The Digital Carbon Footprint of Software

Responding to the availability of green electrons starts with software (inside the infrastructure and within the digital economy)
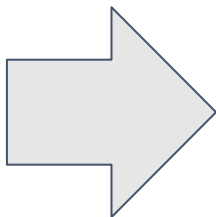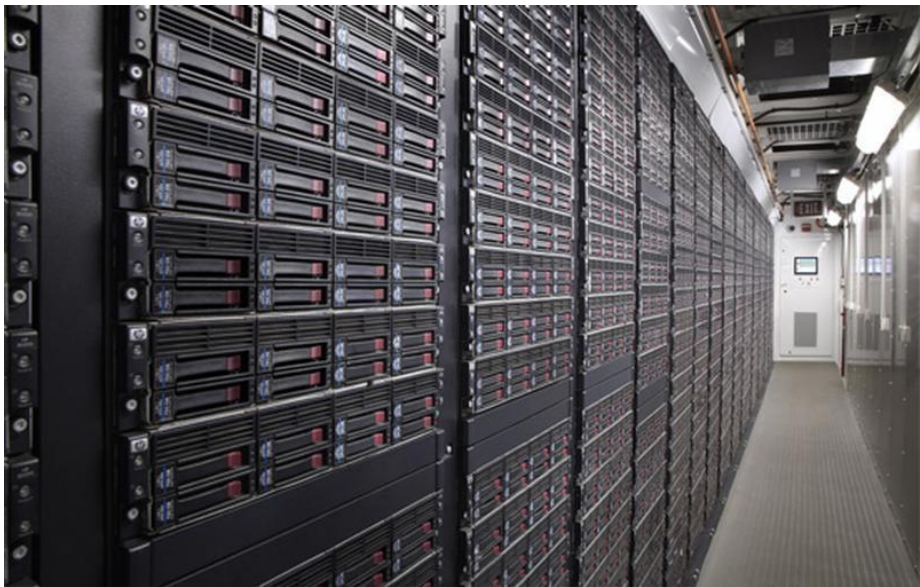
Digital world = 100% electrons
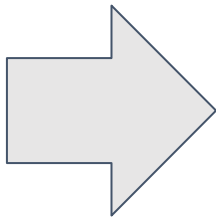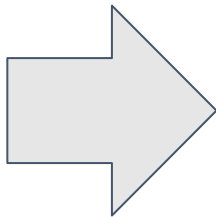
Drive X kilometers
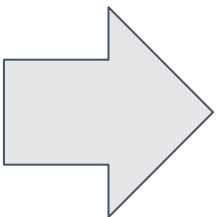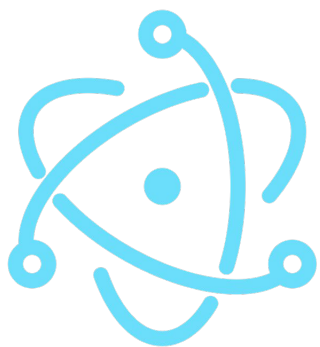
Digital Power = Digital Services

Heat

For a green digital economy, software needs to respond to the availability of green electrons

But for that software needs to know when green electrons are available:

API?

Are green electrons available?

How green is the grid right now and in 3 hours from now?

elia group

Elia | 50Hertz | EGI

And we need transparency across value chain and new software architecture that follows the availability of green electrons:

2000's Monolith

2010's Monolith

2020 is about distributed software architectures = capable of following green electrons

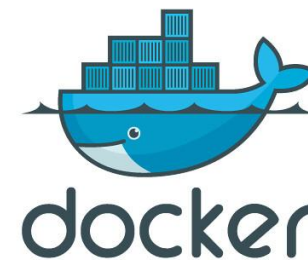# True green digital power & sustainability within software requires collaboration across the whole value chain:

Enable			
Enabling Infrastructure	**Digital Infrastructure**	**The Internet & Enabling Digital Technologies**	**Digital Economy (businesses & applications)**
Electrical Power Generation	Fiber & Mobile Networks	Containerization	E-Commerce (like Zalando)
Rare Minerals & Materials	Data Centers	Internet of Things	Platforms (like Facebook)
Buildings & Land	IT Hardware	Virtualization	Marketplaces (like Airbnb, Ebay)
	Data Storage	Data Analytics & Machine Learning	E-Government (digital transformation)

US$13.7T
economic value

SDIA

SDIA *The Alliance is the platform for collaboration across the digital sector.*

To drive this collaboration, the SDIA created a roadmap of activities for all parties to participate:

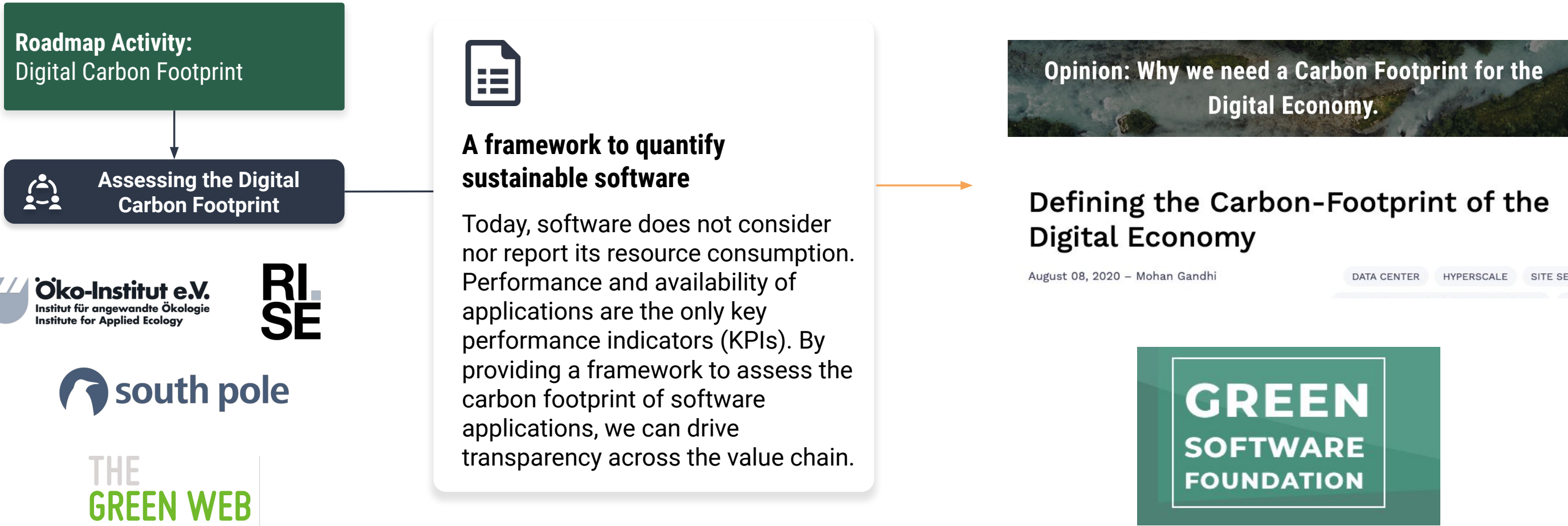| Emissions	Energy Consumption	Electronic Waste	Resource Consumption	Pollution	Cost of Digital Power
Digital Carbon Footprint	Leaner Cooling System/ Data Center Heat Utilization	Standardization of IT Hardware	Digital Resource Footprint	Zero-Pollution Backup Power and Cooling Systems	Standardized Framework for Quantifying Digital Power
Renewable Power Consumption & Integration	Energy-efficient Chip & Hardware Design	Second-hand Hardware Markets	Zero-(Fresh) Water Cooling System	Digital Pollutant Footprint	Efficient Future Digital Infrastructure Architectures
IT Hardware Utilization Efficiency	NZEB Building	Extended Life Hardware	Zero Rare Materials Consumption	Zero-Pollution Manufacturing	Unbundling IT Hardware & Software
	Leaner Architecture/Design for Software	Recycling of Parts			
		Circular Design			

Aligned with:

SUSTAINABLE DEVELOPMENT GOALS

If everything is becoming software, the first question what's the footprint of software?

Emissions	Energy Consumption	Electronic Waste	Resource Consumption	Pollution	Cost of Digital Power
Digital Carbon Footprint	Leaner Cooling System/ Data Center Heat Utilization	Standardiz... H...	...tprint	Zero-Pollution Backup Power and Cooling Systems	Standardized Framework for Quantifying Digital Power
Renewable Power Consumption & Integration	Energy-efficient Chip & Hardware Des...	Secon...	Syst...	...al Pollutant Footprint	Efficient Future Digital Infrastructure Architectures
IT Hardware Utilization Efficiency	NZEB Buildi...	Extend...	Zero Rare Materials Consumption		Unbundling IT Hardware & Software
	Leaner Architecture/Design for Software	Recycling of Parts			
		Circular Design			

Aligned with:

A carbon footprint for software – creating transparency across the stack – framework and market implementation

Roadmap Activity:
Digital Carbon Footprint

Assessing the Digital Carbon Footprint

Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

RI.SE

south pole

THE GREEN WEB FOUNDATION

A framework to quantify sustainable software

Today, software does not consider nor report its resource consumption. Performance and availability of applications are the only key performance indicators (KPIs). By providing a framework to assess the carbon footprint of software applications, we can drive transparency across the value chain.

Opinion: Why we need a Carbon Footprint for the Digital Economy.

Defining the Carbon-Footprint of the Digital Economy

August 08, 2020 – Mohan Gandhi

DATA CENTER   HYPERSCALE   SITE SE

GREEN SOFTWARE FOUNDATION

SDIA

The SDIA is the leading platform for driving sustainability in the digital infrastructure.

Founded on the 17 July 2019 in Hamburg, Germany, with offices in Amsterdam, London, and Brussels

15 full-time employees, 9 board members, 11 advisory board members

58 members across Europe, 4 joint policy papers released in 2020

Our Mission:

To assemble all actors of the digital sector to jointly create and execute a plan toward a sustainable digital economy
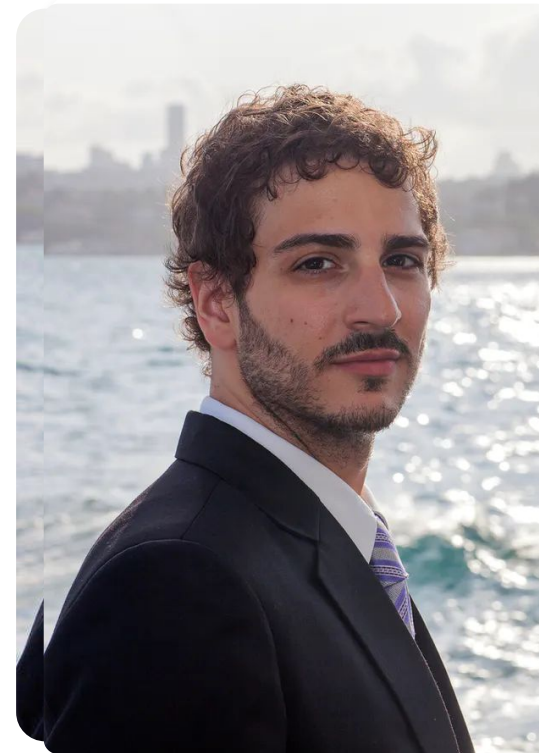
Thank you!

Max Schulze

Executive Chairman, SDIA

max.schulze@sdialliance.org

Michael J. Oghia

External Relations Coordinator

michael.oghia@sdialliance.org

Sustainable Digital Infrastructure Alliance e.V.

Colonnaden 5
20354 Hamburg, Germany

www.sdialliance.org