



**CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02**

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**Revision history of this document**

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	<ul style="list-style-type: none">• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document.• As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at http://cdm.unfccc.int/Reference/Documents.

**SECTION A. General description of the small-scale project activity****A.1. Title of the small-scale project activity:**

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San Carlos renewable energy project.
Version 1, 18/07/2006

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

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The San Carlos Renewable Energy project (SCRE) will be a high efficiency bagasse cogeneration plant with 8MW of electrical power, built on a green field site in the San Carlos Agro-Industrial Economic Zone on the eastern coast of Negros Occidental, Philippines. The Co-generation unit will use bagasse from sugar cane milling supplemented when needed by biogas, wood chips and cane trash.

The San Carlos Renewable Energy project will provide the following:

- Heat to a planned ethanol distillery and related pre-treatment facilities in the form of process steam. The Boiler size is 45t/hr and 65bara.
- Electricity to a cane mill, planned ethanol distillery and related utilities
- Electricity to the Luzon-Visayas grid.
- The cogeneration unit is rated at 8MW. Total annual electricity production is estimated at 58,457 MWh/yr, of which an estimated 29,723 MWh/yr will be supplied to the grid

The main fuel for the project will be bagasse from a planned ethanol distillery. The projected bagasse supply will however be insufficient. Supplementary fuel will be drawn in the form of biogas from an anaerobic digester that will treat waste water from the ethanol distillery. Further fuel needs will be met with cane trash from the fields that are used to supply sugar cane to the distillery, and locally sourced woodchips from existing tree plantations in the San Carlos area.

The identified organization that will be supplying the woody biomass is the Global Environment and Nature Ecosystems Society (GENESYS) Foundation, Inc. GENESYS is a non-profit, non-government organization established in San Carlos City, Negros Occidental to manage and implement environment-based restorative or capability building projects.

The project has a number of sustainable development benefits that are additional to the reduction in anthropogenic greenhouse gas emissions.

- It eliminates the need for the planned ethanol distillery to draw power from the local Luzon-Visayas grid.
- By supplying additional electricity to the grid the project will reduce inter island transmission losses.

By providing power to the grid and displacing power in the ethanol distillery the project reduces the need for the island of Negros to draw electricity from the island of Cebu, thus avoiding inter island



transmission losses. Negros has a 23 MW capacity shortfall and is currently a net importer of power relying on its neighbour Cebu.

- It increases the renewable generating capacity on the Luzon-Visayas grid

A major benefit from the scheme will be the increase in renewable electricity generation and the subsequent displacement of fossil fuel based generation. The reason that the project will displace fossil fuel based electricity and not other forms, is that the marginal generators on the Luzon-Visayas grid are fossil based.

This is highly significant as the Philippines Department of Energy Power Development Plan 2005 – 2014 projects an increase in fossil fuel based generation on the Luzon-Visayas grid. Fossil generation in the form of gas and coal is projected to expand from 14GWh and 623 GWh in 2004 to 1,340GWh, and 1000GWh by 2014 respectively. So the project will to some degree help to reverse this trend.

As such, the project, by using a renewable resource, providing local employment, and contributing towards the meeting of required expansion of generation capacity on the Luzon-Visayas grid, fits perfectly with the Philippine Agenda 21 implementation and the Bruntland commissions definition of Sustainable development. Namely, meeting the needs of the present, in this case an expansion in generation capacity, without compromising the ability of future generations to meet their needs, by utilising renewable energy.

A.3. Project participants:

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Name of Party involved*	Private and/or public entity (ies) project participants (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Philippines	San Carlos Bioenergy Inc.	No

(*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required.

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

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The San Carlos renewable energy project consists of a cogeneration unit providing process steam and electricity to a planned ethanol distillery and its related facilities and electricity to the Luzon Visayas grid. The plant will utilize a mixture of indigenous renewable bio fuels. Primarily the plant will be run on bagasse. It will also use biogas generated from the treatment of waste water from the proposed ethanol distillery, locally sourced woodchips, and cane trash from local sugar cane fields. The boiler pressure of 65bara represents a significant increase in efficiency compared with the traditional bagasse cogeneration plants in the Philippines of approximately 20bara.



The equipment will be provided by the following companies; Triveni Engineering and Services Ltd of India will be supplying the 8000kW extraction Condensing Steam Turbine Generator set; ISGEC John Thompson also of India will be supplying the 45 TPH, 67 Kg/cm² g, 485+/-5 Deg C boiler.

Table A.1 - Technical Details of Boiler Equipment

Item	Equipment	Manufacturer
1	8000kW extraction Condensing Steam Turbine Generator set	Triveni Engineering and Services Ltd of India
2	ISGEC John Thompson of India	45 TPH, 67 Kg/cm ² g, 485+/-5 Deg C boiler

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

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A.4.1.1. Host Party(ies):

>>

Philippines

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

>>

Negros Occidental

A.4.1.3. City/Town/Community etc:

>>

Brgys. Punao and Palampas, San Carlos City

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

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San Carlos is an ideal location for an ethanol and power cogeneration plant using sugar cane as a feedstock. Long a prime sugar producing area with rich soils the cane from this area is among the best in quality and highest yielding in the country (prime areas produce over 100 MT per hectare).

Despite these natural advantages it does not currently have an operational sugar mill in the locality. By going against existing practise and constructing a mill in the area, the project will reduce greenhouse gas emissions by reducing the distance that locally grown sugar cane is transported for processing. However these reductions will not be included in the project baseline calculations in order to maintain a conservative approach.



The site is located in an Agro-Industrial Eco-Zone, approved by the Philippine Economic Zone Authority (PEZA).

Figure A2 - San Carlos renewable energy project location



GPS co-ordinates of the Project:

The Co generation unit will be located on E= 545803.74 , N= 1162655.08

A.4.2. Type and category(ies) and technology of the small-scale project activity:

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According to Appendix B of the simplified modalities and procedures for small scale CDM projects version 08, of 03 March 2006, the project activity is type AMS- I.D (“*Renewable electricity generation for a grid*”).

The project conforms to the project category as it involves the installation of a grid connected cogeneration unit, utilizing renewable fuels. At no point will the output exceed 45MWthermal or 15MW of electrical, the rating of the co-generation unit is 8MW electrical.

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

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The proposed project activity will result in a reduction of activity from marginal electricity generators in comparison to the baseline. As the marginal generators on the Luzon-Visayas grid are fossil based this will result in a reduction of fossil fuel based electricity generation thus reducing carbon dioxide emissions from these activities.

The project does this in two ways, firstly by displacing grid electricity in the SCBI fuel ethanol distillery, and secondly by supplying renewable electricity to the grid, thus reducing the activity of marginal generators.

The presence of increased generation capacity on the island of Negros will reduce the need to transfer power from the island of Cebu during peak demand. This will in turn reduce inter island transmission losses, although in order to maintain a conservative baseline the project will not claim this aspect of the carbon dioxide emissions reductions associated with the project.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

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Based on a projected annual generation of 58,457 MWh of electricity and a CEF of 0.643 the Project activity will reduce GHG emissions by 37,608 tonnes of CO₂ per year, totalling 263,253 tonnes of CO₂ during the initial 7-year crediting period.

Table A.3. Estimated amount of emission reductions

Please indicate the chosen crediting period and provide the total estimation of emission reductions as well as annual estimates for the chosen crediting period. Information on the emissions reductions shall be indicated using the following tabular format.

For type (iii) small-scale projects the estimation of project emissions is also required.

Years	Annual estimation of emission reductions in tonnes of CO ₂ e
Year 1	37,608
Year 2	37,608



Year 3	37,608
Year 4	37,608
Year 5	37,608
Year 6	37,608
Year 7	37,608
*After the initial 7-year crediting period, the baseline will be reassessed, generating a new estimate of emissions reductions yet to be determined.	
Total estimated reductions (tonnes of CO₂e)	263,253
Total number of crediting years	7 (renewable up to 21 years)
Annual average over the crediting period of estimated reductions (tonnes of CO ₂ e)	37,608

A.4.4. Public funding of the small-scale project activity:

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The project will not receive any public funding from Parties included in Annex I of the UNFCCC.

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

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The San Carlos Renewable Energy project is not part of a larger CDM renewable electricity project and is therefore not a debundled component of a larger project activity.

According to *Appendix C* to the Simplified Modalities and Procedures for small scale CDM project activities, the project is not part of a larger CDM project activity. There is no registered small-scale CDM project activity or an application to register another small-scale CDM project activity:

- With the same project participants;
- In the same project category and technology/measure;
- Registered within the previous 2 years; and
- Whose project boundary is within 1 km of the project boundary of the proposed small-scale activity at the closest point.

Therefore, this project is not a debundled component of a larger project activity.

SECTION B. Application of a baseline methodology:

**B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:**

>>

The project activity is applicable to small-scale project type AMS- I.D Renewable electricity generation for a grid:

- Methodology AMS-I.D., - Renewable Electricity Generation for a Grid

From *Appendix B* of Simplified Modalities and Procedures for small scale CDM projects version 8, 03 March 2006.

B.2 Project category applicable to the small-scale project activity:

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The methodology for the San Carlos renewable energy project is Type AMS I.D -“Renewable electricity generation for a grid”

The project meets all of the applicable requirements included in AMS-I.D. This category comprises “Renewable Energy Projects”.

The project proposes to displace potentially carbon intensive grid generated electricity with approximately 8 MW of renewable energy generated from bagasse, cane trash, biogas and woodchips. Since the project co-generation unit is rated at less than 15MW, the project is eligible for the CDM under small-scale methodology I.D., “Renewable electricity generation for a grid”.

The choice of applicable baseline calculation for the project category is justified since the project activity meets the following applicability conditions (See Table B.1 below):

**Table B.1. – Relevant Methodology AMS-I.D. Requirements**

Project Type	Type I-Renewable Energy Project
Project Category	I.D. Renewable Electricity Generation for a Grid
Technology/Measure	<p>This category comprises renewable energy generation units, such as photovoltaics, hydro, tidal/wave, wind, geothermal, and renewable biomass, that supply electricity to and/or displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit.</p> <p><i>Applicable to the San Carlos CDM project:</i> Biomass combined heat and power (co-generation) systems that supply electricity to and/or displace electricity from a grid are included in this category. To qualify under this category, the sum of all forms of energy output shall not exceed 45 MW_{thermal}. E.g. for a biomass based co generating system the rating for all the boilers combined shall not exceed 45 MW_{thermal}.</p>
Boundary	The project boundary encompasses the physical, geographical site of the renewable generation source.
Baseline	In order to calculate the baseline the methodology for small scale renewable energy projects supplying electricity to the grid has been used. The baseline chosen is calculated from the average of the CEF of the grid that electricity is being supplied to and the build margin of that grid for the latest 5 additions or 20% of supply whichever is greater, multiplied by the amount of electricity generated by the project to give the total reduction in anthropogenic emissions of CO ₂ caused by the project. Any anthropogenic GHG emissions associated with the project are deducted from this figure to give the final reduction.
Leakage	<p>If the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.</p> <p><i>Applicable to the San Carlos CDM project:</i> As no equipment is transferred to or from another activity in the project, leakage does not need to be considered.</p>
Monitoring	Monitoring shall consist of metering the electricity generated by the renewable technology. In the case of co-fired plants, the amount of biomass and fossil fuel input shall be monitored.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

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The project activity involves generating electricity from bagasse, woodchips, cane trash and biogas. The electricity will be used by the San Carlos fuel ethanol distillery with the excess being supplied to the grid. Thus, the project is both replacing electricity that would have otherwise been drawn from the grid with



renewable electricity and supplying the grid with renewable electricity. As will be demonstrated in the following steps, CDM revenue has been considered from the early stages of development of the project, and it is an integral part of the financial package of the project. Specifically, renewable power generation has been presented as a potential CDM project as long ago as March 2005. The Project Developer took the decision to implement the project after considering CDM benefits under the Kyoto Protocol.

Additionality of the San Carlos Renewable Energy Project:

Demonstration of why the San Carlos Renewable Energy project is additional falls under the following categories.

- (a) Absence of mandatory policy and regulations.**
- (b) Investment Barrier**
- (c) Technological Barrier.**
- (d) Prevailing practice Barrier**

(a) Absence of mandatory policy and regulations:

The first condition related to additionality is the demonstration of the absence of mandatory policy or regulations requiring the project activity (i.e. renewable electricity generation from biomass). The project activity meets this first requirement, as there are no direct programs, regulations or initiatives that are mandatory, requiring the generation or use of renewable electricity from biomass, that would be applicable to the San Carlos Renewable Energy project.

Moreover, there is no requirement in any license associated with the San Carlos Ethanol distillery or the San Carlos Renewable Energy plant that would require either the use or generation of renewable electricity.

(b) Investment Barrier

The generation unit is estimated by Bronzeoak to entail an initial investment of US\$10.5-11 Million. Additional revenue from the CDM has been considered from the onset as an integral and vital component of the project's financial viability. In the absence of the CDM it is highly unlikely that the San Carlos Renewable Energy project could attract the needed investment and loans, and all deals to date have indeed relied on this component to make the project sufficiently attractive to warrant consideration.

(c) Technological Barrier.

SCBI and its employees will be solely responsible for the operation and maintenance of the high efficiency Bagasse cogen unit. This will involve the hiring and training of additional staff that would not have taken place in the absence of the project. Furthermore, the nature of the project entails the transfer of technology not only in the form of the boiler but also in the additional training of SCBI managers, engineers, supervisors, and operations staff. Contractors will also gain experience in high efficiency Bagasse cogeneration through their involvement in the construction and civil engineering aspects of the project. This not only strengthens the relationships between SCBI and the local community but produces



an additional component of technology transfer and will entail tangible benefits in the form of investment and a broadening of the local skill base.

(d) Prevailing practice Barrier

The use of the mixture of Bagasse, biogas, cane trash, and woodchips for generating electricity supplied to the grid is neither widespread nor commonly accepted practice within the Philippines, at both a national and local scale. In addition, the 65bara boiler represents a significant increase in efficiency compared with traditional energy generation at sugar mills in the Philippines at approximately 20bara. The project would be a first within the Philippines. Therefore the San Carlos renewable energy project represents a considerable diversification from prevailing practice for the Philippines grid in general and presents a steep learning curve for the staff and managers of SCBI. Consequently the operation of the high efficiency co-generation unit will require additional management time, maintenance time and thus SCBI will incur additional expense in comparison to purchasing grid based electricity.

Additionality Summary:

Therefore, in the absence of mandatory policies requiring co-generation facilities or renewable energy facilities, the presence of significant investment, technological, and prevailing practice barriers, the project is deemed to be financially and technically unviable in the absence of the CDM component.

B.4. Description of how the definition of the project boundary related to the <u>baseline methodology</u> selected is applied to the <u>small-scale project activity</u>:
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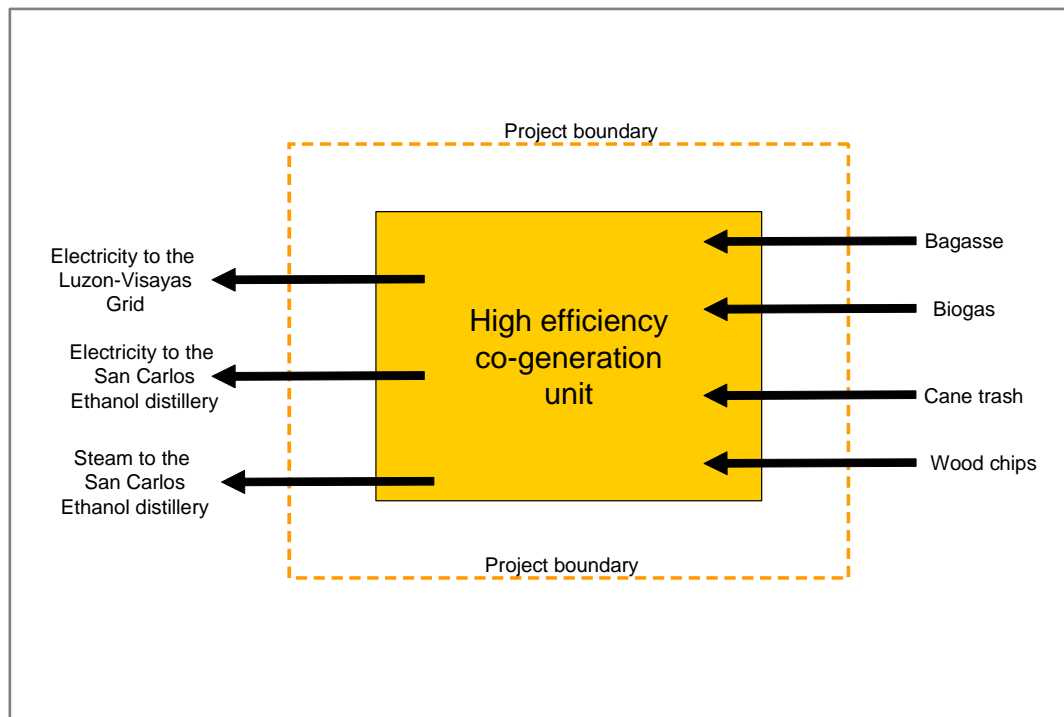
As stated in *Appendix B* for small-scale project activities, the project boundary for small-scale renewable energy projects is defined by the physical, geographical site of the renewable energy generation. The project boundary of the San Carlos renewable energy project CDM Project activity encompasses the physical, geographical area of the proposed renewable co-generation unit.

A brief description of all sources of baseline and project emissions appears below:

The baseline is defined as the emissions which would have occurred in the absence of the project activity, which is the consumption of grid produced electricity and the continued generation by fossil fuel power plants which are on the margin in the Luzon-Visayas grid. The baseline is based on the amount of CO₂ emissions avoided as a result of the electricity that the San Carlos renewable energy project displaces in the distillery and replaces on the grid.

Conforming to the guidelines and rules for small-scale project activities, the emissions related to production, transport and distribution of the fuel used in the power plants in the baseline are not included within the project parameters, as these do not occur within the project boundary.

As shown in figure B1 the activity of the proposed San Carlos Renewable Energy Project is the co generation of process steam and electricity. This activity is under the control of the project developer and is to be included within the project boundary. The emissions related to biomass electricity and heat cogeneration are zero, as the fuel source is renewable biomass.

Figure B1 - San Carlos renewable energy project process**B.5. Details of the baseline and its development:**

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For baseline calculations the data used is the most recent possible. Date of completion of baseline development is July 20 2006.

EcoSecurities B.V. is the entity determining the monitoring plan and participating in the project as the Carbon Advisor. EcoSecurities is not a project participant. The person in charge of its development is:

Miles Austin
EcoSecurities
Kettingstraat 21-A
2511 AM Den Haag
The Netherlands
Phone : +31 70 365 4749
Email : miles.austin@ecosecurities.com

SECTION C. Duration of the project activity / Crediting period:**C.1. Duration of the small-scale project activity:**



>>

C.1.1. Starting date of the small-scale project activity:

>>

1/1/07 (construction commences)

C.1.2. Expected operational lifetime of the small-scale project activity:

>>

The operational lifetime of the technology is estimated at 30 years; however, the crediting period will be limited to a maximum of 21 years.

C.2. Choice of crediting period and related information:

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C.2.1. Renewable crediting period:

>>

The 21-year renewable crediting period (three 7-year renewable periods) has been opted for the proposed project.

C.2.1.1. Starting date of the first crediting period:

>>

1/11/08 (start of commercial operations)

C.2.1.2. Length of the first crediting period:

>>

7y-0m

C.2.2. Fixed crediting period:

>>

Not applicable

C.2.2.1. Starting date:

>>

Not applicable

C.2.2.2. Length:

>>

Not applicable

**SECTION D. Application of a monitoring methodology and plan:**

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D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

>>

The monitoring methodology for Type 1D projects of the simplified methodologies for baseline determination and monitoring is applied to this project.

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

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The San Carlos Renewable Energy CDM project falls within the small scale project type 1D “Grid connected electricity generation.”

The project complies with the criteria for this category as it comprises a high efficiency co-generation unit fuelled by biomass providing electricity to the grid and displacing electricity from the grid within a planned ethanol plant. Additionally, the capacity of the cogeneration unit does not exceed 45MW thermal.

In accordance with the specifications of small scale Type 1.D monitoring of the actual project activity shall involve the monitoring of the electricity generated.

As the project does not involve co-firing with fossil fuels, or the combustion of fossil fuels in any other mode no other monitoring is required.

**D.3 Data to be monitored:**

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Table D.1: Data to be collected in order to monitor emissions from the project activity, and how this data will be archived.

ID #	Data Type	Data Unit	Calculated (c) Indicated (I) or Measured (m), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	How long will the data be kept?	Comment
1	Quantity of electricity supplied to the Grid.	kWh	m	Daily	100%	Electronic and paper	2 years past the ending of the crediting period or the final issuance of CERs, whichever occurs latest.	A calibrated electricity meter will be installed.
2	Quantity of electricity supplied to the San Carlos Ethanol Distillery.	kWh	m	Daily	100%	Electronic and paper	2 years past the ending of the crediting period or the final issuance of CERs, whichever occurs latest.	A calibrated electricity meter will be installed.



D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

>>

Once implemented, the relevant data report will be submitted to a designated operational entity contracted to verify the emission reductions achieved during the crediting period. Any revisions requiring improved accuracy and/or completeness of information will be justified and will be submitted to a designated operational entity for validation. The plan does not include monitoring of any variable regarding leakage since no leakage calculation is required.

Table D.2 - Quality Control and Procedures

Data	Uncertainty level of data: (high, medium, low)	Are QA/QC procedures planned for these data?	Explain QA/QC procedures planed for these data, or why such procedures are not necessary
1	Low	Yes	Measuring instruments will be calibrated and maintained regularly.

D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

>>

The Project Developer will have designated shift technicians on site 24 hours a day which will be responsible for monitoring data (generated electricity) required for the calculation of emissions reductions of the project activity.

Proper management process and routine procedures will be implemented to ensure the quality of reports required by verification audits.

D.6. Name of person/entity determining the monitoring methodology:

>>

EcoSecurities B.V. is the entity determining the monitoring plan and participating in the project as the Carbon Advisor. The person in charge of its development is:

Miles Austin
EcoSecurities
Kettingstraat 21-A
2511 AM Den Haag



The Netherlands
Phone : +31 70 365 4749
Email : miles.austin@ecosecurities.com

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

>>

The project will generate renewable electricity using bio fuel therefore there are no net GHG emissions within the project boundary.

E.1.1 Selected formulae as provided in appendix B:

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The methodology chosen for calculating the baseline is;

29. For all other systems, the baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO₂equ/kWh) calculated in a transparent and conservative manner as:
- (a) The average of the “approximate operating margin” and the “build margin”, where:
 - (i) The “approximate operating margin” is the weighted average emissions (in kg CO₂equ/kWh) of all generating sources serving the system, excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation;
 - (ii) The “build margin” is the weighted average emissions (in kg CO₂equ/kWh) of recent capacity additions to the system, defined as the lower of most recent 20% of plants built or the 5 most recent plants;

29 a (i) Calculating the approximate operating margin.

First the CO₂ emissions per technology are calculated in the following manner for each technology in steps 1 -4.

Step 1

The total electricity that would have been generated at 100% efficiency is calculated.

$$\text{Total electricity generated (GHh)} * 100 / \text{plant efficiency}$$

Step 2

The energy content of the fuel in used in TJ is then calculated using the IPCC conversion factor of 3.6.

$$\text{Electricity generated at 100\% efficiency} * 3.6$$

**Step 3**

From this the carbon content of the fuel used is calculated by multiplying the energy content of the fuel by the IPCC CEF.

$$\text{Energy content of fuel} * \text{CEF}$$

Step 4

The CO₂ emissions are then calculated by multiplying the carbon content by 44/12.

$$\text{Carbon content of fuel} * 44/12$$

Step 5

The Grid CEF of each technology is then calculated by dividing the CO₂ emissions by the power produced.

$$\text{CO}_2 \text{ emissions} / \text{total power generated.}$$

Steps 1 – 5 are repeated for each technology.

Step 6

Then the CEFs are then weighted by multiplying the CEF for each technology by the electricity generated using that technology.

$$\text{CEF for technology } x * \text{total electricity generated using technology } x$$

Step 7

The weighted CEFs are then added together and divided by the total power generated by by the technologies under consideration to give the approximate operating margin.

$$\frac{(\text{weighted CEF technology } x + \text{weighted CEF technology } y + \text{weighted CEF technology } z + \dots)}{(\text{electricity generated by } x + \text{electricity generated by } y + \text{electricity generated } z + \dots)}$$

29 a (ii) Calculating the build margin.

The Build margin is calculated using the steps 1-7 above but for the latest five plants added to the grid rather than by technology.

The approximate operating margin and the build margin are then averaged.

E.1.2 Description of formulae when not provided in <u>appendix B</u>:
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E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

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The project boundary “encompasses the physical geographical site of the renewable generation source” in this case the co generation unit. As the co-generation unit will only ever combust renewable fuels in the form of bagasse, biogas, cane trash, and woodchips there are no net anthropogenic emissions.

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities

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The project does not involve the transfer of equipment either to or from another activity therefore in accordance with the chosen methodology small scale 1D there is no leakage.

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

>>

There are no anthropogenic greenhouse gas emissions from the small scale project activity.

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

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E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

>>

E.2 Table providing values obtained when applying formulae above:

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The table below provides a summary of the projected emissions reductions from the San Carlos Renewable energy project for the first crediting period of 7 years.

Table E.1 Summary of Baseline Emissions, Project Emissions, and Emission Reductions.


Year	Baseline Emissions (t CO ₂ /year)	Project Emissions (t CO ₂ /year)	Emission Reductions (t CO ₂ /year)
2007	37,608	0	37,608
2008	37,608	0	37,608
2009	37,608	0	37,608
2010	37,608	0	37,608
2011	37,608	0	37,608
2012	37,608	0	37,608
2013	37,608	0	37,608
Total (tonnes of CO_{2e})	263,253	0	263,253

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

>>An EIA assessment has been carried out jointly for both the San Carlos renewable energy project and the San Carlos Bio energy project (ethanol distillery). The concerns and impacts identified were all related to the ethanol distillery and the renewable energy project. As a result of the comments received Bronzeoak has set up appropriate avoidance, mitigation, and monitoring programmes and has received an Environmental compliance certificate covering both projects.

Table F1 ECC

	Republic of the Philippines DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES ENVIRONMENTAL MANAGEMENT BUREAU Office of the Regional Director Region VI, Pepita Aquino Avenue, Iloilo City Tel. No.: (033)3379910 * Telefax: (033)3379901 * Email: embro@yahoo.com
	<p align="center">ENVIRONMENTAL COMPLIANCE CERTIFICATE</p> <p align="center"><u>0006-0428-140-120</u></p> <p>The ENVIRONMENTAL MANAGEMENT BUREAU (EMB) of the DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (DENR), Region VI grants this ENVIRONMENTAL COMPLIANCE CERTIFICATE (ECC) to SAN CARLOS BIOENERGY, INC. for the proposed FUEL ETHANOL DISTILLERY AND COGENERATION PROJECT located in BRGYS. PUNAO AND PALAMPAS, SAN CARLOS CITY, NEGROS OCCIDENTAL after complying with the ENVIRONMENTAL IMPACT ASSESSMENT (EIA) requirements pursuant to P.D. 1586.</p>

**SECTION G. Stakeholders' comments:****G.1. Brief description of how comments by local stakeholders have been invited and compiled:**

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Annex 4 contains the minutes of the stakeholder meeting held by Bronzeoak including additional information regarding stakeholders' consultation the list of participants. Bronzeoak addressed stakeholders via a meeting at the Barangay Hall, Punano in San Carlos City on the 2nd of August 2006.. The stakeholders have been part of an ongoing process and were previously extensively consulted about the SCBI as part of the EIA.

G.2. Summary of the comments received:

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The stakeholders did not raise any major concerns or objections. The minutes of the stakeholder meeting are included in Annex 4.

The stakeholders were neutral on the CDM component of the project but in favour of the project itself due to the benefit to the local community in the form of employment.

G.3. Report on how due account was taken of any comments received:

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As stated under G.2 the stakeholders raised no major concerns or objections. The answers provided by Bronzeoak and EcoSecurities in relation to impacts and complying issues satisfied the participants.

**Annex 1****CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY**

Organization:	San Carlos Bioenergy Inc
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Building:	1207 Security Bank Centre
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State/Region:	Metro Manila
Postfix/ZIP:	1226
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URL:	www.bronzeоak.com
Represented by:	Luis O. Villa-Abrille
Title:	President
Salutation:	Mister
Last Name:	Ville-Abrille
Middle Name:	Oteyza
First Name:	Luis
Department:	Project Office
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Direct tel:	-
Personal E-Mail:	-

Annex 2**INFORMATION REGARDING PUBLIC FUNDING**

The San Carlos renewable energy project will receive no public funding.



Annex 3 Emissions reductions calculations

Operating Margin CEF

Luzon-Visayas grid Marginal operators

	2004	2003	2002	A	B	C	D	E	F	G	H
				Total for 2004-2002	Plant efficiencies	Assuming 100% efficiency	Conversion to energy content of fuel combusted Gwh to TJ	CEF of fuel	CO2 emissions	Grid CEF by technology	Weighted by technology
Source	PDOE	PDOE	PDOE	PDOE	CDM EB for Brazil*			IPCC			
Calculation						A * 100/B	C * 3.6		D * E * 44/12	F*1000/A*100,000	G * A
Unit	GWh*	GWh*	GWh*	GWh*	%	GWh	TJ	tC/TJ	tCO2	kg CO2/kWh	
Total Aggregated	48,962	39,257.00	34,823	123,042		334,670.88					95172.67422
Coal	16,185	14,517.00	15,498	46,200	33.00%	140,000.14	504,000.51	26.8	49,526,450	1.072	49526.44996
Oil-based	6,397	5,801.00	5,277	17,475	33.00%	52,953.73	190,633.44	21.1	14,748,674	0.844	14748.67364
Diesel	0	4,142.00	3,545	7,687	33.00%	23,293.94	83,858.18	21.1	6,487,828	0.844	6487.828
Gas Turbine	0	480.00	785	1,265	32.00%	3,953.13	14,231.25	15.3	798,373	0.631125	798.373125
Oil Thermal	0	1,178.00	947	2,125	33.00%	6,439.39	23,181.82	21.1	1,793,500	0.844	1793.5
Natural Gas	12,660	13,139.00	8,771	34,570	32.00%	108,030.55	388,909.97	15.3	21,817,849	0.631125	21817.8495

Grid CEF = Total H / Total A	0.77349683 kg CO2/kWh
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*Average plant efficiencies for the Philippines are not publicly available. Given this situation it was felt that in order to maintain a conservative baseline it was necessary to use plant efficiencies from a country at a similar stage of development to the Philippines rather than figures from a country at a more advanced stage of economic development.



Build Margin CEF

			A	B	C	D	E	F	G	H
			Total for 2003	Plant efficiencies	Assuming 100% efficiency	Conversion to energy content of fuel combusted Gwh to TJ	CEF of fuel	CO2 emissions	Grid CEF by technology	Weighted by technology
			PDOE	Conservative estimate			IPCC			
					A * 100/B	C * 3.6		D * E * 44/12	F*1000/A*100 0,000	G * A
Unit		Year	GWh*	%	GWh	TJ	tC/TJ	tCO2	kg CO2/kWh	
San Roque Hydro		2003	738.009	na	na	na	na	0	0	0
San Lorenzo CCGT		2002	2952.455	50.00%	5,904.91	21,257.68	21.1	1,644,636	0.55704	1644.63553
Illijan CCGT		2002	4505.05	50.00%	9,010.10	32,436.36	21.1	2,509,493	0.55704	2509.49305
Casecnan Hydro		2001	383.743	na	na	na	na	na	0	0
Sta Rita CCGT		2001	5666.309	50.00%	11,332.62	40,797.42	21.1	3,156,361	0.55704	3156.36077
Total			14245.566							7310.48935

Build margin = Total H / Total A	0.51317648	kg CO2/kWh
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Average CEF = 0.64333665

Projected annual generation = 58,457.00 MWh

Projected annual emissions Average CEF * Projected generation = 37,608 tCO2e

7year emissions reductions = 263,253

Annex 4

SAN CARLOS BIOENERGY, INC.

CLEAN DEVELOPMENT MECHANISM (CDM)
STAKEHOLDERS CONSULTATION
FOR THE PROPOSED INTEGRATED ETHANOL FUEL DISTILLERY
AND COGENERATION PLANT

Date: August 2, 2006

Time: 9:30 AM to 11:30 AM

Venue: Barangay Hall, Brgy. Punao, San Carlos City, Neg. Occ.

TRANSCRIPTION OF PROCEEDINGS

Nanette Abuan (Bronzeoak): Good Morning! Welcome to the Clean Development Mechanism (CDM) Stakeholders Consultation Meeting for the proposed Ethanol Distillery and Cogeneration Project. This consultation is spearheaded by EcoSecurities Philippines Inc. and Bronzeoak Philippines. Before we start our program, we wish to recognize the presence of the Honorable Rene Gustilo... Good morning, Sir..

Hon. Rene Gustilo: *Good morning.*

Nanette: Thank you for coming, Sir... and we also have Ms. Marian Burgos. I will now introduce the participants to our Stakeholders Consultation. I will start with our visitors who are seated in front... Mr. Arnold Bufi from EcoSecurities Philippines; Mr. Louie Villa Abrille, San Carlos Bioenergy; and Ms. Mia Jarumayan, Bronzeoak Philippines; and Mr. Jojo Salvador, Community Relations Adviser for San Carlos Bio Energy.)

Nanette: And now the participants... I will start with the participants from the Host Barangay, Barangay Punao... Brgy. Captain Paquito Abadies.. Good morning. Kagawad Crispulo Albana, Kagawad Mario Alota, Kagawad Ricardo Bacasmas, Kagawad Santos Delima, Kagawad Carlos Pasilan, Kagawad Danilo Rodriguez, SK Chairman Cherry Ann Landao, our Barangay Treasurer Mr. Ben Repetillo and Mr. Lucretio Rico... good morning, Sir.)

Nanette: The representatives from Barangay Palampas... Capt. Mike Azcona, Kagawad Hipolito Canete, Kagawad Rogelio Delima, Kagawad Francisco Pacres, Kagawad Aquilino Saavedra, Kagawad Benigno Suan, Kagawad Ricardo Tilag, and Kagawad Diosdado Verana, good morning.)

Nanette: Our representatives from the NGO... from Genesys Foundation... Ms. Princess Solis and Ms. Ina Kadda. Of course we also have our representative from DENR CENRO- Cadiz, Ms. Cora Gonzales. Good morning and welcome to our consultation. I will now turn over the microphone to Arnold.

Arnold Bufi: Thank you, Nanette. Good morning, everyone.



Arnold: We are here for the Stakeholders Consultation for the Clean Development Mechanism (CDM). You might be wondering why there is another consultation here for the project. This consultation is a requirement of the DENR as the Designated National Authority (DNA) for the Kyoto Protocol. Later I will explain what the Kyoto Protocol is. For now I will just present Clean Development Mechanism.

Arnold: These are our topics today: Global Warming Greenhouse Gases and Clean Development Mechanism and the components of the project. If you remember last October, we had a Scoping Meeting in the market to introduce the project and also we were also able to get the Environmental Compliance Certificate last April 28, 2006. So we are almost ready to start. This stakeholder consultation is also a requirement of the DENR to let you understand about Clean Development Mechanism, Kyoto Protocol and if you have issues regarding the CDM project.

Arnold: I am going to start with what greenhouse gases are? The explanation is simple. Everything that we do, using vehicles, operating electric power plants, and virtually all human activities will produce carbon dioxide. These gases block the radiation that is suppose to escape the atmosphere after it bounces off from the ground and oceans. This phenomenon caused temperature anomalies and eventually causes global warming. All of us contribute to this phenomenon of global warming and this environmental impact does not respect boundaries, hence, an international solution was warranted.

Arnold: This is why there is what is called the Kyoto Protocol. The reason why it is called Kyoto Protocol is because many countries got together and had a meeting in Kyoto. That is why it is called the Kyoto Protocol. The Kyoto Protocol stipulates that greenhouse gas emissions should be reduced..

Arnold: The list of Annex I countries are not shown here...Western Europe, Canada and Japan... these are the countries where that already put a cap or a limit on their emission of carbon dioxide. I think they based it on their 1990 levels. So if population increases, if there is increased economic activity, correspondingly there is also an increase in carbon dioxide emission. So this is what they want to reduce. And they want the voluntary participation of developing countries like us, the Philippines, South East Asian countries, Latin America, Asia and former Soviet Union.

Arnold: The Clean Development Mechanism which was agreed on in the Kyoto Protocol will allow developed countries, those that I mentioned earlier... Canada, Europe and Japan, to transfer technologies to other countries like us and in return they will buy our carbon credits. This mechanism is done because it will cost them more to put or implement such measures to reduce carbon dioxide, so they implement it here, that is why we have the Clean Development Mechanism.

Arnold It's an opportunity for countries like Philippines to participate in this mechanism so we will have transfer of technologies and there will be investments coming in. In return, we will provide the credits as a country. How does the Clean Development Mechanism work? How are carbon credits created? This is time, greenhouse emission is this line. In this line, these are the projects that you will not include in CDM. This line, if you implement a CDM project, the emission of carbon will decrease so the difference will be the carbon credits that we will sell to other countries.

Arnold: There are ways to measure these; there are methodologies used to measure exactly how many tons of carbon dioxide will be avoided if we implement a project like this, like the ethanol project. One Certified Emission Reduction is equivalent to 1 ton of carbon dioxide prevented. For example, this ethanol plant, since it will be mixed with gasoline so there is certain percentage of gasoline you will not use so there are tons of carbon dioxide that will be avoided.



Arnold: So what are the components of the project that we will apply for CDM? No.1 is **Ethanol production**, the thing I said while ago because it will replace a certain volume of gasoline, we will have a corresponding reduction of carbon dioxide and EcoSecurities will do the calculation of how many tons of carbon dioxide we can prevent. No. 2 is biomass-produced heat and electricity because this project is cogeneration. Bagasse is taken from the mill will provide heat to the boiler to produce electricity; 8 megawatts will be generated. Now, how can it reduce carbon dioxide? This kind of biomass project is considered carbon-neutral. It means that if this emits carbon dioxide, it will be taken up by the plants in its cropping cycle so it has zero carbon dioxide, unlike, for example if you have coal-fired power plant, when it emits carbon dioxide you can not get it back because the coal came from a mine that is several hundred meters deep in the earth, that's why you can't get it back; unlike biomass which recycles carbon dioxide.

Arnold: And because we will implement this project, there is an equivalent carbon dioxide that will be prevented when the project supplies 8 megawatts to VRESKO. Even heat, we can compute how much heat will be used by the plant in the process, if we can compute how much tons of carbon dioxide will be prevented. No. 3 is what is called Greenfield Anaerobic Digestion because the water waste treatment plant will capture methane. What is commonly done in equivalent projects such as this, though this ethanol project will be the first in the Philippines, but like the distillery, their practice is only using oxidation lagoons. They have a series of lagoons where they treat wastewater and it emits methane because it's anaerobic. There is no oxygen so it generates methane and it goes to the atmosphere; and we don't like that. Like I said earlier, methane is 21 times more potent than carbon dioxide in terms of Global Warming potential. So in this project methane will be captured and used as fuel to the boiler. So we can compute how many tons of carbon dioxide will be prevented.

Arnold: Do you have any question? We are now in the Question and Answer portion. These are basically the things that the DENR wanted to us to impart: information about the Kyoto Protocol and the Clean Development Mechanism in relation to this project that we will be doing. So, do you have questions? Is there anything you don't understand from what I discussed? We need to record this since this is a requirement of the DENR. The Minutes of the Meeting is required so it will be submitted to the DENR so they can issue the Letter of Approval that the project is okay, so we can apply to the Executive Board of the UNFCCC. Any question?

Hon. Rene Gustilo: Point of clarification. You said if there's a plant usually there is a pond. What is in the pond?)

Arnold: What the project will do is construct a pond, what we call a covered in-ground anaerobic reactor (CIGAR). The reactor will treat the wastewater from the ethanol distillery and in process extract methane. The methane will be used as supplemental fuel for the boiler of the proposed project.

Hon. Rene Gustilo: From there, it goes to the boiler? What will happen? Does it control emission?

Arnold: In effect, yes. All methane gas generated will be piped to the boiler as supplemental fuel. The main fuel of the boiler will be bagasse. It reduces emissions in two ways. One is that methane is a relatively clean fuel. The only by-products of methane are carbon dioxide and water vapor. Second is that, since methane is extracted and not passively vent to the atmosphere, we are effectively reducing the emissions of carbon dioxide. As I mentioned earlier in the presentation of the CDM and Kyoto Protocol, methane is 21 times more potent than carbon dioxide in terms of its effect as a greenhouse gas. Hence, our capture of methane will result in substantial reduction in carbon dioxide emissions.



Hon. Rene Gustilo: What the Kagawads, the Barangay officials want to know is when will construction start?

Arnold: I think Louie can shed light on that.

Louie Villa-Abrille (Bronzeoak): The schedule as I've said, the plant will start 2008. Next year 2007, it will start the construction, which will take about 2 years. Then on crop year 2008-2009, around October, the commercial operation of the plant will start. This is our plan. As what Arnold mentioned on carbon dioxide, methane...this methane is like LPG. It is gas that is used to heat up the boiler and it produces carbon dioxide. It's less toxic so it is very minimal in polluting our environment; our air. What we are doing here is explaining to you how we can reduce the emission that will come out from the boiler itself, that's why we want to reduce the toxicity of emissions so it will not poison the atmosphere. This is the poison that causes temperature to change. Let's say the temperature changes because of what we call Greenhouse gases. Do you understand what Arnold explained to you? If you have questions just ask even if its in Ilonggo, Cebuano, whatever, we will find someone to interpret so we can answer your question. Toxic gases are emitted from trucks, from the carburetor.. all these are emitted to the environment. So what we are doing here is to try to control it so we can minimize pollution in the environment. That's the main point of having this project.

Arnold: We do understand a little but if we don't, we can ask someone to translate it for us.

Barangay Kagawad: Has the ECC already been approved?

Arnold: Yes, we already have the environmental compliance certificate (ECC). We got it last April, 2006. This stakeholder consultation is for the CDM component of the project.

Louie: The ECC is approved. Construction will start in 2007. As of now, we are just waiting for the money that the bank will release. A few days ago, bank representative were here. Five banks came; these are the banks that will lend us money. They saw the place and they liked it. They said that they will support us. So, when we get the money, we can start. We will buy equipment, mobilize the contractor to send all the equipment here, and contractor will directly hire construction workers. They will hire you. After that, the operation may start October 2008.)

Ina Kadda: I am from Genesys Foundation. In relation to second bullet on biomass-produced heat and electricity, 8 megawatts replacing grid-produced electricity. Genesys helps farmers to establish plantations, dedicated plantations, to supply the wood requirement of the plant. My question is, as we know on the forestry side, the activity of planting trees can claim carbon credits that can be sold to the buyers of carbon credits per ton of carbon dioxide. Also in measuring carbon dioxide of the tree there is a methodology and Genesys knows about this. My concern is because it was previously mentioned on the second bullet that electricity generation using biomass from wood is carbon neutral. So when we say it is carbon-neutral, zero emissions. If that's the case, zero emission, that means on the forestry side, those who plant trees don't have carbon credits because you already counted it, right? The plant already captured carbon dioxide that is emitted by the wood. So I need explanation on carbon emission and carbon neutral. Is it really carbon neutral? On forestry side, we should claim that, farmers should claim that. Second, from what I understand, in computing emissions and net of those carbon dioxide not emitted, the transportation or the gasoline used should also be counted. Is gasoline used in collecting wood from the farm to the plant included in the computation?

Arnold: Okay, you have two questions, right?



Ina Kadda: Yes, two.

Arnold: For the renewable energy component of the project, it is considered carbon neutral since the carbon dioxide emitted as a result of burning the bagasse and perhaps woodchips will be taken up by the next cropping cycle. As I explained a while ago, the proposed project will consist of three (3) components namely, 1) ethanol production, 2) renewable energy and 3) Greenfield AD. The forestry component will be treated separately. I can put you in contact with our Dutch Office who does the CDM for forestry projects. You may opt to apply for the credits of the forestry component. The only question is who will be the beneficiaries of the CERs? Will it be you or the farmers?

Ina Kadda: *Yeah, the farmers; the farmers.*

Arnold: As it currently stands, we will apply for the three (3) components that I mentioned earlier. The forestry component may come later on. This is because the ethanol/renewable energy/Greenfield AD components will be developed much earlier than the forestry component.

Louie: On fuel that the company will use for hauling wood and everything, that's not incorporated into our computation, that's particular for the wood. But before you can claim credits you would have to justify each one- in its methodology. That's going to be your responsibility, right? Now, if there are also minimum quantities, buyers will not buy unless they are substantial in size so if it's relatively small, you may have difficulties selling those credits anyway., That's the downside of things but if it's substantial then maybe Arnold can help you quantify the carbon credits and then later it can be presented for proper sale or trade

Arnold: I'm not familiar with the threshold in forestry sector projects. I can give you though just as an example in projects that we do the minimum thresholds that we consider for projects to be viable on the CDM side. For instance, our minimum threshold for methane recovery for pig farms is about 1,500 sow level.

Ina Kadda: In a recent document issued by the UNFCCC regarding treatment of emission and double counting of emission. In the forestry side it will be charged or it will be required to account for the emissions when you harvest it, then.... well, the document says the emissions from the forestry side, because you cut it for a dedicated plant or cogen facility, that should be covered by the plant, by the non-ER facility. But the issue on transportation, *maybe, I don't know if that can be settled by a non-ER or we take full responsibility in behalf of farmers or it's the ethanol?*

Arnold: *I'm not sure of that. I will have to clarify that with the Dutch office. I get your point. I don't have the answer right now. We can clarify that...*

Barangay Kagawad: **Can we go back to the filter, the smoke that will be emitted by the project, is it 100% safe for those people who live near the factory?**

Arnold: **In the environmental impact assessment that we did, we included mitigating measures to address air emissions. The proponent will install an electrostatic precipitator. Whether it will be 100% efficient, I don't think it will ever be 100%, maybe 99.9% maybe, 99% The most important thing is that all emission of the plant meets the standards of DENR because the DENR will conduct regular monitoring. Since we have the ECC, the DENR will form a**



multipartite monitoring team (MMT) to include the Barangay, the local government; the city, the DENR and NGO. They will compose the team that will monitor the project from construction up to operation. So we have safeguards... and besides, it's a new plant that will be constructed, not an old plant.

Louie: We will install ESP. All the centrals (mills) in the Philippines do not have ESP. They only have cyclones, inverted cyclones with various designs to trap particulates that will come out from the plant. The ESP is the most sophisticated. It's design is for coal fired power plants but we are installing it here in this facility. So the standard emission that will be emitted by the plant will satisfy world standards, it has to satisfy World Bank standards. It is safe compared to any other centrals here in the Philippines. So all of you are safe.)

Barangay Kagawad: Safe and at the same time people are employed!

Louie: Yeah, safe and people are employed.

Arnold: No more question? Our timing is just right. Question? If there's none, thank you so much for being here. We will wait for the approval of the Clean Development Mechanism. We might be back here maybe when the project will start. Louie will come back here when the project will start.

Nanette: We also wish to thank Honorable Rene Gustilo for gracing the occasion with his presence, thank you Sir. Thank you, Miss Mayan. Thank you, all, for your participation in this consultation, most especially to our host Barangay, Barangay Punao, Mabuhay!!!)