Technology Carbon Standard

and the Carbon Estimator Tool

Oliver Cronk & David Rees, May 2024

Oliver Cronk

- Computer Science vs Science
- Software & Infra Engineer roots
- **Energy and Environmental Consultancy** experience
- Tech Architect in the Energy Sector and many other sectors
- Chief Architect – Big 4 and Cyber
- How do we Architect a better Tomorrow **#ArchitectTomorrow**
- Now **leading on Sustainable Architecture at Scott Logic** (a B Corp Software/Data Consultancy)
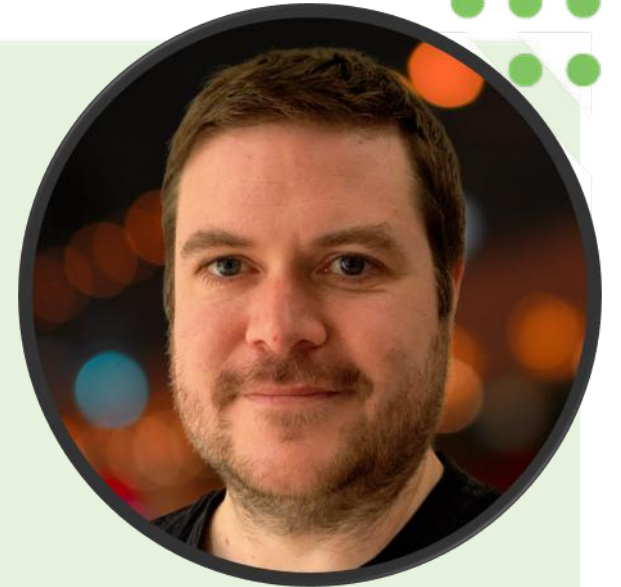
David Rees

- Broad background in Product, UX/UI Design and Architecture
- Specialising in front-end sustainable technology and user devices
- Instrumental in the creation of the Tech Carbon Standard, which we will talk about later
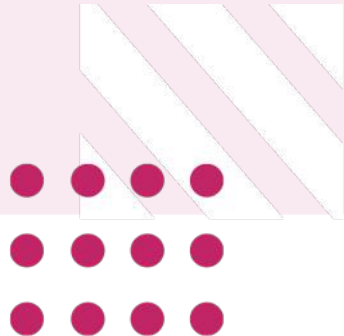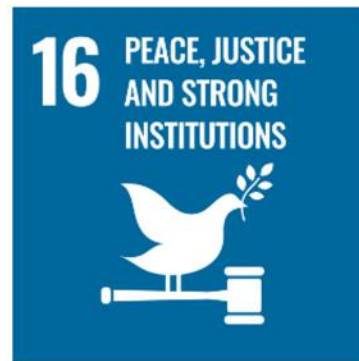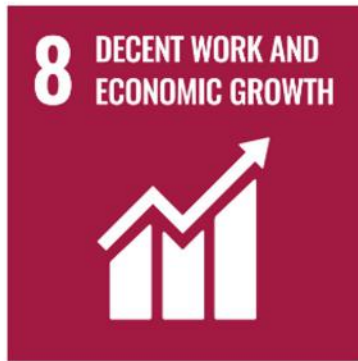
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Where are you on your tech sustainability journey?

The Two Sides of the Tech Coin

Digital

Physical

Tech as a force for good vs the impact of Tech

https://sdgs.un.org/goals

Environmental Impacts
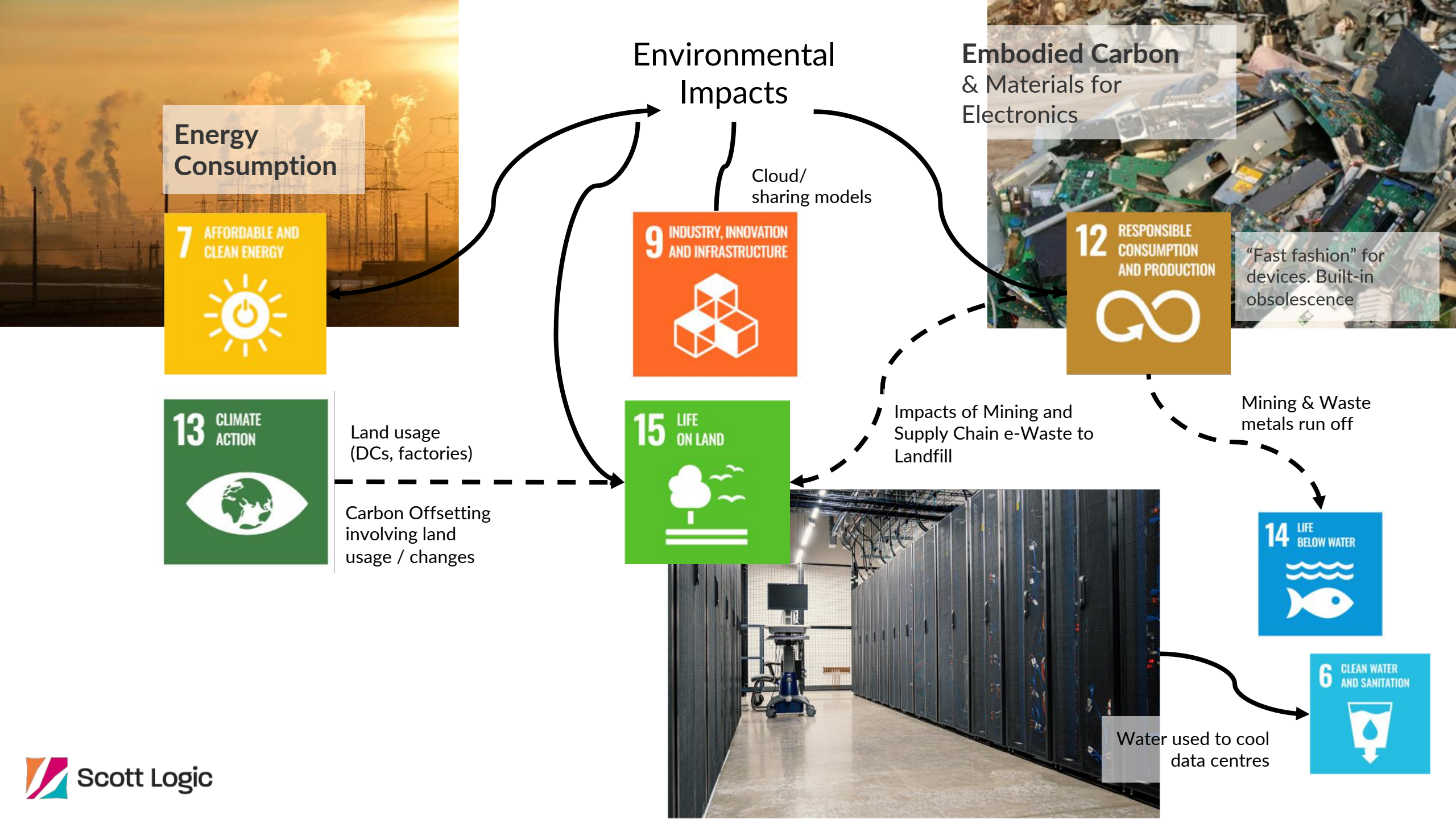
Energy Consumption

Embodied Carbon & Materials for Electronics

Cloud/ sharing models

"Fast fashion" for devices. Built-in obsolescence

7 AFFORDABLE AND CLEAN ENERGY

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

15 LIFE ON LAND

14 LIFE BELOW WATER

6 CLEAN WATER AND SANITATION

Land usage (DCs, factories)

Carbon Offsetting involving land usage / changes

Impacts of Mining and Supply Chain e-Waste to Landfill

Mining & Waste metals run off

Water used to cool data centres

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Technology Carbon Standard

part of the Sustainable Technology Framework
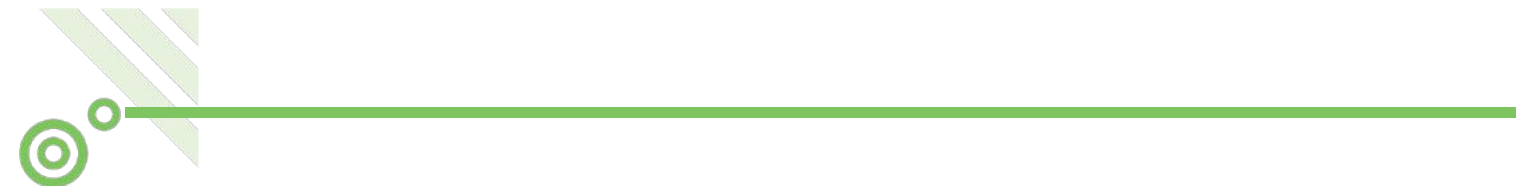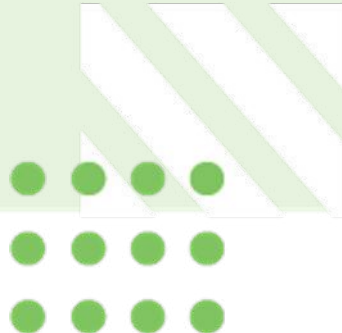
www.techcarbonstandard.org

Why?

Why?

- Sign-post organisations to a collection of useful information and resources.

- Standardise the methodologies used to calculate technology emissions.

- Create a consistent language and structure for reporting technology emissions.

So, what is it?

Technology Carbon Standard
part of the Sustainable Technology Framework

Upstream Emissions	Operational Emissions	Downstream Emissions

Category U | 3

Category D | 3

Software

- Off The Shelf including Open-Source Software

Hardware Manufacture, Transport and Installation

- User Hardware (laptops, printers, etc)
- Networking and Infrastructure Hardware
- Servers and Storage Hardware

Direct

Category O | 2

- User Devices
- Networking and Infrastructure
- Servers and Storage
- Generators

Category G | 1

Indirect

Category C | 3

- Cloud Services
- SaaS
- Managed Services

End Use (B2B, B2C)

- End-User Devices
- Network Data Transfer
- Downstream Infrastructure

Information and Guidance

- In-depth explanation of the categories and items

- Guides and methodology to measuring the technology

- Useful resources and Glossary

Carbon Estimator Tool

- Allows an organisation to provide high-level values about their technology estate

- Returns the estimated carbon emissions of the organisation's technology

- Produces a treemap graphic to visualise the emissions comparatively across the technology estate

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Technology Carbon Estimator

Organisation ⌃

To understand the scale of your emissions, we estimate based on the number of employees and the proportion of desktops to laptops specified. This may be an overestimate if a significant number of employees are not provided with devices, or an underestimate if they typically have more than one.

How many employees are in the organisation?

100

What percentage of those employee devices are desktops or laptops?

Desktops 50%   Laptops 50%

Where are your employees primarily located?   ⑦

Globally	⌄

On-Premise Servers ⌃

We'll use the number of servers you use on-prem and their primary location to estimate the direct operational emissions. If this is unknown, we'll give an initial estimate based on the 10% of the number of employees. This is reduced based on the percentage of cloud services that you report you make use of.

How many on-premise servers do you use?

☐ I don't know

Number of Servers:

10

Where are they primarily located?   ⑦

Globally	⌄

Cloud Services ⌃

Tell us about your cloud services you use.

☐ We don't use cloud services

What percentage of your servers are cloud services vs on-premise?

Cloud 50%   On-premise 50%

Where are your cloud servers primarily located?   ⑦

Globally	⌄

We have derived a rough figure to give a ratio from US dollars spent to kWh of energy used in data centres.

What is your monthly cloud bill?

$0 - $1K	⌄

End-Users ⌃

Tell us about your end-users - this refers to any users of your digital services outside of your organisation. This includes visitors to your web sites, web applications and services like B2B API requests. At present we focus on the downstream impact of web based services, estimating an amount of time spent in hours and of Data transferred in GB per month.

☐ We don't have any external users of our digital services

What's the primary purpose of your digital services?   ⑦

Unspecified (uses average)	⌄

Where are your end-users primarily located?   ⑦

Globally	⌄

How many monthly active users do your digital services have?

100

What percentage of your end-users are mobile or personal computer users?   ⑦

Mobile 50%   Computer 50%

[Reset] [Calculate]

Technology Carbon Estimator

Organisation

To understand the scale of your emissions, we estimate based on the number of employees and the proportion of desktops to laptops specified. This may be an overestimate if a significant number of employees are not provided with devices, or an underestimate if they typically have more than one.

How many employees are in the organisation?

```
100
```

What percentage of those employee devices are desktops or laptops?

Desktops 50%   Laptops 50%

Where are your employees primarily located?   ⑦

```
in the UK                                                          ⌄
```

On-Premise Servers

We'll use the number of servers you use on-prem and their primary location to estimate the direct operational emissions. If this is unknown, we'll give an initial estimate based on the 10% of the number of employees. This is reduced based on the percentage of cloud services that you report you make use of.

How many on-premise servers do you use?

☐ I don't know

Number of Servers:

```
5
```

Where are they primarily located?   ⑦

```
Globally                                                           ⌄
```

Cloud Services

Tell us about your cloud services you use.

☐ We don't use cloud services

What percentage of your servers are cloud services vs on-premise?

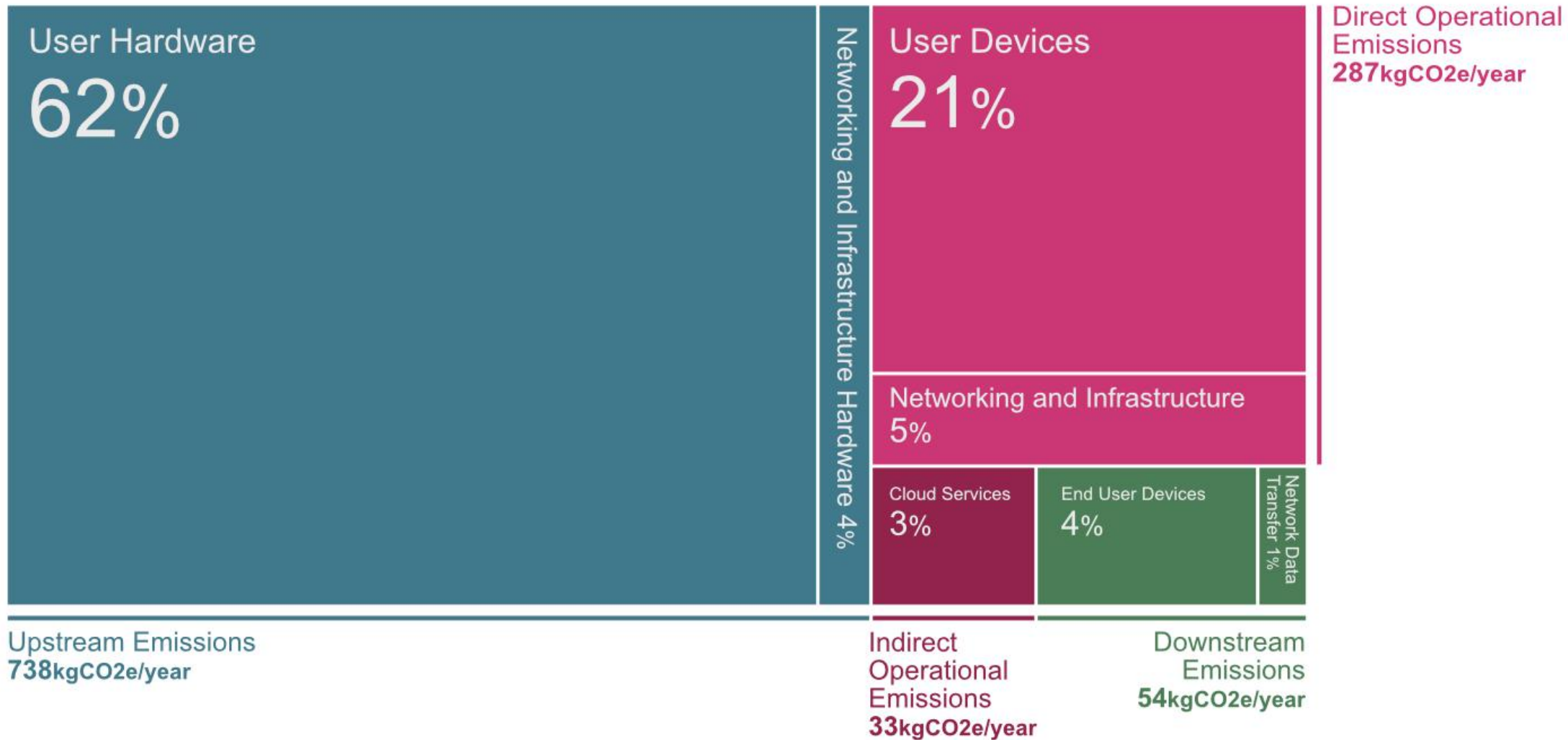Cloud 50%   On-premise 50%

Estimations

The estimations are divided into 4 categories: Upstream Emissions, Operational Direct Emissions, Operational Indirect Emissions, and Downstream Emissions.

■ Upstream Emissions - 13% ■ Direct Emissions - 28% ■ Indirect Emissions - 23%
■ Downstream Emissions - 36%

Assumptions and limitations

Total Carbon Emissions **1112kgCO2e/year**

User Hardware
62%

Networking and Infrastructure Hardware 4%

User Devices
21%

Direct Operational Emissions
287kgCO2e/year

Networking and Infrastructure
5%

Cloud Services
3%

End User Devices
4%

Network Data Transfer 1%

Upstream Emissions
738kgCO2e/year

Indirect Operational Emissions
33kgCO2e/year

Downstream Emissions
54kgCO2e/year

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Get Involved

https://www.techcarbonstandard.org

https://blog.scottlogic.com

Feel free to contact us for a friendly chat