Für Mensch & Umwelt

Umwelt Bundesamt

BEREC External workshop on the ecodesign of digital services for greener networks and ICTs

Analysis of software-based influence on a shortened service life of products

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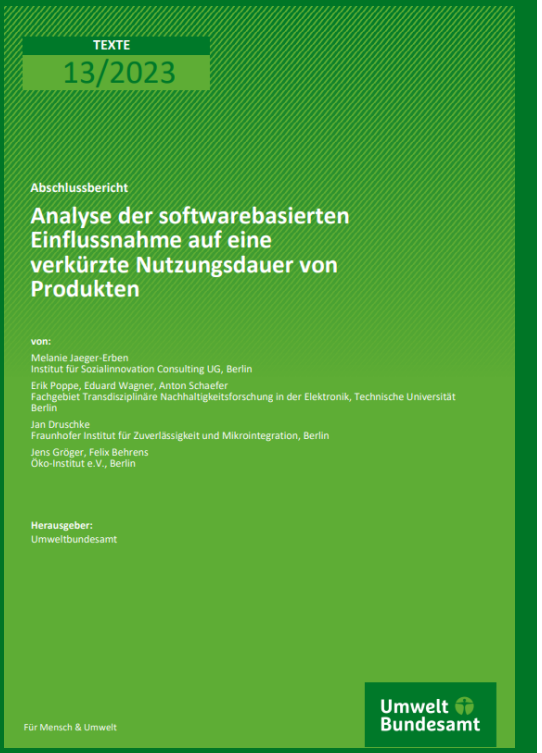
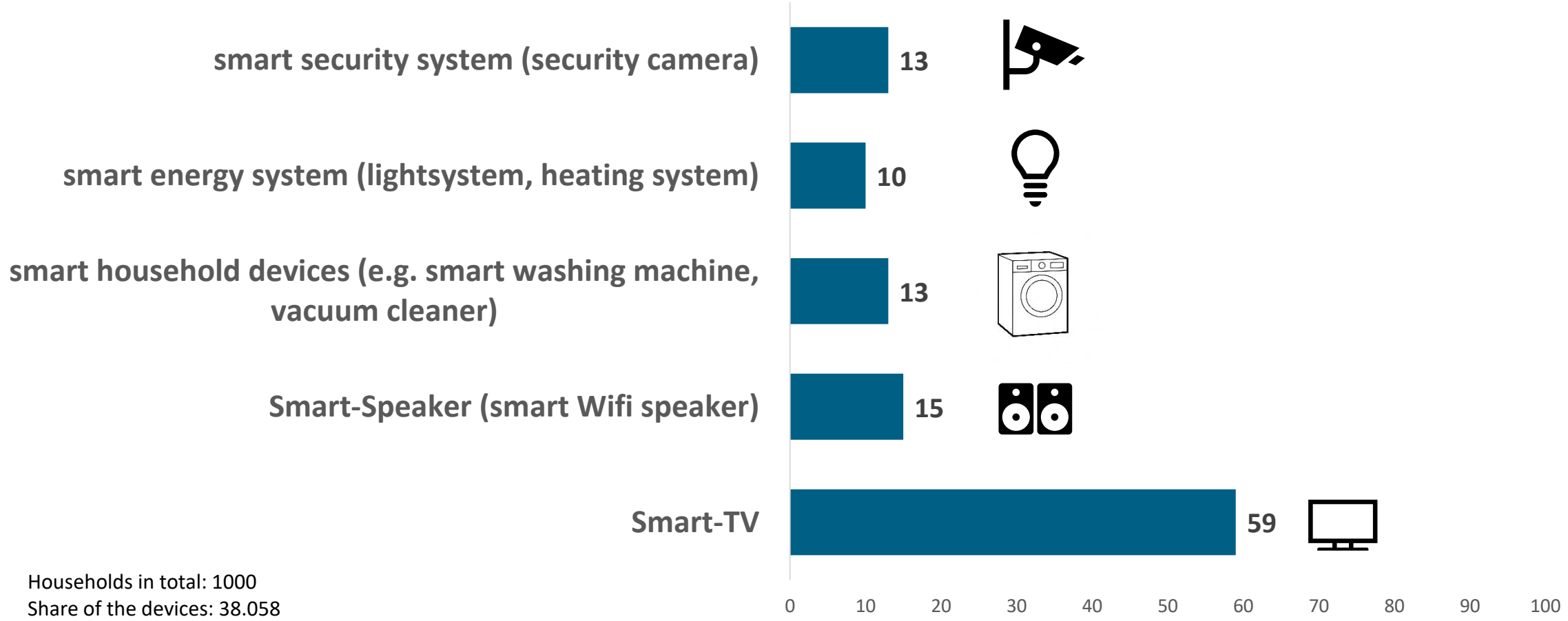


Agenda

1. Facts & Figures
2. Results of the study “Analysing the software-based influence on a shortened service life of products”
3. Policy recommendations

Facts & Figures
Connected devices in households

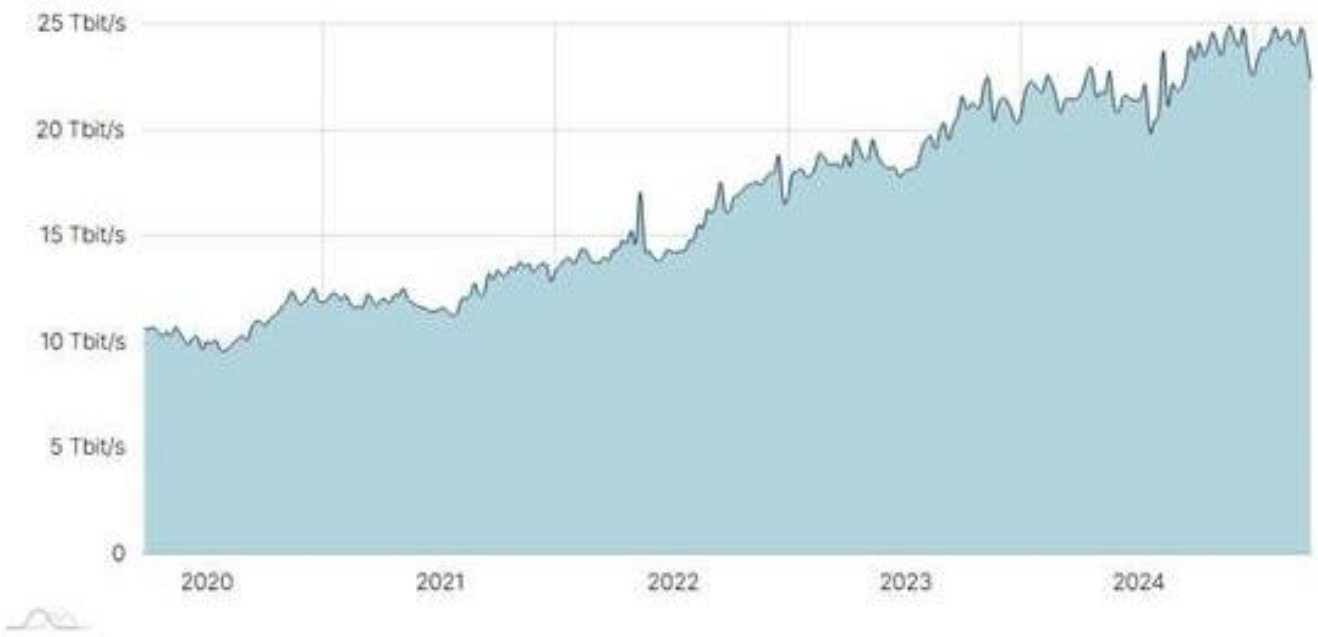
Smart Home devices in german households in 2022 [%]



Households in total: 1000
Share of the devices: 38.058

Reference: own diagram based on https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Einkommen-Konsum-Lebensbedingungen/Ausstattung-Gebrauchsgueter/Tabellen/a-smarte-geraete-systeme-d-lwr.html

Development of the data volumes of DE-CIX internet node in Frankfurt a.M



ALL-TIME PEAK
24.92 Tbit/s

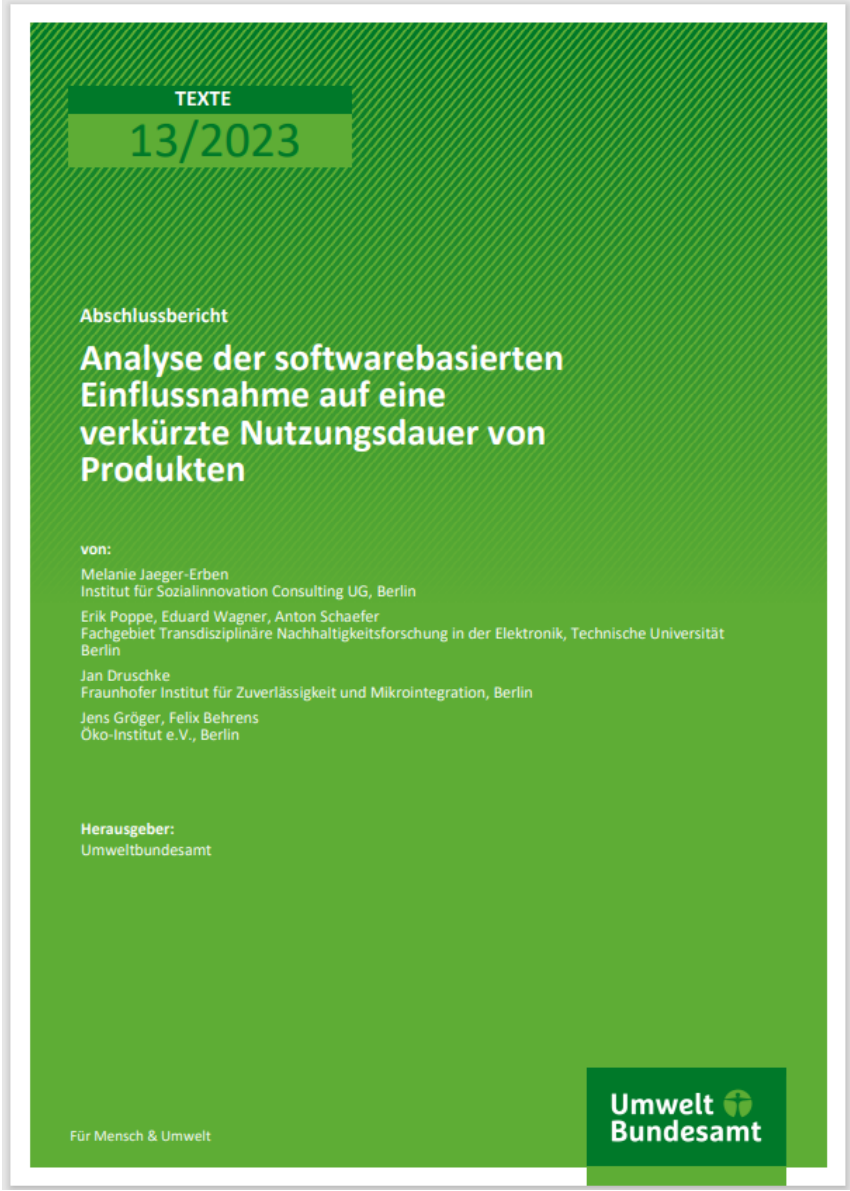
GRAPH PEAK
24.92 Tbit/s

GRAPH AVERAGE
11.56 Tbit/s

CURRENT
19.72 Tbit/s

The increase of data volumes in data centres is also linked to the rise of Smart Home

Results of the study “Analysing the software-based influence on a shortened service life of products”

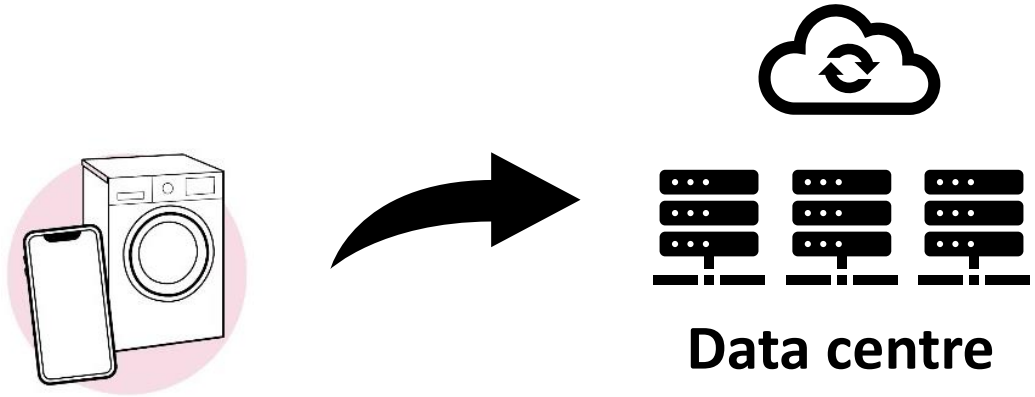


Reference: https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte_13-2023_analyse_der_softwarebasierten_einflussnahme_auf_eine_verkuerzte_nutzungsdauer_von_produkten.pdf

Definition of connected devices

Connected devices:

- are controlled by software
- operate with interfaces & communication protocols
- generate **additional energy consumption that takes place in other devices or other infrastructures**



Devices examples:

- Lighting
- Garden Automation
- Building automation (energy & comfort)
- Children‘s toys
- Body measuring device
- Small kitchen appliances
- Furniture
- Multimedia
- Textiles
- Safety and security
- Surveillance

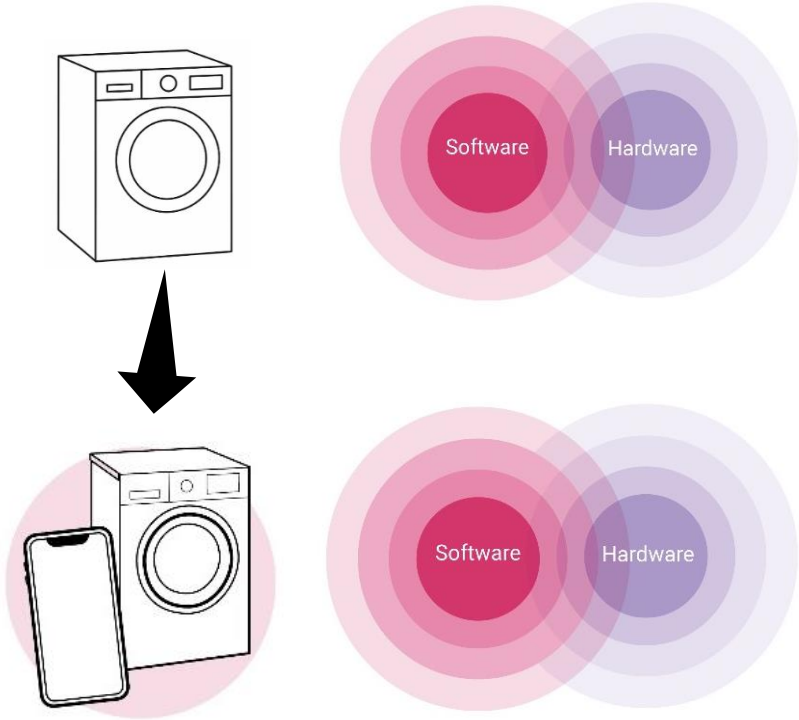
Connected devices versus usual devices and software obsolescence

- **Usual devices:** operate with software

  → **software obsolescence risks** (missing updates, software-induced sensor errors, dependencies of electronic, etc.)

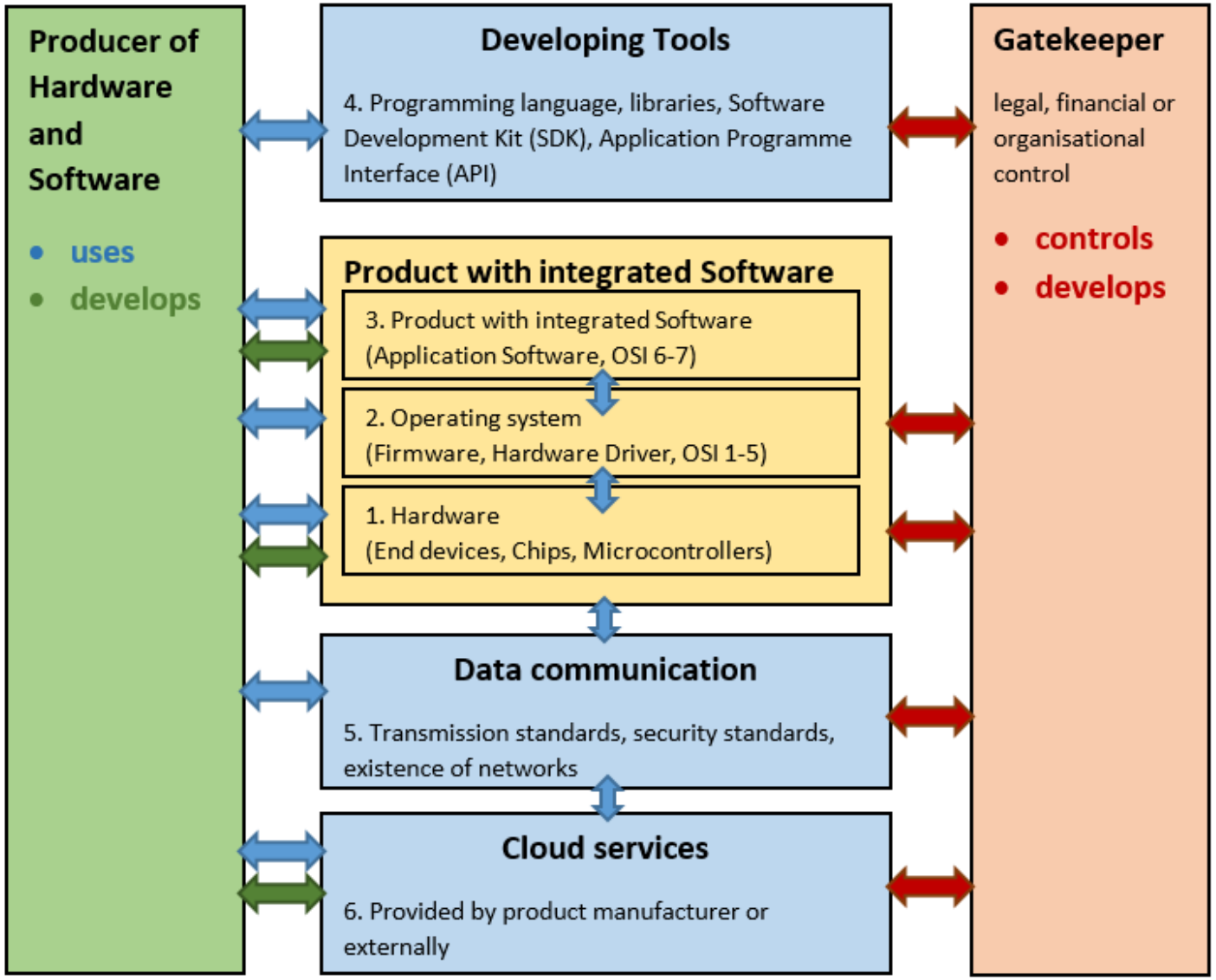
- **With connection of devices:** The networking of devices brings

  → **additional risks** (e.g. cloud dependencies, manufacturer-dependent standards, interfaces etc.)



- **Direct software obsolescence:** initiated by the software itself (e.g. kill switches, missing updates, etc.)
- **Indirect software obsolescence:** The properties of the software are part of other factors that cause obsolescence of the associated product system (missing support, licences etc.)

Dependencies in the smart home product system



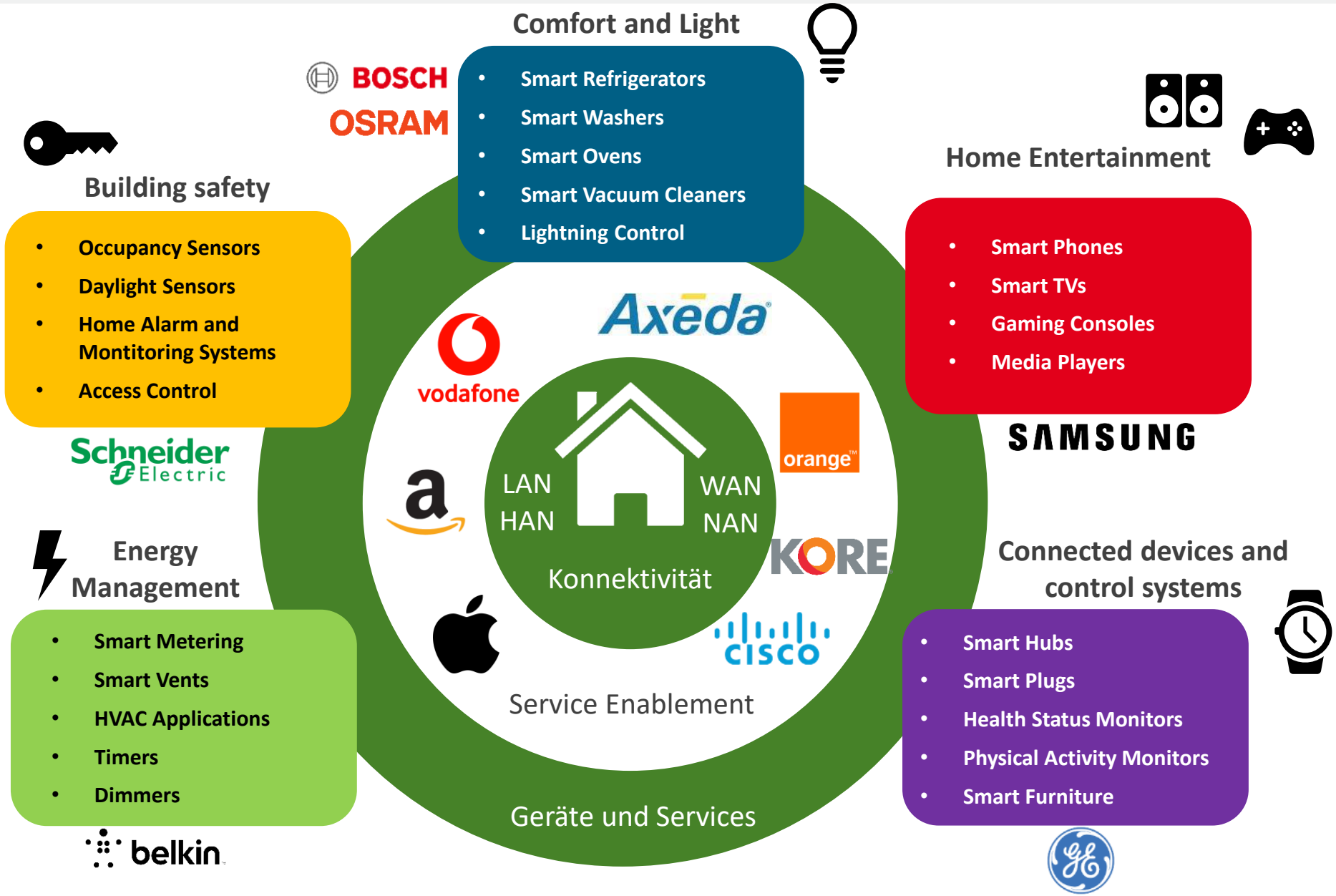
↔ Double arrows indicate the strong functional dependence between the layers. A single break can lead to the unusability of the entire system.

Influential actors:

a. Producer, Developer
b. Gatekeeper
c. Customer
d. Legislation
e. Software developer communities
f. Technology developer

Smart Home (connected) devices that should be understood as a whole product system that provide a functionality and not as a single device

reference: https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte_13-2023_analyse_der_softwarebasierten_einflussnahme_auf_eine_verkuerzte_nutzungsdauer_von_produkten.pdf



*Reference: based on GSMA (2012), Vision of Smart Home The Role of Mobile in the Home of the Future

Obsolescence risks Case study - Smart home lighting system (Philips Hue)

external Hardware

Connection procols (Zigbee, Wifi, Bluetooth)

Obsolescence risks Case study 1: Smart home lighting system (Philips Hue)

Layer	Reason for software obsolescence	Degree of risk
Hardware	Router and Smartphone needed	Middle
Operating system	Support of Security Updates	Middle
Software (App)	Compatibility to the Smartphone	Middle
Data transmission	Security, Delivery of new standard via Softwareupdate	Low
Developing tools	Open interfaces	Very Low
Cloud service	Security Updates are delivered via the cloud of the bridge	High
External Smart Home System	Few market-dominant provider, Service not guaranteed	High
Gatekeeper	Launch of Apple HomeKit led to technical obsolescence of the Bridge v1	High

reference: https://www.umweltbundesamt.de/sites/default/files/medien/479/publikationen/texte_13-2023_analyse_der_softwarebasierten_einflussnahme_auf_eine_verkuerzte_nutzungsdauer_von_produkten.pdf

Obsolescence risks Case study 2: Smart radiator thermostat (Tado)

Transfer protocol (IPv6)

Internet-connection

Bridge

Smartphone App

Obsolescence risks Case study 2: Smart radiator thermostat (Tado)

Layer	Reason for software obsolescence	Degree of risk
Hardware	Router and Smartphone needed	Low
Operating system	Chips need different Firmwareversions	Low
Software (App)	Compatibility with ioS 14 and Android	Low
Data transmission	Security (data protection), availability of wifi	Low
Developing tools	Closed interfaces	Middle
Cloud service	Availability, Security updates delivered via Cloud to the Bridge	High
External Smart Home System	Few matket-dominant provider, Service not guaranteed	Low
Gatekeeper	-	Very Low

Conclusions and Policy recommendations

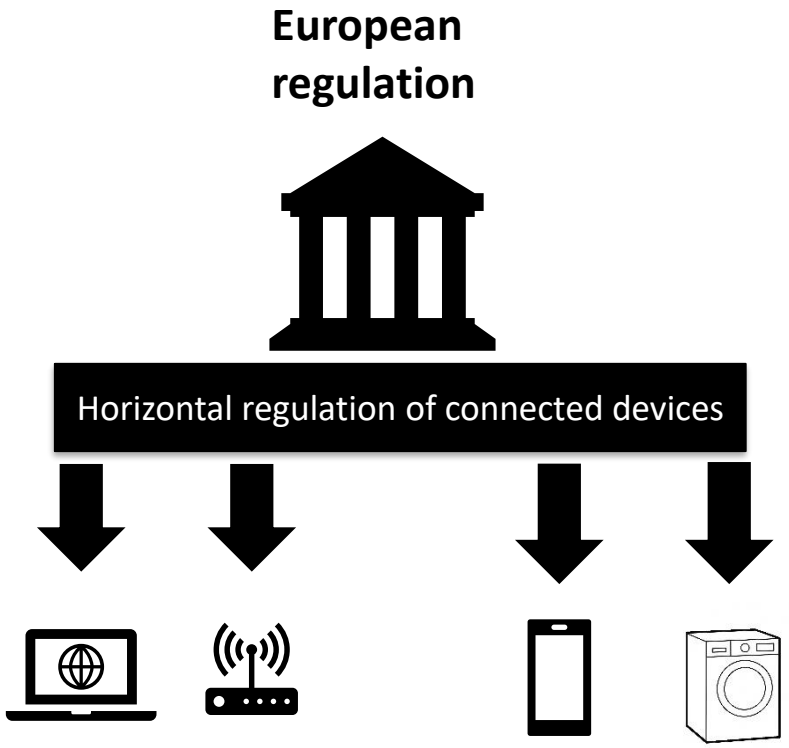
Conclusion - What needs to be regulated and how?

- **Networked devices have an increased risk of obsolescence** compared to normal devices (manufacturer-dependent protocols, standards, etc.)
- **Open standards, interface manufacturer-independent protocols** for communication between devices are needed
- **Gatekeepers must be addressed more strongly** - they decide on the longevity of networked devices with their interfaces, communication protocols and updates
- **Ecodesign regulation is not sufficient** (Only the manufacturer's products are regulated here, but Gatekeepers are not adressed)
- **Legislative regulation via the extension of the Digital Service Act** (Gatekeeper have to be addressed)

Horizontal regulation of connected devices (1)

The minimum requirements for market access should include:

- **The core function of the device must also be usable offline.**
- **Ability to operate the devices without external dependencies**
- Provision of **security-relevant software updates** for a minimum period of **10 years**
- Guarantee of **a minimum service life of typically 10 years**
- **Compatibility and Interoperability of product systems** (interfaces, transmission protocols, open standards)

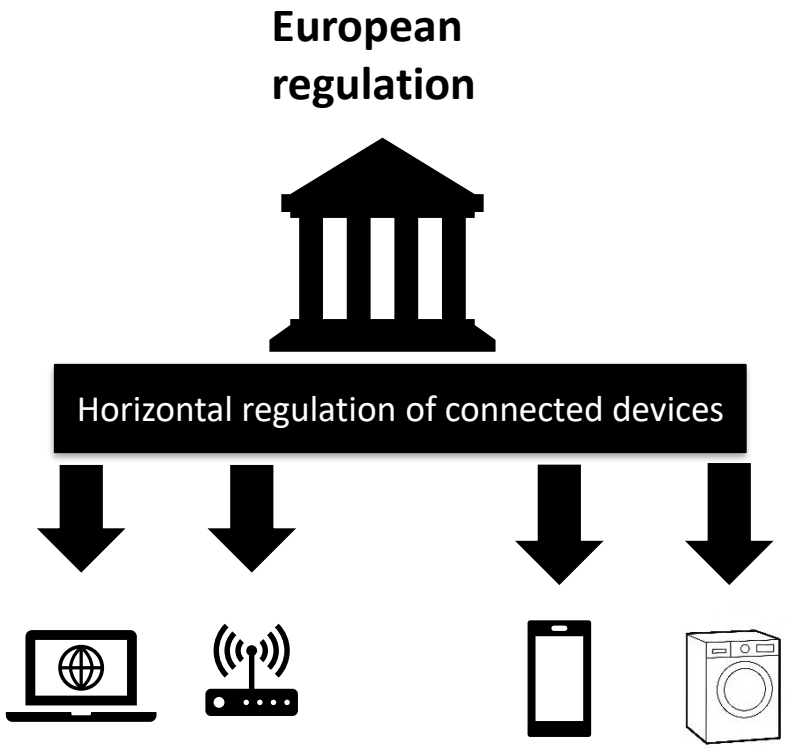


Reference:
https://www.umweltbundesamt.de/themen/digitalisierung/gruene-informationstechnik-green-it/software/risiko-fuer-vernetzte-geraete-software-obsoleszenz#wichtige-mindestanforderungen-fur-vernetzte-gerate

Horizontal regulation of connected devices (2)

The minimum requirements for market access should include:

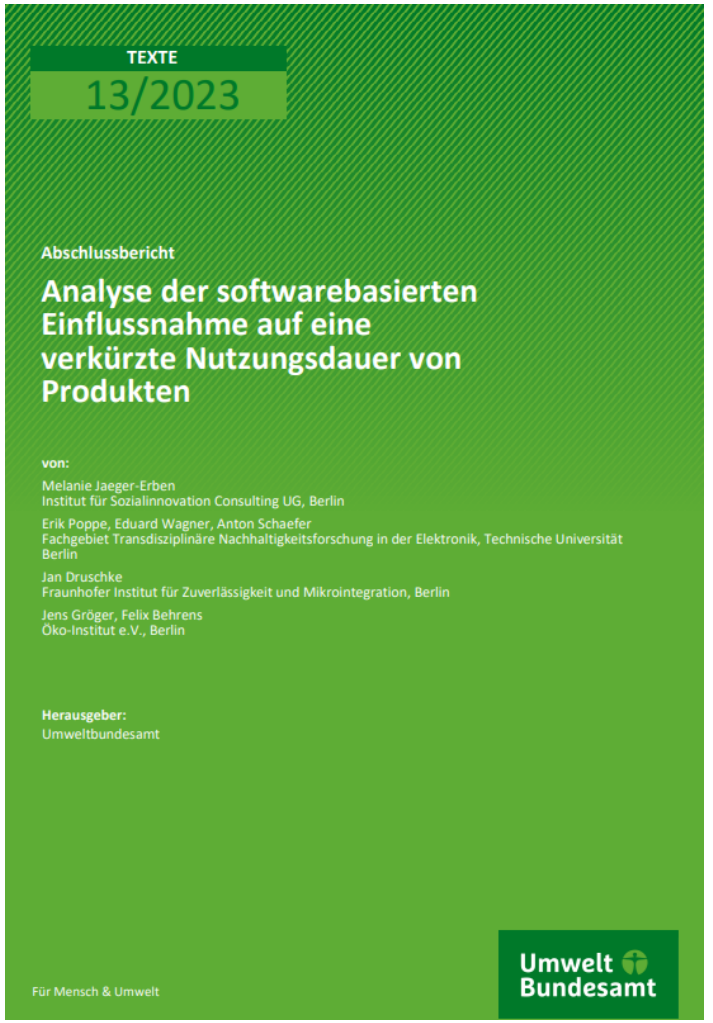
- **Transparency about requirements and dependencies** for the functioning of the device (e.g. OS version, user accounts necessary?)
- **Obligation to specify the type, scope of processed data and the purpose** of external processing of data



Reference:
https://www.umweltbundesamt.de/themen/digitalisierung/gruene-informationstechnik-green-it/software/risiko-fuer-vernetzte-geraete-software-obsoleszenz#wichtige-mindestanforderungen-fur-vernetzte-gerate

Research report

“Analysis of software-based influence on a shortened service life of products” – published in 2023



Link to the research report:
https://www.umweltbundesamt.de/publikationen/analyse-der-softwarebasierten-einflussnahme-auf

Thank you very much!
Questions?

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