Developed by	Approved by
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Annual monitoring report

1st quarter 2010

JI project

Revamping and Modernization of the Alchevsk Steel Mill, Ukraine

Track 1 JI Registration Reference UA 1000022

ІНСТИТУТ ПРОБЛЕМ ЕКОЛОГІЇ
ТА ЕНЕРГОЗБЕРЕЖЕННЯ

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List of abbreviations

OJSC "AISW" - Open Joint Stock Company "Alchevsk Iron and Steel Mill";

JIP – Joint Implementation Project;

Slab Caster – Slab Casting Machine;

LF – Ladle Furnace;

FER – Fuel and Energy Resources.

1. Introduction and project description

The modernization program of Open Joint Stock Company "Alchevsk Iron and Steel Mill" (OJSC "AISW"), which was started in 2004, pursues complex goals: implementation of energy efficient technologies to increase competitiveness of the plant, improvement of ecological impacts, and also expansion of market presence due to increase of manufacture capacity.

The realization of the technical revamping and modernization of the steel manufacturing process, which envisaged displacement old Open-Hearth Furnaces (OHF's) by the complex of oxygen-converter shop with two new LD Converters, was the top priority task of the project. LD Converters are joined together into one cycle with two Slab Casters, with Ladle-Furnaces (LF's) and Vacuumator (VD Plant), which together displaces the Blooming Mills. From the beginning it was envisaged that the project will be implemented as Joint Implementation (JI) project under the Kyoto protocol on climate change.

Before the project implementation OJSC "AISW" was using a traditional steel making technology: OHF's, Ingot Casting and Blooming Mills. According to this technology, around 20-21% of produced slabs in cutoff pieces were returned back to the OHF's.

According to the investment plan the project envisages the following basic Phases:

#1 – installation of Slab Caster #1 along with LF;

#2 – installation of Slab Caster #2 along with VD Plant;

#3 – installation of LD Converter #2

#4 – installation of LD Converter #1

#5 – reconstruction of Oxygen Plant #4

#6 – installation of Oxygen Plant #7

#7 – installation of Oxygen Plant #8

Phases 5-7 aimed to reconstruction and introduction of Oxygen Plants are indissolubly linked with the operation of main steel facilities (Phases #1-4).

With the project implementation, generally with introduction of new Slab Casters with LF's and VD Plant, only around 3% of steel in cutoff pieces returns back to OHF's or to the LD Converters for recasting. As a result, such a difference between projectline and baseline scenarios leads to economy of pig iron, natural gas and also blast furnace gas, which is then used as the result of project activity, for blast furnace blowing production at the existing power plant. However the project leads to increase of electricity consumption in comparison with the baseline.

In general the JI project leads to reduction of fuel and energy resources (FER) consumption and, therefore, to GHG emission reductions.

2. Project monitoring period and version of the document

The emission reductions, examined in this report, include the period from 01/01/2010 till 31/03/2010.

Version of the document – #2 dated 22nd of October 2010

3. Current status of the project

Phases #1 and #2 were implemented: Slab Caster #1 was implemented in August 2005 and Slab Caster # 2 – in March 2007.

The implementation of LD Converter #2 (Phase #3) was completed in January 2008 (it had to be finished in the third quarter of 2007). Such a delay was caused by the financial, technical and customs difficulties and also by the delay of equipment supply.

LD Converter #1 was implemented in September 2008 (completion of Phase #4). However then, in about a month, the operation of LD Converter #1 was suspended because of financial and economic crisis. LD Converter #1 was launched again in March 2009.

The reconstruction of Oxygen Plant #4 (Phase #5) was completed on 30th of September 2005 (almost together with Slab Caster #1).

The installation of Oxygen Plant #7 (Phase #6) was completed on 19th of March 2008 (according to the previous plan it should have been completed in the third quarter of 2007). The delay was caused by the same reasons (financial, technical and customs difficulties), which were mentioned for the Phase #3, because Oxygen Plant #7 supplies oxygen for LD Converter #2.

The installation of Oxygen Plant #8 (Phase #7) was completed on 10th of December 2009 (according to the previous plan it should have been completed in the third quarter of 2009). Such a delay was caused by a lack of money for balancing and commissioning of the facility, which was caused by global financial and economic crisis.

Thereby, all basic units, mentioned in Phases of project implementation, were operational in the reporting period.

During reporting monitoring period the level of OHF steel and rolled-formed slabs output (baseline slabs) was decreased. The main volume of slabs was manufactured at Slab Casters #1,2. The productivity decrease in the baseline has caused the increase of constant FER consumption data (increase of specific FER per 1 ton of steel output). At the same time, the productivity increase in the projectline (at LD Converters and Slab Casters instead of OHF's) has caused the decrease of specific FER consumption data.

The emission reductions, examined in this monitoring report, were generated during the whole monitoring period. The monitoring was based on actual data (mentioned in the reporting documents) of output production and FER consumption in projectline and in baseline scenarios as it is required by the Joint Implementation Project Design Document (PDD).

4. Sustainability – economic and social well-being

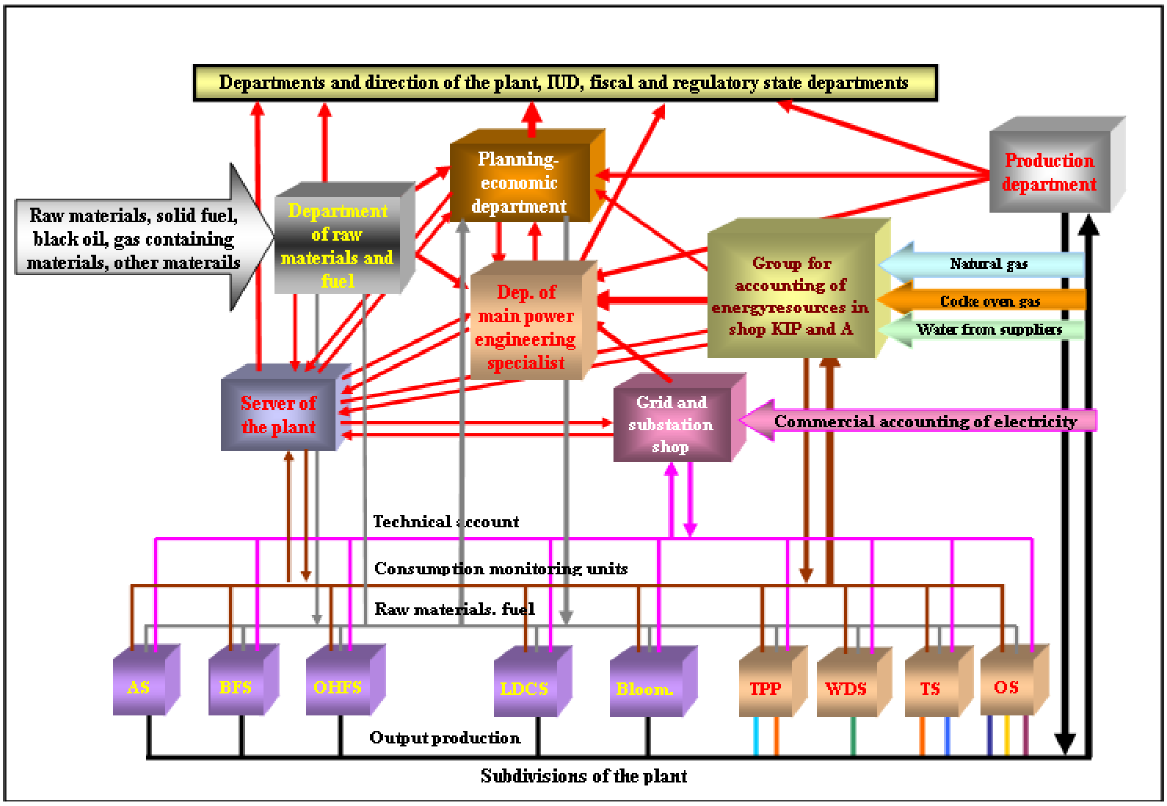
The project consists in the increase of energy efficiency, which reduces consumption of FER per 1 ton of steel output and improvement of the environmental safety due to replacing the main technological components by the modern equipment, highly efficient gas cleaning and aspiration facilities, which stops the increase of mass pollution formation due to raise of output. Besides, according to the project almost all new facilities are constructed with the complex of circulating water supply, which leads to reduction of sewage water and harmful substances spillage into the surface basins.

Therefore the realization of joint implementation project leads to significant improvement of environmental and working conditions at the Steel Mill not only because of GHG emission reductions, but also from reduction of harmful substances discharge.

In addition, project implementation leads to increase of payments to the budgets of all levels and, therefore, to increase of inhabitants social well being.

5. Parameters being monitored according to monitoring plan

The Schematic drawing of information preparation and supply system, which are used in this monitoring report, is presented below.



Legend:
AS - agglomeration shop wilth limestone section; BFC - blast furnace shop; OHFS - open hearth furnace shop; LDCS - LD Convertor shop; Bloom.- blooming; TPP - thermal power plant (blowing production, heat power); WDS - water delivery shop (pump over of technocal and circulating water); TS - thermal shop (compressed air production and secondary heat power); OS - oxygen shop (oxygen, nitrogen, agron production).

All data, used in this chapter, are based on information, confirmed by OJSC "AISW" documents. This information is available to the verifier, also regarding the interconnection with the baseline and projectline tables, presented below.

Colors that are used in the tables are described below:

Projectline	Baseline
Name of each indicator	Name of each indicator
Volume of FER consumption	Volume of FER consumption
Emission factor for FER	Emission factor for FER
Volume of CO_2 emissions	
Blank cell	

Baseline

ID Number	Data variable	Units	January 2010	February 2010	March 2010
	Baseline Emissions (BE)	Tonnes CO2	**793 888**	**617 584**	**883 340**
B-1	**Total Steel Output (TSO)**	Tonnes	224 935	179 791	285 549
B-2	**Total CO2 of Pig Iron (TCPI)**	Tonnes CO2	**705 804**	**551 967**	**810 107**

B-3	**Total CO2 from Fuel Consumption in Pig Iron production (TCFCPI)**	Tonnes CO2	**59 835**	**43 836**	**48 592**
B-4	**Percentage of Total amount of Pig Iron Produced Used in project Steel Making Activity (PII)**	share	**1,00**	**1,00**	**1,00**
B-5	**Total Pig Iron Input into Steel Making Process (TPII)**	Tonnes	226 317	172 860	275 115
B-6	**Total Pig Iron Produced (TPIP)**	Tonnes	226 317	172 860	275 115
B-7	**Quantity of each fuel (fpi) used in making Pig Iron (Q_{fpi})**	m3, 1000 m3			
	NG	m3,	32 610 369	23 540 928	25 379 035
	COG	1000 m3	181	485	2171
B-8	**Emission factor of each fuel (fpi) EF_{fpi}**	Tonnes CO2 per m3			
	NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per 1000 Nm3	0,79824	0,79824	0,79824
B-9	**Total CO2 from Electricity used in Pig Iron production (TCEPI)**	Tonnes CO2	**44 315**	**45 907**	**35 765**
B-10	**Electricity Consumed in producing Pig Iron (ECPI)**	MWh	49 459	51 236	39 917
B-11	**Emissions Factor for Electricity Consumption in making Pig Iron (EFECPI)**	Tonnes CO2/MWh	0,896	0,896	0,896
B-12	**Total CO2 from inputs into Pig Iron (TCIPI)**	Tonnes CO2	**601 654**	**462 224**	**725 749**
B-13	**Total Carbon from Fuel Consumption in Sintering (TCFIO)**	Tonnes CO2	**12 764**	**9 968**	**13 671**
B-14	**Quantity of each fuel (fio) used in Sintering (Q_{fio})**	m3			
	NG	m3	3 872 521	3 225 344	3 595 210
	COG	ths. m3	7111	5030	8811
B-15	**Emission factor of each fuel in Sintering (fio) EF_{fio}**	m3			
	NG	Tonnes CO2 per 1000 m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per m3	0,79824	0,79824	0,79824
B-16	**Total CO2 from Electricity used in Sintering (TCEIO)**	Tonnes CO2	**14 280**	**9 611**	**14 708**
B-17	**Electricity Consumed in Sintering (ECIO)**	MWh	15 937	10 727	16 415
B-18	**Emissions Factor for Electricity Consumption in Sintering (EFECIO)**	Tonnes CO2/MWh	0,896	0,896	0,896
B-19	**Total CO2 from Reducing Agents (TCRAPI)**	Tonnes CO2	**535 136**	**413 261**	**647 214**

	Total Reducing Agent	Tonnes	141 535	109 707	167 257
	Default Emission Factor	Tonnes CO2/Tonne	3,66	3,66	3,66
	Total Reducing Agent	Tonnes	6 847	4 693	14 021
	Default Emission Factor	Tonnes CO2/Tonne	2,50	2,50	2,50
B-20	**Total CO2 from limestone (TCLPI) in Pig iron production**	Tonnes CO2	**39 473**	**29 384**	**50 156**
	Total Limestone	Tonnes	79 154	58 115	102 257
	Default Emission Factor	Tonnes CO2/Tonne	0,44	0,44	0,44
	Total dolomite	Tonnes	9 739	7 994	10 823
	Default Emission Factor	Tonnes CO2/Tonne	0,477	0,477	0,477
B-21	**Total CO2 from steam production in Pig Iron Production (TCSPI)**	Tonnes CO2			
B-22	**Quantity of each fuel (fspi) used in steam production in Pig Iron Production (Q_{fspi})**	m3			
	fuel 1				
	fuel 2				
B-23	**Emission factor of each fuel in steam production (fspi) EF_{fspi}**	Tonnes CO2 per m3			
	fuel 1				
	fuel 2				
B-24	**Total CO2 emissions from the furnace process (TCFP)**	Tonnes CO2	**59 141**	**48 790**	**57 783**
B -25	**Total CO2 emissions from fuel consumption in the furnace process (TCFCFP)**	Tonnes CO2	**23 354**	**18 544**	**22 018**
B -26	**Quantity of each fuel (ffp) used in furnace process (Q_{ffp})**	m3			
	NG	m3	11 828 826	8 674 056	8 623 786
	Total Reducing Agent	Tonnes	465	444	976
	Total Reducing Agent	Tonnes	0	363	1 010
B -27	**Emission factor of each fuel in furnace process (ffp) EF_{ffp}**	Tonnes CO2 per m3			
	NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
	Default Emission Factor	Tonnes CO2/Tonne	3,66	3,66	3,66
	Default Emission Factor	Tonnes CO2/Tonne	2,50	2,50	2,50
B -28	**Total CO2 emissions from electricity consumption in the furnace process (TCECFP)**	Tonnes CO2	**23 086**	**19 888**	**24 210**
B -29	**Electricity Consumed in furnace process (ECFP)**	MWh	25 766	22 197	27 020

B -30	**Emissions Factor for Electricity Consumption in furnace process (EFECFP)**	Tonnes CO2/MWh	0,896	0,896	0,896
B -31	**Total CO2 emissions from inputs to the furnace process (TCIFP)**	Tonnes CO2	**12 701**	**10 358**	**11 554**
B -32	**Total CO2 from Argon entering the furnace (TCAFP)**	Tonnes CO2	**22**	**20**	**20**
B -33	**Total CO2 from steam production in furnace process (TCSFP)**	Tonnes CO2			
B -34	**Quantity of each fuel (fsp) used in steam production in furnace process (Q_{fsp})**	m3			
	fuel 1				
	fuel 2				
B -35	**Emission factor of each fuel in furnace process (fsp) EF_{fsp}**	Tonnes CO2 per m3			
	fuel 1				
	fuel 2				
B -36	**Total CO2 from compressed air production in furnace process (TCCAFP)**	Tonnes CO2	**279**	**189**	**187**
B -37	**Quantity of each fuel (fca) used in compressed air production in furnace process (Q_{fca})**	m3			
	NG	m3			
	fuel 2				
B -38	**Emission factor of each fuel in furnace process (fca) EF_{fca}**	Tonnes CO2 per m3			
	NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
	COG				
B -39	**Electricity Consumed in making compressed air for the furnace process in steel making (ECCA)**	MWh	311	211	208
B -40	**Emissions Factor for Electricity Consumption (EFECCA)**	Tonnes CO2/MWh	0,896	0,896	0,896
B -41	**Total CO2 from oxygen production (TCOFP)**	Tonnes CO2			
B -42	**Quantity of each fuel (fop) used in oxygen production (Q_{fop})**	m3			
	fuel 1				
	fuel 2				
B -43	**Emission factor of each fuel in oxygen production (fop) EF_{fop}**	Tonnes CO2 per m3			
	fuel 1				

	fuel 2				
B -44	**Electricity Consumed in making oxygen (ECOP)**	MWh			
B-45	**Emissions Factor for Electricity Consumption in making oxygen (EFECOP)**	Tonnes CO2/MWh	0,896	0,896	0,896
B-46	**Total CO2 from limestone for furnace process (TCLFP)**	Tonnes CO2	**12 400**	**10 149**	**11 347**
	Total Limestone	Tonnes	26 573	23 067	24 345
	Default Emission Factor	Tonnes CO2/Tonne	0,44	0,44	0,44
	Total dolomite	Tonnes	1 485	0	1 333
	Default Emission Factor	Tonnes CO2/Tonne	0,477	0,477	0,477
B-47	**Total CO2 from blooming (TCBM)**	Tonnes CO2	**28 943**	**16 826**	**15 450**
B-48	**Total CO2 from fuel consumption in blooming (TCFCBM)**	Tonnes CO2	**7 639**	**5 336**	**5 558**
B-49	**Quantity of each fuel (fbm) used in blooming (Q_{fbm})**	m3			
	NG	m3	1 676 695	223 581	55 239
	COG	1000 m3	5 725	6 168	6 835
B -50	**Emission factor of each fuel in blooming (fbm) EF_{fbm}**	Tonnes CO2 per m3			
	NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per 1000 Nm3	0,79824	0,79824	0,79824
B-51	**Total CO2 from electricity consumption in blooming (TCECBM)**	Tonnes CO2	**21 304**	**11 490**	**9 892**
B-52	**Electricity Consumed in blooming (ECBM)**	MWh	23 777	12 824	11 040
B-53	**Emissions Factor for Electricity Consumption in blooming (EFECBM)**	Tonnes CO2/MWh	0,896	0,896	0,896

Projectline

ID number	Data variable	Units	January 2010	February 2010	March 2010
	Project Emissions (PE)	Tonnes CO2	**655 128**	**547 867**	**799 264**
P-1	**Total Steel Output (TSO)**	Tonnes	224 935	179 791	285 549
P-2	**Total CO2 of Pig Iron (TCPI)**	Tonnes CO2	**612 617**	**512 301**	**759 751**
P-3	**Total CO2 from Fuel Consumption for Pig Iron (TCFCPI)**	Tonnes CO2	**35 666**	**31 695**	**39 894**

P-4	**Percentage of Total amount of Pig Iron Produced Used in project Steel Making Activity (PII)**	share	**1,00**	**1,00**	**1,00**
P-5	**Total Pig Iron Input into Steel Making Process (TPII)**	Tonnes	197 944	158 852	252 856
P-6	**Total Pig Iron Produced (TPIP)**	Tonnes	197 944	158 852	252 856
P-7	**Quantity of each fuel (fpi) used in making Pig Iron (Q_{fpi})**	m3			
	NG	m3	19 416 613	16 979 887	20 748 640
	COG	1000 m3	157	445	1 984
P-8	**Emission factor of each fuel in Pig Iron Production (fpi) EF_{fpi}**				
	NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per 1000 Nm3	0,79824	0,79824	0,79824
P-9	**Total CO2 from Electricity used in Pig Iron production (TCEPI)**	Tonnes CO2	**38 459**	**41 924**	**32 697**
P-10	**Electricity Consumed in producing Pig Iron (ECPI)**	MWh	42 923	46 790	36 492
P-11	**Emissions Factor for Electricity Consumption in Pig Iron Production (EFECPI)**	Tonnes CO2/MWh	0,896	0,896	0,896
	Total Electricity Used in Steel Making Process				
	Grid Emission Factor	Tonnes CO2/MWh	0,896	0,896	0,896
	CHP Plant Emission Factor	Tonnes CO2/MWh			
	Total Electricity Produced by CHP	MWh			
	Blast Furnace Gas	1000 m3			
	NG	m3			
	Emission factor for BFG	Tonnes CO2 per 1000 m3			
	Emission factor NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
P-12	**Total CO2 from inputs into Pig Iron (TCIPI)**	Tonnes CO2	**538 493**	**438 682**	**687 160**
P-13	**Total CO2 from Fuel Consumption in Sintering (TCFIO)**	Tonnes CO2	**14 355**	**12 951**	**17 850**
P-14	**Quantity of each fuel (fio) used in Sintering (Q_{fio})**	m3			
	NG	m3	5 130 467	5 017 755	6 166 859

	COG	1000 m3	6 219	4 622	8 098
P-15	**Emission factor of each fuel in Sintering (fio) EF_{fio}**	m3			
	NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per 1000 Nm3	0,79824	0,79824	0,79824
P-16	**Total CO2 from Electricity used in Sintering (TCEIO)**	Tonnes CO2	**12 657**	**8 996**	**13 783**
P-17	**Electricity Consumed in Sintering (ECIO)**	MWh	14 126	10 040	15 383
P-18	**Emissions Factor for Electricity Consumption (EFECIO)**	Tonnes CO2/MWh	0,896	0,896	0,896
P-19	**Total CO2 from Reducing Agents (TCRAPI)**	Tonnes CO2	**468 047**	**379 771**	**594 849**
	Total Reducing Agent	Tonnes	123 791	100 817	153 725
	Default Emission Factor	Tonnes CO2/Tonne	3,66	3,66	3,66
	Total Reducing Agent	Tonnes	5 989	4 313	12 887
	Default Emission Factor	Tonnes CO2/Tonne	2,50	2,50	2,50
P-20	**Total CO2 from limestone (TCLPI) in Pig iron production**	Tonnes CO2	**43 433**	**36 964**	**60 677**
	Total Limestone	Tonnes	84 545	70 567	118 403
	Default Emission Factor	Tonnes CO2/Tonne	0,44	0,44	0,44
	Total dolomite	Tonnes	13 068	12 400	17 987
	Default Emission Factor	Tonnes CO2/Tonne	0,477	0,477	0,477
P-21	**Total CO2 from steam production in Pig Iron Production (TCSPI)**	Tonnes CO2			
P-22	**Quantity of each fuel (fspi) used in steam production in Pig Iron Production (Q_{fspi})**	m3			
	NG	m3	0	0	0
	COG	1000 m3	0	0	0
P-23	**Emission factor of each fuel in Steam Production (fspi) EF_{fspi}**	Tonnes CO2 per m3			
	NG	m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per 1000 Nm3	0,79824	0,79824	0,79824
P-24	**Total CO2 emissions from the furnace process (TCFP)**	Tonnes CO2	**28 580**	**23 574**	**25 467**

P-25	**Total CO2 emissions from fuel consumption in the furnace process (TCFCFP)**	Tonnes CO2	**5 009**	**4 049**	**2 440**
P-26	**Quantity of each fuel (ffp) used in furnace process (Q_{ffp})**				
	NG	m3	1 989 037	1 546 265	798 390
	COG	1000 m3	54	47	4
	Total Reducing Agent	Tonnes	167	125	33
	Total Reducing Agent	Tonnes	286	280	336
P-27	**Emission factor of each fuel in the furnace process (ffp) EF_{ffp}**	Tonnes CO2 per m3			
	NG	Tonnes CO2 per m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per 1000 Nm3	0,79824	0,79824	0,79824
	Default Emission Factor	Tonnes CO2/Tonne	3,66	3,66	3,66
	Default Emission Factor	Tonnes CO2/Tonne	2,50	2,50	2,50
P-28	**Total CO2 emissions from electricity consumption in the furnace process (TCECFP)**	Tonnes CO2	**22 294**	**18 422**	**22 714**
P-29	**Electricity Consumed in the furnace process (ECFP)**	MWh	24 881	20 560	25 350
P-30	**Emissions Factor for Electricity Consumption in the furnace process (EFECFP)**	Tonnes CO2/MWh	0,896	0,896	0,896
P-31	**Total CO2 emissions from inputs to the furnace process (TCIFP)**	Tonnes CO2	**1 276**	**1 102**	**314**
P-32	**Total CO2 from Argon entering the furnace (TCAFP)**	Tonnes CO2	**23**	**22**	**23**
P-33	**Total CO2 from steam production in the furnace process (TCSFP)**	Tonnes CO2			
P-34	**Quantity of each fuel (fsp) used in steam production in the furnace process (Q_{fsp})**	m3			
	NG	m3			
	COG	1000 m3			
P-35	**Emission factor of each fuel in the furnace process (fsp) EF_{fsp}**	Tonnes CO2 per m3			
	fuel 1				
	fuel 2				

P-36	**Total CO2 from compressed air production for the furnace process (TCCAFP)**	Tonnes CO2	**104**	**75**	**77**
P-37	**Quantity of each fuel (fca) used in compressed air production (Q_{fca})**	m3			
	NG	m3			
	COG	1000 m3			
P-38	**Emission factor of each fuel in compressed air production (fca) EF_{fca}**	Tonnes CO2 per m3			
	NG	m3	0,00183	0,00185	0,00185
	COG	Tonnes CO2 per 1000 Nm3	0,79824	0,79824	0,79824
P-39	**Electricity Consumed in making compressed air for the furnace process (ECCA)**	MWh	116	83	86
P-40	**Emissions Factor for Electricity Consumption in compressed air production (EFECCA)**	Tonnes CO2/MWh	0,896	0,896	0,896
P-41	**Total CO2 from oxygen production (TCOFP)**	Tonnes CO2			
P-42	**Quantity of each fuel (fop) used in oxygen production (Q_{fop})**	m3			
	fuel 1				
	fuel 2				
P-43	**Emission factor of each fuel in oxygen production (fop) EF_{fop}**	Tonnes CO2 per m3			
	fuel 1				
	fuel 2				
P-44	**Electricity Consumed in making oxygen (ECOP)**	MWh			
P-45	**Emissions Factor for Electricity Consumption in making oxygen (EFECOP)**	Tonnes CO2/MWh	0,896	0,896	0,896
P-46	**Total CO2 from limestone for furnace process (TCLFP)**	Tonnes CO2	**1 150**	**1 006**	**214**
	Total Limestone	Tonnes	2 467	2 287	484
	Default Emission Factor	Tonnes CO2/Tonne	0,44	0,44	0,44
	Total dolomite	Tonnes	134	0	1
	Default Emission Factor	Tonnes CO2/Tonne	0,477	0,477	0,477
P-47	**Total CO2 from casting (TCBM)**	Tonnes CO2	**13 931**	**11 992**	**14 047**

P-48	**Total CO2 from fuel consumption in casting (TCFCBM)**	Tonnes CO2	**546**	**432**	**598**
P-49	**Quantity of each fuel (fbm) used in casting (Q_{fbm})**	m3			
	NG	m3	197 238	145 684	217 031
	coal electrodes	Tonnes	51	45	55
P-50	**Emission factor of each fuel used in casting (fbm) EF_{fbm}**	Tonnes CO2 per m3			
	NG	m3	0,00183	0,00185	0,00185
	coal electrodes	Tonnes CO2/Tonne	3,6	3,6	3,6
P-51	**Total CO2 from electricity consumption in casting (TCECBM)**	Tonnes CO2	**13 385**	**11 559**	**13 448**
P-52	**Electricity Consumed in casting (ECBM)**	MWh	14 938	12 901	15 009
P-53	**Emissions Factor for Electricity Consumption in casting (EFECBM)**	Tonnes CO2/MWh	0,896	0,896	0,896

The amount of emission reductions that were actually generated in the first quarter of 2010 is higher than it was expected in PDD because of the following reasons. The baseline of the project was developed based on the real steel manufacturing process as well as projectline. Taking into account the implication of economy of scale and the fact that loading factor for baseline was much lower than for projectline, the emission reductions were more sensitive to change of specific energy consumption per 1 t of slabs produced than actually envisaged in the PDD. However this influence was beyond of project participants' control and fully based on market situation and requirements.

The calculations of GHG emission reductions, indicated in the tables, are based on the real data of FER consumption both for baseline and projectline, according to the methodology.

The emission reductions data are given in the next chapter.

6. Emission reductions

Following table shows emission reductions through the project:

	January 2010	**February 2010**	**March 2010**	**1st quarter 2010**
Baseline Emissions, t CO_{2e}	793 888	617 584	883 340	**2 294 811**
Project Emissions, t CO_{2e}	655 128	547 867	799 264	**2 002 258**
Emission Reductions, t CO_{2e}	**138 760**	**69 717**	**84 076**	**292 553**

7. Measures to ensure the accuracy of the results

The monitoring of JI project indicators of at OJSC “AISW” is realized on regular basis where the system of data collection on FER consumption is being used. The data needed for the monitoring of the project is collected during the process of normal equipment use. The production facilities of the plant are equipped with the measuring devices such as scales, meters and gas, water, steam, electricity consumption meters. The monitoring of the project forms an organic part of routine monitoring of manufacturing process. This allows receiving data regarding the project continuously.

OJSC “AISW” uses the accredited system of quality regulation according to the requirements of the ISO 9001 standard. The Guiding Metrological Instructions were developed in accordance with ISO 9001. They secure required level of accuracy by using monitoring equipment and by the possibility to crosscheck the data adequacy.

Monitoring equipment meets the regulatory requirements of Ukraine regarding accuracy and measurement error. All the equipment used for monitoring purposes, are in line with national legislative requirements and standards and also with ISO 9001 standards. The accuracy of devices is guaranteed by the manufacturers; the error is calculated and confirmed by device certificates. All monitoring equipment is covered by the detailed verification (calibration) plan. The verification process is under strict control. All measuring equipment is included in the verification schedule and verified with established periodicity. According to the schedule of verification, all devices are in satisfactory condition. The documented instructions to operate the facilities are stored at the working places.

The monitoring procedures are quite comprehensible, because they had already been used at OJSC “AISW” for measuring input and output production parameters, and also for receiving data on level of FER and raw-materials consumption. The most effective accessible methods are used for the error minimization. Generally the error level is low for all parameters (less than 2%) that are subjected to the monitoring. Thus, the measurements uncertainty level corresponded with technologies, used in the production process, and is taken into the account when the data are taken from devices.

The procedures of receiving data for monitoring execution and responsibility for its realization at OJSC “AISW” are regulated by the normative documents of OJSC “AISW” and by the “Guiding Meteorological Instructions” in accordance with project documentation and monitoring plan.

8. Roles and obligations

The Chief Metrological Specialist of the OJSC “AISW” is in charge for maintenance of the facilities and monitoring equipment as well as for their accuracy required by Regulation PP 229-Э-056-863/02-2005 of "Metrological services of the metallurgical mills" and by "Guiding Metrological Instructions". In case of defect, discovered in the monitoring equipment, the actions of the staff are determined in Guiding Metrological Instructions. The measurements are conducted constantly in automatic regime.

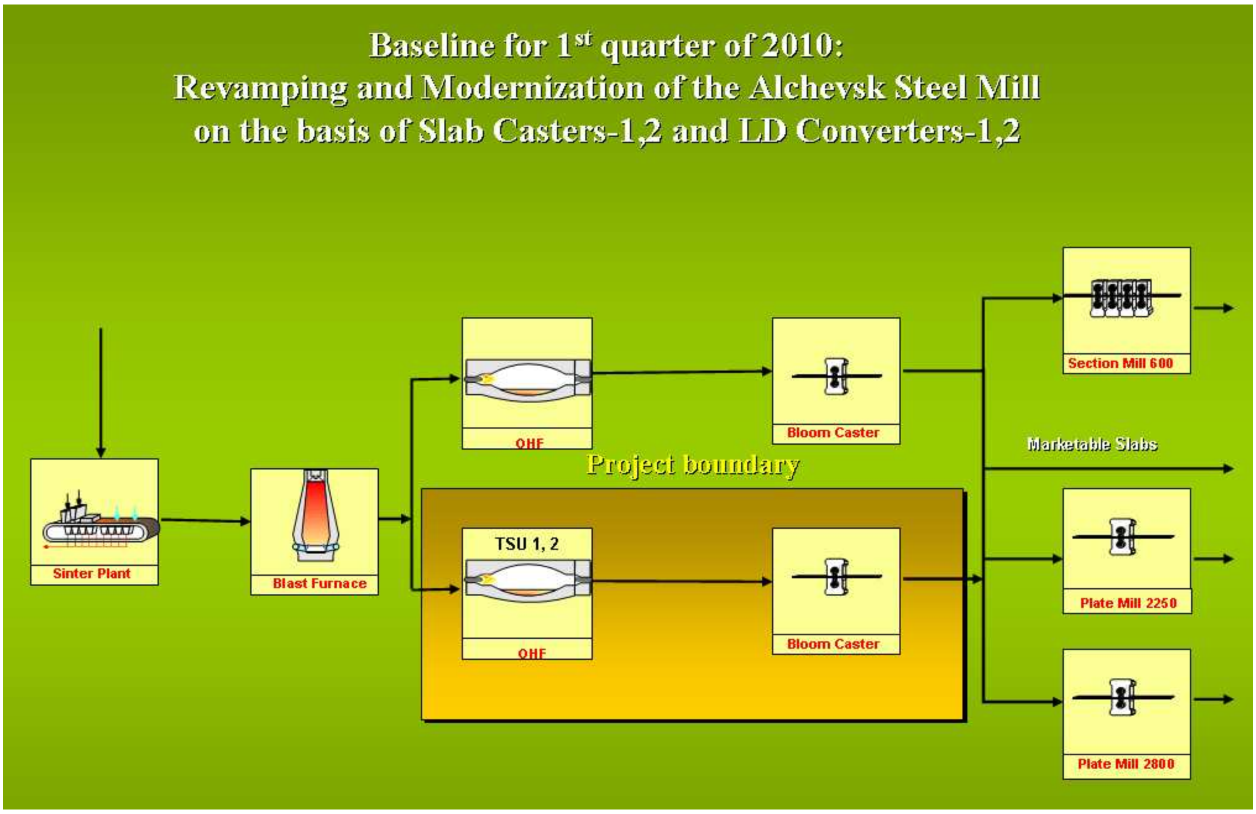
Data are collected in the electronic database of OJSC "AISW" and in printed documents. Also data are systematized in the documents of the daily, monthly and annually registration. All those documents are saved in the planning-economic department.

The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of the Steel Mill. They are reflected in the technological instructions of production processes regime and also in the "Guiding Metrological Instructions" revised versions. The monitoring data reports and calculations are under the competence of the Chief power-engineering specialist assistant in accordance to the interior orders of the Steel Mill.

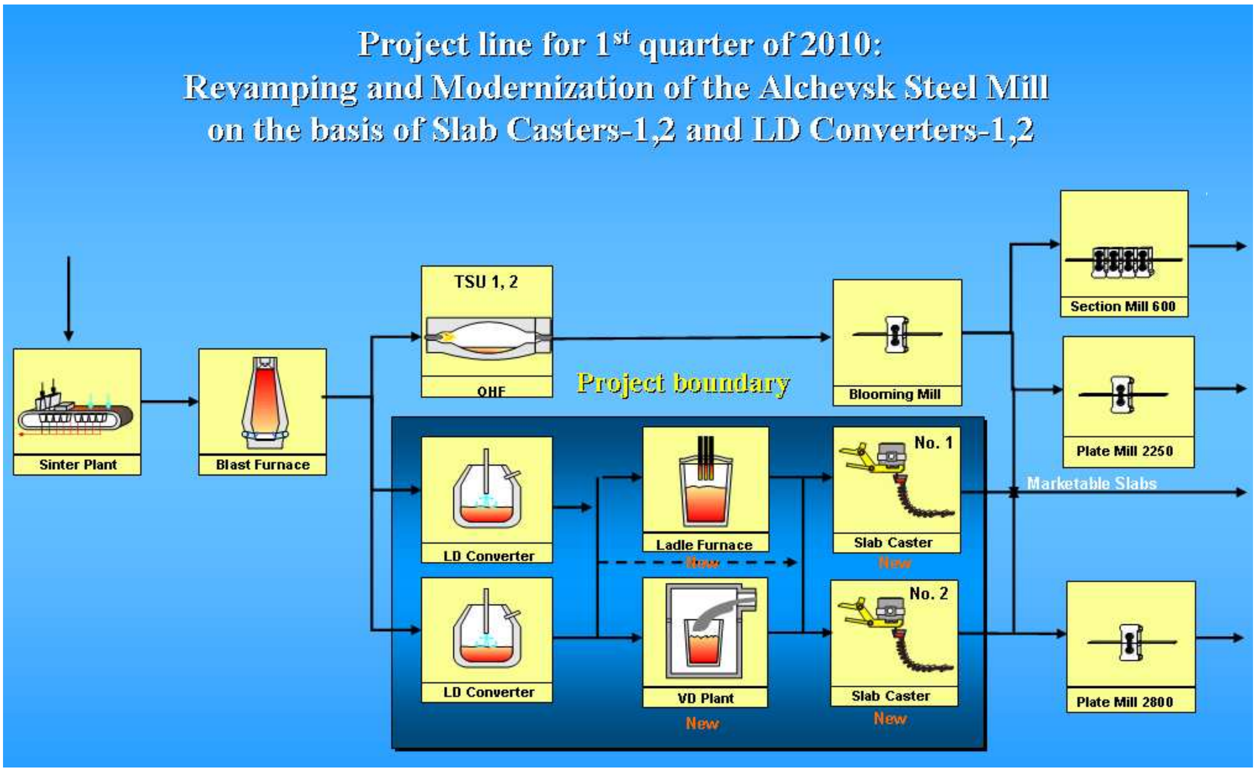
The direction of OJSC "AISW" has organized appropriate staff training to operate the project equipment. Thus, the trainings were conducted at the Ukrainian and foreign plants in order to operate Slab Casters and LD Converters. With the project equipment introduction the workers of OJSC "AISW" have the opportunity to update their working skills, stimulated by the permanent educational theoretical and practical courses at the Steel Plant. The information about the trainings can be given additionally.

9. Schemes for estimate of emission reductions

The baseline is the prolongation of the OJSC "AISW" historical practice of steel output; it means that situation observed in the baseline is the hypothetical situation of what could be without project implementation. The project baseline measures are represented at the picture below.



The projectline measures (the situation, formed during the monitoring period) are examined at the picture below.



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