4D Studio Architects

PPN – 0621
CARBON REDUCTION PLAN

Version 1.0 Date: 08/02/2024

Greenwich Peninsula Low-Carbon Energy Centre, 4D Studio Architects

1 Document Control

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1.1 Revision History

Date	Version	Description	Author
08/02/2024	1.0	Final	Samuel Whatman

1.2 Contact Information

Organisation	4D Studio Ltd
Address	Bedford House Fulham Green 69-79 Fulham High Street London SW6 3JW
Telephone	+44 020 7471 8540/8550
Email	samw@architect.uk.com
Key Contacts	Samuel Whatman

1.3 Quality Control

	Name	Role	Date
Prepared by:	Sam Whatman	Design Director	09/03/2022
Proofread by:			
Checked by:			

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2 Summary

4D Studio refers to the importance of the fourth dimension or “spacetime,” combining the three spatial dimensions with time as the fourth dimension. Time adds an extra axis that represents the spatial and temporal dimensions of human interference in complex ecosystems. We are three-dimensional beings, but we must as architects imagine changes over time.

We are one of the United Kingdom’s leading architectural firms, with over 25 years of award-winning work.

Every day we create architectural quality based on innovation, experience, and human values. This assures sustainable and aesthetic solutions with lasting value for clients, occupants, and society. We are a collective of architects and designers working together to build a better future. Creating positive change is at the core of our practice. Our ambition to deliver equitable, healthy, and resilient spaces is built upon experience in meaningful community engagement.

A diverse and inclusive work environment is crucial to delivering on these ambitions. Our design teams foster a culture where all voices are heard, and the best ideas are elevated. Within and across our studio we continue to advocate for ideas and talent to percolate up.

Our work in areas such as sustainability, materials, digital technology, and fabrication has spanned the entire life of the practice.

4D Studio
Architects

Figure 1 – Bedford House, London. Current HQ of 4D Studio Architects

3 Scope of Carbon Reduction Strategy

3.1 PPN06/21

The PPN 06/21 report should cover:

1. Scope 1 – All Direct Emissions from the activities of 4D Studio or under their control. Including fuel combustion on site such as gas boilers, fleet vehicles and air-conditioning leaks.
2. Scope 2 – Indirect Emissions from electricity purchased and used by 4D Studio. Also included are the generation or consumption of heat or steam. Emissions are created during the production of the energy and eventually used by 4D Studio.
3. Scope 3 – Other indirect emissions; namely Upstream transportation and distribution, Waste generated in operations, business travel, employee commuting,
4. All UK buildings occupied by 4D Studio and staff.

3.2 Applied to 4D Studio

The organisational boundary will be established using **Operational Control:** 4D studio are to report on all sources of carbon emissions shown below over which it has operational control. 4D Studio would be deemed to have operational control over a site if it has full authority to introduce and implement its operating policies.

The following activities are within scope of 4D Studio's Carbon Reduction Strategy.

Scope 1

No scope 1 emissions

Scope 2

Electricity
Electricity consumption at the London office.

Scope 3 Upstream

Upstream transportation and distribution
Transportation and distribution to the London office in vehicles not owned by 4D Studio.

Waste generated in operations
Disposal and treatment of waste from the London office.

Business travel
Transportation of employees for business-related activities.

Employee commuting
Transportation of employees between their home and the London office.

Purchased Goods and services - Coffee procurement

Scope 3 Downstream

Not applicable - No downstream transportation and distribution

4 Inputs

4.1 Scope 2

Electricity

4DS 2023 Electricity usage.JPG
Covering Jan-Dec 2023

4.2 Scope 3

Upstream transportation and distribution

Upstream transportation data provided by Rosie Muir, February 2024
Covering Jan-Dec 2023

Waste generated in operations

N/A This is an office-based business with no formal waste monitoring and negligible emissions arising from waste generated

Business travel

Business travel provided by Rosie Muir, February 2024

Employee commuting

4DS Office Commute.xlsx
Covering Jan-Dec 2023 (using 2024 staff)

Purchased Goods and services - Coffee procurement

Data provided by Rosie Muir
Covering Jan-Dec 2023

5 Methodology

Using the relevant calculations provided by The Department for Business, Energy and Industrial Strategy (BEIS) and The Department for Environment, Food and Rural Affairs (DEFRA), 4D Studio were able to convert the usable data into Kilograms of Carbon Dioxide equivalent ($kgCO_2e$).

6 Carbon emissions

6.1 Scope 2

Electricity

1. There is one electricity meter for the entire building.
2. This data covers 2019 Jan-Dec.
3. Office 300 (4D Studio space) equates to 16.78% of the floor space of the whole building.
4. The figures provided by the landlord therefore equate to 16.78% of the electricity used by the total building.

This equates to **1,700 kgCO_2e per year.**

6.2 Scope 3

Upstream transportation and distribution

1. This data is for all upstream transportation of Tier 1 suppliers who provide 4D Studio with:
    1. Groceries
    2. Model-making materials
    3. Stationary and IT equipment
2. This data covers 2023 Jan-Dec.
3. We will assume all deliveries have a final journey from the UK distribution Centre of 20 miles to reach 4D Studio.
4. We will assume all other deliveries from the distribution centre are made via a Class III (1.74-3.5 tonne) diesel van from the distribution centre to 4D Studio (0.2548kgCo2e/mile)
5. 4D Studio had 62 deliveries to the office in 2023.

Based on the above assumptions, this represents 1,550 miles were driven to transport supplies from the distribution centre to 4D Studio. This equates to **395 kgCO2e per year.**

Waste generated in operations

N/A This is an office-based business with no formal waste monitoring and negligible emissions arising from waste generated.

Business travel

1. This data is for 2023.
2. There was no business-related air travel taken during the year.
3. Train passenger distances and carbon calculator using LNER Carbon Calculator https://www.lner.co.uk/tickets-savings/the-best-way-to-travel/our-commitment-to-the-environment/#calculator

A total of 12,852 passenger kilometers were taken on National Train mileage within the UK. This equates to **571 kgCo_2e per year**.

Employee commuting

1. This data is based on the commuting pattern of staff on the payroll at 4D Studio in 2023.
2. All bicycles are non-electric bicycles.
3. The total km travelled by carbon emitting transport in 2023 was 5907km.
4. Train, Tube (London) London bus, petrol car and electric car were the only carbon emitting transport modes used.
5. Of commutes made with carbon emissions, 52% of the distance covered were by tube, 35% by petrol car, 5% was by local London bus, 4.7% by electric car and 2.7% by train.

   Total emissions from tube were 1080 $kgCO_2e$.
   Total emissions from petrol car were 4080 $kgCO_2e$.
   Total emissions from bus were 240 $kgCO_2e$.
   Total emissions from e-car were 240 $kgCO_2e$.
   Total emissions from train were 120 $kgCO_2e$.

   ..
   Total emissions from commuting equates to **5,760 $kgCO_2e$ per year.**

Coffee procurement

1. We purchased 8 packs of Nespresso coffee pods in the year 2023. Each pack contains 20 sleeves with a net weight of 55g. This totals 8.8kg of coffee purchased.
2. Nespresso quote an emissions factor of 3.9 kgCO2e per kg of coffee.

Total emissions from purchasing Coffee equates to **34.32 $kgCO_2e$ per year.**

6.3 Summary

Scope	Input	KgCo₂e emissions 2023
2	Electricity	1700
3	Upstream transportation and distribution	395
3	Waste generated in operations	0
3	Business travel	571
3	Employee commuting	5760
3	Purchased Goods and Services - Coffee procurement	34
2/3	**TOTAL**	**8460**

Table 1 – Summary of Kilograms of CO_2e

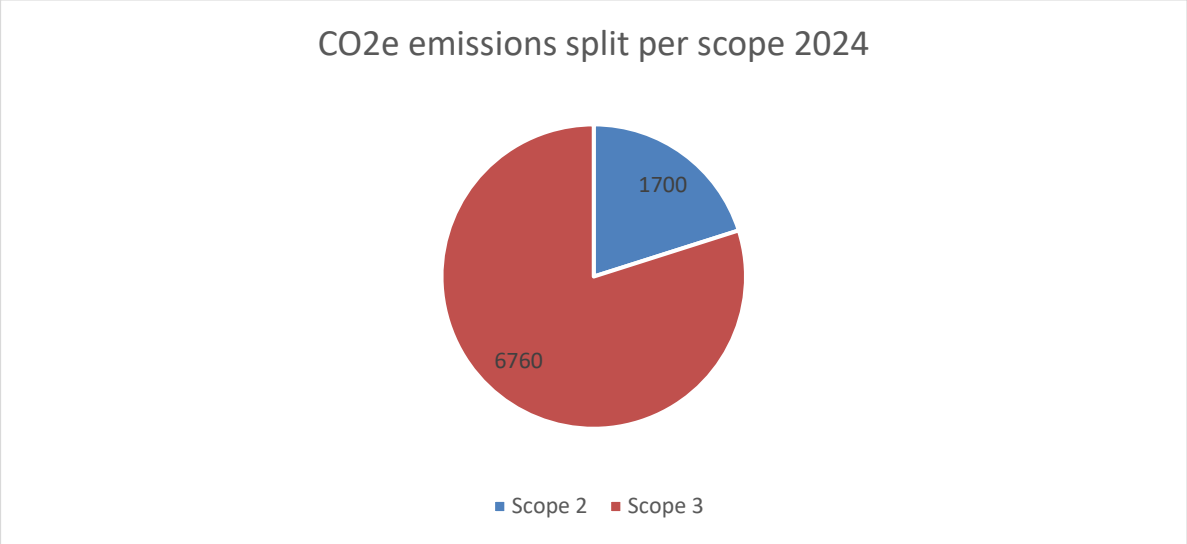

Figure 2 – kgCo₂e emissions, 4D Studio

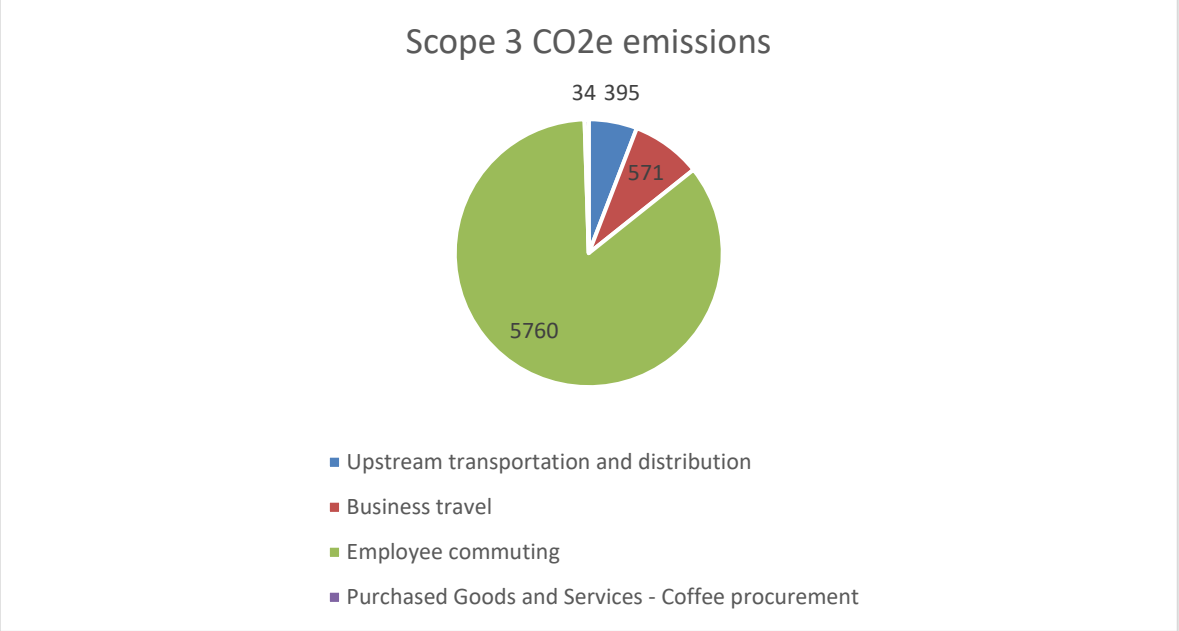

Figure 3 – Scope 3 kgCo₂e emissions, CF Møller

7 Opportunities and Targets

7.1 Opportunities

Approximately 79% of emissions that are a result of the operations of 4D Studio are from scope 3.

Currently 4D Studio lease space in a large office building, meaning scope 2 management is somewhat out of their hands. However, if discussions were held with the landlord about considerations entering into a Power Purchase Agreement to purchase 100% renewable electricity for the building, or the introduction of the sites own renewable energy, such as solar panels on the roof, would help 4D Studio reduce their emissions from electricity usage. Alternatively, 4D Studio could consider future office locations to be in buildings with these measures already in place.

Of a total of 6,760 kgco2e of scope 3 emissions, 571 kgco2e (8.4%) is made up of business travel. This is relatively and can largely be attributed to the absence of air travel during 2023 operations. If future in-person business meetings, especially related to international projects, can be switched to online video calls, 4D Studio can continue to maintain a proportionally low carbon footprint for this portion of the scope.

The largest scope 3 contributor is employee commuting. Having an office in a central London location, most staff commute by public transport, and there is little opportunity to avoid using public transport to get to the office. 35% of the carbon emissions related to employee commuting are contributed by private petrol car. If petrol car commutes can be transitioned to mixed mode/public transport or electric car, a significant reduction can be achieved. Another suggestion could be that those with only a very small commute, for which public transport is used, switch to walking or cycling, but understandably this may not be a viable option. 4D Studio have amended their working pattern to a hybrid system meaning no staff currently commute 5 days a week. This will significantly reduce commuting emissions. The GLA's drive to get to net zero themselves, should also see public transport become far "greener" over the next 10 years or so, further reducing emissions from commuting.

Around 60 deliveries were made to the offices of 4D Studio in 2023. Therefore, if some deliveries could be consolidated into one order this would certainly assist.

Coffee procurement makes up only around 0.5% of total emissions so although these should not be ignored, they have very little overall impact on emissions.

Finally, the residual (unavoidable) emissions that would remain, could be offset by purchasing the equivalent volume of carbon credits (independently verified emissions reductions) to compensate for them. The payments made to purchase these carbon credits (carbon finance) is what makes the emissions reductions projects which created them, financially viable and sustainable. These projects can then continue to reduce global carbon emissions by improving technologies, changing awareness and behaviours in a community.

Finally, 4D Studio is currently undertaking ISO 14001 accreditation to ensure we are taking proactive measures to minimize our environmental footprint.

7.2 Targets

Based on the opportunities listed in section 7.1, there is no reason why 4D Studio can't consider a linear reduction of CO_2e emissions each year. By aiming for an annual reduction in the region of 705 kgCo2e (8.3% reduction on 2019 baseline) this could see 4D Studio hitting a net zero position by 2035.

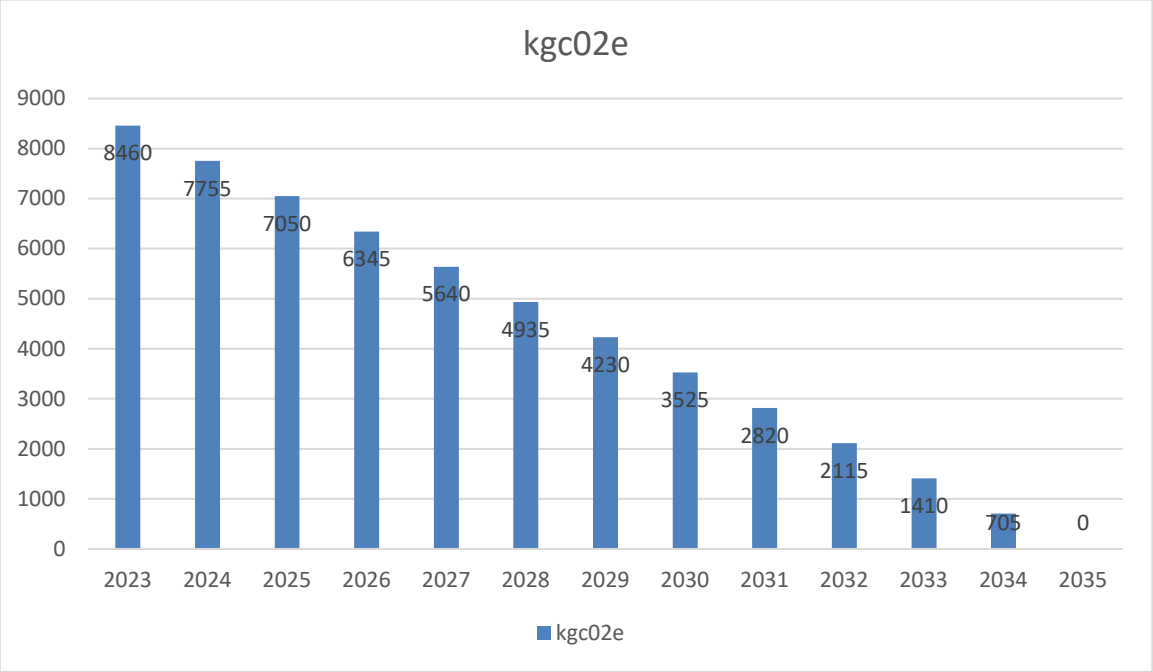

Figure 4 – Targets for annual kgCo_2e emissions, 4D Studio

Annual reporting against targets, using the same inputs used to form the 2023 baseline, but for the year in question, is highly recommended to see how progress is going.

8 Appendix

8.1 Raw Data

8.1.1 Electricity

Electricity data sent by Emilia Duraes Emilia.Duraes@ocubis.co.uk Feb 13 2024

	kWh Consumption											
TENANT	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Office 300 - 4D Studio	591	434	457	326	229	299	427	248	259	221	375	471

2023	**Electricity reads (kWh)**
Jan	591
Feb	434
Mar	457
Apr	326
May	229
Jun	229
Jul	427
Aug	248
Sep	259
Oct	221
Nov	375
Dec	471
Total	**4267**

8.1.2 Upstream Transportation and Distribution

Upstream transportation data sent by Rosie Muir, February 2024

03.01.2023	Nespresso
18.01.2023	Hongye Import & Export
23.01.2023	Elzo Tech
23.01.2023	Hong Kong Staroc Tech
25.01.2023	Amazon
27.01.2023	Amazon
02.02.2023	Nespresso
27.02.2023	Amazon
17.03.2023	Amazon
27.03.2023	Amazon

31.01.2023	Zen Office x 2
11.03.2023	Ben Fei Mao
26.03.2023	Shenzhen Hongze
01.04.2023	Lyndon Copiers
04.04.2023	Amazon
11.04.2023	Nespresso
25.04.2023	Nespresso
18.05.2023	Zen office x 2
22.05.2023	Zen office
25.05.2023	Amazon
26.05.2023	Zen office
08.06.2023	Zen office returns
08.06.2023	Zen office returns
23.06.2023	Shang Cai Xianti
23.06.2023	Shenzhen Shi
04.07.2023	Nespresso
05.07.2023	Zen office
15.07.2023	Amazon
17.07.2023	Cos supplies
04.08.2023	Lyndon Copiers
08.08.2023	Nespresso
09.08.2023	GDL supplies
11.08.2023	Lyndon Copiers
13.09.2023	OT Group
19.09.2023	OT Group
20.09.2023	OT Group
04.10.2023	Nespresso
04.10.2023	Cloudswitch
05.10.2023	Amazon
29.10.2023	Office Team
01.11.2023	Lyndon Copiers
03.11.2023	Electronic World
01.11.2023	Fed EX
14.11.2023	Amazon
21.11.2023	Overlockers
26.11.2023	Amazon
26.11.2023	Amazon
26.11.2023	Amazon
27.11.2023	Essanet Ltd
28.11.2023	Master Wing Ent
28.11.2023	SKS retail
28.11.2023	SKS Retain returns
30.11.2023	Wines Direct
05.12.2023	Nespresso

07.12.2023	ML Living
11.12.2023	Best4Systems
14.12.2023	Hong Kong UGreen
16.12.2023	Shenzhen Angubao
18.12.2023	Hong Kong UGreen
19.12.2023	Kenable Ltd
19.12.2023	Amazon
28.12.2023	Amazon

8.1.3 Waste Generated in Operations

N/A This is an office-based business with no formal waste monitoring and negligible emissions arising from waste generated.

8.1.4 Business Travel

Business travel provided by Rosie Muir 20.02.2024

date	person	Destination	Mode	Distance (Passenger km)	Notes
2023					
9th January	JM & RM	Sunderland	Train	770	overnight
10th January	JM & RM	Sunderland	Train	770	return SCC meeting
10th January	SW	Sunderland	Train	770	Daytrip (Return)
18th January	SW & MB	Sunderland	Train	1540	daytrip ecology site visit
6th February	JM & RM	Sunderland	Train	770	overnight
7th February	JM & RM	Sunderland	Train	770	return SCC meeting
7th February	SW	Sunderland	Train	770	Daytrip (Return)
17th April	JM	Sunderland	Train	385	overnight
18th April	JM	Sunderland	Train	385	return Risk register mtg
18th April	MB	Sunderland	Train	770	Daytrip (Return)
10th October	JM RM SW TH	Manchester	Train	2072	overnight Healthcare conference
14th November	JM RM SW MB		Train	3080	daytrip Presentation of scheme to SCC & Clients

8.1.5 Employee commuting

The below table details the total distance traveled, on average, per month for each employee during 2023. The data is in Kilometers and includes modes of transport taken. Also recorded I the total number of hours worked from home (WFH) for each employee. Carbon released whilst working from home is not in scope as the individual premises are not under the control of 4D Studio and therefore not quantifiable.

Commute distances (km)	Walk and cycle	London Underground	Local London Bus	Petrol Car	Electric Car	Train	WFH
Teva Hesse	25	660					52
Rosie Muir					140		45
John Muir					140		102
Marianna Bia	14	188				160	67.5
Misha Terzis	5	263					136
Gloria Hii	29	761					30
Ben Price	2	244					30
Cristina Ramirez	18	422					90
Sam Whatman	216	237					30
Michael Amenyogbe	26			1931			68
Mark Lyle	63	124					33
Ricardo Pereira	92		309	151			7.5
Masoomi Bhardwaj		177					68
TOTALS	490	3076	309	2082	280	160	759

8.1.6 Coffee procurement

The below information details the carbon impact of our Nespresso Coffee procurement.

https://nestle-nespresso.com/sites/site.prod.nestle-nespresso.com/files/NN_EU_LCA_Infographic_FINAL_September_2023_v2.pdf

NESPRESSO