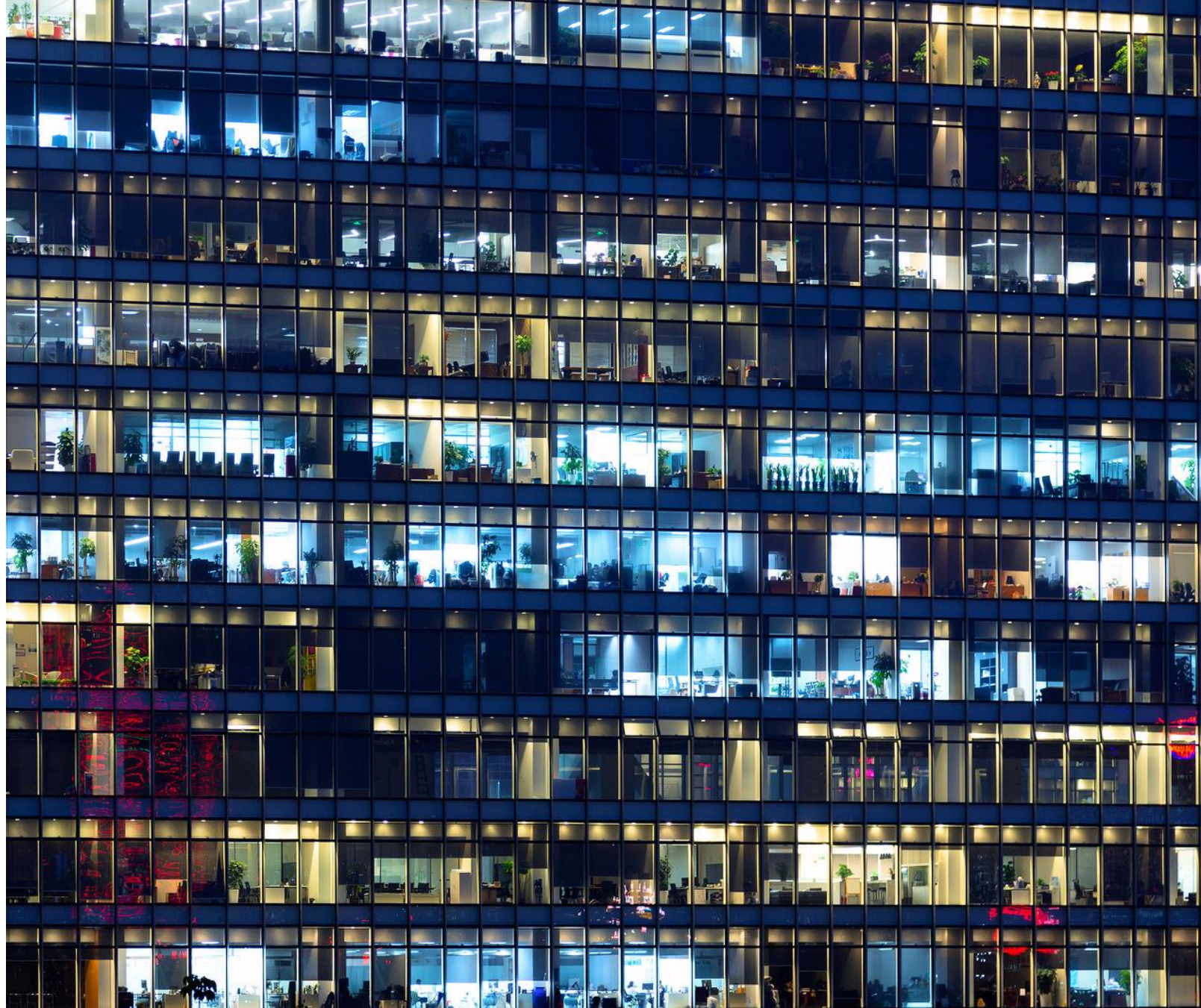




# ZEN INTERNET FY21 GHG EMISSIONS

4<sup>th</sup> March 2022



01

# GHG EMISSIONS OVERVIEW

# GREENHOUSE GAS EMISSIONS OVERVIEW

Anthesis has calculated Zen Internet's full Scope 1, 2 and 3 emissions for FY 2020-21, as the basis for setting a Science Based Target and longer-term ambition for Net Zero.

Zen Internet has already switched its electricity supply to renewable sources, leaving its Scope 2 emissions at zero and Scope 1 very low.

Scope 3 accounts for 97% of the total impact, with 55% associated with line and connection services from third parties (upstream leased assets), and 22% associated with other purchased goods and services. Emissions from customer router energy use contribute 14% of the total (downstream leased assets).

Major suppliers accounted for 58% of total impacts, and these will be the starting point for short-term engagement with the supply chain.

# GREENHOUSE GAS EMISSIONS OVERVIEW

FY21: OCT 2020-SEPT 2021

Category	Emissions Location-Based (tCO2e)	Emissions Market-Based (tCO2e)
Scope 1	487	487
Scope 2	1,966	0
Scope 3	18,723	17,992
<b>Total</b>	<b>21,177</b>	<b>18,480</b>

Zen Internet targets and reporting are tracking Market-based emissions.

Market-based emissions reflect the company's active purchase of renewable energy.

Location-based emissions reflect the local grid averages for electricity.

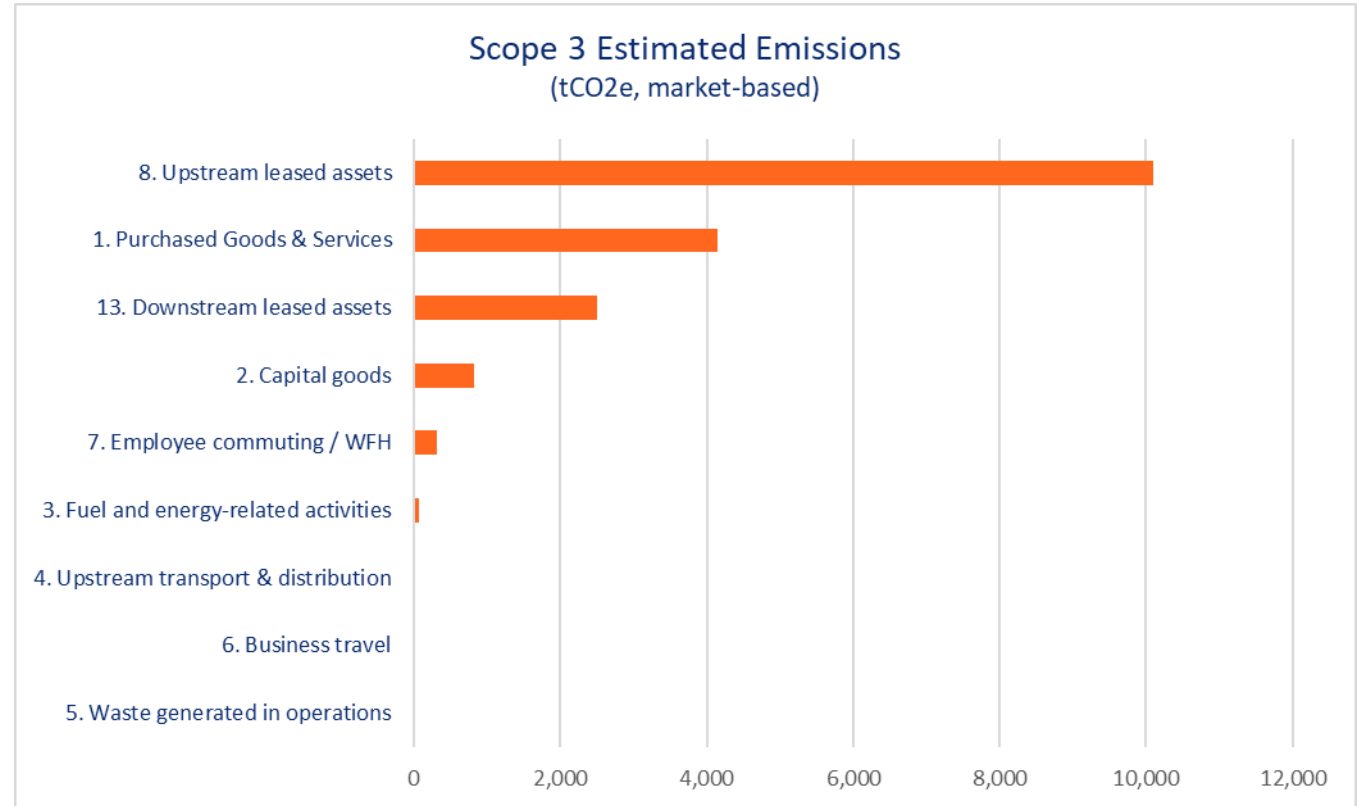
# SCOPE 3 SCREENING RESULTS

FY21: OCT 2020-SEPT 2021

Scope 3 category	Emissions Location-Based (tCO2e)	Emissions Market-Based (tCO2e)
1. Purchased Goods & Services	4,157	4,157
2. Capital goods	818	818
3. Fuel and energy-related activities	804	73
4. Upstream transport & distribution	16	16
5. Waste generated in operations	0.5	0.5
6. Business travel	15	15
7. Employee commuting / WFH	321	321
8. Upstream leased assets	10,092	10,092
9. Downstream transport & distribution		
10. Processing of Sold Products		
11. Use of sold products		
12. End of life treatment		
13. Downstream leased assets	2,499	2,499
14. Franchises		
15. Investments		
<b>Total Scope 3</b>	<b>18,723</b>	<b>17,992</b>

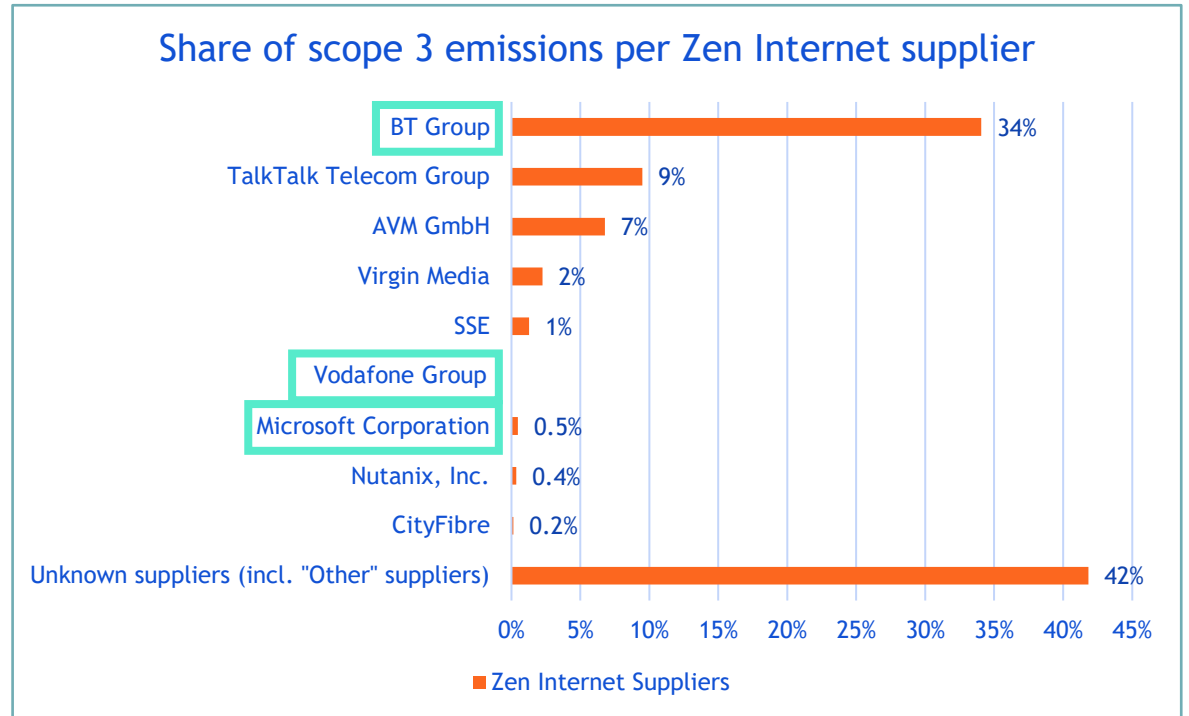
# KEY POINTS

- Largest impact categories are:
  - Upstream leased assets
  - Purchased Goods & Services (PG&S)
  - Downstream leased assets.
- Upstream leased assets include line and connection rentals - represent area of largest spend.
- PG&S include emissions from equipment, employee costs, premises and various services.
- Downstream leased assets represent the annual energy use in routers (by customers).



# SUPPLIER-SPECIFIC EMISSIONS

- Supplier-specific emission factors (EF) were applied for suppliers highlighted in **green**
- More than half of known suppliers did not have reliable emissions data - engagement to collect better data will be crucial
- Supplier-specific EFs were lower than the general IO factor => resulted in reduced emission estimates
- Known suppliers represent **58%** of scope 3 emission.



# SELECTED RESULTS FOR OFFSET PURCHASES

Scope	Activity	Market-based	Location-based
Scope 1	Site gas	422.8	422.8
	Refrigeration & A/C	63.6	63.6
	Company vehicles	1.0	1.0
<b>Scope 1 Sub Total</b>		<b>487.4</b>	<b>487.4</b>
Scope 2	Electricity generation	0.0	1965.7
<b>Scope 2 Sub total</b>		<b>0.0</b>	<b>1965.7</b>
Scope 3	Electricity transmission & distribution, WTT, Fuel WTT	72.6	803.7
	Employee-owned or leased vehicles	14.7	14.7
	Waste	0.5	0.5
	Water (and wastewater)	4.7	4.7
	Flights	0.0	0.0
	Rail travel	0.4	0.4
	Taxi travel	0.0	0.0
Other Scope 3 categories not included here	Purchased goods & services, Capital goods, Upstream transport, Employee commuting / WFH, Downstream leased assets	not included here	not included here
<b>Scope 3 Sub Total</b>		<b>92.8</b>	<b>823.9</b>
<b>Overall Total</b>		<b>580.3</b>	<b>3277.1</b>
<b>For Scopes 1, 2 and a selection of Scope 3 categories:</b>			
	Tonnes of CO2e per employee	1.1	6.0
	Tonnes of CO2e per £M turnover	6.4	35.9
	Offsets bundled with natural gas supply	422.8	422.8
	Net tonnes CO2e (in line with previous reporting)	<b>157.5</b>	2,854.3

Note: 1 tCO2e has moved from Scope 3 in the SECR to Scope 1 Company vehicles due to different groupings in SEC reporting.



02

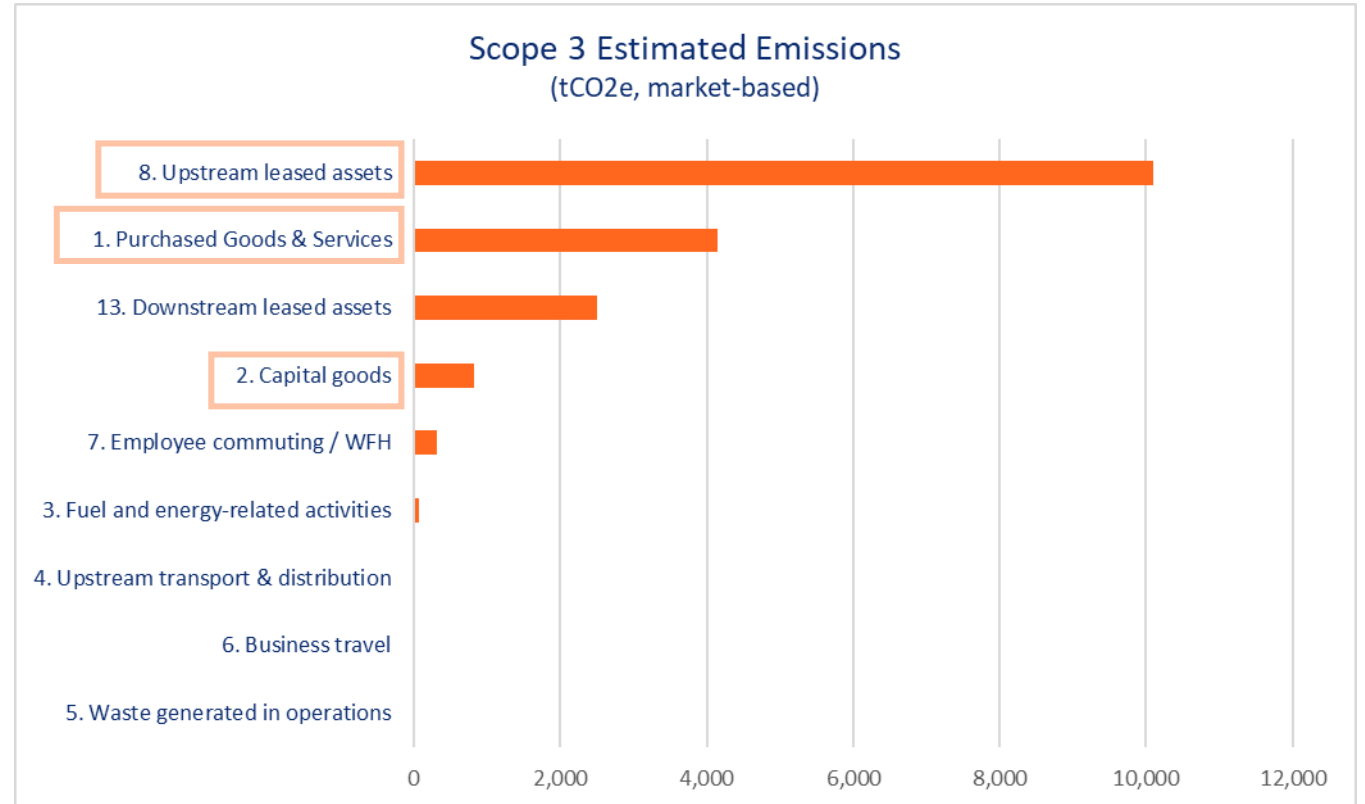
# RECOMMENDATIONS

# RECOMMENDATIONS

- Engage with suppliers to collect supplier-specific data.
  - In cases of large suppliers such as BT or SSE, asking for emissions data relevant to the branch or division that Zen Internet operates in will improve data accuracy.
  - Encourage suppliers to report all Scope 3 categories to CDP.
- Work with suppliers and peers in the sector to encourage and enable data alignment and systematic data sharing.
- Use a consistent format for data collection for all suppliers and year on year. Anthesis would be happy to support this process.
- For high impact categories such as line and connection rentals, core network and equipment:
  - Investigate the sources of emissions and collect activity data (power rating and actual energy usage of kit and of network infrastructure). This information will probably have to be provided by suppliers.

## NEXT STEP

- Three categories include **known suppliers:**
  - Upstream leased assets
  - Purchased Goods & Services (PG&S)
  - Capital Goods.
- Downstream leased assets (energy use from routers by customers) could be an opportunity to engage with customers to help raise awareness of their impact and lower it.



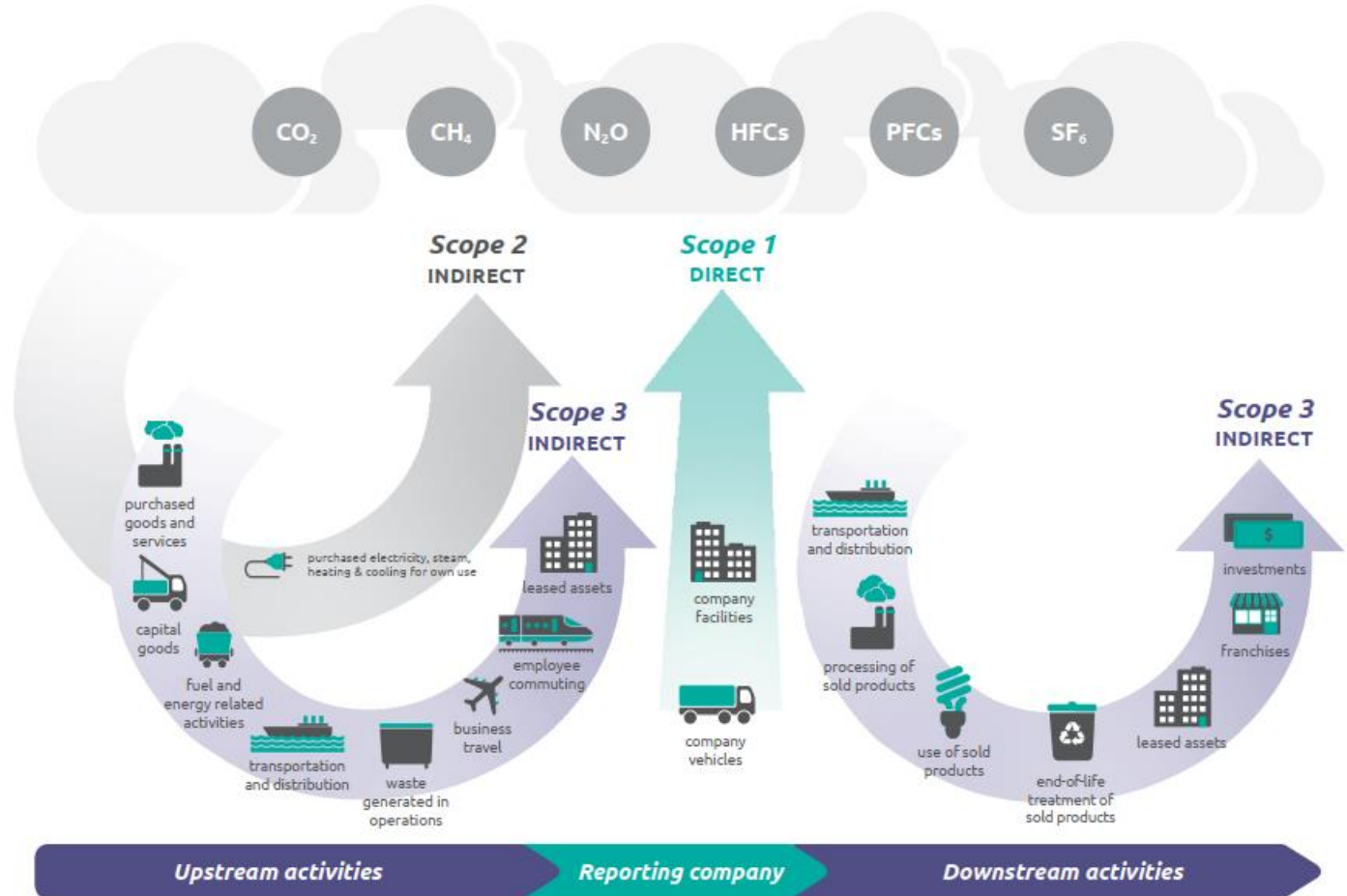
03

# METHODOLOGY

# GHG EMISSIONS – SCOPES 1, 2 & 3

The Greenhouse Gas Protocol Corporate Standard classifies a company's direct and indirect GHG emissions into three scopes

- Scope 1 - direct emissions from owned or controlled sources
- Scope 2 - indirect emissions from the generation of purchased energy
- Scope 3 - all other indirect emissions that occur in a company's value chain



## SCOPE 1 & 2

- Scope 1 includes direct emissions from owned or controlled sources, such as stationary energy and fuel use, mobile fuel use in company owned vehicles, and fugitive emissions - for example refrigerant losses from equipment.
- Scope 2 includes indirect emissions from the generation of purchased energy consumed by the reporting company, such as electricity, heat, steam and cooling.
- Zen Internet reported
  - Natural gas and electricity use for offices, data centres and exchanges
  - Refrigerant losses for Sandbrook House
- Consumption figures were multiplied by appropriate Defra GHG emission factors to give total CO<sub>2</sub>e for all Scope 1 & 2 emissions sources.
- Note that the SECR aggregations are slightly different from the GHG Protocol view

## SCOPE 3

- Scope 3 includes GHG impacts resulting from value chain activities in the entire value chain, both upstream and downstream.
- Because the emissions are outside the company, both activity data and emissions data are more difficult to obtain, and often carry higher uncertainty than Scope 1 & 2 data.
- Most of Zen Internet's Scope 3 results are based on expenditure.

# CALCULATING GHG EMISSIONS FROM EXPENDITURE - Environmentally-Extended Input-Output (EEIO) method

- Input-Output tables map the flow of expenditure through different sectors in a national economy - these are published by government statistics bodies including ONS in the UK
- The GHG emissions from each sector can be overlaid on the expenditure and GHG flow modelled through the economy in a similar way.
- This results in an allocation of GHG emissions and expenditure to each sector, expressed as a GHG emissions factor - kgCO<sub>2</sub>e per GBP spent in the sector.
- Company expenditure categories are mapped to EEIO sectors, and total expenditure is multiplied by the sector EEIO EF to give total CO<sub>2</sub>e for the expenditure category.
- The EEIO method is useful for identifying emission hotspots, but it has low data accuracy:
  - uses spend data (rather than activity data)
  - relies on emissions estimates based on national sector averages



# SUPPLIER-SPECIFIC EMISSION FACTORS

The EEIO method has low data accuracy because it uses emissions estimates based on sector averages.

Anthesis developed some supplier-specific emission factors (EFs) for Zen Internet as a first improvement in data quality for Scope 3.

1. Suppliers with significant spend were identified for categories with the highest impact.
2. Publicly-reported supplier emissions were assessed for completeness (missing emission sources leads to underestimating emissions). CDP Climate Change reports for 2020 were used.
3. Supplier-specific EFs were calculated for suppliers with reliable and complete reported emissions - by dividing their total Scope 1, 2 & 3 reported emissions by their revenue (tCO<sub>2</sub>e/GBP). Downstream emissions were excluded to avoid double-counting and to avoid including emissions irrelevant to Zen Internet activities.
4. Suppliers who did not report all significant sources of emissions were classified as having unreliable data. In this case, the general EEIO factor was applied.

Emission factors based on emissions per revenue are an improvement on the EEIO averages, but supplier data can be refined further by engaging with suppliers and collecting physical data.

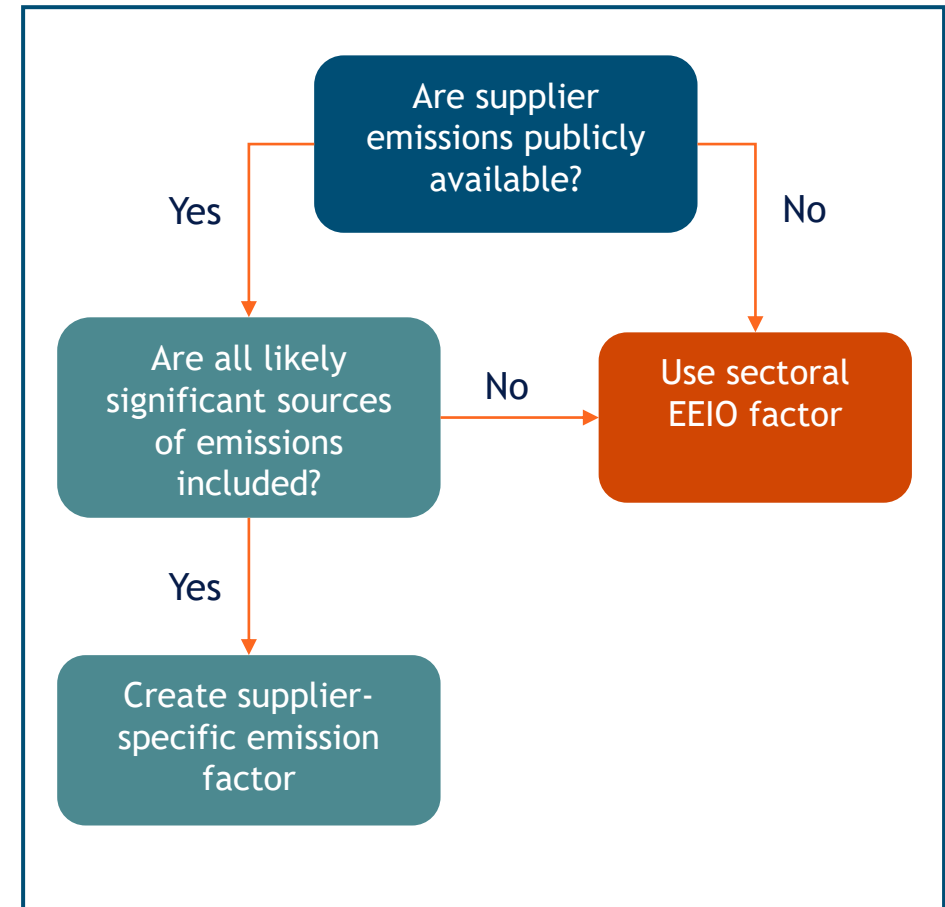


Figure: Decision tree to develop supplier-specific emission factors

# METHOD FOR OTHER SCOPE 3 CATEGORIES (1)

- Fuel and energy-related activities:
  - Upstream emissions of purchased fuels (extraction, production, and transportation of fuels consumed by the reporting company)
  - Upstream emissions of purchased electricity (extraction, production, and transportation of fuels consumed in the generation of electricity, steam, heating, and cooling consumed by the reporting company)
  - Transmission and distribution (T&D) losses (generation of electricity, steam, heating and cooling that is consumed (i.e., lost) in a T&D system) - reported by end user
  - Calculated from consumption data for stationary and mobile fuels and electricity, multiplied by appropriate Defra EFs
- Waste generated in operations
  - Waste data from Sandbrook House, multiplied by appropriate Defra EFs
  - Waste from other sites was not included - considered negligible
- Business travel
  - Reported mileage travelled in employee vehicles, leased vans and leased cars, multiplied by appropriate Defra EFs
  - Reported train mileage, multiplied by appropriate Defra EFs

## METHOD FOR OTHER SCOPE 3 CATEGORIES (2)

- **Upstream transport & distribution**
  - DPD provided a report with the number of Fritz routers delivered and the DPD GHG impact for small packet deliveries.
  - The number of Cisco routers was estimated from Zen Internet estimates for the share of Cisco routers for SME and Enterprise customers, compared to the number of Fritz routers.
  - DPD GHG impact for small packet deliveries was applied to the estimated total number of Fritz and Cisco routers delivered.
- **Downstream leased assets**
  - Routers are leased to customers, so this category covers the energy use of the routers in the reporting year.
  - Energy use profile was developed for domestic and business use giving hours in active and intermediate modes.
  - Power use figures were taken from Fritz and Cisco technical documents.
  - Hours X power draw per mode = total kWh per router per year.
  - Impact = total kWh per router per year X Defra EF for UK electricity (including WTT and T&D).
- **Employee commuting / WFH**
  - Actual working days in office vs at home were calculated from Zen Internet data about home working.
  - Office days multiplied by GHG impact of average UK commute (Anthesis calculated value).
  - WFH days multiplied by GHG impact of average WFH day (Anthesis calculated value).

# CALCULATION METHOD FOR EACH SCOPE 3 CATEGORY

Scope 3 category	Calculation method
1. Purchased Goods & Services	Sectoral EEIO factors & supplier-specific factors where available. UK Govt factors for water use.
2. Capital goods	Sectoral EEIO factors & supplier-specific factors when available.
3. Fuel and energy-related activities	Actual activity data X Defra EFs
4. Upstream transport & distribution	Partial activity data (Fritz routers only) uplifted to cover Cisco routers. DPD EFs
5. Waste generated in operations	Actual activity data X Defra EFs
6. Business travel	Actual activity data X Defra EFs - direct and indirect impacts (WTT & TTW)
7. Employee commuting / WFH	Actual working days in office vs at home Office days X impact of average UK commute WFH days X impact of average WFH day
8. Upstream leased assets	Sectoral EEIO factors & supplier-specific factors where available.
13. Downstream leased assets	Energy use profile developed for domestic and business use giving hours in each mode Power use figures taken from Fritz and Cisco technical documents Hours X power draw per mode = total kWh per router per year X Defra EF for UK electricity.

# 04 APPENDIX

# DATA SOURCES FOR EACH SCOPE 3 CATEGORY

Scope 3 category	Data Source	Emission Factors	Main sources of emissions
1. Purchased Goods & Services	Spend	Sectoral EEIO factors & supplier-specific factors where available. UK Govt factors for water use.	Equipment, general costs, premises, services (from EEIO model) + emissions from water use.
2. Capital goods	Spend	Sectoral EEIO factors & supplier-specific factors when available.	Core network, building improvements (from EEIO model).
3. Fuel and energy-related activities	SECR energy report	UK Govt factors.	Production of fuel and energy purchased and consumed.
4. Upstream transport & distribution	Quantity of routers delivered	DPD emission factors (shared by Zen Internet).	Transport of Fritz! and Cisco routers.
5. Waste generated in operations	Amount of waste and waste management type per site	UK Govt waste factors.	Waste from Sandbrook House office.
6. Business travel	Road and rail transport of employees	UK Govt transport factors, including Well-to-Tank emissions.	Road and Rail business travel
7. Employee commuting / WFH	Number of days and number of employees commuting/WFH	<ul style="list-style-type: none"> <li>Commuting: Emissions based on Anthesis model estimating the average UK commute</li> <li>WFH: Emissions estimated using WFH methodology developed in-house.</li> </ul>	Emissions from employees commuting and working from home.
8. Upstream leased assets	Spend	Sectoral EEIO factors & supplier-specific factors where available.	Line and connection rentals (from EEIO model).
13. Downstream leased assets	Assumptions around average activity of Fritz! boxes and Cisco routers	<p>UK Govt electricity factors.</p> <p>Zen Internet provided a share of router models based on customer types (Domestic, SME, Enterprise).</p>	Emissions from energy use from routers (by customers).

# DATA QUALITY OF ZEN INTERNET SUPPLIER-SPECIFIC EMISSIONS FACTORS

Supplier	Year	Scope 1, 2 and 3 emissions intensity (kgCO2e/GBP)	Data source	Comment
BT Group	2020	0.14	CDP response	Scope 1, Scope 2 and all relevant Scope 3 categories were reported in CDP, leading to confidence in calculating the intensity.
TalkTalk Telecom Group	2020	n/a	CDP response	Relevant scope 3 categories were not calculated, including Purchased Goods & Services and Capital Goods.
Virgin Media	2019	n/a	Carbon report on website	Purchased Goods and Services, Capital Goods, Fuel and Energy-Related Activities and other significant categories did not seem to be included or fully covered.
Vodafone Group	2020	0.29	CDP response	Scope 1, Scope 2 and all relevant Scope 3 categories were reported in CDP, leading to confidence in calculating the intensity.
AVM GmbH	-	n/a		No carbon footprint information available.
CityFibre	2020	n/a	Sustainability report on website	Scope 3 emissions did not include either Purchased Goods & Services or Capital Goods, which should be included because CityFibre builds fibre infrastructure.
SSE	2020	n/a	CDP response	SSE emissions were publicly available and looked complete, but they were much higher than other suppliers'. It is possibly due to energy-related emissions having a much larger impact than their broadband services.
Nutanix, Inc.	2020	n/a	ESG report on website	Scope 3 emissions did not include Purchased Goods & Services, which should be included. Nutanix, Inc. is a cloud computing company, since most of their services are online, their share of purchased goods and services must be significant.
Microsoft Corporation	2020	0.08	CDP response	Scope 1, Scope 2 and all relevant Scope 3 categories were reported in CDP, leading to confidence in calculating the intensity.

# CHANGE LOG

Overview of main changes made to the emissions estimates since the presentation of the results on 9<sup>th</sup> February 2022.

Change	Rationale
Nutanix: supplier-specific emission factor was replaced by a general factor	Nutanix did not include Purchased Goods & Services in their publicly-reported scope 3 emissions. We estimate this category to be significant, and there is a risk of underestimating emissions if using a factor that omits significant emission sources, so a general factor was applied for Nutanix.
SSE supplier-specific emission factor was replaced by a general factor	<p>The SSE emissions intensity was much higher than other suppliers'. It was possibly due to energy-related emissions having a much larger impact than their broadband services. In order to avoid overestimating emissions, the EEIO general factor was used instead, and using an emission factor specific to SSE broadband services would be recommended for future updates.</p> <p>This update also led to a decrease in total scope 3 emissions.</p>
Decrease in supplier coverage	The decrease in emissions estimated from SSE led to a slight decrease in known supplier coverage, from 61% to 58%, despite Zen Internet providing additional supplier information for a few categories.
Updated scope 3 categories for some sources of emissions	A couple of categories were moved from 'Upstream leased assets' to 'Purchased Goods & Services'.



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