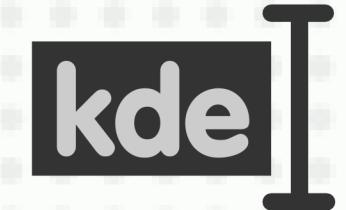
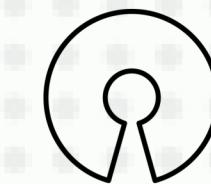
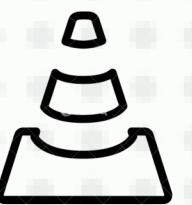
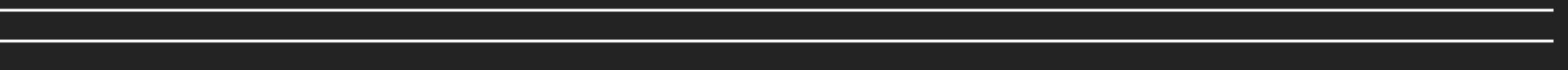




KDE ECO

THE HITCHHIKER'S GUIDE TO SUSTAINABILITY WITH FREE SOFTWARE

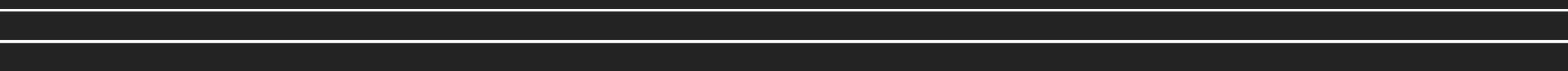




KDE ECO

SLIDES AVAILABLE UNDER





KDE ECO

ABOUT ME



- Engineering @ Atlan
- KDE Eco Contributor
- Part of various open source programs eg. GSoC'23, LFX'23
- Passionate about open source and free software



WHY FREE SOFTWARE?

EASY TO SHARE, STUDY AND MODIFY



GNU

<https://www.gnu.org/philosophy/free-sw.en.html> :

What is Free Software?

“Free software” means **software that respects users' freedom and community**. Roughly, it means that the users have the freedom to run, copy, distribute, ...





EFFICIENCY

Same task, fewer hardware demands



CONSERVATION

Reducing waste driven by software
and eliminating unnecessary
processes



SOURCES

Maximising renewable energy
sources

THE PROBLEM

as well the solution

SOFTWARE DRIVEN ENVIRONMENTAL HARM

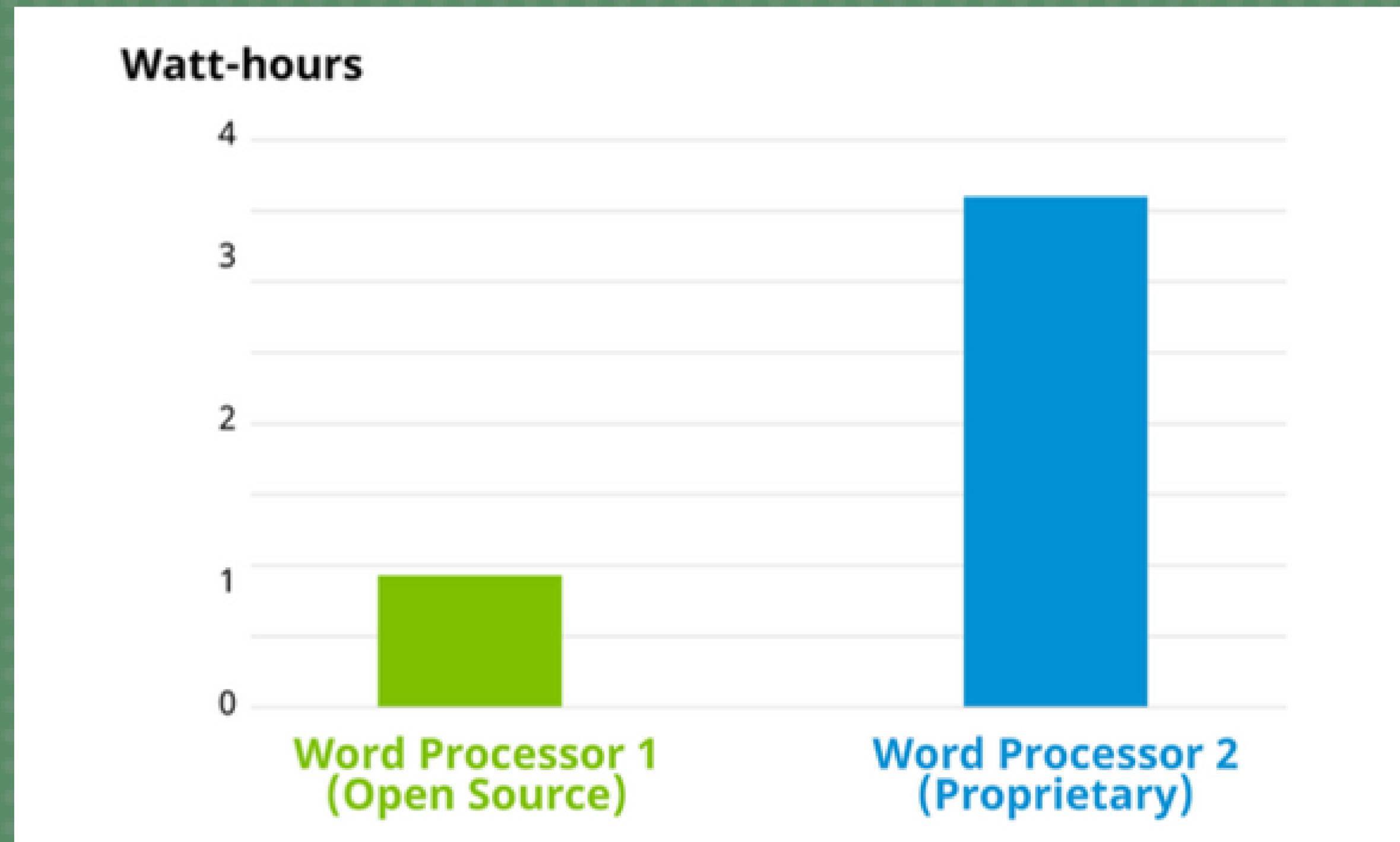




EFFICIENCY

STANDARD USAGE SCENARIO

This word processor consumed four times less energy than Word Processor 2, a proprietary program.

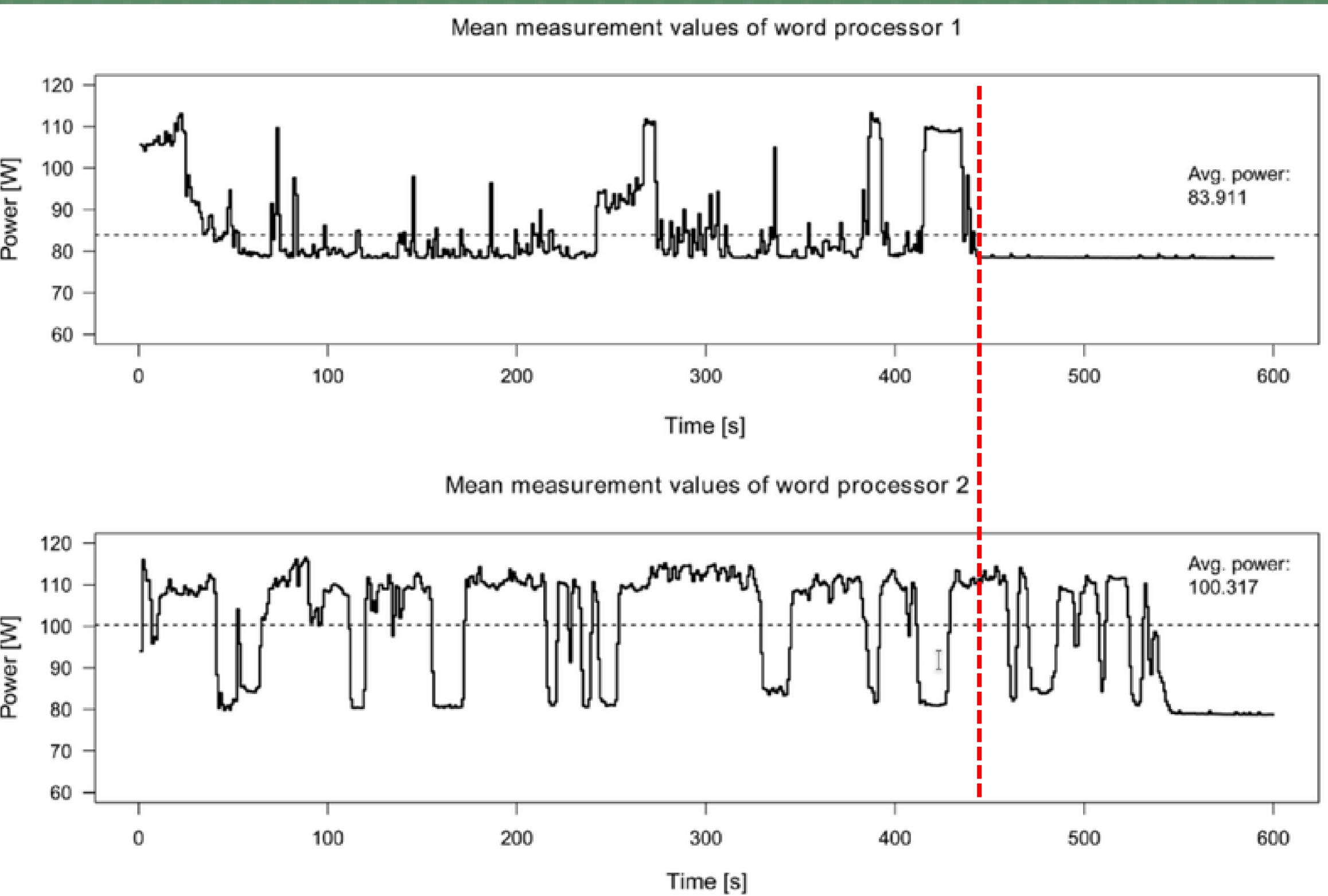




EFFICIENCY

STANDARD USAGE SCENARIO

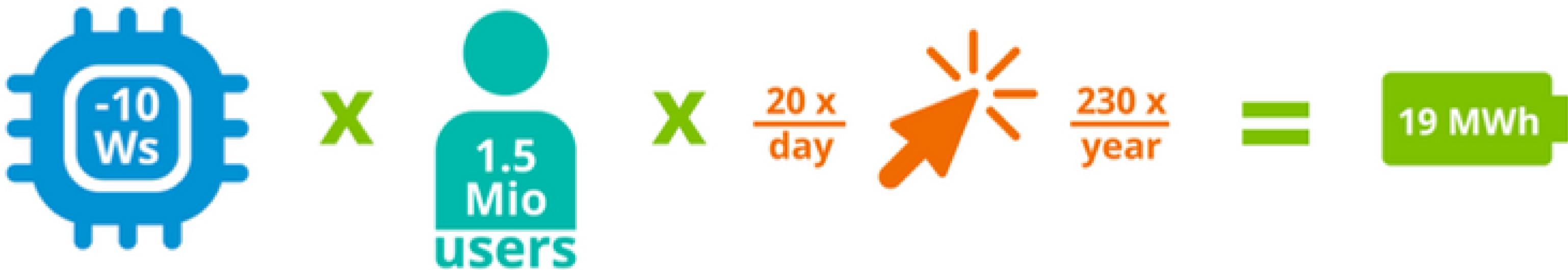
When the last action is performed, Word Processor 1 goes idle (as one might expect). By contrast, Word Processor 2 continues working, consuming power even though the script has ended.

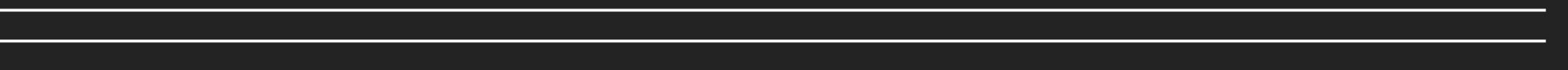




EFFICIENCY

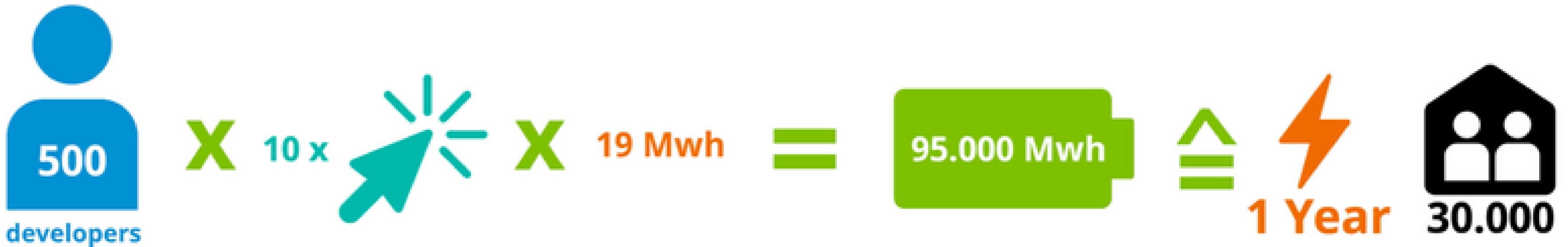
SCALE UP





EFFICIENCY

ACT LOCAL AND ACT GLOBAL





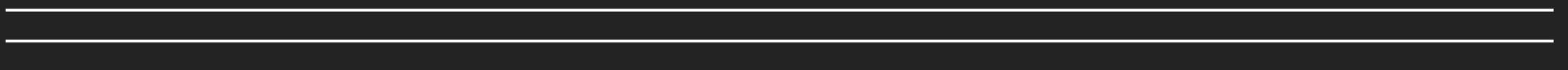
SOFTWARE DRIVEN HARDWARE OBSOLESCENCE

SOFTWARE

- Abandonware / Planned Obsolescence: "Device is no longer supported . . ."
- Bloat / Feature Creep: "Device doesn't meet minimum system requirements . . ."

RESULT

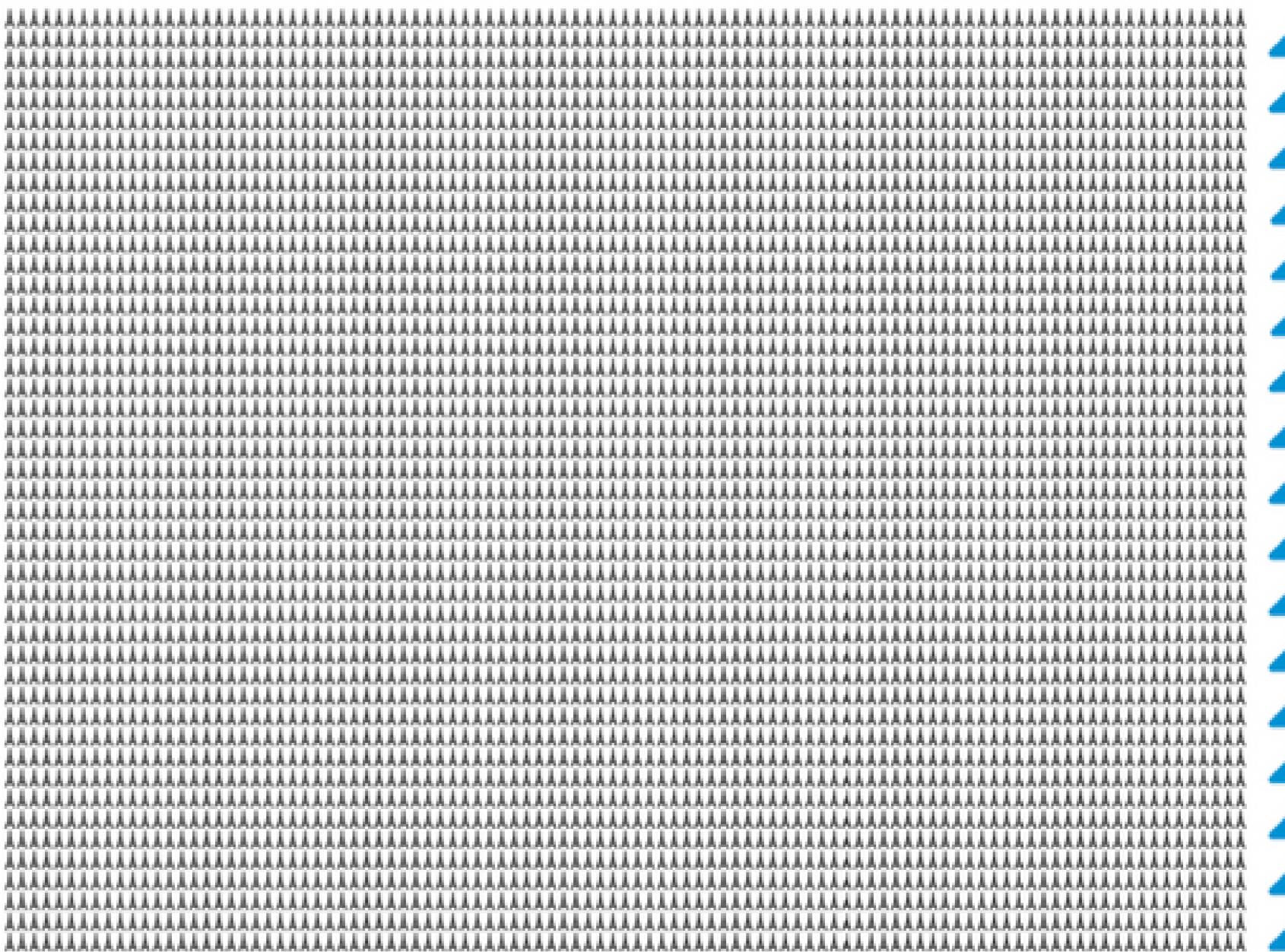
- New devices produced and shipped unnecessarily
- Functioning devices discarded as e-waste



CONSERVATION

TSUNAMI OF E-WASTE

E-waste 2016 = 4500 Eiffel Towers = Height of 17 Mount Everests



FOSS: SOFTWARE DESIGN FOR THE ENVIRONMENT





RESOURCE AND ENERGY EFFICIENCY

- Energy consumption / hardware performance (idle & standard usage)
- Minimum system requirements (CPU, working memory)
- Support for energy saving modes



POTENTIAL HARDWARE OPERATING LIFE

- Runs on hardware at least 5 years old



USER AUTONOMY

- Uninstallability / Modularity (installing essential functions only) Continuity of support (security updates)
- Documentation (open standards, uninstallation how-to, privacy policy)
- Transparency (open source/APIs open standards)
- Offline capability / Freedom from advertising



KDE ECO
HANDBOOK

ECO CERT
okular

KECOLAB

HOW DOES KDE FIT INTO THIS?

Software has a direct affect on energy and resource consumption. KDE has the goal of providing software which does this in a way that reduces software's environmental impact.



KDE ECO

KDE ECO HANDBOOK

APPLYING THE BLUE ANGEL CRITERIA

Applying The Blue Angel Criteria To Free Software

A handbook to certify software
as sustainable

A KDE Eco initiative



TEXT VERSION OF HANDBOOK WRITTEN AND COMPILED BY: Joseph P. De Veauh-Geiss (<https://eco.kde.org/handbook/>)



3 Steps of Eco Certification



MEASURE

Run usage scenarios to measure energy and hardware consumption in three modes



ANALYZE

Data analysis using OSCAR (Open source Software Consumption Analysis in R)



CERTIFY

Submit a report on the fulfillment of the Blauer Engel criteria



KDE ECO

MEASURING SOFTWARE'S ENERGY CONSUMPTION

LAB SETUP

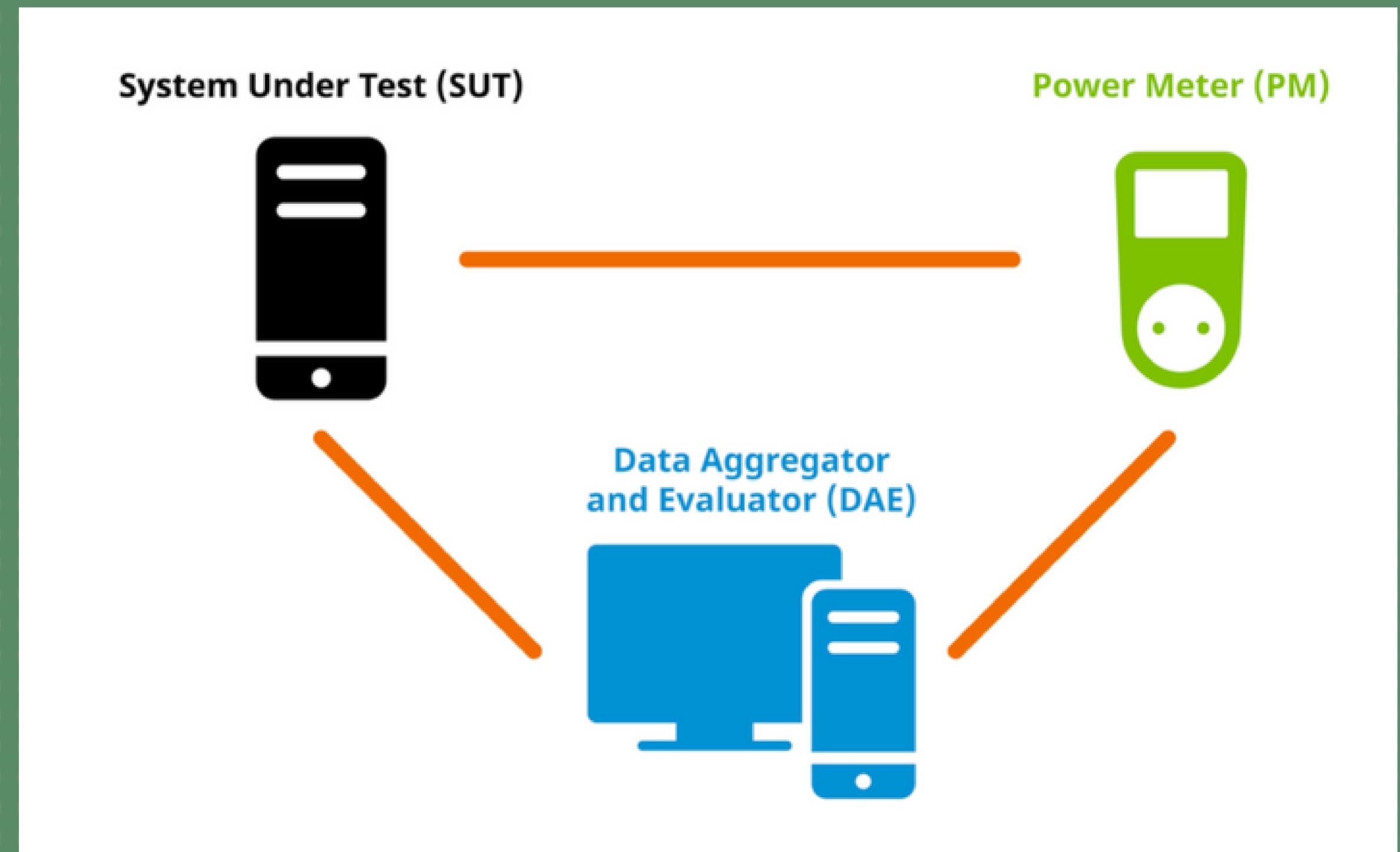


Image from <https://eco.kde.org/handbook/>



STANDARD USAGE SCENARIO – EMULATING USER BEHAVIOR

Preparing Standard Usage Scenarios

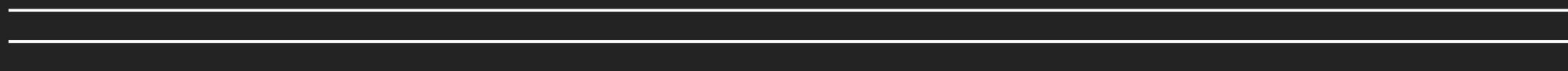
Identify
Typical Tasks

Identify
High Energy
Functions

Create
Flow Chart

Emulate
Actions
with Tool

Test SUS
in Lab



KDE ECO

ANALYZING THE DATA – OSCAR (UMWELT CAMPUS)

(2) Upload Messdaten

Messungen
Bitte die Dateien des gemessenen Nutzungsszenario hochladen:

Aktionen:

Browse...	okularActions.csv
Upload complete	

Elektrische Leistung:

Browse...	Okular_Szenario_elektrLeistung.csv
Upload complete	

Hardware-Auslastung:

Browse...	stdnutzungsszenario_hardware_f
Upload complete	

Dauer der Einzelmessungen (s):
217

Nach dem Hochladen der Messdaten müssen Einstellungen bezüglich des Datenformats der Quelldateien in den oberen Reitern "Formatierung Messdaten" und "Formatierung Zeitstempel" vorgenommen werden. Der Bericht kann anschließend mit einem Klick auf Schritt (3): "Konfiguration Bericht" konfiguriert und anschließend mit "Bericht erzeugen" generiert werden.

Aktivität:

Baselines
Bitte die Dateien der Leerlaufmessungen hochladen:

Aktionen:

Browse...	okularActions.csv
Upload complete	

Elektrische Leistung:

Browse...	okular_baseline_elektrLeistung.csv
Upload complete	

Hardware-Auslastung:

Browse...	baseline.hardware_formatiert.cs
Upload complete	

Art der Messung

Nutzungsszenario

Image from: <https://eco.kde.org/handbook/>



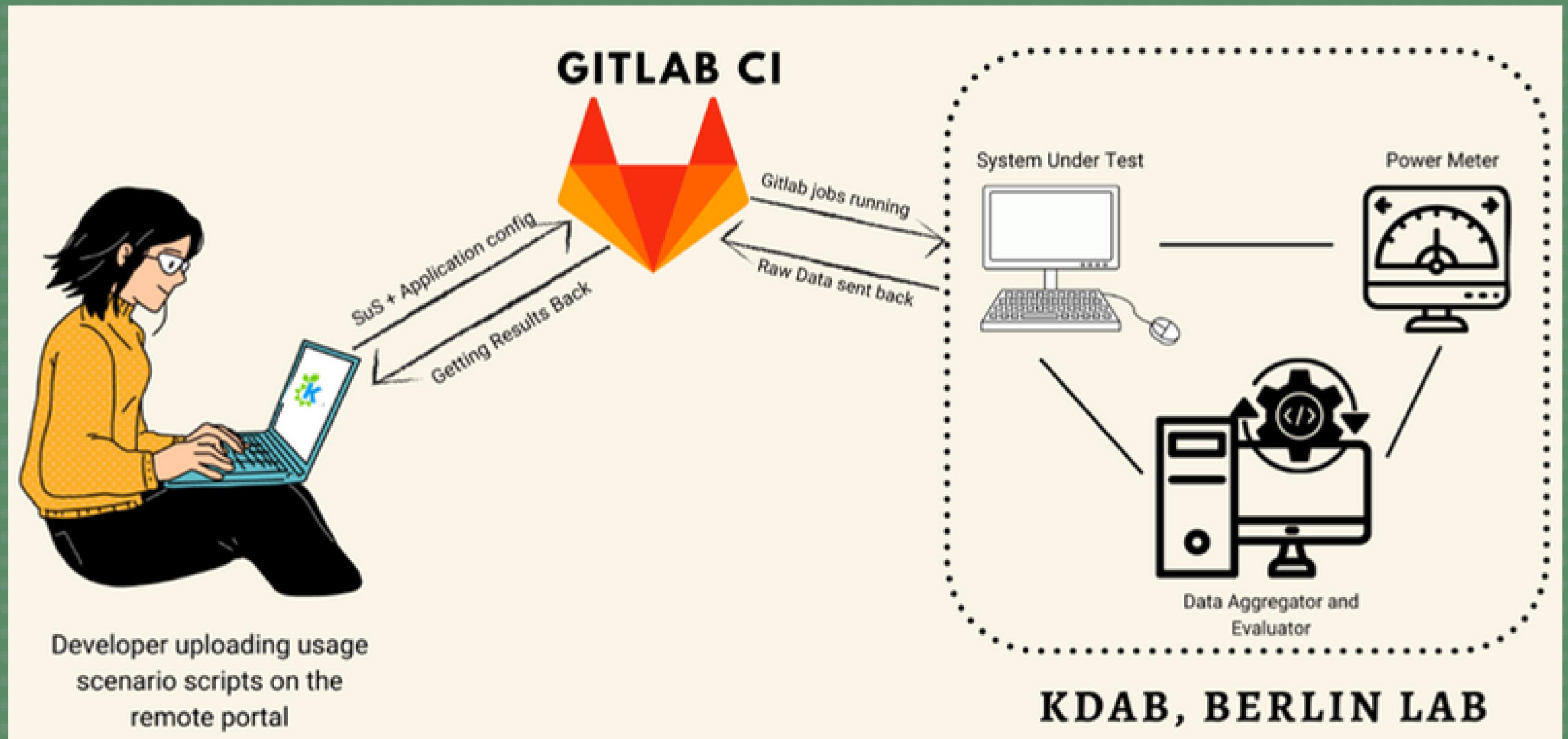
KDE ECO

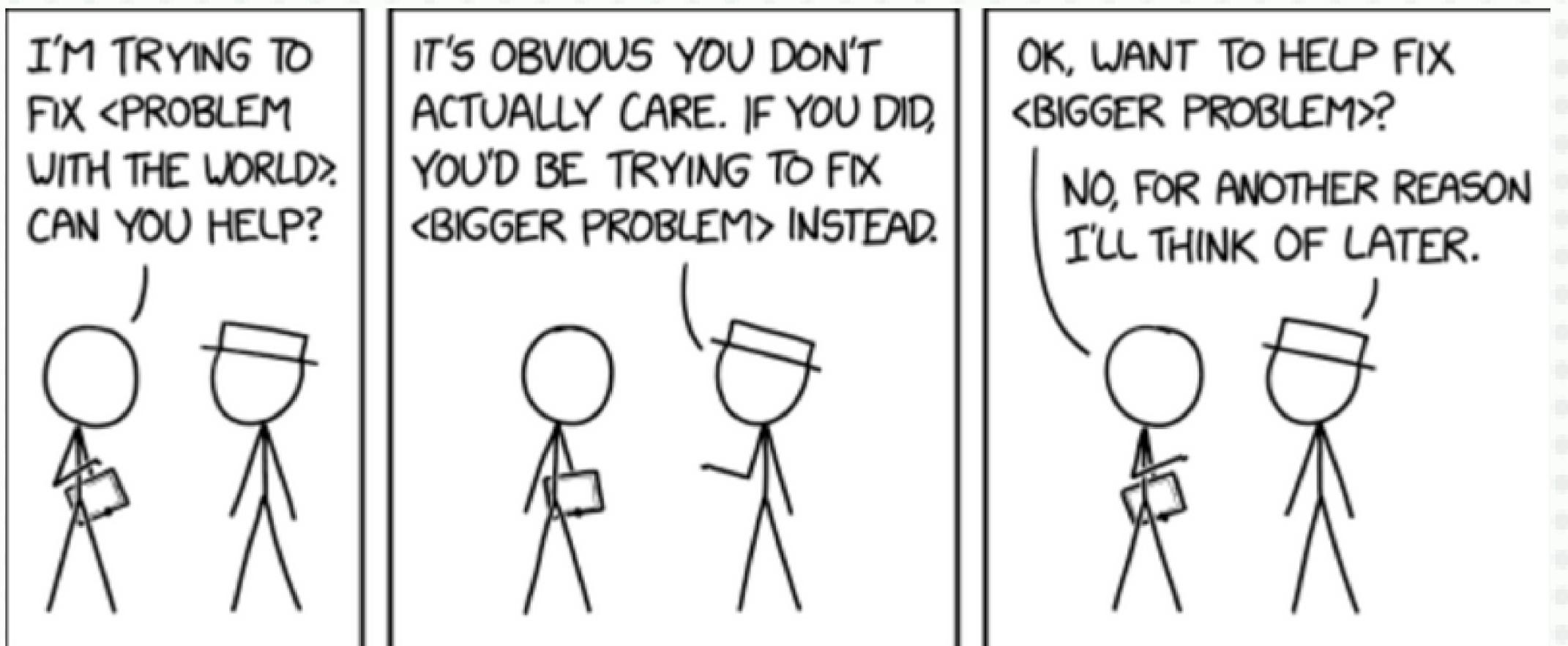
KDE ECO SPRINTS

KDAB BERLIN LAB



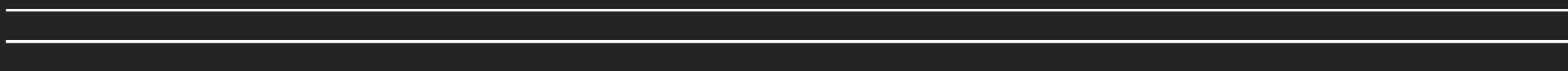
Image from <https://eco.kde.org/blog/2022-07-25-sprint-lab-follow-up/>





IS IT ALL OF THIS
WORTH IT?





KDE ECO

SOME FOSS SUSTAINABILITY INITIATIVES



LEARN MORE - AWSOME
SUSTAINABLE SOFTWARE LIST

DO MORE - KEEPING HARDWARE
IN USE WITH FREE SOFTWARE

MEASURING SOFTWARE –
GREEN CODING BERLIN

MEASURING WEBSITES –
GREEN WEB FOUNDATION

FOSS NIGERIA & KDE / KDE
ECO – RENEW VISION
PROJECT 2023



GET INVOLVED - <https://eco.kde.org>

CONTACT:

Email: drquark@duck.com

Mastodon:

<https://floss.social/@be4foss>

DISCUSS:

BigBlueButton: Monthly meet-ups, 2nd Wed. 19:00 CET/CEST

Energy Efficiency Mailing List:

<https://mail.kde.org/cgi-bin/mailman/listinfo/energy-efficiency>

Matrix Room: <https://webchat.kde.org/#/room/#energy-efficiency:kde.org>