FIRST PERIODIC

ANNUAL JI MONITORING REPORT

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CONTENTS

A. General project activity and monitoring information

B. Key monitoring activities

C. Quality assurance and quality control measures

D. Calculation of GHG emission reductions

Annex 1 Definitions and acronyms

SECTION A. General project activity and monitoring information

A.1 Title of the project activity:

"Introduction of sugar production organic waste management system at the "Podilski sugar mills" LTD"

A.2. Sectoral scope:

13. Waste treatment and utilization.

A.3. Short description of the project activity:

The project has been implemented at three sugar plants of the Vinnytsia Region of Ukraine. "Podilski sugar mills" LTD coordinates the project activity.

The project aims at improving and modernizing the practice of recycling of organic waste at sugar plants included in the project boundaries. The project activity results in decrease of the amount of sugar beet pulp to be disposed in landfills, where due to decomposition of organic matter in the pulp under anaerobic conditions the methane releases, which is a greenhouse gas.

The proposed project activity provides the introduction of deeper pulp extraction systems: installation of additional presses of deeper extraction.

In the baseline scenario in the absence of the project the situation would continue: companies would still store sugar beet pulp in pits in the substance as it was produced, with no additional actions aimed at reduction of its moisture content. After filling the pulp pits with pulp, it would be transported and disposed at landfills. This scenario foresees decomposition of organic matter with the generation of landfill gas containing greenhouse gas – methane.

Sugar production is a main business activity of the sugar plants. However, other products or waste is secondary and those to which not much attention is paid. The base scenario envisaged the continuation of the pulp handling practice that used to be applied by the plants. This scenario does not require any changes to the technical process of the plant, investment and does not face any barriers.

A.4. Monitoring period:

- Monitoring period starting date: 01/01/2008
- Monitoring period closing date: 30/11/2012[1]

A.5. Methodology applied to the project activity (including version number):

Monitoring plan is established in accordance with appendix B of the JI guidelines, Guidance on Baseline Setting and Monitoring, Version 03. JI specific approach is used.

A.5.1. Baseline methodology:

Baseline scenario has been established according to the criteria outlined in the Guidance by JISC:

1) On a project specific basis;
2) In a transparent manner with regard to the choice of approaches, assumptions, methodologies, parameters, data sources and key factors. All parameters and data are either monitored by the project participants or are taken from sources that provide a verifiable reference for each parameter. Project participants use approaches suggested by the Guidance and the methodological Tools approved by the CDM Executive Board;

[1] Both days are included into the monitoring period

3) Taking into account relevant national and/or sectoral policies and circumstances, such as sectoral reform initiatives, local fuel availability, power sector expansion plans, and the economic situation in the project sector. The above analysis shows that the chosen baseline is the most plausible future scenario, taking into account the current situation Ukrainian sugar industry;
4) In such a way that emission reduction units (ERUs) cannot be earned for decreases in activity levels outside the project activity or due to force majeure. According to the proposed approach emission reduction units will be earned only when project activity will eliminate methane emissions from anaerobic decomposition of pulp at landfills and excluding emissions reduction that can be earned due to any changes outside the project activity;
5) Taking account of uncertainties and using conservative assumptions. A number of steps have been taken in order to account for uncertainties and safeguard conservativeness:
    a. If possible, the same approach to calculating the level of baseline and project emissions as specified in the National inventories of anthropogenic emissions by sources and removals by sinks of greenhouse gases in the Ukraine are used. The National emissions inventories use country-specific emission factors that are set to meet the IPCC values;
    b. Lower range of parameters is used for calculation of baseline emissions and higher range of parameters is used for calculation of project activity emissions;
    c. Default values were used to the extent possible in order to reduce uncertainty and provide conservative data for emission calculations.

The baseline scenario of the proposed project is a continuation of the existing situation before the project implementation. The activity of participants in this case would be the following: absence of fresh pulp treatment with the purpose of its drying, keeping it in pulp pits, where it would get spoiled and become unusable for cattle feeding in a first three days and would be transported into the landfills, where due to its anaerobic fermentation landfill gases containing methane (GHG gas) would be formed.

Baseline emissions are CH_4 emissions due to anaerobic fermentation of sugar production waste (pulp).

A.5.2. Monitoring methodology:

Baseline Setting and Monitoring, Version 03. The resulting Monitoring Plan was determined as part of the determination process.

Emission reduction achieved due to the implementation of this project comes from one source:

- CH_4 emissions due to anaerobic fermentation of sugar production waste (pulp).

The following parameters are to be monitored:

- **Amount of sugar plant waste (pulp), which were not sold and were disposed to the landfill (to determine project emissions)**

  This parameter is determined according to the internal accounting procedures adopted by each of the plants through the use of truck scales and, in their absence, the standard coefficients of weight pulp per volume unit of the vehicle. The data are cross-check with the calculated amount of the pulp produced, which is calculated by multiplying the amount of processed sugar beet pulp by the factor of pulp production per ton of sugar beet, which is deducted from the amount of pulp sold.

- **Amount of sugar plant waste (pulp), which would be disposed at the landfill (to determine baseline emissions)**

  Likewise the previous parameter, this one is determined using the truck scales or, in their absence, with the standard factors of pulp weight per volume unit of the vehicle body.

- **Share of methane being captured and utilized at the disposal site (to determine project and baseline emissions)**

  Value of this parameter was taken equal to zero since in accordance with the project owner's information regarding the landfill used, no methane capturing activities hs been undertaken there.

- **Global warming potential for methane (to determine project and baseline emissions)**

  Value of this parameter was taken in accordance with UNFCCC decision and Kyoto Protocol.

- **Oxidation factor, which characterizes the fraction of methane oxidizing in the material that covers wastes (to determine project and baseline emissions)**

  Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

- **Volume of methane in the landfill gas (to determine project and baseline emissions)**

  Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

- **Fraction of carbon of organic origin, which can be decomposed (to determine project and baseline emissions)**

  Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

- **Methane conversion factor (to determine project and baseline emissions)**

  Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

- **Weight fraction of organic origin carbon in the beetroot pulp (to determine project and baseline emissions)**

  Value of this parameter was measured by the project owner through laboratory testing. The results received where in the range provided by 2006 IPCC.

- **Decomposition factor of wastes (beetroot pulp) (to determine project and baseline emissions)**

  Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

A.6. Status of implementation including time table for major project parts:

The project was initiated by "Podilski sugar mills" LTD in early 2005. Along with the ratification of the Kyoto Protocol, the opportunity to receive additional financial benefits from reducing greenhouse gases has appeared that was an additional argument for the introduction of such activities at other plants of the Vinnytsia Region. Implementation of the main project activity took place during 2005-2007.

Table 1 below shows the various stages of project.

Table 1: Implementation plan

Activity	***Date***
Decision making on the project realization	12/03/2005
Investment stage	01/04/2006 - 01/05/2007
Construction-assembly and administration works	23/05/2006 - 28/07/2007
Operation stage	01/08/2007[2]-31/12/2026[3]
Emission reduction generation	01/01/2008[4]-31/12/2026

The following implementation plan is fully consistent with the registered PDD.

Letters of Approval were issued by both project Parties mentioned in the PDD:
Letter of Approval from the SAEI of Ukraine No. 3892/23/7 dated 19/12/2012.
Letter of Approval from NL Agency of Economic Affaires, Agriculture and Innovations No. 2012JI72 dated 11/12/2012.

A.7. Intended deviations or revisions to the registered PDD:

There are no deviations or revisions to the PDD.

A.8. Intended deviations or revisions to the monitoring plan:

There are no deviations to the registered Monitoring Plan.

A.9. Changes since last verification:

Not applicable.

A.10. Person(s) responsible for the preparation and submission of the monitoring report:

"Podilski sugar mills" LTD:

Scorupa Vadym Leonidovych, Head Engineer of SU "Moivskiy sugar".

"MT-Invest Carbon" LLC:

Vasylieva Nataliya Vjacheslavivna, Joint Implementation project manager.

[2] Beginning of sugar making season.

[3] End of sugar making season.

[4] Emission reductions in 2007 are neglected.

SECTION B. Key monitoring activities

(according to the Monitoring plan for the monitoring period stated in A.4.)

According to the monitoring period stated in A.4. the following parameters have to be collected and registered:

1. **Amount of sugar plant waste (pulp), which were not sold and were disposed to the landfill (to determine project emissions)**

   This parameter is determined according to the internal accounting procedures adopted by each of the plants through the use of automobile scales and, in their absence, the standard coefficients of weight pulp per volume unit of the vehicle. The data are cross-check with the calculated amount of the pulp produced, which is calculated by multiplying the amount of processed sugar beet pulp by the factor of pulp production per ton of sugar beet, which is deducted from the amount of pulp sold.

2. **Amount of sugar plant waste (pulp), which would be disposed at the landfill (to determine baseline emissions)**

   Likewise the previous parameter, this one is determined using the automobile scales or, in their absence, with the standard factors of pulp weight per volume unit of the vehicle body.

3. **Share of methane being captured and utilized at the disposal site (to determine project and baseline emissions)**

   Value of this parameter was taken equal to zero since in accordance with the project owner's information regarding the landfill used, no methane capturing activities hs been undertaken there.

4. **Global warming potential for methane (to determine project and baseline emissions)**

   Value of this parameter was taken in accordance with UNFCCC decision and Kyoto Protocol.

5. **Oxidation factor, which characterizes the fraction of methane oxidizing in the material that covers wastes (to determine project and baseline emissions)**

   Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

6. **Volume of methane in the landfill gas (to determine project and baseline emissions)**

   Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

7. **Fraction of carbon of organic origin, which can be decomposed (to determine project and baseline emissions)**

   Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

8. **Methane conversion factor (to determine project and baseline emissions)**

   Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

9. **Weight fraction of organic origin carbon in the beetroot pulp (to determine project and baseline emissions)**

   Value of this parameter was measured by the project owner through laboratory testing. The results received where in the range provided by 2006 IPCC.

10. **Decomposition factor of wastes (beetroot pulp) (to determine project and baseline emissions)**

Data are sourced from 2006 IPCC Guidelines for National Greenhouse Gas Inventories, which is a reliable internationally recognized data source for greenhouse gases emissions calculation.

B.1. Monitoring equipment types:

1. Automobile scales "AC-30" (5 units installed at each of 5 project plants).

B.1.2. Table providing information on the equipment used (incl. manufacturer, type, serial number, information to specific uncertainty, need for changes and replacements):

Table 2: Equipment used for monitoring activities

ID	Parameter	Enterprise	Measuring instrument	Unit	Manufacturer	Serial number	Accuracy class	Installation or manufacturing date
W1	Amount of sugar plant waste (pulp), which would be disposed (or was disposed in the project scenario) at the landfill	SU "Sokolivsk sugar"	Automobile scales "AC-30"	t	Armavir	2453	1%	2008
W2		SU "Kapustianskiy sugar"	Automobile scales "AC-30"	t	Armavir	3663	1%	1970.
W3		SU "Moivskiy sugar"	Automobile scales "AC-30"	t	Minprylad	1706	1%	2006
W4			Automobile scales "AC-30"	t	Minprylad	1429	1%	2006

Calibration of the metering devices and equipment has been conducted on a periodic basis according to the technical regulations of Host Party.

Calibration of automobile electronic scales 60T installed at **SU "Sokolivsk sugar" (ID W1)** carried out during the monitoring period:

- 19/08/2009 − Calibration confirmed that the measurements provided by the device, are valid;
- 09/09/2010 − Calibration confirmed that the measurements provided by the device, are valid;
- 08/09/2011 − Calibration confirmed that the measurements provided by the device, are valid.
- 28/08/2012 − Calibration confirmed that the measurements provided by the device, are valid.

Calibration of automobile scales installed **SU "Kapustianskiy sugar" (ID W2)** carried out during the monitoring period:

- 15/07/2008 − Calibration confirmed that the measurements provided by the device, are valid;
- 21/07/2009 − Calibration confirmed that the measurements provided by the device, are valid;
- 23/06/2010 − Calibration confirmed that the measurements provided by the device, are valid;
- 21/06/2011 − Calibration confirmed that the measurements provided by the device, are valid.
- 3/07/2012 − Calibration confirmed that the measurements provided by the device, are valid.

Calibration of automobile scales installed at **SU "Moivskiy sugar" (ID W3)** carried out during the monitoring period:

- 18/07/2008 − Calibration confirmed that the measurements provided by the device, are valid;
- 19/07/2009 − Calibration confirmed that the measurements provided by the device, are valid;
- 23/07/2010 − Calibration confirmed that the measurements provided by the device, are valid;
- 19/07/2011 − Calibration confirmed that the measurements provided by the device, are valid.
- 15/07/2012 − Calibration confirmed that the measurements provided by the device, are valid.

Calibration of automobile scales AC-60 installed at **SU "Moivskiy sugar" (ID W4)** carried out during the monitoring period:

- 18/07/2008 − Calibration confirmed that the measurements provided by the device, are valid;
- 19/07/2009 − Calibration confirmed that the measurements provided by the device, are valid;
- 23/07/2010 − Calibration confirmed that the measurements provided by the device, are valid;
- 19/07/2011 − Calibration confirmed that the measurements provided by the device, are valid.
- 15/07/2012 − Calibration confirmed that the measurements provided by the device, are valid.

B.1.3. Calibration procedures:

Calibration procedures for monitoring equipment used during the monitoring are provided in Table 3 below:

Table 3: Calibration procedures for monitoring equipment

QA/QC procedures	Body responsible for calibration and certification
Calibration interval for all automobile scales involved into the project is one year. Regular cross-checks with the customers.	Calibration will be performed by the authorized representatives of the State Metrological System of Ukraine.

B.1.4. Involvement of Third Parties:

It is expected to involve regional authorized representatives of the State Metrological System of Ukraine in the process of testing and calibration of measuring devices.

B.2. Data collection (accumulated data for the whole monitoring period):

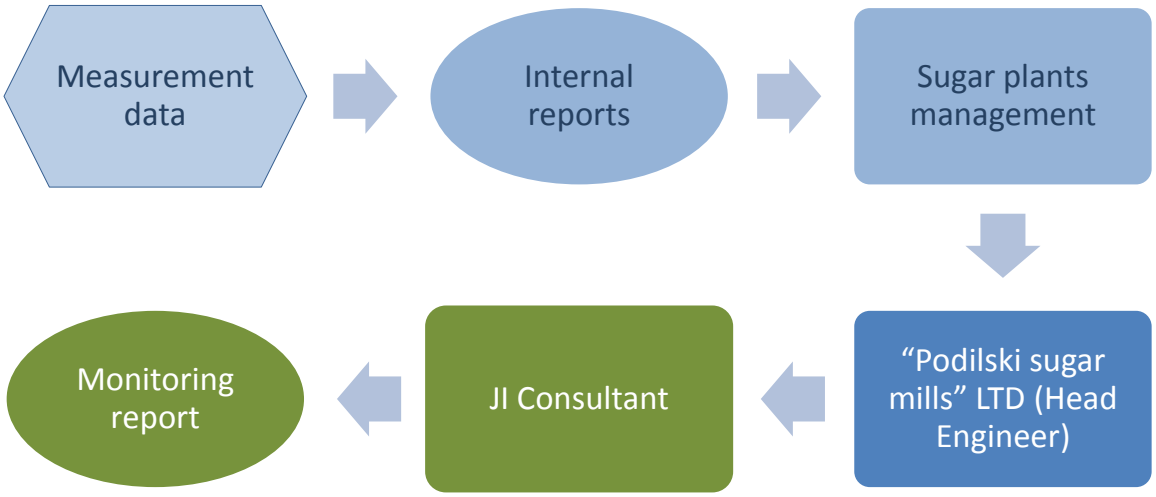

Figure 1: Data collection flow-chart

The responsible person for collecting of monitoring data and ensuring of their authenticity is indicated in the part A.10.

B.2.1. List of fixed default values and ex-ante emission factors:

In accordance with the monitoring plan, no fixed default values and ex-ante emission factors are applied in emission calculations.

B.2.2. List of variables:

Project emissions variables to be monitored:

Table 4: Variables used for calculation under the project scenario

ID (PDD)	***Parameter***	***Calculation method (Measured/ Calculated)***	***Unit***	***Comment***	***Meters used (as per B.1.2)***	***Data aggregation frequency***
D.1.1.1.-P-1	$P_{i,x}$ Amount of sugar plant waste (pulp), which were not sold and were disposed to the landfill	(M) Measurement is performed by using automobile scales and is carried out for every lot of pulp that is disposed to the landfill	t	The data will be archived and kept for two years after the last transfer of ERUs from the project.	W1-W4	Data are aggregated monthly. Annual reports are prepared.

D.1.1.1. P-2	*f* share of methane being captured and utilized at the disposal site	(C) The data from project owner regarding the landfill used	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon introduction of methane capturing activities
D.1.1.1. P-3	GWP_{CH4} global warming potential for methane	(C) In accordance with UNFCCC Decision and Kyoto Protocol	tCO_2e/tCH_4	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of UNFCCC Decision and Kyoto Protocol
D.1.1.1. P-4	*OX* oxidation factor, which characterizes the fraction of methane oxidizing in the material that covers wastes	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.15[5]	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories
D.1.1.1. P-5	*F* volume of methane in the landfill gas	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.15[6]	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories
D.1.1.1. P-6	DOC_f fraction of carbon of organic origin, which can be decomposed	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.13 [7])	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories
D.1.1.1. P-7	*MCF* methane conversion factor	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.14[8]	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories
D.1.1.1. P-8	*DOC* Weight fraction of organic origin carbon in the beetroot pulp	(C) Laboratory testing data. Results are in the range provided by 2006 IPCC Volume 5: Waste, Chapter 2, Page 2.14[9]	t C/ t beetroot pulp	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Determined based on sampling of pulp

[5] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf
[6] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf
[7] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf
[8] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf
[9] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf

D.1.1.1. P-9	*k* Decomposition factor of wastes (beetroot pulp)	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.17[10]	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories

Table 5: Baseline emission variables

ID (PDD)	***Parameter***	***Calculation method (Measured/ Calculated)***	***Unit***	***Comment***	***Meters used (as per B.1.2)***	***Data aggregation frequency***
D.1.1.3.-B-1	$W_{i,x}$- Amount of sugar plant (*i*-plant) waste, which would be disposed at the landfill	(M) Measurement is performed by using automobile scales and is carried out for every lot of pulp that is disposed to the landfill	t	The data will be archived and kept for two years after the last transfer of ERUs from the project.	W1-W4	Data are aggregated monthly. Annual reports are prepared.
D.1.1.3.-B-2	*f* share of methane being captured and utilized at the disposal site	(C) The data from project owner regarding the landfill used	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon introduction of methane capturing activities
D.1.1.3.-B-3	GWP_{CH4} global warming potential for methane	(C) In accordance with UNFCCC Decision and Kyoto Protocol	tCO_2e/tCH_4	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of UNFCCC Decision and Kyoto Protocol
D.1.1.3.-B-4	*OX* oxidation factor, which characterizes the fraction of methane oxidizing in the material that covers wastes	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.1511	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories
D.1.1.3.-B-5	*F* volume of methane in the landfill gas	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.1512	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories
D.1.1.3.-B-6	DOC_f fraction of carbon of organic origin, which can be decomposed	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.13 13)	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories

[10] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf
[11] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf
[12] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf
[13] http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_2_Ch2_Waste_Data.pdf

D.1.1.3.-B-7	*MCF* methane conversion factor	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.1414	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories
D.1.1.3.-B-8	*DOC* Weight fraction of organic origin carbon in the beetroot pulp	(C) Laboratory testing data. Results are in the range provided by 2006 IPCC Volume 5: Waste, Chapter 2, Page 2.1415	t C/ t beetroot pulp	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Determined based on sampling of pulp
D.1.1.3.-B-9	*k* Decomposition factor of wastes (beetroot pulp)	(C) 2006 IPCC Volume 5: Waste, Chapter 3, Page 3.1716	fraction	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Upon updates of 2006 IPCC Guidelines for National Greenhouse Gas Inventories

B2.3. Data concerning GHG emissions by sources of the project activity:

Table 6: Data collected for calculations in the project scenario

Variable	***Description***	***Plant***	***Unit***	***Values***				
				2008	**2009**	**2010**	**2011**	**2012**
$P_{i,x}$	Amount of sugar plant waste (pulp), which were not sold and were disposed to the landfill	SU "Sokolivsk sugar"	t	0	0	0	0	0
		SU "Kapustianskiy sugar"	t	0	0	0	0	0
		SU "Moivskiy sugar"	t	0	0	0	0	0

Table 7: Data collected for calculations in the project scenario (continuation)

Variable	*Data unit*	*Description*	*Value in 2008-2012*
GWP_{CH4}	tCO_2e/tCH_4	Global warming potential for methane	21
f	fraction	CH_4 fraction captured and utilized at the landfill	0
OX	fraction	Oxidation factor reflects the amount of CH_4 that is oxidized in other material covering the waste	0
F	fraction	Fraction of CH_4, by volume, in generated landfill gas	0.5
DOC_f	fraction	Fraction of the degradable organic carbon that decomposes	0.5
MCF	fraction	CH_4 correction factor	0.8
DOC	tC/ ton of pulp	Mass fraction of the degradable organic carbon that decomposes containing in waste of type *j* (pulp)	0.5
k	fraction	Waste (pulp) decomposition factor	0.185

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

B.2.4. Data concerning GHG emissions by sources of the baseline:

Table 8: Data collected for calculations in the baseline scenario

Variable	***Description***	***Plant***	***Unit***	***Values***				
				2008	**2009**	**2010**	**2011**	**2012**
Wi,x	Amount of sugar plant waste (pulp), which would be disposed at the landfill	SU "Sokolivsk sugar"	t	116610	79475	131939	168333	133440.7
		SU "Kapustianskiy sugar"	t	43556	0	53084	97181	97180.8
		SU "Moivskiy sugar"	t	97443	55036	146070	167036	184593

Table 9: Data collected for calculations in the project scenario (continuation)

Variable	*Data unit*	*Description*	*Value in 2008-2012*
GWP_{CH4}	tCO_2e/tCH_4	Global warming potential for methane	21
f	fraction	CH_4 fraction captured and utilized at the landfill	0
OX	fraction	Oxidation factor reflects the amount of CH_4 that is oxidized in other material covering the waste	0
F	fraction	Fraction of CH_4, by volume, in generated landfill gas	0.5
DOC_f	fraction	Fraction of the degradable organic carbon that decomposes	0.5
MCF	fraction	CH_4 correction factor	0.8
DOC	tC/ ton of pulp	Mass fraction of the degradable organic carbon that decomposes containing in waste of type *j* (pulp)	0.5
k	fraction	Waste (pulp) decomposition factor	0.185

B.2.5. Data concerning leakage:

According to the methodology applied no leakage is observed under the project.

B.2.6. Data concerning environmental impacts:

The Host Party for this project is Ukraine. Environmental Impact Assessment (EIA) is the part of the Ukrainian project planning and permitting procedures. Implementation regulations for EIA are included in the Ukrainian State Construction Standard DBN A.2.2.-1-2003[17] (Title: "Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures").

The full scope EIA in accordance with the Ukrainian legislation has been conducted for each of the poultry farms attributed to the proposed project.

In general, the environmental impact of the project activity implementation is positive. Changing the methods of waste management reduces pollution of groundwater with products of pulp decomposition during its storage at the landfills that also significantly effects on the conditions for the growth of pathogenic flora that may also spread through groundwater. In addition, less amount of pulp anaerobic fermentation products release into the atmosphere, not only methane that in toxicology is classified as industrial poison[18], but also ammonia, hydrogen sulfide and carbon monoxide

Implementation of the project activity also has a positive social impact through removing of the concentrated odor coming from pulp pits and improving working conditions at sugar plants. Since most of the farms are located in rural areas, where the use of well water is widespread, the reduction of groundwater pollution has positive effects on health of locals.

No transboundary effects are identified. Impacts that occur in any other country, and caused by the implementation of this project physically located entirely within Ukraine, were not identified.

B.3. Data processing and archiving:

All data will be archived electronic and paper Data acquisition and processing procedure for each parameter monitored are standard and are being implemented within a common commercial activity of the plants.

B.4. Special event log:

All special and exceptional events (critical equipment failures, reconstruction works, and emergencies) are documented by the special notes to the management of the coordinating company. No such events were observed during the monitoring period

The nature of the project and underlying operations does not foresee any factors that can cause unintended emissions due to emergencies.

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[17] *State Construction Standard DBN A.2.2.-1-2003: "Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures" State Committee Of Ukraine On Construction And Architecture, 2004*

[18] http://grigaonline.narod.ru/farma/toxicoligija.htm

SECTION C. Quality assurance and quality control measures

C.1. Documented procedures and management plan:

C.1.1.. Roles and responsibilities:

"Podilski sugar mills" LTD coordinates the joint activity. Sugar plant management headed by the Director will be responsible for performance monitoring, data collection, registration, visualization, archiving of monitoring data, and periodic inspection of measuring devices. A responsible person from "Podilski sugar mills" LTD (Head Engineer of SU "Moivskiy sugar") will control this process. The block diagram (see Figure 1 above) demonstrates principal scheme of data flow

C.1.2. Trainings:

The project is utilizing technology that requires skills and knowledge in operation of complex equipment. This kind of skills and knowledge is available locally through the system of vocational training and higher education. This system is state-supervised in Ukraine. Professionals who graduate from vocational schools receive a standard certificate in the field of their professional study. Only workers with proper training can be allowed to operate industrial equipment like. Management of the project host ensures that personnel of the project have received proper training and are eligible to work with the prescribed equipment

Training on safety issues is mandatory and must be provided to all personnel of the project as required by local regulations. Procedure for safety trainings includes the scope of the trainings, training intervals, forms of training, knowledge checks etc. The project host management maintains records for such trainings and periodic knowledge check-ups.

Activities that are directly related to the monitoring do not require specific training other than provided by the professional education. Thus, monitoring personnel will receive training on monitoring procedures and requirements, and necessary training and consultations on Kyoto Protocol, JI projects and monitoring from the project consultant − "MT-Invest Carbon" LLC.

C.2. Involvement of Third Parties:

It is expected to involve regional authorized representatives of the State Metrological System of Ukraine in the process of testing and calibration of measuring devices.

C.3. Internal audits and control measures:

Internal cross-checks and audits are performed for all of the data monitored as the raw documents used for monitoring are also used in the commercial dealings of the company. The Director of the company reviews monthly and yearly reports and conducts selective cross-checks with the raw documents.

For the fixed data and ex-ante parameters and factors the quality assurance requires to check that the data were acquired from the reliable (i.e. recognized and/or based on research), verifiable (data are open for access, or are available for the project participants) sources.

C.4. Troubleshooting procedures:

All exceptional and troubleshooting events are documented by internal notes. As the data monitored to calculate emission reductions are also used in the commercial dealings of the company and correlate to the sugar produced no emission reductions can be earned if the plant is not in operation

In cases if any errors, fraud or inconsistencies will be identified during the monitoring process special commission will be appointed by project host management that will conduct a review of such case and issue an order that must also include provisions for necessary corrective actions to be implemented that will ensure such situations are avoided in future.

SECTION D. Calculation of GHG emission reductions

D.1. Table providing the equations used:

Table 10: Equations used for calculations

Formula number from Revised Monitoring Plan	***Formula***	***Formula description***
Equation 6	$ER_y = BE_y - LE_y - PE_y$	Calculation of emission reductions in year *y*
Equation 3	$BE_y = \sum_{i=1}^{n} BE_{i,biomass,y}$	Baseline emissions in year *y*
Equation 4	$BE_{i,biomass,y} = (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot {}^{16}/_{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^{y} W_{i,x} \cdot DOC \cdot e^{-k\cdot(y-x)} \cdot \left(1-e^{-k}\right)$	Baseline CH_4 emissions from degradable organic waste at the landfill in year *y*
Equation 5	$LE_y = 0$	Leakage in year *y* (according to the chosen methodology the leakage equals to 0)
Equation 1	$PE_y = \sum_{i=1}^{n} PE_{i,biomass,y}$	Project emissions in year y
Equation 2	$PE_{i,biomass,y} = (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot {}^{16}/_{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^{y} P_{i,x} \cdot DOC \cdot e^{-k\cdot(y-x)} \cdot \left(1-e^{-k}\right)$	Project CH_4 emissions from degradable organic waste at the landfill in year *y*

Parameters of the equations are provided in Sections B.2.1 and B.2.2 of this report.

The coefficient 16/12 in the equations above is the ratio of the molecular weight of CH_4 (16) and the molecular weight of C (12) and describes the conversion of carbon to methane.

Results of the emissions calculations above are presented in metric tons of carbon dioxide equivalent (tCO_2e). The metric ton of carbon dioxide equivalent is equal to the metric ton of carbon dioxide (tCO_2). Therefore 1 tCO_2e = 1 tCO_2.

D.2. Description and consideration of measurement uncertainties and error propagation:

All measurement uncertainties and error propagation of the measured parameters are according to the manuals of equipment manufacturers. Uncertainty level of the fixed values and external data is low as they are taken from reliable and publicly available, verifiable sources.

D.3. GHG emission reductions (referring to B.2. of this document):

D.3.1. Project emissions:

Table 11: Project emissions during the monitoring period

Parameter	Unit	2008	2009	2010	2011	2012	Total
Project emissions	tCO_2e	0	0	0	0	0	**0**

D.3.2. Baseline emissions

Table 12: Baseline emissions during the monitoring period

Parameter	Unit	2008	2009	2010	2011	2012	Total
Baseline emissions	tCO_2e	**293 294**	**307 369**	**412 032**	**546 998**	**651 163**	**2 210 856**

D.3.3. Leakage:

Table 13: Leakage during the monitoring period

Parameter	Unit	2008	2009	2010	2011	2012	Total
Leakage	tCO_2e	0	0	0	0	0	**0**

D.3.4. Summary of the emissions reductions during the monitoring period:

Table 14: Emission reductions during the monitoring period

Parameter	Unit	2008	2009	2010	2011	2012	Total
Emission reductions	tCO_2e	**293 294**	**307 369**	**412 032**	**546 998**	**651 163**	**2 210 856**

Annex 1

Definitions and acronyms

Acronyms and Abbreviations

CH_4	Methane
CO_2	Carbon Dioxide
GHG	Greenhouse gases
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
PDD	Project Design Document

Definitions

Baseline	The scenario that reasonably represents what would have happened to greenhouse gases in the absence of the proposed project, and covers emissions from all gases, sectors and source categories listed in Annex A of the Protocol and anthropogenic Removals by sinks, within the project boundary.
Emissions reductions	Emissions reductions generated by a JI project that have not undergone a verification or determination process as specified under the JI guidelines, but are contracted for purchase.
Global Warming Potential (GWP)	An index that compares the ability of greenhouse gases to absorb heat in the atmosphere in comparison to carbon dioxide. The index was established by the Intergovernmental Panel on Climate Change.
Greenhouse gas (GHG)	A gas that contributes to climate change. The greenhouse gases included in the Kyoto Protocol are: carbon dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorcarbons (HFCs), Perfluorcarbons (PFCs) and Sulphurhexafluoride (SF_6).
Joint Implementation (JI)	Mechanism established under Article 6 of the Kyoto Protocol. JI provides Annex I countries or their companies the ability to jointly implement greenhouse gas emissions reduction or sequestration projects that generate Emissions Reduction Units.
Monitoring plan	Plan describing how monitoring of emission reductions will be undertaken. The monitoring plan forms a part of the Project Design Document (PDD).