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Push to Shrink Digitalization's Carbon Footprint

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Digitalization is making products more efficient, smarter, and internet connected, and thus beneficial in the war against greenhouse gas (GHG) emissions. But there are also questions about the impact of digitalization on products' energy efficiency and use.

Around the world, regulators have initiated inquiries on further reducing digitalized products' carbon footprint. Long a leader in efficiency standards, the United States is studying the energy impact of digital features and connectivity. Europe is stepping up its game with ambitious plans to make digitalization more ecologically compatible. More broadly, the International Energy Agency (IEA) has a set of policy issues for governments to consider on increasing the use of digital technologies for energy efficiency. Others are likely to jump on board.

Industry needs to take account of these trends as it plans for its markets in the United States—and around the globe.

U.S. Efforts on Energy Impact of Digitalization

Tech products already face a host of U.S. efficiency rules today. California has adopted standards for computers.[1] The voluntary Energy Star program has standards for data center equipment (data center storage, enterprise servers, network equipment, uninterruptible power supplies); electronics (audio/video, digital media players, set-top boxes, signage displays, slates and tablets, telephones, and televisions); and office equipment (computers, imaging equipment, monitors, and voice over internet protocol [VOIP]). The Department of Energy (DOE) has standards for computer room air conditioners,[2] battery chargers,[3] and uninterruptible power supplies, a class of battery chargers.[4] Myriad other products are subject

[1] 20 Cal. Code Regs. § 1605.3(v).

[2] 10 C.F.R. § 431.97(e).

[3] *Id*. § 430.32(z).

[4] *Id.* § 430.32(z)(3), *as added*, Energy Conservation Program: Energy Conservation Standards for Uninterruptible Power Supplies, 85 Fed. Reg. 1447 (Jan. 10, 2020). This standard applies to uninterruptible power supplies manufactured on or after January 10, 2022.

to DOE, Energy Star, and/or state efficiency rules and potentially subject to scrutiny on the energy impact of their digitalization.

In a Request for Information (RFI) proceeding that began in the Fall of 2018,[5] DOE is grappling with issues arising from smart products that include features such as Wi-Fi connectivity; remote access; full-color touch screens; and video capabilities. DOE is considering (i) the market for such products; (ii) the impact of smart features on energy consumption; and (iii) the potential privacy and security risks those features present. DOE is weighing whether and, if so, how energy used for network connectivity should be measured for purposes of its efficiency standards. DOE stresses that it wants to avoid inadvertently impeding such new tech innovations through its standards and test procedure processes.

As expected, the RFI has elicited a range of views. For example, some argue that power used for smart components is adequately accounted for in current efficiency standards and test procedures; that such components can reduce overall energy use of a product; and regulation could inhibit innovation. In contrast, others argue that the incremental power use caused by such features can be significant and needs to be better accounted for in DOE test procedures and standards; and that DOE should provide guidance on how to treat software updates that potentially impact a product's energy use.[6] The results of the RFI proceeding remain uncertain, but could increase pressure for regulation.

Ambitious European Initiatives on Digitalization

Recent European activity likewise addresses digitalization issues and their impact on energy efficiency.

- **European Commission.** On December 10, 2019, the European Commission presented "The European Green Deal."[7] It indicates that the Commission will propose a European "Climate Law" by March 2020, which will enact into legislation the Commission's 2050 climate neutrality objective. The Commission will adopt an EU industrial strategy to address the challenge of the green and digital transformations. This will be combined with a new EU "circular economy action plan" to stimulate the development of lead markets for climate neutral and circular products, "in the EU and beyond."[8]

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[5] DOE, Office of Energy Efficiency and Renewable Energy, 10 C.F.R. Parts 430 and 431, Energy Conservation Program: Request for Information on the Emerging Smart Technology Appliance and Equipment Market, 83 Fed. Reg. 46886 (Sept. 17, 2018).

[6] The comments are located at DOE Docket No. EERE-2018-BT-OT-0019.

[7] European Commission, Communication from the Commission to the European Parliament, The European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, *The European Green Deal* (Nov. 12, 2019), https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf.

[8] *Id.* at 7. "The circular economy action plan will include a 'sustainable products' policy to support the circular design of all products based on a common methodology and principles. It will prioritise reducing and reusing

The Green Deal goes on to state that the Commission

> will explore measures to ensure that digital technologies such as artificial intelligence, 5G, cloud and edge computing and the internet of things can accelerate and maximise the impact of policies to deal with climate change and protect the environment. . . . At the same time, Europe needs a digital sector that puts sustainability at its heart. The Commission will also consider measures to improve the energy efficiency and circular economy performance of the sector itself, from broadband networks to data centres and ICT devices. The Commission will assess the need for more transparency on the environmental impact of electronic communication services, more stringent measures when deploying new networks and the benefits of supporting 'take-back' schemes to incentivize people to return their unwanted devices such as mobile phones, tablets and chargers.[9]

- **Germany.** Germany is particularly focused. Its Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) has called for digitalization to be ecologically compatible.[10] This includes, *e.g.*, digital monitoring of the environment and compliance with environmental law; artificial intelligence to enhance energy efficiency and reduce emissions; digitalization to enhance sharing of environmental data; eco-labeling of information and communications technology (ICT) and data centers and efficiency standards; assuring resource-efficient software; protection of human health with expansion of mobile networks and the introduction of 5G; manufacturers taking responsibility from production to operation, maintenance, and repairs to recycling and disposal; and environmentally friendly design of digital devices.

  Germany's environmental minister, Svenja Schulze, has stressed "[t]he digital age's environmental risks:" rising energy and resource use for electronic devices; greater transport and packaging volumes due to online retail; and increasing electricity use. [11] She has also acknowledged that digitalization "has enormous potential for environmental protection:" sustainable energy transition; low-emission mobility

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materials before recycling them. It will foster new business models and set minimum requirements to prevent environmentally harmful products from being placed on the EU market. Extended producer responsibility will also be strengthened." *Id.*

9 *Id*. at 9.

10 BMU, *Umwelt in die Algorithmen! Eckpunkte für eine umweltpolitische Digitalagenda des BMU* (Jun. 5, 2019), https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Nachhaltige_Entwicklung/eckpunktepapier_digitalisierung_bf.pdf.

11 BMU, *Speech of Svenja Schulze at the EEB (European Environmental Bureau) 2019 Annual Conference* (Nov. 18, 2019), https://www.bmu.de/en/speech/speech-of-svenja-schulze-at-the-eeb-2019-annual-conference/.

systems; implementing the goal of a "true" circular economy; and monitoring environmental status.

She has presented ideas for a digital policy agenda for the environment, which would include: standards for efficient data centers and a European right to repair; support for start-ups planning to use environmental data for species protection and climate action; a funding program for 50 lighthouse projects that use artificial intelligence for environmental protection; and resource conservation. At the Environment Council in July 2020, she wants to discuss these and other ideas for a European digital agenda for the environment with her EU counterparts. She is "aiming for concrete action and measures and proposals for legislative solutions, in order to secure the greatest possible protection for people and our planet in the digital era."

- **France.** ARCEP, France's telecommunications regulator, is likewise addressing digital tech's carbon footprint. In October 2019, it issued a progress report[12] on its inquiry to date, which takes into account the views of a Scientific Committee of experts. ARCEP's goal is to prepare for upcoming challenges in regulating communications networks.

  ARCEP asserts that the digital sector is a net GHG emitter when comparing the sector's own emissions and the emissions avoided in other sectors by digital technology. ARCEP asks: "Are technological developments enough to absorb the ongoing increase in traffic and new uses? Which technologies will be the most efficient? What levers can be employed to reduce digital technology's GHG emissions?"[13]

  ARCEP has asked for feedback before publishing a final version.

- **Finland.** While most EU leaders have pledged to become carbon neutral by 2050, Finland has pledged to do so by 2035. This will likely include measures to reduce the effect of the ICT sector on the environment. The Finnish government has appointed a working group to study these ICT issues and provide recommendations.

  The working group is to issue an interim report in June 2020 and a final report in November 2020.[14]

IEA proposed framework of policy principles

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[12] ARCEP (Autorité de Régulation des Communications Électroniques et des Postes), *Réseaux du future: L'empreinte carbone du numérique* (Oct. 21, 2019), https://www.arcep.fr/uploads/tx_gspublication/reseaux-du-futur-empreinte-carbone-numerique-juillet2019.pdf.

[13] ARCEP, *"Digital tech's carbon footprint": Arcep publishes a new brief as part of its reflection process on future networks* (Oct. 23, 2019), https://en.arcep.fr/news/press-releases/p/n/future-networks-3.html.

[14] Press Release, Finnish Government, Ministry of Transport and Communications, Preparations of the climate and environmental strategy for the ICT sector starting (Jan. 11, 2019), https://valtioneuvosto.fi/en/article/-/asset_publisher/tieto-ja-viestintateknologia-alan-ilmasto-ja-ymparistostrategian-valmistelu-alkaa.

Beyond these efforts, IEA has identified a set of policy issues that governments should consider when seeking to increase the use of digital technologies for energy efficiency.[15] These are: improve access to energy-related data; ensure that data and cybersecurity protection is robust; strengthen energy users' trust in digital technologies; ensure that energy markets value the services provided by digital energy efficiency; give all parts of society access to digital efficient technologies and infrastructure; ensure the workforce is ready to use digital technologies; minimize negative environmental impacts; and give technology providers and businesses incentives to innovate.

IEA's views on minimalization of environmental impact[16] may draw substantial attention from regulators. Digital management devices "require resources for production and contain embodied energy, so minimizing their environmental impact should still be a policy priority, especially considering the rapid pace of change and stock turnover for many digital technologies." IEA notes that digital devices often contain metals and rare minerals that are scarce and resource intensive to extract. In addition, battery-powered devices rely on elements that are often mined in conflict-ridden areas and are toxic. In addition, consumer behavior, including increased use (rebound effect), affects the environmental impact of digital devices.

Conclusion

While digitalization has been welcomed for its environmental and other benefits, the impact on products' energy use is receiving increasing attention. 2020 could see significant developments in the United States and abroad, with current investigations potentially leading to concrete proposals and measures.

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[15] IEA, *Energy Efficiency 2019* (rev. version Nov. 2019) at 92-98, https://webstore.iea.org/download/direct/2891?fileName=Energy_Efficiency_2019.pdf.

[16] *Id.* at 97.