

Annex I**ACTIVITIES IMPLEMENTED JOINTLY
REVISED UNIFORM REPORTING FORMAT (URF 01)****A. Governmental acceptance, approval or endorsement**

- Date of this report: 15/03/2006
- This report is a (*please underline*):
 - First report
 - Interim report (Seventh report. First report was submitted 1997)
 - Final report
- Please indicate here which sections were modified since the last report (*e.g. B.2, E.2.4, F.2*): Report is newly completed on the Revised Uniform Reporting Format.

B. Summary of AIJ project**B.1 Title of project**

Adavere, Renovation of Adavere district heating system

B.2 Participants

Please describe briefly the role(s) of the main participating organization(s) and provide detailed contact information in annex 1:

- The donor country is Sweden, represented by a governmental institution – Swedish Energy Agency (STEM).
- The host country local organisation, which owns or operates the facility, where investment was made was Põltsamaa Municipality owned company AVESOO Ltd. From the 1-st November 2003 the new owner of the Adavere boiler house is Fortum Termest Ltd subsidiary company of Fortum Power and Heat Oy.
- The host country primary institution responsible for the Framework Convention on Climate Change and all other climate related issues is The Ministry of Environment.
- The technical assistance during project implementation and follow-up activities were provided by STEM consultants (ÅF-International).
- Projects performance data collection and reporting activities are carried out by Regional Energy Centres in Estonia.

B.3 Activity summary**B.3.1 General description**

The village Adavere with around 750 inhabitants is located in the centre of Estonia. The distance from Tallinn is 120 kilometers. Adavere is a former agricultural kolkhoz administrative centre, and has a small

district heating system with a heat output of about 2 MW to supply heat mainly to the residential buildings. Today, the collective farm is privatised and several smaller enterprises are established. They are now disconnected from district heating. In 1993 the investment projects became actual and it was caused by high price of heavy fuel oil and bad availability of oil. The World Bank has financed the conversion of the heating plant to bio fuel firing. The converted boiler is in operation from autumn 1995. Another necessary investment project was started by STEM (former NUTEK) in 1994 with the aim to secure the heat delivery, install equipment to control both heat and domestic hot water supply in the buildings as well as introduce commercial delivery terms by metering.

B.3.2 Type of activity

Sector	Activity
Energy	Energy efficiency (renovation of DH pipelines and building substations)

B.3.3 Location (e.g. city, region, state):

Adavere village, Jõgeva County, Estonia

B.3.4 Stage of activity (*Please underline the appropriate option*):

- Pre-feasibility study completed
- Feasibility study completed
- In start-up or construction phase
(e.g. ensuring financing, construction of site, purchase of land, installation of new equipment)

B.3.4 Stage of activity (continued)

- In operation
(e.g. new windmill plant is connected, converted boiler reconnected, etc. and real, measurable and long-term GHG emission reductions or removals by sinks are generated)

B.3.5 Lifetime of AIJ project activity:

- Approval date: 14/09/1994 (Letter of Intent)
(Date at which the AIJ project activity was mutually approved by designated national authorities of **all** Parties involved.)
- Starting date: Autumn 1995 (In operation from)
(Date at which real, measurable and long-term GHG reductions or removals by sinks will begin or began to be generated.)
- Ending date (expected): 31/03/2005 (loan expire date)
(Date at which AIJ project activity is expected to no longer generate GHG reductions or removals by sinks.)
- Ending date (actual): In operation
(Date at which AIJ project no longer generated GHG reductions or removals by sinks or was terminated.)
- Ending of the operational life of the project if different from the ending date of the AIJ project activity: Expected technical lifetime is 15 years which means that the installations

are expected to be in operation till 2011.

- Reasons for the choice of lifetime dates (*Describe briefly (up to half a page)*):

The lifetime criteria have been arranged in different groups depending on type of implemented activities. This classification assumes a level of operation and maintenance, which is normal in western countries.

Heat production plants (bio fuel)

25 years	New installation of all main equipment parts (fuel handling system, firing equipment and boiler) and modernisation of secondary equipment.
15 years	Conversion of existing boiler but new installation fuel handling system and firing equipment. Modernisation of secondary equipment.
10 years	Limited installation of new equipment (only one part of the three main parts, normally the firing equipment). Modernisation of other equipment.

Heat distribution systems and sub-stations

25 years	Pre-fabricated pipes and installations using certified contractors and supervisor according to EN norms and applicable district heating practise
15 years	Pre-fabricated pipes and installations without using certified contractors and supervisor
10 years	Modernisation of existing pipes.

Energy efficiency in buildings

25 years	Additional insulation roofs walls etc. with Scandinavian technology. New installed heating systems.
15 years	Renovation and balancing of heating systems including thermostat valves.
10 years	Weather stripping windows, doors etc.

* if a combination of measures is done a reasonable lifetime for the project have to be calculated.

B.4 Determination of the baseline

B.4.1 Date of completing the baseline determination: 1997 (first report)

B.4.2 Carried out by (name): STEM/ÅF-International
(Please provide detailed contact information in annex 1)

B.4.3 Type of baseline methodology applied and described in detail in section E.1
(Please underline the appropriate option(s))

- Project-specific by:
 - I. Simulating a likely situation that would have existed without the project
 - II. Taking an actual reference case project
 - III. Other (Please specify (insert lines as needed)):
- Multi-project by using (please specify briefly):

B.4.4 Describe the scope of the project boundary (Please summarize briefly the related information provided in section E. 2):

The project is district heating distribution and end-user project. The project activities are heat distribution by network and heat consumption in the 14 residential buildings and this includes emissions from combustion of fossil fuels in the Adavere boiler house concerning these activities. Heat distribution losses and heat consumption in the buildings will be reduced after implementation of the project. The emission reduction from the project is based on the difference in fossil fuels consumption in the boiler houses before and after pipelines and residential buildings substations renovation due to achieved energy saving.

B.4.5 Describe the degree of aggregation of the multi-project baseline (*Please summarize briefly the related information provided in section E. 1*):

C. General compatibility with and supportiveness of national economic development and socio-economic and environment priorities and strategies

Describe briefly, to the extent that information is available (up to one page) and refer to documents, decisions and laws, as appropriate:

The project meets the following objectives in the Act on Sustainable Development, Estonian National Environmental Strategy, Estonian National Environmental Action Plan, the Long-term Development Plan for the Estonian Fuel and Energy Sector, District Heating Act, Electricity Market Act and Energy Saving Programme:

- efficient and sustainable use of energy resources;
- to provide the sufficient and stable fuel and energy supply in conformity with the required quality and with optimal prices for the consistent regional development;
- to provide the political and economical independence of the state by the fuel and energy supply as a strategic branch of economy;
- to increase the share of renewable energy sources in the primary energy supply from present (2000) 10.5% up to 13% - 15% to the year 2010;
- by 2010 indicative target to produce 5.1% of gross consumption of electricity from renewables (including bio fuels);
- to reduce the environmental damage arising from fuel and energy production, transport, conversion and distribution;
- to create the reliable energy conservation system stimulating the implementation of energy conservation measures by consumers;
- creation and usage of energy efficient technologies, fuel/energy consuming and diagnostic equipment;
- stimulation of environmental awareness and environmentally friendly consumption patterns;
- to attract foreign investments for projects which ensure better use natural resources as well as environmental improvement;
- to develop co-operation between Baltic, Nordic and Central European countries

D. Environmental, economic and social and cultural impacts

D.1 Environmental impact (positive and/or negative)

The environmental impact for the project activity is mainly positive. Reduction on mazout consumption will reduce the local pollution of SO₂ and NO_x and the emission of CO₂ as shown below:

- Annual emission reduction:
Projected: Actual 2005

267 tons CO ₂	568 tons CO ₂
4.3 tons SO ₂	9.2 tons SO ₂
0.7 tons NO _x	1.5 tons NO _x

D.2 Economic impact (positive and/or negative)

- Decreased energy consumption
- Energy use can now be charged by measured figures
- The economic impact issues are also including in the following reports:
 - PHARE programme Estonia. Energy Sector: Post Implementation Performance Analysis for Energy Investments, 1998.

D.3 Social and cultural impact (positive and/or negative)

- More stable energy supply
- Possibilities to control heat consumption in the house (no more overheated houses and high energy bills)
- Domestic hot water at a sufficient and stable temperature (+55°C)
- Increased motivation to pay energy bills
- The social and cultural impact issues are also including in the following reports:
 - PHARE programme Estonia. Energy Sector: Post Implementation Performance Analysis for Energy Investments, 1998.

E. Calculation of real, measurable and long-term environmental benefits related to the mitigation of climatic change, that would not have occurred otherwise

E.1 Assumptions and characteristics of the baseline

E.1.1 Assumptions of the baseline (Describe (up to 1 page)):

The project based status quo baseline had been assumed to be static for the project. The key parameters for the used baseline are:

- Baseline fuel – heavy fuel oil (mazout);
- Baseline efficiency of the fossil fuel boilers;
- DH network total efficiency, including supply heat to the consumers;
- Heat distribution losses in the network;
- Heat consumption in the selected buildings before renovation of heat substations (degree-day corrected).

It has been assumed that these parameters used for baseline will not change during whole period. The numerical data are presented in section E.1.4.

For an energy efficiency project (renovation of heat substations) the decrease in emissions reflects the amount of fuel that is saved through the project. In the case that the system uses renewable fuels, the reduction is calculated comparing the amount of fossil fuels that was used before the conversion to renewable fuels.

E.1.2 Describe the baseline (Please describe the baseline as well as leakage effects (up to 1 page)):

The project baseline is status quo baseline (heat distribution by DH network and heat consumption in the buildings heat substations to be renovated and corresponding emissions in the period before implementation of planned activities). The most important factors in calculation baseline emission are the annual efficiency of fossil fuel boilers and DH system total efficiency). Baseline efficiency of the fossil fuel boilers and DH system total efficiency have been derived from available heat production data, boiler house energy balance, technical specifications or expert judgement.

There was not assumed any indirect effects outside project boundary and leakages in the baseline emission calculation.

The project baseline boundary includes Adavere boiler plant emissions from heat distribution by DH network and heat consumption in the buildings included in the project, i.e. emissions from combustion of fossil fuels. Emissions related e.g. to the transport of fuels to the project site are not included.

E.1.3 Reasons for selecting a baseline and its methodology (Describe (up to 1 page)):

The project specific baseline as status quo case has been initially selected to start reporting on AIJ with the future plans to re-evaluate chosen baseline at pre-determined intervals in order to account for developments in the heating sector and indirect effects.

E.1.4 Calculation of values reported in 'Baseline scenario' in table E.5.1 column (A):

CO₂ emissions values are calculated according to the Regulations No. 94 of 16 July 2004 of the Ministry of Environment "The method of determination of the volume of emissions of carbon dioxide". Estonian Regulation is based on the IPCC Guidelines (1996). Carbon Emission Factors (CEF) are used to calculate CO₂ emitted during fuel combustion. There is presented a table in the Regulation to calculate CO₂ emission (M_{CO₂}). Instead of the table calculation it is possible to present a formula for this calculation as follows:

- in the case of heat distribution:

$$(M_{CO_2})_{db} = (Q_{fb} \times K_c \times 3,6 \times 44 \times q_c) / \eta_b \times 12 \times 1000 \text{ tons/year,}$$

were,

- Q_{fb} – boiler(s) heat production (network losses included), MWh/year,
- K_c - fraction of carbon oxidised,
- q_c - carbon emission factor, tC/TJ,
- η_b - annual efficiency of boiler(s), i.e. baseline efficiency of fossil fuel boilers.

- in the case of end-user energy saving:

$$(M_{CO_2})_{eb} = (Q_{eb} \times K_c \times 3,6 \times 44 \times q_c) / \eta_{DHb} \times 12 \times 1000 \text{ tons/year,}$$

were,

- Q_{eb} – heat energy consumption, MWh/year,
- K_c - fraction of carbon oxidised,
- q_c - carbon emission factor, tC/TJ,
- η_{DHb} - annual efficiency of DH system, i.e. baseline efficiency of DH system.

The total CO₂ emission is calculated as:

Total CO₂ emission = CO₂ emission from reduction of distribution losses + CO₂ emission from end-user energy savings.

Documentation box (*Please provide numerical data referred to in this section*):

The following data are used for calculation of the baseline scenario CO₂ emission reductions:

Total heat production of the boiler plant before implementation of project – 6100 MWh/y

Heat consumption of the buildings before renovation of heat substations – 4522 MWh/y

Baseline efficiency of the fossil fuel boilers – 75%

Baseline efficiency of the DH system – 52%

Carbon emission factor for heavy fuel oil – 21,1 tC/TJ

Fraction of carbon oxidised – 0,99

E.2 Assumptions and characteristics of the project scenario

E.3.1 Assumptions for the AIJ project activity and its boundary

The project activities are heat distribution by network and heat consumption in the 14 residential buildings and this includes emissions from combustion of fossil fuels in the Wendre boiler house. The emissions from reduction of heat distribution losses of renovated pipeline are not directly under control of the DH company. Only total network heat losses (reduction of losses) can be estimated. The emissions from end-user energy savings (renovation of heat substations) are depending on behaviour of the consumers and implementation of energy saving measures in the future. These factors are not taking into account in the calculations of the actual reduction of CO₂ emission.

E.3.2 Describe the project scenario

(Please describe the project scenario as well as effects occurring outside the project boundary (up to 1 page)):

The project scenario activity is heat distribution by renovated (partly) network and heat consumption in the renovated residential building. The annual reduction of heat distribution losses in the network is projected to be 150 MWh and end-user energy saving is projected to be 400 MWh. The building energy consumption is depending on the climate conditions and therefore for energy saving calculation the energy consumptions before and after project are corrected with degree-days. Indirect effects are not taken in to account in the emissions calculations. No direct leakage of any significance has been identified.

E.3.3 Please explain why the AIJ project activity would not have taken place anyway

(Describe (up to 1 page)):

As a party to the Climate Convention, Estonia has started to facilitate the transformation toward an ecologically sustainable energy system as subject to the conditions of the Convention. Several factors have been restrained implementation AIJ projects:

- Lack of investment capital for renewable energy sources and energy efficiency projects, allowing financing at reasonable costs as long-term loans at reasonable interest rates;
- Lack of sufficient institutional responsibility for implementation AIJ projects;
- A weak local tradition applying an up to date technology for energy saving. The local technology for the energy efficiency improvement has largely been missing;
- Lack of effective energy use know-how.

During the implementation of the EAES Programme in Estonia these barriers have been over-come by transfer reliable wood fuels firing technology and know-how.

E.3.4 Calculation of values reported in 'Project scenario' in table E.5.1, column (B)

According to the section E.1.4 the following is used to calculate CO₂ emission:

- in the case of heat distribution:

$$(M_{CO_2})_{dp} = (Q_{fp} \times K_c \times 3,6 \times 44 \times q_c) / \eta_b \times 12 \times 1000) \text{ tons/year,}$$

were,

- Q_{fp} – boiler(s) heat production (network losses included), MWh/year,
- K_c - fraction of carbon oxidised,
- q_c - carbon emission factor, tC/TJ,
- η_b - annual efficiency of boiler(s), i.e. baseline efficiency of fossil fuel boilers.

- in the case of end-user energy saving:

$$(M_{CO_2})_{ep} = (Q_{ep} \times K_c \times 3,6 \times 44 \times q_c) / \eta_{DHb} \times 12 \times 1000) \text{ tons/year,}$$

were,

- Q_{ep} – heat energy consumption, MWh/year,
- K_c - fraction of carbon oxidised,
- q_c - carbon emission factor, tC/TJ,
- η_{DHb} - annual efficiency of DH system, i.e. baseline efficiency of DH system.

The total CO₂ emission is calculated as:

Total CO₂ emission = CO₂ emission from reduction of distribution losses + CO₂ emission from end-user energy savings.

Boiler(s) heat production Q_{fp} is calculated as:

$$Q_{fp} = Q_{fb} - Q_{nw} (6100 - 150 = 5950 \text{ MWh}).$$

Documentation box (*Please provide numerical data referred to in this section*):

The following data are used for calculation of the baseline scenario CO₂ emission reductions:

Projected reduction of heat losses in the DH network (Q_{nw}) – 150 MWh/y
 Projected end-user energy saving – 400 MWh/y
 Baseline efficiency of the fossil fuel boilers – 75%
 Baseline efficiency of the DH system – 52%
 Carbon emission factor for heavy fuel oil – 21,1 tC/TJ
 Fraction of carbon oxidised – 0,99

E.3 Revision of the baseline for the project

E.3.1 Baseline revisions are planned (please underline): Yes/ No
If yes, please complete the remainder of section E.3.

- E.3.2 Revisions are planned at regular intervals (please underline): Yes/No
- If yes, please specify date of first planned revision and the length of the intervals:
 - If no, please explain revision schedule (*up to half a page*):

The new data are planned to introduce in the baseline scenario, using international rules and guidelines for how such revision should be made. The time schedule is not yet specified.

E.3.3 Information on revisions

- If a baseline (and/or the project scenario) revision is covered by this report, describe briefly the nature of this revision, including parameters changed in the revision as well as the calculation of the new set of values in the column 'Baseline scenario' in a revision of table E.5.1, column (A): (*up to one page*)
- Date of last baseline revision: (*DD/MM/YYYY*)
- Date of next baseline revision: (*DD/MM/YYYY*)

Documentation box (*Please provide numerical data referred to in this section*):

E.4 Scope and performance of the actual project

Provide actual project data (E.5.2. Column B) and the calculations of the actual real, measurable and long-term emission reductions and/or removals as measured against the relevant (original/revised) baseline scenario values

Documentation box (*Please provide numerical data referred to in this section*):

The following data are used for calculation of the actual CO₂ emission reductions:

Actual energy saving on DH pipelines renovation, MWh/y										
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Energy saving	150	150	150	150	150	150	150	150	150	150

Actual energy saving on heat substations renovation (degree-day corrected), MWh/y										
Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2004
Energy saving	330	368	755	612	796	904	827	693	929	967

Energy saving = Baseline energy consumption – actual energy consumption

Other data used for calculations are presented in sections E.1 and E.2

Buildings Pargi 4 and Kesk 3 are disconnected from DH network. Heat consumption of these buildings is not included in the baseline heat consumption after disconnections.

E.5 Tables on real, measurable and long-term GHG emission reductions or removals by sinks (in CO₂ equivalent)

E.5.1 Projected real, measurable and long-term GHG emission reductions or removals by sinks

Projected real, measurable and long-term GHG emission reductions or removals by sinks over the lifetime of the AJJ activity
(Please underline and fill, as appropriate: **This is the initial table** or this is revision ___ of this table)
(in metric tons of CO₂ equivalent^d)

Insert rows as needed

Year	Baseline scenario ^b (A)				Project scenario ^b (B)				Projected real, measurable and long-term GHG emission reductions (-) or removals by sinks (+) <i>((B)-(A))</i>			
	CO ₂	CH ₄ ^a	N ₂ O ^a	Other ^a	CO ₂	CH ₄ ^a	N ₂ O ^a	Other ^a	CO ₂	CH ₄	N ₂ O	Other
1996	4640				4373				-267			
1997	4640				4373				-267			
1998	4640				4373				-267			
1999	4640				4373				-267			
2000	4640				4373				-267			
2001	4640				4373				-267			
2002	4640				4373				-267			
2003	4640				4373				-267			
2004	4640				4373				-267			
2005	4640				4373				-267			
2006	4640				4373				-267			
2007	4640				4373				-267			

2008	4640				4373							-267	
2009	4640				4373							-267	
2010	4640				4373							-267	
TOTAL	69607				65598							-4009	

^a Please convert values into global warming potentials, according to the IPCC (1995) conversion factors.

^b Including effects occurring outside the project boundary (leakage) as described in sections E.1.4, and E.2.4, as applicable

E.5.2 Actual real, measurable and long-term GHG emission reductions or removals by sinks

Actual real, measurable and long-term GHG emission reductions or removals by sinks of the AIJ activity
(in metric tons of CO₂ equivalent^a)

Please insert values assessed ex post i.e. after measurement. Insert rows as needed.

Year	Baseline scenario ^{b c} (A)				Actual project ^{b c} (B)				Actual real, measurable and long-term GHG emission reductions (-) or removals by sinks (+) ((B)-(A))				Values indicated are assessed independently (Yes/No)	
	CO ₂	CH ₄ ^a	N ₂ O ^a	Other ^a	CO ₂	CH ₄ ^a	N ₂ O ^a	Other ^a	CO ₂	CH ₄	N ₂ O	Other		
1996	4640				4410					-230				
1997	4640				4390					-250				
1998	4640				4185					-455				
1999	4640				4261					-380				
2000	4640				4163					-477				
2001	4640				4106					-535				
2002	4640				4147					-493				

E.6 Mutually agreed assessment procedures

If the AIJ activity provides for mutually agreed assessment procedures, please fill subsections E.6.1 or E.6.2, as applicable.

E.6.1 Assessment procedures that use all or one of the following steps:

E.6.1.1 Initial independent assessment of the project activity:

- Has the project design been subject to such an assessment?
(Please underline): Yes/**No**
- If yes, what organization(s) is/are involved: *(Please indicate the type of organization(s) (consultancy, accredited certification body, government body, university, etc.) and provide their detailed contact information in annex 1 to this report).*

Only a set of principles for the selection and verification of projects was worked out by the experts of the implementing agency STEM in Sweden. The host country governmental representatives have had a rather modest role in launching the projects.

E.6.1.2 Monitoring

- Does the project have a monitoring plan? *(Please underline):* **Yes** / No
- Summarize briefly the key elements of the monitoring plan *(i.e. which parameters are being monitored, with what frequency, providing sampling intensities if appropriate, methods and equipment; associated uncertainties, etc.) (not more than 1 page):*

STEM has continued its assistance in monitoring and reporting the projects in the host countries. Experts from STEM, as well as the Swedish consultancy company ÁF-International provided guidance in methodology. For the regular follow-up activities a special format has been developed to collect performance data from each plant for each heating season. The monitoring activities have continued by local experts for preparing Swedish AIJ reports.

The following monthly data are collected and monitored:

- ✓ Heat consumption of buildings;
 - ✓ Monthly average outdoor temperatures;
 - ✓ Total heat production of the boiler house;
 - ✓ Heat supplied to the network (if available).
- Is the monitoring conducted by project proponents? *(Please underline):* **Yes** / No
 - If no, which organization(s) is/are involved: *(Kindly indicate the type of organization(s) (consultancy, accredited certification body, government body, university, etc.) and provide their detailed contact information in annex 1 to this report).*

E.6.1.3 Independent assessment of the project performance

- Is the activity subject to such an assessment? *(Please underline):* **Yes** / No
- If no, is such an assessment intended? *(Please underline):* Yes / No
- If yes, what organization(s) is/are involved: *(Please indicate the type of organization(s) (consultancy, accredited certification body, government body, university, etc.), and provide their detailed contact information in annex 1 to this report. Indicate the frequency of the assessments, how many assessments have taken*

		5. Total costs	0	0	7400	22200	37028	51855	67391	
1 USD=	10	SEK								

F. Financial additionality

Bearing in mind that the financing of AIJ shall be **additional** to financial obligations of Parties included in Annex II to the Convention within the framework of the financial mechanism, as well as to current official development assistance (ODA) flows (decision 5/CP.1):

Please list sources and the purpose:

Source and purpose of the AIJ project activity funding <i>Including pre-feasibility phase (One line for each source)</i>	Amount <i>in thousand US\$ (in Swedish crone, SEK)</i>
Loan from NUTEK*	142.6 (SEK 1 069 440)
Grant from NUTEK* for technical assistance	72 (SEK 540 000)

1 USD = 7,5 SEK

* From 1 January, 1998, the new Swedish National Energy Administration was established – from 1 January 2002 the name in English has been changed to the Swedish Energy Agency - has taken over the responsibility for the Programme for an Environmentally Adapted Energy System in the Baltic region and Eastern Europe (EAES Programme) from NUTEK (Swedish National Board for Industrial and Technical Development).

G. Contribution to capacity building, transfer of environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties

G.1 Identification of environmentally sound technology and know-how

- Name of manufacturer: Lörstör Rör A/S (preinsulated DH pipes)

The substation delivery and installation were made by a turn key contractor Tulves Ltd from Estonia.

- Place of manufacture (*country*): Denmark
- Model names and numbers of equipment (*where appropriate*):
The main parts of the delivery have been:
 - Preinsulated DH pipes;
 - Heat substations components (circulation pumps - Grundfos, regulation valves and controllers - Honeywell, shut-off valves, strainers, heat exchangers, control devices, expansion tank, heat meters – Multical (Kamstrup Energi) and other necessary components).
- Any other relevant key specific technology characteristics:

A part of the corroded main pipeline with length 450 m, has been replaced by a pre-insulated DN125 pipeline. Nearly all substations were rebuilt. The district heating network remained directly connected to the radiator system, but the heat supply can now be adjusted to the actual heat demand. The heat substations are reconstructed by installing a mixing pump with control valve and the supply temperature is controlled as a function of the ambient temperature. Also some substations received control equipment in order to keep a constant domestic hot water temperature. New heat meters were installed in 14 substations.

- Where applicable, name and location of provider and nature of training:

The operation and maintenance manuals were handed over to the local personal according to the Contracts

G.2 **Characteristics of environmentally sound technology**

The technology is (underline the option):

- At a research and development stage
- Being tested or demonstrated in similar conditions outside the host country
- At the initial stage of introduction into the world market
- At the initial stage of introduction into the host market
- Commercially available and deployed in the world market
- Commercially available and deployed in the host market
- Not characterized by the above options. *Please describe:*

G.3 **Impact of the AIJ project on capacity-building and transfer of environmentally sound technology and know-how (up to two pages):**

Systematically, the capacity building and transfer of know-how have involved the following activities over time and have taken place through:

i) Technology transfer through STEM technical specialist and co-operation between foreign supplier and local partner during the implementation of the project:

- Technical support of STEM specialist to the local project leader and municipality;
- Knowledge in negotiations to foreign companies;
- Knowledge in managing and planning of projects;
- Transferring of environmental issues to the local parties;
- Transferring of knowledge in operation and maintenance issue.

ii) Conferences, seminars, documentation and training:

- Personal from boiler plant has been invited to different seminars and workshops and several presentations about company experience have made, documentation for training has been handed over;
- There were arranged seminars through close cooperation between STEM and Estonian partners:
 - o Environmentally Friendly Energy Systems in the Baltic Region and Eastern Europe – seminar in Tallinn, 14-15 April, 1994;
 - o Environmentally Friendly Energy Systems in the Baltic Region and Eastern Europe – seminar and workshops in Tartu, 25 November, 1994 (prepared information by topics in Estonian over than 150 pages);
 - o EAES Programme District Heating Day in Vändra, 27 July, 1995;

- o Environmentally Adapted Local Energy Systems - seminar and presentation of translated into Estonian booklet "Environmentally Adapted Local Energy Planning" in Rakvere, 11 November, 1998 and in Tartu, 12 November, 1998;
- o Energy efficiency projects in Mustamäe residential buildings - seminar in Tallinn, 16 September, 1996.

iii) Stimulate "net-working" for the exchange of experience between plant owners with similar problems:

- Activities have been supported by STEM to stimulate cooperation with local experts, consultants, project owners to achieve two-way communication and to find respect for chosen solutions from both sides.
- The project site has been visited by specialists of other areas for exchange of experience

H. Additional comments

Complete as appropriate:

1) Any practical experience gained:

- The training of the local staff is necessary for operation and maintenance of the heat substations. The motivation of the staff to learn is very important to get good results.
- One of the lessons learnt is that it is important to have persons responsible for the adjustment of the equipment for each building and that they have good understanding of the consequences of their actions.
- Maintenance service of heat substations is necessary to develop.
- Balancing of the buildings heating systems is necessary, but this work was not foreseen during heat substation reconstruction.
- The staff of the boiler plant has got experience in installation and exploitation of modern western technology.

2) Technical difficulties:

- The high rate of change of the district heating supply temperature and weak correlation between the supply temperature and outdoor air temperature. The service life of the district heating network is longer and the need for maintenance is lower if the rate of change of the temperature in the district heating network is slow.
- In the substation units there are lack of pipe insulation and temperature meters.
- The domestic hot water has been too hot. This is not necessary a consequence of the investment because the control of hot water has remained unchanged in most of the buildings. In some buildings there are installed a self-operated control valve with a set-point not correct.

3) Effects encountered:

- In the school the control unit of radiator network was out of use and the heating was manually controlled. The reason for this was to cut the heating costs!
- At the end of year 1999 there was installed in the Pargi str. project building local boiler and the inhabitants will not use more district heating service. The heat energy was supplied to this building by aerial pipeline with bad isolation condition.
- On March 2003 there was installed in the Keskk str. 3 project building local boiler and the inhabitants will not use more district heating service.
- Several local companies have participated in the project (design, ground and constructions works).

4) Impacts encountered:

- Better indoor climate in the most of the buildings and improved domestic hot water supply

5) Other obstacles encountered:

- The problems with the converted boiler (World Bank financing) and probably caused a “stripped down” version due to low budget will decrease the positive effect of the present district heating rehabilitation project. The pre-furnace needs some repairing and at the same time OÜ Avesoo has to keep its expenditures on minimum level, as the clients are in difficulties to pay their heat bills (low income in the agricultural sector). There is risk that the clients will start disconnecting from district heating with a rising heat price.
- High unemployment level in the region due to economic recession of local enterprises and the plant has also debts due to unpaid heat bills. Heating company has been in economical difficulties (year 2002).

6) Other:

- The district heating plant in Adavere is down outside the heating season. This means corrosion problems for the boilers and the pipeline. The heating season is started too late and ended too early.
- Calculations of the volume of emissions of sulphur dioxide and nitrogen oxide in the section D are calculated according to the Regulation No. 99 of 02 August 2004 of the Ministry of the Environment “The procedure and methods of determination of the volume of pollutants from combustion plants to the air”.
- On 2002 by the Ministry of Environment there was prepared draft National Programme for Reduction of Greenhouse Gases 2003-2012, which has been adopted by the Government on 2004.
- From the 1-st November 2003 the new owner of the Adavere boiler house is Fortum Termest Ltd subsidiary company of Fortum Power and Heat Oy.
- Fortum Termest Ltd has renovated the existing wood fuel boiler and rebuilt fuel storage. At the present time the boiler house is operated mainly without permanent staff.

Annex 1 to the revised uniform reporting format (URF 01)**PARTICIPANTS' CONTACT INFORMATION**

Please provide contact information for each organization. Add rows as required (by copying and pasting)

Name	Address ^a	Voice/Fax/E-mail
Organization(s) ^b: Swedish Energy Agency[*] Function(s) within activity^c: Financing/Project development		
Officer responsible:	The System Analysis Department, Climate Change Division Kungsgatan 43 BOX 310 S-63104 Eskilstuna SWEDEN http://www.stem.se	Tel: +46 16 544 20 81 Fax: +46 16 544 22 64 E-mail: bengt.bostrom@stem.se
Contact person, if different from above: Gudrun Knutsson	Head of Section, Climate Investment Programme	Tel: +46 16 544 20 72 Fax: +46 16 544 22 54 E-mail: Gudrun.Knutsson@stem.se

^{*} From 1 January, 1998, the new Swedish National Energy Administration – from 1 January 2002 the name in English has been changed to the Swedish Energy Agency - has taken over the responsibility for the Programme for an Environmentally Adapted Energy System in the Baltic region and Eastern Europe (EAES Programme) from NUTEK (Swedish National Board for Industrial and Technical Development).

Name	Address ^a	Voice/Fax/E-mail
Organization(s) ^b: ÅF-International (Malmö) Function(s) within activity^c: Technical assistance		
Officer responsible:	Stensjögatan 3 S-21765 Malmö SWEDEN http://www.af.se	Tel: +46 40 37 50 00 Fax: +46 40 13 03 69 E-mail:
Contact person, if different from above: Ulf Lindgren	Project leader	Tel: +46 40 37 50 97 Fax: +46 40 13 03 69 E-mail: Ulf.lindgren@af.se

Name	Address ^a	Voice/Fax/E-mail
Organization(s) ^b: Ministry of the Environment of the Republic of Estonia		
Function(s) within activity^c: Designated national authority/reporter		
Officer responsible:	Department of Environment Management and Technology Narva mnt. 7A 15172 Tallinn ESTONIA http://www.envir.ee	Tel: +372 62 62 802 Fax: +372 62 62 801 E-mail: min@envir.ee
Contact person, if different from above: Karin Radiko	Specialist	Tel: +372 62 62 977 Fax: E-mail: karin.radiko@envir.ee

Name	Address ^a	Voice/Fax/E-mail
Organization(s) ^b: DH company Fortum Termest Ltd		
Function(s) within activity^c: Project owner – from November 2003		
Officer responsible:	Kassi 1 12618 Tallinn ESTONIA http://www.fortumtermest.ee	Tel: +372 6 678 600 Fax: +372 6 678 601 E-mail: fortum.termest@fortum.com
Contact person, if different from above: Aare Jalajas	South-Estonia region manager	Tel: +372 775 2929 Fax: +372 775 1755 E-mail: louna.eesti@fortumtermest.ee

Name	Address ^a	Voice/Fax/E-mail
Organization(s) ^b: Regional Energy Centres in Estonia		
Function(s) within activity^c: Local reporter		
Officer responsible:	Võru P.O., BOX 43 65602 Võru ESTONIA	Tel: +372 78 282 30 Fax: +372 78 282 30 E-mail:
Contact person, if different from above: Elmu Potter	Consultant	Tel: +372 78 282 30 Fax: +372 78 282 30 E-mail: elmupotter@hotmail.ee

^a Address should include: department; street; postal code; city; country and the Internet address of the organization (if available).

^b Organization includes: institutions, ministries, government agency closely following the activity, companies, non-governmental organizations, etc. involved in the activity.

^c Function within activity: please use the following categories:

Function	Description of function

<i>Project development</i>	<i>Designing/developing the AIJ project and/or submitting the AIJ project proposal</i>
<i>Project operator</i>	<i>Implementing and administering the AIJ project activities</i>
<i>Government regulation/oversight</i>	<i>Ensuring compliance of the project with laws and regulations</i>
<i>Technical assistance</i>	<i>Providing scientific or other technical guidance or support for the purposes of project development and/or project administration, implementation, training and education activities</i>
<i>Financing</i>	<i>Serving as a source of funding for the AIJ project</i>
<i>Initial independent assessment of project activity</i>	<i>Assessing whether the project activity meets a given set of criteria</i>
<i>Monitoring</i>	<i>Monitoring the environmental and/or socio-economic results of the project in accordance with a monitoring protocol</i>
<i>Independent assessment of project performance</i>	<i>Assessing the performance (environmental and/or socio-economic) achieved by a project against pre-set criteria</i>
<i>Providing independent written statement on performance</i>	<i>Providing written assurance that a performance is achieved and/or a set of criteria is met by an activity</i>
<i>Designated national authority</i>	<i>Entity authorized to officially accept, approve or endorse the AIJ project</i>
<i>Other (please specify)</i>	