JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM FOR SMALL-SCALE PROJECTS
Version 01.1 - in effect as of: 27 October 2006

CONTENTS

SECTION A. General description of the small-scale project

A.1. Title of the small-scale project:

Tooma Wind Power Joint Implementation Project, Estonia

Ver. no. 3, May 22 2009

A.2. Description of the small-scale project:

The proposed project activity is the development of a wind power project at the western coast of Estonia at the municipality of Hanila. The wind farm will consist of six 2.0 MW wind turbines and will thus have a total installed capacity of 12 MW. The expected net output of this project is 31,536 MWh per year. The renewable electricity produced by the wind power plant will displace carbon intensive electricity produced from fossil fuel sources in the Estonian grid.

A.3. Project participants:

Party involved	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of Estonia (host Party)	Tooma Tuulepark OÜ	No
To be defined	To be defined	No

The PDD was prepared by an Estonian company Nelja Energia OÜ in cooperation with LHCarbon OÜ. Contact person: Hannu Lamp. Tel: +372 6 306 408, Hannu@online.ee

A.4. Technical description of the small-scale project:

A.4.1. Location of the small-scale project:

A.4.1.1. Host Party(ies):

Republic of Estonia

A.4.1.2. Region/State/Province etc.:

Lääne County

A.4.1.3. City/Town/Community etc.:

Hanila municipality

A.4.1.4. Detail of physical location, including information allowing the unique identification of the small-scale project:

The proposed JI Project project is located at the western coast of Estonia at the municipality of Hanila. The site is located next to the sea. The location is suitable for wind power due to its good wind conditions (verified by near-by operating Esivere wind farm), nearby technical infrastructure (grid, ports, roads) and absence of enviromental or other constraints. Good soil conditions exist for the

establishment of foundations, access roads and other necessary infrastructure. The land-units at the wind farm territory are owned by the project company.

Figure 1. Location of the project

Figure 2. Location of the project

The proposed locations of Tooma wind park wind turbines have been shown in yellow. Windmill symbols depict the location of existing Esivere 8 MW wind park, the tan circles depict Rõuste 12 MW. Dark red oval is the location of Rõuste 110 kV substation.

The Tooma wind park will be located at the following land-units:

- "Tooma" land plot (cad. no 19501:002:0129), 4 wind turbines
- "Rebasekivi" land plot (cad. no 19501:002:2090), 2 wind turbines

A.4.2. Small-scale project type(s) and category(ies):

Type I JI SSC project: Renewable energy project with a maximum output capacity of less than 15 MW(e).

A.4.3. Technology(ies) to be employed, or measures, operations or actions to be implemented by the small-scale project:

The purpose of the project is the development and construction of a wind power project in Estonia. Emission reductions will be generated by the operation of the wind power facility as described in this PDD. The power generation will displace carbon-intensive generation from the Estonian grid.

The project foresees an erection of 6 units of ENERCON E-82 2000 kW wind turbines. The site is located at the western coast of Estonia at Hanila municipality and meets all prerequisites for successful wind power generation – good wind conditions, nearby technical infrastructure (grid, roads, port) and no environmental or other restrictions.

The project will employ state of the art wind turbine technology from one of the world's foremost equipment suppliers, ENERCON. The E-82 wind turbine will have a 78 m hub height steel tower and an 82 m rotor diameter designed for class II wind speeds. For further information on the technology and the supplier please visit www.enercon.de.

The chosen wind turbines are well suited for the site's wind conditions as they enable to maximise the green electricity output from the site and to benefit from economies of scale as ENERCON is also servicing four similar E-70 2,0 MW wind turbines at the nearby Esivere site, three E-70 2,3 MW wind turbines at Virtsu II site and four E-44 wind turbines at the Virtsu I site, both located at the same region with the Tooma project.

Wind measurements on site have not been performed, but near-by Esivere 8 MW wind farm production data has been taken as a basis of estimation. Esivere wind farm has erected similar Enercon turbines and wind measurements performed by Enercon for OÜ Roheline Ring gives sufficient basis on considering the wind potential suitable for the establishment of the Tooma wind farm. Average usage of capacity has been estimated to 30% suggesting the production to be 31,536 MWh/year, which is also used in the estimate of generated emission reductions.

A contract for grid connection to a nearby 110 kV substation has already been signed with Eesti Energia Main Grid business unit and reconstruction of the substation for the purpose will be finalized by Q4 2009.
The wind farm will have separate energy meters at the 110 kV side of the transformer in order to distinguish between the electricity and emission reduction generation of the separate projects.
The metering equipment will be sealed and calibrated and checked periodically for accuracy.

Negotiations with ENERCON for the delivery of wind turbines have been finalized and the wind turbine supplier has been contracted to construct the wind turbine generators on a fixed-priced basis, according to an EPC contract. Local civil construction companies will be sub-contracted for construction of project infrastructure. Technical operation and maintenance of the wind farm will be taken care of by ENERCON in cooperation with Nelja Energia OÜ. The expected technical lifetime of the wind turbines, confirmed by ENERCON, is 20 years.

Tooma Tuulepark OÜ owns 28,2 ha of land where the 6 wind turbines of the JI project will be erected. The detailed land use plan and environmental impact assessment of the project has been approved by local municipality, the technical design of the wind farm is complete and the building permit has been issued. Also grid connection for the wind farm at a nearby substation has been secured.

All necessary agreements for construction and operation of the wind farm are expected to be signed during Q3 2008 so that the implementation of the wind farm can start in Q3-4 2008 and full operation achieved during Q4 2009. The generation of GHG emission reductions will start from the moment of delivery of the first kWh of electric power of the first wind turbine to the power grid (expected by latest on Oct. 1 2009).

A.4.4. Brief explanation of how the anthropogenic emissions of greenhouse gases by sources are to be reduced by the proposed small-scale project, including why the emission reductions would not occur in the absence of the proposed small-scale project, taking into account national and/or sectoral policies and circumstances:

The renewable electricity produced by the wind power plant will displace carbon intensive electricity produced from fossil fuel sources in the Estonian grid.

The JI project has been under development for several years. The project supports Estonia's goals under the Long Term Development Plan for Estonian Fuel and Energy Sector for the promotion of the renewable energy sector. In line with the EU RES directive Estonia's goal is to reach a 5,1% share of renewable electricity in final electricity consumption (RES-E) by year 2010 (current share is ca. 2%). This is assisted by the Electricity Market Act which sets out an obligatory purchase of electricity generated from renewable sources. It should be easy for the country to reach the RES-E target through use of especially biomass powered combined heat and power generation. Thus the incentive to promote the more expensive wind power is limited taken the current goals.

The wind energy sector in Estonia is yet small (currently ca. 60 MW installed) but showing signs of growth. However, large financing barriers exist, and therefore the implementation of all modern wind power projects has been possible only due to utilization of carbon financing through the Kyoto JI scheme. The principal barrier is the low rate of return due to the low feed-in tariff that is not sufficient taken the (increasing) cost of technology.

The tariff is currently fixed at level of 1.15 EEK/kWh (7.35 Euro cents/KWh) and it is valid only until total annual wind power generation reaches 200 GWh which corresponds to ca. 75 MW of installed wind power capacity. As of today ca. 60 MW has already been installed. From that point onwards until annual cap of 400 GWh, the operators are only eligible to receive a subsidy of 0.84 EEK/kWh (5.37 Euro cents/KWh) and sell power at the free market. Beyond the 400 GWh cap, no subsidy is available to the operators, including these operators whose wind farms were put into operation before the cap was reached. Furthermore, Estonian Ministry of Economy has in June 2008 proposed an amendment to the Electricity Market Act that would worsen the investment conditions even further.
Thus there exists a large uncertainty related to the level of support already in the short term.

Here it should also be noted that the wind power developers face additional uncertainties and costs related to very strict grid connection requirements to wind power plants due to which Estonia's largest Viru-Nigula Wind Power Plant was disconnected from the grid in February 2008.

Thus, although Estonia has a support mechanism in place for wind power (albeit insufficient for a commercial return) it is not likely that any future project will proceed without additional cash flows from the Joint Implementation scheme.

The proposed JI project had been under development for several years before AS Vardar Eurus and AS Freenergy took over the shares and control in the privately owned Tooma Tuulepark OÜ.

A.4.4.1. Estimated amount of emission reductions over the crediting period:	
Length of the crediting period	3 years, 3 months
Year	**Estimate of annual emission reductions in tonnes of CO2 equivalent**
2009	8,685
2010	34,739
2011	34,739
2012	34,739
Total estimated emission reductions over the crediting period (tonnes of CO2 equivalent)	112,901
Annual average of estimated emission reductions over the crediting period (tonnes of CO2 equivalent)	28,225

A.4.5 Confirmation that the proposed small-scale project is not a debundled component of a larger project:

The Tooma Wind Power JI Project is not a debundled component of a larger project. There do exist near-by wind turbines and wind power development projects but:
- The Rõuste wind farm (under construction and also developed as a JI project) has different project participants
- The Esivere wind farm (already operating as a JI project) was also developed by different project participants. Positive determination for the JI project was achieved already in May 2006.

A.5. Project approval by the Parties involved:

Written approvals by the Parties involved, including the necessary authorisations, will be attached to the final PDD.

Once the draft determination report is available, the necessary request to issue a host country Letter of Approval will be made to the Designated JI Focal Point of Estonia. To avoid double counting, a JI reserve has been established in Estonia's National Allocation Plan 2008-12 and the LoAs will be issued on first-come-first served basis.

The investor country approval will be issued latest prior to submission of the first verification report to the JI Supervisory Committee.

SECTION B. Baseline

B.1. Description and justification of the baseline chosen:

Approved CDM methodology AMS-I.D./Version 14: Grid connected renewable electricity generation has been applied to the project which is an indicative simplified baseline and monitoring methodology for selected small-scale CDM project activity categories, applicable

The relevant applicability conditions of AMS-I.D. are as follows:

- "This category comprises renewable energy generation units, such ….., wind, …., that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit."
- The capacity of the wind power plant is less than 15 MW.

All of these conditions are met in the case of the proposed Tooma wind power JI project.

For baseline calculation option (a) of AMS-I.D. has been followed. As defined in the methodology the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_2e/kWh) calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin.
More specifically, the Operating and Build Margins have been calculated on the basis of detailed electricity generation and fuel consumption data from years 2003-2005 of 19 Estonia's oil shale, natural gas and other fossil fuels consuming as well as renewable energy plants supplying power to the grid. The below table provides an overview of the aggregate generation and fuel consumption data for these plants.

Table 1. Power Plants' Aggregate Data for Combined Margin

	Capacity	**Generation**			**Fuel consumption for electricity production**		
	(MW)	*Net output (GWh)*			*(TJ)*		
	2006	2003	2004	2005	2003	2004	2005
Total fossil fuel based plants	2 699,2	9 076,4	9 193,6	9 025,8	101 866	101 283	97 682
Total RES plants	54,0	25,0	38,0	88,0	0	0	0
Imports		93,0	347,0	345,0			
Total net output	**2 753,2**	**9 101**	**9 232**	**9 114**	**101 866**	**101 283**	**97 682**
Gross output from plants		**10159**	**10304**	**10205**			
Exports		1989	2141	1953			
Total domestic consumption (incl. PP self consumption**)**		**8077**	**7816**	**7907**			

The average Operating Margin was calculated to be 1,081 tCO2/MWh and average Build Margin was calculated to be 1,164 tCO2/MWh. Applying default weights of the methodology of 0,75 (Operating Margin) and 0,25 (Build Margin) the Combined Margin was calculated to be 1,102 tCO2/MWh. Please refer to the enclosed Baseline Study for more information.

The emission factor from the extensive study of NGO Stockholm Environmental Institute, utilizing then confidential detailed plant-level data, is still applicable as no changes have occurred in the Estonian energy policy that may reduce the share of oil-shale power based power generation during the crediting period of the JI project (2009-12). In contrary, Eesti Energia has during recent years increased the power production at the Narva Power Plants and utilizing the oldest and most polluting power blocks.

Due to the EU directive concerning large combustion plants, the Iru Power Plant had an obligation to close its 1st block from January 2008 (85 MW, 50% of the net capacity of the plant). In addition the price of natural gas has increased remarkably compared to period 2003-5, thus the production at Iru Power Plant has diminished. In connection with establishment of a cable connection between Estonia and Finland and an increase of consumption, the sale of electricity by Eesti Energia has increased compared to period 2003-5

Year	GWh
2002/2003	6 931
2003/2004	7 674
2004/2005	7 983
2005/2006	8 002
2006/2007	7 841
2007/2008	9 716

Source: Eesti Energia 2007/2008 annual report, page 2

As the 1st energy block at Iru Power Plant was closed (where the CO2 emission factor was about three times lower than at oil shale based power plants), and as at the same time the electricity sale of Eesti Energia increased, the Narva Power Plants had to use at a larger extent its older and less efficient production facilities (also emitting more CO2), the CO2 emissions per MWh of generated electricity have not decreased when compared to the emission factor as given in the baseline study used for this JI project.

B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the small-scale project:

Additionality of the project is proven using the ver. 5.2 of the CDM Tool for the Demonstration and Assessment of Additionality as approved by the CDM Executive Board.

Additionality of the proposed project is further supported by recent determinations of wind power JI projects in Estonia, namely Virtsu III, Esivere/VirtsuII and Viru-Nigula wind power JI projects.

Step 1. Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a. Define alternatives to the project activity:

A) The proposed project activity not undertaken as a JI project activity;

B) Continuation of the current situation (no project activity or other alternatives undertaken);
Electric power in the Estonian network will be produced mainly in Narva power plants that will be upgraded and partially closed. This baseline scenario is described in detail in the enclosed Baseline Study where it is proven that this is the only credible future scenario as it is the only one that enables to meet environmental targets set out in local and EU accession legislation, is economically viable, and reflects current renovation projects underway.

Sub-step 1b. Consistency with mandatory laws and regulations:

The existing legal and regulatory requirements in Estonia are in favour of alternative B - continuation of the current situation and is not in favour of alternative A - proposed project activity not undertaken as a JI project activity.

The level of state support to wind power generators and associated risks do not support commercial development of modern wind power plants (Sub-step 2c).

Step 2. Investment analysis

Sub-step 2a. Determine appropriate analysis method

Simple cost analysis (option I) is not applicable for the project as the income from sale of 'carbon credits' is not the only source of revenues for the project.

The *investment comparison analysis (option II)* has neither been used and thus *benchmark analysis (option III) has been applied as a relevant benchmark for Estonia is available.*

Sub-step 2b. – Option III. Apply benchmark analysis

IRR (Internal Rate of Return) and NPV (Net Present Value), as the most common financial feasibility indicators will be used for investment comparison analysis. NPV is the difference in the present values of cash outflows and inflows - the higher the NPV the more attractive the project is for investors. IRR estimates the discount rate used in order to obtain NPV equal to 0. IRR is commonly calculated on total investment (disregarding capital structure and depreciation rate) to compare the project with similar projects or on the equity part of investment, which is relevant indicator for investors.

Sub-step 2c. Calculation and comparison of financial indicators

Given investor requirements and the risks associated with this project, a higher long-term feed-in tariff is required to make the project financially viable if the project is not implemented as a JI project.

In accordance with the Electricity Market Act The tariff is currently fixed at level of 1.15 EEK/kWh (7.35 Euro cents/KWh) and it is valid only until total annual wind power generation reaches 200 GWh which corresponds to ca. 75 MW of installed wind power capacity. As of today ca. 60 MW has already been installed. From that point onwards until annual cap of 400 GWh, the operators are only eligible to receive a subsidy of 0.84 EEK/kWh (5.37 Euro cents/KWh) and sell power at the free market. Beyond the 400 GWh cap, no subsidy is available to the operators, including these operators whose wind farms were put into operation before the cap was reached. Furthermore, Estonian Ministry of Economy has in June 2008 proposed an amendment to the Electricity Market Act that would worsen the investment conditions even further.
Thus there exists a large uncertainty related to the level of support already in the short term.

No financing from EU or other multilateral or bilateral sources is available for wind power projects in Estonia.

Given investor requirements and the risks associated with the renewable electricity support scheme, additional revenue is required to make the project financially viable. Financial modelling proves that the financial income from sale of Emission Reduction Units during 2008-12 improves the IRR of the equity investment by ca. 1,6 percentage points (from 6,5% to 8,1%) and turns the NPV of the project from negative to positive.
The expected IRR of the JI project can be compared to the weighted average cost of capital (WACC) established by the Estonian Competition Authority when approving the price calculation methodology for Estonian energy sector companies. The WACC today stands at around 8.7% (also for state power utility Eesti Energia) and is a relevant benchmark to compare the profitability of the wind power JI projects. According to the Competition Authority the WACC will further increase in 2009 due to the changes in financial environment.[1] The IRR of Tooma Wind Power JI project without the revenue from sale of carbon credits (6,5%) is significantly below this indicated benchmark and it would in this case be more attractive for the developers to undertake investments in other energy sectors when compared to the Tooma wind power project.

[1] Source: Explanation of calculation of average cost of capital (WACC). Estonian Competition Authority

Step 3. Barrier analysis

Sub-step 3a. Identify barriers that would prevent the implementation of type of the proposed project activity:

One of the key barriers listed in the tool for additionality assessment is, "investment barriers…no private capital is available from domestic or international capital markets due to real or perceived risks associated with investment in the country…."
This is the case with this wind power project in Estonia, as no debt as well as equity funding would be available if the project did not have JI status. JI revenue has been considered since the early stages of development of this project and is an integral part of the project financing. A prepayment for the carbon credits is also of large value taken today's difficult situation at the financial markets..

Sub-step 3b. Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

Fossile fuel based power does not face the same limitations on availability of finance. More importantly the identified baseline scenario does not require external funding, but can be financed internally by Eesti Energia.

Step 4. Common practice analysis

Sub-step 4a. Analyze other activities similar to the proposed project activity:

As explained earlier, all larger modern wind farms in Estonia have been implemented due to additional (expected) cash-flows from the JI scheme. The following table lists the main wind power JI projects and developments.

Table 2. Operating and Planned Wind power JI projects in Estonia

Name	Established/ Planned	Capacity, MW	Carbon credit purchaser	Owner
Pakri	2005	18.4	Finland	Pakri Tuulepark OÜ
Viru-Nigula	2006	24.0	Sweden/TGF	Viru-Nigula Tuulepark OÜ
Esivere/Virtsu2	2005/2008	8.0/6.9	Austria	Roheline Ring Tuulepargid OÜ
Rõuste	Commissioning 2009	12.0	Finland	Skinest Energia
Virtsu III	Planned 2010	6.9	Austria	Roheline Ring Tuulepargid OÜ
Vanaküla	Planned 2010	9.0	TGF	Vanaküla Tuulepark OÜ
Paldiski	Planned	50.6	Holland	Paldiski Tuulepark OÜ
Türisalu	Planned	22.0		Paldiski Stevedoring OÜ
Tamba/Mäli	Planned	18.0		Paldiski Stevedoring OÜ
Aseri	Planned	24.0		WindEst Green Energy

Only one large wind farm, the Aulepa 40 MW wind farm, has not been developed as a JI project. The reason is that the project owner is the national utility Eesti Energia which is operating the oil-shale based power plants and thus has the possibility to benefit from the EU ETS scheme once the Aulepa wind farm starts to generate emission reductions. Originally this project was also developed as a JI project (incl. listing in the draft JI reserve of NAP) before the state utility acquired it from private developers. In addition the relevance of carbon financing is smaller as the state utility has access to cheaper financing and can also afford a longer payback of the investment as it has other reasons than just commercial to implement renewable energy projects.

Sub-step 4b. Discuss any similar options that are occurring:

No similar options are occurring for the time being or are foreseen to occur in the mid-term future.

B.3. Description of how the definition of the project boundary is applied to the small-scale project:

As defined in AMS-I.D. the project boundary encompasses the physical, geographical site of the renewable generation source – i.e. it is drawn simply around the physical boundary of the wind power plant. The project activity will reduce the equivalent electricity production on the grid.

The spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the project power plant is connected to. The project electricity system is the Estonian National Grid, because the power plants on that system can be dispatched without significant transmission constraints. The plants and their characteristics are presented in Annex A of the Baseline Study. In addition, the electricity system in neighbouring Russia and Latvia are considered connected electricity systems. Imports from connected electricity systems in other countries are taken as having an emission factor of 0 (zero).
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B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline:

Baseline Study date: November 6 2006

Conducted by: Valdur Lahtvee and Dr Tiit Kallaste, Stockholm Environment Institute Tallinn Centre.
Tel: + 372 6276100

The above study has been used in several recent grid connected wind and other renewable JI projects (Virtsu III wind power, Jägala-Joa hydropower) that have obtained positive determinations by TÜV-SÜD. Several earlier baseline studies (e.g. in connection with Esivere/Virtsu II Wind Power JI Project) have also indicated a similar carbon emission factor for the Estonian power sector over the chosen crediting period. See also an explanation in section B.1 why the emission factor as defined in the above baseline study can still be considered to be conservative.

Stockholm Environmental Institute is not considered as a project participant.
The person who decided to use the above baseline study and is responsible for proper application of it is Hannu Lamp, Tel: +372 6 306 408.

SECTION C. Duration of the small-scale project / crediting period

C.1. Starting date of the small-scale project:

The wind farm construction has started on February 1 2009.

C.2. Expected operational lifetime of the small-scale project:

20 years, 0 months

C.3. Length of the crediting period:

Crediting period: 3 years, 3 months (Oct. 1 2009 – Dec. 31 2012)
Starting date: Oct. 1, 2009

Pending decisions on the framework for generation and transfer of emissions reduction credits post 2012, the project developer will seek the right to earn carbon credits for the period 2013 to 2017 in addition to emission reductions units (ERUs) generated under the first commitment period of the Kyoto Protocol (2009 to 2012).

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

As defined in AMS-I.D "monitoring shall consist of metering the electricity generated by the renewable technology."

Thus only net electricity supplied by the Tooma wind power plant to the Estonian electricity grid will be monitored.

D.2. Data to be monitored:

Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1	EG_y – Net electricity supplied to the grid	Project proponent	kWh	Measurement. Directly measured with electricity meter, and checked with sales data	Constant recording	100%	Electronic and in paper form	See below.*.

* Data will be aggregated monthly and yearly and double checked with receipt of sales, with the SCADA system as a back-up. The wind power plant will have a separate power meter than other wind power plants connected to the same substation.

D.3. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:		
Data (Indicate table and ID number)	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1. EG_y	The maximum allowed deviation of the meters is 0,5% (at 110 kV) and their verifications has to be carried out at minimum every eight years.	As explained above data will be directly measured with metering equipment at the connection point of Tooma wind power plant to the Eesti Energia's grid at the 110 kV side of the transformer. All equipment will be sealed, calibrated and checked periodically for accuracy. In addition: - all metered data will be double checked by receipts of electricity sales, with SCADA system as back-up and - an internal double control system is implemented whereby the production data is cross-checked with the readings of power meters. The power meter values will be written down at least three times a year

D.4. Brief description the operational and management structure that the project operator will apply in implementing the monitoring plan:

Please find details of a.o. the operational and management structure in the enclosed Monitoring Plan (annex 3).

Data collection

ID number	Data variable	Responsible person	
		Name	**Position and department**
MP1	EGy – Net electricity supplied to the grid (kWh)	Martin Kruus	Member of the Management Board

D.5. Name of person(s)/entity(ies) establishing the monitoring plan:

Martin Kruus, Tooma Tuulepark OÜ. Tooma Tuulepark OÜ is also a project participant as listed in annex 1.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions and formulae used in the estimation:

Wind power does not create any anthropogenic greenhouse gas emissions in operation, so project emissions are zero.

E.2. Estimated leakage and formulae used in the estimation, if applicable:

No leakage estimate is required in ACM0002 for wind power.

E.3. The sum of E.1. and E.2.:

Since there are no leakages: E.1 + E.2 = E.1 (0)

E.4. Estimated baseline emissions and formulae used in the estimation:

Baseline emissions (BE) are calculated as following:

BE_y (tCO_2) = EG_y (MWh) x EF_y (tCO_2/MWh)
EG_y – Net electricity supplied to the grid
EF_y – Emission factor of the Estonian grid

Please refer to the enclosed Baseline Study using ACM0002 methodology for detail on how the emission factor is calculated for the Estonian grid.

	2009	2010	2011	2012	∑ 2009-2012
Baseline emissions (in t CO_{2e})	8,685	34,739	34,739	34,739	112,901

E.5. Difference between E.4. and E.3. representing the emission reductions of the project:

	2009	2010	2011	2012	∑ 2009-2012
Baseline emissions = Emission reductions (in t CO_{2e})	8,685	34,739	34,739	34,739	112,901

E.6. Table providing values obtained when applying formulae above:

Year	Estimated project emissions (tonnes of CO2 equivalent)	Estimated leakage (tonnes of CO2 equivalent)	Estimated baseline emissions (tonnes of CO2 equivalent)	Estimated emission reductions (tonnes of CO2 equivalent)
Year 2009	0	0	8,685	8,685
Year 2010	0	0	34,739	34,739
Year 2011	0	0	34,739	34,739
Year 2012	0	0	34,739	34,739
Total (tonnes of CO2 equivalent)	0	0	112,901	112,901

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party:

In accordance with the Estonian Environmental Impact Assessment and Environmental Management System Act par. 35, which is in line with the respective EU EIA legislation, Environmental Impact Assessment (EIA) is initiated for energy sector projects (that may cause considerable environmental impact) during the preparation of strategic planning documents.

The environmental impacts of the wind turbines of Tooma wind farm have been assessed as part of SEIAs for Esivere and Rõuste wind farms. The SEIA for Esivere wind farm also included the "Tooma" land plot (cad no 19501:002:0129) where 4 wind turbines of Tooma project will be erected. The EIA was carried out in 2003 (report no KMH-01-03) by an independent expert company OÜ Vetepere (EIA license KMH0068, contact person Aare Kuusik).
The EIA of Rõuste wind farm, carried in 2002 by Hendrikson & Ko, also included the "Rebasekivi" land plot (cad no 19501:002:2090), where two wind turbines of Tooma project will be erected.

The lack of need to compose a new EIA in addition to existing EIA for already operating Esivere wind park has also been confirmed by Head of Hanila Municipality Mr. Arno Peksar on 19 August 2003 (reg. no. 9-3.3/1365).

F.2. If environmental impacts are considered significant by the project participants or the host Party, provision of conclusions and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

The findings of the EIA of Esivere wind farm (including turbines of "Tooma" land plot) describe that there is no material impact on environment from the construction and operation of the wind park. The EIA paid special attention to an impact of wind power generation to people, incl. impact from noise,

visual and shadow effects. EIA also relied on the results of an EIA carried out in 2002 for a near-by Rõuste wind farm development project. The main conclusions of the EIAs are:
Wind power generation is environmental friendly as it reduces the use of non-renewable oil-shale for electricity generation and thereby reduces the emission of CO2, NOx and SO2 into atmosphere.
There are few negative impacts associated with the activity and they do not influence the environment significantly. These include:
- Some of the existing flora is destroyed,
- The rotating blades cause danger to birds,
- Temporary banning of movement in the area during wind farm construction,
- Impact on people due to noise and shadow,
- Limitation to planning of new residential areas due to noise,
- It is recommended to design the wind farm area as a low vegetation (wind) park open for the public.

Lääne County Regional Environmental Department has approved the EIA and made the recommendation that surveillance of birds prior and after the construction of the wind farm is recommended to be carried out during a period of min. 3 years in order to obtain more data on basis of which it can be decided whether mitigation measures should be taken to reduce the death of birds.

The EIA of Rõuste wind farm (including turbines of "Rebasekivi" land plot) assessed the impact on birds to be average (scale none-low-average-high) due to bird migration routes, however pointed out that there is no risk on bird habitation disturbance. The impact on flora and landscape was assessed to be small and insignificant as the civil works would be done on an area of little biological value. No houses are located within the noise-impacted area.

SECTION G. Stakeholders' comments

G.1. Information on stakeholders' comments on the project, as appropriate:

Stakeholder comments have been invited and compiled in accordance with all local planning legislation as outlined below.

According to the Planning Act (effective since January 2003), the planning system in Estonia is four levels – National planning, County planning, (Municipal) Comprehensive planning and Detailed planning. On the one hand the planning system is hierarchical, i.e. the more Detailed Land Use Plan has to observe the more general plan. On the other hand – it is interactive, i.e. in case a more detailed plan requires modification of a more general plan, the necessary change comes into effect with enforcement of the more detailed plan.

A Detailed Land Use plan is a plan that is prepared for a smaller part of a town municipality and is the basis for building activities in the short term. The local municipality organises the production of the plan and communication with the public during the planning process. The municipality can transfer organisation and financing of detailed planning to the owner of the land under planning or to a person interested in plan preparation with conclusion of a contract. That is common practice and this is also the case with the Tooma wind farm where Hanila Municipal Government has prepared a Detailed Land Use Plan for the establishment of the wind farm at the chosen site. On Hanila municipality comprehensive planning map Tooma wind park is located within the boundaries of the designated reserve area for wind power generation.

The preparation of the Detailed Land Use Plan is public. It has to be produced in cooperation with the owners of immovable property and inhabitants of the area as well as other stakeholders. Preparation of the plan includes minimum one public discussion and a two-week public display after the adoption of the plan by the local government. In addition, the plan requires approval of corresponding sectoral authorities. Any written suggestions and comments during the public display will be answered by the local municipality, which in this case will also organise a new public discussion. Possible planning disputes will be settled by the county governor. If no objections to the plan arise during the public display, the plan will be enforced by the municipal council.

Arrangement of public discussions has to be pre-announced in the newspaper selected for official announcements by local municipality. Public meetings related to environmental impact assessment and detailed land use planning can be held at the same time.

Stakeholder consultation for Rebasekivi land plot (cad no 19501:002:2090) – 2 wind turbines of Tooma wind farm

The detail planning process of Rebasekivi land plot was initiated on 15 January 2002 basing on the resolution no. 116 by Hanila municipal government. A public meeting in connection with the Detailed Land Use Plan and EIA of the Rõuste wind power project (Rebasekivi land plot) was held on 15 May 2002 and attended by 11 people from municipal government, local inhabitants, environmental service, EIA compiler Hendrikson and Ko, detail planning compiler OÜ Urban Mark, national newspaper Maaleht and the project developer.
At the meeting Ms. Jana Morozov from developer Renewable Energy Group OÜ (then the owner of Rebasekivi land plot and the wind park project) and Ms. Maarja Zingel from OÜ Urban Mark presented the project and starting points for detailed planning and EIA process. Environmental service and municipality representatives asked about stone fences and Natura 2000 areas. Head of Municipality Mr. Arno Peksar explained that the area is outside Natura 2000 areas and the stone fences on the planning area are not under heritage protection. Neighbouring land plot owner Mr. Heino Piirsalu asked about the construction limitations around the wind turbines and minimum distance between two turbines, environmental service representative Ms. Malle Piirsoo asked about ground water level and the size of foundations. Mr. A. Peksar explained that the area has been thoroughly explored geologically, and is still being explored. Two sets of positioning were proposed during the meeting. Ms. M. Piirsoo preferred option no. 2 and Ms. M. Zingel pointed out that in this case the noise impact on Mr. H. Piirsalu's land property must be studied in more detail.

Another public meeting in connection with the Detailed Land Use Plan and EIA of the Rõuste wind power project (Rebasekivi land plot) was held on 21 February 2003 and attended by 8 people representing local people, environmental service, EIA compiler Hendrikson and Ko, municipal government and the project developer.
Neighbouring land plot owner Mr. Heino Piirsalu (not present) had submitted a written proposal to change the location because he could not erect another wind turbine on his land if he wanted due to the minimum distance of 250 m between the turbines. He also expressed a concern that the plant could interfere the radio phone on Kikka land plot cottage. Head of Municipality Mr. Arno Peksar had talked to Mr. Peeter Turnau from Eesti Telefon and received information that fix-mobile would be interfered by big electric transformers, and if Rõuste substation nearby has not interfered the signal, wind turbines are even less likely to do that. Environmental service representative Ms. Malle Piirsoo asked specifying questions about the size of land plot, hub height, and wind measurements. The differences were caused by various drafts of the document, Ms. Agne Peetersoo from Hendrikson & Ko. promised to correct the discrepancies in the final report.

Läänemaa county planning office approved the detail plan and EIA on 21 January 2003, Hanila municipality and Läänemaa county rescue service on 23 January 2003 and Läänemaa county environmental service on 26 March 2003. After the public meetings, on 26 March 2003 Läänemaa county municipality instituted the detail planning for "Rebasekivi" land plot basing on the detail plan composed by Urban Mark OÜ and Hanila municipality enforced the detail planning by resolution no. 40.

Stakeholder consultation for Tooma land plot (cad no 19501:002:0129) – 4 wind turbines of Tooma wind farm

The detail planning process of Tooma, Tuuliku, Kadastiku and Kivililles land plots (the latter three are the land plots where existing Esivere 8,0 MW wind park is situated) was initiated on 16 July 2003 basing on the resolution no. 51 by Hanila municipal government. The proposal for EIA was submitted by Roheline Ring OÜ (then the owner of Tooma land plot) on 31 July 2003.
The first public discussion of the Detailed Land Use Plan and Environmental Impact Assessment programme of Esivere Wind Farm was held in September 2003 at Hanila municipality government building, The meeting was attended by the wind farm developer Mr. Ink, author of the detailed land use plan from OÜ Ösel Plan Mr. Kaseorg, an EIA expert Mr. Kuusik, representative of the Lääne County Regional Environmental Department Ms. Piirsoo, representatives of the municipal government (Mr. Tanissar, Mr.Vepsi) and a self-employed wind power developer Mr. Tormis.
At the meeting Ms. Piirsoo raised concern of the depth of wind turbine foundations in relation to the limestone layer and of whether her comments to the EIA have been taken into account. Mr. Ink said that the foundation will not reach the limestone layer which was also the case with Virtsu1 wind farm. Mr. Kuusik said that they have taken the comments of Ms. Piirsoo into full account. In addition, Mr. Ink stated that until today no collisions have been registered or dead birds found. Experts agreed to all comments and the EIA report was accordingly supplemented. Mr. Tanissaar stated that the airport at the wind farm area was established during World War II not World War I.
The second public discussion of the EIA report was held in October 2003. The meeting was attended by the representatives of Hanila municipality (Mr. Peksar, Mr. Tanissaar), an EIA expert Mr. Kuusik, Mr. Ink from Roheline Ring OÜ and Ms. Piirsoo from Lääne County Regional Environmental Department. Mr. Peksar informed no comments were received to the EIA during public display, interest was shown by a local person and Estonian Environmental Fund. Mr. Kuusik introduced the results of the environmental impact assessment. Ms. Piirsoo proposed that employees of North-East Estonia industrial area should not be considered as project stakeholders and that the EIA report should mention the worsening of quality of drinking water due to the activity of AS Nordkalk. Experts agreed. Ms. Piirsoo also proposed to add the site plan of the wind farm to the EIA report. Mr. Ink agreed.
Neither the Detailed Land Use Plan nor EIA of the Esivere project received any relevant comments during their public display.

All minutes of public meetings related to stakeholder consultations are available upon request.

Annex 1

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Annex 2

BASELINE STUDY

Please see enclosed document “Estonian JI Project Development Baseline Study”, Stockholm Environment Institute Tallinn Centre, Tallinn, November 2006

Annex 3

MONITORING PLAN

Please see enclosed document “Monitoring Plan of Tooma Wind Power Joint Implementation Project”, Ver. 1.1 May 18 2009.