

Navigating the Green Path

Plan A's Journey to Sustainable IT

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Principal Engineer

planA

goto;



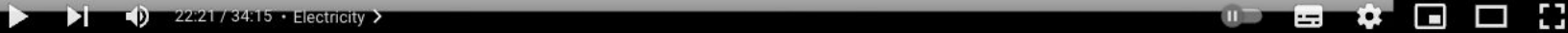
2/ Electricity

Build applications that are **energy efficient**

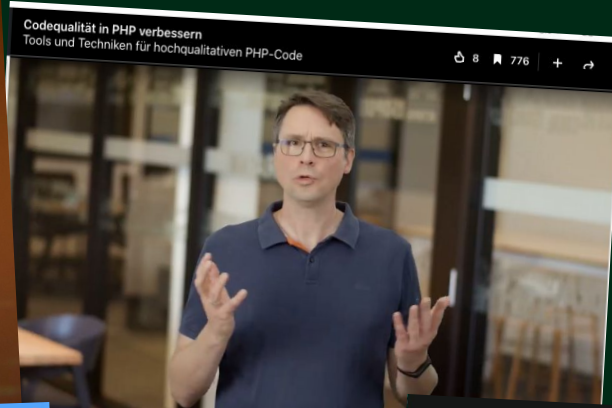


@JAWACHE / PRINCIPLES.GREEN

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Who is this?



en Windler
 al Engineer



CARSTEN WINDLER | ALEXANDRE DAUBOIS

planA



Collect & Process Complex Data



Measure Scope 1, 2 & 3 Emissions



Set Science-Based Targets



Leverage Granular Decarbonisation Actions



Receive Expert Guidance



Ensure Compliance with ESG Regulations

planA Collect & update data Measure emissions Reduce emissions Report & communicate

Overview

Organisational data

- Scope 1
- Scope 2
- Scope 3

Data collection

Data is the raw material of your emissions calculation - high quality and complete data yields accurate emissions estimations. The better your emissions estimations, the more targeted your decarbonisation actions will be.

Organisational data Update data

Scope 1

- Stationary combustion Update data
- Mobile combustion Update data
- Fugitive emissions Update data

Scope 2

- Purchased electricity Update data
- Purchased heating Update data

Emissions Action Plan Compensation ESG

Action Plan

Here's a selection of action items to get you started. These items have been picked based upon your worst performing indicators as per your emission levels and sustainability commitments so far. Select an action and set the timeframe to create your pathway to reduction.

My Emission Forecast

Legend: Emissions over time, Emissions trajectory, Action end date

Action Item	CO2e	Status	Settings
Install light sensors in the office	667.35	On	🗑️
Implement cycle-to-work programme	667.35	On	🗑️
Switch to A+ equipment in the office	282.07	On	🗑️
Switch to a green energy provider	282.07	On	🗑️
Implement flight offsetting scheme	694.87	Off	🗑️
Clean your inbox	227.03	Off	🗑️
Switch to green servers	667.35	Off	🔄

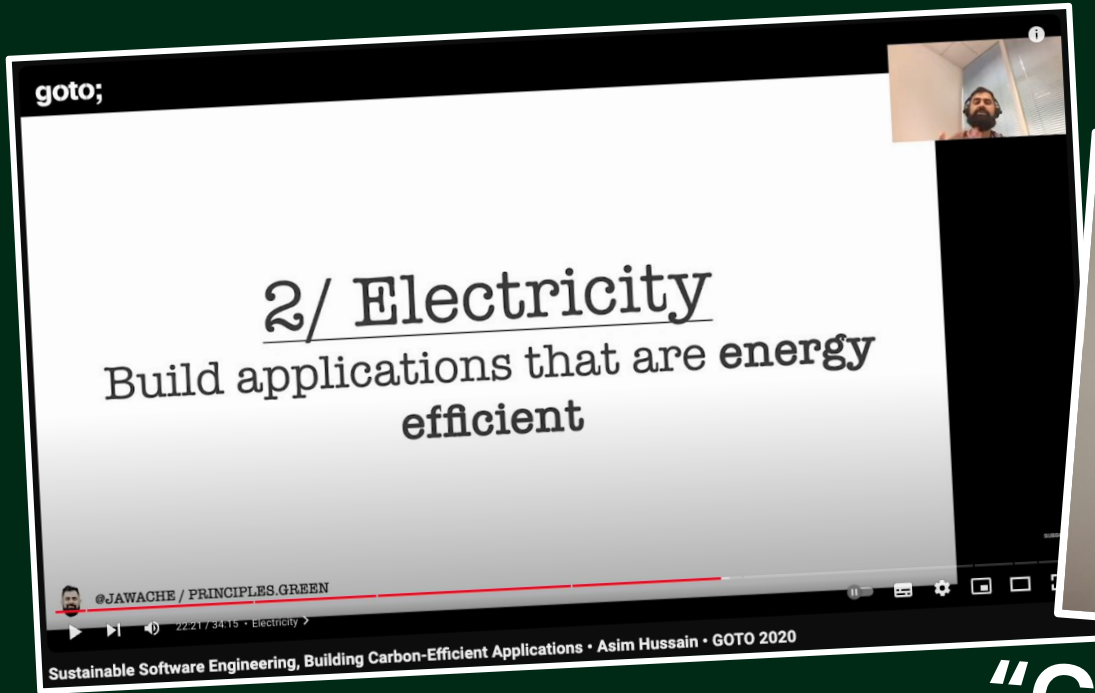
This chart shows your current emissions since you began monitoring them, and the predicted emissions trajectory for the next 1, 5 and 10 years based on your current emitting activities. Each time an action is planned, your emissions reduction trajectory line will decrease.

Plan A's Journey to Sustainable IT

- 01 How it started
- 02 How it went so far
- 03 Where we are now
- 04 Where we want to be

How it started

How it started

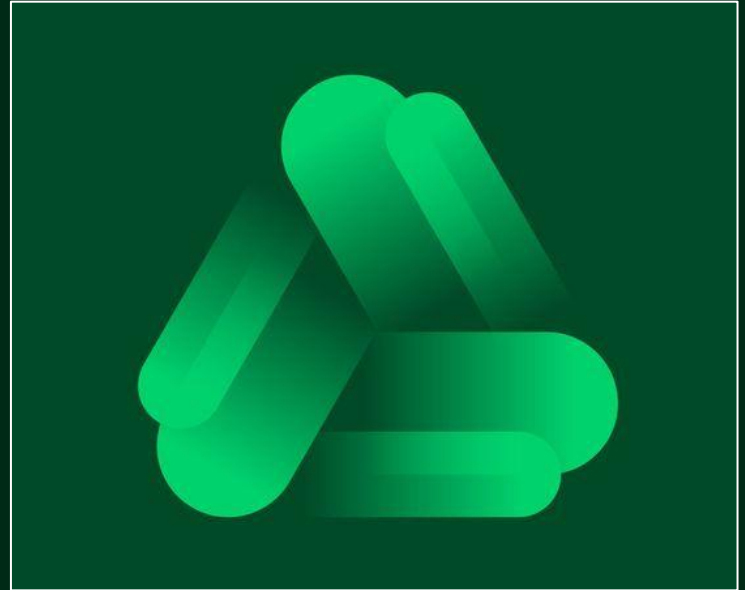


“Climate Quitting”

Plan A – 2 years ago

The Beginning

- No sustainable software engineering
- Unaware of own IT emissions
 - Spent based approach
 - Not granular
 - Not suited for optimization
- Unknown emissions of our customers



Develop a green mindset among developers

Let's get started

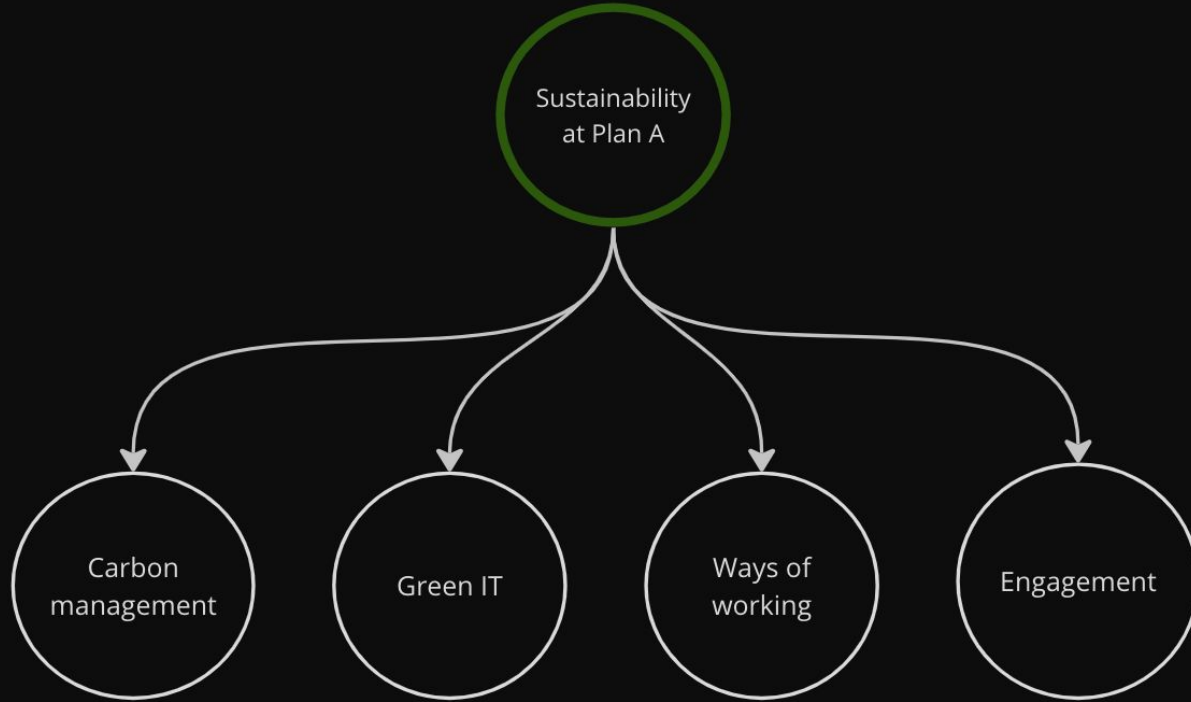
- GreenTech company
 - Sustainability minded people
- Start talking about carbon emissions of software
 - E.g. Pull vs Event-Driven
- Being active
 - Social Media
 - Articles
 - Conference talks
 - Inhouse sessions
- Forming the Green IT Chapter



<https://www.pexels.com/photo/a-man-rolling-up-his-sleeve-4827144/>

How it went so far

Sustainability Initiative



Obstacles on the way

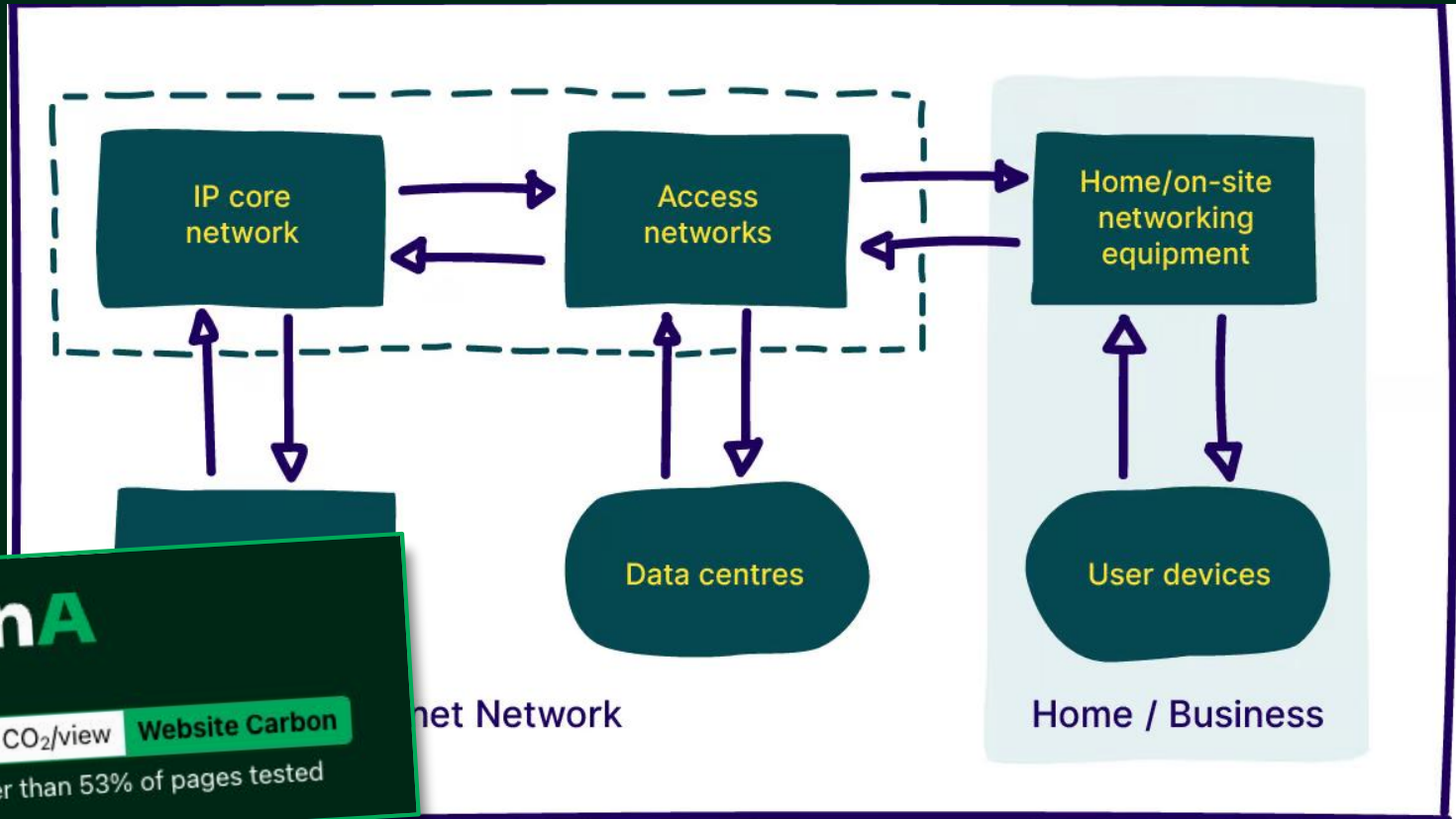
Obstacles

- Ignorance
 - “Has no effect anyway”
- Management
 - “Emissions are too small”
- Workload
 - Not enough time during sprints

Remedies

- Be resilient
- Be patient
- Keep the narrative
- Find allies
- Go that extra mile
- Showcase

How to measure IT emissions?

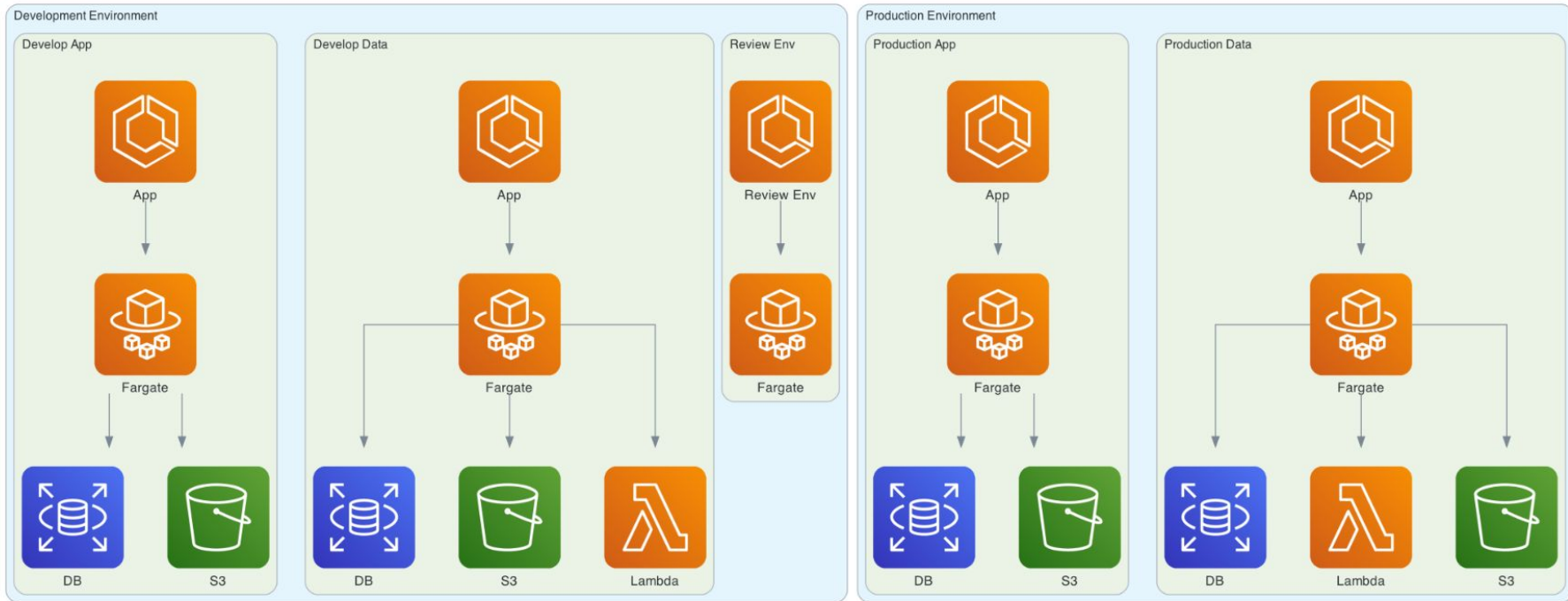


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0.45g of CO₂/view **Website Carbon**

Cleaner than 53% of pages tested

Our infrastructure (excerpt)



Plan A

AWS Customer Carbon Footprint "Tool"

Start month: May 2021 | End month: Jan 2024 | Download

Your carbon emissions summary

Compares your carbon emissions with on-premises computing equivalents


0.0 MTCO ₂ e Your estimated AWS emissions	0.0 MTCO ₂ e Your emissions saved on AWS
--	---

Your emission savings

0.0 MTCO ₂ e Saved from AWS renewable energy purchases	0.0 MTCO ₂ e Saved by using AWS computing services
---	---

Your emissions by geography

You don't have any carbon emissions for this time period.





Cloud Providers: 4 of 4

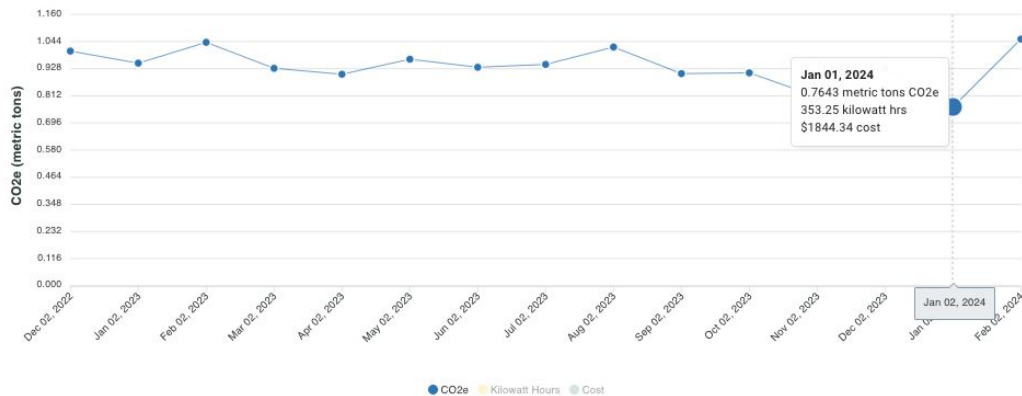
Accounts: 16 of 16

Services: 8 of 8

Start Date → End Date

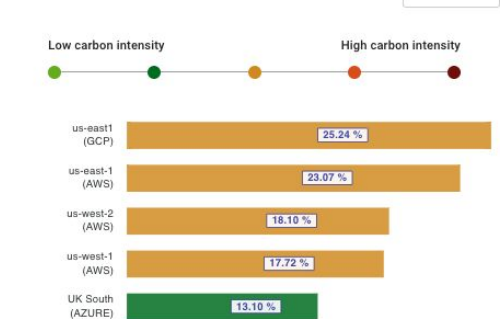
1M 3M 6M 12M ALL

Cloud Usage



Your cumulative emissions are
14.1 metric tons CO2e
 that is equivalent to

Emissions Breakdown



Cloud Carbon Footprint

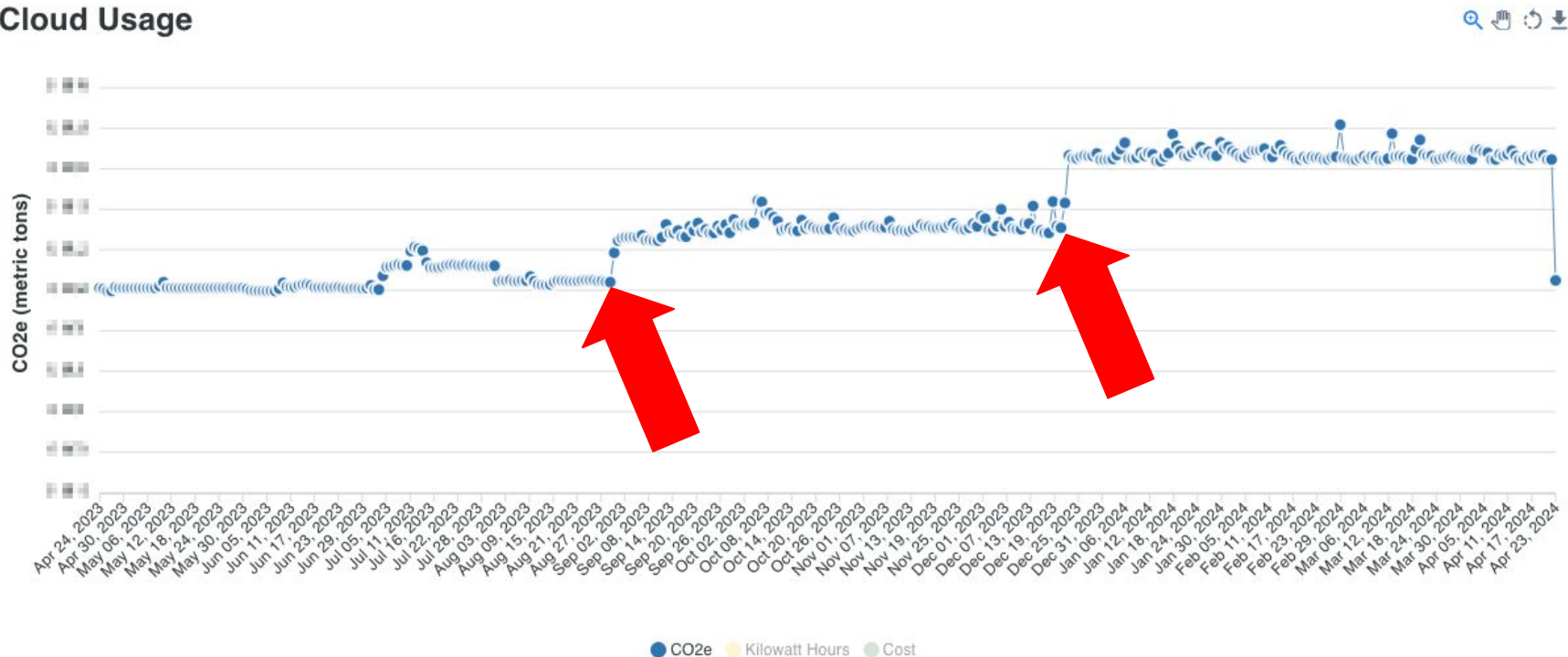
<https://www.cloudcarbonfootprint.org>

emissions from
 ne way flights
 C to London

Where we are right now

Cloud emissions (last 12 months)

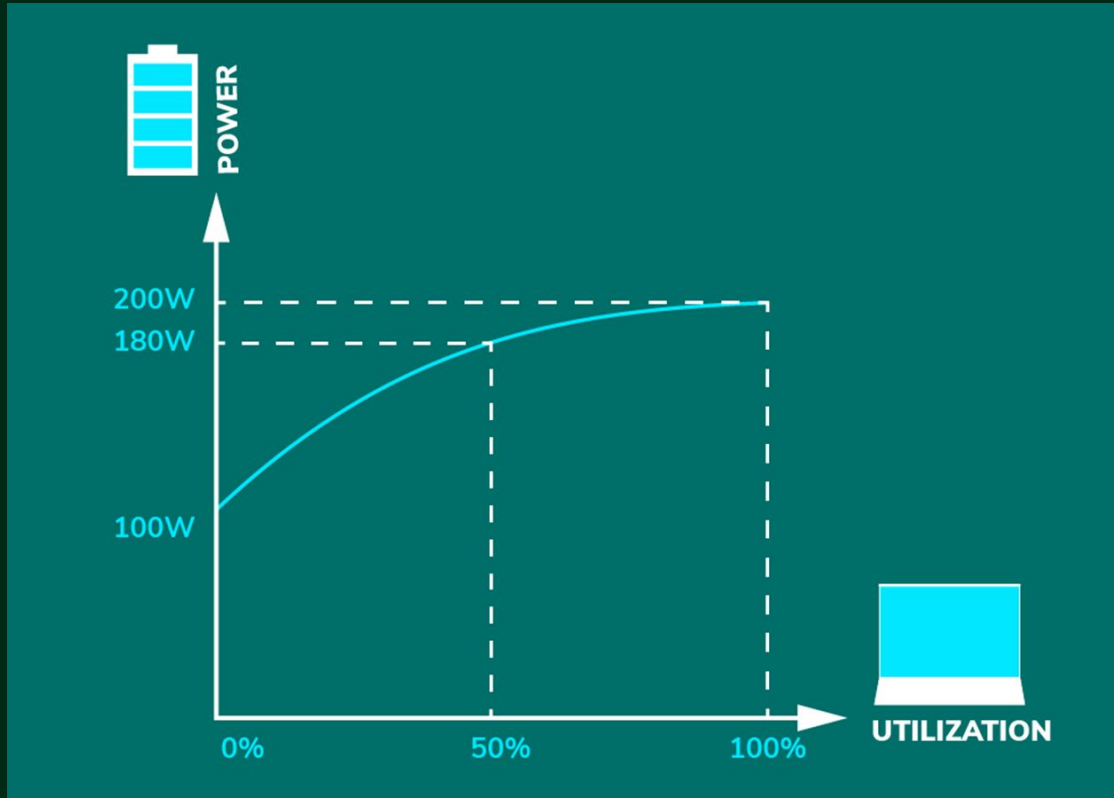
Cloud Usage



Cluster utilization



Energy proportionality



<https://learn.greensoftware.foundation/energy-efficiency#energy-proportionality>

Low hanging fruits



“Slightly” overprovisioned

- Auto-scaling
- Easy to set up

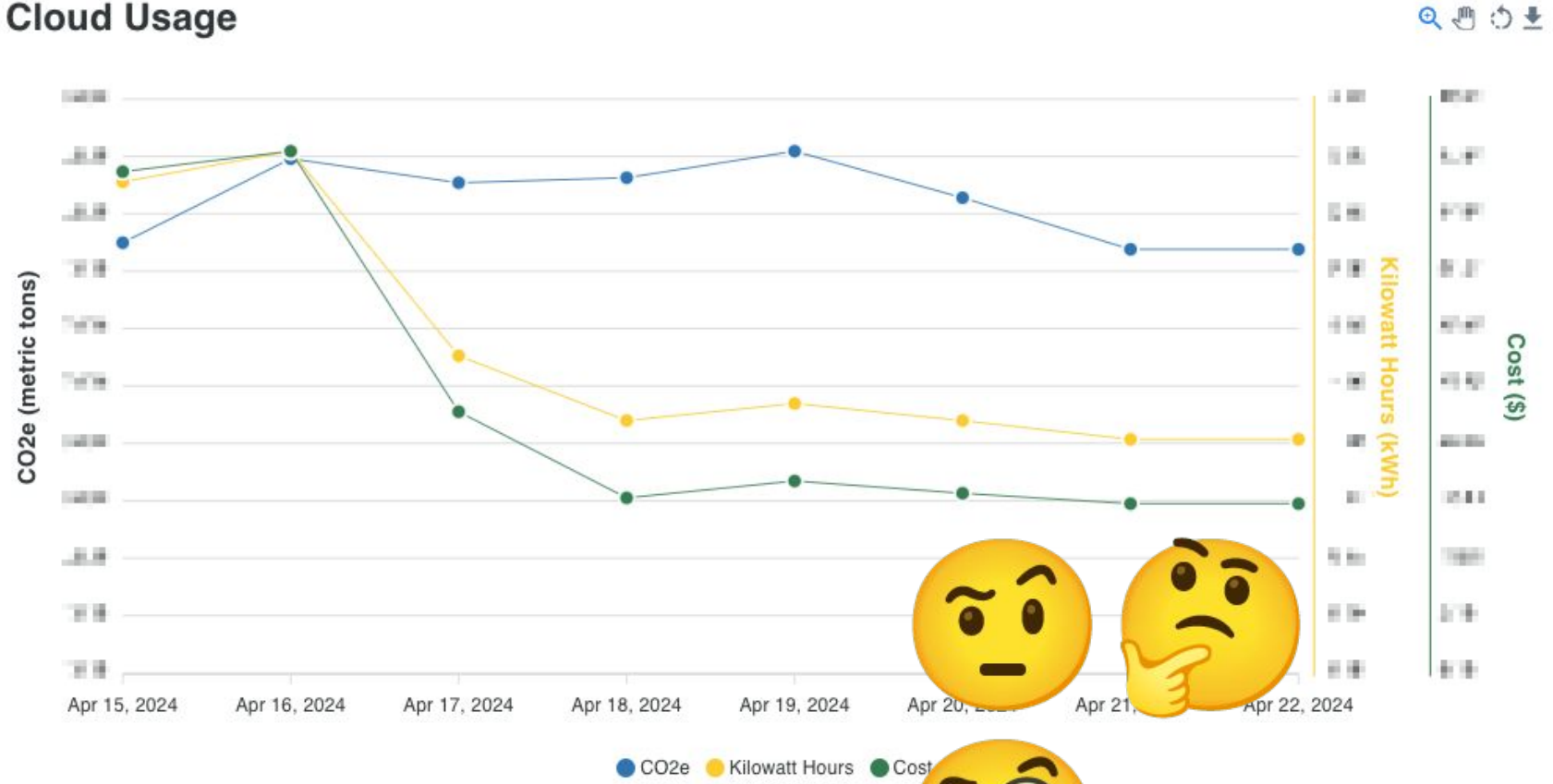
Carbon == money?

- Cloud computing
 - Money spent roughly indicates carbon emissions
 - Reducing emissions saves money
- How much carbon will we save?
- How much money will we save?

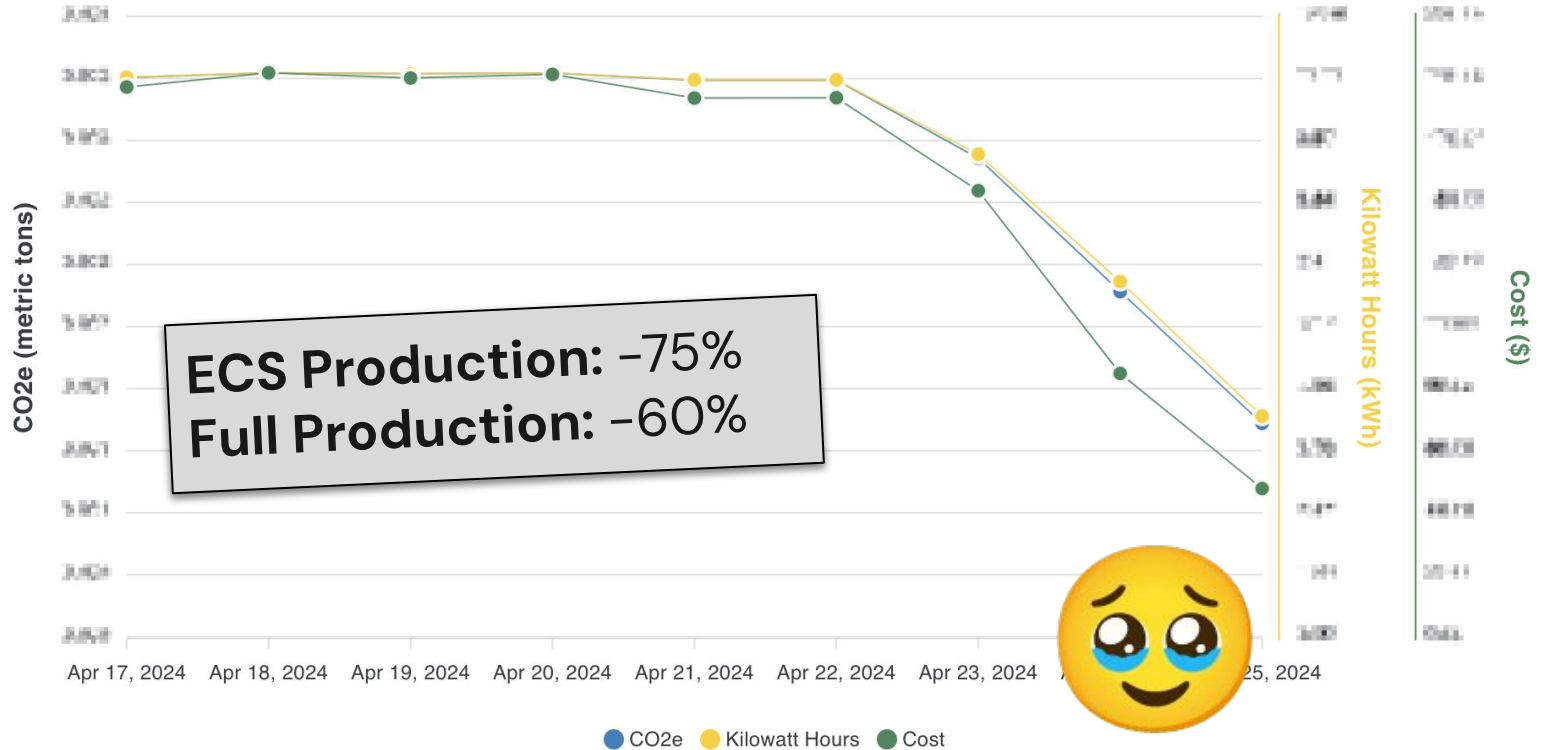


<https://www.pexels.com/photo/a-businessman-counting-paper-bills-8872403/>

Cloud Usage



Cloud Usage



ECS Production: -75%
Full Production: -60%

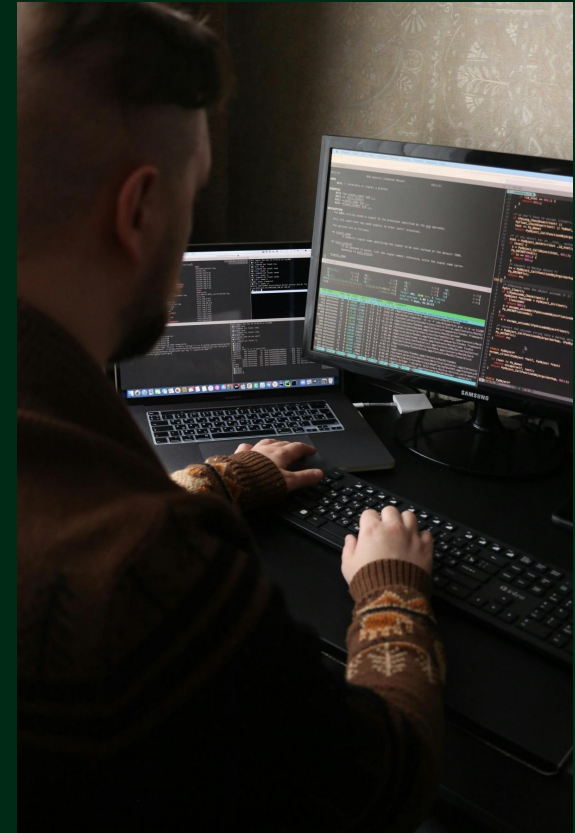


● CO2e ● Kilowatt Hours ● Cost

Carbon = money

But ... wasn't that a DevOps job?

- Short answer: "Yes, but"
- Error in policy configuration
- Never checked due to "reasons"
- Green IT was the reason to optimize



<https://www.pexels.com/photo/person-in-brown-long-sleeve-shirt-typing-on-a-keyboard-9553909/>

Next steps



<https://www.pexels.com/photo/crop-kid-weighing-on-scale-4474052/>

Short-term measures

- Fine-tune autoscaling
- Network and storage
 - Logs
 - S3
- Other optimizations
 - PHP server settings
 - Python optimization
- Rightsizing
 - DB instances
 - Fargate instances
 - Lambdas

Rightsizing

Savings opportunities [Info](#)

Explore your savings opportunities using the filters below.

Resources with estimated savings

Group related recommendations

< 1 > 

	Estimated monthly savings ▲	Top recommended action ▼	Current resource summary	Recommended resource st
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="radio"/>	US\$14.78	Rightsize	1024.0 vCPU/2048 MB memory	512.0 vCPU/2048 MB mem
<input type="radio"/>	US\$14.78	Rightsize	1024.0 vCPU/2048 MB memory	512.0 vCPU/2048 MB mem
<input type="radio"/>	US\$13.60	Purchase Reserved Instances (Reserved Node)	-	2 cache.t4g.micro in eu-we
<input type="radio"/>	US\$9.01	Rightsize	512.0 vCPU/1024 MB memory	256.0 vCPU/512 MB memo
<input type="radio"/>	US\$7.21	Rightsize	512.0 vCPU/1024 MB memory	256.0 vCPU/512 MB memo

Shorter lifetime of review environments

Services (7) [Info](#)

[Manage tags](#)[Update](#)[Delete service](#)[Create](#)

Filter launch type

Any launch type

Filter service type

Any service type

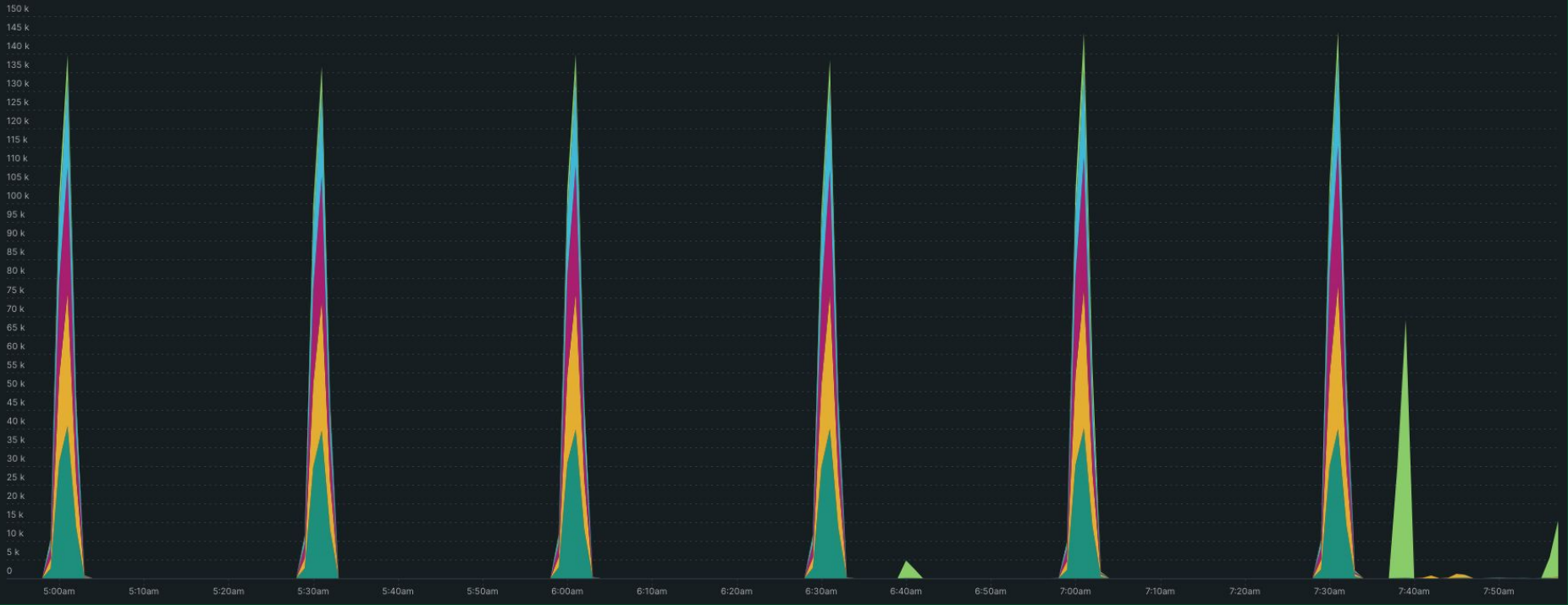
< 1 >



<input type="checkbox"/>	Service name	ARN	Status	Service type	Deployn
<input type="checkbox"/>	feature-dc-1236-action-translation-content-crud	arn:aws:ec...	Active	REPLICA	
<input type="checkbox"/>	ar-482-be-export-methodology-columns-are-added-to-al...	arn:aws:ec...	Active	REPLICA	
<input type="checkbox"/>	onb-1893-change-closed-at-and-opened-at-types-on-the...	arn:aws:ec...	Active	REPLICA	
<input type="checkbox"/>	ar-468-be-create-an-endpoint-for-business-activity-charts	arn:aws:ec...	Active	REPLICA	
<input type="checkbox"/>	tools	arn:aws:ec...	Active	REPLICA	
<input type="checkbox"/>	traefik	arn:aws:ec...	Active	REPLICA	
<input type="checkbox"/>	feature-dc-933-introduce-new-categories	arn:aws:ec...	Active	REPLICA	

Software Architecture

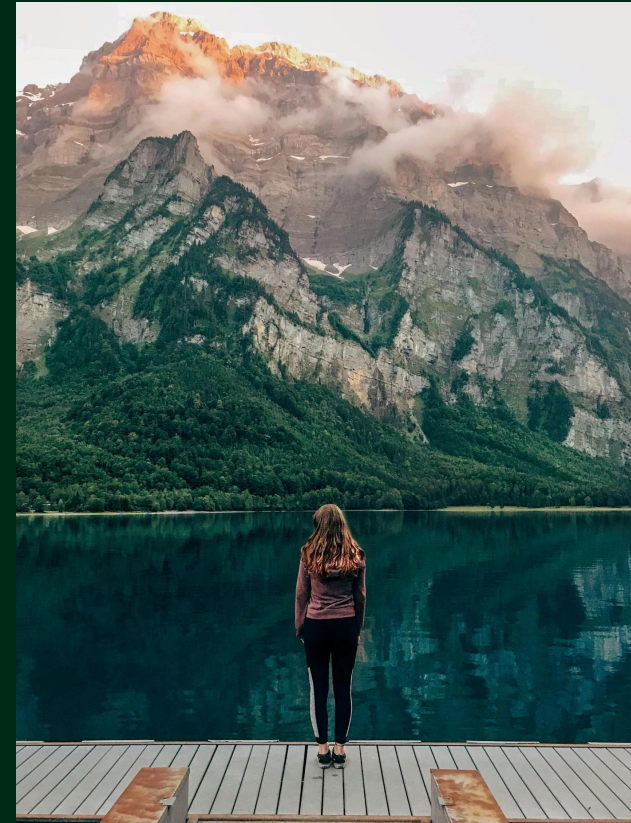
Top 5 database operations
By time consumed



Where we want to be

What's next

- Measuring emissions
 - Cloud ✓
 - 3rd party services 📋
 - Break down by service 📋
- Optimizations
 - Infrastructure ✓ 📋
 - Architecture ✓ 📋
 - Code 📋
- Customer emissions
 - How to calculate? 📋



<https://www.pexels.com/photo/back-view-of-a-woman-standing-on-brown-wooden-planks-1232594/>

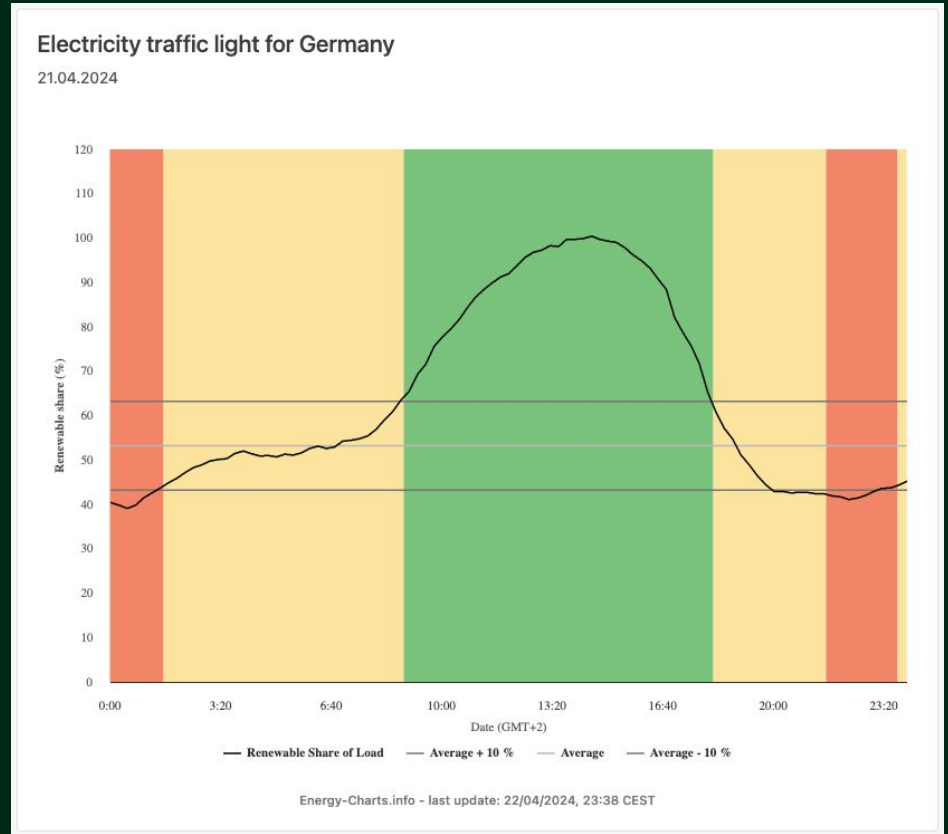
Go beyond optimization



Go beyond optimization

Carbon-awareness

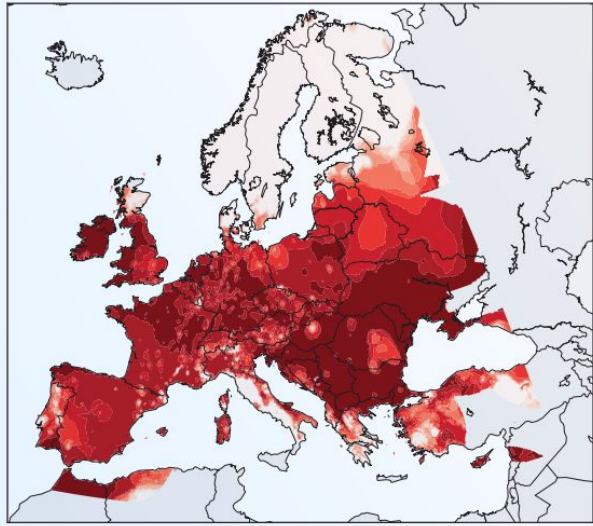
- Use energy when it's the greenest
- Criticism
 - Large scale?
 - How to measure savings?
- This is just the beginning
 - Exploring possibilities
 - Later: APIs which indicate best usage?



https://energy-charts.info/charts/consumption_advice/chart.htm?l=en&c=DE&dateimepicker=21042024

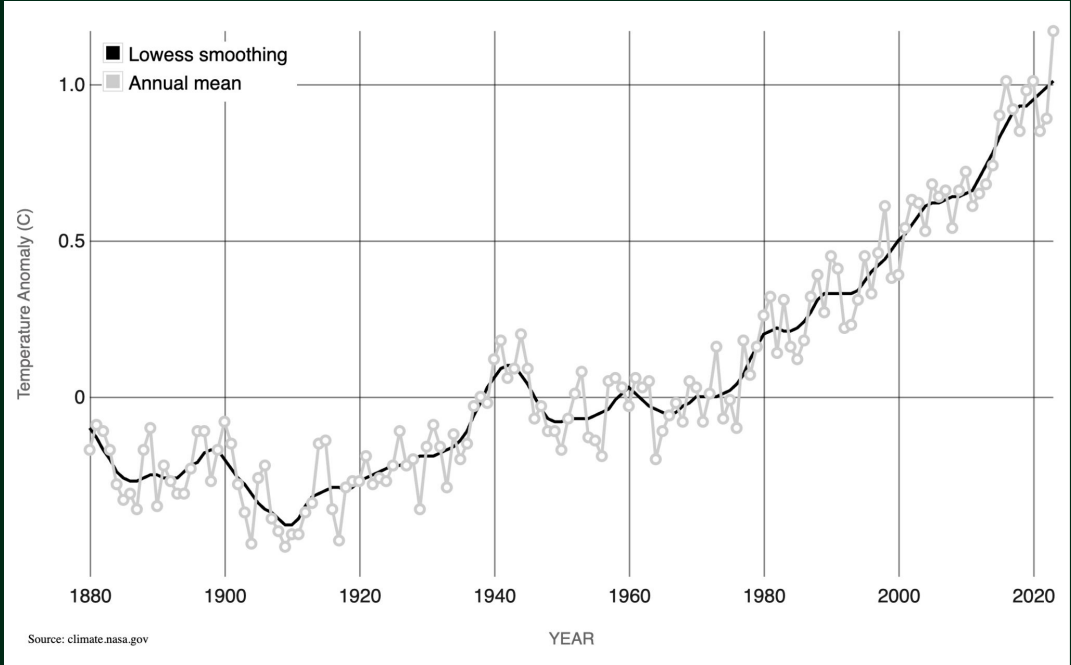
Is it worth it?

"It's not worth the effort"



Ranking of annual average surface air temperatures in 2023

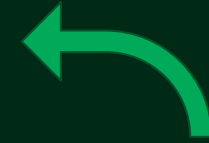
Data source: E-OBS - Credit: C3S/ECMWF/KNMI



It's worth the effort!

1. Emission reduction
2. Cost reduction
3. Transparency
4. Credibility
5. Pioneering
6. Employee attraction and retention





Lean more
about Plan A!

Thank you!

[linkedin.com/in/cwindler](https://www.linkedin.com/in/cwindler)