

# GREENHOUSE GAS EMISSIONS REPORT 2020



АРХАНГЕЛЬСКИЙ  
ЦЕЛЛЮЛОЗНО-БУМАЖНЫЙ  
КОМБИНАТ



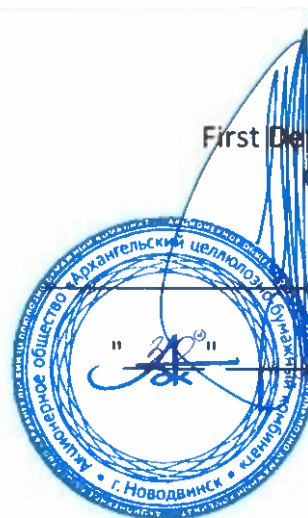
APPROVED

First Deputy General Director -  
Chief Operating Officer  
JSC Arkhangelsk PPM

D.V.Khrapach

2021

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# JSC ARKHANGELSK PPM GREENHOUSE GAS EMISSIONS REPORT 2020

IN COMPLIANCE WITH THE GREENHOUSE GAS PROTOCOL: A CORPORATE  
ACCOUNTING AND REPORTING STANDARD

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## INTRODUCTION

This report has been produced by CarbonLab 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, 2020, to December 31, 2020, in compliance with the requirements of the Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard.

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 an independent expert organization 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 CO<sub>2</sub>e 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 CO<sub>2</sub>e 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 CO<sub>2</sub>e. **According to the calculations performed, this obligation was successfully fulfilled in the reporting year 2020 (for more details, see Section 5).**

Since 2013 GHG emissions reports of JSC Arkhangelsk PPM have been annually verified by an independent auditing company, which has an appropriate license for this. By the results of each verification the organization receives expert conclusion which certifies that the corporate GHG emissions management system and the quantification of GHG emissions meet the requirements of international carbon standards.

Since 2014, the company has been annually disclosing information on its climate activities in the framework of the CDP reporting system (The Carbon Disclosure Project - an international project for the disclosure of data on greenhouse gas emissions).

Since 2016 JSC Arkhangelsk PPM has annually calculated the carbon footprint of its end products and services according to international standard ISO/TS 14067:2018 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 (Scope 1) and energy indirect (Scope 2) GHG emissions by 55% by 2030 compared to 1990 – up to 1.4 Mt CO<sub>2</sub>e per year. It is necessary to reduce other indirect emissions (Scope 3) under the strategy by 20% by 2030 compared to 2015 up to 370 000 tCO<sub>2</sub>e per year.

In 2019, as part of its low-carbon development strategy for the period up to 2030, Arkhangelsk PPM sent an official statement to SBTi of its intention to establish a scientifically based GHG emission reduction target that would meet the goals and objectives of the Paris Agreement in terms of mitigating climate change.

In 2021, the order “On the GHG Emissions Management System of Arkhangelsk PPM JSC” was approved. The order establishes the composition of the working group and the personal duties and powers of persons responsible for accounting and management of GHG emissions and carbon intensity of manufactured commercial products of Arkhangelsk PPM, including branches and subsidiaries.

# 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. In June 2016 the enterprise was renamed into Arkhangelsk Pulp and Paper Mill Joint Stock Company (abbreviated as Arkhangelsk PPM JSC).

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 operates according to ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007 и ISO 45001:2018.

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

Web-site: [www.appm.ru](http://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 five daughter companies <sup>1</sup> (See Fig.1, 2):

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

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<sup>1</sup> In this report, for the purposes of inventory of GHG emissions, only those company's organizations and units are considered that operated in the reporting 2020.

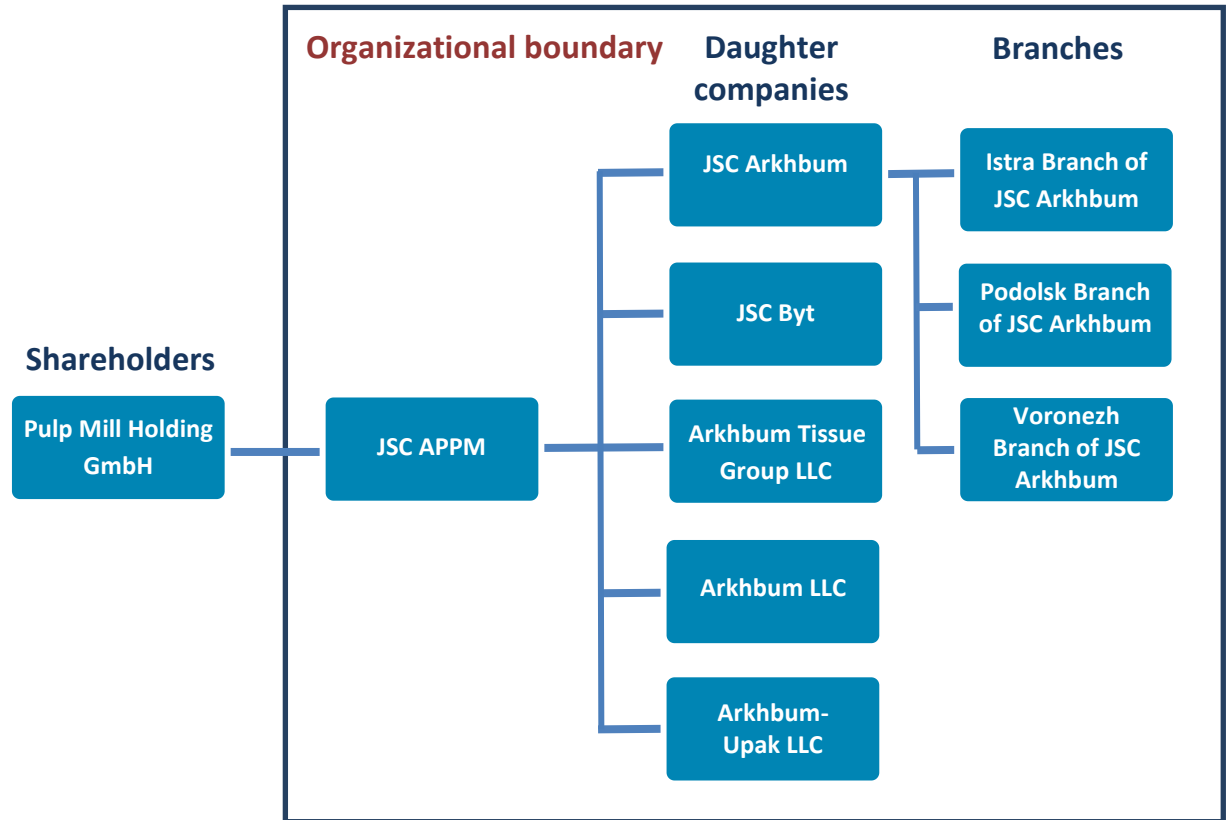


Fig.1. Shareholders and daughter companies of JSC Arkhangel'sk PPM



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 GHG Protocol 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.

### 2.2. Operational boundaries

According to the GHG Protocol, defining operational boundaries involves identifying the GHG emissions associated with an organization's activities and dividing them into the following 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 (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrogen oxide (N<sub>2</sub>O) from stationary fuel combustion;
- Emissions of carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrogen oxide (N<sub>2</sub>O) from mobile fuel combustion;
- Methane leakage (CH<sub>4</sub>) from waste handling.

According to GHG Protocol (Chapter 9) 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 from 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.

Table 1. Direct GHG emission sources in 2020

Industrial facility	Categories of GHG emission sources											
	Stationary fuel combustion								Mobile fuel combustion			Methane leakage (waste handling)
	Fossil fuel					Biomass			Gasoline	Diesel fuel	Liquefied/ compressed gas	
	Natural gas	Liquefied gas	Coal	Heavy fuel oil	Diesel fuel	Bark and wood waste	Liquor	Wastewater sludge				
JSC Arkhangelsk PPM (Novodvinsk)	-	✓	✓	✓	-	✓	✓	✓	✓	✓	-	✓
JSC Byt	-	-	-	-	-	-	-	-	✓	-	-	-
Arkhum Tissue Group LLC	✓	-	-	-	✓	-	-	-	✓	-	✓	-
Arkhum LLC (Novodvinsk)	-	-	-	-	-	-	-	-	-	✓	-	-
Podolsk Branch of JSC Arkhum	✓	-	-	-	-	-	-	-	✓	✓	✓	-
Istra Branch of JSC Arkhum	✓	-	-	-	✓	-	-	-	✓	-	✓	-
Voronezh Branch of JSC Arkhum	✓	-	-	-	-	-	-	-	✓	✓	-	-
Arkhum-Upak LLC	✓	-	-	-	-	-	-	-	✓	✓	-	-

**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 of imported energy in 2020**

Energy consumer	Consumption of energy from the outside suppliers		Comments
	Electricity	Heat	
JSC Arkhangelsk PPM (Novodvinsk)	✓	–	Electricity demand of JSC Arkhangelsk PPM (Novodvinsk) 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. No heat is delivered from an outside supplier.
JSC Byt	✓	–	Electricity demand of JSC Byt is covered only from the power grid.  All its heat demand is supplied by Arkhangelsk PPM.
Arkhum Tissue Group LLC	✓	–	Electricity demand of Arkhum Tissue Group LLC is covered from the power grid.  Heat demand is completely met by the own boiler house.
Arkhum LLC (Novodvinsk)	✓	–	Electricity demand of Arkhum LLC (Novodvinsk) is covered from the power grid.  All its heat demand is supplied by Arkhangelsk PPM.
Podolsk Branch of JSC Arkhum	✓	–	Electricity demand of Podolsk Branch of JSC Arkhum is covered from the power grid.  Heat demand is completely met by the own boiler house.
Istra Branch of JSC Arkhum	✓	–	Electricity demand of Istra Branch of JSC Arkhum is covered only from the power grid.  Heat demand is completely met by the own boiler house.
Voronezh Branch of JSC Arkhum	✓	–	Electricity demand of Voronezh Branch of JSC Arkhum is covered only from the power grid.  Heat demand is completely met by the own boiler house.
Arkhum-Upak LLC	✓	–	Electricity demand of Arkhum-Upak LLC is covered only from the power grid.  Heat demand is completely met by the own boiler house.

**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 GHG Protocol standard according to which other indirect GHG emissions are not obligatory for calculation.

**Table 3. GHG sources considered in category "Other indirect GHG emissions" (Scope 3) in 2020**

Name of the resource delivered to Arkhangelsk PPM (Novodvinsk)	GHG sources	
	Resource production	Resource production
<b>Raw material</b>		
Broadleaf pulpwood	✓	✓
Coniferous pulpwood	✓	✓
Purchased broadleaf chips	✓	✓
Purchased coniferous chips	✓	✓
<b>Fuel</b>		
Diesel fuel	✓	✓
Heavy fuel oil	✓	✓
Vorkuta coal	✓	✓
Khakass coal	✓	✓
Kuznetsk coal	✓	✓
<b>Chemicals</b>		
Ammonia water	✓	✓
Quicklime	✓	✓
Sulphuric acid	✓	✓
Glue	✓	✓
Bleach	✓	✓
Hydrogen peroxide	✓	✓
Sulphur dioxide	✓	✓
Caustic soda	✓	✓
Sodium sulfate	✓	✓
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 Protocol;<sup>2</sup>
- Necessary input data for 1990 and the following years are available and can be used to identify sources and estimate GHG emissions.

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<sup>2</sup> 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 Change<sup>3</sup>, 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, that 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.<sup>4</sup>

For direct and energy indirect GHG emissions the emissions are calculated separately for each type of GHG (carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O)) in tonnes of CO<sub>2</sub>e and finally are summed up.

Other indirect GHG emissions are calculated straight as an aggregate emission in tonnes of CO<sub>2</sub>e without separation by GHG types.

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

<sup>4</sup> 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](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 2020 was 1 959 242 tCO<sub>2</sub>e, that is 1 144 179 tCO<sub>2</sub>e lower than in the base year 1990 and 113 457 tCO<sub>2</sub>e higher than this figure of the previous year 2019 (see Table 4).

The yearly pulp cooking volume at JSC Arkhangelsk PPM increased by 177 985 or 21.8% compared to the previous year and reached 993 555 that updated the historical maximum of 1990 - 921 500 t.

The reporting year 2020 is the target year for limiting the volume of GHG emissions in accordance with the climate strategy of JSC Arkhangelsk PPM, approved in 2013. The company's voluntary emission<sup>5</sup> limit set by the strategy is 2 200 000 tCO<sub>2</sub>e per year with increase of cooked pulp up to 1 million tonnes per year. The corresponding GHG emissions per unit of output should not exceed 2.2 tCO<sub>2</sub>e/tonne of cooked pulp.

The sum of direct and energy indirect GHG emissions of JSC Arkhangelsk PPM in 2020 was 240 758 tCO<sub>2</sub>e or 10.9% lower the level set by its voluntary commitment. Actual GHG emissions amounted in 2020 to 1.972 tCO<sub>2</sub>e/tonne 0.228 tCO<sub>2</sub>e/tonne (-10.4%) lower the level set by its voluntary commitment.

**Thus, the voluntary commitment of JSC Arkhangelsk PPM to limit GHG emissions for the period up to 2020 was successfully fulfilled.**

In the total direct and energy indirect GHG emissions the largest amount (calculated to tCO<sub>2</sub>e) is accounted for carbon dioxide – 92.8%, 6.2% for methane and 1.0% for nitrous oxide (see Table 5).

Other indirect GHG emissions (Scope 3) are equal 438 907 tCO<sub>2</sub>e (see Table 6). Other indirect GHG emissions decreased by 1 734 tCO<sub>2</sub>e or 0.4% as compared to the previous year 2019.

Total direct and indirect GHG emissions (Scope 1+2+3) at JSC Arkhangelsk PPM in 2020 were 2 398 149 tCO<sub>2</sub>e, that is 111 723 tCO<sub>2</sub>e or 4.9% higher than the emissions level in 2019.

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<sup>5</sup> Voluntary GHG emissions limit of Arkhangelsk PPM is related to the sum of direct and energy indirect GHG emissions. Other indirect emissions are not taken into consideration.

**Table 4. Summary table of GHG emissions, tCO<sub>2</sub>e**

Emission Categories	GHG Emissions, tCO <sub>2</sub> e			Compared to 1990		Compared to 2019	
	1990	2019	2020	tCO <sub>2</sub> e	%	tCO <sub>2</sub> e	%
<b>Direct GHG Emissions (Scope 1)</b>	3 008 936	1 827 233	1 899 553	-1 109 383	-36,9%	72 320	4,0%
JSC Arkhangelsk PPM (Novodvinsk)	3 008 936	1 810 635	1 863 483	-1 145 453	-38,1%	52 848	2,9%
JSC Byt	–	25	15	15	–	-10	-40,0%
Arkhbum Tissue Group LLC	–	1 937	20 445	20 445	–	18 508	955,5%
Arkhbum LLC (Novodvinsk)	–	826	1 755	1 755	–	929	112,5%
Podolsk Branch of JSC Arkhbum	–	4 637	4 143	4 143	–	-494	-10,7%
Istra Branch of JSC Arkhbum	–	6 088	6 033	6 033	–	-55	-0,9%
Voronezh Branch of JSC Arkhbum	–	3 085	3 663	3 663	–	578	18,7%
Arkhbum-Upak LLC	–	–	16	16	–	16	–
<b>Energy Indirect GHG Emissions (Scope 2)</b>	94 485	18 552	59 689	-34 796	-36,8%	41 137	221,7%
JSC Arkhangelsk PPM (Novodvinsk)	94 485	2 812	7 815	-86 670	-91,7%	5 003	177,9%
JSC Byt	–	389	256	256	–	-133	-34,2%
Arkhbum Tissue Group LLC	–	2 453	36 859	36 859	–	34 406	1402,6%
Arkhbum LLC (Novodvinsk)	–	50	88	88	–	38	76,0%
Podolsk Branch of JSC Arkhbum	–	3 774	3 796	3 796	–	22	0,6%
Istra Branch of JSC Arkhbum	–	6 216	7 223	7 223	–	1 007	16,2%
Voronezh Branch of JSC Arkhbum	–	2 858	3 467	3 467	–	609	21,3%
Arkhbum-Upak LLC	–	–	185	185	–	185	–
<b>Total Direct and Energy Indirect GHG Emissions (Scope 1+2)</b>	<b>3 103 421</b>	<b>1 845 785</b>	<b>1 959 242</b>	<b>-1 144 179</b>	<b>-36,9%</b>	<b>113 457</b>	<b>6,1%</b>
JSC Arkhangelsk PPM (Novodvinsk)	3 103 421	1 813 447	1 871 298	-1 232 123	-39,7%	57 851	3,2%
JSC Byt	–	414	271	271	–	-143	-34,5%
Arkhbum Tissue Group LLC	–	4 390	57 304	57 304	–	52 914	1205,3%
Arkhbum LLC (Novodvinsk)	–	876	1 843	1 843	–	967	110,4%
Podolsk Branch of JSC Arkhbum	–	8 411	7 939	7 939	–	-472	-5,6%
Istra Branch of JSC Arkhbum	–	12 304	13 256	13 256	–	952	7,7%
Voronezh Branch of JSC Arkhbum	–	5 943	7 130	7 130	–	1 187	20,0%
Arkhbum-Upak LLC	–	–	201	201	–	201	–
<b>Other Indirect GHG Emissions (Scope 3)</b>	NE	440 641	438 907	–	–	-1 734	-0,4%
<b>Total Direct and Indirect GHG Emissions (Scope 1+2+3)</b>	<b>NE</b>	<b>2 286 426</b>	<b>2 398 149</b>	<b>–</b>	<b>–</b>	<b>111 723</b>	<b>4,9%</b>
GHG Emissions from Sold Energy	528 105	118 288	120 861	-407 244	-77,1%	2 573	2,2%
CO <sub>2</sub> Emissions from Biomass Combustion	1 274 993	1 388 689	1 598 736	323 743	25,4%	210 047	15,1%



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

Emission Categories	GHG Emissions in 2020										
	Metric tons			tCO <sub>2</sub> e							
	t CO <sub>2</sub>	t CH <sub>4</sub>	t N <sub>2</sub> O	CO <sub>2</sub>		CH <sub>4</sub>		N <sub>2</sub> O		Total	
				tCO <sub>2</sub> e	%	tCO <sub>2</sub> e	%	tCO <sub>2</sub> e	%	tCO <sub>2</sub> e	%
<b>Direct GHG Emissions (Scope 1)</b>	<b>1 758 068</b>	<b>4 859</b>	<b>67</b>	<b>1 758 068</b>	<b>92,6%</b>	<b>121 478</b>	<b>6,4%</b>	<b>20 007</b>	<b>1,0%</b>	<b>1 899 553</b>	<b>100,0%</b>
Stationary Fuel Combustion	1 733 539	209	66	1 733 539	98,6%	5 218	0,3%	19 633	1,1%	1 758 390	100,0%
Mobile Fuel Combustion	24 529	2	1	24 529	98,3%	54	0,2%	374	1,5%	24 957	100,0%
Industrial Processes (Use of Carbonates)	–	–	–	–	–	–	–	–	–	–	–
Leakage (Waste Management)	–	4 648	–	–	–	116 206	100,0%	–	–	116 206	100,0%
<b>Energy Indirect GHG Emissions (Scope 2)</b>	<b>59 689</b>	<b>–</b>	<b>–</b>	<b>59 689</b>	<b>100,0%</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>–</b>	<b>59 689</b>	<b>100,0%</b>
<b>Total Direct and Energy Indirect GHG Emissions (Scope 1+2)</b>	<b>1 817 757</b>	<b>4 859</b>	<b>67</b>	<b>1 817 757</b>	<b>92,8%</b>	<b>121 478</b>	<b>6,2%</b>	<b>20 007</b>	<b>1,0%</b>	<b>1 959 242</b>	<b>100,0%</b>
GHG Emissions from Sold Energy	120 301	1	2	120 301	99,54%	29	0,02%	531	0,44%	120 861	100,0%
CO <sub>2</sub> Emissions from Biomass Combustion	1 598 736	–	–	1 598 736	100,0%	–	–	–	–	1 598 736	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					
	2019		2020		Variation compared to 2019	
	t CO <sub>2</sub> e	%	t CO <sub>2</sub> e	%	t CO <sub>2</sub> e	%
Broadleaf pulpwood	72 977	16,6%	71 025	16,2%	-1 952	-2,7%
Coniferous pulpwood	37 052	8,4%	52 823	12,0%	15 771	42,6%
Purchased broadleaf chips	2 347	0,5%	2 376	0,5%	29	1,2%
Purchased coniferous chips	28 867	6,6%	31 494	7,2%	2 627	9,1%
<b>Raw materials, total</b>	<b>141 244</b>	<b>32,1%</b>	<b>157 719</b>	<b>35,9%</b>	<b>16 475</b>	<b>11,7%</b>
Diesel fuel	4 131	0,9%	4 972	1,1%	841	20,4%
Heavy fuel oil	25 394	5,8%	28 811	6,6%	3 417	13,5%
Vorkuta coal	74 486	16,9%	89 694	20,4%	15 208	20,4%
Khakass coal	102 850	23,3%	91 051	20,7%	-11 800	-11,5%
Kusnetsk coal	924	0,2%	913	0,2%	-11	-1,1%
<b>Fuel, total</b>	<b>207 785</b>	<b>47,2%</b>	<b>215 441</b>	<b>49,1%</b>	<b>7 656</b>	<b>3,7%</b>
Ammonia water	3 222	0,7%	2 780	0,6%	-442	-13,7%
Quicklime	4 553	1,0%	6 803	1,6%	2 250	49,4%
Sulphuric acid	1 910	0,4%	1 717	0,4%	-193	-10,1%
Glue	<i>NM</i>	<i>NM</i>	3 064	0,7%	3 064	–
Bleach	<i>NM</i>	<i>NM</i>	7 600	1,7%	7 600	–
Hydrogen peroxide	<i>NM</i>	<i>NM</i>	2 017	0,5%	2 017	–
Sulphur dioxide	2 734	0,6%	982	0,2%	-1 751	-64,1%
Caustic soda	20 266	4,6%	21 147	4,8%	881	4,3%
Sodium sulfate	2 647	0,6%	2 181	0,5%	-466	-17,6%
Chlorine	3 055	0,7%	0	0,0%	-3 055	-100,0%
Sodium chlorate	53 228	12,1%	17 456	4,0%	-35 772	-67,2%
<b>Chemicals, total</b>	<b>91 613</b>	<b>20,8%</b>	<b>65 748</b>	<b>15,0%</b>	<b>-25 865</b>	<b>-28,2%</b>
<b>TOTAL</b>	<b>440 641</b>	<b>100,0%</b>	<b>438 907</b>	<b>100,0%</b>	<b>-1 734</b>	<b>-0,4%</b>

\**NM* – non-material

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 2019 as against 1990 base year are as follows:

- **increase of biomass in the fuel mix from 28.1% to 45,7%;**
- **reduction in energy intensity of production at JSC Arkhangelsk PPM in Novodvinsk (in terms of heat consumption – by 37.1%, and in terms of power consumption by 21.2%);**
- **reduction in electricity consumption from outside sources by 56.6%, from 232 721 MWh down to 100 993 MWh.**

The key factors that determined the increase in total direct and energy indirect GHG emissions at JSC Arkhangelsk PPM in 2020 as compared to the previous year 2019 are as follows:

- **increase of cooking volumes at the plant by 177 985 or 21.8%;**
- **increase of the volume of commercial products of Arkhbum Tissue Group LLC by 682%.<sup>6</sup>**

Other indirect GHG emissions Scope 3 in 2020 compared to 2019 changed insignificantly – the decrease was 1 734 tCO<sub>2</sub>e or 0.4%.

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<sup>6</sup> <https://bumazhnik.ru/2021/02/13/602afb47de2e01ae3329dee2.html>

## 6. VERIFICATION RESULTS

Since 2013 GHG emissions reports of JSC Arkhangelsk PPM have been annually verified by an independent auditing company. In the process of verification, the corporate GHG emissions management system and the results of GHG emissions quantification are verified according to the requirements of international carbon standards.

Principal data on the organization's GHG emissions verification for the base year 1990 and 2012-2020 are shown in Table 7.

**Table 1. Verification data on GHG emissions of JSC Arkangesk PPM**

Reporting year	Name of the applied standard		Level of assurance	Auditing company
	GHG emissions estimation (report preparation)	Verification of the GHG emissions report		
1990 (base year)	ISO 14064-1:2006 GOST R ISO 14064-1-2007	ISO 14064-3:2006 GOST R ISO 14064-3-2007	Reasonable	Bureau Veritas Certification Rus
2012-2018	ISO 14064-1:2006 GOST R ISO 14064-1-2007	ISO 14064-3:2006 GOST R ISO 14064-3-2007	Reasonable	Bureau Veritas Certification Rus
2019-2020	GHG Protocol	ISAE 3410	Limited	KPMG

Verification statement of KPMG confirming limited level of assurance of the data on GHG emissions of JSC Arkhangelsk PPM for 2020 is attached below in Annex 1.

## 7. IMPLEMENTATION OF GHG EMISSIONS REDUCTION PROJECTS

According to the adopted climate strategy for the period till 2030 JSC Arkhangelsk PPM implements or plans to implement a number of GHG emissions reduction projects at the production site in Novodvinsk.

By the results of 2020 total GHG emissions reduction for 2020 from the implementation of carbon projects was 370.7 thousand tCO<sub>2</sub>e (see Table 8).

**Table 8. The implementation process of GHG emissions reduction projects**

Project	Implementation status	GHG emissions reduction in 2020, tCO <sub>2</sub> e
<b>Biomass waste utilization</b>		
Biomass-to-energy project at CHPP-3	Implemented in 2000-2005	168 689
Construction of new multifuel boiler in CHPP-1	Implemented in 2014	93 921
Construction of wastewater sludge dewatering unit Flottweg	Implemented in 2015	33 291
Utilization of undercooked pulp produced at cellulose production	Implemented in 2017	608
<b>Energy saving</b>		
Upgrade of cardboard-making machines	Implemented in 2020	39 970
Upgrade of washing unit at cellulose production department	Implemented in 2014	26 891
Construction of evaporator plant	Implemented in 2019	–
<b>Lower carbonate consumption</b>		
Construction of new sulfate semi-chemical pulp plant	Implemented in 2015	–
Replacement of crushed limestone used in the lime kilns-3,4 with quicklime	Implemented in 2017	7 349
<b>Total GHG emissions reduction in 2020</b>	–	<b>370 719</b>

# ANNEX 1. VERIFICATION STATEMENT



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## Independent Practitioner's Limited Assurance Report in relation to Information on Greenhouse Gas Emissions of JSC «Arkhangelsk Pulp & Paper Mill» for 2020

To Shareholders of JSC «Arkhangelsk Pulp & Paper Mill»

### *Introduction*

We were engaged by the Management of JSC «Arkhangelsk Pulp & Paper Mill» (hereinafter – the "Management") to undertake a limited assurance engagement on the information on direct greenhouse gas emissions, indirect energy greenhouse gas emissions, other indirect greenhouse gas emissions, greenhouse gas emissions from sold energy and CO<sub>2</sub> greenhouse gas emissions from biomass combustion for 2020 (hereinafter – the "information on GHG emissions") in the attached Greenhouse Gas Emissions Report of JSC Arkhangelsk PPM for 2020 (hereinafter – the "Report") with a conclusion providing limited assurance that nothing has come to our attention that causes us to believe that the Management's Statement that the information on GHG emissions is prepared in accordance with the applicable criteria (set out below in "Applicable Criteria" section of this report) and is free from material misstatement, is not, in all material respects, fairly stated.

The information on GHG emissions of the Company is presented in the attached Report in Table 4 «Summary table of GHG emissions, t CO<sub>2</sub>e». Our conclusion does not extend to any other information provided in the Report.

### *Management's Responsibility*

Management is responsible for the preparation of the information on GHG emissions in accordance with the applicable criteria (set out below in section "Applicable Criteria" section of this report) and for all information contained therein.

This responsibility includes designing, implementing and maintaining the system of internal control relevant to the preparation of the information on GHG emissions that is free from material misstatement, whether due to fraud or error. This responsibility also includes: selecting the applicable criteria; selecting and applying relevant GHG quantification methodologies and GHG reporting policies; preventing and detecting fraud; identifying of and complying with laws and regulations applicable to JSC «Arkhangelsk Pulp & Paper Mill»; making judgements and estimates that are reasonable in the circumstances; maintaining adequate records in relation to the information on GHG emissions.

Examined entity: JSC «Arkhangelsk Pulp & Paper Mill»

Entered in the Unified State Register of Legal Entities № 1022901003070

Novodvinsk, Russia

Audit firm (Practitioner): JSC "KPMG", a company incorporated under the Laws of the Russian Federation.

Registration in Register of Legal Entities № 1027700125628.

Member of the Self-regulatory Organization of Auditors Association "Sodruzhestvo" (SRO AAS). The Principal Registration Number of the Entry in the Register of Auditors and Audit Organisations: No. 12008020351.



JSC « Arkhangelsk Pulp & Paper Mill »

*Independent Practitioner's Limited Assurance Report in relation to Information on Greenhouse Gas Emissions of JSC «Arkhangelsk Pulp & Paper Mill» for 2020*

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### **Our Responsibilities**

Our responsibility is to express a conclusion on the Management's Statement on the information on GHG emissions based on procedures performed and evidence obtained. We conducted our limited assurance engagement in accordance with International Standard on Assurance Engagements 3410 *Assurance Engagements on Greenhouse Gas Statements*, issued by the International Auditing and Assurance Standards Board. That Standard requires that we plan and perform our procedures to obtain a meaningful level of assurance about whether the Management's Statement that the information on GHG emissions has been prepared in accordance with the applicable criteria (set out in the "Applicable Criteria" section of this report) and is free from material misstatement, is fairly stated.

### **Our Independence and Quality Control**

We have complied with the independence and ethical requirements established by the *Rules on Independence of Auditors and Audit Firms* and the *Code of Professional Ethics for Auditors* approved by the Audit Council of the Ministry of Finance of the Russian Federation and by the *International Code of Ethics for Professional Accountants (including International Independence Standards)* issued by the International Ethics Standards Board for Accountants, which are based on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

We apply the International Standard on Quality Control 1 and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

### **Procedures Performed**

A limited assurance engagement undertaken in accordance with ISAE 3410 involves assessing the suitability, in the circumstances of JSC «Arkhangelsk Pulp & Paper Mill», of the applicable criteria (set out below in the "Applicable Criteria" section of this report) as a basis for the preparation of the information on GHG emissions, assessing the risks of material misstatement of the information on GHG emissions whether due to fraud or error, responding to the assessed risks as required in the specific circumstances of the engagement, and evaluating the overall presentation of the information on GHG emissions. The nature, timing and extent of the procedures selected is a matter of our professional judgment, including the assessment of the risk of material misstatement in the preparation of the information on GHG emissions, whether due to fraud or error, our understanding of the activities of JSC «Arkhangelsk Pulp & Paper Mill», as well as other circumstances of the engagement.

In making this risk assessment, we considered the internal control relevant to the preparation of the information on GHG emissions, in order to design procedures that are appropriate in the circumstances, but not for the purposes of expressing a conclusion as to the effectiveness of the internal control.

Our engagement also included: assessing the appropriateness of the particular GHG emissions included in the information on GHG emissions; the suitability of the applicable criteria (set out below in the "Applicable Criteria" section of this report) used in preparing the information on GHG emissions in the circumstances of the engagement; evaluating the appropriateness of the GHG quantification methods, policies and procedures used in the preparation of the information on GHG emissions and the reasonableness of estimates made by Management.



JSC « Arkhangelsk Pulp & Paper Mill »

Independent Practitioner's Limited Assurance Report in relation to Information on Greenhouse Gas Emissions of JSC «Arkhangelsk Pulp & Paper Mill» for 2020

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The procedures we performed were based on our professional judgment and included inquiries, inspection of documents, analytical procedures, assessment of the appropriateness of the GHG quantification methods, as well as reconciliation of information and data with the respective underlying records.

The procedures we developed based on the risk assessment included, but were not limited to, the following:

- Assessment of compliance of the information on GHG with applicable criteria (set out in the "Applicable criteria" section of this report);
- Assessment of the reasonableness and suitability of key assumptions;
- Inquiries to obtain an understanding of conditions of the operations impacting the information on GHG emissions;
- Interviewing responsible employees of JSC «Arkhangelsk Pulp & Paper Mill» regarding internal procedures regulating the collection of data used in the preparation of the information on GHG emissions;
- Inquiries regarding and analysis of information to assess the completeness of the emission sources, data collection methods, assessment of input data and assumptions relevant in the circumstances of the engagement;
- Corroboration of the data used in the preparation of the information on GHG emissions with data from other sources, to assess completeness, accuracy and consistency of such data;
- Recalculation of quantitative data and inspection of underlying documentation.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

Accordingly, we do not express a reasonable assurance opinion about whether the information on GHG emissions is prepared, in all material respects, in accordance with the applicable criteria (set out below in the "Applicable Criteria" section of this report).

### **Applicable Criteria**

Applicable criteria comprise relevant requirements, contained in the following documents:

- The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. Revised Edition <sup>1</sup>;
- The Greenhouse Gas Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard <sup>2</sup>;
- Guidelines for National Greenhouse Gas Inventories IPCC, 2006 r. <sup>3</sup>;
- Methodological Guidance on the Quantification of Greenhouse Gas Emissions by Entities Engaging in Business and Other Activities in the Russian Federation

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<sup>1</sup> <https://ghgprotocol.org/corporate-standard>

<sup>2</sup> <https://ghgprotocol.org/standards/scope-3-standard>

<sup>3</sup> <https://www.ipcc-nggip.iges.or.jp/public/2006gl/>





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(approved by Order No. 300 of the Ministry of Natural Resources and the Environment of Russia dated 30 June 2015) <sup>4</sup>;

- Methodological Guidance on the Quantification of Energy Indirect Greenhouse Gas Emissions (approved by Order No. 330 of the Ministry of Natural Resources and the Environment of Russia dated 29 June 2017 <sup>5</sup>).

### **Management's Statement**

Management states that the following information on GHG emissions presented in the Report in the Table 4 «Summary table of GHG emissions, t CO<sub>2</sub>e ».

Direct greenhouse gas emissions (Scope 1)	1 899 553 t CO <sub>2</sub> e
Energy indirect greenhouse gas emissions (Scope 2)	59 689 t CO <sub>2</sub> e
Other indirect energy greenhouse gas emissions (Scope 3)	438 907 t CO <sub>2</sub> e
Total direct and indirect greenhouse gas emissions (Scope1+Scope2+Scope3)	2 398 149 t CO <sub>2</sub> e
Greenhouse gas emissions from sold energy	120 861 t CO <sub>2</sub> e
CO <sub>2</sub> emissions from biomass combustion	1 598 736 t CO <sub>2</sub> e

was prepared in accordance with the applicable criteria (set out in section "Applicable Criteria" of this report) and is free from material misstatement.

### **Inherent Limitations**

GHG quantification is subject to inherent uncertainty because of the incomplete scientific knowledge used to determine emission factors and the values needed to combine emissions of different gases.

### **Conclusion**

Our conclusion has been formed on the basis of, and is subject to, the matters outlined in this report. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

Based on the procedures that we have performed and the evidence that we have obtained, nothing has come to our attention that causes us to believe that the Management's Statement that the information on GHG emissions has been prepared in accordance with the applicable criteria (set out in the "Applicable Criteria" section of this report) and is free from material misstatement, is not, in all material respects, fairly stated.

<sup>4</sup> <http://docs.cntd.ru/document/420287801>

<sup>5</sup> <http://docs.cntd.ru/document/456079014>



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**Restriction of Use of Our Report**

Our report has been prepared for the Shareholders of JSC «Arkhangelsk Pulp & Paper Mill» solely for the purposes of providing the information on GHG emissions by JSC «Arkhangelsk Pulp & Paper Mill» in the Report and is not intended to be used for any other purposes or in any other context.



Misiura Egor Ivanovich  
Director JSC "KPMG"  
JSC "KPMG"  
Moscow, Russia

27 July, 2021