



ISO Open Consultation on resource-efficient software

2024-09-30 / 2024-10-01

Public

Housekeeping

- You are **muted** until Q&A.
- Session is **recorded**.
- Please change your name to *Your Name (your NSB)*.
- Ask your questions using the **chat** option.
- To speak, **raise your virtual hand** using the option under „reactions“.

Agenda

- 01** Introduction to Open Consultation
ISO (Sarah Parker / Stefanie Müller)
- 02** Introduction to resource-efficient software
Thought Leaders (Verena Majuntke / Anna Zagorski)
- 03** Introduction to next steps and schedule
DIN (Pauline Böhm)

04 Q&A

Introduction to ISO Open Consultation

ISO (Sarah Parker / Stefanie Müller)

Welcome to ISO Open Consultation

What is it and why is it needed?

Discovering and tapping into stakeholder expectations of standardization at a global level.

Showcasing the benefits of standards and aligning with stakeholder expectations

ISO Open Consultation is an excellent opportunity to showcase standardization and the benefits of standards to a wider audience, to understand global expectations from standardization before investing in the standardization process.

Shaping ISO's engagement in emergent topics

ISO Open Consultation is a member-driven means of empowering the ISO community to prioritize topics for consideration by Council; you can help shape ideas and opinions into strategic, tangible actions, and help to optimize the position of ISO in these topics.

Council Resolution 53/2024

What was decided?

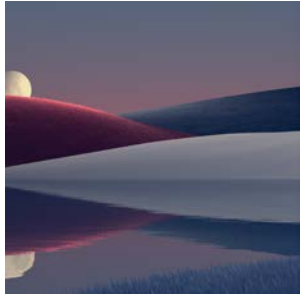
Under Council Resolution 53/2024, Council has **approved two proposals to ISO Open Consultation**

- **Resource-efficient software**, led by DIN (Germany).
- **Positioning, navigation and timing services**, led by KATS (Republic of Korea).



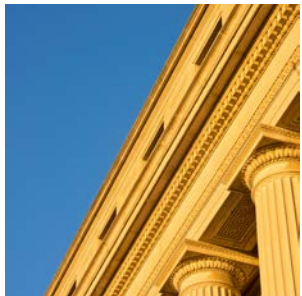
Open Consultation

What will be the Output?



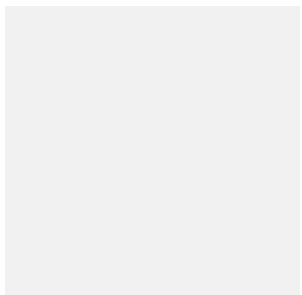
Landscape and drivers of change

Scope and dependencies, global perspective, relative importance, legal / regulatory, technological, social, ecological



Standardization landscape

Presence / absence of national and international standards, coordination & cohesion of international standards



Expectations of standardization

Consolidation of the value proposition of standards in the Council-endorsed field, including inter alia testing, quality, safety, interoperability



Stakeholder representation / key players

Government, business, academia, civil society



Consolidated user stories

Summary of key actors, interactions and desired outcomes that could be supported with standards in the Council-endorsed field



Recommendations for ISO action

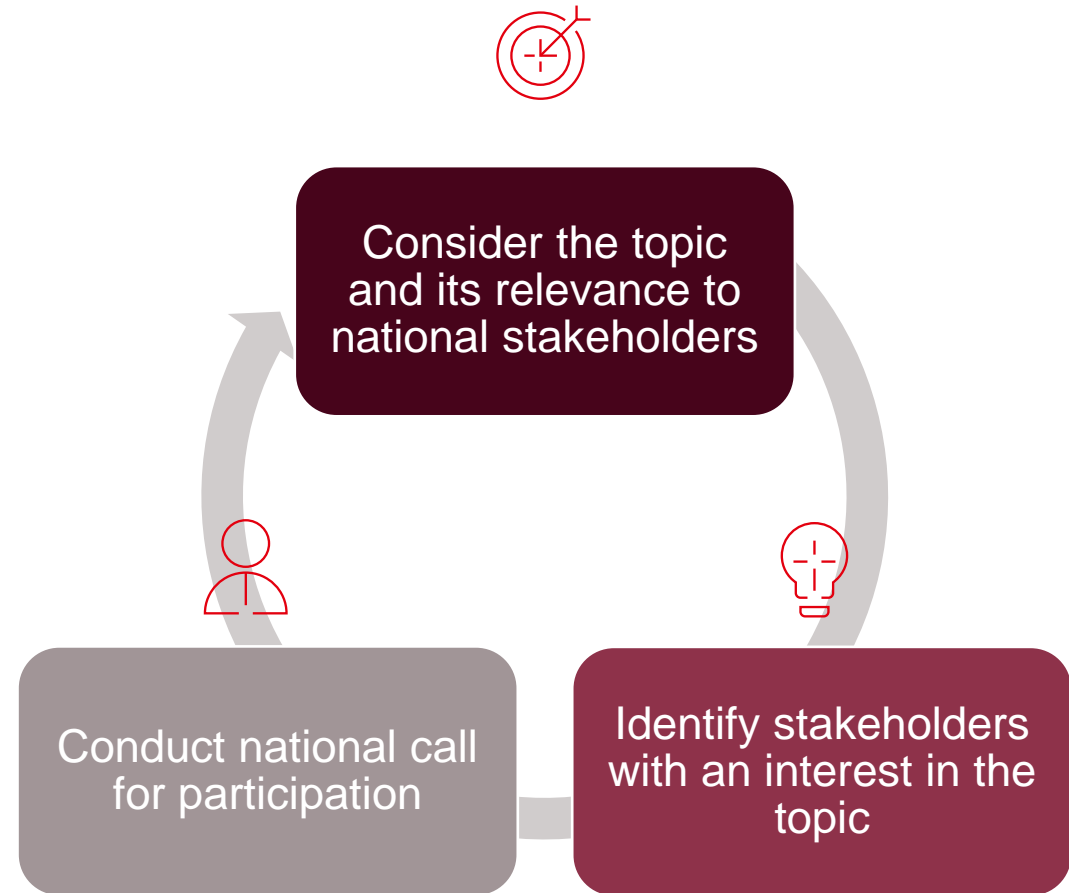
CSC/SP: strategic partnerships, projects

TMB: technical committee structure, ISO/IEC Directives, new work items

The way forward

How to participate?

ISO Open Consultation is a means to **capture new stakeholders' expectations** of standardization in emerging topics **before making critical decisions** and multi-year investments in standards development work.



Introduction to resource-efficient software

Thought Leaders (Verena Majuntke / Anna Zagorski)



Thought Leaders



Ms. Anna Zagorski (Chair)

German Environment Agency
(UBA)



Prof. Dr. Verena Majuntke

University of Applied Sciences
for Engineering and
Economics Berlin (HTW)



Dr. Jochen Friedrich

IBM Germany

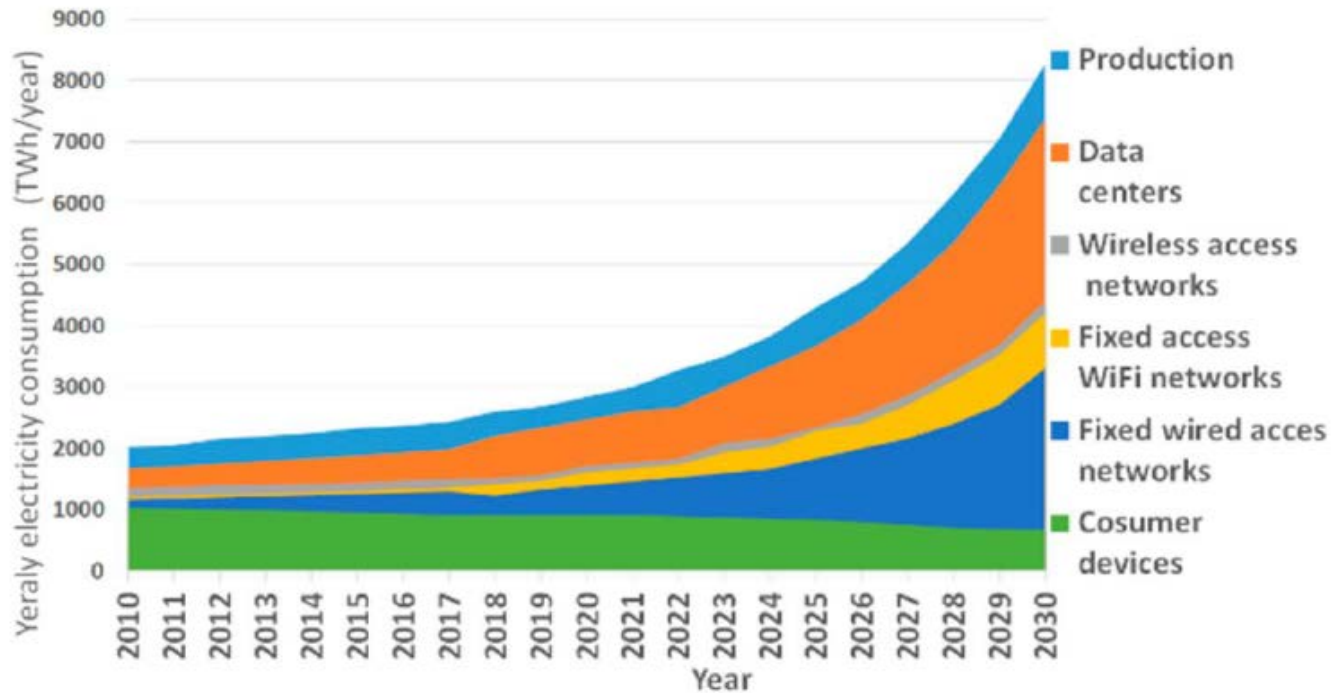
Motivation

- ICT accounts for approx. **8-10 %** of the total global energy consumption ([1], 2023)
- Data centers used **1-1.3% (240-340 TWh)** of global electricity (IEA, 2023)
- Further scope: Radio Access Networks, Internet, IoT Devices, Smart Home ...

Environmental influence data centers:

- Carbon Intensity Germany 2023: **354g CO₂/kWh → 85 billion kg CO₂**
- Carbon Intensity China 2023: **492 g CO₂/kWh → 118 billion kg CO₂**

Energy demand – Worldwide trend (2019)

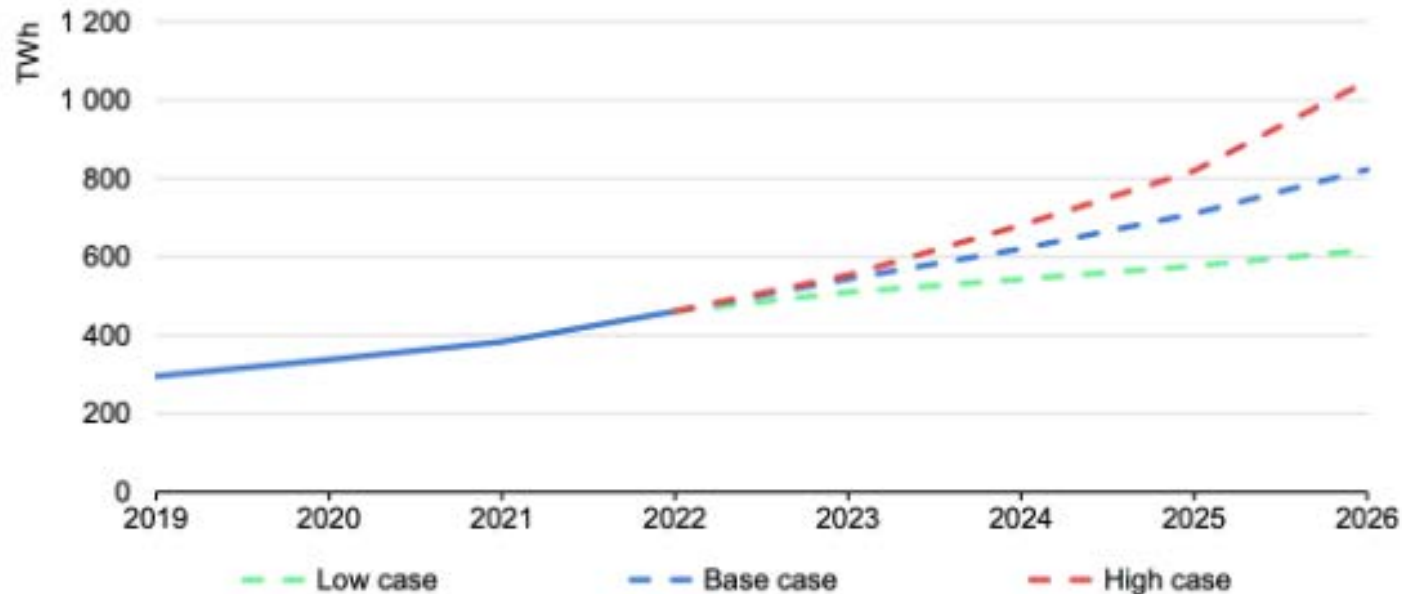


- The continuous digitalization has an increasing energy demand and thus a high environmental impact
- While energy efficiency has improved, energy demand is increasing

J. Lorinc et al., Greener, Energy-Efficient and Sustainable Networks: State-Of-The-Art and New Trends, *Sensors* 2019, 19, 4864; doi:10.3390/s19224864

IEA - Forecast on the energy consumption of data centres worldwide

Global electricity demand from data centres, AI, and cryptocurrencies, 2019-2026



IEA, CC BY 4.0.

Notes: Includes traditional data centres, dedicated AI data centres, and cryptocurrency consumption; excludes demand from data transmission networks. The base case scenario has been used in the overall forecast in this report. Low and high case scenarios reflect the uncertainties in the pace of deployment and efficiency gains amid future technological developments.

Sources: Joule (2023), [de Vries, The growing energy footprint of AI: CCRl Indices \(carbon-ratings.com\)](#); The Guardian, [Use of AI to reduce data centre energy use](#); [Motors in data centres](#); The Royal Society, [The future of computing beyond Moore's Law](#); Ireland Central Statistics Office, [Data Centres electricity consumption 2022](#); and Danish Energy Agency, [Denmark's energy and climate outlook 2018](#).

The IEA estimates that data centres, cryptocurrencies and artificial intelligence (AI) will consume around 460 TWh of electricity worldwide by 2022 and will double by 2026

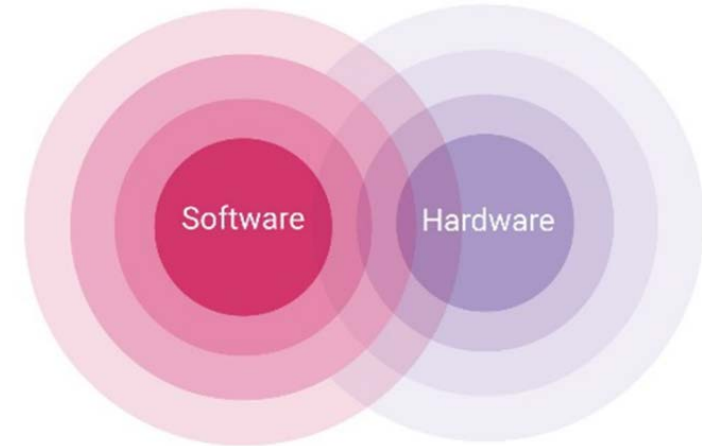


Software is the main driver of ICT's environmental impact

Software is the main driver of ICT's consumption of resources

- Software has a significant influence on the energy consumption of hardware
- Data-intensive formats
- Cloud dependencies
- Missing updates

→ Software-related obsolescence



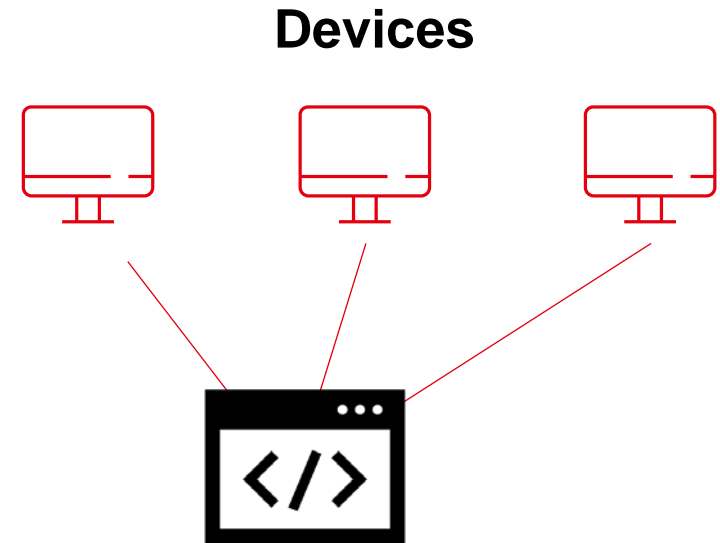
In 2013, the Greenpeace study stated that if new operating software had been used across the board, 50% of computers would have had to be replaced due to increased operating software requirements for the hardware

Example: Energy consumption of software



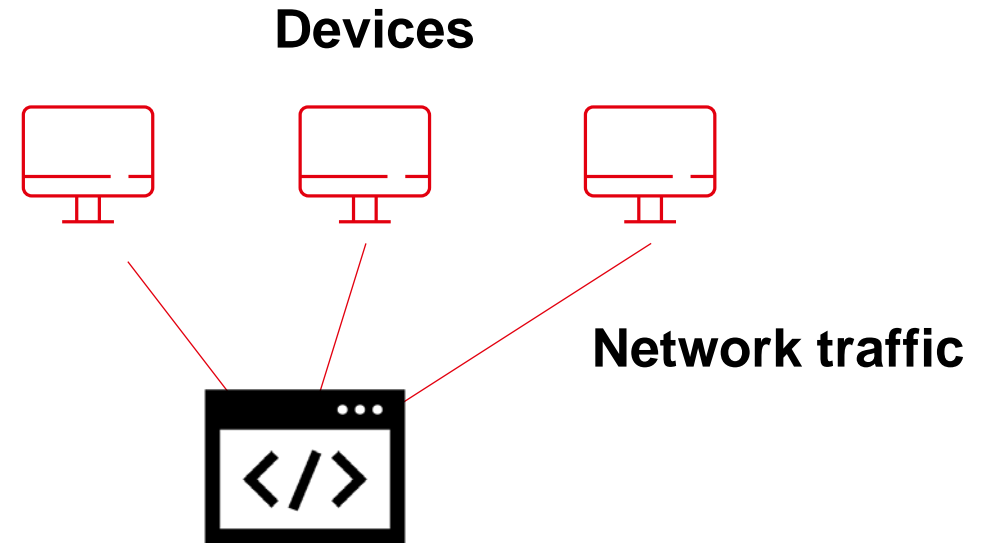
**306.500 MWh
for data centers in
2022¹**

Example: Energy consumption of software



**306.500 MWh
for data centers in
2022¹**

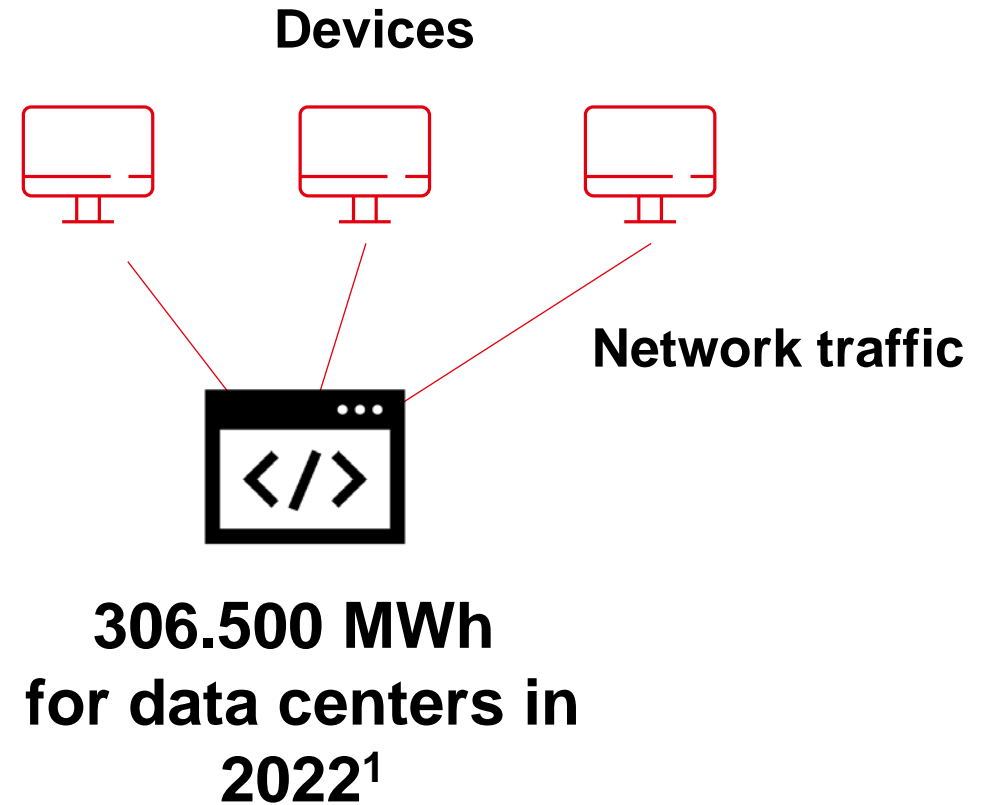
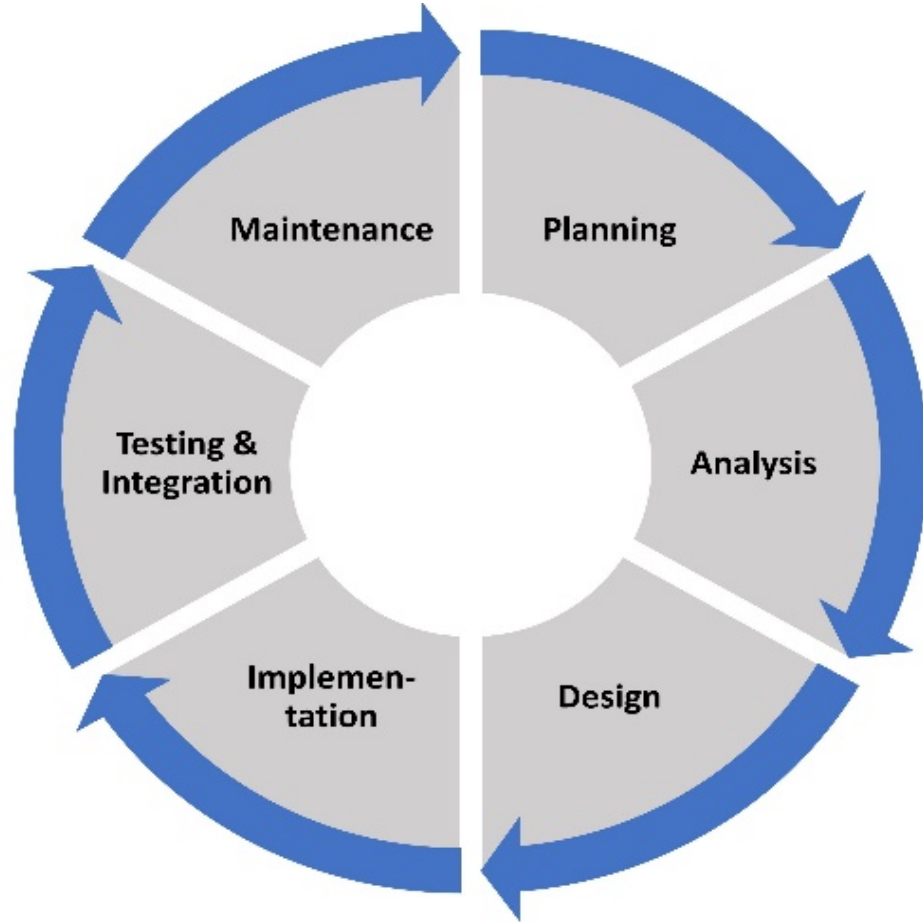
Example: Energy consumption of software



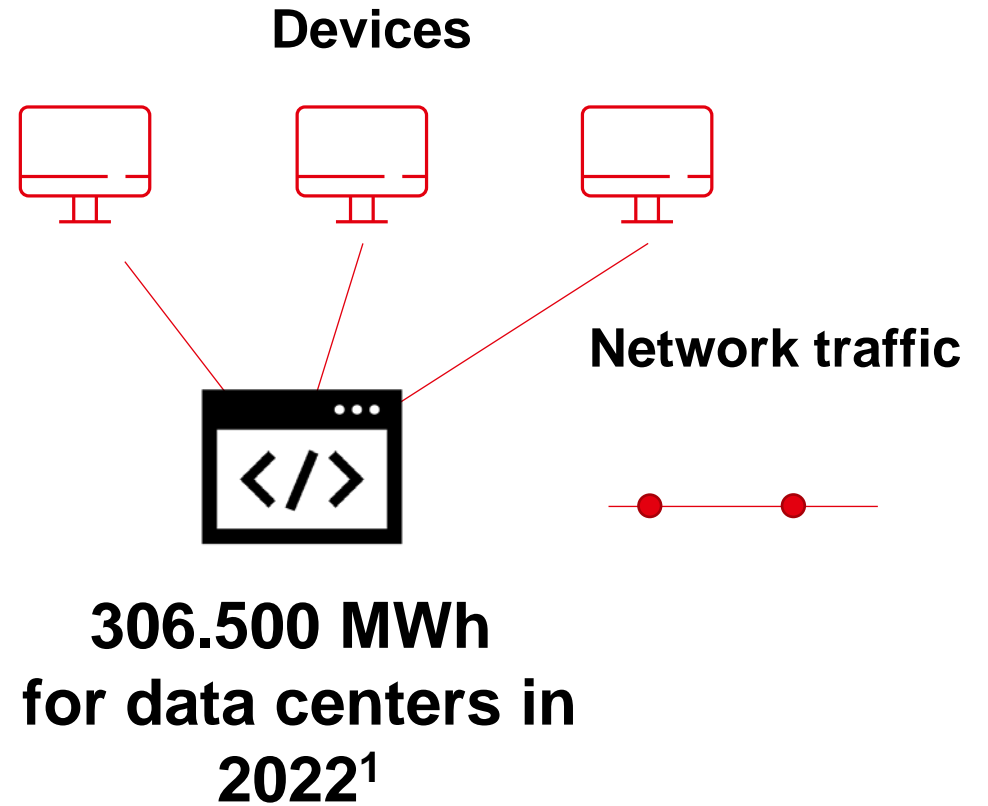
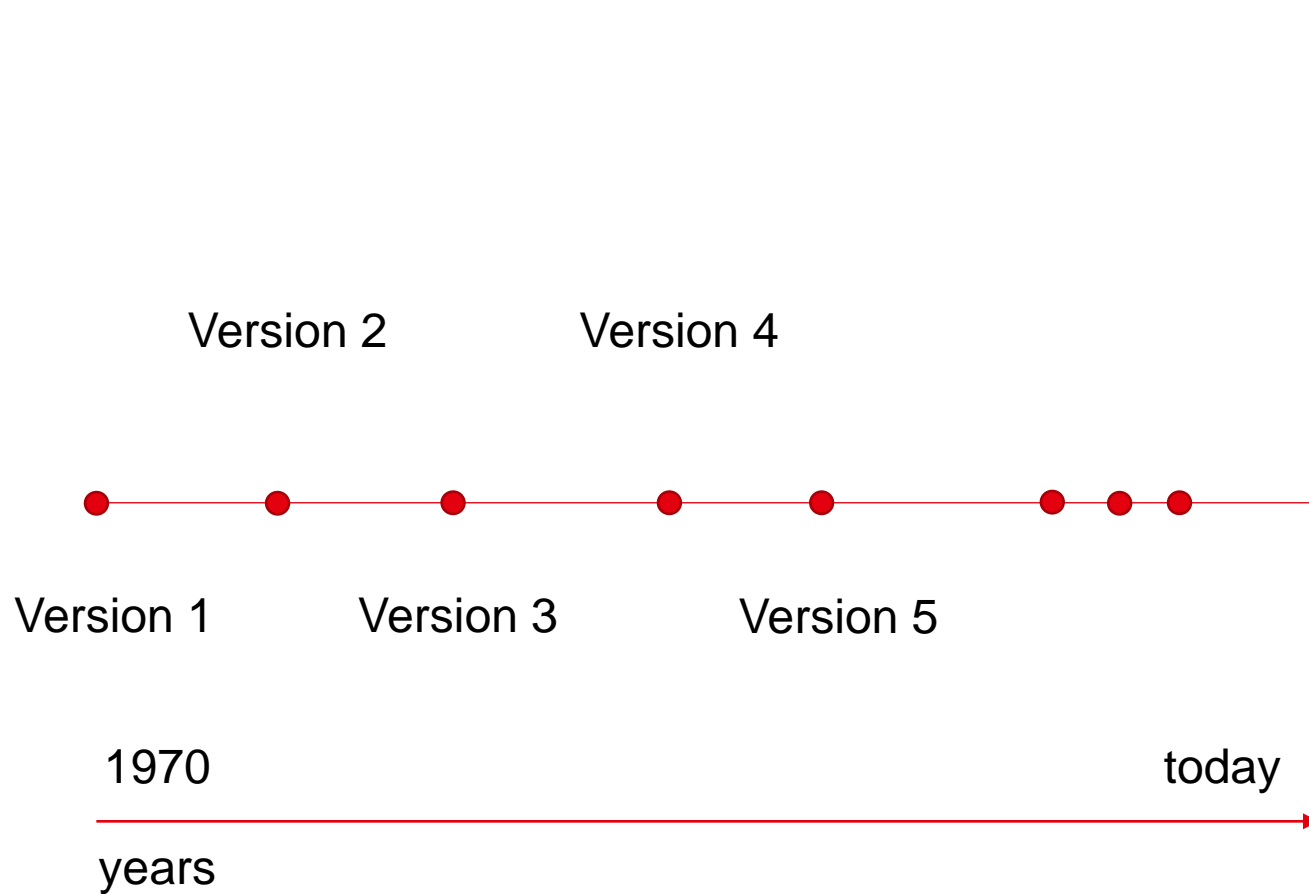
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Example: Energy consumption of software

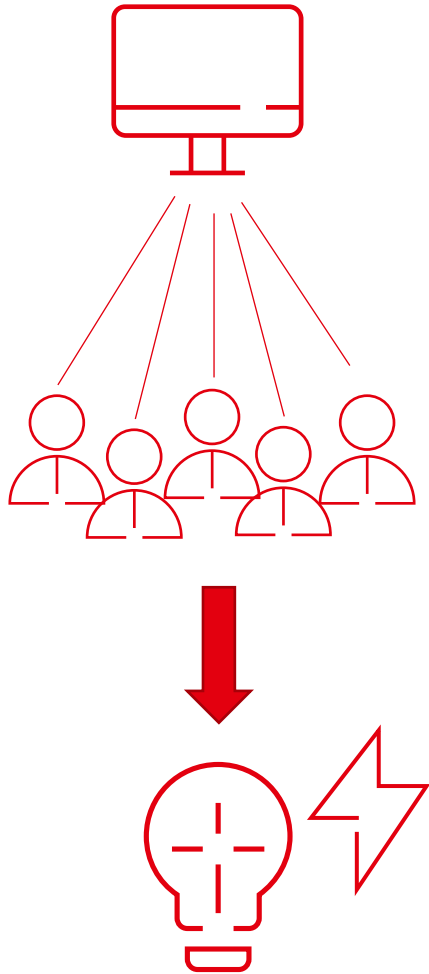
Software Development Life Cycle



Example: Energy consumption of software



Huge savings potential through millions of software rollouts



Even small savings of a few CPU seconds in resource-efficient software can result in enormous energy savings potential (of many MWh) and resource savings. As software is executed several times a day on many millions of computers, the **scaling effects** here are enormous.



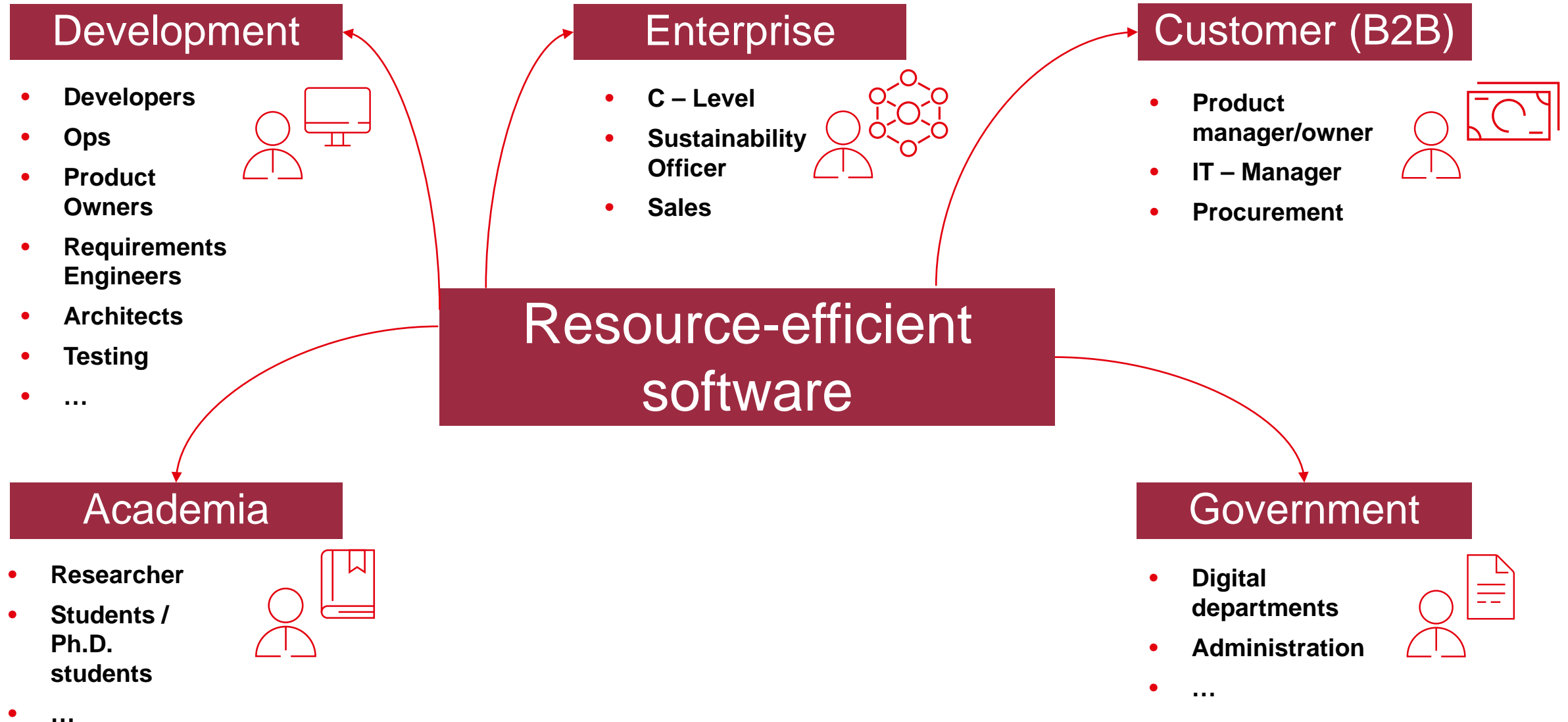
**Resource-efficient
software** → minimize
environmental impact of ICT



Resource-efficient software

- **Precise definition of resource-efficient software** (hardware and natural resource type, efficiency, ...)
- **Measurement and assessment** (e.g. Energy demand and hardware resources)
- **Transparency aspects** such as updates, data traffic, modularity, interfaces, license agreements

Relevant Stakeholders



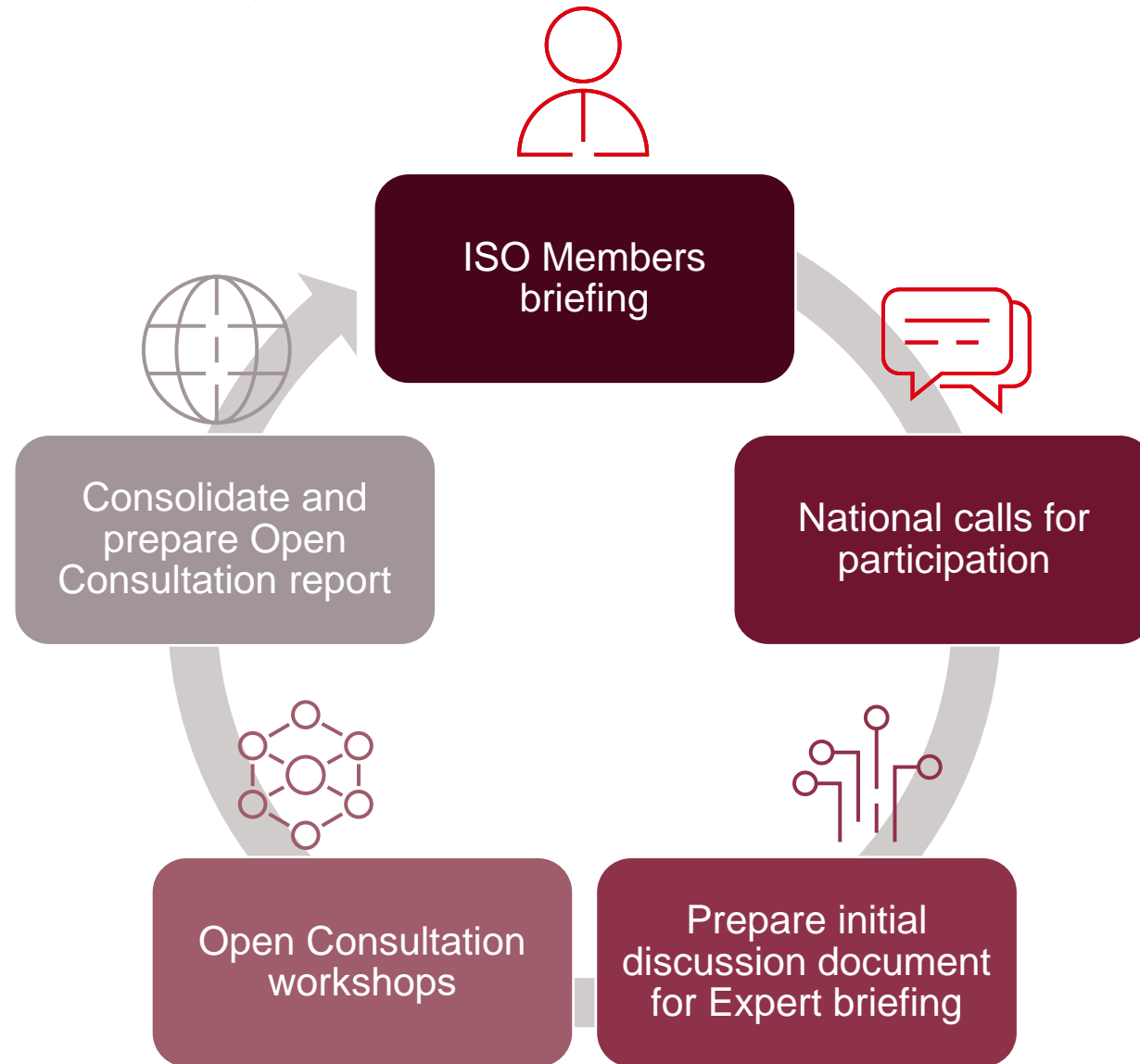
Introduction to next steps and schedule

DIN (Pauline Böhm)



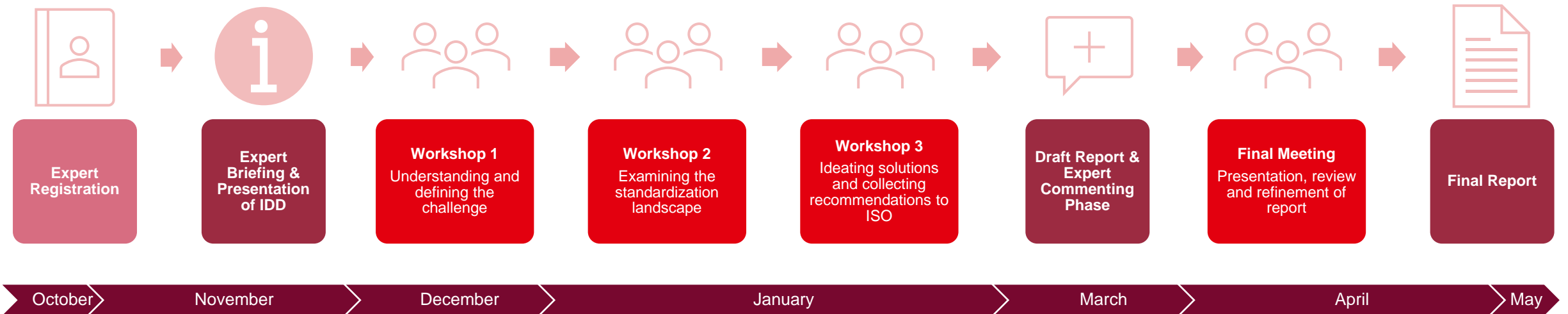
Open Consultation

Major milestones



Open Consultation

Timeline



Schedule (preliminary)

Event	Date	Aim
Registration	until 11. November 2024	
Expert briefing	13 November 2024, 9:00-11:00 CET/ 14 November 2024, 16:00-18:00 CET	Introduction to ISO Open Consultation
Workshop 1	9 December 2024, 8:00-12:00 CET / 11 December 2024, 15:00-19:00 CET	Understanding and defining the challenge
Workshop 2	20 January 2025, 15:00-19:00 CET / 22 January 2025, 8:00-12:00 CET	Examining the standardization landscape
Workshop 3	27 January 2025, 15:00-19:00 CET / 30 January 2025, 8:00-12:00 CET	Ideating solutions and collecting recommendation to ISO
Expert commenting phase on final report	March 2025 (tba)	
Final Meeting	April 2025 (tba)	Presentation, review and refinement of final report
Submission of final report	April / May 2025	

Call for participation

Registration

The ISO Open Consultation is aimed at a diverse target audience involved in the development process and the delivery of digital services. This includes particularly those in leadership positions and practitioners such as practitioners and developers. Additionally, it is intended for a broader group of interested representatives from academia, government bodies (digital departments). Knowledge of standardization is helpful but not required for participation.

Please register via: <https://forms.office.com/e/sfYcYqph4>

Deadline for registration: 11. November 2024

Contact

For more information on this Call for participation or the ISO Open Consultation on resource-efficient software, please contact Ms. Pauline BÖHM at pau.bohm@iso.org. For more information on ISO Open Consultation generally, please contact iso@iso.org.



ISO OC DIN Call for participation
2024-09-30

ISO OPEN CONSULTATION – INTERNATIONAL CALL FOR PARTICIPATION

DIN (German Institute for Standardization) is seeking **experts in the field of "resource-efficient software"**. Software has been shown to significantly influence the environmental impact of hardware by affecting its energy consumption and the use of other resources. *Resource-efficient software* therefore refers to software that minimizes resource usage and thus its environmental impact throughout its entire lifecycle. However, standardized definitions of software resource usage and methods for measuring and assessing software resource efficiency are largely missing, and a coordinated global approach is yet to be developed.

To address these questions, DIN is launching an **ISO Open Consultation**. ISO Open Consultation is a new mechanism designed to explore an emerging topic with a broad range of stakeholders, and to document and consolidate global stakeholder expectations into an analytical report with recommendations for ISO action. The aim is not to reach consensus and develop a standard. The aim is to consolidate and define stakeholder expectations before investing in a standardization process.

DIN is inviting experts to discuss their expectations of standardization in the field of resource-efficient software and collaborate in developing recommendations to ISO on how to address the topic most effectively. Information on the registration can be found below.

Schedule (preliminary)

Event*	Date (session 1)**	Date (session 2)	Aim
Registration	until 11. November 2024		
Expert briefing	13. November 2024 9-11 CET	14. November 2024 16-18 CET	Introduction to ISO Open Consultation and Initial Discussion Document
Workshop 1	9. December 2024 8-12 CET	11. December 2024 15-19 CET	Understanding and defining the challenge
Workshop 2	22. January 2025 8-12 CET	20. January 2025 15-19 CET	Examining the standardization landscape
Workshop 3	30. January 2025 8-12 CET	27. January 2025 15-19 CET	Ideating solutions and collecting recommendation to ISO
Commenting phase	March 2025 (tba)		
Final Meeting	April 2025 (tba)		Presentation, review and refinement of final report

* It is desirable for participants to attend the entire workshop series.

** The workshop sessions are identical and cater to different time zones. Attending one session per workshop is sufficient.

Please distribute the call for participation among

- local experts in software development, particularly those in leadership positions and practitioners,
- relevant representatives from local academia, government bodies (digital departments), administration, and procurement, etc.,
- other interested stakeholders.

Expert participation

- Expert registration until **11 November 2024** via <https://forms.office.com/e/sfYcYquph4>
- Direct participation (no nomination by NSB necessary)
- Experts to
 - attend Experts Briefing
 - contribute their expertise through participation in workshop series
 - comment on draft report (*comment phase only for registered participants*)
- Knowledge of standardization is helpful but not a requirement

Q&A

Please raise your virtual hand or use the chat to ask your questions.

Thank you.

Making lives *easier, safer* and *better*.

ISO Open Consultation Team

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