Let's be honest

A reality check on sustainability in digitalization

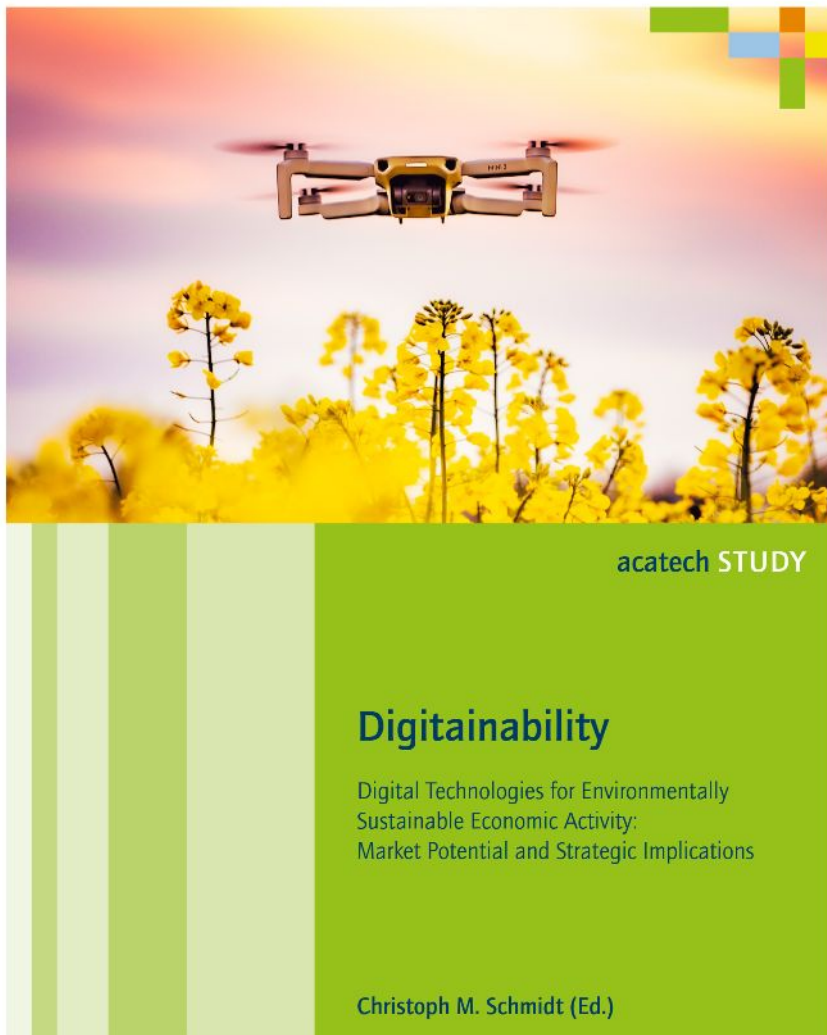**Stefan Kruijer**

ecoCompute | Berlin | 14 November 2025

acatech, 2023

On its current course, Germany will not achieve the climate targets it has set itself – a 65 per cent reduction in emissions by 2030 in comparison with 1990 and complete greenhouse gas neutrality by 2045.

There is an urgent need for additional meas ures. **Digitalisation can be a key starting point here by helping to decouple economic growth from the resultant negative environmental impact.**

Bundesnetzagentur, 2023

Digitalisierung und ökologische Nachhaltigkeit in Unternehmen

Eine vergleichende Betrachtung von KMU und Großunternehmen

Bundesnetzagentur

The digital and ecologically sustainable transformation of the economy and society is one of the key challenges of the present and future.

The interaction of both transformation processes, known as the 'twin transition', is becoming increasingly important at all level.

bitkom/accenture, 2024:

Study to assess the contribution of digital technologies to climate protection in Germany

- *Digital technologies can contribute around 24 per cent to the 2030 climate target (for Germany)*

- *The savings potential of digital technologies is 'net positive'*

- *A key finding of the study is that the faster digitalisation is driven forward, the greater the CO_2 savings achieved as a result.*

bitkom/accenture, 2024:

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- *A key finding of the study is that the faster digitalisation is driven forward, the greater the CO_2 savings achieved as a result.*

Statement by the Umweltbundesamt on the bitkom study 'Climate Effects of Digitalisation 2.0'

„The evaluation of the methodology, the quality of the studies used for the analysis, and the plausibility and traceability of the (interim) results shows that the study does not provide a valid basis for estimating the climate contribution of digitalisation."

Vodafone Institute for Society and Communications, 2020

- Climate change: Germans see digitalisation as an opportunity

- Digitalisation as a solution to climate change

And what about AI? Same promises!

Fraunhofer IKS, November 2020
„Using artifical intelligence to combat climate change"

Press release bitkom, January 2024
„Business sees AI as an opportunity for the climate"

Bundesministerium für Umwelt, Klimaschutz, Naturschutz und nukleare Sicherheit
„Artificial intelligence as a driver of opportunity"

J. Clausen, T. Niebel, R. Hintemann, S. Schramm, J. Axenbeck, S. Iffländer, Klimaschutz durch digitale Transformation: Realistische Perspective oder Mythos, Berlin, Borderstep Institut, 2016
„… point out … that it is not reasonable to assume that digitalisation will automatically unlock climate protection potential."

S. Gährs, H. Bluhm, E. Dunkelberg, J. Katner, J. Weiß, P. Hennig, L. Herrmann, M. Knauff, Potenziale der Digitalisierung für die Minderung von Treibhausgasemissionen im Energiebereich, Umweltbundesamt, 2021
„Extrapolated to Germany as a whole, the new applications can make only a small contribution to achieving the 2030 climate protection targets under current market conditions. Even if their use can be expanded via political measures, digitalization can only supplement and not replace other key climate protection measures such as building refurbishment and alternative energy sources."

S. Lange, J. Pohl, T. Santarius, Digitalization and energy consumption. Does ICT reduce energy demand?, 2020
„The hopes set on digitalization reducing energy consumption have not yet been justified. Instead of saving energy, digitalization has brought additional energy consumption; the energy-increasing effects (direct effects and economic growth) of digitalization have been greater than the energy-reducing effects (energy efficiency increases and sectoral change). This increasing energy consumption is likely to persist as the energy-reducing effects tend to trigger mechanisms leading to the energy-increasing effects."

Data center in Germany
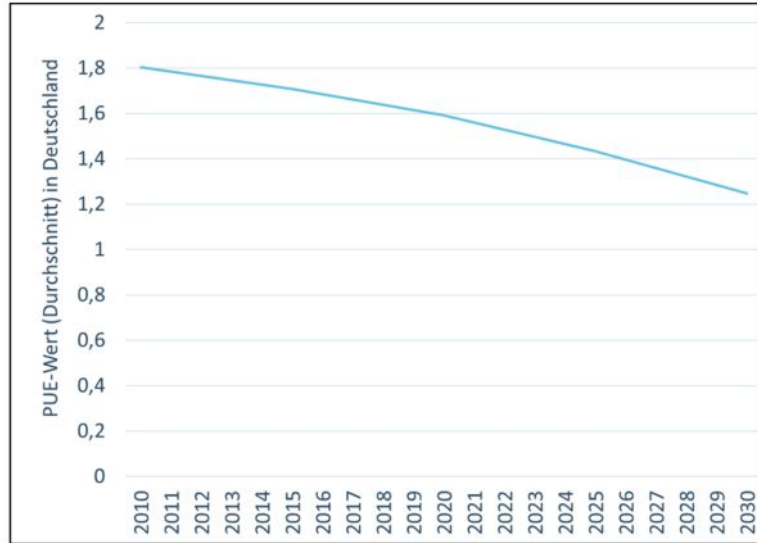
PUE (power usage effectiveness)

Abbildung 17: Entwicklung des PUE-Werts in Deutschland in den Jahren 2010 bis 2024 und Prognose bis 2030. Quelle: Berechnungen Borderstep
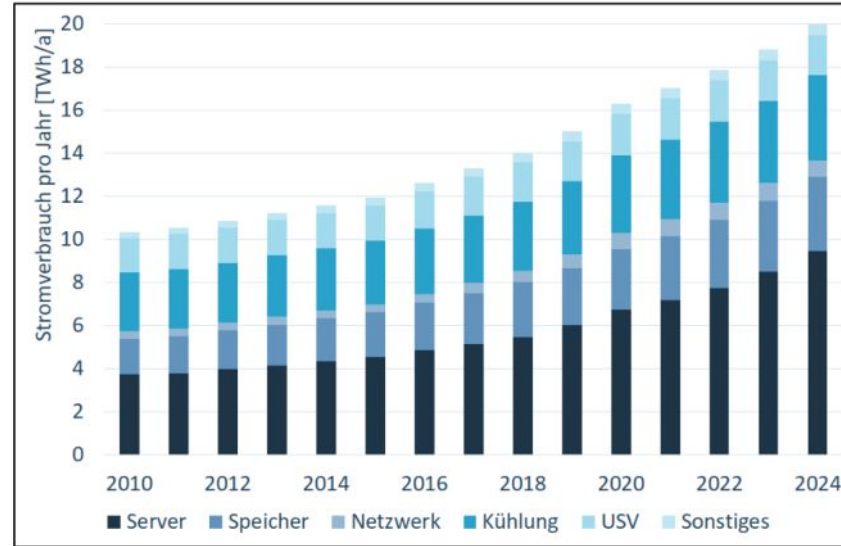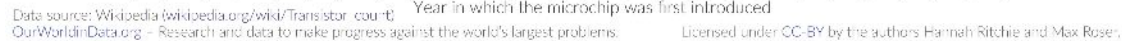
electric power consumption

Abbildung 14: Entwicklung des Stromverbrauchs der Rechenzentren und kleineren IT-Installationen in Deutschland in den Jahren 2010 bis 2024. Quelle: Hintemann et al. (2024a)

In 50 years the computing power has increased by a factor of approx **10 million**

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"Sustainability transformation can only succeed if the digital upheavals can be successfully geared towards sustainability. Otherwise, digitalization threatens to act as a 'fire accelerant',exacerbating growth patterns that breach the planetary guard rails."

WBGU – German Advisory Council on Global Change (2019): Towards our Common Digital Future. Summary. Berlin: WBGU

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Let's be honest ...

… be sceptical when the story sounds too optimistic

… don't look for predictions or promises, look for evidence

… take the whole life cycle into account

… look for side effects

… don't ignore the rebound effect

… energy efficency is not equal sustainability

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The Sustainable Digitalization Project

Thank you

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