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

CONTENTS

SECTION A. General description of the small-scale project activity

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

Title of the small-scale project activity: Emek Hefer Biogas Project
Version number of the document: 01
Date of the document: 28.09.2006

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

The purpose of the CDM project activity is the installation and operation of a combined heat and power (CHP) plant at Emek Hefer region Kibuzim in Israel. The first project phase involves a CHP plant installation (2 of GE Jenbacher gas engines) at an recently build biogas reactor which is operated on cow and manure.
In mid 2007, a third CHP unit will be implemented at the project site (second phase, 1 additional GE Jenbacher gas engine), which will operate on biogas from an planned anaerobic municipal waste water facility near to the cow manure facility. The anaerobic waste water facility will be connected to the gas holder of the biogas reactor which operates on cow manure. Hence, the gas from the anaerobic digester and the cow manure treatment plant will be merged and the total amount of biogas will increase after the implementation of the second project phase.

The investment in the plant is made by Hefer Ecology, Israel. Hefer Ecology also owns the recently commissioned biogas reactor.

The CDM project activity involves electricity generation which will be fed to the national grid to be sold to specific customers. The project activity thereby contributes to the reduction of greenhouse gas (GHG) emissions because it generates power from a non-fossil fuel and avoids GHG emissions from (mostly) fossil fuel fired power sources connected to the national grid.

The project activity will contribute to the sustainable development of the host country since it supports Israel in meeting its increasing energy demand in an environmentally friendly way. It contributes to environmental, social and economic sustainability by increasing the share of renewable energies in electricity generation and consumption. This helps to reduce dependency on fossil fuels and expenditures for oil imports. At the same time, the project activity will imply social benefits such as new job opportunities during the construction phase and operation of the plant.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party)	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)
Israel (host)	Hefer Ecology	No
Israel (host)	Madei Taas, Ltd. 21 Hamelacha ST. Park-Afek Rosh Haayn 48091 Israel	No
Annex I country	To be established	No

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

The project activity involves the installation of a combined heat and power (CHP) plant at an existing biogas reactor at Emek Hefer Kibuzim in Israel which handles manure in 3 phases (pre-treatment, anaerobic digester, effluent and sludge treatment). The biogas reactor was commissioned in December 2005. Presently about 550 t per day of cow manure is delivered to the biogas reactor which generates 880 Nm^3/h of biogas with a CH_4 content of around 64%.
During the first phase of the project activity two GE Jenbacher engines with an electrical output of 2 x 1,064 MW_{el} and 2 x 599 kW_{th} were installed in December 2006. The CHP unit will be commissioned after the visit of the validator. The two biogas engines are connected to the existing biogas reactor to supply heat for fermenter heating. The engines have each a thermal capacity of 599 kW_{th} and consume each 421 Nm3/hr. Excess biogas is currently flared.

During the second project phase, a third GE Jenbacher engine (1,065 kW_{el}) utilizing biogas from an until now not build anaerobic municipal waste water plant will be installed. Therefore, additional 280 Nm³/hr would be available from this municipal waste water plant. In additional, and as per the agreement between Emek Hefer and the farmers, dry solid content of the cow manure enter to the plant should be 8-12 %. Actually the farmers are not fulfilling this obligation, however Emek Hefer management will insist on this commitment of the farmers and as of June 2007 the cow manure will be enter to the plant would be in the frame of 8-12 % DS. As results of more organic content the biogas production will be increase and the expected bio gas flow from the cow manure plant is 1060 Nm³/hr. adding the gas from the waste water treatment plant (280 Nm³/hr) the total available biogas would be 1340 Nm³/hr. The third engine is expected to be commissioned in mid 2007 and will sell electricity to the grid.
The heat produced will only be used for fermenter heating and no emission reductions are claimed from renewable heat supply.
GHG emissions are reduced because the project activity generates renewable electricity in the amount of 23,560 MWh per year which is fed to the national grid. As the national grid in Israel is dominated by coal-fired power plants, the electricity generated by the project activity offsets electricity generation from those plants and thereby avoids fossil-fuel consumption in those plants.

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

A.4.1.1. Host Party(ies):

Israel

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

Emek Hefer region

A.4.1.3. City/Town/Community etc:

Emek Hefer regional council

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

The project is located at Emek Hefer in Israel, about 50 kilometers south of Haifa and about 50 kilometer north to Tel Aviv

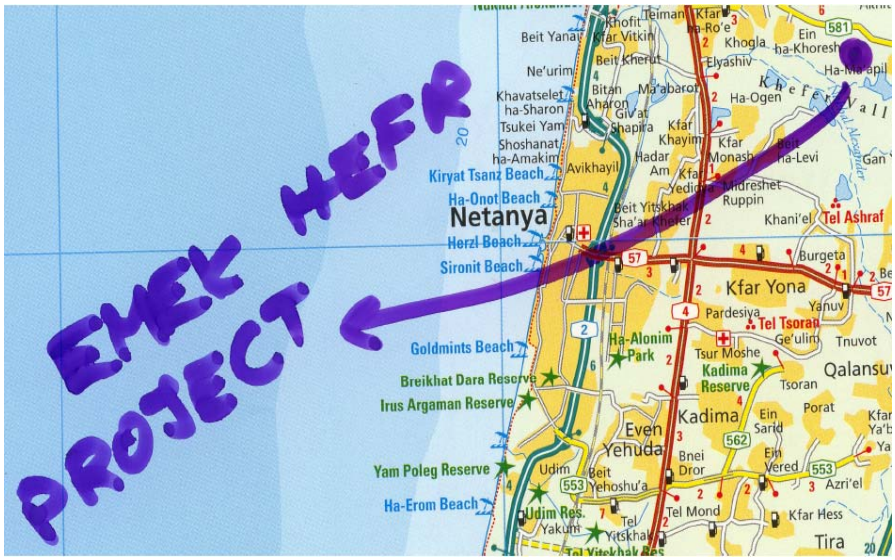

Figure 1: Location of Emek Hefer Project

Figure 2: Map of Israel
(http://home.att.net/~davepride/images/map_israel.gif)

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

The project activity complies with type I. category D. of the most recent version of the simplified modalities and procedures for small-scale CDM project activities (as of March 3rd 2006):

Type I: Energy industries (renewable/non-renewable energy production)
Category D: Grid connected renewable electricity generation

The project activity produces grid-connected electricity from 3 biogas CHP units. The installed capacity is 3.195 MW_{el} (3 x 1.065 MW_{el}) and thus below the 15 MW_{el} limit for Type I. projects.
The installed thermal capacity is 3 x 599 kW_{th}, and below the 45MW_{th} limit for category I.D. types as well.

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:

The CDM project activity involves electricity generation which will be fed to the national grid. The project activity thereby contributes to the reduction of greenhouse gas (GHG) emissions because it generates power from a non-fossil fuel and avoids GHG emissions from (mostly) fossil fuel fired power sources connected to the national grid.
Currently, legislation in Israel does not require installation of biogas reactors and CHP units for cow manure treatment. The payment for electricity export to the grid and sale to customers will be about 4.9 € cents per kwh.
The project's additionality is determined by proving barriers to investment. If the proposed project activity would not be registered as a CDM project activity Hefer Ecology would not invest in the project due to an unfavorable payback period of 20 years. The cash flow the payback period has been determined to include the above mentioned 4.9 €-ct/kWh for electricity generation from the proposed project activity as project revenue.

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

The estimated amount of emission reductions over the chosen crediting period is summarized in Table **1** below.

Years	Annual estimation of emission reductions in tonnes of CO2e
2007	14,119
2008	19,437
2009	19,437
2010	19,437
2011	19,437
2012	19,437
2013	19,437
2014	19,437
2015	19,437
2016	19,437
2017	4,859
Total estimated reductions (tonnes of CO2 e)	193,911
Total number of crediting years	10

Annual average over the crediting period of estimated reductions (tonnes of CO_2 e)	19,391

Table 1: Estimated amount of emission reductions over the chosen crediting period

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

No public funding is used in the project activity.

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

The project activity consists of the construction and operation of three biogas CHP components with an installed capacity of 3 x 1,065 MW_{el}. It is not component of another project activity with the same project participants, being 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.

SECTION B. Application of a baseline methodology:

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

Type I: Energy industries (renewable/non-renewable energy production)
Category D: Grid connected renewable electricity generation.

Reference: Appendix B of the simplified modalities and procedures for small scale CDM project activities (Version 08: 03. March 2006)

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

The project activity conforms to the eligibility conditions for application of the small scale baseline methodology I.D in the following ways:

- The project comprises the use of biogas from manure management system, which is a renewable biomass, and from anaerobic municipal solid waste water facility to be used to supply grid connected electricity to displace electricity from national grid that contains coal fired power plants. Thus the project activity replaces the use of at least one fossil fuel source.
- The installed electrical capacity of 3.195 MW_{el} is below the eligibility threshold for category I.D projects.
- The installed thermal capacity of 1797 KW_{th} is below the eligibility threshold for category I.D.

It is concluded that project activity is eligible for application of the simplified modalities and procedures for small-scale CDM project activities, category I.D.

Application of the baseline methodology

To estimate the baseline emissions related to grid connected renewable electricity generation, the baseline as defined under category I.D. of Appendix B is applied. The electricity grid to which the electricity

generated by the project activity is exported does not purely consist of diesel/oil fuelled generators. Hence, baseline emissions have to be calculated by either using the average of the approximate "operating margin" and the "build margin" or taking the weighted average emissions of the current generation mix. It was decided to apply the latter method.

Table 2: Key information and data used to determine the baseline scenario

	Parameter	Data source (ex-ante figures)	Value used for ex-ante baseline calculation
1a	Electricity generation/export to the grid (first project phase)	Installation planning and design	16.000 MWh/yr
1b	Electricity generation/export to the grid (first and second project phase)	Installation planning and design	23.560 MWh/yr
2	Combined margin	National Electricity Authority for Israel (Annual Report 2005)	0.805 t/MWh

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:

According to attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities, project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:

(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;

(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;

(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;

(d) Other barriers (e.g. institutional barriers, limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies)

The proposed project activity faces barriers to investment as the financial returns from the planned CHP operation are very low. Although Israel adopted an energy policy that promotes energy generation from renewable energy sources in 2004, the feed-in tariff of 4.9 €-ct/kWh of electricity from biogas power generation does not provide a sufficient financial incentive to implement the proposed project activity. This is demonstrated in the table below:

Table 3: Impact of CDM registration on project IRR (Internal rate of return) and payback period

IRR and payback without CERs	IRR	5.33%
	Payback (years)	19.75
IRR and payback (CER price=5EUR)	IRR	9.95%

	Payback (years)	11.05
IRR and payback (CER price=10EUR)	IRR	14.27%
	Payback (years)	8.01

The results in the above table have been taken from a detailed cash flow analysis which has been given to the validating DOE. The cash flow analysis includes the following cost and revenue components:

- Investment costs: 3 GE Jenbacher engines, peripheral interface equipment and engine installation, a H_2S removal system and installation, gas cooling system, power plant building, high voltage connection to main grid, piping and electro mechanical;
- Refurbishment costs of the CHP unit in the amount of 1/3 of investment into the engines at the fifth year of project activity operation
- Operational costs: labour, service & maintenance
- Financing costs: 100% debt financing with an interest rate of 12%
- Revenues: power sales

All costs and revenues have been discounted with an interest rate of 2.4% which resembles the annual inflation rate of Israel in 2005[1].

With a project payback period of 20 years without CER revenue the investment made by Hefer Ecology is clearly financially not attractive given the relatively short overall technical lifetime of the equipment (~12 years) and the risks involved in long-term biogas CHP plant operations (engine break-downs, corrosion of pipes, high maintenance efforts etc.). However, when taking into account the economic value of the CERs at a market price of 5-10 EUR/CER, the payback period can be reduced up to 8 years (see table above). Such a payback period makes Hefer Ecology more confident that the actual investment can be recovered. Therefore, the project activity should be registered as a CDM project activity. Otherwise Hefer Ecology will not implement the project activity due to the risk that the initial investment made cannot be recovered.

The project participants wish to apply step 0 (b) of the "Tool for Demonstration and Assessment of Additionality" as the project starting date is before the registration date. This is to show that in the decision to proceed with the project activity the incentive from the CDM project activity was seriously considered.

Madei Taas assigned Perspectives GmbH with the development of baseline and project documentation prior to the planned project start in June 2006. Due to the small-scale project size and the significant impact of CER issuance on the project's internal rate of return (as demonstrated above), the project participants decided to start the installation and operation of the biogas CHP unit as originally planned and before the project registration. Their decision was based on the certain assumption, that the project activity would be registered as CDM project.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

[1] See Bank of Israel (2006): INFLATION REPORT. URL: http://www.bankisrael.gov.il/deptdata/general/infrep/eng/inf0502e.htm (5.4.2006).

Referring to the simplified modalities and procedures for small-scale CDM project activities (Version 08: 03 March 2006) 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. The project boundary encompasses "the physical, geographical site of the renewable generation source" (AMS I.D).

With regard to the proposed CDM project activity, this means that the project boundary includes the biogas power plant including its site of operation. Since in the existing manure management system methane is already captured, the methane avoidance component is not included in the project boundary. The methane avoidance component regarding the municipal waste water treatment facility is also not considered in the project boundary.

B.5. Details of the baseline and its development:

As mentioned above, the project activity involves renewable electricity generation, for which the approved small scale methodology is applied without deviances.

For the component "electricity generation" the baseline for grid connected renewable electricity generation based on AMS I.D is applied. In this case baseline emissions are the product of the weighted grid emission factor times the electricity supplied by the project activity to the grid minus the baseline electricity supplied to the grid (in MWh) in the case of modified or retrofit facilities (see section E for detailed description). The latter is not applicable to the proposed project activity.

The baseline has been prepared by Perspectives GmbH.

Company name:	Perspectives GmbH
Address:	Bei der Apostelkirche 24 20257 Hamburg, Germany
Contact person:	Ms. Katja Glombik and Mr. Matthias Krey
Telephone number:	+49 40 87 88 07 56
Mobile:	+49 176 246 04 014
Fax number:	+49 89 14 88 28 08 22
E-mail:	glombik@perspectives.cc and krey@perspectives.cc

Completion date of baseline: 28.09.2006

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:

01/06/2006

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

12 years.

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

C.2.1. Renewable crediting period:

Not applicable.

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

Not applicable.

C.2.1.2. Length of the first crediting period:

Not applicable.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

01/03/2007

C.2.2.2. Length:

10 years, 0 months

SECTION D. Application of a monitoring methodology and plan:

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

The project activity follows the monitoring methodology AMS I.D for grid connected renewable electricity generation according to the simplified modalities and procedures for Small Scale CDM project activities (version 08: 03 March 2006).

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

As has been discussion in section B.2., the eligibility conditions for application of the small scale baseline methodology I.D are fulfilled by the project activity.

D.3 Data to be monitored:

D.2.1.1. Data to be collected in order to monitor emissions, and how this data will be archived, related to project category I.D "Grid connected renewable electricity generation":

ID number	Data type	Data variable	Source of data	Data unit	Measured (m) calculated (c) estimated (e)	Recording frequency	Proportion of data to be monitored	How will data be archived? (electronic/ paper)	Comment
1.	EG_y	Electricity supplied to the grid	Electricity metering	MWh	m	Continuous recording, monthly reporting	100%	electronic	Standard electricity metering and electricity bills, respectively.
2.	EF_y	Emission factor of the grid (Combined Margin)	National Electricity Authority for Israel	t CO_2 / MWh	c	Fixed for crediting period	n.a.	electronic	Calculated according to ACM0002

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

D.4. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1.	Low	Double check by electricity metering and by invoice control. This ensures quantity control and consistency.
2.	Low	Calculation with most recent data provided by National Electricity Authority for Israel. This ensures consistency with national statistics and inventories..

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 CHP operation will be supervised by a local technician, who is already trained by the CHP plant supplier. Madeei Taas engineers are responsible for schedule services and obtain the major supervising position, if problems occur.

In detail, quality control and quality assurance are carried out by the following methods.

- The project implementing organization will consist of operating personnel and management. Both will be assigned by Madei Taas Ltd.
- Management will prepare written procedures for operating facilities.
- Written procedures, containing daily work schedules, periodic maintenance methods and judgment criteria, etc., will be compiled according to appropriate formats.
- Operating personnel will be assured recurrent opportunities to receive training in order to enable them to carry out work according to the above procedures.
- Operating personnel will work according to the above procedures and will report results to management.
- Management will check reports from operating personnel and determine whether there are problems according to the procedures. If problems are found in such checks, management will implement the appropriate countermeasures with appropriate timing.
- Management will file and store reports from operating personnel according to the procedures.
- Measuring instruments will be periodically and appropriately calibrated according to the procedures.

Calibration timing and methods will be in accordance with the monitoring plan.

All data will be saved on a server with unique file names reflecting the month for which the monitoring has been carried out. Hard copies shall be printed out, signed by the biogas plant manager and stored in the archive room. After each data entry or modification the file name has to be renewed and hard copies shall be signed and stored safely.

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

The monitoring methodology is determined by:

Company name:	Madei Taas
Address:	21 Hamelacha St. Park Afek, 48091 Rosh Haayn Israel
Contact person:	Mr. Eli Matz
Telephone number:	+972 3 90 27174
Fax number:	+972 3 9027176
E-mail:	elimatz@madeitaas.co.il

Company name: Perspectives GmbH
Address: Bei der Apostelkirche 24
20257 Hamburg, Germany
Contact person: Miss Katja Glombik and Mr. Matthias Krey
Telephone number: +49 40 87 88 07 56
Mobile: +49 176 246 04 014
Fax number: +49 89 14 88 28 08 22
E-mail: glombik@perspectives.cc and krey@perspectives.cc

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

E.1.1 Selected formulae as provided in appendix B:

For the power generation the calculations are used as given in AMS I.D.

The baseline emissions are the product of the baseline emission factor times the electricity supplied by the project activity grid minus the baseline electricity supplied to the grid in the case of modified or retrofit facilities as follows:

$$BEy = (EG_y - EG_{baseline}) * EF_y$$

Where

BE_y	baseline emission (tonnes CO_2)
EG_y	electricity supplied by the project activity to the grid (MWh)
$EG_{baseline}$	baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh)
EF_y	baseline emission factor (t CO_2/MWh)

As explained in the simplified modalities and procedures for small scale CDM project activities category I.D. the baseline emission factor is calculated as a weighted average of the approximate “operating margin” (OM) and the “build margin” (BM).

The following calculations are used to calculate the combined margin factor:

$$EF_{OM,Y} = \frac{\sum_{i,j} F_{i,j,y} \times COEF_{i,j}}{\sum_{j} GEN_{j,y}}$$

Where

$\sum_{i,j} F_{i,j,y}$ F	amount of fuel I (in mass or volume unit) consumed by relevant power sources j in year(s) y
$COEF_{i,j}$	CO_2 coefficient of fuel i (tCO_2e/ mass or volume unit of the fuel)

$\sum_j GEN_{j,y}$ electricity delivered to the grid (MWh)

The CO_2 coefficient is estimated as

$$COEF_{i,j} = NCV_i * EF_{CO2,i} * OXID_i$$

Where

NCV_i is the net calorific value per mass or volume unit of fuel i

$OXID_i$ is the oxidation factor of the fuel i

$EF_{CO2,i}$ CO_2 emission factor per unit of energy of the fuel i

The build margin emission factor is the weighted average emissions of recent capacity additions to the system, which capacity additions are defined as greater (in MWh) of the most recent 20% of existing plants or the 5 most recent plants.

$$EF_{BM,y} = \frac{\sum_{i,m} F_{i,m,y} \times COEF_{i,m}}{\sum_m GEN_{m,y}}$$

Where $F_{i,m,y}$, $COEF_{i,j}$ and $GEN_{j,y}$ are analogous to the variables described above for the operating margin for plants m, based on the most recent information available on the plants already built.

The baseline emission factor is the weighted average of operating margin factor ($EF_{OM,y}$) and build margin emission factor ($EF_{BM'y}$):

$$EF_y = 0.5 * EF_{OM,y} + 0.5 * EF_{BM'y}$$

E.1.2 Description of formulae when not provided in appendix B:

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:

Since, the proposed project activity is a project utilizing biogas for electricity generation in order to replace at least one fossil fuel source, no anthropogenic emissions by sources of greenhouse gases within the project boundary are identified. Hence, no formulae are applicable.

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

No leakage calculation is required; because no transfer of energy generating equipment is involved in the project activity.

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

Category I.D.:
Project emissions = 0 t CO_2e.
The total project emissions are 0 t CO_2e.

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:

The baseline emissions are calculated as:

$$BE_y = EG_y * EF_y$$

Where

BE_y	baseline emission (tonnes CO_2)
EG_y	electricity supplied by the project activity to the grid (MWh)
EF_y	baseline emission factor (tCO_2/MWh)

First project phase (01/03/2007-30/6/2007):
$EG_y = 2\ MW_{elec} * 8000h = 16{,}000$ MWh

Second and first project phase (from 01/07/2007):
$EG_y = 2.945\ MW_{elec} * 8000h = 23{,}560$ MWh

The capacity of the CHP unit has been reduced from 3.195 MW_{el} to 2.945 MW_{elec} for the purpose of estimating annual power generation supplied to the grid in order to account for own power consumption of the CHP unit. 8000 hours operation per year is a conservative estimate for CHP unit operation.

$BE_y = 16{,}000$ MWh * 0.825 t CO_2 /MWh = 13,200 t CO_2e (first project phase)
$BE_y = 23{,}560$ MWh * 0.825 t CO_2 /MWh = 19,437 t CO_2e (second and first project phase)

The total baseline emissions are 19,437 t CO_2e once the three engines will be commissioned.

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:

Emission reductions are measured as the difference between the baseline emissions and the sum of the project emissions and leakage.

$$ER_y = BE_y – (PE_y + Leakage)$$

As stated above, no leakage is expected. Thus, the total emission reductions are 19,437 t CO_2e annually once both project phases of the CDM project activity will have been implemented. The annual average of emission reductions over the total crediting period is expected to be 19,391 t CO_2e. This results in total emission reductions of 193,911 t CO_2e over the total crediting period of 10 years.

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

Year	Estimation of project activity emission reductions (tonnes of CO2e)	Estimation of baseline emission reductions (tonnes of CO2e)	Estimation of leakage (tonnes of CO2e)	Estimation of emission reductions (tonnes of CO2 e)
2007	0	14,119	0	14,119
2008	0	19,437	0	19,437
2009	0	19,437	0	19,437
2010	0	19,437	0	19,437
2011	0	19,437	0	19,437
2012	0	19,437	0	19,437
2013	0	19,437	0	19,437
2014	0	19,437	0	19,437
2015	0	19,437	0	19,437
2016	0	19,437	0	19,437
2017	0	4,859	0	4,859
Total	0	193,911	0	193,911

Table 4: Estimated amount of emission reductions due to the project activity during the chosen crediting period

SECTION F.: Environmental impacts:

Air
The air quality will be considerably increased due to controlled combustion of the biogas and utilization of electricity instead of flaring the biogas. The combustion of biogas in the engines to be utilized in the project activity complies with the air-pollution requirements in Israel.

Biodiversity
There is minimal impact due to construction of the CHP unit.

Noise
No additional noise will be created apart from the existing equipment..

Consumption of ground
All construction will be on the ground of the existing facility.

Social issues
The plant operation will create 5 full-time jobs during civil works and implementation of the CHP unit.

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

An environmental impact study is not required by the host party.

SECTION G. Stakeholders' comments:

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

Madei Taas Ltd. invited local stakeholders to inform about the Emek Hefer CDM project at November 10th 2005. Participants of the public hearing were Avraham Sulemany and Miriam Bialik (both HEfer Ecologies) and Eli Matz from Madei Taas Ltd.

The public audience consisted of the following participants:

1. Gilad Efrat (Phone: 04-6127311)
2. Yosep Barnea (Phone: 050-5348648)
3. Yoram Sahar (Phone 04-6255453)
4. Alon Shpitzer (Phone 04-6368274)
5. Zamir Shmuel (Phone 057-7221745)
6. Yosi Israel (Phone 04-6258033)
7. Nati Hagai (Phone 04-6387953)
8. Shamoi Medini (Phone 04-6321450)
9. Yoram Ben Horin (Phone 04-6364309
10. Bialik Miryam (Phone 04-6258277)
11. Ami Rebiner (Phone 09-8663989)
12. Shmulik Dndai (Phone 09-8982170)
13. Yiatn Pinches (Phone 09-8666019)

G.2. Summary of the comments received:

Eli Matz (General Manager of Madei Taas Ltd.) held a presentation regarding the aim of Kyoto protocol and the implementation of the project at Hefer Ecology site including description of gas treatment system after anaerobic phase, gas engines for electricity and heat production He elaborated on the benefits producing electricity heat from renewable energy (Methane gas) and save emission from production electricity from fossil fuels.

After the presentation the audience asked questions concerning the projects finances, more precisely about the investment costs and the expected income through CERs. Besides financial questions the audience asked for the projects technology (about the biogas production, electricity outcome and electricity distribution). One question occurred due to project's impact on the environment.

The detailed questions and answers can be seen below:
1. Question by participant no. 8:

How much is the needed investment. What is the revenue per year?

Answer by Eli Matz and Abraham Sulemany

The total investment in the CHP plant is about Mio. Euro 1.5, and we expect an revenue of Mio NIS 4.5 per year. Revenue will come from sales of electricity to the grid or to end customers.

2. Question by participant no. 8:

What is the expected income from trading with the CER?

Answer by Eli Matz

Current market price is 5-10 Euro/TonCO2/Year. Calculated emission reduction is about 12,000 tons per year, so expected income is K Euro 60-120 per year.

3. Question by participant no. 3:

Is the electricity that produced from the methane will be enough for the 2 Kibbutzim near the plant?

Answer by Eli Matz:

The installed power is about 2 MW and would be increased maybe up to 3 MW. Yes, it looks that 2 Kibuzim consumption are suitable to the forecast production.

4. Question by participant no. 5:

Does the power will be distribute through the main grid or parallel wires should be installed to distribute the electricity?

Answer by Eli Matz:

No parallel cabling should be installed. All power would be delivered through the main grid.

5. Question by participant no. 5:

Who will finance the project?

Answer by Abraham Sulemany:

The Project will be finances by our internal sources with the income from the CERs sales.

6. Question by participant no. 6:

Is all the Biogas that would be produced in the anaerobic plant will be used ?

Answer by Eli Matz:

The majority on the gas will be use in the gas engines, the reaming will be flair. No gas will go to the surrounding.

7. Question by participant no. 8:

Who is actually pay for the CERs?

Answer by Eli Matz:

The countries (and the companies in those countries) that sign and committed to the implementation of Kyoto protocol purchasing the CERs

8. Question by participant no. 2:

Is this application will make the air surrounding cleaner for us?

Answer by Eli Matz:

Definitely yes, the methane is burning in the gas engines to produce clean energy that instead of currently produce by Israel Electric Company. So the general air quality in Israel (and the world) will improve.

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

Not required.

Annex 1
CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Madei Taas Ltd.
Street/P.O.Box:	21 Hamelacha St. Park Afek
Building:	
City:	Rosh Haayn
State/Region:	
Postfix/ZIP:	48091
Country:	Israel
Telephone:	+972 3 90 27174
FAX:	+972 3 9027176
E-Mail:	mail@madaitaas.co.il
URL:	www.madaitaas.co.il
Represented by:	
Title:	M.Sc Eng.
Salutation:	Mr.
Last Name:	Matz
Middle Name:	-
First Name:	Eli
Department:	
Mobile:	+972544248271
Direct FAX:	+972 3 5423722
Direct tel:	+97239027174
Personal E-Mail:	elimatz@madeitaas.co.il

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No public funding has been received.

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