Achieving absolute reductions

Digital Sufficiency as a Principle for Energy Transition Policies

The energy transition will only succeed if digital tools are used under the guiding principle of digital sufficiency. Using only as much digitalisation as necessary to bring sufficient momentum to the urgently needed socio-ecological transformation of society.

By Irmela Colaço

Discussions about digitalisation often follow the narrative that "digitalisation" brings progress per se and should therefore be implemented as quickly as possible. Critical questions about where and what kind of digitalisation is necessary and will bring added value to society as a whole are often dismissed as technophobic.

Such perspectives distort discussions about digitalisation. Digital applications should be understood as tools. Depending on the goal and skill of the user, they can bring benefits or harm to society as a whole. It is therefore important to consider both the advantages and disadvantages and to define clear guidelines for the use of the tools.

Those guidelines should follow the principle of "digital sufficiency" in the sense described by Lange et al. (2019): Digital technologies should be designed thriftily as regards the use of energy, natural resources and data (technical and data sufficiency). In addition, they must be applied for the objectives of user sufficiency and economic sufficiency, which means that digital applications should aim to enable a way of life and an economy that is preferably based on local structures and freed from the pressure to grow. In a nutshell, digital sufficiency means as much digitalisation as necessary to bring sufficient momentum to the urgently needed socio-ecological transformation of society, but as little as possible to protect the environment and people from negative impacts.

Using the example of energy transition policy, this contribution outlines what this guiding principle could mean and where positive approaches, but also contrary movements and decisions, can already be observed.

Saving energy thanks to digitalisation

In order to transform the energy system towards 100% renewable energy sources quickly and in a resource-conserving, environmentally and socially compatible manner, energy consumption needs to at least be halved. However, the energy efficiency policy has so far not resulted in the necessary savings.

Many digital applications for visualising energy consumption, for automation and for monitoring the operation of production, heating and ventilation systems can exploit new energy-saving potential (Colaço et al. 2019). The German Federal Ministry for Economic Affairs and Energy (BMWi) would like to bring such applications into the mainstream with the funding programme "Einsparzähler" (Eng.: "Savings Meter"). Provided that a smart meter is used to monitor success, companies and actors in civil society receive a grant for innovative programmes that help to save energy through technical solutions or behavioural changes in target groups of their choice.

The funding programme partially fulfils the sufficiency criteria mentioned above. Firstly, the majority of the grant is only paid out if absolute energy savings can be proved. This success control ensures the effectiveness of the measures and curbs rebound effects, which can support user sufficiency defined by Lange et al. (2019). Smart meters and thus digitalisation facilitates this performance-based approach, which should be included in further funding programmes such as the KfW grants and loans for energy efficient construction and refurbishment. Secondly, the programme explicitly strengthens small actors and the use of open-source software. This supports local energy transition activities and community value creation (economic sufficiency). Thirdly, the installation of the smart meter is associated with a concrete added value and not only with a theoretical potential that may never be addressed. This is a right step in the sense of technical sufficiency.

Other criteria, however, such as using as few technical resources and as little data traffic as possible, are missing from this funding programme and should be included in its further development. This also counts to other funding programmes for "smart" technologies. It should be clarified for which parts new digital technology is necessary at all, where intelligence in a single unit of a system or facility is sufficient and where networking of different devices with each other or with third parties to the outside is necessary. If networking is advantageous, it would be necessary to check how long it has to be in place and what kind of data has to be transmitted how often in order to achieve energy-saving effects.

In addition to suitable funding and advisory programmes, however, there's an urgent need for legal requirements in order to reliably achieve the energy-saving goals and activate the

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innovation potential of new business models based on digitalisation. This includes the obligation for energy management in larger buildings or the mandatory commissioning measurement of heating systems, in which digital services can provide added value because errors in operation and their causes are more easily detected (Pehnt et al. 2016). Furthermore, legally defined energy saving targets are necessary to increase the pressure to take action across all sectors in order to contain the increasing energy consumption resulting from digitalisation (cf. Pohl et al. this issue).

Saving energy despite digitalisation

In Germany alone, data centres are expected to consume about 40% more energy by 2025 than in 2015 (Stobbe et al. 2015). Policymakers are primarily focusing on increasing energy efficiency in data centres, transmission networks and end devices. This is a basic prerequisite for the success of the energy transition and political regulations to this end should be put in place as quickly as possible. However, it is doubtful that a mere increase in efficiency is sufficient to reduce energy consumption reliably, quickly and sufficiently.

A huge environmental challenge in private households is that "smart" homes serve perfectly for companies to provide new consumption options. The associated narrative promotes the "smart" home with a view to a sophisticated, digital energy management system as ecologically advantageous. But it is neglecting that other components of the "smart" environment which promise comfort or security will at the same time weigh down the ecological footprint of a household heavily. Advertising and even the *Smart Living Business Initiative* supported by BMWi do not distinct between "smart" lifestyle products and "smart" offers that serve the socio-ecological transformation. Sustainability criteria are not discernible. This is a missed opportunity to make Germany's economy and households fit for the future since the number of digital end devices has a crucial influence on the digital carbon footprint of private users (Gröger 2020).

An essential lever for a sustainable digitalisation is to ensure durable, repairable and recyclable products (cf. Pohl et al. this issue) which can, amongst other positive environmental effects, reduce energy consumption in the industrial sector. First steps to anchor requirements for repairability and durability in the EU Ecodesign Directive are not far-reaching enough. Software-related obsolescence is neglected, which is disastrous in view of the rapidly increasing availability of "smart" products. Repair services offered by small crafts enterprises or civil society organisations are hindered because they have limited or no access to construction manuals and spare parts. Yet it is precisely the proliferation of such local repair initiatives and Makerspaces that could make an important contribution to the socio-ecological transformation (cf. Voigt this issue). This must be remedied as soon as possible and applied to further products.

Furthermore, in order to minimise energy consumption in the use phase, the trend towards more and more functions, larger screens and higher resolution must be stopped. This can be achieved by setting absolute energy consumption limits and progressive efficiency requirements in the Ecodesign Directive. Data frugality (cf. Pohl et al. this issue) and further aspects of sustainability for software and digital services, should be operationalised and included as a new requirement.

Besides the efficient and sufficient design of devices and infrastructure, however, it is also necessary to look at the system as a whole. After all, in an economic system dependent on growth, it should for example be feared that longer-lasting products will not mean that fewer products are put into circulation overall. A sufficient reduction in energy consumption requires overarching measures that pave the way to a social economy ("Gemeinwirtschaft") without the pressure for growth, very much in the spirit of the economic sufficiency mentioned at the beginning.

Digitalisation and decentralisation

An important pillar of a social economy is not only the release from the pressure for growth, but also the re-regionalisation of value creation, as ensured by a decentral organised energy transition. For decentralised infrastructures distribute the benefits and financial profits amongst municipalities, public utilities and citizens, instead of leaving them in the hands of large energy suppliers, mineral oil and state-owned companies in oil-rich countries. The regional balancing of supply and demand also minimises energy losses as well as costs and resources for transport and storage.

A local and regional electricity trade as well as balancing the temporally fluctuating energy supply with the energy demand will require many digital interfaces and services. The political strategy in Germany currently envisages equipping larger consumers with a smart meter across the board and thereby creating a technical basis for such services. The catch is that the added value of the smart meters for the energy transition is not yet guaranteed. Moreover, political practice leaves considerable doubt as to whether the federal government actually has an interest in strengthening prosumers, landlord-to-tenant electricity supply ("Mieterstrom"), peer-to-peer sharing and other forms of a decentralised design of the energy transition. Energy citizenship has already been massively stifled with the switch to tenders. In course of the revision of the Renewable Energy Sources Act at the end of 2020, the BMWi planned to phase out subsidies for renewable energy systems that are more than 20 years old and to establish an obligation to install a smart meter even for small systems, which would have made them economically highly inefficient. These and other proposals would have worsened the situation for small citizen-operated renewable energy plants and were prevented only at the last minute. However, fair and appropriate framework conditions in order to boost the energy transition "revolution" by citizens, as demanded by the European Union, are still missing.

Using the energy transition for transformation

From Friends of the Earth Germany's point of view, the essential question for the advancement of the energy transition is therefore not whether sufficient digital solutions are available for the decentralised organisation of the energy transition. Instead, the focus is on the question of whether the energy transition will remain in the hands of large corporations or whether it will be shaped by citizens and digital applications will therefore contribute to social and economic change.

When designing the technical infrastructure for the energy transition, it should be considered that upgrades and data collection should only take place where proven added value can be expected. For example, there is reason to doubt the vision that everyone should contribute to the success of the energy transition by remotely controlling their washing machine so that it runs when the sun is shining, and the wind is blowing. In order to minimize data traffic and complexity it should rather be discussed where standard load profiles will be sufficient for the balancing of energy supply and demand. Those visions rather reinforce dominant narratives of the industry as mentioned previously, that promote "smart", networked devices as good for the energy transition and thus create new needs for consumption.

The ecological price for this narrative can be high. Across Europe, the networked standby consumption of household appliances could increase to up to 14 terawatt hours per year by 2025 (Hintemann/Hinterholzer 2018), which is equivalent to the annual electricity consumption of all households in the Czech Republic. Above that, short product lifetimes and software restrictions could lead to increasing resource consumption.

In summary, there is great innovation potential in digital products and services for both the decentralised organisation of the energy transition and the frugal use of energy. What has been lacking so far are guidelines and regulatory conditions oriented towards digital sufficiency to steer this potential in the right direction and to constrain it where it impedes the resource-conserving, socially acceptable and environmental-friendly success of the energy transition.

References

BMWi (2015): Entwicklung des IKT-bedingten Strombedarfs in Deutschland: Abschlussbericht. www.bmwi.de/Redaktion/DE/Downloads/E/entwicklung-des-ikt-bedingten-strombedarfs-in-deutschland-abschlussbericht.pdf?__blob=publicationFile&v=3

BMWi (2020): Smart Living: Die Digitalisierung der Wohn- und Lebensumgebung: Chancen für die deutsche Wirtschaft. www.smart-living-germany.de/SL/Redaktion/DE/Publikationen/2018-flyer-sl.html

Colaço, I./Brischke L.-A./Pohl, J. (2019): „Smartes" Zuhause – Zum Beitrag vernetzter Haushalte für den Klima- und Ressourcenschutz. In: Höfner, A./Frick, V. (eds.): Was Bits und Bäume verbindet – Digitalisierung nachhaltig gestalten. München, oekom. 28–31.

Gröger, J. (2020): Digitaler CO_2-Fußabdruck – Datensammlung zur Abschätzung von Herstellungsaufwand, Energieverbrauch und Nutzung digitaler Endgeräte und Dienste. https://bund.net/studie_digitaler_fussabdruck

Hintemann, R./Hinterholzer, S. (2018): Smarte Rahmenbedingungen für Energie- und Ressourceneinsparungen. https://bund.net/kurzstudie_smarthome

Lange, S./Santarius, T./Zahrnt, A. (2019): Von der Effizienz zur digitalen Suffizienz – Warum schlanke Codes und eine reflektierte Nutzung unerlässlich sind. In: Höfner, A./Frick, V. (eds.): Was Bits und Bäume verbindet – Digitalisierung nachhaltig gestalten. München, oekom. 112–114.

Pehnt, M./Mellwig, P./Wehrle, M. (2016): 13 Maßnahmen gegen Energieverschwendung im Heizungskeller – Kurzgutachten zur Stärkung von Instrumenten für Energieeinsparungen im Bestand: Beispiel Heizkessel. https://bund.net/kurzgutachten_heizung

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