

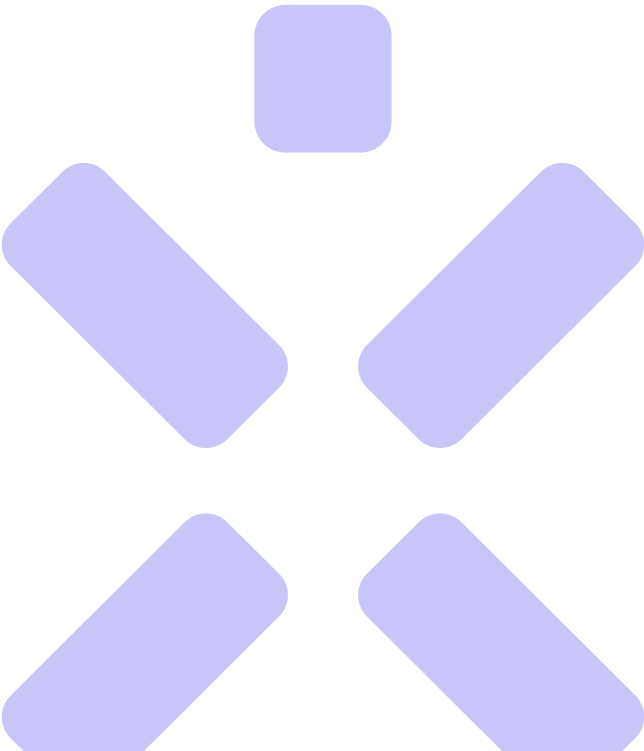


Greenhouse gas inventory report

2023

Contents

- 1. Introduction 3
- 2. Methodology 7
- 3. Qualitative estimation of uncertainty 9
- 4. Quantification of GHG emissions 10
 - Scope 1 (direct GHG emissions) 10
 - Scope 2 (indirect GHG emissions) 12
 - Indirect GHG emissions from imported energy and electricity distribution 12
 - Scope 3 (indirect GHG emissions) 13
 - Indirect GHG emissions from transportation 13
 - Indirect GHG emissions from products used by the organisation 14
 - Indirect GHG emissions associated with the use of products from the organisation 15
- 5. Intensity metrics 16
- 6. Exclusions 17
- 7. Verification statement 18
- 8. Glossary 19
- 9. Appendix I: Total GHG emissions (based on GHG protocol) 20





Introduction

Ignitis Group is a **renewables focused integrated utility** and one of the largest energy groups in the Baltic region. The Group's core activities include power and heat production and supply, power and natural gas trading and distribution, and power system maintenance and development. Group companies operate in Lithuania, Latvia, Estonia, Poland and Finland. Group innovation fund invests in energy startups in the UK, Norway, Sweden, France and Israel.

The Group's 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 Reserve Capacities 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). The Group also explores new opportunities



in countries on the energy transition path. The Group's strategy places a priority on rapid renewables expansion and commitment to create a 100% green and secure energy ecosystem for current and future generations. The Group has set a target to reach 4–5 GW of installed green generation capacity by 2030 and is committed to achieving net zero greenhouse gas (GHG) emissions by 2040–2050.

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, GHG emissions must drop to net zero by 2040–2050. In 2021 the Science Based Targets Initiative (SBTi), a collaboration between the largest global organisations fighting climate change, approved the ambitious GHG reduction targets of the Group. We are the first Lithuanian capital organisation to have its GHG reduction targets approved by this initiative. After assessing the targets of the Group, the SBTi

confirmed that they are in line with the latest climate science on actions that should limit global warming to 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 [2023–2026 Strategic Plan](#), the Group confirmed the investments of EUR 2.2–2.8 billion, mainly allocated to the Green Generation and Networks segments.

Group's structure



Structure of the Group

The Group's governance structure and model have been developed on the basis of the best international and national practices and by following the recommendations of the OECD. The parent company of the Group is AB "Ignitis grupė" and is responsible for the co-ordination of activities and transparent management of the Group. The Group, directly or indirectly, controlled 50 companies at the end of 2023. Approximately 4,405 employees work at the Group. More information about the companies and their financial indicators can be found [here](#). Detailed information about the activities of the Group is provided in the [2023 annual report](#).



The main activity of the segment is generation of electricity and heat using renewable energy sources, including wind, hydro, solar, biomass and waste-to-energy, while developing and operating new generation capacities. Strategically, the focus is on the consistent expansion of capacity, development of new projects not only in Lithuania, but in the surrounding countries as well. Our current capacity includes 5 operating wind farms in Lithuania (121 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 plants in Vilnius (20 MWe, 70 MWth) together with biomass unit (73MWe, 169 MWth) and Kaunas (26 MWe, 70 MWth). Total installed capacity of the Green Generation segment is 1,328 MW. Around 55%, of the Group's investments over 2023-2026 will be directed towards the expansion of Green Generation capacity. We target to reach 2.2–2.4 GW of installed Green Generation capacity by 2026, and 4–5 GW by 2030.



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 is around 65,300 km². 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 2023 amounted to EUR 346.8 million and were EUR 78.7 million higher compared to 2022.



The Reserve Capacities segment operates the largest electricity generation facility in Lithuania, the Elektrėnai Complex, with a total 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. The Reserve Capacities segment includes activities carried out by "Ignitis gamyba" AB (except Kaunas HPP, Kruonis PSHP, Biofuel and Steam Boiler). Electricity generation (net) volume of combined cycle gas turbine plant (CCGT) as well as units 7 and 8 at Elektrėnai Complex was 0.31 TWh in 2023 and increased by 15% compared 2022.



Activities of the Customers & Solutions segment include electricity and gas supply, trading, balancing and development of the EV public charging network in the Baltics, implementing energy efficiency projects. 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. Customers & Solutions segment already supplies electricity and natural gas to over 2 million clients while expanding its activities in the Baltic region. Total electricity sales in the electricity retail market in 2023 decreased by 14% compared to 2022 and amounted to 6.65 TWh in total. The volume of natural gas sold to retail and wholesale customers in 2023 was 9.29 TWh and represented a 27% decrease compared to 2022.

Other activities

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

Strategy

In 2023, we updated our [strategic plan for 2023-2026](#) and sustainability remains at the core of our strategy. We are accelerating our transition towards a decarbonised world, transforming our business models by developing and scaling smart solutions, expanding our operations in the region, and exploring new opportunities in the markets undergoing the energy transition.

In our strategy we focus on four key strategic priorities. First, we aspire 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 a strong commitment to a more sustainable future. We align our business targets with the UN Sustainable Development Goals and our strategies with science-based targets to have a 1.5 °C-compliant business model. Thus, we are committed to reach net zero GHG emissions by 2040–2050. Second, we strive to ensure the resilience and flexibility of the energy system as well as enable energy transition and evolution. Third, we aim to grow renewables to meet regional energy commitments. Our target is to reach 4–5 GW of installed green generation capacity by 2030. Fourth, we have ambitions to capture growth opportunities and develop innovative solutions to make life easier and more energy smart with a focus on green and flexible technologies such as offshore wind, onshore hybrid, P2X & storage.





Methodology

Ignitis Group GHG Inventory Report (hereafter – report) presents the results of the carbon footprint of the entire Group and its value chain 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 [GHG Protocol Corporate standard](#). The report also follows good practice principles and has been prepared in accordance with the following frameworks and databases:

- [Association of Issuing Bodies \(AIB\), 2023 European Residual Mixes](#);
- [International Energy Agency \(IEA\), 2023 The Emission factors database](#);
- [Intergovernmental Panel on Climate Change \(IPCC\), 2006 Guidelines for National Greenhouse Gas Inventories](#);
- [The European Bank for Reconstruction and Development \(EBRD\), 2014 Methodology for the assessment of greenhouse gas emissions](#);
- [UK Department for Environment, Food & Rural Affairs \(DEFRA\), 2023 Government Greenhouse Gas Conversion Factors for Company Reporting](#).

The methodology used for the footprint calculations is covered in the Quantification of GHG emissions section below, including the reporting principles of the methodology 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 the Organisational boundaries.

Principles

This report is carried out in accordance with the following key GHG Accounting and Reporting Principles, 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 greenhouse gas 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:** All relevant GHG emission sources and activities within the defined inventory boundary were accounted for.
- **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.
- **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. In line with the operational control approach, the Group 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. 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 2023. This inventory report covers the period from 1 January 2023 to 31 December 2023. The base year for monitoring emissions reduction performance is 2020.

The Group's Sustainability unit is responsible for the completeness, accuracy and validity of the information provided in the 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.



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 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 the emissions stem from operations under 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 the Group's internal fleet services unit. Purchased fuel is recorded in the 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 Group's GHG monitoring plan. Some facilities (Elektrėnai Complex, Vilnius Third Combined Heat Power Plant and Kaunas Combined Heat and Power Plant (CHP)) participate in the [EU emissions trading system](#). GHG calculation 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) operated by the Group are based on actual meter readings. Leased buildings' consumption is estimated from spend data as there are no meters in place.
- Waste generated during operations – there is a lack of emission factors for some waste types and waste treatment methods in the DEFRA database, therefore we use emission factors of the closest available category.
- 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 or represent average values across a range of sites. The established emission factors have been derived from reliable references for each emission source.

The carbon footprint is measured in CO₂ equivalent (kg CO₂ 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 CO₂ equivalent (t CO₂ eq).

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

CFP (Carbon footprint) – kg CO₂ eq

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

EF (Emissions factor) – coefficient kg CO₂ eq / unit of measure

i (Index) – activity type

Once the emissions figures for each gas type (methane, nitrous oxide, and hydrofluorocarbon) are determined, the CO₂ eq value is determined by multiplying the figures by the appropriate Global Warming Potential (GWP) for that GHG (Table 1). These come from the fifth 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 reflect the sixth assessment report when they are approved and taken into account by DEFRA.

For reporting purposes, these gases (Table 1) are converted to CO₂ equivalent, using their GWP:

Table 1. Greenhouse gases and GWP

Gas	Global Warming Potential ² (GWP)
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	265
Hydrofluorocarbons (HFCs)	4–12,400*
Perfluorocarbons (PFCs)	6,630–11,100*
Sulphur Hexafluoride (SF ₆)	23,500
Refrigerant 410A	2,088

*Depending on gas type

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

Scope 1 (direct GHG emissions)

Direct emissions occur from GHG sources within the organisation's boundaries 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 occur mainly from combustion of natural gas and waste. The GHG Protocol requires that CO₂ emissions from biomass combustion at stationary sources are reported as biomass CO₂ emissions (in terms of the total amount of biogenic CO₂ emitted) and are tracked separately from fossil CO₂ emissions. Biogenic CO₂ emissions are not included in the overall GHG emissions inventory of Ignitis Group following this guidance and are displayed in the out of scope category. Only CH₄ and N₂O emissions from biomass and waste are included in the overall GHG emissions inventory. Natural gas consumption is converted

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

² The Fifth Assessment Report of the IPCC.

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 the internal accounting system. Emissions factors (secondary data) were taken from DEFRA (2023) and Lithuania's 2023 national inventory report.

Table 2. Emissions from stationary combustion

Category	t, CO ₂ eq
Natural gas	132,526
Waste (non-biogenic)	239,181
Waste (biogenic, only CH ₄ &N ₂ O)	3,594
Wood chips (CH ₄ &N ₂ O)	3,136
Total	378,473

Out of scope factors are used to account for the direct CO₂ impact of burning biomass and biofuels. The emissions are labelled 'out of scope' 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 CO₂ during the growth phase as the amount of CO₂ released through combustion).

Table 3. Biogenic emissions (out of scope)

Category	t, CO ₂ eq
Biogenic waste (only CO ₂)	193,752
Wood chips (only CO ₂)	167,273
Total	361,025

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 locomotives powered by petrol or diesel engines. The quantities of fuel were obtained from the internal accounting system. Emissions factors were taken from DEFRA (2023).

Table 4. Emissions from mobile combustion

Category	t, CO ₂ eq
Diesel	4,643
Petrol	711
Total	5,354

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 factor was taken from DEFRA (2023).

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

Category	t, CO ₂ eq
Natural gas losses	71,186
Total	71,186

Fugitive emissions of refrigerants

Emissions of hydrofluorocarbons occur from leakage in air conditioning systems during its use and the disposal at the end of its lifecycle. Another gas – SF₆ is used for electrical insulation and current interruption in equipment during the transmission and distribution of electricity. Most of the SF₆ used in electrical equipment is used in gas insulated switchgear and substations and in gas circuit breakers. SF₆-containing units used in the medium voltage grid are hermetic; they are serviced by the manufacturer who guarantees they are leak-proof. At the end of their service period, the units will be returned to the manufacturer. No leakage of SF₆ occurred in 2023. The quantities of refrigerants were obtained from the internal accounting system. Emissions factors were taken from DEFRA (2023).

Table 6. Refrigeration losses on site

Category	t, CO ₂ eq
R-410A	62
R-32	5
R-134A	0
Total	67

Scope 2 (indirect GHG emissions)

Indirect emissions are generated as a consequence of company activities and do not derive from controlled or owned sources. A reporting organization’s emissions associated with the consumption of the purchased electricity, heating/cooling, or steam for own consumption as well as electricity distribution losses are reported in scope 2. The emissions fall into several indirect emission categories of the GHG Protocol standard that are described below.

Indirect GHG emissions from imported energy and electricity distribution

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 data is taken from the grid for office buildings or for energy generation in thermoelectric and hydroelectric plants. To estimate Indirect emissions location-based and market-based methods were used in line with GHG protocol. The location-based³ method reflects the average emissions intensity of grids on which energy consumption occurs, while the market-based⁴ method reflects emissions from electricity that companies have purposefully chosen (or not chosen) using contract agreements in the market.

Actual and estimated (average based) electricity consumption in the Group offices, premises and customer service buildings was accounted for. Activity data (primary data of electricity quantities) was collected internally. The newest available emissions factors were used (secondary data): emissions conversion factors were taken from IEA (2023) and AIB (2023). IEA emission factors for 2023 are therefore based on the data from 2021 statistics.

Table 7. Emissions from electricity consumption

Category	t, CO ₂ eq
Electricity (location-based)	93,474
Electricity (market-based)	335,503

³ 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 utilise 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.

⁴ 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 CO₂ 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.

District heating

District heating means actual and estimated (average based) district heating consumption in the Group offices, premises and customer service buildings. Activity data of heating consumed by the Group during the reporting year was collected by employees internally. Emissions factors: CO₂ eq conversion factor was taken from [local legislation](#).

Table 8. Emissions from district heating

Category	t, CO ₂ eq
District heating	495
Total	495

Electricity distribution grid losses

Emissions from the electricity distribution grid losses are calculated by taking the activity data from the internal accounting system and multiplying the activity data by the standard emission factors. This category includes indirect emissions deriving from dissipated energy emissions from technical losses of the Group grid distribution network.

Only that part of the losses that comes from the distribution network is used in the calculations. Emissions from the electricity distribution losses are calculated according to two methods: location-based and market-based. Location-based emission factors are obtained from the IEA (2023). Market-based emission factors are used from AIB (2023).

Table 9. Emissions from the electricity distribution grid losses

Category	t, CO ₂ eq
Grid losses (location-based)	22,849
Grid losses (market-based)	81,968

Scope 3 (indirect GHG emissions)

Indirect emissions are generated as a consequence of company activities and do not derive from controlled or owned sources. Scope 3 indirect GHG emissions cover reporting organization's indirect emissions other than those covered in scope 2. These indirect emissions concern the Group's entire value chain, from generation and transportation to the sale of energy.

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 category we calculate the emissions resulting in losses in the grid from energy transmission from third parties. Emission from distribution losses is calculated in Scope 2 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 10. Well-to-tank emissions from fuel and energy related activities

Category	t, CO ₂ eq
Natural gas (WTT)	22,368
District heat (WTT)	174
Electricity Lithuania (WTT)	43,507
Electricity transmission losses	2,891
Diesel (WTT)	1,129
Petrol (WTT)	231
Biomass/ Wood chips (WTT)	3,217
Total	73,517

Indirect GHG emissions from transportation

Upstream transportation

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

- For Kaunas CHP, an average waste transportation distance of 120 km was assumed. The total transportation distance amounted to 1,469,280 km and an average truck fuel consumption of 35l/100km was presumed.
- For Vilnius CHP waste transportation routes were calculated based on the data provided by the company managers. For the biomass transportation an average transportation distance of 120 km was assumed. The total transportation distance of waste amounted to 145,830 km and the transportation of biomass 437,040 km. An average truck fuel consumption of 35l/100km was presumed.

Emission factors (secondary data) for diesel fuel were obtained from DEFRA's GHG Conversion Factors for Company Reporting (2023).

Table 11. Emissions from upstream transportation

Category	t, CO ₂ eq
Transportation diesel	1,804
Total	1,804

Downstream transportation

This category includes the reporting of emissions from transportation (by contractors) of waste resulting from the operation of the power plants. For calculation, basic assumptions were made regarding the length and frequency of the trip as well as the emissions of the mode of transport. 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 204 total trips and an average truck consumption of 35l/100km was presumed.
- For Kaunas CHP, truck transportation and an average transportation distance of 120 km (both ways) were assumed. The total transportation distance amounted to 302,280 km and an average truck consumption of 35l/100km was presumed.
- For Vilnius CHP waste transportation routes were calculated based on the data provided by the company managers. The total transportation distance amounted to 226,747 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 (2023).

Table 12. Emissions from downstream transportation

Category	t, CO ₂ eq
Transportation diesel	487
Total	487

Business travel

This category covers emissions from all domestic and international flights as well as trains and coaches taken by employees for business travel purposes. To calculate GHG emissions from business travel by air, actual distance travelled (in kilometres) between airports was converted to CO₂ equivalents using conversion factors for an average passenger in short-haul and international-haul flights. Activity data, i.e., travelled kilometres by means of transport of Group employees in the reporting year were collected internally. Emissions factors: CO₂ eq conversion factors for short-haul and international-haul flights were taken from DEFRA's GHG Conversion Factors for Company Reporting (2023).

Table 13. Emissions from business trips

Category	t, CO ₂ eq
Short-haul (Air), (<3700 km)	175
International haul (Air), (>3700 km)	31
Short-haul (Train), (<3700 km)	0.2
Short-haul (Coach), (<3700 km)	0.3
Total	206

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 included in Scope 1. Mobile combustion). The information is obtained through employee surveys. The last survey was done in 2023. Emissions factors: CO₂ eq conversion factors were taken from DEFRA's GHG Conversion Factors for Company Reporting (2023).

Table 14. Emissions from employee commuting

Category	t, CO ₂ eq
By diesel-run transport	1,553
By petrol-run transport	973
By LPG-run transport	122
Total	2,648

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 2023: office paper and water. Activity data (primary data) used refers to the quantity and volume of the goods and services purchased during the reporting period and was obtained from the responsible business units and from the main supplier of office paper. There are three main types of water use in our operations: surface, 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 (2023) and other sources.

Table 15. Emissions from purchased goods and services

Category	t, CO ₂ eq
Paper, virgin	3
Water, network supply	67
Water supply (surface)	199
Water supply (groundwater)	13
Total	281

Waste generated in operation

The waste figures are based on actual and estimated (average based) amounts of waste. This category 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 sewage system through the drains. The quantities of solid waste and wastewater generated during production at the Group generation sites were obtained from the Unified Product, Packaging and Waste Record Keeping Information System of Lithuania 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 were obtained from the DEFRA (2023) and Ecoinvent (2019) databases.

Table 16. Emissions from waste

Category	t, CO ₂ eq
Metal waste, recycled	51
Hazardous waste, incinerated	1,212
Waste mix, landfill (municipal)	4,462
Waste (ashes)	918
Wastewater treatment (network)	129
Total	6,771

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

Emissions associated with the use of the energy produced and sold 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 CO₂ eq per kWh. So, certified renewable electricity emissions are equal to 0 in the market-based method.
- Emissions associated with gas supplied to customers. These are the GHG emissions from the combustion of gas sold to the end customer, excluding the gas consumed within the Group (which is already included in Scope 1). 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.
- Emissions associated with the electricity from leased assets category represent electricity sold to commercial customers.

Quantities of products sold during the reporting period were obtained from the Group internal business data management systems. The newest emissions factors were used: CO₂ eq conversion factor was taken from IEA (2023), European Residual Mixes (2023) and Lithuania's national inventory report (2023). IEA EF for 2023 is therefore based on the data from 2021 statistics.

Table 17. Emissions from use of sold products

Category	t, CO ₂ eq
Sold electricity in retail market (location-based)	1,167,761
Sold electricity in retail market (market-based)	2,798,350
Use of sold natural gas in retail market	1,174,318
Electricity from leased assets (location-based)	27
Electricity from leased assets (market-based)	97
Total (location-based)	2,342,105
Total (market-based)	3,972,765



Intensity metrics

When calculating electricity and heat energy production emissions per kWh produced, only the production-related direct emissions are included, which are divided by the produced (gross) electricity and heat quantities. For 2023, this ratio amounted to 113 g CO₂ eq/kWh.



Exclusions



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, for example from life cycle analysis;
 - Travel using bus, taxi, or car sharing services. 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 by third parties. Reason for exclusion – products are mainly used (included in the category '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 does not operate franchises;
 - Investments – the parent company's subsidiary UAB "Ignitis renewables" holds 5 percent of shareholding interest in the development project of the Moray West wind farm on the east coast of Great Britain and is a minority (non-controlling) partner in the project.



Verification statement

The GHG inventory statements for 2023 were assured by “KPMG Baltics”, UAB member of the KPMG international network, with a limited level of assurance. An Independent Practitioners' Assurance Report can be found in the [2023 Group's Annual Report](#).



Glossary

AIB	Association of Issuing Bodies
CCGT	combined cycle gas turbine plant
CH₄	methane
CO₂	carbon dioxide
CO₂ eq	carbon dioxide equivalent
EF	emission factor
ESO	AB "Energijos skirstymo operatorius"
IEA	International Energy Agency
GHG	greenhouse gas
GoO	guarantee of origin
Group or Ignitis Group	AB "Ignitis grupė" and its controlled companies
GW	gigawatt
GWP	global warming potential
IPCC	Intergovernmental panel on climate change
Kaunas CHP	UAB Kauno kogeneracinė jėgainė
LNIR	Lithuania's national inventory report
MW	megawatt
MWh	megawatt hour
N₂O	nitrous oxide
RECs	renewable energy certificates
SBTi	Science Based Targets initiative
TW	terawatt
Vilnius CHP	UAB Vilniaus kogeneracinė jėgainė
WBCSD	World business council for sustainable development



Appendix I: Total GHG emissions (based on GHG protocol)

Total GHG emissions by scopes (location-based)

GHG emissions	t, CO ₂ eq
Direct (Scope 1) emissions	455,044
Indirect (Scope 2) emissions (location-based)	116,819
Other indirect (Scope 3) emissions	2,427,819
Total (Scope 1, 2, 3)	2,999,682
Emissions outside the specified scopes (biogenic origin)	361,025
Total	3,360,707

Total GHG emissions by scopes (market-based)

GHG emissions	t, CO ₂ eq
Direct (Scope 1) emissions	455,044
Indirect (Scope 2) emissions (market-based)	417,967
Other indirect (Scope 3) emissions	4,058,479
Total (Scope 1, 2, 3)	4,931,490
Emissions outside the specified scopes (biogenic origin)	361,025
Total	5,292,515

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