

# Corporate Carbon Footprint Report 2022

INTREAL

Date: January 2024



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## MESSAGE FROM THE BOARD

Dear Stakeholders,

We are pleased to present INTREAL's 2022 Carbon Footprint Report, an important document that underscores our commitment to environmental sustainability and climate action in alignment with the Paris Agreement. INTREAL is dedicated to reducing greenhouse gas (GHG) emissions from our operations, with the overarching goal of achieving CO<sub>2</sub>-neutrality by 2030.

This report marks a significant milestone in our sustainability journey, as we provide a more detailed overview of our GHG inventory and carbon footprint for the fiscal year 2022 (FY22). Building upon the foundation laid in our inaugural report for the FY21 period, we have continued to enhance data quality and expand the scope of activities measured. We have decided to target FY23 as our base year for ongoing reporting.

We continue to learn more about the impacts of our activities, as we try to make better decisions and implement initiatives that will make a difference.

Our carbon footprint encompasses both direct (scope 1) and indirect (scope 2) GHG emissions from purchased electricity. We have also reported on material scope 3 activities where data was available, in an ongoing attempt to ensuring an accurate representation of our environmental impact.

A key development in the reporting period includes the expansion of our operational footprint with the addition of new office spaces in Hamburg which has resulted in an associated increase in emissions and higher energy consumption. These new spaces were occupied as of November 1, 2022, and therefore, only two months of activity data were measured, which means that further GHG emissions impacts will be experienced in the next reporting period.

Our report provides an analysis of the factors contributing to a year-on-year increase of 335.490 tCO<sub>2e</sub> in total emissions. These factors include, in particular, the growth in our workforce and increased business travel.

We recognise the importance of transparency and accountability in addressing climate change, and this report underscores our commitment to continually measuring, analysing and improving our environmental performance.

Thank you for your ongoing support as we strive towards a sustainable and CO<sub>2</sub>-neutral future.

Sincerely,

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Andreas Ertle

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Michael Schneider

## ABOUT

### IntReal Group

The IntReal Group comprises four legal entities which are managed by the operating parent company IntReal International Real Estate Kapitalverwaltungsgesellschaft GmbH (INTREAL), a Service KVG (capital investment company) focussed exclusively on the setup and management of regulated real estate funds for third parties.

INTREAL is a 100% shareholder of three of the four entities: IntReal Legal Advisory GmbH, IntReal Luxembourg S.A. and IntReal Solutions GmbH.



The headquarters for INTREAL is in Hamburg, Germany. Additional subsidiary offices are also located in Hamburg with a further office in Frankfurt and IntReal Luxembourg S.A. located in Luxembourg.

Headquarter address:  
Ferdinandstraße 61  
20095 Hamburg  
Germany

### AQ Green TeC GmbH

AQ Green TeC (AQGT) provides greenhouse gas (GHG) emissions management services to support companies and their stakeholders to develop and execute integrated climate strategies.

AQGT was retained by INTREAL to provide GHG emissions (emissions) measurement services for scope 1, 2 and 3, for INTREAL's own operations, not including emissions from their portfolio assets. This GHG inventory and carbon footprint report has been compiled by AQGT, using data and information provided by INTREAL.

## APPROACH

### Organisational Boundary

The organisational boundary for this report was defined using the operational control approach, where the organisation accounts for all GHG emissions from the operations that it owns or controls.

The boundary of this carbon footprint report includes the three 100% owned subsidiaries and excludes one entity in which INTREAL has only a 20% equity stake.

The operations included are:



Additional floors at the INTREAL office at Gertrudenstraße 9, were newly occupied as of 01 November 2022 and data for these operations were only included for the last two-months of the reporting year.

### Operational Boundary

An operational boundary is established through the identification of operational activities which cause GHG emissions. Activities are categorised as either direct or indirect emission sources.

In terms of the requirements in line with the GHG Protocol, all direct (scope 1) GHG emissions are included, as are indirect (scope 2) GHG emissions from purchased electricity. Reporting on other indirect (scope 3) emissions, from upstream and downstream supply chain activities is voluntary.

INTREAL has elected to report on all material scope 3 activities where data was available. Where data was incomplete, assumptions and estimations have been used. Further details are included in the methodology section of this report.

The following activities are included in this report:

Scope 1	
Stationary combustion	Natural gas
Mobile combustion	Company owned vehicles
Scope 2	
Electricity consumption	Purchased electricity (green tariff)
Heating	District heating
Scope 3	
Business travel	Air travel
	Land travel
	Sea travel
	Hotel stay
Employee commute	Employee commuting
Homeworking	Energy consumption from office equipment & heating
Purchased goods and services	Water supply
	Paper use
	Plastic items
	Electrical items
Downstream transportation and distribution	Air freight
	Land freight
Waste generated in operations	Landfill waste
	Recycled waste
Fuel and energy activities not in scope 1 or 2	Well-to-tank (WTT) natural gas
	Well-to-tank (WTT) district heating
	Well-to-tank (WTT) district heating distribution
	Transmission and distribution (T&D) losses from district heating
	Transmission and distribution (T&D) losses from purchased electricity

Table 1

## Reporting Period

This report covers the period: 01 January 2022 through 31 December 2022 (FY22).

## Base Year

INTREAL compiled its inaugural GHG inventory and carbon footprint for the FY21 period and decided to measure GHG emissions for two further annual reporting periods before assigning a 'base year' for ongoing reporting purposes. This FY22 inventory reflects improvements in data quality and an increase in the number of activities measured. INTREAL is targeting FY23 as its base year.

## Data Integrity and Verification of Emissions

AQGT follows the GHG Protocol's Corporate Standard approach to GHG emissions calculations, which requires the gathering (or estimating if necessary) of carbon activity data, as applicable, after scope 1, 2 and 3 emission sources have been identified.

The quantities of materials were internally verified by the INTREAL team to the greatest degree possible and where data was not available, assumptions and estimates were applied. INTREAL is satisfied that assumptions and estimates used were reasonable and accurate and does not believe that external, third-party verification is necessary at this time, however, the company will consider verification as it progresses on its journey of GHG emissions management.

## Reporting Standards and Approach

This GHG inventory has been prepared by AQGT with and on behalf of INTREAL using the norms and standards determined the GHG Protocol.

The GHG Protocol is a partnership between the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD) and is the most widely applied international accounting tool for quantifying and managing GHG emissions.

This report is aligned with, and utilises, the GHG Protocol's Corporate Standard, Scope 2 Standard and Scope 3 Standard. The GHG Protocol Scope 2 Standard requires that companies make use of both location-based and market-based approaches. In line with the requirement of the Scope 2 Standard, INTREAL has reported using the location-based and market-based approach given that market-based supplier data has been provided.

## Reasons for Measuring & Managing GHG Emissions

INTREAL is committed to reducing GHG emissions from operations and taking climate action in line with the Paris Agreement. The company aims to increase resource efficiency each year with the goal of becoming CO<sub>2</sub>-neutral by 2030. The measurement and reporting of GHG emissions is the foundation on which to build this intention. Early identification of changes in the market, implementation of regulatory requirements and future-oriented digital management form part of INTREAL's corporate philosophy.

## Data Presentation

Values expressed in this report can be rounded for presentation purposes, which may result in slight variations when compared with source documentation (available upon request.) This is particularly the case for data presented in tables and charts.

## CARBON FOOTPRINT

INTREAL's carbon footprint has been analysed and presented as follows:

### Emissions overview

A summary of total emissions by location

### Emissions by scope and category

A breakdown of emissions by scope and category

### Emissions by categories

A detailed breakdown of GHG emission categories and percentage contribution to total emissions, in terms of the market-based and location-based approaches used

### Building and mobility related emissions

An analysis of emissions relating to INTREAL's physical building and travel, transport, and commuting activities

### Intensity metrics

An analysis of INTREAL's emission per employee and per square metre of office space

## Emissions Overview

Total GHG emissions for INTREAL for the reporting period 2022:

Total emissions	830.450 tCO <sub>2</sub> e	Market-based approach
	950.850 tCO <sub>2</sub> e	Location-based approach

Table 2

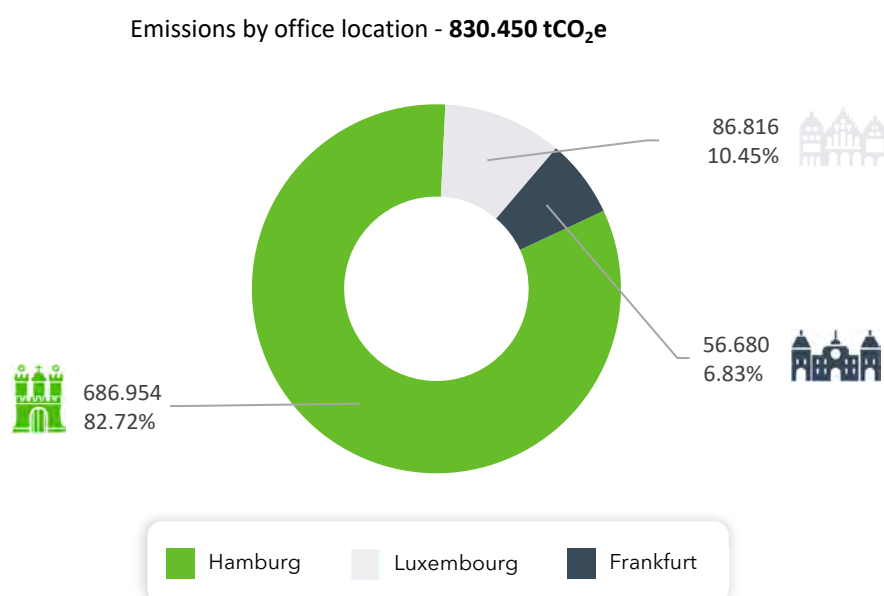


Figure 1: INTREAL's total emissions by office location, market-based approach



The majority of INTREAL's emissions are caused by the operations of the offices located in Hamburg, which is a reflection of the company's operational presence. Hamburg is home to the largest number of employees and serves as INTREAL's headquarters.

## Emissions by Scope and Category

The GHG Protocol requires emissions to be reported and classified as direct and indirect emissions. Direct emissions, reported as scope 1 emissions, are emissions which result from activities owned or controlled by the organisation. Indirect emissions, reported in the scope 2 and scope 3 section of the inventory, are a consequence of the activities of the organisation but occur at sources owned or controlled by other organisations in the value chain.

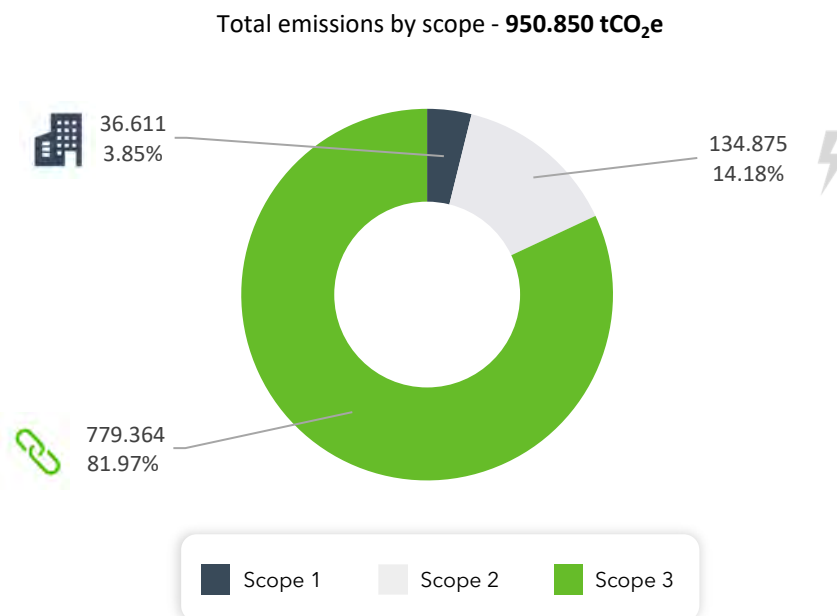


Figure 2: INTREAL's total emissions by scope, location-based approach

## Overview of Scopes

The discussion below relates to emission values as per the location-based approach unless otherwise indicated.

- INTREAL's emissions profile by scope is in line with that of a typical office-based organisation in which scope 1, direct emissions are relatively low and scope 3, value chain emissions are relatively high
- Scope 3 indirect emissions, from sources owned or controlled by organisations in INTREAL's value chain, are the biggest contributor to total emissions. Value chain emissions include activities such as the purchase of goods, products and services procured for the day-to-day running of the business, and travel and transport
- Initiatives to reduce overall emissions should be focused on the value chain via active engagement with upstream and downstream stakeholders

## Scope 1

- Scope 1 emissions account for less than 4% of total emissions
- Mobile combustion of fuels from company owned vehicles is the highest contributing category to scope 1 emissions (57.85%)
- Stationary combustion of natural gas, the heating source at the Frankfurt and Luxembourg offices, accounts for the remaining scope 1 emissions (42.15%)

## Scope 2

Scope 2 includes emissions from purchased electricity and district heating.

INTREAL purchases electricity for all office locations from suppliers who generate electricity through renewable energy sources. Scope 2 emissions are therefore calculated and reported on using the market-based and location-based approach, in line with the recommendations of the Scope 2 Standard of the GHG Protocol.

District heating is only applicable to the offices located in Hamburg.

- Using the location-based approach, scope 2 electricity consumption contributes 120.400 tCO<sub>2</sub>e (12.66%) to the total GHG inventory and accounts for 89.27% of total scope 2 emissions
- Using the market-based approach, and data provided by the supplier, emissions from electricity consumption are reported as zero. This indicates that the total emissions avoided from the purchase of renewable energy is 120.400 tCO<sub>2</sub>e, for the reporting period
- The remainder of scope 2 emissions, 14.475 tCO<sub>2</sub>e (10.73%), is from district heating

## Energy consumption

Comparing energy consumption-based activities between locations requires looking at the activity data in a single comparable unit of measure such as kilowatt-hours and not the emissions unit of tCO<sub>2</sub>e. This is principally because emissions from energy consumption-based activities are calculated using a variety of emission factors. Emission factors are determined by aspects such as location, supplier data and type of activity/fuel used, which means that comparisons are not on a like-for-like basis.

The following table provides consumption data by geographical location for all energy sources measured: electricity, district heating and natural gas.

Activity	Unit	Frankfurt	Hamburg	Luxembourg	INTREAL
Electricity	kWh	25,503.40	280,890.40	21,940.00	328,333.80
District heating			226,163.87		226,163.87
Natural gas		38,623.33		33,750.00	72,373.33
<b>Total</b>		<b>64,126.73</b>	<b>507,054.27</b>	<b>55,690.00</b>	<b>626,871.00</b>

Table 3

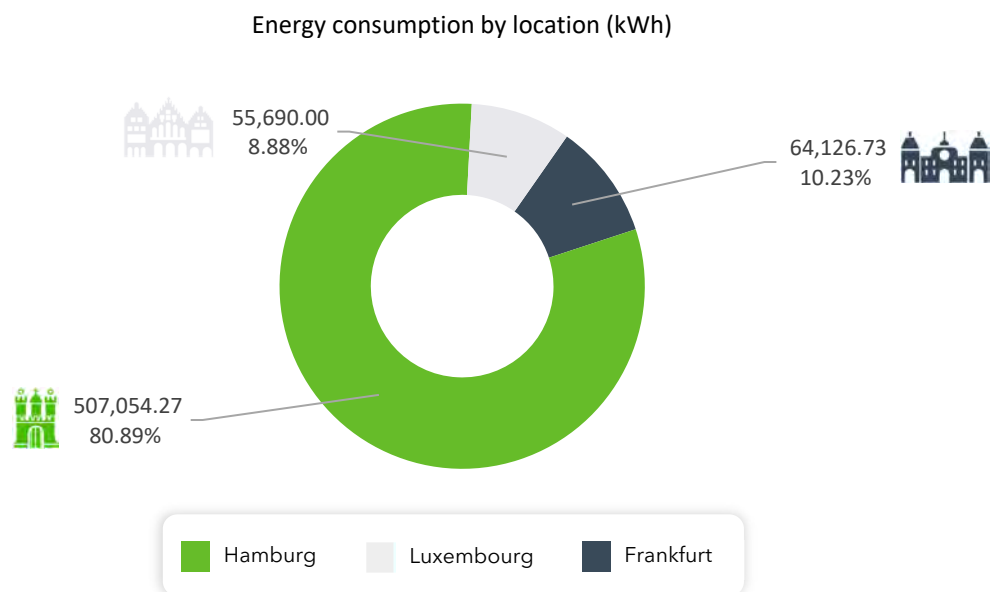


Figure 3: INTREAL's total energy consumption by office location

## Scope 3

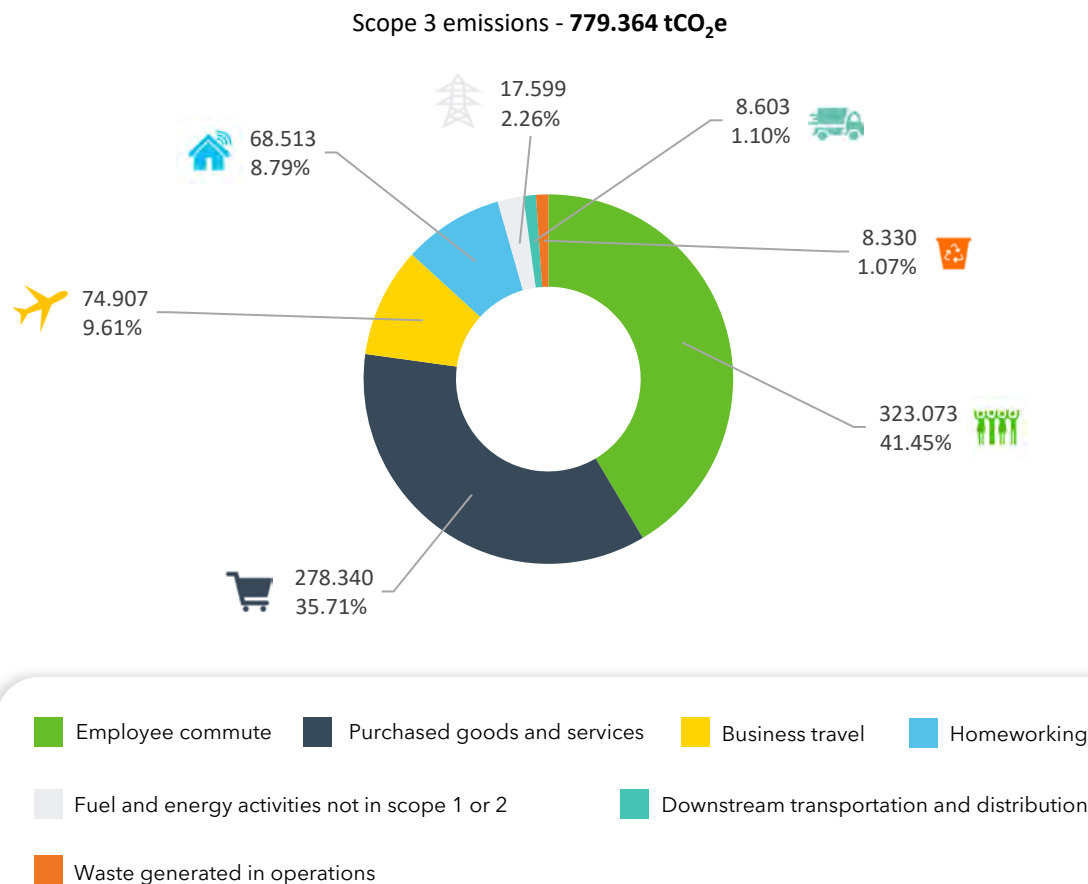


Figure 4: Scope 3 emissions breakdown by category

- Scope 3 (indirect) emissions are the most significant source of total GHG emissions (81.97%)
- Emissions from employees commuting to and from work is the highest contributing scope 3 category (41.45%) and the highest overall GHG emissions activity (33.98%)
- The second highest scope 3 category is purchased goods and services (35.71%), which includes electrical items, paper use, plastic items, and water supply
- Electrical items purchased as part of new employee IT starter packs accounts for the majority (99.45%) of these emissions, and is also the second highest contributor to total emissions (29.11%)
- Emissions from business travel, which include air, land, and sea travel and hotel-stay activities, is the third highest contributor to total scope 3 emissions (9.61%)
- Emissions from homeworking (8.79% of scope 3 emissions) include activities associated with the energy consumption of office equipment and heating, which may otherwise have been included in the organisation's building emissions if those employees were working at the office
- Fuel and energy activities not accounted for in scope 1 and 2 provides a category for an organisation to report the upstream well-to-tank (WTT) emissions of purchased fuels and the transmission and distribution (T&D) losses from the generation of electricity, steam, heating, and cooling that is consumed in a T&D system. These fuel and energy activities are reported under scope 3 and contribute 1.85% to total emissions



- Downstream transportation and distribution emissions from the use of courier services for parcel deliveries accounts for 1.10% of scope 3 emissions and is less than 1% of total emissions
- INTREAL has reported on recycled waste and landfill waste. Waste generated in operations is a very small contributor to total emissions (0.88%) however, it remains important to reduce waste in the context of broader environmental impacts. Furthermore, some waste materials have value and can be used as raw material inputs in circular systems. Avoiding, reducing, repurposing and redirecting waste is a critical step to reducing impact and contributing to a circular economy

## Emissions by Categories

The GHG Protocol recommends assigning scope 1, 2 and 3 inventories to GHG emissions categories which provides a framework to organise, track and manage a variety of emission sources across the corporate value chain.

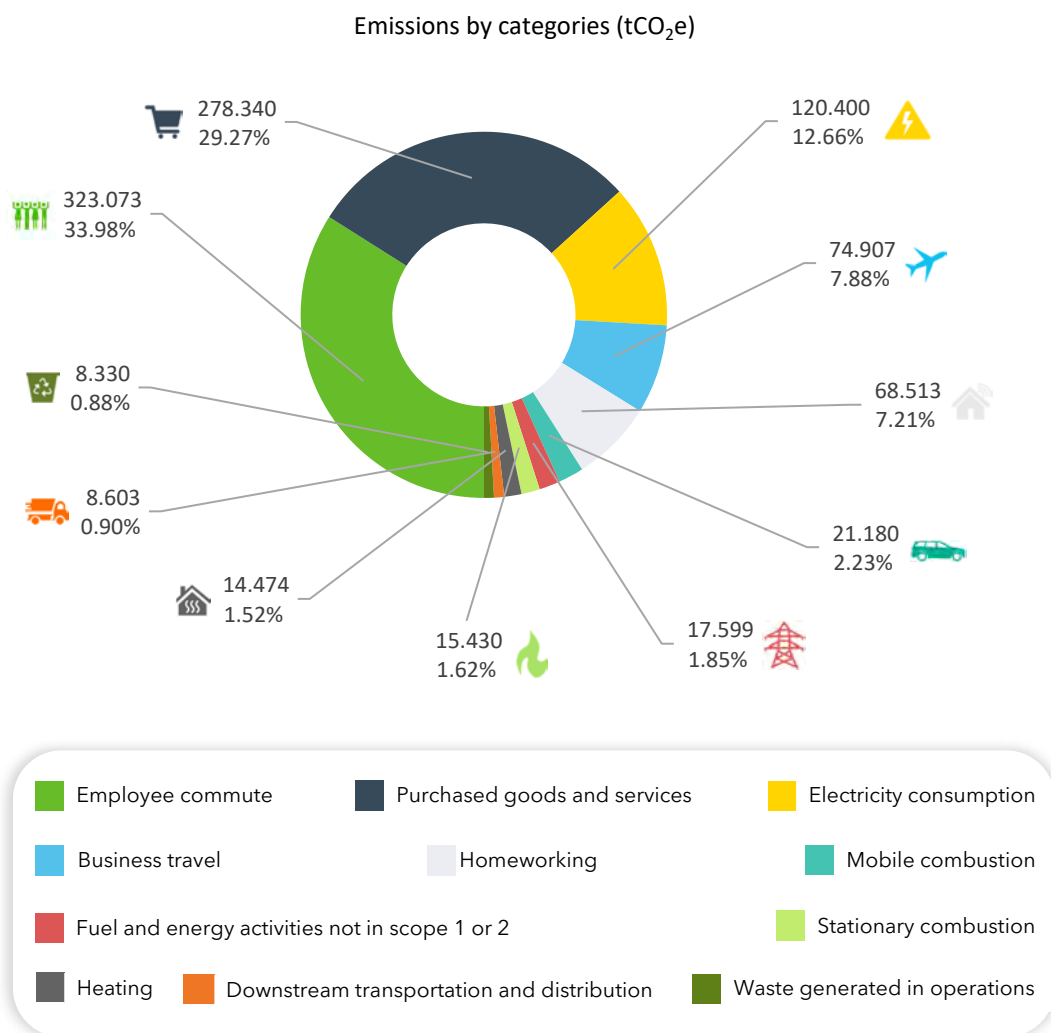


Figure 5: Emissions breakdown by category

Table 4 (below) provides a detailed breakdown of emission categories and their contribution (%) to total emissions.

Scope and category	Activities	Market-based approach (tCO <sub>2</sub> e)	% of Total emissions	Location-based approach (tCO <sub>2</sub> e)	% of Total emissions
<b>Scope 1</b>		<b>36.611</b>	<b>4.41%</b>	<b>36.611</b>	<b>3.85%</b>
Stationary combustion	Natural gas	15.430	1.86%	15.430	1.62%
Mobile combustion	Company owned vehicles	21.180	2.55%	21.180	2.23%
<b>Scope 2</b>		<b>14.474</b>	<b>1.74%</b>	<b>134.875</b>	<b>14.18%</b>
Electricity consumption	Purchased electricity (green tariff)	0.000	0.00%	120.400	12.66%
Heating	District heating	14.474	1.74%	14.474	1.52%
<b>Scope 3</b>		<b>779.364</b>	<b>93.85%</b>	<b>779.364</b>	<b>81.97%</b>
Business travel	Air travel	40.531	4.88%	40.531	4.26%
	Land travel	24.867	2.99%	24.867	2.62%
	Sea travel	0.034	0.00%	0.034	0.00%
	Hotel stay	9.474	1.14%	9.474	1.00%
	Total	<b>74.907</b>	<b>9.02%</b>	<b>74.907</b>	<b>7.88%</b>
Employee commute	Employee commuting	<b>323.073</b>	<b>38.90%</b>	<b>323.073</b>	<b>33.98%</b>
Homeworking	Homeworking	<b>68.513</b>	<b>8.25%</b>	<b>68.513</b>	<b>7.21%</b>
Purchased goods and services	Water supply	0.166	0.02%	0.166	0.02%
	Paper use	1.328	0.16%	1.328	0.14%
	Plastic items	0.031	0.00%	0.031	0.00%
	Electrical items	276.815	33.33%	276.815	29.11%
	Total	<b>278.340</b>	<b>33.52%</b>	<b>278.340</b>	<b>29.27%</b>
Downstream transportation and distribution	Air freight	7.670	0.92%	7.670	0.81%
	Land freight	0.933	0.11%	0.933	0.10%
	Total	<b>8.603</b>	<b>1.04%</b>	<b>8.603</b>	<b>0.90%</b>
Waste generated in operations	Landfill waste	8.154	0.98%	8.154	0.86%
	Recycled waste	0.176	0.02%	0.176	0.02%
	Total	<b>8.330</b>	<b>1.00%</b>	<b>8.330</b>	<b>0.88%</b>
Fuel and energy activities not in scope 1 or 2	WTT - Natural gas	2.251	0.27%	2.251	0.24%
	WTT - District heat and steam	7.131	0.86%	7.131	0.75%
	WTT - District heat and steam distribution	0.375	0.05%	0.375	0.04%
	T&D losses from district heating	2.033	0.24%	2.033	0.21%
	T&D losses from purchased electricity	5.808	0.70%	5.808	0.61%
	Total	<b>17.599</b>	<b>2.12%</b>	<b>17.599</b>	<b>1.85%</b>
		<b>830.450</b>	<b>100%</b>	<b>950.850</b>	<b>100%</b>

Table 4

## Building & Mobility Emissions

The examination of GHG emissions from building and mobility-related activities, provides organisations with a practical lens through which to identify and manage potential projects and initiatives for the purpose of reducing emissions. It also provides a useful frame of reference for setting targets and tracking intensity metrics.

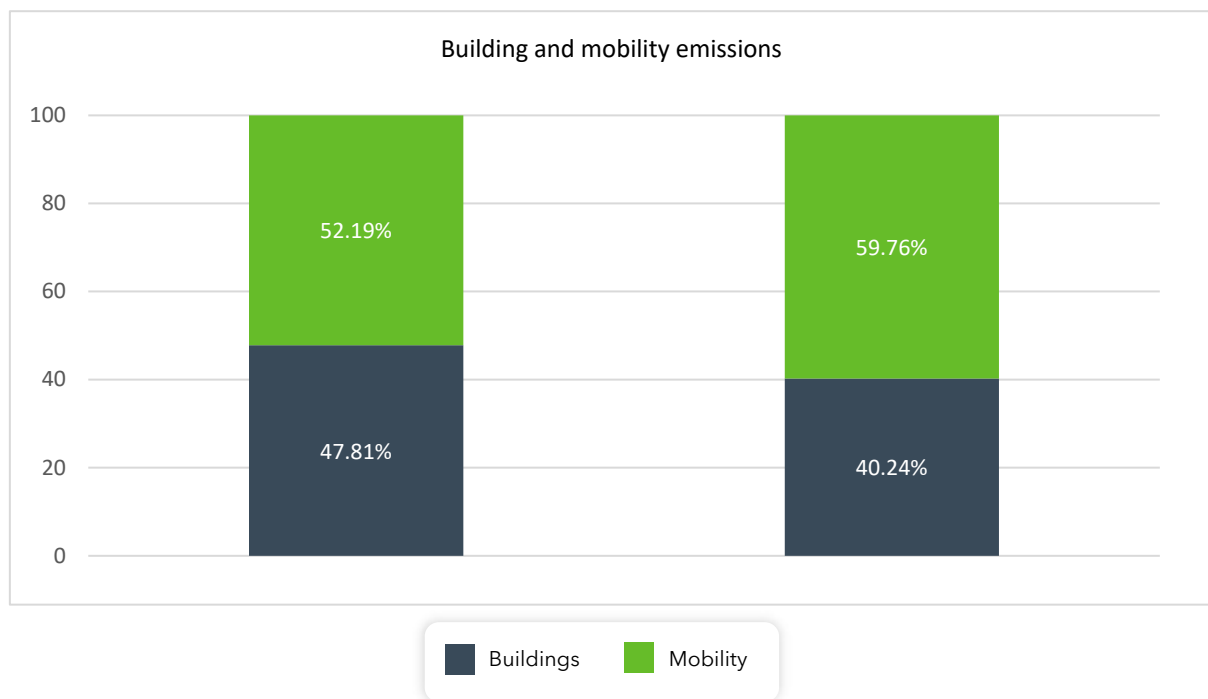


Figure 6: Percentage breakdown of location-based and market-based emissions (tCO<sub>2</sub>e)

## Building Emissions

Emissions from activities associated with physical buildings includes energy consumption, water supply, purchased goods and services and waste generated.

When using the location-based approach:

- Almost half of INTREAL's emissions (47.81%) can be attributed to building-related activities
- Total emissions from energy consumption accounts for 36.94% of building-related emissions
- The balance (63.06%) includes emissions from electrical items purchased, water supply, paper use, plastic items and waste generation activities

When using the market-based approach:

INTREAL purchases electricity from renewable energy suppliers that have specified the electricity supply as 'void of emissions' (zero emissions). The use of renewable energy has resulted in a decrease in building-related emissions of 7.57%.

- 40.24% of INTREAL's emissions can be attributed to building-related activities
- Total emissions from energy consumption accounts for 14.22% of building-related emissions
- The balance (85.78%) includes emissions from electrical items purchased, water supply, paper use, plastic items and waste generation activities

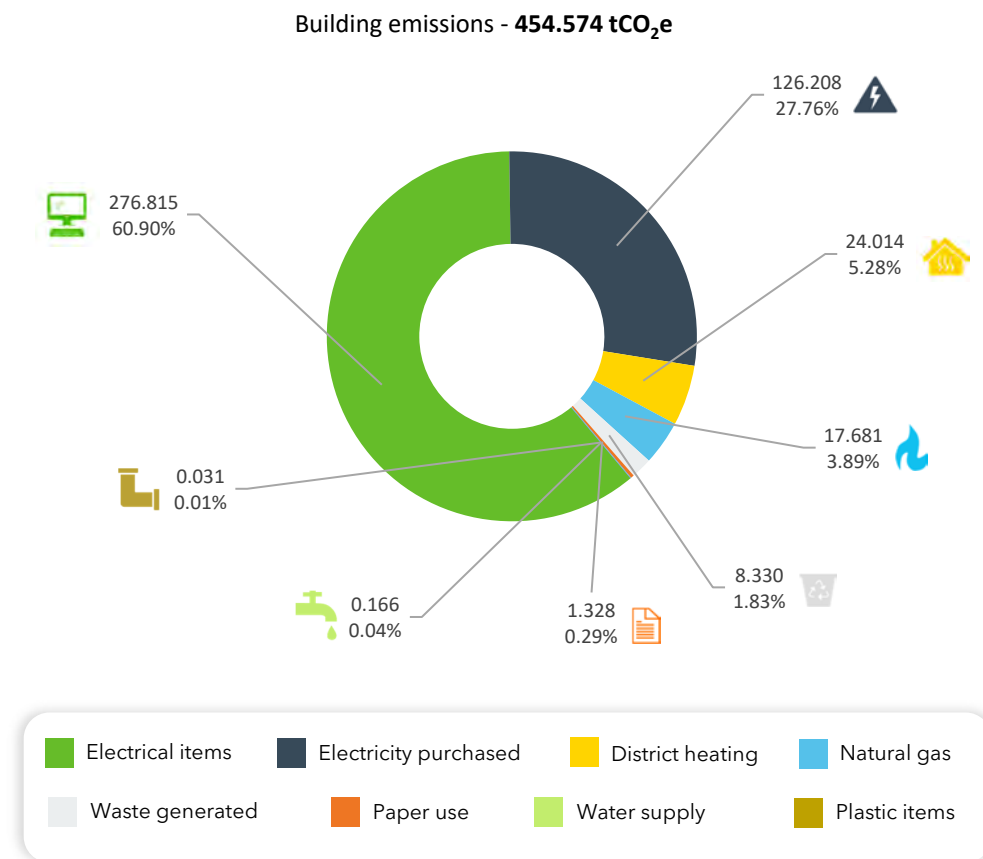


Figure 7: Building-related emissions by source



## Mobility Emissions

Mobility emissions include all activities relating to travel and transport, the movement of people and goods as well as emissions from homeworking.

- Emissions from activities associated with mobility account for 52.19% of location-based emissions and 59.76% of market-based emissions
- Employee commuting, homeworking, and business travel account for 92.09% of mobility emissions. The impact of employee commute has been highlighted in more detail in the previous discussion on scopes
- Emissions from employee commuting account for 65.10% of mobility emissions and 33.98% of total emissions

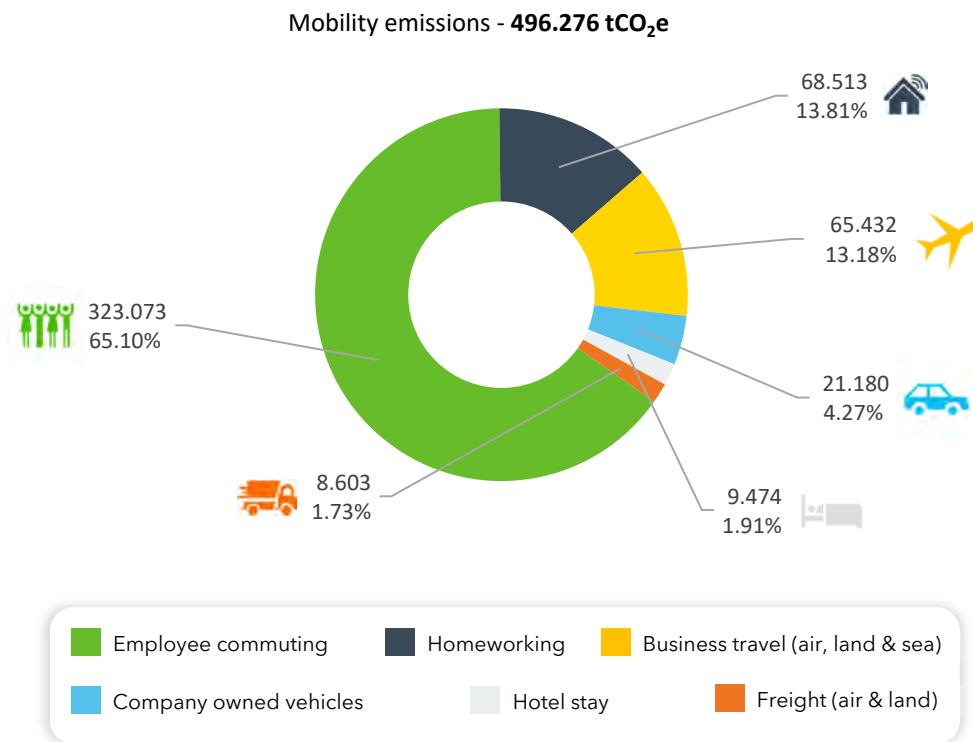


Figure 8: Mobility-related emissions by source

## Employee Commute

The employee commute category includes emissions from employee travel to and from places of work. An online survey was shared to INTREAL employees and a response rate of 52.24% was achieved. INTREAL's homeworking policy permits employees to work from home for two days a week. Annual leave and public holidays were considered in the calculations.

Various modes of transport are used by employees. The use of private motor vehicles is the biggest contributor to emissions (70.83%).

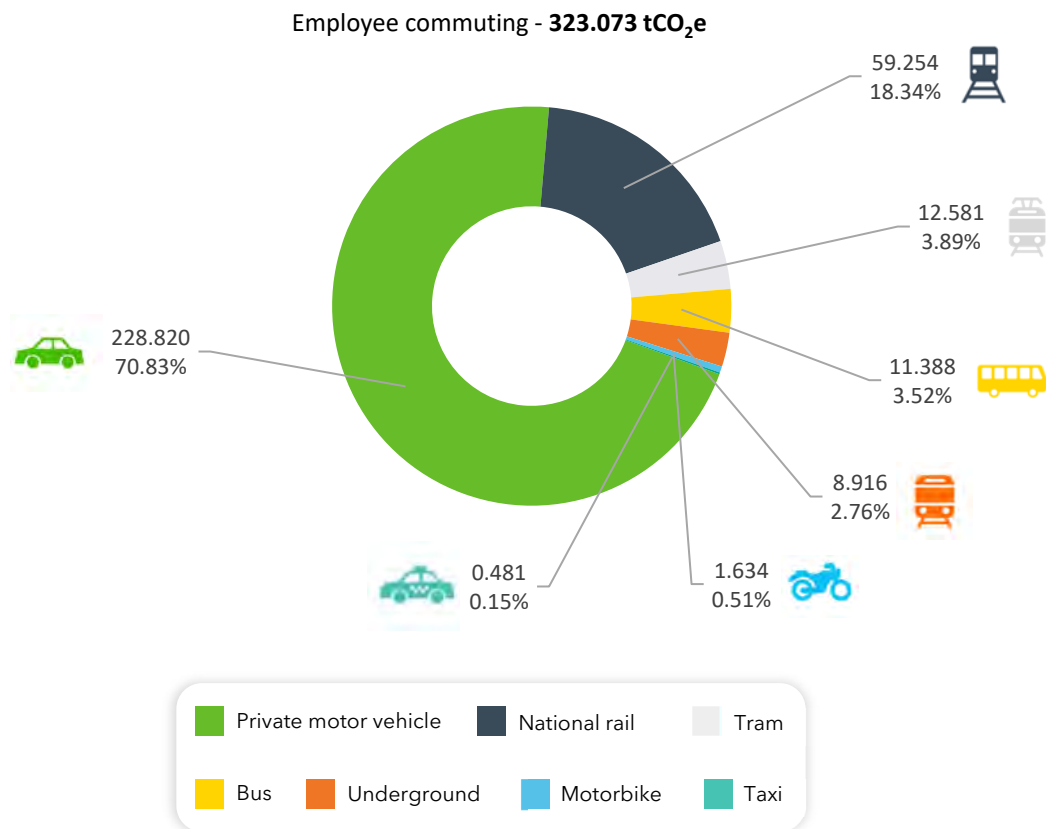


Figure 9: Employee commute: break down by mode of transport

## Intensity Metrics

Intensity reporting makes it possible to analyse the relative increase or decrease in emissions against key operational or production denominators, e.g., emissions per square metre (m<sup>2</sup>) of office space and per employee (head count). They are therefore a tool for benchmarking over time.

INTREAL has calculated intensity metrics using tonnes of CO<sub>2</sub>e per employee and per m<sup>2</sup>.

### Emissions Intensity

Market-based approach:

2022	Unit	No.		tCO <sub>2</sub> e/ employee	tCO <sub>2</sub> e/m <sup>2</sup>
INTREAL		tCO <sub>2</sub> e	830.450		
		Employees	490	1.695	
		m <sup>2</sup>	12,381.20		0.067

Table 5: INTREAL's intensity metrics based on market-based emissions

## Location-based approach:

2022	Unit	No.	tCO <sub>2</sub> e/ employee	tCO <sub>2</sub> e/m <sup>2</sup>
INTREAL		tCO <sub>2</sub> e	950.850	
		Employees	490	1.941
		m <sup>2</sup>	12,381.20	0.077

Table 6: INTREAL's intensity metrics based on location-based emissions

It should be noted when reading the above intensity metrics that INTREAL's total office space (m<sup>2</sup>) increased meaningfully in the last two months of the reporting period. This means that the square metre value is disproportionately high as the denominator in the intensity metric ratio, resulting in an emissions-per-employee value that is relatively low. This ratio should normalise in the following reporting period.

## Emissions Comparisons between FY21 & FY22

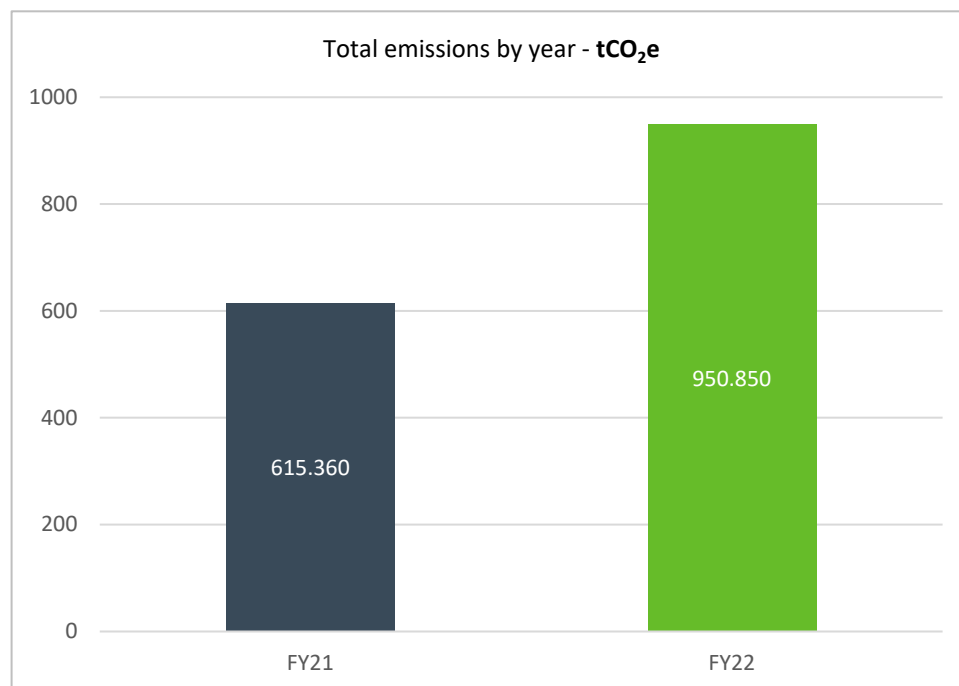


Figure 10: Total emissions by year

INTREAL's total emissions increased by 335.490 tCO<sub>2</sub>e year on year. There are several reasons for this increase:

- The company's total number of employees increased by 87 in the reporting period, which had a direct impact on emissions relating to employee commute, homeworking, electrical items purchased and energy consumption
- Business travel increased, especially air travel and hotel stay, which was to be expected after the slump in travel resulting from the Covid-19 pandemic
- Improved data quality as well as an increase in the number of activities measured

- An increase in office space in Hamburg, which resulted in additional 4,847m<sup>2</sup>, taking the total area from 7,534.20m<sup>2</sup> to 12,381.20m<sup>2</sup>. This additional area came into effect on 01 November 2022 and therefore only two months of activity data were measured.

Figure 11 below illustrates these increases in emissions by office location:

- The overall increase in emissions at Frankfurt and Luxembourg is due to organic growth experienced seen in the higher employee numbers
- The biggest increase is observed at Hamburg, and this is because a) the activities of electrical items purchased and business travel were assigned to the head office and both of these activities have increased due to organic growth, b) the addition of the new office space and c) Hamburg is the main operational centre with a higher employee count and other associated activities

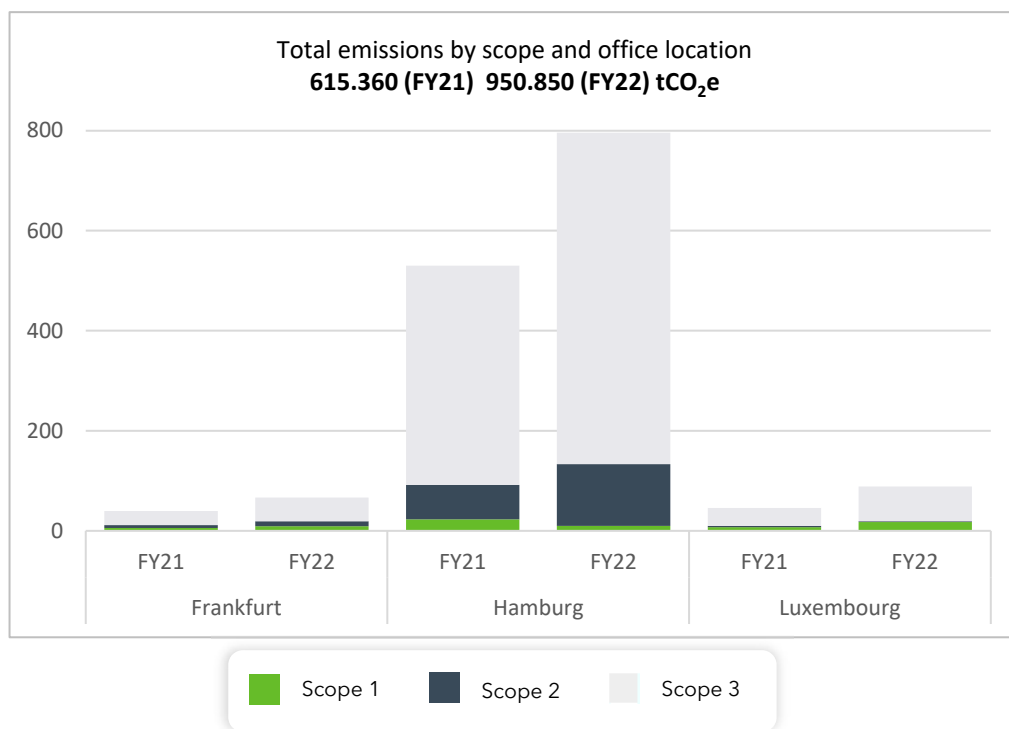


Figure 11: Total emissions by scope and office location



Table 7 below provides an overview of the change in GHG emissions year-on-year. An overview of activity data for the two reporting periods is available in Appendix 2.

Scope and category	Activities	tCO <sub>2</sub> e		
		FY21 Location-based	FY22 Location-based	Change
<b>Scope 1</b>		<b>36.004</b>	<b>36.611</b>	<b>0.607</b>
Stationary combustion	Natural gas	12.952	15.430	2.479
Mobile combustion	Company owned vehicles	23.052	21.180	-1.872
<b>Scope 2</b>		<b>77.101</b>	<b>134.875</b>	<b>57.774</b>
Electricity consumption	Purchased electricity (green tariff)	64.007	120.400	56.393
Heating	District heating	13.093	14.474	1.381
<b>Scope 3</b>		<b>502.255</b>	<b>779.364</b>	<b>277.109</b>
Business travel	Air travel	12.883	40.531	27.648
	Land travel	21.301	24.867	3.566
	Sea travel	-	0.034	0.034
	Hotel stay	1.673	9.474	7.801
	Total	<b>35.857</b>	<b>74.907</b>	<b>39.050</b>
Employee commute	Employee commuting	<b>249.936</b>	<b>323.073</b>	<b>73.137</b>
Homeworking	Homeworking	<b>55.641</b>	<b>68.513</b>	<b>12.871</b>
Purchased goods and services	Water supply	0.130	0.166	0.036
	Paper use	0.585	1.328	0.743
	Plastic items	-	0.031	0.031
	Electrical items	142.412	276.815	134.404
	Total	<b>143.127</b>	<b>278.340</b>	<b>135.214</b>
Downstream transportation and distribution	Air freight	0.610	7.670	7.060
	Land freight	1.526	0.933	-0.593
	Total	<b>2.135</b>	<b>8.603</b>	<b>6.467</b>
Waste generated in operations	Landfill waste	1.166	8.154	6.989
	Recycled waste	0.103	0.176	0.073
	Total	<b>1.269</b>	<b>8.330</b>	<b>7.062</b>
Fuel and energy activities not in scope 1 or 2	WTT- Natural gas	1.980	2.251	0.271
	WTT - District heat and steam	6.450	7.131	0.680
	WTT - District heat and steam distribution	0.339	0.375	0.036
	T&D losses from district heating	1.839	2.033	0.194
	T&D losses from purchased electricity	3.681	5.808	2.127
	Total	<b>14.290</b>	<b>17.599</b>	<b>3.308</b>
		<b>615.360</b>	<b>950.850</b>	<b>335.490</b>

Table 7: INTREAL's total emission by year, scope, and category

To summarise the findings in the table above:

- GHG emissions from stationary combustion, electricity consumption and heating increased due to the increase in employees, and increased emissions from electricity consumption can be attributed to the additional floor space requirement
- Emissions from company owned (long term leased) vehicles have been reduced due to lower mileage travelled and the use of electric vehicles

- An increase in business activity and organic growth is responsible for increased emissions from business travel, employee commuting, homeworking, purchased goods and services, downstream transportation and waste generated
- The increase in emissions from waste generated in operations is also due to an improvement in data collection

## Intensity Metrics

Intensity metrics are used as a tool for benchmarking and comparing emissions and units of consumption over time.

An average upward trend (average of market-based and location-based values) of 25.48% is seen in tCO<sub>2</sub>e/employee and an average downward trend of 7.15% for tCO<sub>2</sub>e/m<sup>2</sup> when comparing FY22 with FY21. The upward trend is due to the overall increase in total emissions and the downward trend is as a result of the significant increase in floor area, noting that emissions for this additional floor area were only included for a period of two months.

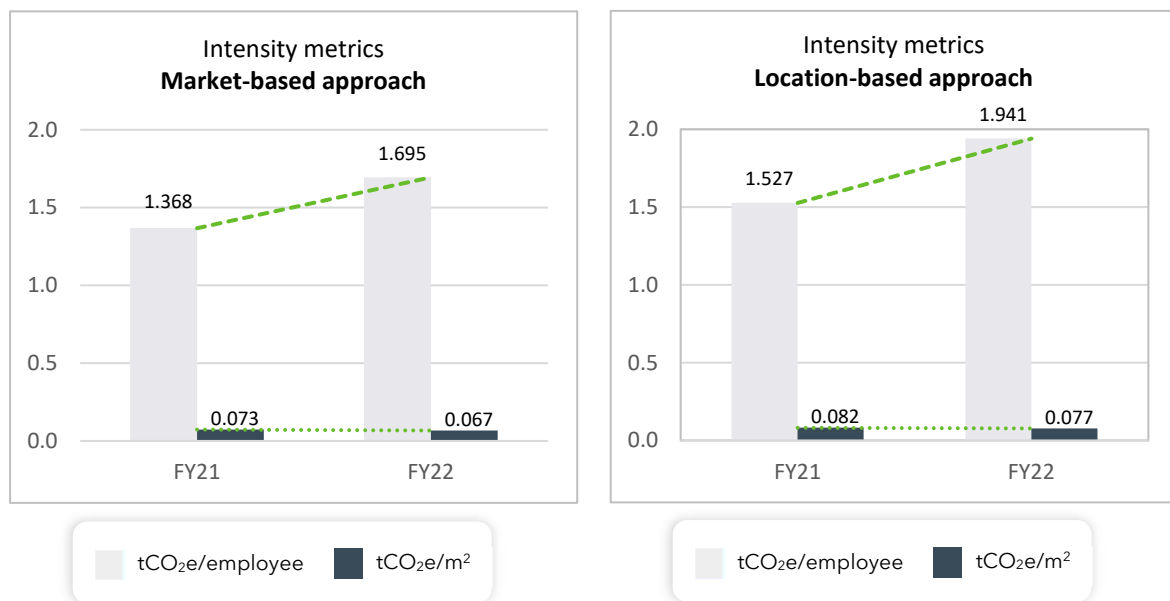


Figure 12: Intensity metrics by approach and reporting periods

## SUMMARY

INTREAL is committed to emission reduction initiatives in line with the Paris Agreement and has a corporate goal to be CO<sub>2</sub>-neutral by 2030. INTREAL's GHG inventory and carbon footprint reporting process is an important step in this journey. The measurement and reporting of GHG emissions is a foundation on which to set targets and to take action.

The INTREAL emissions profile is in line with that of a typical office-based organisation in which scope 1, direct emissions are relatively low, and scope 3 (value chain) emissions are relatively high. Although not evidenced in the Data Confidence Table (Appendix 1), INTREAL's carbon footprint processes improved in the FY22 reporting period, in terms of access to data and quality, and operations were less impacted by the Covid-19 pandemic. This provided a carbon footprint result which better reflects the activities of INTREAL. The impact of the increase in floor space for only the last two months of the reporting period will become clear in the following reporting period.

INTREAL's other sustainability initiatives include:

### Energy efficiency

- All halogen lamps have been replaced with LED's
- Installation of motion detectors and sensor taps
- Roll out of smart meters for electricity and district heating at the Ferdinandstraße 55-61 and Gertrudenstraße 9 offices in Hamburg
- Emission factors of products and services to be integrated into decision-making processes
- Installations of drinking water dispensers

### Technology

- Mobile apps have been deployed to make it easier to connect/work remotely
- Teleconferencing tools have been improved to reduce travel
- Unused IT equipment has been decommissioned and removed

### Reducing consumption and waste

- Primary "paperless" contract processing via DocuSign
- Electronic equipment is recycled wherever possible or destroyed and disposed of responsibly under the waste electrical and electronic equipment (WEEE) regulations
- Paper cups have been removed and replaced with ceramic cups
- Avoidance of single-use plastic
- The use of environmentally friendly cleaning chemicals has been implemented
- Food/catering that is ordered for events and not consumed is donated to organizations
- Smaller recycling systems have been initiated (crown cap donations to finance social and environmentally sustainable projects)
- Suppliers from the region are preferred in order to keep delivery distances short
- Where possible, we choose the best possible environmental standards for the purchase of copy paper and marketing supply, if available, INTREAL chooses to buy "climate neutral" copy paper
- Use of bicycle couriers for inner-city transportation
- Abolition of "disposable gifts" (bouquets of flowers) for employees birthday: instead of cut flowers, every employee receives a jar of regional HIH honey from the Group's own beehives for their birthday

### Staff mobility

- An employee commuting survey is conducted twice a year to improve awareness
- Company bikes were purchased so employees can drive to meetings in the city center by bike
- Bicycle parking facilities have been provided
- Subsidising of professional tickets for public transport in Germany
- Subsidising of the JobRad
- Flexible work location: remote/presence



## RECOMMENDATIONS

Various ongoing recommendations for INTREAL's consideration remain important to consider and action over time. If implemented, they will surely a) improve the collection and quality of data, b) reduce risk associated with claims and c) potentially reduce emissions:

INTREAL should continue to:

- Promote and incentivise the use of public transport for employee commuting
- Consider conducting the employee commute survey twice a year, to better allow for variances between winter and summer travel and to improve overall accuracy
- Roll out smart meters to monitor and record consumption data for all utilities (e.g., electricity, water, and heating) to:
  - Provide real-time accurate data, offering data granularity and enable monthly reporting
  - Help reduce current waiting periods for activity data
  - Help to identify possible inaccuracies in the billing processes, which could result in costs and emissions reductions
- Keep abreast of announcements regarding possible alternative (renewable) supply options for natural gas for heating
- Insist on as much specific information as possible from renewable energy suppliers which contributes to the ongoing development of the approach and methodology for emissions calculations. This includes, but is not limited to, lifecycle analysis data, GO certificates, supplier-mix factors, and residual-mix factors if applicable
- Reduce the number of parcels shipped via the courier service to reduce emissions associated with freight
- Evaluate and improve systems to record fuel consumption data for company owned vehicles
- Keep abreast of options for waste measurement
- Consider the use of carbon reporting software or other digital systems to capture carbon activity data more regularly and accurately

## APPENDIX 1: DATA CONFIDENCE TABLE

Legend:

	Primary data, no estimations
	Data provided, estimations mostly unavoidable
	Data provided with estimations required
	Entirely estimated

Scope	Emission Source	Activity Data	Comment
Scope 1	Natural gas		Consumption data for Frankfurt was extrapolated
	Company owned vehicles		Actual mileage or fuel consumption cannot be provided at this stage
Scope 2	Purchased electricity		
	District heating		Data for Glockengießerwall 3 was extrapolated
Scope 3	Air travel		
	Land travel		By nature this data point makes us of assumptions. For some public transport modes data estimations are unavoidable
	Sea travel		
	Hotel stay		
	Employee commuting		By nature this data point make us of assumptions. Not all employees complete the survey and commuting behaviour varies between seasons
	Homeworking		By nature this data point make us of assumptions. Calculations are based on the work from home policy which may not be an accurate reflection of employee choices or number of hours worked
	Water supply		Consumption data for Frankfurt was extrapolated
	Paper use		Data was provided but additional information had to be assumed to obtain calculations
	Plastic items		Data was provided but additional information had to be assumed to obtain calculations
	Electrical items		
	Air and land freight		By nature this data point make us of assumptions. Service providers to not keep record of all details required for CO <sub>2</sub> e calculations
	Landfill and recycled waste		The majority of data points are available, estimations were applied to the rest
	All fuel and energy related activities for WTT and T&D		Data is based on consumption data of gas and heating

Table 8: Data quality of activity data by source

Note: The detailed discussion on assumptions and estimations is found in Appendix 3.

## APPENDIX 2: ACTIVITY DATA TABLE

			FY21	FY22	Change
Scope & Category	Activity	Unit	Quantities		
Scope 1					
Stationary combustion	Natural gas*	kWh	61,851.57	72,373.33	10,521.77
Mobile combustion	Large car - Petrol	km	70,000.00	37,100.00	-32,900.00
	Large car - Plug-in hybrid electric vehicle	km	50,000.00	40,000.00	-10,000.00
	Large car - Petrol	km	0.00	38,000.00	38,000.00
Scope 2					
Electricity consumption	Purchased electricity	kWh	208,107.89	328,333.80	120,225.91
Heating	District heating	kWh	204,582.79	226,163.87	21,581.07
Scope 3					
Business travel - Air	Flights <900 km	passenger.km	33,628.84	140,594.92	106,966.08
	Flights 900 - 3,700 km	passenger.km	7,105.21	13,008.56	5,903.35
	Flights >3,700 km	passenger.km	16,146.22	0.00	-16,146.22
Business travel - Land	Train - National rail	passenger.km	86,208.33	277,084.71	190,876.38
	Tram - Tram and underground	passenger.km	295.29	682.56	387.27
	Taxi - Medium engine size petrol car	km	577.33	2,626.42	2,049.09
	Car hire - Large engine size diesel car	km	40,000.00	2,000.00	-38,000.00
	Car hire - Medium engine size diesel car	km	0.00	520.00	520.00
	Car hire - Small engine size battery electric car	km	0.00	8.00	8.00
	Employee private use - Average engine size unknown fuel car	km	0.00	19,631.20	19,631.20
	Bus - Coach	passenger.km	0.00	638.85	638.85
	Business travel - Sea	Ferry - Foot passenger	passenger.km	0.00	1,500.00
Business travel - Hotel stay	Luxembourg	Room night	23.00	44.00	21.00
	Germany	Room night	117.00	683.00	566.00
	Austria	Room night	0.00	2.00	2.00
	France	Room night	0.00	12.00	12.00
	Netherlands	Room night	0.00	3.00	3.00
	Spain	Room night	0.00	7.00	7.00
Employee commute	Taxi - Medium engine size petrol car	km	1,641.27	2,028.27	387.00
	Bus	passenger.km	66,733.22	93,772.11	27,038.89
	Train - Underground	km	219,268.52	254,367.23	35,098.71
	Car - Average size unknown fuel type	km	802,734.50	1,060,580.00	257,845.50
	Motorbike	km	7,275.74	11,276.88	4,001.14
	Train - Light rail and tram	passenger.km	296,724.93	348,883.53	52,158.60
	Train - National rail	passenger.km	1,099,143.82	1,334,241.82	235,098.00
Homeworking	Heating	FTE working hour	149,400.00	183,960.00	34,560.00
	Office equipment	FTE working hour	298,800.00	367,920.00	69,120.00
Purchased goods and services	Water supply	m³	872.10	1,113.15	241.06
	Paper and board	tonne	0.64	1.44	0.81
	Plastic items	tonne	0.00	0.01	0.01
	Computer - Notebook	nr	76.00	161.00	85.00
	Computer - Monitor	nr	76.00	161.00	85.00
	Computer - Conferencing Monitor	nr	76.00	161.00	85.00
	Computer - Wireless Headset	nr	76.00	161.00	85.00
	Mobile Phone - Apple iPhone SE 3rd Gen	nr	76.00	161.00	85.00
	Computer - Average Docking Station	nr	76.00	161.00	85.00
	Computer - Keyboard & Mouse Set	nr	0.00	161.00	161.00
	Computer - Keyboard average	nr	76.00	0.00	-76.00
	Computer - Wireless mouse average	nr	76.00	0.00	-76.00
Downstream transportation and distribution	Air freight - flights <900 km	tonne.km	4,896.41	1,520.68	-3,375.73
	Air freight - flights 900 - 3700 km	tonne.km	119.41	34.67	-84.74
	Road freight - Van - Average (up to 3.5t) unknown fuel type	tonne.km	2,080.73	1,271.82	-808.91
	Rail freight - Freight train	tonne.km	0.00	4.01	4.01
Waste generated in operations	Recycled waste - Paper and board	tonne	3.16	6.44	3.28
	Recycled waste - Mixed recyclables	tonne	1.68	1.84	0.16
	Landfill - Commercial waste	tonne	2.50	17.46	14.96
Fuel and energy activities not in Scope 1 or 2	WTT - Natural gas	m³	3,666.12	0.00	-3,666.12
	WTT - Natural gas	kWh	23,174.00	72,373.33	49,199.33
	WTT - District heat and steam	kWh	204,582.79	226,163.87	21,581.07
	WTT - District heat and steam distribution	kWh	204,582.79	226,163.87	21,581.07
	District Heating Transmission & Distribution	kWh	204,582.79	226,163.87	21,581.07
	Electricity Transmission & Distribution	kWh	208,107.89	328,333.80	120,225.91

Table 9: Activity data table by year (these figures include estimations and/or assumptions, please see Appendix 3 for detailed descriptions)

\*Note: Luxembourg data for FY21 was converted from m³ to kWh using an average factor of 10.55 for comparative purposes

## APPENDIX 3: METHODOLOGY, ASSUMPTIONS & LIMITATIONS

The methodology used to develop this GHG Inventory is as recommended by the GHG Protocol Corporate Standard (WRI & WBCSD, 2015).

All scope 1 and 2 emissions are reported as per the minimum requirements set by the Corporate Standard. In addition, material scope 3 emissions have been reported.

The unit of measure is carbon dioxide equivalent (CO<sub>2</sub>e) which includes the gases:

Carbon dioxide (CO<sub>2</sub>)

Methane (CH<sub>4</sub>)

Nitrous oxide (N<sub>2</sub>O)

All emissions factors applied are derived from the factor database of the United Kingdom Government's Department for Environment Food & Rural Affairs (DEFRA), version 2.0 of 2022. The DEFRA emissions factor database is considered to be one of the most comprehensive and reliable and is updated on an annual basis.

Where an emission factor was sourced from a different database it is indicated.

All data submitted by INTREAL is assumed to be accurate, precise, and complete unless otherwise stated. Where data was not available figures were estimated and extrapolated according to the methodologies described below. AQGT was not asked to verify data against source documentation.

Further information regarding data collection limitations, assumptions and extrapolations are available on request.

### Scope 1

#### Stationary combustion

Natural gas is used as a heating fuel at Frankfurt and Luxembourg. The consumption data for Frankfurt for FY22 was not available and was estimated based on extrapolating the FY21 data on the basis of employee headcount. The GHG emissions for Frankfurt were calculated based on the supplier emission factor provided by INTREAL.

According to the GHG Protocol, under the operational control approach, emissions associated with fuel combustion in leased assets are reported under scope 1.

The well-to-tank (WTT) emissions relating to upstream extraction, refining and transportation of natural gas, prior to consumption were included under scope 3.

#### Mobile combustion

Fuel consumption data for company owned vehicles was not available and emission factors were chosen based on estimated distances provided by INTREAL, engine size and fuel type.

All vehicles on lease periods for longer than two months, were considered long term leased vehicles, and therefore under the control of INTREAL and thus included under scope 1. All vehicle models provided were classified as large vehicles with engine sizes above 2.0 litres.

Where vehicles are leased for less than two months and rented for employees to commute for business travel, these emissions were reported under land-based business travel in scope 3.

The WTT emissions relating to upstream extraction, refining and transportation of fuel, prior to consumption, were included under scope 3.

## Scope 2

### Electricity consumption

INTREAL purchases electricity from a supplier providing electricity generated from renewable (green) energy sources which the supplier states has zero GHG emissions from generation.

In line with the recommendations of the GHG Protocol, emissions from purchased electricity were calculated using the market-based and location-based approach.

As per the reporting requirements, for the market-based approach, emissions were calculated based on the zero product specific emission factor provided by the supplier. For the location-based approach, emissions were calculated using a production mix factor of 387.63 gCO<sub>2</sub>/kWh for Germany and 74.42 gCO<sub>2</sub>/kWh for Luxembourg. Emission factors were obtained from the Association of Issuing Bodies (2022). Upstream transmission and distribution (T&D) losses were accounted for under scope 3, fuel and energy activities not reported in scope 1 or 2.

### District heating

The GHG emissions were calculated using a supplier emission factor provided by INTREAL. Upstream T&D losses were accounted for under scope 3, fuel and energy activities not reported in scope 1 or 2.

The heating consumption data for Glockengießerwall (Hamburg) office was not available. As per the prior GHG inventory approach, the data was extrapolated based on the per m<sup>2</sup> intensity, for the office at Ferdinandstraße 59-61 (Hamburg). The activities at both these offices are of a similar nature and the m<sup>2</sup> intensity was derived from the data provided for FY22 for Ferdinandstraße.

The newly occupied office space for INTREAL, situated at Gertrudentraße in Hamburg, was only occupied from November 2022 and therefore only includes two months of consumption data for electricity and district heating.

## Scope 3

### Business travel

#### Air travel

Flights are classified according to the one-way route distance and by class as per the DEFRA database categories:

Domestic flights: up to 900 km

Short haul flights: 901 – 3,700 km

International flights: >3,700 km flights

All flight routes provided were specified as economy class.

All emission factors selected are with radiative forcing (RF) to include the indirect effects of non-CO<sub>2</sub> emissions such as water vapour, contrails and NO<sub>x</sub> on climate change.

#### Land travel

##### *Car rentals*

The GHG emissions for vehicles rented or leased for a period of two months or less were accounted for based on the distance travelled, engine size and fuel type.

##### *Employee private vehicle use*

The total distance travelled in privately owned vehicles was calculated by taking the total spend and dividing by the flat rate per kilometre (km), as the km data is not recorded. GHG emissions were calculated based on an average car - unknown fuel type.

##### *Taxi rides*

The distances travelled in taxi rides are not recorded. The distances were estimated using the total spend. The total base cost for the 167 rides recorded was deducted from the total spend to determine the spend on distance travelled. The total km travelled was determined by dividing the total spend on distance travelled by an estimated price per km of €3.00 as indicated by INTREAL. The emission factor for a medium sized petrol car was applied to the estimated total km.

##### *Train rides*

For shorter trips relating to underground and/or tram use, the actual distances travelled were not available. The total distance travelled was determined by using an average public transport distance of 9.48 km and multiplying it by the total number of trips provided for both underground and tram use. The 9.48 km is an average distance obtained from 2022 data provided by Moovit Public Transit Index for Germany.

The DEFRA emission factor for light rail and tram was applied to the total estimated underground and tram distances. The DEFRA emission factor for national rail was applied to all other train trips.

##### *Coach and ferry rides*

All coach and ferry rides were calculated on a passenger.km basis. The emission factor for ferry rides is based on "foot passenger" as the passengers did not travel with their vehicles on board.



### Hotel stays

Hotel stays were totalled by country and the average hotel stay factor per country was used to calculate GHG emissions. The emission factor for Austria and Luxembourg was obtained from the Greenview Hotel Footprinting Tool which uses data from the Cornell Hotel Sustainability Benchmarking (CHSB) index, 2021.

### **Employee commute**

The data for employee commute was obtained from an electronic survey shared with all employees. The survey was conducted during December 2022.

### Respondents

The survey had a response rate of 52.24%.

Location	Nr. of respondents	Nr. of employees
Hamburg	231	424
Frankfurt	15	40
Luxembourg	10	26

Table 10

The total daily distances travelled for the various modes of transport were calculated based on the information provided by the respondents. Once the total daily distances were calculated this data was extrapolated to the number of employees for each location.

For Hamburg the extrapolation was based on 410 employees. The 14 employees who work from home on a permanent basis were excluded and the two respondents who provided data for their annual travel behaviour which was calculated separately and added to the calculation.

The daily distances were extrapolated to a yearly figure based on the assumption that there are 135 travel days within the year. INTREAL has a 3:2 work from home policy. It was assumed that there are 45 working weeks in the year allowing for 30 days (six weeks of annual leave) and five days (one week of public holidays), each week has three days for travel to work, resulting in an annual total of 135 travel days.

### Modes of transport

The following emission factors from the DEFRA database were applied to the respective modes of transport:

Mode of transport selected in survey	DEFRA Emission factor
Car	Average car, unknown fuel type
Motorcycle	Average motorcycle (no specified fuel type)
Taxi/Uber	Medium size car, petrol
Bus	Average local bus
Train/Railway	National rail
Tram	Light rail and tram
Underground	Underground

Table 11

## Homeworking

INTREAL has a work from home policy which allows employees to work from home for two days per week. The GHG emissions resulting from homeworking are regarded to be from the energy consumption of office equipment and heating. Should the employees have worked at the office, these emissions would normally be accounted for under the company's scope 1 and 2 emissions.

To account for the GHG emissions associated with employees working from home, a total number of work-from-home hours was calculated. It was assumed that employees work from home 16hrs per week (two days). For the 14 employees who work from home on a permanent basis, a 40hr week was used. It was assumed that there are 45 working weeks in the year. GHG emissions from heating were calculated for only half of the work-from-home hours whereas emissions from the use of office equipment, were calculated for the total number of work-from-home hours.

## Purchased goods & services

### Electrical items

INTREAL provides all new employees with an IT starter package. There were 161 new employees during 2022. The emission factors for these items were provided by INTREAL and obtained from the manufacturer's datasheets:

Item description	Emission factor
Notebook - ThinkPad E15 Gen 3	551.00 kgCO <sub>2</sub> e
Conference monitor - Dell C2422HE	602.00 kgCO <sub>2</sub> e
Monitor - Dell P2422H	481.00 kgCO <sub>2</sub> e
Docking station - Non-specific/average	22.00 kgCO <sub>2</sub> e
Keyboard & mouse – Logitec MK120 Bundle	5.03 kgCO <sub>2</sub> e
Headset - Jabra Evolve2 65	12.32 kgCO <sub>2</sub> e
Mobile phone – Apple iPhone SE (3 <sup>rd</sup> gen), 64GB	46.00 kgCO <sub>2</sub> e

Table 12

### Paper use

For office paper and brochures, where information was not available, the following assumptions were made:

Description	Assumption
Luxembourg purchases	
Copy paper/5000 per package	Size - A4
Folder DIN A4 width 80 mm	Weight per item - 400gm
Envelopes 75g/sqm 1000pcs	Size - C4

Table 13

For copy paper purchases at Hamburg purchased as "CO<sub>2</sub> Neutral" - as claimed by the supplier - no emissions were accounted for.

## Marketing materials – paper use and plastic items

For marketing materials, where information was not available, the following assumptions were made:

Description	Assumption
Business cards, 8.5 x 5.5 cm	Paper weight – 300gsm
Notebook, DIN A5, 192 pages, tone in tone, incl. ribbon bookmark	Paper weight – 80gsm
Sticker, DIN A7, coloured	Material type – Vinyl plastic Material weight – 80gsm
Roll Up Banner, 102x227 cm, coloured	Material type – PET plastic Material weight – 450gsm
Square flag, 65 x 244 cm, coloured	Material type – PET plastic Material weight – 130gsm

Table 14

## Water supply

The DEFRA emission factor for water supply (UK) in cubic metre was applied.

The consumption data for Frankfurt for FY22 was not available and was estimated based on extrapolating the FY21 data on the basis of employee headcount.

The water consumption data for Glockengießerwall (Hamburg) office was not available. The data was extrapolated based on the per m<sup>2</sup> intensity for the office at Ferdinandstraße 59-61 (Hamburg). The activities at both these offices are of a similar nature and the m<sup>2</sup> intensity was derived from the data provided for FY22 for Ferdinandstraße.

The newly occupied office space for INTREAL, also situated at Gertrudentraße in Hamburg was only occupied from November 2022 and therefore only includes two months of consumption data.

## **Downstream transportation & distribution**

All activity data for deliveries were supplied by the freighting company.

## Air freight

Air freight was divided into two categories. Domestic freight flights for distances of less than 900 kilometres and short haul freight flights for distances between 900 and 3,700 kilometres.

Weight and distance were provided, and emissions were calculated on a tonne.km basis for each route listed.

## Land freight

### Hamburg

For land freight, the mode of transport for all deliveries were assumed to be an average van (up to 3.5 tonnes) unknown fuel type. Weight and distance were provided, and emissions were calculated on a tonne.km basis for each route listed.

For the additional list of shipments (local deliveries within Hamburg), the weight of the items was not known, and it was assumed that 80% of the deliveries weighed 0.2kg and 20% of the deliveries weighed 1.5kg. All e-bike deliveries were excluded.

### Luxembourg

All shipments were assumed to have been transported by rail. To account for the motor vehicle emissions of transportation to rail, 30% of the total calculated tonne.km was calculated based on the emission factor of an average van (up to 3.5 tonnes) unknown fuel type. The remaining 70% was calculated based on the emission factor for a freight train.

## Well-to-tank emissions

Where applicable these emissions have been included. WTT GHG emissions relate to upstream extraction, refining and transportation of fuel, prior to consumption WTT emissions are regarded to be indirect scope 3 emissions according to the GHG Protocol.

## Waste generated

Data for waste generated, for all offices, were provided as per the table below. Where data was not available, assumptions were made and indicated with an asterisk.

The newly occupied offices for INTREAL were only occupied from November 2022 and emissions from waste generated were therefore only calculated for an eight-week (two month) period.

Office location	Type of waste	No. of bins	Size (litres)	Frequency of emptying	Destination
Hamburg Ferdinandstraße (all)	Residual	1	120	1x/week	Landfill
	Residual	2	1,100	2x/week	Landfill
	Paper	1	1,100	2x/week	Recycling
	Packaging with plastic content	1	1,100	1x/week	Recycling
	Shredded paper	6	240	1x/quarter	Recycling
	Shredded paper	2	70	2x/year	Recycling
	Shredded paper	2	350	2x/month	Recycling
Hamburg Glockengießerwall 3	Shredded paper	1	240	3x/year	Recycling
	Residual*	1	120	1x/week	Landfill
Hamburg Raboisen 38-40	Shredded paper	1	240	5x/year	Recycling
	Shredded paper	1	240	1x/year	Recycling
	Residual*	1	120	1x/week	Landfill
Hamburg Gertrudenstraße 9	Residual	1	60	2x/month	Landfill
	Residual	2	1,100	2x/week	Landfill
	Paper	1	1,100	2x/week	Recycling
	Packaging with plastic content	1	660	1x/week	Recycling
Frankfurt Erlenstraße 2	Shredded paper	1	240	1x/year	Recycling
	Residual*	1	120	1x/week	Landfill
Luxembourg Boulevard de la Foire 11-13	Shredded paper	1	240	1x/year	Recycling
	Residual*	1	120	1x/week	Landfill

Table 15

\*Note: Based on data estimations

It was estimated that a 1,100 litre bin has the following capacities: 65 kg of general residual waste, 35 kg of cardboard/paper waste and 35 kg of light fraction/dry mixed recycling. The capacities for the 660 and 120 litres bins were derived from the above estimation. For shredded paper it was assumed that 12 litres of shredded paper weighs approximately 1kg. The total weight of waste was determined based on the total number and volume of bins, and the frequency of the bins being emptied.

The following emission factors were assigned to the various waste streams:

Waste type	DEFRA emission factor category
Residual waste	Commercial and industrial waste, landfill
Paper waste	Paper and board, closed loop (recycled)
Packaging with plastic content (dry mixed recycling)	Average plastics*, open loop (recycled)

Table 16

\*The average plastic open loop factor is the same value as various other open loop materials and therefore not a meant as a description of the waste stream but for the emission factor it represents and shares with other materials indicated in this waste stream.

## Fuel and energy activities not reported in scope 1 or 2

### Well-to-tank emission from stationary fuels

WTT GHG emissions were included to account for the upstream scope 3 emissions associated with extraction, refining and transportation of raw fuel sources to the organisation's site/asset, prior to combustion of the relevant fuel/s.

### Transmission & distribution losses of electricity and district heating

For the purposes of location-based reporting, GHG emission from T&D losses from electricity consumption, were accounted for using the associated DEFRA emission factor and applying it to total electricity consumption (in kWh). For district heating the associated DEFRA emission factor was also applied.

## FY21 Reporting Period Recalculation

The GHG Protocol recommends that organisations publish any recalculations of GHG emissions for previous reporting periods, for reasons of comparability, particularly to account for changes in calculation methodology or where there have been improvements in data accuracy over time.

Newly sourced (utility specific) emission factors from the suppliers of natural gas in Frankfurt and district heating in Hamburg were also applied retrospectively to the FY21 consumption data, to allow for meaningful year on year comparisons.

Improvements in activity data relating to GHG emissions from downstream transportation and distribution for INTREAL's FY21 reporting period, necessitate an adjustment to the calculation approach for FY22 and this updated approach was then also applied to FY21.

Table 17 below summarises these changes and table 18 the updated GHG inventory for F21.

GHG Activity	Stated figure (tCO <sub>2</sub> e)	Updated figure (tCO <sub>2</sub> e)	Difference (tCO <sub>2</sub> e)	Reason
Natural gas	4.230	5.562	+1.332	Utility specific emission factor supplied
District heating	34.928	13.093	-21.835	Utility specific emission factor supplied
Downstream transportation and distribution	138.568	2.135	-136.433	Improvement in data accuracy

Table 17

Scope and category	Activities	Market based approach (tCO <sub>2</sub> e)	% of Total emissions	Location based approach (tCO <sub>2</sub> e)	% of Total emissions
<b>Scope 1</b>		<b>36.004</b>	<b>6.53%</b>	<b>36.004</b>	<b>5.85%</b>
Stationary combustion	Natural gas	12.952	2.35%	12.952	2.10%
Mobile combustion	Company owned vehicles	23.052	4.18%	23.052	3.75%
<b>Scope 2</b>		<b>13.093</b>	<b>2.37%</b>	<b>77.101</b>	<b>12.53%</b>
Electricity consumption	Purchased electricity (green tariff)	0.000	0.00%	64.007	10.40%
Heating	District heating	13.093	2.37%	13.093	2.13%
<b>Scope 3</b>		<b>502.255</b>	<b>91.10%</b>	<b>502.255</b>	<b>81.62%</b>
Business travel	Air travel	12.883	2.34%	12.883	2.09%
	Land travel	21.301	3.86%	21.301	3.46%
	Sea travel		0.00%		0.00%
	Hotel stay	1.673	0.30%	1.673	0.27%
	<b>Total</b>	<b>35.857</b>	<b>6.50%</b>	<b>35.857</b>	<b>5.83%</b>
Employee commute	<b>Employee commuting</b>	<b>249.936</b>	<b>45.33%</b>	<b>249.936</b>	<b>40.62%</b>
Homeworking	<b>Homeworking</b>	<b>55.641</b>	<b>10.09%</b>	<b>55.641</b>	<b>9.04%</b>
Purchased goods and services	Water supply	0.130	0.02%	0.130	0.02%
	Paper use	0.585	0.11%	0.585	0.10%
	Plastic items		0.00%		0.00%
	Electrical items	142.412	25.83%	142.412	23.14%
	<b>Total</b>	<b>143.127</b>	<b>25.96%</b>	<b>143.127</b>	<b>23.26%</b>
Downstream transportation and distribution	Air freight	0.610	0.11%	0.610	0.10%
	Land freight	1.526	0.28%	1.526	0.25%
	<b>Total</b>	<b>2.135</b>	<b>0.39%</b>	<b>2.135</b>	<b>0.35%</b>
Waste generated in operations	Landfill waste	1.166	0.21%	1.166	0.19%
	Recycled waste	0.103	0.02%	0.103	0.02%
	<b>Total</b>	<b>1.269</b>	<b>0.23%</b>	<b>1.269</b>	<b>0.21%</b>
Fuel and energy activities not in scope 1 or 2	Well-to-tank (WTT) natural gas	1.980	0.36%	1.980	0.32%
	WTT - District heat and steam	6.450	1.17%	6.450	1.05%
	WTT - District heat and steam distribution	0.339	0.06%	0.339	0.06%
	Transmission & distribution losses from district heating	1.839	0.33%	1.839	0.30%
	Transmission & distribution losses from purchased electricity	3.681	0.67%	3.681	0.60%
	<b>Total</b>	<b>14.290</b>	<b>2.59%</b>	<b>14.290</b>	<b>2.32%</b>
		<b>551.352</b>	<b>100.00%</b>	<b>615.360</b>	<b>100.00%</b>

Table 18



## APPENDIX 4: GLOSSARY

CHSB	Cornell Hotel Sustainability Benchmarking
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
DEFRA	Department for Environment Food & Rural Affairs
FTE	Full time equivalent
GHG	Greenhouse Gas
LCA	Life Cycle Assessment
RF	Radiative forcing
T&D	Transmission and distribution
UK	United Kingdom
WTT	Well-to-tank
WRI	World Resources Institute
WBCSD	World Business Council for Sustainable Development

## DISCLAIMER

The accuracy of any carbon footprint calculation is linked to the accuracy of the primary input data provided by the reporting entity and its representatives/affiliates, the veracity of data sourced/provided for assumptions and various other factors that may be out of AQGT's control. AQGT was not required to verify data or data source information as part of this assignment. INTREAL acknowledges and accepts (i) that the calculation results are a best approximation, (ii) that AQGT cannot and do not guarantee that the calculated carbon footprint corresponds to INTREAL's actual carbon footprint and (iii) that AQGT does not support any carbon-related claims unless these have been expressly endorsed by AQGT in writing, and (iv) to the extent the calculation yields INTREAL's carbon footprint over a time period partly in the future, that the calculated carbon footprint is not necessarily a prediction about the future and as such necessarily an estimate or forecast.

