Determination Report

Determination of the "Viru-Nigula Wind Farm JI-Project", Estonia, Track 1

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TÜV SÜD Industrie Service GmbH,
Carbon Management Service
Westendstr. 199 - 80686 Munich - GERMANY

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Executing Operational Unit:	TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 – 80686 Munich - GERMANY
Client:	Swedish Energy Agency (STEM) P.O. Box 310 SE 631 04 Eskilstuna Sweden
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Summary:

The Certification Body "Climate and Energy" of TÜV SÜD Industrie Service GmbH has been ordered by the Swedish Energy Agency in Eskilstuna, Sweden, to determine the above mentioned project according to the Track 1 procedure.

Using a risk based approach, the validation of this project has been performed by document reviews and on-site inspection, audits at the locations of the project and interviews at the offices of the project developer.

There are no unresolved corrective action requests (CAR) or clarification requests (CR)/ additional information requests (AI). As result of this procedure, it can be confirmed that the submitted project documentation is in line with all requirements set by the Marrakech Accords and the Kyoto Protocol and relevant guidelines of Estonian Designated National Focal point.

Additionally the assessment team reviewed the estimation of the projected emission reductions.

The eligibility criterion regarding Designated Focal Point and National JI-Guidelines of the host country is a crucial one. Complying with that eligibility criterion is pre-required for approval of the project by Estonia as Track 1 and submission to UNFCCC for publication at website as JI Track 1. The determination has been conducted according to Track 2 JISC requirements, something which covers the potential national requirements.

We can confirm that the indicated amount of 330.127 tons CO_2 (ERUs) during the intended ERU crediting period from January 1st, 2008 – December 31st, 2012 and the indicated amount of 49.661 tons CO_2 early emission reductions during the intended early emission reduction period from February 1st, 2007 – December 31st, 2007 represents a conservative estimation using the assumptions given by the project documents.

Work carried out by:	Klaus Nürnberger (Project manager), Thyge Weller (Technical Expert, GHG auditor) Ranno Mellis (Local Expert, GHG Trainee)	Internal Quality Control by: Thomas Kleiser

Abbreviations

AE	Applicant Operational Entity
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CR	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER(U)	Emission reduction (unit)
GHG	Greenhouse gas(es)
IRL	Information Reference List
JI	Joint Implementation
KP	Kyoto Protocol
MP	Monitoring Plan
NEFCO	Nordic Environment Finance Corporation
NGO	Non Governmental Organization
PDD	Project Design Document
STEM	Swedish Energy Agency (Energimyndigheten)
TGF	Baltic Sea Region Testing Ground Facility (part of NEFCO)
TÜV SÜD	TÜV Industrie Service GmbH (TÜV SÜD Group)
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

The Swedish Energy Agency (STEM) in Eskilstuna, Sweden, has commissioned TÜV Industrie Service GmbH TÜV SÜD Group (in short: TÜV SÜD) to make a determination of the "Viru-Nigula Wind Farm" JI-project with regard to the relevant Track-2-requirements for JI project activities. The project participants have nevertheless officially requested later on the switch of this project from Track 2 to Track 1 procedure. The purpose of a validation is to have an independent third party assess the project design. The determination serves as a design verification and is a requirement for all JI projects submitted to the JISC.

The purpose of a determination is to have an independent third party assess the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are determined in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Determination is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of early emission reductions and Emission Reduction Units (ERUs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

1.2 Scope

The determination scope is defined as an independent and objective review of the project design document (PDD), the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has employed a risk-based approach in the determination, focusing on the identification of significant risks for project implementation and the generation of ERUs and early emission reductions. The project also has to be checked against specific national requirements of the host country as defined in the "national regulations and procedures" as well as - if applicable - specific requirements set by the investor party.

The determination is not meant to provide any consulting towards STEM. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

The audit team has been provided with a draft PDD in August 2005 with the goal to pursue a track-1-determination as a design verification as required for all JI projects submitted to the Swedish CDM / JI Pilot Programme and for projects in which NEFCO takes a share. Those documents were thoroughly reviewed and comments were sent back. A fact finding mission in form of an on-site audit has taken place August 16 – 19, 2005. In December 2005 a revised final PDD (version 1) has been submitted. January 10, 2006 a first version of the final determination report according to JISC-guidelines was sent to STEM.

Additionally to above mentioned "track-1-determination" the Certification Body "Climate and Energy" of TÜV SÜD Industrie Service GmbH has been ordered at February 9, 2007 by the Swedish Energy Agency in Eskilstuna, Sweden, to accomplish a determination of the above mentioned project according to track 2 of the JI-rules. The audit team has been provided with a revised PDD (version 1, dated January 22, 2007). It served as the basis for the public stakeholder process (January 27, 2007 – February 25, 2007) and the assessment presented herewith. The document was thoroughly reviewed and a first determination protocol (version 1) was sent back, including 4 CARs and 6 CRs. Another PDD (version 2) was issued April 30 2007 already reflecting the requested additional information as described in the CARs and CRs, and last remaining CARs / CRs were resolved by PDD version 3, issued June 5, 2007. Some more clarifications were requested as a result of TÜV SÜD's internal quality assurance process. They were included in another version of the PDD (version 4, issued October 29, 2007). The changes in versions 2 to 4 are not considered to be significant with respect to the qualification of the project as a JI project based on the two main objectives of the JI to achieve a reduction of anthropogenic GHG emissions by sources and to contribute to sustainable development. Hence no repetition of the public stakeholder process has taken place.

1.3 GHG Project Description

The objective of the "Viru-Nigula Wind Farm" Project is to generate renewable electricity using wind power resources and to sell the generated output to the Estonian grid operator Eesti Energia on the basis of a power purchase agreement (PPA). The project activity will generate greenhouse gas (GHG) emission reductions by avoiding CO_2 emissions from electricity generation mainly by oil shale power plants that supply more than 90% of the Estonian electricity production.

The Viru-Nigula Wind Farm Project is located at the north coast of Estonia, some 125 km east of Tallinn. The distance to the Baltic Sea is about 7 km. The project involves the installation of 8 Finnish WinWinD turbines with a capacity of 3,0 MW each, providing a total capacity of 24 MW. The wind parks feeds into the Estonian national grid a total estimated supply of 60.570 MWh per year, at a projected load factor of 29 percent.

Project participants are

- Viru-Nigula Tuulepark OÜ, Tallinn, Estonia, the owner and operator of the wind farm
- STEM, the Swedish Energy Agency as buyer of the early emission reductions / ERUs
- NEFCO, the Nordic Environment Finance Corporation, Helsinki, Finland, in its capacity as Fund Manager to the Baltic Sea Region Testing Ground Facility (TGF)

The wind farm construction started October 27, 2005 (begin of foundation works). The starting date of the wind farm was February 1, 2007. The crediting period for ERUs will start January 1, 2008. The pre-JI emission reduction period has started February 1, 2007. According to the LoA from Estonia these ERs are covered by AAUs.

The generated early emission reductions and ERUs are supplied by Viru-Nigula Tuulepark OÜ. The project documentation has been developed by Intercon Energy OÜ, Tallinn, and WSP Environmental, Vaasa, Finland. Both companies act as technical advisors to the project and are not formally project participants.

2 METHODOLOGY

In order to ensure transparency, a determination protocol was customised for the JI project. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The determination protocol serves the following purposes:

- It organises, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process where TÜV SÜD has documented how a particular requirement has been validated and the result of the determination.

The determination protocol for this JI project consists of three tables. The different columns in these tables are described in Figure 1.

The completed determination protocol is enclosed in Appendix A to this report.***Determination Protocol Table 1: Mandatory Requirements***			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the determination report.* ***O** is used in case of an outstanding, currently not solvable issue, **AI** means Additional Information is required.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent determination process.*

Determination Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in six different sections. Each section is then further subdivided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** or **Additional Information** is used when the independent entity has identified a need for further clarification or more information.*

Determination Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action and additional Information requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Determination conclusion***
If the conclusions from the draft determination are either a Corrective Action Request or a Clarification or Additional Information Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification or Additional Information Request is explained.*	*The responses given by the Client or other project participants during the communications with the independent entity should be summarised in this section.*	*This section should summarise the independent entity's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

Figure 1 Determination protocol tables

2.1 Review of Documents

As mentioned in section 1.2 the audit team has been provided with a PDD (version 1, dated January 22, 2007). It served as the basis for the public stakeholder process (January 27, 2007 – February 25, 2007) and the assessment presented herewith. The document was published on the TÜV SÜD website www.netinform.net and on the JISC-website. The document was thoroughly reviewed and a first determination protocol (version 1) was sent back, including 4 CARs and 6 CRs.

2.2 Follow-up Interviews

As part of the JI track-1-determination, TÜV SÜD performed interviews with project stakeholders to confirm selected information in the period of August 16 – 19, 2005. Representatives of the project developer Intercon Energy, the Estonian grid operator Eesti Energia, of the wind farm owner Viru-Nigula Tuulepark OÜ and of STEM were interviewed. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Intercon Energy	➢ Project design ➢ Technical equipment ➢ Sustainable development issues ➢ Additionality ➢ Crediting period ➢ Monitoring plan ➢ Management system ➢ Stakeholder process ➢ Approval by the host country
Eesti Energia	➢ Baseline determination ➢ Monitoring plan ➢ Environmental impacts ➢ Stakeholder process
Viru-Nigula Tuulepark OÜ (Estonian project participant)	➢ Technical equipment ➢ Environmental impacts ➢ Stakeholder process ➢ Monitoring plan ➢ Management system
STEM	➢ Project design ➢ Sustainable development issues ➢ Crediting period ➢ Additionality

As part of the track-2-determination no additional on-site audit was performed. Information exchange was by mail and telephone.

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination is to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for TÜV SÜD's positive conclusion on the project design.

The findings and comments during the follow-on interviews were recorded in the determination protocol with 4 CARs and 6 CRs. Some of them were resolved in PDD v2 (April 30, 2007), but the majority was resolved in PDD v3 (June 3, 2007). No open CARs and CRS remained.

To guarantee the transparency of the determination process, the concerns raised and the responses given are summarised in chapter 3 below. The whole process is documented in more detail in the determination protocol in Appendix A.

3 DETERMINATION FINDINGS

In the following sections the findings of the determination are stated. As the findings of the track-1-determination have already been included into the initial PDD of this track-2-determination only findings from the track-2-determination have to be covered. The determination findings for each determination subject are presented as follows:

1) The findings from the review of the PDD (v.1, 2,3 and 4) and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Determination Protocol in Appendix A.

2) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, has been issued. The Clarification, Corrective Action Requests and Additional Information Requests are stated, where applicable, in the following sections and are further documented in the Determination Protocol in Appendix A.

3) Where Clarification Requests and Additional Information Requests have been issued, the exchanges with OÜ Intercon Energy and OÜ Nelja Energia to resolve these Clarification and Additional Information Requests will be summarized in the determination report.

4) The conclusions of the determination are presented consecutively.

3.1 Project Design

3.1.1 Findings

The planned wind turbines are of an innovative design (permanent magnets, planetary gear) and the first turbines of the 3-MW-class in Estonia. Hence, the employed technology goes even beyond established good practice in the host country. It is, moreover, not likely that the project technology will be substituted by a more efficient technology. The operation of the turbines is online monitored by the manufacturer's service center. On-site support is guaranteed by the manufacturer's specialists and - after a first period of 2 years – by local specialists, who will be thoroughly trained before.

Estonia has appointed a national focal point to UNFCCC and has ratified the Kyoto Protocol. Also a DFP is officially nominated. The project has been approved by the Estonian government, represented by the Ministry of the Environment. The project ERUs are included in the second reserve of the Estonian NAP (2008 – 2012). (Hanna must deliver a confirmation)

From the Swedish designated national authority (Swedish Energy Agency [STEM], Climate Change Unit, www.stem.se) two LoAs exist. One LoA covers the role of STEM as purchaser, the other one the role of NEFCO as purchaser. NEFCO's role in the project is to act as Fund Manager to the Baltic Sea Region Testing Ground Facility (TGF).

The project starting date is clearly defined. In the PDD the term crediting period is used in two senses - either as the Kyoto crediting period including only ERU issuance or the total crediting period, including also the early credits (2007-2012). The ERU crediting period is defined as being from January 1, 2008 to December 31, 2012. Also the operational lifetime of the project is clearly defined and in accordance with international practice.

3.1.2 Issued CARs / CRs

Corrective Action Request 3:
When mentioning "crediting period" in the PDD indicate clearly which period is meant.

Response:
The CAR has been resolved by changes in the PDD v2. The meaning of the term "crediting period" is now clearly understandable in each specific case.

3.1.3 Conclusion

There are no open CARs / CRs. The project fulfils the prescribed requirements.

3.2 Baseline

3.2.1 Findings

The application, discussion and determination of the chosen baseline methodology is transparent. The application follows the steps outlined in the methodology and answers the corresponding sections in a proper manner.

The baseline of the JI-project is established in a project specific manner and is based on the assumption that the Narva power plants are upgraded and partially closed (refurbishing of 200 MW units at Eesti and Balti power stations from pulverized bed to circulating fluidized bed combustion technology by 2005/2006, and closing down of units 1 - 8 at Balti power station). These upgrades are contained in the National Fuel and Energy Development Plan. The baseline is a plausible assumption and appropriate. The calculation of Operating Margin and Build Margin follows the approach of the Estonian JI-project "Esivere and Virtsu II Wind Power Developments" (OÜ Roheline Ring, Kuressaare, Estonia, February 2005). These factors will be applicable throughout the whole crediting period.

The generation of the turbines is based on long-term local wind measurements. A professional and thorough assessment of the energy production was performed by an independent consult-

ing company. Additionally to the technical losses a "commercial safety margin" of 7,5% was introduced. The chosen yearly energy production of 60,57 GWh/a considers therefore all known risks and can be regarded as conservative.

Also the baseline carbon emission factor is determined in a transparent manner.

The Operating Margin was calculated using the simple OM approach. The emission factor for the first crediting period (5 years when considering only ERUs, 5 years 11 months when including the early credits) has been determined for the validation ex-ante. Basis were the years 2003 - 2005; these were the most recent years for which all needed data were available. All plant specific emission data were available.

The Build Margin has been calculated using option 1 of the ''Tool to calculate the emission factor for an electricity system'' (calculate build margin emission factor ex-ante based on the most recent information available on plants already built) by using the data of those 2 power plants which contribute more than 20% of the system generation (basis: 2005). All data are derived from official national statistics or other publicly available sources.

The (implementation of the) envisaged wind park project is additional. Detailed financial modelling and sensitivity analysis shows that the existing Estonian feed-in tariff results in a low rate of return in the year of the investment decision (6,23%) in the year of the investment decision.

Additionally to the applied Step 2 "investment analysis" of the CDM ''Tool for the demonstration and assessment of the additionality'' it is shown in Step 3 "Barrier analysis" that the investment barriers are considerable. No large wind turbine exists in Estonia which is not supported by a JI-project or other grants. It is the sale of early emission reductions / ERUs which make such projects viable. Evidence was given that JI revenue has been considered from the beginning.

Taking into account the estimation of generation and the respective financial attractiveness the implementation of the wind park project can be considered as additional. The project fulfils all prescribed requirements completely.

3.2.2 Issued CARs / CRs

Corrective Action Request 1:
Indicate version number of chosen methodology in PDD.

Response:
The CAR has been resolved by changes in the PDD v4. The version number of the chosen methodology has been mentioned in section B.1 (ACM0002 / Version 06; (19 May 2006). At the same time the somewhat confusing numbering scheme of the PDDs was changed.

Corrective Action Request 2:
Include plant Iru in BM calculation or explain in detail why it is excluded from the BM calculation.

Response:
The CAR has been resolved by changes in the PDD v3. In the BM calculations plant Iru has been included to 100% and plant Eesti to 100%. Based on the most recent information from year 2005 $EF_{BM,2005}$ was re-computed and changed from 1,16 to 1,12.

Clarification Request 1:

The baseline values for the year 2003 differ somewhat from the values used in the baseline calculation of the former project determination. Explanation of those differences is needed.

Response:
The CR has been resolved by PDD v2. The former project determination (finalized 2005) included years 2001-2003. The current project determination includes years 2003-2005 based on available data by the end of 2006. Statistics for 2003 available in 2005 and 2007 differed. According to the principle that best available data have to be used to compute the emission factor the newest available data for 2003 have been used, as it can be assumed that they are more reliable than earlier data.

Clarification Request 2:
There is no derivation of the electricity production of the year 2007. Please explain.

Response:
The CR has been resolved by PDD v2. The electricity production for 2007 and for the other years is now clearly presented. Electricity production of the year 2007 includes estimated production for months April-December, totally 45 558 MWh. A preliminary timetable for each wind turbine (1-8) was added to the PDD (table 5). A commercial safety margin was introduced in the calculation by excluding months February and March.

Clarification Request 3:
Updated financial calculation spreadsheets are needed to check the PDD-statements (including sensitivity analysis) and the applied formulae.

Response:
The CR has been resolved by PDD v3.

The additional information given as response to the original CR3 led to new requests which have been answered in detail by additional information.

The Swedish Energy Agency called for JI-proposals on 30. July 2003 (see IRL 27). The Viru-Nigula Wind farm PDD was presented to the Swedish Energy Agency on 1 Sept. 2003. At this the expected feed-in tariff was 0.051 €/kWh for the following 12 years. This feed-in tariff was still expected in the Final PDD_ver0 (22. Nov. 2005). Based upon these calculations Vardar Eurus decided to invest in OÜ Viru-Nigula Tuulepark 29. April 2005 (see IRL 28).

The preliminary amendments to the Electricity Market Act regarding the feed-in tariff at different production/support levels (200/400 GWh) became available to the public on 30. August 2006. The amendments were presented to the parliament, still without monetary values, on 4. Dec. 2006. When the amendment was approved by the parliament on 15. Feb 2007, the feed in tariff became public. The amendment was put into force on 1. May 2007. When Vardar Eurus decided to invest in OÜ Viru-Nigula Tuulepark the new support structure, and especially the monetary value of the amendment, was, thus, not foreseeable. Thus only the tariffs valid at the time of investment decision were applicable to prove the additionality.

3.2.3 Conclusion

There are no open CARs / CRs. The project fulfils the prescribed requirements.

3.3 Monitoring Plan

3.3.1 Findings

The monitoring approach is based onto the approved monitoring methodology ACM0002 (version 03). It is described in section D of the PDD. There the monitoring tasks and the monitoring responsibilities are clearly defined.

Monitoring is simplified by the fact that there are no project specific emissions. To calculate the achieved emission reductions, only the net electricity production of the wind farm has to be measured. This includes back-up energy. The quality of the data as well as their collection and archiving is defined in the monitoring plan.

3.3.2 Issued CARs / CRs

Corrective Action Request 4:
Demonstrate that monitoring processes are defined, described and put into practice. Improve monitoring protocol form.

Response:
The CAR has been resolved. The additional information given as response to the original CAR 4 led to a new request which has been fulfilled in PDD v4.

An improved monitoring protocol form, a wind park substation single line diagram and detailed information on the metering system was sent as additional information.

Clarification Request 4:
Detailed information on the metering concept is needed.

Response:
The CR has been resolved. The needed information was received as part of the reply to CAR 4.

Clarification Request 5:
Please indicate whether a second electricity line exists to provide back-up energy to the wind farm. If yes, explain how the consumption is metered.

Response:
The CR has been resolved. The needed information was received as part of the reply to CAR 4.

Clarification Request 6:
Give clear names of the responsible persons for the monitoring process

Response:

The CR has been resolved. The needed information was received as part of annex 3 of the PDD.

3.3.3 Conclusion

The project fulfils all the prescribed requirements completely.

3.4 Calculation of GHG Emissions

3.4.1 Findings

The Baseline study (see IRL 35) describes that the simple OM approach has been used to calculate the Operating Margin (low cost / must run resources less than 50% of total generation). The OM is calculated ex-ante. The Build Margin is also calculated ex-ante on the basis of the power plants which constitute the most recent 20% of the system generation (see ''Tool to calculate the emission factor for an electricity system'').

The clarification in the CDM-EB 23 session "that even if a part of the plant capacity enables meeting the requirement of 20% (of the generation capacity in the systems) for estimating the build margin emission factor, the total plant capacity should be considered in estimating the build margin emission factor" was taken into consideration and led to the fact that the build margin plants cover 78% of the Estonian production.

EF_y, the operating margin emission factor of the grid, is calculated using the most recent information (which years?)on the generation and the fuel consumption of the power plants in the Estonian grid. This implies some changes, which have been made retroactively by the Estonian government for former years.

The project's spatial boundaries are clearly described. Regarding emission sources all aspects are covered. Only CO_2 emissions have correctly been identified as relevant for the project. Leakage calculations are not required.

According to the presented data the project leads to emission reductions of 379,789 tonnes CO_{2e} in the period from 2007 to 2012. For 2007 the emission reductions are 49,662 tonnes CO_2 and 330,127 ERUs in the years 2008 - 2012. This represents a reasonable estimation using the assumptions given by the project documents.

3.4.2 Issued CARs / CRs

There are no CARs / CRs

3.4.3 Conclusion

The project fulfils all the prescribed requirements completely.

3.5 Environmental Impacts

3.5.1 Findings

A two-stage assessment (EIA) has been carried out according to the Estonian law by the authorised company Hendrikson & CO. The first EIA (see IRL 14) was performed in an early stage of

the project in 2003 and included several realisation options. Based on the outcome of this report changes were made in the design of the wind park in order to minimize any environmental issues. In a second step a new environmental impact assessment was performed ,covering the project changes (see IRL 15). It was demonstrated that the new plan was much superior to the former options and that the issues mentioned in the first stage were resolved. Based on the result of the EIA the wind farm project was accepted by the Estonian authorities.

3.5.2 Issued CARs / CRs

There are no CARs / CRs

3.5.3 Conclusion

The project fulfils all the prescribed requirements completely.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

As part of the "track-1-determination" TÜV SÜD started to publish the PDD and the baseline study on its homepage and on the UNFCCC JI project site November 22, 2006, open for comments till December 21, 2006. No comments have been received. As part of the "track-2-determination" TÜV SÜD started to publish the PDD and the baseline study on its homepage and on the UNFCCC JI project site January 27, 2007, open for comments till February 25, 2007. No comments have been received

5 DETERMINATION OPINION

TÜV SÜD has performed a determination of the Estonian JI Project "Viru Nigula Wind Farm, Estonia" according to Track 1 procedure.

The determination was performed on the basis of UNFCCC criteria as well as criteria given to provide for consistent project operations, monitoring and reporting. Further, reference has been taken to the national requirements of Estonia regarding the determination of climate change projects.

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for JI as well as the Estonian requirements.

By building a wind farm with state of the art wind turbines and thereby displacing fossil fuel-based electricity in principal with electricity generated from a renewable source the project results in reductions of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. An analysis of the investment and technological barriers demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is implemented as designed, the project is likely to achieve the estimated amount of emission reductions.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 379 789 tonnes CO_{2e} in the period from 2007 to 2012, resulting in 49 662 tonnes CO_2 in 2007 and 330 127 ERUs in the years 2008 - 2012, represent a reasonable estimation using the assumptions given by the project documents.

The determination is based on the information made available to us and the engagement conditions detailed in this report. The determination has been performed following the VVM requirements. The only purpose of this report is its use during the registration process as part of the JI project cycle. Hence, TÜV SÜD cannot be held liable by any party for decisions made or not made based on the determination opinion, which will go beyond that purpose.

Munich, 2009-11-24

Thomas Kleiser

Head of certification body "climate and energy"

Munich, 2009-11-24

Klaus Nürnberger

Project Manager

Annex 1
Determination Protocol for JI Track 1 project ‘’Viru-Nigula Wind Farm, Estonia’’

Industrie Service

Table 1 Mandatory Requirements for Joint Implementation (JI) Project Activities

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a), 6	☑	A LoA (letter of approval) exists from the Estonian National Focal Point (Ministry of Environment), dated November 12, 2006. Another LoA exists from the Swedish DNA (Swedish Energy Agency), dated February 27, 2006.
2. Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	☑	Table 2, Section B.2.
3. The sponsor Party shall not acquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	☑	Estonia has submitted its fourth national communication in December 2005.
4. The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting commitments under Article 3	Kyoto Protocol Article 6.1 (d)	**O 1**	This issue can not be answered by now as such as the JI system is not installed yet.
5. Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects	Marrakech Accords, JI Modalities, §20	**O 1**	Sweden has designated a national authority (Swedish Energy Agency, Climate Change Unit). Estonia has a national focal point (Ministry of the Environment). See IRL 31,32, 33.

* ☑: Compliant; CAR: Corrective Action Request; CR: Clarification Request; AI: Additional Information required; O: Outstanding Issue (due to missing institutions and guidelines)

** MoV = Means of Verification, DR= Document Review, I= Interview

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
			Specific national guidelines and procedures (G&P) are available in Sweden. In Estonia national guidelines and procedures for the approval of JI projects are just being worked out. Remark: National political trends are out of the influence of the project partners.
6. The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	☑	Estonia has ratified the Kyoto Protocol on October 14th 2002.
7. The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts.	Marrakech Accords, JI Modalities, §21(b)/24	☑	Initial report is published on the UNFCCC-website.
8. The host Party shall have in place a national registry in accordance with Article 7, paragraph 4	Marrakech Accords, JI Modalities, §21(d)/24	☑	According to the final report to the EU-Commission (11. April 2007) Estonia's registry system has been tested successfully with the EU Commission and after the testing the Registry went live.
9. Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Marrakech Accords, JI Modalities, §31	☑	A PDD has been submitted in February 2007
10. The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers	Marrakech Accords, JI Modalities, §32	☑	The PDD has been entered on the TÜV SÜD website

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REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
shall be invited to, within 30 days, provide comments			from January 27, 2007 to February 25, 2007. Parties, stakeholders and UNFCCC accredited observers have been invited to provide comments. No comments were received.
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	Marrakech Accords, JI Modalities, §33(d)	☑	Table 2, Section F
12. The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Marrakech Accords, JI Modalities, Appendix B	☑	Table 2, Section B.2
13. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, JI Modalities, Appendix B	☑	Table 2, Section B.2
14. The baseline methodology shall exclude to earn ERUs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, JI Modalities, Appendix B	☑	Table 2, Section B.2
15. The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	☑	Table 2, Section D

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Industrie Service

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity The project design is assessed.					
A.1. Project Boundaries Project boundaries are the limits and borders defining the GHG emission reduction project.					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	1, 5, , 26	DR, I	The project's spatial boundaries are clearly and plausibly described in the PDD.	☑	☑
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	1, 5, 26	DR, I	System boundaries are clearly defined.	☑	☑
A.2. Technology to be employed Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.					
A.2.1. Does the project design engineering reflect current good practices?	1, 3, 5, 11, , 26	DR, I	Yes, the employed technology does reflect current good practice in the host country.	☑	☑
A.2.2. Does the project use state of the art technology	11	DR,	The project uses state of the art technology.	☑	☑

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or would the technology result in a significantly better performance than any commonly used technologies in the host country?		I			
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?		DR, I	It is unlikely that the project technology will be substituted by a more efficient technology.	☑	☑
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1, 3, 5, 21, , 26	DR, I	No. The experience of the wind farm operator guarantees that an adequate operating approach is chosen. Documentation concerning a full-service contract with the turbine supplier was presented	☑	☑
A.2.5. Does the project make provisions for meeting training and maintenance needs?	1, 3, 5, 21, , 26	DR, I	Yes, see above remark	☑	☑
B. Project Baseline The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the discussion and selection of the baseline methodology transparent?	1, 5, 35,	DR, I	The discussion and selection of the baseline methodology is transparent, re-		

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	17, 19, , 26		traceable and plausible. Version number of the chosen methodology is not indicated. **Corrective Action Request 1:** Indicate version number of chosen methodology in PDD. **Result:** The open issue was resolved by PDD version **3**	**CAR 1**	☑
B.1.2. Does the baseline methodology specify data sources and assumptions?	1, 5, 35, 17, 19, , 26	DR, I	Yes, all data used are specified and documented.	☑	☑
B.1.3. Does the baseline methodology sufficiently describe the underlying rationale for the algorithm/formulae used to determine baseline emissions (e.g. marginal vs. average, etc.)	1, 5, 35, 17, 19, , 26	DR, I	Yes.	☑	☑
B.1.4. Does the baseline methodology specify types of variables used (e.g. fuels used, fuel consumption rates, etc)?	5, , 26	DR, I	Yes.	☑	☑
B.1.5. Does the baseline methodology specify the spatial level of data (local, regional, national)?	5, , 26	DR, I	Yes.	☑	☑

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B.2. Baseline Determination The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	1, 5, 35, 19, , 26	DR, I	The application of the methodology and the discussion and determination of the chosen baseline is plausible. **Clarification Request 1:** The baseline values for the year 2003 differ somewhat from the values used in the baseline calculation of the former project determination. Explanation of those differences is needed. **Result:** The open issue was resolved by PDD version **2** **Clarification Request 2:** There is no derivation of the electricity production of the year 2007. Please explain. **Result:** The open issue was resolved by PDD ver-	**CR1** **CR 2**	☑ ☑

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			sion **2**		
B.2.2. Has the baseline been determined using conservative assumptions where possible?	1, 2, 5, 35, 19, , 26	DR, I	Most assumptions are conservative. When computing the build margin the plant Iru has no longer been included in contrast to the previous PDD and its determination. This leads to a higher and less conservative BM. **Corrective Action Request 2:** Include plant Iru in BM calculation or explain in detail why it is excluded from the BM calculation. **Result:** The open issue was resolved by changes in PDD v2	**CAR 2**	☑
B.2.3. Has the baseline been established on a project-specific basis?	1, 2, 5, 35, 19, , 26	DR, I	Yes, the baseline is established in a project specific manner.	☑	☑
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	1, 2, 5, 35, 16, 17, 18, 19, ,	DR, I	Yes, the baseline does take into account the major national and/or sectoral policies, macro-economic trends and political developments. Relevant key factors are described and their impact on the baseline and the project risk is evaluated.	☑	☑

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	26				
B.2.5. Is the baseline determination compatible with the available data?	1, 2, 5, 8, 9, 10, 35, 19, , 26		See B.2.1	**CR 1**	☑
B.2.6. Does the selected baseline represent a likely scenario in the absence of the project?	1, 2, 5, , 26	DR, I	Yes, the project does represent a likely scenario in the non project case.	☑	☑
B.2.7. Is it demonstrated that the project activity itself is not a likely baseline scenario (e.g. through (a) a flow-chart or series of questions that lead to a narrowing of potential baseline options, (b) a qualitative or quantitative assessment of different potential options and an indication of why the non-project option is more likely, (c) a qualitative or quantitative assessment of one or more barriers facing the proposed project activity or (d) an indication that the project type is not common practice in the proposed area of implementation, and not required by a Party's legislation/regulations)?	1, 5, 8, 9, 10, 35, 19, 27,28,29, 26, 34	DR, I	The additionality-tool of ACM 0002 has been used to demonstrate the required characteristics. However, no back-up information is available to assess the findings and to check the sensitivity analysis. **Clarification Request 3:** Updated financial calculation spreadsheets are needed to check the PDD-statements (including sensitivity analysis) and the applied formulae. **New input, made on basis of PDD V.2:** The financial calculations indicate that the new support structure applies to the project.	**CR 3**	☑

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			This is not mentioned in the PDD nor are any implications concerning the additionality of the project being mentioned. The project owner has to prove that at the time of the business decision for a (JI-supported) Viru-Nigula project the new support structure was not foreseeable and that he had to base its decision on the old (and less favourable) support structure. He has to show the IRR according to the new support structure as wells as to the old structure, and has to make clear that the "old" IRR-values are decisive for the additionality criterion. The additional information led to new requests which have to be answered. **Result:** The open issue was resolved additional information and by changes in PDD v3		
B.2.8. Have the major risks to the baseline been identified?	1, 5, 8, 9, 10, 35, 19, , 26	DR, I	Yes, the major risks have been determined.	☑	☑
B.2.9. Is all literature and sources clearly referenced?	1, 5, 8, 9,	DR,	Yes.	☑	☑

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	10, 35, 19, 26	I			
C. Duration of the Project/ Crediting Period It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	4, 5, , 26	DR, I	The starting date is clearly indicated and reasonable.	☑	☑
C.1.2. Is the project's crediting time clearly defined?	4, 5 26	DR, I	The use of the term "crediting period" is unclear and confusing. It is used in the sense of an "overall crediting period", covering an early period where VERs are generated, and the "Kyoto period" where ERUs are generated. In other cases it is used only for the Kyoto period. Examples are table A.4.3.1 in the PDD or section C.3. **Corrective Action Request 3:** When mentioning "crediting period" in the PDD indicate clearly which period is meant. **Result:** The open issue was resolved additional information and by changes in PDD v2	**CAR 3**	☑

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D. Monitoring Plan The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate baseline methodology.					
D.1.1. Does the monitoring methodology reflect good monitoring and reporting practices?	1, 5, 7, , 26	DR, I	Yes, the monitoring methodology does reflect current good practice.	☑	☑
D.1.2. Is the selected monitoring methodology supported by the monitored and recorded data?	1, 5, 7, , 26	DR, I	Yes, the monitoring methodology is supported by the monitored and recorded data.	☑	☑
D.1.3. Are the monitoring provisions in the monitoring methodology consistent with the project boundaries in the baseline study?	1, 5, 7, , 26	DR, I	Yes, the monitoring provisions are in line with the project boundaries.	☑	☑
D.1.4. Have any needs for monitoring outside the project boundaries been evaluated and if so, included as applicable?	1, 5, 7, , 26	DR, I	There is no need for monitoring outside the project boundaries.	☑	☑
D.1.5. Does the monitoring methodology allow for conservative, transparent, accurate and complete calculation of the ex post GHG emissions?	1, 5, 7, , 26	DR, I	Yes.	☑	☑
D.1.6. Is the monitoring methodology clear and user friendly?	1, 5, 7, , 26	DR, I	Yes, the monitoring methodology is clear and user friendly.	☑	☑

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D.1.7. Does the methodology mitigate possible monitoring errors or uncertainties addressed?	1, 5, 7, , 26	DR, I	Yes, the methodology provides redundant metering and allows comparison of data from different sources.	☑	☑
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	5, 26	DR	This is not needed as there are no project emissions	☑	☑
D.2.2. Are the choices of project GHG indicators reasonable?	5, 26	DR	See D.2.1	☑	☑
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	5,26	DR	See D.2.1	☑	☑
D.2.4. Will the indicators enable comparison of project data and performance over time?	5, 26	DR	See D.2.1	☑	☑
D.3. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	5, 26	DR, I	This is not needed as there is no project leakage.	☑	☑

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D.3.2. Have relevant indicators for GHG leakage been included?	5, 26	DR, I	See D.3.1	☑	☑
D.3.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	5, 26	DR, I	See D.3.1	☑	☑
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?	5, 26	DR, I	See D.3.1	☑	☑
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining the baseline emissions during the crediting period?	1, 3, 5, 7, , 26	DR, I	Even if the operation of the wind farm has already started or is about to start, no operational monitoring plan was demonstrated. Annex 3 does not fulfill the requirements of a monitoring plan, nor of a monitoring protocol. All relevant meters have to be included, indicating both directions (if bi-directional). The meter value is needed, not only the electricity dispatched to the grid. **Corrective Action Request 4:** Demonstrate that monitoring processes are defined, described and put into practice. Improve monitoring protocol form. **New input, made on basis of PDD V.2:**	**CAR 4**	☑

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			A monitoring form sheet cannot include the upfront remark that there is no problem in monitoring. The monitoring protocol form has to be changed. **Result:** The open issue was resolved additional information and by changes in PDD v2 and v3 --- Net electricity is the only parameter which must be measured. It is not defined, however, how net energy is metered, which metering concept exists, what meters are being used, where they are located etc. Annex 4, the single line diagram, gives none of those answers. As the wind farm is ready to start all those details should be known and included in the PDD. It is not clear whether there is a separate low-voltage backup line to guarantee auxiliary supply in case of 110 kV-line issues. **Clarification Request 4:** Detailed information on the metering concept is needed.	**CR 4**	☑

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			Result: The open issue was resolved additional information and by changes in PDD v2 and v3 **Clarification Request 5:** Indicate whether a second electricity line exists to provide back-up energy to the wind farm. If yes, explain how the consumption is metered. **Result:** The open issue was resolved additional information and by changes in PDD v2 and v3	**CR 5**	☑
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	1, 3, 5, 7, 26	DR, I	**Clarification Request 5:** See comment above.	**CR 5**	☑
D.4.3. Will it be possible to monitor the specified baseline indicators?	1, 3, 5, 7, 26	DR, I	**Clarification Request 5:** See comment above.	**CR 5**	☑

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D.5. Monitoring of Environmental Impacts It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.					
D.5.1. Does the monitoring plan provide for the collection and archiving of relevant data on environmental impacts?	1, 5, 7, 14, 26	DR, I	No collection and archiving of data on environmental impacts is needed. A two-stage EIA-process was performed and completed successfully without further constraints.	☑	☑
D.5.2. Will it be possible to monitor the specified environmental impact indicators?	1, 5, 7, 14, 26	DR, I	See comment above.	☑	☑
D.6. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.6.1. Is the authority and responsibility of project management clearly described?	1, 5, 7, 26	DR, I	The respective roles between the different project participants (Intercon Energy OÜ, WSP, Viru-Nigula Tuulepark OÜ) could be identified during the on-site audit and is described in the PDD.	☑	☑
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1, 5, 7, 26	DR, I	As the wind farm is ready to start it can be expected that clear names are given in the PDD or supporting documents instead of anonymous function descriptions and functions.	**CR 6**	☑

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			Clarification Request 6: Give clear names of the responsible persons for the monitoring process. **Result:** The open issue was resolved by changes in PDD v2		
D.6.3. Are procedures identified for training of monitoring personnel?	1, 5, 7, 26	DR, I	A specific training of monitoring personnel is not necessary.	☑	☑
D.6.4. Are procedures identified for emergency preparedness where emergencies can result in unintended emissions?	1, 5, 7, 26	DR, I	In the case of wind energy this is not possible.	☑	☑
D.6.5. Are procedures identified for calibration of monitoring equipment?	1, 5, 7, 26	DR, I	Yes; these are the standard processes for metering devices	☑	☑
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	1, 5, 7, 26	DR, I	See comment above.	☑	☑
D.6.7. Are procedures identified for monitoring, measurements and reporting?	1, 5, 7, 26	DR, I	Yes, procedures for monitoring, measurement and reporting are sufficiently covered in the monitoring plan	☑	☑
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	1, 5, 7, 26	DR, I	Yes, procedures for day-to-day records handling are sufficiently covered in the monitoring plan	☑	☑
D.6.9. Are procedures identified for dealing with possi-	1, 5,	DR,	Yes, see above	☑	☑

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ble monitoring data adjustments and uncertainties?	7, 26	I			
D.6.10. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	1, 5, 7, 26	DR, I	Procedures for internal audits of GHG project exist.	☑	☑
D.6.11. Are procedures identified for project performance reviews?	1, 5, 7, 26	DR, I	Procedures for project performance exist.	☑	☑
D.6.12. Are procedures identified for corrective actions?	1, 5, 7, 26	DR, I	Procedures for corrective actions exist.	☑	☑
E. Calculation of GHG Emissions by Source It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.					
E.1. Predicted Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	1, 5, 26	DR, I	There are no project GHG emissions.	☑	☑
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	1, 5, 26	DR, I	See comment above.	☑	☑
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	1, 5, 26	DR, I	See comment above.	☑	☑
E.1.4. Are uncertainties in the GHG emissions esti-	1, 5,	DR,	See comment above.	☑	☑

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mates properly addressed in the documentation?	26	I			
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	1, 5, 26	DR, I	See comment above.	☑	☑
E.2. Leakage Effect Emissions It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed.					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	1, 5, 26	DR, I	There is no project-specific leakage.	☑	☑
E.2.2. Have these leakage effects been properly accounted for in calculations?	1, 5, 26	DR, I	See comment above.	☑	☑
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	1, 5, 26	DR, I	See comment above.	☑	☑
E.2.4. Are the calculations documented in a complete and transparent manner?	1, 5, 26	DR, I	See comment above.	☑	☑
E.2.5. Have conservative assumptions been used when calculating leakage?	1, 5, 26	DR, I	See comment above.	☑	☑
E.2.6. Are uncertainties in the leakage estimates properly addressed?	1, 5, 26	DR, I	See comment above.	☑	☑

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E.3. Baseline Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	1, 2, 5, 35, 26	DR, I	Yes.	☑	☑
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	1, 2, 5, 35, 26	DR, I	Yes.	☑	☑
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	1, 2, 5, 35, 26	DR, I	The baseline emission factor is well documented. The electricity supplied by the project to the grid, i.e. the wind farm production, is not yet derived in a transparent way – see CR 4	**CR 4**	☑
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	1, 2, 5, 35, 26	DR, I	Yes, conservative assumptions have been used.	☑	☑
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	1, 2, 5, 35, 26	DR, I	Yes, uncertainties like meter problems have been properly addressed.	☑	☑

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E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	1, 2, 5, 35, 26	DR, I	Yes.	☑	☑
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1, 5, 35, 26	DR, I	Yes. Emission-rich oil shale energy production is replaced by emission-free renewable energy.	☑	☑
F. Environmental Impacts Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	1, 5, 14, 15, 26	DR, I	Yes, a full EIA has been performed in two stages. After stage 1 the planning was changed and the new plan led to a positive result and approval of the project.	☑	☑
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	1, 5, 14, 15, 26	DR, I	Yes, an EIA was required. See comment F.1.1.	☑	☑

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** MoV = Means of Verification, DR= Document Review, I= Interview

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
F.1.3. Will the project create any adverse environmental effects?	1, 5, 14, 15, 26	DR, I	No, the project will not create any adverse environmental effects.	☑	☑
F.1.4. Are transboundary environmental impacts considered in the analysis?	1, 5, 14, 15, 26	DR, I	Trans-boundary environmental impacts are seen as being insignificant.	☑	☑
F.1.5. Have identified environmental impacts been addressed in the project design?	1, 5, 14, 15, 26	DR, I	Yes. They have been successfully resolved during project design and planning. There are no remaining obligations.	☑	☑
F.1.6. Does the project comply with environmental legislation in the host country?	1, 5, 14, 15,	DR, I	Yes the project does comply with the environmental legislation in Estonia.	☑	☑

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Industrie Service

Table 3 Resolution of Corrective Action and Clarification/Additional Information Requests

Draft report clarifications and corrective action requests	Ref. to check-list question in table 2	Summary of project owner response	Determination conclusion
Corrective Action Request 1: Indicate version number of chosen methodology in PDD.	B.1.1.	In PDD version 4 the version number of the chosen methodology has been mentioned in section B.1 (ACM0002 / Version 06; (19 May 2006). At the same time the somewhat confusing numbering scheme of the PDDs was changed.	The CAR has been resolved by changes in PDD v3.
Corrective Action Request 2: Include plant Iru in BM calculation or explain in detail why it is excluded from the BM calculation.	B.2.2	In the calculations of BM plant Iru has been included to 100% and plant Eesti to 100%. Based on the most recent information from year 2005 the **$EF_{BM,2005}$ =1,12.** The new $EF_{BM,2005}$ = 1,12 replace the earlier used $EF_{BM,2001}$ =1,16.	The BM calculation is now correct. The CAR has been resolved by changes in the PDD v3
Corrective Action Request 3: When mentioning "crediting period" in the PDD indicate clearly which period is meant.	C.1.2	The PDD has been updated to more clearly indicate which period is meant. In the PDD the term crediting period is used in two senses - either as the Kyoto crediting period including only ERU issuance (2008-2012) or the total crediting period, including also the early credits (2007-2012).	The meaning of the term "crediting period" is now clearly understandable in each specific case. The CAR has been resolved by changes in the PDD v2.
Corrective Action Request 4: Demonstrate that monitoring processes are defined, described	D.4.1	Attached you can find the Viru Nigula wind park substation single line diagram. It is made by OÜ Põhivõrk (Estonian National	Further explanations by the project owner have been received. Further on a monitoring protocol form has been

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Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
and put into practice. Improve monitoring protocol form.		Grid (NG)). The commercial metering system is connected with power transformer C2T feeders Voltage Transformer (1PT2T) and Current Transformer (1PVT2). The VT and CT commercial metering winding is at least with accuracy class 0,5 (if needed Andrus Zavadskis can specify the metering transformer type and accuracy class). The meter is metering both directions (WP generation and consumption) separately. Meter is via phone line connected to NG-s commercial metering system located in NG Dispatch Centre from where automatically daily and monthly reports of WP net generation and consumption are sent to 4E (Andrus Zavadskis). Metering system is built by Siemens and meters in substations are made by Landis and Gyr. Metering systems are ready built and operating from December 2006. There is no separate low voltage line in order to back up the grid failure from 110 kV side. Wind park is feeded with two 110 kV lines (see attached file), both connected to the same busbar with transformer C2T	added as annex 3 to the PDD. The additional information given as response to the original CAR4 led to a new request which has been fulfilled in PDD v4. The CAR has been resolved.

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Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
		feeder. The metering system for both lines is the same as described above. Remark in Monitoring Form sheet has been removed.	
Clarification Request 1: The baseline values for the year 2003 differ somewhat from the values used in the baseline calculation of the former project determination. Explanation of those differences is needed.	B.2.1, B.2.2, B.2.5	The former project determination finalized 2005 included years 2001-2003. The current project determination includes years 2003-2005 based on available data by the end of 2006. Statistics for 2003 available in 2005 and 2007 differs.	According to the principle that best available data have to be used to compute the emission factor it is correct to apply the newest available data for 2003, as it can be assumed that they are more reliable than earlier data. The CR has been resolved by PDD v2.
Clarification Request 2: There is no derivation of the electricity production of the year 2007. Please explain.	B.2.1	Electricity production of the year 2007 include estimated production for months April-December, totally 45 558 MWh. (See table below or Annex 6 in PDD) Preliminary timetable for each wind turbine (1-8) is presented in PDD, Table 5. A commercial safety margin was introduced in the calculation by excluding months February and March.	The electricity production for 2007 and for the other years is now clearly presented. The CR has been resolved by PDD v2.
Clarification Request 3: Updated financial calculation	B.2.7	First response: INTERCON ENERGY OÜ/ Michael Hegner	The additional information given as response to the original CR3 led to new requests which have been answered in

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Draft report clarifications and corrective action requests	Ref. to check-list question in table 2	Summary of project owner response	Determination conclusion
spreadsheets are needed to check the PDD-statements (including sensitivity analysis) and the applied formulae.		has updated the financial calculations 26.4.2007, see Annex 6. Second response: The Electricity Market Act "Elektriturusea-dus" entered into force on 1. July 2003. The Swedish Energy Agency called for JI-proposals on 30. July 2003 (Appendix CR3-1). EMP-projects proposed the Viru-Nigula Wind farm PDD to the Swedish Energy Agency on 1 Sept. 2003 (Appendix CR3-3). At this the expected feed-in tariff was 0.051 €/kWh for the following 12 years. This feed-in tariff was still expected in the Final PDD_ver0 (22. Nov. 2005). Based upon these calculations Vardar Eu-rus decided to invest in OÜ Viru-Nigula Tuu-lepark 29. April 2005 (Appendix CR3-2). The preliminary amendments to the Electric-ity Market Act regarding the feed-in tariff at different production/support levels (200/400 GWh) became available to the public on 30. Aug. 2006. The amendments were pre-sented to the parliament, still without mone-tary values, on 4. Dec. 2006. When the	detail by additional information. The CR has been resolved by PDD v3.

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Draft report clarifications and corrective action requests	Ref. to check-list question in table 2	Summary of project owner response	Determination conclusion
		amendment was approved by the parliament on 15. Feb 2007, the feed in tariff became public. The amendment was put into force on 1. May 2007. When Vardar Eurus decided to invest in OÜ Viru-Nigula Tuulepark the new support structure, and especially the monetary value of the amendment, was, thus, not foreseeable	
Clarification Request 4: Detailed information on the metering concept is needed.	D.4.1, E.3.3	See CAR 4.	The needed information was received. The CR has been resolved.
Clarification Request 5: Please indicate whether a second electricity line exists to provide back-up energy to the wind farm. If yes, explain how the consumption is metered.	D.4.1, D.4.2, D.4.3	See CAR 4.	The needed information was received. The CR has been resolved.
Clarification Request 6: Give clear names of the responsible persons for the monitoring process.	D.6.2	See Monitoring Plan and Monitoring protocol form Annex 3.	The needed information was received. The CR has been resolved.

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Table. Clarification Request 2: Estimated electricity production of the year 2007.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average monthly wind speed	**m/s**	5,5	7,1	6,2	6	6,4	5,7	4,8	6	6,7	6,5	6,1	8,7
Monthly energy production	**MWh**	5033	8879	6723	6235	7210	5509	3467	6235	7936	7453	6479	12099
Percentage of yearly production	**%**	6,0	10,7	8,1	7,5	8,7	6,6	4,2	7,5	9,5	9,0	7,8	14,5
Net energy production per month	**kWh**	3661488	6459438	4890956	4535938	5245247	4007776	2522229	4535938	5773409	5422028	4713447	8801975

Annex 2
Information Reference List for JI Track 1 project ‘’Viru-Nigula Wind Farm, Estonia’’

Reference No.	Document or Type of Information
1.	On-site interview with the project developer at the office of Intercon Energy OÜ in Tallinn, Estonia at the 17th and 18th of August 2005, by auditing team of TÜV Industrie Service GmbH Validation team on-site: Dr. Thyge Weller — TÜV Industrie Service GmbH, TÜV SÜD Group Ranno Mellis — OÜ Projektkeskus, Tallin, Estonia Interviewed persons: Markku Tarkiainen — Intercon Energy OÜ (Managing Director), Tallinn, Estonia
2.	On-site interview with two representatives of the Estonian utility at the office of Eesti Energia at the 17th of August 2005 by auditing team of TÜV Industrie Service GmbH Validation team on-site: Dr. Thyge Weller — TÜV Industrie Service GmbH, TÜV SÜD Group Ranno Mellis — OÜ Projektkeskus, Tallin, Estonia Interviewed person: Marie Kalmet — Eesti Energia AS (Customer Manager), Tallinn, Estonia Jossif Sinivee — Eesti Energia AS (Project Manager), Tallinn, Estonia Further participants: Jaan Raudsepp — EMPOWER EEE AS (project manager), Tallinn, Estonia Markku Tarkiainen — Intercon Energy OÜ (Managing Director), Tallinn, Estonia
3.	On-site interview / visit at site of the planned wind farm Viru-Nigula at the 17th of August 2005 by auditing team of TÜV Industrie Service GmbH Validation team on-site: Dr. Thyge Weller — TÜV Industrie Service GmbH, TÜV SÜD Group Ranno Mellis — OÜ Projektkeskus, Tallin, Estonia Interviewed persons: Martin Kruus — Viru-Nigual Tuulepark OÜ (Managing Director), Tallinn, Estonia

Reference No.	Document or Type of Information
	Further participant: Markku Tarkiainen Intercon Energy OÜ (Managing Director), Tallinn, Estonia
4.	On-site interview with representative of the Swedish Energy Agency at the 18th of August 2005 by auditing team of TÜV Industrie Service GmbH Validation team on-site: Dr. Thyge Weller TÜV Industrie Service GmbH, TÜV SÜD Group Ranno Mellis OÜ Projektkeskus, Tallin, Estonia Interviewed person: Christian Sommer Swedish Energy Agency (Programme Manager), Eskiltuna, Sweden Further participant: Markku Tarkiainen Intercon Energy OÜ (Managing Director), Tallinn, Estonia Martin Kruus Viru-Nigula Tuulepark OÜ (Managing Director), Tallinn, Estonia
5.	*Project Design Document for JI Project "Viru-Nigula Wind Farm", v. 4, September 15, 2005)* [superseded]
6.	*"Letter of Preliminary Approval" from the Estonian Ministry of the Environment , June 28, 2004 (appendix 1 of PDD*) [superseded]
7.	*Monitoring Plan, appendix 20 of PDD* [superseded]
8.	Assessment of long term wind energy yield / Viru-Nigula wind farm; Dr. Ain Kull, University of Tartu, November21, 2004
9.	Annual Energy Calculation of wind turbines in Viru-Nigula by Enveco Steinfurt GmbH&Co KG, July 27, 2004 (in German)
10.	3. add-on computation to define the wind potential for 8 wind turbines in Viru-Nigula, by Enveco Steinfurt GmbH&Co KG, November 11, 2004 (in German)
11.	WinWinD turbine description, http://www.winwind.fi/english/tuotteet.html
12.	*PDD for the Estonian JI project "Esivere and Virtsu II Wind Power Developments", March 8, 2005* [superseded]
13.	*Baseline Information, appendix 19 of PDD*) [superseded]
14.	EIA study: Viru-Nigula Tuulepargi arendamise Keskkonnamoju hindamise aruanne; Hendrikson & Ko, Tallinn, Töö nr. 474a/04, November 13, 2003 (study in Estonian, summary in English)
15.	Supplement to the environmental impact assessment report of Viru-Nigula windmill park development, Hendrikson & Ko, Tartu 2004 (appendix 10 of PDD)
16.	Building permits by Viru-Nigula Vallavalitsus (June 21, 2005; in Estonian)
17.	Draft Power Purchase Agreement, Eesti Energia, March 9, 2004 (in Estonian) (appendix 17 of PDD)
18.	Liitumisleping Nr PV-FIN-052-1 (Grid Connection Agreement), January 3, 2005 (in Estonian)

19.	ACM0002/Version 1; published as Annex 2: Approved consolidated methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", 15th meeting of the cdm Executive Board (EB); 1th – 3rd September, 2004
20.	"Protocol for Validation of JI project (version 3.0)" in connection with "Template - Initial Validation Report (Version 3.0)": published under "Validation and Verification Manual"; IETA 2004; www.vvmanual.info
21.	Operation and Maintenance agreement with the wind turbine supplier [confidential]
22.	Power Purchase Agreement with OÜ Põhivõrk, 10. August 2005
23.	*Final Project Design Document for JI Project "Viru-Nigula Wind Farm", December 21st, 2005* [superseded]
24.	Track 2 Determination: Project Design Document for JI Project "Viru-Nigula Wind Farm", v. 1, Januar 22, 2007
25.	Track 2 Determination: Project Design Document for JI Project "Viru-Nigula Wind Farm", v. 2, April 30, 2007
26.	Track 2 Determination: Project Design Document for JI Project "Viru-Nigula Wind Farm", v. 3, June 05, 2007
27.	Track 2 Determination: Call for JI Project Proposals, Swedish Energy Agency, July 30, 2003
28.	Track 2 Determination: Minutes from Board Meeting of Vardar Eurus (business decision for the project) April 29, 2005
29.	Track 2 Determination: JI Pilot Programme Project Design Document; EMP Projects OY, August 22, 2003
30.	Track 2 Determination: JI-Determination Protocol V2 with answers by client
31.	Track 2 Determination: LoA by Energimyndigheten for NEFCO as purchaser; February 27, 2007
32.	Track 2 Determination: LoA by Energimyndigheten for STEM as purchaser; February 02, 2006
33.	Track 2 Determination: LoA by the Estonian Ministry of the Environment, November 13, 2006
34.	Track 2 Determination: Financial calculations, Annex 6 of PDD. Confidential and therefore not published with PDD
35.	Track 2 Determination: Estonian JI Project Development Baseline Study, Stockhol Environment Institute, Tallinn Centre, November 2006
36.	Official letter to switch from Track 2 to Track 1