UNIT 1. MA GCD.
METHODS OF CONTEXTUALISING.

MIKO
DASHA
TIANYU
VALERIE

DIGITAL CARBON EMISSONS

REFLECTIONS

Feedback of the previous week:

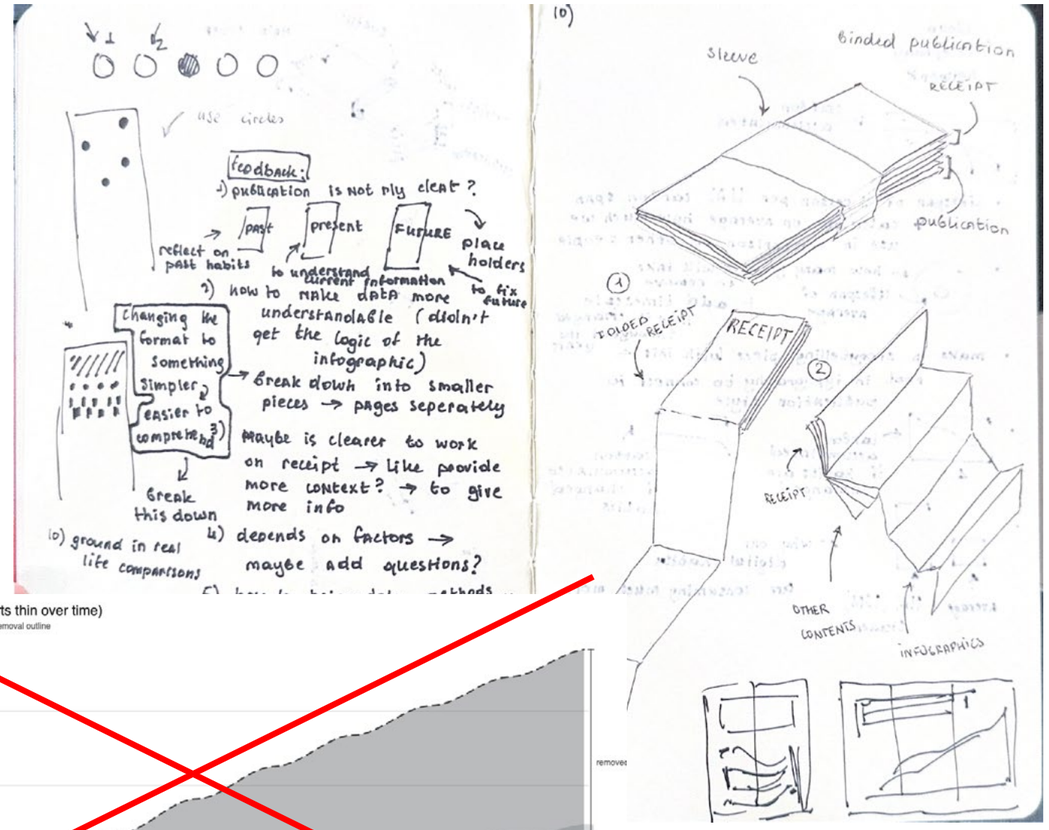
What worked:

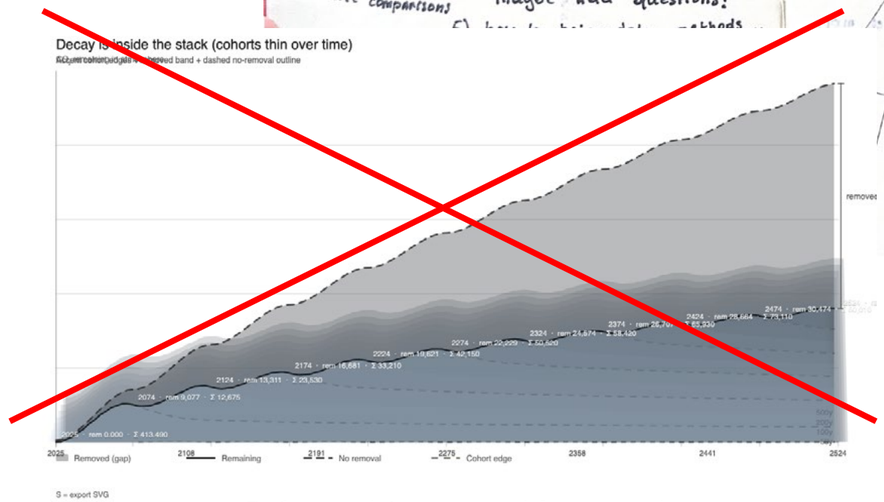
- The focus on perception + time (how present/past/ future changes understanding).
- The receipt metaphor as a physical, accumulating object that makes "invisible" behaviour hard to ignore.

Gap to fix:

- Be clearer about what data you're translating and how it becomes the outputs.
- Avoid giant charts that are unreadable—break the data down into small, sequenced pieces across pages.

notes from the sketchbook to process the received feedback





Infographic created last week

REFLECTIONS

Thinking forward:

1 **CLEAR STORYTELLING**

How to make the overarching publication's logic clearer through the structure and visual style?

2 **SIMPLICITY OF CHARTS**

How to make figures comprehendable and easy to read to make them actionable and relatable to human experience?

3 **BREAKING DOWN INTO PIECES**

How to make all the data digestible by breaking down tables with numbers into engaging visuals?

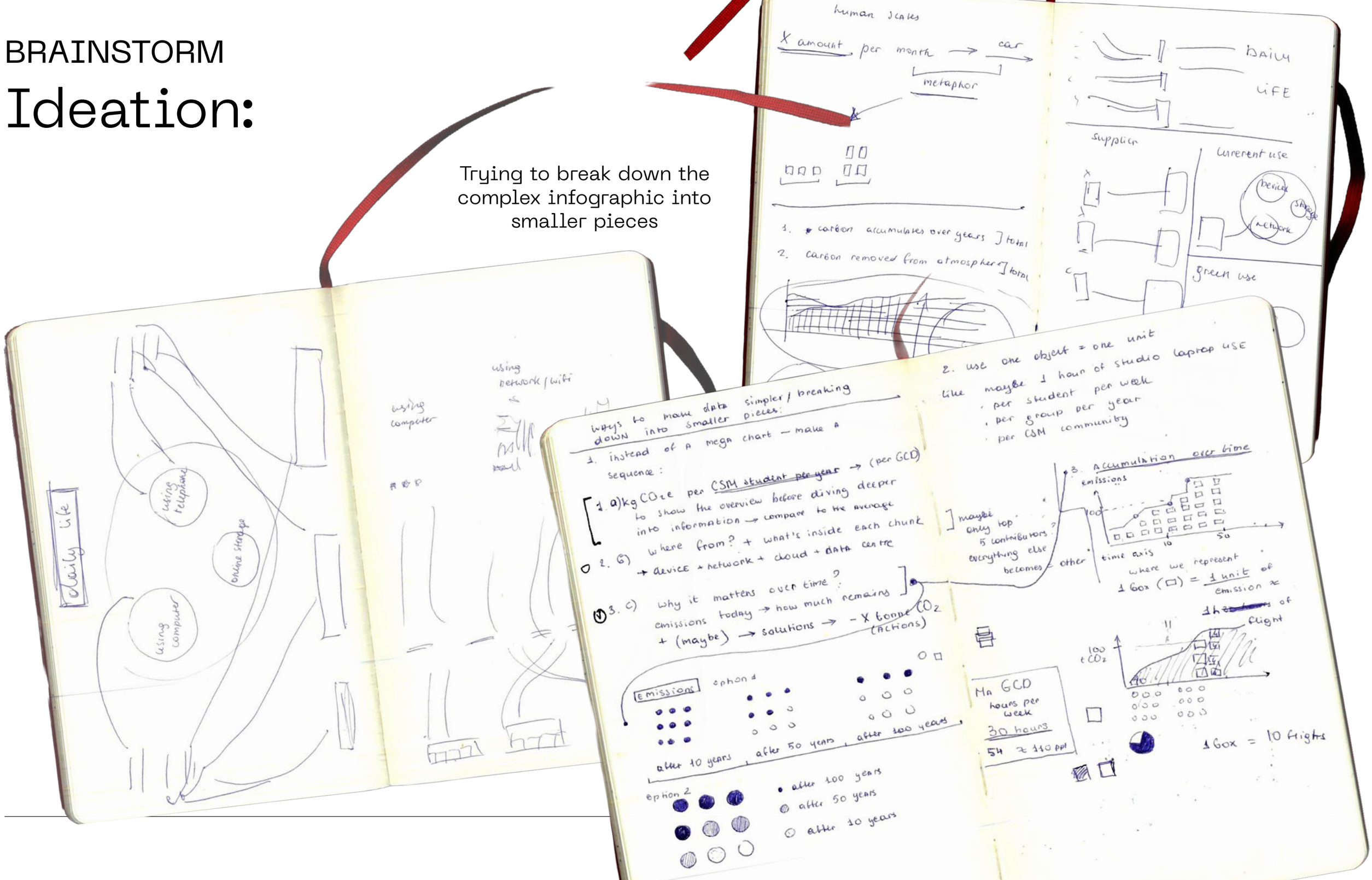
A	B	C	D
receipt(individual)	Single action of one MA GCD student	One student's weekly accumulation	One cohort over one term
infographic(institution)	Carbon coefficient (per Wh → per $kgCO_2e$)	All digital devices in MAGCD / CSM	Future carbon persistence (100–1000 years)
Plan2	peception	Time	object
receipt(individual)	**Strong: Physical growth\Paper length\Tactile weight**	one day	computer
infographic(institution)	**Weak: Number\ Diagram\ Narrative**	thousand years	all digital devices in CSM
Plan3	Cause	digital emission	time(micro)
receipt(individual)	action in the computer	energy& emission of one user in(CSM) in UAL	one week 30hours
infographic(institution)	basic running	energy& emission of the devices one institution(CSM) in UAL	one term

Carefully planning the next steps
& working out options

BRAINSTORM

Ideation:

Trying to break down the complex infographic into smaller pieces



BRAINSTORM

Working on the publcation structure:

How can we make the scale more visible?

from MICRO

to MACRO

from PRESENT

to FUTURE

0 CONT

INTRODUCTION
Context

1 MICRO

INDIVIDUAL:
YOUR PERSONAL DIGITAL FOOTPRINT

Make individual activity visible (device / network / cloud) so the cost feels immediate and personally relevant.

2 MESO

HOW INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL?

Show how many small actions add up: break down where CSM's digital emissions come from and highlight practical levers to reduce them.

3 MACRO

INSTITUTIONAL CONSUMPTION:
WHY IT MATTERS OVER TIME?

Visualise accumulation across years and compare two futures: "no change" vs "intervention," to show urgency and long-term impact.

BRAINSTORM

Working on the publcation structure:

0	CONT	INTRODUCTION Context	CHAPTER 1
1	MICRO	INDIVIDUAL: YOUR PERSONAL DIGITAL FOOTPRINT Make individual activity visible (device / network / cloud) so the cost feels immediate and personally relevant.	CHAPTER 2
2	MESO	HOW INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL? Show how many small actions add up: break down where CSM's digital emissions come from and highlight practical levers to reduce them.	CHAPTER 3
3	MACRO	INSTITUTIONAL CONSUMPTION: WHY IT MATTERS OVER TIME? Visualise accumulation across years and compare two futures: "no change" vs "intervention," to show urgency and long-term impact.	

INSPIRATION

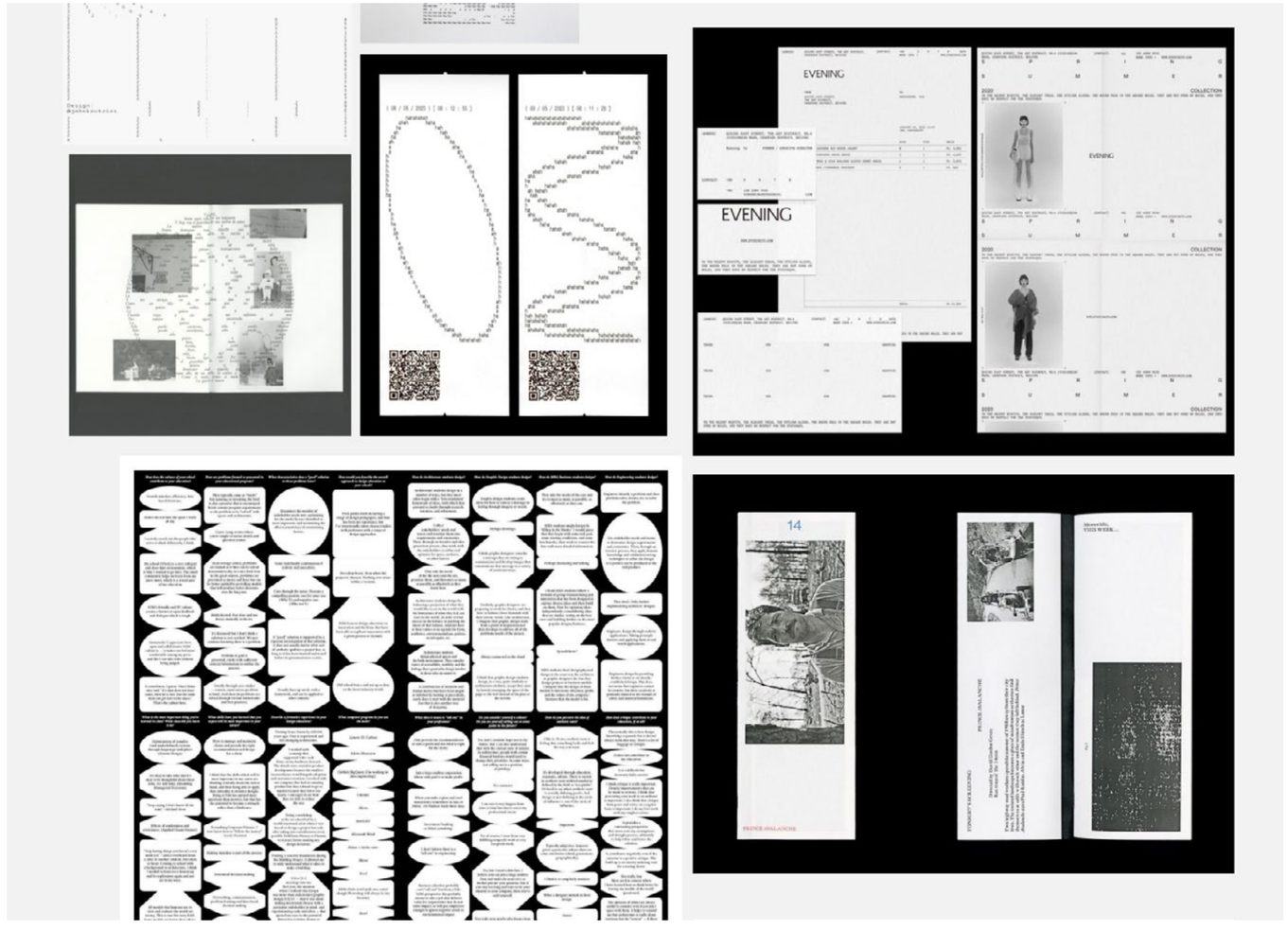
Format and visual style:

CONTAINER — FOLDER

We chose a folder as a case file: it frames the work as evidence. Digital carbon is usually invisible, so the container makes it feel documented, collected, and "real"

INSIDE — CARDS

Separate cards replace pages to introduce play and choice: each card is one idea, data point, designed to be handled, compared, and rearranged.



Chapter 2

1. PERSONAL DIGITAL FOOTPRINT IN DATA
2. PERSONAL DIGITAL FOOTPRINT IN RECEIPT

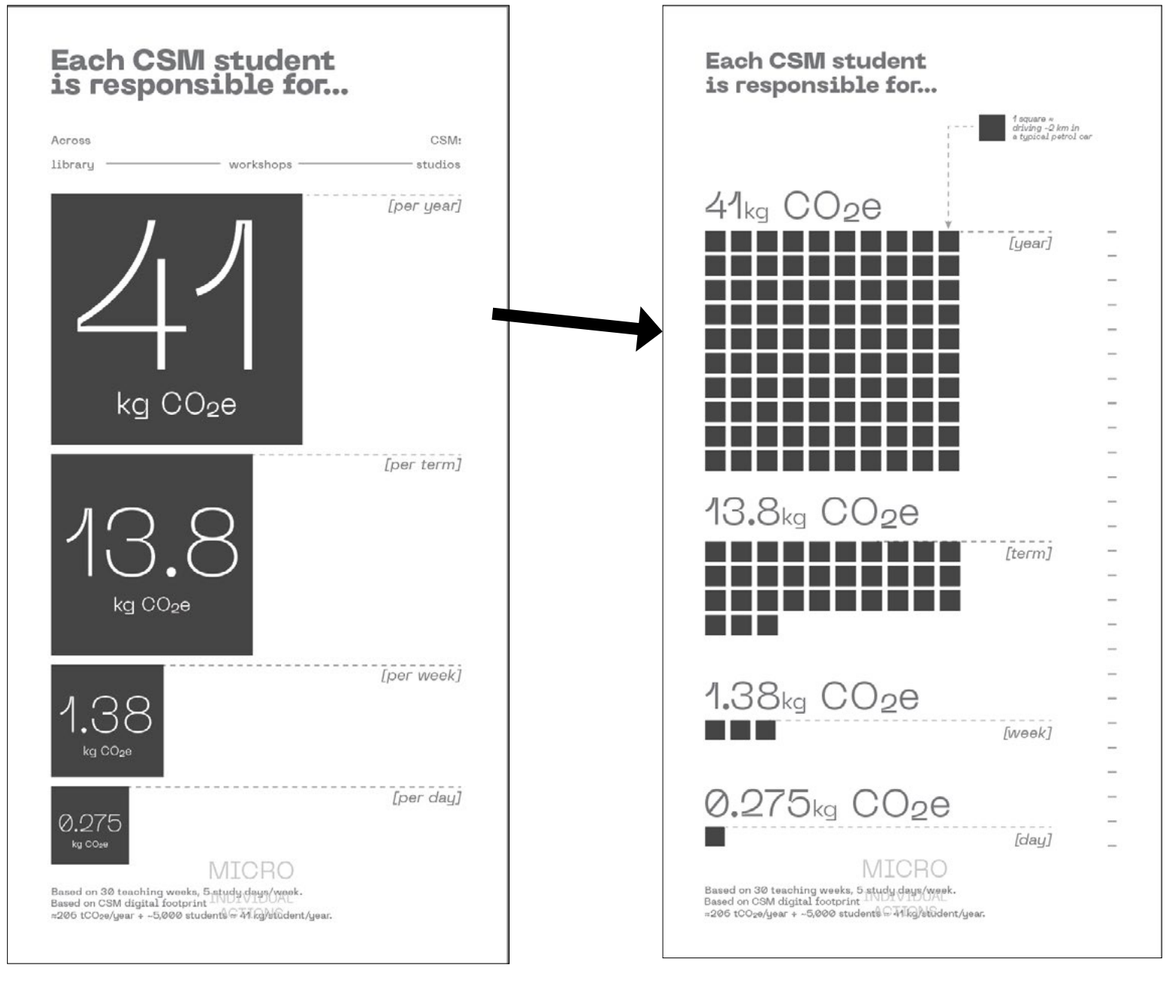
IDEATION+PROCESS

Working on Chapter 2:

1. PERSONAL DIGITAL FOOTPRINT IN DATA
2. PERSONAL DIGITAL FOOTPRINT IN RECEIPT

This is the "hook" that makes the scale legible. We translate CSM's annual digital emissions into one student's share and show it across time: day → week → term → year.

People don't feel institutional totals. Breaking the number down into daily units creates relevance (this is my portion of a bigger system)



TO SHOW SCALE&RELEVANCE

IDEATION+PROCESS

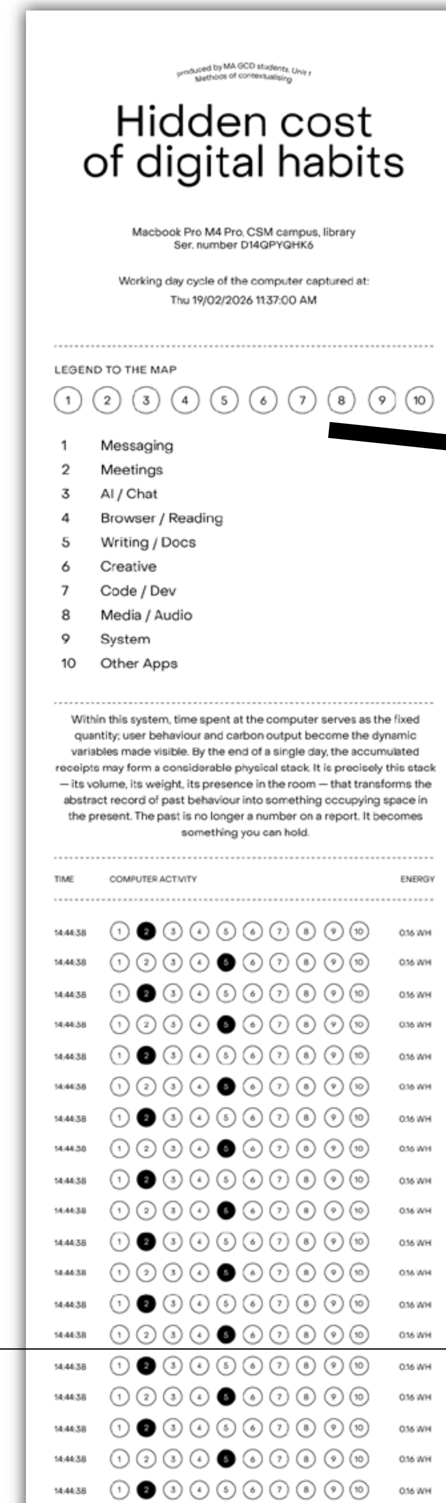
Working on Chapter 2:

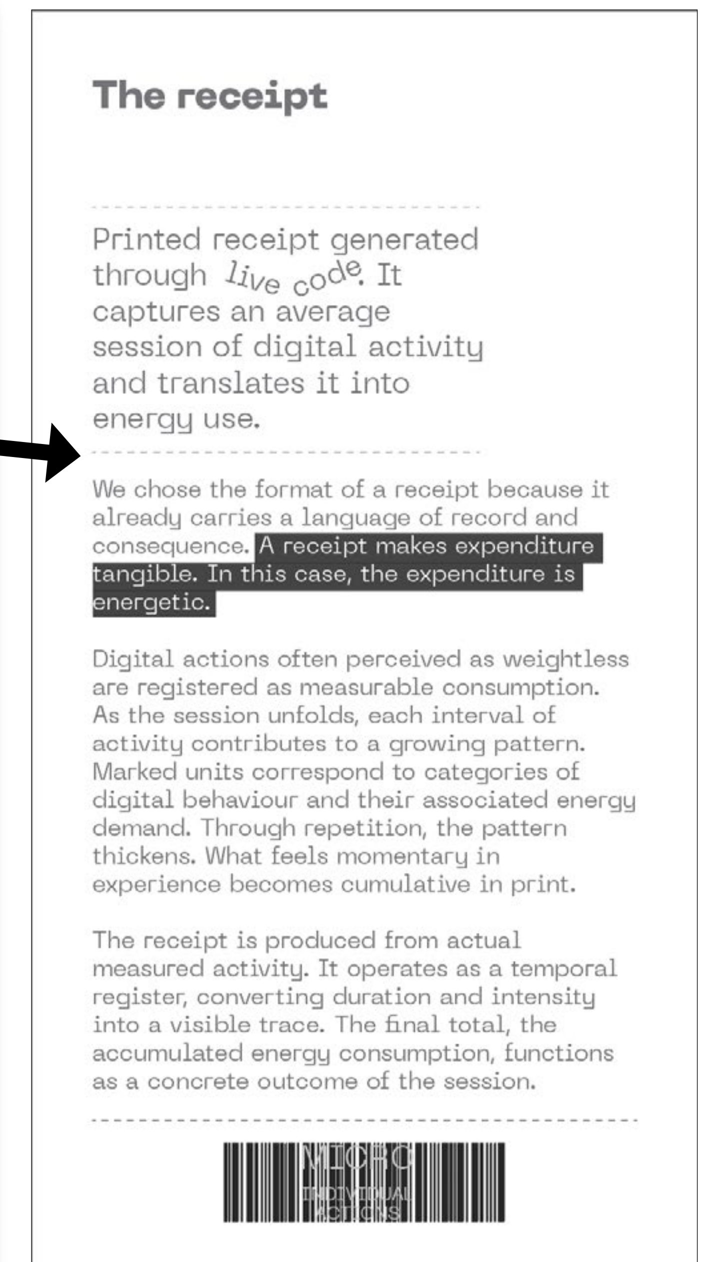
1. PERSONAL DIGITAL FOOTPRINT IN DATA
2. PERSONAL DIGITAL FOOTPRINT IN RECEIPT

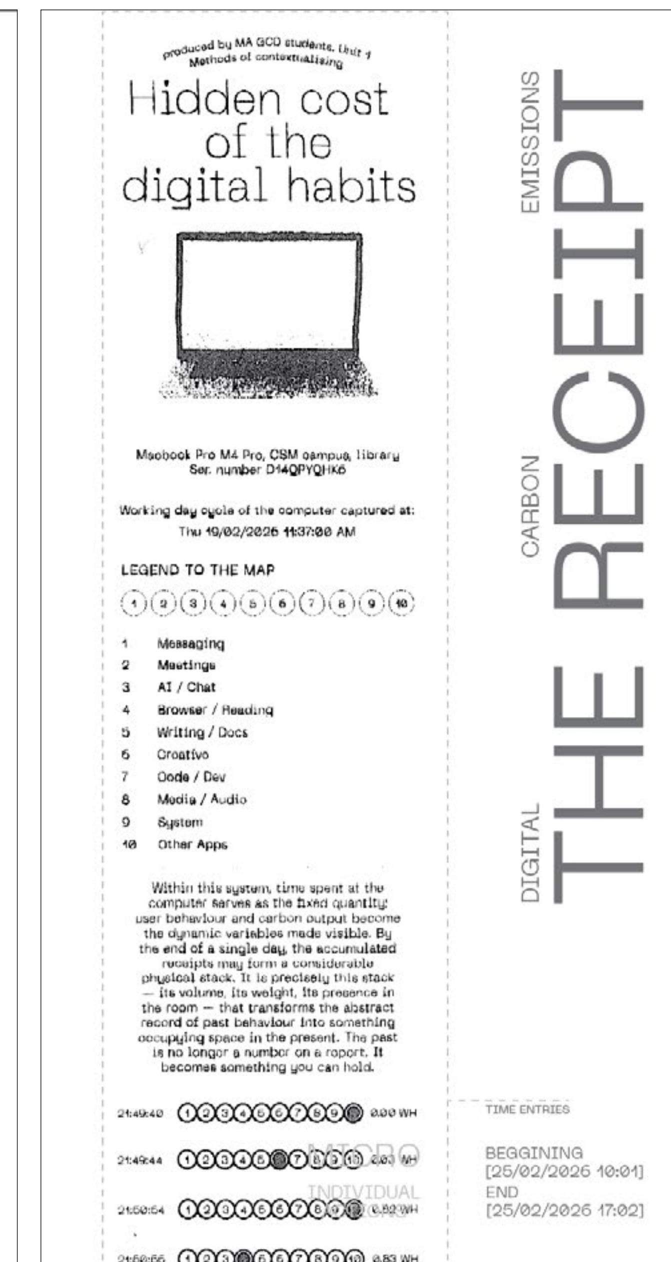
This turns the footprint into evidence. A receipt printer logs your computer activity in real time and prints it as a continuous record.

Receipts are a familiar language of cost and accountability. Printing line-by-line makes invisible digital habits physically visible and hard to ignore.

TO SHOW DIGITAL HABITS







IDEATION+PROCESS

Working on Chapter 2:

1. PERSONAL DIGITAL FOOTPRINT IN DATA
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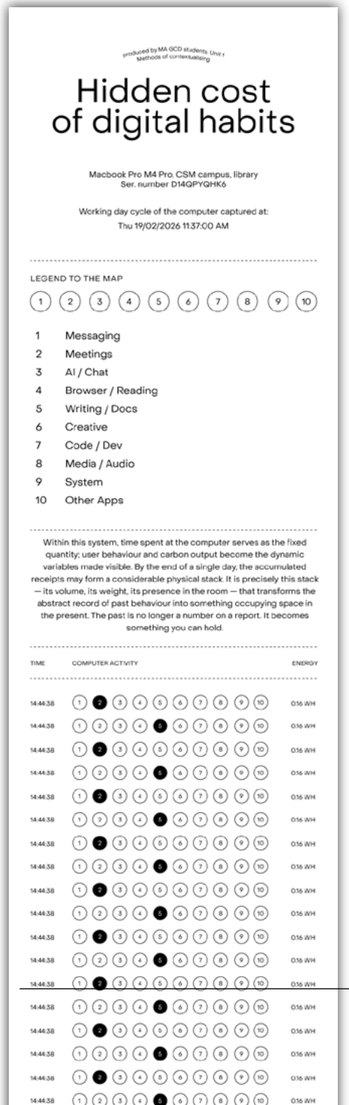
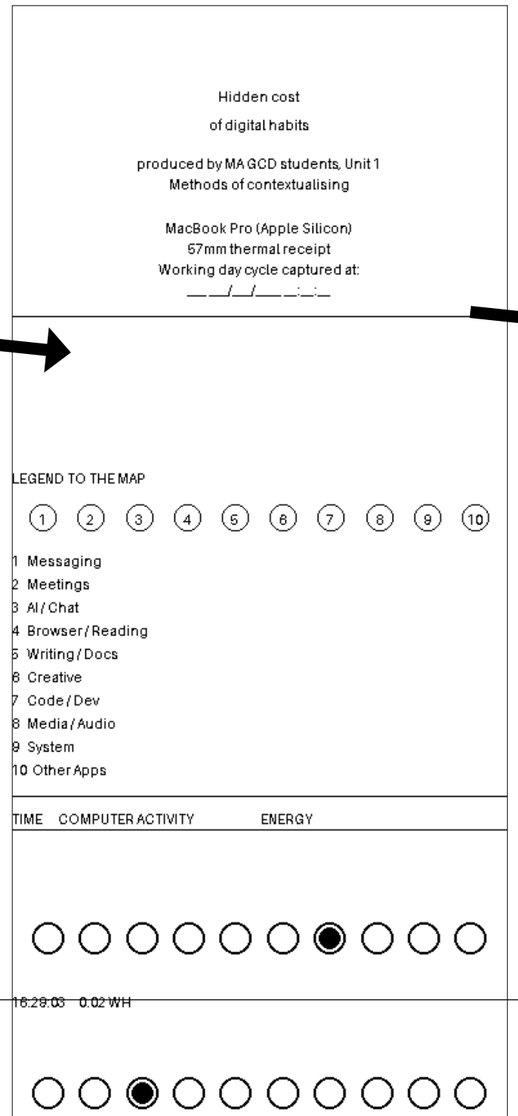
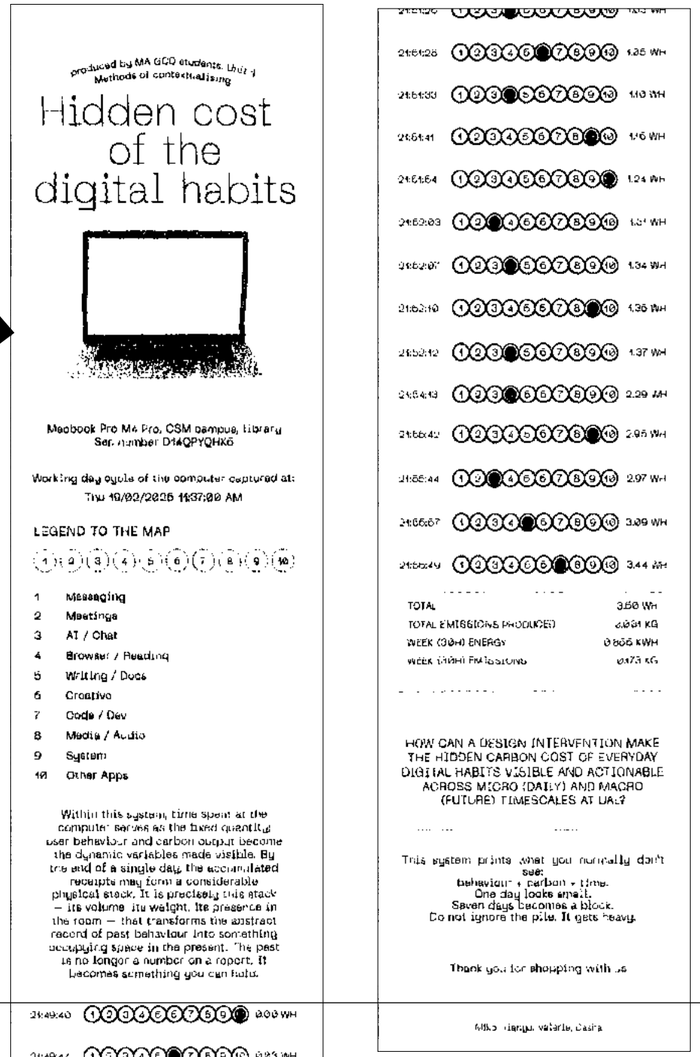
digital iteration



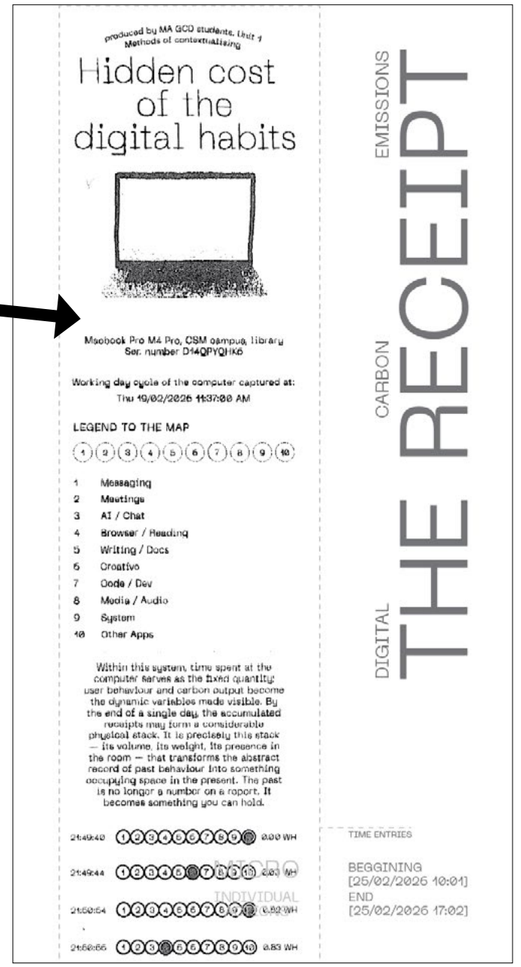
python test



short test printed on receipt machine



integrated into the page



IDEATION+PROCESS

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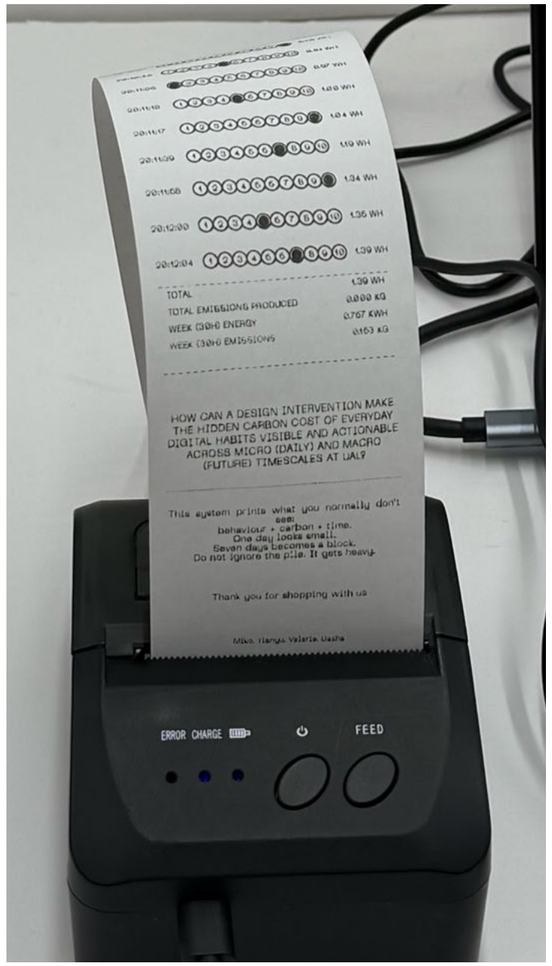

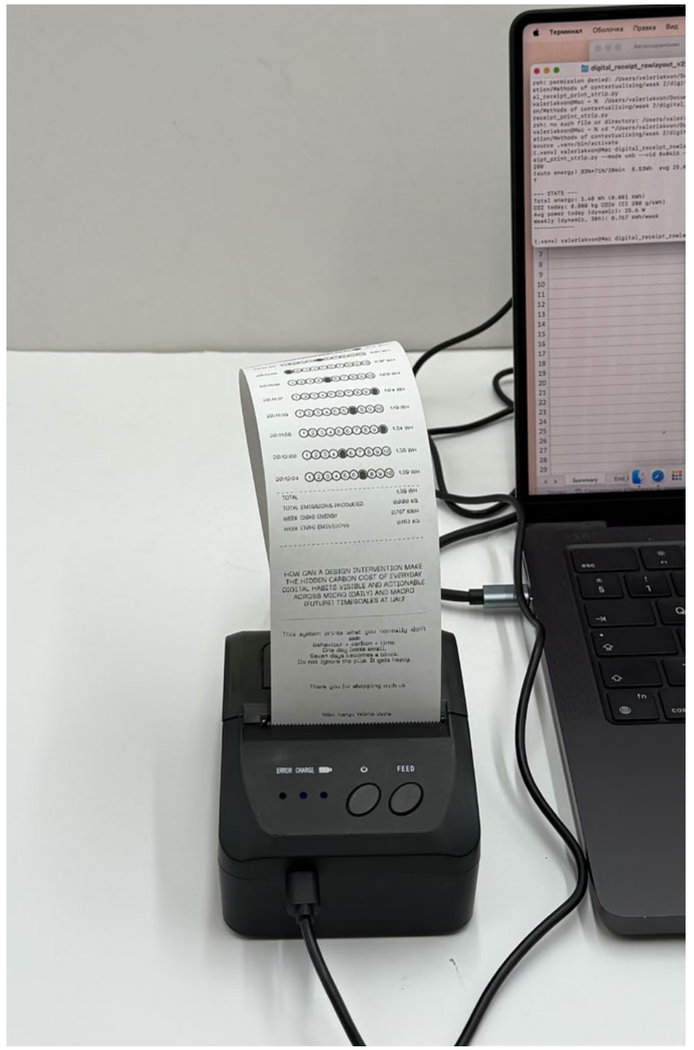

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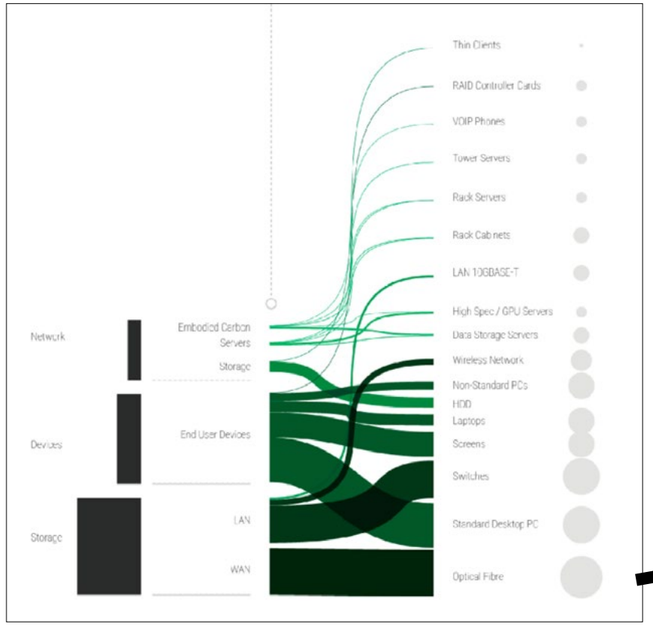
Chapter 3

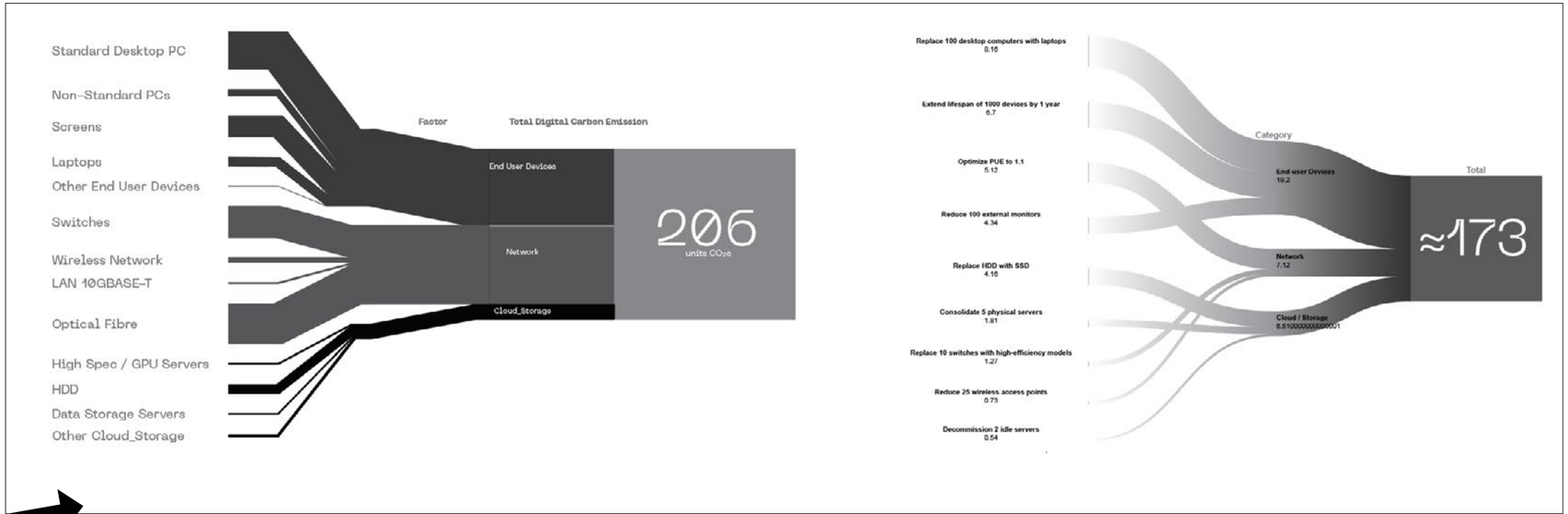
1. INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL
2. INSTITUTIONAL CONSUMPTION: WHY IT MATTERS OVER TIME?

IDEATION+PROCESS

Working on Chapter 3:

1. INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL
2. INSTITUTIONAL CONSUMPTION: WHY IT MATTERS OVER TIME?





Chapter 3 connects personal digital habits to the larger CSM total. It shows how many small, everyday actions scale up through shared infrastructure.

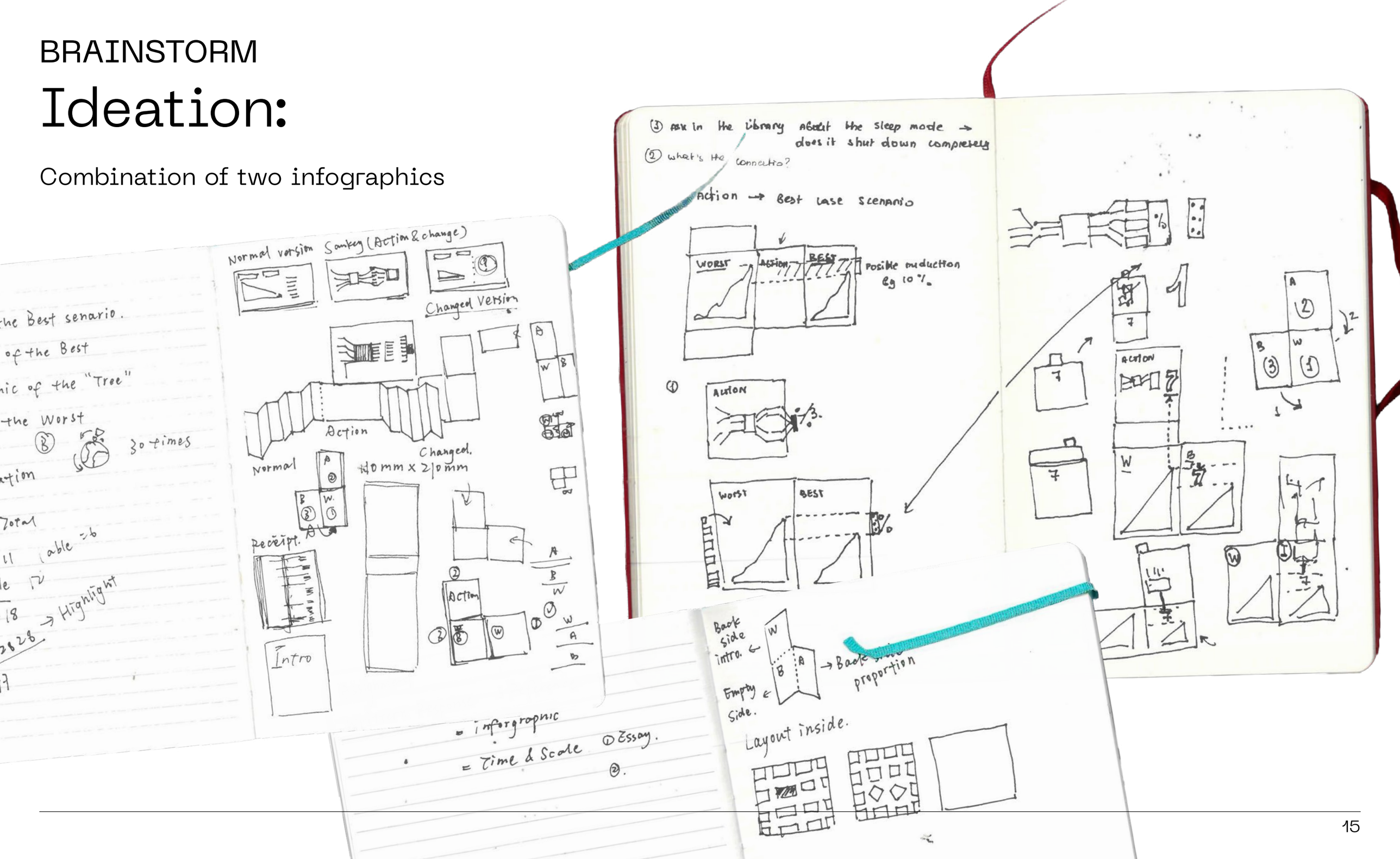
1) Infographic

Breaks CSM's digital infrastructure into clear parts (devices, network, cloud/storage) to explain where the total footprint comes from. It then highlights the most realistic reduction levers—where cutting or redesigning usage would have the biggest impact.

BRAINSTORM

Ideation:

Combination of two infographics

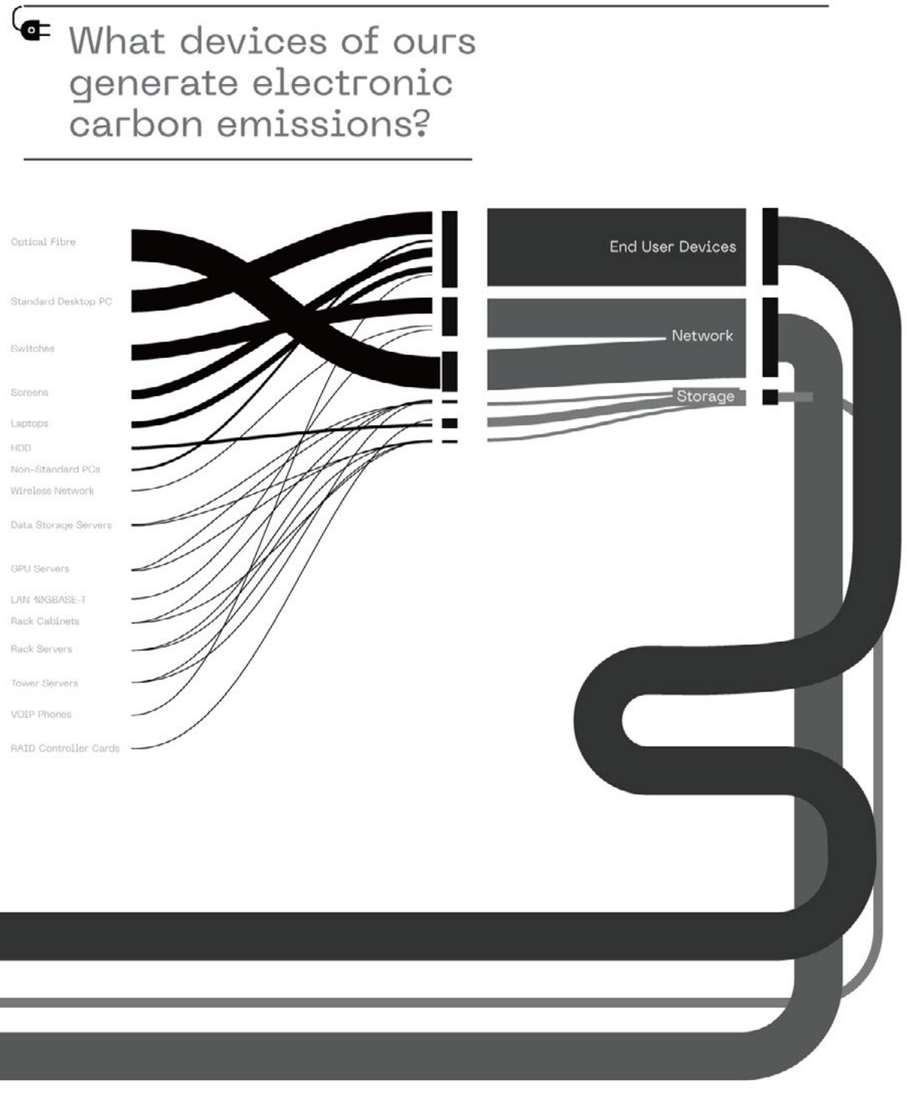


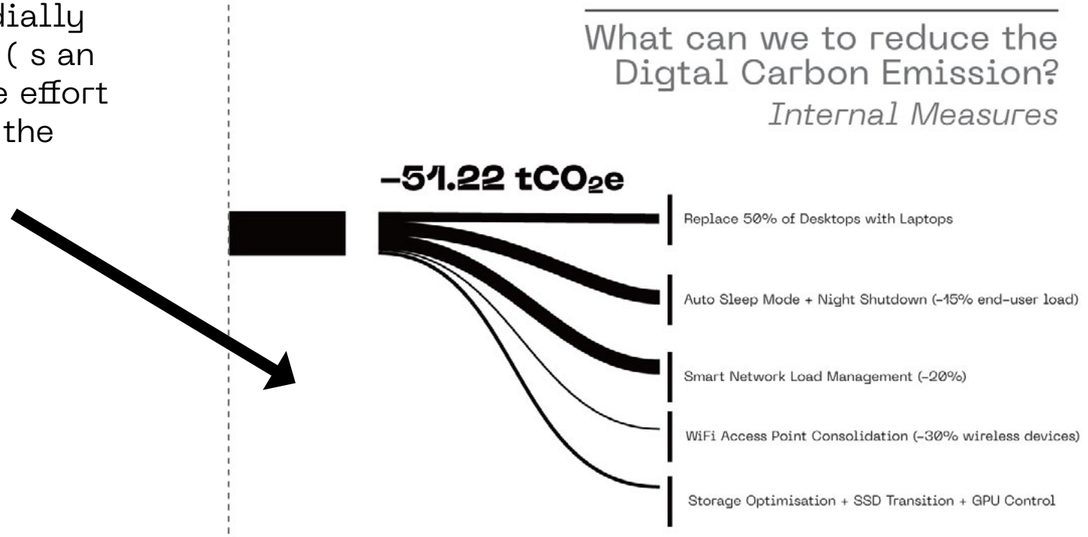
Working on Chapter 3:

1. INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL
2. INSTITUTIONAL CONSUMPTION: WHY IT MATTERS OVER TIME?

Visualising what elements comprises our emissions to inform the audience and remove uncertainty around what elements actually contribute to Digital Carbon

Based on observations we proposed areas in which we could individially and collectively (s an institution) make effort in cutting down the emissions





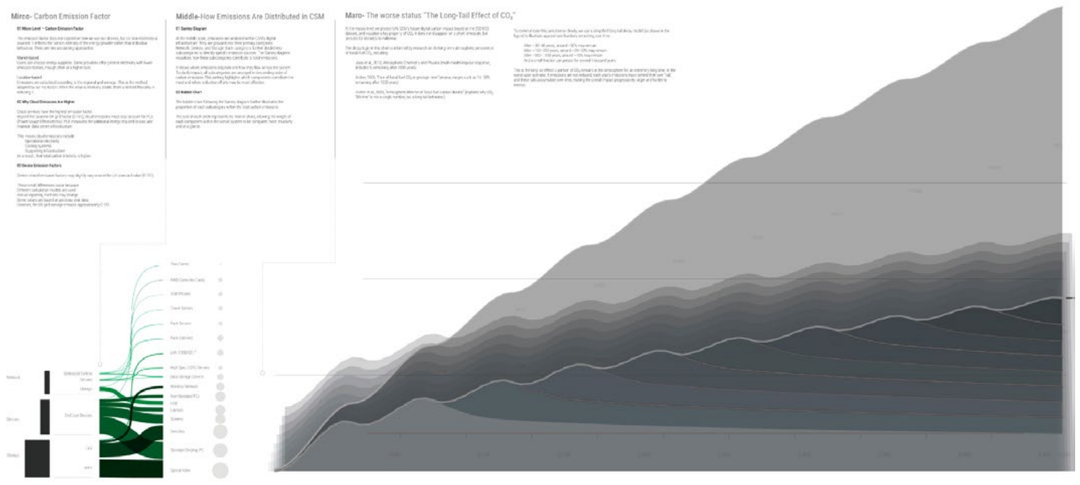
IDEATION+PROCESS

Working on Chapter 3:

1.INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL

2. INSTITUTIONAL CONSUMPTION: WHY IT MATTERS OVER TIME?

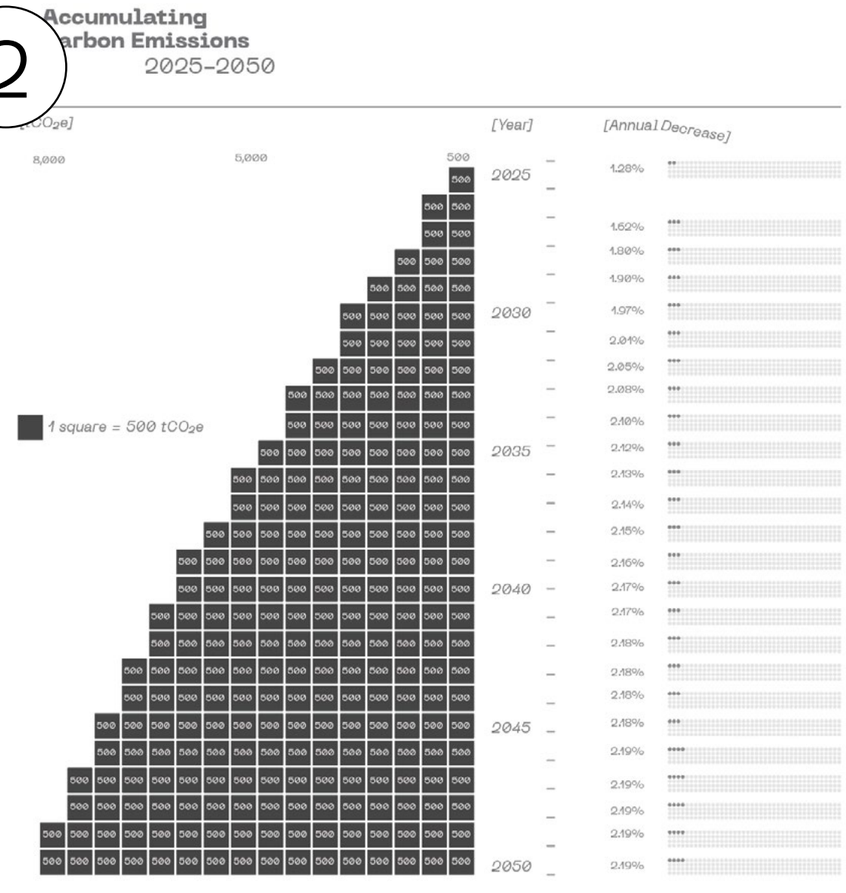
1



breaking down into smaller pieces

simpler visuals

2

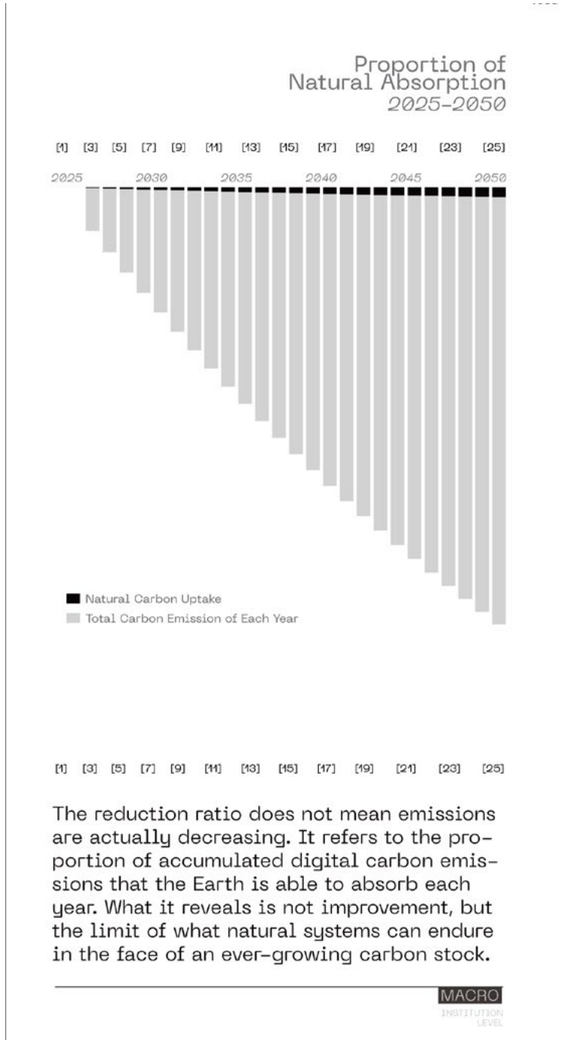


IDEATION+PROCESS

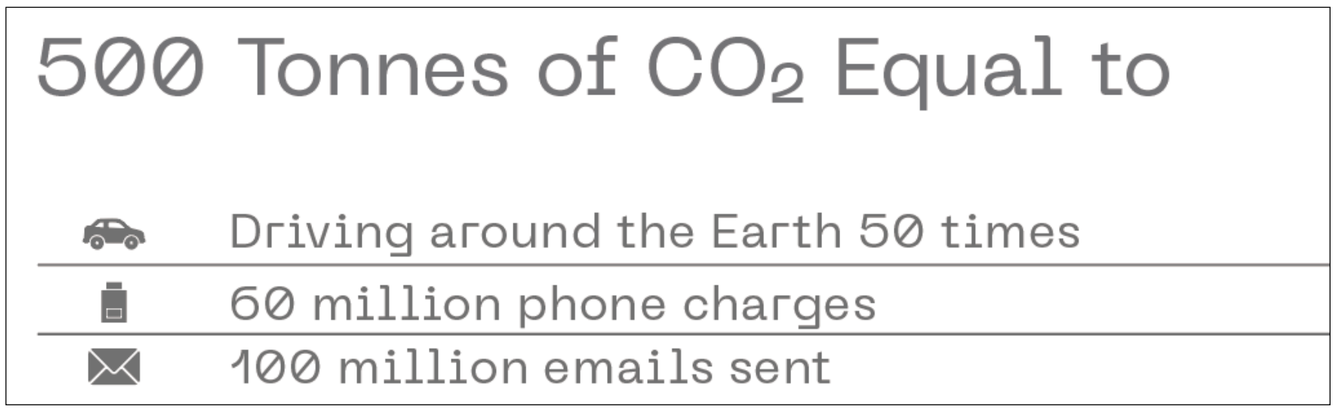
Working on Chapter 3:

1.INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL
2. INSTITUTIONAL CONSUMPTION: WHY IT MATTERS OVER TIME?

Showing absorption of the Carbon Emissions to highlight the urgency of the issue



comparisons of the data to make it more relatable to human experience



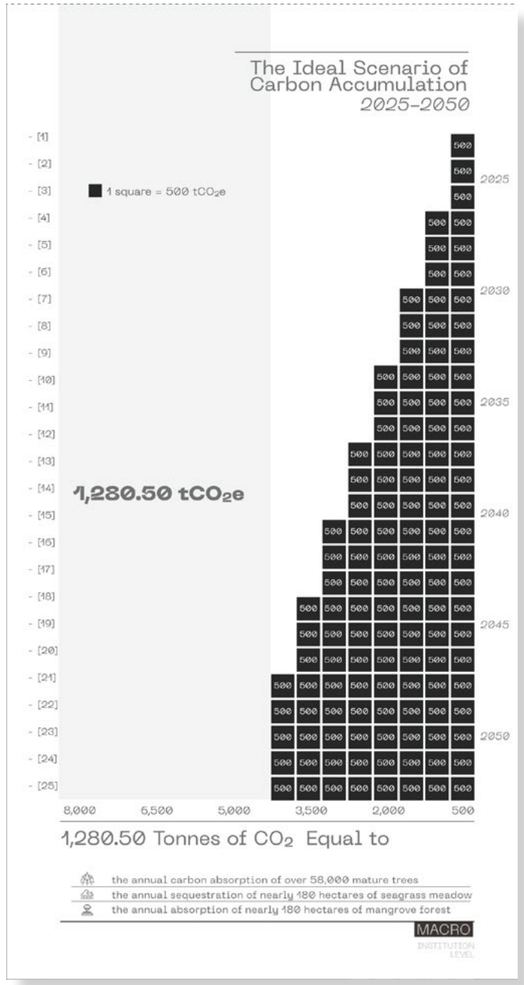
IDEATION+PROCESS

Working on Chapter 3:

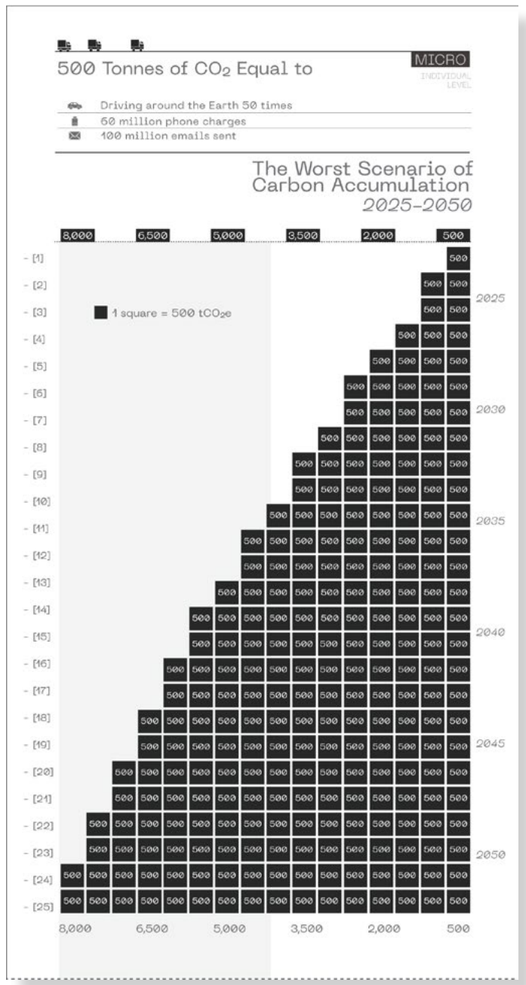
1.INDIVIDUAL USE FEEDS INTO THE INSTITUTIONAL LEVEL
2. INSTITUTIONAL CONSUMPTION: WHY IT MATTERS OVER TIME?

1) Infographic with the worst case scenario — the current usage of the technology in the CSM based on the dataset provided by the UAL Net Zero team + Small graph of how
emissions will be absorved over time

2) Infographic with the best case scenario — the mindful usage of the technology where we cut down certain aspects and avoid uncontrolled consumption



Ideal Scenario

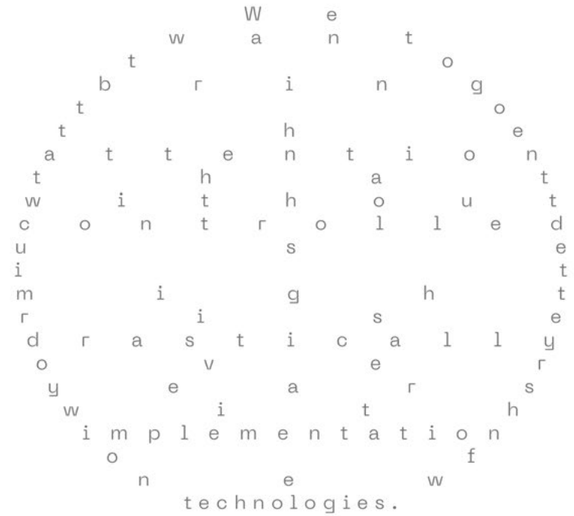


Worst Scenario

CHAPTER 3

CONTENTS

THIS CHAPTER INTRODUCES THE IMPORTANCE OF UNDERSTANDING HOW ON INDIVIDUAL LEVEL WE CONTRIBUTE TO THE BIGGER CHUNK OF CONSUMPTION



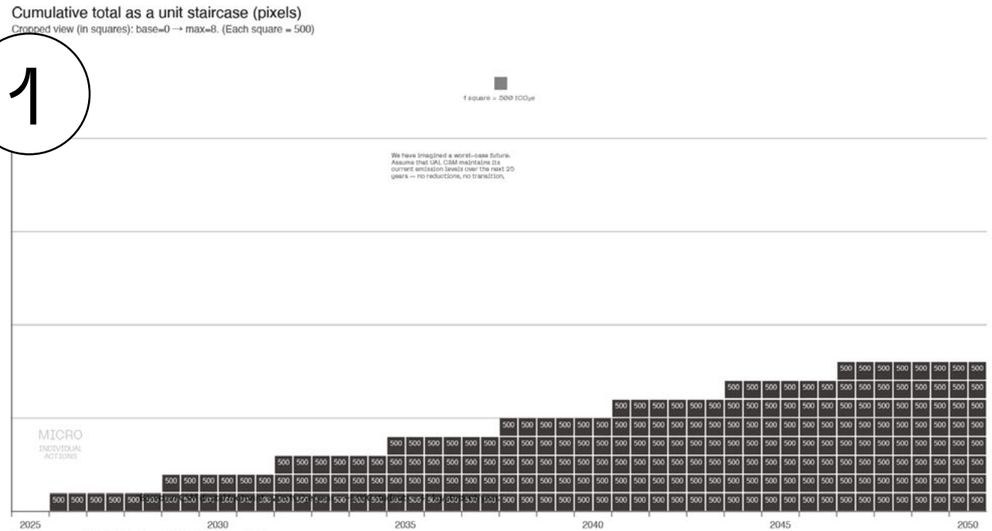
INTRO → DIGITAL CARBON
MICRO → INDIVIDUAL ACTIONS
MACRO → INSTITUTION LEVEL

IDEATION+PROCESS

Working on Chapter 3:

Iteration of infographics

1



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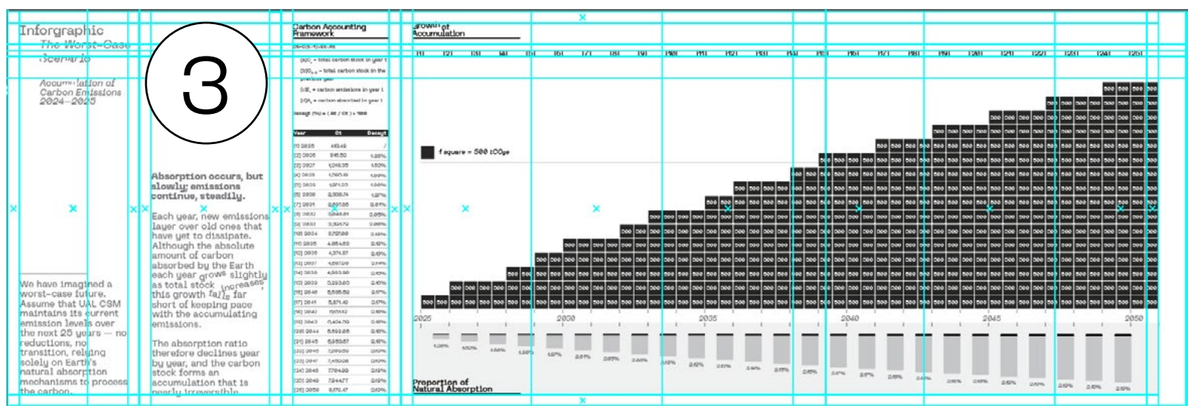

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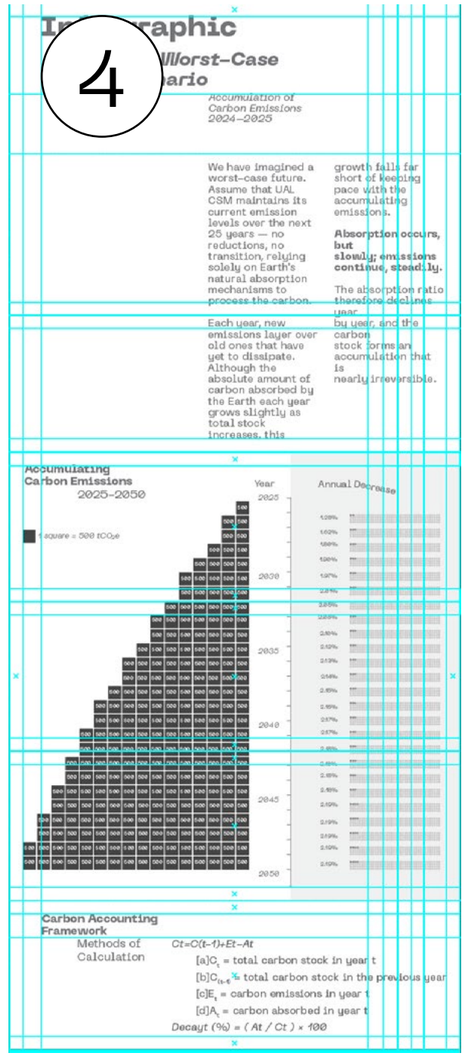

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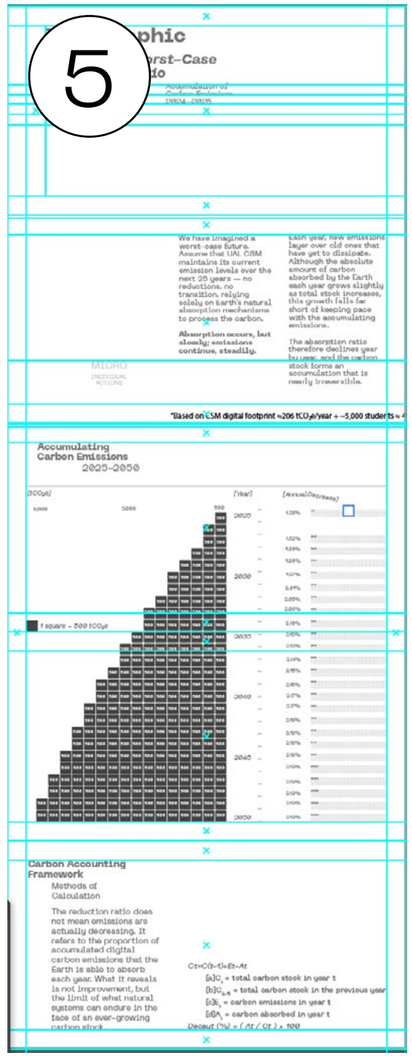


PROCESS

Working on the contents

Ensuring the cohesion across the publciation

	Font	Font size	Color
Title	Plain UltraBold	18 pt	737477
Subtitle	Plain Regular	12 pt	737477
Text Regular	Inktrap Light	11 pt	737477
Graphics			282828
Chapter separators	Plain Light CAPITALS	42 pt	737477
Small text	Plain Regular	6 pt	737477

Writing text to contextualize the topic of Digital Carbon

mockup 2 — Открыть в приложении «Adobe Acrobat»

Cards design + text

Card 1 - introduction
Side 1: "introduction"
Side 2: The digital feels immediate. Yet beneath every click lies infrastructure: servers, networks, storage systems, and electricity grids that translate digital habits into energy demand and carbon emissions. Every digital action extends beyond its moment. Files remain stored for years. Servers continue running long after a document is forgotten. Electricity flows whether or not we are looking at the screen. Digital carbon emission does not disappear when the session ends.

Digital carbon is often reported in annual summaries, institutional targets, and aggregated datasets. Yet digital infrastructure operates continuously. Single user behaviour unfolds in seconds. Atmospheric accumulation unfolds across decades. These temporalities rarely meet.

Using infrastructure data from UAL as a concrete starting point - rather than a closed case - we situate digital carbon within a layered understanding of time. The datasets ground the project in measurable institutional reality, yet the condition we address extends beyond one campus or reporting cycle. Digital carbon unfolds across three temporal dimensions: the immediacy of interaction, the institutional duration of storage and maintenance, and the atmospheric accumulation that exceeds both devices and annual targets. These scales rarely align. The gap between them is not only quantitative, it is perceptual. We feel the present and we rarely feel accumulation.

Card 2 - The Receipt
Side 1: "The Receipt"
Side 2: The publication opens with a printed receipt generated through live code. It captures a short session of digital activity and translates it into energy use.

We chose the format of a receipt because it already carries a language of record and consequence. A receipt makes expenditure tangible. In this case, the expenditure is energetic. Digital actions often perceived as weightless are registered as measurable consumption.

As the session unfolds, each interval of activity contributes to a growing pattern. Marked units correspond to categories of digital behaviour and their associated energy demand. Through repetition, the pattern thickens. What feels momentary in experience becomes cumulative in print.

The receipt is produced from actual measured activity. It operates as a temporal register, converting duration and intensity into a visible trace. The final total, the accumulated energy consumption, functions as a concrete outcome of the session.

Card 3 - chapter 1
Side 1: Chapter 1
Side 2: The next chapters present three infographics that explore digital carbon emissions from different perspectives. We move from the micro scale or individual digital actions to a broader, systemic view, and finally to a future projection that reflects long-term accumulation. These infographics are not meant to overwhelm with numbers, but to shift perception.
They translate invisible processes into visual structures that can be read gradually from detail to pattern.
You can approach them sequentially, or focus on the layer that feels most immediate to you.
Together, they map how small digital habits expand into larger environmental consequences over time.

Card 4
Side 1: Infographic 1 picture
Side 2: Infographic explained text

Card 5
Side 1: Infographic 2 picture
Side 2: Infographic explained text

Recalculating the data to work on inforgraphics

data reduce — Открыть в приложении «Microsoft Excel»

Category	Measure	Emission Re	Reduction %		Category	Current Emissions (tCO_2e/year)	% of Total
End-user Devices	Replace 100 desktop computers with laptops	8.16	3.96%		End-user Devices	92.5	44.90%
End-user Devices	Reduce 100 external monitors	4.34	2.11%		Network	95.21	46.20%
End-user Devices	Extend lifespan of 1000 devices by 1 year	6.7	3.25%		Cloud / Storage	18.29	8.90%
Network	Reduce 25 wireless access points	0.73	0.35%		**Total**	**206**	**100%**
Network	Replace 10 switches with high-efficiency models	1.27	0.62%				
Network	Optimize PUE to 1.1	5.12	2.49%				
Cloud / Storage	Consolidate 5 physical servers	1.81	0.88%				
Cloud / Storage	Replace HDD with SSD	4.16	2.02%				
Cloud / Storage	Decommission 2 idle servers	0.54	0.26%				
Total	**≈ 32.83 tCO_2e/year**	**≈ 15.94%**					

PROCESS

Publication production

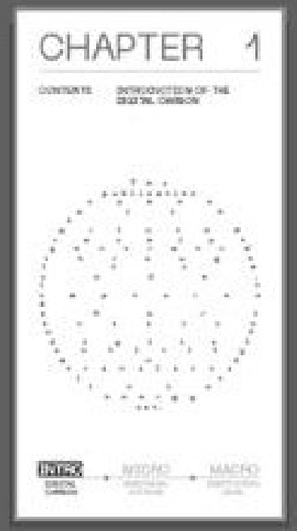
Working in the Publication Workshop to produce cards + cover

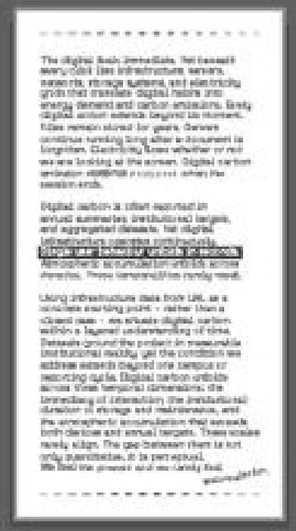
OUTCOME

PUBLICATION STRUCTURE

CARD 1

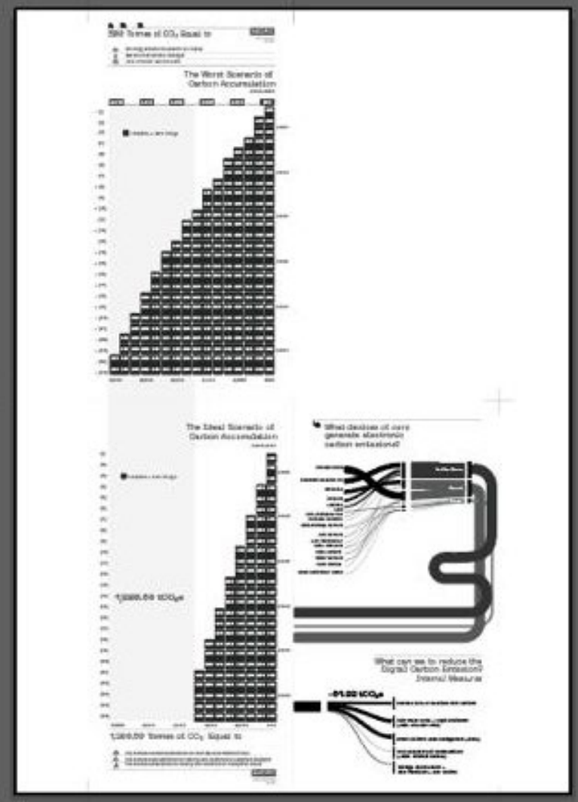
CHAPTER 1

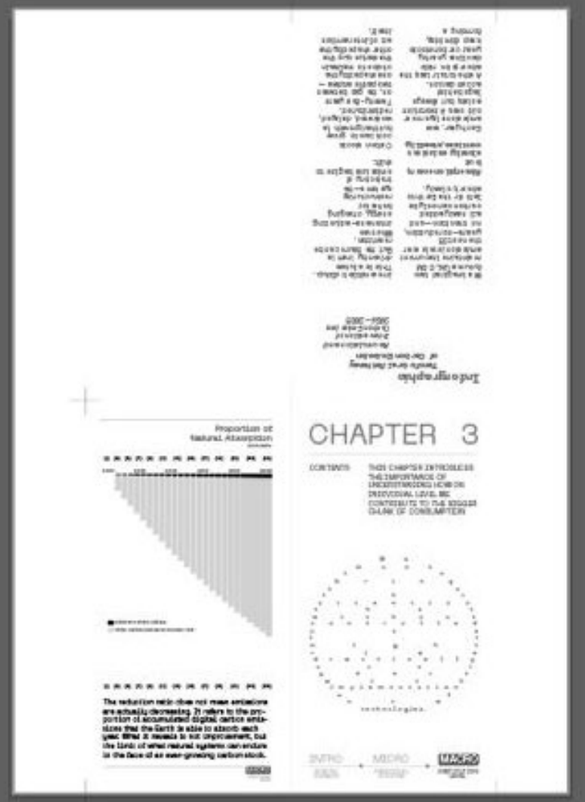




CARD 1

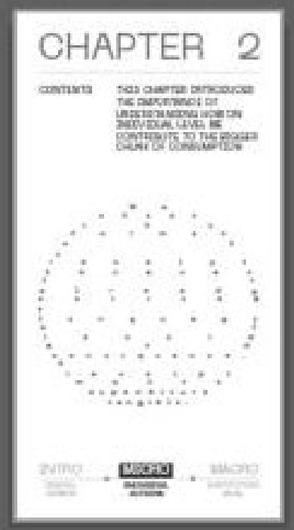
CHAPTER 3

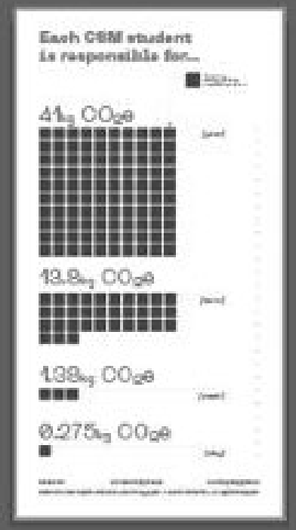




CARD 1

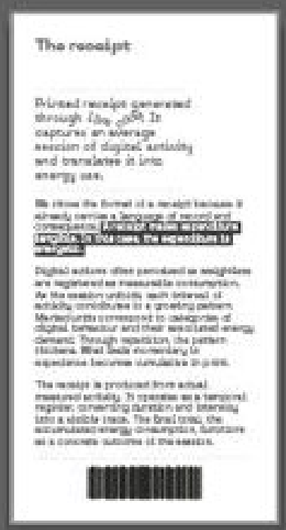
CHAPTER 2



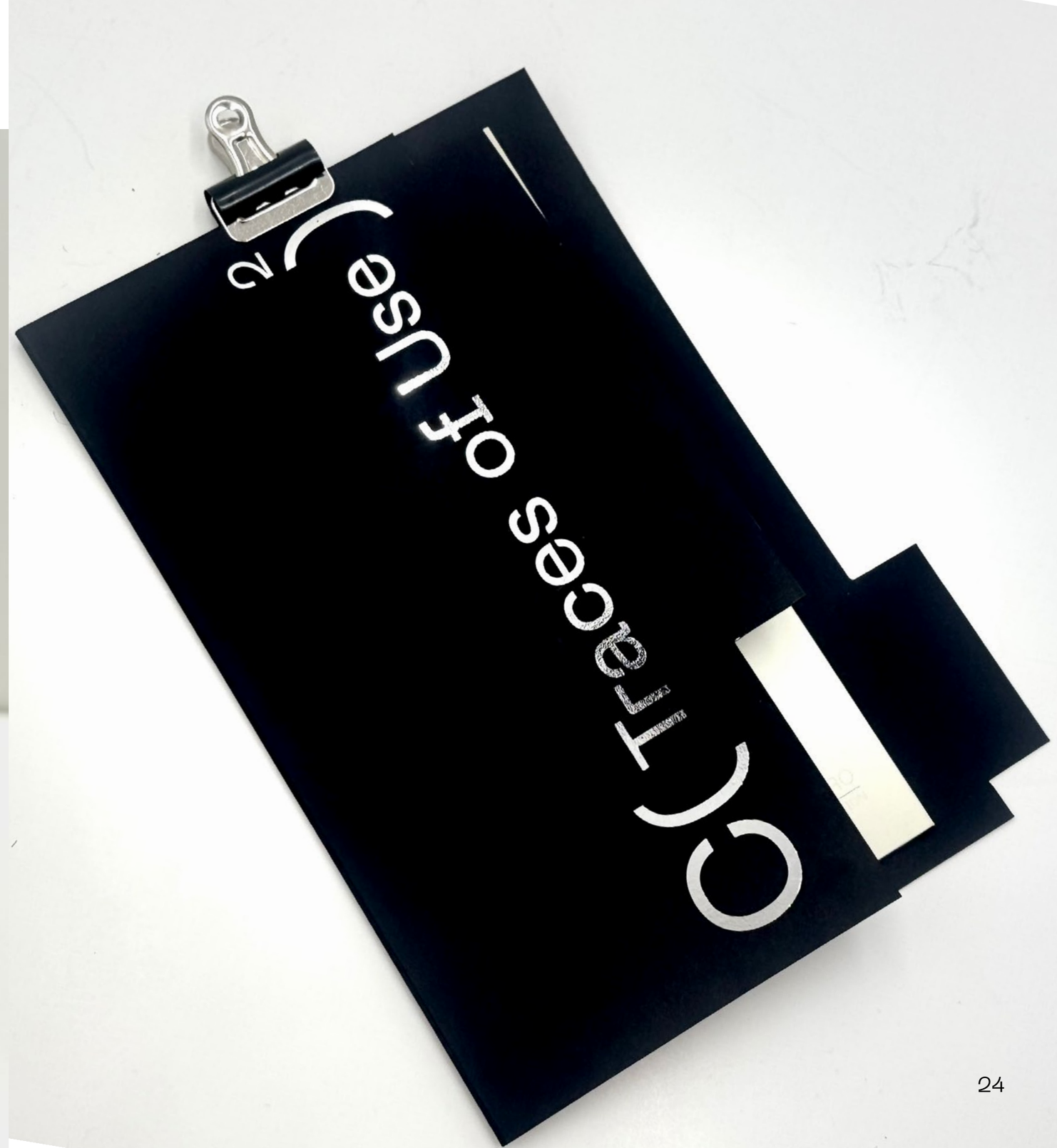


CARD 2

CHAPTER 3



FINAL OUTCOME



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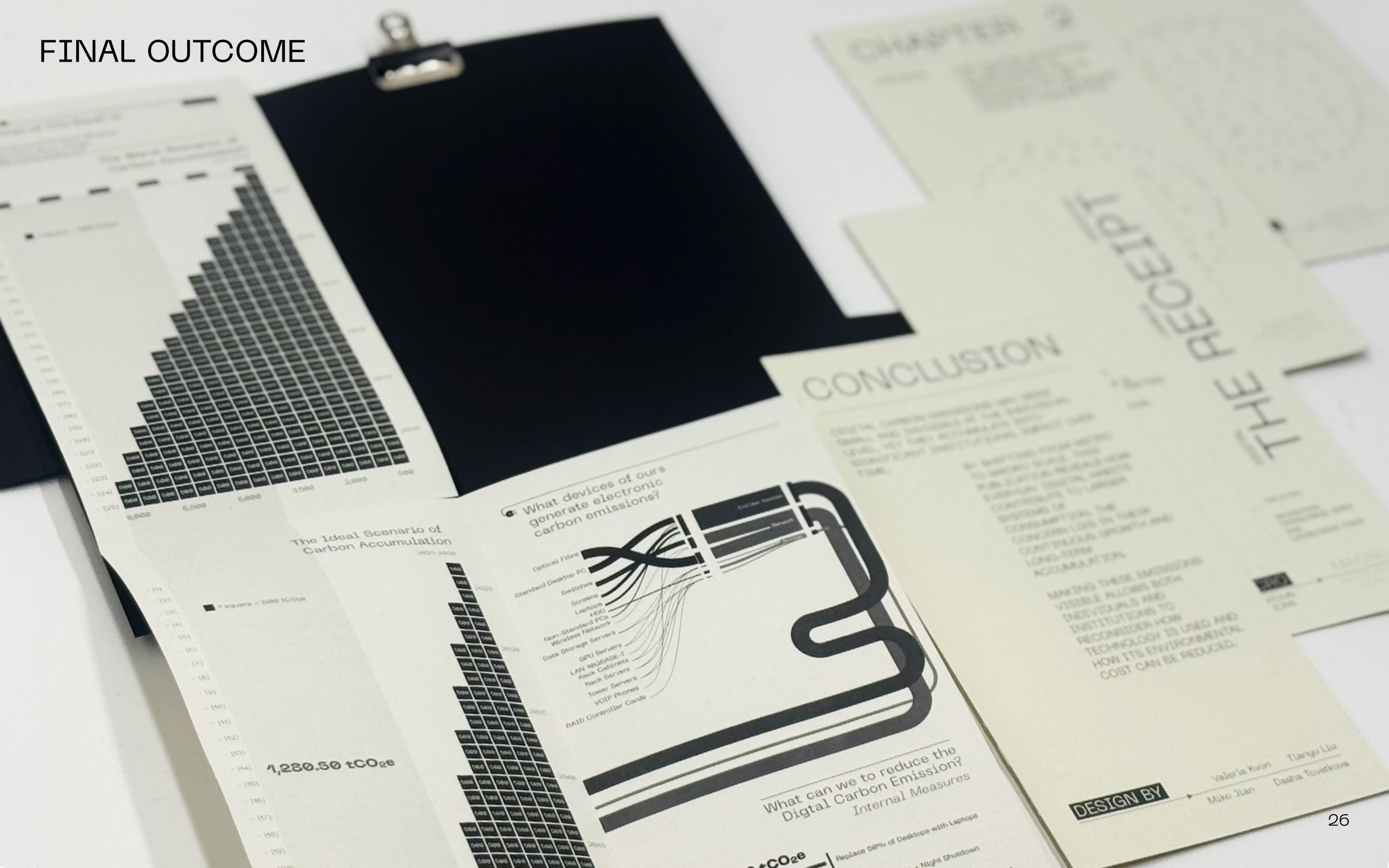

FINAL OUTCOME