

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

- Date of this report: 17/03/2006
- This report is a (*please underline*):
  - First report
  - **Interim report** (second report - 2006)
  - Final report
- Please indicate here which sections were modified since the last report  
*A, D.1, E.4, E.5, E.5.1, E.5.2*

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

Kazlu Ruda. Project of boiler conversion to burn wood waste in Kazlu Ruda boiler house.

**B.2 Participants**

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

- The donor country is Sweden, represented by a governmental institution – Swedish Energy Agency (STEM).
- 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 host country local organisation, which owns and operates the facility, where investments were made, is AB Kazlu Rudos Metalas.
- The technical assistance during project implementation and follow-up activities was provided by STEM consultants from Swedish company ÅF-International.
- Projects performance data collection and reporting activities are carried out by Lithuanian Energy Institute.

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

Kazlu Ruda is a small town close to Kaunas with several boiler plants and district heating networks. One boiler plant is owned by the public company Kazlu Rudos Metalas. Besides deliveries to the company's own buildings the plant supplies heat to the municipal district heating network. There were three DKVR 6,5-13 oil fired boilers with annual energy production about 12 000 MWh.

Conversion of an oil-fired DKVR 6.5-13 boiler to biofuels firing through installation of a pre-furnace. Automatic fuel storage and flue-gas cleaning are included in the project. The estimated power output after conversion is 3 MW, annual energy production 12 000 MWh.

B.3.2 Type of activity

*Please use project type descriptors contained in annex 2.*

| Sector | Activity   |
|--------|--|
| Energy | Fuel-switching to renewable (from heavy oil to biofuels) |

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

Kazlu Ruda town, Marijampole county, Lithuania

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)*
- Completed  
*(AIJ project activity no longer generates GHG reductions or removals by sinks or has been terminated)*
- Suspended  
*(Please indicate date when AIJ project activity is expected to resume, and give brief explanation of reasons for suspension (up to half a page)):*

B.3.5 Lifetime of AIJ project activity:

- Approval date: 24/03/1994 (Letter of Intent)  
*(Date at which the AIJ project activity was mutually approved by designated national authorities of **all** Parties involved.)*
- Starting date: February 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): 30/09/ 2004 (loan expire date)  
*(Date at which AIJ project activity is expected to no longer generate GHG reductions or removals by sinks.)*
- Ending date (actual): -  
*(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 plant is expected to be in operation until 2009.

- 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.      |
| <b>15 years</b> | <b>Conversion of existing boiler but new installation fuel handling system and firing equipment. Modernisation of secondary equipment.</b>      |
| 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.<br>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: 1995 (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 activity is heat production and this includes emissions from on-site combustion of fossil fuels and bio fuels. The project and baseline heat production activity is assumed to be equal. This means that the emission reduction from the project is based on the difference in fossil fuels consumption before and after the implementation of the project activity.

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 National Energy Strategy (2002), National Energy Efficiency Programme (2001), Law of Energy (2002), Law on Electricity (2000), Law on Biofuel (2000), Forestry and Forest Industry Development Programme (2002), Resolution No. 7 “On renewable and waste energy prices”, Law on Pollution Taxes(1999):

- efficient and sustainable use of energy resources;
- to provide favourable conditions for developing the production of biofuels, to make efforts for increasing the share of renewable energy sources in the primary energy balance from present 8% to 12% by 2010;
- to reduce adverse effects of energy on the environment
- to reduce the energy intensity
- to reduce dependence on fuel imports
- to create new working places
- to involve the local companies into production of equipment for new firing technology
- to create and improve energy infrastructure based on indigenous energy resources
- to utilise the existing energy production capacity efficiently
- to reduce of fossil fuel consumption which results in emission reduction and currency saving
- 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 other Central European countries

## **D. Environmental, economic and social and cultural impacts**

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

- Annual emissions reduction:
 

|                           |                           |
|---------------------------|---------------------------|
| Projected                 | 2005                      |
| 3 858 ton CO <sub>2</sub> | 1 548 ton CO <sub>2</sub> |
| 3 318*                    | 1 331*                    |
| 59 ton SO <sub>2</sub>    | 24 ton SO <sub>2</sub>    |
| 1 ton NO <sub>x</sub>     | 1 ton NO <sub>x</sub>     |

- Lower pollution in town
- Emission measurements have been carried out in 1997 by Lithuanian specialists.

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

- Through cooperation with the Swedish company the Kazlu Rudos Metalas has started boiler/prefurnace production that stands for about 80% of their income.
- Reduction of heat price for heating and hot water preparation about 20%.

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

Improved working conditions, increased motivation

- The project has a good demonstration effect
- Improved working conditions, increased motivation
- Higher employment (new fuel and service companies)
- More stable heat price for consumers

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### **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 on status quo baseline. It is assumed that heat production of the renewable power plant installed as AIJ project is the same as using fossil fuel before the project. The factors used for baseline did not change over time. These factors are:

- Baseline fuel – heavy fuel oil (mazout);
- Baseline efficiency of the fossil fuel boilers;
- Total heat production of the boiler plant before boiler conversion.

The numerical data are presented in section E.1.4.

##### 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 (total boiler plant heat production and emissions in the period before the conversion to renewable fuel). The most important factor in calculation baseline emission is the annual efficiency of fossil fuel boilers. Baseline efficiency of the fossil fuel boilers has 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 direct on-site (boiler plant) emissions, i.e. emissions from on-site 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):

CO<sub>2</sub> emissions values are calculated according to the IPCC Guidelines (1996) and EC Commission decision of 29/01/2004 establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council. Carbon Emission Factors (CEF) are used to calculate CO<sub>2</sub> emitted during fuel combustion. CO<sub>2</sub> emission (M<sub>CO2</sub>) are calculated according to the formula, as follows:

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

were,

Q<sub>fb</sub>– boiler(s) heat production, MWh/year,

K<sub>c</sub> - fraction of carbon oxidised,

q<sub>c</sub> - carbon emission factor, tC/TJ,

η<sub>b</sub> - annual efficiency of boiler(s), i.e. baseline efficiency of fossil fuel boilers.

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

The following data are used for calculation of the baseline scenario CO<sub>2</sub> emission reductions:

Total heat production of the boiler plant before boiler conversion – 12000 MWh/year

Baseline efficiency of the fossil fuel boilers – 86%

Carbon emission factor for heavy fuel oil – 21,16 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 activity is heat production and this includes emissions from on-site combustion of fossil fuels and bio fuels. These emissions are under control of the boiler house staff. The project and baseline heat production activity is assumed to be equal.

### 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 production on bio fuels using converted boiler with 3 MW heat output as base load boiler. The annual heat production of the wood fuel boiler is projected to be 12000 MWh. The peak load will be covered by existing fossil fuels boilers. The climate conditions and minor heat load changes do not influence significantly wood fuel boiler heat production. 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)):*

## 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 CO<sub>2</sub> emission:

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

were,

$Q_{fp}$  – boiler(s) energy production, MWh/year,

$K_c$  - fraction of carbon oxidised,

$q_c$  - carbon emission factor, tC/TJ,

$\eta_b$  - annual efficiency of boiler(s), i.e. baseline efficiency of fossil fuel boilers.

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

$$Q_{fp} = Q_{fb} - Q_w \text{ (12000 - 0 = 12000 MWh/year)}$$

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

The following data are used for calculation of the baseline scenario CO<sub>2</sub> emission reductions:

Projected heat production on wood fuel boiler ( $Q_w$ ) – 12000 MWh/year

Baseline efficiency of the fossil fuel boilers – 86%

Carbon emission factor for heavy fuel oil – 21,16 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. 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 CO<sub>2</sub> emission reductions:*

| Actual heat production on bio fuels, MWh/y |      |      |      |      |      |      |      |      |      |
|--|------|------|------|------|------|------|------|------|------|
| Year                                       | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
| Heat production, MWh/year                  | 3960 | 5430 | 3860 | 3686 | 3890 | 3900 | 3893 | 4668 | 4781 |

  

| Actual heat production on bio fuels, MWh/y |      |      |  |  |  |  |  |  |  |
|--|------|------|--|--|--|--|--|--|--|
| Year                                       | 2004 | 2005 |  |  |  |  |  |  |  |
| Heat production, MWh/year                  | 4750 | 4815 |  |  |  |  |  |  |  |

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





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 CO<sub>2</sub> equivalent<sup>a</sup>)

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

| Year | Baseline scenario <sup>b c</sup><br>(A) |                              |                               |                    | Actual project <sup>b c</sup><br>(B) |                              |                               |                    | Actual real, measurable and long-term GHG emission reductions (-) or removals by sinks (+)<br>((B)-(A)) |                 |                  | Values indicated are assessed independently (Yes/No) |       |
|------|---|------------------------------|-------------------------------|--------------------|--------------------------------------|------------------------------|-------------------------------|--------------------|---|-----------------|------------------|--|-------|
|      | CO <sub>2</sub>                         | CH <sub>4</sub> <sup>a</sup> | N <sub>2</sub> O <sup>a</sup> | Other <sup>a</sup> | CO <sub>2</sub>                      | CH <sub>4</sub> <sup>a</sup> | N <sub>2</sub> O <sup>a</sup> | Other <sup>a</sup> | CO <sub>2</sub>   | CH <sub>4</sub> | N <sub>2</sub> O |  | Other |
| 1995 | 1229                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1229   |                 |                  |  | Yes   |
| 1996 | 1746                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1057*  |                 |                  |  | Yes   |
| 1997 | 1252                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1746   |                 |                  |  | Yes   |
| 1998 | 1184                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1502*  |                 |                  |  | Yes   |
| 1999 | 1262                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1252   |                 |                  |  | Yes   |
| 2000 | 1254                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1077*  |                 |                  |  | Yes   |
| 2001 | 1252                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1184   |                 |                  |  | Yes   |
| 2002 | 1500                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1018*  |                 |                  |  | Yes   |
| 2003 | 1537                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1262   |                 |                  |  | Yes   |
| 2004 | 1527                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1085*  |                 |                  |  | Yes   |
| 2005 | 1548                                    |                              |                               |                    | 0                                    |                              |                               |                    | -1254   |                 |                  |  | Yes   |
| ...Σ | 15291                                   |                              |                               |                    | 0                                    |                              |                               |                    | -1078*  |                 |                  |  | Yes   |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1500   |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1290*  |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1537   |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1322*  |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1527   |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1313   |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1548   |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -1331   |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -15291  |                 |                  |  |       |
|      |   |                              |                               |                    |                                      |                              |                               |                    | -13150*   |                 |                  |  |       |



## 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 ÅF-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 production on bio fuels;
  - ✓ Heat production on fossil fuels;
  - ✓ Total heat production of the boiler house;
  - ✓ Bio fuels consumption;
  - ✓ Fossil fuels consumption.
- 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*

*place to date, and whether the assessment report(s) is/are publicly available if requested).*

Projects are followed and evaluated from technical and economic points of view by local experts in 1995 and 1996 special measurements (emissions) programs and performance tests were carried out of boiler conversion projects. These tests were carried out by Swedish specialists (ÅF-International) with assistance of local staff in the boiler houses.

Det Norske Veritas (DNV) performed Multi-Project verification of Swedish AIJ projects in Estonia, Latvia and Lithuania. "Multi-Project Verification of 31 Swedish-Baltic AIJ Projects" report presented in 2001.

- Summarize briefly the key elements of the assessment activities: *(Please describe issues such as criteria used; the project design; project implementation; key project parameters being verified; the frequency of assessment/surveillance; sampling approach applied by the assessing organization) (up to one page):*

Key elements of the assessment activities of performance tests and environmental measurements carried out by Swedish specialists (ÅF-International):

- ✓ Performance tests (heat output, input losses and efficiency of the converted boiler);
- ✓ Environmental measurements (instantaneous and annual emissions (dust, NO<sub>x</sub>, S, CO, CO<sub>2</sub>);
- ✓ Analysis of the operational problems;

Key elements of the assessment activities of Multi-Project verification of Swedish AIJ projects in Estonia, Latvia and Lithuania:

- ✓ Assessment and analysis of reported data;
- ✓ Verification of emission reduction;
- ✓ Assessment of projects specific baselines;
- ✓ Discounting for uncertainties.

E.6.1.4 Provision of written statement by an independent entity regarding the performance of the project activity

*(Please note that such a statement is not a formal requirement under the AIJ pilot phase (see also the note at the beginning of section E.6). If the project has made provision for such a statement, please indicate the name of the independent body and attach a copy of the written statement(s)).*

E.6.2 Other form of mutually agreed assessment procedure *(please specify):*

Ministry of Environment is a central Lithuanian authority responsible on reporting of JI-projects. This authority assigns a local organisation Lithuanian Energy Institute, which is involved in to the evaluation of the climate effects of this project and takes the main responsibility to continue measuring, results collecting for AIJ-reporting.

## E. 7 Cost (to the extent possible)

E.7.1 The cost information is *(Please underline):*

- Provided below
- Not provided because the data are *(Please underline):*



**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:

| <b>Source and purpose of the AIJ project activity funding</b><br><i>Including pre-feasibility phase</i><br><i>(One line for each source)</i> | <b>Amount</b><br><i>(in thousand US\$)</i> |
|--|--|
| Loan from NUTEK*   | 667,00                                     |
| Grant from NUTEK* for technical assistance   | 94,00                                      |
|  |  |

1 USD = 7,50 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: HOTAB AB (main contractor of the combustion equipment)
- Place of manufacture (*country*): Sweden
- Model names and numbers of equipment (*where appropriate*):

The main parts of the delivery have been:

- Fuel storage above the ground complete with hydraulic discharge scrapers;
- Fuel conveyor from storage to furnace;
- Prefurnace with gas channel and air system;
- Flue gas cleaning of multicyclone type;
- Flue gas fan, air fans;
- Frequency control of the fans;
- Ash and slag removable system;
- Control and supervision system;
- Stairs walkways and railings for operation and maintenance;

- Any other relevant key specific technology characteristics:

The project comprises Conversion of an oil-fired DKVR 6.5-c13 boiler to biofuels firing through installation of a pre-furnace. Automatic fuel storage and flue-gas cleaning are included in the project. The estimated power output after conversion is 3 MW.

Boiler type: DKVR 6.5-c13 (steam)  
Boiler output: 3 MW  
Pre-furnace: Free standing with moving inclined grates  
Flue gas cleaning: Multicyclone  
Fuel type: Wood chips, sawdust, bark, 35-55% RH  
Previous fuel: Mazout (high-sulphur content heavy fuel oil)

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

In-site training of local staff on operation and maintenance of the installed equipment provided by main supplier according to the Contract

#### 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;
- The following up group for testing and adjustment of converted boilers has been formed in Lithuanian Energy Institute. Personnel of Heat-Equipment Research and Testing Laboratory is carrying out following up procedures keeping a close relation with and ÅF International AB company as the main supervisor of conversion projects supported by STEM.
- The local company “Kazlu Rudos Metalas” with participation of Swedish company “Hotab” mainly performed the execution of these biofuel conversion projects.
- Knowledge in managing and planning of industrial projects;
- Transferring of environmental issues to the local parties;
- Transferring of knowledge in operation and maintenance issue;
- Operation and maintenance software was introduced to the plant-owners.

**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 Lithuanian partners:
  - ✓ Environmentally Friendly Energy Systems in the Baltic and Eastern Europe Countries/ (Seminar), Kaunas, 21-22 March, 1995 (prepared information by topics in Lithuanian over than 150 pages);
  - ✓ Environmentally Adapted Energy Systems in the Baltic Region and Eastern Europe/ (Seminar), Birzai, 19-20 November, 1998;
  - ✓ Environmentally-Adapted Local Energy Systems /(Seminar and book presentation), Druskininkai, 21 November, 1998.
  - ✓ Translation and preparation of safe operation regulations for wood waste burning boiler houses. This job was supported by STEM.

**iii) Stimulate "net-working" for the exchange of experience between plant owners with similar problems, e g "bio-clubs":**

- Association "Bioenergy and energy saving" has been founded at the end of 1997 to co-ordinate the attempts of wood firing equipment producers, wood wastes suppliers and owners of boiler plants;
- The boiler plant has been visited by specialist from another boiler plants (incl. Russia, Baltic Countries). The local staff has an exchange of experience with the staff from another boiler plants and has been active in "bio-club";

**Endogenous capacity supported or enhanced:**

| Endogenous capacity<br>Name of organisation <sup>1)</sup>                  | Development (DEV) /<br>enhancement (ENH) | Describe briefly   |
|--|--|--|
| AB "Kazlu Rudos Metalas"   | DEV                                      | New biofuel firing technology was developed. Experience in installation and maintenance of modern western technology.<br>The new modern equipment for production pellets from wood dust were developed as demand for other wood fuel kinds increased<br>The straw burning technology was started to spread as continuation of successfully realized biofuel conversion projects.<br>Many smaller boiler conversion projects were successfully finished in Lithuania by local companies AB "Kazlu Rudos Metalas", AB "Singaras", AB "Elhamers" during past five years. The implementation of these projects was initiated by the successfully realized STEM projects. |
| AB "Kazlu Rudos Metalas"   | DEV                                      |  |
| AB "Umega"   | DEV                                      |  |
| AB "Kazlu Rudos Metalas"<br>AB "Singaras"<br>AB "Menranga"<br>AB "Germeta" | ENH                                      |  |

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**H. Additional comments**

*Complete as appropriate:*

**1) Any practical experience gained:** The project has a good demonstration effect. The boiler house staff actively participated in wood fired boiler rebuilding.

In 1995 AB Kazlu Rudos Metalas (KRM) have started a co-operation with the Swedish company Hotab, working with boiler reconstruction. Now KRM is working independent and expand its activity to neighbourhood countries: Russia, Belarus, Ukrain. KRM is working with information and development of new technique in the bio fuel area.

**2) Technical difficulties:** At initial stage of boiler operation were such problems:

1. Ash blockage problems of flue gas channel between prefurnace and boiler.
2. The lever of flue gas control valve was too weak.

From 2001 no serious problems have occurred.

**3) Effects encountered:** Execution of biofuel conversion projects according to STEM JI programme caused the activity in the following fields:

- production of pre-furnaces and small wood fired boilers by local companies;
- new policy formation in respect of cleaning the forests and using the wood wastes or preparing of wood fuel by the forestry industry;
- research and testing of new equipment, training the local personnel and etc.

The experiences from EAES Programme projects have formed the basis for a new policy as respect to increasing renewable energy sources in the total energy balance of Lithuania.

**4) Impacts encountered:** Competition between biofuel boiler houses in local region influenced increase of wood waste fuel price. The wood waste fuel price increased from 20,35 Lt/m<sup>3</sup> in 1997 to 28,98 Lt/m<sup>3</sup> in 1998 and respectively to 30 Lt/m<sup>3</sup> in 1999 and 2000. The long fuel transportation distance about 30 km has direct influence on high fuel price. The future fuel supply perspectives are not very clear, as during the last year few new companies have started to operate for production briquettes from wood waste.

**5) Other obstacles encountered:** Wood-fired boiler operated only during the heating season and didn't operate in summer time for the lack of consumers. So the yearly heat production decreased from 5430 MWh in 1996 to 3890 MWh in 1999 and to 3900 MWh in 2000 respectively.

Restrictions from the municipal council to deliver heat (heat will not be delivered when medium temp is over 10 °C).

**6) Other:** There is a possibility to increase the load of the boiler house in the future, by developing production capacities with high-energy consumption.

In 2000 a research project was started with Det Norske Veritas with the aim to develop methods for simplifying the verification of JI-projects based on the experiences from the Swedish boiler conversion projects in the Baltic countries. The project has been finished in 2001.

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

| Name  | Address <sup>a</sup>   | Voice/Fax/E-mail  |
|---|--|---|
| <b>Organization(s) <sup>b</sup>: Ministry of Environment of the Republic of Lithuania</b> |  |   |
| <b>Function(s) within activity<sup>c</sup>: Designated national authority/reporter</b>    |  |   |
| <b>Officer responsible:</b>   | Environmental Quality Department<br>Jaksto 4<br>LT-01105 Vilnius<br>Lithuania<br><a href="http://www.am.lt">http://www.am.lt</a> | <b>Tel: +370-52 66 36 61</b><br><b>Fax: +370-52-66 36 63</b><br><b>E-mail: <a href="mailto:kanceliarija@am.lt">kanceliarija@am.lt</a></b> |
| <b>Contact person, if different from above:</b><br>Arunas Cepele                          | Director of Environmental Quality Dept.  | <b>Tel: +370-52-66 35 09</b><br><b>Fax: + 370-52-66 36 63</b><br><b>E-mail: <a href="mailto:a.cepele@am.lt">a.cepele@am.lt</a></b>        |

| Name  | Address <sup>a</sup>   | Voice/Fax/E-mail  |
|---|--|---|
| <b>Organization(s) <sup>b</sup>: Joint Stock Company AB Kazlu Rudos Metalas</b> |  |   |
| <b>Function(s) within activity<sup>c</sup>: Project owner/borrower</b>          |  |   |
| <b>Officer responsible:</b>   | Daukanto 19<br>LT-69430 Kazlu Ruda,<br>Marijampole district<br>Lithuania | <b>Tel: +370 43 95 038</b><br><b>Fax: +370 43 95 136</b><br><b>E-mail: <a href="mailto:metalas@metalas.lt">metalas@metalas.lt</a></b> |

|  |          |  |
|--|----------|--|
| <b>Contact person, if different from above:</b><br>Mecislovas Daugiala | Director | <b>Tel:</b> +370 43 95 038<br><b>Fax:</b> +370 43 95 136<br><b>E-mail:</b> - |
|--|----------|--|

| Name  | Address <sup>a</sup>   | Voice/Fax/E-mail  |
|---|--|---|
| <b>Organization(s) <sup>b</sup>:</b> ÅF-International AB (Malmö)            |  |   |
| <b>Function(s) within activity<sup>c</sup>:</b> <i>Technical assistance</i> |  |   |
| <b>Officer responsible:</b>   | Stensjögatan 3<br>S-21765 Malmö<br>Sweden<br><a href="http://www.af.se">http://www.af.se</a> | <b>Tel:</b> +46 40 37 50 00<br><b>Fax:</b> +46 40 13 03 69<br><b>E-mail:</b> metalas@metalas.lt   |
| <b>Contact person, if different from above:</b><br>Ulf Lindgren             | Project leader   | <b>Tel:</b> +46 40 37 50 97<br><b>Fax:</b> +46 40 13 03 69<br><b>E-mail:</b> <a href="mailto:Ulf.lindgren@af.se">Ulf.lindgren@af.se</a> |

| Name  | Address <sup>a</sup>  | Voice/Fax/E-mail   |
|---|---|--|
| <b>Organization(s) <sup>b</sup>:</b> Lithuanian Energy Institute      |   |  |
| <b>Function(s) within activity<sup>c</sup>:</b> <i>Local reporter</i> |   |  |
| <b>Officer responsible:</b>   | Heat-Equipment Research and Testing Laboratory<br>Breslaujos 3<br>LT-44403 Kaunas<br>Lithuania<br><a href="http://www.lei.lt">http://www.lei.lt</a> | <b>Tel:</b> +370 37 40 18 63<br><b>Fax:</b> +370 37 35 12 71<br><b>E-mail:</b> testlab@isag.lei.lt |
| <b>Contact person, if different from above:</b><br>Nerijus Pedisius   | Consultant  | <b>Tel:</b> +370 37 40 18 63<br><b>Fax:</b> +370 37 35 12 71<br><b>E-mail:</b> nerijus@isag.lei.lt |

| Name   | Address <sup>a</sup>  | Voice/Fax/E-mail  |
|--|---|---|
| <b>Organization(s) <sup>b</sup>:</b> Det Norske Veritas AS   |   |   |
| <b>Function(s) within activity<sup>c</sup>:</b> <i>Independent assessment of project performance</i> |   |   |
| <b>Officer responsible:</b>  | DNV development section<br>Veritasveien 13<br>N-1322 Hovik<br>Norway<br><a href="http://www.dnv.com">http://www.dnv.com</a> | <b>Tel:</b> +47 67 57 99 00<br><b>Fax:</b> +47 67 57 74 74<br><b>E-mail:</b> -  |
| <b>Contact person, if different from above:</b><br>Jesse B. Uzzell                                   | Expert  | <b>Tel:</b> +47 67 57 95 10<br><b>Fax:</b> +47 67 57 99 11<br><b>E-mail:</b> <a href="mailto:Jesse.Uzzell@dnv.com">Jesse.Uzzell@dnv.com</a> |

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

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

<sup>c</sup> Function within activity: please use the following categories:

| <i>Function</i>   | <i>Description of function</i>  |
|---|---|
| <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>                                 |   |

\* During the years 1993-1997 NUTEK (Swedish National Board for Industrial and Technical Development) has been responsible for the Programme for an Environmentally Adapted Energy System in the Baltic region and Eastern Europe (EAES Programme). Since 1 January 1998 the EAES Programme was managed by the Swedish National Energy Administration, which was renamed to the Swedish Energy Agency on 1 January 2002.)