OSB Open Source Business
ALLIANCE
Bundesverband für digitale Souveränität e.V.

Sovereign
Cloud Stack

ECO:DIGIT
Enabling green **CO**mputing
and **DIGI**tal **T**ransformation

Supported by:

Federal Ministry
for Economic Affairs
and Climate Action

on the basis of a decision
by the German Bundestag

OCP Experience Center Opening 2023-09-05

OSBA's Projects SCS & ECO:DIGIT: Making the Dream of Sustainable and Sovereign Cloud Computing come true.

Manuela Urban   **Maria Bauer**

Why are we here at the OCP Europe Meetup?

It only seems logical...

...to deploy SCS on OCP Hardware

Sovereign Cloud Stack & ScaleUp Technologies

...to measure the resource consumption of cloud computing

Sovereign Cloud Stack & **ECO:DIGIT** & ScaleUp Technologies

Sovereign Cloud Stack — An OSB ALLIANCE project

https://scs.community

Gefördert durch:
Bundesministerium für Wirtschaft und Klimaschutz

aufgrund eines Beschlusses des Deutschen Bundestages

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Sovereign Cloud Stack

...is an open community that standardizes, integrates and builds Open Source cloud technology for Europe & the world and shares operational knowledge.

https://scs.community

Sovereign Cloud Stack
An OSB ALLIANCE project

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Sovereign Cloud Stack Deliverables

1 Certifiable Standards

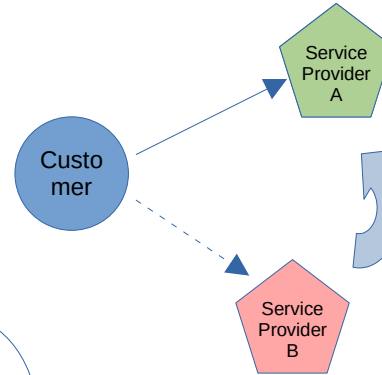**2** Modular Open Source Reference Implementation

3 Operational Knowledge
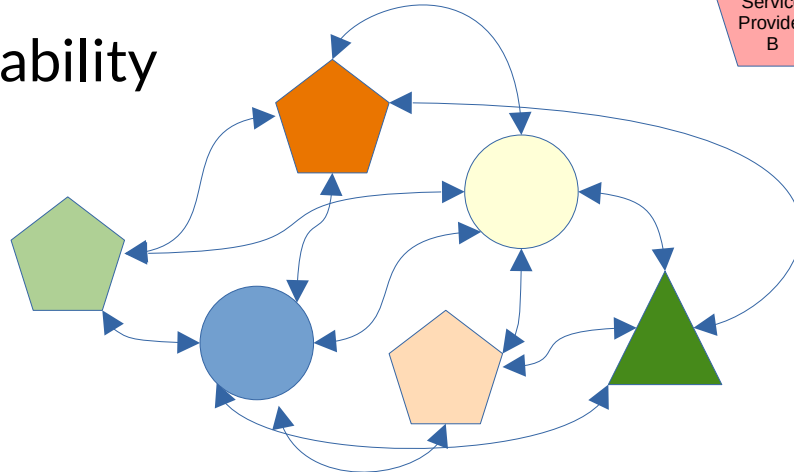
SCS Certified Standards provide...

Modularity

KaaS

IaaS | ..... | IAM
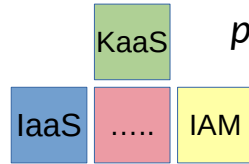
All pieces can be used independently or put together to build a complete stack.

Interoperability, Portability

Customer → Service Provider A

Customer ⇢ Service Provider B

Choose your service provider freely, transfer your data & applications easily and safely.

Federability, Scalability

Build a virtual hyperscaler.

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SCS Reference Architecture (current status)

SCS

Open Policy Agent (R)

cortex (R) · tele-metry (R) · zuul (R)

skydive (R) · netdata (R) · grafana (R)

prome-theus (R) · ansible (R) · ELK (R)

Automation
Continuous
Integration Framework
Logging
Monitoring
Metering
(Node Wide Part)

Optional Local Portal
(Locally on this GAIA-X Node)

Local Orchestration Govenance Discovery
(Locally on this GAIA-X Node)

ansible · terra form · Rancher

SCS-3 (future)
Xpanse, Glasskube, ...

Data-base (O) · cortex (O) · Nextcloud/ownCloud (O) · FaaS (O)

Tensor-flow (O) · Cloud Foundry (O) · Open Shift (O)

SCS Platform Services
(As GAIA-X Services, selected via GAIA-X catalogue)

Gaia-X
FEDERATION SERVICES
GXFS

Other GAIA-X Services
(Compatible with this GAIA-X execution layer via self description)

oID connect (S) · SAML (S) · UCS (R)

keystone (O)

keycloak (R)

Dark squares: future

SCS-1 (R5)

Container Layer
(aaS or managed)

Mesh (istio) & Proxy (envoy) · helm · registry (harbor) (S) · k8s CAPI (S)

kuber-netes (S) · CSI (S) · CNI (S) · kata · fire-cracker

nova (O) · ironic (O) · glance (O) · barbican (O)

Linux (R) · KVM (R) · libvirt (R)

Compute (IaaS)

cinder (O) · freezer (O) · Swift (O) · S3 protocol (S)

ceph (R) · rados gateway (R)

Storage SDS

neutron (O) · octavia (O)

OvS (R) · OVN (R)

Network SDN

Node Wide Identity Access Management

Hardware & DC deployment automation & management

(S) SCS Standard · (O) Optional Standard · (R) Reference Implementation Detail

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Open Operations

Open Operations Manifesto

Building a community of practice and transparency for Operations

We – *the founding and supporting organizations* – proclaim our primary objectives to be transparency along with the sharing of knowledge and are in the process of building a community of practice – Open Operations.
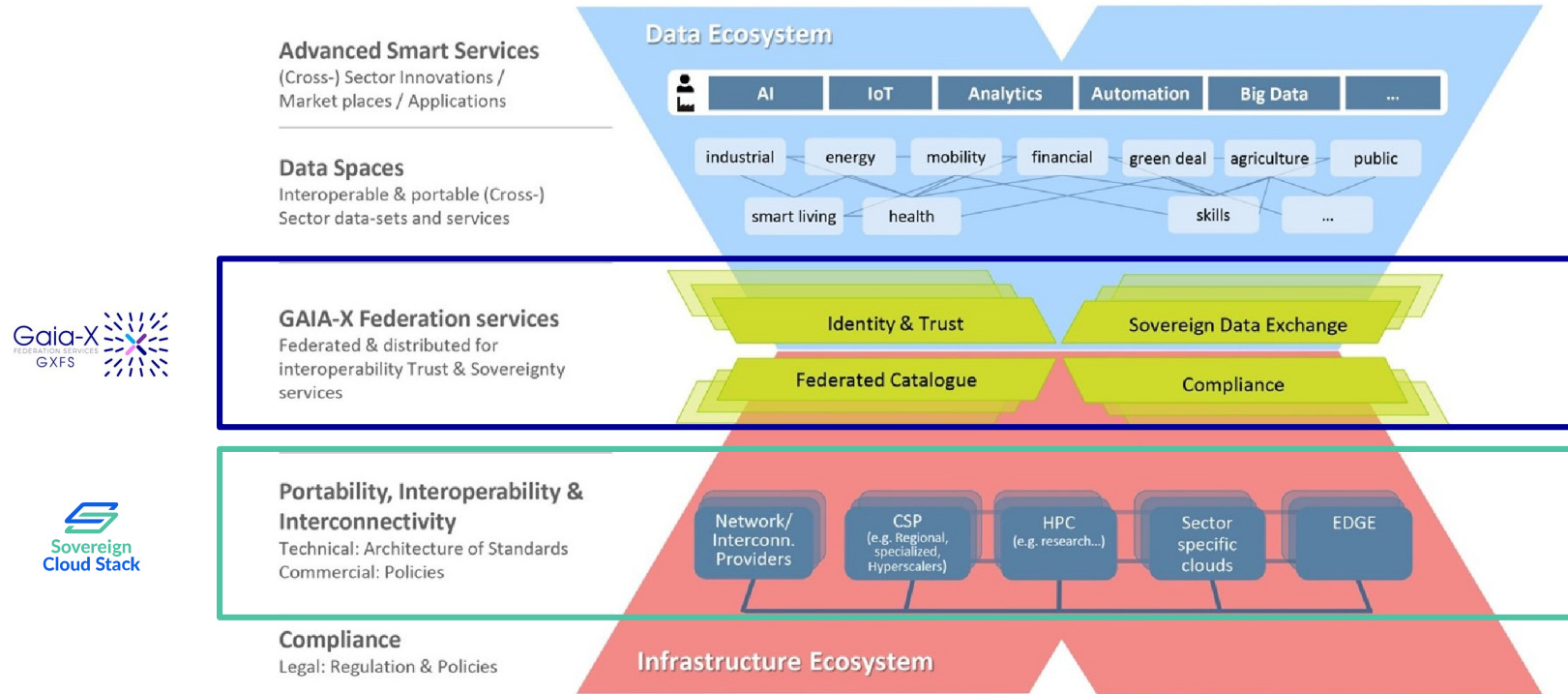
https://openoperations.org

Sovereign Cloud Stack: Open Source Cloud Technology Toolbox and a Community of Practice for Industry, Science and the Public Sector

https://scs.community
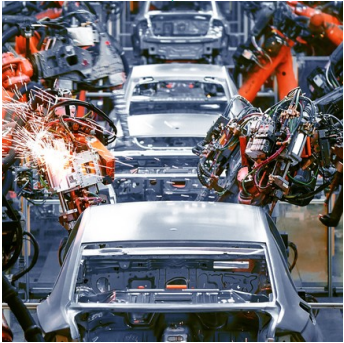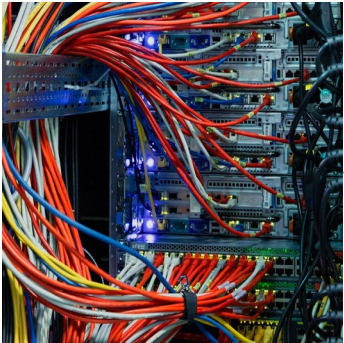
SCS: Technical Underpinning for Gaia-X

Advanced Smart Services
(Cross-) Sector Innovations / Market places / Applications

Data Spaces
Interoperable & portable (Cross-) Sector data-sets and services

GAIA-X Federation services
Federated & distributed for interoperability Trust & Sovereignty services

Portability, Interoperability & Interconnectivity
Technical: Architecture of Standards
Commercial: Policies

Compliance
Legal: Regulation & Policies

Data Ecosystem

AI | IoT | Analytics | Automation | Big Data | ...

industrial — energy — mobility — financial — green deal — agriculture — public

smart living — health — skills — ...

Identity & Trust | Sovereign Data Exchange

Federated Catalogue | Compliance

Network/Interconn. Providers | CSP (e.g. Regional, specialized, Hyperscalers) | HPC (e.g. research...) | Sector specific clouds | EDGE

Infrastructure Ecosystem

Gaia-X FEDERATION SERVICES GXFS

Sovereign Cloud Stack

Sovereign Cloud Stack — An OSB ALLIANCE project

https://scs.community

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Supporting Organisations

23 | Technologies

B1 SYSTEMS

SPRIN-D

Bundesministerium für Wirtschaft und Klimaschutz

cleura

CLOUD & HEAT

{c} CLOUDICAL

dataport

dilossacon

dNation DevOps Nation

GONICUS PIONEERS OF OPEN SOURCE

gridscale

LEITWERK Die Zukunft Ihrer IT

noris network

Open Infrastructure FOUNDATION

OSB Open Source Business ALLIANCE Bundesverband für digitale Souveränität e.V.

T··

OX Stay Open.

OSISM

OVHcloud

plusserver

Stackable

StackHPC

Syself

univention be open

WAVECON

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Bundesministerium für Wirtschaft und Klimaschutz
aufgrund eines Beschlusses des Deutschen Bundestages

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Cloud Services based on SCS

aov IT.Services GmbH

BETACLOUD

REGIO
Digital für Deutschland

wavestack

...more are in development.

IT-Planungsrat

SCS is involved in DVC (Deutsche Verwaltungscloud)

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We are open.

Test SCS: https://github.com/SovereignCloudStack
Visit our online meetings: https://scs.community/de/contribute/
Meet us in person: SCS Hackathon 8 November 2023, Cloud&Heat, Dresden

https://scs.community

Join us!

One platform – standardized, built and operated by many.

Giudelines and Core Values

- Digital Sovereignty
- Open Source
- Reduction of dependencies
- Open standards
- Innovative capability
- Resilience
- Sustainability and energy efficiency

- Open collaboration
- Education
- Transparency and auditing capability
- Network neutrality
- Public Money, Public Code
- Open source as a common standard

Sovereign Cloud Stack

— An OSB ALLIANCE project —

Digital Sustainability
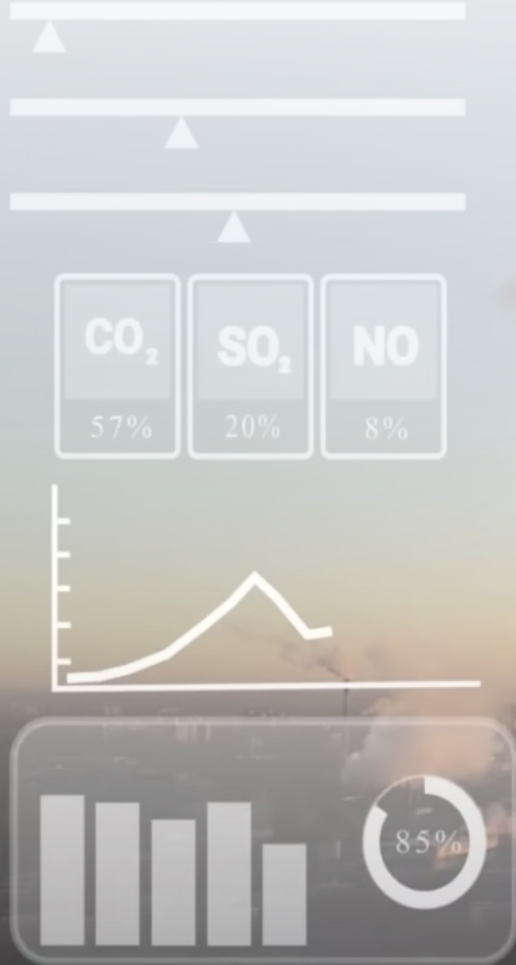
ECO:DIGIT
Enabling green Computing and DIGItal Transformation

Time to act sustainable

❝ ECO:DIGIT is here to create transparency, objectivity and standardisation with regard to the evaluation of resource consumption when using any software solution.

ECO:DIGIT Project Partners

- Science and Research Communities
- Industry, Computing and Politics
- Duration: 06/01/2023 – 05/31/2026
- DLR as project management agency
- Very divers teams

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Scientific and technical work objectives
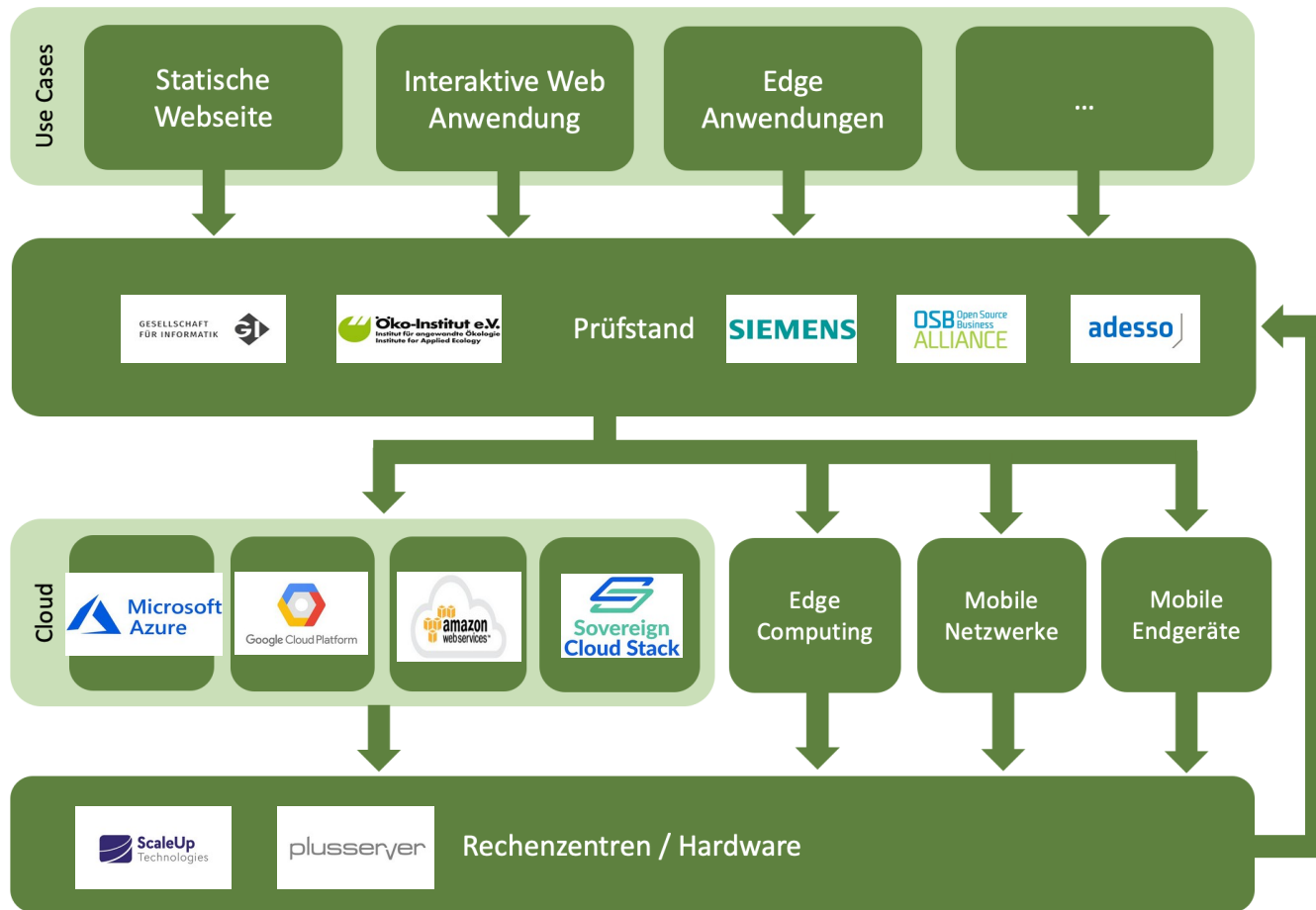
Main Objective

Development, validation and provision of an automated evaluation environment (test bench) that brings transparency about key figures and data on resource consumption, CO_2 emissions, etc. for software applications that can be tested.

Milestones ECO:DIGIT

M	Month	Outcome
M 1	6	Requirements for the test bed identified, architecture concept finalised
M 2	18	Virtual test environment incl. balancing methodology completed
M 3	30	Demonstrator including standards developed and tested

Impact of ECO:DIGIT

Figure 4 – Disclosure to the climate transition plan elements

Legend:
- Entire disclosure sample (Group 1)
- Climate transition plan disclosure sample (Group 2)

ARE COMPANIES DEVELOPING CREDIBLE CLIMATE TRANSITION PLANS?

Disclosure to key climate transition-focused indicators in CDP's 2022 Climate Change Questionnaire

February 2023

Impact of ECO:DIGIT
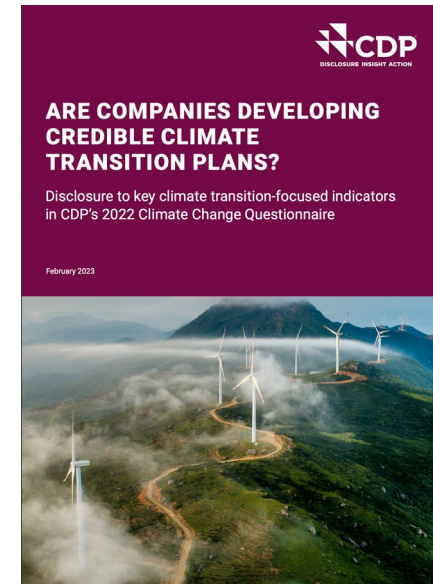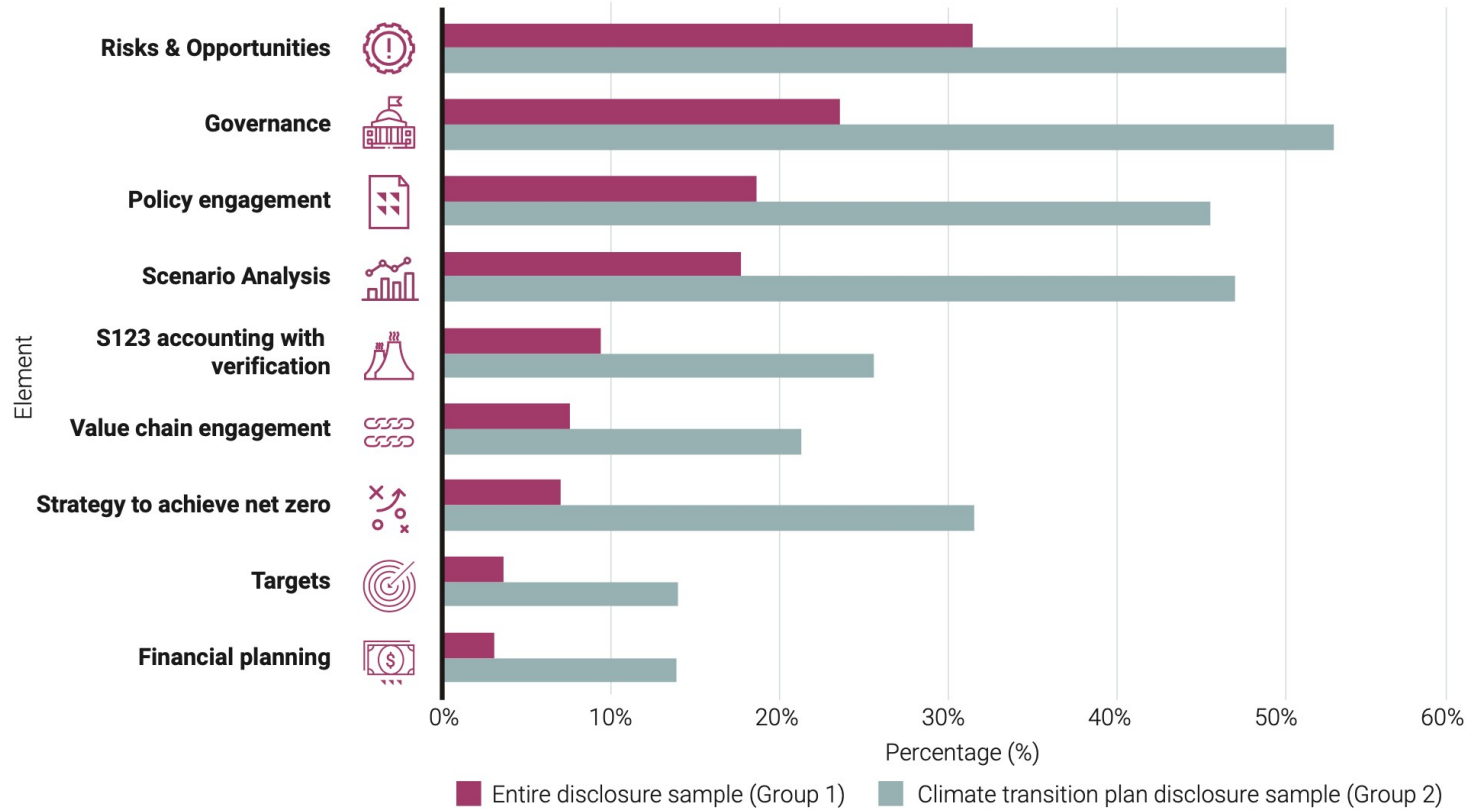
Scope 1, 2 and 3 accounting with verification

A climate transition plan should be accompanied by an annual Scope 1, 2 and 3 emissions inventory that is complete, accurate, transparent, consistent, relevant, and verified by a third-party. In this year's analysis, we assessed the disclosure of indicators within this element and identified that of all three scopes of emissions reported, Scope 2 disclosures most met the disclosure criteria (99%), followed by Scope 1 (71%) and Scope 3 (22%) - see Figure 7, below:

Figure 7 – Scope 1, 2 and 3 accounting with verification

ARE COMPANIES DEVELOPING CREDIBLE CLIMATE TRANSITION PLANS?

Disclosure to key climate transition-focused indicators in CDP's 2022 Climate Change Questionnaire

February 2023
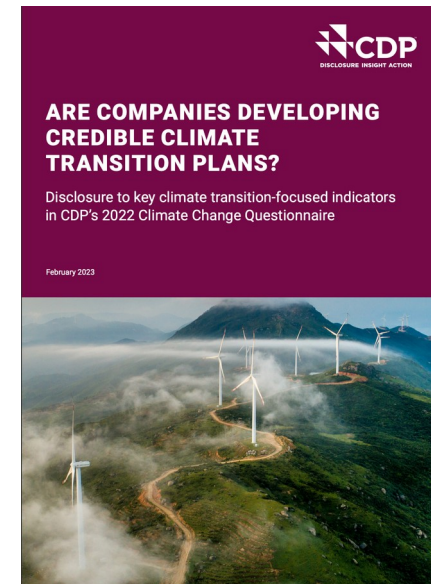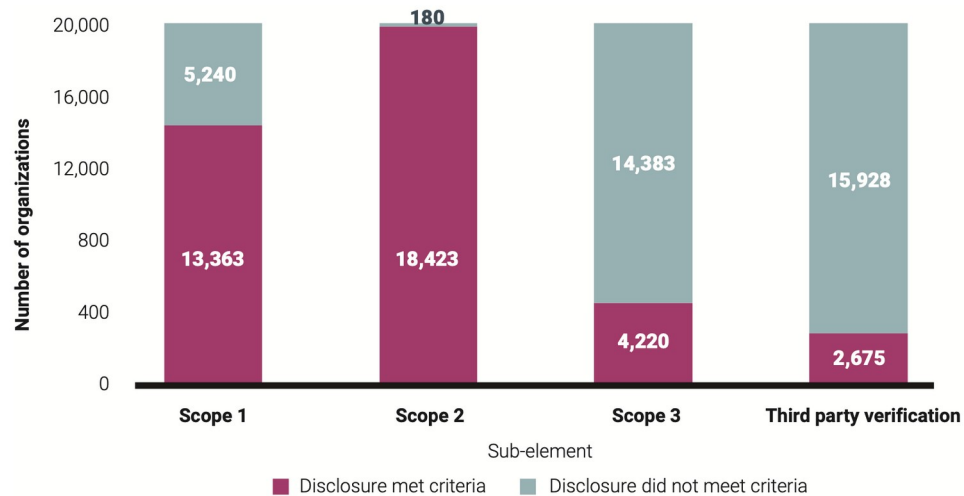
What about consumption and DCs?

Rechenzentren und Nachhaltigkeit

3.2 Energiebedarf und Treibhausgasemissionen

Energiebedarf von Rechenzentren in Deutschland

Energiebedarf pro Jahr (Mrd. kWh/a)

Jahr	Wert
2010	10,4
2011	10,6
2012	10,9
2013	11,2
2014	11,6
2015	12,0
2016	12,6
2017	13,3
2018	14,0
2019	15,1
2020	16,3
2021	17,0
2022	17,9

Legend: Server, Speicher, Netzwerk, Kühlung, USV, Sonstiges
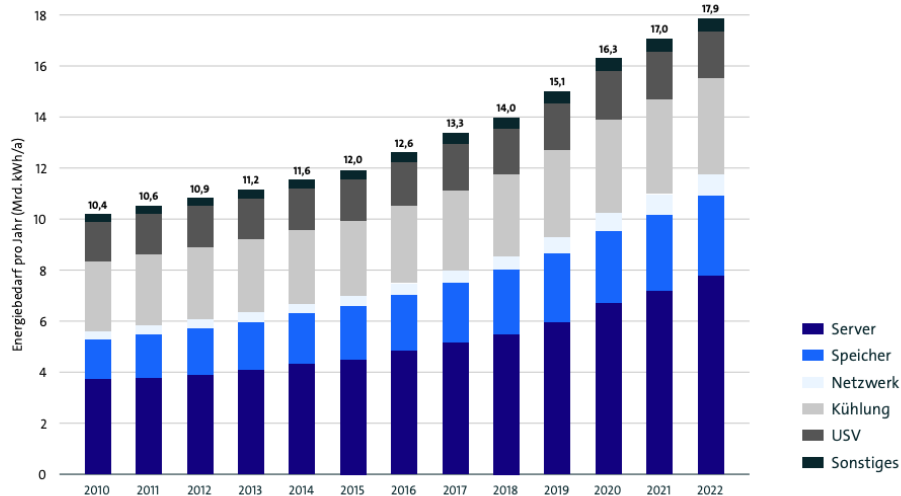
Quelle: Borderstep 2023

Abbildung 11: Energiebedarf der Rechenzentren und kleineren IT-Installationen in Deutschland in den Jahren 2010 bis 2022

Market developments in Germany are clearly dependent on the location decisions of a few large cloud providers.

About half of the servers produced worldwide are currently sold to the large hyperscale cloud providers.

Rechenzentren in Deutschland

Aktuelle Marktentwicklungen – Update 2023

bitkom

Complexity and intransparency
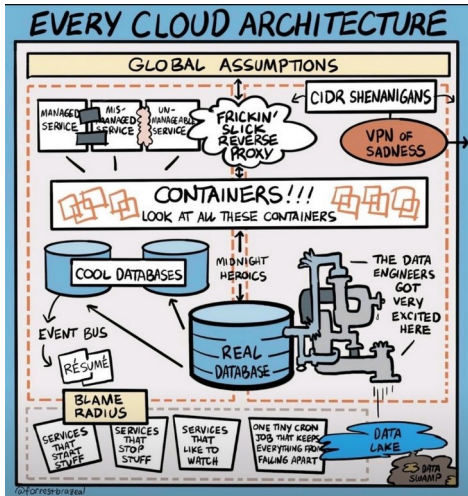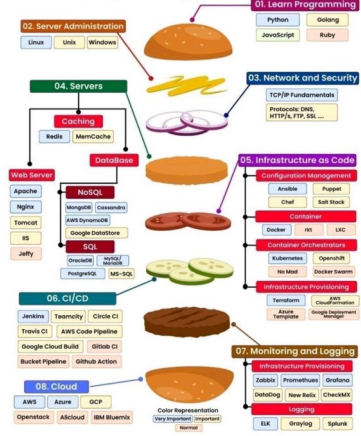
Transparancy, comunication and collaboration are key factors to succeed and to sustain.

The adventure of life is to learn.
The purpose of life is to grow.
The nature of life is to change.
The essence of life is to care.
The opportunity of life is to serve.
The secret of life is to dare.
The spice of life ist to befriend.
The beauty of life ist to give.

by William Arthur Ward