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8. Infrastructure after welfare: communal infrastructure and the problem of (digital) monopolisation

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INTRODUCTION

If welfare is the success of meeting basic needs, then it is infrastructure that is both the tool and the product of meeting such needs. An infrastructure and its managing, repairing, and adjusting by people can show us how that is.

Underneath urban and suburban homes – in which most people and their companions sleep, hang out, and prepare meals; the schools where children read books and play; the hospitals that provide temporary homes to the injured and the sick and their caretakers; the myriad buildings where people work; and all the other structures of the built environment that make up what we know as *the city* – lies a mesh of pipes. In Odense, a city in central Denmark on the island of Fyn that houses approximately 200,000 people, these pipes distribute electricity, television and internet, water, and sewage. And in addition, there is another system the locals know as *district heating* (Danish: fjernvarme). The utility workers in charge of the district heating system ensure that a coloured water solution is heated up and then transferred to almost all buildings of the city. It then enters their exchangers, warming radiators, underfloor panels, faucets, and shower heads. The moderately cold autumns, springs, and winters in Denmark have made the use of heating technologies for rooms and water taps essential. The heating of buildings is considered a basic need to the extent that all cities and most smaller towns are supplied through the non-profitable infrastructure of district heating.

A few towns in Denmark have established cooperatives to manage the infrastructure, but all larger cities manage and extend them through municipal ownership. Energy utilities in Denmark are embedded in a history of collective ownership. The cooperative movement of the 1800s formed organisations based around agriculture, energy, and grocery shopping, and soon municipalities started to build large-scale infrastructures, owned through local, municipal

budgets (today, however, they have become economically and politically dominant and highly profitable cooperatively owned companies like Arla, Danish Crown, COOP, and Andel Energi) (Sørensen and Mordhorst 2024). This drive for developing communal and local ownership inspired the construction of collectively owned heating systems.

District heating infrastructures, aided by government subsidies, are extended to all areas of Denmark, as they are in other locations in Northern and Central Europe, Russia, China, and Northeast Asia. District heating is typically presented as a solution to lowering the amount of fossil fuels burned for keeping people and buildings warm. The common, national strategy for ensuring such fossil fuel phase-outs is electrification: the supply of electricity increasingly produced from, particularly, wind turbines used for heat pumps installed and plugged into the heating infrastructure. This ambition of electrifying, large-scale systematising, and integrating all energy infrastructures for more efficient energy use has involved many industries, actors, and strategic projects.

In 2019, Odense's heating infrastructure was connected to the city's new Facebook data centre by the engineering of pipes in between. Warm air from data processing servers was channelled into the heating infrastructure, where heat pumps would increase the temperature enough to fit the system. Then, utility workers ensured that cold air was transported back to the data centre to cool the precious servers. In the news media, the choice of Odense was presented as the opportunity to connect to the district heating system as well as the strategic location for stable energy security next to the 'Northern European electric highway' on the island of Fyn with a high-voltage converter station and substation connecting the two existing Danish transmission systems.

As with many other territories, the Danish state has, from the early 2010s onwards, been a digital laboratory for the global data industry (O'Brien et al. 2021). The welfare state's shift to self-producing onto welfare state governance, with welfare provisions dependent on industrial growth (Pedersen 2013), has provided fertile national grounds for multinational tech companies to operate in (Collington 2022). Transnational tech companies purchase plots of land, hire local and international workers, and create new digital markets, thereby digitalising livelihoods.

Within welfare state economics, it is usually not up for debate that critical welfare responsibilities include infrastructures for education, health, and social care. However, district heating has extensively developed in Denmark as a consequence of intense subsidies, regulation, incentivised monopolisation, and municipal ownership. This connection and disconnection between (1) infrastructure of welfare utility and (2) infrastructure maintained and developed as a consequence of welfare state policies inspire questions such as: When, where, and for whom is an infrastructure a welfare infrastructure? Which implications does contemporary welfare economic practices via industry partnerships

with digital monopolies have for infrastructure autonomy? And what can be learned about the differences between infrastructures presented to the humans that use them as specifically communal and community infrastructure?

To address these questions, I draw on empirical findings from fieldwork and interviews with utility workers and employees in the municipality of Odense in October and November 2020, as well as document analysis of reports published by Facebook. The infrastructure in focus within this chapter is an example of a real, popular, and not at all utopian non-profitable energy infrastructure owned by the Municipality of Odense. I aim to unfold which policy design and administrative conditions such infrastructure requires. The Danish term for municipality is *kommune* – a term on which the contemporary organisation of the municipality and its infrastructures still builds. For that reason, I contextualise the municipal organisation as *the commune*. While municipalities are transnationally and intra-nationally organised differently, there is also a point in contextualising the commune as a specific welfare state-administered organisation.

The chapter first outlines the analytical framework in which I develop the notion of ‘communal infrastructure’ and analyse how forms of communal ownership and autonomy thrive despite digital monopolisation. Then I mobilise literature on monopolisation in the digital age to show the techno-economic conditions in which companies like Facebook build upon and get folded into the production of welfare. After that, I analyse first empirics of what I call (1) welfare as service, followed by (2) welfare as utility. As shown through the analysis, communal infrastructure not only produces and delivers welfare but also differentiates between techno-economic forms of welfare.

ANALYTICAL FRAMEWORK

Communal Infrastructure

In recent years, scholars have dismantled the semantic distinction between public and private infrastructures. Largely, scholarship has emerged that focuses on public goods rather than on public institutions and infrastructures, by showing how public material value is produced (Collier 2004). This can be seen, for example, in the administratively and hydraulically engineered access to water as a public good (Ballesterio 2019). Scholarly excavations of the presumed divide have also shown that only a few legal differences can be documented between private and public ownership of land (Freyfogle 2006), and how the public–private divide is a sense-making device similar to other common interdependent distinctions. These distinctions are not opposing but fractal, thereby continuously public and private within every categorisation of public or private forms (Gal 2002). What might seem like neoliberal

interventions into public provisioning, calculative governance, and privatisation of services does not necessarily signify a retreat of the state (Löfbrand and Strippel 2012). As Hoeyer (2020) has argued, the problem of the data industry's role in state activities is not a sudden ontological blurring of private and public domains but the inequalities in relation to humans' lack of control over data-producing processes and the limited direct distribution of revenue from data produced about oneself.

What I will term *communal* refers to a specific history of infrastructure and policy development. First, it is relevant to contrast it with a term often used in a Euro-American context: 'the social enterprise', often presented as a company that is entrepreneurial in its manner of solving societal issues while remaining largely non-profitable (Dafourney and Nyssens 2010). This organisational form belongs to a context in which the public and the private are positioned as the dominant bastions of human organisation and where limits to profitability as a means to welfare provisioning have been recognised. In the context of Denmark, where this analysis is situated, such an organisational form also exists, even with the same title. Yet, other forms of non-profitable provisioning also exist, which are indeed interesting because they are not only recognised locally as the organisations, which they arguably are, but as infrastructures.

The development of such utility infrastructures in Denmark is a history of public-private relations defined by arrangements around *the communal*, which may in English be translated to something close to the area of the municipality, although not exactly. The Constitution of Denmark was passed in 1849 and ensured that 'communes have with the oversight of the state the right to autonomously govern their affairs'. When communes in the years after the passing of the constitution started to build and buy utility infrastructures, it was with a twofold purpose: (1) to ensure the sufficient construction and extension of electricity and water supplies for general, equal access, and (2) to create a source of income from utility bills for the distribution of social, equalising welfare such as education, housing, and health provision (Thomsen 2019). Before the era of the welfare state, the Danish public administration took place in the communes. Known as the smallest, local, political, public administrative organisation, the commune was the primary welfare agent until the 1930s, when many responsibilities and government liberties were centralised as state affairs.

The term 'communal socialism', initially a direct translation from German, was the social democratic political programme of the early 20th century (Kolstrup 1996). With the development of the term, as a certain form of local, public administration, the welfare economics of income and expenditure were deliberated in the political circles of the time. Up until the 1950s, the income from Danish communal utility infrastructures was a central source in lowering the cost of housing, education, and health provision, thereby making it more widely accessible. When the state budget became heavily dependent on high

taxes, booming in the 1950s due to rising personal incomes, the first laws on ensuring non-profitable utilities were passed (Kolstrup 1996). Communes were no longer dependent on utility bills but rather on the remittance of funds from the state budget to commune budgets. Since then, communal budgets have functioned through state distributions of block grants that communes are compensated for with funds spent on the nationally agreed upon welfare expenditures, such as the case in the 1980s, ensuring free education (Christiansen and Petersen 2001). The major shift in the legal organisation of the utility provision marks a historical milestone in the political economy of communal infrastructure. Late 20th-century state centralisation left few opportunities for communes to create their own better economic conditions for raising the standards on their welfare responsibilities – more specifically, social housing, primary education, social work, elderly care, disabled people's care, and child-care (Thomsen 2019).

While it may be tempting to consider communal infrastructuring a form of public administration, the localised history focused on autonomy and ownership instead suggests communal arrangements overflow understandings of what makes the public sphere and public responsibilities. Utilities come in all kinds of administrative arrangements and have changed over time in Denmark. Many state-owned or communally owned energy companies have been sold. Such an example is the former state-owned Ørsted (formerly known as DONG Energy) – 26% was sold to capital funds such as Goldman Sachs and several private pension funds in 2014. Capital investment in energy has also enabled forms of monopolisation in energy production. Small, new (and more emission-reduction ambitious) energy utilities are struggling with the dominance of large, yet increasingly profitable, centralised companies (Rohracher 2010). Through shifting tendencies in policy, communal infrastructure development has been incentivised via intentional monopolisation to create subsistent infrastructuring for fair and equal living conditions and meeting basic needs via not just material redistribution (as in economic management) but also distribution (as in transferring energy and water non-profitably).

Monopolisation in the Digital Age

In 2014, former Facebook/Meta board member and venture capitalist, Peter Thiel, said the famous words, 'competition is for losers', at a Stanford University lecture. Subscribing to intentional monopolisation as a business strategy was what gave Facebook its success in extending its social network and material impact so widely (Balzam and Yuran 2022). Competition in hyper-form, as a short initial business phase before monopoly and monopsony (the ability to rapidly outcompete in order to absorb), is a tech company's tool for market dominance (Narayan 2023). Tech corporations make their capital on the

products they absorb and outcompete rather than their own manufacturing. Small-scale actors in the tech industry – which provide the source code for almost all other services and apps than those directly owned by big tech – are the core material for the generation of value for the largest corporations (Blanke and Pybus 2020). This dual dynamic works, not in contradiction, but by the co-existence and co-dependence of monopolisation (the centralisation of sellers) and monopsonisation (the centralisation of buyers). Both are traits of multinational tech companies (Giblin and Doctorow 2022).

The rise of big tech is, according to market analysts, often explained as a consequence of neoliberal policies aimed at outsourcing public responsibilities, such as welfare services, to companies. Birch (2015), in contrast to such explanations of big tech's power, has shown how the divergence between neoliberal theory and neoliberal policy has fostered private monopolies to replace public monopolies. He calls this 'automated neoliberalism', where markets are configured by digital platform companies. The power of tech corporations, in policy, has only been challenged by strengthening market mechanisms, such as antitrust policy including merger restrictions and limiting data surveillance via data protection regulation (Birch 2020). However, studies often strategically overlook processes of monopolisation by digital industries, with the assumption that monopoly power is only the tip of the iceberg in the platformisation ensured by digital industries (Rikap 2023). It is also a rather recent issue compared with the forms of monopoly power that societies have seen at large. For example, Lenin, a month before the October Revolution in 1917, inspired by German industrialisation, spoke of a transition from 'monopoly capitalism to state-monopoly capitalism', which Scott (1998) describes as a form of state-making aspiring to monopolise the legitimate use of power. The assertion on transitioning from one kind of monopoly to another shows the extent to which ideological concerns have created political waves tending to shift between which kinds of monopolies are better for the welfare and freedom of societies. This history of monopolisation explains the political readiness to accept new monopolies such as those by new tech companies, but not how monopolisation unfolds in practice. The following sections analyse the transitions taking place in and around the communal utility infrastructure of district heating in Odense, Denmark.

WELFARE AS SERVICE: CUSTOMERS OF THE COMMUNE AND COMMUNE FOR THE CUSTOMERS

Odense was one of those communes whose governing politicians put in a bid in for becoming a home to one of big tech's new industrial 'cloud factories' (Ensmenger 2021). The deal with Facebook was signed at a time in history in which only a few companies would build new factories within the territory

of the Danish state as a consequence of high levels of regulation on wages, working conditions, working hours, environmental pollution, etc. For decades, smaller Danish companies and major corporations had outsourced much, in many cases all, of their factory work to regions in the Global South. While the initial matchmaking with Odense was an effort made by the Danish state, the maintenance of the infrastructural relationship has been totally on the shoulders of Odense's civil servants. The commune, officially titled in English 'City of Odense', had already, before the opening of the data centre, delegated most of the responsibilities for managing that relationship to a department within the commune called 'Invest in Odense'. By the employment of former business owners and business strategists, these civil servants were to cultivate the business environment in Odense. Similar to the state subsection of the Foreign Ministry, 'Invest in Denmark', that negotiated the placement of several big tech data centres in Denmark based on arguments on high-percentage renewable energy and energy security (Salling and Winthereik 2025), the work involved both attracting businesses and caring for the businesses already operating and manufacturing within the boundaries of, respectively, the commune and the state. In an interview with a manager from 'Invest in Odense', I was informed about what such work with Facebook requires:

We spend much time with, for example, Facebook on how to make sure that they have an experience of feeling like they are treated well, popular, and integrated into the local community. We invite them to sponsor events, make them visible, arrange matchmaking with the local companies, and make them aware of interesting research projects at the University of Southern Denmark [in Odense] that we think they should know of because it could support their agenda. This is certainly quite standard customer care.

In line with all the other businesses that have offices and factories in Odense, Facebook is handled as a customer of the commune that requires business care in order to cooperate and to continue their industrial operations within the boundaries of the city. While certain subsections of the commune treat the Facebook data centre as an industrial operation ground that needs to be managed, this organisational subsection ensures that the local Facebook employees and those responsible for the site generally experience that the corporation is well liked by Odense's citizens. Here, the public and the private are separate entities, yet organisations that facilitate and make the existence of each other possible. As he went on to explain, the reason why this work is necessary for the welfare provisioning in the commune, the relations in between are positioned as a chain of services that enable other services:

The local businesses and those we want to attract are approached from a customer perspective because we want to service them with outputs that match their needs.

It's important not to consider them an intrusive element. The commune's primary task is to deliver welfare to its citizens, and that welfare – schools, nursing homes, whatever – can only be financed if we have a sufficient tax foundation, and we only get a tax foundation if there's growth and private jobs. So, from that perspective, what we do in my office is to secure as many private jobs as possible. And for that reason, all businesses are our customers. This is a totally simple service perspective.

In the words of the 'Invest in Odense' manager, welfare is economically made possible by local industrial operations. Welfare services, such as ensuring free and quality education, are sustained and improved through the income to the commune budget that industries can support in growing. Harvey's (1989) concept of 'urban entrepreneurialism' helps in understanding this local welfare provisioning model. His point is that the entrepreneurial governance trend since the 1970s – creating inter-urban competition in securing jobs between cities and towns – corresponds with parts of the manager's take on the relationship between businesses big and small and welfare. This subsection of the City of Odense takes upon itself to compete with other communes in attracting businesses, which therefore means more taxpaying citizens. In light of Harvey's analysis, the commune project, having a specific subunit work to convince as many industries to build – aiming not for the ideology in itself but for the creation of jobs – stands out as a rather traditional strategy, initially pursued under the ideology of communal socialism. The commune is not a separate organisation from the local industry, but industries new and old are to become encapsulated within the commune. The project is in fact so ideological in terms of how to finance the commune welfare that any kind of business (big tech or a small biscuit factory) can be absorbed into the commune. This applies to the extent to which the inclusion of businesses is strategised upon, which the manager in 'Invest in Odense' mentioned when talking about how Facebook's profile was fitting for the city:

The robot industry and medicinal cannabis are also big companies in Odense, so it's the kind of businesses that point into the future rather than old industry or a closed shipyard that will create the jobs of the future.

The welfare economic strategies and civil servanthship of the commune have made sure to attract as many businesses as possible, yet also considered those fitting the imagined industrially digital future – Facebook was considered such a business.

In the early 2010s, when 'Invest in Denmark' negotiated the construction of several big tech data centres within its national territory lines, many local politicians across the political spectrum, along with communal civil servants, competed in offering plots of land and well-presented information, including

details on local energy connections, natural environments, and industries. The welfare's historical tension between commune and state in relation to economic autonomy has ensured that most local politicians, despite ideological differences, will take the chance on new industries in the hope of increasing the local circulation of money for the benefit of the commune's inhabitants. Similar to the Euro-American historical industrial expansions into new markets, multinational digital corporations in the 2000s sought to sell products in more regions of the world. The colonialist arrangement of contemporary digital capitalism has seen the major tech empires originating in the US and China make strategic investments in nation-states of the Global South in order to distribute digital technologies and increase levels of data production, analysis, and marketing (Kwet 2019). The expansionist business methods of the digital empires have so far been shown to hinge on the corporations' inherent substantial need for increased datafication of social life, camouflaged as producing 'social goods' (Magalhães and Couldry 2021). Yet in 2022, Facebook announced that the planned expansion of its Odense data centre was cancelled due to the changing computing demands of 'the metaverse'; it also put a halt to its data centre construction plans in Esbjerg, another Danish city. It remains an open question whether Facebook in 2023 is expanding more slowly or just differently. While these digital business methods for global expansion are starting to receive essential scholarly interest, the conditions that have created the receiving ends are less studied. Beyond being an industry that is imagined as an industry of the future, Facebook also relied on a line of efforts that the corporation refers to as 'community action'.

WELFARE AS UTILITY: COMMUNAL AND COMMUNITY INFRASTRUCTURE

After I had spent two months doing fieldwork with the utility workers responsible for the connection between district heating and the data centre, I became curious to learn more about the commune's, and thereby the infrastructure owners', perspective on Facebook's role in Odense. The manager of 'Invest in Odense' made a last remark during my interview with him:

[...] Facebook, through their community grants and their community engagement, is in principle a clean public affairs initiative: I mean to become engaged locally to get local guys like me to say that Facebook are the good guys. But they do good. They really do. They support all kinds of local initiatives that smell a bit like tech.

Facebook's 'Data Center Community Action Grants' target all the local areas in which the corporation's data factories are located. While there are only a few in Europe, the Facebook corporation stores and processes social media

data for advertising in a long list of cities in the US. Every year, local groups in these cities can apply for funding of projects that, in Facebook's terms, are considered to benefit the local community. In general, *community* is a central term for Facebook both offline and online. Whereas online Facebook claims to create and prolong communities, offline, as with their grants programme, the corporation claims to give back to the already existing local communities. This has been carried out by funding institutions in Odense, supporting initiatives such as an afterschool club for girls to learn coding and robot-building, communal primary and secondary schools, a university's astronomy project, an orphanage, an archive for local history, a gymnastics association, and an open STEM lab for children. According to a collaborator of Facebook's action grants, the Odense umbrella organisation for local volunteering communities (*frivilligcenter*), Facebook has funded local groups in Odense with approximately €740,000 from 2020 to 2023.¹ However, by positioning itself as the authority to make decisions on what is most worthy of getting funded in the community, and consequently in the commune, Facebook additionally makes and delineates the community offline as it does through the social media platform and the metaverse online.

While Odense before the arrival of Facebook was primarily a city and a commune with inhabitants, the residents' invitation into *the community* creates another social group identity for the locals that comprises being a community member. To the local politicians who initially participated in inviting Facebook to Odense and into the commune, the qualities of the community and the commune might have seemed, if not identical, then matching. But as with the social media platform, the invitation into the community is based on extraction for profit first, social needs second. Comparing the Odense communal budget of 2019 (when the data centre opened) and 2023 shows that spending on the area of children and youth, including schools, has slightly increased from approximately €400.6 million to €405.4 million. Quantitatively measuring to what extent the actions grant 'need-to-have things' or supply 'nice-to-have things' with their targeted funding in the area of children, schooling, and STEM will be difficult, if not impossible. Yet what this comparison indicates is that rather than significantly substituting communal spending, Facebook's action grants add additional funding to projects, technologies, or buildings for existing schools or groups, thereby guiding their direction of development, focus, and attitude towards Facebook as a multinational institution with local agency and communal ties. Additionally, Facebook's spending is significantly minor in comparison with communal budgets, which allows for the imagination of an economically and socially well-functioning commune without Facebook's action grants.

The qualities of the commune are highlighted in its communal infrastructure. Returning analytically to the communal infrastructure of district heating,

it's important to emphasise the practicalities of the utility work that made the use of the Facebook server air for district heating possible at all. During my visits to the new unit of the communal infrastructure, built right next to both the data centre and the central energy plant, the utility workers repeated that despite the infrastructural connection taking several years to build, the technicalities of the connection were surprisingly simple to sort out. The headache of constructing the connection and test trialling was instead the funding and making the heat pumps work properly. Facebook claims to donate excess industrial heat to the communal infrastructure and thereby the commune. Despite that claim, all the construction, funding, and processing was carried out by the utility workers and other workers that they employed to do so.

A utility worker I shared a desk with and followed to meetings on the topic of Facebook air indicated: "it would be a waste to not use this heat when it's there." The other response to the readiness of the workers and managers of the district heating to connect the data centre is the component of Danish district heating law and history that is usually referred to as heat planning. The political and cultural practice of not only regulating, building, and selling heat but particularly in planning it has ensured wide distributions of non-profitable district heating in Denmark. Communal autonomy, decision-making, and empowerment are key to why district heating accounts for two out of three heating options in Denmark (Chittum and Østergaard 2014). A difference between general understandings of community autonomy, such as on social media platforms, and communal autonomy of district heat planning is structures of responsibility. The communal infrastructure is practised and transformed through clarified responsibility by elected politicians and hired workers of the commune and of the commune-owned district heating for the benefit of all those depending on the commune. In contrast, the maintenance and transformation of the community infrastructure is deliberately decided to be a responsibility of all those who have come to participate in the community – no people more than others. The difference therefore hinges on one side on the heterogeneous, planned, differentiated responsibilities in contrast to the spontaneous, equal responsibility of the community.

During my fieldwork in Odense, the utility engineers often mentioned a certain principle of particular importance to their work and the infrastructure which they work to maintain, extend, and decarbonise. The *rest-in-itself principle* was introduced in Denmark in the 1950s to both incentivise and regulate communal utility infrastructure extensions. The principle ensured that communes should produce district heating without any profit used for other welfare areas such as education or elderly care. It was later updated in 1976 to also cover communally owned electricity infrastructures (Thomsen 2019). Paradoxically, regulation by the no-profit-or-deficit principle depends on the acceptance of a natural monopoly. After many decades in effect, several

Danish politicians in the 2010s campaigned against this ‘resting principle’ for district heating. They argued that the lack of competition limited possibilities for economic efficiency and innovation, much like other contemporary claims in the globalised wave of pushes for privatisation as a driver of economic efficiency and freedom (Olsen and Smidt 2012). The economic conceptualisation of district heating as a natural monopoly – similar to other water and energy utility-delivering infrastructures – had, by definition, included the desire to protect the infrastructure as both critical and of public interest, as well as framing its economic form in relation to other economic forms in the capitalist welfare society. District heating is highly localised. Its core infrastructure is pipes containing hot water, meaning that sometimes even short extensions of pipework make the temperature of the water so susceptible to cool-down that an extension makes no sense at all.

In other words, it is, in economic terms, a natural monopoly not because it has achieved, outcompeted, or strategised to become so, but because it is actually the only organisation that can, by its pragmatic practice of energy conservation (thermodynamics), offer the cheapest source of ensuring sufficiently heated buildings for the built architecture and people living in the landscape in which its pipework sits. It is here that district heating can be claimed to monopolise, or more fittingly, to be policy-sanctioned as a monopoly – although, obviously, only if enough prospective local citizens get connected before they purchase subsidised, individual heat pumps.

In recent years, some communes have worked towards what practitioners and scholars have referred to as ‘remunicipalisation’ (Becker, Naumann and Moss 2017), in which local social movements aim to gain or regain communal ownership over infrastructures such as those that produce and distribute energy. Such movements have been operating, for example, in the cities of Berlin and Hamburg to take charge of infrastructures for the communal good and for increasing the decarbonisation processes prioritised highly by the movements. These movements provide an interesting comparison to the communal infrastructures of heating, as in the German cases which have shown how the infrastructures have been positioned as in need of communing through constructing cooperatives and participatory public ownership models. Whereas the community is called to power in such movements, the district heating infrastructures of Denmark stand out as an example in which those living, working, studying, etc., in the commune are not to participate at all in the communal infrastructure that they depend on, simply because they do not need to for the communal infrastructure to work well, be maintained, and be extended to more inhabitants.

Participation in ownership and maintenance is the central delineator between communal and community infrastructures. With Facebook’s community infrastructure, however, those spheres of participation are restricted by

clear cuts into when people can participate. For instance, Facebook's Libra currency delineates specific conditions for who and when participants can engage in the ownership of material provisions (Tischer 2020). With the community infrastructure, participation is paradoxically a privilege that participants are expected to utilise and contribute to. In other words, community infrastructure is created through active participation, whereas communal infrastructure is established through planned and differentiated responsibility.

Eventually, communal infrastructure stands in clear contrast to corporate community infrastructures such as that of the Facebook data stream. However, it is also estranged from cooperative infrastructure, which functions differently by making infrastructure and material compounds into 'collective private property' through the foundation of moral economisation (Bruun 2018). Communal infrastructure depends on economic transactions but is not, as with cooperatives, managed as a property or agent within the space of the economy.

In the world of digitalisation, infrastructures are usually positioned to offer the sharing of materials and goods by mobilising resourceful, empowered urban locals to participate in communal practices (Santala and McGuirk 2022). Within that nexus of communal sharing, participation offers more just and rapidly transformed infrastructures for the required needs of digital, climate-changed societies and cities. Such movements are often mobilised as resistance towards the highly profitable corporate data industry. Reimagining communal infrastructure, however, does not necessarily have to take place on a foundation of how to nurture participation from the community but rather on how to organise the democratic commune in terms of differentiated responsibility by decision-making on the topics of employment and ownership. It is not markets that afford problems for developing communal infrastructures needed for just access and just transitions; it is the profit-driven mechanisms that out-compete non-profitable infrastructuring. As Callon (2022) has noted, there is an extraordinarily long way from free street market dynamics and trade relations to the levels of centralised power in digital capitalism.

CONCLUSION

Scholarship on digitalisation often starts with the puzzlement of boundaries and lack of boundaries between the infrastructures of the public and the private. The problem with continuously studying how those boundaries of said distinction are blurred is that it reinforces the imaginaries that more transparent, or at least sufficiently documented, boundaries might solve the issues relating to the societal power and influence of the corporate data industry, including their impacts on increasing greenhouse gas emissions from data production, storage, and targeted advertisement.

The argument of this chapter is not to turn to infrastructures in order to judge how privately profitable or publicly welfare-oriented they are, but to shift analytical perspective at the dawn of a research endeavour. This means nurturing interest in empirical understandings of how welfare politics also afford possibilities beyond state monopolies and corporate monopolies, such as with political interventions into making possible maintaining and making new communal infrastructures. The communal infrastructure is not politically but materially autonomous. In the context of the communal infrastructure in Odense, district heating is to supply all in need of heated rooms and water in the city with non-profitable heating, produced by utility workers employed by the utility owned by the municipality – what I have here referred to as the commune (in direct translation from Danish). What comes after welfare is, practically, infrastructures that can take shape as communal – in the example I offer here, communal infrastructure. Yet such infrastructure is helped on its way by welfare-strategic policy giving space to provisioning for basic needs with restrictions on producing no profit, therefore keeping economic surplus in the loop of the infrastructure for its repair, maintenance, and climate transition-specific projects.

Studying the effects of ownership forms and their characteristics offers empirical and situated insights into the infrastructures that drive the data industry's societal influence and their emission effects on the production and provision of welfare after digitalisation. This includes points on profitability and employment. Communal and corporate infrastructures offer another contrasting conceptualisation through which differences and interrelated consequences can be studied. To conclude, two forms of welfare are at play in the transformation of communal infrastructure in the age of digital monopolisation:

1. Welfare as service, which is enacted by the relation between the communal administration unit 'Invest in Odense'. Within this arrangement of welfare, welfare is distributed via schooling, elderly care, etc., by the commune based on income from inhabitants and companies. As digital services are increasingly monopolised, the workers in the commune try to ensure that the communal budget will benefit as much as possible from current and future revenue.
2. Welfare as utility, which is enacted by the relation between the energy utility and Facebook. Here, welfare is produced via the conditions in which inhabitants, workers, and users of the commune have a right to keep themselves and the buildings they rent, use, and own warm as cheaply as possible. Self-reliance, autonomy, and balancing out are installed mechanisms of the 'rest-in-itself principle' ensuring non-profitable infrastructure operations. The communal infrastructures producing welfare become connected to Facebook's community-constructing infrastructure

via transferring company values from the social media platform onto local donation grants.

Communal infrastructure is built upon policies binding non-profitable ownership and management with transition responsibilities delegated to workers, whereas community infrastructure is built upon the management of social lock-in as a form of continuous social re-engagement with the social needs encapsulated into the infrastructure. Both produce and enact forms of monopolisation; the main difference, however, is who gets to decide the limits and potentials for said monopolisation. Communal infrastructures are already intervened into through a variety of local organisations, such as positioning both corporate industries and small businesses as customers of the commune that enable the commune to thrive economically.

However, the welfare economic management logics of such communal practices prove to be stronger than the economic contribution that the corporate data industry eventually offers to the commune and its residents, workers, and users. With that, studying corporate infrastructures rather than private infrastructures offers a nuanced view into different local impacts between small, local businesses and the corporate industry that have also come to offer business and outreach models that seek to imitate communal engagement.

NOTE

1. <https://www.frivilligcenter-odense.dk/action-grants/>

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