

JSC Arkhangelsk PPM

GHG EMISSIONS REPORT 2018

Condensed website version



IN COMPLIANCE WITH ISO 14064-1:2006

ARKHANGELSK, 2019

Published by: JSC Arkhangelsk PPM.

Reporting period: 01.01.2018 – 31.12.2018.

Basis: The report has been produced by CCGS LLC for and in cooperation with JSC Arkhangelsk PPM in compliance with the requirements of ISO 14064-1:2006 *Greenhouse Gases. Part 1. Specification with Guidance at the Organization Level for Quantification and Reporting of Greenhouse Gas Emissions and Removals.*

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INTRODUCTION

This report has been produced by CCGS LLC for and in close cooperation with JSC Arkhangelsk PPM and is a follow-up to a corporate greenhouse gas (GHG) management system development at JSC Arkhangelsk PPM, which has been ongoing since 2000.

The purpose of this report is to make a registry of JSC Arkhangelsk PPM's GHG emissions that occurred over the period from January 1, 2018, to December 31, 2018, in compliance with the requirements of ISO 14064-1:2006.

In 2000 JSC Arkhangelsk PPM launched the Biomass to Energy Joint Implementation Project at JSC Arkhangelsk Pulp and Paper Mill within the framework of Article 6 of the Kyoto Protocol. The project covered modernization (replacement) of two utilizing boilers and the fuel feed system at CHPP-3. Due to such upgrade it now became possible to burn more bark, wood waste and wastewater sludge, and to do it with higher efficiency. The GHG emissions reduction achieved due to this project were successfully validated, verified and sold in the international market as carbon units.

In 2003 JSC Arkhangelsk PPM with the assistance of ANO Environmental Investment Center took the first inventory of its GHG emissions for the years from 1990 to 2002. The results of this inventory were verified and approved by Environmental Resources Trust.

In 2003 Director General of JSC Arkhangelsk PPM, Mr. Vladimir Beloglazov, delivered a speech at the 9th Conference of the Parties to the UN Framework Convention on Climate Change in Milan, Italy, announcing JSC Arkhangelsk PPM's voluntary commitment for the period ending on December 31, 2012, to cap its GHG emissions at 2.6 Mt CO₂e per year with the projected pulp production of 1 Mt per year.

In 2004 ANO Environmental Investment Center on assignment coming from JSC Arkhangelsk PPM developed the fundamental concepts of the Climate Strategy for JSC Arkhangelsk PPM for the period towards 2012.

From 2003 onwards, JSC Arkhangelsk PPM has taken inventories of its GHG emissions occurring within the boundary of its Novodvinsk industrial site and from 2012 within the boundary of the whole organization including its daughter companies on a yearly basis. The GHG emission data are disclosed to the Mill's buyers and other interested parties on request.

In 2013 the Climate Strategy for the period towards 2020 was approved. In accordance with this strategy the company assumed a voluntary obligation to limit its GHG emissions at 2.2 Mt CO₂e per year with an increase in pulp cooking up to 1 Mt per year. Emissions per 1 tonne of pulp, therefore, should not exceed 2.2 tonnes of CO₂e.

From 2013 yearly verification of GHG emission reports prepared according with ISO 14064-1:2006 standard is carried out. The verifications are conducted by Bureau Veritas Certification Rus with a reasonable (justified) level of assurance.

By the results of each verification JSC Arkhangelsk PPM received the certificate and expert conclusion which certifies that GHG emissions management system and data on GHG emissions volume answer the requirements of the international standard ISO 14064-1:2006.

Since 2014 JSC Arkhangelsk PPM has participated in CDP's program for disclosure of GHG emissions data and annually proved its leading position in the sphere of climate change among Russian companies.

In 2016 JSC Arkhangelsk PPM together with CCGS LLC was the first among Russian enterprises that calculated the carbon footprint of its end products and services according to standard ISO/TS 14067:2013, Greenhouse gases — Carbon footprint of products — Requirements and guidelines for quantification and communication.

In 2018 JSC Arkhangelsk PPM approved the strategy of low-carbon development for the period up to 2030. According to it the company undertakes voluntary obligation to reduce total direct and energy indirect GHG emissions by 55% by 2030 compared to 1990 – up to 1.4 Mt CO₂e per year. It is necessary to reduce other indirect emissions under the strategy by 20% by 2030 compared to 2015 up to 370 000 tCO₂e per year.

1. COMPANY PROFILE

1.1. General information about JSC Arkhangelsk PPM

Arkhangelsk Pulp and Paper Mill (APPM) was founded in 1940 and until 1992 used to be a state-owned industrial enterprise with all its industrial facilities based in Novodvinsk, Arkhangelsk Region. In 1992 the Mill was restructured into a joint stock company, Arkhangelsk Pulp and Paper Mill (JSC Arkhangelsk PPM), which later on was privatized.

JSC Arkhangelsk PPM's major shareholder is Austrian-German Group [Pulp Mill Holding GmbH](#) (based in Vienne, Austria) which owns 100% of shares of JSC Arkhangelsk PPM. Pulp Mill Holding produces pulp, cardboard and packaging in Russia and Ukraine.

JSC Arkhangelsk PPM has a fully operational integrated management system which incorporates:

- Quality management system to ISO 9001;
- Environment management system to ISO 14001;
- Occupational health and safety management system to OHSAS 18001.

JSC Arkhangelsk PPM is annually certified according to standards ISO 14064-1:2006 and GOST R ISO 14064-1-2007.

Legal and mailing address of JSC Arkhangelsk PPM: 1, Melnikov Street, Novodvinsk, Arkhangelsk Region, 164900, Russia.

Web-site: www.appm.ru

1.2. Organizational structure

Apart from the pulp and paper mill in Novodvinsk, Arkhangelsk Region (hereinafter JSC Arkhangelsk PPM (Novodvinsk)), JSC Arkhangelsk PPM has three daughter companies located in different areas of Russia (See Fig.1, 2):

- JSC Arkhbum (based in Novodvinsk with branches in Podolsk, in Istra District of Moscow Region and in Voronezh Region);
- JSC Byt (Novodvinsk);
- Arkhbum Tissue Group LLC (Kaluga Region).

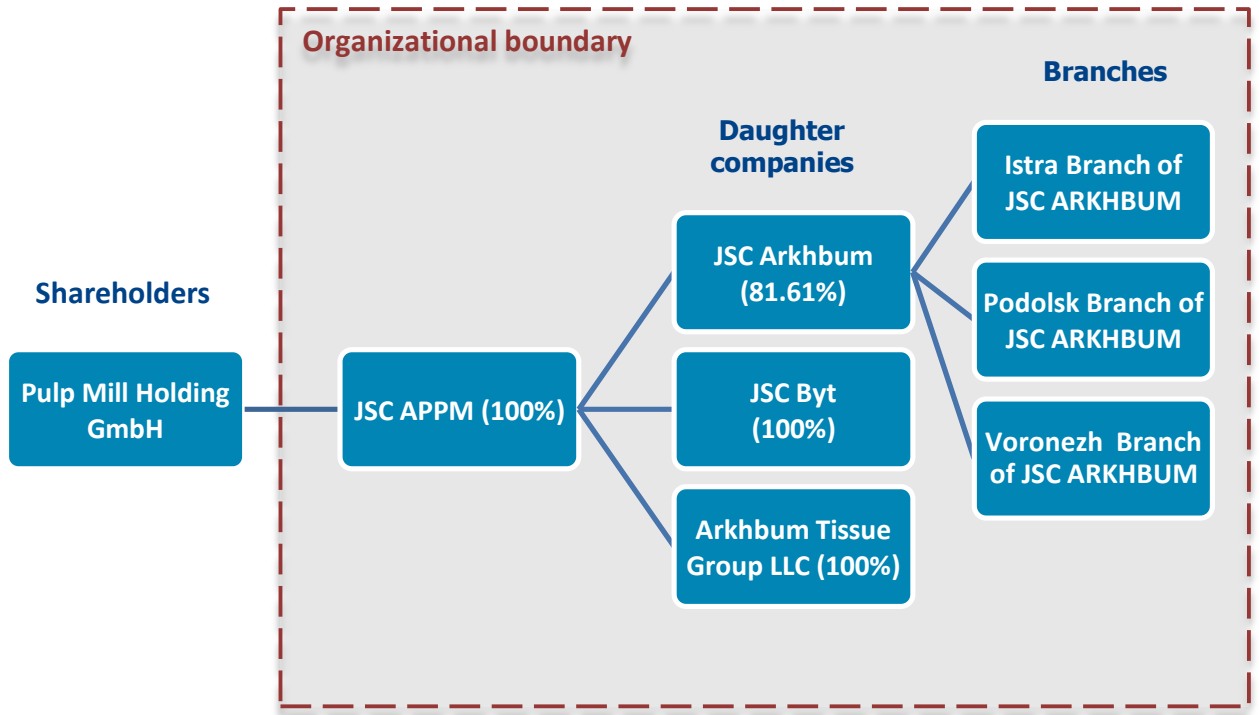


Fig.1. Shareholders and daughter companies of JSC Arkhangel'sk PPM



Fig.2. JSC Arkhangel'sk PPM on the map of Russia

2. OUTLINING THE BOUNDARIES FOR THE GHG REGISTRY

2.1. Organizational boundaries

In accordance with ISO 14064-1:2006 and considering the operational specifics of JSC Arkhangelsk PPM and its affiliated companies, it was decided to establish the organizational boundaries and to consolidate the GHG emissions following the **control approach**, which implies that the organization accounts for all quantified GHG emissions from its industrial facilities over which it has financial or operational control.

So, JSC Arkhangelsk PPM's boundaries for registering GHGs shall comprise all organizations and units mentioned in Section 1.2.¹

2.2. Operational boundaries

Operational boundaries include the following GHG categories (sources):

- Direct GHG emissions (**Scope 1**);
- Energy indirect GHG emissions (**Scope 2**);
- Other indirect GHG emissions (**Scope 3**).

Direct GHG emissions (Scope 1) from JSC Arkhangelsk PPM include:

- Emissions of carbon dioxide (CO₂), methane (CH₄) and nitrogen oxide (N₂O) from stationary fuel combustion;
- Emissions of carbon dioxide (CO₂), methane (CH₄) and nitrogen oxide (N₂O) from mobile fuel combustion;
- Methane emissions (CH₄) from waste handling.

According to ISO 14064-1:2006 (paragraph 4.2.2) carbon dioxide emissions from biomass combustion are accounted for separately and are not included in the total amount of GHG emissions. Refrigerant emissions resulted from leakages for conditioners are insignificant and therefore are not considered.

Table 1 below shows direct emission sources of all industrial facilities included in the organizational boundaries with a breakdown by categories.

¹ Arkhbum Tissue Group and Voronezh branch of Arkhbum are included in the organizational boundaries of Arkhangelsk PPM but excluded from quantification of GHG emissions in the reporting year as the contribution to aggregate direct and indirect GHG emissions from these subdivisions into the total emissions of Arkhangelsk PPM is insignificant. Such approach answers the requirement of paragraph 4.3.1 of standard ISO 14064-1:2006.

Table 1. Direct GHG emission sources at JSC Arkhangelsk PPM

Industrial facility	Categories of GHG emission sources													
	Stationary fuel combustion								Mobile fuel combustion			Use of carbonates		Waste handling
	Fossil fuel					Biomass			Gasoline	Diesel fuel	Liquefied/ compressed gas	CaCO ₃	Na ₂ CO ₃	
	Natural gas	Liquefied gas	Coal	Heavy fuel oil	Diesel fuel	Bark and wood waste	Liquor	Wastewater sludge						
JSC Arkhangelsk PPM (Novodvinsk)	-	✓	✓	✓	-	✓	✓	✓	✓	✓	-	-	-	✓
JSC Byt	-	-	-	-	-	-	-	-	✓	✓	-	-	-	-
Arkbum Tissue Group LLC	NM	-	-	-	NM	-	-	-	-	NM	-	-	-	-
JSC Arkbum (Novodvinsk)	-	-	-	-	-	-	-	-	✓	✓	-	-	-	-
Podolsk Branch of JSC Arkbum	✓	-	-	-	-	-	-	-	✓	✓	✓	-	-	-
Istra Branch of JSC Arkbum	✓	-	-	-	✓	-	-	-	✓	✓	✓	-	-	-
Voronezh Branch of JSC Arkbum	NM	-	-	-	-	-	-	-	NM	NM	-	-	-	-

* NM – The source is excluded from quantification of GHG in the reporting year due to its insignificance

Energy indirect emissions (Scope 2) are typical for most industrial facilities and are related to generation of electric energy, received (imported) from the outside suppliers for own needs of organization (See Table 2).

Table 2. Consumers and suppliers of imported energy

Energy consumer	Energy supplier	Comments
JSC Arkhangelsk PPM (Novodvinsk)	Supplier of electric energy: - PJSC IDGC of the North-West; - LLC TGK-2 Energosbyt	Electricity demand is almost completely covered by in-house generation, and only a small amount of electricity is purchased from a grid company. The Mill's heat demand is entirely met by its own CHPPs 1, 2, 3.
JSC Byt	Supplier of electric energy: - PJSC IDGC of the North-West; - LLC TGK-2 Energosbyt	Electricity demand is covered only from the power grid. All its heat demand is supplied by Arkhangelsk PPM.
Arkhum Tissue Group LLC	Supplier of electric energy: PJSC Kaluga Sales Company	Sources of energy indirect GHG emissions of Arkhum Tissue Group in the reporting year are excluded from the quantification of GHG due to their insignificance
JSC Arkhum (Novodvinsk)	Supplier of electric energy: - PJSC IDGC of the North-West; - LLC TGK-2 Energosbyt	Electricity demand is covered from the power grid. All its heat demand is supplied by Arkhangelsk PPM.
Podolsk Branch of JSC Arkhum	Supplier of electric energy: PJSC Mosenergosbyt	Electricity is supplied from the grid. Heat demand is completely met by the own boiler house.
Istra Branch of JSC Arkhum	Supplier of electric energy: - PJSC Mosenergosbyt; - Municipal enterprise Joint Istra electric networks.	Electricity is supplied from the grid. Heat demand is completely met by the own boiler house.
Voronezh Branch of JSC Arkhum	Supplier of electric energy: JSC AtomSbyt	Sources of energy indirect GHG emissions of the Voronezh Branch of Arkhum in the reporting year are excluded from quantification of GHG due to their insignificance

Other indirect GHG emissions (Scope 3) emissions are characteristic for all industrial units (facilities) of JSC Arkhangelsk PPM including daughter companies and their branches.

In this report only the most significant GHG emissions up the supply chain related to production and transportation of outside resources (raw materials, fuel, chemicals) used in production to the enterprise's gate in the Novodvinsk were taken into consideration for estimation of other indirect emissions (see Table 3). This approach conforms with paragraph 4.2.4 of standard ISO 14064-1:2006.

Table 3. GHG sources considered in category "Other indirect GHG emissions" (Scope 3)

Name of the resource delivered to Arkhangelsk PPM (Novodvinsk)	GHG sources	
	Resource production	Resource transportation
Raw material		
Broadleaf pulpwood	✓	✓
Coniferous pulpwood	✓	✓
Purchased broadleaf chips	✓	✓
Purchased coniferous chips	✓	✓
Fuel		
Diesel fuel	✓	✓
Heavy fuel oil	✓	✓
Vorkuta coal	✓	✓
Khakass coal	✓	✓
Chemicals		
Ammonia water	✓	✓
Quicklime	✓	✓
Sulphuric acid	✓	✓
Sulphur dioxide	✓	✓
Caustic soda	✓	✓
Sodium sulfate	✓	✓
Chlorine	✓	✓
Sodium chlorate	✓	✓

3. BASE YEAR

The year 1990 was selected as the base year for the following reasons:

- The RF Presidential Decree No.752 of September 30, 2013, commissions to the Government of the Russian Federation to ensure that GHG emissions are reduced down to 75% of 1990 levels by the year 2020;
- The year 1990 is also the base year for Russia according to the Kyoto Protocol²;
- Necessary input data for 1990 and the following years are available and can be used to identify sources and estimate GHG emissions;
- It is the year when pulp production volumes hit their historical maximum, which APPM is currently aiming to go back to.

² Russia did not make any quantitative commitments to limit and reduce its GHG emissions during the second Kyoto period (2013-2020), but neither did it bail out of the Kyoto Protocol, and it still remains its full participant.

4. GHG EMISSIONS QUANTIFICATION METHOD

Following the recommendations of the Intergovernmental Panel on Climate Change³ in most cases GHG emissions were estimated using a calculation method that operates with the following formula:

$$E = A \times EF$$

Where E – GHG emissions;

A – data on the company's activity, causes GHG emissions over the reporting period, for example, data related to fuel combustion;

EF – emission factor.

The *First Order Decay* method was used to calculate methane emissions from landfills. *FOD* takes into consideration the specifics of anaerobic decomposition of bio-organic waste over time. The calculations were based on approaches and methods suggested by the IPCC in 2006.⁴

For direct and energy indirect GHG emissions the emissions are calculated separately for each type of GHG (carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O)) in tonnes of CO₂e and finally are summed up.

Other indirect GHG emissions are calculated straight as an aggregate emission in tonnes of CO₂e without separation by GHG types.

³ See 2006 IPCC Guidelines for National Greenhouse Gas Inventories. <http://www.ipcc-nggip.iges.or.jp/public/2006gl/>

⁴ See 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 5, Chapter 3: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/5_Volume5/V5_3_Ch3_SWDS.pdf

5. GHG REGISTRY OUTPUTS

According to the calculations the total direct and energy indirect GHG emissions (Scope 1+2) at JSC Arkhangelsk PPM in the reporting year 2018 was 1 805 399 tCO₂e, that is 1 298 022 tCO₂e lower than in the base year 1990 and 3 353 tCO₂e higher than this figure of the previous year 2017 (see Table 4).

The total direct and energy indirect GHG emissions from JSC Arkhangelsk PPM in 2018 were 17.9% below the company's voluntary emission limit of 2 200 000 tCO₂e per year set for the period up to 2020. It means that in 2018 the **company succeeded in performing its voluntary commitment**.

However, it should be noted that APPM's voluntary GHG emissions limit allowed for an increase in pulp cooking volumes, which was expected to reach up to 1 million tonnes per year by 2020.⁵ However, in reality only 870 260 tonnes of pulp were cooked in 2018, which is 13.0 % less than the planned volume.

In order to bring the projected and actual GHG emissions and pulp cooking volumes down to a common denominator it might be worthwhile to introduce one more parameter: GHG emissions per 1 tonne of cooked pulp.⁶ This is an integral indicator of the product's carbon intensity.

GHG emissions per unit of output that correspond to JSC Arkhangelsk PPM's voluntary commitment are $2\,200\,000/1\,000\,000=2.2$ tCO₂e/tonne of cooked pulp. Actual GHG emissions per unit of output amounted in 2018 to 2.075 tCO₂e/tonne of cooked pulp. So, the carbon intensity of JSC Arkhangelsk PPM's output in 2018 was 5.7% lower the level set by its voluntary commitment.

In the total direct and energy indirect GHG emissions the largest amount (calculated to tCO₂e) is accounted for carbon dioxide – 91.7%, 7.2% for methane and 1.1% for nitrous oxide (see Table 5).

Other indirect GHG emissions are equal 474 989 tCO₂e (see Table 4, 6). Other indirect GHG emissions increased by 53 430 tCO₂e or 12.7% as compared to the previous year 2017.

Total direct and indirect GHG emissions (Scope 1+2+3) at JSC Arkhangelsk PPM in 2018 were 2 280 388 tCO₂e, that is 56 783 tCO₂e or 2.6% higher than the emissions level in 2017.

⁵ Voluntary GHG emissions limit of Arkhangelsk PPM for the period up to 2020 set by the company's climate strategy is related to the sum of direct and energy indirect GHG emissions.

⁶ Only direct and energy indirect emissions are taken into account for calculation of specific GHG emissions.

Table 4. Summary table of GHG emissions, tCO₂e

Emission Categories	1990	2017	2018								Compared to 1990		Compared to 2017	
	APPM	JSC APPM	JSC APPM Novodvinsk	JSC Byt	Arkhubum Tissue Group LLC	JSC Arkhubum Novodvinsk	Branches of JSC Arkhubum			Total for JSC Arkhangelsk PPM	tCO ₂ e	%	tCO ₂ e	%
							Podolsk	Istra	Voronezh.					
DIRECT GHG EMISSIONS (SCOPE 1)	3 008 936	1 791 298	1 779 321	27	NM	3 536	5 012	5 390	NM	1 793 286	-1 215 650	-40,4%	1 988	0,1%
Stationary fuel combustion	2 909 045	1 648 640	1 640 534	–	NM	–	4 569	4 948	NM	1 650 051	-1 258 994	-43,3%	1 411	0,1%
Mobile fuel combustion	15 187	10 476	13 173	27	NM	3 536	443	442	NM	17 621	2 434	16,0%	7 145	68,2%
Industrial processes (use of carbonates)	30 383	1 580	0	–	–	–	–	–	–	0	-30 383	-100,0%	-1 580	-100,0%
Leakage (waste management)	54 321	130 602	125 614	–	–	–	–	–	–	125 614	71 293	131,2%	-4 988	-3,8%
ENERGY INDIRECT GHG EMISSIONS (SCOPE 2)	94 485	10 748	1 870	394	NM	125	3 851	5 873	NM	12 113	-82 372	-87,2%	1 365	12,7%
TOTAL DIRECT AND ENERGY INDIRECT GHG EMISSIONS (SCOPE 1+2)	3 103 421	1 802 046	1 781 191	421	NM	3 661	8 863	11 263	NM	1 805 399	-1 298 022	-41,8%	3 353	0,2%
OTHER INDIRECT GHG EMISSIONS (SCOPE 3)	NE	421 559	474 989	NE	NE	NE	NE	NE	NE	474 989	–	–	53 430	12,7%
TOTAL DIRECT AND INDIRECT GHG EMISSIONS (SCOPE 1+2+3)	NE	2 223 605	2 256 180	NE	NE	NE	NE	NE	NE	2 280 388	–	–	56 783	2,6%
Emissions with sold energy	528 105	137 381	135 041	–	–	–	–	–	–	135 041	-393 064	-74,4%	-2 340	-1,7%
CO ₂ emissions from biomass combustion	1 274 993	1 548 201	1 533 082	–	–	–	–	–	–	1 533 082	258 089	20,2%	-15 119	-1,0%

NE- not estimated

NM - not material

Table 5. Distribution of direct and energy indirect emissions by GHG types

Категории источников выбросов	GHG Emissions in 2018							
	CO ₂		CH ₄		N ₂ O		Total	
	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%	tCO ₂ e	%
DIRECT GHG EMISSIONS (SCOPE 1)	1 643 509	91,6%	130 723	7,3%	19 054	1,1%	1 793 286	100,0%
Stationary fuel combustion	1 626 193	98,6%	5 066	0,3%	18 792	1,1%	1 650 051	100,0%
Mobile fuel combustion	17 316	98,3%	43	0,2%	262	1,5%	17 621	100,0%
Industrial processes (use of carbonates)	–	–	–	–	–	–	–	–
Leakage (waste management)	–	–	125 614	100,0%	–	–	125 614	100,0%
ENERGY INDIRECT GHG EMISSIONS (SCOPE 2)	12 113	100,0%	–	–	–	–	12 113	100,0%
TOTAL DIRECT AND ENERGY INDIRECT GHG EMISSIONS (SCOPE 1+2)	1 655 622	91,7%	130 723	7,2%	19 054	1,1%	1 805 399	100,0%
Emissions with sold energy	134 411	99,53%	32	0,02%	598	0,45%	135 041	100,0%
CO ₂ emissions from biomass combustion	1 533 082	100,0%	–	–	–	–	1 533 082	100,0%

Table 6. Other indirect GHG emissions

Name of the delivered resource	Other indirect GHG emissions related to production and transportation of outside resources					
	2017		2018		Variation compared to 2017	
	t CO ₂ e	% (by Scope 3)	t CO ₂ e	% (by Scope 3)	t CO ₂ e	%
Broadleaf pulpwood	67 036	15.9%	89 747	18.9%	22 711	33.9%
Coniferous pulpwood	38 323	9.1%	53 287	11.2%	14 964	39.0%
Purchased broadleaf chips	1 953	0.5%	2 458	0.5%	505	25.8%
Purchased coniferous chips	13 883	3.3%	23 200	4.9%	9 317	67.1%
Raw materials, total	121 195	28.7%	168 692	35.5%	47 497	39.2%
Diesel fuel	608	0.1%	2 968	0.6%	2 360	388.1%
Heavy fuel oil	28 242	6.7%	27 169	5.7%	-1 073	-3.8%
Vorkuta coal	84 771	20.1%	80 435	16.9%	-4 336	-5.1%
Khakass coal	91 340	21.7%	101 537	21.4%	10 197	11.2%
Fuel, total	204 961	48.6%	212 109	44.7%	7 148	3.5%
Ammonia water	3 517	0.8%	2 967	0.6%	-550	-15.6%
Quicklime	7 610	1.8%	4 859	1.0%	-2 751	-36.1%
Sulphuric acid	1 876	0.4%	2 020	0.4%	144	7.7%
Sulphur dioxide	2 520	0.6%	2 590	0.5%	70	2.8%
Caustic soda	26 371	6.3%	24 049	5.1%	-2 322	-8.8%
Sodium sulfate	2 487	0.6%	2 898	0.6%	411	16.5%
Chlorine	3 472	0.8%	3 882	0.8%	410	11.8%
Sodium chlorate	47 550	11.3%	50 923	10.7%	3 373	7.1%
Chemicals, total	95 403	22.6%	94 188	19.8%	-1 215	-1.3%
TOTAL	421 559	100.0%	474 989	100.0%	53 430	12.7%

The company's key performance indicators were analyzed in order to identify the reasons for changes in emissions in regard to the base and the previous year.

The analysis has shown that the key factors that contributed to reduction in total direct and energy indirect GHG emissions from JSC Arkhangelsk PPM in 2018 as against 1990 base year are as follows:

- Larger proportion increase of biomass in the fuel mix which raised from 28.1% to 46.2%;
- reduction in energy intensity of production at JSC Arkhangelsk PPM in Novodvinsk (in terms of heat consumption – by 33.0%, and in terms of power consumption by 18.2%);
- 5.6% decline in pulp cooking, from 921 500 tonnes down to 870 260 tonnes;
- reduction in electricity consumption from outside sources by 91.1%, from 232 721 MWh down to 20 752 MWh.

The key factors that determined the increase in GHG emissions at JSC Arkhangelsk PPM in 2018 as compared to the previous year 2017 are as follows:

- growth in pulp cooking by 7 245 tonnes or 0.8%;
- extension of the park of its own transport by Arkhangelsk PPM (Novodvinsk) as a result of joining Auto-Transport Enterprise;
- increase of output by the Istra Branch of Arkhbum – by 38 845 thousand m² or by 24,6%.

The most important contribution in the growth of indirect GHG emissions in 2018 compared to 2017 was made by the increase of deliveries of broadleaf pulpwood (by 242 318 m³ of dense timber or by 14,3%) and coniferous pulpwood (by 90 720 m³ of dense timber or by 8,1%).

6. VERIFICATION RESULTS

GHG emissions reports for 2012-2018 were verified according to ISO 14064-1:2006 standard.

The verifications were carried out by Bureau Veritas Certification Rus with the reasonable (justified) level of assurance.

By the results of each verification JSC Arkhangelsk PPM received the certificate and expert conclusion which certifies that GHG emissions management system and data on GHG emissions volume answer the requirements of the international standard ISO 14064-1:2006 (see Annex 1).

7. IMPLEMENTATION OF GHG EMISSIONS REDUCTION PROJECTS

According to the adopted climate strategy for the period till 2020 JSC Arkhangel'sk PPM implements or plans to implement a number of GHG emissions reduction projects at the production site in Novodvinsk.

By the results of 2018 total GHG emissions reduction for 2018 from the implementation of carbon projects was 342,1 thousand tCO₂e (see Table 7).

Table 7. The implementation process of GHG emissions reduction projects

Project	Implementation status	GHG emissions reduction in 2018, tCO ₂ e
Biomass waste utilization		
Biomass-to-energy project at CHPP-3	Implemented in 2000-2005	151 844
Construction of new multifuel boiler in CHPP-1	Implemented in 2014	79 209
Construction of wastewater sludge dewatering unit Flottweg	Implemented in 2015	21 852
Utilization of undercooked pulp produced at cellulose production	Implemented in 2017	73
Energy saving		
Upgrade of cardboard-making machines	In the process of implementation	25 782
Upgrade of washing unit at cellulose production department	Implemented in 2014	49 970
Construction of evaporator plant	In the process of implementation	–
Lower carbonate consumption		
Construction of new sulfate semi-chemical pulp plant	Implemented in 2015	5 437
Replacement of crushed limestone used in the lime kilns-3,4 with quicklime	Implemented in 2017	7 971
Total GHG emissions reduction in 2018		342 138

ANNEX 1. GREENHOUSE GASES VERIFICATION STATEMENT

BUREAU VERITAS
Certification



Greenhouse Gases verification statement

JSC Arkhangelsk Pulp and Paper Mill

Address: 164900, Melnikov str.1, Novodvinsk, Arkhangelsk Region, Russia

Bureau Veritas Certification Holdings hereby confirms that the Greenhouse Gas management system and the reported quantity of Greenhouse Gas emissions of the above organization in 2018 comply with the requirements of ISO 14064-1: 2006, and GHG Monitoring Plan.

Organization boundary:

- JSC Arkhangelsk Pulp and Paper Mill, the main industrial site in Novodvinsk
address: 1, Melnikov street, Novodvinsk, Arkhangelsk Region, 164900
- JSC Byt
address: bld. 2, 15, Frontovyykh Brigad street, Novodvinsk, Arkhangelsk Region, 164900
- Arkhbum Tissue Group LLC
address: 14, Molodyozhnaya street, Vorsino village, Borovsky District, Kaluga Region, 249020
- JSC Arkhbum, Head office
address: 1, Melnikov street, Novodvinsk, Arkhangelsk Region, 164900
- JSC Arkhbum, Podolsk branch
address: 5a, Vishnyovaya street, Podolsk, Moscow Region, 142111
- JSC Arkhbum, Istra branch
address: 206, Leshkovo village, Pavlo-Slobodskoye settlement, Istra District, Moscow Region, 143581
- JSC Arkhbum, Voronezh branch
address: 1, 1-st Parkovaya str., Industrial Park "Maslovsky", Novousmanskyy district, Voronezh region, 396333

Total emissions of greenhouse gases of JSC Arkhangelsk Pulp and Paper Mill for 2018 are calculated with an uncertainty of 7.8% and amount to **2,280,388 tonnes of CO₂-eq**, including:

Direct emissions, t CO ₂ e	1,793,286
Energy indirect emissions, t CO ₂ e	12,113
Indirect GHG emissions upwards supply chain, t CO ₂ e	474,989

Emissions from biomass, t CO ₂ e	1,533,082
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Conclusion limitations:

materiality threshold - 5% total emission; level of assurance – reasonable

Lead Verifier:



Nechaev V.V.

Date: 16/12/2019

Issuing office address: **Bureau Veritas Certification Rus JSC**

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