



Green
Software
Foundation

Building green software with the Software Carbon Intensity Specification

Green Software Foundation - Building a trusted ecosystem of people, standards, tooling and best practices for green software.

Who am I?

Sara Bergman

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Software Foundation

Senior Software Engineer @ Microsoft

@SaraEBergman

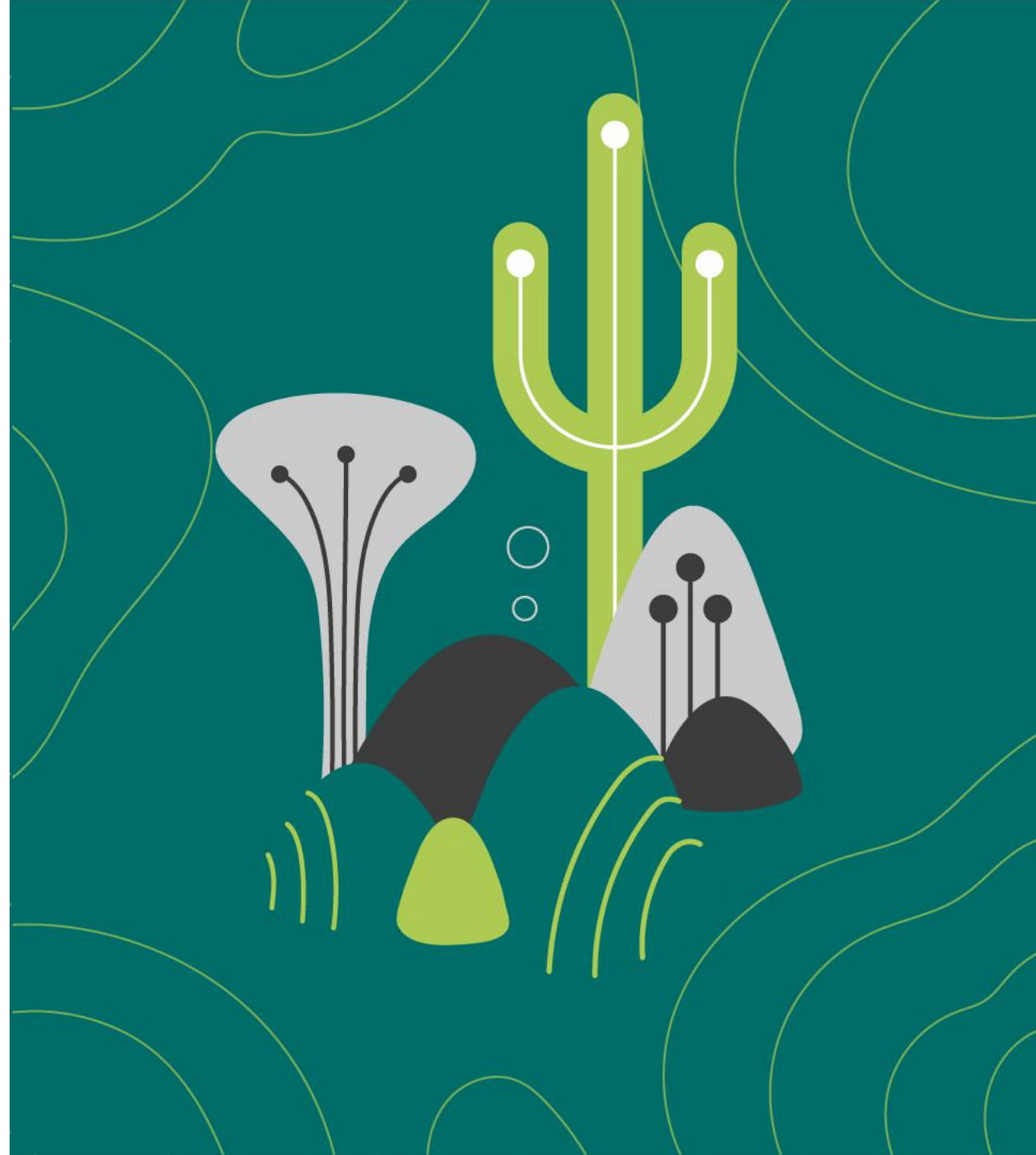
Swede living in Norway



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Agenda

- Introduction
- Structure of the GSF
- Projects
- Software Carbon Intensity
- Q&A



Structure

Why we exist and how we are structured

Our Theory Of Change



Mission

Change how we build so there are zero harmful environmental effects.



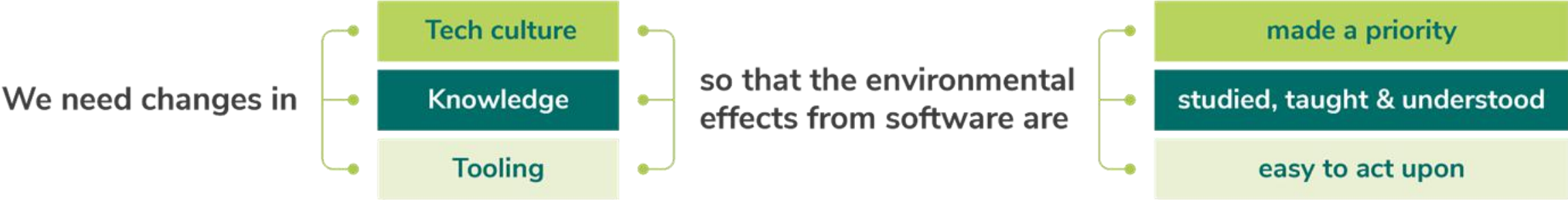
Vision

We are building a trusted ecosystem of people, standards, tooling and best practices for creating and building green software.



Who we serve

Primarily software practitioners
Secondarily leaders, policy makers, students, and anyone in software adjacent roles.

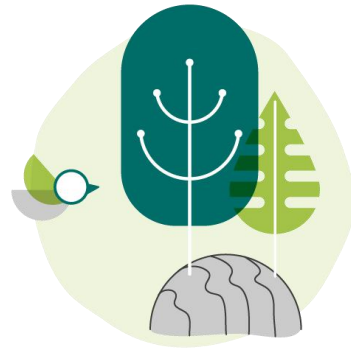


Why do we need a Foundation?



Enable Collaboration

Gives organisations clarity regarding patent rights, IP, copyright with shared work and agreed methods of coming to a decision.



Trusted Ecosystem

Create an ecosystem of standards, tooling and best practices which can be trusted by enterprises, governments and the public.



Increased Market Size

Increases the demand for people, services, and products that support the creation and maintenance of green software.

Structure

Steering Committee



Standards WG



Trademark WG



Innovation WG



Community WG

Linux Foundation

We Represent the Global Software Industry



Our members operate in over **190 countries**



with a global workforce of over **1.5 million people**



Five of our members are **FORTUNE Global 500** companies

Our steering members

accenture

avanade

BCG
GAMMA

GitHub

Globant

intel.

Microsoft

NTT DATA

/thoughtworks

UBS

Our general members

AMADEUS

AVEVA



University of
BRISTOL

Container
Solutions

<epam>

FUTUREWEI
Technologies

Goldman
Sachs

INTESA
SANPAOLO

KERING

LEADERS
FOR
CLIMATE
ACTION.



NRI

OpenUK



SDIA

TEXAS
STATE
UNIVERSITY



THE GREEN WEB
FOUNDATION



Supercritical

SYNGENIO AG

UNIVERSITÀ
DEL SALENTO

virtasant

vmware

WattTime

Projects

A few of the projects being run in the Foundation



COMMUNITY WG



Green Software Practitioner Certification

Tags: Tech Culture Knowledge

- Training and certification for Green Software.
- Goal is 1 million practitioners certified by end of 2023.



COMMUNITY WG



Green Software Patterns Catalog

Tags: Knowledge

- Catalog of best practices for building Green Software.
- Verified by subject matter experts from the GSF.
- Agreed via consensus by all member organizations.
- Apply any of these patterns in your software and it will reduce your emissions.



OPENSOURCE WG



Carbon Aware SDK

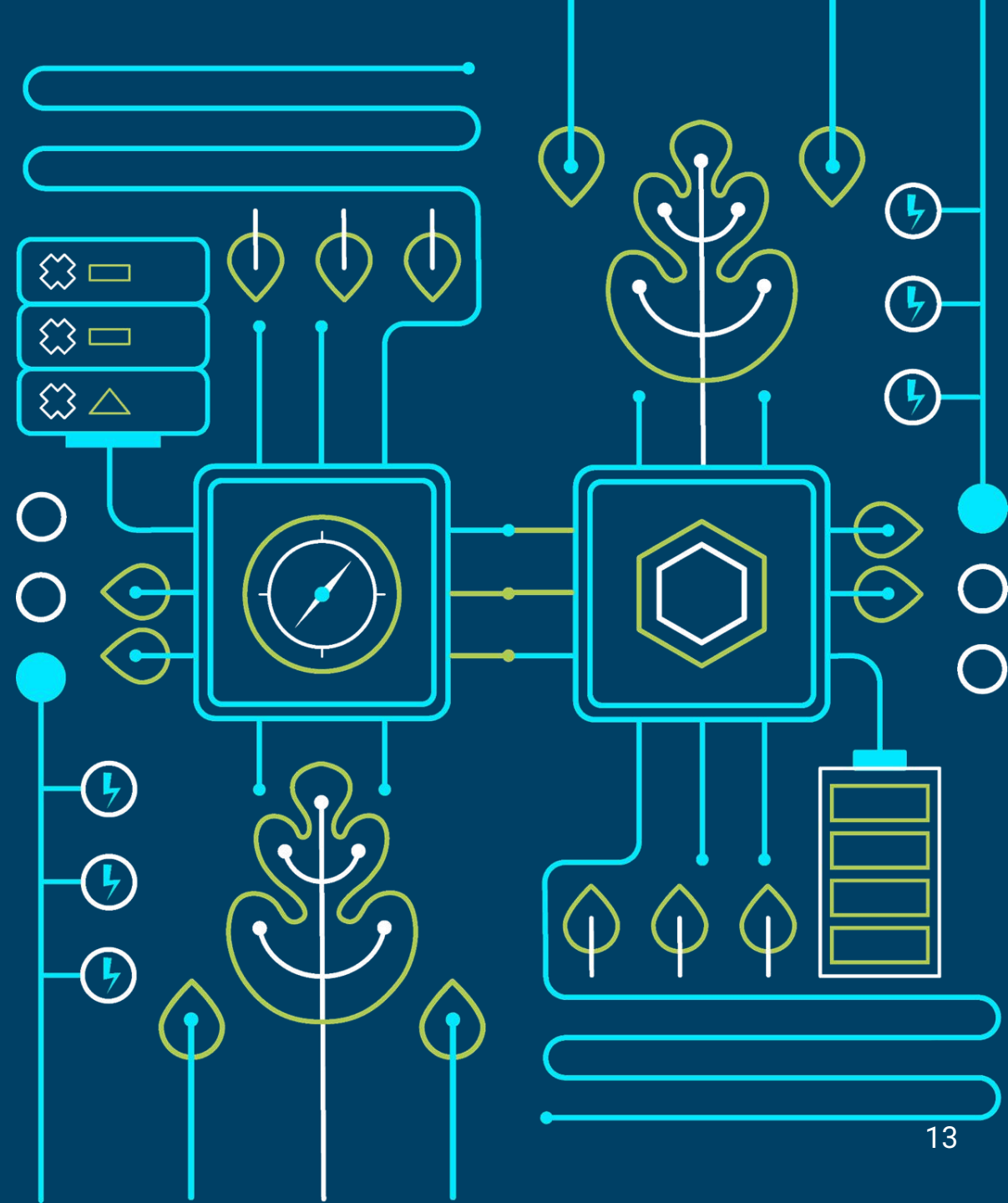
- Releasing a toolkit that enables developers to easily build applications that do more when the electricity is cleaner and less when it's dirty.
- One of the hottest topics in green software.
- Focus of the Carbon Hack 22.

Tags: [Tech Culture](#) [Tooling](#)



Carbon Hack 22 is about building software that can reduce the amount of carbon emissions generated through software using the new Carbon Aware API.

grnsft.org/hack22/api





STANDARDS WG



Software Carbon Intensity

- Release of version 1.0 of the Software Carbon Intensity Specification.
- Helps organizations **eliminate** emissions.
- Essential part of any **Net Zero** strategy.

Tags: [Tech Culture](#) [Tooling](#)

What makes software green?

Carbon Efficiency

Emit the least amount of carbon possible



Energy Efficiency

Consume the least amount of electricity possible



Hardware Efficiency

Use the least amount of embodied carbon possible



Carbon Awareness

Do more when the electricity is clean and less when it's dirty

Do totals tell the whole story?

Q1: Carbon emissions are 34 tonnes

Q2: Carbon emissions **increased** to 52 tonnes

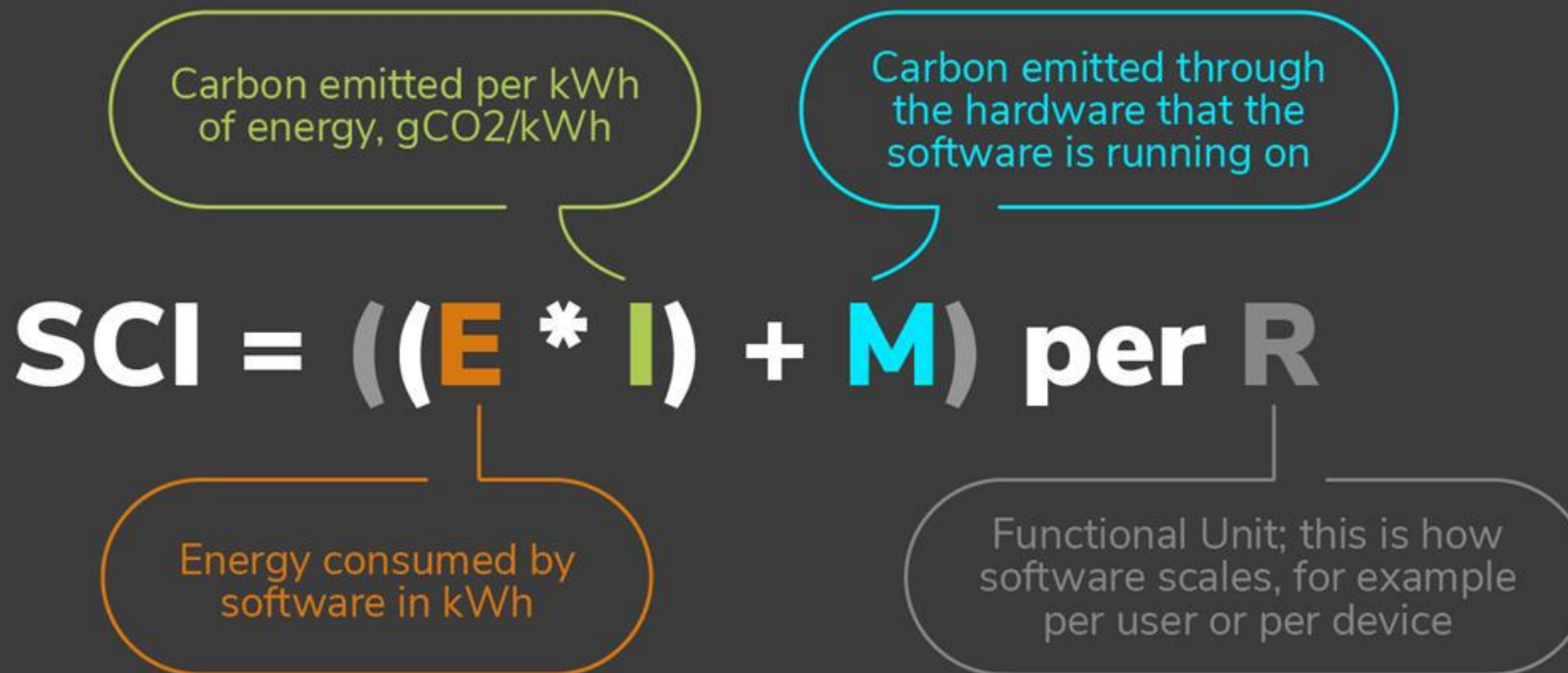
Do totals tell the whole story?

Q1: Carbon emissions are 3.3g **per User**

Q2: Carbon emissions are 2.9g **per User**

Software Carbon Intensity (SCI)

The SCI score is a rate of carbon emissions, not a total. The equation is a simple and elegant solution to the extremely complex problem behind it:



The “per R” is what makes the SCI into a tool that works for every software domain, every use case, and every person.

Core characteristics

As this specification develops, the following core characteristics shall remain true:

- The SCI is sensitive to carbon awareness, energy efficiency, and hardware efficiency
- The SCI takes a systems-impact view
- The SCI is easy to implement
- The SCI encourages the use of granular data

Exclusions

Only actions that eliminate emissions reduce an SCI score. As such, an SCI score cannot be reduced through carbon offsets, such as market-based measures.

STATE OF GREEN SOFTWARE

grnsft.org/sogs/survey

Launching Q1 2023

The State of Green Software will be the first report to map the new green software ecosystem, from key stakeholders to regulatory frameworks, from impact metrics to academic literature, open source tooling to actionable design patterns.

Get involved, **take the 5 min survey now**

[Take the survey now](https://grnsft.org/sogs/survey)





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Thank you!

<https://greensoftware.foundation>

