CLEAN DEVELOPMENT MECHANISM
PROPOSED NEW METHODOLOGY: MONITORING (CDM-NMM)
Version 01 - in effect as of: 1 July 2004

CONTENTS

SECTION A. Identification of methodology

A.1. Title of the proposed methodology:

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Title: Introduction of integrated demand-side energy saving system for existing beer brewing system

Version: 7.1

Date: 06/02/2006

[Note] Changes from the previous version are specified in red.

A.2. List of category(ies) of project activity to which the methodology may apply:

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Energy efficiency improvement project:
[Demand-side energy efficiency improvements for specific industrial production]

A.3. Conditions under which the methodology is applicable to CDM project activities:

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The methodology is applied to a CDM project activity, which installs an integrated high energy efficient utility system in the beer brewery production process in an existing factory.

The applicability conditions of this methodology are as follows (same as those in the baseline methodology):

Condition 1:

The project activity shall not result in the construction of new/additional beer production facilities with separate/new energy utility systems. Modification of the existing utility system is eligible even if new beer production facilities are added simultaneously.

Condition 2:

The project activity does not set its crediting period beyond the physical lifetime of the whole existing utility system.

The project participants shall demonstrate the lifetime by determination of the technical lifetime on a case-by-case basis, for each equipment or equipment type that is being replaced. The transparent and suitable evidences may include quantitative and/or documented information

when relevant, such as catalogue spec, renovation plan, the real situation of the beer factories in the host country, *etc.* and provide conservative interpretations. The DOE assesses the validity of the evidences.

Condition 3:

The project activity does not export electricity or heat to the outside of the beer factory.

Condition 4:

The project activity does not emit effluent water under an anaerobic condition in the open air, *i.e.*, no methane is generated in the project scenario.

Condition 5:

The project participants shall use a theoretical model to have an energy audit for the beer brewery factory energy utility system. The model calculates the theoretical consumption of the utilities from the material balance and the energy balance.

A.4. What are the potential strengths and weaknesses of this proposed new methodology?

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The monitoring methodology avoids using the default values and measure the parameters as much as possible to obtain more accurate values.

SECTION B. Proposed new monitoring methodology

B.1. Brief description of the new methodology:

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The monitoring methodology focuses on "monitoring to estimate energy-saving based CO_2 emission reductions.

Precise monthly data for beer production, energy consumption by source are measured to estimate emission reductions not only after implementation but also before implementation of the project for more precise estimation of the counter-factual baseline emissions specified in the baseline methodology.

Table NMM-1: Emissions Sources to Be Monitored

	Source	Gas	Project Boundary?	Monitored?	Justification / Explanation
Baseline	Fossil fuel combustion for heat/steam supply	CO_2	Inside	Yes	CO_2 emissions from in-house fuel use as the main source of GHG emissions in the baseline scenario.
	Fossil fuel combustion for internal power generation	CO_2	Inside	Yes	If any internal power generation is used to supply electricity at the beer factory, these CO_2 emissions shall be counted.
	Fossil fuel combustion at the external power grid	CO_2	Inside	Yes	Indirect CO_2 emissions from the use of grid-electricity.
Project Activity	Fossil fuel combustion for heat/steam supply	CO_2	Inside	Yes	CO_2 emissions from in-house fuel use as the main source of GHG emissions in the project scenario.
	Fossil fuel combustion for internal power generation	CO_2	Inside	Yes	If any internal power generation is used to supply electricity at the beer factory, these CO_2 emissions shall be counted.
	Fossil fuel combustion at the external power grid	CO_2	Inside	Yes	Indirect CO_2 emissions from the use of grid-electricity.

[**Note**] An internal power generation system is NOT a part of project activity even if it is inside of the project boundary.

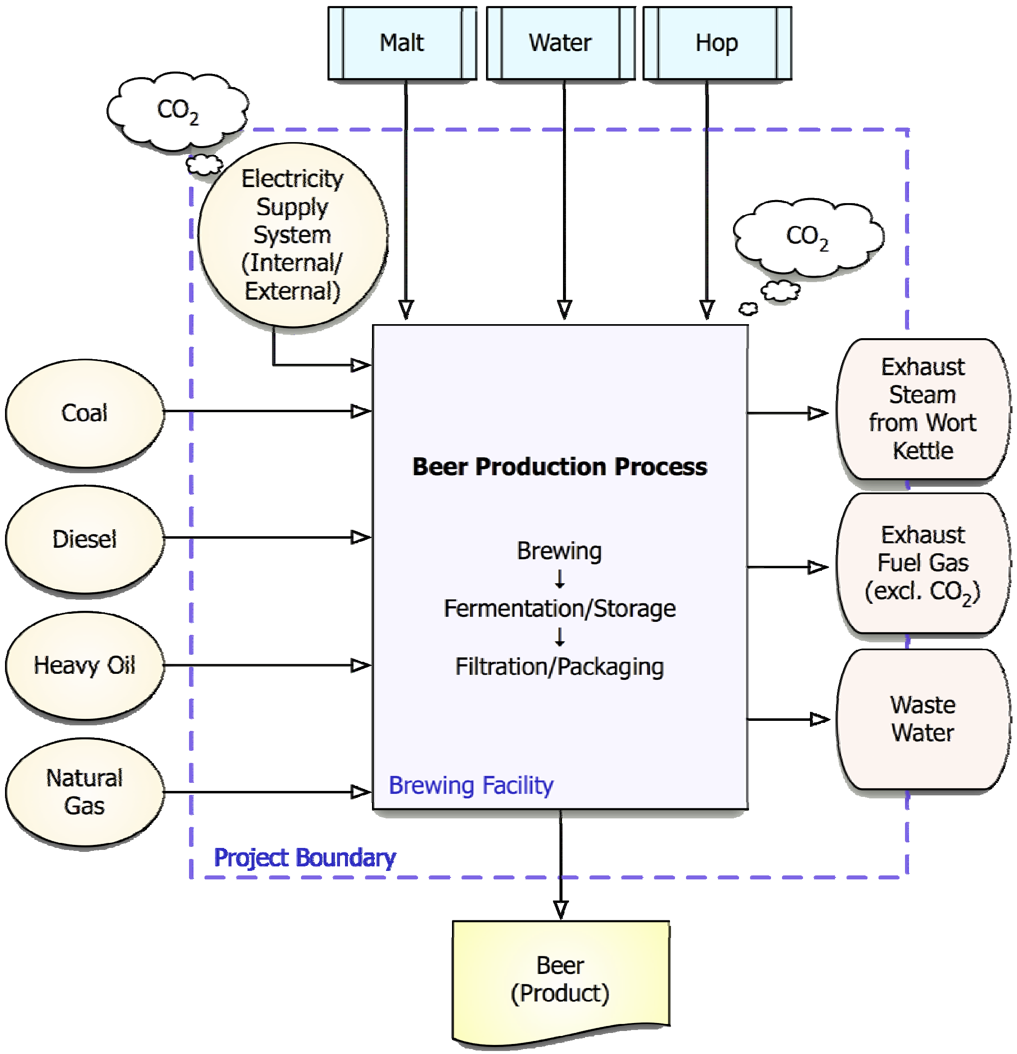

Figure NMM-1: Project Boundary for Brewery Plant Energy Saving Project

Definition of the “theoretical energy audit model” and its role

“Theoretical energy audit model” is the theoretical model to calculate the energy and utility consumption in the beer production process from the material balance and the energy balance by using the theory of thermodynamics.

In reality, a specific model must be developed to accurately simulate a target beer factory because different factories have different facilities and equipments. Facilities and equipment expressed in the model are beer production facilities, production processes, as well as facilities for utilities (boilers, water treatment, waste water treatment, cooling systems, compressed-air generation systems , carbon dioxide recovery systems, co-generation system, *etc*.).

This model allows the theoretical calculation of energy consumption. This theoretical energy consumption is the energy consumption in a so-called theoretically optimized operation condition, which is not dependent on the operating rate and manner of the relevant facilities (see Figure NMB-1 of the NMB). Therefore, the output is unique and highly reliable.

It is noted that the reduction by using the energy audit model (*i.e.*, by introducing a new technology/hardware) is the principal part of the reductions.

Outputs of the model include the calculated values of necessary heat and electricity demand by product type. These are used for calculation of conversion factor of “pilsner-equivalence” for each type of products.

If the relevant utilities or the beer production facilities undergo modification, replacement or addition some point in time these effects can be theoretically calculated by energy audit model accordingly. For example, if such modification, replacement or addition would be expected in the baseline scenario (taking account of conservativeness) sometime in the future after the continuation of the current practice, new baseline parameters (especially, energy intensities) accordingly adjusted by the theoretical model must be used thereafter for the calculation of the baseline emissions in this methodology.

In addition to this adjustment for the optimized operation condition, the methodology also provides an adjustment for an actual (non-optimized) operation.

Definition of the “pilsner-equivalence” concept

In general, beer factories produce multiple products (with different unit energy consumption). Separating out each of them to calculate their respective energy efficiency improvement is a highly complicated process, which is not realistic. In many cases, such measurements are impossible. Therefore, this methodology introduces the concept of “pilsner-equivalence”, which enables to convert energy intensities for various kinds of beer into that for the typical beer type “pilsner”. In other words, it is to calculate how many liters of pilsner can be produced from the same amount of energy that can produce 1 liter of a certain product. (This does not always have to be pilsner, and users may choose any typical kind of their products as their standard.)

Since the concept of “pilsner-equivalence” is different for electricity and heat, it should be calculated for each different product type. Pilsner-equivalent factors $EQ^{[electricity]}_i$ and $EQ^{[heat]}_i$ are calculated prior to the implementation of the project as constants by using a theoretical energy audit model for electricity consumption and heat consumption for each beer/beverage type *i*.

In case a product *i* requires α_i times of electricity and β_i times of heat in comparison to pilsner per unit volume production—driven by the theoretical energy audit model, $EQ^{[electricity]}_i = \alpha_i$ and $EQ^{[heat]}_i = \beta_i$.

Applicable scope of the baseline scenario and adjustment

The methodology set its scope that the utility system (as a whole) would not be replaced in the baseline scenario identified by the procedures specified in Section D of the NMB.

Through the steps to identify the baseline scenario, the baseline scenario is assumed to be identified as one of the following cases:

[Case 1] The continuation of current practice for utilities;

[Case 2] Some modification is added to the current utility system; or

[Case 3] Expanding the beer production capacity without modification of the utility system.

If the baseline scenario is not concluded as one of the cases without replacement of the utility system, the methodology cannot be applicable to the project activity.

In [Case 2], "adjustments" associated with the "modification of equipment in the baseline" are calculated by using the energy audit model as a form of theoretical specific energy consumption rates (SECs). Namely, using the identified system (not equivalent to pre-project state), the energy audit model calculates the energy demand for heat and electricity and calculate associated specific energy consumption rates. By using these "adjusted theoretical SECs", the same procedures for the [Case 1] is applied to calculate the baseline emissions.

B.2. Option 1: Monitoring of the emissions in the project scenario and the baseline scenario:

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B.2.1. Data to be collected or used in order to monitor emissions from the project activity, and how this data will be archived:

ID number *(Please use numbers to ease cross-referencing to table B.7)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
P0-e-i. $EQ^{[electricity]}_i$	*pilsner-equivalent energy consumption*	*estimation by using an energy audit model*	*No dimension*	*estimated*	*Once before implementation of the project*	*100%*	*electronic*	*Pilsner-equivalent energy consumption factor for electricity of the product category i. Energy audit*

	factor for electricity							*model is used for estimation.*
P0-h-i. $EQ^{[heat]}_i$	*pilsner-equivalent energy consumption factor for heat*	*estimation by using an energy audit model*	*No dimension*	*estimated*	*Once before implementation of the project*	*100%*	*electronic*	*Pilsner-equivalent energy consumption factor for heat of the product category i. Energy audit model is used for estimation.*
P1-e. $Q_y^{[Electricity\text{-}eq]}$	*Beer production of the facility*	*calculation*	*kL-beer*	*calculated*	*monthly*	*100%*	*electronic*	*Aggregated by using "pilsner-equivalence (heat)" over the product category i of* $Q_{i,y}$*. Aggregation to be done monthly basis.*
P1-h. $Q_y^{[heat\text{-}eq]}$	*Beer production of the facility*	*calculation*	*kL-beer*	*calculated*	*monthly*	*100%*	*electronic*	*Aggregated by using "pilsner-equivalence (heat)" over the product category i of* $Q_{i,y}$*. Aggregation to be done monthly basis.*
P1-i. $Q_{i,y}$	*Beer production of the facility (product category i)*	*Record of shipping bottles, cans, barrels*	*kL-beer*	*measured*	*daily*	*100%*	*electronic*	*Aggregated monthly production volume is checked against the sales and stock record of beer products and tax records*
P1. Q_y	*Beer production of the facility*	*Record of shipping bottles, cans, barrels*	*kL-beer*	*measured*	*daily*	*100%*	*electronic*	*Aggregated monthly production volume is checked against the sales and stock record of beer products and tax records*
P2-k. $Q\_Energy_{k,y}$	*Energy source k consumed*	*meter (e.g., weightometer for coal, fuel meter for oil/gas, wattmeter for electricity, etc.)*	*Physical unit or energy unit*	*measured*	*daily*	*100%*	*electronic*	*All energy sources consumed at the facility. The energy source k includes the fuel(s) such as coal, heavy fuel oil, diesel oil, … and external electricity purchased from grid. Checked against the purchase record (receipt).*

P3-0-el. $SEC_0^{PJ}{}_{electricity}$	*Theoretical specific energy consumption rate of electricity*	*calculated by using energy audit model*	*kWh / kL-beer*	*calculated*	*once before implementation*	*100%*	*electronic*	*Theoretical energy audit model is used for calculation, specific to the utility configuration of the project scenario.*
P3-0-heat. $SEC_0^{PJ}{}_{heat}$	*Theoretical specific energy consumption rate of heat*	*calculated by using energy audit model*	*[Physical unit or energy unit] / kL-beer*	*calculated*	*once before implementation*	*100%*	*electronic*	*Theoretical energy audit model is used for calculation, specific to the utility configuration of the project scenario.*
P3-y-el. $SEC^{PJ}{}_{electricity,y}$	*Specific energy consumption rate of electricity*	*calculated by aggregating electricity sources*	*kWh / kL-beer*	*calculated*	*once before implementation*	*100%*	*electronic*	*Aggregated by electricity sources (P3-k).* *Data for the 1st year is the basis to obtain Kaizen effect*
P3-y-heat. $SEC^{PJ}{}_{heat,y}$	*Specific energy consumption rate of heat*	*calculated by aggregating heat sources /fuels*	*[Physical unit or energy unit] / kL-beer*	*calculated*	*once before implementation*	*100%*	*electronic*	*Aggregated by heat sources /fuels (P3-k).* *Data for the 1st year is the basis to obtain Kaizen effect*
P3-k. $SEC^{PJ}{}_{k,y}$	*Specific energy consumption rate of energy k*	*calculated from P1. & P2.*	*[Physical unit or energy unit] / kL-beer*	*calculated*	*monthly*	*100%*	*electronic*	$SEC^{PJ}{}_{k,y} = Q\_Energy_{k,y}/Q_y$ *Especially, the value for the first year is the basis to calculate "Kaizen" effect.*
P3-int_el. $SEC^{PJ}{}_{electricity}{}^{INT}{}_{y}$	*Specific energy consumption rate of internal electricity*	*calculated*	*kWh/ kL-beer*	*calculated*	*monthly*	*100%*	*electronic*	$SEC^{PJ}{}_{electricity}{}^{INT}{}_{y} = Q\_Energy_{InternalElectricity,y} / Q_y^{[Electricity\text{-}eq]}$
P4-k. $CEF_{k,y}$ *(excl. Grid Electricity)*	*Carbon emission factor of energy k*	*Information provided by the fuel supplier*	tCO_2 */ [Physical unit or energy unit]*	*Provided or calculated (by using energy content and carbon content of the fuel)*	*yearly*	*100%*	*electronic*	*If sufficient data is not provided by the fuel supplier, regular (monthly) sampling should be done to measure such carbon emission factor.* *For coal, take many samples to check the dispersion of data.* *Afterwards, regular (monthly) sampling by lot is applied.*

								Checked against the IPCC default values.
P4-GridElectricity. $CEF_{GridElectricity,y}$	*Carbon emission factor of grid electricity*	*Information provided by the grid operator or Statistics of the electric power company*	*tCO_2/kWh*	*calculated (CO_2 / kWh from the marginal plant(s))*	*yearly*	*100%*	*electronic*	*• the calculation methods specified in the consolidated methodology for renewable power plants connected to the grid (ACM0002), or • the calculation methods specified in the small-scale CDM methodology for renewable power plants connected to the grid (AMS-I.D.) if the saved electricity level is less than 15 GWh_{el}/yr.*
P5. $Loss_{GridElectriocity,y}$	*Transmission & distribution loss*	*Obtained from power supplier's statistics or information*	*No dimension*	*Cited*	*yearly*	*100%*	*electronic*	*Latest statistics or information is applied.*

B.2.2. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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$Q_y^{[\ ]} = \sum_i Q_{i,y} * EQ^{[\ ]}_i$ is the annual production of beer at the facility [kL-beer/yr] calculated by using "pilsner-eq. (for electricity)" and "pilsner-eq. (for heat)", *i.e.,* adjusted beer production.

The amount of project emissions PE_y in a year y is given by

$$PE_y = Q_y * \sum_k SEC^{PJ}_{k,y} * CEF_{k,y} / (1 - Loss_{k,y}) = \sum_k Q\_Energy_{k,y} * CEF_{k,y} / (1 - Loss_{k,y}) \quad (1)$$

where Q_y is the annual production of beer in the facility [kL-beer/yr], $SEC^{PJ}_{k,y}$ is the specific energy consumption rate (energy intensity) of the project scenario [MJ/kL-beer], and $CEF_{k,y}$ is the CO_2 emission factor of the energy k (such as external electricity, diesel oil, heavy oil, *etc.*) [tCO_2/MJ or tCO_2/t-fuel, tCO_2/kL-fuel] consumed by the facility (measured annually).

$Loss_{k,y}$ is the transmission and distribution loss of the grid for k = external electricity. Otherwise, $Loss_{k,y}$= 0.

As for the calculation of the $CEF_{\mathrm{GridElectricity},y}$,

$$CEF_{\mathrm{GridElectricity},y} = w^{OM} * CEF^{OM}_y + w^{BM} * CEF^{BM}_y \quad (w^{OM} + w^{BM} = 1) \quad (2)$$

where CEF^{OM}_{y} and CEF^{BM}_{y} are carbon emission factors of the operating margin and build margin power plants in the grid, respectively, with associated weights w^{OM} and w^{BM}. The calculation method is:

- specified in the consolidated methodology for renewable power plants connected to the grid (ACM0002), or
- specified in the small-scale CDM methodology for renewable power plants connected to the grid (AMS-I.D.) if the saved electricity level is less than 15 GWh_{el}/yr.

B.2.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of greenhouse gases (GHG) within the project boundary and how such data will be collected and archived:

ID number *(Please use numbers to ease cross-referencing to table B.7)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
B1-el-k. $SEC^{BL(el)}_{k,y}$	*Specific electricity consumption rate of energy k*	*Calculated by* $SEC^{BL}_{electricity,y}$	*[MWh / kL-beer*	*calculated*	*yearly*	*100%*	*electronic*	*See B.2.4. for calculation*
B1-heat-K. $SEC^{BL(heat)}_{K,y}$	*Specific heat consumption rate of energy K*	*Calculated by* $SEC^{BL}_{heat,y}$	*[Physical unit or energy unit] / kL-beer*	*calculated*	*yearly*	*100%*	*electronic*	*See B.2.4. for calculation*
B2. $SEC^{BL}_{electricity,y}$	*Specific energy consumption rate of electricity*	*Calculated by B2-0 and B2-s.*	*[MWh /kL-beer]*	*calculated*	*monthly*	*100%*	*electronic*	*See B.2.4. for calculation*
B2-0. $SEC_0{}^{BL}{}_{electricity}$	*Specific energy consumption rate of electricity with perfect operation*	*Calculated from an energy audit model*	*[MWh /kL-beer]*	*calculated*	*Once before implementation*	*100%*	*electronic*	*An energy audit model is used for calculation. Fixed value. In case some modification is found for past and/or for the baseline scenario, appropriate adjustment is added by using an energy audit model.*
B3.	*Specific energy*	*Calculated by*	*[MJ (or*	*calculated*	*monthly*	*100%*	*electronic*	*See B.2.4. for calculation*

$SEC^{BL}_{heat,y}$	*consumption rate of heat*	*B3-0 and B3-s.*	*physical unit of fuel) /kL-beer*					
B3-0. $SEC_0{}^{BL}{}_{heat}$	*Specific energy consumption rate of heat with perfect operation*	*Calculated from an energy audit model*	*[MJ /kL-beer]*	*calculated*	*Once before implementation*	*100%*	*electronic*	*An energy audit model is used for calculation. Fixed value. In case some modification is found for past and/or for the baseline scenario, appropriate adjustment is added by using an energy audit model.*
B4. $Q^{before}{}_{y}$	*Beer production prior to implementatio n of the project*	*Meter or sales/stock record*	*kL-beer*	*measured*	*Monthly before implementation of the project (at least for three years)*	*100%*	*electronic*	*Monitored for checking chronological consistency*
B5. $Electricity^{before}{}_{y}$	*Electricity consumption prior to implementatio n of the project*	*Wattmeter*	*MWh*	*Measured (and calculated)*	*Monthly before implementation of the project (at least for one year)*	*100%*	*electronic*	*Monitored for checking chronological consistency*
B6. $Fuel_K{}^{before}{}_{y}$	*Fuel consumption prior to implementatio n of the project*	*Fuel meter (oil/gas) or weightometer (coal)*	*MJ*	*Measured (and calculated)*	*Monthly before implementation of the project (at least for one year)*	*100%*	*electronic*	*Monitored for checking chronological consistency*

B.2.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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The amount of baseline emissions BE_y in a year y is given by

$$BE_y = Q_y{}^{[Electricity\text{-}eq]} * \sum_k SEC^{BL(el)}{}_{k,y} * CEF_{k,y} / (1 - Loss_{k,y}) + Q_y{}^{[Heat\text{-}eq]} * \sum_K SEC^{BL(heat)}{}_{K,y} * CEF_{K,y} \quad [tCO_2/yr] \qquad (3)$$

where

$SEC^{BL(el)}{}_{k,y}$: specific energy consumption rate (energy intensity) for electricity use in the baseline scenario [MWh/kL-beer or MJ/kL-beer] of the energy type k (such as external electricity, fuels for internal power generation),

$SEC^{BL(heat)}{}_{K,y}$: specific energy consumption rate (energy intensity) for heat use in the baseline scenario [MJ/kL-beer or MWh/kL-beer] of the energy type *K* (such as coal, heavy oil, diesel oil, *etc*).

For the specific energy consumption rate for *heat* ($SEC^{BL}{}_{heat,y}$) and *electricity* ($SEC^{BL}{}_{electricity,y}$) regardless of its origin (*e.g.*, fuel type or grid/internal power generation), $SEC^{BL}{}_{\#\#,y}$ is given by: (## = heat or electricity)

$$SEC^{BL}{}_{\#\#,y=1} = SEC^{PJ}{}_{\#\#,y=1} + (\ SEC_0{}^{BL}{}_{\#\#} - SEC_0{}^{PJ}{}_{\#\#}) \quad \text{for } y = 1^{st} \text{ year to implement the project} \qquad (4)$$

if significant Kaizen is not detected as the host company's current practice. The effect of an energy intensity improvement by an improved operation rate is included in $SEC^{PJ}{}_{y=1}$.

As *Kaizen* is quite a sophisticated practice, it may be assumed that it is not usually applied for the baseline scenario. That can be confirmed by the DOE through following procedures:

- Confirming that there is no place for *Kaizen* like some management plan and/or practices for improvement provided in the target beer factory, or
- Conducting interview about the actual practices of beer factories at the brewers' association, *etc*. in the target country.

However, if *Kaizen* should already be implemented in the target factory, the *Kaizen* effect in the project should be made zero (not counting its effect for either BLS or PJS). Only a difference between BLS and PJS theoretically calculated should be counted as emission reductions.

If some significant Kaizen practices are detected,

$$SEC^{BL}{}_{\#\#,y} = SEC_0{}^{BL}{}_{\#\#} \qquad (4')$$

i,e, only the technological improvement (constant over time) is considered as the effect of the project.

For disaggregation of $SEC^{BL}{}_{electricity,y}$,

$$SEC^{BL}{}_{electricity}{}^{GRID}{}_{y} = SEC^{BL}{}_{electricity,y} - SEC^{PJ}{}_{electricity}{}^{INT}{}_{y} \qquad (5)$$

As for the heat part, $SEC^{BL}{}_{heat,y}$ is decomposed into each fuel with the same ratio of the project scenario measured *ex post*:

$$SEC^{BL}{}_{heat,y} = \sum_K SEC^{BL}{}_{K,y} \qquad (6)$$

with

$$SEC^{BL}{}_{K,y} / SEC^{BL}{}_{heat,y} = SEC^{PJ}{}_{K,y} / SEC^{PJ}{}_{heat,y} \qquad (7)$$

for each fuel *K*.

B.3. Option 2: Direct monitoring of emission reductions from the project activity:

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This section is not applicable.

B.3.1. Data to be collected or used in order to monitor emissions from the project activity, and how this data will be archived:								
ID number *(Please use numbers to ease cross-referencing to table B.7)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

B.3.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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B.4. Treatment of leakage in the monitoring plan:

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No significant leakage is found.

B.4.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity:

ID number *(Please use numbers to ease cross-referencing to table B.7)*	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

B.4.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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B.5. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.):

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The amount of emission reductions ER_y in a given year y is given by

$$ER_y = BE_y - PE_y \tag{8}$$

See the notations above.

B.6. Assumptions used in elaborating the new methodology:

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No significant assumptions are added to those specified in the baseline methodology.

In the baseline methodology, key assumptions are:

- Regression analysis leads to significant and conservative results if the analysis meets all the tests of its applicability,
- The baseline fuel mix for heat generation is identical to that of the project assuming that the cheapest fuel dominates, and

- An energy audit model can calculate the specifics of energy use under the theoretically optimal operation even if beer production process and/or energy utility system are modified. If such energy audit model is not utilized, the methodology cannot be applied to the project activity.

B.7. Please indicate whether quality control (QC) and quality assurance (QA) procedures are being undertaken for the items 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.
P1, P2, B4, B5	*Low*	*Checked against the sales/stock/purchase records as well as the tax records. For P2 (energy used by type), the associated meters are to be calibrated annually.*
P4-k	*Low*	*If sufficient data are not provided by the fuel supplier, regular (monthly) sampling should be done to measure such carbon emission factor.* *For coal, take many samples to check the dispersion of data. Afterwards, regular (monthly) sampling by lot is applied. Checked against the IPCC default values.* *IPCC default factors are used to for appropriateness check.*
All	*Low*	*Consistency with the past records are checked in order to minimize errors.*

In general, a management system is established to identify/clarify the responsibilities for monitoring, recording and reporting the parameters. Its appropriateness is to be checked by the operational entity.

B.8. Has the methodology been applied successfully elsewhere and, if so, in which circumstances?

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No application is found.

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