

GreenOps Customer Showcase Panel

Unlocking the double wins for the business and IT sustainability



Andri Johnston
Digital Sustainability
Lead



Mark Buss
Senior Digital
Sustainability Manager



Tom Parry
Head of Digital Sustainability



Department
for Environment
Food & Rural Affairs



Moderated by **Kevin Leslie**
CRO - Greenpixie

WHO IS GREENPIXIE?

ONE TRUSTED EMISSIONS STANDARD FOR ALL AI AND ALL CLOUD



WHAT DO WE DO?

**We allow customers to open
the black box of AI and cloud
emissions.**

Speaking today:



Department
for Environment
Food & Rural Affairs



Get Greenpixie certified

VISIT THE NEW GREENOPS ACADEMY DATA EXPLORER COURSE

and there's even more to learn at greenpixie.com/docs





CAMBRIDGE
UNIVERSITY PRESS & ASSESSMENT

The road to Technology Scope 3 targets & the AI question

GreenIO 2026

Andri Johnston, Digital Sustainability Lead

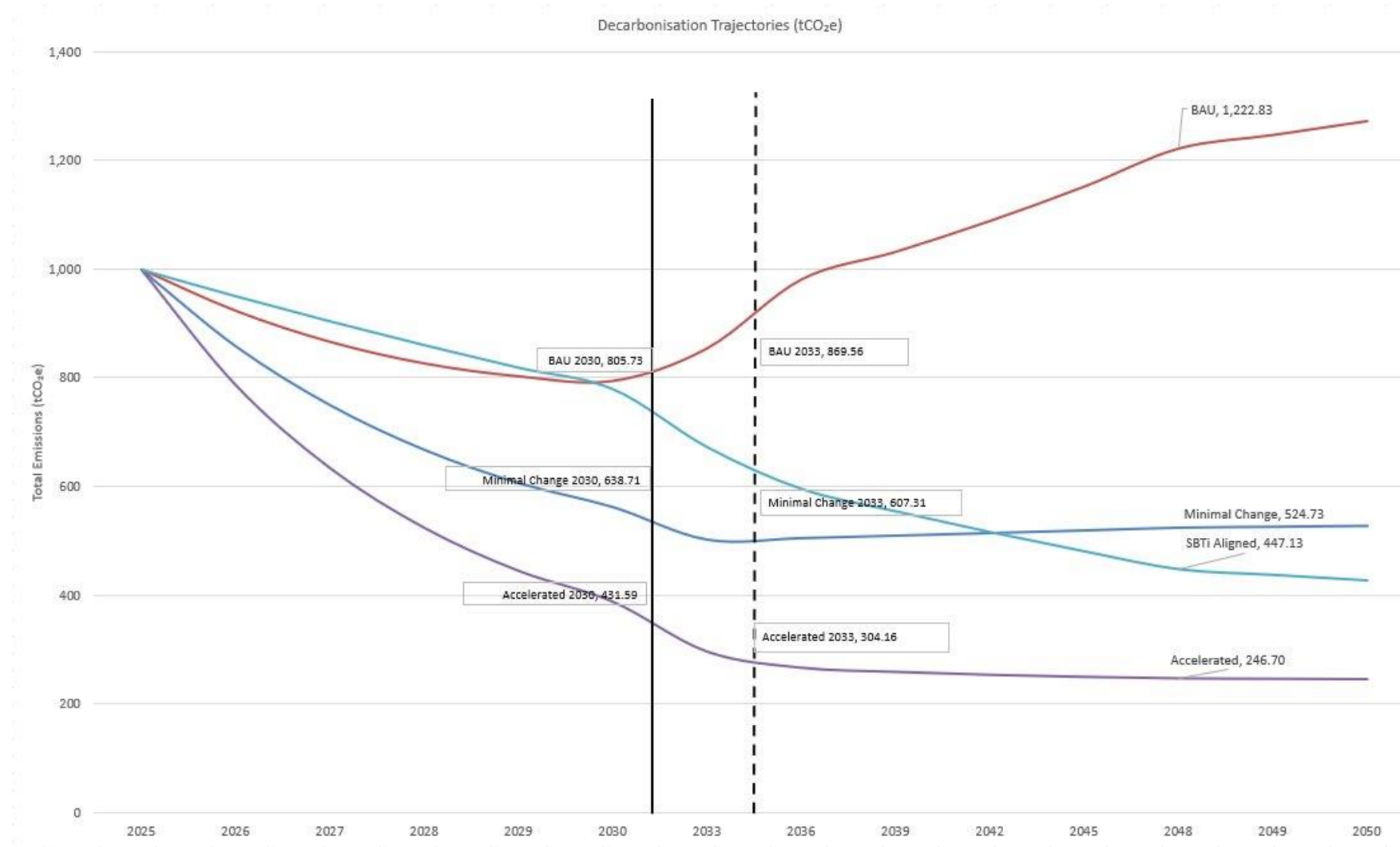


Our commitment

Cambridge University Press & Assessment has committed to being carbon zero on all energy-related emissions by 2048, with a 72% reduction by 2030

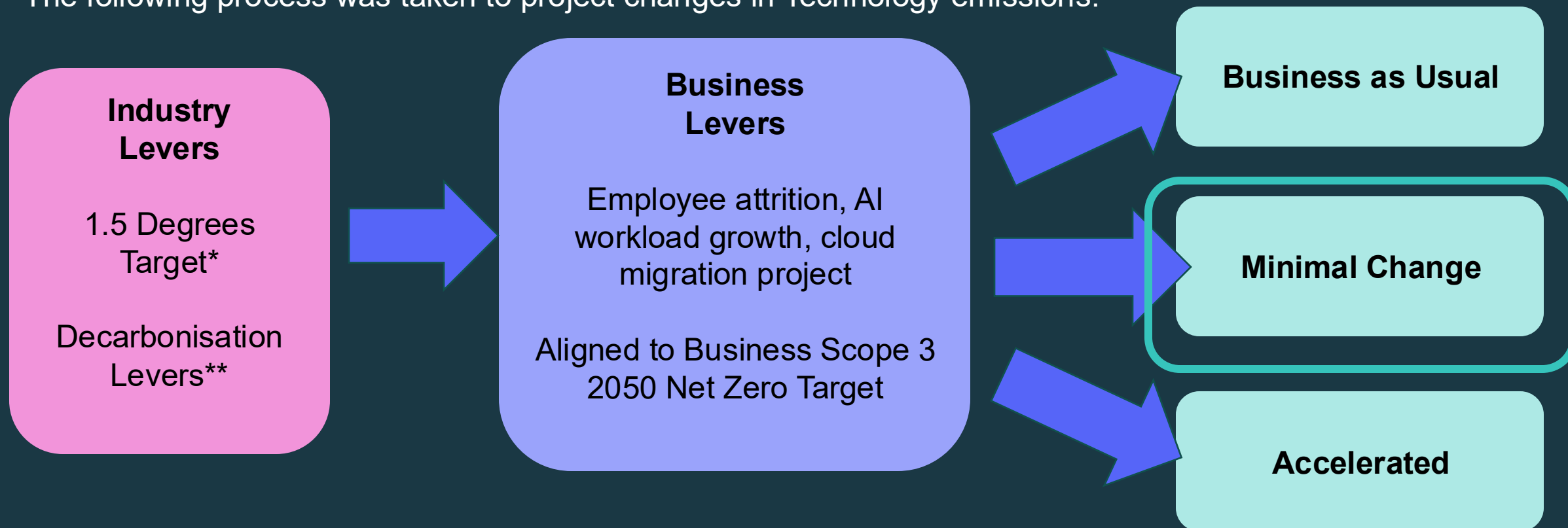
Technology Scope 3 Emissions Target

44% reduction target by 2030



Target setting recommendation

The following process was taken to project changes in Technology emissions:



*Calibrate to reach a 1.5°C-aligned target and Science Based Targets initiative – Absolute Contraction Approach (SBTi ACA)

**Model against industry decarbonisation levers (extended refresh cycles, refurbished devices, etc.)

Technology carbon emissions forecast

Levers – Cloud suppliers

Levers Impacting Scenario Differences			
Lever	BAU	Minimal	Accelerated
Rightsizing, autoscaling & idle resource elimination (GreenOps + FinOps)	Remove 8% oversized / idle resources - 8.00%	Remove 10% oversized / idle resources - 10.00%	Remove 15% oversized / idle resources - 15.00%
Carbon-aware workload placement (low-carbon region routing)	Move <5% of outlier workloads 0.00%	Move 10–20% of outlier workloads - 2.00%	Move 30–50% of outlier workloads - 4.00%

Most workloads already run in carbon-efficient regions. Focus is on outliers

P.S: scenario upside comes from removing cloud waste and shifting remaining outliers to cleaner regions; AI/ML growth remains the main pressure.

Fixed Levers	
Cloud Levers	Value
Provider RE100 progress	5%
Workload efficiency & green architecture	4%
AI/ML workload growth offset	2%
AI/ML workload growth pressure	+40%
Post-migration modernisation modelled	4.11%

Modelling with Greenpixie

Region	eu-west-2	London
(based on yearly averages)		

Hourly Usage Totals		
Energy (Wh)	CO2e (grams)	Water (litres)
87567.95	22689.87	208.67

Monthly Usage Totals		
Energy (MW)	CO2e (tonnes)	Water (litres)
63.92	16.56	152331.78

Yearly Usage Totals		
Energy (MW)	CO2e (tonnes)	Water (litres)
767.10	198.76	1827981.32

Forecast Provided by Cambridge

Power State poweredOn

Cambridge - London Migration Model. Instance types and Quantities provided by PC											
Instance		Release	Environmental Impact for one hour of usage			Cambridge		Total Modelled Environmental Impact for one hour			
family	size	Type	Year	Energy (wh)	CO2e (grams)	Water (litres)	Qty Modelled	Energy (wh)	CO2e (grams)	Water (litres)	
c4	large	c4.large	2013	5.64	1.23	0.01	1	5.64	1.23	0.01	
c4	xlarge	c4.xlarge	2013	11.28	2.47	0.03	1	11.28	2.47	0.03	
c4	2xlarge	c4.2xlarge	2013	22.56	4.94	0.05	43	969.92	212.26	2.31	
c4	4xlarge	c4.4xlarge	2013	45.11	9.87	0.11	16	721.80	157.96	1.72	
c6a	large	c6a.large	2021	2.76	0.64	0.01	321	886.04	204.20	2.11	
c6a	xlarge	c6a.xlarge	2021	5.52	1.27	0.01	35	193.22	44.53	0.46	
c6a	2xlarge	c6a.2xlarge	2021	11.04	2.54	0.03	80	883.28	203.57	2.10	
c6a	4xlarge	c6a.4xlarge	2021	22.08	5.09	0.05	498	10996.87	2534.40	26.21	
c7i	large	c7i.large	2023	5.37	1.06	0.01	172	923.13	181.51	2.20	
c7i	xlarge	c7i.xlarge	2023	10.73	2.11	0.03	93	998.27	196.29	2.38	
c7i	2xlarge	c7i.2xlarge	2023	21.47	4.22	0.05	4	85.87	16.88	0.20	
c7i	4xlarge	c7i.4xlarge	2023	42.94	8.44	0.10	112	4808.88	945.55	11.46	
c7i	8xlarge	c7i.8xlarge	2023	85.87	16.88	0.20	24	2060.95	405.23	4.91	
m4	large	m4.large	2013	6.05	1.44	0.01	1	6.05	1.44	0.01	
m4	xlarge	m4.xlarge	2013	12.10	2.88	0.03	8	96.79	23.05	0.23	
m4	2xlarge	m4.2xlarge	2013	24.20	5.76	0.06	3	72.59	17.29	0.17	

Instances to Consider for Modernization											
Instance		Release	Environmental Impact for one hour of usage								
family	size	Type	Year	Energy (wh)	CO2e (grams)	CO2e (grams)	CO2e (grams)	Water (litres)	Water (litres)	Water (litres)	Water (litres)
c8g	large	c8g.large	2024	3.25	0.50	0.24	0.75	0.00	0.01	0.01	
c8g	xlarge	c8g.xlarge	2024	6.51	1.01	0.48	1.49	0.00	0.02	0.02	
c8g	2xlarge	c8g.2xlarge	2024	13.02	2.02	0.97	2.99	0.00	0.03	0.03	
c8g	4xlarge	c8g.4xlarge	2024	26.03	4.04	1.94	5.97	0.00	0.06	0.06	
c8i	large	c8i.large	2024	3.31	0.51	0.18	0.69	0.00	0.01	0.01	
c8i	xlarge	c8i.xlarge	2024	6.62	1.03	0.35	1.38	0.00	0.02	0.02	
c8i	2xlarge	c8i.2xlarge	2024	13.24	2.05	0.70	2.76	0.00	0.03	0.03	
c8i	4xlarge	c8i.4xlarge	2024	26.49	4.11	1.41	5.51	0.00	0.06	0.06	
c8a	large	c8a.large	2024	1.66	0.26	0.17	0.43	0.00	0.00	0.00	
c8a	xlarge	c8a.xlarge	2024	3.32	0.51	0.34	0.85	0.00	0.01	0.01	
c8a	2xlarge	c8a.2xlarge	2024	6.64	1.03	0.67	1.70	0.00	0.02	0.02	
c8a	4xlarge	c8a.4xlarge	2024	13.28	2.06	1.35	3.41	0.00	0.03	0.03	
m8i	large	m8i.large	2024	3.41	0.53	0.31	0.84	0.00	0.01	0.01	
m8i	xlarge	m8i.xlarge	2024	6.82	1.06	0.62	1.68	0.00	0.02	0.02	
m8i	2xlarge	m8i.2xlarge	2024	13.63	2.11	1.24	3.36	0.00	0.03	0.03	
m8i	4xlarge	m8i.4xlarge	2024	27.27	4.23	2.48	6.71	0.00	0.06	0.06	
m8i	8xlarge	m8i.8xlarge	2024	54.53	8.45	4.97	13.42	0.00	0.13	0.13	
m8a	large	m8a.large	2024	1.76	0.27	0.30	0.58	0.00	0.00	0.00	
m8a	xlarge	m8a.xlarge	2024	3.52	0.55	0.61	1.15	0.00	0.01	0.01	
m8a	2xlarge	m8a.2xlarge	2024	7.04	1.09	1.21	2.30	0.00	0.02	0.02	
m8a	4xlarge	m8a.4xlarge	2024	14.08	2.18	2.42	4.61	0.00	0.03	0.03	
m8a	8xlarge	m8a.8xlarge	2024	28.16	4.37	4.85	9.21	0.00	0.07	0.07	
m8g	large	m8g.large	2024	3.48	0.54	0.38	0.92	0.00	0.01	0.01	
m8g	xlarge	m8g.xlarge	2024	6.95	1.08	0.75	1.83	0.00	0.02	0.02	
m8g	2xlarge	m8g.2xlarge	2024	13.90	2.16	1.51	3.66	0.00	0.03	0.03	
m8g	4xlarge	m8g.4xlarge	2024	27.81	4.31	3.01	7.33	0.00	0.07	0.07	
m8g	8xlarge	m8g.8xlarge	2024	55.62	8.62	6.03	14.65	0.00	0.13	0.13	

Replacement family	Replacement instance type	Replacement instance type (Updated)
c8i	c8i.large	c8i.large
c8i	c8i.xlarge	c8i.xlarge
c8i	c8i.2xlarge	c8i.2xlarge
c8i	c8i.4xlarge	c8i.4xlarge
c8a	c8a.large	c8a.large
c8a	c8a.xlarge	c8a.xlarge
c8a	c8a.2xlarge	c8a.2xlarge
c8a	c8a.4xlarge	c8a.4xlarge
c8i	c8i.large	c8i.large
c8i	c8i.xlarge	c8i.xlarge
c8i	c8i.2xlarge	c8i.2xlarge
c8i	c8i.4xlarge	c8i.4xlarge
c7i.8xlarge	c7i.8xlarge	c8i.4xlarge
m4.large	m4	m8i.large
m4.xlarge	m4	m8i.xlarge
m4.2xlarge	m4	m8i.2xlarge
m4.4xlarge	m4	m8i.4xlarge
m4.10xlarge	m4	m8i.8xlarge
m6a.large	m6a	m8a.large
m6a.xlarge	m6a	m8a.xlarge
m6a.2xlarge	m6a	m8a.2xlarge
m6a.4xlarge	m6a	m8a.4xlarge
m6a.8xlarge	m6a	m8a.8xlarge
m7a.large	m7a	m8a.large
m7a.xlarge	m7a	m8a.xlarge
m7a.2xlarge	m7a	m8a.2xlarge
m7a.4xlarge	m7a	m8a.4xlarge
m7a.8xlarge	m7a	m8a.8xlarge

Using the Greenpixie calculator to do modelling around moving from newer instance families in our on-prem to cloud life and shift migration project allowed us to show the business decisions senior leadership needed to consider to achieve the Scope 3 emissions reduction pathways.

Do-ability, Cost, Trade-offs (Cloud – Modernisation)

Moving to Graviton alone will not be enough, Location Shifting will also be required to gain full benefit

**Will require more time and resources to work with the teams to move to Graviton and require Technology guidance to allow teams to adopt the move themselves*

Minimal Change

Yearly Total Reduction Percentage

Energy (Wh)	CO2e (grams)	Water (litres)
45.92%	34.30%	45.92%

Moving to the closest available replica instance families

Trade-off: Not the most sustainable option

Do-ability: Simple modelling and have to move for modernisation

Cost: No additional cost

Accelerated Change

Yearly Total Reduction Percentage

Energy (Wh)	CO2e (grams)	Water (litres)
48.17%	34.22%	48.17%

Moving 50% of our infrastructure to similar instance families and Graviton

Trade-off: Graviton will not be the best option for every platform

Do-ability: Individual application evaluation using AWS Compute Optimizer*

Cost: Internal costs for testing and application rearchitecting

Do-ability, Cost, Trade-offs (Cloud – Location Shifting)

Trade-off:

- Data sovereignty.
- Proximity to users (customers and colleagues).
- Only accounts without residency or latency constraints.

Do-ability:

- About 85.14% of accounts have in sustainable locations.
- 14.86% outliers moves.
- Per account review of data residency and latency required first; move is achievable where no constraint applies.

Cost:

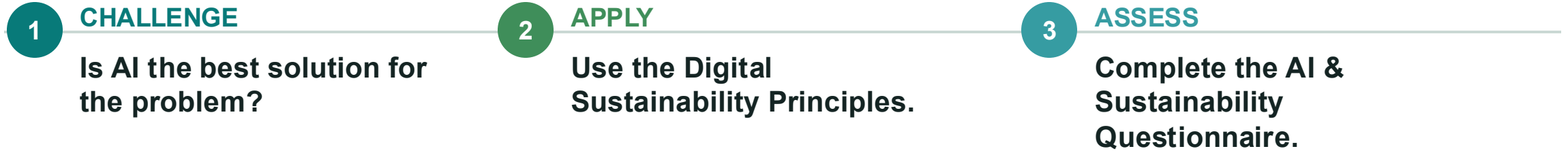
- Cost of hosting outside carbon aware regions is cheaper on average than other in carbon aware regions.
- However, we are running bigger workloads in our carbon aware regions, pushing up costs.

Carbon-aware regions are:
eu-west-1 (Ireland), eu-west-2 (London), us-west-2 (Oregon) & eu-north-1 (Stockholm)

account_class	# of account	% share	Avg_cost_per_acct
Primary region in carbon aware regions	550	85.14	56,706.2
Primary region outside carbon aware regions	96	14.86	35,449.3

Build sustainability into every AI decision

A simple three-stage check brings sustainability into our Safe Use process.



“Is AI needed?”

Start with the business need- not the technology.

Use the least resource-intensive route to the outcome.



DIGITAL SUSTAINABILITY PRINCIPLES

AI & Sustainability Questionnaire

You have an idea for an AI project—fantastic! This survey will help you ensure your approach is sustainable, efficient, and mindful of its impact on people and the planet. Please review the **AI & Sustainability Guidelines** on the Digital Sustainability Connect page before starting: cambridgeorg.sharepoint.com/sites/Connect/SitePages/Digital-sustainability-guidelines.aspx#we-re-very-excited-to-share-our-new-principle-specific-digital-sustainability-guidelines!

Section 1

Getting started - Problem Framing

Right at the start of your thinking, this is the most important question to consider.

1

Is AI the most suitable solution for your challenge, or have you explored alternatives such as scripts or traditional tools? *

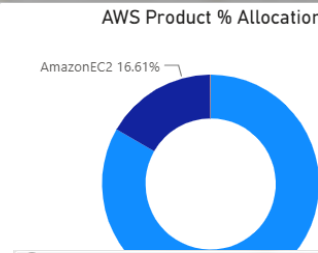
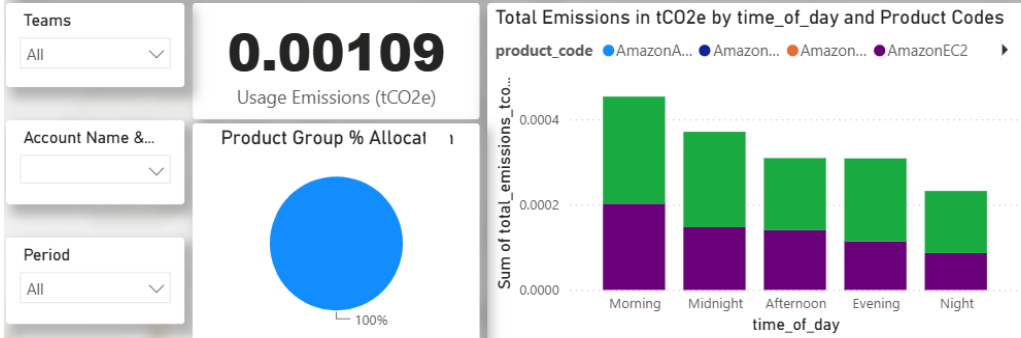
- ☐ Yes, AI is the best solution
- ☐ No, I haven't considered other options
- ☐ I considered alternatives but chose AI

AI & SUSTAINABILITY QUESTIONNAIRE

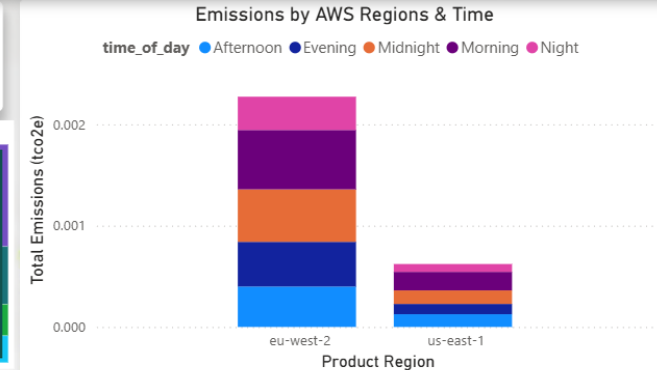
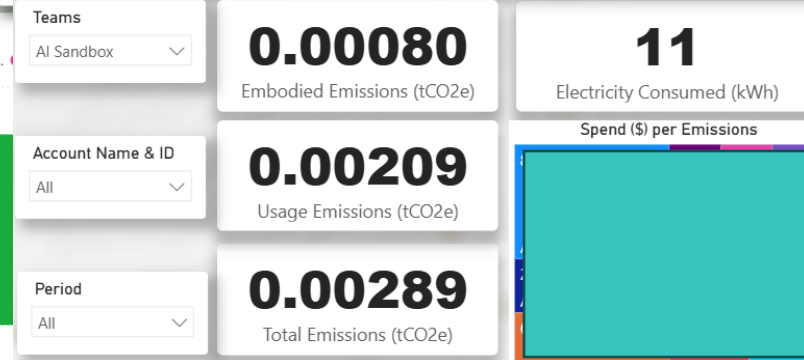
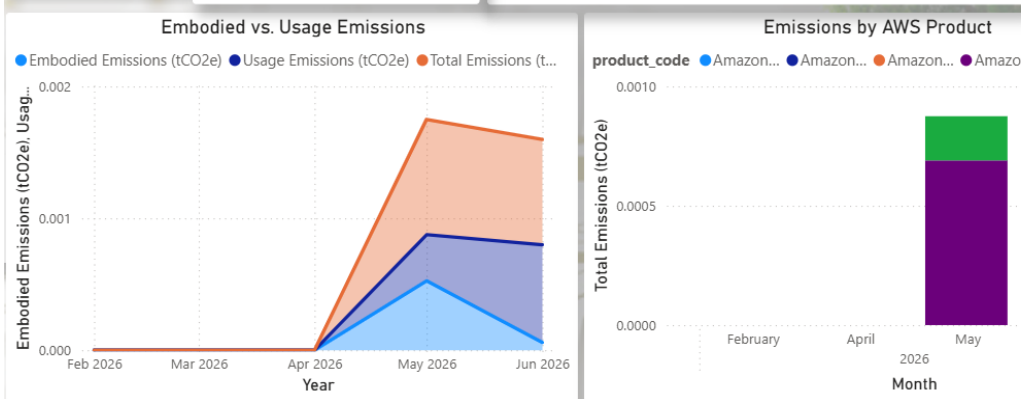
OUTCOME Sustainability becomes an explicit input to our Safe Use decision.

The AI Impact Question

Carbon Emissions by Accounts & Products



Carbon Emissions by Regions



Region of Use	Location	Emissions (tCO ₂ e)	Grid Carbon Intensity	Electricity Consumed (kWh)
us-east-1	North Virginia	0.00062115693	3.09	0.56030
eu-west-2	London	0.00227292501	1.20	10.69066
eu-north-1	Stockholm	0.00000002871	1.02	0.00113
eu-central-1	Frankfurt	0.00000000334	1.00	0.00003
eu-west-1	Ireland	0.00000002477	1.00	0.00012
us-west-1	North California	0.00000000019	1.00	0.00000
us-west-2	Oregon	0.00000000369	1.00	0.00002



CAMBRIDGE
UNIVERSITY PRESS & ASSESSMENT

People Powered Progress

**OVO's Collaborative Blueprint for
Responsible AI Use**

Mark Buss, GreenIO London, October 2026



Our people are driven by our mission

**Powering human progress with clean
affordable energy for everyone**

Plan Zero

Net-zero by 2035



Finding the Data

	Carbon Emissions	Number of Tokens	Energy Per Token	Carbon Intensity	Embodied Emissions
AI products we build					
AI productivity tools					
AI coding tools					



...enter



Finding the Data

	Carbon Emissions	Number of Tokens	Energy Per Token	Carbon Intensity	Embodied Emissions
AI products we build					
AI productivity tools					
AI coding tools					

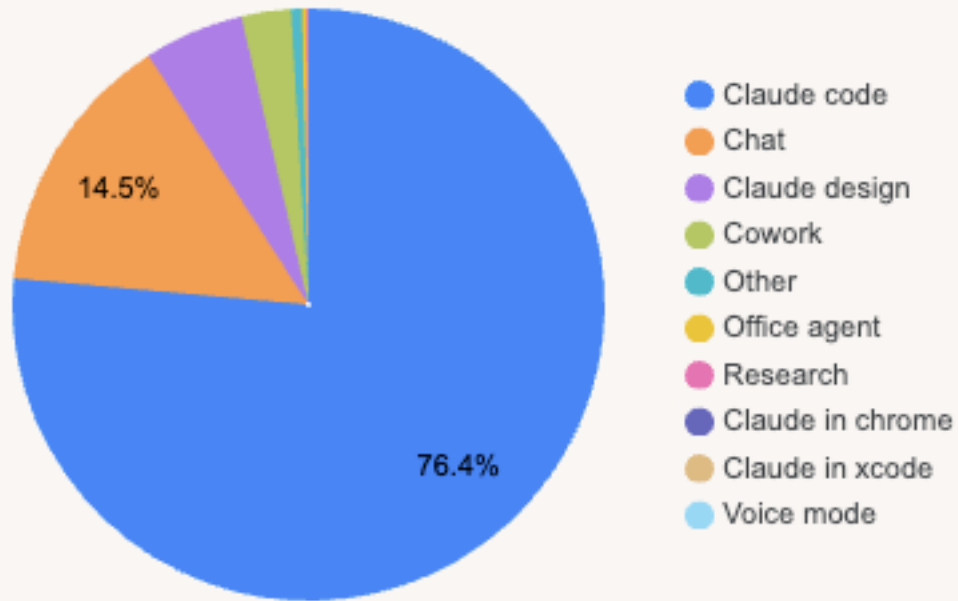


...enter

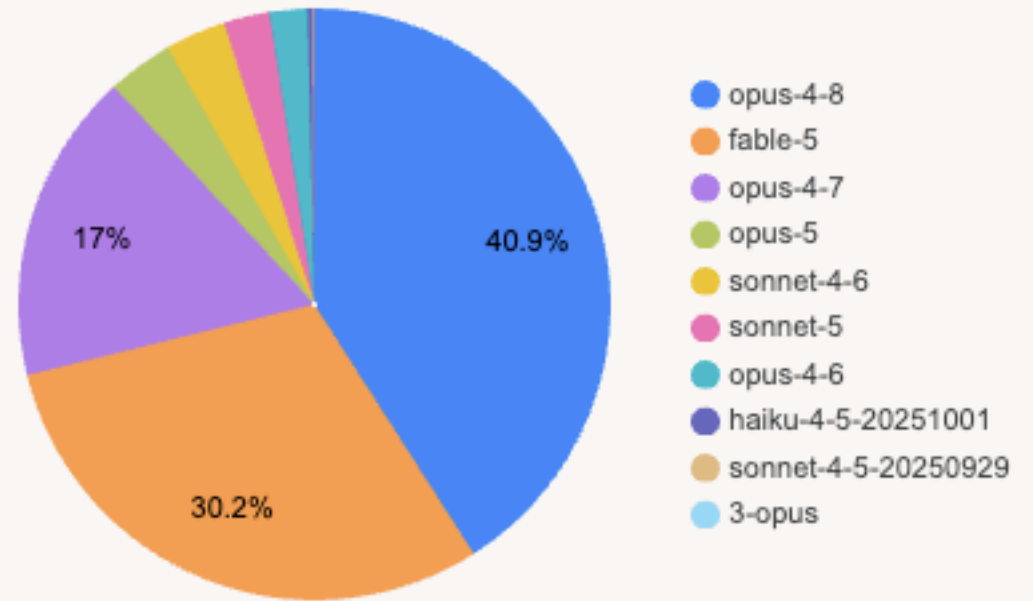
 greenpixie

Case study: Where are the impacts coming from?

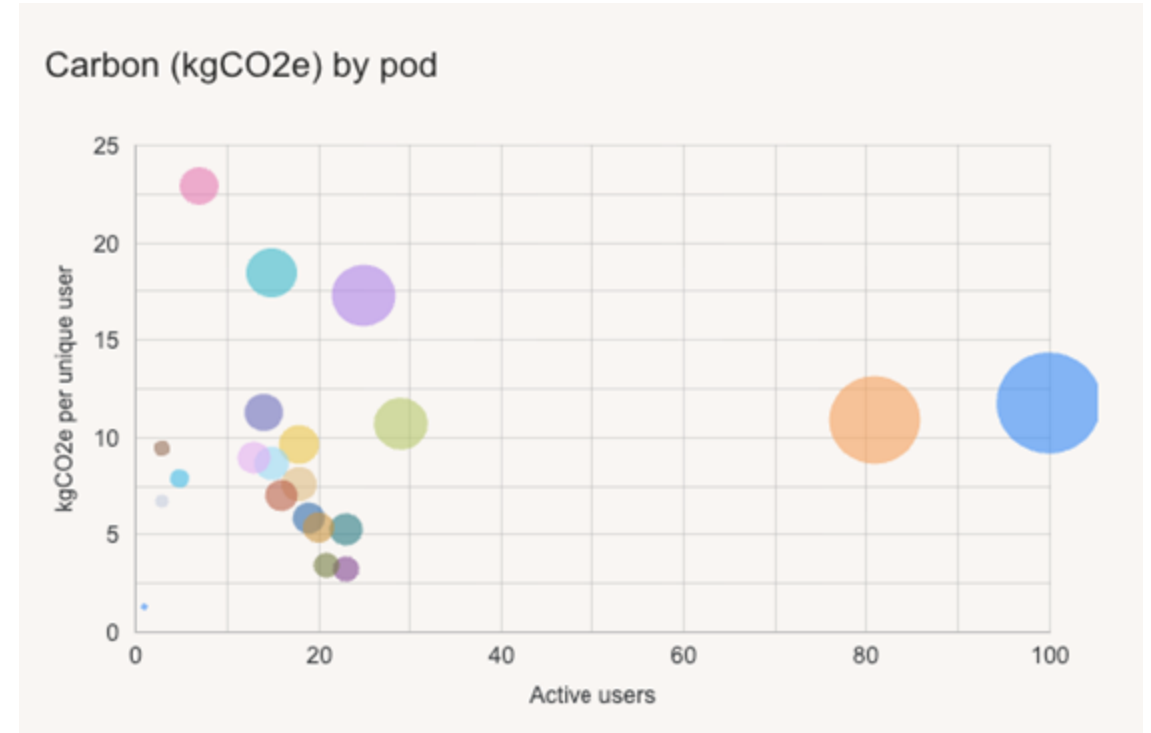
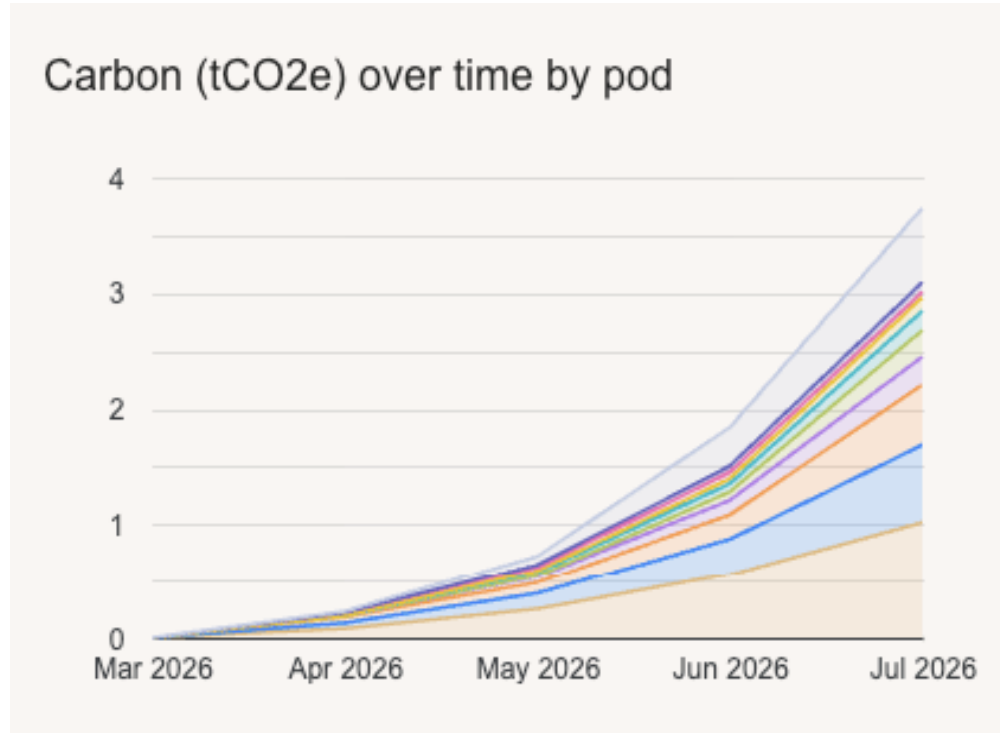
Carbon by product (tCO2e)



Carbon by model (tCO2e)

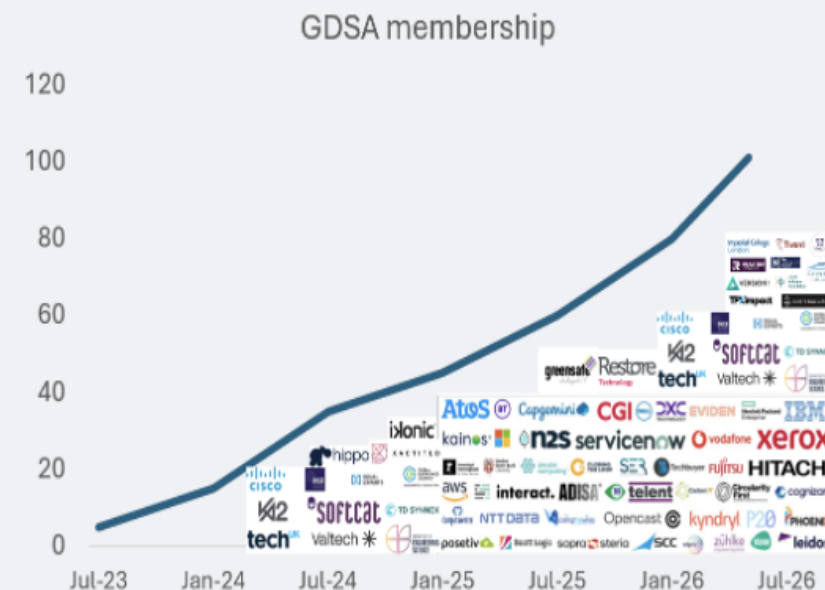


Case study: Team carbon intensity



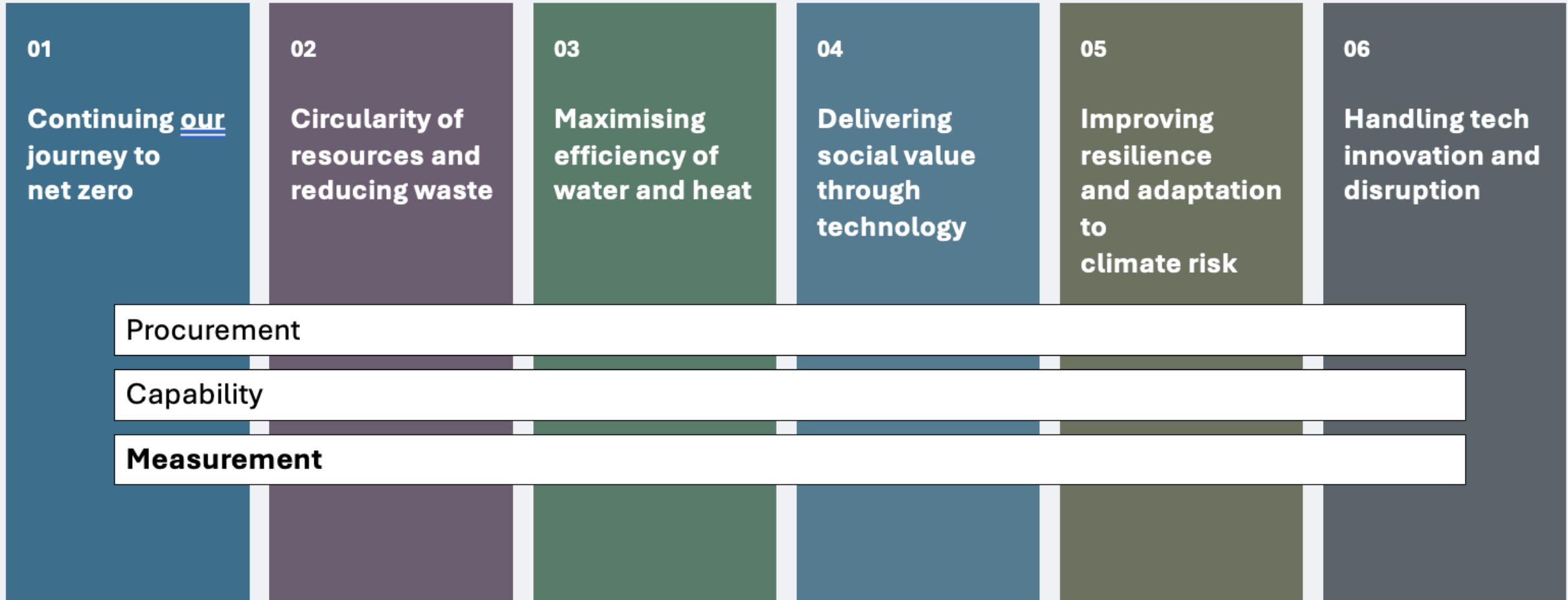


Department
for Environment
Food & Rural Affairs



UK Government's priorities for digital sustainability of its estate

Digital, Data, Technology and Security



Defra's own work so far

Sustainability Indicators

This section will help us to assess the level of sustainability impact your project may have. It will also help us to pinpoint specific guidance to help you manage particular elements of your project. For some questions, you may need to consult with your **service owner** or **solution architect** if applicable.

16. How many people will use your service annually? *

19. Will your service involve **software**? *

This includes implementing or renewing digital assets as part of your service, such as:

- digital device,
- website
- database
- artificial

22. Will your service involve **cloud & hosting** services? *

This includes implementing, renewing or utilising compute and data storage provisions as part of your service, such as:

- cloud hosting services - hosting software virtually on a third-party network, such as Azure, AWS or Google Cloud
- collocated hosting services - hosting software on servers in a rented space in a data centre

15. Deliver a sustainable service

Understand any social and environmental risks created by your service and take steps to reduce those as far as possible.

Why it's important

Defra's services aim to bring tangible environmental benefits to our society – from improving water quality to boosting the nation's resilience to flooding. Defra's can also come from the replacing existing processes that are relatively resource intensive with more lightweight and modern equivalents.

However, the use of technology for government services also contributes to climate change and other sustainability risks.

Energy use contributes to warming greenhouse gases. The mining and processing of materials to manufacture hardware can lead to water scarcity, resource depletion and biodiversity loss. The use of technology for government services can also have unintended social impacts, such as labour exploitation in the technology supply chain.

The [Government Communications](#) and Defra's [Digital Sustainability Strategy](#) set objectives to reduce the impacts of the use of digital technology.

What it means

Service teams should design, develop and operate their services to be as sustainable as possible, and set out their approach in a sustainability statement.

The sustainability statement should lay out what actions have been taken, and those that are planned, against the 11 strategic objectives of Defra's [Digital Sustainability Strategy](#).

1. Reduce greenhouse gas emissions as far as possible to contribute towards Defra's net zero target.
2. Reduce wider planetary impacts such as water consumption, land use change and biodiversity impacts.
3. Put circular products in to action, for example through extending the lifespan of existing equipment or purchasing remanufactured or refurbished hardware.

Digital Sustainability Statement for 'Dispose of Toxic Waste' Service

This sustainability statement applies to the 'Dispose of Toxic Waste' service being developed by the Department for the Environment, Food and Rural Affairs. It covers both the work being done by suppliers and teams internal to the department to design, develop and operate the service.

1. Sustainability commitment

The 'Dispose of toxic waste' service is currently at the 'Private beta' stage.

The service is currently in a 'beta' state that is as sustainable as possible. The [Digital Sustainability Strategy](#) objectives for delivery of service at 'beta' state.

Objective 1	Reduce carbon emissions from our supply chain
Objective 2	Reduce the wider planetary impacts of digital services
Objective 3	Reduce resource use and improve our resource efficiency
Objective 4	Reduce social risk and deliver social value
Objective 5	Reduce impact on biodiversity and ecosystems
Objective 6	Reduce impact on climate and environment

2. Assessing sustainability risks

The project completed a Digital Sustainability Assessment on October 20th 2024, using the Public phase.

The Digital Sustainability Assessment assigned a 'medium' level of impact for sustainability to the service.

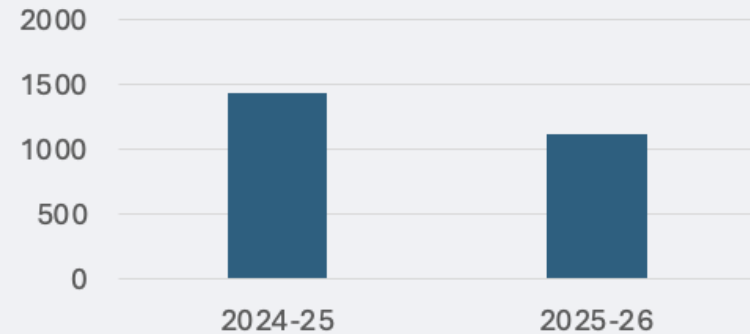
Digital Sustainability Assessment	Medium
Sustainability Impact level	Medium

The assessment period is 1 day (see below for details).

"Getting a full picture of emissions across our cloud estate is essential for us to align FinOps with GreenOps, with the information being as actionable and as comprehensive as possible. The foundations we have put in place with Greenpixie sets us up to do that. The next stage will be better integrating of cost and carbon reporting to help us demonstrate the full value of optimisation initiatives and provide a stronger incentive for teams to pursue FinOps-driven improvements."

- Defra Cloud Team

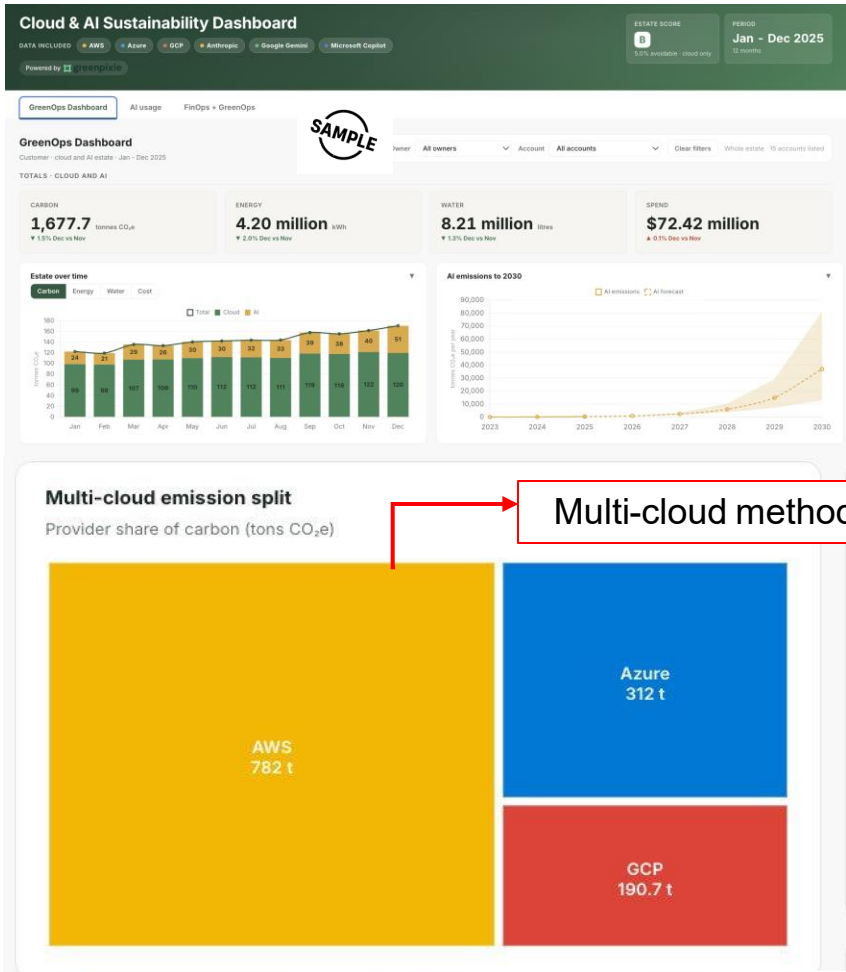
Defra hosting emissions



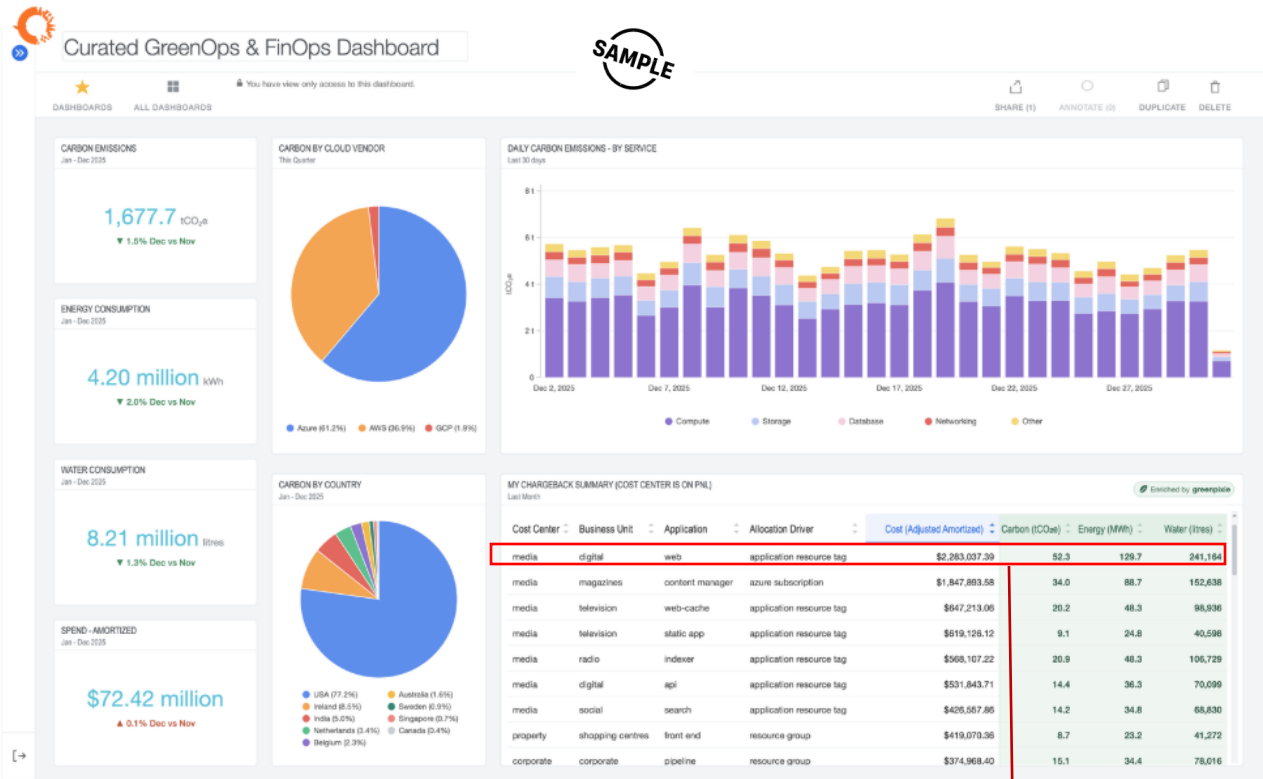
■ Defra hosting emissions

Next steps with Greenpixie

What we've got:
Full picture across cloud estate



What's next: FinOps and GreenOps alignment



Energy, carbon, and water
reduction strategies

COME JOIN US FOR DINNER

TONIGHT



✦ Private Event

GreenOps After Hours: Dinner with Greenpixie

 Greenpixie Events >

OCT

1

Thursday 1 October

18:30 - 22:30



Caravan City ↗

London, England