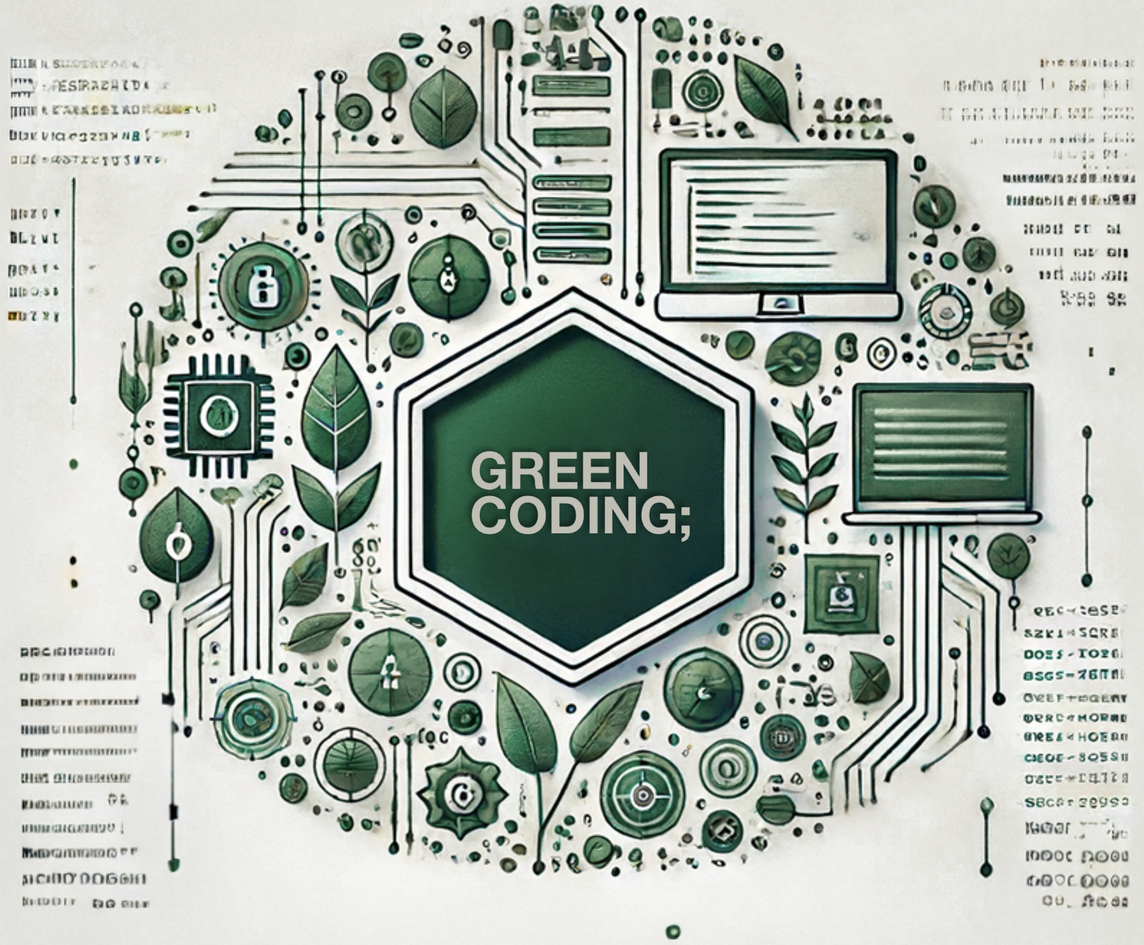
Green Coding Solutions GmbH



Grants and Awards

WSA Winner 2023

Green Screen Coalition

Investitionsbank Berlin

Who am I

Arne Tarara - Green Coding Solutions GmbH (Germany)

- CEO & Founder - Green Coding Solutions
- We are specialized in the reduction of Software-CO_2-Emissions
- Areas: Consulting & Integration, Research, Measurement Tools & Infrastructure
- We love open source - all our tools are open source and free to use
- We founded ecoCompute in 2024

Lufthansa Industry Solutions

Hochschule für Technik und Wirtschaft Berlin

BLUE ANGEL THE GERMAN ECOLABEL

opentext™

wagtail

GREEN CODING;

What is this talk about?

A yearly look back - Highlights / Lowlights in eco computing

- Even experts miss some news :)
- And newcomers get some quick condensed news

- Some **sad developments :(**
- Some **uplifting developments :)**
- Some **tools** and **research**

- And finally: A look into the future of what will happen in 2026 - Hopefully 🔮

CSRD

The ~~elephant~~ Omnibus in the room

- We had high hopes for the CSRD
- **Downsides**
  - Would have required companies to be more transparent about carbon emissions
  - Would have made carbon a trackable value / KPI
- **"Upsides"**
  - Postponed (mostly) does not mean it's lost forever
  - Money that would get lost for actual reduction due to reporting overhead

Blue Angel for Software / Blauer Engel

Major Update end of 2024 - Many new certified sustainable softwares

NEW

Desktop-Computer-Software

Webbrowser-Anwendung

Server-Client-Software mit Webbrowser als Desktop-Computer-Anwendung

Server-Software

Server-Client-Software

Apps für mobile Geräte

Server-Client-Software mit nativer App für mobile Geräte

Now Client-Server Software AND Mobile Software can be certified!

GREEN CODING;

Blue Angel for Software / Blauer Engel

Major Update end of 2024 - Many new certified sustainable softwares

Green Metrics Tool

Green Coding Solutions GmbH

HOLMES

neuland - Büro für Informatik GmbH

KADAI Open Source Software for Task Management

envite consulting GmbH

KDE Okular

KDE e.V.

Nextcloud Server

nextcloud GmbH

OpenCloud

OpenCloud GmbH

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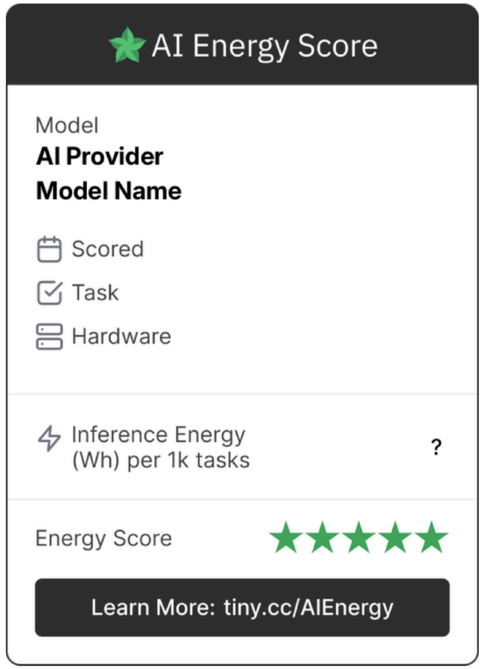
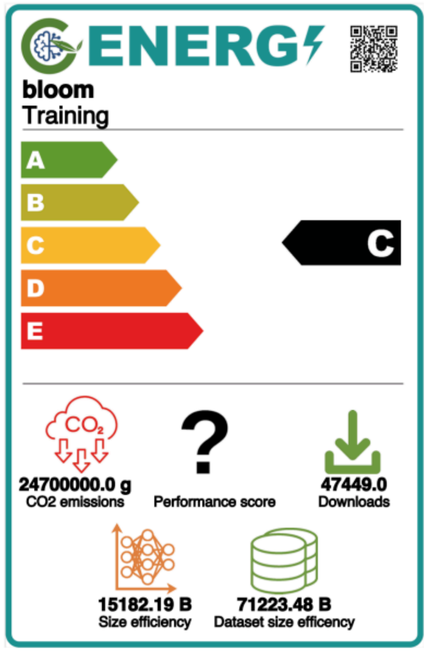
AI emissions are on the rise

With no end in sight

- We will hear a lot about this today. But also, we see sustainability initiatives



https://huggingface.github.io/AIEnergyScore/



https://arxiv.org/pdf/2401.17150

SCI for AI

https://sci-for-ai.greensoftware.foundation/

AI Energy Cost

First data was released by bigger orgs

- OpenAI released first data about energy cost per query (and water use) [1]
  - **0.34 Wh** per query
- Google released first data about energy cost per query (and water use) [2]
  - **0.24 Wh** per query
- GreenPT has launched providing real-time insights
  - **You will hear more about it on the conference :)**

Summary

- Numbers received mixed responses.
- They give orientation, but can still deviate greatly in select applications. Methodology is only partially published.
- Total numbers still unknown
- Methodology on carbon numbers and water use heavily debated

[1] https://blog.samaltman.com/the-gentle-singularity
[2] https://cloud.google.com/blog/products/infrastructure/measuring-the-environmental-impact-of-ai-inference/

NVIDIA GPU Teardown A100

By NVIDIA and independent parties

- NVIDIA released their own PCF of a H100 [1]
  - **164 kgCO2e** per card (no use-phase)
- Independent team with more experts released also PCF of A100 [2][3]
  - **150 kgCO2e**

Finally some harder numbers to work with (although estimates were around)

[1] https://images.nvidia.com/aem-dam/Solutions/documents/HGX-H100-PCF-Summary.pdf
[2] Hubblo, ICTEAM, TIDE, Bonn University, LITEM, Hugging Face
[3] https://arxiv.org/html/2509.00093v1

Carbon Aware Computing

A still quite debated topic

- A pioneering concept in the Green Software community [1]
- Has seen papers showing it works, but has limited applicability for big workloads [2]
- Has seen many tool implementations for Kubernetes, Docker Tooling and heavy critique [3] but also discussion [4]

- Now today on the conference with two interesting talks:
  - **Dryden Williams** - carbonrunner.io - Making it work in practice
  - **Benoit Petit**: The hidden complexity that might hinder your carbon-aware efforts

[1] https://movement.greensoftware.foundation/spaces/19525645/content
[2] https://arxiv.org/pdf/2106.11750
[3] https://adrianco.medium.com/dont-follow-the-sun-scheduling-compute-workloads-to-chase-green-energy-can-be-counter-productive-b0cde6681763
[4] https://fershad.com/writing/chasing-efficiency-rather-than-green-energy/

GSF & W3C Collaboration

Sustainable Web Interest Group

- Already founded in 2013 it has now become a strong push
- **Plans:**
  - Development of **training materials** to implement web sustainability measurements
  - **Templates** for open source tools (e.g. Impact Framework)
  - Regular meetings **to participate** and create a new sustainable web standard
- Get involved: https://github.com/w3c/sustainableweb-ig/

WordPress Sustainability Team

Has been disbanded - The news is more the "how"

On Wednesday 8th January, WordPress cofounder Matt Mullenweg disbanded the WordPress Sustainability Team.

The team of volunteers have been working to embed sustainable practices into the WordPress community and its processes since 2023. In that time, they've worked openly and honestly to ensure WordPress's social, economic, and environmental longevity.

We should take time to acknowledge the hard work and dedication of the now defunct team. Nora Ferreirós, Csaba Varszegi, Nahuai Badiola and Thijs Buijs worked to highlight the opportunities to improve sustainability at WordPress to a sometimes disengaged leadership. They are on the right side of history and we thank them.

https://www.wholegraindigital.com/blog/the-disbanding-of-the-wordpress-sustainability-team/

Big Tech carbon goals

Hopes are high - Commitments seem lower

- **Google** has quietly removed explicit references to its 2030 net-zero pledge from some sustainability communications in 2025.

- **Microsoft** reaffirms its commitment to become carbon negative by 2030, despite a significant increase in emissions and energy use driven by data center growth and AI.

Microsoft remains "pragmatically optimistic" about meeting its 2030 goal but faces operational challenges and changing standards that cast some uncertainty on how exactly it will measure progress.

How will this play out? - Maybe our community track has some answers for you with nice critical touches on this

=> Thanks to @Matthias Haymoz!

Strong movements

For more sustainability and AI awareness

- Publication of the Bits & Bäume demands for the 2025 German federal election:
  - “Digital sovereignty and a future through democratic control” [1]

- An appeal, published by tech NGOs for the **COP in Brazil**,
  opposes AI as a solution to climate change and advocates for the protection of land rights, biodiversity and "low-tech" climate solutions. [2]

<u>Democratic instruments like participation and discourse are still the best way to raise awareness</u>

=> Thix **@Friederike Hildebrandt**

[1] https://bits-und-baeume.org/assets/images/pdfs/Bits-und-Baeume_Politische-Forderungen-2025.pdf
[2] https://greenscreen.network/en/blog/cop30/

DIN ISO Consultation

Ressource efficient software

- "The **ISO Open Consultation** invites stakeholders from business, academia, government, and civil society to **help identify standardization** needs for “green IT.”
- Participants can join workshops and discussions to shape future international standards.
- A European driven intiative!

We will hear from Holger Smolinski and Jens Gröger about it today!

=> Thx **@Verena Majuntke**

[1] https://www.din.de/en/innovation-and-research/climate-change/resource-efficient-software-in-the-focus-of-the-iso-open-consultation

AWS Customer Carbon Footprint Tool

Something is happening!

- Now **including Scope 3** and using **location-based** data for **Scope 2**
- Still not everything included, still no real time data, but:
  - AWS is moving!
  - After years of not adding anything AND the US climate
    not exactly pro cabon accounting / sustainability it was still updated
  - This shows that there is a demand for better data, and AWS is also being forced to provide better CO2 data, even if they simultaneously downplay their emissions and water consumptions

=> Thx **@DavidKopp**

CCF project has been dropped

But SPRUCE to the rescue!

- Beloved tool Cloud Carbon Footprint has lost support by it's main contributors and was archived [1]
- **SPRUCE** is an open source solution to step in!
  - "SPRUCE helps estimate the environmental impact of your cloud usage. By leveraging open source models and data, it enriches usage reports generated by cloud providers and allows you to build reports and visualisations.
  - Having the GreenOps and FinOps data in the same place makes it easier to expose your costs and impacts side by side.
- Like every OSS project it needs support - Interested? [2]

=> Thx **@Anita Schüttler**

[1] https://github.com/cloud-carbon-footprint/cloud-carbon-coefficients
[2] https://opensourcegreenops.cloud/

Bundesverband Green Software

Major new project in the pipeline - Bring Green Software to Organisations

Activities

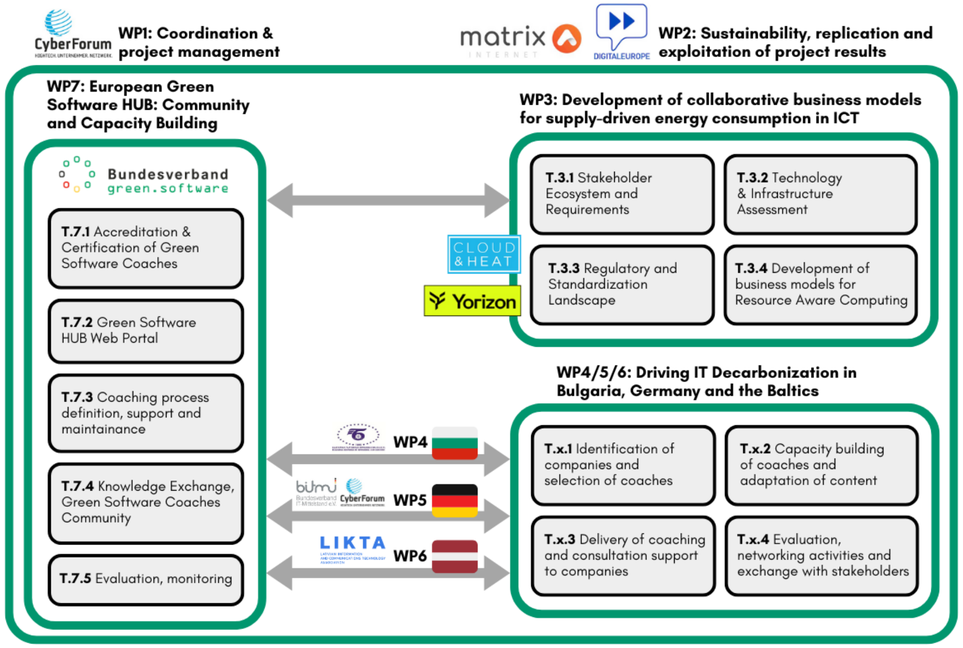
- 🔷 Green Software-Initiativies throughout Europe
- 🔷 A Green Software Hubs, to accredit Coaches
- 🔷 Collab of DCs and Software-Companies to use green power

Partners

- Bundesverband Green Software e.V., CyberForum Karlsruhe, BITMi, DIGITALEUROPE, Bulgarian Chamber of Commerce and Industry in Bulgarien, The Latvian Information and Communications Technology Association - LIKTA in Le GmbH und Yorizon Cloud.

Goals

- 👉 A new profession: Green Software Coach
- 👉 Several hundred IT companies reducing their emissions
- 👉 New business models for data centers



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The list could go longer

But there is only so much time

Enjoy the conference!

Your organizers