



Banco do Brasil's Greenhouse Gas (GHG) Inventory

2022

The Inventory consists of the measurement and publication of Banco do Brasil's (BB) GHG emissions and is based on the GHG Protocol Program methodology, adapted to the Brazilian context by Center for Sustainability Studies (GVces), of the Business Administration School of São Paulo (FGV-EAESP), of the Fundação Getúlio Vargas (FGV), with support from the Brazilian Business Council for Sustainable Development (CEBDS), the Ministry of the Environment (MMA), the World Resources Institute (WRI), the World Business Council for Sustainable Development (WBCSD) and 27 founding companies, including BB.

Emissions management is conducted in accordance with our General Policy and our Social, Environmental and Climate Responsibility Policy (PRSAC), through which we strengthen our performance, which takes into account the interests of our stakeholders in promoting initiatives aimed at reducing risks and taking advantage of opportunities related to socio-environmental issues, including climate change.

The Inventory follows the principle of continuous improvement of our Environmental Management System (EMS) and to ensure its reliability, we have hired a company specialized in environmental audits to perform the external verification of the Inventory, according to the specifications of NBR ISO 14064:3 and the GHG Protocol methodology. The basic data for the BB's GHG emissions calculations are obtained primarily from our systems, especially from the applications for controlling administrative expenses and human resources management, and requested directly from the responsible areas. Annually, since 2008, we have carried out and published our GHG Inventory on the Public Emissions Register website (www.registropublicodeemissoes.com.br), under the responsibility of the Brazilian GHG Protocol Program (FGV-GVces).

It is worth emphasizing that we are founding members of the Empresas pelo Clima (EPC - Companies for the Climate) initiative and of the Brazilian GHG Protocol Program, both aimed at reflecting on and proposing actions to combat and adapt to climate change. We are also members of the Thematic Chamber on Climate Change (CT Clima), an initiative coordinated by CEBDS with the purpose of helping companies to adopt strategies to take advantage of the opportunities and minimize risks and restrictions from GHG emissions.

In view of this history, understanding our role and that of the financial market as protagonists to boost the country's economic growth on a sustainable basis, in 2021 we launched the 10 Long-Term Sustainability Commitments with targets until 2030, in alignment with global objectives (Paris Agreement and Sustainable Development Goals - SDGs). Among them are the following:

- Reinforcement of the commitment to reduce Scope 1 and 2 GHG emissions by 30% by 2030;
- Offset 100% of BB's Scope 1 and 2 GHG emissions as of 2021;
- Acquire 90% renewable energy by 2024.

In 2021, we also joined the Business Ambition for 1.5°C Initiative, which shows our commitment to the definition of targets to reduce Greenhouse Gas (GHG) emissions, based on science, that contribute to limit global warming by 1.5°C above pre-industrial levels and that seek to reach carbon neutrality in the value chain by 2050.



METHODOLOGY

The Banco do Brasil's Greenhouse Gas Emissions Inventory - reference year 2021 accounts and reports GHG emissions in 3 Scopes, according to specifications of the Brazilian GHG Protocol Program, in tons of CO₂ equivalent (tCO₂e). The report is made under the Operational Control approach and represents more than 4 thousand facilities all over the country, including retail, wholesale and government branches, regional units and strategic units, for their direct activities in Scope 1 and indirect activities in Scopes 2 and 3, with their emission sources defined as follows:

Scope 1 - Direct emissions from fuel consumption activities (mobile combustion - fleet vehicles, stationary combustion – fuel electricity generators) and fugitive emissions (refrigerant and fire extinguishers gases);

Scope 2 - Indirect emissions are calculated based on the Bank's estimated electricity consumption (MWh) and, as of 2021, the report has been performed according to the approaches accepted by the Brazilian GHG Protocol Program (PBGHGP), being:

- **Location-based approach (mandatory):** considers electric energy consumption according to the Brazilian energy matrix where the emission factor of the National Interconnected System (SIN) must be used. The SIN supplies electric energy from different sources, from hydroelectric to thermoelectric (non-renewable), a situation that, annually, significantly interferes in the conversion of energy consumption to carbon equivalent (SIN emission factor), and:
- **Purchase Choice-based approach (optional):** where we report the consumption of photovoltaic electricity from BB's plants, complemented by the purchase of Renewable Energy Certificates (i-RECs), which guarantee, for the same amount of electricity consumed, the traceability and renewable origin of the energy.

Scope 3 - Indirect emissions (other) from the activities that BB influences:

- Category 1 - Purchased Goods and Services (emissions that occur in the life cycle - extraction, production and transportation of paper purchased by BB);
- Category 3 - Fuel and Energy Activities (emissions related to the extraction, production and transportation of fuels purchased and consumed by BB, reported in Scope 1);
- Category 4 - Transportation and Distribution - Upstream (emissions from the transportation of FEBRABAN's shared mailbags, cash transportation and other transportation contracted by BB);
- Category 5 - Waste Generated in Operations (emissions from the effluents generation based on water consumption, and emissions from the paper consumption, performed by BB);
- Category 6 - Business Travels (emissions from air and land travels performed by BB employees);
- Category 7 - Employees Commuting (home to work).



According to the GHG Protocol, for the emission calculations, we consider the gases controlled by the Kyoto Protocol, according to the following GWP table:

Gases included in GHG Emissions calculations	Global Warming Potential (GWP) ⁽¹⁾
CO ₂	1
CH ₄	28
N ₂ O	265
HFCs	04 – 12,400
PFCs	6,630 – 17,400
SF ₆	23,500
NF ₃	16,100
composto	0 – 11,698

(1) Source: IPCC 2013/ASHRAE 2019

SUMMARY OF TOTAL GHG EMISSIONS 2022

The BB's 2022 GHG Inventory was submitted to external verification by a third party, according to the specifications of the GHG Protocol Program and ISO 14.064-3, by Totum Institute. The data presented below are in tons of CO₂ equivalent (tCO₂e).

BB's GHG Emissions Inventory – 2022

Location-based Approach – Scope 2		
Scope 1	Scope 2	Scope 3
25,650.970	21,827.442	41,168.664
Purchase Choice-based Approach – Scope 2		
Scope 1	Scope 2	Scope 3
25,650.970	0.000	41,168.664

Carbon Emission Intensity per employee

We calculate a Carbon Emission Intensity Indicator, expressed by the quotient of total GHG emissions (Scopes 1 and 2) by the number of employees, as shown in the table below.

BB's Carbon Emission Intensity - Employees	2019	2020	2021	2022
GHG Emissions (Scope 1 e 2) ⁽¹⁾ (tCO ₂ e)	67,231	60,501	20,518	25,651
Number of Employees ⁽²⁾	93,190	91,673	84,597	85,953
Carbon Emission Intensity (tCO ₂ e/employee)	0.721	0.660	0.243	0.298

(1) BB emissions were considered within the Scope 2 Power Purchase Choice approach for the years 2021 and 2022.

(2) The number of employees by CLT employment contract was considered – Annual Report 2022. p.13.



Greenhouse Gas Inventory of Banco do Brasil - Historical Series

GHG Emissions Inventory - BB						
Scope	Emission Source	2018	2019	2020	2021	2022
1	TOTAL (tCO₂e)	22,347.623	24,382.317	27,611.273	20,517.729	25,650.970
	Mobile Combustion (vehicle fleet)	3,296.267	3,091.991	1,353.587	3,296.267	959.875
	Stationary Combustion (fuel for electricity generators)	674.456	912.243	458.578	674.456	374.285
	Fugitive Emissions (refrigerant and fire extinguishers gases) ⁽¹⁾	18,376.900	20,378.083	25,799.108	18,376.900	24,316.810
2	TOTAL (tCO₂e) (Location-based approach)	43,721.788	42,848.792	32,889.487	63,829.922	21,827.442
2	TOTAL (tCO₂e) (Purchase Choice-based approach) ⁽²⁾	-	-	0.000	0.000	0.000
3	TOTAL (tCO₂e)	66,313.932	54,539.411	42,937.045	42,210.971	41,168.664
	Category 1 - Purchased Goods and Services ⁽³⁾	-	-	-	1,599.750	1,804.775
	Category 3 - Fuel and Energy Activities ⁽³⁾	-	-	-	745.190	947.614
	Category 4 - Transportation and Distribution - Upstream	31,943.119	27,903.160	29,266.821	17,311.595	14,163.933
	Category 5 - Waste Generated in Operations	20,932.800	13,101.850	7,434.000	10,545.080	12,172.692
	Category 6 - Business Travels	5,618.230	6,421.180	1,632.598	1,153.262	3,208.575
	Category 7 - Employees Commuting (home to work)	7,463.587	6,853.987	4,524.056	10,856.094	8,871.075
	Category 9 - Transportation and Distribution - Downstream ⁽⁴⁾	356.196	259.234	79.570	-	-

- (1) As of the 2021 inventory, the data on fugitive emissions of refrigerant gases are no longer estimated but measured, reflecting the amount of gas actually replaced in the air-conditioning equipment during maintenance.
- (2) As of the 2020 inventory, BB's Scope 2 emissions also started to be presented based on the voluntary reporting of Purchase Choice, where emissions from electricity consumption are zeroed out, by the consumption of photovoltaic energy from its plants and the acquisition of Renewable Energy Certificates (RECs).
- (3) As of the 2021 inventory, the accounting of two more Scope 3 categories has started, namely: Category 1 - Purchased Goods and Services and Category 3 - Fuel and Power Activities;
- (4) As of the 2021 inventory, there was a change in understanding regarding the accounting of Category 9 - Downstream Transportation and Distribution, with emissions previously listed in this category being accounted for in Category 4 - Transportation and Distribution - Upstream.



EMISSION TARGETS

Scope	2018 (Base Year)	2022 (Reference Year)	Percentage Change
1	22,347.623	25,650.970	
2 ⁽¹⁾	43,721.788	0	
Total	66,069.411	25,650.970	

(1) This scenario considers the effective implementation of BB's strategy to reduce 100% of Scope 2 emissions through the migration of electricity consumption to a renewable (and traceable) basis, with the use of electricity from its photovoltaic plants and the acquisition of Renewable Energy Certificates (RECs), which makes it possible to report Scope 2 emissions as zero, so as not to be influenced by variations in the SIN emission factor.

By the end of 2019, GHG reduction targets for Scopes 1 and 2 were set at 30% by 2030, in line with and contributing to the Brazilian reduction targets (NDC - Nationally Determined Contributions) stipulated in the Paris Agreement, and the UN's Sustainable Development Goals (SDG).

At the time, the target-setting process was based on the methodology of the SBTi (Science-Based Targets initiative) and used the initiative's own tool, calculating the targets using the metric for the well-below 2 degrees temperature scenario (WB2C). The 30% reduction target by 2030 is based on the absolute emissions reported in the 2018 BB Emissions Inventory, and encompasses Scopes 1 and 2.

In 2022, the BB's Scope 1 and 2 emissions, considered in the target, reduced 61% compared to the base year, from 66,069 tCO₂e (Scope 1: 22,348 tCO₂e, Scope 2: 43,722 tCO₂e), to 25,651 tCO₂e in 2022 (Scope 1 emissions: 25,651 tCO₂e, Scope 2: 0 tCO₂e).

Last year, BB ratified the commitment, previously assumed in 2019, regarding Climate Change by signing the Business Ambition for 1.5°C Commitment Letter, in which it committed to make efforts to develop GHG reduction targets according to the level of decarbonization necessary to achieve zero emissions in the value chain by 2050, following the SBTi guidelines.

Thus, seeking to adapt to the new SBTi requirements, BB initiated discussions to update the emission targets for Scopes 1, 2 and 3, providing for a window between 5 and 15 years, with an average annual reduction of 4.2%, depending on the base year that will be defined and the target year.

OFFSETTINGS AND REDUCTIONS

After establishment of the 10 Long-Term Sustainability Commitments, BB defined the offsetting of 100% of its direct emissions and the zeroing of emissions from energy consumption. To this end, the Climate Change Management strategy was implemented, which defined the purchase of carbon credits to offset Scope 1 emissions and the migration of BB's energy matrix to clean energy (mainly with the installation of photovoltaic plants), in addition to the acquisition of RECs.



Scope 01 Offsettings - Carbon Credits

In 2022, the bidding for carbon credits, in the standards and terms recognized by the market, sought to combine the social issues that carbon credit projects may have, requiring, in addition to the basic standards, some standard of social benefits, such as CCB¹ and SOCIALCARBON².

The purchase of carbon credits was carried out with the company Biofílica, which provided BB with 23,392 carbon credits from the REDD+ Jari Amapá project, verified under the VCS and CCB standards, which aims to generate carbon credits from the REDD+ mechanism to promote forest conservation in order to generate benefits to the climate, biodiversity and communities in the region of Laranjal do Jari and Vitória do Jari in Amapá, in the Brazilian Amazon. The project is a partnership between Ambipar Environment and the Jari Group (Jari Celulose and the Jari Foundation), and is based on an economic development model that values the forest, combining forest management and local community development, with technical training and capacity building in rural production, agricultural and forestry techniques according to family interest. The project hopes to make producers able to implement appropriate agricultural and forestry techniques, enabling constant production and income generation, producing food and generating income without the need to open new areas, perpetuating the benefits to themselves, the climate and biodiversity.

Company	Project/ Enterprise	Location	Project type	Certification standard	Registration platform	Registration	Amount of credits
Biofílica	Bandeirantes Landfill Gas to Energy Project (BLFGEE)	São Paulo/ SP	Gerenciamento de gases de aterro sanitário	MDL – Mecanismo de Desenvolvimento Limpo	CDM - UNFCCC	0164	6.990⁽³⁾
Biofílica	Jari Project - Amapá	Laranjal do Jari and Vitória do Jari (AP)	Forest conservation	VCS e CCBs	VERRA	1115	18.661
Compensação							
BB	Inventário GEE BB – ano de referência 2022 – Escopo 1						-25.651

- (1) CCB - As defined by the Climate, Community and Biodiversity Alliance (CCBA), the Climate, Community and Biodiversity (CCB) Standards were launched in 2005 to promote the development and investment in local projects that deliver significant climate, community and biodiversity benefits in an integrated and sustainable manner.
- (2) SOCIALCARBON® Standard Launched in 2008, SOCIALCARBON® is a standard developed by Instituto Ecológica in Brazil and is classified as a "Best Practice Co-benefit Standard" by the International Carbon Reduction and Offset Alliance. SOCIALCARBON is a cobenefits assessment and monitoring standard, and is applied in conjunction with carbon accounting standards.
- (3) Balance of carbon credits after offsetting 2021 Scope 1 emissions.



Scope 2 Emissions Decrease – Purchase Choice-based Approach

Consolidating the strategy for Climate Change Management, to reduce Scope 2 emissions to zero, in 2022 BB acquired 493,758 RECs, in the RECfy standard, provided by the company Furnas Centrais Elétricas, from hydroelectric plants, in addition to using 15,711 MWh of photovoltaic energy from the Porteirinha (MG), Lindoia (PA), Naviraí - Apollo 2 (MS) and Rio Paranaíba (MG) plants.

The Renewable Energy Certificate (REC) issued by Furnas, via RECfy platform, is traceable from origin and generated through Blockchain technology, each certificate has a unique tracking code (there is no double counting of certificates) and are attested by Bureau Veritas independent audit.

Emission Reductions

Origin	Project/ Enterprise	Location	Source	Origin tracking instruments	Emission factor	Unit	Amount
Furnas Centrais Elétricas	UHE Serra da Mesa	Minaçu/GO	Hídrica	Certificado de Energia Renovável	0,000	REC	493,758
Photovoltaic Plant	Usinas Porteirinha (MG), Lindoia (PA), Naviraí - Apollo 2 (MS) and Rio Paranaíba (MG)	Porteirinha (MG), São Domingos do Araguaia (PA), Naviraí (MS) e Rio Paranaíba (MG)	Solar	Clean energy self-declaration	0,000	MWh	15,711
Redução							
BB	Inventário GEE BB – ano de referência 2022 – Escopo 2 (MWh)						509.469
Emissão GEE BB - Consumo de Energia Elétrica (Reporte Baseado na Escolha de Compra)							0,000

RESULTS BY SCOPE

Scop 1

Since 2021, BB has improved the calculation of the database on the refrigerant gases of its air conditioning park, no longer estimating the amount of gases according to the inventory of installed assets, but accounting for the amount of gas replaced during equipment maintenance, thus accounting for the amount of refrigerant gas actually emitted to the atmosphere. In 2022, it started to present this information on its internal portal, GABBi - Interactive Environmental Management BB, in order to allow the dependencies to monitor their environmental performance.

Scope 1 - Emission sources

Fugitive emissions - Refrigerant gases (air conditioning): Since 2021, BB calculates what was actually replaced with refrigerant gas during the maintenance process of air conditioning equipment, thus moving from a conservative estimate to the calculation of actual use. From this calculation methodology, it is possible to observe that fugitive emissions increased by 32%, from 18,377 tCO₂e in 2018 to 24,317 tCO₂e in 2022.

Another factor that has influenced the increase in emissions linked to this source is the fact that the Bank's Engineering area, seeking to improve BB's environmental performance, has intensified the replacement of R-22 gas (prohibited by the Montreal Protocol) with R-410A gas, in addition to including the following text in its internal regulations, "To comply with Conama Resolution No. 267, the acquisition of equipment using R-22 refrigerant gases is prohibited".



Fugitive emissions - Fire extinguishers: The quantity of fire extinguishers on BB sites is in compliance with NBR 12.693, with an estimated recharge of 133.3 tCO₂, in existing units of CO₂ extinguishers in 2022. Compared to the 2018 figures, there is an increase of 11%, from 120 tCO₂ in 2018 to 133.3 tCO₂ in 2022, due to the increase in the number of extinguishers considered for the current area (m²) of BB's facilities.

Emissions from stationary combustion: Over the past few years, BB has been reducing the number of generators on its premises, thus, in 2022 there was a reduction in the fuel consumption of generators, which translates into a significant reduction in emissions from this source by 45%, from 674 tCO₂e in 2018, to 374 tCO₂e in 2022.

Emissions from mobile combustion: Emissions from this source decreased by 71%, from 3,296 tCO₂e in 2018 to 960 tCO₂e in 2022, due to the encouragement of ethanol consumption to the detriment of gasoline consumption. In addition, there was maintenance of the clauses established in the contracts with suppliers of the vehicle fleet, used by BB, which require eco-efficient models, with flex engine that allows the use of ethanol, a less polluting fuel and from a renewable source.

Even with the end of the Covid-19 pandemic, BB maintained the home-office proposal for a few days a week, encouraging the use of electronic means (web conferences) to hold meetings, which reduced the number of trips made, in addition to the implementation of the Alelo Auto card for fuel payment, which generated greater control of supplies and consumption.

Scope 2

Scope 2 indirect emissions are calculated based on the Bank's electricity consumption (MWh) and, as of 2021, the reporting has been carried out according to the approaches accepted by the Brazilian GHG Protocol Program (PBGHGP). Thus, in addition to location-based reporting, BB included the Choice-Based Approach to Purchasing, where we report the consumption of photovoltaic electricity from BB's plants and the purchase of RECs, which guarantee, in the same amount of electricity consumed, the traceability and renewable origin of the energy.

Thus, when reporting the 509,469 MWh consumed by BB in 2022, it is possible to observe that emissions within the Location-Based Approach, which uses the emission factor of the National Interconnected System - SIN, were significantly reduced (-50%), from 43,722 tCO₂e in 2018 (with an average SIN factor of 0.0740) to 21,827 tCO₂e in 2022 (with an average SIN factor of 0.0426). In order to comply with its climate change management strategy (Agenda 30 and 10 Long-Term Sustainability Commitments), in addition to mitigating variations in the SIN emission factor, BB backed its electricity consumption with the acquisition of 493,758 RECs and the self-generation of 15,711 MWh of photovoltaic energy from the Porteirinha (MG), Lindoia (PA), Naviraí - Apollo 2 (MS) and Rio Paranaíba (MG) plants. Thus, the 21,827 tCO₂e emissions of BB Scope 2, based on location, were zeroed, according to the Choice-Based Approach of the PBGHGP methodology.

For more details see the Annual Report 2022 pages 96 and 97, and the ESG Databook 2022 pages 20, 21, 25, 26 and 29.



Scope 3

BB's Scope 3 emissions have been monitored since the first versions of its Inventory (2011) and, although estimated, are a sample of the influence, in terms of emissions, of the Bank's activities in its value chain.

In 2022, it is possible to observe a 2% reduction in total Scope 3 emissions compared to the previous year, from 42,211 tCO₂e in 2021 to 41,169 tCO₂e in 2022. The two new categories - Category 01 and Category 03, included in 2021, continue to be improved and with the inclusion of more data: "Category 1 - Purchased Goods and Services" increased by 13%, from 1,600 tCO₂e in 2021 to 1,805 tCO₂e in 2022; and "Category 3 - Fuel and Energy Activities" increased by 27%, from 745 tCO₂e in 2021 to 948 tCO₂e in 2022.

"Category 4 - Upstream Transportation and Distribution" decreased by 18%, from 17,312 tCO₂e in 2021 to 14,164 tCO₂e in 2022; "Category 5 - Waste Generated in Operations" increased by 15%, from 10,545 tCO₂e in 2021 to 12,173 tCO₂e in 2022; "Category 6 - Business Travel" increased by 178%, from 1,153 tCO₂e in 2021 to 3,209 tCO₂e in 2022, the sharp increase in this category can be explained by the return to normality of business travel with the end of the Covid-19 pandemic; "Category 7 - Employee Travel (home-work)" reduced its emissions by 18% in 2022, from 10,856 tCO₂e in 2021 to 8,871 tCO₂e in 2022.



Verification of Greenhouse Gas (GHG) Inventory

Totum Institute declares that

Banco do Brasil S.A

Quadra 05, Lote B, Edifício Banco do Brasil
70040-912 - Brasília - Distrito Federal

Had its GHG inventory verified and it complies to

Specifications of the Brazilian GHG Protocol Program

Verification Standard : Brazilian Program Verification Specifications GHG
Protocol – Edition 2011 and ABNT NBR ISO 14064-3

Process Number: 337-21 / 2023

Certificate Number: 337-21/2023

Inventory Year: 2022

Confidence Level: Limited

Details: Declaration of Verification Nº 337-21 / 2023

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