Table of Contents

Project Idea Note (PIN)

A PROJECT IDENTIFICATION

A 1 Project summary	
Title of project activity	"SAMGORI" Wind farm
Applicant	**JSC CARRIDAN (ERPA contact)**
Host Country	Georgia
Project type	○ Joint Implementation ○ **X** Clean Development Mechanism
Category of project activity	Renewable energy – wind energy
Generation of emission reductions	From 01.01.2009 to 01.01.2030
Estimated emission reductions *(in t CO_{2e} up to 2012)*	157,440 tCO_2 during the period 2008-2012
Crediting Period	7years *3
Offered amount of emission reductions	TOTAL- 295,200 tCO_2 –7 year period **TOTAL - CER's: 938 080 tCO_2**
Proposed CER price (EUR)	€12/t CO_2

TOTAL- 157,440 tCO_2 during the period 2008-2012

TOTAL- 295,200 tCO_2 –7 year period

Total in 3* 7 years – 938 080 tCO_2

B PROJECT PARTICIPANTS

B 1 Applicant	
Name	CARRIDAN JSC **(ERPA contact)**
Type of organisation *Please also describe the ownership structure.*	Joint-stock company (Different information is considered to be confidential at this stage)
Other functions of the Applicant within the project	○ **X** Sponsor ○ Intermediary ○ Technical consultant ○ Other: _____
Main activities, knowledge and experience	This is a joint Georgian-American company created to attract financing to support renewable energy projects, in particular, construction of wind farms
Name of contact person	Mamuka Merabishvili
Address	
Phone/fax	877 49 20 49
E-mail	mmm-m@list.ru ; www.carridan.com

B 2 Project developer	
Name	Karenergo
Type of organisation	Ltd
Other functions of the project developer within the project	○ Sponsor ○ Intermediary ○ **X** Technical consultant ○ Other: _____
Main activities, knowledge and experience	Wind energy resources investigation Wind farms designing. Karenergo was established in 1986 by the group of scientists engaged in the research of wind energy potential throughout the Caucasus. Beginning from 2000 till 2004 Karenergo was involved in the comprehensive research of the wind energy potential on the territory of Georgia. In 2004 based on the result of the investigations the "Wind Energy Atlas of Georgia was published. Karenergo is the author of several feasibility studies & business plans for the construction of wind farms in various regions of Georgia, in particular, Batumi wind farm, Gori wind farm, Samgori wind farm and others.

Name of contact person	Archil Zedginidze
Address	Tbilisi, Tsereteli ave. 63-2-57
Phone/fax	Phone: 35-15-51, 8-99-50-93-93; Fax: 35-15-51
E-mail	karenergo@gol.ge

B 3 Other project participants	
Name of project participant	Energy Efficiency Centre Georgia
Type of organisation	○ Governmental body: _____ ○ Private enterprise ○ x NGO ○ Other: _Independent consulting company_____
Function within the project	○ Sponsor ○ Intermediary ○ XTechnical consultant ○ Other: _____
Name of contact person	Liana Garibashvili
Address	10 Lermontov St.
Phone/fax	+ 995 32 92 16 40/99; + 995 32 92 15 08
E-mail	eecgeo@eecgeo.org; l_gari@eecgeo.org

C HOST COUNTRY

C 1 Location of project activity	
Host Country Party(ies)	Georgia
Region/State/Province etc.	
City/Town/Community etc.	Tbilisi
Brief description of the project location	The wind farm will be located on the banks of the Tbilisi water reservoir in the north-east suburbs of Tbilisi. The site represent a high elevation plateau with sufficient area to accommodate 20 turbines, each with a 3 MW capacity.

C 2 Status of Host Country	
Host Country	○ **X** Signed and ratified, accepted, approved or acceded to the Kyoto Protocol ○ Signed the Kyoto Protocol and has demonstrated a clear interest in becoming a Party in due time ○ Has already started or is on the verge of starting the national accession process

D GENERAL PROJECT INFORMATION

D 1 General Information	
Project name	SAMGORI Wind farm
Project objective	Electricity production from renewable energy. This is in line with the Georgian governments priority of expanding the percentage of electricity produced from renewable sources. The project will also assist in making the country self sufficient in electricity.
Description of project background	"Karenergo" has carried out wind regime investigations on the proposed site area with 40 m height mast. The mast is equipped with wind measuring apparatus (NRG Systems firm, USA). On the basis of these measurements and the many-years' data, obtained from the nearest meteorological stations, the wind regime structural elements have been calculated and the wind farm parameters obtained. It was concluded that the chosen location has favourable wind regime for the construction of a 60 MW wind farm. In addition there is developed infrastructure near the construction site. The planned project start date is the spring 2008. Up to date the project developer team has signed several documents with government entities covering purchasing tariff, connection to the grid etc

D 2 Category(ies) of project activity	
Project category *Please mark accordingly.*	○ Construction (or retrofitting) of combined heat and power installations; ○ Fuel-switch projects in energy conversion installations and production plants to renewable energy sources or from energy sources with high carbon content to energy sources with lower carbon content, especially in existing district heating systems; ○ **X** Construction (or retrofitting) of generating plants operated with renewable energy sources (especially wind power plants, biogas or biomass combined heat and power plants as well as hydroelectric power plants); ○ Projects whose purpose is the avoidance or (energy) recovery of landfill gas; ○ Waste management measures which contribute to the avoidance of greenhouse gas emissions, especially through energy recovery from waste, if possible with waste heat utilisation; ○ Energy efficiency projects: projects serving the reduction of end-user energy consumption in residential buildings, public and private office buildings as well as industrial applications and processes (including waste heat potentials);

	○ Other: _____

D 3 Technical aspects	
Technical description *The essential technical aspects should be briefly presented.* *A detailed description (max. 3 A4 pages) should be enclosed with the PIN including the following aspects:* *Project purpose* *Applicant's facilities to generate Emission Reductions* *Description of technology employed and associated risks* *Milestones, time schedule and current status of implementation* *Key permits and expected date of approval* *Key contracts and expected date of signing* *Risks during project implementation and operation*	Wind farm will be located on the environs of Tbilisi, near Samgori Reservoir, at the flat elevated plateau. In total 20 wind turbines each with the capacity of 3 MW will be installed in this proposed project. The total installed capacity will be 60 MW. The supplier of the wind turbines will be the Danish firm Vestas, one of the world's leading producers of high-tech wind power systems. The type of wind turbine identified for the project is V 90- 3,00 MW. Technical specifications of V 90- 3,00 MW are: • Rotor: Diameter - 90 m; 3 blades; Pitch/Optispeed® power regulation • Tower-hub height 80-105 m • Operational data: cut-in wind speed 4 m/s; nominal wind speed- 15 m/s; cut-out wind speed- 25 m/s; • Generator: Asynchronous with OptiSpeed®, 3,000 kW, 50 Hz, 1,000V; • Gearbox: Two planetary and one helical stage • Control: Microprocessor-based control of all the turbine functions with the option of remote monitoring. Output regulation and optimization via OptiSpeed® and OptiTip® pitch regulation. The wind farm will also include the construction of the 110 kV substation which will be connected to the energy system by a transmission line.. Necessary permits and licenses for the project implementation include: Land parcelling; environmental impact permit; construction permit; power generation licence issued by GNERC (Georgian National Energy Regulatory Commission); grid connection permit; etc. At this stage of the project development the land parcelling permit and grid connection permits for the proposed wind farm have been obtained. According to the existing legislation the generated electricity could be sold to the Electricity System Commercial Operator (ESCO) in accordance with the preliminary signed agreement (before the construction) at the long-term tariff conformed with GNERC or its excess exported. The implementation time for putting the wind farm into operation is 2 years. The table below states how many MW that will be installed each year and how much electricity they are expected to generate: Year | Installed capacity (MW) | Generation (GWh/year) 2009 | 24 | 60 2010 | 60 | 140 2011 | 60 | 140 2012 | 60 | 140 At present the project developer has concluded negotiations with the GNERC and the Electricity System Commercial Operator (ESCO) on the details of electricity purchase agreement.

E PROJECT ORGANISATION

E 1 Project team	
Project-specific qualifications and experiences	The scientific Wind Energy Centre "Karenergo" was founded in 1986. Currently the main direction of its activity is the determination of wind energy resources on the territory of Georgia. In 2004 "Karenergo" developed and published "The Wind Energy Atlas of Georgia". "Karenergo" has an experience in developing wind energy projects and moreover the necessary apparatus and equipment as well as software are in its disposal.

E 2 Schedule	
Current project status	○ Project idea ○ **X** Planning ○ Implementation
Status of financing	The procedure of getting credit by the investor.
Status of negotiations with the Host Country	DNA is informed about the project and but official application for Letter of No Objection has not been sent
Status of permission procedures of authorities	At this stage of the project development the land parcelling permit and grid connection permits for the proposed wind farm have been obtained. Outstanding permits include: • environmental impact permit; • construction permit; • power generation licence issued by GNERC.
Project preparation	Project will be prepared during 2007.
Construction/assembly	1 – 1.5 years
Project lifetime	From the moment of the building completion 25 – 30 years.
Generation of CERs	25 – 30 years. The crediting period could 3*7
Other milestones	
Effect of PIN acceptance on the time schedule of the project	To increase wind farm's economical efficiency. To speed up the project implementation

<table>
<tr><th>E 3 Financial aspects</th><th></th></tr>
<tr><td>Costs of project development (EUR)</td><td>The wind farm construction will be carried out in 3 stages:
Stage 1: Construction and commissioning of 8 turbines each 3MW capacity the wind farm capacity 24 MW;
Stage 2: Construction and commissioning of 8 more turbines each 3MW capacity increasing the farm capacity to total 60 MW;
Cost of project by stages:
Stage 1: € 23,433,600
➢ Feasibility study: € 600,000
➢ Development: € 400,000
➢ Engineering: € 500,000
➢ Energy Equipment: €11, 510,000
➢ Balance of plant: € 8,710,000
➢ Miscellaneous: € 1,711,600
Stage 2: € 35,150, 000
TOTAL: € 58,581,600</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Estimated annual operating costs (EUR) $
Please give figures and briefly explain (background of) calculations.</td><td>Preventive maintenance - 50,000 O &M 300,000
Salary - 100,000
Other - 150,000
Total 300,000</td></tr>
<tr><td>Estimated annual revenues (EUR)
Please give figures and briefly explain (background of) calculations.</td><td>The table below shows the project revenues from the sale of electricity. The average electricity purchase tariff is 0,028 €. Revenue from potential sale of CERs not included, and O&M costs not subtracted.
<table>
<tr><th>Year</th><th>Installed capacity (MW)</th><th>Generation (GWh/year)</th><th>Annual revenue €</th></tr>
<tr><td>2009</td><td>24</td><td>60</td><td>1,680,000</td></tr>
<tr><td>2010</td><td>60</td><td>140</td><td>3,920,000</td></tr>
<tr><td>2011</td><td>60</td><td>140</td><td>3,920,000</td></tr>
<tr><td>2012</td><td>60</td><td>140</td><td>3,920,000</td></tr>
</table></td></tr>
</table>

Financing sources (equity/debt capital, financing institutions)	At present JSC CARRIDAN (joint Georgian-American company) expressed commitment to finance the project partially.

F GREENHOUSE GAS EMISSION REDUCTIONS

Only projects resulting in emission reductions of greenhouse gases listed in table F1 can be accepted as JI or CDM projects. All emissions and/or emission reductions must be stated in metric tonnes of CO_2 equivalent.

F 1 Greenhouse gases	
Greenhouse gases to be reduced by the project	○ **X** CO_2 ○ CH_4 ○ N_2O ○ HFCs ○ PFCs ○ SF_6

The Project Boundary shall encompass all anthropogenic emissions by sources of greenhouse gases under the control of the project participants that are significant and reasonably attributable to the project activity.

F 2 Project Boundary	
Description of Project Boundary	The project boundary proposed in ACM002 methodology is used: The spatial extent of the project boundary includes the project site and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

F 3 Project emissions	
Description and estimation of project-specific greenhouse gas emissions within the Project Boundary	The Wind farm does not give rise to any greenhouse gas emissions.

F 4 Baseline	

Outline of considered Baseline methodology/scenario and estimation of Baseline emissions within the Project Boundary	ACM0002 methodology is used in calculation of emission factor. The baseline scenario assumes that electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants (many of which are fired with fossil fuels) and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described below. The DNA in Georgia have calculated an emission factor for grid supplied electricity, based on the operating margin and the build margin. They have concluded that this emission factor is 0.328kg CO_2/kWh. Baseline emissions are therefore calculated by multiplying generated electricity by the project with the emission factor above. As the project produces no emissions, and no leakage, baseline emissions are considered to be equal to emission reductions (see F6).

Leakage is defined as the net change of anthropogenic emissions by sources of greenhouse gases which occurs outside the Project Boundary, and which is measurable and attributable to the project activity.

F 5 Leakage	
Description and estimation of Leakage	According to ACM0002: The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction, fuel handling, and land inundation (for hydroelectric projects – see applicability conditions above). Project participants do not need to consider these emission sources as leakage in applying this methodology.

F 6 Emission reductions	
Crediting period	7 years 3times
Estimated annual and total abatement of greenhouse gas emissions in tonnes of CO_2 equivalent in comparison to the Baseline scenario (taking into account Leakage)	<table><tr><td>Year</td><td>tCO_2</td></tr><tr><td>2009</td><td>19,680</td></tr><tr><td>2010</td><td>45,920</td></tr><tr><td>2011</td><td>45,920</td></tr><tr><td>2012</td><td>45,920</td></tr><tr><td>2013</td><td>45,920</td></tr><tr><td>2014</td><td>45,920</td></tr><tr><td>2015</td><td>45,920</td></tr><tr><td>TOTAL</td><td>295,200</td></tr></table> TOTAL- 157,440 tCO_2 during the period 2008-2012 TOTAL- 295,200 tCO_2 –7 year period Total in 3* 7 years – 938 080 tCO_2

G (ADDITIONAL) ECOLOGICAL, SOCIO-ECONOMIC AND/OR DEVELOPMENT EFFECTS

G 1 Expected environmental effects	
Expected global/local environmental effects (positive and negative) of the project[1]	The project will contribute to the local environmental sustainability since it will decrease the use of fossil fuels. Therefore the project contributes to the better use of the local natural resources. In addition the project uses clean and efficient technologies. The project will contribute to meeting the Kyoto Protocol goals by helping to reduce GHG emissions. The wind power generated electricity will partly replace fossil fuelled generated electricity and therefore reduce the emissions of SO2 and NOx. The only potential negative impact is the that the wind turbine generates some noise and should hence not be constructed close to any settlements

G 2 Socio-economic and development aspects	
Expected social and economic effects of the project	The project will contribute: ➢ To the increase of the employment opportunities in the area - the new plant will require the employees for operation, management and repair services; ➢ Towards improving the local economy and energy security since the use of the renewable energy will decrease the dependence on fossil fuels - the project diversifies the sources of electricity generation and decreases dependence on imported natural gas from Russia. ➢ Towards improving the living conditions of the population in the area through the improvement of the power supply in the region ➢ To transfer of technology (wind turbines) and capacity building as a result of this technology transfer as local staff will operate and maintain the technology.
Project-related employment structure	○ Employees under 14 years ○ **X** Employees over 14 years

H ADDITIONALITY AND SUSTAINABILITY EFFECTS

H 1 Additionality	
Presentation of the Additionality of the project	A number of significant barriers to the implementation of this project demonstrate clearly that the proposed CDM project is additional. These barriers include: Technology and know-how: This is the first wind power plant to be constructed in Georgia and there are hence technological risks connected to this. Furthermore will it require some infrastructure development due since the turbines are large and hence difficult to transport. Investment barrier: Due to the barriers and obstacles relating to technology, cost and funds, the wind power plants would lack investment appeal for the project owner without CDM. So this wind power project would meet difficulties for implementation owing to the following barriers: • financing barriers for investors to operate wind farm because the proposed project needs a large initial investment in a technology which is still perceived as high risk • it is the first project of its size in Georgia, and in particular for the project owner to apply the technology of VESTAS Company, which leads to technical risks Economic/financial barriers: due to the large capital investment required and the relatively low electricity tariff in Georgia, a preliminary investment analysis shows that the IRR of the project is low, estimated at under 7%, without the revenues from CDM. This does not make the project an attractive investment opportunity for potential developers. In the initiate stage of the project, the investor has fully considered the important role played by CDM Therefore the developer started the CDM process aiming to obtain the additional CDM funding to secure the performance of the project. So the project owner would not build this project without the support of CDM fund and the GHG reduction of this project activity will not be realized either.

H 2 Sustainability Effects	
Summarising description of the project's contribution to the sustainable development of the Host Country	The project realization will improve energy security, will reduce energy imports and will promote the country's sustainable development due to an improvement in the stability of energy supply to customers. The project will produce electricity with no emissions of CO2 or pollutants.