

Study for the review of the Commission Regulation 2019/424 Ecodesign of Servers and Data Storage Products



1st Stakeholder Meeting

29 March 2023



Housekeeping rules of the meeting

- During each sub-session of presentation, virtual participants will be able to pose written questions or to ask for the floor (type [name organization] + 'floor please' [+topic]). Please write them in the chat when invited to do so by the Chair, starting with the name of your organisation (questions without the organisation name will not be considered).
- The questions will be answered at the end of each sub-session. In case of time constraints, priority in replying to the questions will be given, based on the order in the chat. Everyone remains muted (unless speaking when invited by the Chair)
- **Concise** intervention or question

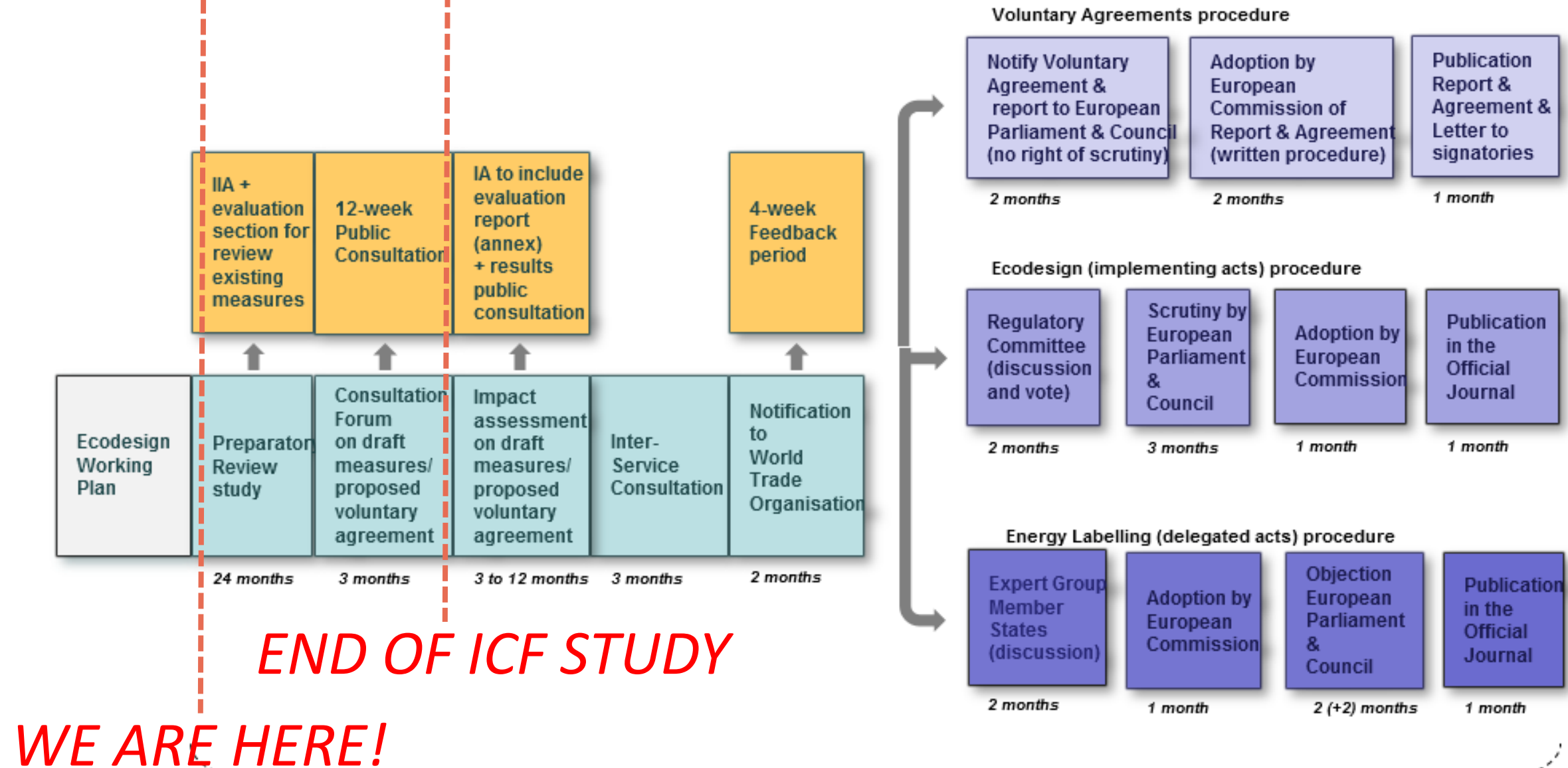
NB : The chats will not be kept/copied. Please do **not** make comments in the chat area unless invited by the Chair.

Agenda

- Introductions
- Setting the scene (DG GROW)
 - Q&A
- Delivery Plan
 - Scope
 - Study Objectives
 - Project Team
 - Project Website, Registration & Audiences
 - Milestones & Timeline
 - Deliverables
 - Starting Position
- Stakeholder Involvement
 - Qualitative questionnaire
 - Quantitative questionnaire
- Q&A
- Technical Analysis– Phase 1
 - Review items a–t (split into themes)
- AOB
- Closing statement (DG GROW)
 - Call for action (ICF)

Setting the scene

The policy implementation process



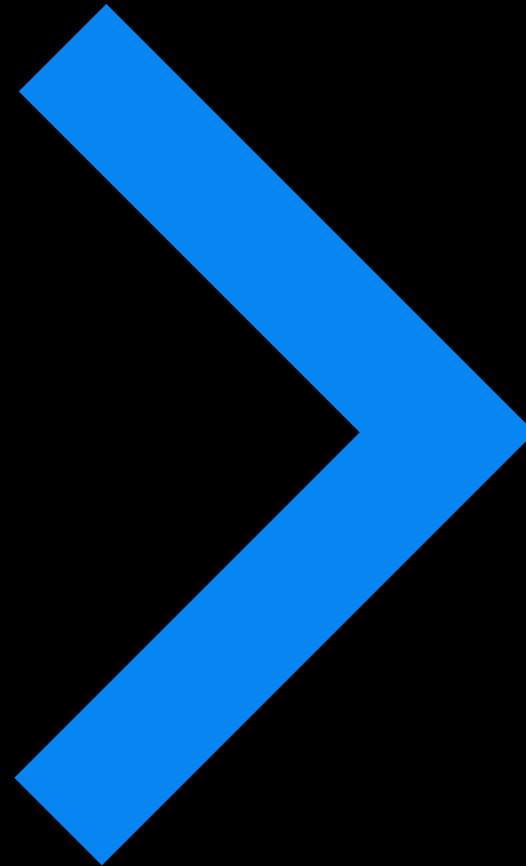
Main points (DG GROW)

- Introduction and overall process
- Scope of the review
- Interplay with ESPR
- Energy efficiency and material efficiency
- Product level / system level



Q&A

Delivery Plan



Scope

Study Objectives

Project Team

Project Website, Registration & Audiences

Milestones & Timeline

Deliverables

Starting Position

Scope

Phase 1 – Technical analysis

This involves a detailed assessment of all items raised in the review section of Commission Regulation (EU) 2019/424 plus the other items raised by DG GROW, as well as an update to the Ecodesign frequently asked questions (FAQ).

Phase 2- Update of the preparatory study for the server and data storage Regulation

This phase will update the existing preparatory study of Commission Regulation (EU) 2019/424, informed by Phase 1, and further by additional market research, consultation and experience in the EU.

Study Objectives



supporting the Commission with technical expertise for the assessment of the items listed in Article 8 of Regulation 2019/424, and of further items listed in Phase 1

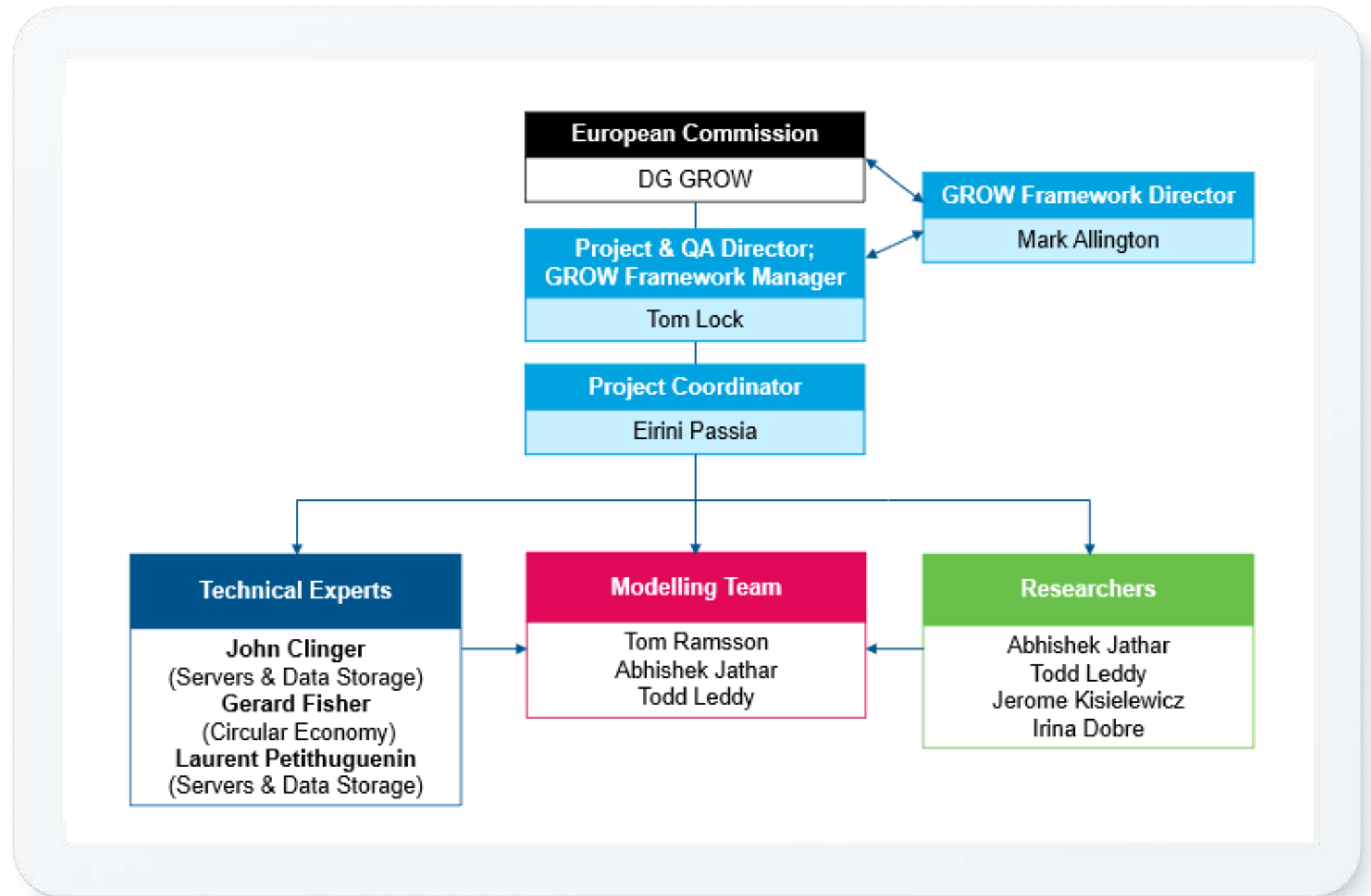


updating the existing preparatory study in support of Regulation 2019/424



draft the working documents on the revised Ecodesign Regulation for servers and data storage products.

Project team



Project Website, Registration & Audiences



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Register →

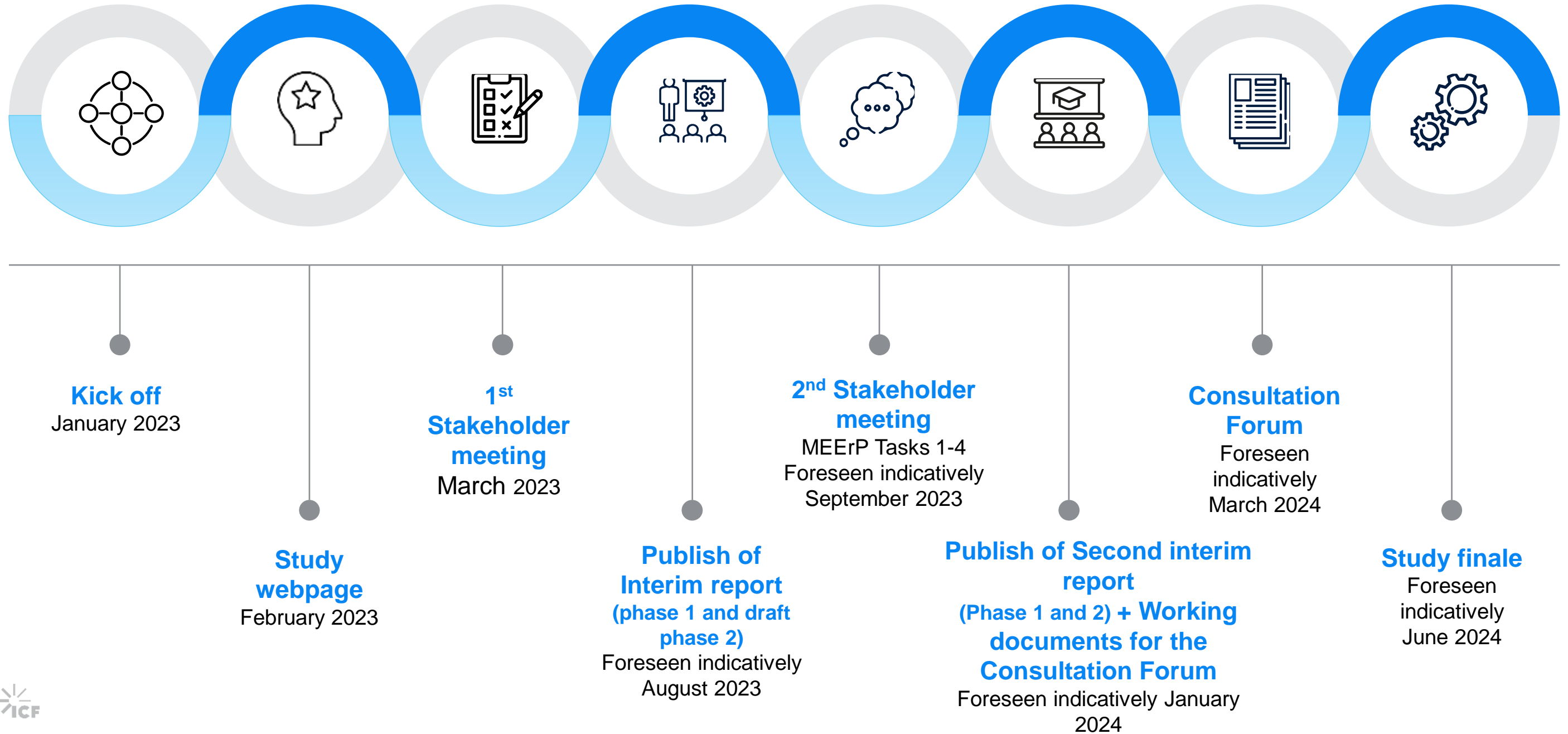
Study website:
eco-servers-review.eu

ECODESIGN REVIEW STUDY SERVERS AND DATA STORAGE PRODUCTS

Encouraging registration for all
types of stakeholders:

Manufacturers,
Recyclers,
Repairers,
Data Centre Operators

Study milestones & timeline



Deliverables

1. Report on Phase 1, and updated preparatory study (Phase 2).
2. Working documents on the revised Ecodesign Regulation for servers and data storage products (draft revised Ecodesign Regulation and explanatory memorandum)
3. Update of the 'Commission guidelines: Ecodesign frequently asked questions (FAQ) on servers and data storage products'.

Starting position

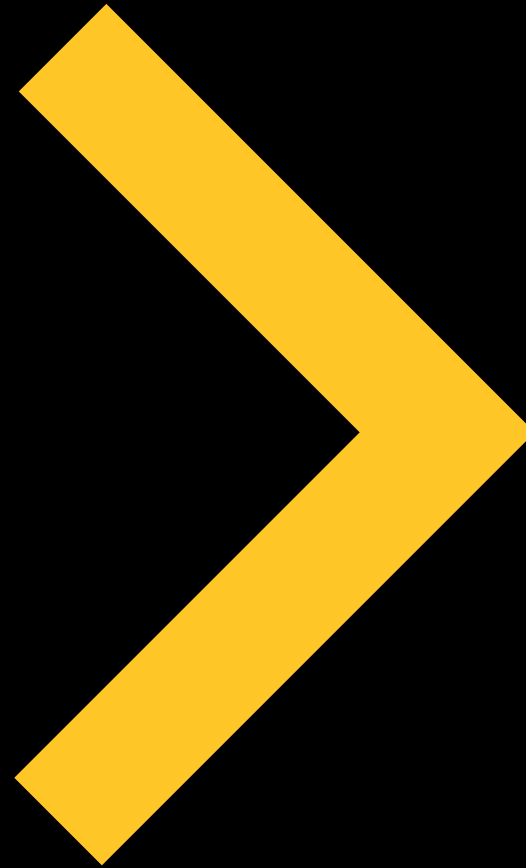
Data

- Data that span across [a huge variety](#) of products and manufacturers covering [models](#) introduced from [2017 through early 2022](#), all of which are currently on the market. This data was collected in collaboration with ITI and Green Grid and made available as part of the ENERGY STAR v4 computer servers process.
- Data from the past prep study

Methodology

- Use of the updated MEErP

Stakeholder Involvement



Qualitative questionnaire
Quantitative questionnaire

Qualitative questionnaire

General questions related to the review items

(2 formats) Word file or MS form

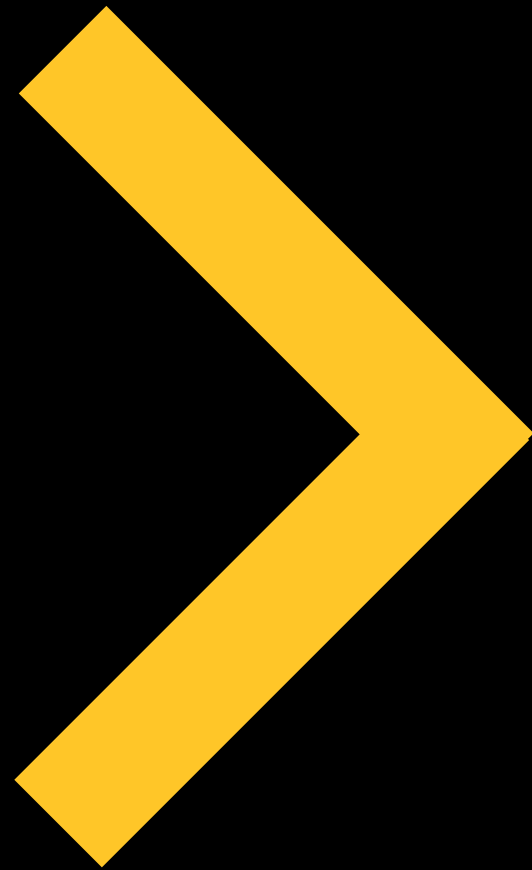
<https://forms.office.com/r/L7XpMkLmet>

Quantitative questionnaire

Quantity related questions
Excel file

Why to contribute:
Input/ engagement
Reflection on the study
All responses are taken into account

Return by email to
serversreview@icf.com
By 28th April 2023



Any questions?



Technical Analysis – Article 8 of Regulation 2019/424

Overview of review items

Items listed in Article 8 of Regulation 2019/424:

- a) to update the specific ecodesign requirements on server active state efficiency;
- b) to update the specific ecodesign requirements for servers on idle state power;
- c) to update the definitions or the scope of the Regulation;
- d) to update the material efficiency requirements for servers and data storage products, including the information requirements on additional critical raw materials (tantalum, gallium, dysprosium and palladium), taking into account the needs of the recyclers;
- e) to exempt server appliances, large servers, fully fault tolerant servers and network servers from the scope of the regulation;
- f) to exclude resilient servers, High Performance Computing (HPC) servers and servers with integrated APA from the ecodesign requirements set out in Annex II point 2.1 and point 2.2 of Regulation 2019/424;
- g) to set specific ecodesign requirements on the Processor Power Management Function of servers;
- h) to set specific ecodesign requirements on the operating condition class;
- i) to set specific ecodesign requirements on the efficiency, performance and power demand of data storage products.

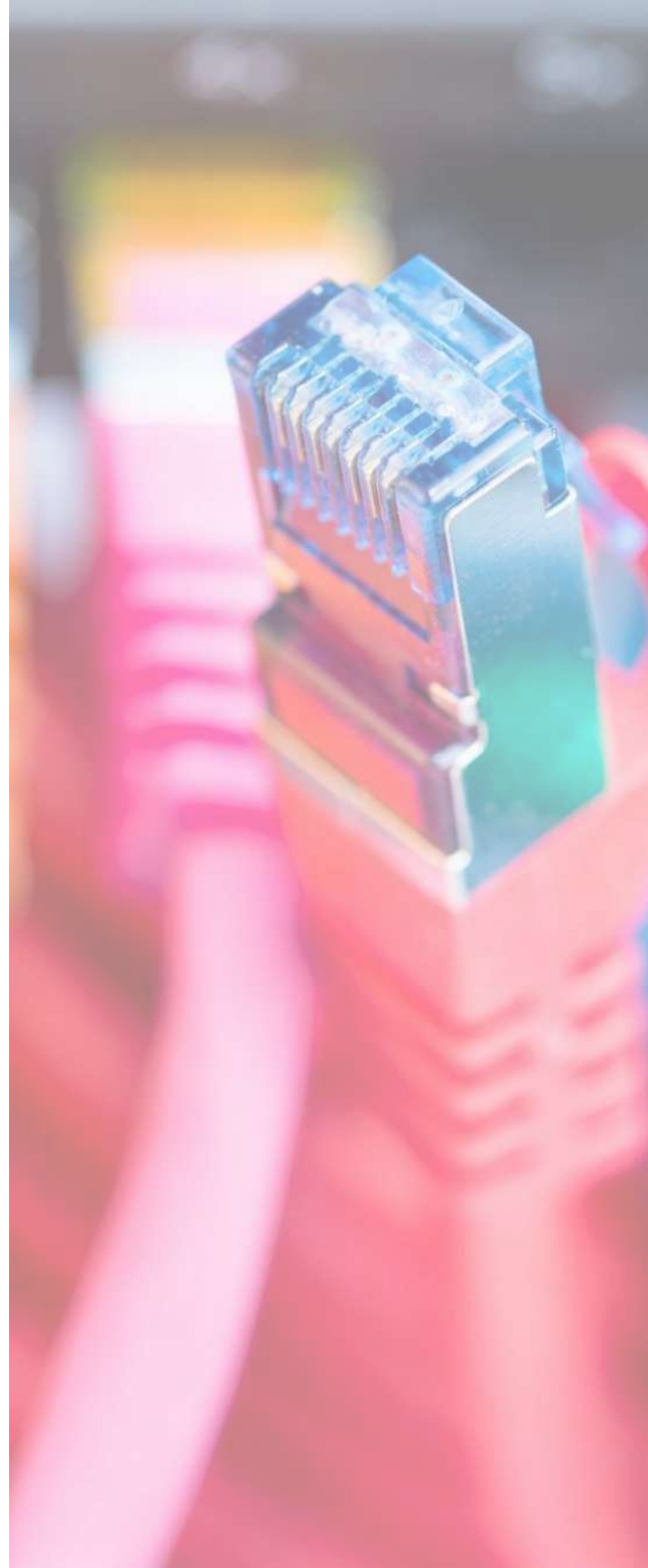
Further items to be analysed:

- j) on material efficiency aspects:
 - a. the provisions on disassemblability of certain components, also considering advancements in standards (mandate M/543) since the publication of the regulation;
 - b. an analysis of the benefits of the information requirements under Regulation 2019/424 already covering cobalt in the batteries and Neodymium in the hard disks;
- k) analysis of the benefits of the information requirements under Regulation 2019/424 on the operating conditions of servers and data storage products;

- l) an analysis of the standards, and of their relevance for regulatory purposes, developed/under development under the standardisation request M/573, ‘Commission implementing decision C(2021)14 of 12.1.2021 on a standardisation request to the European standardisation organisations in support of Regulation (EU) 2019/424 as regards ecodesign requirements for servers and data storage products’;
- m) Technological, market and regulatory evolutions affecting the environmental performance/aspects of data centers, and how they would reflect at product specific level, for servers and data storage products;
- n) The technical and economic feasibility and relevance of product specific requirements on liquid cooling systems/solutions
- o) The technical and economic feasibility and relevance of product specific requirements on waste heat recovery systems/solutions
- p) The technical and economic feasibility and relevance of product specific requirements on the standby-readiness of servers (for instance allowing to move to and from idle mode in a fast and seamless manner), if not covered by the analysis on the Processor Power Management Function
- q) The technical and economic feasibility and relevance of product specific requirements on DC (direct current) power supply for servers
- r) The technical and economic feasibility and relevance of product specific requirements related to:
 - a. the availability of information (temperature, (fan) speed, etc..) for open data exchange about the input/output air flow data of the server/data storage product, and/or
 - b. the capability to enable external overriding of the internal fan speed control, in view of potential synchronisation of the product cooling system with the data center cooling system2.
- s) The technical and economic feasibility and relevance of introducing an energy label for servers and data storage products, including a label and a detailed product information sheet comprising targeted indicators for the different possible uses of the product (*e.g.* as webserver, disk server, database server, file/disk server, etc.)
- t) Other topics, as emerged from consultations with stakeholders.

Updating current Ecodesign requirements

- a) to update the specific ecodesign requirements on server active state efficiency;
- b) to update the specific ecodesign requirements for servers on idle state power.



- **SERT data** covers products from 2016 to 2021 and can be leveraged to set new active efficiency and idle state criteria.
- Internal power supply efficiency may be challenging to further increase.
- **Idle state requirement** is an important topic
 - As raw idle consumption is increasing there is pressure to review this metric.
 - However, idle power considerations have also been made within the SERT testing metric.

Regulation definitions and scope

c) to update the definitions or the scope of the Regulation;

e) to exempt server appliances, large servers, fully fault tolerant servers and network servers from the scope of the regulation;

f) to exclude resilient servers, High Performance Computing (HPC) servers and servers with integrated APA from the ecodesign requirements set out in Annex II point 2.1 and point 2.2 of Regulation 2019/424.



- Definitions for **resilient servers** and **High Performance Computing** may be reviewed for alignment. **Storage Heavy Servers** and **Hyperconverged server** definitions may also be required.
- With regards to exemptions, the approach is to gather evidence to justify keeping exemptions in place.
- Exemptions have been made for:
 - **products out of scope for both SPEC SERT and ISO/IEC 21836:2020.**
 - **Too niche a product**
 - **Too complex for testing.**
- **SERT V3** is under development, which may allow for **HPC** and **servers with integrated APA** to be back in scope.

Data Storage devices performance requirements

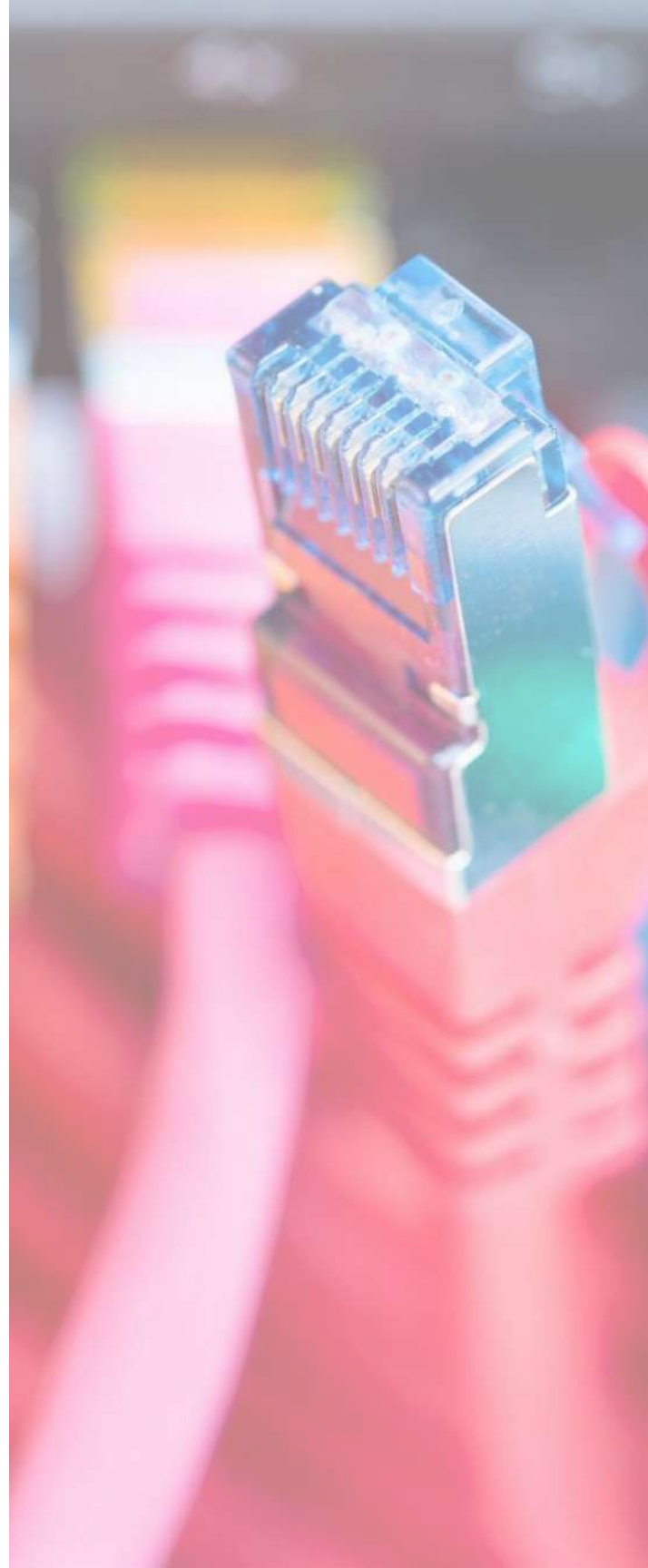
i) to set specific ecodesign requirements on the efficiency, performance and power demand of data storage products.



- Create new active levels based on data available from **SNIA Emerald benchmark**.
- Increase stringency of existing storage **internal power supply** performance.
- Explore how to increase the usage of **Capacity Optimising Methods (COMs)** in data storage devices.
 - Thin provisioning
 - Data deduplication
 - Compression
 - Delta snapshots

Processor Power Management Function

g) to set specific ecodesign requirements on the Processor Power Management Function of servers.



- Review the adoption of:
 - Reducing voltage and/or frequency through **Dynamic Voltage and Frequency Scaling (DVFS)**
 - Enabling **reduced processor power states** (C-states) when socket is not in use
- Explore having power management features **enabled as shipped**.

Standby-Readiness for Servers

p) The technical and economic feasibility and relevance of product specific requirements on the standby readiness of servers (for instance allowing to move to and from idle mode in a fast and seamless manner), if not covered by the analysis on the Processor Power Management Function.

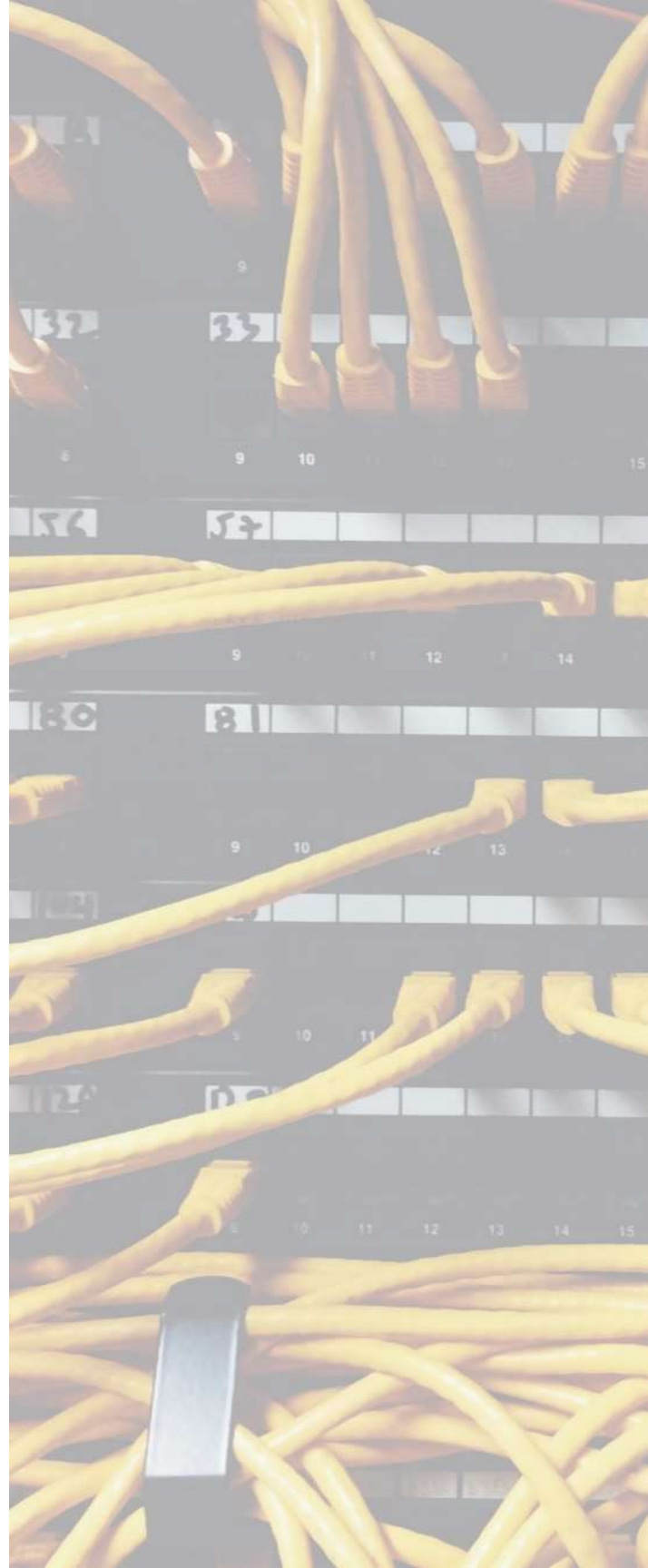


- Servers typically take **a few minutes** to boot back up from **deep sleep state**.
- **Standby-readiness** describes a server which can **be powered up quickly** from deep sleep (within a second).
 - Benefits of such action are to be able to “park” servers when not needed.
- **Explore** the progress in the **development** of this technology.
- **Review the impacts** of the technology on energy usage.

Parameters Information Requirements

r) The technical and economic feasibility and relevance of product specific requirements related to:

- a. the availability of information (temperature, (fan) speed, etc..) for open data exchange about the input/output air flow data of the server/data storage product, and/or.
- b. the capability to enable external overriding of the internal fan speed control, in view of potential synchronisation of the product cooling system with the data center cooling system.



- Requirements for the availability of air flow data exist with ENERGY STAR, making this requirement a **readily available** improvement.
 - the data can be fed into **data centre infrastructure management** tools, allowing for facilities energy efficiency.
 - Opportunity for **harmonization**
- Enabling **external overriding and synchronization** could provide benefits to reduce HVAC requirements but may also run the risk of equipment overheating and reduce the product lifetime as well as impact uptime (reliability).

Energy Label

s) The technical and economic feasibility and relevance of introducing an energy label for servers and data storage products, including a label and a detailed product information sheet comprising targeted indicators for the different possible uses of the product (e.g., as webserver, disk server, database server, file/disk server, etc.)



- **Ecodesign labels** have been introduced for many domestic products to clarify product energy efficiency considerations to the consumer.
 - Should icons be included on the label for specific task capabilities?
 - label could include values for:
 - idle power consumption
 - SERT server score
 - SERT CPU, memory and storage workload scores
- A **detailed product information** sheet could be included for consumers to have readily available information such as
 - Idle power
 - SERT worklet scores

Material Efficiency (1/3)

d) to update the material efficiency requirements for servers and data storage products, including the information requirements on additional critical raw materials (tantalum, gallium, dysprosium and palladium), taking into account the needs of the recyclers;

j) on material efficiency aspects:

a. the provisions on disassemblability of certain components, also considering advancements in standards (mandate M/543) since the publication of the regulation;

b. an analysis of the benefits of the information requirements under Regulation 2019/424 already covering cobalt in the batteries and Neodymium in the hard disks.

l) an analysis of the standards, and of their relevance for regulatory purposes, developed/under development under the standardisation request M/573, 'Commission implementing decision C (2021)14 of 12.1.2021 on a standardisation request to the European standardisation organisations in support of Regulation (EU) 2019/424 as regards ecodesign requirements for servers and data storage products

- Current Ecodesign regulation requires:
 - Joining, fastening and sealing which do not prevent disassembly
 - Secure data deletion capability
 - The availability of latest firmware and security updates.
 - Information requirements on Cobalt for batteries and Neodymium.
- Critical Raw materials now also include **tantalum, gallium, dysprosium and palladium**, and may need to be declared.
- Current recycling rates and industry best practice would be required to ensure material circularity.
 - Any remaining market barriers to increase adoption of recycling
- Have **cobalt and neodymium declarations** been impactful to recyclers?

Material Efficiency (2/3)

d) to update the material efficiency requirements for servers and data storage products, including the information requirements on additional critical raw materials (tantalum, gallium, dysprosium and palladium), taking into account the needs of the recyclers;

j) on material efficiency aspects:

a. the provisions on disassemblability of certain components, also considering advancements in standards (mandate M/543) since the publication of the regulation;

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- Disassemblability requirements have been set out in the draft Ecodesign smartphone regulation:
 - fasteners shall be **removable or reusable**.
 - the process for replacement shall be feasible with **non-specialised tools**.
 - Replacement processes shall not require specialised setups beyond a **workshop environment**,
 - Replacement processes will be accessible by a **generalist repairer**.

Disassembly requirements

Fastener types

Classification according to EN 45554:

- **Reusable (class A):** An original fastening system that can be completely reused, or any elements of the fastening system that cannot be reused are supplied with the new part for the repair, reuse or upgrade process.
- **Removable (class B):** An original fastening system that is not reusable, but can be removed without causing damage or leaving residue which precludes reassembly (in case of repair or upgrade) or reuse of the removed part (in case of reuse) for the repair, reuse or upgrade process.

Disassembly requirements

Basic tools

basic tools as listed in Table A.3 of EN 45554, examples:

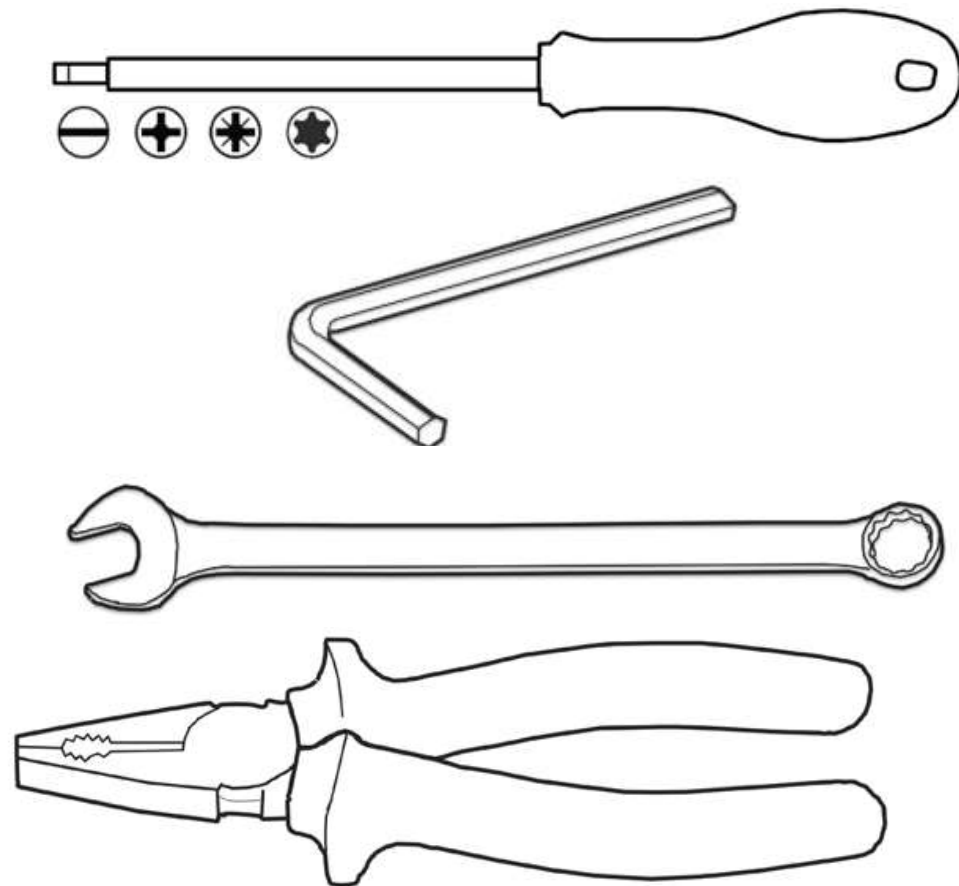


Table A.2 — Process classification by necessary tools

Category Description	Class
Feasible with: <ul style="list-style-type: none"> — the use of no tool, or — a tool or set of tools that is supplied with the product or spare part, or — basic tools as listed in Table A.3 	A
Feasible with product group specific tools	B
Feasible with other commercially available tools	C
Feasible with proprietary tools	D
Not feasible with any existing tool	E



Disassembly requirements

Working environment

Classification according to EN 45554:

- **Use environment (Class A):** If a repair, reuse or upgrade process can be carried out in the environment where the product is in use without any working environment requirements
- **Workshop environment (Class B):** If a repair, reuse or upgrade process cannot be carried out in the environment where the product is in use (class A) but does not require a production-equivalent environment
- **Production-equivalent environment (Class C):** If a repair, reuse or upgrade process can only be carried out in an environment that is comparable with the environment in which the product was manufactured



Disassembly requirements

Skill level

Classification according to EN 45554:

- **Layman (Class A):** person without any specific repair, reuse or upgrade experience or related qualifications
- **Generalist (Class B):** repair, reuse or upgrade process cannot be carried out by layman (class A) but can be carried out by a person with a general knowledge of basic repair, reuse or upgrade techniques and safety precautions
- **Expert (Class C):** person with specific training and/or experience related to the product category concerned

Material Efficiency (3/3)

d) to update the material efficiency requirements for servers and data storage products, including the information requirements on additional critical raw materials (tantalum, gallium, dysprosium and palladium), taking into account the needs of the recyclers;

j) on material efficiency aspects:

a. the provisions on disassemblability of certain components, also considering advancements in standards (mandate M/543) since the publication of the regulation;

b. an analysis of the benefits of the information requirements under Regulation 2019/424 already covering cobalt in the batteries and Neodymium in the hard disks.

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- Standards have been requested with regards to energy efficiency, disassembly, critical raw material content, firmware availability, updates, and secure data deletion functionality.
- Are there additional standards you believe should be considered? e.g. EPEAT?
- What other standards are you aware of that apply to server and data storage products?
- Are there material efficiency measures that should be considered for networking equipment (such as routers and ethernet switches)?

Operating Conditions

h) to set specific ecodesign requirements on the operating condition class;

k) analysis of the benefits of the information requirements under Regulation 2019/424 on the operating conditions of servers and data storage products.



- Ecodesign currently requires an **information declaration** to meet **ASHRAE operating class A1 (15–32°C)** to **A4 (5–45°C)**.
- Has the provision of ASHRAE operating information affected data centre operation?
- A review could propose a **higher recommended operation range**.
- Concerns arise that:
 - Products may be capable of running at higher temperatures for **short time periods but not consistently**.
 - An increase in operating temperature may lead to a decrease in HVAC consumption for datacentres, but **increase server internal fan consumption**.
 - Operating temperature to affect **longevity**.

System Performance Considerations

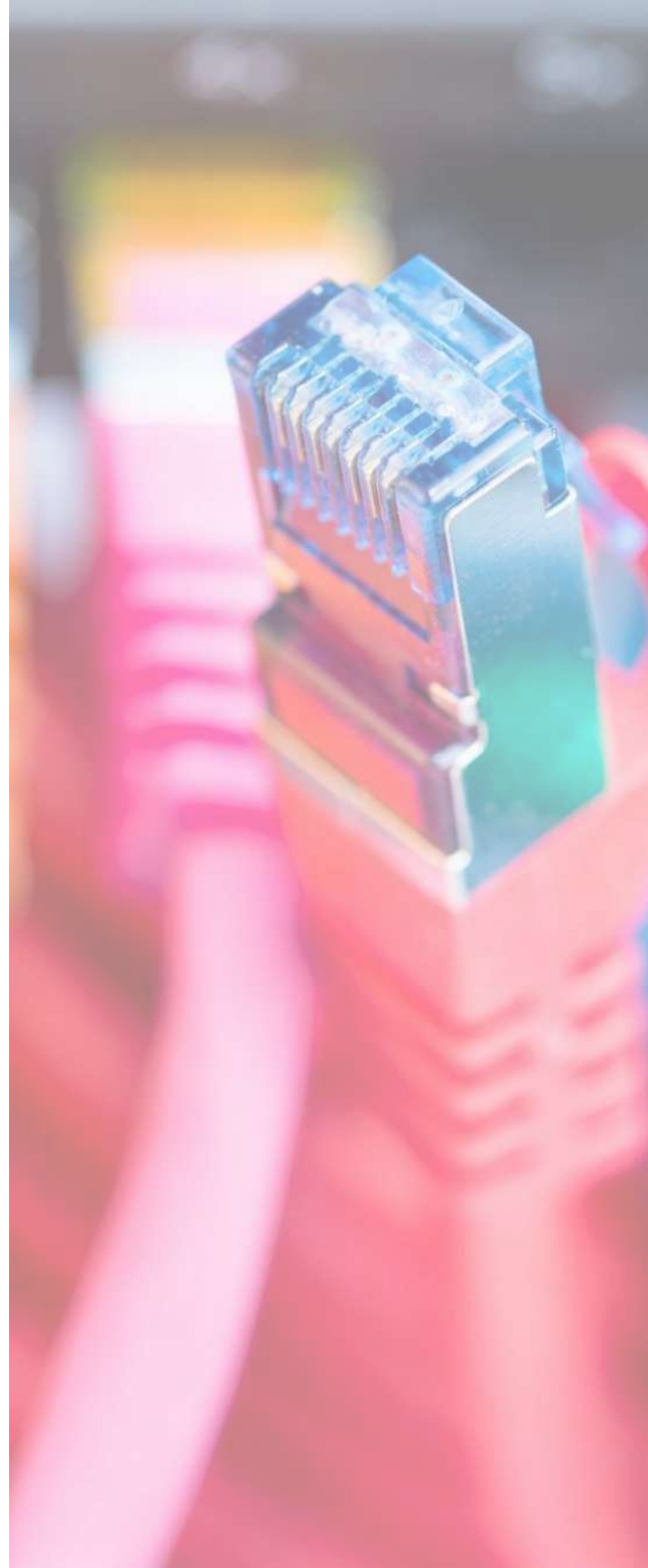
m) Technological, market and regulatory evolutions affecting the environmental performance/aspects of data centers, and how they would reflect at product specific level, for servers and data storage products.



- Beyond the product performance, datacenter energy efficiency is a concern. Ecodesign **does not intend to make regulations for datacentre systems**, but this understanding is useful in the context of framing this study.
- Power Usage Effectiveness (PUE) has been used to measure datacentre efficiency.
 - PUE value has been decreasing but is now reaching a **plateau**.
 - There are concerns that PUE could provide a **perverse incentive to increase server consumption** to decrease PUE value.
- What other efficiency metrics should be considered?
 - EDNA proposed The Idle Coefficient for servers and Datacentres in 2021

Liquid Cooling Systems and Solutions

n) The technical and economic feasibility and relevance of product specific requirements on liquid cooling systems/solutions.



- Review the evidence of liquid cooling provision on a product basis. Keen to understand the **market prevalence** and **effectiveness** of the technology.
 - Our understanding is that the technology is implemented for **High Performance Computing systems**, and at a **rack hardware** level.
 - Aware that SERT testing configurations are currently set for air cooled systems.
- Are there other liquid cooling solutions to consider?

Waste Heat Recovery Systems and Solutions

o) The technical and economic feasibility and relevance of product specific requirements on waste heat recovery systems/solutions



- Study is to focus on the effectiveness of waste heat recovery from a product perspective.
 - The study will **not delve into** the effectiveness of waste heat recovery at **a data centre level**.
 - Are there **technologies or requirements** to be applied at a **product level**?
 - Are greater energy efficiencies noted in the **product lifecycle**?
 - Is there evidence that the technology **detracts from energy efficiency activities or overall decarbonisation efforts**?
- Keen to receive additional case studies on the effectiveness of waste heat recovery systems. A recent one:
 - [Innovative heat tech could save England's swimming pools from closure | Technology | The Guardian](#)

Direct Current Power Supply for Servers

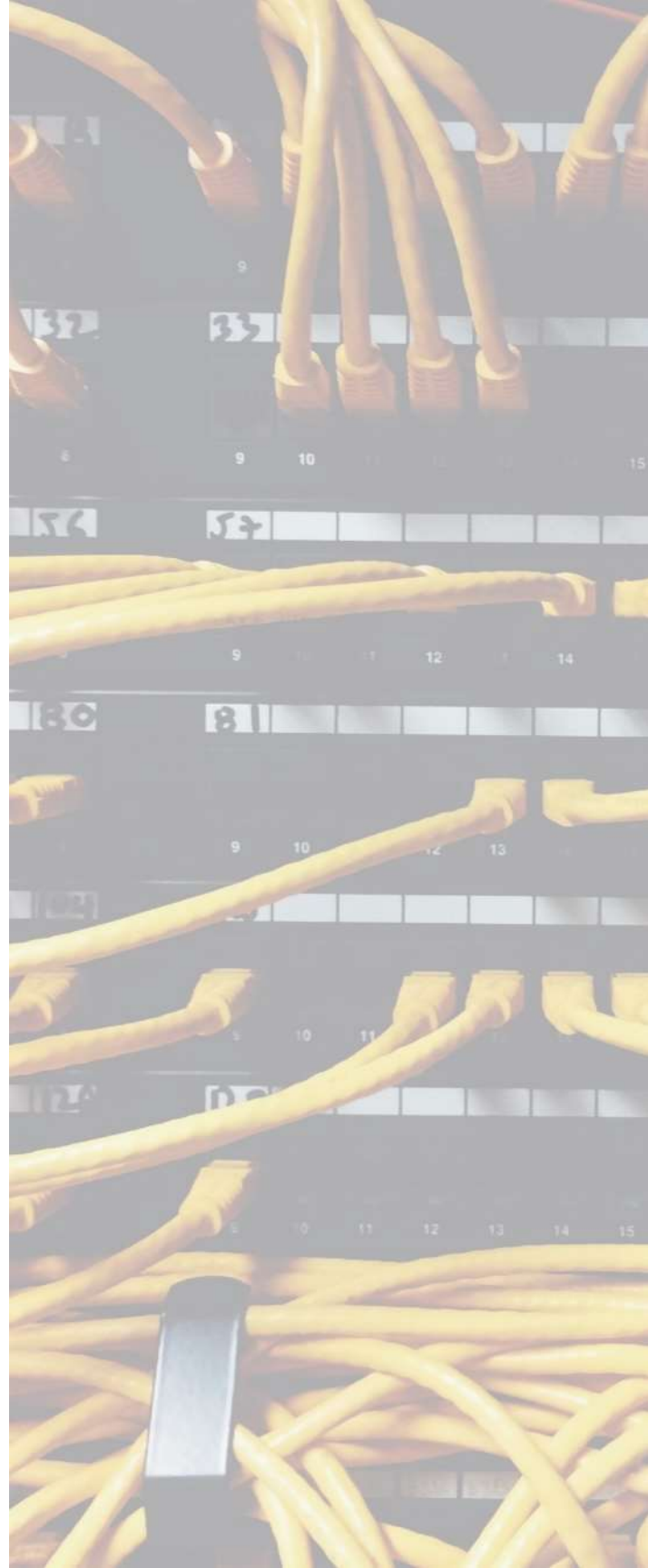
q) The technical and economic feasibility and relevance of product specific requirements on DC (direct current) power supply for servers.



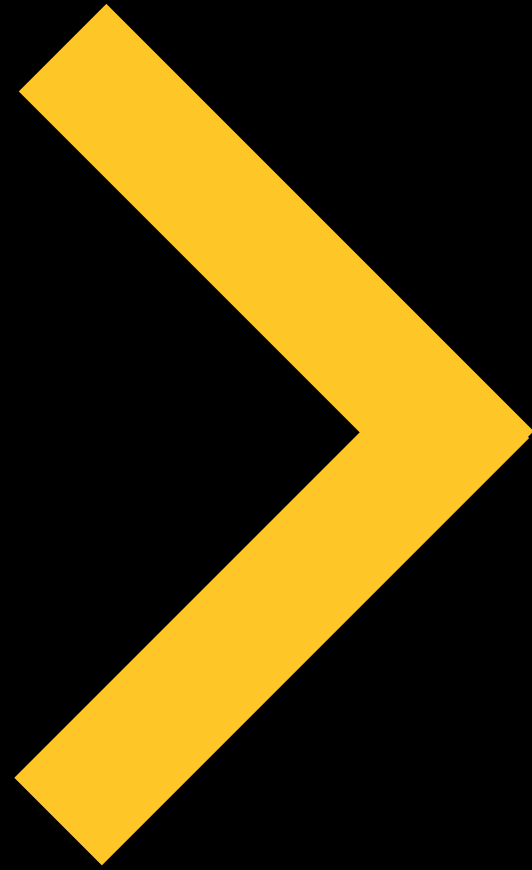
- Consider the evidence to support maintaining the exclusion of DC servers from the regulation.
 - What is the **market share** of **DC servers**? Is this share growing?
 - Review the **energy efficiency evidence** for DC servers.
- SERT test tool does not support DC servers. Can consider:
 - Include DC servers in the next regulation once SERT V3 is complete, which will include DC servers.

Other Topics

t) other topics, as emerged from consultations with stakeholders.



Please let us know if there are other topics which should be researched during this process.



AOB

Closing statement

Call to action:

- Please complete and return both questionnaires by 28th April 2023
- If not already done so, please register your interest on the website to be automatically notified of updates:

<https://eco-servers-review.eu/>

- Please get in touch if you have any queries: serversreview@icf.com

→ Thank you

for your participation

Get in touch with us:
Servers Study Review
serversreview@icf.com



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