

Opt In? Opt Out? Opt Green!

Bringing Free Software To Eco-Consumers



 @be4foss@floss.social

SFSCon – 8 November 2024



Slides available under "talks":

<https://invent.kde.org/teams/eco/opt-green/>





Opt Green: Coordinating a Windows 10-to-Linux upcycling campaign across Free Software communities worldwide

14:40

40 mins
08/11/2024

www.sfsccon.it/workshops/opt-green-coordinating-a-windows-10-to-linux-upcycling-campaign-across-free-software-communities-worldwide/

Today's Presentation

- Part I — This Is NOT Fine!
- Part II — The Critical Role Of Software?
- Part III — Opt In? Opt Out? Opt Green!
- Part IV — How To Contribute?

Part I — This Is NOT Fine

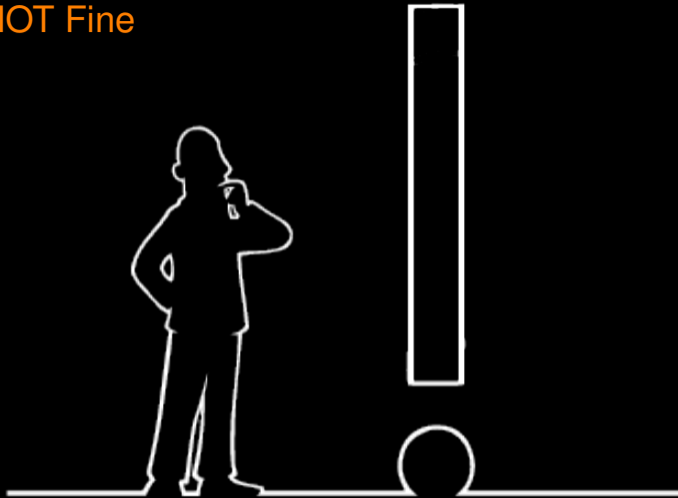


Image (modified) from Karanjot Singh published under a CC BY-SA 4.0 license:

<https://eco.kde.org/blog/2022-03-03-sok22-kde-eco/>

This Is NOT Fine



The Observer
Climate crisis

'Simply mind-boggling': world record temperature jump in Antarctic raises fears of catastrophe

An unprecedented leap of 38.5C in the coldest place on Earth is a harbinger of a disaster for humans and the local ecosystem



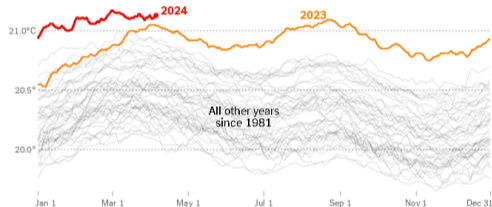
Robin McKie
Science editor

Sat 6 Apr 2024 16:00
CEST



Ocean Heat Has Shattered Records for More Than a Year. What's Happening?

Daily Global Sea Surface Temperatures



<https://www.nytimes.com/2024/04/10/climate/ocean-heat-records.html>

<https://www.theguardian.com/environment/2024/apr/06/>

[simply-mind-boggling-world-record-temperature-jump-in-antarctic-raises-fears-of-catastrophe](#)

It's Been the Hottest Summer on Record, European Officials Say

Sept. 5, 2024

The excessive heat worldwide suggests the full year will also be a record-breaker, according to Copernicus, the E.U. agency that tracks global warming.



Las Vegas has seen a particularly hot summer season. Wade Vandervort/Las Vegas Sun, via Associated Press



By Austyn Gaffney

WE'RE ALL MELTING —

It's really f—ing hot, and it's really our fault

The hottest Northern Hemisphere summer on record follows climate-driven heat waves.

JOHN TIMMER - 9/7/2023, 8:08 PM



<https://www.nytimes.com/2024/09/05/climate/2024-hottest-summer-on-record.html>

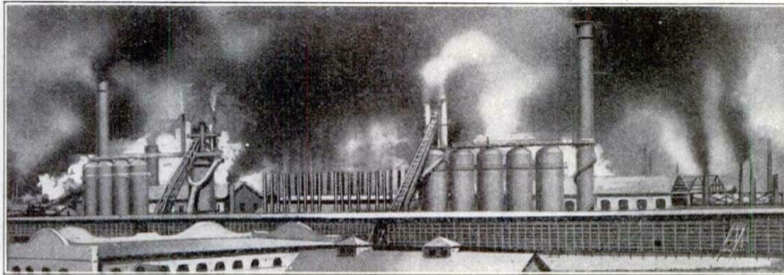
<https://arstechnica.com/science/2023/09/yes-this-year-is-as-hot-as-you-think-it-is/>

1912 – CO2: A “Blanket For The Earth”

March, 1912

POPULAR MECHANICS

341

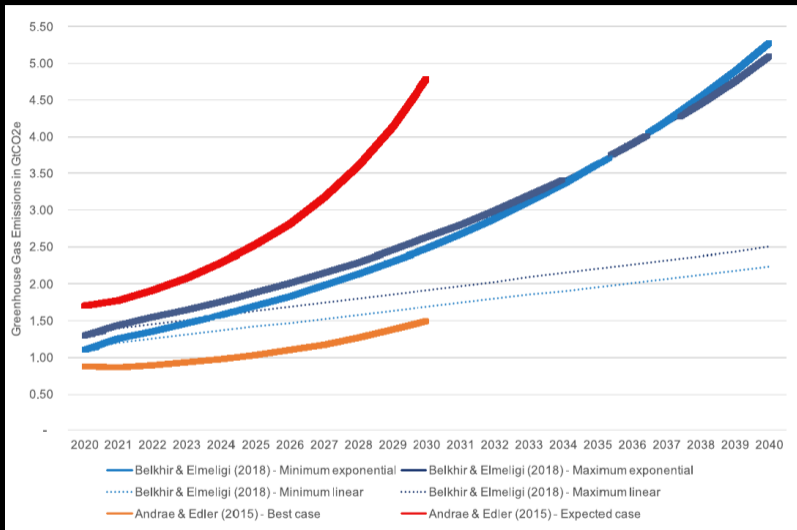


The furnaces of the world are now burning about 2,000,000,000 tons of coal a year. When this is burned, uniting with oxygen, it adds about 7,000,000,000 tons of carbon dioxide to the atmosphere yearly. This tends to make the air a more effective blanket for the earth and to raise its temperature. The effect may be considerable in a few centuries.

“[Adding CO2] tends to make the air a more *effective blanket* for the earth and to raise its temperature. This effect may be *considerable in a few centuries*.” – Popular Mechanics, 1912

https://commons.wikimedia.org/wiki/File:191203_Furnaces_of_the_world_-_Popular_Mechanics_-_Global_warming.jpg

ICT Sector – All Estimates Go Up



Freitag et al. 2021 (bold): <https://www.sciencedirect.com/science/article/pii/S2666389921001884>

Manufacturing – Half Of Energy Consumption In ICT

WORLDWIDE ICT ELECTRICITY CONSUMPTION 8 TO 9% OF TOTAL

FIGURES FROM 2019 ~8.5%

WORLDWIDE ELECTRICITY CONSUMPTION ~23500 TWH

DATA CENTRES	~ 200	TWH
NETWORKS: INTERNET & RAN	~ 250	TWH
END USERS	~ 550	TWH
MANUFACTURING OF ICT	~ 1000	TWH
ICT ELECTRICITY CONSUMPTION	~ 2000	TWH

Table 1. Summary of the International Energy Agency's (IEA) estimates for the year 2019 of the electricity consumption (in terawatt-hours) worldwide by different sectors of ICT, namely data centers, networks including the radio access network and end users, and the manufacturing of ICT equipment, which represents roughly 50% of the total amount.

From: "Electricity Consumption by ICT: Facts, trends, and measurements" (2023, ACM):

<https://dl.acm.org/doi/pdf/10.1145/3613207>

Carbon Footprint By Device

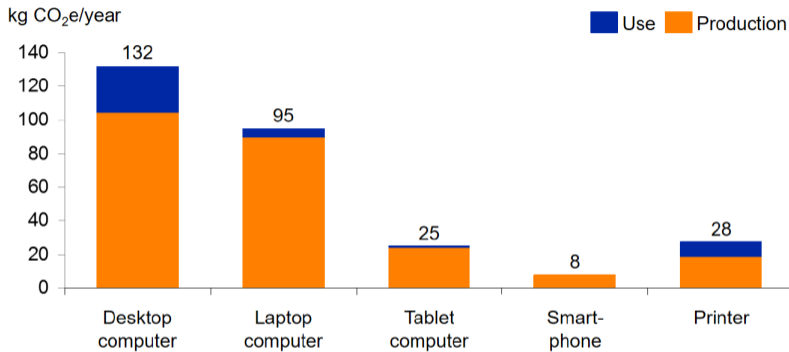


Figure 2: Average annual greenhouse gas emissions per end-user device during production and use by device type. The annual values of production emissions (grey) are based on current average useful lives of the devices.

From (modified): "Opportunities and Risks of Digitalization for Climate Protection in Switzerland" (2017):

https://www.zora.uzh.ch/id/eprint/141128/10/Study_Digitalization_Climate_Protection_Summary_Oct2017.pdf

“Tsunami Of E-Waste” – High Environmental Impact



Image by Muntaka Chasant: https://en.wikipedia.org/wiki/File:Agbogbloshie,_Ghana_2019.jpg

Part II — The Critical Role Of Software

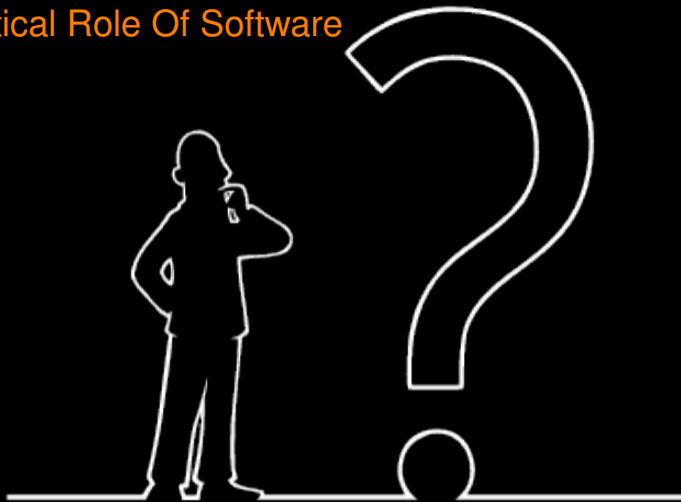
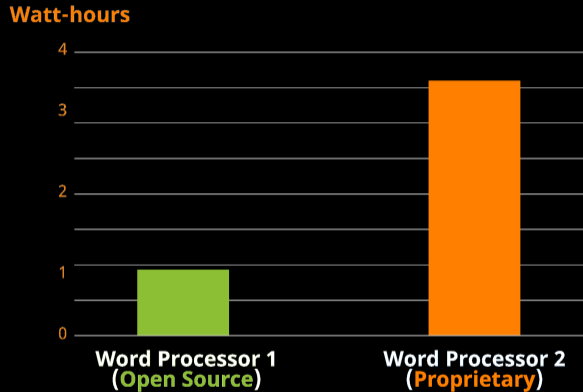


Image (modified) from Karanjot Singh published under a CC BY-SA 4.0 license:

<https://eco.kde.org/blog/2022-03-03-sok22-kde-eco/>

Increasing Energy Use



Adapted from: <https://www.umweltbundesamt.de/publikationen/entwicklung-anwendung-von-bewertungsgrundlagen-fuer>

Their Ads, Our Computing . . . Even When You Pay



The screenshot shows a PCWorld article. At the top is a red navigation bar with the PCWorld logo and menu items: NEWS, BEST PICKS, REVIEWS, HOW-TO, DEALS, LAPTOPS, WINDOWS, SECURITY, and MORE. The main headline is "There's no stopping Windows 11's Start menu ads now" in large, bold black text. Below the headline is a sub-headline: "The ads are (almost) here and ready to party." The author's name, Mark Hachman, is listed as "Senior Editor" with a small circular profile picture. The publication date is "MAR 22, 2023 10:30 AM PDT". The main image is a blue abstract graphic with the Windows 11 logo and the text "Windows 11" overlaid.

PCWorld

NEWS ▾ BEST PICKS ▾ REVIEWS ▾ HOW-TO ▾ DEALS LAPTOPS WINDOWS SECURITY MORE ▾

There's no stopping Windows 11's Start menu ads now

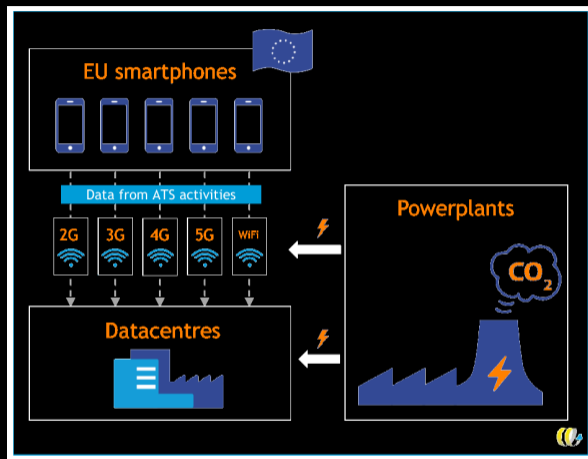
The ads are (almost) here and ready to party.

By Mark Hachman
Senior Editor | MAR 22, 2023 10:30 AM PDT



Screenshot (modified) colors from: <https://www.pcworld.com/article/1668041/ads-in-the-windows-11-start-menu-are-definitely-coming.html>

No Opt Out For Ads/Tracking



Data from ATS = Ad / Tracking Services

Screenshot with modified colors from "Carbon footprint of unwanted data-use by smartphones: An analysis for the EU":
https://groenlinks.nl/sites/groenlinks/files/2021-09/CE_Delft_210166_Carbon_footprint_unwanted_data-use_smartphones.pdf

End Of Support Of Newer Hardware Is Driving E-Waste

Windows 10 support ending means more e-waste

240 million PCs ineligible for Windows 11 could become e-waste from October 2025



Incompatibility with Windows 11 prevents partners and ITAD firms from refurbishing and reselling still-viable PCs



Donating unsupported devices to disadvantaged communities globally presents challenges for digital equity



Microsoft will offer Extended Security Updates for Windows 10 from 2025 until 2028, but at an undisclosed annual cost

If all the PCs ineligible for Windows 11 were folded laptops stacked one on top of another, they would be 4,080km tall – 600km taller than the moon!



Source: Canalys estimates, PC Service and Sustainable Ecosystems Analysis, December 2023



From: <https://www.canalys.com/insights/end-of-windows-10-support-could-turn-240-million-pcs-into-e-waste>

And More E-Waste . . . And More CO2 And Toxic Pollution

ars TECHNICA

BIZ & IT TECH SCIENCE POLICY CARS GAMING & CULTURE STORE

SO, NO MORE UPDATES —

How long will the last Intel Macs be supported? macOS Sonoma gives us some hints

Nearly 20 years of data show how Intel Macs are faring as Apple switches chips.

ANDREW CUNNINGHAM - 7/17/2023, 11:00 AM



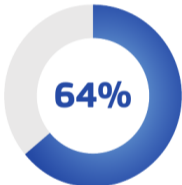
Enlarge

The image shows three Apple logo icons arranged horizontally. Each icon is split vertically, with the left half in blue and the right half in white. The first icon has a simple black smile, representing a happy or supported state. The second icon has a straight horizontal line for a mouth, representing a neutral or indifferent state. The third icon has a downward-curving line for a mouth and two small 'x' marks for eyes, representing a sad or unsupported state. The background is a light blue gradient.

From: <https://arstechnica.com/gadgets/2023/07/with-macos-sonoma-intel-macs-are-still-getting-fewer-updates-than-they-used-to/>

Consumers Are Aware Of A Problem, But Not A Solution!

Most respondents would like to keep using their current digital devices for at least 5 years



Reason for purchasing a new device:



37%
old device broke



30%
the performance of your old device had significantly deteriorated



19%
certain applications or software stopped working on your old device

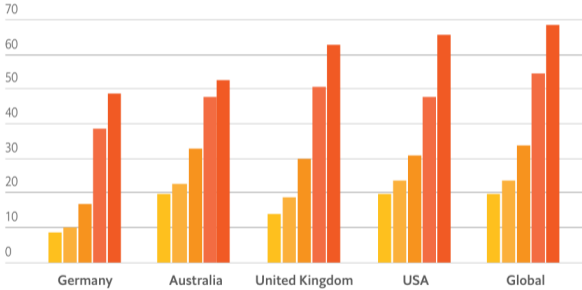
Screenshot (modified) from: <https://europa.eu/eurobarometer/surveys/detail/2228>

Consumer Interest & Influence Is Up

Shopping sustainably?

Google searches for sustainable products in the 'shopping' category. All countries. English. Index Value per Yearly average.

2016 2017 2018 2019 2020



Source: The EIU, Google Trends

In the driver's seat: Consumers

What drives the focus on sustainability issues in the fashion and textile industry?



Source: EIU Survey, 2020.

Screenshots from: <https://www.worldwildlife.org/publications/an-eco-wakening-measuring-awareness-engagement-and-action-for-nature>

How Many Consumers Know About The Blue Angel For Software?

And the role **software** plays in hardware longevity!



Blauer Engel For Desktop Software (v. 4 2024)

FOSS For Sustainability

Autonomy and **Transparency** recognized
as being crucial to sustainable software design!



ABC of Certification Criteria



Resource &
Energy Efficiency

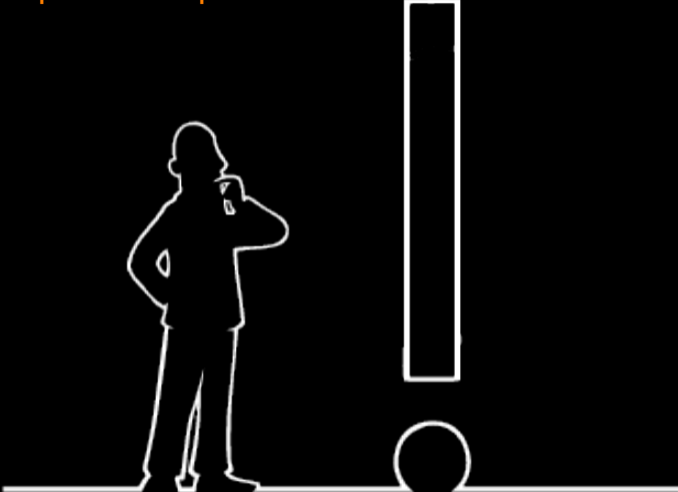


Potential
Hardware
Operating Life



User
Autonomy

Part III — Opt In? Opt Out? Opt Green



Focus On Eco-Consumers



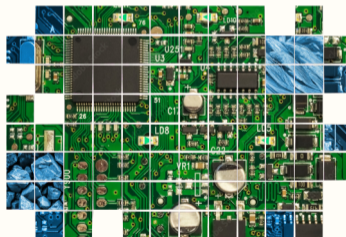
Images from Karanjot Singh
Images from Karanjot Singh

Visuals: Imagery

Image selection emphasizes the physical world and human connection within the context of technology. Sample image types include hardware, nature, natural resources, people, and communities.

Images are framed in simple hand-drawn shapes to emphasize tactility and the human touch. They are sometimes colorized in dark versions brand's primary colors to unify disparate images and styles.

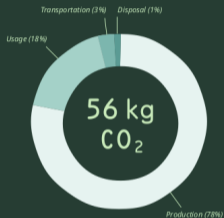
Images can be used in isolation or be composed into collages with other images and elements. A pixel-based structure, inspired by computer screens, can be used as a foundation for larger collages.



See : <https://invent.kde.org/teams/eco/opt-green/-/blob/master/organizational/brand/opt-green-branding-proposal.pdf>

Campaigns & Advertisements – To Combat E-Waste With FOSS

The most environmentally-friendly device is the one you already own!



CO₂ impacts of the iPhone 7, Model 32GB



Production of a device accounts for 50–80% of CO₂ emissions over the device's lifecycle.³



A German Environment Report estimates you'd need to use a computer for 30+ years before efficiency gains in newly-produced devices justify their purchase.⁶

What's FOSS* got to do with sustainability?



FOSS guarantees **user autonomy** & **transparency** by design.



Remove vendor dependencies: **use your device how you want for as long as you want!**⁷



Avoid software bloat and stop unwanted ads from **consuming energy unnecessarily.**⁸



Use software designed for the hardware you have — **lean, efficient FOSS runs on devices that are decades old!**

* Free and Open Source Software (FOSS) is software that anyone can use, distribute, or modify.

Unlike proprietary software, FOSS allows users to take full ownership of their software experience, so there's no risk of software depreciation that renders devices obsolete.

Combat E-Waste, Install FOSS!

You don't need a new computer to get secure, up-to-date software — **you need the right software!**

PCs

Newer hardware

Kubuntu
Ubuntu
Linux Mint

Older hardware (10+ y)

Lubuntu
Xubuntu

...and more!

Smartphones/Tablets

Android/Linux

LineageOS
CalyxOS
/e/OS

GNU/Linux

postmarketOS with
Plasma Mobile
Phosh
Ubuntu Touch

...and more!

Spotlight: Okular

KDE's PDF and document reader Okular is the first ever Blue Angel eco-certified software!



Resource
& Energy
Efficiency



Potential
Hardware
Operating Life



User
Autonomy

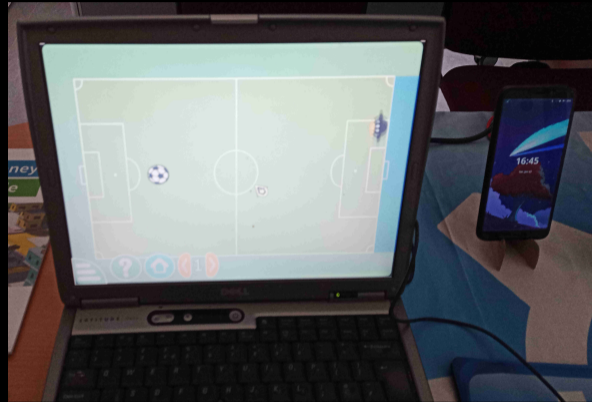
Read more at okular.kde.org/eco

Eco-Festivals, Open-Air Markets, Organic Shops



From: <https://www.umweltfestival.de/social-media-kits/>

Eco-Festivals, Open-Air Markets, Organic Shops



Demo (Unsupported) Hardware Running Free Software

FOSS already **excels** in this space, by design . . . and it is a blue ocean!



Image (CC BY-SA 4.0) from Raimond Spekking: https://upload.wikimedia.org/wikipedia/commons/6/65/Apple_MacBook_Pro%2C_model_A1278-8109.jpg

Visibility – Energy Measurements & Sustainability Documentation

The screenshot shows a GitLab CI pipeline named 'energy_measurement' that has just finished. The pipeline consists of 27 jobs. The first 15 jobs are related to setting up the environment on a Raspberry Pi, including cloning the repository, installing dependencies, and running tests. The final jobs (16-27) are related to packaging and deploying the application to a Raspberry Pi. The pipeline status is 'Completed' and it took 20 minutes and 29 seconds to run.

```
1 Running with gitlab-runner 16.2.1 (574ade29)
2 on ec2labrunner-TYH6Z2nb, system ID: s_046h63d820f
3 Preparing the "default" executor
4 Using SSH! (Basic) executor...
5 Preparing environment
6 Running on raspberrypi...
7 Getting source from Git repository
8 Fetching changes with git remote url: ssh://...
9 Reinitialized existing Git repository in /home/gitlab-runner/builds/TYH6Z2nb/6/team/eco-remote-eco-lab/.git/
10 Checking out 4b6f42e as detached HEAD (ref is refs/heads-requests/01/read)...
11 Relating Git repository error
12 Executing "step_script" stage of the job script
13 $ cd - && ./scripts/checkingtool -i -f /etc/ansible/ansible-test_scripts/BCI_MERGE_REQUEST_TITLE/ karnw@BLAMP_IP /tmp/
14 $ cd - && ./scripts/checkingtool -i -f /etc/ansible/ansible-test_scripts/BCI_MERGE_REQUEST_TITLE/ karnw@BLAMP_IP /tmp/
15 $ cd - && ./scripts/checkingtool -i -f /etc/ansible/ansible-test_scripts/BCI_MERGE_REQUEST_TITLE/ karnw@BLAMP_IP /tmp/
16 $ cd - && ./scripts/checkingtool -i -f /etc/ansible/ansible-test_scripts/BCI_MERGE_REQUEST_TITLE/ karnw@BLAMP_IP /tmp/
17 $ cd - && ./scripts/checkingtool -i -f /etc/ansible/ansible-test_scripts/BCI_MERGE_REQUEST_TITLE/ karnw@BLAMP_IP /tmp/
18 $ cd - && ./scripts/checkingtool -i -f /etc/ansible/ansible-test_scripts/BCI_MERGE_REQUEST_TITLE/ karnw@BLAMP_IP /tmp/
19 Importing shortcuts
20 Finished importing shortcuts
21 Okular: no previous frame
22 /home/karnw/Documents/okular/20yearsokfDE.pdf exists
23 Sleep 58.872924756
24 start iteration 1
25 Sleep 4.9840151766
26 Open Okular
27 Sleep 1.9800773990
28 open PDF document
29 Sleep .85149222620
```

Screenshot KEcoLab

The screenshot shows the Okular website page titled 'How is Okular Sustainable?'. The page features a green background image of a forest. Below the title, there are four main sections: Eco-Certification, Energy Efficiency, Transparency & Autonomy, and Ethics & Privacy. Each section includes a brief description and a 'Learn More' link. The page also features a Blue Angel certification logo and a link to the certification details.

How is Okular Sustainable?

- Eco-Certification**: Blue Angel certified for transparency in energy use, a longer hardware operating life, and user freedoms. [Learn More >](#)
- Energy Efficiency**: Software efficiency determines the energy demands and operating life of digital infrastructure. [Learn More >](#)
- Transparency & Autonomy**: A Free Software license makes for the efficient, long-term, and sustainable use of hardware. [Learn More >](#)
- Ethics & Privacy**: The four freedoms are critical for an inclusive, equitable, and ecologically sustainable digitization. [Learn More >](#)

Medal by Ongccorn, Green Lamp by Stefania Servidio, User by Guru, Ethics by Ruben Hojo from Noun Project (CC BY 3.0)

Blue Angel www.blauer-engel.de/uz215

- energy efficient
- save resources
- transparent interfaces

Eco-Certification

Okular is proud to be the first computer software worldwide to have received the Blue Angel seal in 2022. Introduced in 1978, the Blue Angel is the first ever ecolabel worldwide and the official environmental label of the German government. In 2020, the German Environment Agency (Umweltbundesamt) released the award criteria for desktop software with three main categories: (A) Resource & Energy Efficiency, (B) Potential Hardware Operating Life, and (C) User Autonomy. Software products that demonstrate compliance with these criteria enable longer and more efficient use of hardware.

Screenshot (design Anita Sengupta): <https://okular.kde.org/eco/>

Upcycling Workshops – In Culture Centers

Fincan

19 APR
Familienchor
im Körnerkiez

Familienchor im Körnerkiez
🕒 2024-04-19 @ 16:30 - 2024-04-19 @ 18:00
📍 Fincan

19 APR
Wir können Fragen wie:
• Was ist ein Verkehrskonzept?
• Was soll hier im Kiez passieren?
• Was hat das mit mir zu tun?
• Was kann ich entscheiden?
• Wie kann ich meine Meinung sagen?
• ...

Wir bringen mit:
• Einen Werkzeugschäffer, um das Verkehrskonzept zu verstehen

Workshop zum Verkehrskonzept im...
🕒 2024-04-19 @ 18:15 - 2024-04-19 @ 19:30
📍 -

19 APR
Küfa – Küche für Alle

Küfa – Küche für Alle
🕒 2024-04-19 @ 19:30 - 2024-04-19 @ 21:00
📍 Fincan, Altenbraker Str. / Ecke Nogatstr.

20 APR
Shag Jam Berlin April

Shag Jam Berlin April
🕒 2024-04-20 @ 15:00 - 2024-04-20 @ 18:00

20 APR
Swiping? Looking for a real connection?
An evening of **dating, drinks, music and more!**

SORE THUMBS SPEED DATING

Sore Thumbs Speed Dating
🕒 2024-04-20 @ 20:00 - 2024-04-20 @ 23:45

21 APR
Fluentbody Workshop

Fluentbody Workshop
🕒 2024-04-21 @ 11:00 - 2024-04-21 @ 13:00

Screenshot (modified) from: <https://fincan.eu/veranstaltungen/#events>

... And Schools



See: <https://engineering.upvest.co/posts/sponsoring-future-engineers/>

Good For The Environment – Good For Penguins

And Gnus and Geckos ... and Dragons



Screenshot (modified) from <https://arstechnica.com/gadgets/2024/03/linux-continues-growing-market-share-reaches-4-of-desktops/>

Part IV — How To Contribute



Windows 10-to-Linux BoF!



- Target audience? Incentives to change?
- Which Free Software communities?
- Message we agree on?
- Channels of communication?
- Follow-up BoFs at 38C3 in Hamburg and FOSDEM in Brussels

Join Us In Opt Green Project!

- **Design** – promotional materials, advertisements, website
- **Workshops/Campaigns** – organize in your home town
- **Documentation** – software's minimal system requirements
- **Awareness** – measuring and comparing software products
- **Translation** – Opt Green infoflyers, pamphlets, etc.

Get Involved With Measurement Tooling!

Topics

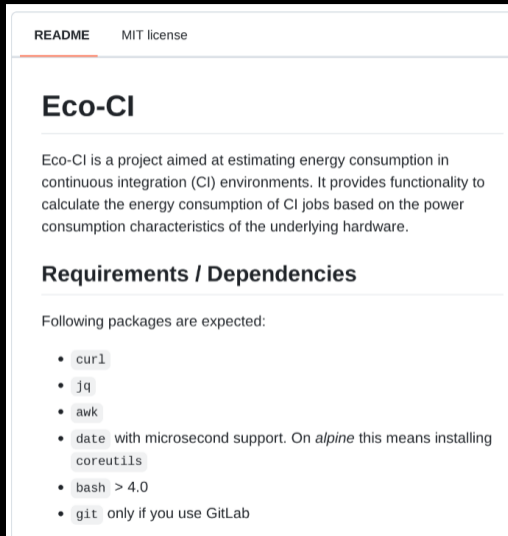
- **Energy Consumption** – KEcoLab, Watt-Wiser
- **Automation** – KdeEcoTest / Selenium
- **CI/CD Pipeline** – Eco-CI from Green Coding Solutions

Wed. 20 Nov.

19-20h CET, BBB

Topics

- “Eco-CI” to measure energy consumption of CI/CD pipeline
- “Powerletrics” a Linux Kernel power estimation extension



The screenshot shows the GitHub README for the Eco-CI project. At the top, there are links for 'README' (which is active) and 'MIT license'. The main heading is 'Eco-CI'. Below it, a paragraph describes the project's goal: estimating energy consumption in CI environments. A section titled 'Requirements / Dependencies' lists the following packages: curl, jq, awk, date (with a note about coreutils on alpine), bash > 4.0, and git (only if using GitLab).

README MIT license

Eco-CI

Eco-CI is a project aimed at estimating energy consumption in continuous integration (CI) environments. It provides functionality to calculate the energy consumption of CI jobs based on the power consumption characteristics of the underlying hardware.

Requirements / Dependencies

Following packages are expected:

- `curl`
- `jq`
- `awk`
- `date` with microsecond support. On *alpine* this means installing `coreutils`
- `bash` > 4.0
- `git` only if you use GitLab

<https://github.com/green-coding-solutions/eco-ci-energy-estimation>

Funding Notice

This project was funded by the Federal Environment Agency and the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV). The funds are made available by resolution of the German Bundestag.



The publisher is responsible for the content of this publication.

Slides available under "talks":

<https://invent.kde.org/teams/eco/opt-green/>

