

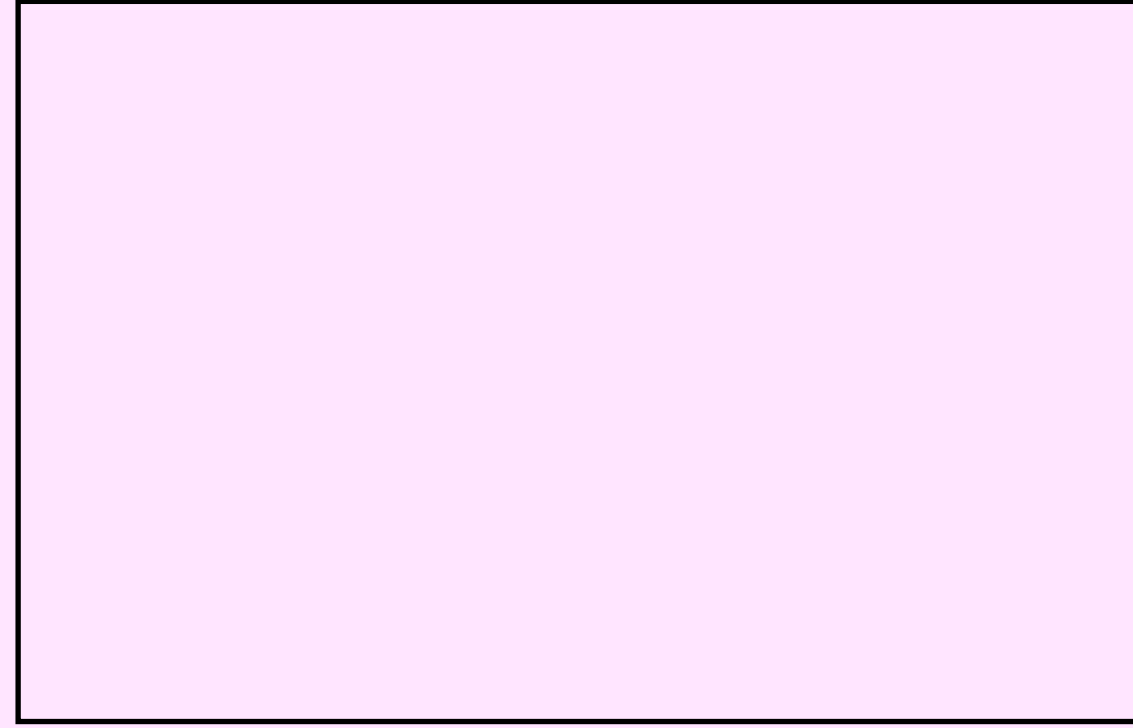
# Action Research Project 24/25

What is the estimated environmental impact\*  
of my everyday use of the UAL digital tools and services,  
as an academic staff member of UAL (LCF/LCC)?

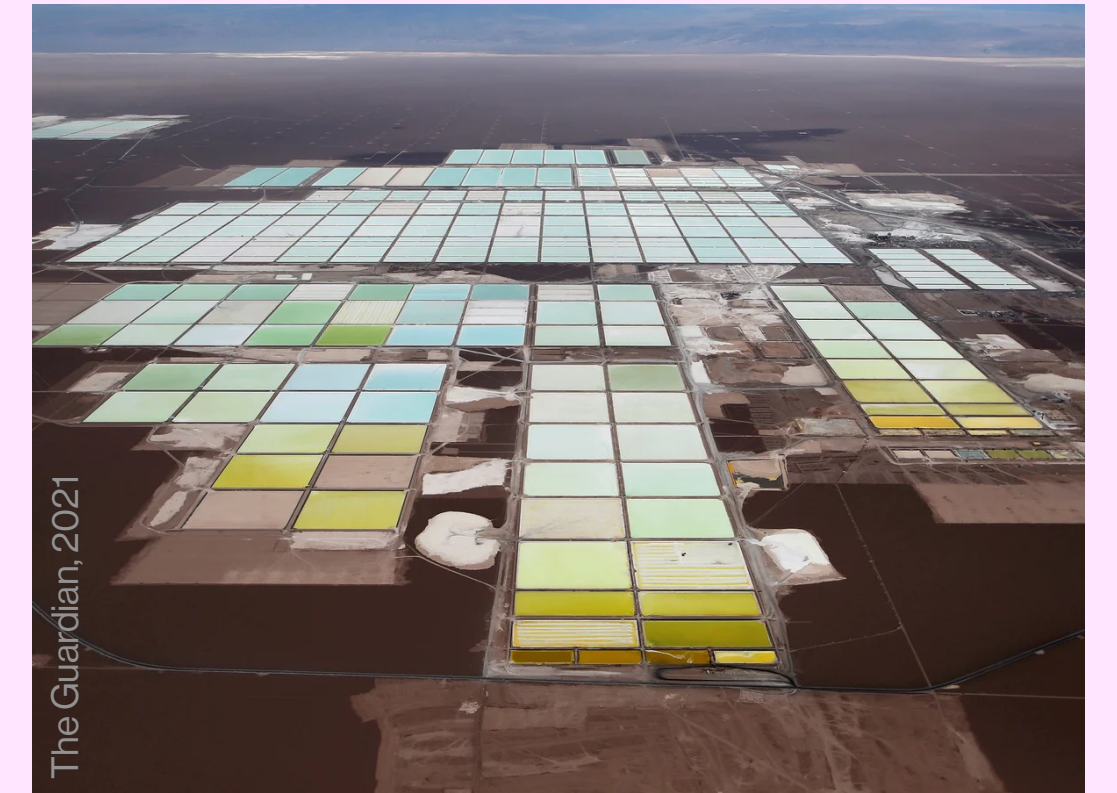
\* in terms of GHG emissions / kg of CO<sub>2</sub>e

**Greg Orrom Swan**

# Context



1. The world is literally burning.
2. Manufacturing digital devices, their use, and extractivist practices around raw materials contribute to anthropogenic climate change. This disproportionately affects the global majority.
3. UAL has produced a 'Climate Action Plan' in 2022/23



# Rationale

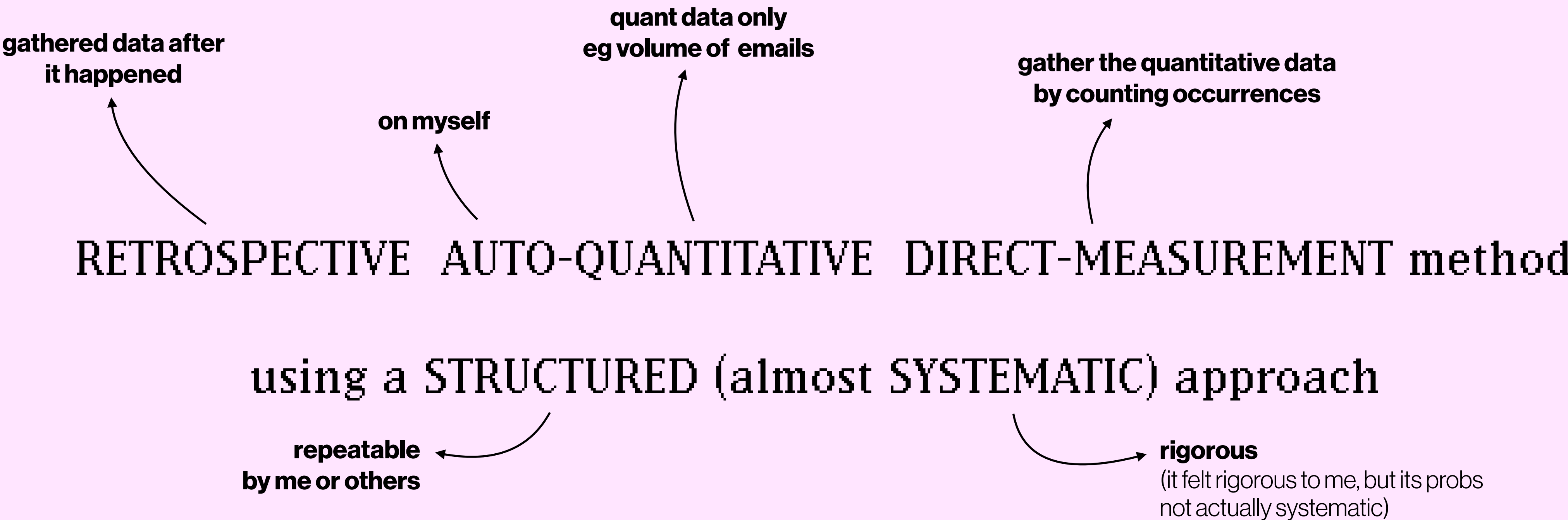
I teach using digital technologies; I teach mostly digital software across 22 courses at LCF, and 2 courses at LCC. My impact from digital tools and devices is therefore implicit within my teaching context.

What then, is my impact by using these digital tools?

To teach, communicate, etc. Should I change? Should we change?

A desire to interrogate UAL's institutional position

# Research Methods + Data Gathering



10 day sample period.  
‘Truly’ randomly generated start date of: 02 Dec 2024

# Research Methods + Data Gathering

email data no mid totals.numbers

ATTACHMENTSNO ATTACH

Table 1

DATE	TEXT	IMAGES	ATTACHMENTS/ ONEDRIVE LINKS	STUDENTS/ OTHERS IN CHAIN	+1 FOR ME	REPLIES	MOODLE	NOTES
06/12/2024								
Jewellery y1		1		48	1			1
All LCF staff		1	1	4460	1			
Carbon literacy project		1	1	1	1			
Ba fpc y1		1		40	1			1
People insight		1			1			
		1		1	1	6		
BA UXD		1		96	1			1
FDD y2		1		89	1			1
FDD y3		1		130	1			1
FDD y1		1		77	1			1
MA PGT		1		18	1			1
Teams		1		1	1			1
FDD y1		1		77	1			1
PgCert people		1		100	1	4		1
07/12/2024								
Outlook reaction		1		1	1			
08/12/2024								
MA textiles		1		19	1			1
		1	1	1	1			
09/12/2024								
MA PGT		1		18	1			1
Ba textiles Y2		1		60	1			1
Textiles Y3		1		58	1			1
BA FPC Y3		1		61	1			1

SUM 92

AVERAGE 23

MIN 1

MAX 89

COUNTA 5

Table Styles

Table Options

Title

Caption

Headers & Footer

0

1

0

Rows

266

Columns

9

Table Font Size

A

A

Table Outline

0.35 pt

Outline Table Title

Gridlines

Alternating Row Colour

Row & Column Size

Height

20 pt

Fit

Width

151 pt

Fit

Turnitin Online Help Gu...FC/ISA Submission area for FDD Professional Practice Project (3rd February)

# Findings + Data Analysis

TOTAL EMAILS RECEIVED: 335

Average energy intensity model:  
 $17\text{g} \times 335 \text{ emails} = 5695\text{g}$

Power Model:  
 $5695\text{g} \times 0.207 \quad (20.7\%)$   
 $= 1178.86\text{g}$   
 $= \sim 1.17\text{kg CO}_2\text{e}$

- Quasi-statistical analysis
- My CO<sub>2</sub>e impact is tiny, and therefore statistically meaningless.  
But any (minor) impact is still empirical and still measurable.
- Devices themselves are much more environmentally damaging than their use.
- Students receive a lot of emails.  
(one MA course received 22 Moodle emails in 10 days)  
Does this impact them? What would happen if we changed that?



# Findings + Data Analysis

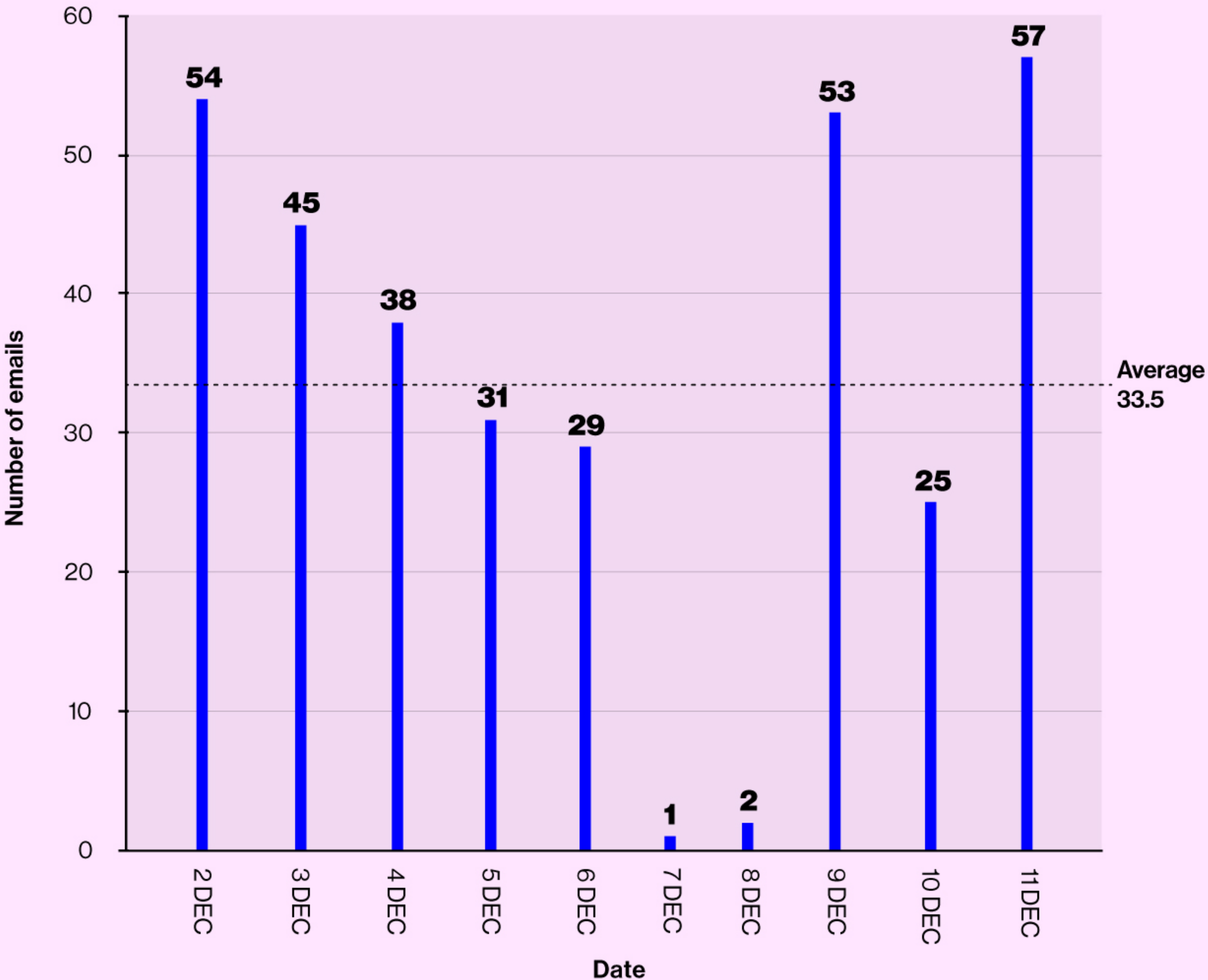
TOTAL INDIVIDUAL  
EMAILS RECEIVED:

335

2—11 DEC 2024

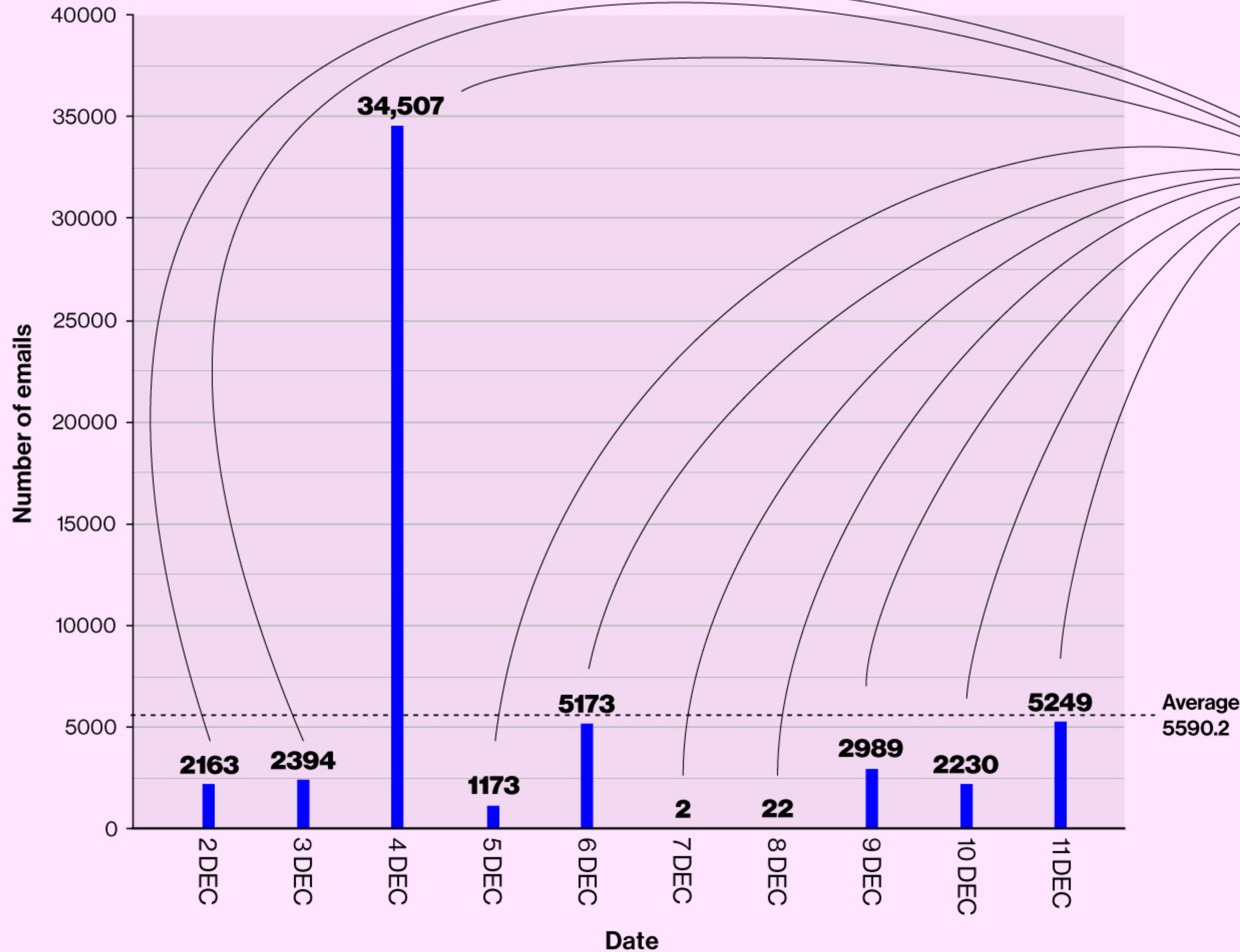
= ~1.17kg  
CO<sub>2</sub>e\*

TOTAL INDIVIDUAL EMAILS RECEIVED EACH DAY



\*Source: Malmodin 2024; Berners-Lee, 2020, Carbon Literacy, 2022

# NUMBER OF RECIPIENTS IN EMAIL CHAINS



**TOTAL NUMBER OF  
RECIPIENTS IN EMAIL CHAINS:**

**~55,678**

2 — 11 DEC 2024

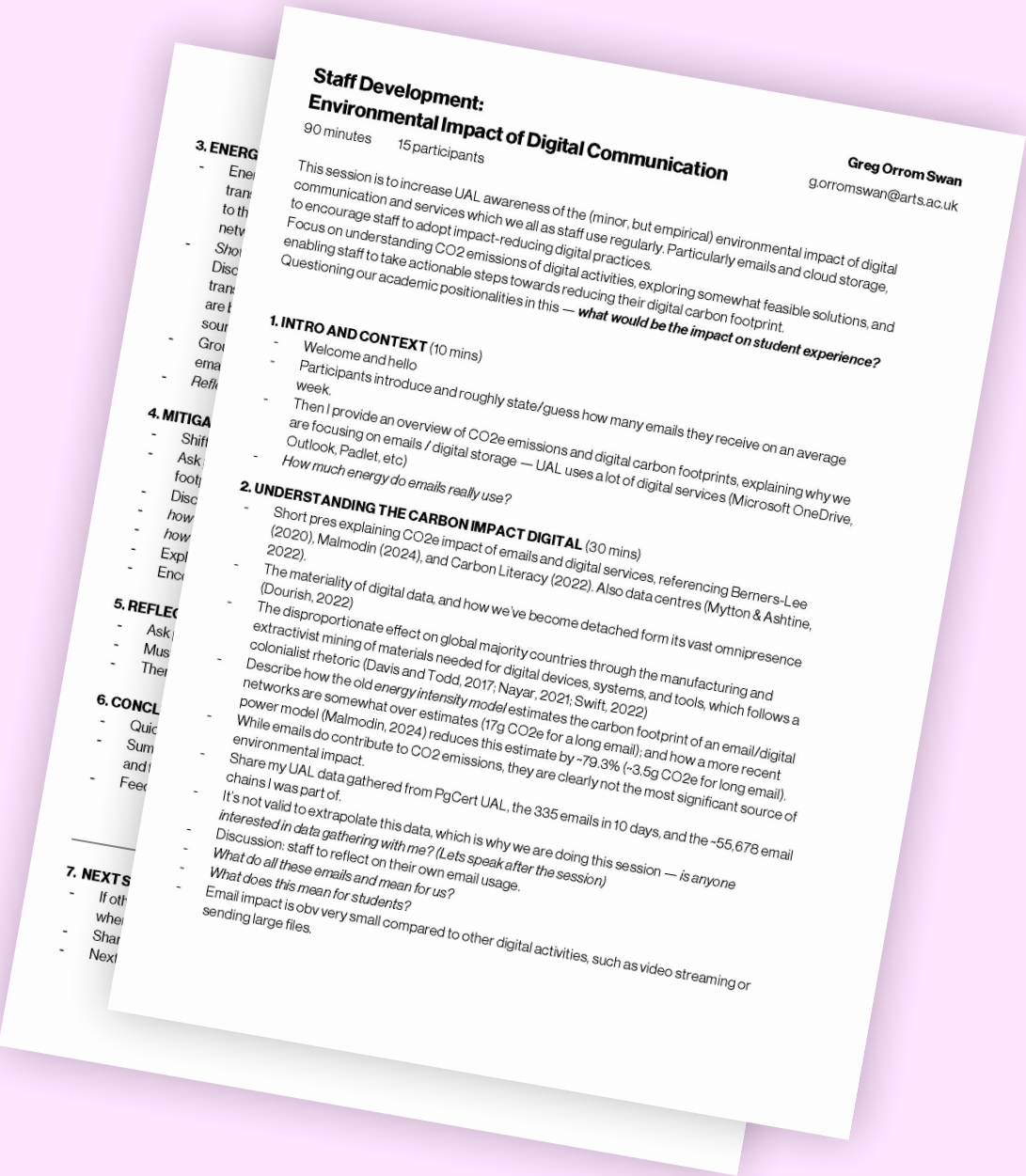
**= ~195.93kg  
CO<sub>2</sub>e\***

\*Source: Malmudin 2024; Berners-Lee, 2020, Carbon Literacy, 2022

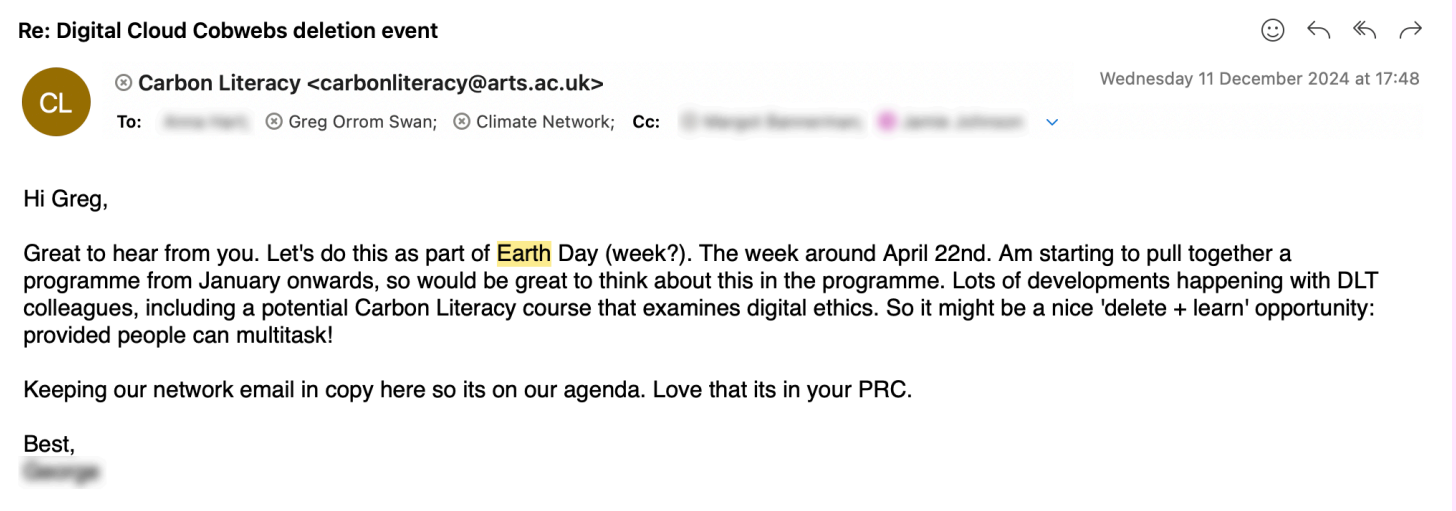


# Actions

1. Staff development lesson plan

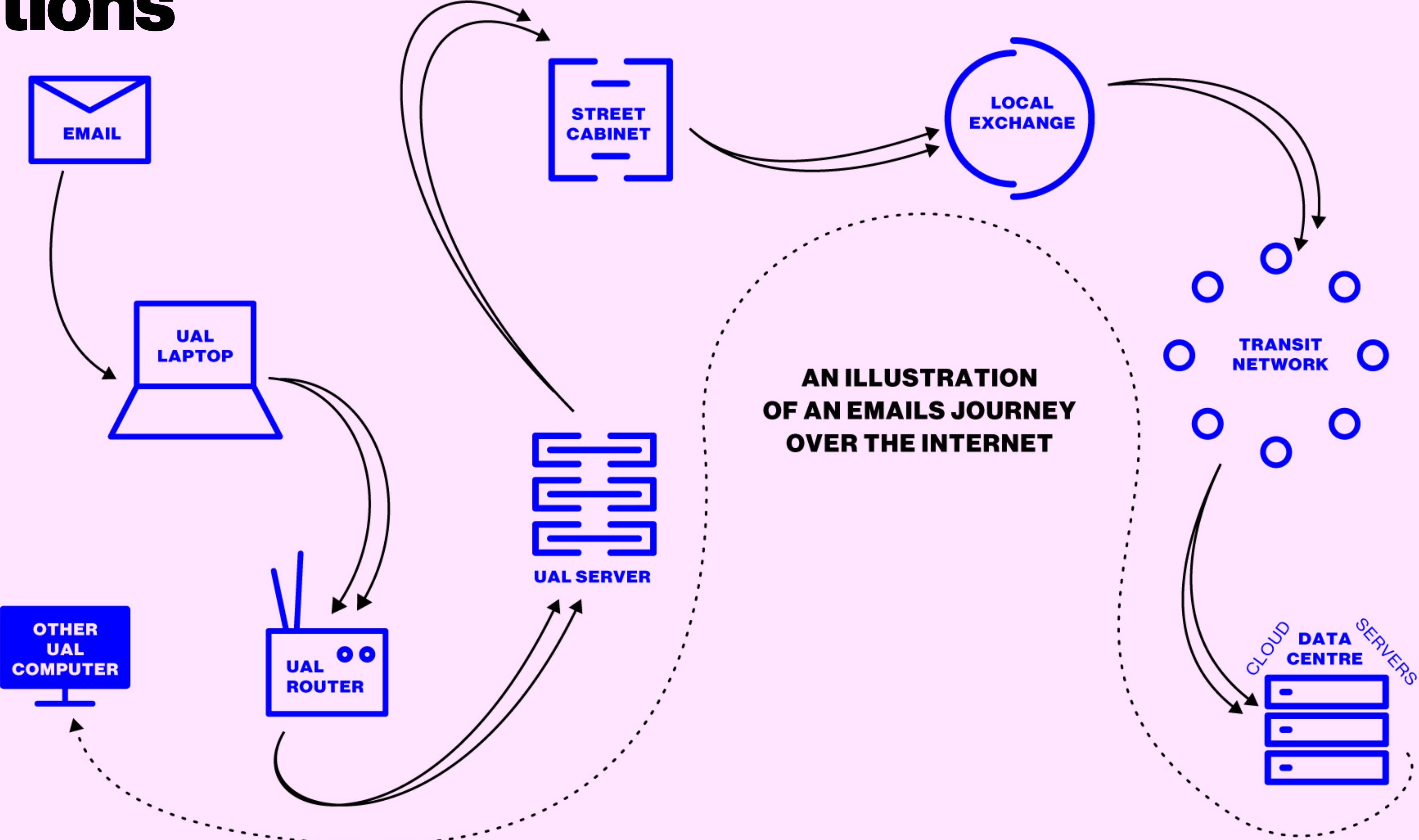


2. Digital cobweb clear-out (email deletion) event.  
Earth Day 2025 [22 April]



3. Personal knowledge growth, small changes I will make.  
eg. Previously wanted my UAL laptop to be upgraded,  
but now I recognise its still fit for purpose.

# Actions



# Reflections + Futuring

- My project feels a little utilitarian and meek, but I have personally grown in knowledge.

Further research ideas:

- I looked at transfer of data, not storage – what is the impact of storing unused UAL ‘dark data’ on the cloud?
- Research in to UAL’s digital device lifecycles.  
“30% was migrated from previous LCF sites” what happened to the rest?!
- Students receive many emails – do they take it in? Are there alternative (better?) ways? What happens to student experience if it changes?
- EC has given me empathetic understanding from a student perspective.



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# Appendices

## Common occurrences:

COMMON OCCURRENCE	NUMBER OF OCCURRENCES
MA [REDACTED]	22
MA [REDACTED]	11
BA [REDACTED] Y3	10
BA [REDACTED] Y3	6
BA [REDACTED] Y3	5

FIGURE 3. Obfuscated data showing the most common course emails from Moodle I was included in Precise data is shown [on raw data page](#).

## Huge 22k Student number:

\* This figure does seem huge, predominantly because on 4/12/2024 all current 21,856 students (UAL, 2025) were sent an internal email, see Figure 3 below or row 78 of my [raw data found here](#).

1	DATE	TEXT	IMAGES	ATTACHMENTS/ ONEDRIVE LINKS	STUDENTS/OTHERS IN CHAIN
78	All UAL students (no research)	1	1		21,856

FIGURE 4. Highlighting the except from my raw data, using the figure from UAL ActiveDashboard, 2025.

## How I calculated my CO2e:

	Malmodin et al. paper (Wh/h) Power model	Carbon Trust report (Wh/h) Average energy intensity model	% of original	Median of difference
Network	5	20	25.0%	20.7%
Customer Premises Equipment	11.58	71	16.3%	

FIGURE 1. Adapted figure (Malmodin et al.,2024) showing median difference between older average energy intensity model and new power model.

Email Type	Emissions (CO2e)
Spam email picked up by your filters	0.03 g
Short email sent and received on a phone	0.2 g
Short email sent and received on a laptop	0.3 g
Long email that takes 10 minutes to write and 3 minutes to read sent and received on a laptop	17 g
Email blast that takes 10 minutes to write and sent to 100 people, of whom 1 reads it and the other 99 glance at it for 3 seconds to decide that they should ignore it	26 g

FIGURE 2. Emissions in CO2e of an email, which uses the older and disproved average energy intensity model (Berners-Lee, 2020; Carbon Literacy, 2022; WholeGrain Digital, 2020; Griffiths, 2020)

TOTAL EMAILS RECEIVED: 335

TOTAL EMAIL RECIPIENTS: ~55,678

Average energy intensity model:  
17g × 335 emails = 5695g

Average energy intensity model:  
17g × 55,678 email recipients = 946,526g

Power Model:  
5695g × 0.207 (20.7%)  
= 1178.86g  
= ~1.17kg CO<sub>2</sub>e

Power Model:  
946,526g × 0.207 [20.7%]  
= ~195,930.88g  
= ~195.93kg CO<sub>2</sub>e