CURBIN G THE CARBON

of the digital industry

Jan van Dam
Robey de Jong

DID YOU KNOW?

digital accounts for

4-5%

of global carbon emissions

... that's more than all aviation, shipping and rails... combined

DID YOU KNOW?

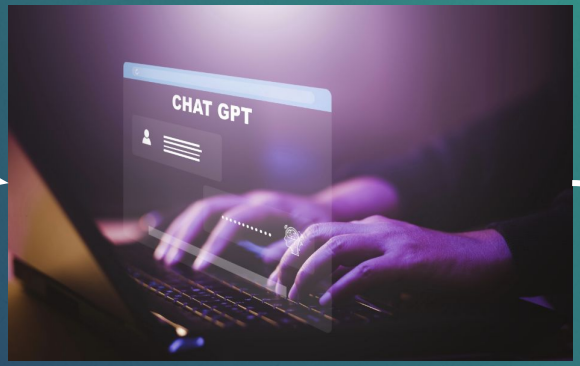
9 x  =

1 

provides 1 tree with a day worth of work

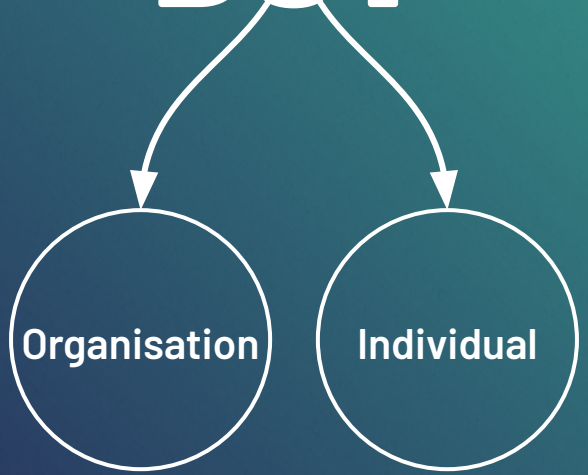
DID YOU KNOW?

1 prompt to Chat GPT consumes and costs around 3,96 -Watt hour of energy / $0.019



3,96-Watt hours (Wh) in tangible numbers:
The average smartphone battery has a capacity of around 10 to 12 Wh. So, 3.96 Wh could charge such a phone from 0% to about 33-40%

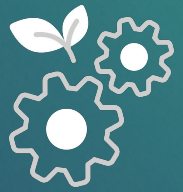
WHAT CAN YOU DO?



WHAT CAN YOU DO?

as an organisation

Sustainable design



Green engineering

Sustainable ops

Elegance meets sustainability

SUSTAINABLE DESIGN

Sustainability by design

The creative and technical design process is where crucial decisions are made. It is in this phase that apps, websites and platform are designed and the foundation is laid for the energy-efficiency of the digital product

Think...

- Minimize video & imaging content
- Apply dark mode
- Limit and control, features


Eagerly
Werkwijze
Cases
Stories
Over ons
Vacatures
Contact
DARK MODE · D
Goed voor toegankelijkheid, je ogen, slaap én milieu

Building a greener tomorrow

GREEN ENGINEERING

Engineering-by-design

Designs are translated into actual digital products through engineering. Through sustainable engineering principles, the energy footprint of the digital product can be further minimized.

Think...

- Efficient caching and minimizing data exchange
- Dynamic code and energy consumption analysis
- Choice of programming language

SUSTAINABLE OPS

The last green mile

Thanks to sustainable design and green engineering the final digital product has a maximized energy-efficiency. But now it must be hosted and maintained for the remainder of its lifecycle. Sustainable options will help keep the energy-usage and carbon footprint low.

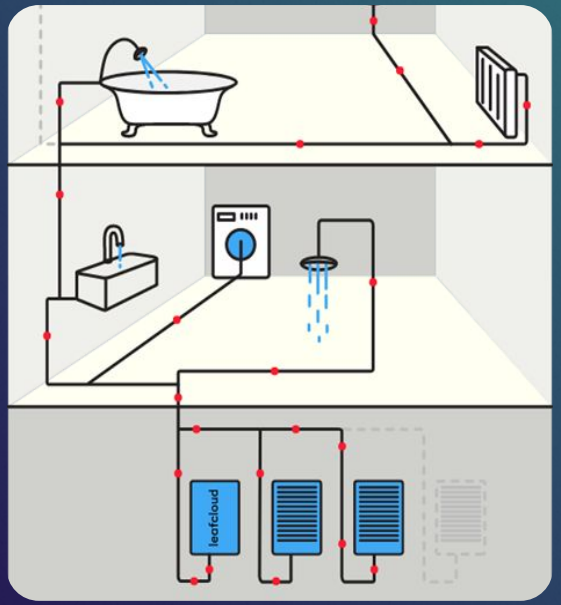
Think...

- Remove unused features and dark data
- Monitor, manage and refactor code base
- Choose a circular cloud

Eagerly

X CIRCULAR CLOUD

Circular cloud



reusing heat

- ✔ Residual heat is directly used to heat water that is used within the same building (heating, showers, washers)
- ✔ Eliminates the extra 20%-60% energy consumption used by air conditioners
- ✔ Decreases the usage of natural gas otherwise needed to heat buildings

existing buildings

- ✔ Existing buildings such as apartments blocks, hotels and schools are used to house servers
- ✔ Eliminates the need to build entire facilities just to house servers
- ✔ Prevents large capital investments and uncertain capacity forecasts

BEFORE WE GO TO THE NEXT SECTION

let's talk a little about AI...

WHAT'S THE NEWS?

The Green Algorithm: Measuring Sustainability in AI

Rosemary J Thomas, PhD · Follow
Published in Version 1 · 7 min read · Oct 9, 2023

8

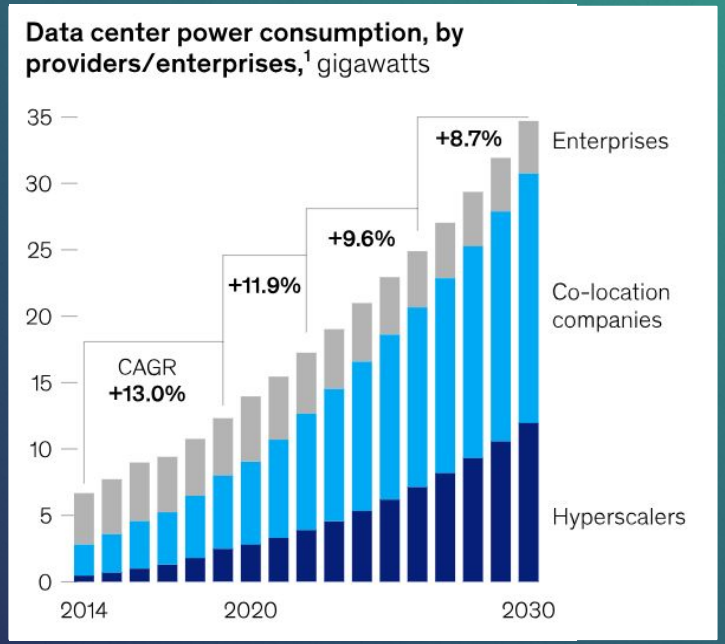
differences in energy sources and grids. While AI currently contributes a relatively small 1.4% to global GHG emissions within Information and Communication Technologies, concerns arise about potential rapid increases if current AI research trends continue.

NOS Nieuws • Vandaag, 13:57

Energieslurpende AI zorgt voor forse stijging CO2-uitstoot Google

In één jaar tijd is de CO2-uitstoot van Google met 13 procent gestegen. Ten opzichte van vijf jaar geleden is de uitstoot zelfs met bijna 50 procent toegenomen. De stijging komt vooral door de groei van datacenters die AI-systemen ondersteunen.

AI NEEDS MORE ENERGY



Demand is measured by power consumption to reflect the number of servers a data center can house. Demand included megawatts for storage, servers, and network.
CAGR = Compound Average Growth Rate

ENERGY UNAVAILABLE?

Infrastructure > Data Centres

Global power shortages mean data centers could struggle to shoulder the burden of energy-intensive generative AI demands in 2024

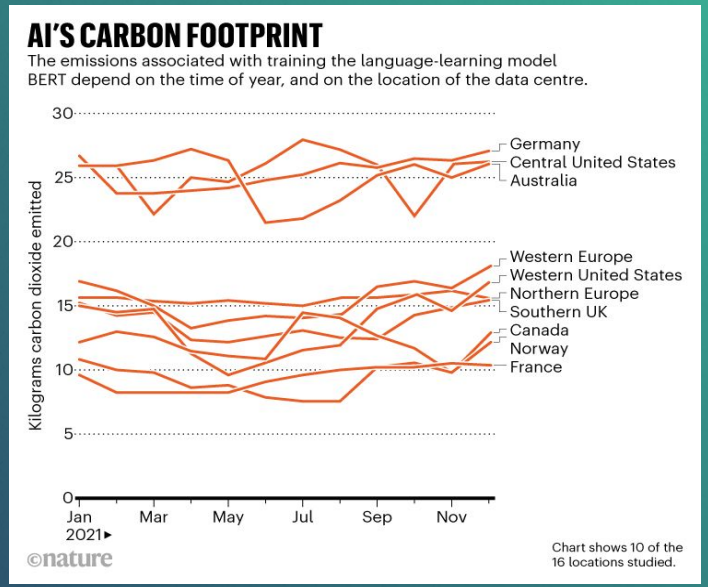
News By George Fitzmaurice published February 15, 2024

The global outlook for data centers is optimistic, but there are some serious roadblocks to overcome

Power and storage requirements for data centers are growing exponentially and creating problems for the industry, according to JLL's data centers global outlook report for 2024.

The increased enterprise focus on generative AI requires a huge amount of power, which in turn is exacerbating a "scarcity of data center colocation supply" caused by regional power limitations.

Generative AI is expected to be a major factor in rising global electricity consumption in the coming years, according to research, which the European Commission estimates will have increased 60% by 2030.



AI EMISSION INSIGHTS

The survey found 64% of executive leaders believe they do not receive the emissions performance data they need from vendors. “Because of these limitations, some executive leaders struggle to prioritize sustainable IT initiatives or know where to start,” said Moyer. “They also neglect to consider sustainable IT initiatives that are low cost and achieve moderate GHG reduction.”

Green AI =

the practice of designing, developing and deploying data & analytics solutions that minimize their environmental impact

SMART CHOICES CUT CO2

Three main phases	Some recommendations	
Model training *development*	▪ Suitable AI algorithms ▪ Length & frequency of training cycles ▪ Right size of training batch ▪ Optimal number of parameters ▪ Re-use existing models/resources	***Example**: "AI developers can also schedule computation at times when renewable sources are more available. This can cut AI's carbon footprint by as much as 30% to 40%, compared to using a fossil fuel powered-grid"*
Model operations *runtime*	▪ Conscious usage of models ▪ Optimize prompt structure ▪ Modify models without retraining	***Example: "**Deploying large deep-learning models to the cloud for inference purposes also consumes a lot of energy. Analysts report that NVIDIA estimates that 80–90% of the energy cost of neural networks lies in ongoing inference processing after a model has been trained"*
Hardware & Cloud data center	▪ Eco-conscious server selection ▪ Evaluate energy efficiency of hardware ▪ Usage of renewable energy source	***Example**: "Google's study says that using a more efficient AI model architecture, processor and a greener data center can reduce the tech's carbon footprint by 100x to 1,000x"*

WHAT CAN YOU DO?

as an individual

5 questions to ask yourself

Recommendation questions

1. Do I need to visit this page?

Recommendation questions

2. Can I include a link to a document instead of an attachment in my email to save energy?

Recommendation questions

3. Can I turn off location services or background apps to save my phones battery?

Recommendation questions

4. Can I go over my pictures stored and delete pictures to keep myself from buying extra storage capacity?

Recommendation questions

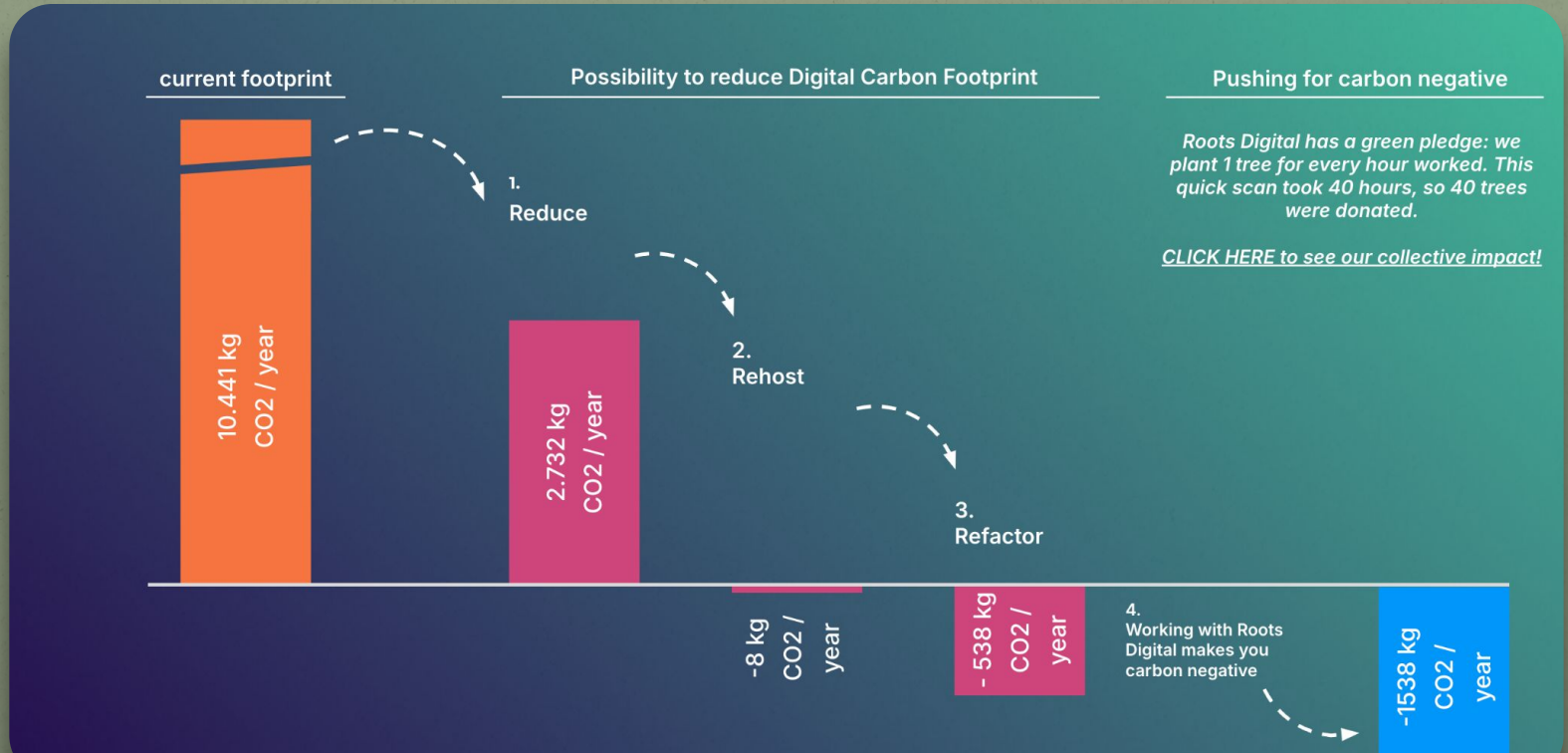
5. Can I remove some open tabs in my browser?

WHAT IS A GOOD FIRST STEP?

as an organisation

MEASURE
MEASURE
MEASURE

DO A QUICK SCAN: SEE YOUR POTENTIAL



Your Impact Report

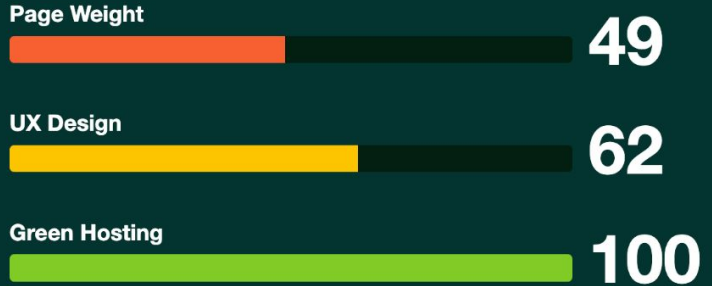
Report for:
https://eagerly.nl/

Performance Impact

Ecograder Score	Emissions per Pageload
56	2.06
Out of 100	grams of carbon dioxide

This page scores worse than 80% of all URLs crawled by Ecograder

Ecograder scores pages based on a variety of performance, efficiency, and user experience factors as well as emissions estimates and green hosting powered by renewable energy.




Pilosa quick scan
Scan another site
Eagerly - Digitale strategie met als hart je website
Hosted on sustainable infrastructure
Total size
5.05 MB
Cacheable
14.71%
CDN hits
70.59%
Compressed
8.82%
Score: F
Bad
Average
Good
Excellent

WANT TO KNOW MORE?

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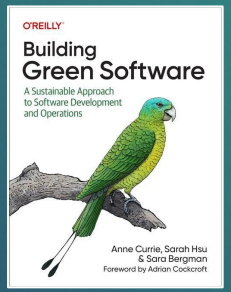
www.rootsdigital.io
info@rootsdigital.io
0622717580

Documentaries

Duurzame data

Books



Community

Green Software Foundation