

**FIRST PERIODIC
ANNUAL JI MONITORING REPORT**

Version 2.0

11 December 2012

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SECTION A. General project activity and monitoring information**A.1 Title of the project activity:**

“Implementation of energy efficiency measures in enterprises of “Agrarian Holding Avangard”

A.2. Sectoral scope:

3. Energy Demand.

13. Waste handling and disposal.

A.3. Short description of the project activity:

The project aims at achieving of the greenhouse gas emissions reduction by decreasing of specific energy consumption at enterprises of “Agrarian Holding Avangard”, and improving of production waste management practice (chicken manure).

The project generates GHG emission reductions through the improving and modernization of waste disposal practice and by decreasing specific energy consumption at 21 enterprises and their units (total amount is 30) included into LLC “Agrarian Holding Avangard” and the project boundaries.

In the project scenario a large-scale modernization of enterprises is taking place, along with replacing equipment that is selected based on its technical specifications in terms of power consumption and ability to optimize its performance under particular conditions at a facility. When choosing the equipment, such additional features as drying of manure at the stage of its collection in the floor house and its transportation by belt conveyor are also taken into account. Therefore, the derived manure is drier, but after the addition of dry biomass its water content gets to level as it gets while storing in solid substance. At the facilities where the amount of manure produced per day is small, the shift to the method of removing to the fields is occurring. While being distributed into small portions, the chicken manure decomposes quite quickly, when turning into valuable fertilizer, thus the high level of its aeration is ensured, due to which anaerobic fermentation and the appropriate allocation of methane is being significantly reduced. At the new facilities with great capacity, received manure in solid form is subjected to composting, during which a mixture of litter and manure from time to time is being stirred to ensure better access of oxygen. Microbiologic specimens may be added in order to accelerate decomposition of chicken manure to substances that can be easily assimilated by plants. The resulting product is ready for use as a fertilizer; it has no strong odor and does not pollute groundwater with infiltrate.

Under the program of modernization and reconstruction the following actions were realized:

- Energy supply schemes optimization;
- Pumping, compressing and climate equipment modernization, including engines replacement;
- Lighting systems renovation, including replacement of light bulbs with the energy efficient lamps;
- The use of integrated control systems in all production facilities to automate the production process.
- Shift to solid chicken manure storage practice at the farms that used to store manure in liquid form.
- Shift to composting or daily removal of chicken manure to the fields at small-capacity farms with a relatively small amount of manure produced; or at those farms where arising from the aspects of technological process (less frequent removal of manure from a floor house or litter use), solid manure storage was applied in practice.

A.4. Monitoring period:

- Monitoring period starting date: 01/01/2008
- Monitoring period closing date: 30/11/2012¹

¹ Both days are included into the monitoring period

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;
- 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 of the poultry sector in Ukraine;
- 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 reductions will be earned only when activity is being carried out within the project, excluding emission reductions earned due to the 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.

In the baseline scenario, facilities would have continued to work with the same specific power consumption as well as before the project realization. In case of equipment failure, its replacement would have been carried out element-by-element to the equipment with similar technical specification that would have not led to the emergence of energy-saving effect due to the lack of systematic approach and limited opportunities for optimizing of energy consumption. Chicken manure would have been mixed as it had been produced, with no additional operations aimed at its drying, addition of dry biomass and its subsequent composting.

Baseline emissions come from the following sources:

- Electricity consumption generated by power plants connected to the United Energy System of Ukraine;
- CH₄ emissions from anaerobic digestion of poultry waste (chicken manure).

A.5.2. Monitoring methodology:

A JI-specific monitoring approach was developed for this project in line with the JI Guidance on Criteria for Baseline Setting and Monitoring, Version 03. The resulting Monitoring Plan was determined as part of the determination process.

Emission reductions are achieved due to:

- Reducing the specific energy consumption for products output at enterprises of the “Agrarian Holding Avangard”;

- Avoiding anaerobic waste fermentation processes leading to methane emissions through changing the manure handling practice.

The following parameters are to be monitored:

- **Electricity consumption by poultry farm i in period y**

The parameter is determined in accordance with the accounting procedures approved by each company, using electricity meters. The data received are cross-checked with the data of energy supply company and used to pay for electricity consumed.

- **Average number of birds permanently kept at the poultry farm i in period y**

The parameter is determined in accordance with the accounting procedures approved by each company, using special methods of calculation. The value is determined with respect to internal QA/QC procedures of the farm, and is one of the key parameters of the company, which is reported to state agencies that is sufficient to ensure high quality of data.

- **Number of eggs produced at the poultry farm i in period y**

The parameter is determined in accordance with the accounting procedures approved by each company, using special methods of calculation and used in the economic and financial statements. The value is determined with respect to internal QA/QC procedures of the farm, and is one of the key parameters of the company, which is reported to state agencies that is sufficient to ensure high quality of data. The data received are cross-checked with the data on company turnover.

- **Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052**

The parameter is determined with respect to the Orders of Designated Focal Point (DFP) of Ukraine, and is calculated by DFP of Ukraine on the basis of the most recent available data on emissions from electricity production by the companies of United Energy Systems of Ukraine. Application of any additional QA/QC procedures is not necessary.

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

The project was initiated at the beginning of 2007, when the “Avangard” Holding Company has been established. The general strategic modernization program was applied, which adjusted with the specific conditions of production process. Implementation of the basic program activity took place during 2007-2009, although implementation of some measures continued even in 2010-2011.

Table 1 below shows the implementation of different stages of the project.

Table 1: Implementation plan

<i>#</i>	<i>Name</i>	<i>Facility type/ division</i>	<i>Address</i>	<i>Implementation plan</i>
1.	Agricultural Limited Liability Company “Donetsk birds”	Egg-laying hens farm	85760, Ukraine, Donetsk Region. Volnovaska District, Rivnopil village, 4 Donetska Str.	01/2007 - Decision on project realization; 01/2007 – 11/2009 – Construction-assembly and organizational works; 01/2008 - Start of operational phase
2.	Public Joint Stock Company Agricultural Company “Avis”	Egg-laying hens farm	32325, Ukraine, Khmelnytsky Region, Kamenets District, Gumentsy village,	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase

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			1 Verbetske Highway Str.	
3.	Limited Liability Company “Makarivsk Birds”	Egg-laying hens farm	08000, Ukraine, Kyiv Region, Makariv District, Makariv town, 68 Pershotravneva, Building F.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
4.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	Egg-laying hens farm	62480, Ukraine, Kharkiv Region, Kharkiv District, Khroly village, 25/2 Chervonoarmiyska Mykolaivska Str. interjection.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
5.	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	Egg-laying hens farm	62447, Ukraine, Kharkiv Region, Kharkiv District, Sanjar village, 137 Sportyvna Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
6.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Egg-laying hens farm	94320, Ukraine, Luhansk Region., Perevalskiy District, Chervony Prapor town, 31 Fabrychna Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
7.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Egg-laying hens farm	53020, Ukraine, Dnipropetrovsk Region, Kryvyi Rih District, Lozuvatka village, 29 Chkalova Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
8.	Public Joint Stock Company “Avangard”	Egg-laying hens farm	77450, Ukraine, Ivano-Frankivsk Region., Tysmenytsya District, Zahvizdya village.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
9.	Public Joint Stock Company “Chornobayivske”	Egg-laying hens farm	75024, Ukraine, Kherson Region, Biloserskyi District, Chornobaiivka village.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
10.	Public Joint Stock Company “Kirovskiy”	Egg-laying hens farm	27640, Ukraine, Kirovohrad Region, Kirovohrad District, Vilne village, 1 Lenina Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
11.	Public Joint Stock Company “Poultry farm “Pershe Travnja”	Egg-laying hens farm	19603, Ukraine, Cherkasy Region, Cherkaskyi District, Khutory village, 2 Centralna Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
12.	Limited Liability Company “Areal-Snigurivka”	Egg-laying hens farm	57300, Ukraine, Mykolaiv Region, Snihurivskiy District, Snihurivka City, 7 Pozamiska Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase

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13.	Subsidiary “Rogatynska Poultry farm” of PJSC “Avangard”	Egg-laying hens farm	77000, Ukraine, Ivano-Frankivsk Region, Rohatynskiy District, Zaluzhzhya vaillage.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
14.	Private Research and Production Company “Interbusiness”	Egg-laying hens farm	83059, Ukraine, Donetsk Region, Donetsk, Kalininsk District, 2 Sechenova Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
15.	Limited Liability Company “Poultry farm “Volnovaska”	Egg-laying hens farm	85735, Ukraine, Donetsk Region, Volnovaskiy District, Rybyske village.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
16.	Private Joint Stock Company “Chernivetska Poultry farm”	Egg-laying hens farm	60411, Ukraine, Chernivtsy Region, Glybotskiy District, Valya Kuzmyna village, 10 Trudova Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
17.	Bird Breeding Limited Liability Company “Ptitsekomplex”	Egg-laying hens farm	97034, Ukraine, Autonomous Republic of Crimea, Chervonohvardiyskiy District, Kotelnikov village, A Sovetska Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
18.	Agribusiness Farm LLC “Yuzhnaya-Holding”	Egg-laying hens farm	97560, Ukraine, Autonomous Republic of Crimea, Simferopol District, Perove village, 9 Shkilna Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
19.	Subsidiary “Avangard-Agro” of PJSC “Avangard”	Grow-out farms	77450, Ukraine, Ivano-Frankivsk Region, Tysmenytskiy District, Zagvizdy village.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
20.	<i>Public Joint Stock Company “Poultry farm “Chervony Prapor”</i>	<i>Grow-out farms</i>	<i>94320, Ukraine, Lugansk region, Perevalskiy District, Chervonyi Prapor village, 31 Fabrychna Str.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
21.	Subsidiary “Poultry farm “Chornobayivske” of PJSC “Chornobayivske”	Grow-out farms	75024, Ukraine, Kherson Region, Bilozerskiy District, Chornobayivka village.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
22.	<i>Agricultural Limited Liability Company “Donetsk birds”</i>	<i>Grow-out farms</i>	<i>85760, Ukraine, Donetsk Region, Volnovaskiy District, Rivnopil village, 4 Donetska Str.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
23.	<i>Public Joint Stock Company “Poultry farm “Pershe Travnya”</i>	<i>Grow-out farms</i>	<i>19603, Ukraine, Cherkasy Region, Cherkasy District, Khutory village, 2 Centralna Str.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase

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24.	<i>Public Joint Stock Company “Kross-Poultry farm “Zorya”</i>	<i>Grow-out farms</i>	<i>62480, Ukraine, Kharkiv Region, Kharkiv District, Khroly village, село Хролю, 25/2 Chervonoarmiyska Mykolaivska Str. interjection..</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
25.	<i>Agricultural Limited Liability Company “Yuzhnaya – Holding”</i>	<i>Grow-out farms</i>	<i>97560, Ukraine, Autonomous Republic of Crimea, Simferopol District, Perove village, 9 Shkilna Str.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
26.	<i>Limited Liability Company “Poultry farm “Volnovaska”</i>	<i>Grow-out farms</i>	<i>85735, Ukraine, Donetsk Region, Volnovaskyi District, Rybynske village.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
27.	<i>Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”</i>	<i>Grow-out farms</i>	<i>53020, Ukraine, Dnipropetrovsk Region, Kryvyi Rih District, Lozuvatka village, 29 Chkalova Str.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
28.	LLC “Slov’yany”	Breeder farms	08023, Ukraine, Kyiv Region, Marariv District, Sadky-Stroivka village, 34 Sadova Str.	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
29.	<i>Bird Breeding Limited Liability Company “Ptitsekomplex”</i>	<i>Breeder farms</i>	<i>97034, Ukraine, Autonomous Republic of Crimea, Chervonohvardiyskiy District, Kotelnikove village, 1A Sovetska Str.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase
30.	<i>Public Joint Stock Company “Poultry farm “Pershe Travnya”</i>	<i>Breeder farms</i>	<i>19603, Ukraine, Cherkasy Region, Cherkasy District, Khutory Village, 2 Centralna.</i>	01/2007 - Decision on project realization; 01/2007 – 11.2009 - Construction-assembly and organizational works; 01/2008 - Start of operational phase

The following implementation plan is fully consistent with the registered PDD version 2.0 dated 1/10/2012 available through UNFCCC web-page:
<http://ji.unfccc.int/JIITLProject/DB/HA1X6JK9D05SOF24FLOPFR3ZXT6I91/details>.

Letters of Approval were issued by both project Parties mentioned in the PDD:

Letter of Approval from the SAEI of Ukraine No. 3666/23/7 dated 28/11/2012 p;

Letter of Approval from NL Agency of Economic Affaires, Agriculture and Innovations No. 2012JI63 dated 28/11/2012.

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

There are no deviations or revisions to the registered PDD version 2.0 dated 1/10/2012 available through UNFCCC web-page: <http://ji.unfccc.int/JIITLProject/DB/HA1X6JK9D05SOF24FLOPFR3ZXT6I91/details>.

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:

LLC “Agrarian Holding Avangard”:

- Vasylyuk Nataliya Romanivna, Director.

“Company “MT-Invest” LTD:

- Vasylieva Nataliya Vjacheslavivna, Environmental project manager.

SECTION B. Key monitoring activities

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

The proposed project involves three functional types of production facilities: egg-laying hens farm, grow-out farms and breeder farms. Specific baseline electricity consumption on egg-laying hens farms is calculated per unit of production – eggs, and for grow-out farms and breeder farms – per conventional head of bird permanently kept at the farm (taking into account poultry account age and sex-specific structure). In cases when the enterprise involved in the project unites different production facilities, specific electricity consumption is calculated separately for each of them (egg-laying hens farm, grow-out farms and breeder farms). Such facilities get their specific identification numbers. Metering of electricity consumption and other parameters is performed separately as well.

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

- **Electricity consumption by poultry farm *i* in period *y***

The parameter is determined in accordance with the accounting procedures approved by each company, using electricity meters. The data received are cross-checked with the data of energy supply company and used to pay for electricity consumed.

- **Average number of birds permanently kept at the poultry farm *i* in period *y***

The parameter is determined in accordance with the accounting procedures approved by each company, using special methods of calculation. The value is determined with respect to internal QA/QC procedures of the farm, and is one of the key parameters of the company, which is reported to state agencies that is sufficient to ensure high quality of data.

- **Number of eggs produced at the poultry farm *i* in period *y***

The parameter is determined in accordance with the accounting procedures approved by each company, using special methods of calculation and used in the economic and financial statements. The value is determined with respect to internal QA/QC procedures of the farm, and is one of the key parameters of the company, which is reported to state agencies that is sufficient to ensure high quality of data. The data received are cross-checked with the data on company turnover.

- **Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052**

The parameter is determined with respect to the Orders of Designated Focal Point (DFP) of Ukraine, and is calculated by DFP of Ukraine on the basis of the most recent available data on emissions from electricity production by the companies of United Energy Systems of Ukraine. Application of any additional QA/QC procedures is not necessary.

B.1. Monitoring equipment types:

1. Electricity meter “EPQS 122.09.04”
2. Electricity meter “NIK 2303 ART2T”
3. Electricity meter LZQM 321.02.534
4. Electricity meter EMS 132.11.4
5. Electricity meter “SL 7000 Smart”

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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	Type	Serial number	Accuracy level	Installation or manufacturing date
1	EL	Electricity consumption by poultry farm i in period y	Agricultural Limited Liability Company “Donetsk birds”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	493478	0.5s	2007
2	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company Agricultural Company “Avis”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0057155	±1%	2006
3	EL	Electricity consumption by poultry farm i in period y	Limited Liability Company “Makarivsk Birds”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0045378	±1%	2006
4	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Kross-Poultry farm “Zorya”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0026549	±1%	2006
5	EL	Electricity consumption by poultry farm i in period y	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	296478	0.5s	2007
6	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0021789	±1%	2006
7	EL	Electricity consumption by poultry farm i in period y	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Electricity meter LZQM 321.02.534	kWh	Elgama-Elektronika	Electronic electricity meter	123429	0.5s	2007
8	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Avangard”	Electricity meter EMS 132.11.4	kWh	Elgama-Elektronika	Electronic electricity meter	674641	1	2007

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9	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Chornobayivske”	Electricity meter LZQM 321.02.534	kWh	Elgama-Elektronika	Electronic electricity meter	334002	0.5s	2007
10	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Kirovskiy”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	278978	0.5s	2007
11	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0033459	±1%	2006
12	EL	Electricity consumption by poultry farm i in period y	Limited Liability Company “Areal-Snigurivka”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	296478	0.5s	2007
13	EL	Electricity consumption by poultry farm i in period y	Subsidiary “Rogatynska Poultry farm” of PJSC “Avangard”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0022669	±1%	2006
14	EL	Electricity consumption by poultry farm i in period y	Private Research and Production Company “Interbusiness”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	334478	0.5s	2007
15	EL	Electricity consumption by poultry farm i in period y	Limited Liability Company “Poultry farm “Volnovaska”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0032678	±1%	2006
16	EL	Electricity consumption by poultry farm i in period y	Private Joint Stock Company “Chernivetska Poultry farm”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	456234	0.5s	2007
17	EL	Electricity consumption by poultry farm i in period y	Bird Breeding Limited Liability Company “Ptitsekomplex”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	335678	0.5s	2007
18	EL	Electricity consumption by poultry farm i in period y	Agribusiness Farm LLC “Yuzhnaya-Holding”	“SL 7000 Smart”	kWh	Itron (Actaris)	Electronic electricity meter	47852193	0.5s	2007

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19	EL	Electricity consumption by poultry farm i in period y	Subsidiary “Avangard-Agro” of PJSC “Avangard”	“SL 7000 Smart”	kWh	Itron (Actaris)	Electronic electricity meter	56896203	0.5s	2007
20	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Poultry farm “Chervony Prapor”	“SL 7000 Smart”	kWh	Itron (Actaris)	Electronic electricity meter	5387993	0.5s	2007
21	EL	Electricity consumption by poultry farm i in period y	Subsidiary “Poultry farm “Chornobayivske” of PJSC “Chornobayivske”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	334467	0.5s	2007
22	EL	Electricity consumption by poultry farm i in period y	Agricultural Limited Liability Company “Donetsk birds”	“SL 7000 Smart”	kWh	Itron (Actaris)	Electronic electricity meter	5332443	0.5s	2007
23	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Poultry farm “Pershe Travnja”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	324457	0.5s	2007
24	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Kross- Poultry farm “Zorya”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0045678	±1%	2006
25	EL	Electricity consumption by poultry farm i in period y	Agricultural Limited Liability Company “Yuzhnaya – Holding”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	451234	0.5s	2007
26	EL	Electricity consumption by poultry farm i in period y	Limited Liability Company “Poultry farm “Volnovaska”	Electricity meter LZQM 321.02.534	kWh	Elgama-Elektronika	Electronic electricity meter	345602	0.5s	2007
27	EL	Electricity consumption by poultry farm i in period y	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	273458	0.5s	2007
28	EL	Electricity consumption by poultry farm i in period y	LLC “Slov’yany”	Electricity meter “NIK 2303 ART2T”	kWh	NIK-Elektronika, Ukraine	Electronic electricity meter	0022457	±1%	2006

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29	EL	Electricity consumption by poultry farm i in period y	Bird Breeding Limited Liability Company “Ptitsekomplex”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	291239	0.5s	2007
30	EL	Electricity consumption by poultry farm i in period y	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Electricity meter EPQS 122.09.04	kWh	Elgama-Elektronika	Electronic electricity meter	190859	0.5s	2007

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

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 is six years. <ol style="list-style-type: none"> 1. Electricity meter “EPQS 122.09.04” 2. Electricity meter “NIK 2303 ART2T” 3. Electricity meter LZQM 321.02.534 4. Electricity meter EMS 132.11.4 5. Electricity meter “SL 7000 Smart” Regular cross-checks with the electricity supply company.	Calibration will be performed by the authorized representatives of the State Metrological System of Ukraine

B.1.4. Involvement of Third Parties:

Authorized representatives of the State Metrological System of Ukraine– calibration of the metering equipment.

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

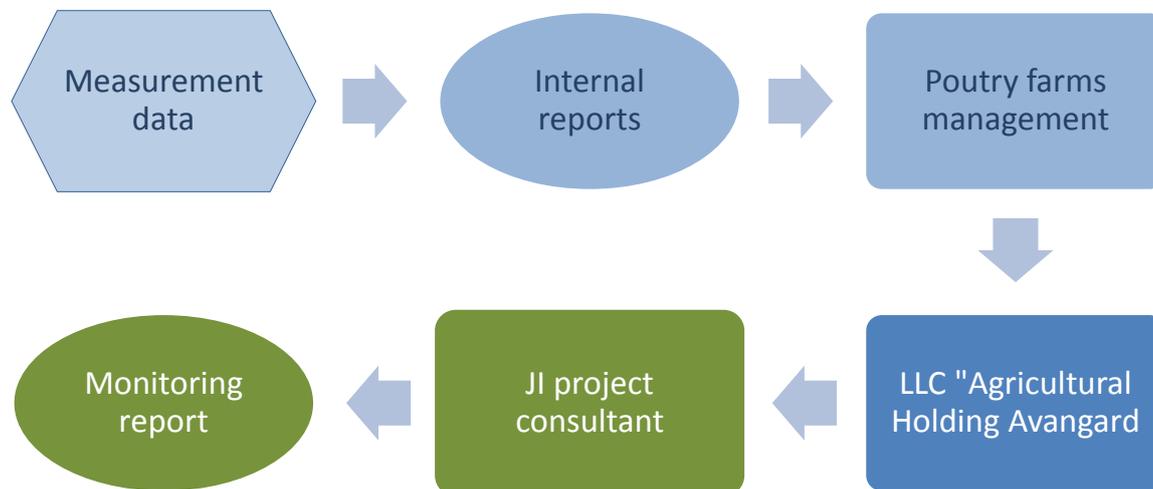


Figure 1: Data collection

The poultry farm management headed by its Director is responsible for performance monitoring, data collection, registration, visualization, archiving of monitoring data, and periodic inspection of measuring instruments. A responsible person from the Company “Agrarian Holding Avangard” controls this process, indicated in section A10

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

Since the type of waste at all farms participating in joint activity is the same (chicken manure), and all the plants are located in one country – a set of fixed parameters for all farms participating in joint activity are also the same, but depending on the method of waste treatment some factors may take on different values. The list of fixed parameters is provided in the table below.

Parameter values and factors that are not monitored throughout the monitoring period, but are determined only once and thus remain fixed throughout the crediting period are presented in the tables below.

Table 4: Fixed parameters

Parameter	Unit	Description	Source of data	Value
MCF_1	fraction	Annual methane conversion factor for uncovered anaerobic lagoons	2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 10, p. 10.51 ² . Value for cold climate (average temperature 10 °C and below).	0.660
MCF_2	fraction	Annual methane conversion factor for solid storage	2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 10, p. 10.50. Value for cold climate (average temperature 10 °C and below).	0.020
MCF_3	fraction	Annual methane conversion factor for composting	2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 10, p. 10.52. Value for cold climate (average temperature 10 °C and below).	0.005
MCF_4	fraction	Annual methane conversion factor for daily removal to the fields	2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 10, p. 10. 51. Value for cold climate (average temperature 10 °C and below).	0.001
GWP_{CH_4}	tCO ₂ e/ tCH ₄	Global warming potential for methane	Climate Change 1995. The Science of Climate Change. Edited by J. T. Houghton and other (1996), p. 22, Table 4 ³	21
D_{CH_4}	t/m ³	Methane density	2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 10, p. 10.47. Value of methane density is fixed to the standard conditions (temperature 20°C and pressure 101 325 Pa).	0.00067
$B_{0,Ch}$	m ³ /kg	Maximum potential of methane generation from manure	National Inventory Report of Ukraine for 1990-2010, p. 226	0.32
VS_{Ch}	kg/pc per day	Amount of volatile solids generated from manure	National Inventory Report of Ukraine for 1990-2010, p. 570	0.042

The values of methane emission factors for collection, storage and utilization of manure were calculated on the basis of the fixed values indicated in the table above. ($n \in (1; 4)$) was conducted using tier 2 method in accordance with 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 10, Equation 10.23, p. 10.47⁴. Calculation formula for methane emission factor for collection, storage and utilization of manure using the method n was changed by simplifying for accounting for emissions during collection, storage and utilization of one type of manure, involved in project (poultry manure), by replacing values with parameters “methane density” and “number of days in the period” and by inserting multiplier “global warming potential” to get results in tonnes of CO₂ equivalent.

²http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/4_Volume4/V4_10_Ch10_Livestock.pdf

³http://www.ipcc.ch/ipccreports/sar/wg_I/ipcc_sar_wg_I_full_report.pdf

⁴http://www.ipcc-nggip.iges.or.jp/public/2006gl/russian/pdf/4_Volume4/V4_10_Ch10_Livestock.pdf

$$EF_{CH_4,MSn} = GWP_{CH_4} \times D_{CH_4} \times MCF_n \times B_{0,Ch} \times VS_{Ch} \times d, \quad (\text{Equation 1})$$

where:

- n Index of manure handling method, dimensionless $n \in (1; 4)$;
- $EF_{CH_4,MSn}$ Methane emission factor for collection, storage and utilization of manure using the method n at the poultry farm i , tCO₂e/pc (Method n for each of the farms is indicated in Tables 6 and 7).
- GWP_{CH_4} Methane global warming potential, tCO₂e/tCH₄ (Values are provided in Table 4);
- D_{CH_4} Methane density, t/m³ (Values are provided in Table 4);
- MCF_n Methane conversion factor for collection, storage and utilization of manure using the method n , fraction (Values are provided in Table 4);
- $B_{0,Ch}$ Maximum potential of methane generation from manure, m³/kg (Values are provided in Table 4);
- VS_{Ch} Amount of volatile solids generated from manure, kg/per head per day (Values are provided in Table 4);
- d Number of days per monitoring period, days.

Table 5: Methane emission factors for collection, storage and utilization of manure

Parameter	Unit	Description	Value
$EF_{CH_4,MS1}$	tCO ₂ e/pc	Methane emissions factor due to collection, storage and utilization of manure with use of anaerobic uncovered lagoons	0.0456
$EF_{CH_4,MS2}$	tCO ₂ e/pc	Methane emissions factor due to collection, storage and utilization of manure with solid storage	0.0014
$EF_{CH_4,MS3}$	tCO ₂ e/pc	Methane emissions factor due to collection, storage and utilization of manure with composting	0.0003
$EF_{CH_4,MS4}$	tCO ₂ e/pc	Methane emissions factor due to collection, storage and utilization of manure with daily removal to the fields	0.0001

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The method of chicken manure collection, storage and utilization by each of the farm in the baseline scenario is provided in Table 6.

Table 6: Method of collection, storage and utilization of manure by each of poultry farms in the baseline scenario

<i>Identification #</i>	<i>Name</i>	<i>Facility type/ division</i>	<i>Method</i>	<i>Value of n (n ∈ (1; 4))</i>
1.	Agricultural Limited Liability Company “Donetsk birds”	Egg-laying hens farm	Solid storage	2
2.	Public Joint Stock Company Agricultural Company “Avis”	Egg-laying hens farm	Solid storage	2
3.	Limited Liability Company “Makarivsk Birds”	Egg-laying hens farm	Solid storage	2
4.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	Egg-laying hens farm	Anaerobic uncovered lagoons	1
5.	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	Egg-laying hens farm	Solid storage	2
6.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Egg-laying hens farm	Anaerobic uncovered lagoons	1
7.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Egg-laying hens farm	Solid storage	2
8.	Public Joint Stock Company “Avangard”	Egg-laying hens farm	Anaerobic uncovered lagoons	1
9.	Public Joint Stock Company “Chornobayivske”	Egg-laying hens farm	Solid storage	2
10.	Public Joint Stock Company “Kirovskiy”	Egg-laying hens farm	Solid storage	2
11.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Egg-laying hens farm	Solid storage	2
12.	Limited Liability Company “Areal-Snigurivka”	Egg-laying hens farm	Solid storage	2
13.	Subsidiary “Rogatynska Poultry farm” of PJSC “Avangard”	Egg-laying hens farm	Solid storage	2
14.	Private Research and Production Company “Interbusiness”	Egg-laying hens farm	Solid storage	2
15.	Limited Liability Company “Poultry farm “Volnovaska”	Egg-laying hens farm	Anaerobic uncovered lagoons	1
16.	Private Joint Stock Company “Chernivetska Poultry farm”	Egg-laying hens farm	Solid storage	2
17.	Bird Breeding Limited Liability Company “Ptitsekomplex”	Egg-laying hens farm	Anaerobic uncovered lagoons	1
18.	Agribusiness Farm LLC “Yuzhnaya-Holding”	Egg-laying hens farm	Anaerobic uncovered lagoons	1
19.	Subsidiary “Avangard-Agro” of PJSC “Avangard”	Grow-out farms	Anaerobic uncovered lagoons	1
20.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Grow-out farms	Anaerobic uncovered lagoons	1
21.	Subsidiary “Poultry farm “Chornobayivske” of PJSC “Chornobayivske”	Grow-out farms	Solid storage	2
22.	Agricultural Limited Liability Company “Donetsk birds”	Grow-out farms	Solid storage	2
23.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Grow-out farms	Anaerobic uncovered lagoons	1
24.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	Grow-out farms	Anaerobic uncovered lagoons	1

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25.	Agricultural Limited Liability Company “Yuzhnaya – Holding”	Grow-out farms	Anaerobic uncovered lagoons	1
26.	Limited Liability Company “Poultry farm “Volnovaska”	Grow-out farms	Anaerobic uncovered lagoons	1
27.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Grow-out farms	Solid storage	2
28.	LLC “Slov’yany”	Breeder farms	Anaerobic uncovered lagoons	1
29.	Bird Breeding Limited Liability Company “Ptitsekomplex”	Breeder farms	Anaerobic uncovered lagoons	1
30.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Breeder farms	Solid storage	2

The method of chicken manure collection, storage and utilization by each of the farm in the project scenario is provided in Table 7.

Table 7: Method of collection, storage and utilization of manure by each of poultry farms in the project scenario

<i>Identification #</i>	<i>Name</i>	<i>Facility type/division</i>	<i>Method</i>	<i>Value of n (n ∈ (1; 4))</i>
1.	Agricultural Limited Liability Company “Donetsk birds”	Egg-laying hens farm	Composting	3
2.	Public Joint Stock Company Agricultural Company “Avis”	Egg-laying hens farm	Composting	3
3.	Limited Liability Company “Makarivsk Birds”	Egg-laying hens farm	Daily removal of manure to the fields	4
4.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	Egg-laying hens farm	Solid storage	2
5.	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	Egg-laying hens farm	Daily removal of manure to the fields	4
6.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Egg-laying hens farm	Solid storage	2
7.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Egg-laying hens farm	Daily removal of manure to the fields	4
8.	Public Joint Stock Company “Avangard”	Egg-laying hens farm	Solid storage	2
9.	Public Joint Stock Company “Chornobayivske”	Egg-laying hens farm	Composting	3
10.	Public Joint Stock Company “Kirovskiy”	Egg-laying hens farm	Daily removal of manure to the fields	4
11.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Egg-laying hens farm	Daily removal of manure to the fields	4
12.	Limited Liability Company “Areal-Snigurivka”	Egg-laying hens farm	Daily removal of manure to the fields	4
13.	Subsidiary “Rogatynska Poultry farm” of PJSC “Avangard”	Egg-laying hens farm	Daily removal of manure to the fields	4
14.	Private Research and Production Company “Interbusiness”	Egg-laying hens farm	Daily removal of manure to the fields	4
15.	Limited Liability Company “Poultry farm “Volnovaska”	Egg-laying hens farm	Solid storage	2

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16.	Private Joint Stock Company “Chernivetska Poultry farm”	Egg-laying hens farm	Daily removal of manure to the fields	4
17.	Bird Breeding Limited Liability Company “Ptitsekomplex”	Egg-laying hens farm	Solid storage	2
18.	Agribusiness Farm LLC “Yuzhnaya-Holding”	Egg-laying hens farm	Solid storage	2
19.	Subsidiary “Avangard-Agro” of PJSC “Avangard”	Grow-out farms	Solid storage	2
20.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Grow-out farms	Solid storage	2
21.	Subsidiary “Poultry farm “Chornobayivske” of PJSC “Chornobayivske”	Grow-out farms	Composting	3
22.	Agricultural Limited Liability Company “Donetsk birds”	Grow-out farms	Composting	3
23.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Grow-out farms	Solid storage	2
24.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	Grow-out farms	Solid storage	2
25.	Agricultural Limited Liability Company “Yuzhnaya – Holding”	Grow-out farms	Solid storage	2
26.	Limited Liability Company “Poultry farm “Volnovaska”	Grow-out farms	Solid storage	2
27.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Grow-out farms	Daily removal of manure to the fields	4
28.	LLC “Slov’yany”	Breeder farms	Solid storage	2
29.	Bird Breeding Limited Liability Company “Ptitsekomplex”	Breeder farms	Solid storage	2
30.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Breeder farms	Daily removal of manure to the fields	4

In addition, the value of baseline specific electricity consumption for eggs production and growing-out of poultry permanently kept at the farms refers to the fixed values. These values are listed in the table below:

Table 8: Specific electricity consumption in the baseline scenario

<i>Ident. №</i>	<i>Parameter</i>	<i>Unit</i>	<i>Name</i>	<i>Facility type/ division</i>	<i>Source of data</i>	<i>Value</i>
1.	$SEC_{BL,Eggs,i}$	kWh/egg	Agricultural Limited Liability Company “Donetsk birds”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.042
2.	$SEC_{BL,Eggs,i}$	kWh/egg	Public Joint Stock Company Agricultural Company “Avis”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.060
3.	$SEC_{BL,Eggs,i}$	kWh/egg	Limited Liability Company	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records.	0.019

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			“Makarivsk Birds”		Average arithmetic for the previous three years prior to project implementation	
4.	$SEC_{BL,Eggs,i}$	kWh/egg	Public Joint Stock Company “Kross-Poultry farm “Zorya”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.027
5.	$SEC_{BL,Eggs,i}$	kWh/egg	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.024
6.	$SEC_{BL,Eggs,i}$	kWh/egg	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.034
7.	$SEC_{BL,Eggs,i}$	kWh/egg	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.039
8.	$SEC_{BL,Eggs,i}$	kWh/egg	Public Joint Stock Company “Avangard”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.080
9.	$SEC_{BL,Eggs,i}$	kWh/egg	Public Joint Stock Company “Chornobayivsk e”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.065
10.	$SEC_{BL,Eggs,i}$	kWh/egg	Public Joint Stock Company “Kirovskiy”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.026
11.	$SEC_{BL,Eggs,i}$	kWh/egg	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.033
12.	$SEC_{BL,Eggs,i}$	kWh/egg	Limited Liability Company “Areal-Snigurivka”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.060
13.	$SEC_{BL,Eggs,i}$	kWh/egg	Subsidiary “Rogatynska	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records.	0.112

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			Poultry farm” of PJSC “Avangard”		Average arithmetic for the previous three years prior to project implementation	
14.	$SEC_{BL,Eggs,i}$	kWh/egg	Private Research and Production Company “Interbusiness”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.045
15.	$SEC_{BL,Eggs,i}$	kWh/egg	Limited Liability Company “Poultry farm “Volnovaska”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.099
16.	$SEC_{BL,Eggs,i}$	kWh/egg	Private Joint Stock Company “Chernivetska Poultry farm”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.080
17.	$SEC_{BL,Eggs,i}$	kWh/egg	Bird Breeding Limited Liability Company “Ptitsekomplex”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.095
18.	$SEC_{BL,Eggs,i}$	kWh/egg	Agribusiness Farm LLC “Yuzhnaya-Holding”	Egg-laying hens farm	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.039
19.	$SEC_{BL,Ch,i}$	kWh/egg	Subsidiary “Avangard-Agro” of PJSC “Avangard”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.800
20.	$SEC_{BL,Ch,i}$	kWh/egg	Public Joint Stock Company “Poultry farm “Chervony Prapor”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	1.081
21.	$SEC_{BL,Ch,i}$	kWh/egg	Subsidiary “Poultry farm “Chornobayivsk e” of PJSC “Chornobayivsk e”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	3.458
22.	$SEC_{BL,Ch,i}$	kWh/egg	Agricultural Limited Liability Company “Donetsk birds”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.800
23.	$SEC_{BL,Ch,i}$	kWh/egg	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	1.244

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24.	$SEC_{BL,Ch,i}$	kWh/ egg	Public Joint Stock Company “Kross- Poultry farm “Zorya”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.753
25.	$SEC_{BL,Ch,i}$	kWh/ egg	Agricultural Limited Liability Company “Yuzhnaya – Holding”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	2.505
26.	$SEC_{BL,Ch,i}$	kWh/ egg	Limited Liability Company “Poultry farm “Volnovaska”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	1.831
27.	$SEC_{BL,Ch,i}$	kWh/ egg	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	Grow-out farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	14.543
28.	$SEC_{BL,Ch,i}$	kWh/ egg	LLC “Slov’yany”	Breeder farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	0.546
29.	$SEC_{BL,Ch,i}$	kWh/ egg	Bird Breeding Limited Liability Company “Ptitsekomplex”	Breeder farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	1.831
30.	$SEC_{BL,Ch,i}$	kWh/ egg	Public Joint Stock Company “Poultry farm “Pershe Travnya”	Breeder farms	Registered PDD. Calculated on the basis of plant records. Average arithmetic for the previous three years prior to project implementation	2.505

B.2.2. List of variables:

Project emissions variables to be monitored:

Table 9: Project variables

ID (PDD)	Parameter	Calculation method (Measured/ Calculated)	Unit	Comment	Meters used (as per B.1.2)	Data aggregation frequency
ID P-1	$EC_{PJ,i,y}$ Electricity consumption by poultry farm <i>i</i> in period <i>y</i>	(M/C) Continuously measured with specialized meter. Summarized monthly by calculation. Direct input of data from supplier-company records and meter readings.	MWh	The data will be archived and kept for two years after the last transfer of ERUs from the project.	EL ⁵	Data are aggregated monthly. Periodic reports are prepared.
ID P-2	$N_{Ch,i,y}$ Average number of birds permanently kept at the poultry farm <i>i</i> in period <i>y</i>	(C) Calculations are based on primary documents and company reports. Direct input of data from the company records.	per capita	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Data are aggregated monthly. Periodic reports are prepared.
ID P-3	$EF_{CO_2,EL,y}$ - Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052	(C) Calculated by the DFP on the annual basis.	tCO ₂ /MWh	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Data are aggregated every year by collecting the publicly available information

⁵ Data from the meter and documents of energy supply company provided in kWh are converted into MWh for the monitoring purposes.

Table 10: Baseline variables

ID (PDD)	Parameter	Calculation method (Measured/Calculated)	Unit	Comment	Meters used (as per B.1.2)	Data aggregation frequency
ID B-1	$N_{Eggs,i,y}$ Number of eggs produced at the poultry farm i in period y	(C) Calculations are based on primary documents and company reports. Direct input of data from the company records.	eggs	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Data are aggregated monthly. Periodic reports are prepared.
ID B-2	$N_{Ch,i,y}$ Average number of birds permanently kept at the poultry farm i in period y	(C) Calculations are based on primary documents and company reports. Direct input of data from the company records.	birds	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Data are aggregated monthly. Periodic reports are prepared.
ID B-3	$EF_{CO_2,EL,y}$ Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052	(C) Calculated by the DFP on the annual basis.	tCO ₂ /MWh	The data will be archived and kept for two years after the last transfer of ERUs from the project.	-	Data are aggregated every year by collecting the publicly available information

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

Table 11: Data collected in the project scenario are the same for all the farms

Variable	Description	Units	Values				
			2008	2009	2010	2011	2012 ^{6*}
$EF_{CO_2,EL,y}$	Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052 ⁷	tCO ₂ /MWh	1.219	1.237	1.225	1.227	1.227

* – the value adopted for 2012 is taken from the Order #75 of the National Environmental Investment Agency dated 12/05/2011 valid till 2011.

Table 12: Data collected in the project scenario on the electricity consumption by the poultry farms

ID	Name	Unit	Value				
			2008	2009	2010	2011	2012 (01.01-30.11)
1.	Agricultural Limited Liability Company “Donetsk birds”	MWh	4 119.685	3 581.153	3 958.076	3958.076	5126.334
2.	Public Joint Stock Company Agricultural Company “Avis”	MWh	2 785.552	2 551.740	2 914.570	2914.57	7169.902
3.	Limited Liability Company “Makarivsk Birds”	MWh	1 258.000	1 250.000	1 170.000	1170	1298.08
4.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	MWh	5 057.795	5 491.463	5 099.094	5099.094	5020.271

⁶ Hereinafter, the data for 2012 related to the period from 01/01/2012 to 30/11/2012 are provided

⁷ Order # 62 of the National Environmental Investment Agency dated 15/04/2011; Order #63 of the National Environmental Investment Agency dated 15/04/2011; Order #43 of the National Environmental Investment Agency dated 28/03/2011; Order # 75 of the National Environmental Investment Agency dated 12/05/2011.

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5.	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	MWh	2 637.669	3 699.188	6 021.094	6021.094	2466.722
6.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	MWh	5 393.206	4 714.412	5 391.969	5391.969	5589.001
7.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	MWh	3 189.287	2 925.109	2 993.438	2993.438	2286.903
8.	Public Joint Stock Company “Avangard”	MWh	3 705.640	2 894.547	4 110.331	4110.331	2589.948
9.	Public Joint Stock Company “Chornobayivske”	MWh	4 130.716	2 657.746	2 985.770	2985.77	4667.208
10.	Public Joint Stock Company “Kirovskiy”	MWh	2 711.435	2 773.637	3 005.217	3005.217	2434.799
11.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	MWh	5 918.310	5 783.417	5 448.625	5448.625	3178.898
12.	Limited Liability Company “Areal-Snigurivka”	MWh	1 518.317	2 045.842	2 867.148	2867.148	3171.28
13.	Subsidiary “Rogatynska Poultry farm” of PJSC “Avangard”	MWh	1 276.428	1 689.743	1 128.513	1128.513	1639.442
14.	Private Research and Production Company “Interbusiness”	MWh	877.114	2 126.111	2 582.550	2582.55	2052.265
15.	Limited Liability Company “Poultry farm “Volnovaska”	MWh	3 106.000	2 900.394	2 886.926	2886.926	2144.363
16.	Private Joint Stock Company “Chernivetska Poultry farm”	MWh	2 056.018	2 608.805	4 000.533	4000.533	1618.277
17.	Bird Breeding Limited Liability Company “Ptitsekomplex”	MWh	290.351	838.403	229.636	229.636	0
18.	Agribusiness Farm LLC “Yuzhnaya-Holding”	MWh	2 004.290	3 247.724	3 103.000	3103	3429.591
19.	Subsidiary “Avangard- Agro” of PJSC “Avangard”	MWh	1 011.925	992.070	949.070	949.07	838.605
20.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	MWh	403.185	290.755	222.013	222.013	182.5
21.	Subsidiary “Poultry farm “Chornobayivske” of PJSC “Chornobayivske”	MWh	57.147	788.654	908.814	908.814	665.575
22.	Agricultural Limited Liability Company “Donetsk birds”	MWh	722.804	708.621	677.907	677.907	0
23.	Public Joint Stock Company “Poultry farm	MWh	564.459	407.057	310.818	310.818	936.92

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	“Pershe Travnya”						
24.	Public Joint Stock Company “Kross- Poultry farm “Zorya”	MWh	451.567	325.646	248.655	248.655	376.315
25.	Agricultural Limited Liability Company “Yuzhnaya – Holding”	MWh	1 190.121	1 056.076	1 199.000	1199	1070.869
26.	Limited Liability Company “Poultry farm “Volnovaska”	MWh	1 789.231	1 801.532	2 291.399	2291.399	1865.36
27.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	MWh	3 189.287	2 925.109	2 993.438	2993.438	563.81
28.	LLC “Slov’yany”	MWh	2 032.842	2 117.497	2 208.661	2208.661	2456.63
29.	Bird Breeding Limited Liability Company “Ptitsekomplex”	MWh	1 118.269	1 125.958	1 432.124	1432.124	0
30.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	MWh	661.178	586.709	666.111	666.111	924.319

Table 13: Data collected in the project scenario on the average number of birds permanently kept at the poultry farms

ID	Name	Unit	Value				
			2008	2009	2010	2011	2012 (01.01-30.11)
1.	Agricultural Limited Liability Company “Donetsk birds”	pc	422 740	292 493	123 679	351 882	1 875 104
2.	Public Joint Stock Company Agricultural Company “Avis”	pc	230 369	354 189	78 498	276 854	2 924 377
3.	Limited Liability Company “Makarivsk Birds”	pc	277 823	212 335	79 225	175 060	927 481
4.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	pc	443 185	365 161	112 252	250 919	918 035

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5.	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	pc	270 763	266 528	131 397	249 784	1 137 327
6.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	pc	367 607	353 661	148 768	277 366	1 472 699
7.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	pc	305 911	216 775	77 787	148 487	869 055
8.	Public Joint Stock Company “Avangard”	pc	342 354	187 698	80 729	139 163	686 800
9.	Public Joint Stock Company “Chornobayivske”	pc	404 364	207 377	76 177	135 303	944 788
10.	Public Joint Stock Company “Kirovskiy”	pc	308 249	204 606	79 504	132 527	677 906
11.	Public Joint Stock Company “Poultry farm “Pershe Travnaya”	pc	384 522	248 851	115 061	186 988	664 000
12.	Limited Liability Company “Areal-Snigurivka”	pc	280 546	265 326	108 284	198 950	1 001 465
13.	Subsidiary “Rogatynska Poultry farm” of PJSC “Avangard”	pc	144 226	164 410	36 747	85 309	455 566
14.	Private Research and Production Company “Interbusiness”	pc	70 465	183 824	88 286	211 292	1 102 386
15.	Limited Liability Company “Poultry farm “Volnovaska”	pc	202 788	269 368	115 506	186 394	950 646
16.	Private Joint Stock Company “Chernivetska Poultry farm”	pc	189 950	225 558	104 763	147 747	706 433
17.	Bird Breeding Limited Liability Company “Ptitsekomplex”	pc	21 460	43 493	11 275	26 760	0
18.	Agribusiness Farm LLC “Yuzhnaya-Holding”	pc	315 677	215 964	82 973	167 343	760 787
19.	Subsidiary “Avangard- Agro” of PJSC “Avangard”	pc	1 854 963	2 030 869	1 518 723	1 893 953	410 583
20.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	pc	449 514	516 263	433 506	315 542	150 310

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21.	Subsidiary “Poultry farm “Chornobayivske” of PJSC “Chornobayivske”	pc	695 649	1 077 851	1 243 515	1 613 559	321 876
22.	Agricultural Limited Liability Company “Donetsk birds”	pc	1 324 974	1 450 621	1 084 802	1 352 824	0
23.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	pc	629 320	722 768	606 908	441 759	303 116
24.	Public Joint Stock Company “Kross- Poultry farm “Zorya”	pc	658 700	838 900	453 400	771 100	226 985
25.	Agricultural Limited Liability Company “Yuzhnaya – Holding”	pc	921 138	959 809	1 528 084	1 259 983	389 899
26.	Limited Liability Company “Poultry farm “Volnovaska”	pc	1 203 504	1 899 636	3 411 426	4 053 400	971 951
27.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	pc	232 359	423 586	544 492	443 256	122 808
28.	LLC “Slov’yany”	pc	4 624 437	8 922 923	14 307 555	13 417 362	168 832
29.	Bird Breeding Limited Liability Company “Ptitsekomplex”	pc	752 190	1 187 273	2 132 141	2 533 375	0
30.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	pc	511 743	533 227	848 936	699 991	53 422

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

Table 14: Data collected in the baseline scenario on the amount of eggs produced at the poultry farm

#	Name	Unit	Value				
			2008	2009	2010	2011	2012 (01.01-30.11)
1.	Agricultural Limited Liability Company “Donetsk birds”	eggs	228 787 000	225 531 075	314 857 365	595 246 773	556 667 781
2.	Public Joint Stock Company Agricultural Company “Avis”	eggs	124 675 970	273 102 789	199 836 208	468 330 024	911 350 207
3.	Limited Liability Company “Makarivsk Birds”	eggs	150 357 648	163 724 291	201 687 151	296 133 843	275 350 467

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4.	Public Joint Stock Company “Kross-Poultry farm “Zorya”	eggs	239 852 000	281 563 608	285 765 549	424 458 027	351 073 942
5.	Limited Liability Company “Trading house “Bogodukhivska Poultry Farm”	eggs	146 537 139	205 510 455	334 505 205	422 537 960	321 690 763
6.	Public Joint Stock Company “Poultry farm “Chervony Prapor”	eggs	198 949 000	272 696 042	378 726 787	469 194 868	430 180 926
7.	Subsidiary Poultry farm “Lozuvatska” of Public Joint Stock Company with limited liability “Avangardko investment public limited”	eggs	165 559 282	167 147 942	198 026 401	251 181 846	256 741 072
8.	Public Joint Stock Company “Avangard”	eggs	185 282 000	144 727 332	205 516 549	235 409 555	177 179 678
9.	Public Joint Stock Company “Chornobayivske”	eggs	218 842 000	159 901 689	193 929 043	228 879 910	242 810 490
10.	Public Joint Stock Company “Kirovskiy”	eggs	166 824 519	157 764 437	202 397 061	224 184 842	208 795 116
11.	Public Joint Stock Company “Poultry farm “Pershe Travnya”	eggs	208 103 590	191 880 652	292 917 553	316 310 287	308 855 528
12.	Limited Liability Company “Areal-Snigurivka”	eggs	151 831 747	204 584 234	275 665 068	336 545 505	283 414 595
13.	Subsidiary “Rogatynska Poultry farm” of PJSC “Avangard”	eggs	78 055 290	126 770 609	93 548 086	144 310 486	138 824 545
14.	Private Research and Production Company “Interbusiness”	eggs	38 135 400	141 740 748	224 755 737	357 423 113	277 109 320
15.	Limited Liability Company “Poultry farm “Volnovaska”	eggs	109 749 000	207 700 671	294 051 306	315 306 757	950 646
16.	Private Joint Stock Company “Chernivetska Poultry farm”	eggs	102 800 910	173 920 350	266 702 211	249 929 841	176 752 718

17.	Bird Breeding Limited Liability Company “Ptitsekomplex”	eggs	11 614 039	33 536 101	28 704 520	45 267 800	0
18.	Agribusiness Farm LLC “Yuzhnaya-Holding”	eggs	170 844 200	166 522 324	211 228 462	283 078 725	221 025 982

Data on indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052 and on the average number of birds permanently kept at the poultry farms, i.e. Parameters ID B-2 and ID B-3 coincide with the similar parameters, the data on which were collected in the project scenario – the Parameters ID P-2 and ID P-3. These data are provided in the tables above.

B.2.5. Data concerning leakage:

Leakage is the net change of anthropogenic emissions by sources and/or removals by sinks of GHGs which occurs outside the project boundary, and that can be measured and is directly attributable to the JI project.

Due to the project implementation, no leakages are expected.

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.-1-2003⁸ (Title: "Structure and Contents of the Environmental Impact Assessment Report (EIR) for Designing and Construction of Production Facilities, Buildings and Structures").

Annex F of this standard contains a list of "types of projects or activities which constitute higher environmental risk" for which full EIA is mandatory, and the Ministry of Environment being the competent authority. Project activity related to the construction of livestock complexes with capacity of more than 5000 heads and poultry farms included in this list.

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. Reducing of electricity consumption has an indirect positive impact on the environment through reduction of greenhouse gases and other products of fuel combustion at thermal power plants. Changing the methods of waste management reduces pollution of groundwater with products of chicken manure decomposition during its storage in lagoons and in excavated storage pits that also significantly effects on the conditions for the growth of pathogenic flora that may also spread through groundwater. In addition, less amount of manure anaerobic fermentation products release into the atmosphere, not only methane that in toxicology is classified as industrial poisons, but also ammonia, hydrogen sulfide and carbon monoxide. The applied methods of poultry manure composting can be used as fertilizers, a valuable recovery of soil fertility.

Implementation of the project activity also has a positive social impact through removing of the concentrated odor of chicken manure storage facilities and improving working conditions at poultry farms. 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.

⁸State 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

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 (including the software):

The proposed project involves three functional types of production facilities: egg-laying hens farm, grow-out farms and breeder farms. Specific electricity consumption on egg-laying hens farms is calculated per unit of production – eggs, and for grow-out farms and breeder farms – per conventional head of bird permanently kept at the farm (taking into account poultry account age and sex-specific structure). In cases when the enterprise involved in the project unites different production facilities, specific electricity consumption is calculated separately for each of them (egg-laying hens farm, grow-out farms and breeder farms). Such facilities get their specific identification numbers. Metering of electricity consumption and other parameters is performed separately as well.

All data will be archived electronic and paper. Data acquisition and processing procedure for each parameter monitored:

1. Electricity consumption by poultry farm i in period y

This parameter is documented in the monthly invoices for the electric energy. The documents are collected every month by the responsible person. The documents obtained are collected by the economics department on a monthly basis. The paper originals are binded into the special folder. Data on the electricity and identification parameter of each individual document are logged into the electronic register that is maintained at the head office of the company. The IT and data storage system containing this information at the head office has back-ups and allows for reliable data storage with virtually no chance of data loss. This log is printed and bound as a reference into the same folder with the original documents. At the same time the responsible person (as per Section C.1.1) maintains an independent account of the monitoring data. At the end of the month the summarizing report is prepared containing the information on the monthly monitored data. This report is signed by the responsible person and is submitted to the director of the company. At the end of the year the annual summarizing report is prepared for all monitoring parameters containing monthly and annual figures. This report is submitted to the director of the company. These reports are kept in electronic form in the IT system of the company and in paper form with signatures of the responsible persons.

2. Average number of birds permanently kept at the poultry farm i in period y

Technical reports (in the absence – accounting data and statistical reports) are used in order to confirm the average number of birds permanently kept at the poultry farm. The documents obtained are collected by the economics department on a monthly basis. The paper originals are binded into the special folder. Data on the average number of birds permanently kept at the poultry farm and identification parameter of each individual document are logged into the electronic register that is maintained at the head office of the company. The IT and data storage system containing this information at the head office has back-ups and allows for reliable data storage with virtually no chance of data loss. This log is printed and binded as a reference into the same folder with the original documents. At the same time the responsible person (as per section C.1.1) maintains an independent account of the monitoring data. At the end of the month the summarizing report is prepared containing the information on the monthly monitored data. This report is signed by the responsible person and is submitted to the director of the company. At the end of the year the annual summarizing report is prepared for all monitoring parameters containing monthly and annual figures. This report is submitted to the director of the company. These reports are kept in electronic form in the IT system of the company and in paper form with signatures of the responsible persons.

3. Number of eggs produced at the poultry farm i in period y

Technical reports (in the absence – accounting data and statistical reports) are used in order to confirm the number of eggs produced at the poultry farm. The person in charge collects the documents on the number of eggs produced. The documents obtained are collected by the economics department on a monthly basis.

The paper originals are binded into the special folder. Data on the number of eggs and identification parameter of each individual document are logged into the electronic register that is maintained at the head office of the company. The IT and data storage system containing this information at the head office has back-ups and allows for reliable data storage with virtually no chance of data loss. This log is printed and binded as a reference into the same folder with the original documents. At the same time the responsible person (as per section C.1.1) maintains an independent account of the monitoring data. At the end of the month the summarizing report is prepared containing the information on the monthly monitored data. This report is signed by the responsible person and is submitted to the director of the company. At the end of the year the annual summarizing report is prepared for all monitoring parameters containing monthly and annual figures. This report is submitted to the director of the company. These reports are kept in electronic form in the IT system of the company and in paper form with signatures of the responsible persons.

4. Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052

The parameter is determined with respect to the Orders of Designated Focal Point (DFP) of Ukraine, and is calculated by DFP of Ukraine on the basis of the most recent available data on emissions from electricity production by the companies of United Energy Systems of Ukraine. Application of any additional QA/QC procedures is not necessary.

B.4. Special event log:

All special and exceptional events (critical equipment failures, reconstruction works, emergencies etc.) are documented by the special notes to the management of the 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. Possible emergencies can have impact on the continuation of electric equipment operation (shutdowns) which will lead to a decreased number of ERUs which is, in turn, conservative.

SECTION C. Quality assurance and quality control measures**C.1. Documented procedures and management plan:****C.1.1. Roles and responsibilities:**

The general project management will be implemented by the Director of LLC “Agrarian Holding Avangard” through supervising and coordinating activities of his subordinates, including executives of each project farm. To determine the GHG emissions within the project (the baseline and project scenarios) internal standard of data reporting were used, which are collected and processed independently of the joint implementation project for commercial purposes of the company, using the rules and procedures for collecting, processing and carrying out the cross-checks. On-site day-to-day management is implemented by the directors of the relevant farms. Chief Energy Officer is responsible for operation and maintaining of the energy equipment, electrical meters and transformers. A specialised technician teams are responsible for preventive measures and maintenance of all technological equipment. The raw reporting documents are collected and compiled on-site. Data are entered into the computer system, and raw documents are transferred to the company archive.

Main responsibilities are divided as follows:

- Production Manager is responsible for acquiring data on the number of eggs produced at the poultry farm for each period, average number of birds permanently kept at the poultry farm for the period and electricity consumption by the farm for the relevant period. Then, he transfers raw documents on these data into the archive and prepares monthly report on the performances indicated;
- Electronic versions of monitoring databases are sent to the responsible person from the management of LLC “Agricultural Holding Avangard” (Director, or other person designated by the order), which prepares the common base of values of monitoring parameters to be transferred to the consultant for development of joint implementation projects for the calculation of emission reduction and preparation of monitoring reports;
- Production Manager and Accounting department of each farm are responsible for acquiring data in the form of raw documents and reports on monitoring parameters. They transfer raw documents on these data into the archive and prepare monthly reports on the parameters to be monitored.

Documents and reports on the data that are monitored will be archived and stored by the project participants. The following documents will be stored: primary documents for the accounting of monitored parameters in paper form; intermediate reports, orders and other monitoring documents in paper and electronic form; documents on measurement devices in paper and electronic form. These documents and other data monitored and required for determination and verification, as well as any other data that are relevant to the operation of the project will be kept for at least two years after the last transfer of ERUs.

C.1.2. Trainings:

Activities that are directly related to the monitoring do not require specific knowledge and skills other than provided in the job descriptions of personnel involved into the monitoring. The facilities at which the project is being implemented, periodic health and safety training are carried out. Control over the performance of the rules, detection and correction of violations is assigned to the heads of departments. Thus, the personnel responsible for monitoring receive appropriate training on procedures and requirements for monitoring. JI projects consultant will provide consultations on the Kyoto Protocol, JI projects and monitoring.

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 pass the course 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.

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. recognised 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, significant errors or uncertainties in the data collected are not expected.

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.

The project host management also established a communication channel that makes it possible to submit suggestions, improvement proposals and project ideas for more accurate future monitoring for every person involved in the monitoring activities. Such communications will be delivered to the project host management who is required to review these communications and in case it is found appropriate implement necessary corrective actions and improvements. Project participant – LLC “Agrarian Holding Avangard” – will conduct periodic review of the monitoring plan and procedures and if necessary propose improvements to the project participants.

SECTION D. Calculation of GHG emission reductions

D.1. Formulas for calculating the emission reductions:

Annual emission reductions are calculated as follows:

$$ER_y = BE_y - LE_y - PE_y \quad \text{(Equation 2)}$$

where:

ER_y Emission reduction under JI project in period y (tCO₂e);

LE_y Leakage due to the project realization in period y (tCO₂e);

BE_y Baseline emissions in period y (tCO₂e);

PE_y Project emissions in period y (tCO₂e).

Leakage in year y is calculated as follows:

$$LE_y = 0, \quad \text{(Equation 3)}$$

where:

LE_y Leakage due to the project realization in period y (tCO₂e).

Baseline emissions are calculated as follows:

$$BE_y = BE_{EC,y} + BE_{AW,y}, \quad \text{(Equation 4)}$$

where:

BE_y Baseline GHG emissions during the period y , (tCO₂e⁹);

$BE_{EC,y}$ Baseline CO₂ emissions attributable to the electricity consumption by the poultry farm i in period y , (tCO₂);

$BE_{AW,y}$ Baseline GHG emissions from anaerobic fermentation of manure at the poultry farm i in period y , (tCO₂e).

Baseline emissions of carbon dioxide due to electricity consumption are calculated as follows:

$$BE_{EC,y} = EF_{CO2,EL,y} \times \left(\sum_{i=1}^{18} N_{Eggs,i,y} \cdot SEC_{BL,Eggs,i} + \sum_{i=19}^{30} N_{Ch,i,y} \cdot SEC_{BL,Ch,i} \right), \quad \text{(Equation 5)}$$

where:

i Poultry farm index, dimensionless. Where ³ ∈ (1;18) is the farms for egg-laying hens; if ³ ∈ (19;30) is grow-out farms and breeder houses;

$BE_{EC,y}$ Baseline CO₂ emissions for electricity consumption attributable to the electricity consumption by the poultry farm i in period y , (tCO₂);

⁹1 tCO₂e= 1 tCO₂.

$EF_{CO_2,EL,y}$ Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052, (tCO₂/MWh). [Parameter ID B-3];

$N_{Eggs,i,y}$ Amount of eggs produced at the poultry farm i in period y , (eggs). [Parameter ID B-1];

$N_{Ch,i,y}$ Average number of birds permanently kept at the poultry farm i in period y , (pc). [Parameter ID B-2];

$SEC_{BL,Eggs,i}$ Baseline specific electricity consumption for eggs production, (MWh /egg). (Values are provided in Table 8);

$SEC_{BL,Ch,i}$ Baseline specific electric energy consumption for breeding of one head of bird permanently kept at the farm, (MWh /pc). (Values are provided in Table 8).

$$BE_{AW,y} = \sum_{i=1}^{30} (N_{Ch,i,y} \times EF_{CH_4,MSn}), \quad \text{(Equation 6)}$$

where:

i Poultry farm index, dimensionless;

n Index of manure handling method, dimensionless $n \in (1; 4)$;

$BE_{AW,y}$ Baseline GHG emissions for anaerobic fermentation of manure at the farm i in period y , (tCO₂e);

$N_{Ch,i,y}$ Average number of birds permanently kept at the poultry farm i in period y , (pc). [Parameter ID B-2];

$EF_{CH_4,MSn}$ Methane emission factor for collection, storage and utilization of manure using the method n at the poultry farm i , (tCO₂e/pc). (Method n for each of the farms is indicated in Table 6).

Project emissions are calculated as follows:

$$PE_y = PE_{EC,y} + PE_{AW,y}, \quad \text{(Equation 7)}$$

where:

PE_y , Project GHG emissions from project implementation in period y , (tCO₂e¹⁰);

$PE_{EC,y}$ Project CO₂ emissions for electricity consumption attributable to the electricity consumption by the poultry farm i in period y , (tCO₂);

$PE_{AW,y}$ Project GHG emissions for anaerobic fermentation of manure at the farm i in period y , (tCO₂e).

¹⁰1 tCO₂e= 1 tCO₂.

Project CO₂ emissions due to the electricity consumption by the project equipment are calculated as follows:

$$PE_{EC,y} = \sum_{i=1}^{30} (EC_{PJ,i,y} \times EF_{CO2,EL,y}), \quad (\text{Equation 8})$$

where:

- i* Poultry farm index, dimensionless;
- $PE_{EC,y}$ Project CO₂ emissions for electricity consumption attributable to the electricity consumption by the poultry farm *i* in period *y*, (tCO₂);
- $EC_{PJ,i,y}$ Electricity consumption for the production of product type *i* in the base year *m*, (MWh).
[Parameter ID P-1];
- $EF_{CO2,EL,y}$ Indirect specific carbon dioxide emissions in the period of consumption of electricity by consumers which are classified as 2nd class according to the procedure for determining the classes of consumers, approved by the National Electricity Regulatory Commission of Ukraine from August 13, 1998 № 1052, (tCO₂/MWh). [Parameter ID P-3].

Project emissions of methane due to the operation of poultry waste disposal system are calculated as follows:

$$PE_{AW,y} = \sum_{i=1}^{30} (N_{Ch,i,y} \times EF_{CH4,MSn}), \quad (\text{Equation 9})$$

where:

- i* Poultry farm index, dimensionless;
- n* Index of manure handling method, dimensionless $n \in (1; 4)$;
- $PE_{AW,y}$ Project GHG emissions for anaerobic fermentation of manure at the farm *i* in period *y*, (tCO₂e);
- $N_{Ch,i,y}$ Average number of birds permanently kept at the poultry farm *i* in period *y*, (birds).
[Parameter ID P-2];
- $EF_{CH4,MSn}$ Methane emission factor for collection, storage and utilization of manure using the method *n* at the poultry farm *i*, (tCO₂e/pc). (Values are provided in Table 5, and method *n* for each of the farms is indicated in Table 7).

Other formulas are provided in Section B.2.1 and Section B.2.2 of this report.

Results of the emissions calculations above are presented in metric tons of carbon dioxide equivalent (tCO₂e). The metric ton of carbon dioxide equivalent is equal to the metric ton of carbon dioxide (tCO₂). Therefore 1 tCO₂e = 1 tCO₂.

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 15: Project emissions

Parameter	Unit	2008	2009	2010	2011	2012 (01.01-30.11)	Total
Project emissions	tCO ₂ e	98 432	110 016	126 292	128 046	87 556	550 342

D.3.2. Baseline emissions:

Table 16: Baseline emissions

Parameter	Unit	2008	2009	2010	2011	2012 (01.01-30.11)	Total
Baseline emissions	tCO ₂ e	773 504	1 094 581	1 446 752	1 568 959	479 551	5 363 347

D.3.3. Leakage:

Not calculated and equals to 0.

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

Table 17: Emission reductions

Parameter	Unit	2008	2009	2010	2011	2012 (01.01-30.11)	Total
Emission reductions	tCO ₂ e	675 072	984 565	1 320 460	1 440 913	391 995	4 813 005

Annex 1

Definitions and acronyms

Acronyms and Abbreviations

CH₄	Methane
CO₂	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 (CO₂), Methane (CH₄), Nitrous Oxide (N₂O), Hydrofluorcarbons (HFCs), Perfluorcarbons (PFCs) and Sulphurhexafluoride (SF₆).

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).