

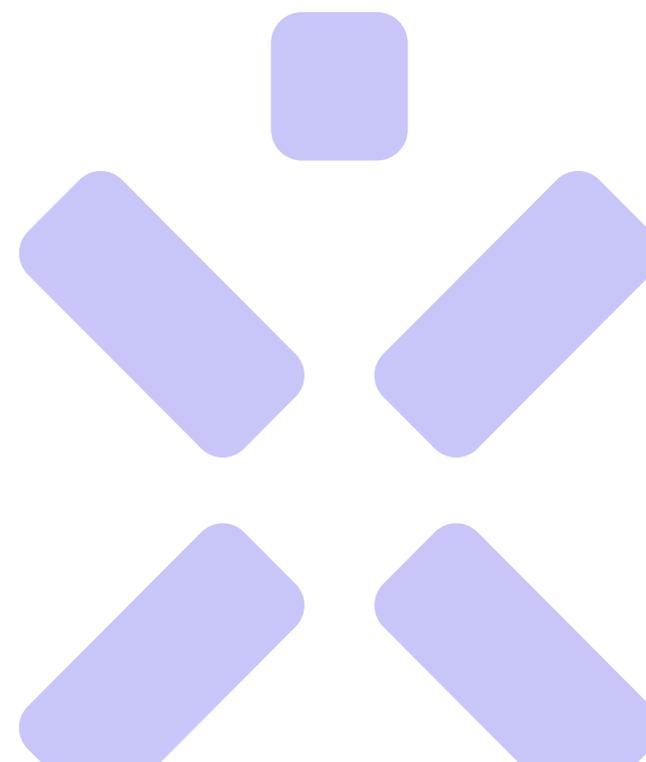


# Greenhouse gas inventory report

# 2022

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## Introduction

Ignitis Group (hereinafter – the Group) is a leading utility and renewable energy group in the Baltic region. The Group's companies operate in Lithuania, Latvia, Estonia, Poland and Finland. The Group's core activities include power and heat generation and supply, power and natural gas trading and distribution as well as development of smart-energy solutions.

### Activities of the Group

The Group is one of the largest energy groups in the Baltic region. Its core business is focused on operating electricity and gas distribution networks and managing and developing its Green Generation portfolio. The Group also manages strategically important Flexible Generation assets and provides Customers & Solutions services, including the supply of electricity and gas, solar, e-mobility, energy efficiency, and innovative energy solutions for households and businesses.



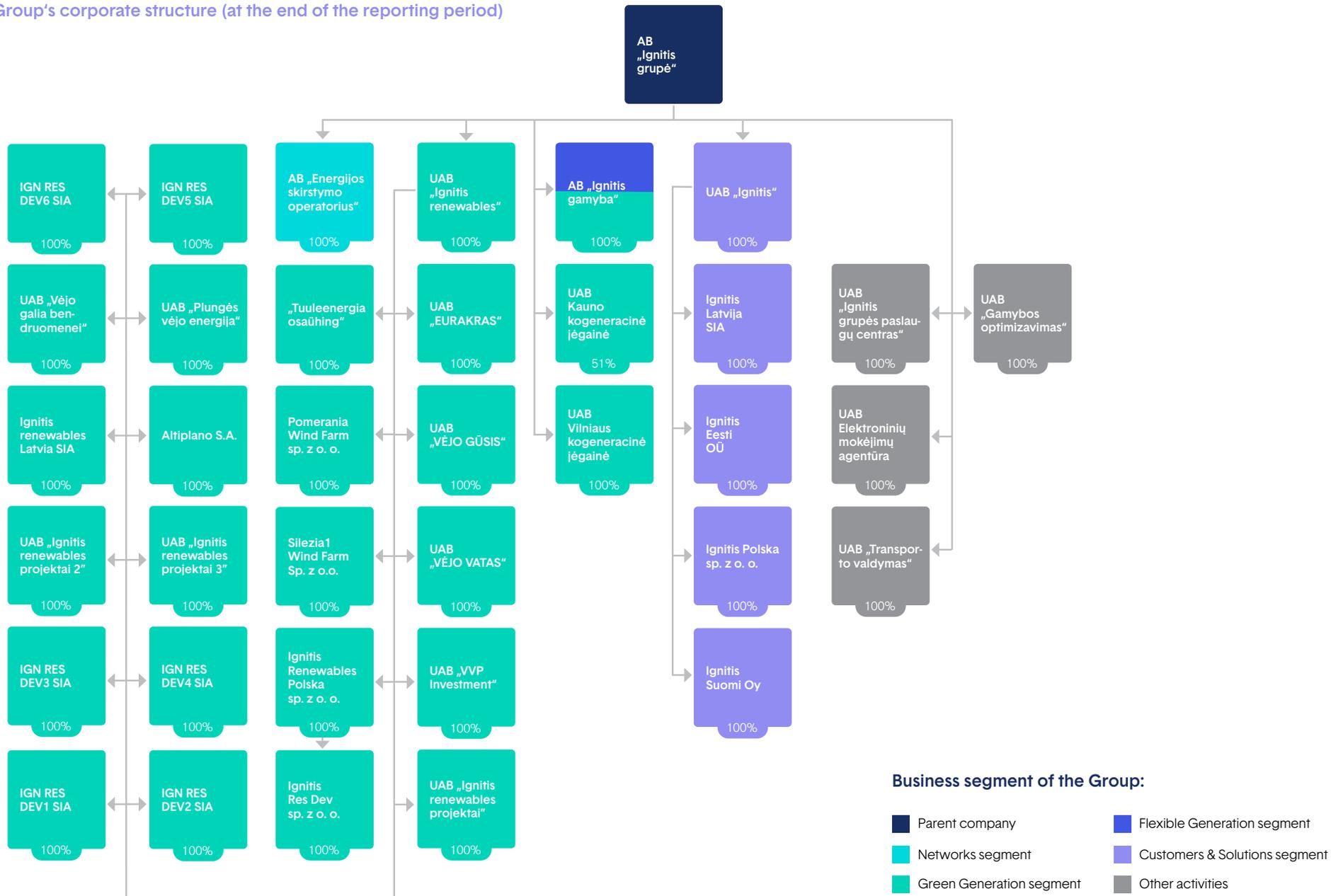
The Group operates in its home market (Lithuania, Latvia, Estonia, Poland and Finland). We also explore new opportunities in countries on the energy transition path. Our strategy places a priority on rapid renewables expansion and commitment to create a sustainable future. We target to reach 4 GW of installed green generation capacity by 2030 and are committed to reducing net zero by 2050.

Ignitis Group has fully endorsed the global commitment to avoid the worst effects of climate change by limiting the warming of the average Earth's surface temperature to 1.5 °C compared to pre-industrial levels. To achieve this, greenhouse gas (GHG) emissions must drop to net-zero by 2050. In 2021 the Science Based Targets Initiative (SBTi) approved the ambitious GHG reduction targets of the Group. We are the first Lithuanian capital organisation and one of roughly a two thousand organisations worldwide which have their GHG reduction targets approved by this initiative, which is

a collaboration between the largest global organisations fighting climate change. After assessing the targets of the Group, the SBTi confirmed that they are in line with the latest science-based recommendations on actions which should keep global warming below 1.5 °C compared to pre-industrial levels. According to scientists, this threshold should not be crossed in order to avoid catastrophic natural disasters, adversely affecting the health and wealth of the population.

The majority of the Group's investments are aimed at the reduction of GHG emissions. In the updated 2022–2025 Strategic Plan, the Group confirmed the investments of EUR 1.7–2.0 billion, mainly directed to Green Generation and Networks. With this, we aim to increase our Green Generation installed capacity to 2.0–2.2 GW by the end of 2025, from the current 1.2 GW, and to improve network reliability, enable digitalisation and expand the grid by connecting new customers.

The Group's corporate structure (at the end of the reporting period)



The parent company of the Group is AB „Ignitis grupė“ is responsible for the co-ordination of activities and transparent management of the Group. Further information, including financials about the parent company and its subsidiaries is available on our [website](#). The entities presented on the next page are directly or indirectly controlled by the Group.

Detailed information about the activities of the Group is provided in the [2022 annual report](#). The GHG emissions report was audited by Bureau Veritas according to the LST EN ISO 14064-1:2019 standard.



## Networks

The core activities of the Networks segment are to operate, maintain, manage and develop electricity and gas distribution networks and to ensure safe and reliable operation as well as the gas and electricity supply of last resort and deployment of the smart metering systems for customers. The Networks segment includes the activities carried out by Energijos skirstymo operatorius AB (ESO). ESO serves 1.8 million customers throughout Lithuania. The area serviced by the company in square kilometres is around 65,300. The company operates over 9,000 kilometres of natural gas distribution pipelines and more than 127,000 kilometres of overhead and underground power lines. The Networks segment investments in 2022 amounted to EUR 273 million and were EUR 81.6 million higher compared to 2021. 10-year investment plan was updated with investments planned for the period of 2021–2030, amounting to EUR 1.9 billion.



## Green Generation

The main direction of the segment is generation of electricity and heat using sustainable energy sources, including wind, hydro, solar, biomass and waste-to-energy, while developing and operating new generation capacities. Strategically, our focus is on consistent expansion of capacity, development of new projects not only in Lithuania, but in the surrounding countries as well. Our current capacity includes 3 operating wind farms in Lithuania (58 MW), one in Poland (94 MW) and one in Estonia (18 MW). We also

maintain significant hydropower capacity in Lithuania: Kruonis Pumped Storage Hydroelectric Plant (Kruonis PSHP) (900 MW) and Kaunas Hydroelectric Power Plant (Kaunas HPP) (101 MW). The Group operates two modern waste-to-energy cogeneration power plant in Vilnius (19 MWe, 60 MWth) and Kaunas (24 MWe, 70 MWth). Total installed capacity of the Green Generation segment is 1,215 MW. A large part, or around 50%, of investments will be directed towards the expansion of Green Generation capacity. We target to reach 2.0–2.2 GW of installed Green Generation capacity by 2025, and 4 GW – by 2030.



## Customers & Solutions

Activities of Customers & Solutions segment include electricity and gas supply, trading and balancing, energy efficiency projects, construction of solar power plants for businesses and residents, installation and operation of electric vehicle charging stations, energy solutions (EV charging stations, heat pumps). The Customers & Solutions segment includes activities carried out by Ignitis UAB, Ignitis Eesti OÜ, Ignitis Latvija SIA, Ignitis Polska Sp. z o. o., Ignitis Suomi OY. Ignitis company already supplies electricity and natural gas to over 2 million clients while expanding its activities in the Baltic region. Total electricity sales in retail market in 2022 increased by 14% compared to 2021 and reached 7.71 TWh in total. The volume of natural gas sold in 2022 increased and reached 12.80 TWh in total (retail and wholesale). The volume of natural gas sold in 2022 increased by 10.8%, mainly from utilizing Lithuania's LNG terminal, securing profitable transactions with foreign customers and providing additional gas supply in the light of geopolitical uncertainty.



## Flexible Generation

Flexible Generation segment operates the largest electricity generation facility in Lithuania, the Elektrėnai Complex, with a total gross installed capacity of 1,055 MW. The Elektrėnai Complex provides regulated system services (such as Tertiary Power Reserve Services and Isolated Regime Services) to ensure the flexibility and stability of Lithuania's electricity system. Flexible Generation segment includes activities carried out by Ignitis gamyba AB (except Kaunas HPP, Kruonis PSHP, Biofuel and Steam

Boiler). Electricity generation (net) volume of CCGT as well as units 7 and 8 at Elektrėnai Complex was 0.27 TWh in 2022 and decreased by 66.9% (0.55 TWh) compared 2021. During the first three quarters of the year, clean spark spread was negatively affected by high natural gas prices, which caused significant drop in volumes generated.

## Other activities

- Support services - Ignitis grupės paslaugų centras UAB - shared business support services;
- Non-core activities - Transporto valdymas UAB - vehicle rental, leasing, repair, maintenance, renewal and service;
- Additional services:
  - Elektroninių mokėjimų agentūra UAB - payment aggregation;
  - Gamybos optimizavimas UAB - planning, optimization, forecasting, trading, brokering and other electricity related services;
- Parent company – Ignitis grupė AB - management and coordination of activities of the Group companies.

## Strategy

In 2020, we updated our [Corporate Strategy](#) by putting sustainability at the core of our strategy. We are accelerating our transition towards a decarbonized world, transforming our business models by developing and scaling smart solutions, expanding in our region, and exploring new opportunities in the markets undergoing energy transition.

In our strategy we focus on four key strategic priorities. First, we are striving to create a sustainable future where there is no place for coal or nuclear. ESG criteria are an integral part of our strategic goals with strong commitment to a more sustainable future. We align our business targets with the UN Sustainable Development Goals and we are committed to reducing net carbon dioxide emissions to zero by 2050. We also strive to align our businesses with science-based targets to have a 1.5 °C-compliant business model. Second, we are striving to ensure the resilience and flexibility of the energy system as well as enable energy transition and evolution. Third, we are striving to grow renewables to meet regional energy commitments. Our target is to reach 4 GW of installed green generation capacity by 2030. Fourth, we are striving to capture growth opportunities and develop innovative solutions to make life easier and more energy smart.

## Structure of the Group

The Group's governance structure and model have been developed on the basis of the most advanced international and national practices and by following the recommendations published by the OECD. The Group, directly or indirectly, controlled 36 companies at the end of 2022. Approximately 4,160 employees work at the Group. More information about the companies and their financial indicators can be found [here](#).

The Group's Sustainability unit is responsible for the completeness, accuracy and validity of the information provided in this report. The data presented herein is based on the input received from internal data collection, management systems and external stakeholders. To provide feedback on the GHG inventory report please contact us at [sustainability@ignitis.lt](mailto:sustainability@ignitis.lt).





## Methodology

This report presents the results of the carbon footprint of the entire Group and details the categories, boundaries, assumptions and methodology used in its creation. The Group defines the categories (scopes) of its direct and indirect emissions of operations within the limits of the organisation with the GHGs classified in accordance with the LST EN ISO 14064-1:2019 standard. The report also follows the good practice principles and has been prepared according to the following frameworks:

- [World Business Council for Sustainable Development \(WBCSD\) and the World Resources Institute \(WRI\), 2004 A Corporate Accounting and Reporting Standard](#)
- [Intergovernmental Panel on Climate Change \(IPCC\), 2006 Guidelines for National Greenhouse Gas Inventories](#)
- [UK Department for Environment, Food & Rural Affairs \(DEFRA\), 2022 Government Greenhouse Gas Conversion Factors for Company Reporting](#)
- [The European Bank for Reconstruction and Development \(EBRD\), 2014 Methodology for the assessment of greenhouse gas emissions](#)

The methodology used for the footprint calculations is covered in the [Quantification of GHG emissions section](#), including the reporting principles of what the methodology is based on and how the baseline is broken down into different emission categories for reporting purposes. Sources of data and boundaries for data gathering are summarised in Organisational boundaries.

## Principles

This report is carried out in accordance with the following key principles of GHG Accounting and Reporting Principles and ISO 14064-1, which are central to the assessment of the footprint and are applied throughout the calculation of the baseline year, and should be referred to for any subsequent annual calculations:

- **Relevance:** All identified sources of carbon emissions considered likely to make a material contribution to the sector footprint were included in the data collection exercise. No sources are knowingly excluded without initial quantification and assessment of their contribution to the overall footprint.
- **Completeness:** Account for and report all relevant GHG emission sources and activities within the defined inventory boundary.
- **Consistency:** Emissions category (scope), boundaries, data sources, calculation methodologies, assumptions and extrapolations used have been documented in this report so they can be consistently applied year on year to allow meaningful comparison of the footprint in the future. This footprint report is aligned with ISO 14064 standard, adding to the credibility and consistency of the emissions category (scope) and approach.
- **Transparency:** To assist the company in the communication of the footprint to stakeholders and third parties, information on the scope, boundaries and overall output is provided in this report. Throughout the development of the footprint, detailed records of input data, methods of calculation, assumptions and

extrapolations have been made, with the objective of retaining a transparent and comparable audit trail for the assessment. A detailed calculation of the company's footprint is provided in the [Quantification of GHG emissions section](#).

- **Accuracy:** In all aspects of the footprint, uncertainty has been reduced as far as is practicable by the use of primary data relating to the Group. Where this was unavailable, historical data, where publicly available, and extrapolation based on data from other companies or national data has been used.

## Organisational boundaries

The organisational boundaries define the businesses and operations that constitute the company for the purpose of accounting and reporting greenhouse gas emissions. Organisational boundaries determine which activities and operating facilities, such as grid and gas distribution and processing plants (collectively termed 'operations' in this report), shall be included in the inventory. As detailed in the GHG Protocol, a company has three options for defining its organisational boundaries: equity share, financial control and operational control. In line with its approach for financial accounting, the Group has opted for the operational control approach for its emission inventory. Under the operational control approach, a company accounts for 100 percent of the GHG emissions over which it has operational control. It is also the approach that has greater potential for reducing GHG emissions.

## Reporting boundaries

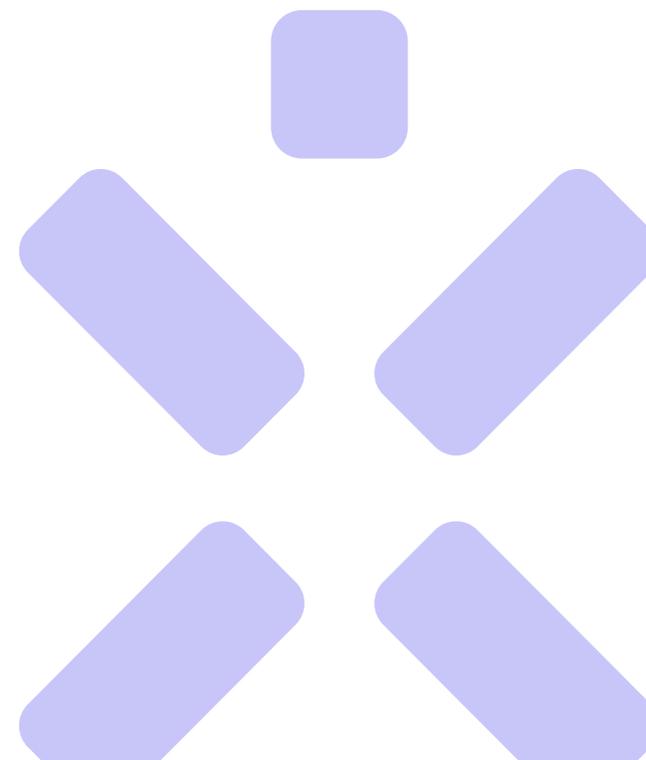
Defining the operational boundaries involves identifying the emissions associated with its operations. The WBCSB/WRI GHG Protocol classifies these emissions as Scope 1, Scope 2 and Scope 3. ISO 14064-1:2018 categorises them as follows:

- Direct GHG emissions and removals that occur inside the organisational boundary and that are directly controlled by the organisation (i.e., any owned or controlled activities that release emissions straight into the atmosphere).
- Indirect GHG emissions from imported energy – include only GHG emissions from fuel combustion associated with the production of final energy and utilities, such as electricity, heat, steam, cooling and compressed air.
- Indirect GHG emissions from transportation which are the consequence of the activities of the organisation but occur from sources not owned or controlled by the company. GHG emissions occur from sources located outside the organisational boundaries. Those sources are mostly due to fuel burned during transport of persons and goods (rail, maritime, air and road).
- Indirect GHG emissions from products used by the organisation which occur from sources located outside the organisational boundaries and are associated with the goods used by the organisation. Those sources are associated with all types of goods purchased by the reporting organisation.
- Indirect GHG emissions which are associated with the use of products sold by the organisation during the life stages occurring after the organisation's production process.
- Indirect GHG emissions from other sources – they are specific emissions (or removals) that cannot be reported in any other category.

Presenting the footprint by categories facilitates understanding of the key emissions sources in the organisation's footprint. It gives potential for the company and stakeholders in future years to target improvements in data collection and the areas where data has been identified to be less robust in this footprint.

## Reporting period

This report refers to the GHG analysis and quantification for the calendar year 2022. This inventory report covers the period from 1 January 2022 to 31 December 2022. The base year for monitoring emissions reduction performance is 2020.





## Qualitative estimation of uncertainty

The uncertainty associated with the calculation of GHG emissions is a combination of uncertainties associated with the activity data and the emission factors. The emission factors used to create the Group GHG inventory report are extracted from official sources and are specific to each source category. The emission factors and caloric data value used are not considered as uncertain because they come from official sources and they are beyond the control of the organisation. To minimise the uncertainty associated with the activity data, most of emission sources have environmental management systems that conform to the ISO 14001:2015 standard. Data for direct emissions is obtained from commercial invoices or the internal accounting system. Uncertainties in the accounting of the emissions are related to the following general assumptions:

- Fuel is bought using fuel cards from independent fuel suppliers. Fuel card data is provided by independent fuel suppliers to Fleet Services. Purchased fuel is recorded in fleet database and is matched against the supplier invoices.
- Fuel use (natural gas, waste, biomass) is measured using scales or meters and the uncertainty is calculated according to the GHG monitoring plan. Some facilities (Elektrėnai Complex, Vilnius Third Combined Heat and Power Plant and Kaunas CHP) are operating based on the [EU emissions trading system](#). Uncertainties are identified and managed according to the system's requirements.
- Data of buildings classified as offices, plants, warehouses and customer service centres is submitted as actual meter readings or is estimated based on the billing system. Buildings (facilities) which companies of the Group operate are based on actual meter readings. Leased buildings' consumption is estimated as there are no meters in place.
- Waste generated during operations – there is lack of emissions factors for some waste types and waste treatment methods in the DEFRA source.
- The quantity of fugitive emissions of refrigerants is based on the amount which was used for refilling.
- The actual flight or employee commuting distance may not always be exactly accurate in respect of the route. The conversion factors used take into account the fact that distances travelled may not be representative of the journey due to changes in flight paths for safety/weather/etc.





## Quantification of GHG emissions

### Quantification approach

The emission factor approach involves the multiplication of business activity data by the relevant emission factor, which is a coefficient describing the amount of GHG flux per unit of activity. For instance, to calculate the GHG emissions from stationary combustion, emissions may be estimated by multiplying the quantity of natural gas by the emission factor that specifies how much GHG emissions are emitted during the combustion process. Default emission factors are largely based either on field measurements at individual research sites<sup>1</sup> or represent average values across a range of sites. The established emissions factors have been derived from reliable references for each emissions source.

The carbon footprint is measured in CO<sub>2</sub> equivalent (kg CO<sub>2</sub> eq) and is calculated by multiplying the activity data by the standard emission factors. The final emissions' total for each section is provided in tonnes of CO<sub>2</sub> equivalent (t CO<sub>2</sub> eq).

$$CFP = \sum (AD_i \times EF_i)$$

CFP (Carbon footprint) – kg CO<sub>2</sub> eq

AD (Activity data) – activities of the organisation based on units of measure

EF (Emissions factor) – coefficient kg CO<sub>2</sub> eq / unit of measure

i (Index) – activity type

Once the emissions figures for each gas type (methane, nitrous oxide, and hydrofluorocarbon) are determined, the CO<sub>2</sub> eq value is determined by multiplying the figures by the appropriate Global Warming Potential (GWP) for that GHG (Table 1). These come from the fourth IPCC assessment report and are in line with DEFRA methodology, which explains that, even though the values from the sixth assessment report are already published, they have not been officially accepted for use under the United Nations Framework Convention on Climate Change. Therefore, these values will be updated to fifth or sixth assessment report when they are approved and taken into account by DEFRA.

For reporting purposes, these gases are converted to CO<sub>2</sub> equivalent, using their GWP:

Table 1. Greenhouse gases and GWP

Gas	Global Warming Potential <sup>2</sup> (GWP)
Carbon Dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	25
Nitrous Oxide (N <sub>2</sub> O)	298
Hydrofluorocarbons (HFCs)	650–11,700*
Perfluorocarbons (PFCs)	6,500–9,200*
Sulphur Hexafluoride (SF <sub>6</sub> )	23,500
Refrigerant 410A	2,088

\*Depending on gas

The gases generally chosen for quantification are the six "Kyoto Gases", as detailed in the ISO 14064-1 standard and the WBCSD/ WRI GHG Protocol.

### Direct GHG emissions

Direct emissions and removals occur from GHG sources or sinks within the organisation's boundaries and that are owned or controlled by the organisation. Those sources can be stationary (e.g., heaters, electricity generators, industrial process) or mobile (e.g., vehicles).

#### Stationary combustion

These emissions are mainly from CO<sub>2</sub> emissions from combustion of natural gas and waste. The GHG Protocol and ISO 14064 requires that CO<sub>2</sub> emissions from biomass combustion at stationary sources are reported as biomass CO<sub>2</sub> emissions (in terms of total amount of biogenic CO<sub>2</sub> emitted) and are tracked separately from fossil CO<sub>2</sub> emissions. Biogenic CO<sub>2</sub> emissions are not included in the overall CO<sub>2</sub> equivalent emissions inventory

<sup>1</sup> WRI, WBCSD, 2014. GHG Protocol Agricultural Guidance. World Resources Institute and World Business Council for Sustainable Development.

<sup>2</sup> The Fourth Assessment Report of the IPCC

of organisations following this guidance. CH<sub>4</sub> and N<sub>2</sub>O emissions from biomass and waste are included in the overall CO<sub>2</sub> equivalent emissions inventory. Natural gas consumption is converted to gross calorific value. For some facilities (e.g., Kaunas CHP) continuous emission monitoring systems (CEMS) are used as a tool to monitor the effluent gas streams resulting from combustion in industrial process. The quantities of fuel were obtained from internal accounting system. Emissions factors (secondary data) was taken from DEFRA, 2022 and Lithuania's national inventory report, 2022.

Table 2. Emissions from stationary combustion

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Natural gas	MWh	599,968	107,716
Waste (non-biogenic)	Tonnes	198,176	210,635
Waste (biogenic, only CH <sub>4</sub> &N <sub>2</sub> O)	Tonnes	171,932	3,342
Wood chips (CH <sub>4</sub> &N <sub>2</sub> O)	Tonnes	47,410	1,086
<b>Total</b>			<b>322,779</b>

Outside-of-scopes factors are used to account for the direct carbon dioxide (CO<sub>2</sub>) impact of burning biomass and biofuels. The emissions are labelled 'outside of scopes' because the direct (Scope 1) impact of these fuels has been determined to be a net '0' (since the fuel source itself absorbs an equivalent amount of CO<sub>2</sub> during the growth phase as the amount of CO<sub>2</sub> released through combustion).

Table 3. Biogenic emissions

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Biogenic waste (only CO <sub>2</sub> )	Tonnes	153,105	160,412
Wood chips (only CO <sub>2</sub> )	Tonnes	47,410	74,951
<b>Total</b>			<b>258,952</b>

### Mobile combustion

The quantification methodology employed for calculating direct emissions is based on activity data (consumption of fuel). All vehicles owned or leased by the Group that burn fuels are producing greenhouse gases. Typically, these will be cars, trucks and locomotive powered by petrol or diesel engines. The quantities of fuel were obtained from the internal accounting system. Emissions factors (secondary data) was taken from DEFRA, 2022.

Table 4. Emissions from mobile combustion

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Diesel	Litres	1,830,328	4,682
Petrol	Litres	284,809	616
<b>Total</b>			<b>5,297</b>

### Fugitive emissions of methane

Natural gas comprises circa 90% methane. Thus, any natural gas leak to the atmosphere from distribution by pipelines is inherently related to the release of methane. In turn, methane is a greenhouse gas co-responsible for climate change. The quantities of gas losses were obtained from the internal accounting system. Emissions factors (secondary data) was taken from DEFRA, 2022.

Table 5. Emissions from natural gas losses during the distribution process

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Natural gas losses	MWh	83,238	135,214
<b>Total</b>			<b>135,214</b>

### Fugitive emissions of refrigerants

Emissions of hydrofluorocarbons occur from leakage when filling an air conditioner, its use and from the disposal of such equipment at the end of its lifecycle. Another gas – SF<sub>6</sub> is used for electrical insulation and current interruption in equipment during the transmission and distribution of electricity. Most of the SF<sub>6</sub> used in electrical equipment is used in gas insulated switchgear and substations and in gas circuit breakers. SF<sub>6</sub> containing units used in medium voltage grid are hermetic. Leak proof is guaranteed and serviced by the producer. At the end of their service period, the units will be returned to the manufacturer. Any leakage of SF<sub>6</sub> was not observed in 2022. The quantities of refrigerants were obtained from the internal accounting system. Emissions factors (secondary data) was taken from DEFRA, 2022.

Table 6. Refrigeration losses on site

Category	Unit	Activity data	t, CO <sub>2</sub> eq
R-410A	kg	50	104
R-32	kg	1	0
R-134A	kg	10	14
<b>Total</b>			<b>118</b>

## Indirect GHG emissions

Indirect emissions are generated as a consequence of company activities and do not derive from controlled or owned sources. These indirect emissions concern the Group's entire value chain, from generation and transportation to the sale of energy. The emissions fall into several indirect categories of the ISO 14064 standard that are described below.

### Indirect GHG emissions from imported energy

#### Electricity

Indirect GHG emissions from imported energy, deriving from the generation of electricity and heat that was purchased and consumed by the Group. Actual and estimated electricity consumption is taken from the network for office buildings or for energy generation in thermoelectric and hydroelectric plants. Primarily, two methods are used to "allocate" the GHG emissions from electricity generation to the end consumers of a given grid. These are the location-based method and the market-based method. The location-based method reflects the average emissions intensity of grids on which energy consumption occurs, while the market-based method reflects emissions from electricity that companies have purposefully chosen (or not chosen).

Actual and estimated electricity consumption in the Group offices, premises and customer service buildings was accounted for. Activity data (primary data): electricity quantities were collected by internal administration. The newest emissions factors were used (secondary data): emissions conversion factor was taken from IEA, 2022, and European Residual Mixes, 2022. IEA EF for 2022 is therefore based on the data from 2020 statistics.

Table 7. Emissions from electricity consumption

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Electricity (location-based)	MWh	805,265	119,985
Electricity (market-based)	MWh	805,265	309,894

#### District heating

District heating means actual and estimated district heating consumption in the Group offices, premises and customer service buildings. Activity data (primary data): data of heating consumed by the Group during the reporting year was collected by internal administration. Emissions factors (secondary data): CO<sub>2</sub> eq conversion factor was taken from [local legislation](#).

Table 8. Emissions from district heating

Category	Unit	Activity data	t, CO <sub>2</sub> eq
District heating	MWh	6,005	601
<b>Total</b>			<b>601</b>

#### Energy related activities

Emissions related to the extraction, production, and transportation of fuels and energy purchased or acquired by the reporting company in the reporting year, not already accounted for in the direct emissions category:

- Well-to-tank (WTT) conversion factors are used to account for the upstream emissions associated with extraction, refinement and transportation of raw fuel sources to an organisation's site (or asset) prior to the combustion or generation of the heat and electricity from sources that the organisation had purchased (e.g., diesel, petrol). Note that emissions from the combustion of fuels at our facilities are accounted for as our direct (Scope 1) emissions; similarly, emissions from the generation of purchased electricity consumed by the Group are accounted for as our indirect GHG emissions from imported energy (Scope 2) emissions.
- Transmission emissions associated with grid losses (the energy loss that occurs in getting the electricity from the power plant to the organisations that purchase it). In this section we will calculate the emissions resulting from these losses in the grid from energy transmission from third parties. Emission from distribution losses is calculated in Indirect GHG emissions associated with the use of products from the organisation category.

Activity data (primary data): actual and estimated district heating consumption quantities of fuel and energy (electricity and heat) purchased during the reporting year were obtained from internal accounting systems. The cradle-to-gate emissions factors were obtained from the DEFRA database.

Table 9. Well-to-tank emissions from fuel and energy related activities

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Natural gas (WTT)	MWh	599,968	18,659
District heat (WTT)	MWh	6,005	243
Electricity Lithuania (WTT)	MWh	805,265	48,688
Electricity transmission losses	MWh	805,265	3,204
Diesel (WTT)	Litres	1,830,328	1,116
Petrol (WTT)	Litres	284,809	175
Biomass/ Wood chips (WTT)	Tonnes	47,410	1,441
<b>Total</b>			<b>73,526</b>

<sup>3</sup> The location-based method is based on statistical emissions information and electricity output aggregated and averaged within a defined geographic boundary and during a defined period. Within this boundary, the different energy producers utilize a mix of energy resources, where the use of fossil fuels (coal, oil, and gas) result in direct GHG-emissions. These emissions are reflected in the location-based emissions factor.

<sup>4</sup> The choice of emissions factor using this method is determined by whether the business acquires guarantee of origin/ renewable energy certificates (GoOs/RECs) or not. When selling GoOs or RECs, the supplier certifies that the electricity is produced exclusively by renewable sources, which has an emission factor of 0 grams CO<sub>2</sub> eq per kWh. However, for electricity without the GoO or REC, the emission factor is based on the remaining electricity production after all GoOs and RECs for renewable energy are sold. This is called a residual mix, which is normally substantially higher than the location-based factor.

## Indirect GHG emissions from transportation

### Upstream transportation

This category includes the reporting of emissions due to the transportation (by contractors) of used fuels (waste) for the operation of Kaunas and Vilnius CHPs. For calculation, basic assumptions were made regarding the length of the trip, the emissions of the mode of transport used and its frequency. The transportation distance was estimated by the logistics experts:

- For Kaunas CHP, truck transportation and routes were calculated based on bills of loading for 1 month multiplied by 12. The total transportation distance amounted to 578,292 km and an average truck consumption of 35l/100km was presumed.
- For Vilnius CHP, truck transportation and routes were calculated based on bills of loading for 1 month multiplied by 12. The total transportation distance amounted to 141,624 km and an average truck consumption of 35l/100km was presumed.

Emission factors (secondary data) for diesel fuel were obtained from DEFRA's GHG Conversion Factors for Company Reporting (2022).

Table 10. Emissions from upstream transportation

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Transportation diesel	Litres	327,571	645
<b>Total</b>			<b>645</b>

### Downstream transportation

This category includes the reporting of emissions from transportation (by contractors) of waste from operation of the plants. For calculation, basic assumptions were made regarding the length of the trip, the emissions of the mode of transport and its frequency. The transportation distance is estimated by the logistics experts:

- Truck transportation and an average transportation distance of 120 km were assumed for Elektrėnai Complex (both ways). There were around 435 total trips and an average truck consumption of 35l/100km was presumed.
- For Kaunas CHP, truck transportation and routes were calculated based on bills of loading for 1 month multiplied by 12. The total transportation distance amounted to 140,580 km and an average truck consumption of 35l/100km was presumed.
- For Vilnius CHP, truck transportation and routes were calculated based on bills of loading for 1 month multiplied by 12. The total transportation distance amounted to 220,584 km and an average truck consumption of 35l/100km was presumed.

Emissions factors (secondary data) for diesel fuel were obtained from DEFRA's GHG Conversion Factors for Company Reporting (2022).

Table 11. Emissions from downstream transportation

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Transportation diesel	Litres	144,677	370
<b>Total</b>			<b>370</b>

### Business travel

This category covers emissions from all domestic and international flights taken by employees for business travel purposes. GHG emissions from business travel by air: actual distance travelled (in kilometres) between airports was converted to CO<sub>2</sub> equivalents using conversion factors for an average passenger in short-haul and long-haul flights. Activity data (primary data): travelled kilometres by means of transport of Group employees in the reporting year were collected by internal administration. Emissions factors (secondary data): CO<sub>2</sub> eq conversion factors for short-haul and long-haul flights were taken from DEFRA's GHG Conversion Factors for Company Reporting (2022).

Table 12. Emissions from business trips

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Short-haul, (<3700 km)	pkm	643,408	99
Long-haul, (>3700 km)	pkm	91,618	17
<b>Total</b>			<b>116</b>

### Employee commuting

This category includes emissions from the transportation of employees between their homes and worksites. Emissions are estimated by collecting data on the quantity of fuel used by employees to commute from their home to the office during the reporting period and multiplying by the relevant emissions factor (commuting in company fleet cars is not included). The information is obtained through employee surveys. Emissions factors (secondary data): CO<sub>2</sub> eq conversion factors were taken from DEFRA's GHG Conversion Factors for Company Reporting (2022).

Table 13. Emissions from employee commuting

Category	Unit	Activity data	t, CO <sub>2</sub> eq
By diesel transport	Litres	640,800	1,639
By petrol transport	Litres	318,145	688
<b>Total</b>			<b>2,327</b>

## Indirect GHG emissions from products used by the organisation

### Purchased goods and services

This category includes all upstream (i.e., cradle-to-gate) emissions generated from the manufacturing of products purchased or acquired (non-durable) by the Group in 2022: office paper and water. Activity data (primary data): quantity and volume of the goods and services purchased during the reporting period were obtained from internal companies and from the main supplier of office paper. There are three main types of water use in our operations: surface, ground water from boreholes and from the supply network. Water is used mainly in our generation facilities for technological processes. Emissions factors (secondary data) for raw materials and packaging (cradle-to-gate) were obtained from DEFRA's GHG Conversion Factors for Company Reporting (2022) and other sources.

Table 14. Emissions from purchased items

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Paper, virgin	tonnes	13	12
Water, network supply	m <sup>3</sup>	226,336	34
Water supply (surface)	m <sup>3</sup>	405,852	254
Water supply (groundwater)	m <sup>3</sup>	26,768	15
<b>Total</b>			<b>315</b>

### Waste generated in operation

The waste figures are based on actual and estimated amount of waste. This section describes the emissions associated with material waste disposal which is used for end-of-life disposal of different materials using a variety of disposal methods. Wastewater is treated in local treatment facilities or returned into the sewerage system through the drains. The quantities of solid waste and waste water generated during production at the Group production sites were obtained from the Unified Product, Packaging and Waste Record Keeping Information System of Lithuania ([www.gpais.eu](http://www.gpais.eu)) and from the internal accounting system. Each category is divided into different sub-categories. Emission factors are then applied for the volumes of each sub-category. Emission factors (secondary data) were obtained from the DEFRA, 2022 and Ecoinvent, 2019 databases.

Table 15. Emissions from waste

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Metal waste, recycled	tonnes	2,806	60
Hazardous waste, incinerated	tonnes	480	1,161
Waste mix, landfill (municipal)	tonnes	6,049	2,825
Waste (ashes)	tonnes	102,555	851
Wastewater treatment (network)	m <sup>3</sup>	454,815	124
<b>Total</b>			<b>5,020</b>

## Indirect GHG emissions associated with the use of products from the organisation

Emissions associated with the use of the organisation's products that come from energy products traded by the organisation:

- Emissions associated with electricity purchased from third parties for sale to end customers. When selling electricity with GoOs or RECs, the supplier certifies that the electricity is produced exclusively by renewable sources, which has an emission factor of 0 grams CO<sub>2</sub> eq per kWh. So, "green" electricity emissions are equal to 0.
- Emissions associated with gas supplied to customers. These are the GHG emissions from the combustion of the gas sold to the end customer. Emissions related to combustion of the goods, which are those corresponding to the combustion of natural gas sold by the Group to the customer, excluding the gas consumed within the organisation (which is already included in Direct category). Use of sold products is calculated based on actual sales of gas to end-users. It was assumed that 100% of the gas is combusted for heating or chemical purposes.
- Grid losses are emissions associated with grid losses during the transportation of energy from third parties. This category includes indirect emissions deriving from dissipated energy emissions from technical losses of the Group grid distribution network. The quantities of grid losses were obtained from the internal accounting system.

Activity data (primary data): quantities of products sold during the reporting period were obtained from the Group internal business data management systems. The newest emissions factors were used (secondary data): CO<sub>2</sub> eq conversion factor was taken from IEA, 2022, European Residual Mixes, 2022 and Lithuania's national inventory report, 2022. IEA EF for 2022 is therefore based on the data from 2022 statistics.

Table 16. Emissions from use of sold products

Category	Unit	Activity data	t, CO <sub>2</sub> eq
Sold electricity in retail market (location-based)	MWh	7,934,032	1,335,865
Sold electricity in retail market (market-based)	MWh	5,043,692	2,076,459
Use of sold natural gas in retail market	MWh	9,933,241	1,782,633
Electricity from leased assets (location-based)	MWh	499	74
Electricity from leased assets (market-based)	MWh	499	192
Electricity grid losses (location-based)	MWh	477,851	71,200
Electricity grid losses (market-based)	MWh	477,851	183,973
<b>Total (location-based)</b>			<b>3,189,772</b>
<b>Total (market-based)</b>			<b>4,043,258</b>



## Exclusions

This report was based on a materiality criterion. Emissions that do not figure highly (< 5%) in relation to total emissions were not included.

This report was based on materiality criterion, with the following exceptions:

- Emissions from purchased good & services (e.g. solar panels) - reason for exclusion – there is no reliable data like life cycle analysis;
- Bus, taxi, car sharing travels. Reason for exclusion – minimal impact;
- Emissions from production of purchased capital goods (e.g., construction) by the Group. Reason for exclusion – there is no reliable data;
- Emissions from the use of leased assets – activity data, such as water and municipality waste, is included in other categories: 'Indirect emissions from energy' and 'Indirect GHG emissions from products used by the organisation';
- Processing of sold intermediate products (related to GHG protocol) by third parties. Reason for exclusion – products are mainly used ('Indirect GHG emissions associated with the use of products from the organisation') and are not processed;
- Emissions from waste disposal and treatment of products sold by the reporting companies at the end of their life. Reason for exclusion – not relevant;
- Transmission and distribution of sold electricity abroad – there is no reliable data;
- Emissions from operation of assets that are owned by the reporting companies and leased to other entities. Activity data, such as water and municipality waste, is included in other categories;
- Emission from operation of franchises (a business operating under a license to sell/distribute another company's goods/ services). Reason for exclusion – the Group doesn't have such type of operations;
- Investments – the parent company's subsidiary UAB "Ignitis renewables" has acquired 5 percent of shareholding interest in the development project of the Moray West wind farm on the east coast of Great Britain and will be the minority partner in the project.





## Verification statement

The GHG inventory statements for 2022 were audited by Bureau Veritas, with a reasonable level of certainty. The audit was conducted according to standard LST EN ISO 14064-3:2019.



Bureau Veritas Certification



### VERIFICATION STATEMENT OF THE GREENHOUSE GAS EMISSIONS reported by

**AB „Ignitis grupē“**  
Laisvės ave. 10, LT-04215 Vilnius, Lithuania

Verification Institution of Bureau Veritas Latvia LLC has verified  
AB „Ignitis grupē“ report of the greenhouse gas emissions  
in accordance with ISO 14064-3:2019

and found that the report developed by  
AB „Ignitis grupē“ is in accordance with the requirements of

**ISO 14064-1:2018**

Verification period: 01.01.2022. – 31.12.2022.

Confirmed and verified amount of the Greenhouse Gas Emissions  
**4 899 479 tons CO<sub>2</sub>e (market based)**

Confirmed and verified amount of the Greenhouse Gas Emissions  
**3 856 084 tons CO<sub>2</sub>e (location based)**

Verification scope:  
ELECTRIC POWER GENERATION, TRANSMISSION AND DISTRIBUTION,  
DISTRIBUTION OF GASEOUS FUELS THROUGH MAINS,  
TRADE OF GAS THROUGH MAINS,  
CONSTRUCTION OF UTILITY PROJECTS.

Verification date 23.02.2023.

Verification statement No RIG02026760

Issue date 27.02.2023.

*Address of Bureau Veritas Latvia LLC Verification Institution: Dantes iela 17a, Rīga, LV-1005*

*Further clarifications regarding the scope and validity of this verification statement and the applicability, please call: +371 67323246*

## INDEPENDENT REASONABLE ASSURANCE STATEMENT

To: The Stakeholders of AB „IGNITIS GRUPĒ“



### Introduction and objectives

UAB "Bureau Veritas Lit." provides services within The Verification institution of SIA "BUREAU VERITAS LATVIA" accreditation certificate No. LATAK-GHG-488-12-2013 approved by State Agency "Latvian National Accreditation Bureau", has been commissioned by AB „IGNITIS GRUPĒ“ to provide reasonable assurance for the data included in the organization's greenhouse gas emission (GHG) report. This Assurance Statement applies to the related information included within the scope of work described below.

### Scope

The scope of independent reasonable assurance statement is to provide assurance over the following information included within the AB „IGNITIS GRUPĒ“, registration number 301844044, legal and actual address: Laisvės pr. 10, LT-04215 Vilnius, Lithuania, **Greenhouse Gas Emissions Inventory** ('the Report') for the period 1<sup>st</sup> January to 31<sup>st</sup> December 2022 (the 'Selected Information'):

- Market based emissions reported as **4 899 479 t CO<sub>2</sub> eq**
- Location based emissions reported as **3 856 084 t CO<sub>2</sub> eq**
- Anthropogenic biogenic emissions as **258 952 t CO<sub>2</sub> eq**

### Reporting criteria

Year 2022 Greenhouse Gas Emissions Inventory of AB „IGNITIS GRUPĒ“ (version 1).

### Limitations and exclusions

Excluded from the scope is verification of any information related to activities outside of the defined verification period.

This reasonable assurance engagement relies on a risk based selected sample of data and the associated limitations that this entails. This independent statement should not be relied upon to detect all errors, omissions or misstatements that may exist.

### Responsibilities

This preparation and presentation of the Selected Information in the Report are the sole responsibility of the management of AB „IGNITIS GRUPĒ“.

Bureau Veritas was not involved in the drafting of the Report or of the Reporting Criteria. Our responsibilities were to:

- obtain reasonable assurance about whether the Selected Information has been prepared in accordance with the Reporting Criteria;
- form an independent conclusion based on the assurance procedures performed and evidence obtained; and
- report our conclusions to the management of AB „IGNITIS GRUPĒ“.

### Assessment Standard

Assessment performed in accordance with the ISO 14064-1:2018 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals and ISO 14064-3:2019 Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions, taking into account additional requirements of The Greenhouse Gas Protocol. A Corporate Accounting and Reporting Standard. Revised edition.

### Summary of work performed

As part of its independent verification, Bureau Veritas undertook the following activities:

1. Assessed the appropriateness of the Reporting Criteria for the Selected Information;
2. Conducted interviews with relevant personnel of AB „IGNITIS GRUPĒ“;
3. Carried out detailed on-site review of data from AB „IGNITIS GRUPĒ“ sites;
4. Reviewed the data collection and consolidation processes used to compile the Selected Information, including assessing assumptions made, the data scope and reporting boundaries;
5. Reviewed documentary evidence produced by AB „IGNITIS GRUPĒ“;
6. Agreed a sample of the Selected Information to the corresponding source documentation; and
7. Re-performed aggregation calculations of the Selected Information.

### Conclusion

On the basis of our methodology and the activities described above, nothing has come to our attention to indicate that the Selected Information has not been prepared, in all material respects, in accordance with the Reporting Criteria

### Statement of Independence, Integrity and Competence

Bureau Veritas has implemented and applies a Code of Ethics, which meets the requirements of the International Federation of Inspection Agencies (IFIA)<sup>1</sup> across the business to ensure that its employees maintain integrity, objectivity, professional competence and due care, confidentiality, professional behaviour and high ethical standards in their day-to-day business activities.

Bureau Veritas is accredited by the State agency Latvian National Accreditation body (LATAK) in accordance with the recognised International Standard ISO 14065:2013 Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.

The verification team for this assessment does not have any involvement in any other Bureau Veritas projects with AB „IGNITIS GRUPĒ“.

SIA Bureau Veritas Latvia  
27.02.2023.



<sup>1</sup> International Federation of Inspection Agencies – Compliance Code – Third Edition



## Glossary

CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
EF	emission factor
ESO	AB "Energijos skirstymo operatorius"
GHG	greenhouse gas
GoO	guarantee of origin
<b>Group or Ignitis Group</b>	AB "Ignitis grupė" and its controlled companies
GW	gigawatt
GWP	global warming potential
IPCC	Intergovernmental panel on climate change
<b>Kaunas CHP</b>	UAB Kauno kogeneracinė jėgainė
LNIR	Lithuania's national inventory report
MW	megawatt
MWh	megawatt hour
N <sub>2</sub> O	nitrous oxide
RECs	renewable energy certificates
SBTi	Science Based Targets initiative
TW	terawatt
<b>Vilnius CHP</b>	UAB Vilniaus kogeneracinė jėgainė
WBCSD	World business council for sustainable development



## Appendix I: Total GHG emissions (based on ISO 14064)

### Total GHG emissions by categories (location-based)

Emissions	Total (t, CO <sub>2</sub> eq)	t, CO <sub>2</sub> eq (from CO <sub>2</sub> )	t, CO <sub>2</sub> eq (from CH <sub>4</sub> )	t, CO <sub>2</sub> eq (from N <sub>2</sub> O)	t, CO <sub>2</sub> eq (from Hydrofluorocarbons)
<b>1. Cat. 1: Direct emissions and removals (t CO<sub>2</sub> eq)</b>	<b>463,409</b>	<b>319,562</b>	<b>138,483</b>	<b>5,245</b>	<b>118</b>
1.1 Direct emissions from stationary combustion	322,779	314,337	3,267	5,175	-
1.2 Direct emissions from mobile combustion	5,297	5,225	3	70	-
1.3 Direct fugitive emissions	135,332	-	135,214		118
Direct emissions in tonnes of CO <sub>2</sub> from biomass	74,951	74,951			
Direct emissions in tonnes of CO <sub>2</sub> from biogenic waste	184,002	184,002			
<b>2. Cat. 2: Indirect emissions from energy</b>	<b>120,585</b>				
2.1 Emissions from imported electricity (location-based)	119,985				
2.2 Emissions from imported heating	601				
<b>3. Cat. 3: Indirect GHG emissions from transportation</b>	<b>3,457</b>				
3.1 Upstream transportation	645				
3.2 Downstream transportation	370				
3.3 Business travel	116				
3.4 Employee commuting	2,327				
<b>4. Cat. 4: Indirect GHG emissions from products used by the organisation</b>	<b>78,861</b>				
4.1 Emissions from purchased goods and services	315				
4.2 Emission from fuel and energy related activities	73,526				
4.3 Emission from disposal of solid and liquid waste	5,020				
<b>5. Cat. 5: Indirect GHG emissions associated with the use of products from the organisation</b>	<b>3,189,772</b>				
5.1 Emissions from the use stage of the product (location-based)	3,118,498				
5.2 Emission from downstream leased assets (location-based)	74				
5.3 Emission from grid losses	71,200				
<b>Total anthropogenic emissions (location-based):</b>	<b>3,856,084</b>				
<b>Total anthropogenic biogenic emissions:</b>	<b>258,952</b>				

## Total GHG emissions by categories (market-based)

Emissions	Total (t, CO <sub>2</sub> eq)	t, CO <sub>2</sub> eq (from CO <sub>2</sub> )	t, CO <sub>2</sub> eq (from CH <sub>4</sub> )	t, CO <sub>2</sub> eq (from N <sub>2</sub> O)	t, CO <sub>2</sub> eq (from Hydrofluorocarbons)
<b>1. Cat. 1: Direct emissions and removals</b>	<b>463,409</b>	<b>319,562</b>	<b>138,483</b>	<b>5,245</b>	<b>118</b>
1.1 Direct emissions from stationary combustion	322,779	314,337	3,267	5,175	-
1.2 Direct emissions from mobile combustion	5,297	5,225	3	70	-
1.3 Direct fugitive emissions	135,332	-	135,214		118
Direct emissions in tonnes of CO <sub>2</sub> from biomass	74,951	74,951			
Direct emissions in tonnes of CO <sub>2</sub> from Biogenic waste	184,002	184,002			
<b>2. Cat. 2: Indirect emissions from energy</b>	<b>310,495</b>				
2.1 Emissions from imported electricity (market-based)	309,894				
2.2 Emissions from imported heating	601				
<b>3. Cat. 3: Indirect GHG emissions from transportation</b>	<b>3,457</b>				
3.1 Upstream transportation	645				
3.2 Downstream transportation	370				
3.3 Business travel	116				
3.4 Employee commuting	2,327				
<b>4. Cat. 4: Indirect GHG emissions from products used by the organisation</b>	<b>78,861</b>				
4.1 Emissions from purchased goods and services	315				
4.2 Emission from fuel and energy related activities	73,526				
4.3 Emission from disposal of solid and liquid waste	5,020				
<b>5. Cat. 5: Indirect GHG emissions associated with the use of products from the organisation</b>	<b>4,043,258</b>				
5.1 Emissions from the use stage of the product (market-based)	3,859,092				
5.2 Emission from downstream leased assets (market-based)	192				
5.3 Emission from grid losses	183,973				
<b>Total anthropogenic emissions (market-based):</b>	<b>4,899,479</b>				
<b>Total anthropogenic biogenic emissions:</b>	<b>258,952</b>				



## Appendix II: Total GHG emissions (based on GHG protocol)

### Total GHG emissions by scopes (location-based)

GHG emissions	t, CO <sub>2</sub> eq
Direct (Scope 1) emissions	463,409
Indirect (Scope 2) emissions (location-based)	191,785
Other indirect (Scope 3) emissions	3,200,891
<b>Total (Scope 1, 2, 3)</b>	<b>3,856,084</b>
Emissions outside the specified scopes (biogenic origin)	258,952
<b>Total</b>	<b>4,115,037</b>

### Total GHG emissions by scopes (market-based)

GHG emissions	t, CO <sub>2</sub> eq
Direct (Scope 1) emissions	463,409
Indirect (Scope 2) emissions (market-based)	494,467
Other indirect (Scope 3) emissions	3,941,603
<b>Total (Scope 1, 2, 3)</b>	<b>4,899,479</b>
Emissions outside the specified scopes (biogenic origin)	258,952
<b>Total</b>	<b>5,158,431</b>

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