JOINT IMPLEMENTATION PROJECT DESIGN DOCUMENT FORM
Version 01 - in effect as of: 15 June 2006

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SECTION A. General description of the project

A.1. Title of the project:

Reduction of power consumption and waste disposal at "Obolon" PJSC

Scope #3:Energy demand
Scope #13: Waste handling and disposal

Version 02

Date: 10/06/2011

A.2. Description of the project:

The main goal of the Joint Implementation project "Reduction of power consumption and waste disposal at "Obolon" PJSC" is the implementation of the integrated programme of technical and technological modernization of the company, adoption of the disposal system for organic waste of brewing, which includes both technical and organisational measures.

The adoption of actions provided for by the Project will allow to improve energy efficiency of the brewing process, reduce the amount of and assure environmentally-friendly disposal of organic waste produced during the process. At the same time this will lead to the reduction of power consumed in beer production, will allow to give up removal of organic waste to landfills and, as a result, reduce the emission of greenhouse gasses emitted in the process.

The situation at the moment of the project initiation

Considering that the plant is located in a residential district of Obolon, the company has always paid close attention to factors that could have negative effect on the environment. To reduce the amount of pollution that is emitted into the atmosphere as a result of the plant's work, the management of "Obolon" PJSC has started the installation of the new economic and energy-efficient equipment, high technologies in brewing, bottling and delivering beer to consumers.

However, the implementation of such large-scale programme as presented in this project was impossible due to its lack of financial attractiveness (pay-back period on investment over 10 years, while costs for some investments will have never been recovered), risks associated to its implementation (the general effect from the implementation of the technological processes could be negated in case of partial implementation or if mistakes were made during the process), unstable economic and political situation in Ukraine.

Taking into consideration the above factors, the management of the company has come to the conclusion that it is necessary to implement a programme aimed at reducing energy consumption and the amount of residual sparging during the production of beer and implement the utilization of sparging only in 2000, after the ratification of the Kyoto Protocol has allowed recovering a portion of the costs through the mechanisms of the Kyoto Protocol.

Prior to the implementation of the project (2000), the unit cost of heat energy for every 1000 dkl of beer was 0.85 tonnes of oil equivalent, the amount of waste produced was 1.98 tonnes per 1000 dkl.

Project scenario

The Joint Implementation Project is based on the implementation comprehensive technical and technological modernisation of the Obolon plant that received financing and was launch din 2000-2001.

Actions taken within the framework of this programme (see section A.4.2 below) allowed the Obolon plant to reduce the specific energy consumption in the brewing process and assure environmental friendliness of the process through the utilization of all organic waste produced.

Baseline scenario

The baseline scenario envisages the further use of the installed equipment with ongoing renovation and restoration works without significant capital expenditures and maintaining the current power consumption and waste production as well as maintaining the practice, commonly used at the time, of removing waste to landfills. The grounds for the baseline scenario are described in section B.

Project history

02/06/2000 – Order #408 established at the Obolon plant a workgroup for reducing power consumption and waste production in the process of brewing and other production activities. The responsibilities of this group includes consideration of possibility and ensure that additional investment from the mechanisms of the Kyoto Protocol. This date is the date of this project considered as a JI project.

December 2000 – start of the implementation of measures stipulated by the Project

07/04/2011 – signing of the agreement with “Company MT-Invest” (Agreement #1).

08/04/2011 – preparation and submission of PIN to the State Agency for Ecological Investments.

The tentative plan and the list of measures stipulated by the Project is listed below (see section A.4.2)

Project benefits

Besides reducing the emission of greenhouse gasses the project of the implementation of the Project has the following benefits:

- Creation of additional employment opportunities related to the installation of new equipment, technological lines and cycles;
- Reduction of the emission of harmful substances;

The implementation of the Joint Implementation project will have positive effect on the environmental and socio-economic conditions in the city of Kyiv and the region at large.

A.3. Project participants:

Party involved	Legal entity project participant (as applicable)	Please indicate if the Party involved wishes to be considered as project participant (Yes/No)
Ukraine (Host party)	"Obolon" PJSC	No
Party 2	Will be defined later	

"Obolon" — national corporation engaged in the production of beer, non-alcoholic beverages and beverages with low concentration of alcohol, and mineral water. Besides, the company has licenses for the wholesale and retail distribution of drinks, provision of cargo agent services (codes KVED 51.34.0, 52.25.0, 63.40.0). [1] The company consists of the main production plant in Kyiv with remote facilities in Oleksandria and Tcheremivtsi in the Khmelnitskiy oblast, two affiliate companies – Zibert's Brewery (Fastiv, Kyiv oblast) and Krasylivske (Krasyliv, Khmelnitskiy oblast), as well as companiew with corporate rights in Bershad, Kolomyia, Okhtyrka, Rokytne, Sebastopol and Chemerivtsi.

The Obolon plant, which modernisation is to be carried out within the framework of this project, was founded in 1974 (Kyiv brewery #3, named "Obolon" in 1983). In 1986, on the basis of Kyiv brewery #3, Beer-and-nonalcoholic company "Obolon" was established. The company also included Kyiv brewery #1, Kyiv brewery #2 (now "Podol Brewery" JSC), and Fastiv brewery (now subsidiary of "Obolon" PJSC "Zibert's Brewry").

"Obolon" PJSC was established on 25 March 1993 in the process of privatization of state property of Kyiv production company for the production of beer, nonalcoholic beverages and mineral water "Obolon" through the buyout of the property by the employees of Kyiv leased enterprise "Obolon" and the establishment of "Obolon" PJSC on the basis of that property.

"MT-Invest" is the first specialized operator on the Ukrainian M&A (mergers and acquisitions) market. The company provides the following services: purchase and disposal of businesses/assets, search for investors or strategic partners, investment consulting and financial consulting, execution of investment projects and agreements. Making the M&A market more transparent, civilized and comprehensible to investors, the company effectively meets its main goals – increasing market capitalization of the clients of "MT-Invest".

A.4. Technical description of the project:

A.4.1. Location of the project:

The project is implemented on the equipment and at the properties of the "Obolon" plant, which is a part of "Obolon" PJSC.

A.4.1.1. Host Party(ies):

Ukraine

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

Kyiv oblast

A.4.1.3. City/Town/Community etc.:

Kyiv

A.4.1.4. Detail of physical location, including information allowing the unique identification of the project (maximum one page):

Picture 1.1 The city of Kyiv on the map of Ukraine

The Obolon plant is located in the Obolon district of the city of Kyiv (city coordinates 50°27′00″ northern latitude 30°30′00″ eastern longitude)

Obolon district as an administrative unit was created on March 3, 1975 and named Minsk district after the caital city of Belarus.

At that time the unit included the territorird of Kureniovka, Minsk residential district, Priorky and Oblon.

In accordance with the decision of the Kyiv city council from 2001, the district was given its historic name, Obolon, and included into the Pushcha-Vodytsia territory.

Nowadays, the Obolon district occupies the territory of slightly over 11 thousand hectares and is inhabited by over 360 thousand peole.

A.4.2. Technology(ies) to be employed, or measures, operations or actions to be implemented by the project:

The production facilities of "Obolon" are supplied with three kinds of energy that is/was purchased from outside suppliers:

- Electric power
- Natural gas
- Steam

The main reasons for greenhouse emissions:

- Excess energy consumption as a result of: imperfections in the technological processes, use of working but outdated equipment
- Emissions due to the disintegration of sparging at dumps and storage grounds

Brief description of actions within the project frameworks:

- replacement of 1 piston compressor and 3 ammonia compressors,

- reconstruction of in-house boiler shop,

- reconstruction of brew house #2

- implementation of changes in the technological process in order to reduce the production of residual sparging,

- utilization of sparging through pressing and further use as animal feed,

- replacement of 3 ammonia compressors,

- installation of Steinecker carbon dioxide unit,

- installation of PET recycling waste,

- replacement of 1 piston air compressor and 6 ammonia compressors,

- construction and launching of brew house #4,

- replacement of 2 ammonia compressors,

- dismantling the old backwater water supply system and installation of autonomous water-cooling towers,

- replacement of 2 air compressors with new, more efficient ones,

- reconstruction of lighting system with the replacement of glow lamps with energy-saving ones,

- replacement of 2 ammonia compressors,

- launching of brew house #5,

- construction of a drying shop for sparging and utilization of biological waste,

- changing steam drying of work clothing with electric system,

- replacement of water pump at the water station,

- installation of post-treatment system for condensate at the central heating shop,

- reconstruction of brew houses #2 and #3 using energy-saving technologies,

- reducing losses during the boiling of condensate during collection and returning to the boiler shop,

- reconstruction of the hot-water supply system with the use of thermal energy from boiling at boiler shop #2,

- reconstruction of the sparging drying system with the implementation of thermal energy from boiling condensate,

- studying the possibilities and gradual implementation of the project “The use of hot water from heat-transfer apparatus at brew house #4 in production”.

Chronology of the implementation:

2000 – establishment of the workgroup for developing and implementation of the Project.

2000 – replacement of 1 piston compressor and 3 ammonia compressors.

2000 – construction of in-house boiler shop.

2001 – reconstruction of brew house #2;

Picture 2.1. Brewing line №2

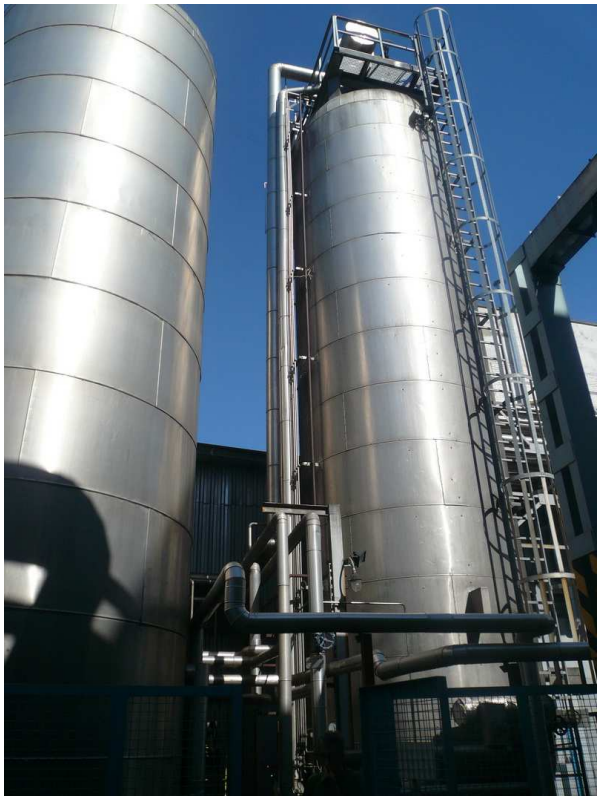
– implementing changes to the process in order to abate the formation of sparging;

– implementing of programme of utilization of sparging through pressing for use as animal feed.

2002 – replacement of 3 ammonia compressors;

Picture 2.2. Old refrigerating machine - ammonia compressors 21A-410-7

– installation of Steinecker carbon dioxide unit.



Picture 2.3. Capacity to collect carbon dioxide that comes from fermenting tanks

Picture 2.4. Wittemann Brewery CO2 recovery system

2003 – installation of PET recycling line.

2004 – replacement of 1 piston air compressor and 6 ammonia compressors;

Picture 2.5. Refrigerant shop in the middle

– construction and launching of brew house #4.

Picture 2.6. Brewing line №4

2006 – replacement of 2 ammonia compressors;

Picture 2.7. Ammonia refrigeration compressor

– dismantling of the old back water supply system and installation of autonomous water-cooling towers.

Picture 2.8. place with cooling towers, on the left there is building of refrigerating compressor shop

2007 – replacement of 2 air compressors with new, more efficient ones;

– reconstruction of lighting system with the replacement of glow lamps with energy-saving ones;

– replacement of 2 ammonia compressors;

Picture 2.9. Refrigerator of cooling machine

– launching brew house #5.

Picture 2.10. Brewing line №5

Picture 2.11. Vacuum evaporator and heat exchanger of brewing line №5

2008 – construction of a drying shop for sparging and utilization of biological waste.

Picture 2.12. Storage containers granular wort after drying and granulation.

Picture 2.13. The building of drier of beer wort

2009 – changing steam drying of work clothing with electric system;

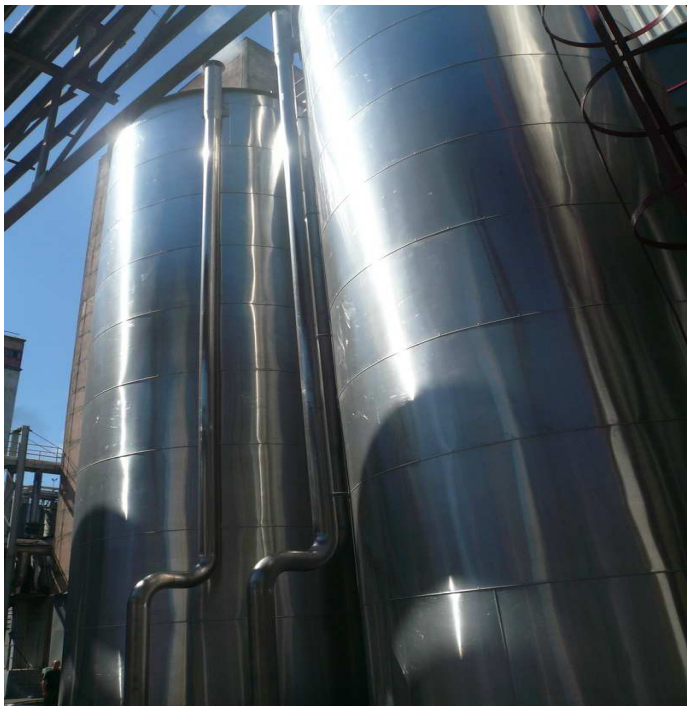
– replacement of water pump at a water station;

– installation of post-treatment system for condensate at the central heating shop.

2010 – reconstruction of brew houses #2 and #3 with implementation of energy-saving technologies;

Picture 2.14. Control room of brewing lines 2 and 3

Picture 2.15. Brewing lines



Picture 2.15. Energy-saving capacity of brewing line 2 and 3 (reconstruction 2009-2010)

2011 – reducing thermal loss from boiling condensate during collection and returning it to the boiler house;

– reconstruction of the hot-water supply system with the use of thermal energy from boiling at boiler shop #2;

– reconstruction of the sparging drying system with the implementation of thermal energy from boiling condensate.

2012 – studying the possibilities and gradual implementation of the project "The use of hot water from heat-transfer apparatus at brew house #4 in production".

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

GHG emissions at the Obolon plant take (took) place as a result of:

- consumption of electric energy by the technological equipment and the pant's lighting equipment;
- consumption of thermal energy by the technological equipment and heating systemps of the plant;
- consumption of natural gas by the technological equipment and the power-generating equipment of the plant;
- methane emissions caused by the utilization of organic waste from peer production (sparging) at landfills and silos.

The implementation of this project provides for the reduction of the consumption of electric power by the plant and utilization of sparging through pressing (drying) it and further sale (transfer) to agricultural companies and fisheries as animal and fish feed.

Reducing the consumption of electric and thermal power will lead to the reduction of CO2 gasses emitted during generation. Reducing the consumption of natural gas will reduce the emission of GHG associated with its burning by technological and generating equipment. Using sparging as animal and fish feed will allow avoiding emissions of methane (CH4), which is a greenhouse gas that would have been emitted if sparging were disposed at landfills or silos.

Means taken to achieve the set goals are listed in section A.4.2 above.

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

Emission reduction calculations provided in the Excel file «Obolon_v.2».

Table 1. Emission reductions for the period 2004-2007.

	Years
Length of the crediting period	4
Year	Estimate of annual emission reductions in tonnes of CO2 equivalent
2004	160508
2005	248383
2006	303429
2007	370496
Total estimated emission reductions over the crediting period 2004-2007 (tones of CO_2 equivalent)	1082815
Annual average of estimated emission reductions over the crediting period 2004-2007 (tones of CO_2 equivalent)	270704

Table 2. Emission reductions for the crediting period 2008-2012.

	Years
Length of the crediting period	5
Year	Estimate of annual emission reductions in tonnes of CO2 equivalent
2008	400922
2009	348164
2010	312088
2011	312331
2012	312331
Total estimated emission reductions over the crediting period 2008-2012 (tones of CO_2 equivalent)	1685837
Annual average of estimated emission reductions over the crediting period 2008-2012 (tones of CO_2 equivalent)	337167

Table 3. Reduction of post-Kyoto period 2013-2025.

	Years
Length of the crediting period	13
Year	Estimate of annual emission reductions in tonnes of CO2 equivalent
2013	312331
2014	312331
2015	312331
2016	312331
2017	312331
2018	312331
2019	312331
2020	312331
2021	312331
2022	312331
2023	312331
2024	312331
2025	312331
Total estimated emission reductions over the crediting period 2013-2025 (tones of CO_2 equivalent)	4060306
Annual average of estimated emission reductions over the crediting period 2013-2025 (tones of CO_2 equivalent)	312331

A.5. Project approval by the Parties involved:

Approval by the investor country and approval by the Ukrainian authorities (State Environmental Investment Agency of Ukraine) will be received after the successful passage of determination.

SECTION B. Baseline

B.1. Description and justification of the baseline chosen:

For determining the baseline and demonstrating additionality a JI Specific Approach developed on the basis of a Methodological Tool 'Combined tool to identify the baseline scenario and demonstrate additionality' (Version 03.0.0) and the guidance 'Guidance on Criteria for Baseline Setting and Monitoring' (Version 2).

The baseline scenario is determined in accordance to the following four Steps:
STEP 1: Determining alternative scenarios;
STEP 2. Barrier analysis;
STEP 3. Investment analysis (if permissible);
STEP 4. Analysis of general practice.

Step 1: Determining alternative scenarios
Sub-Step 1a: Determining alternative scenarios to the project activity suggested by the JI
Only two alternatives are the most credible to the suggested project activity.
Alternative A: Continuation of the existing situation.
Alternative B: Implementation of the proposed project activity without registering it as a JI project.

Partial implementation of the programme to reduce electric power losses in the grid of "Obolon" PJSC would significantly reduce the effect from its implementation. Therefore this scenario is not considered as an alternative to the suggested project activity.

Resolution from Sub-Step 1a: Two most likely alternative were determined. See the list of alternative above.

Sub-Step 1b: Meeting the demands of the corresponding laws and norms
At the inception of the project (2000) there were a number of legal acts (Law on energy conservation), that aimed to stimulate producers and suppliers to act in the field of energy conservation. However, the acts were mostly formalities and were not very effective. An example of that is the continuous increase of losses in the grid of "Obolon" PJSC prior to the implementation of the project.

***Resolution from Sub-Step 1b*:** All the suggested alternatives meet the existing legal rules and regulations.

Step 2: Barrier analysis.
Sub-Step 2a: Determining barriers that will prevent the implementation of alternative scenarios
Alternative A: Continuation of the existing situation.
There are no barriers to this alternative scenario.

Alternative B: Implementation of the suggested project activity without registering it as a JU project.

Investment barriers: Project activities under the proposed project is a gradual process and requires annual significant capital investments and attracting human resources.

Access to financial resources on international markets for the suggested project is greatly limited. Investment climate in Ukraine is considered unattractive, especially in comparison with neighbor states. As confirmation of that is the sovereign rating of Ukraine by Fitch compared to some other neighbor states from Easter Europe.

- Ukraine B-

- Poland A-
- Hungary BBB
- Slovakia A+

Taking into consideration significant amount of capital investments necessary for implementing the suggested project, it may be very difficult to receive financing from international institutions. Financing on the local market is also limited. Local banks currently provide project financing at approximately 30% annual interest in the national currency for up to three years. As an example the largest Ukrainian banks can be taken: Raiffeisen Bank Aval (www.aval.ua), Privatbank (www.privatbank.com.ua), Praveks Bank (www.pravex.com.ua).

Taking the above into consideration, continuous financing in Ukraine is only achievable provided the project's attractiveness. However, a simple analysis of expenses shows that, at the required level of project financing the payback period exceeds 15 years.

The registration of the project as a JI project will allow partial reimbursement of funds with the use of funds from the sale of emission reduction units and will give the project the status of environmentally oriented and will make obtaining loans easier. The above factors have been key when deciding on the implementation of the project.

Other barriers: The complexity of the production process and the suggested measures, some of which had not had analogues in Ukraine at the beginning of the project, constant fluctuations of the cost of energy sources in Ukraine do not allow for exact forecasting of energy and economic results from the implementation of measures within the framework of this project. The vagueness of results leads to additional risks by the project owner.

The registration of this project as a JI project improves the financial attractiveness of the project as well as its status were important arguments for the project owners in favor of the project implementation.

Conclusion from Sub-Step 2a: List of barriers listed above.

Sub-Step 2b: Removal of alternative scenarios that are excluded by the determined barriers.

Only *Alternative A* does not contradict any of the barriers.

Conclusion from Sub-Step 2b: Only *Alternative A* does not contradict any of the barriers.

Step 3:Investment analysis.
For providing foundation for the baseline and demonstrating additionality barrier analysis was used.

Conclusion from Step 3: Not applied.

Step 4: Analysis on generally accepted practice.
Most similar projects have been implemented with the aid of grants and other non-profit financing means, for example through Joint Implementation projects. At the time of the project initiation the general practice in Ukraine was to carry out exploitation works in the amount necessary for preserving output; there have been no reconstructions similar to the suggested ones and of similar scope at other breweries.

Conclusion: Taking the above mentioned into the account, Alternative A is the most fitting baseline scenario, which does not have any barriers and fits the general practices of the host country.

Year 2000, the year prior to the project implementation, was taked as the baseline year.

Key parameters used in determining the baseline.

Data/Parameter:	EC_{BL}
Measure:	MWh
Description:	Consumption of electric power by Obolon brewery in a base year
Frequency of determination/ monitoring	Once
Source of data	Measured with measuring equipment. Annual reports.
Values used during previous computation	According to statistical data of the enterprise for the year 2000 EC_{BL} = 39280,265 MWh
Foundation for the choice or description of the measuring methods	Objectively reflects the amount of used electricity energy by brewery in a base year. Value based on measures done with working and calibrated measuring equipment.
Description of the control procedures and quality guarantee	This value is included in the general energy balance of the enterprise, based on measures done with working and calibrated measuring equipment and crosschecked by electricity supplier and state authorities.
Commentary:	

Data/Parameter:	HC_{BL}
Measure:	Gcal
Description:	Consumption of thermal energy by Obolon brewery in a base year
Frequency of determination/ monitoring	Once
Source of data	Measured with measuring equipment and determined with normative calculations. Annual reports.
Values used during previous computation	According to statistical data of the enterprise for the year 2000 HC_{BL} = 38902 Gcal
Foundation for the choice or description of the measuring methods	Objectively reflects the amount of used thermal by Obolon brewery in a base year. Value based on measures done with working and calibrated measuring equipment and based on calculations used actual norms.
Description of the control procedures and quality guarantee	This value is included in the general energy balance of the enterprise, based on measures done with working and calibrated measuring equipment and based on calculations used actual norms and crosschecked by heat supplier and state authorities.
Commentary:	

Data/Parameter:	$FC_{BL,NG}$
Measure:	Thousand m^3
Description:	Consumption of natural gas by Obolon brewery in a base year
Frequency of determination/ monitoring	Once
Source of data	Measured with measuring equipment. Commercial accounting of natural gas at the plant (the entire production). Acts with

	Kyivgaz.
Values used during previous computation	According to statistical data of the enterprise for the year 2000 FC_{BL}= 14599 ths m^3
Foundation for the choice or description of the measuring methods	Objectively reflects the amount of used natural gas by brewery in a base year. Value based on measures done with working and calibrated measuring equipment.
Description of the control procedures and quality guarantee	This value is included in the general energy balance of the enterprise, based on measures done with working and calibrated measuring equipment and crosschecked by natural gas supplier and state authorities.
Commentary:	

Data/Parameter:	P_{BL}
Measure:	Thousand dal (t.dal)
Description:	Production of beer in a base year
Frequency of determination/ monitoring	Once
Source of data	Production reports of the planning department
Values used during previous computation	According to statistical data of the enterprise for the year 2000 P_{BL}= 27644 t.dal
Foundation for the choice or description of the measuring methods	Objectively reflects the amount of beer produced in a base year. Is amount based on measures done with working and calibrated measuring equipment.
Description of the control procedures and quality guarantee	This value crosschecked by state authorities..
Commentary:	

Data/Parameter:	P_y
Measure:	Thousand dal (t.dal)
Description:	Production of beer in year *y*
Frequency of determination/ monitoring	monthly
Source of data	Production reports of the planning department
Values used during previous computation	For the years 2004-2010 factual data was used. For the period beyond 2010 data on 2010 was applied: P_y= 85666 t.dal
Foundation for the choice or description of the measuring methods	Objectively reflects the amount of beer produced in a report year. Value based on measures done with working and tested measuring equipment. Subject to accounting cross verification.
Description of the control procedures and quality guarantee	This value crosschecked by state authorities..
Commentary:	

Data/Parameter:	η
Measure:	
Description:	Efficiency of OJSC "Generator" boiler house
Frequency of determination/	Once

monitoring	
Source of data	Determined used Tool to determine the baseline efficiency of thermal or electric energy generation systems[1], Version 1.
Values used during previous computation	0.87
Foundation for the choice or description of the measuring methods	Using Tool to determine the baseline efficiency of thermal or electric energy generation systems, Version 1 is a common practice in determining of boilers efficiency for the baseline scenario. Taking into account that the lifetime of gas boilers of OJSC "Generator" boiler house is more than 20 years the efficiency of boilers was taken 0.87 in Table 1 of the Tool.
Description of the control procedures and quality guarantee	Determined used Tool to determine the baseline efficiency of thermal or electric energy generation systems, Version 1.
Commentary:	

Data/Parameter:	$NCV_{NG,BL}$
Measure:	Gcal/ths m^3
Description:	Net calorific value of natural gas in a base year
Frequency of determination/ monitoring	Once
Source of data	Estimated based on statistical data of the enterprise.
Values used during previous computation	$NCV_{NG,BL}$ = 8.2 Gcal/ths m^3
Foundation for the choice or description of the measuring methods	According to statistic data Net calorific value is variable and variables in period 8100-8300 ccal/m^3 (8.1-8.3 Gcal/ths m^3). Therefore in calculations was used $NCV_{NG,BL}$ = 8.2 Gcal/ths m^3.
Description of the control procedures and quality guarantee	Estimation of this value based on statistic data of enterprise and common practice of Ukraine.
Commentary:	When volume of gas is expressed in m^3, this means that this is standard m^3.

Data/Parameter:	$MSW_{T,BL}$
Measure:	t
Description:	Total amount of organic waste generated in a base year
Frequency of determination/ monitoring	Once
Source of data	Measured with measuring equipment and determined by normative calculations. Ecological reports to state authorities.
Values used during previous computation	According to statistical data of enterprise for the year 2000 $MSW_{T,BL}$ = 54735,12 t
Foundation for the choice or description of the measuring methods	Objectively reflects the amount of beer produced in a base year. Is amount based on measures done with working and tested measuring equipment as well as accounting verification and verification through the closing of energy balances of the enterprise. Subject to accounting cross verification.
Description of the control procedures and quality	This data is subject to cross checking by government authorities.

[1] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-09-v1.pdf

guarantee	
Commentary:	

Data/Parameter:	$MSW_{F,BL}$
Measure:	
Description:	Share of organic waste from brewing disposed at landfills according to the base scenario
Frequency of determination/ monitoring	Monthly
Source of data	According to the generally accepted practice at the "Obolon" plant and at Ukrainian breweries at the inception of the Project
Values used during previous computation	1 (100%)
Foundation for the choice or description of the measuring methods	According to generally accepted practice in year 2000 100% of organic waste was disposed at landfills and silos.
Description of the control procedures and quality guarantee	This data is based on generally accepted practice.
Commentary:	

Parameters that are subject to monitoring are listed in tables D.1.1.1. and D.1.1.3 Section D.

B.2. Description of how the anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the JI project:

To determine the baseline, demonstrate additionality and feasibility of implementing the proposed JI project "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 03.0.0) was used. Application of this tool is common practice in the development of JI projects.

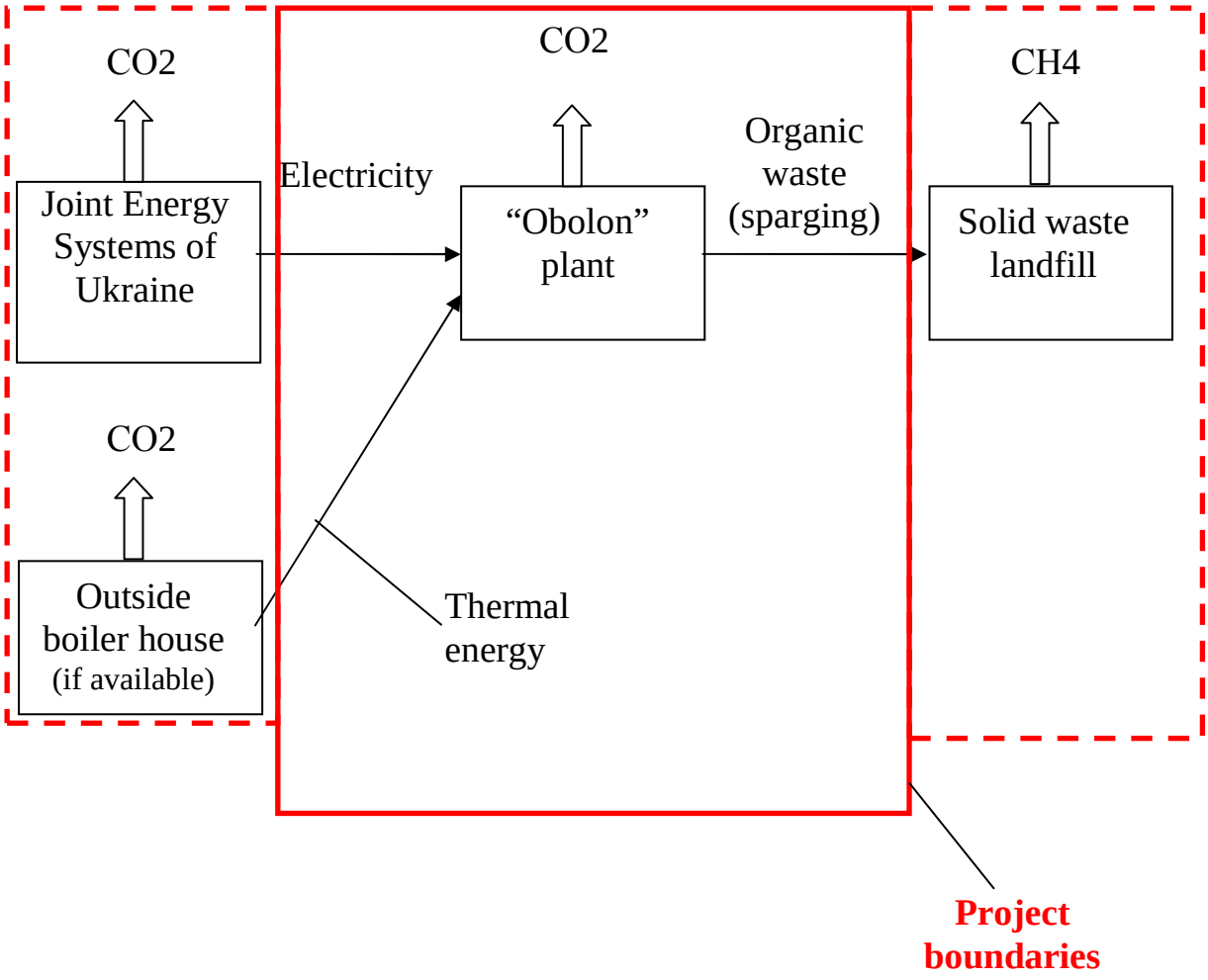
According to this tool for demonstrating additionality of the proposed project was used barrier analysis and analysis of common practice. As a result of the analysis showed that the most plausible baseline scenario is the continuation of the current situation at the start of the project (2000). Thus, the proposed project is not a baseline and corresponds to the principle of additionality.

More detailed the use of "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 2.2) and demonstration of additionality is described in Section B.1 above.

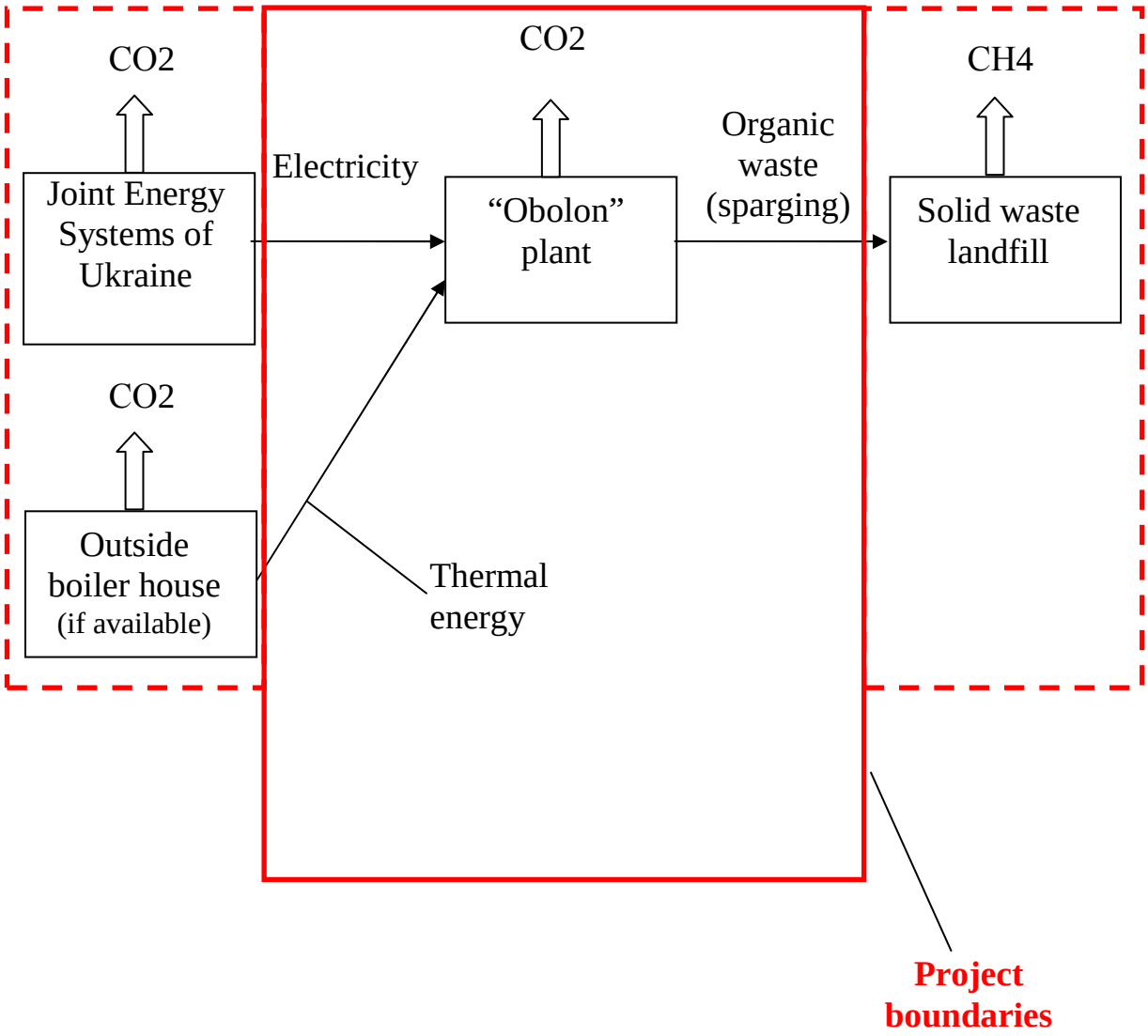
B.3. Description of how the definition of the project boundary is applied to the project:

Project boundary

The approach takes into account when assessing the carbon emissions of CO_2, which are formed as a result of generation of electric and thermal energy needed for beer production and CH4 emissions caused by disposal of organic waste of beer production. The figures 3.1 and 3.2 shows the boundaries of the project scenario and baseline scenario respectively (outlined with red solid line).



Picture 3.1. Boundaries of the project scenario



Picture 3.2. Boundaries of the baseline scenario

The list of sources of emissions and GHG that are encompassed by the project boundary is presented in table 4.

Table 4. Sources of emissions and GHG that are included or excluded in the project boundaries

	Source	Gas	Included?	Reasoning / Explanation
Baseline	Electric power plants of the Joint Electric Systems of Ukraine that use	CO_2	Yes	Emissions caused by the burning of extracted fuels by the electric power plants of the Joints Electric Systems (JES) of Ukraine to generate electric power used in the production of beer

	extracted fuels	CH_4	No	Excluded for simplification purposes
		N_2O	No	Excluded for simplification purposes
	Outside heat supplier (OJSC "Generator")	CO_2	Yes	Emissions caused by burning natural gas for generation of thermal energy supplied to the brewery "Obolon" outside supplier (boiler-house OJSC "Generator")
		CH_4	No	Excluded for simplification purposes
		N_2O	No	Excluded for simplification purposes
	Technological and generating equipment of the "Obolon" plant	CO_2	Yes	Emissions caused by the burning of natural gas in technological and generating equipment at the "Obolon" plant during the production of beer
		CH_4	No	Excluded for simplification purposes
		N_2O	No	Excluded for simplification purposes
	Organic waste from the production of beer (sparging)	CO_2	No	Excluded for simplification purposes
		CH_4	Yes	At the inception of the project the general practice for disposing of organic waste from the production of beer (sparging) was removal of these waste products to landfills where, in the process of rotting gas that contained methane was emitted
		N_2O	No	Excluded for simplification purposes
Project scenario	Electric power plants of JES of Ukraine that use extracted fuels	CO_2	Yes	Emissions caused by the burning of extracted fuels by the JES of Ukraine to generate electric power necessary to make beer
		CH_4	No	Excluded for simplification purposes
		N_2O	No	Excluded for simplification purposes
	Outside heat supplier (OJSC "Generator")	CO_2	Yes	Emissions caused by burning natural gas for generation of thermal energy supplied to the brewery "Obolon" outside supplier (boiler-house OJSC "Generator")
		CH_4	No	Excluded for simplification purposes
		N_2O	No	Excluded for simplification purposes
	Technological and generating equipment of the "Obolon" plant	CO_2	Yes	Emissions caused by the burning of natural gas in technological and generating equipment at the "Obolon" plant during the production of beer
		CH_4	No	Excluded for simplification purposes
		N_2O	No	Excluded for simplification purposes
	Organic waste from the production of beer (sparging)	CO2	No	Excluded for simplification purposes
		CH4	Yes	As a result of project implementation will be complete utilization of organic waste (sparging). But if the planned utilization of the system will not ensure full utilization of educated sparging, greenhouse gas emissions caused by its removal of waste landfill to be taken into account in calculations.
		N2O	No	Excluded for simplification purposes

B.4. Further baseline information, including the date of baseline setting and the name(s) of the person(s)/entity(ies) setting the baseline:

Date of baseline setting - 25/03/2011.

Development of the baseline level was carried out by "Company "MT-Invest" LTD that is not a project participant.

Project developer – personal information

Organization	"Company "MT-Invest" LTD
Street/PO Box	Kikvidze st.
House:	11
City	Kyiv
Oblast:	Kyiv
Zip code:	01103
Country:	Ukraine
Telephone:	+38 (044) 227-66-86, 253-50-69
Fax:	
E-mail:	zhuravlev@mtinvest.com.ua
Position:	Director for environmental projects
Family name:	Zhuravlev
Patronymic:	Volodymyrovych
Name:	Eugene
Telephone (direct)	+38 (044) 227-66-86
Fax (direct)	+38 (044) 254-07-60
Mobile telephone:	

SECTION C. Duration of the project / crediting period

C.1. Starting date of the project:

02/06/2000 – Order #408 established at the Obolon plant a workgroup for reducing power consumption and waste production in the process of brewing and other production activities.

C.2. Expected operational lifetime of the project:

25 years (300 months) or more – the program includes continuous implementation of measures aimed at reducing the consumption of power resources and utilization of organic waste, which envisages continuous modernization of equipment and its repair or replacement in case of discovering defects or breakdowns.

C.3. Length of the crediting period:

Duration period is 22 years (264 months):

2004-2007 – Early crediting period (the project will qualify for an early test of quotas in accordance with Article 17 of the Kyoto Protocol);

2008-2012 – credit period (the period of commitment);

2013-2025 – post-commitment period (period of credit extension beyond 2012 requires approval by the project Host country).

Period ERU generation will begin only on 01.01.2008 and will not exceed the lifetime of the project.

Date of the crediting period January 1, 2004 End Date December 31, 2025

SECTION D. Monitoring plan

D.1. Description of monitoring plan chosen:

The monitoring plan has been developed with the use of own JI approach based on the criteria of the heads of JISC Guidance on criteria for baseline setting and monitoring. Version 02.

During the development of own JI approach elements of the following instruments and normative documents were used:

- Tool to calculate baseline, project and/or leakage emissions from electricity consumption[2], Version 01;
- Tool to calculate project or leakage emissions from electricity consumption[3], version 02;
- 1996 IPCC[45] Guidelines for National Greenhouse Gas Inventories);
- 2006 IPCC[678] Guidelines for National Greenhouse Gas Inventories;
- Approved consolidated methodology ACM009 "Consolidated baseline and monitoring methodology for fuel switching from coal or petroleum fuel to natural gas"[9];
- Tool to determine the baseline efficiency of thermal or electric energy generation systems[10], Version 1.

All formulas that have been identified for monitoring process were made according to the approaches used in the documents mentioned above and taking into account current monitoring system used by the enterprise and the special features of the project. The formulas are listed in the section below.

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[2] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf

[3] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf

[4] http://www.ipcc-nggip.iges.or.jp/public/gl/wastrusn.html

[5] http://www.ipcc-nggip.iges.or.jp/public/gl/invs6a.htm

[6] http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf

[7] http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf

[8] http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf

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ttp://cdm.unfccc.int/filestorage/K/4/P/K4P3YG4TNQ5ECFNA8MBK2QSMR6HTEM/Consolidated%20methodology%20for%20industrial%20fuel%20switching%20from%20coal%20or%20petroleum%20fuels%20to%20natural%20gas.pdf?t=Sm98MTMwNjE0OTEzMy4yNg==|RuLrYV7BOR_qS9hKsApVelA168Q=

[10] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-09-v1.pdf

Year 2000, the year prior to the project implementation, was taken as the baseline year.

Consumption of energy Obolon brewery is in the following areas:

- Production of beer;
- Production of soft drinks;
- Bottling of mineral water;
- Other production consumption.

Other production consumption in turn divided into:

- space heating;
- gasifier carbon plant;
- factory hot water;
- drying work clothes;
- Work dryers sparging.

All pages of consumption of energy resources that belong to other production consumption directly or indirectly related to beer production, but due to the peculiarities of the balance sheet brewery it was made a separate paragraph.

The analysis revealed the structure of energy consumption Obolon brewery (form number 11-MPT in 2010) for distribution to consumers is:

Type the consumer	**Share in the total thermal energy consumed,%**	**Share in total electricity consumed,%**
Production of beer	69.5	82.5
Production of soft drinks	0.5	3.5
Bottling of mineral water	0.1	2.5
Other production consumption	29.9	11.5

As seen from the presented above is a major beer production consumption and other production consumption are the main areas of energy brewery consumption (more than 99% of heat consumption and 94% of electricity consumption). Taking into account that other production consumption directly or indirectly related to beer production, with the aim of simplifying the calculations were made relative to the value of beer produced.

Natural gas used only for heat producing by plant boiler house.

Data collected for monitoring should be kept in electronic and/or paper form. All the key data to be monitored and are necessary for the determination of the project will be kept for two years after the last transfer of ERUs the project.

The main parameters that are monitored during the crediting period and parameters to be defined once for the entire crediting period and not subject to monitoring are presented below. Other parameters not included in the monitoring are derivatives and should be calculated using the initial parameters.

The following parameters of emissions are subject to monitoring under the project scenario:

$EC_{PJ,y}$ = amount of electric power consumed in the project scenario by Obolon brewery in a year y, MWh;
$HC_{PJ,i,y}$ = amount of heat consumed by Obolon brewery in accordance with project scenario in the year y, Gcal;
$FC_{PJ,NG,y}$ = amount of natural gas consumed by Obolon brewery according to the project scenario in a year *y*, ths m^3;
$MSW_{T,PJ,y}$ = total sparging generated under the project scenario in year *y*, tons;
$MSW_{F,PJ,y}$ = fraction of sparging disposed to solid waste disposal sites under the project scenario in year *y*.

All of the above parameters objectively and clearly reflect the parameters of beer production at the "Obolon" plant, such as: the amount of used electric power, the amount and the movement of organic waste. All parameters are determined using working and calibrated measuring equipment , using the current methods and technological norms, based on passport data provided by the suppliers of equipment and energy resources.

$EF_{CO2,ELEC,y}$ = indirect emissions of GHG during the consumption of electric power by consumers of electric power in Ukraine, tCO_2e/MWh;

This ratio reflects the amount of specific emissions of greenhouse gases linked to the consumption of electricity in Ukraine. Using these factors are common practice in the calculation of joint implementation projects related to electricity consumption. In the calculations used only deterministic and / or approved rates.

The following parameters are determined only once for the entire crediting period for the project scenario emissions:

$NCV_{NG,y}$ = caloricity of natural gas by Obolon brewery in year *y*, Gcal/ths m^3;
η = efficiency of boiler house OJSC "Generator", 0.87;
$EF_{CO2,NG}$ = emission factor of natural gas, tCO_2e/GJ;
4.1868 = coefficient of translation of Gcal into GJ;
MCF = coefficient of correction of the methane flow;
DOC_F = portion of *DOC* that actually decomposes;
F = portion of CH4 in gasses generated at landfills (typical value 0.5);
$\frac{16}{12}$ = coefficient of conversion of carbon into methane;
R_y = recovered CH4 in year *y*, tCH4;

OX = oxidation factor, (0 as stated in 1996 IPCC);

GWP_{CH4} = global warming potential of methane, tCO2e/tCH4.

These factors are formally approved and widely used in relevant calculations in JI projects.

The following parameters are subject to monitoring under the baseline scenario:

P_y = amounts of beer production in year *y*, t.dal.

This option displays the amount of beer produced by the Obolon. Determined using procedures and are subject to commercial accounting.

$EF_{CO2,ELEC,y}$ = indirect emissions of GHG during the consumption of electric power by the consumers of electric power in Ukraine, tons CO_2e/MWh;
This ratio reflects the amount of specific emissions of greenhouse gases linked to the consumption of electricity in Ukraine. Using these factors are common practice in the calculation of joint implementation projects related to electricity consumption. Only determinated and / or officiallyapproved rates are used in the calculations.

The following parameters are determined only once for the entire crediting period for the baseline emissions:

η = efficiency of boiler house OJSC "Generator", 0.87;

$EF_{CO2,NG}$ = emission factor of natural gas, tCO_2e/GJ;

4.1868 = coefficient of translation of Gcal into GJ;

MCF = methane correction factor (fraction);

DOC = degradable organic carbon (fraction);

DOC_F = fraction organic waste dissimilated;

F = fraction of CH4 in landfill gas (default value 0.5);

$\frac{16}{12}$ = coefficient of conversion of carbon into methane;

R_y = recovered CH4 in year *y*, tCH4;

OX = oxidation factor, (0 as stated in 1996 IPCC);

GWP_{CH4} = potential of global warming of methane, tCO2e/tCH4.

These factors are formally approved and widely used in relevant calculations in JI projects.

$NCV_{NG,BL}$ = caloricity of natural gas consumed by Obolon brewery in base year, Gcal/ths m^3;

P_{BL} = volumes of beer production in base year, t.dal;

EC_{BL} = amount of electric power consumed by Obolon brewery in base year, MWh;

HC_{BL} = amount of heat consumed by Obolon brewery in base year, Gcal;
$FC_{BL,NG}$ = amount of natural gas consumed by Obolon brewery in base year, ths m^3;
$MSW_{T,BL}$ = total sparging generated in base year, tons.

The above options represent an objective and transparent parameters of beer production at the plant Obolon in base year. Determined using a properly calibrated measuring equipment and the valid methodologies and technological standards are based on passport data provided by suppliers of equipment and energy.

Calorific value of natural gas consumed Obolon brewery is variable. Value changes every 1-2 weeks within 8.1-8.3 Gcal/ths m3 (8100-8300 kkal/m^3). To simplify the calculations and considerations of conservative calorific value of natural gas was taken equal to 8.2 Gcal/ths m^3.

The calculation formulas used during project monitoring, data description and sources listed in the following sections of this document.

Scheme of data collection and data management is given in section D.3.
Verification of emissions reduction units is conducted based on annual data. Responsible for the preparation of documentation and submissioin of documents to the Accredited Independent Entities (AIEs)) is "Company "MT-Invest" LTD.

D.1.1. Option 1 – Monitoring of the emissions in the project scenario and the baseline scenario:

D.1.1.1. Data to be collected in order to monitor emissions from the project, and how these data will be archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	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
1. PE_y	Project GHG emissions	Monitoring of GHG emissions	tCO2e	c	annually	100 %	Electronic/ Paper	
2. $PE_{ELEC,y}$	Project GHG emissions related to the consumption of electric power	Monitoring of GHG emissions	tCO2e	c	annually	100 %	Electronic/ Paper	
3. $PE_{HEAT,y}$	Project GHG emissions related to	Monitoring of GHG	tCO2e	c	annually	100 %	Electronic/ Paper	

	the consumption of electric power	emissions						
4. $PE_{NG,y}$	Project GHG emissions related to the consumption of natural gas	Monitoring of GHG emissions	tCO2e	c	annually	100 %	Electronic/ Paper	
5. $PE_{CH4,y}$	Project GHG emissions related to the disposal of organic waste at landfills	Monitoring of GHG emissions	tCO2e	c	anually	100 %	Electronic/ Paper	
6. $EC_{PJ,y}$	Consumption of electric power according to project scenario in year y	Measured with metering equipment. Annual reports	MWh	m	monthly	100 %	Electronic/ Paper	
7. $EF_{CO2,ELEC,y}$	Coefficient of CO_2 equivalent in JES of Ukraine for projects aimed at reducing electric power consumption in year y	Default value	tCO_2e/MWh	e	anually	100 %	Electronic/ Paper	For 2004 – 0.916[11] tCO_2e/MWh For 2005 – 0.896[12] tCO_2e/MWh For 2006-2007 – 0.896[13] tCO_2e/MWh For 2008 – 1,219[14] tCO_2e/MWh For 2009 – 1.237[15] tCO_2e/MWh For 2010 – 1.225[16] tCO_2e/MWh For 2011-2025 – 1.227[17] tCO_2e/MWh

[11] ERUPT 4, Senter, Netherlands

[12] ERUPT 4, Senter, Netherlands

[13] Emission dvookysuyu carbon (for energy consumption according to the methodology "Ukraine - Assessment of new calculation of CEF", approved by TUV SUD 17.08.2007)

[14] http://www.neia.gov.ua/nature/doccatalog/document?id=127171

[15] http://www.neia.gov.ua/nature/doccatalog/document?id=127172

8.	$HC_{PJ,y}$	Consumption of thermal energy according to project scenario in year y	Measured with metering equipment and normative calculation. Annual reports	Gcal	m, c	monthly	100 %	Electronic/ Paper	
9.	η	Efficiency coefficient of boiler-house OJSC "Generator"	Default value		e	once	100 %	Electronic/ Paper	Determined used Tool to determine the baseline efficiency of thermal or electric energy generation systems[18], Version 1. 0.87
10.	$EF_{CO2,NG}$	Emission factor for natural gas	Default value 1996 IPCC[19]	tCO_2e/GJ	e	once	100 %	Electronic/ Paper	0.0561 tCO2e/GJ
11.	$FC_{PJ,NG,y}$	Consumption of natural gas according to project scenario in year y	Measured by measuring equipment. Commercial accounting of natural gas for the plant (entire production). Acts with Kyivgas	ths m^3	m	monthly	100 %	Electronic/ Paper	
12.	$NCV_{NG,y}$	Caloricity of natural gas	Default value	Gcal/ths m^3	e	annually	100%	Electronic/ Paper	To simplify the calculations and taking into account the statistics of the

[16] http://www.neia.gov.ua/nature/doccatalog/document?id=126006

[17] http://www.neia.gov.ua/nature/doccatalog/document?id=127498

[18] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-09-v1.pdf

[19] http://www.ipcc-nggip.iges.or.jp/public/gl/invs6a.htm

									enterprise in the calculations used $NCV_{NG,y}$ = 8.2 Gcal/ths m^3, which objectively reflects the average calorific value of natural gas consumed by the Obolon brewery.
13.	$MSW_{T,PJ,y}$	Total sparging generated according to project scenario in year *y*	Measured by measuring equipment and determined by normative calculations. Annual reports	tons	m, c	monthly	100%	Electronic/ Paper	
14.	$MSW_{F,PJ,y}$	Fraction of sparging disposed to solid waste disposal sites according to project scenario	Company statistical data.		m,c,e	annually	100%	Electronic/ Paper	For preliminary calculations 0 is used as no waste is expected to be taken to landfills upon the beginning of the project.
15.	*MCF*	Methane correction factor (fraction)	Default value. 2006 IPCC [20]		e	once	100%	Electronic/ Paper	
16.	*DOC*	Degradable organic carbon	Default value. 2006 IPCC [21]		e	once	100%	Electronic/ Paper	
17.	DOC_F	Fraction organic waste dissimilated	Default value. 2006 IPCC [22]		e	once	100%	Electronic/ Paper	0.5
18.	R_y	Recovered CH4 in year y	Default value.	tCH4	e	once	100%	Electronic/ Paper	Utilization of GHG is beyond the responsibility of

[20] http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf

[21] http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf

[22] http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf

								project owners and beyond the boundaries of the project. Therefore, this value for conservative measures, was set at 0.
19. *F*	Fraction of CH4 in landfill gas	Default value. 1996 IPCC [23]		e	once	100%	Electronic/ Paper	
20. *OX*	Oxidation factor	Default value. 1996 IPCC [24]		e	once	100%	Electronic/ Paper	
21. GWP_{CH4}	Potential of global warming of methane	According to the decision of the UNFCCC and the Kyoto protocol	$tCO_2e/tCH4$	e	once	100 %	Electronic/ Paper	21 $tCO_2e/tCH4$

D.1.1.2. Description of formulae used to estimate project emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

$$PE_y = PE_{ELEC,y} + PE_{HEAT,y} + PE_{NG,y} + PE_{CH4,y}, \quad (1)$$

Where

PE_y = greenhouse gas emissions in the project scenario in year y, tCO_2e;

$PE_{ELEC,y}$ = greenhouse gas emissions in the project scenario related to the consumption of electric energy in year y, tCO_2e;

$PE_{HEAT,y}$ = greenhouse gas emissions in the project scenario related to the consumption of thermal energy in year y, tCO_2e;

$PE_{NG,y}$ = greenhouse gas emissions in the project scenario related to the consumption of natural gas in year y, tCO_2e;

$PE_{CH4,y}$ = greenhouse gas emissions in the project scenario related to the utilization of organic waste (sparging) during the production of beer through depositing it at landfills, tCO_2e;

y = year for which calculations are carried out.

[23] http://www.ipcc-nggip.iges.or.jp/public/gl/wastrusn.html

[24] http://www.ipcc-nggip.iges.or.jp/public/gl/wastrusn.html

GHG emissions in the project scenario related to the consumption of electricity are calculated according to the approach described in the Tool to calculate baseline, project and/or leakage emissions from electricity consumption[25], Version 01.

$$PE_{ELEC,y} = EC_{PJ,y} \cdot EF_{CO2,ELEC,y}, \quad (2)$$

Where

$PE_{ELEC,y}$ = greenhouse gas emissions in the project scenario associated with the consumption of electric energy in year *y*, tCO_2e;
$EC_{PJ,y}$ = amount of electricity consumed in the project scenario by Obolon brewery in year *y*, MWh;
$EF_{CO2,ELEC,y}$ = indirect emissions of electricity consumption of electric energy consumers from the Joint Energy systems of Ukraine, tCO_2e/MWh;
y = year for which calculations are carried out.

GHG emissions in the project scenario related to the consumption of thermal energy are calculated in accordance with the approach described in the Approved CDM methodology ACM009 Consolidated baseline and monitoring methodology for fuel switching from coal or petroleum fuel to natural gas [26], Version 03.2.

$$PE_{HEAT,y} = \sum \frac{HC_{PJ,i,y}}{\eta} \cdot EF_{CO2,NG} \cdot 4.1868, \quad (3)$$

Where

$PE_{HEAT,y}$ = greenhouse gas emissions in the project scenario related to the consumption of thermal energy in year *y*, tCO_2e;
$HC_{PJ,i,y}$ = amount of thermal energy supplied from OJSC "Generator" for by Obolon brewery according to project scenario in year *y*, Gcal;
η = efficiency coefficient of boiler-house OJSC "Generator", 0.87;
$EF_{CO2,NG}$ = natural gas emission coefficient, tCO_2e/GJ;
4.1868 = conversion coefficient of Gcal into GJ, Gcal/GJ;
y = year for which calculations are carried out.

GHG emissions in project scenario related to the consumption fo natural gas are calculated in accordance with approach described in Tool to calculate baseline, project and / or leakage emissions from electricity consumption, Version 02.

[25] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf

[26] ttp://cdm.unfccc.int/filestorage/K/4/P/K4P3YG4TNQ5ECFNA8MBK2QSMR6HTEM/Consolidated%20methodology%20for%20industrial%20fuel%20switching%20from%20coal%20or%20petroleum%20fuels%20to%20natural%20gas.pdf?t=Sm98MTMwNjE0OTEzMy4yNg==|RuLrYV7BOR_qS9hKsApVelA168Q=

$$PE_{NG,y} = FC_{PJ,NG,y} \cdot NCV_{NG,y} \cdot EF_{CO2,NG} \cdot 4.1868, \quad (4)$$

Where

$PE_{NG,y}$ = gas emissions in the project scenario related to the consumption of natural gas in year *y*, tCO_2e;
$FC_{PJ,NG,y}$ = volume of natural gas consumed during beer production according to project scenario in year *y*, ths m^3;
$NCV_{NG,y}$ = caloricity of natural gas used by Obolon brewery in year *y*, Gcal/ths m^3;
$EF_{CO2,NG}$ = natural gas emission coefficient, tCO_2e/GJ;
4.1868 = conversion coefficient of Gcal into GJ, Gcal/GJ;
y = year for which calculations are carried out.

For calculating GHG emissions according to project scenario related to the utilization of organic waste from the production of beer by depositing it at landfills a typical approached described in1996 IPCC Guidelines for National Greenhouse Gas Inventories [27] was used.

$$PE_{CH4,y} = (MSW_{T,PJ,y} \cdot MSW_{F,PJ,y} \cdot MCF \cdot DOC \cdot DOC_F \cdot F \cdot \frac{16}{12} - R_y) \cdot (1 - OX) \cdot GWP_{CH4}, \quad (5)$$

Where

$PE_{CH4,y}$ = greenhouse gas emissions in the project scenario related to the disposal of organic waste (sparging) from beer production by depositing it at landfills in year *y*, tCO_2e;
$MSW_{T,PJ,y}$ = total sparging generated according to project scenario in year *y*, tons;
$MSW_{F,PJ,y}$ = fraction of sparging disposed to solid waste disposal sites according to project scenario in year *y*;
MCF = methane correction factor (fraction);
DOC = degradable organic carbon (fraction);
DOC_F = fraction organic waste dissimilated;
F = fraction of CH4 in landfill gas (default value 0.5);
$\frac{16}{12}$ = coefficient of conversion of carbon into methane;
R_y = recovered CH4 in year *y*, tCH4;
OX = oxidation factor, (0 as stated in 1996 IPCC);

[27] http://www.ipcc-nggip.iges.or.jp/public/gl/invs6e.html

GWP_{CH4} = potential of methane global warming, tCO2e/tCH4;

y = year for which calculations are carried out.

D.1.1.3.Relevant data necessary for determining the baseline of anthropogenic emissions of greenhouse gases by sources within the project boundary, and how such data will be collected and archived:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	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
22. BE_y	Baseline GHG emissions	Monitoring GHG emissions	Tons of CO2equivalent	c	annually	100 %	Electronic/ Paper	
23. $BE_{ELEC,y}$	Baseline GHG emissions related to electric power consumption	Monitoring GHG emissions	tons CO2 equivalent	c	annually	100 %	Electronic/ Paper	
24. $BE_{HEAT,y}$	Baseline GHG emissions related to consumption of thermal energy	Monitoring GHG emissions	tons CO2 equivalent	c	annually	100 %	Electronic/ Paper	
25. $BE_{NG,y}$	Baseline GHG emissions related to consumption of natural gas	Monitoring GHG emissions	tons CO2 equivalent	c	annually	100 %	Electronic/ Paper	
26. $BE_{CH4,y}$	Baseline GHG emissions related to disposal of waste at landfills	Monitoring GHG emissions	tons CO2 equivalent	c	annually	100 %	Electronic/ Paper	
27. $EC_{BL,y}$	Consumption of electric power related to baseline scenario in year *y*	Calculated by project developers based on the statistical data of the company and parameters of base year	MWh	c	annually	100 %	Electronic/ Paper	Calculated using formula (8) below

28.	EC_{BL}	Consumption of electric power in base year	Measured with measuring equipment and determined by normative calculations. Annual report.	MWh	m	once	100 %	Electronic/ Paper	According to statistical data of the company for year 2000 EC_{BL} = 39280.265 MWh
29.	P_y	Beer production in year *y*	Production reports	t.dal	m, c	monthly	100 %	Electronic/ Paper	
30.	P_{BL}	Beer production in base year	Production reports	t.dal	m, c	once	100 %	Electronic/ Paper	According to statistical data of the company for year 2000 P_{BL} = 27644 t.dal
31.	$HC_{BL,y}$	Consumption of thermal energy in baseline scenario in year y	Calculated by project developers based on the statistical data of the company and parameters of base year	Gcal	c	annually	100 %	Electronic/ Paper	Calculated using formula (10) below
32.	HC_{BL}	Consumption of thermal energy in base year	Measured with measuring equipment and determined by normative calculations. Annual report	Gcal	m, c	once	100 %	Electronic/ Paper	According to statistical data of the company for year 2000 HC_{BL} = 38902 Gcal
33.	η	Efficiency coefficient of boiler-house OJSC “Generator”	Default value		e	once	100 %	Electronic/ Paper	Determined used Tool to determine the baseline efficiency of thermal or electric

								energy generation systems[28], Version 1. 0.87

[28] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-09-v1.pdf

34.	$FC_{BL,NG,y}$	Consumption of natural gas in base scenario in year y	Calculated by project developers based on the statistical data of the company and parameters of base year	Thousand m^3	c	annually	100 %	Electronic/ Paper	Calculated using formula (12) below
35.	$FC_{BL,NG}$	Natural gas consumption in base year	Measured with measuring equipment. Commercial accounting of gas on the plant (entire production). Act with Kyivgas	ths m^3	m	once	100 %	Electronic/ Paper	According to statistical data of the company for year 2000 HC_{BL} = 14599 ths m^3
36.	$NCV_{NG,BL}$	Caloricity of natural gas in base year	Company statistics, data from natural gas supplier	Gcal/ths m^3	e	once	100%	Electronic/ Paper	To simplify the calculations and taking into account the statistics of the enterprise in the calculations used $NCV_{NG,y}$ = 8.2 Gcal/ths m^3, which objectively reflects the average calorific value of natural gas consumed by the Obolon brewery.
37.	$MSW_{T,BL,y}$	Total sparging generated according to base scenario in year y	Calculated by project developers based on statistical data and plant parameters of the base year	tons	c	annually	100%	Electronic/ Paper	Calculated using formula (12) below

38.	$MSW_{T,BL}$	Total sparging generated in base year	Measured with measuring equipment and determined by normative calculations. Environmental reports of government agencies.	tons	m, c	once	100%	Electronic/ Paper	According to statistical data of the company for year 2000 $MSW_{T,BL}$ = 54735,12 tons
39.	$MSW_{F,BL}$	Fraction of sparging disposed to solid waste disposal sites according to base scenario	According to general practice at Obolon plant and other Ukrainian breweries at the time of Project inception		c, e	once	100%	Electronic/ Paper	According to general practice in year 2000, 100% of organic waste was buried in silos.
40.	R_{BL}	Recovered CH4 in base year	Default value.	tCH4	e	once	100%	Electronic/ Paper	At project inception (year 2000) there were no projects aimed at utilizing landfill gasses in Ukraine. Moreover, utilization of landfill gasses lies outside the control of project owners and outside the project boundaries. Therefore this value was set equal to 0.

D.1.1.4. Description of formulae used to estimate baseline emissions (for each gas, source etc.; emissions in units of CO_2 equivalent):

$$BE_y = BE_{ELEC,y} + BE_{HEAT,y} + BE_{NG,y} + BE_{CH4,y}, \quad (6)$$

Where
BE_y = GHG emissions according to baseline scenario in year y, tCO_2e;
$BE_{ELEC,y}$ = baseline GHG emissions related to electric power consumption in year y, tCO_2e;
$BE_{HEAT,y}$ = baseline GHG emissions related to consumption of thermal energy in year y, tCO_2e;
$BE_{NG,y}$ = baseline GHG emissions related to the consumption of natural gas in year y, tCO_2e;
$BE_{CH4,y}$ = baseline GHG emissions related to utilization of organic waste from beer production by disposing them at landfills in year y, tCO_2e;
y = year for which calculations are carried out.

GHG emissions in baseline scenario related to the consumption of electricity are calculated according to the approach described in the Tool to calculate baseline, project and/or leakage emissions from electricity consumption[29], Version 01.

$$BE_{ELEC,y} = EC_{BL,y} \cdot EF_{CO2,ELEC,y}, \quad (7)$$

Where
$BE_{ELEC,y}$ = GHG emissions according to baseline scenario related to consumption of electric power in year y, tCO_2e;
$EC_{BL,y}$ = amount of electric power consumed according to baseline scenario by Obolon brewery in year y, MWh;
$EF_{CO2,ELEC,y}$ = indirect GHG emissions from consumption of electric power by consumers of electric power in Ukraine, tCO_2e/MWh;
y = year for which calculations are carried out.

$$EC_{BL,y} = P_y \cdot \frac{EC_{BL}}{P_{BL}}, \quad (8)$$

Where
$EC_{BL,y}$ = amount of electric power consumed according to baseline scenario by Obolon brewery in year y, MWh;
P_y = volumes of beer production in year y, t.dal;
P_{BL} = baseline year volumes of beer production, t.dal;
EC_{BL} = amount of electric power consumed by Obolon brewery in base year, MWh;

[29] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v1.pdf

y = year for which calculations are carried out.

GHG emissions in the project scenario related to the consumption of thermal energy are calculated in accordance with the approach described in the Approved CDM methodology ACM009 Consolidated baseline and monitoring methodology for fuel switching from coal or petroleum fuel to natural gas [30], Version 03.2.

$$BE_{HEAT,BL,y} = \sum \frac{HC_{BL,y}}{\eta} \cdot EF_{CO2,NG} \cdot 4.1868, \quad (9)$$

Where

$BE_{HEAT,BL,y}$ = baseline GHG emissions related to consumption of thermal energy by Obolon brewery in year y, tCO_2e;
$HC_{BL,y}$ = amount of thermal energy consumed by Obolon brewery in according to baseline scenario in year y, Gcal;
η = efficiency coefficient of boiler-house OJSC “Generator”, 0.87;
$EF_{CO2,NG}$ = natural gas emission coefficient, tCO_2e/GJ;
4.1868 = conversion of Gcal into GJ coefficient;
y = year for which calculations are carried out.

$$HC_{BL,y} = P_y \cdot \frac{HC_{BL}}{P_{BL}}, \quad (10)$$

Where
$HC_{BL,y}$ = amount of thermal energy used according to baseline scenario by Obolon brewery in year y, Gcal;
P_y = volumes of beer production in year y, t.dal;
P_{BL} = baseline year volumes of beer production, t.dal;
HC_{BL} = amount of thermal energy consumed by Obolon brewery in base year, Gcal;
y = year for which calculations are carried out.

30 ttp://cdm.unfccc.int/filestorage/K/4/P/K4P3YG4TNQ5ECFNA8MBK2QSMR6HTEM/Consolidated%20methodology%20for%20industrial%20fuel%20switching%20from%20coal%20or%20petroleum%20fuels%20to%20natural%20gas.pdf?t=Sm98MTMwNjE0OTEzMy4yNg==|RuLrYV7BOR_qS9hKsApVelA168Q=

GHG emissions in baseline scenario related to the consumption of natural gas are calculated according to the approach described in the Tool to calculate baseline, project and / or leakage emissions from electricity consumption result Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion[31], Version 02.

$$BE_{NG,y} = FC_{BL,NG,y} \cdot NCV_{NG,BL} \cdot EF_{CO2,NG} \cdot 4.1868, \quad (11)$$

Where

$BE_{NG,y}$ = GHG emissions according to baseline scenario related to consumption of natural gas in year *y*, tCO_2e;
$FC_{BL,NG,y}$ = amount of natural gas consumed by Obolon brewery according to baseline scenario in year *y*, ths m^3;
$NCV_{NG,BL}$ = caloricity of natural gas used in beer production in base year, Gcal/ths m^3;
$EF_{CO2,NG}$ = natural gas emissions ratio, tCO_2e/GJ;
4.1868 = conversion of Gcal into GJ coefficient;
y = year for which calculations are carried out.

$$FC_{BL,NG,y} = P_y \cdot \frac{FC_{BL,NG}}{P_{BL}}, \quad (12)$$

Where

$FC_{BL,NG,y}$ = volume of natural gas used by Obolon brewery in baseline scenario year *y*, Gcal;
P_y = volumes of beer production in year *y*, t.dal;
P_{BL} = baseline year volumes of beer production, t.dal;
$FC_{BL,NG}$ = volume of natural gas used by Obolon brewery in base year, Gcal;
y = year for which calculations are carried out.

For calculating baseline scenario GHG emissions related to utilization of organic waste (sparging) through disposal at landfills was used typical approach described in 1996 IPCC[32] Guidelines for National Greenhouse Gas Inventories was used.

[31] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf

[32] http://www.ipcc-nggip.iges.or.jp/public/gl/invs6e.html

$$BE_{CH4,BL,y} = (MSW_{T,BL,y} \cdot MSW_{F,BL,y} \cdot MCF \cdot DOC \cdot DOC_F \cdot F \cdot \frac{16}{12} - R_{BL}) \cdot (1 - OX) \cdot GWP_{CH4}, \qquad (13)$$

Where

$BE_{CH4,BL,y}$ = baseline GHG emissions related to utilization of organic waste (sparging) from beer production through disposal at landfills in year *y*, tCO_2e;
$MSW_{T,BL,y}$ = total sparging generated according to baseline scenario in year *y*, tons;
$MSW_{F,BL,y}$ = fraction of sparging disposed to solid waste disposal sites according to baseline scenario in year *y*;
MCF = methane correction factor (fraction);
DOC = degradable organic carbon (fraction);
DOC_F = fraction organic waste dissimilated;
F = fraction of CH4 in landfill gas (default value 0.5);
$\frac{16}{12}$ = coefficient for converting carbon into methane;
R_{BL} = recovered CH4 in base year, tCH4;
OX = oxidation factor (0 as stated in 1996 IPCC);
GWP_{CH4} = potential of global warming of methane, tCO2e/tCH4;
y = year for which calculations are carried out.

$$MSW_{T,BL,y} = P_y \cdot \frac{MSW_{T,BL}}{P_{BL}}, \qquad (14)$$

Where

$MSW_{T,BL,y}$ = total sparging generated according to baseline scenario in year *y*, tons;
$MSW_{T,BL}$ = total sparging generated in base year, tons;
P_y = volumes of beer production in year *y*, t.dal;
P_{BL} = volumes of beer production in base year, t.dal;
y = year for which calculations are carried out.

D. 1.2. Option 2 – Direct monitoring of emission reductions from the project (values should be consistent with those in section E.):

Not applicable

D.1.2.1. Data to be collected in order to monitor emission reductions from the project, and how these data will be archived:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	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

D.1.2.2. Description of formulae used to calculate emission reductions from the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

Not applicable

D.1.3. Treatment of leakage in the monitoring plan:

An increase in GHG emissions outside the project boundaries in result of the project implementation is not expected.

D.1.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project:								
ID number *(Please use numbers to ease cross-referencing to D.2.)*	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

D.1.3.2. Description of formulae used to estimate leakage (for each gas, source etc.; emissions in units of CO_2 equivalent):

Leakage not expected.

The project does not envisage any activities that may lead to leakage.

D.1.4. Description of formulae used to estimate emission reductions for the project (for each gas, source etc.; emissions/emission reductions in units of CO_2 equivalent):

GHG emission reductions calculated in line with the approach described in Approved CDM methodology ACM009 Consolidated baseline and monitoring methodology for fuel switching from coal or petroleum fuel to natural gas [33], Version 03.2.

$$ER_y = BE_y - PE_y - LE_y, \quad (15)$$

Where

ER_y = emission reduction in year y, tCO_2e;

[33] ttp://cdm.unfccc.int/filestorage/K/4/P/K4P3YG4TNQ5ECFNA8MBK2QSMR6HTEM/Consolidated%20methodology%20for%20industrial%20fuel%20switching%20from%20coal%20or%20petroleum%20fuels%20to%20natural%20gas.pdf?t=Sm98MTMwNjE0OTEzMy4yNg==|RuLrYV7BOR_qS9hKsApVelA168Q=

BE_y = baseline GHG emissions in year *y*, tCO_2e;
PE_y = GHG emissions from the project activity in year *y*, tCO_2e;
LE_y = emissions from leakage in year *y* , tCO_2e;

D.1.5. Where applicable, in accordance with procedures as required by the host Party, information on the collection and archiving of information on the environmental impacts of the project:

Collection, handling, transfer and utilization of waste at the company is carried out in accordance with the Law of Ukraine "On waste".

Applicable laws and regulations on environmental safety are the legal basis for waste management.

More in-depth description of waste management can be found in below in the section of Annex 3 of this document.

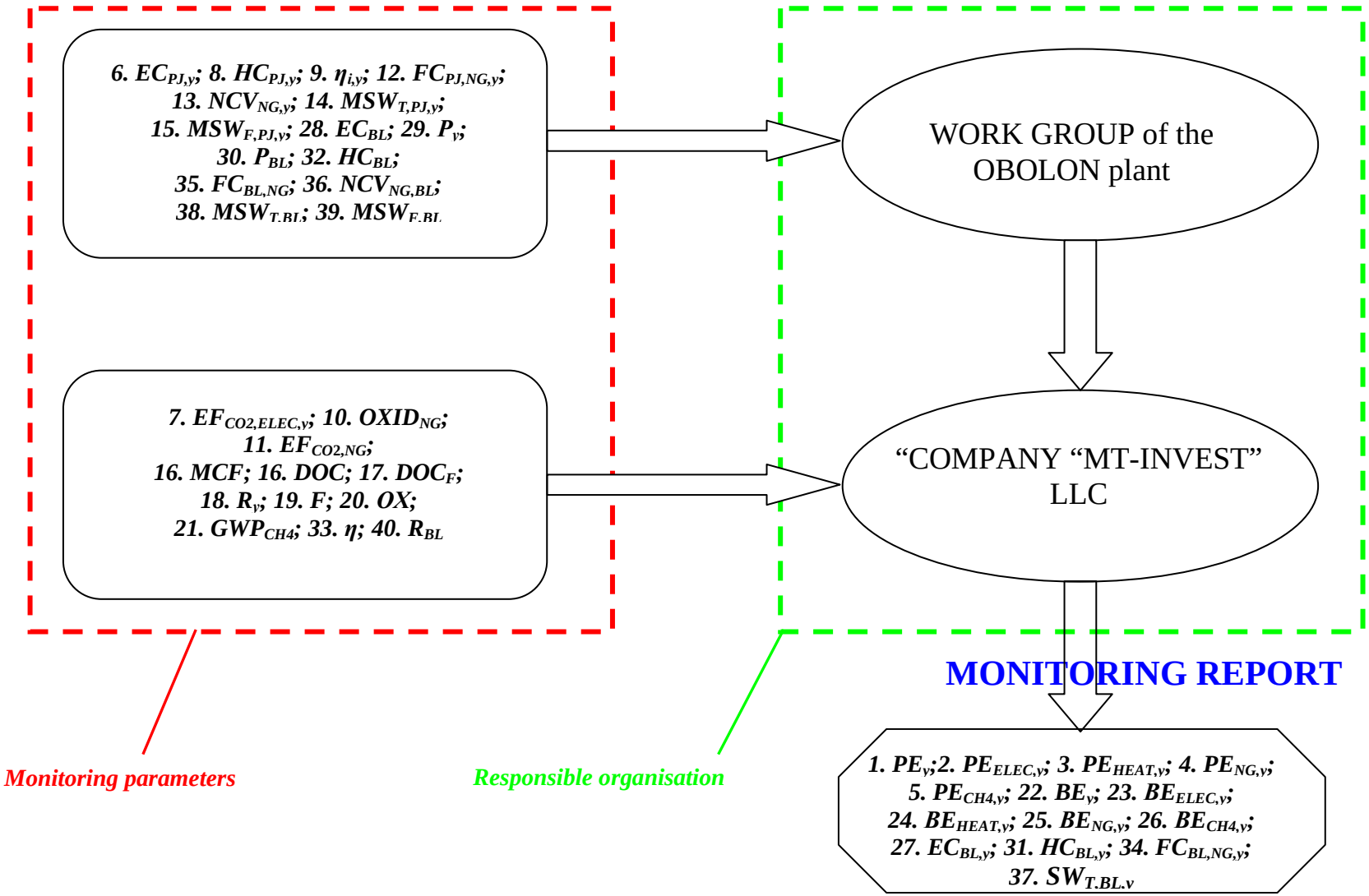
The project implementation does not require gathering of information on the influence on the environment in excess of information collected at the pant prior to the project inception.

D.2. Quality control (QC) and quality assurance (QA) procedures undertaken for data monitored:		
Data *(Indicate table and ID number)*	Uncertainty level of data (high/medium/low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
Table D.1.1.1. 6. $EC_{PJ,y}$ *Table D.1.1.3. 28.* EC_{BL}	low	Quantity of electric power consumed by Obolon brewery is determined using working, calibrated and tested in accordance with the current demand in Ukraine equipment. Moreover, the amount of electric power consumed is cross-checked with the supplier of electricity and state authorities..
Table D.1.1.1. 8. $HC_{PJ,y}$ *Table D.1.1.3. 32.* HC_{BL}	low	Quantity of thermal energy consumed by Obolon brewery is determined using working, calibrated and tested in accordance with the current demand in Ukraine equipment and calculated based on the current technological norms. The amount of used thermal energy is cross-checked with the supplier of thermal energy and state authorities..

Table D.1.1.1. *12. $FC_{PJ,NG,y}$* *Table D.1.1.3.* *35. $FC_{BL,NG}$*	low	Quantity of natural gas consumed by Obolon brewery is determined using working, calibrated and tested in accordance with the current demand in Ukraine equipment. This value is cross-checked with the supplier of natural gas and state authorities.
Table D.1.1.1. *13. $NCV_{NG,y}$* *Table D.1.1.3.* *36. $NCV_{NG,BL}$*	low	Fuel caloricity (natural gas) is subject to measuring by the supplier. The information on the value of this parameter is provided by the supplier (Kyivgas) in accordance with procedures regulated by agreements. For ease of calculation, based on statistics and common practice it was adopted a constant 8.2 Gcal/ths. m^3 (8200 ccal/m^3).
Table D.1.1.1. *14. $MSW_{T,PJ,y}$* *Table D.1.1.3.* *38. $MSW_{T,BL}$*	low	Production and movement of organic waste is subject to close control by state agencies in the sphere of ecology and environmental protection, which is why the trustworthiness of this information is beyond doubt.
Table D.1.1.1. *15. $MSW_{F,PJ,y}$*	low	Production and movement of organic waste is subject to close control by state agencies in the sphere of ecology and environmental protection, which is why the trustworthiness of this information is beyond doubt.
Table D.1.1.1. *7. $EF_{CO2,ELEC,y}$*	low	During the monitoring of emission reductions in this project only officially-approved in Ukraine or determinated coefficient for tons of CO_2 equivalent in Joint Electric Systems of Ukraine for projects aiming to reduce electric power in a year. The project developer carries out annually the monitoring of the actuality of this coefficient and actualizes its value during the development and design of the next periodic monitoring report, which would prevent the use of outdated or incorrect coefficient.
Table D.1.1.3 *29. P_y* *30. P_{BL}*	low	The amount of output is subject to commercial reporting, which is in turn subject to periodic cross reference by state governmental agencies (Tax inspection and others). This information is subject to multiple duplications at various stages from the bottling to the sale of this beer, which excludes mistakes or incorrect information.

D.3. Please describe the operational and management structure that the project operator will apply in implementing the monitoring plan:

The monitoring plan does not foresee any other additional measures, resulting in installation of new measuring equipment or collection of additional parameters in addition to those that are already implemented. A scheme of data collection is provided in Figure 6.



Picture 4.1. Collection data for monitoring the project parameters

D.4. Name of person(s)/entity(ies) establishing the monitoring plan:

"Obolon" PJSC that is a project participant.

"Company "MT-Invest" LTD that is not a project participant.

SECTION E. Estimation of greenhouse gas emission reductions

E.1. Estimated project emissions:

The calculation of project emissions is carried out in accordance with formulae listed in section D.1.1.2.

Results of calculations are presented in the table below. Calculations themselves can be found in file Obolon_v.2.xls, which is attached to the PDD.

Table 5. Emissions of the project scenario

Year	$PE_{ELEC,y}$ tCO2e	$PE_{HEAT,y}$ tCO2e	$PE_{NG,y}$ tCO2e	$PE_{CH4,y}$ tCO2e	PE_y tCO2e
2004	52332	15224	30392	0	97948
2005	60791	17759	29468	0	108018
2006	68103	33185	30739	0	132027
2007	70036	32782	35693	0	138511
Total for 2004-2007:					476504
Average amount of emissions in 2004-2007:					119126
2008	101487	28728	44606	0	174821
2009	57844	0	47821	0	105665
2010	84230	0	50577	0	134807
2011	84230	0	50577	0	134807
2012	84230	0	50577	0	134807
Total for 2008-2012:					684907
Average amount of emissions in 2008-2012:					136981
2013	84230	0	50577	0	134807
2014	84230	0	50577	0	134807
2015	84230	0	50577	0	134807
2016	84230	0	50577	0	134807
2017	84230	0	50577	0	134807
2018	84230	0	50577	0	134807
2019	84230	0	50577	0	134807
2020	84230	0	50577	0	134807
2021	84230	0	50577	0	134807
2022	84230	0	50577	0	134807
2023	84230	0	50577	0	134807
2024	84230	0	50577	0	134807
2025	84230	0	50577	0	134807
Total for 2013-2025:					1752487
Average amount of emissions in 2013-2025:					134807
Всього 2004-2025:					2913899
Average amount of emissions in 2004-2025:					132450

E.2. Estimated leakage:

No leakages are expected.

E.3. The sum of E.1. and E.2.:

Since the leakage emissions LEy = 0, the sum of leakage emissions and project scenario emissions is in fact equal to the identified project scenario emissions. The resulting emissions volumes are presented below in the Table 6.

Table 6. Sum of emissions from leakages and project activity.

Year	PE_y tCO2e	LE tCO2e	PE_y+LE tCO2e
2004	97948	0	97948
2005	108018	0	108018
2006	132027	0	132027
2007	138511	0	138511
Total for 2004-2007:	476504	0	476504
Average amount of emissions in 2004-2007:	119126	0	119126
2008	174821	0	174821
2009	105665	0	105665
2010	134807	0	134807
2011	134807	0	134807
2012	134807	0	134807
Total for 2008-2012:	684907		684907
Average amount of emissions in 2008-2012:	136981		136981
2013	134807	0	134807
2014	134807	0	134807
2015	134807	0	134807
2016	134807	0	134807
2017	134807	0	134807
2018	134807	0	134807
2019	134807	0	134807
2020	134807	0	134807
2021	134807	0	134807
2022	134807	0	134807
2023	134807	0	134807
2024	134807	0	134807
2025	134807	0	134807
Total for 2013-2025:	1752487	0	1752487
Average amount of emissions in 2013-2025:	134807	0	134807
Total for 2004-2025:	2913899	0	2913899
Average amount of emissions in	132450	0	132450

2004-2025:			

E.4. Estimated baseline emissions:

Calculation of emissions of the baseline is carried out with formulas presented in section D.1.1.4.

Results of calculations are presented in the table below. Calculations themselves can be found in file Obolon_v.2.xls, which is attached to the PDD.

GHG emissions for baseline scenario are presented in table 7

Table 7. Baseline emissions

Year	$BE_{ELEC,y}$ tCO2e	$BE_{HEAT,y}$ tCO2e	$BE_{NG,y}$ tCO2e	$BE_{CH4,y}$ tCO2e	BE_y tCO2e
2004	70411	20553	55024	112468	258456
2005	95543	28511	76330	156016	356401
2006	116736	34835	93262	190624	435456
2007	136453	40719	109014	222821	509007
Total for 2004-2007:					1559320
Average amount of emissions in 2004-2007:					389830
2008	191479	41999	112441	229825	575744
2009	152413	32944	88198	180274	453830
2010	149114	32547	87134	178100	446894
2011	149357	32547	87134	178100	447138
2012	149357	32547	87134	178100	447138
Total for 2008-2012:					2370744
Average amount of emissions in 2008-2012:					474149
2013	149357	32547	87134	178100	447138
2014	149357	32547	87134	178100	447138
2015	149357	32547	87134	178100	447138
2016	149357	32547	87134	178100	447138
2017	149357	32547	87134	178100	447138
2018	149357	32547	87134	178100	447138
2019	149357	32547	87134	178100	447138
2020	149357	32547	87134	178100	447138
2021	149357	32547	87134	178100	447138
2022	149357	32547	87134	178100	447138
2023	149357	32547	87134	178100	447138
2024	149357	32547	87134	178100	447138
2025	149357	32547	87134	178100	447138
Total for 2013-2025:					5812793
Average amount of emissions in 2013-2025:					447138
Всього 2004-2025:					9742857
Average amount of emissions in 2004-2025:					442857

E.5. Difference between E.4. and E.3. representing the emission reductions of the project:

Emission reductions calculated using formula (15) above. Results presented in table 8 below.

Table 8. Emission reductions

Year	ER_y tCO2e
2004	160508
2005	248383
2006	303429
2007	370496
Total for 2004-2007:	1082815
Average emissions amounts 2004-2007:	270704
2008	400922
2009	348164
2010	312088
2011	312331
2012	312331
Total for 2008-2012:	1685837
Average emissions amounts 2008-2012:	337167
2013	312331
2014	312331
2015	312331
2016	312331
2017	312331
2018	312331
2019	312331
2020	312331
2021	312331
2022	312331
2023	312331
2024	312331
2025	312331
Total for 2013-2025:	4060306
Average emissions amounts 2013-2025:	312331
Total for 2004-2025:	6828958
Average emissions amounts 2004-2025:	310407

E.6. Table providing values obtained when applying formulae above:

Year	*PEy* tCO2e	*LEy* tCO2e	*BEy* tCO2e	*ERy* tCO2e
2004	97948	0	258456	160508
2005	108018	0	356401	248383
2006	132027	0	435456	303429
2007	138511	0	509007	370496
Total in 2004-2007:	476504	0	1559320	1082815
Average reductions in 2004-2007:	119126	0	389830	270704
2008	174821	0	575744	400922
2009	105665	0	453830	348164
2010	134807	0	446894	312088
2011	134807	0	447138	312331
2012	134807	0	447138	312331
Total in 2008-2012:	684907	0	2370744	1685837
Average reductions in 2008-2012:	136981	0	474149	337167
2013	134807	0	447138	312331
2014	134807	0	447138	312331
2015	134807	0	447138	312331
2016	134807	0	447138	312331
2017	134807	0	447138	312331
2018	134807	0	447138	312331
2019	134807	0	447138	312331
2020	134807	0	447138	312331
2021	134807	0	447138	312331
2022	134807	0	447138	312331
2023	134807	0	447138	312331
2024	134807	0	447138	312331
2025	134807	0	447138	312331
Total if 2013-2025:	1752487	0	5812793	4060306
Average reductions in 2013-2025:	134807	0	447138	312331
Total in 2004-2025:	2913899	0	9742857	6828958
Average reductions in 2004-2025:	132450	0	442857	310407

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts of the project, including transboundary impacts, in accordance with procedures as determined by the host Party:

Collection, handling and transfer of waste for utilization was carried out in accordance with the law of Ukraine "On waste".

The legal foundation for handling waste are the current legal and normative acts on environmental safety.

Production waste, depending on its physical, chemical and biological characteristics is divided into four danger classes:

- I class - extremely high-risk waste;
- II class - high-risk waste;
- III class - medium-risk waste;
- IV class - low-risk waste.

Procedures for handling waste are described in Annex 3 of this document.

In accordance with Ukrainian laws new construction projects, reconstruction and technical re-equipment, industrial and civil projects must include Environmental Impact Assessment (EIA), which main requirements are listed in the State Construction Norms of Ukraine A.2.2-1-2003.

"Obolon" PJSC has the necessary Environmental Impact Assessment of its activities in accordance with Ukrainian law.

In general the «Reduction of power consumption and disposal of waste at «Obolon" PJSC" project will have positive effect on the environment. The following points will give detailed information on the positive effect on the environment:

1. The project implementation will reduce CO_2 emissions in the city of Kyiv due to more effective energy consumption. This will be achieved by implementing modern equipment and preproduction processes.

2. Due to lower fuel consumption, electricity and ecologic technologies for the utilization of organic waste, the implementation of the project will reduce emissions of SO_x, NOx, CO and CH_4 solid particles (co-product of combustion).

No transboundary environmental impact is expected from the implementation of this project.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to supporting documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

Impact on the aquatic environment
Impact on the aquatic environment will be the same as in the base scenario. The existing technologies used in the production of beer by the "Obolon" plant require the disposal of waste water through the drainage system with mandatory chemical control. All these actions are stipulated by the Water Code of Ukraine, State Standart 28.74-82 "Rules of hygiene and quality control", Construction rules and regulations 4630-92 that determine the maximum concentration for internal water bodies. Disposal into open water bodies will not be done.

Project implementation will have positive effect. It will allow reducing water consumption and, as a result, lead to the reduction of waste water discharge.

Impact on ambient air
Project implementation will have positive effect on air:
1) Reduce the emissions of NOx, SOx, CO and solid particles due to the use of more environmentally clean technologies and reduction of power consumption;
2) Reduced consumption of electric power will lead to lower emissions of the same pollutants into the air;
3) Will reduce the emission of CH_4 through the utilization of organic waste.

Effects on land use
There will be no effect on land/soil.
The corresponding law on land use is stated in the Land Code of Ukraine. The National technological practice/standart: State Standart 17.4.1.02-83 "Protection of nature, soil. Classificatioin of chemicals for controlling pollution".

Impact on biodiversity
There will be no impact on biodiversity.

Generation of waste, waste discharge and handling
Generation of waste, waste discharge and handling are present. In the process of project implementation waste will be generated after the collection of physically and morally outdated equipment, burners, pipes etc. There will be construction waste as a result of dismantling of boilers and construction of boiler shops and others.

Collection, handling and transfer of waste for utilization of the enterprise's waste will be carried out in accordance with the law of Ukraine "On waste".

Handling procedures are described in Annex 3 of this document.

Conclusions concerning the most significant environmental impacts from implementation of activities under this project are presented in the Environmental Impact Assessment (EIA), obtained according to state building codes of Ukraine A.2.2-1-2003:

- Conclusion of the State Environmental Review in the city of Kyiv # 26/07-12-2010-0001 from 10.01.2011. Registered 10.01.2011 # 04-14/981. The reconstruction project of property complex for improving productivity "Obolon" PJSC;
- Conclusion of the State Environmental Review in the city of Kyiv # 133 from 15.06.2004 # 08-8-10/2217. "Reconstruction of the enterprise for increasing beer production capacity";
- Conclusion of the State Environmental Review in the city of Kyiv # 107 from 29.04.2005 # 06-6-16/1535. "Reconstruction of sewage runoff ";

- Conclusion of the State Environmental Review in the city of Kyiv # 181 from 14.09.1998 # 08-8-10/2738. “Reconstruction of the “Obolon” plant with increasing beer production”.

“Obolon” PJSC is certified according to ISO-14001:2004 and OHSAS-18001 systems, which supports the ability and desire of the company to manage its impact on the environment.

SECTION G. Stakeholders’ comments

G.1. Information on stakeholders’ comments on the project, as appropriate:

Project activity does not include the negative impact on the environment and the negative social impact. Therefore, consultation with stakeholders is required and not conducted.

According to Ukrainian law, business owners, which implemented the project of new construction, renovation and modernization of industrial and civil objects that require EIA to inform the public through local authorities (State Building Standards Ukraine A.2.2-1-2003 p. 1.6). Therefore, in the process of receiving the EIA in the detection of possible cases of significant environmental impacts from implementation of activities under the project was conducted to inform the public about these events through media.

Moreover, “Obolon” PJSC is one of the leading companies of Ukraine in the industry; therefore all of its activities including environmental projects and projects aimed at improving the efficiency of enterprise will receive wide coverage in the media regardless of the materiality of the impact of these projects on the environment.

Examples of publications related to environmental projects and projects aimed at improving the efficiency of the enterprise:

- “Obolon” participant of the UN Global Agreeemtn: http://www.yutube.com/watch?v=KsxCyDg51-A
- Social responsibility report of the “Obolon”: http://www.yutube.com/watch?v=pdrHRy9WOwU
- “Obolon’s” ecologic initiatives: http://www.yutube.com/watch?v=xxj8FoZ-BXc
- “Obolon” supports Earth Hour: http://www.yutube.com/watch?v=j6I10YAMNwA
- “Obolon” pans to increase recycling of PET bottles, UNIAN-Consumer News: http://obolon.ua/ukr/press/about-us/?news_id=34&news_next=11

There have been no negative Stakeholders’ comments.

Annex 1

CONTACT INFORMATION ON PROJECT PARTICIPANTS

Project owner:

Organisation:	"Obolon" PJSC
Street/P.O.Box:	Bogatyrska St.
Building:	3
City:	Kyiv
State/Region:	Kyiv
Postal code:	04655
Country:	Ukraine
Phone:	+38 044 412- 84-10
Fax:	+38 044 412- 84-10
URL:	http://www.obolon.ua
Represented by:	
Title:	General director of "Obolon" PJSC
Salutation:	
Last name:	Puchok
Middle name:	Dmytrovych
First name:	Oleksandr
Department:	
Phone (direct):	
Fax (direct):	+38 044 412- 84-10
Mobile:	
Personal e-mail:	general@kiev.obolon.ua

Sponsor Party:

Organisation:	
Street/P.O.Box:	
Building:	
City:	
State/Region:	
Postal code:	
Country:	
Phone:	
Fax:	
URL:	
Represented by:	
Title:	
Salutation:	
Last name:	
Middle name:	
First name:	
Department:	
Phone (direct):	
Fax (direct):	
Mobile:	
Personal e-mail:	

Annex 2

BASELINE INFORMATION

Please refer to the Section B.

Main information and data for determining baseline scenario

#	Description	Variable
28.	Consumption of electric power in baseline year	EC_{BL}
29.	Volumes of beer production in year *y*	P_y
30.	Volumes of beer production in baseline Year	P_{BL}
32.	Thermal energy consumption in baseline Year	HC_{BL}
33.	Efficiency coefficient of boiler-house OJSC "Generator"	η
35.	Natural gas consumption in baseline Year	FC_{BL}
36.	Caloricity of natural gas in baseline year	$NCV_{NG,BL}$
38.	Total volume of organic waste from beer production in baseline year	$MSW_{T,BL}$
39.	Portion of organic waste from beer production deposited at landfill according to baseline scenario	$MSW_{F,BL}$

Annex 3

MONITORING PLAN

The main information on the monitoring plan can be found in Section D.

WASTE HANDLING

Collection, handling and transfer of waste for utilization was carried out in accordance with the law of Ukraine “On waste”.

The legal foundation for handling waste are the current legal and normative acts on environmental safety.

Production waste, depending on its physical, chemical and biological characteristics is divided into four danger classes:

- I class - extremely high-risk waste;
- II class - high-risk waste;
- III class - medium-risk waste;
- IV class - low-risk waste.

Total waste management algorithm is given in **block diagram number 1**.

To organize and conduct work on waste management an **order** on “Obolon” PJSC, responsible persons were approved for waste management.

For each type of waste leading engineer of the Environment (OTOS) makes **Waste registre card**. Each Registre card includes: code for danger to human health hazards and the availability of this type of waste, its aggregate state and chemical composition, formation and performance of waste management. Registre cards are approved by the city's sanitary-epidemiological station and approved by the State Department of Environmental Protection in Kyiv.

For all types of waste that are included in the Registre card the leading principal engineer of the Environment (OTOS) receives in the State Department of Environmental Protection in Kyiv an annual **permit and limit the generation and disposal of waste.**

The leading principal engineer of the Environment (OTOS) acquaints the departments responsible for the transfer of waste to third parties with the permit and limit the generation and disposal of: commercial department for plastics and pellets (OPK), department of capital construction (OBK), administrative-and-economic department (OKA).

In utilization or disposal of waste only those companies and organizations are involved that that the necessary permit (license) from the Ukrainian Environmental Ministry for carrying out such works.

To determine the temporary storage of waste at the enterprise **"Scheme for temporary storage of waste at “Obolon” PJSC (Scheme # 2)** is approved.

The leading engineer of the Environment (OTOS) of “Obolon” PJSC carries out the control over the works for managing and handling of waste.

General order procedures for waste management.

The main objective of waste management is to prevent the formation of excessive volumes of waste in their proper collection, storage, transmission processing, utilization and disposal, as well as prevent the negative impact of waste on the environment and human health.

Waste generated by "Obolon" PJSC depending on their type are subject to:

- collection;
- accounting;
- timely removal from production lines;
- temporary storage in specially-designated places;
- handling (transportation – if necessary);
- recycling, utilization or removal.

At production lines waste is collected into special packaging (bags, boxes, containers etc.) based on the type of waste.Those responsible for waste storage make sure that the packaging is clearly marked in accordance with **"Table of waste generation at "Obolon" PJSC" (F.20.01OTOS)** (See below).

Mixing of different waste types is not allowed.

The responsible persons for collecting and storing waste keep track of all waste generated.

Collected waste is removed from production facilities for temporary storage to specially-equipped places in accordance with the approved **"Scheme for temporary waste storage at "Obolon" PJSC" (Scheme 2)** and are stored in accordance with sanitary-and-hygienic and environmental norms and regulations up to removal of waste for utilization and disposal.

In accordance with signed agreements the responsible persons transfer waste to special organizations with the appropriate supporting handling documents that confirm the transfer and state the amounts of waste transferred.

Order processing waste at the enterprise

Used polyethylene containers and wet malt pellet are subject to processing at the enterprise, according to **Section I of Table of waste generation at "Obolon" PJSC (F.20.01.OTOS)** (see below)**.**

Used polyethylene containers is processed by the production personnel engaged in the production of polyethylene goods in accordance with approved technological instructions.

- The transfer of waste for processing is carried out by the personnel of the department where the waste is originated, with registration by the head of the department of the fact of waste transfer in transfer log.
- Waste is accepted by the personnel at the facilities for the production of polyethylene containers with registration by the head of the facilities of the fact of acceptance of waste in the log.
- Polyethylene container production facilities carry out temporary storage of processed waste in bags.

- In accordance with technological instructions, processed polyethylene waste is utilized at own production during the making of (plastic) bins.
- Transfer of excessive waste for utilization by specialized organizations is carried out by the head of the facilities engaged in the production of polyethylene goods with filling in of the necessary transfer documents on the fact of transfer with indicating the amount of transferred waste.
- Transfer of waste for utilization by outside organizations is carried out by the commercial plastics and pellets department (OPK) in accordance with signed agreement with organizations that have the necessary licenses from the Ministry of Environmental Protection of Ukraine for engaging in such works.

Processing of **wet malt pellet** is carried out by the personnel at the facilities for drying and granulating pellets in accordance with approved technological instructions.

- Transfer of the portion of waste of wet malt pellets for drying is carried out by the personnel of the brewing facilities with registration of the amount of transferred waste in the **corresponding documents.**
- Acceptance of wet malt pellets is carried out by the personnel of the drying facilities with registration by the head of the elevator of the transfer of waste in the **corresponding documents.**
- Accepted waste is dried and granulated in accordance with the approved technological instructions. Malt granules are collected in collection containers with registration by the master in the log of the amount of stored dry malt pellets.
- Store persons of the malt production organize the loading of dry malt pellets into the appropriate transport in accordance with unloading orders and issuance of the necessary transportation documents that state the fact of transfer and the amount of transferred waste.
- Transfer of waste for utilization by third-party organizations is carried out by the commercial plastics and pellets department (OPK) in accordance with signed agreements.

Procedure for transfer of waste for disposal by outside organizations

Waste that has resource value and determined in **Section II of the Table of waste generation at "Obolon" PJSC (F.20.01.OTOS)** is transferred for utilization to outside organizations**.**

For transportation some types of waste are subject to **compressing**:

- **in shops of packaging and ready products #1 , №4 and #8** – polyethylene tape waste;
- **in bottling shop #6** – damaged can;
- **in brewing shop** – metal containers from hops concentrates;
- **at filtration shop** – bags from filtration materials;
- **at the shop for polyethylene goods** – waste from PET bottles.

Personnel from the department where waste is generated carries out the transfer through the central storage or the raw materials storage with registration by the head of the structural department of the fact of wste transfer in the **corresponding documents.**

Personnel of the central storage organizes the transfer of waste to outside organizations and filing of the necessary transfer documentation on the fact and the amount of transfer.

Plastics and pellet commercial department (OPK), malt production (OBSB) and the administrative-and-economic departments carry out the transfer of waste for utilization to outside organizations in accordance with the signed agreements and approved limits and permits for generation and disposal of waste.

Procedures for export of waste for burial, disposal, burning

Waste listed in **Section III of the Table of waste generation at "Obolon" PJSC (F.20.01.OTOS)** is subject to burial, disposal, burning.
Temporary storage of waste is carried out in appropriate marked containers, depending on the types of waste, located on the territory of the enterprise in accordance with **"Scheme for temporary storage of waste at "Obolon" PJSC" (Scheme 2).**

Heads of departments are responsible for the temporary storage of waste, organize separate collection of waste sorting (if necessary) and storage in compliance with sanitation and environmental requirements.

The organization of works for the transfer of waste to landfill, incineration and disposal under held contracts is carried out by: Department of capital construction (OBK), administrative office (OKA), the commercial department of plastic and pellet (DIC), a leading engineer of the Environment (OTOS) health posts (OKZ) and the service department of commerce and advertising equipment (OHPV) according to the types of waste identified in **"Table of waste generation at "Obolon" PJSC" (F.20.01.OTOS).**

Automobile transportation department takes waste to landfills and for incineration.

Removal of waste products for incineration is done by own transport in accordance with the provision of permits and limits on the creation and disposal. Accounting for waste subject to burning is conducted by measuring bills and and protocols of completed works.

Removal of waste from infirmary is carried out by special transport of outside organization with which removal and incineration agreement had been signed for the infirmary waste materials; the organization has the necessary license for engaging in such works.

Personnel of the electric shop keeps count in the log of used luminescent lamps of mercury-containing waste (lamps, thermometers) that are temporarily stored.

Capital construction department (OBK) personnel, administrative-and-economic department (OKA) keep count of the removed waste in **"Ledger of waste removal", (F.20.11._____).**

Data (in m^3)on the removed waste is given to the leasing engineer on environment once a quarter on the 1^{st} day of the month following the quarter.

Preparation of report data

Senior Engineer Environmental Protection (OTOS) keeps track of the number allocated to waste disposal in the form of 1-TU "Accounting for waste and packaging materials and containers" under the form of computer reporting of waste in the company and transferring them to the recycling and acts performed works.

Quarterly, leading engineer of the Environment (OTOS), conducts calculation pay charges for waste disposal.

According to the calculation provided by collecting accounting company shall pay the tax calculation of the fee for waste disposal.

Lead engineer of the Environment (OTOS) prepares a statistical report on the creation, processing and disposal of waste of 1-4 hazard classes in F-1 hazardous waste and submits to the State Statistics Committee of Statistics at appropriate time.

Senior Engineer on Environmental Protection (OTOS) analyzes the waste generation for the reporting year and for the first quarter of current year and calculates the **Dynamics of waste production (F.20.02.OTOS.#3/p).**

Production organization department (OBO) on demand from the leading engineer on environmental protection provides information on the norms of generation of waste of production.

The leading engineer on the environment (OTOS) in accordance with norms of waste generation carries out normative calculations and determines grounds for the volumes of waste for the following Year, which are submitted to the State agencies no later than 1 June of the current year.

Managing waste,
that may be generated in case of emergency

With the purpose of reducing the influence on the environment a "List of possible emergency situations at "Obolon" PJSC" was developed and approved by the General director of "Obolon" PJSC.

In case of emergency the personnel of the corresponding department and services engaged in the liquidation of such situations act in accordance with the instructions and PLASes, in accordance with the "List of possible emergency situations at "Obolon" PJSC" and engage in the following actions for waste management:

In case of fire in production and warehousing facilities (including elevator) if possible, work on the sorting of products, raw materials, auxiliary materials and waste is carried out:

- Grain polluted by combustion products and other admixtures, other raw materials and materials of organic origin are disposed at landfills for everyday/domestic and solid waste;
- Separate sorting of packaging waste is carried out to reduce environmental impact; this waste is recycled in accordance to the current instructions;
- Fragments of broken infrastructure are taken to landfills for construction waste;

In case of emergency situations that lead to the production of products, such products are removed until further decision on utilization/disposal. If utilization is necessary the nonconforming products are temporarily stored in the specially-designated place and are marked accordingly.

In case of emergency that results in spilling of hazardous chemicals (acids and alkalis) works aimed at neutralizing the spilled chemicals with alkali or sand are carried out with further cleaning of the spill place with sufficient amount of water. Neutralized solution is collected into specially-marked containers for further removal for utilization.

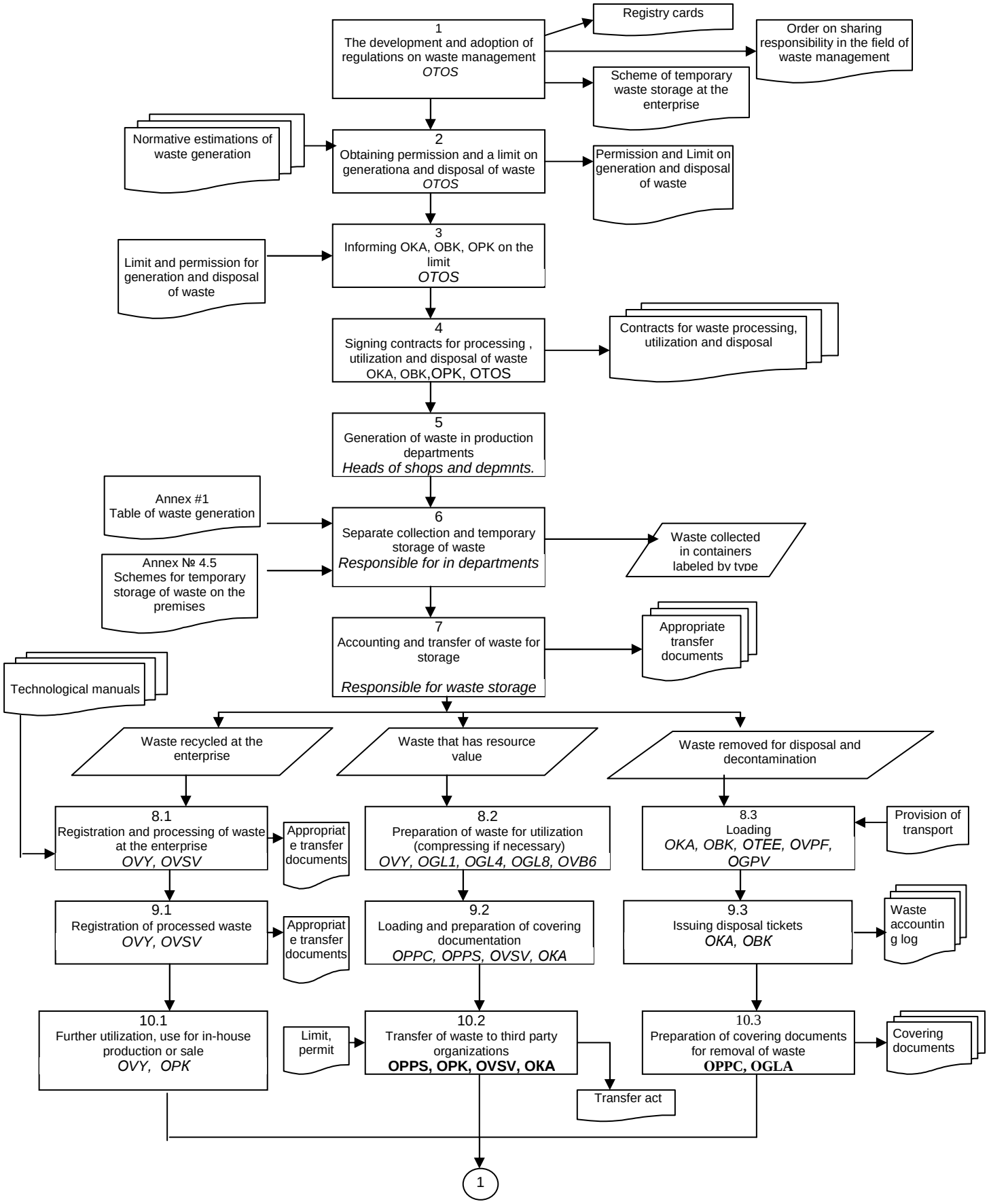
In case of ammonia spillage separators are equipped with solid concrete trays. To prevent the spreading of ammonia fumes use of water curtains is provided for on the separator perimeter. Ammonia water after the determination of concentration (no greater than 25%) is used as raw material for the production of mineral fertilizer for agricultural enterprises in accordance with signed agreements.

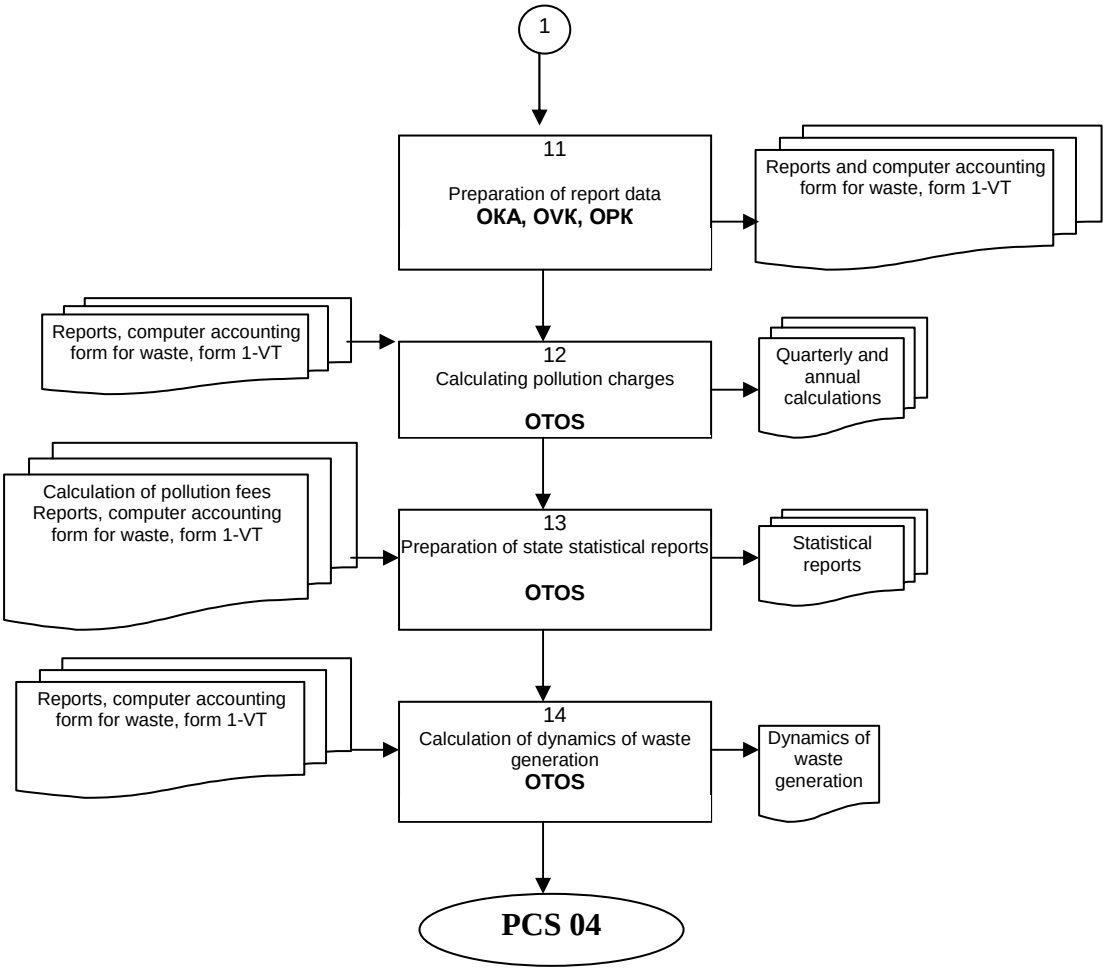
Responsibility

Responsibility for upholding the standards of this manual and for sorting and timely removal of waste from production facilities and shops is assigned to the heads of structural departments in which the waste is generated.

Control over the execution of the demands of this manual is assigned to the leading engineer on the environmental protection.

Flow chart 1. WASTE MANAGEMENT


1
The development and adoption of regulations on waste management
OTOS
Registry cards
Order on sharing responsibility in the field of waste management
Scheme of temporary waste storage at the enterprise
Normative estimations of waste generation
2
Obtaining permission and a limit on generationa and disposal of waste
OTOS
Permission and Limit on generation and disposal of waste
Limit and permission for generation and disposal of waste
3
Informing OKA, OBK, OPK on the limit
OTOS
4
Signing contracts for processing , utilization and disposal of waste
OKA, OBK,OPK, OTOS
Contracts for waste processing, utilization and disposal
5
Generation of waste in production departments
Heads of shops and depmnts.
Annex #1
Table of waste generation
Annex № 4.5
Schemes for temporary storage of waste on the premises
6
Separate collection and temporary storage of waste
Responsible for in departments
Waste collected in containers labeled by type
7
Accounting and transfer of waste for storage
Responsible for waste storage
Appropriate transfer documents
Technological manuals
Waste recycled at the enterprise
Waste that has resource value
Waste removed for disposal and decontamination
8.1
Registration and processing of waste at the enterprise
OVY, OVSV
Appropriate transfer documents
8.2
Preparation of waste for utilization (compressing if necessary)
OVY, OGL1, OGL4, OGL8, OVB6
8.3
Loading
OKA, OBK, OTEE, OVPF, OGPV
Provision of transport
9.1
Registration of processed waste
OVY, OVSV
Appropriate transfer documents
9.2
Loading and preparation of covering documentation
OPPC, OPPS, OVSV, OKA
9.3
Issuing disposal tickets
OKA, OBK
Waste accounting log
10.1
Further utilization, use for in-house production or sale
OVY, OPK
Limit, permit
10.2
Transfer of waste to third party organizations
OPPS, OPK, OVSV, OKA
Transfer act
10.3
Preparation of covering documents for removal of waste
OPPC, OGLA
Covering documents
1


1
11
Preparation of report data
OKA, OVK, OPK
Reports and computer accounting form for waste, form 1-VT
Reports, computer accounting form for waste, form 1-VT
12
Calculating pollution charges
OTOS
Quarterly and annual calculations
Calculation of pollution fees
Reports, computer accounting form for waste, form 1-VT
13
Preparation of state statistical reports
OTOS
Statistical reports
Reports, computer accounting form for waste, form 1-VT
14
Calculation of dynamics of waste generation
OTOS
Dynamics of waste generation
PCS 04

F.20.01.OTOS

Table of waste generation at "Obolon" PJSC

Numbering according to the marking of Scheme for temporary storage of waste (scheme #2)	Types of waste	Waste hazard class	The capacity of waste collection and the inscription	Temporary waste storage		Responsibility for transfer to third parties	Transfer to third parties
				Temporary waste storage on the premises of "Obolon" PJSC	Responsibility for storage		
1	2	3	4	5	6	7	8
Section I Waste subject to recycling at the enterprise							
1.	**Used plastics**	3	Storage on pallets	Shop for the production of polyethylene products	Head of the Shop for the production of polyethylene products		Recycling, use as recycled materials
24	**Dry spargings**	4	Technological equipment (closed metal bunker)	Behind the elevator	Head of malt shop	Head of the commercial department for plastics and pellets	
SECTION II WASTE SUBJECT TO UTILIZATION OUTSIDE THE ENTERPRISE							
2.	**Grain residue from cleaning of grain (germ)**	4	Technological equipment (closed metal bunker)	Elevator, malt shop, brewing shop	Head of malt department, head of brewing department	Head of malt department	As animal feed to agricultural enterprises
3.	**Spargings (wet)**	4	Technological equipment (closed metal bunker)	Behind elevator, near malt shop and brewery	Head of brewing department	Head of the commercial department for plastics and pellets	As animal feed to agricultural enterprises

4.	**Ferrous metals** Including: 4.1 write-off equipment 2.4 Waste electrodes 4.3 Waste RFP and seals	4	Metal container **"Ferrous metal waste"** (near RMC)	Repairs shop, temporary storage near production shops on pallets	Head of repairs shop and heads of shops where waste was generated	Head of the commercial department for plastics and pellets	Utilization
5.	**Non ferrous metals** Including: 5.1 Waste crown caps, 5.2 Cans	4	Metal container **"Non-ferrous metal waste"** Compressed cans	Repairs shop, temporary storage near production shops on pallets Bottling shop #6	Head of repairs shop and heads of shops where waste was generated Head of bottling shop #6	Head of the commercial department for plastics and pellets	Utilization
6.	**Waste Paper:** packaging from materials and raw materials	4	Special containers	In front of boiler shop in the butt end of the packaging storage grounds	Head of administrative and economic department	Head of the commercial department for plastics and pellets	Utilization
	6.1 Waste from spools for polyethylene labels	4	Cardboard boxes **"Spools waste "**	At bottling shops #1 and 2	Heads of bottling shops #1 and 2		
8.	**Low-pressure substandard polyethylene** (waste from polyethylene tape)	3	Cardboard box **"Polyethylene waste"** Compressed tape	At corresponding shops	Heads of finished products depts.. # 1, 4, 8 and bottling shop #6	Head of the commercial department for plastics and pellets	Compressing and utilization
9.	**The waste electronic equipment, household appliances**	4	Repair shops for such equipment and structural departments	Repairs shops and structural departments	Heads of corresponding structural departments	Head of the commercial department for plastics and pellets	Utilization
10.	**Broken glass**	4	Metal bunker **"Broken glass"**	Grounds for broken glass	Senior storekeeper central material warehouse	Head of the commercial department for plastics and pellets	Utilization

11.	**Small plastic containers used**	3	Cardboard boxes With appropriate inscriptions:	At corresponding departments	Heads of corresponding departments	Deputy sales director on logistics	**Transfer for further compressing to the shop for production of polyethylene products and utilization at "Obolon" subsidiary in the town of Oleksandria**
	11.1 Waste from polyethylene bottles		**"Waste from polyethylene bottles"**				
	11.2 Waste from defective pre-forms	3	**"Waste from pre-forms"**				
	11.2 Waste from polyethylene caps		**"Waste from polyethylene caps"**				
	11.3 Waste from packaging tape (or PCV tape)		**"Tape waste"**				
12.	**Spent accumulators/batteries**	4	Metal containers with lids **"Lead waste"**	Loading equipment shop, automobile transport shop, packaging and finished goods shop #8	Heads of loading equipment shop, automobile transport shop, packaging and finished goods shop #8	Head of the commercial department for plastics and pellets	Utilization
13.	**Spent oil and grease**	3	Closed metal barrels "**Spent lubricants"**	Central storage, refrigeration-compressor room	Head storekeeper of the central storage, head of the refrigeration-compressor room, heads of corresponding shops	Head of the commercial department for plastics and pellets	Utilization
14.	**Spent tires**	3	Asphalted lot **"Spent tires"**	Automobile transport shop, packaging and finished goods shop #8	Heads of automobile transport shop, packaging and finished goods shop #8	Head of the commercial department for plastics and pellets	Utilization
							13
Section III Waste to landfills, disposal, incineration outside the enterprise							
1 Waste subject to incineration at specialized enterprises (inflammable)							
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**

15.	**Inflammable production waste**		Metal bunker, asphalted lot **"Waste for incineration"** Note	Collectors of production waste of the enterprise		Chief environmental protection engineer	Incineration
	15.1 Tarry cloth	3			Heads of repair shop, bottling shop #2		
			At mechanical shops in metal containers **"Tarry cloth"**				
	15.2 Waste rubber, Teflon, rubber protection means, containers from acids	3	Metal containers **"Rubber waste"** -				
	15.3 Spent air filters and filter elements	3	-				
	15.4 Waste activated carbon and silica gel.	4	-				
	15.5 Waste polyethylene dust	3	-	Technological equipment	Head of polyethylene products shop		
	15.6 Waste packaging bags from filter powder	4	**"Waste packaging bags"**	Temporary storage on pallets	Head of fermentation shop		
	15.7 Waste from advertising materials	3	**"Waste tents"**	Rented base	Service of sales and marketing equipment	Service of sales and marketing equipment department	Incineration
2. Waste for disposal at landfills (incombustible)							
16.	**Mixed household waste, mixed municipal waste**	4	Metal bunker, asphalted lot **"Household waste"**	Collectors of household waste of the enterprise	Head of malt department	Head of administrative and commercial department	Disposal at household waste landfills
	16.1 Waste grain admixture, alloy	4					
	16.2 Food waste	4			Deputy public diner head		
17.	**Waster filter powder – kizelgur**	4	Technological metal container	Camp-filtration section	Head of fermentation	Chief engineer on environmental protection	Removal to filtering fields

18.	**Waste wet labeling**	4	Metal bunkers **"Waste labeling"**	Corresponding shops	Heads of special bottling shops #1,4,5,7	Head of administrative and commercial department	Disposal at household waste landfills
19.	**Waste from cleaning area**	4	Metal tank, paved area **"Household waste"**	Collectors of household waste on territory of the factory	Heads of the relevant departments		
	Spent filtration materials (air) sleeve filters	4			Heads of special bottling shops #1,2,3,4,7, malt shop, brewing shop		
	19.3 Spent abrasive wheels	4			Head of repairs department		
20	**Small construction waste** (waste polyethylene tape and cardboard gasketpaint containers, rubber waste)	4	Metal bunker **"Construction waste"**	--	Head of capital construction department	Head of capital construction department	Disposal at construction waste landfills
21.	**Sawdust and wood dust**	3	Metal bunker (technological equipment)	Chips and dust collecting repair and construction shop	Head of repairs and construction shop	Head of repairs and construction shop	For sale
3 Waste subject to disposal (detoxification and demercurization) outside "Obolon" PJSC							
22.	**Fluorescent lamps and waste containing mercury**	1	Cardboard boxes, lamps in covers	Special premises for storing spent lamps	Head of electric shop	Head of the commercial department for plastics and pellets	Disposal (demercurization)
23.	**Dirt from cleaning transport**	3	--	Transport-cleaning shops	Head of automobile transport department	Chief engineer on environmental protection	Disposal (detoxification)
25	**Spent packaging**	4	On pallets «**Spent packaging**»	Camp-filtration section	Head of fermentation	Chief engineer on environmental protection	
26	**Auxiliary materials, damaged or spent materials (infirmary)**	4	Metal bunker **«Infirmary waste»**	Near central entrance	Head od infirmary	Head of infirmary	For incineration

F.20.02.OTOS. #

Dynamics of waste generation

#	Waste name	Hazard class	Previous year 2004		Current year 2005		Next year
			Approved waste generation limit ,tons	Actual waste,tons	Approved waste generation limit ,tons	Actual waste,tons on 1.04.05	Project waste generation, tons
1	2	3	4	5	6	7	8

Approved:

Technical director _____ "____"_____20
(Last name and initials)

F.20.11._____._____
Subdivision code #

Journal of production waste removal

Date of registration counter foils for waste removal	Vehicle number	Driver's name	Number of counterfoils m^3			Driver's signature
			Issued	Used	Returned	
1	**2**	**3**	**4**	**5**	**6**	**7**

F.18.16.OBK._____
Subdivision code #

Journal of construction waste

#	Date of registration counterfoils for waste removal	Vehicle number	Driver's name	Number of counterfoils m^3	Object	Driver's signature
1		**2**	**3**	**4**	**5**	**6**

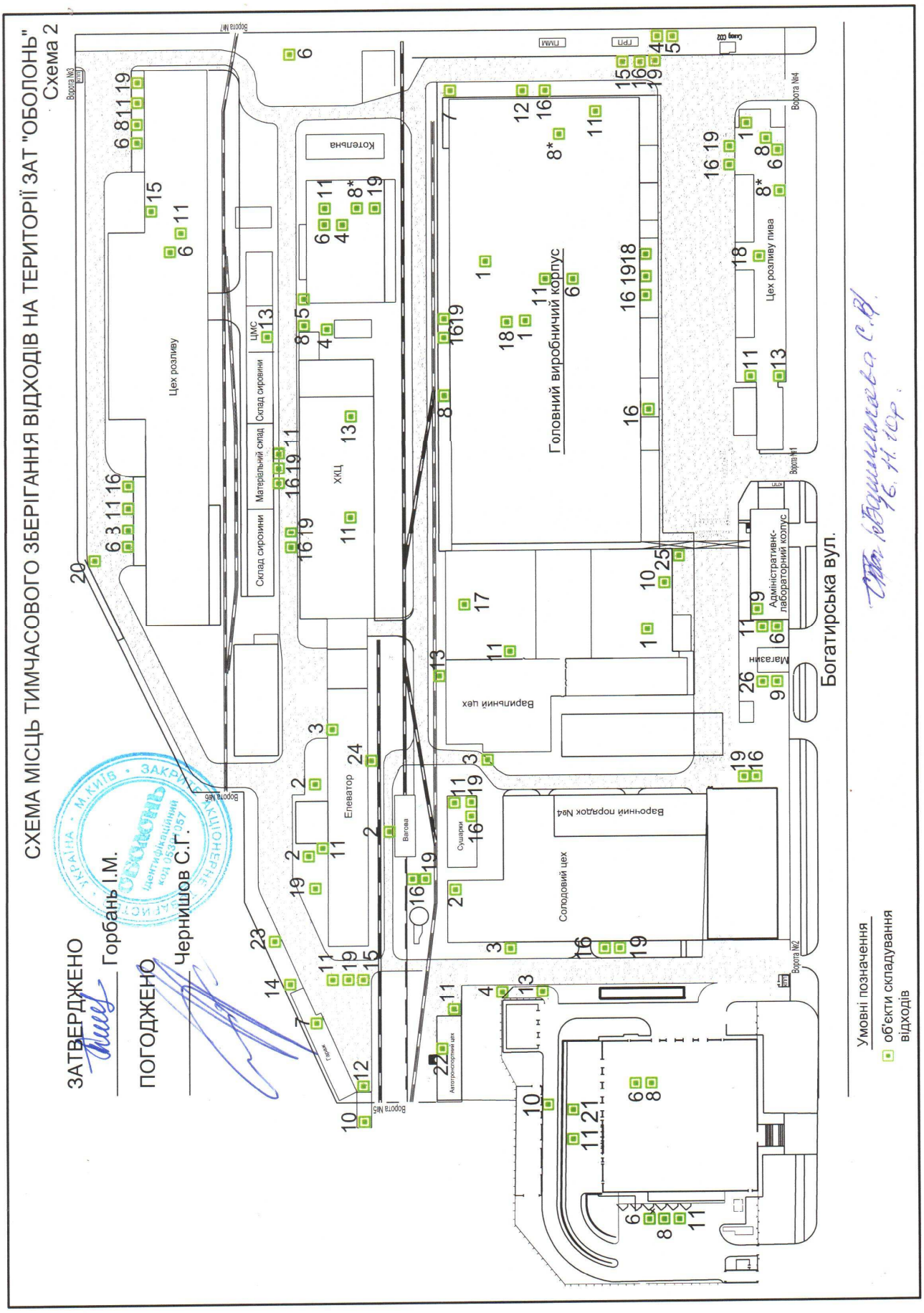


СХЕМА МІСЦЬ ТИМЧАСОВОГО ЗБЕРІГАННЯ ВІДХОДІВ НА ТЕРИТОРІЇ ЗАТ "ОБОЛОНЬ"
Схема 2
ЗАТВЕРДЖЕНО
Горбань І.М.
ПОГОДЖЕНО
Чернишов С.Г.
Богатирська вул.
Головний виробничий корпус
Цех розливу
Цех розливу пива
Елеватор
Варочний цех
Солодовий цех
Адміністративно-лабораторний корпус
Котельня
Склад сировини
Матеріальний склад
ЦМС
ХХЦ
Ворота №1
Ворота №2
Ворота №3
Ворота №4
Ворота №5
Ворота №6
Умовні позначення
об'єкти складування відходів

Numbering on the marking of
Scheme for temporary storage of waste at "Obolon" PJSC (Scheme # 2)

	List of waste
1.	Spent plastic packaging
2.	Grain residue from cleaning of grain (germ)
3.	Spargings
4.	Ferrous metals waste
5.	Non-ferrous metals waste
6.	Waste paper
8.	Low-pressure substandard polyethylene
9.	Waste electronic equipment, household appliances
10.	Broken glass
11.	Small plastic packaging waste (polyethylene bottles waste)
11*	Polyethylene (packaging tape waste)
12.	Spent accumulator batteries
13.	Spent oils and grease
14.	Spent tires
15.	Inflammable production waste
16.	Mixed household waste, mixed municipal
17.	Filter-powder waste
18.	Waste wet labels
19.	Waste from cleaning area
20.	Small construction waste
21.	Sawdust and wood dust
22.	Fluorescent lamps and waste containing mercury
23.	Dirt from cleaning transport
24	Dry malt pellet
25	Spent packaging
26	Infirmary waste