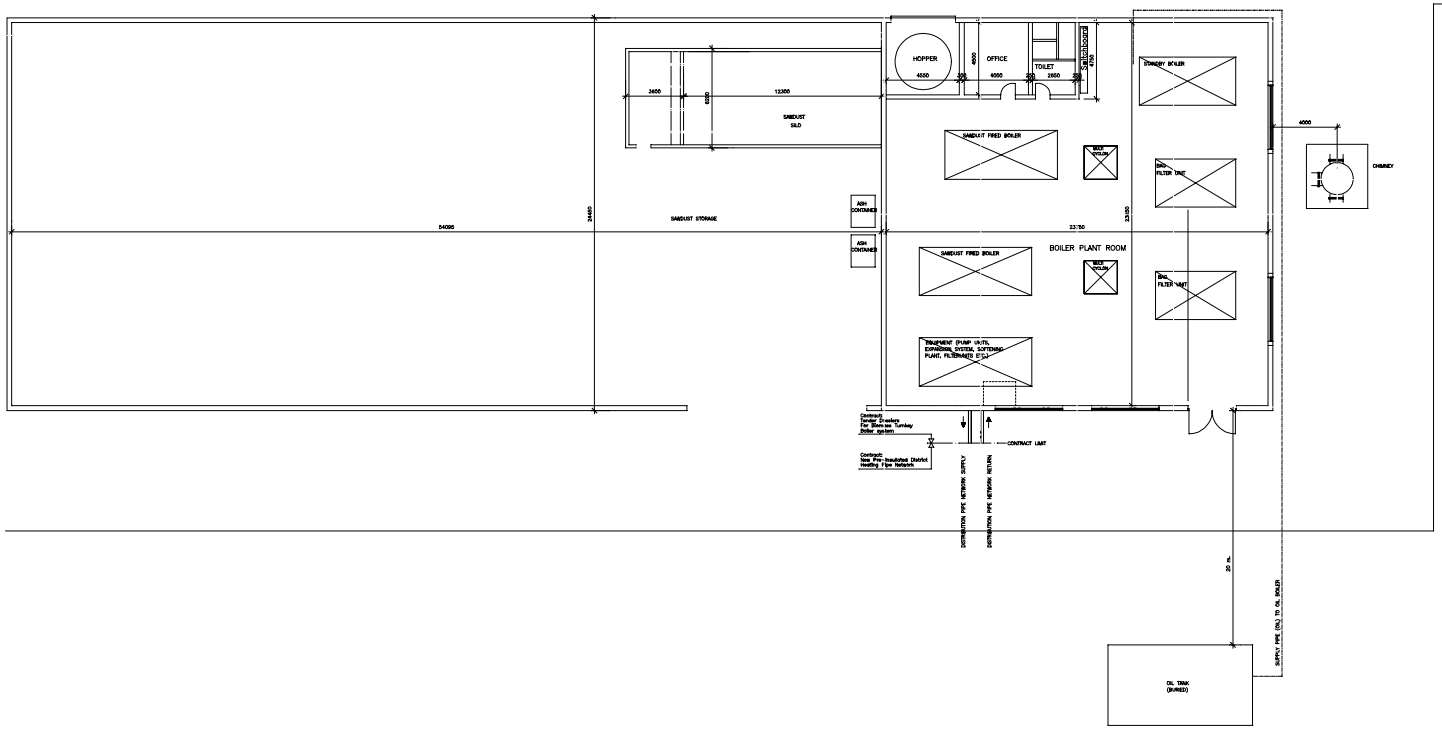


HUEDIN – NEW DISTRIBUTION PIPE NETWORK



6.4 Annex IV Drawing distribution pipe network and boiler plant in Vatra Dornei

VATRA DORNEI – BIOMASS BOILER PLANT



NOTES :

THE SIZE/DIMENSION OF THE PLOT OF LAND AND BUILDING ARE NOT BASED ON SURVEYING.

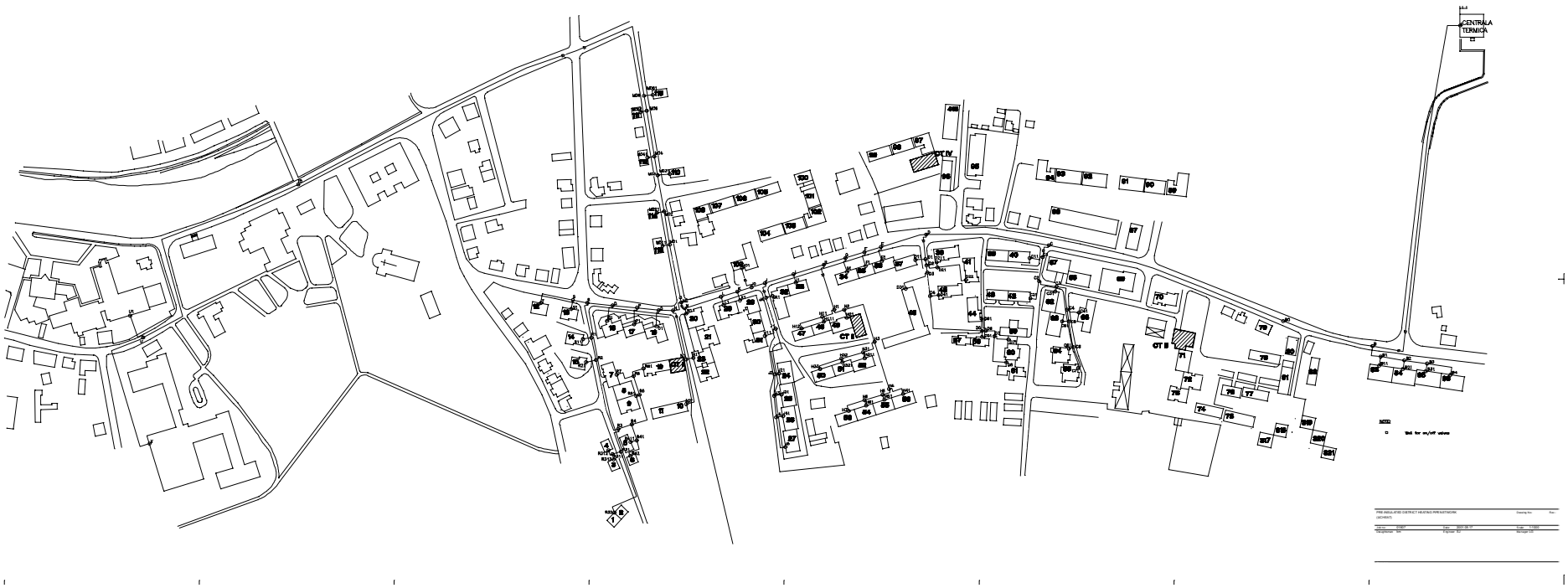
DATE: 2002.06.17

BIOMASS BOILER PLANT — Drawing No. — Rev.

Job no. 01607 — Date 2001.09.17 — Scale 1:100

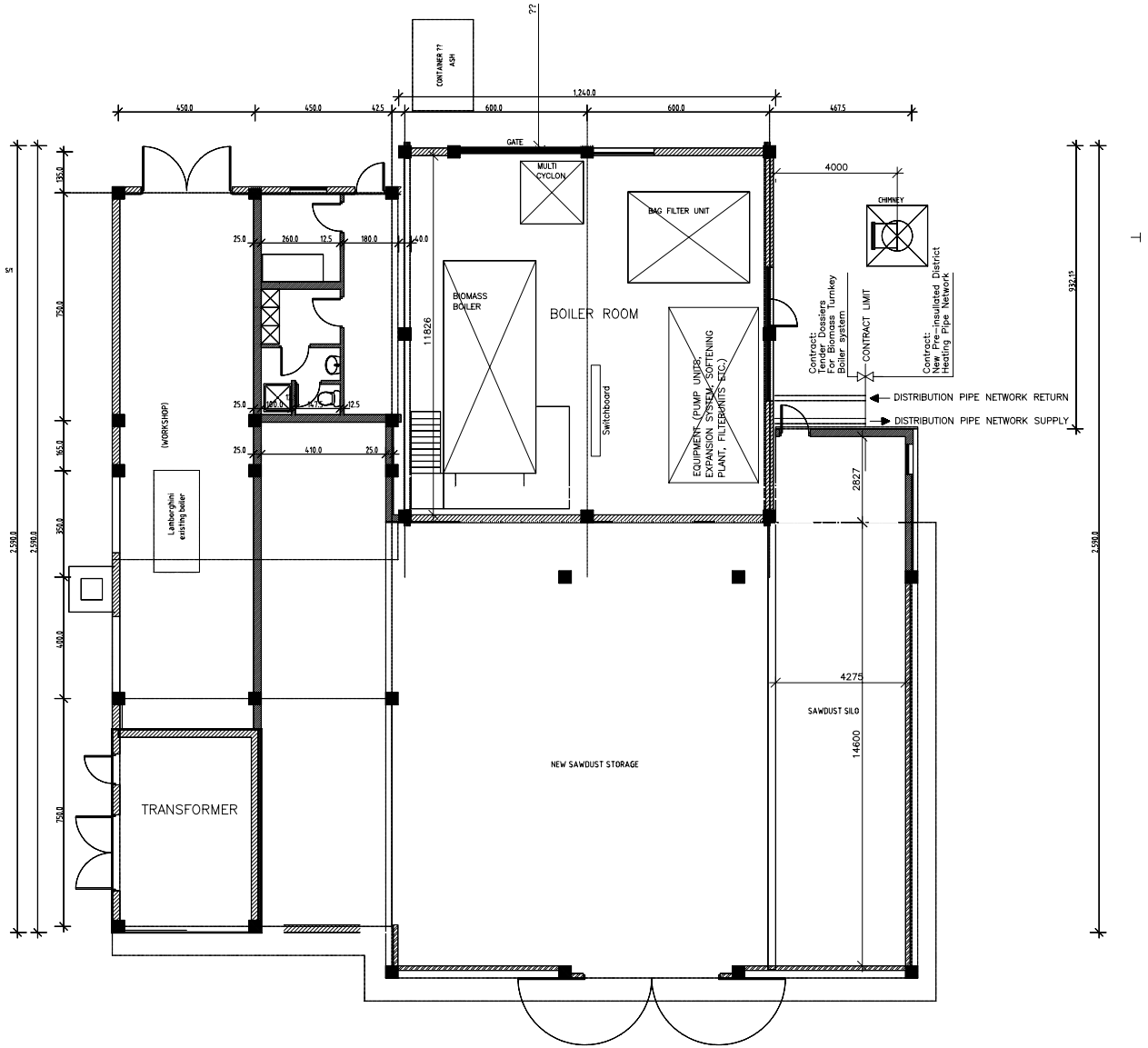
Draughtsman: MH — Engineer: SJ — Manager: LG

VATRA DORNEI – NEW DISTRIBUTION PIPE NETWORK

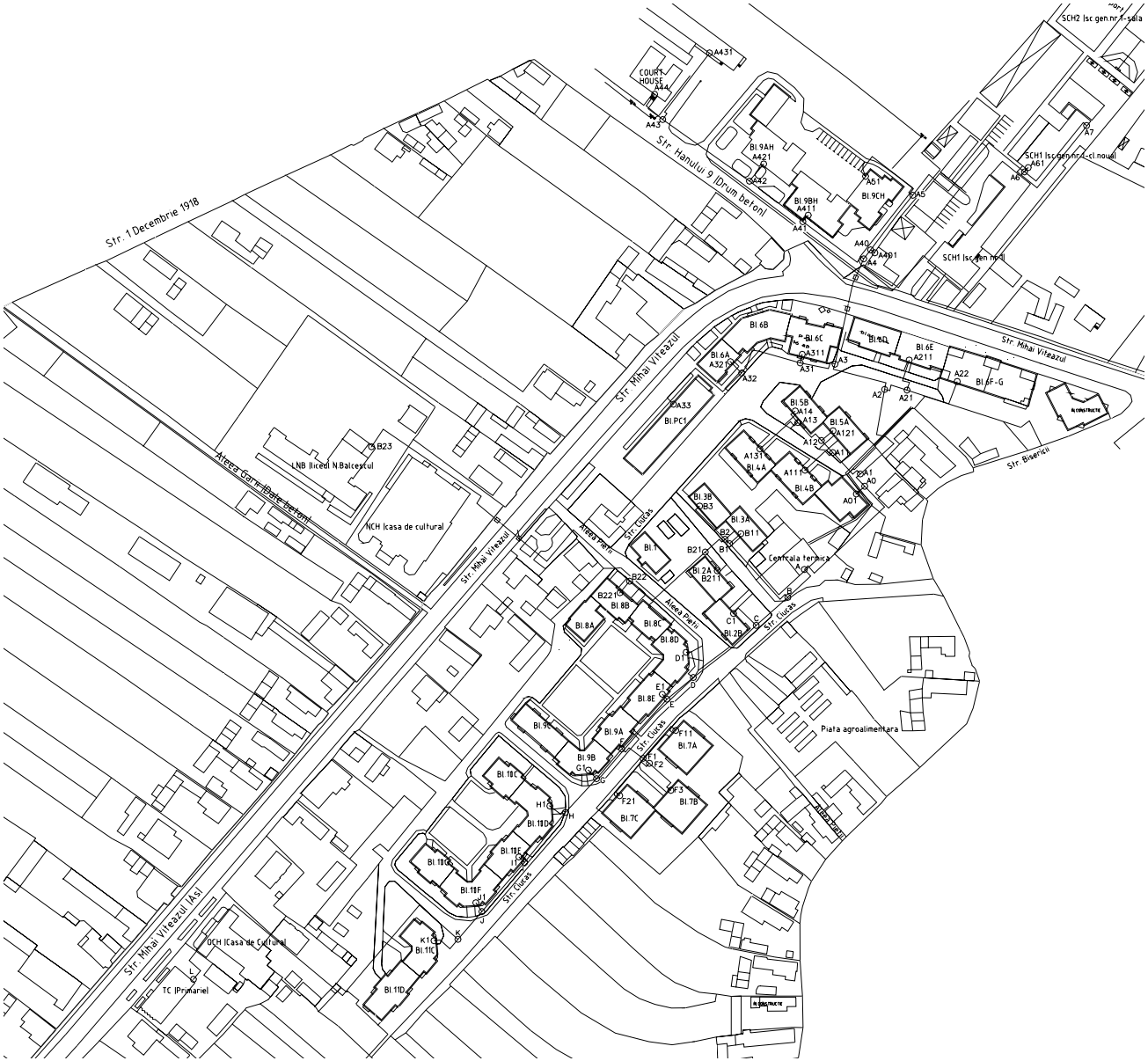


6.5 Annex V Drawing distribution network and boiler plant in Intorsura Buzaului

INTOSURA BUZAULUI – BIOMASS BOILER PLANT



INTORSURA BUZAULUI – NEW DISTRIBUTION PIPE NETWORK



6.6 Annex VI Potential Suppliers of Wood Residues

SAWDUST 2000 - IMPLEMENTATION PROJECT **VLAHITA**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues			Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust	Wood chips	Bark				
	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
S.C. ROMOLD SRL - STR. GÁRBOR ÁRON	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. BRADUL SRL - STR. REPUBLICII	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. VELENCE SRL - STR. REPUBLICII	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. SELTERS SRL - VALEA SELTERSULUI	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. MOLNÁR SRL - INTR. VITUSOK	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. AUTOGÁSPÁR SRL - INTR. CAMPULUI	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. VIRÁGOSKERT SRL - STR. HARGHITEI	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. GATER SRL - STR. TURISTILOR	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
S.C. CONIMPEX SRL - STR. TURISTILOR	Under preparation	Under preparation	Under preparation		yes	fresh	40 - 50
Total							

SAWDUST 2000 - IMPLEMENTATION PROJECT **GHEORGHENI**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues				Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust		Wood chips	Bark				
	m3/year	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
1. SC TINLOV SRL	800,0	640,0	Not included	Not included		Yes	Freesh	40 - 50
2. SC SALAMANDRA SRL	850,0	680,0	Not included	Not included		Yes	Freesh	40 - 50
3. SC TIBSIL SRL	500,0	400,0	Not included	Not included		Yes	Freesh	40 - 50
4. SC SANKAR SRL	100,0	80,0	Not included	Not included		Yes	Freesh	40 - 50
5. SC MONOLIT SRL	1.000,0	800,0	Not included	Not included		Yes	Freesh	40 - 50
6. SC CSIKLIV SRL	52,0	41,6	Not included	Not included		Yes	Freesh	40 - 50
7. SC SANELI SRL	803,0	642,4	Not included	Not included		Yes	Freesh	40 - 50
8. SC SZILIBAU SRL	180,0	144,0	Not included	Not included		Yes	Freesh	40 - 50
9. SC ROMTEX SRL	1.500,0	1.200,0	Not included	Not included		Yes	Freesh	40 - 50
10. SC TIGRAD SYSTEM SRL	1.200,0	960,0	Not included	Not included		Yes	Freesh	40 - 50
11. SC PENTAGON IMPEX SRL	150,0	120,0	Not included	Not included		Yes	Freesh	40 - 50
12. SC EXPOBRAD SRL	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
13. SC FORESTA-PRIM SRL	2.023,0	1.618,4	Not included	Not included		Yes	Freesh	40 - 50
14. SC DARVAS COM SRL	55,0	44,0	Not included	Not included		Yes	Freesh	40 - 50
15. PICIMEX SRL	24,0	19,2	Not included	Not included		Yes	Freesh	40 - 50
16. DELIMIT SRL	22,0	17,6	Not included	Not included		Yes	Freesh	40 - 50
17. B-CS MATCOM SRL	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
18. SIKLODI	40,0	32,0	Not included	Not included		Yes	Freesh	40 - 50
19. HOLMOB SRL	300,0	240,0	Not included	Not included		Yes	Freesh	40 - 50
20. TIMABOB SRL	65,0	52,0	Not included	Not included		Yes	Freesh	40 - 50
21. CSIBI A.	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
22. CSERGO	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
23. POORTIK E.	118,0	94,4	Not included	Not included		Yes	Freesh	40 - 50
24. MOBIPROD SRL	36,0	28,8	Not included	Not included		Yes	Freesh	40 - 50
25. IMP-EXP TIBCOMT SRL	84,0	67,2	Not included	Not included		Yes	Freesh	40 - 50
26. RUSCOM IMPEX SRL.	120,0	96,0	Not included	Not included		Yes	Freesh	40 - 50
27. MIRADA SRL	42,0	33,6	Not included	Not included		Yes	Freesh	40 - 50
28. CASTOR PRO SRL	250,0	200,0	Not included	Not included		Yes	Freesh	40 - 50
29. BUCIN SA	1.450,0	1.160,0	Not included	Not included		Yes	Freesh	40 - 50
30. GREEN WOOD SRL	1.600,0	1.280,0	Not included	Not included		Yes	Freesh	40 - 50
31. AROM EXIMP SRL	650,0	520,0	Not included	Not included		Yes	Freesh	40 - 50
32. BAKOS PROD COM SRL	45,0	36,0	Not included	Not included		Yes	Freesh	40 - 50
33. INDUSTRY TRANSILVAN	250,0	200,0	Not included	Not included		Yes	Freesh	40 - 50
34. LEPLAST SUHARD	320,0	256,0	Not included	Not included		Yes	Freesh	40 - 50
35. RIO BRAVO	42,0	33,6	Not included	Not included		Yes	Freesh	40 - 50
36. TRANSCOM ALEX SRL	24,0	19,2	Not included	Not included		Yes	Freesh	40 - 50
37. SC DONI PRODEX SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
38. AF CSATA EMIL CSABA	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50

SAWDUST 2000 - IMPLEMENTATION PROJECT **GHEORGHENI**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues				Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust		Wood chips	Bark				
	m3/year	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
39. MAXEL SRL	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
40. HAR BRAD SRL	115,0	92,0	Not included	Not included		Yes	Freesh	40 - 50
41. LION MARSAL SRL	65,0	52,0	Not included	Not included		Yes	Freesh	40 - 50
42. ELCOK PROD LEMN SRL	48,0	38,4	Not included	Not included		Yes	Freesh	40 - 50
43. AF BEGE S.	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
44. FACOMPLEX SRL	100,0	80,0	Not included	Not included		Yes	Freesh	40 - 50
45. LEMACOM SRL	120,0	96,0	Not included	Not included		Yes	Freesh	40 - 50
46. HAMOR KL SRL	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
47. SC LUKACS TIHA SRL	50,0	40,0	Not included	Not included		Yes	Freesh	40 - 50
48. AGLECOM MURESULUI SRL	65,0	52,0	Not included	Not included		Yes	Freesh	40 - 50
49. AF HABA V.	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
50. GLORIA SRL	50,0	40,0	Not included	Not included		Yes	Freesh	40 - 50
51. GOSPODARIE COMUNALA	160,0	128,0	Not included	Not included		Yes	Freesh	40 - 50
52. BIEN PLUS SRL	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
53. SA LIBERA	260,0	208,0	Not included	Not included		Yes	Freesh	40 - 50
54. SC BARO LEMN SRL	95,0	76,0	Not included	Not included		Yes	Freesh	40 - 50
55. BARTOF TRANSCOK SRL	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50
56. AI CSATA ISTVAN	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
57. SC LAFTIN COM SRL	42,0	33,6	Not included	Not included		Yes	Freesh	40 - 50
58. PRODCOM ESZTER SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
59. STEFI COM SRL	32,0	25,6	Not included	Not included		Yes	Freesh	40 - 50
60. ROCOMPLEX	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
61. AF. BARTALIS	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
62. COM EDI SRL	24,0	19,2	Not included	Not included		Yes	Freesh	40 - 50
63. REXIN SRL	34,0	27,2	Not included	Not included		Yes	Freesh	40 - 50
64. TROPY COM SRL	68,0	54,4	Not included	Not included		Yes	Freesh	40 - 50
65. PROGRES K SRL	110,0	88,0	Not included	Not included		Yes	Freesh	40 - 50
66. KEREKTYO KL. SRL	120,0	96,0	Not included	Not included		Yes	Freesh	40 - 50
67. WIKK EEND	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
68. PROD SUMULEU MIC SRL	100,0	80,0	Not included	Not included		Yes	Freesh	40 - 50
69. FAULKNER SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
70. GOLD RUM COM SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
71. TRANSFOREM SRL	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
72. MALAJO SRL	55,0	44,0	Not included	Not included		Yes	Freesh	40 - 50
73. TATRA SRL	60,0	48,0	Not included	Not included		Yes	Freesh	40 - 50
74. APEXTER SRL	80,0	64,0	Not included	Not included		Yes	Freesh	40 - 50
75. MAD COM LEMN SRL	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
76. ALERTA COM SRL	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50

SAWDUST 2000 - IMPLEMENTATION PROJECT **GHEORGHENI**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues				Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust		Wood chips	Bark				
	m3/year	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
77. MURES PROD SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
78. MAD IMPEX SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
79. SC KANTOR SRL	42,0	33,6	Not included	Not included		Yes	Freesh	40 - 50
80. MARIBAND COM SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
81. AF CSATA I.	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
82. NORI LOR SRL	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50
83. APICOM SRL	1.450,0	1.160,0	Not included	Not included		Yes	Freesh	40 - 50
84. REGE L. SRL	60,0	48,0	Not included	Not included		Yes	Freesh	40 - 50
85. AGM EMIL SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
86. BARDECOM SRL	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50
87. ENIBON SRL	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
88. LEMN TRANS SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
89. BILFOR IMPEX SRL	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
90. BARTICOM IMPEX SRL	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
91. PROD LEMN COM NORA SRL	160,0	128,0	Not included	Not included		Yes	Freesh	40 - 50
92. COLFOR IMPEX SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
93. AF MOLNAR	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
94. SC HUROM BUDA SRL	250,0	200,0	Not included	Not included		Yes	Freesh	40 - 50
95. AF. ORBAN I.	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
96. SC TIPGO SRL	150,0	120,0	Not included	Not included		Yes	Freesh	40 - 50
97. AI KIRALY GERGELY	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
98. AF KOOLO ARPAD	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
99. AF BEGE ARPAD	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50
100. AF KOLLO VENCEL	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
101. AF SALI FOREST	80,0	64,0	Not included	Not included		Yes	Freesh	40 - 50
102. AF DOMOKOS ARPAD	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
103. SC IMICOM SRL	50,0	40,0	Not included	Not included		Yes	Freesh	40 - 50
104. SC MABOR SRL	55,0	44,0	Not included	Not included		Yes	Freesh	40 - 50
105. FUTURA PRODEX SRL	100,0	80,0	Not included	Not included		Yes	Freesh	40 - 50
106. HUNGHIROM SRL	550,0	440,0	Not included	Not included		Yes	Freesh	40 - 50
107. KERY TRANS SRL	50,0	40,0	Not included	Not included		Yes	Freesh	40 - 50
108. ALPINFACT	120,0	96,0	Not included	Not included		Yes	Freesh	40 - 50
109. ZOLA SRL	345,0	276,0	Not included	Not included		Yes	Freesh	40 - 50
110. SELSNA SRL	60,0	48,0	Not included	Not included		Yes	Freesh	40 - 50
111. MORLEMN SEACA SRL	55,0	44,0	Not included	Not included		Yes	Freesh	40 - 50
112. TIBCOMT SRL	80,0	64,0	Not included	Not included		Yes	Freesh	40 - 50
113. BOTCOMP SRL	75,0	60,0	Not included	Not included		Yes	Freesh	40 - 50
114. AI NAGY DEZSO	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50

SAWDUST 2000 - IMPLEMENTATION PROJECT **GHEORGHENI**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues				Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust		Wood chips	Bark				
	m3/year	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
115. AI NAGY ATTILA	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
116. AF VAD IOAN	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
117. AF KISS ALBERT	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50
118. AF BALAZS KAROLY	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
119. AI KISS LADISLAU	40,0	32,0	Not included	Not included		Yes	Freesh	40 - 50
120. AI SZEKERES DAVID	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
121. AI MAGYARI FERENC	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
122. AI MAGYARI MARTON	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
123. AI BARICZ EMIL	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
124. AI BEGE VILHELM	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
125. AF BICSAK KALMAN	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
126. AI NAGY DENES	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
127. AI BENEDEK ALEXANDRU	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50
128. AI BARICZ LASZLO	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
129. AI VARGYAS LAJOS	10,0	8,0	Not included	Not included		Yes	Freesh	40 - 50
130. AI KISS LASZLO	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
131. AI MADARASZ TIBOR	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
132. AI BARICZ PAVEL	30,0	24,0	Not included	Not included		Yes	Freesh	40 - 50
133. TRANS SILVER HOLLAND	110,0	88,0	Not included	Not included		Yes	Freesh	40 - 50
134. LIBAN IMP-EXP. SRL	100,0	80,0	Not included	Not included		Yes	Freesh	40 - 50
135. PROD LEMN GERGELY SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
136. MOLID SRL	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
137. BRAD SUSENI SRL	50,0	40,0	Not included	Not included		Yes	Freesh	40 - 50
138. AGLECON SRL	120,0	96,0	Not included	Not included		Yes	Freesh	40 - 50
139. COMLEMN TISZAS SRL	65,0	52,0	Not included	Not included		Yes	Freesh	40 - 50
140. SOC. AGR. AGROPREST	80,0	64,0	Not included	Not included		Yes	Freesh	40 - 50
141. TID SRL	55,0	44,0	Not included	Not included		Yes	Freesh	40 - 50
142. LONG SRL	60,0	48,0	Not included	Not included		Yes	Freesh	40 - 50
143. LEMN METAL SRL	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
144. FORCOM GAZDI SRL	65,0	52,0	Not included	Not included		Yes	Freesh	40 - 50
145. ALBERT IMPEX SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
146. SIMACOM SRL	90,0	72,0	Not included	Not included		Yes	Freesh	40 - 50
147. PRODVAL IMPEX SRL	95,0	76,0	Not included	Not included		Yes	Freesh	40 - 50
148. LEGAL PRODLEMN SRL	75,0	60,0	Not included	Not included		Yes	Freesh	40 - 50
149. BUZAS IMPEX SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
150. WILLEX SRL	120,0	96,0	Not included	Not included		Yes	Freesh	40 - 50
151. KOVACS IMPEX SRL	50,0	40,0	Not included	Not included		Yes	Freesh	40 - 50
152. GAL FOREST SRL	60,0	48,0	Not included	Not included		Yes	Freesh	40 - 50

SAWDUST 2000 - IMPLEMENTATION PROJECT **GHEORGHENI**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues				Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust		Wood chips	Bark				
	m3/year	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
153. ZOLI COM SRL	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
154. ROLLING IMPEX SRL	85,0	68,0	Not included	Not included		Yes	Freesh	40 - 50
155. NAMOBI SRL	65,0	52,0	Not included	Not included		Yes	Freesh	40 - 50
156. BARNA SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
157. SILFOREST SRL	85,0	68,0	Not included	Not included		Yes	Freesh	40 - 50
158. AI BANYASZ	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
159. AI LAZAR	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
160. AI GAGYI	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
161. AI LAZAR IMRE	20,0	16,0	Not included	Not included		Yes	Freesh	40 - 50
162. AI GYULAI	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
163. AI GERGELY	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
164. TAMPLARIA SZARMANY SRL	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
165. TISA IMPEX SRL	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
166. AGORA MIXT SRL	65,0	52,0	Not included	Not included		Yes	Freesh	40 - 50
167. AF SZABO BALINT	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
168. AF PUSKAS ARPAD	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
169. LEMN TRANS SRL	35,0	28,0	Not included	Not included		Yes	Freesh	40 - 50
170. AF KOVACS BELA ANDRAS	15,0	12,0	Not included	Not included		Yes	Freesh	40 - 50
171. AF OLAH IGNAC	100,0	80,0	Not included	Not included		Yes	Freesh	40 - 50
172. AF OLAH IGNAC	25,0	20,0	Not included	Not included		Yes	Freesh	40 - 50
Total	23.705,0	18.964,0						

SAWDUST 2000 - IMPLEMENTATION PROJECT **HUEDIN**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues			Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust	Wood chips	Bark				
	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
S.C. TRANS AURONATU S.R.L.	350,0	-		15,0	Yes	Freesh	40 - 50
S.C. HERCULES PROD IMPEX S.R.L.	600,0	-		25,0	Yes	Freesh	40 - 50
OCOLUL SILVIC HUEDIN - FRUCTE DE PADURE	200,0	-		3,0	Yes	Freesh	40 - 50
S.C. CARIERELE POIENI	350,0	-		19,0	Yes	Freesh	40 - 50
S.C. SALAJANA S.R.L.	350,0	-		2,0	Yes	Freesh	40 - 50
S.C. MEGATEST S.R.L.	200,0	-		10,0	Yes	Freesh	40 - 50
S.C. DOBRINEX COM S.R.L.	100,0	-		3,0	Yes	Freesh	40 - 50
S.C. CODRII VLASINULUI S.R.L.	380,0	-		30,0	Yes	Freesh	40 - 50
S.C. ELIM PROD SERV CALATELE	400,0	-		12,0	Yes	Freesh	40 - 50
S.C. ECLUZA S.R.L.	250,0	-		25,0	Yes	Freesh	40 - 50
S.C. PLESILVA IMPEX S.R.L.	350,0	-		3,0	Yes	Freesh	40 - 50
S.C. STANCIU FOREST S.R.L.	100,0	-		10,0	Yes	Freesh	40 - 50
S.C. SPERANTA MOTILOR S.R.L.	200,0	-		27,0	Yes	Freesh	40 - 50
S.C. DEALU NEGRU S.R.L.	130,0	-		22,0	Yes	Freesh	40 - 50
S.C. BRAISOR VLADEASA S.R.L.	150,0	-		10,0	Yes	Freesh	40 - 50
S.C. AGASTAU RACHITELE S.R.L.	240,0	-		30,0	Yes	Freesh	40 - 50
S.C. MOND MARC CIUCEA S.R.L.	280,0	-		25,0	Yes	Freesh	40 - 50
Total	4.630,0						

SAWDUST 2000 - IMPLEMENTATION PROJECT **VATRA DORNEI**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues			Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust	Wood chips	Bark				
	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
Dorna Arini Municipality	1072,0	3125,0			yes	fresh	40 - 50
Dorna Candreni Municipality	1376,0	2349,0			yes	fresh	40 - 50
Panaci Municipality	99,0	430,0	19,0		yes	fresh	40 - 50
Iacobeni Municipality	1049,0	3475,0	105,0		yes	fresh	40 - 50
Saru Dornei Municipality	790,0	1190,0			yes	fresh	40 - 50
Brosteni Municipality	300,0	500,0	50,0		yes	fresh	40 - 50
Carlibaba Municipality	6189,0	11260,0	9506,0		yes	fresh	40 - 50
Vatra Dornei Municipality	147,0	365,0	25,0		yes	fresh	40 - 50
Fundu Moldovei Municipality					yes	fresh	40 - 50
Sadova Municipality	36,0	60,0	14,0		yes	fresh	40 - 50
Frumosu Municipality	120,0	450,0	28,0		yes	fresh	40 - 50
Vama Municipality	287,0	438,0	110,0		yes	fresh	40 - 50
Crucea Municipality					yes	fresh	40 - 50
Pojorata Municipality					yes	fresh	40 - 50
Vatra Moldovitei Municipaltiy	10,0	32,0			yes	fresh	40 - 50
Breaza Municipality					yes	fresh	40 - 50
Modovita Municipality	650,0	1025,0			yes	fresh	40 - 50
Campulung Moldovenesc Municipality					yes	fresh	40 - 50
Stulpicani Municipality					yes	fresh	40 - 50
Frasin Municipality	135,0	1450,0			yes	fresh	40 - 50
Manastirea Humorului Municipality					yes	fresh	40 - 50
Paltinoasa Municipality					yes	fresh	40 - 50
Valea Moldovei Municipality					yes	fresh	40 - 50
Ostra Municipality	146,0	1620,0	56,0		yes	fresh	40 - 50
Total	12406,0	27769,0	9913,0				

SAWDUST 2000 - IMPLEMENTATION PROJECT **INTORSURA BUZAULUI**
SAWDUST RESOURCES

NAME OF SAWDUST SUPPLIER (SAWMILL, WOOD COMPANY ETC.)	Annual Production of Wood Residues			Distance (one way) Sawmill - Boiler Plant	Will the sawmill able to supply wood residues all year	Ouality of wood residue	Water content of wood residue
	Sawdust	Wood chips	Bark				
	Tons/year	Tons/year	Tons/year	km	Yes/No.	Freesh/old	%
S.C. TRACON							
S.C. JWC ROMWOOD	1.500,0	650,0		2,7	yes	fresh	40 - 50
S.C. FAGET					yes	fresh	40 - 50
S.C. PIT					yes	fresh	40 - 50
S.C. GATFOREST	2.000,0	2.000,0		7,0	yes	fresh	40 - 50
S.C. EMI	100,0	20,0		5,0	yes	fresh	40 - 50
S.C. URSUL	1.100,0	1.000,0		13,0	yes	fresh	40 - 50
S.C. EUROMAGIC	650,0	650,0		6,0	yes	fresh	40 - 50
S.C. RIAD	520,0	400,0			yes	fresh	40 - 50
S.C. PRODLEMN COSMIN	650,0	650,0		1,2	yes	fresh	40 - 50
S.C. NEMACO	1.500,0	600,0		14,0	yes	fresh	40 - 50
VILLAGE SITA BUZAULUI (3000-4000 qm/year)	1.200,0				yes	fresh	40 - 50
VILLAGE VAMA BUZAULUI (5000 qm/year)	1.500,0				yes	fresh	40 - 50
Total	10.720,0	5.970,0					

6.7 Annex VII Environmental Permits

VLAHITA – HARGHITA COUNTY

MINISTRY OF WATER AND ENVIRONMENTAL PROTECTION
ENVIRONMENTAL PROTECTION INSPECTORATE MIERCUREA CIUC
NO 3877/ 17.03.2003

ENVIRONMENTAL APPROVAL
NO 262 / 29. May 2000
Renewed on the 17th March 2003

Following the application forwarded by *Vlahita Municipality* located in Harghita County, Vlahita town, 20 Turnatorilor street, recorded with the no. 716 / 22.05 2000 supplemented with no. 3877/17.03.2003:

As a result of the analysis of the forwarded documentation and of the inspection on site performed by eng. Bernadt Zelma, accordinf to the final decision of EPI Miercurea Ciuc, taking into account the opinion of the inter-disciplinary technical analysis Committee in 23 .05.2000, based on the Governmental Decision no 104/1999, regarding the organization and the functioning of the Ministry of Waters and Environmental Protection, and on the Environmental Protection Law no 137/1995, republished, with the subsequent adjustments and completions included in the Emergency Governmental Ordinance no. 91/ 2002 it is issued :

ENVIRONMENTAL APPROVAL

for sawdust utilization for heat production in Vlahita, Harghita County

with **the following provisions**:

- the implementation of the new boiler plant with a capacity of 6 MW, using as fuel the sawdust with 50 % humidity = 7156 tons/year (21,468 m^3 /year) in order to produce hot water , 90 °C, 4-6 bar pressure. The boiler plant will be installed in the existing building of the former substation located in Vlahita, 7, Teilor Alley.
- The implementation of the sawdust storage, next to the boiler plant building, having a total area S= 190 m^2, with a storage capacity for 3 days of operation, V = 483 m^3, endowed with a feeding device for the screw conveyor which transports the sawdust from the storage to the combustion chamber.
- The implementation of the heat carrier distribution network (forward and return) on pre-insulated steel pipes with the dimensions between DN 25 and DN 250 having a total estimated length L= 2010 m.
- The replacement of the pipes in the basements of the blocks of flats
- The endowment of each building with heat exchangers, designed according to the hot potable water consumption.

The purpose: the supply of the required heat amount: 11,307 Gcal / year, in the blocks of flats and in the public institutions of Vlahita and, at the same time, the sawdust collection

from the wood processing companies located in Vlahita and in an area of 30 km around the town.

At the same time, the project is environmental friendly also due to the fact that comprises the utilization of a renewable energetically resource, neutral from CO_2 emission point of view and which does not produce SO_2 emissions.

With the following conditions:

1.The thermal carrier secured has the following characteristics:
- forward temperature: 90 °C
- return temperature: 50 – 70 °C
- the pressure in the network: 4-6 bar
- the temperature of the hot potable water at the consumers connection : 45 – 50 °C

2. The endowment of the boiler plant with:
- one boiler using as fuel sawdust with 50 % humidity= 2.0 tons / h = 9.6 m^3 /h , with a boiler efficiency of 80 %
- multi-cyclone
- bag filters unit
- flue gases chimney having H=25m and 2 flue gas channels, with Φ = 400 mm
- container and ash transportation system
- water softening plant
- filter for the supplied water
- expansion system
- valves and meters
- fire protection system
- main pumps
- control panel for the automatically operation of the boiler plant
- electrical installations

In order to secure the sawdust supply, a tractor, two wagons and one front end loader are included.

3. The amount of flue gases V tot = 14 361,6 Nm^3 / h, resulted will be emitted through a thermal insulated chimney, having H=25m and 2 flue gas channels, with Φ = 400 mm, endowed with a hole for emission measurements.

4. The necessary amount of potable water for the network filling and for the hygienic and sanitary purposes and also for fire protection, will be supplied from the municipality network by a connection to the existing internal water network of the building.

5. The domestic wastewaters are discharged into Vlahita sewage system.

6. The selective collection of the resulted solid waste:
- the domestic waste – in a container located inside the perimeter
- the ash, 71.56 tons/year, in a container special designed for this purpose
- the waste resulted during the construction and montage activity, in a special place established for this purpose inside the perimeter

VLAHITA – HARGHITA COUNTY

The documentation contains:

- the Municipality of Vlahita application no. 595/2003
- technical description elaborated by SC MODUL SRL MIERCUREA CIUC
- the drawing with the investment location and neighborhoods elaborated by SC MODUL SRL MIERCUREA CIUC.
-

and the following approvals issued by the other authorities:

- Planning Certificate no 95/2001, issued by Vlahita Local Council, regarding the juridical, economical and technical regime of the works
- Certificate no 1000/2000, issued by Vlahita Local Council regarding the plot of land property, which belongs to the public domain, according to the Local Council decision no 66/1995
- Sanitary approval for location and construction no 7425/2000, issued by Harghita Public Health department, regarding the fulfilling of the sanitary norms
- Approval for location and fire protection no 650051/2000, issued by Fire Department OLTUL, Harghita County
- Approval no 355/2000, issued by SC DISTRIGAZ NORD SA
- Favorable approval no 367 / 2000, issued by SC COMUNAL VLAHITA SA
- Favorable approval no 25 / 2000, issued by SD Miercurea Ciuc
- Approval no 83/2000 , issued by Tele- communication Department Miercurea Ciuc
- Announcement in the newspaper for public hearing, in " Adevarul Harghitei"- 12.05.2000 and " Hargita Nepe" – 12.05.2000, regarding the regulation application

This environmental approval is issued with the following conditions:

1. The maximum pollutants concentrations in the waste water discharged, will fulfill the max values established by SC COMUNAL VLAHITA SA, taking into account the provisions of MWEP Orders no 645/1997 and no 756/1997.
2. The max concentrations of the noxes in the flue gases will not exceed the preventive emission limit values established in the MWEP Order no 462/1993, annex no 2, respectively:

- Dust: 100 mg / Nm^3
- CO: 250 mg/Nm^3
- NOx: 500 mg/ Nm^3

For an oxygen content of 6.0 % in the flue gases

It is forbidden to use as fuel the wood waste covered with synthetically products or treated with preserving products.

The emission concentration levels (air quality in the inhabited area) have to fulfill the limit values mentioned in STAS 12574/1987.

3. The emission measuring sections on the chimney will be located according to the methodology in the MWEP Order no 462/1993.
4. The noise level due to the activity, measured 3m far from the closest inhabited building and 1.5 m height from the soil level, according to the provisions of Health ministry Order no 536/1997, will nor exceed the max value of:

Lech = 50 dB(A) between 6.00 am- 22.00 pm
Lech = 40 dB(A) between 22.00 pm- 6.00 am

5. The domestic solid waste will be transported by the beneficiary to the authorized landfill of the locality.

The ash resulted (71.56 tons/year) will be used as natural fertilizer (having a high content of mineral salts) or it will be transported together with the domestic waste, to the authorized landfill of the locality.
The waste resulted from the construction montage activity will be transported to a place established by the Local Council.
The metallic waste resulted from the dismantling of the substation will be sold to the specialized company for the metals recycling (S.C. REMAT HERGHITA SA)

6. It is forbidden to produce damages on the sites outside the investment location, by
   - Domestic waste un-controlled disposal
   - Alteration or destruction in anyway of the vegetation
   - The vehicles parking outside of the location special established in this purpose
7. The façade of the sawdust storage, located on Teilor Alley, will have an appropriate architectural aspect.
8. the operation of the boiler plant will be regulated by environmental permit, which will be issued based of the technical documentation elaborated according to the MWEP Order no 125/1996, annex no 8. The application will be forwarded to EPI Miercurea Ciuc in max 3 months from the commissioning date.
9. The beneficiary has the obligation to organize the self-monitoring system for the emission of air pollutants resulted during the boiler plant operation.

The environmental approval is valid during the period of the implementation of the project but it will be annulled if the investment works for which it was issued will not start within maximum 2 years from the issuing date- 17.03.2005

The non-compliance with the environmental approval provisions leads to the approval suspending or canceling, according to the case.

This environmental approval will be cancelled also in the case when, during the validity period of this document, the approvals issued by other authorities will exceed the validity period.

DIRECTOR,
Eng. Samay Peter

Regulation Department chief,
Eng. Bernadt Zelma

Elaborated,
Eng. Bernadt Zelma

GHEORGHENI – HARGHITA COUNTY

MINISTRY OF WATER AND ENVIRONMENTAL PROTECTION
ENVIRONMENTAL PROTECTION INSPECTORATE MIERCUREA CIUC
NO 3870/17.03.2003

ENVIRONMENTAL APPROVAL
NO 357 / 30. June 2000
Renewed on the 17th March 2003

Following the application forwarded by *Gheorgheni Municipality* located in Harghita County, Gheorgheni town, 27, Libertatii square, recorded with the no. 894 / 23.06 2000, supplemented with no. 3870/ 17.03.2003

As a result of the analysis of the forwarded documentation and of the inspection on site performed by eng. Bernadt Zelma, according to the final decision of EPI Miercurea Ciuc, taking into account the opinion of the inter-disciplinary technical analysis Committee in 27 .06.2000, based on the Governmental Decision no 104/1999, regarding the organization and the functioning of the Ministry of Waters and Environmental Protection, and on the Environmental Protection Law no 137/1995,republished, with the subsequent adjustments and completions included in the Emergency Governmental Ordinance no. 91/ 2002 it is issued :

ENVIRONMENTAL APPROVAL

for sawdust utilization for heat production in Gheorgheni, Harghita County

with **the following provisions**:

- the implementation of the new boiler plant with a capacity of 6.0 MW, using as fuel the sawdust with 50 % humidity = 7244 tons/year (21,731 m^3 /year) in order to produce hot water , 90 °C, 4-6 bar pressure. The boiler plant will be installed in a new building which will be erected on Cimitirului street in Gheorgheni,
- The implementation of the sawdust storage, next to the boiler plant building, having a total area S= 300 m^2, with a storage capacity for 4 days of operation, V = 804 cm, endowed with a feeding device for the screw conveyor which transports the sawdust from the storage to the combustion chamber.
- The implementation of the heat carrier distribution network (forward and return) on pre-insulated steel pipes with the dimensions between DN 25 and DN 250 having a total estimated length L= 1700 m.
- The replacement of the pipes in the basements of the blocks of flats
- The endowment of each building with heat exchangers, designed according to the hot potable water consumption.

GHEORGHENI – HARGHITA COUNTY

The purpose: the supply of the required heat amount: 11,446 Gcal / year, for the buildings listed in the documentation, the sawdust collection from the wood processing companies located in Gheorgheni and in an area of 30 km around the town.

At the same time, the project is environmental friendly also due to the fact that comprises the utilization of a renewable energetically resource, neutral from CO_2 emission point of view and which doesn't produce SO_2 emissions.

With the following conditions:

1.The thermal carrier secured has the following characteristics:
- forward temperature: 90 °C
- return temperature: 50 – 70 °C
- the pressure in the network: 4-6 bar
- the temperature of the hot potable water at the consumers connection : 45 – 50 °C

2. The endowment of the boiler plant with:
- one boiler using as fuel sawdust with 50 % humidity = 3,26 tons / h = 9,78 cm /h , with a boiler efficiency of 80 %
- multi-cyclone
- bag filters unit
- flue gases chimney having H=25m and 2 flue gas channels, with Φ = 400 mm
- container and ash transportation system
- water softening plant
- filter for the supplied water
- expansion system
- valves and meters
- fire protection system
- main pumps
- control panel for the automatically operation of the boiler plant
- electrical installations

In order to secure the sawdust supply, a tractor, two wagons and one front end loader are included.

3. The amount of flue gases V tot = 14 361,6 Nm^3 / h, resulted, will be emitted through a thermal insulated chimney, having H=25m and 2 flue gas channels, with Φ = 400 mm, endowed with a hole for emission measurements.

4. The necessary amount of potable water for the network filling and for the hygienic and sanitary purposes and also for fire protection, will be supplied from the municipality network.

5. The domestic wastewaters are discharged into Gheorgheni sewage system.

6. The selective collection of the resulted solid waste:
- the domestic waste – in a container located inside the perimeter
- the ash, 72,44 tons/year, in a container special designed for this purpose
- the waste resulted during the construction and montage activity, in a special place established for this purpose inside the perimeter

GHEORGHENI – HARGHITA COUNTY

The documentation contains:

- the Municipality of Gheorgheni application no. 1846/2003
- technical description elaborated by SC MODUL SRL MIERCUREA CIUC
- the drawing with the investment location and neighborhoods elaborated by SC MODUL SRL MIERCUREA CIUC

and the following approvals issued by the other authorities:

- Planning Certificate no 87/2003, issued by Gheorgheni Local Council, regarding the juridical, economical and technical regime of the works
- Property Document no 6157 - Gheorgheni, stipulating that the plot of land is Romanian state property
- Sanitary approval for location and construction no 936 /2000, issued by Harghita Public Health department, regarding the fulfilling of the sanitary norms
- Approval for location and fire protection no 650070/2000, issued by Fire Department OLTUL, Harghita County
- Favorable approval no 1644 / 2000, issued by SC GO GHEORGHENI SA
- Location approval no 270 / 2000, issued by FDEE Miercurea Ciuc – CD Gheorgheni (electricity company)
- Approval no 104 /2000, issued by Tele- communication Department Miercurea Ciuc
- Announcement in the newspaper for public hearing, in "Adevarul Harghitei"- 12.06.2000 and " Hargita Nepe" – 12.06.2000, regarding the regulation application
- The bill no 45072/2003 for the payment (tariff)

This environmental approval is issued with the following conditions:

1. The maximum pollutants concentrations in the waste water discharged, will fulfill the max values established by SC GO GHEORGHENI SA, taking into account the provisions of MWEP Orders no 645/1997 and no 756/1997.
2. The max concentrations of the noxes in the flue gases will not exceed the preventive emission limit values established in the MWEP Order no 462/1993, annex no 2, respectively:

- dust: 100 mg / Nm^3
- CO: 250 mg/Nm^3
- NOx: 500 mg/ Nm^3

For an oxygen content of 6.0 % in the flue gases

It is forbidden to use as fuel the wood waste covered with synthetically products or treated with preserving products.

The emission concentration levels (air quality in the inhabited area) have to fulfill the limit values mentioned in STAS 12574/1987.

3. The emission measuring sections on the chimney will be located according to the methodology in the MWEP Order no 462/1993.
4. The noise level due to the activity, measured 3.0 m far from the closest inhabited building and 1.5 m height from the soil level, according to the provisions of Health ministry Order no 536/1997, will nor exceed the max value of:

Lech = 50 dB(A) between 6.00 am - 22.00 pm

Lech = 40 dB(A) between 22.00 pm- 6.00 am

5. The domestic solid waste will be transported by the beneficiary to the authorized landfill of the locality.

The ash resulted (72.44 tons/year) will be used as natural fertilizer (having a high content of mineral salts) or it will be transported together with the domestic waste, to the authorized landfill of the locality.

The waste resulted from the construction montage activity will be transported to a place established by the Local Council.

6. The vegetal topsoil resulted from the excavation works will be used for the green areas arrangements.

7. It is forbidden to produce damages on the sites outside the investment location, by

- Domestic waste un-controlled disposal
- Alteration or destruction in anyway of the vegetation
- The vehicles parking outside of the location special established in this purpose

8. The operation of the boiler plant will be regulated by environmental permit, which will be issued based of the technical documentation elaborated according to the MWEP Order no 125/1996, annex no 8. The application will be forwarded to EPI Miercurea Ciuc in max 3 months from the commissioning date.

9. The beneficiary has the obligation to organize the self-monitoring system for the emission of air pollutants resulted during the boiler plant operation.

The environmental approval is valid during the period of the implementation of the project but it will be annulled if the investment works for which it was issued will not start within maximum 2 years from the issuing date- 17.03.2005

The non-compliance with the environmental approval provisions leads to the approval suspending or canceling, according to the case.

This environmental approval will be cancelled also in the case when, during the validity period of this document, the approvals issued by other authorities will exceed the validity period.

DIRECTOR,
Eng. Samay Peter

Regulation Department chief,
Eng. Bernadt Zelma

Elaborated,
Eng. Bernadt Zelma

HUEDIN – CLUJ COUNTY

MINISTRY OF WATER AND ENVIRONMENTAL PROTECTION
ENVIRONMENTAL PROTECTION INSPECTORATE CLUJ

ENVIRONMENTAL APPROVAL
NO 903 / 04.July.2001

Following the application forwarded by Huedin Municipality located in Cluj County, Huedin town, 2, Horea street, recorded with the no. 4185 / June 2001

As a result of the analysis of the forwarded documentation in the Approval Committee of EPI Cluj and of the inspection on site, based on the Governmental Decision no 17/2001, regarding the organization and the functioning of the Ministry of Waters and environmental Protection, and on the Environmental protection Law no 137/1995, it is issued:

ENVIRONMENTAL APPROVAL

for (works execution, social – economical activity, technology of …..etc) *Sawdust utilization for heat production in Huedin.*
Location*: Huedin, 8, Republicii square*
Which consists in*: the implementation of one sawdust supplied boiler plant by the re-endowment of the CT 1 thermal station and the erection of a sawdust storage in a space in common with the boiler plant building.*
The purpose: *production of heat and hot potable water; the diminishing of the un-controlled sawdust dumps by the utilization of the sawdust for the proposed boiler plant.*
In the following conditions:

- *capacity : 3 MW, designed pressure: 6 bar, temperature : 120 0C*
- *water supply: from the municipal network, through the existing connection; Q=0,12 cm/h*
- *discharge of domestic waste water and rainfalls – into the sewage system, through the existing connection*
- *the water softening for the boiler is performed using an automatically softening installation*
- *the flue gases cleaning system includes:* ***the multi- cyclone ,****including 16-20 small cyclones- for bigger particles separation;* ***bags filter*** *– fine particles separation;* ***the chimney –****on steel with H=18m*

The documentation contains: *Technical Description*
Elaborated by : *SC MEDINSTAL SRL*
And the following preliminary approvals issued by other authorities:

- *Planning Certificate no 44/2000-Huedin City Hall*
- *Approvals : -sanitary no 513/2000 DSP Cluj; - on principle SC CRISUL SA Huedinno 1602 / 2000;-SC CONEL SA no 390 / 2000; - ROMTELECOM SA no 574/2001;- certificate no 3125/ 2000 Huedin City Hall*
- *Announcement in the newspaper for public hearing*

HUEDIN – CLUJ COUNTY

- *The invoice issued by EPI Cluj no 4701955/2000*

This environmental approval is issued with the following conditions:

- *the compliance with the provisions of the : Law no 137/95 ; NTPA 002/97; Ministerial Order no 756/97;Ministerial Order 462/93; STAS 12574 / 87; STAS 10009/87*
- *the self monitoring of the emitted flue gases will be ensured*
- *all the transportation systems for the sawdust, ash and the solid residue resulted from the filters cleaning, will be closed type*

This environmental approval has a validity period of *3 years,* from *July 2001* issuing date, until *July 2004.*

The non-compliance with the environmental approval provisions leads to the approval suspending or canceling, according to the case.

DIRECTOR,
Eng. Marian Proorocu

Regulation department chief,
Eng. S. Sanmarghitan

Elaborated,
Eng Lucia Santa

VATRA DORNEI – SUCEAVA COUNTY

MINISTRY OF WATER AND ENVIRONMENTAL PROTECTION
ENVIRONMENTAL PROTECTION INSPECTORATE SUCEAVA

ENVIRONMENTAL APPROVAL
NO 209/ 29 August 2000

Following the application forwarded by *Vatra Dornei Municipality* located in Suceava County, Vatra Dornei town recorded with the no. 6030 / 02. August 2000.

As a result of the analysis of the forwarded documentation in the Approval Committee of EPI Suceava and of the inspection on site, based on the Governmental Decision no 104/1999, regarding the organization and the functioning of the Ministry of Waters and Environmental Protection, and on the Environmental Protection Law no 137/1995, it is issued:

ENVIRONMENTAL APPROVAL

For *construction and arrangement works for a sawdust and wood waste supplied boiler plant*

Location*: Vatra Dornei*

In the purpose*: production of heat and hot potable water for the dwellings located in the outskirts of Vatra Dornei.*

In the following conditions:

The boiler plant supplied with sawdust and wood waste will be equipped with two boilers of 6 MW, to be supplied with sawdust and one boiler of 6.0 MW to be supplied with liquid fuel type M and it will secure an yearly heat amount of 27,348 Gcal.

The system is functioning completely automatically and it requires a minimum maintenance, being used a technology 100% tested in Denmark and in other Eastern European countries.

The sawdust storage will be arranged in an open space and it will use the automatically transportation system with inclined screw conveyors to a silo located near to the boiler, having the role of buffer storage in order to secure a continuous sawdust supply.

The flue gases cleaning system is in compliance with the Romanian and western European norms and standards, including a multi cyclone and a bag filters unit which operates completely automatically.

The heat transportation network will be made on pre-insulated pipes mounted underground.

Environmental component – soil-

The surface occupied by the boiler plant system building, belonging to Vatra Dornei Municipality, is 486,2 m^2 and the surface occupied by the sawdust storage is 479,4 m^2.

VATRA DORNEI – SUCEAVA COUNTY

The heat transportation network will have a total length of 3000 m.

The yearly heat production will be accomplished by the combustion of 47,308 tons of sawdust / year.

The ash quantity estimated represents 1.0 % from the combusted sawdust, respectively 473.1 tons ash/year, and it will be collected in closed metallic containers, which will be transported to the municipal landfill or it will be used as agricultural fertilizer.

Environmental component – water

The necessary potable water and the water for the boiler plant with closed circuit will be secured by the connection to the existing municipal potable water supply network. The discharge of the wastewater from the toilet and the possible leakages from the installation will be drained into the sewage pipe which transports the waste waters to the Municipal WWTP.

Environmental component – air

The flue gases from the sawdust supplied boiler plant will be emitted into the atmosphere through a chimney having H= 38.0 m. The noxes (NO_x) concentration at the emission will be in compliance with the limits established by the Ministerial Order 462/93 and after the dispersion it will be in compliance with STAS 125745/87.

The documentation contains: Technical Description
Elaborated by: SC EDIL PROIECT SA PIATRA NEAMT
And the following preliminary approvals issued by other authorities:

- Planning Certificate no 119/ 8.08.2000, Sanitary Approval no 11662/ 21.08.2000, Fire Protection approval no. 603508 / 2000, the invoice no. 1278415 / 2000 for the announcement in the newspaper for public hearing, the invoice issued by EPI Suceava no 136 8710/ 2000 (tariff environmental approval).

This environmental approval is issued with the following special conditions: during the construction works, environmental protection measures will be taken and the negative impact on the neighborhoods will be avoided; the excess of vegetal soil resulted from the excavatioon will be used for the rehabilitation of the green areas affected by the works.

This environmental approval has a validity period of 2 years, from 29 August 2000, until 29 August 2002.

The non-compliance with the environmental approval provisions leads to the approval suspending or canceling, according to the case.

DIRECTOR,
Eng. Valeria Ditoiu

Regulation Department chief,
Eng. Carmen Lungu

Elaborated,
Eng Catalin Buimistriuc

VATRA DORNEI – SUCEAVA COUNTY

ENVIRONMENTAL PROTECTION INSPECTORATE SUCEAVA
No. 18396 / 7 December 2002

To Vatra Dornei Municipality

In reply to your official letter recorded at EPI Suceava with the number 12 252 / 6 December 2002, regarding the validity prolongation of the Environmental approval no 209 / 29.08.2000 for *construction and arrangement works for a sawdust and wood waste supplied boiler plant in Vatra Dornei ,* we inform you:

- according to the Environmental Protection Law no 137/1995 , republished, with the modification and completions in the Governmental Ordinance no 91/2002, taking into account that the investment implementation works have been started in the first two years from the date of the Environmental approval issuing, the Environmental approval is valid during the whole period of the project implementation.

Chief Inspector,
Eng. Iluta Cocris

INTORSURA BUZAULUI – COVASNA COUNTY

MINISTRY OF WATER AND ENVIRONMENTAL PROTECTION
ENVIRONMENTAL PROTECTION INSPECTORATE SFINTU GHEORGHE

ENVIRONMENTAL APPROVAL
NO 274 / 19.10.2001

Following the application forwarded by

Municipality of Intorsura Buzaului located in Covasna County, Intorsura Buzaului town, 173, Mihai Viteazu Street, recorded with the no. 4551 / 18.10. 2001, as a result of the analysis of the forwarded documentation and of the inspection on site, based on the Governmental Decision no 17/2001, regarding the organization and the functioning of the Ministry of Waters and environmental Protection, and on the Environmental protection Law no 137/1995, it is issued:

ENVIRONMENTAL APPROVAL

For

„THE TRANSFORMATION OF THE THERMAL STATION INTO SAWDUST FIRED BOILER PLANT"

in Intorsura Buzaului, Ciucas Street

Which consists in:

- the rehabilitation of the existing boiler plant building, which used to burn light liquid fuel and the endowment with a sawdust fired boiler.
- The boiler plant will have a 8.0 MW capacity in order to ensure the yearly demand of heat of 14,800 Gcal, a quantity of 10,000 tons of sawdust and wood waste will be burned
- In order to ensure the continuous operation of the Boiler plant, an automatically feeding system and sawdust storage will be implemented. One front end loader will be used in order to fill the sawdust silo.
- The boiler is endowed with an automatically grate system, the air supply is automatically controlled by the measurement of the oxygen content in the flue gases
- The following auxiliary systems will be included: an air pre-heater, an expansion system, a softening installation, and the main supply pumps.
- For the flue gases purification, a multi cyclone (for the big particles separation) and a bag filter unit (operation with compressed air) will be installed. After purification, the flue gases will be released through a steel chimney with 16 m height and the internal diameter of 400 mm.
- The water supply and the sewage system will be accomplished by connections to the existing networks.
- The waste will be conducted to an internal platform in order to be selected and stored.

INTORSURA BUZAULUI – COVASNA COUNTY

In the purpose: the rehabilitation of the existing district heating system with equipment which will ensure proper efficiency and will use fuel which is available in the area at a very law price.

In the following conditions:

- to comply with the designed parameters included into the technical documentation, any modification will lead to the cancellation of this approval
- the terrain temporary affected by the connection works will be reconstructed as it was initially
- the minimum distances to the inhabited areas will be fulfilled
- the compliance with the maximum allowable concentrations for the emissions, according to the Order no 462 & 1993 regarding air protection

The documentation includes: Technical description elaborated by SC TC3 SRL SF. GHEORGHE

And the following approvals issued by the other authorities:

- Planning Certificate no 2100 / 8.07.2001
- Property Document no 4346/ 1999
- Approval from SC ELECTRICA SA / 10.10.2001
- Approval SC CONFORT SRL No 1434/21.07.2001
- Sanitary approval no 3702/11.10.2001
- Announcement in the newspaper for public hearing

This environmental approval is issued with the following conditions:

-the compliance with the provisions of the : Law no 137/95

Validity period of the environmental approval: 18 months from the issuing date, 19.10.2001 until 19.04.2003.

The non-compliance with the environmental approval provisions leads to the approval suspending or canceling, according to the case.

Chief Inspector,
Eng. Vasilescu Octavian

Chief of the Regulation department,
eng. Jehac Constantin

Elaborated by
Eng. Vladareanu Eva

6.8 Annex VIII Stakeholder Consultation Report

Sawdust 2000 - Project Implementation

Stakeholder Consultation Report

Version 1 – 2003 03 12

GRUE & HORNSTRUP CONSULTING ENGINEERS
Østergade 18 . DK 7500 Holstebro . Denmark . TEL. +45 96 10 13 30 . Fax +45 97 40 45 20 . www.grue-hornstrup.dk

Abbreviation

Annex B countries	Emssion capped industrialised countries and economies in transition listed in Annex B - Kyoto Protocol.
Annex I countries	Industrialised countries and economies in transition listed in Annex I of the UNFCC.
AIJ	Activities Implemented Jointly. In the first UNFCC Conference of Parties (COP 1) in Berlin 1995 a pilot phase for bilateral GHG mitigation projects was created with the name Activities Implemented Jointly. During the AIJ phase experience shall be established, but without allowing carbon credit transfer between countries.
AAU	Assigned Amount Unit is tradable units of the Assigned Amount of an Annex B country as issued pursuant to the rules of article 17 of the Kyoto Protocol, expressed as one metric ton of CO2.
ARCE	Romanian Agency for Energy Conservation
Baseline	A description of the most likely future development in the considered GHG emission or sequestrating system without the JI or CDM project.
BAU	Buisness As Usual. The BAU scenario describes the future development of the existing fossil fuel based district heating sytem if it was continued to be in operation.
Btu (btu)	British Thermal Unit (1 Btu = 1055 Joules)
CDE	Carbon Dioxide Equivalent
CDM	Clean Development Mechanism
CEECs	Central and East European Countries
CER	Certified Emission Reduction
CH_4	Methane
CO_2	Carbon Dioxide
DEPA	Danish Evironmental Protection Agency
DERSA	Danish Emission Reduction System Administration
DH	District Heating
EPI	Enviromental Protection Inspectorate (Romanian facility with 48 county offices)
ERU	Emission Reduction Unit describes the technical term for GHG emission reduction output of JI - Project according to the Kyoto Protocol.
EU-NARD	National Agency for Regional Development - European Union
EUR	Euro (currency European Union)
Gcal	Giga-calorie (1.0 Gcal = 4.187 GJ)
GES	Gross Energy Supply (total energy demand of DH system including losses boiler system, distribution pipe network, under buildings and in buildings).
GHG	Greenhouse Gasses
GWP	Global Warming Potential
Host Contry	Country in which the JI or CDM project is implemented
IPCC	Intergovernmetal Panel on Climate Change
JI	Joint implementation Porject according to Article 6 - Kyoto Protocol.
kWh	Kilowatt hour (1.0 KWh = 3,600,000 Joule)
Leakage	The net change of anthropogeni GHG emission which occur outside the project boundary.
MDP	Romanian Ministry of Development and Prognosis
MOU	Memorandum of Understanding between countries
MP	Monitoring Plan
MWh	Megawatt hour (1.0 MWh = 3,600,000,000 Joule)
N_2O	Nitrous Oxide
NED	Net Energy Demand (energy demand in buildings, excluding losses in basements).
PCF	Prototype Carbon Fund of the World Bank
PDD	Project Design Document
ROL	Romanian Lei (currency)
RSFESD	Romanian Special Fund for Energy System Development
SINK	A procees, activity or mechanism, which removes anthropogenic GHG from the atmosphere.
STEP	Swiss Thermal Energy Project in Bauzau and Pascani (Romania)
UNFCC	United Nations Framework Convention on Climate Change

Table of Contents

1. Introduction

Consultation of stakeholders have been conducted in compliance with the guidelines of the "Manual for project developers - Joint Implementation and Clean Development Mechanism Projects – version 1 May 2002" publicised by the Danish Energy Authority.

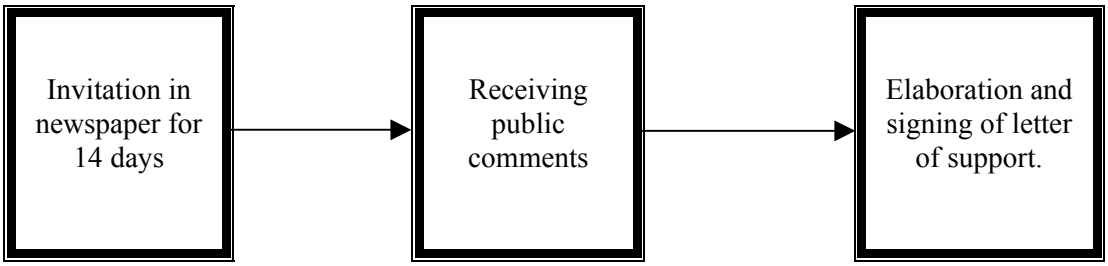
Consultation of stakeholders has been performed in Romania and Denmark to secure that the public in both countries could submit their support or objections to the project. Consultation of stakeholders was performed locally and nationally using newspapers on the inter-net.

Consultation of stakeholders shall secure that local stakeholders have been invited to submit their comments to the proposed JI – project in relation to environmental aspects, social aspects, local development, economical development.

2. Summary of Stakeholders Consultation

The consultation of stakeholders in the five Romanian municipalities has been executed by inviting the local public (NGOs, inhabitants, different organisations etc.) to submit their comments to the project.

Stakeholders Consultation in Romania



Each of the municipalities has issued a letter of support signed by the municipality presenting the comments and support to the project received from the public. Copies of the support letters are presented later in this paragraph.

Consultation in Denmark

In Denmark the project design document, baseline study and monitoring plan was published on the website of the Danish ministry of Environment from the 18 October year 2022 to middle of December year 2002.

2.1 Outcome of stakeholders consultation

Consultation in Romania

Stakeholder consultation has been conducted by announcements in local Romanian newspapers for a time period of minimum two weeks in all towns under the project. Local stakeholders have not submitted any comments or objections against the implementation of the project.

No comments have been received from local stakeholders like NGOs, local environmental authorities, forestry, wood processing industry etc. and in this respect the below table is empty.

Comments No.	Name of stakeholder	Description of comments

Table 1:

Letter of Support for each town has been issues by the respective municipality and signed by municipalities, NGOs etc.

Consultation in Denmark

One comments was submitted (see stakeholder report paragraph 2.7), which presented issues already known by the project team.

2.2 Support Letter – Intorsura Buzaului

ROMANIA

COVASNA COUNTY

INTORSURA BUZAULUI MUNICIPALITY

NO 6318/18.11.2002

To,

Grue & Hornstrup

Related to the implementation of the project "Sawdust 2000", we have the following statement:

The public administration of Intorsura Buzaului municipality, Covasna County, as well as the Local Council and the Municipality received with trust and hope the implementation of this project.

Taking into account that in the family budget of the inhabitants as well as the public administration budget considerable savings will occur, it obvious that we, the inhabitants, will be encouraged.

Taking into account the project dimension and the positive impact, which it will have on the environment and air quality, all the inhabitants fully agree the project implementation.

The public administration, constantly made publicity concerning the project, using the newspapers, radio and discussions with the inhabitants.

Neither the inhabitants, nor the institutions in the town ever expressed any concern about the project, by contrary, the project was sustained by each of the interested person and will also be in the future.

Sincerely Yours,
Mayor of Intorsura Buzaului,
Gheorghe Baciu

Intorsura Buzaului
18 November 2002

No. 31/15.11.2002

LETTER OF SUPPORT

Related to the implementation of the project "Sawdust 2000" we appreciate that it will solve a lot of our town problems.

First of all, the locality will become ecologically due to the fact that all the sawdust produced by the wood processing companies in the area will be used as fuel at the boiler plant and will not be stored in wood stockpiles anymore.

Secondly, a good price per Gcal of approx. 10 USD will be obtained, which means a sensitive saving in the budget of each inhabitant of the residential district.

Connecting the institutions financed by the local budget to the boiler plant (middle school, kindergartens with normal and prolonged program, "Nicolae Balcescu school, the city hall, the house of culture, etc) an important saving of the local budget will be achieved.

We have this opportunity to declare that we are stakeholders of this project and to thank to the financers for helping our town.

President,
Leontina Urda

No. 104/12.11.2002

LETTER OF SUPPORT

Our Association making acquaintance with the implementation of the project " Sawdust 2000", will express our fully support to its implementation, estimating that a lot of the problems our town is facing will be solved in the future.

Being mainly focused to the environment, the project implementation will, first of all make the locality ecologically due to the fact that all the sawdust produced by the wood processing companies in the area will be used as fuel at the boiler plant and will not be spread by dumping of wood residues or in other places anymore. The pollution of the environment will be reduced, as well as the air pollution due to the decreasing of the CO2 emitted in the atmosphere. This will be an opportunity to accomplish the Kyoto Protocol requirements, which has been ratified by Romania.

Secondly, a good price per Gcal of approx. 10 USD will be obtained, which means a sensitive saving in the budget of each inhabitant of the residential district.

Connecting the institutions financed by the local budget to the boiler plant (middle school, kindergartens with normal and prolonged program, "Nicolae Balcescu school, the city hall, the house of culture, etc) an important saving of the local budget will be achieved.

We have this opportunity to declare that we are stakeholders of this project and to thank to the financers for helping our town.

President,
Adrian Badiu

Intorsura Buzaului
12 November 2002

2.3 Support Letter – Huedin Cluj County

ROMANIA

CLUJ COUNTY

HUEDIN MUNICIPALITY

NO 6325/19.11.2002

LETTER OF SUPPORT

Taking into account that there is the possibility that in the autumn of 2003 the sawdust fired boiler plant will be put into operation under the investment "Sawdust utilization for heat production in Huedin", the Local Council, the owners associations and the inhabitants are expressing their satisfaction for the implementation of this type of ecological boiler plant , based on the following reasons:

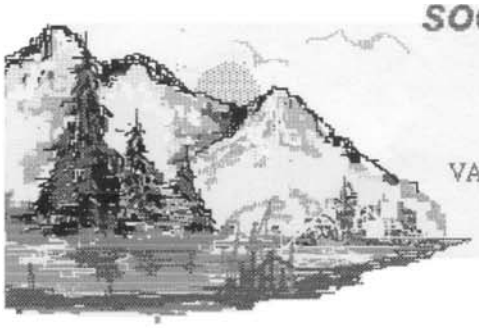
- the decrease of the expenses/ Gcal
- providing a higher standard of life
- the important increase of the local budget by incomes to the local Council representing the payment of the utilities supplied
- savings at the local budget of about 1 billion ROL by using the heat for space heating at the school and the sports hall which will be connected to the new boiler plant

Besides the owners associations , most of the inhabitants are very excited to see this project implemented. Among the local NGOs, the first which expressed the interest for cooperation is the Foundation SKABINSON HUMANITAS in Huedin , 3-5 Avram Iancu Street.

Owner Associations, Foundation SKABINSON HUMANITAS

Mayor,
CHIS NICOLAE

2.4 Support Letter – Vatra Dornei Suceava County



SOCIETATEA FILANTROPICA DE PROTECTIA MEDIULUI

- D O R N A -

VATRA DORNEI, str. MIHAI EMINESCU nr. 8

tel. 030/371216, 375264

CONT B.C.R. nr. 45104172

SCRISOARE DE SUSȚINERE
PENTRU OBIECTIVUL
CENTRALĂ TERMICĂ PE DEŞEURI DIN LEMN
ÎN MUNICIPIUL VATRA DORNEI

Societatea filantropică de protecția mediului "Dorna" - Vatra Dornei, având ca obiect de activitate protecția mediului, reprezentată prin Ec. Malcinschi Viorel, în calitate de preşedinte , am luat act de intenția Primăriei municipiului Vatra Dornei de construire a unei Centrale termice pe deşeuri din lemn.

Având în vedere impactul ecologic şi social al acestui obiectiv, respectiv:

Ecologizarea zonei

Îmbunătățirea parametrilor de protecția mediului ;

Creşterea gradului de confort a populației

Obținerea energiei termice cu preț de cost scăzut

susținem proiectul municipalității şi asigurăm Consiliul Local şi Primarul municipiului Vatra Dornei de întregul nostru sprijin.

Vatra Dornei
30.10.2002

SOCIETATEA ECOLOGISTA DE PROTECTIA MEDIULUI "DORNA" VATRA DORNEI 1

2.5 Support Letter – Vlahita Harghita County

ANNOUNCEMENT

Hereby, Vlahita Municipality announces the following stakeholders of the project " Sawdust utilization in order to produce heat in Vlahita":

- Vlahita County Council
- The inhabitants association no. 1
- The inhabitants association no. 2
- Vlahita Philharmonic Foundation for children
- The foundation "SZENT KERESZT" – Vlahita
- The foundation "GABOR ARON" - Vlahita

Everybody who has an opinion about this investment is asked to make it public within 15 days.

Vlahita Municipality

Vlahita
6.11.2002

ROMANIA

HARGHITA COUNTY

VLAHITA MUNICIPALITY

No. 168/6.11.2002

TO,

VLAHITA COUNTY COUNCIL

The inhabitants association no. 1 in Vlahita, support the implementation of the project " SAWDUST UTILIZATION IN ORDER TO PRODUCE HEAT IN VLAHITA", which contributes to the development of the town infrastructure , to the rehabilitation of the dwellings and public institutions heating system as well as to the environmental improvement due to the uncontrolled sawdust storages disappearance.

INHABITANTS ASSOCIATION NO. 1 IN VLAHITA

ROMANIA

HARGHITA COUNTY

VLAHITA MUNICIPALITY

No. 72/ 7.11.2002

TO,

VLAHITA COUNTY COUNCIL

The inhabitants association no. 1 in Vlahita, support the implementation of the project " SAWDUST UTILIZATION IN ORDER TO PRODUCE HEAT IN VLAHITA", which contributes to the development of the town infrastructure , to the rehabilitation of the dwellings and public institutions heating system as well as to the environmental improvement due to the uncontrolled sawdust storages disappearance.

INHABITANTS ASSOCIATION NO. 2 IN VLAHITA

VLAHITA PHILHARMONIC FOUNDATION FOR CHILDREN

Vlahita , 24, Republicii street, tel. 00 40 266 246 130, 214 361
e-mail: gyerekfili@freemail.hu

TO,

VLAHITA COUNTY COUNCIL

Our non governmental foundation from Vlahita – "Vlahita Philharmonic Foundation for children"- fully support the implementation of the project " SAWDUST UTILIZATION IN ORDER TO PRODUCE HEAT IN VLAHITA", which contributes to the environmental improvement through the uncontrolled sawdust storages disappearance.

Vlahita

7.11.2002

ROMANIA

HARGHITA COUNTY

VLAHITA MUNICIPALITY

"SZENT KERESZT" foundation

TO,

VLAHITA COUNTY COUNCIL

"SZENT KERESZT" foundation in Vlahita fully support the implementation of the project " SAWDUST UTILIZATION IN ORDER TO PRODUCE HEAT IN VLAHITA", which contributes to the environmental improvement through the uncontrolled sawdust storages disappearance and the rehabilitation of the dwellings heating system in Vlahita municipality.

Vlahita

7.11.2002 "SZENT KERESZT" foundation

The foundation of the high school "GABOR ARON"
Vlahita
M. Eminescu street, 2/b

TO,

VLAHITA COUNTY COUNCIL

The foundation of the high school "GABOR ARON" from Vlahita, having the main purpose to sustain the schools and the cultural activities in Vlahita municipality, considering opportune the project " Sawdust Utilization In Order To Produce Heat In Vlahita", sustain the project which contributes to the development of the infrastructure in the town, to the rehabilitation of the heat supply system in the middle and high schools, kindergartens, house of culture, etc as well as to the environment quality improvement which is now affected by the improper sawdust storages.

Vlahita

7.11.2003 President of the Foundation

Mathe Istvan

ROMANIA

HARGHITA COUNTY

VLAHITA MUNICIPALITY

No. 29941/7.11.2002

To,

Grue & Hornstrup

Denmark

Attn : Mr. Soren Jelleso

Within the implementation of the project " SAWDUST UTILIZATION IN ORDER TO PRODUCE HEAT IN VLAHITA", the existing intermediary sawdust storages located in the administrative area of the locality will disappear.

For the moment there are 8 intermediary storages in which an amount of approx. 7300 to of wood waste are disposed.

Mayor of Vlahita,

RUS SANDOR

2.6 Support Letter – Gheorgheni Harghita County

ROMANIA

HARGHITA COUNTY

GHEORGHENI MUNICIPALITY

LETTER OF JUSTIFICATION

Regarding the inhabitants, NGOs and different public institutions support for the implementation of the program " Sawdust 2000" in Gheorgheni municipality

The undersigned of this memorandum consider to be opportune and absolutely necessary to implement this investment for the rehabilitation and modernization of the district heating system under the program "SAWDUST 2000" in Gheorgheni municipality, within the cooperation with the Danish Government, European Union, Romanian Government and Gheorgheni Local Council.

Our support is justified as follows:

1. The environmental protection due to the CO2 reduction by using solid sawdust instead of the liquid fuel.
2. Losses elimination, the actual system being very old (from the 60-70's) and the delivery and production of the heat price reduction.
3. The new system which will be implemented in Gheorgheni will be also used, apart of the inhabitants, by the following public institutions:
   - 4 high schools
   - One middle school
   - the municipal hospital
   - the house for the old people
   - the kindergarten

4. There are no disconnections of the inhabitants from the system

List of signatures

2.7 Comments from Danish Public Hearing

Consulting Engineers and Planners A/S

NIRAS
Sortemosevej 2
DK-3450 Alleroed
Denmark

Telephone +45 4810 4200
Fax +45 4810 4300
E-mail niras@niras.dk

Direct:
Telephone +45 4810 4371
E-mail vni@niras.dk

Reg. No. 37295728 Denmark
F.R.I, FIDIC

18 November 2002

Grue & Hornstrup Rådgivende Ingeniører A/S
Østergade 18
7500 Holstebro

Attn.: Søren Jellesø

CC: Danish Environmental Protection Agency
Att: Morten Pedersen
Miljøstyrelsen • Strandgade 29 • 1401 København K

Comments on Project Document and Baseline Study for the Sawdust 2000 JI Project – DEPA file number 124/033-0079

NIRAS has read the project document and baseline study of the above mentioned possible JI project with interest as it is the first Danish developed JI project in public hearing. NIRAS was the lead partner in developing the "Manual for Project Developers – Joint Implementation and Clean Development Mechanism Projects – version 1 may 2002" which has been used as a guideline for development of the project into a JI-project. The present project is thus also the first project developed according to the Manual and gives an opportunity to collect experience in the actual use of the Manual.

It should be stated that we do not have any comments that should result in changes in the project document and baseline study as we found that our project specific comments are dealt with in the validation report and thus can be assumed to be solved in the final Project Design Document. This is especially the case for the fact that the current Project Design Document does not include evidence that the project has been approved by the Romanian Government and that national and/or regional requirements of Environmental Impact Assessments have been made. No further comments are made on these issues in the current document. We find good evidence in the baseline study that the project is additional and that the claimed ERUs are calculated on a conservative basis.

The invitation to stakeholders for comments on the Sawdust 2000 project is made public on the web-site of the Danish Environmental Protection Agency at 18 October 2002. The documents available on the web-site were:

- The project Design Document
- Baseline Study

- Monitoring Report

According to the Marrakech Accords it is the responsibility of the Independent Entity to make the Project Design Document and Baseline Study publicly available and receive comments. According to the invitation to comments on the Sawdust 2000 project, it is the Environmental Protection Agency that makes the project public on behalf of the project developer where comments are to be sent. A practice has to be elaborated in these matters for future projects.

It is stated that the use of the DEPA web-site for public hearing is due to the fact that the UNFCCC-secretariat has not yet opened up for the use of their facilities for public hearings. In the invitation for comments reference is made to the 30 days for comments as stated in the Marrakech Accords. As it also is stated that the PDD and Baseline – Study will be publicly available through the UNFCCC-secretariat, when their procedures are set up, it is unclear if the current public comment procedure is a part of the formal procedure or additional to what is required in the Marrakech Accords. We highly recommend that a designated web-site will be used for invitation to comments for further JI projects initiated from Denmark until this function can be taken over by the UNFCCC-secretariat.

Yours faithfully,

NIRAS

Vilhjálmur Nielsen