Data centers and Indigenous sovereignty

Data center materialities, representation and power in Sápmi/northern Sweden

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Abstract

From "disguised and concealed" (Parks and Starosielski 2015) in nature to more recent, select attempts at "visible, accessible, environmentally friendly" (Holt and Vonderau 2015), data centers are the backbone of the digital infrastructure. Studies of data centers continuously help develop media and communications studies in understanding the role of media infrastructure, representations of imaginaries of the cloud; social, political and economic realities embedded in data, and issues of power, agency and resistance against the backdrop of increased global concerns for the environment and greening practices, built into the discourse of tech companies. This research provides an insight into data centers in Sápmi, in the Arctic and near-Arctic regions in Sweden, from the perspective of Indigenous Sámi communities. Data centers are examined here through their materialities and representations and as industrial sites of politics, power and promise through lived realities of the Sámi people in Sweden. As a result, data centers emerge not only as entities with built-in, inherent dependence on materialities and representations of land, water and air but also as *contrapuntal nodes* – assemblages perpetually at odds with their built-in power through time: their narratives –neutral connectedness and natural sustainability – at odds with their material infrastructure: detaching and uprooting from land.

Keywords: data center, Indigenous, Sámi, contrapuntal, digital infrastructure, Sápmi, Sweden

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2. Introduction and background

In a late September 2016 Facebook post, Mark Zuckerberg shared a first sneak peek from inside then-Facebook's, now Meta's first data center outside the United States, and the first data center of scale in Sweden, in Luleå (Zuckerberg 2016). The pictures – most of them in greyscale – featured futuristic images of grey, pristine and cold-looking bunkers of methodically organized fans, neatly stacked pipes and server racks in what appeared to be their natural state: machines without outside interference (Taylor 2019). Of the 16 pictures in the post, only 7 featured people: all carefully-orchestrated shots of single data center employees, inside the data center, against obscured backgrounds, in apparently posed positions, looking not directly at but beyond the camera, with accompanying quotes, ascribed to the employees in Zuckerberg's captions. The main photo of the post (Fig. 1) featured a low-angle shot of the data center's cooling fans, followed by a caption:

> "I love this shot because it looks like a sci-fi movie. These enormous fans draw in the outside air to cool the tens of thousands of servers in the data hall. In the winter, when temperatures plunge to -30 degrees the situation is reversed, and the heat from the servers warm the massive buildings" (Zuckerberg 2016)."

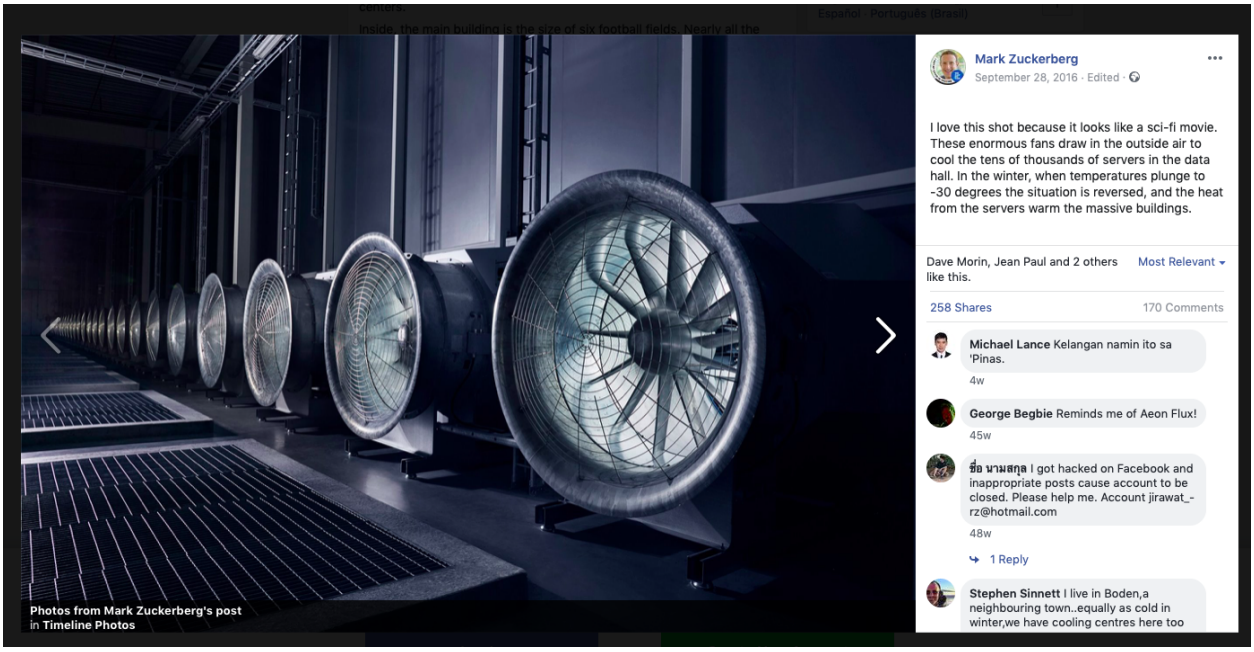

Fig. 1. Screenshot of the main photo from Zuckerberg's 2016 post of the Luleå data center.

Zuckerberg's quote and the remaining pictures also blended the futuristic machine to another predominant feature emphasized in the post: the very relationship of the data center to the surrounding environment and nature. While the inside photos show the futuristic 'pure machine' with select humans who do not directly interact with the data centers (Taylor 2019), the outside is portrayed as a kind of "nature-culture hybridity," to borrow Donna Haraway's canonical framework (Taylor 2019): two pictures feature the clean architectural lines of the top of the building blending into the dark blue, cloudy skies above, forecasting the upcoming winter in Luleå, and one of a birds-eye panoramic view of the entirety of the data center – dominant, centered, surrounded by Arctic pine trees, well-groomed green lawns, with glimpses of rivers in the background, blanketed with the same dark blue, cloudy Arctic skies. Zuckerberg's own caption for the picture reads:

> "Luleå is a small coastal town just south of the Arctic Circle, and near the top of the world. It's surrounded by dense forests and icy rivers."

Zuckerberg's carefully-curated unveiling of the data center in Luleå – 5 years after the construction of the data center had begun in 2011 and 3 years after it had become fully operational in 2013 – is pregnant with meaning and, in many ways, quintessential for how tech companies set data center narratives: either invisible or, if visible, existing in harmony with nature (Holt and Vonderau 2015). While data centers, in general, had largely existed – and to some degree continue to exist at the "peripheries of popular imagination" (Taylor 2019) based on the tech companies' "dematerialized popular visions of the Internet as a virtual and borderless space" (Hu 2015, p. 2), the medial and academic curiosity about these sites of internet infrastructures has increased over time, arguably putting more pressure on tech companies to consider new, more open representational strategies.

Elements of Zuckerberg's post provide helpful clues about imaginaries and representations of data centers. Ideas of the relationship between nature, culture and sites of data centers (Taylor 2018, 2019, Vonderau 2018, 19, Velkova 2019) and their surrounding environment, the remote location (Johnson 2019), highlighting cold air (Vonderau 2019) and the emphasis on green energy (Pasek 2019) emerge as critical characteristics of these tech representations in the post.

What is often missing in these representations – people – raises essential, critical questions about how data centers are understood by and impact the lives of local communities. What are the lived realities of people in proximity of data center sites and discourses, and how do they help to critically examine media infrastructures?

3. Statement of purpose

This research aims to explore and critically examine how the materialities of data centers – the use of land and water, cold air (Vonderau 2019) and energy (Velkova 2016) – relate to representations of data centers in Sweden from the perspectives of Indigenous Sámi communities, and how the representation - materialities continuum relates to data centers as sites of power and politics for Sámi in northern Sweden/Sápmi. While there has been some inquiry into the perspectives of communities, such as Asta Vonderau's findings from her years-long extensive research engaging a pool of local politicians, journalists and specialists involved in actualizing the data centers (Vonderau 2018, 2019), the perspectives of Indigenous communities in Sweden, remain, by and large, under-studied and under-understood both in the narratives of the data center industrial complex and, indeed, by academic inquiry. Taking advantage of and expanding on the broad range of global and local perspectives in Vonderau's years-long research into the data centers in the north of Sweden, this research aims to **further extend the insights on data centers by centering lived realities of Sámi communities in the data center discourse** – both of those who live near sites of existing and planned data centers and those who don't but participate in Sámi discourse-making in Sweden.

The inquiry of the research is conditionally divided into three areas: understanding how materialities of data centers relate to their representations through Sámi perspectives; the technologies of imagination for place-making practices informed by data centers in relation to Sápmi; and critically examining how the materialities - representation continuum informs critical issues of power, politics and promise.

4. Research questions

The research questions are designed to address and unpack the three general areas, as outlined in the statement of purpose, as follows:

1) What are the key tensions in materialities and representations of data centers, as they relate to the Indigenous Sámi struggle for self-determination?
2) How do data center materialities and representations relate to imaginaries of Sápmi?
3) How do data centers inform Indigenous agency in Sápmi?

5. Approaches, materials and methodology

5.1. Methodological Overview

The theme of the inquiry - data centers - places this research in the interdisciplinary field of infrastructure studies within critical cultural studies, pioneered by Marshall McLuhan and Harald Innis and revitalized by, among others, John Durham Peters, Lisa Parks and Nicole Starosielski. A combination of different methodologies is used in this research to understand the interaction and relationship between data centers, Indigenous communities and place-making, including interviews and textual analysis of archival material while simultaneously employing a lens of Indigenous and postcolonial methodologies.

Two specific cases were referenced and studied throughout the interviews and the research: the earlier-mentioned Meta data center in Luleå/NorthenSápmi and plans to establish a data center in Midskog, in Östersund municipality/southern Sápmi that were eventually placed on hold. While there are other data centers that could be of interest, such as the Bitcoin data center, which is a much-contested site, I chose to delineate the scope of the inquiry and focus on Facebook/Meta as it is popularly understood to pertain to communication in a narrower sense as a social media site. As a primary method for this research, I conducted semi-structured, open-ended interviews with Sámi politicians, activists, reindeer herders and community leaders about data centers in Sápmi/Sweden. To complement and further expand on the experiences of Sámi research

participants, I also studied archival materials - the steering documents and decision-making processes of a planned data center near the Östersund municipality in 2017.

The opinions and conclusions expressed in this study should not be read as exhaustive and representative of all Sámi people in Sweden. As one of the first exploratory studies of this kind, gauging the experiences of Indigenous communities of data centers in Sweden, this research maps out and outlines some perspectives of Sámi leaders and decision-makers and offers some primary insights for future academic inquiry.

5.2. Indigenous methodologies and postcolonial theory lens

As this research centers Indigenous perspectives on data centers, several methodological points are essential to address, including ethical considerations of the feasibility of managing the power dynamics about my own position as a non-Indigenous researcher and the situatedness of this research within academic inquiry.

I would be remiss not to mention the Western, Euro-centric, colonial history and nature of 'research' (Tuhiwai Smith 2012). Recognizing *research* as a colonizing practice (Tuhiwai Smith2012) and making a conscious effort not to perpetuate colonial knowledge creation based on Indigenous experiences is a fundamental ambition and a starting point in this research.

In *Decolonizing Methodologies: Research and Indigenous Peoples* (2012), Linda Tuhiwai Smith ultimately connects research with activism and states that ethical research must work toward social justice. In the *Handbook for Critical and Indigenous Methodologies,* research with the aim of Indigenous knowledge-production is ultimately connected to the question *Who benefits?* (Denzin et al. 2018). In this research, recognizing Indigenous ways of creating knowledge and centering Indigenous perspectives – while also being mindful of the pitfalls of exotification of Indigenous peoples or creations of an 'ultimate truth' via a manufactured unified Indigenous voice (Tuhiwai Smith 2012) – has been one of the central contemplations on my behalf regarding both my role as a researcher and the aim of this study as contributing to a deeper understanding of media and communications generally and data centers particularly.

While it is difficult to assess if this contribution can or will be deemed helpful as a tool for Indigenous activism, and fully acknowledging the "roles that knowledge, knowledge production, knowledge hierarchies and knowledge institutions play in decolonization and social transformation" (Denzin et al.,p. xii), **this research aspires to, at the very least, start a discussion and bring forward perspectives of some Sámi community leaders in Sweden as a way of visibilizing and raising Sámi perspectives that have largely been invisiblized in the discourse of data centers.**

In my contemplations on the central question posed by Indigenous methodologies, *Who benefits? I* have found that the answer is not clear-cut. I recognize that as a researcher I have had the power to select this research topic and set the research objectives. As a media and communications student-researcher, I hope this research contributes to the complex relationships that arise in the human interactions with "promissory infrastructures" (Anand et al. 2018, p. 25), while also raising Indigenous ways of knowing (Öhman 2015). And while this research does not primarily intend to contribute to the field of Indigenous studies, the fact that it centers Indigenous experiences in relation to data centers demands an elaboration on its situatedness in relationship to Indigenous academia.

In an attempt to address these concerns, I raised my position as a researcher, a non-Indigenous researcher as well as a racialized researcher in Sweden with interview participants as an opportunity to discuss and address possible reflections, tensions and concerns in tending to experiences of research participants. Before the interviews, I did due diligence to familiarize myself with contemporary Sámi debate and gain a deeper understanding of Sámi history and culture, where several key resources were central in deepening my knowledge before taking on the interviews: the extensive website of Sametinget (sametinget.se), *Sámi Media and Indigenous Agency in the Arctic North* (2020) by Coppéllie Cocq and Thomas A. Dubois and a selection of works of May-Britt Öhman. Throughout the course of the interviews, I took cues from research participants to improve my understanding of the context between interviews. I chose to use several direct quotes in the discussion section of this research in order to stay true to the research participants' perspectives. Finally, throughout this research I have chosen to use first-person pronouns to further highlight the role of the researcher in interpreting Indigenous perspectives.

The study uses a combination of decolonizing and postcolonial methodological lenses to address the data center discourse. A case in point is that while the idea of the *contrapuntal* (Parks 2020) – used as a theoretical framework in the research – derives from postcolonial theory, the intent of its use is not to suggest a postcolonial condition in Sápmi but rather to use the framework that the *contrapuntal* offers in deconstructing some of the issues of power and agency occurring at the sites of data centers. The framework, therefore, should be seen as an auxiliary tool to contextualize rather than a statement of post-coloniality.

Lastly, an important issue to acknowledge is the academic debate on the merits and pitfalls of postcolonial theory and Indigenous methodologies. Among others, in a 2021 article, a professor of history at Umeå University, Johnny Hjelm, criticized postcolonial theory and Indigenous methods, citing the university's Várdduo Center for Sámi Research for, among other things, conflating activism and research and representing Sámi as a 'homogenous group' with an "ethnic self-perception that has defined/defines the basis for collective action"[1] and that Sámi swedification has led to collective trauma and psychosocial effects today (2021). The article is important here because it summarizes a more extensive critique, often ascribed to postcolonial theory and Indigenous methodologies. Hjelm argues that the lens of postcolonial theory presents Sámi as 'clear-cut' 'passive victims,' which should be nuanced as it reproduces colonial structures. While I do not disagree with the critique of certain essentialist tendencies postcolonial theory can present, I side with Amar Acheraiou (2011) in acknowledging that "emancipation of postcolonial studies requires moving away from the cultural and spatial turn into a historicized, contextualized, and diachronic conceptualization of power relationships" (185). While it may be fair to be cautious of postcolonial theory contributing to further colonial imaginaries, to avoid reproducing old – and producing new – colonial imaginaries, postcolonial studies must be situated in the complex present rendered by a historical past. Cultural texts must, therefore, be seen "in the context of the means and conditions of (their) production" (Barker 2004, 39-40). In this thesis, I have approached the general frameworks of postcolonial theory and Indigenous methodologies as tools of self-reflection for a more extensive critical inquiry to contextualize inherent issues of power and agency in the data center discourse vis-à-vis Sámi in Sweden.

[1]Translated from Swedish "en etnisk självförståelse som utgjort/utgör grund för kollektivt agerande"

5.3. Interviews

This work is primarily based on 'attending to experience' (Pickering 2008) as a fundamental tool of critical and cultural studies. By "gathering and interrogating representations and expressions of "direct personal participation in or observation of events, accumulated knowledge of the world in particular sets of circumstances … the personal feelings and emotions" (Pickering 2008; p. 26), I acquired a nuanced, multi-dimensional understanding of data centers through the perspectives of some Sámi community leaders. The interpretation and analysis of these experiences through media studies theoretical framework as an "intermediary category between a way of being and way of knowing" (Pickering 2008, p. 30) is one of the central tools for this research.

To gauge the experiences of Sámi research participants, I conducted **seven semi-structured**, **open-ended interviews with seven Sámi activists**, **politicians, reindeer herders and community leaders**, currently residing both in Sápmi/northern Sweden and in southern Sweden. The participants' ages ranged from the late 20s to 60s at the time of conducting the interviews. The snowball sampling method (Morgan 2008) was used, where research participants made personal introductions to other Sámi persons who had agreed to take part in the research.

All participants live in Sweden. Most of the participants live in Sápmi/northern Sweden, with one participant residing in Stockholm at the time of the interview. Some are involved in reindeer herding - significant for exploring the materialities of data centers - while others are not. Three out of seven participants owned reindeer at the time of the interview.

The typical duration of an interview was approximately an hour, with some outliers: one interview at a little over 30 minutes and another – a quarter over an hour. Six out of 7 interviews were conducted in English, a non-native language for the interviewees, while one was in Swedish, a non-native language for myself. I translated the Swedish interview and transcribed all interviews in English using transcription software, denaturalizing and adjusting the interviews for formal errors. While the participants had an excellent command of English, and language was not a barrier during the interviews, it is worth noting that sometimes words were directly translated from Swedish, and sometimes Swedish terminology was used. I have considered this at the stage of

textual analysis and have elaborated on this in the analysis section of this thesis, when it is relevant and applicable. In some parts, I have chosen to keep the Swedish words if and when it enhances the context and include translations in footnotes.

I used NVivo (release on March 2020), a software that helps analyze qualitative research, to code and organize the interviews by frequency of keywords to deduce themes and patterns. To prepare the data for analysis in NVivo, I removed the questions I posed in the interview texts, leaving only the research participant responses, ensuring that my words were not included in word frequency searches and during textual analysis and coding. This ensured that the eventual results had only participants' own words and points of view. I kept the questions open-ended, and while I largely stayed true to the Interview Guide attached in this research, the order and the direction of the questions varied as I followed the natural flow of the discussion with themes that participants themselves brought up during their responses.

5.4. Archival materials

Although the interviews provided great insight from 7 highly-regarded Sámi community members, I decided to complement the research by acquiring public documents regarding a proposed data center in the larger Östersund municipality in Jämtland. In total, I studied five documents pertaining to the case - around 100 pages in total – including two maps of the planned developments and their proximity to *riksintresse* (Riksdagen 1998) –- regulated areas of national interest for specific industries, including reindeer husbandry and mineral production–as well as the official Environmental Impact Analysis, Plan Description and Audit Statement[2], prepared by the county administration. I used textual analysis to deduct themes, frequencies and context in which Sámi communities were mentioned in these documents. The documents themselves provide rich text for deeper examination for future inquiries into data centers and provided additional insights into the interviews.

[2]Translated from Swedish Miljöbeskrivning, Planbeskrivning and Granskningsuttålande

5.5. Limitations and assumptions

The interviews were conducted in February - March 2021. Due to the pandemic, all interviews were carried out digitally and via phone, which can pose certain limitations in interaction, such as informal exchanges or the duration of the discussions. The study could have benefitted from in-person conversations or site observation; however, data centers at large are inaccessible to researchers. On the other hand, the flexibility of the remote format likely allowed for the participation of persons who may have otherwise been unavailable for in-person interviews.

Several research participants discussed frustration with the amount of time spent on interviews not resulting in concrete actions in media and academia on Sámi issues, lack of recognition for the time and effort spent by Sámi communities in knowledge-creation and prior negative interview experiences. I was mindful of the time and my position as a non-Indigenous researcher. While my experiences certainly differ from that of Sámi research participants, my own experiences of racialization in Sweden allowed me to reflect deeply on my relationship to the research.

The interviews were open-ended to allow participants to raise relevant issues and help guide the discussion. The content and sometimes direction of interviews varied, as research participants had distinct and varying expertise.

While the number of participants in this research is lower than I had initially hoped, the situatedness of the Sámi research participants – well-placed and highly-regarded community leaders, activists, politicians and civil servants – and the quality of the discussions both exceeded my expectations. More than half of the research participants preferred to remain anonymous. Therefore, I have chosen to anonymize the remaining responses to not single out specific individuals in a susceptible and ever-changing political climate.

6. Data centers: Literature Review

6.1. Literature Overview

Data centers are the backbone of the internet infrastructure and continuously help develop media and communications studies in understanding the role of media infrastructure. Data centers shape

imaginaries of the cloud; inform social, political and economic relationships and issues of power, agency and resistance against the backdrop of increased global concerns for the environment, built into the discourse of tech companies (Caruth 2014; Hu 2015; Holt and Vonderau 2015; Parks 2011, 2020; Parks and Starosielski 2015; Vonderau 2018, 2019, 2020; Velkova 2018, 2019, 2020).

In her review of data center literature, Julia Rone begins by stating that the cloud - and by extension, its home - the data center - "has been so far defined mainly by the PR of big tech companies" (Rone 2021, p.1). As academic and popular interest in data centers has taken off, so have representation strategies of tech companies and new ways of understanding and defining data centers.

There are noticeable changes from data centers as "disguised and concealed" (Parks and Starosielski 2015) in nature to some select attempts at "visible, accessible, environmentally friendly" (Holt and Vonderau 2015), with increased popular interest in the tangible sites of data centers. A quick internet search also shows less grey and more colorful depictions in the last few years – the blue lights of servers and blue skies and green grass surrounding the data center buildings, arguably signaling a shift from a more futuristic, distant, grey machine to a more optimistic present now, blended with nature and promise of the future (Fig. 2).

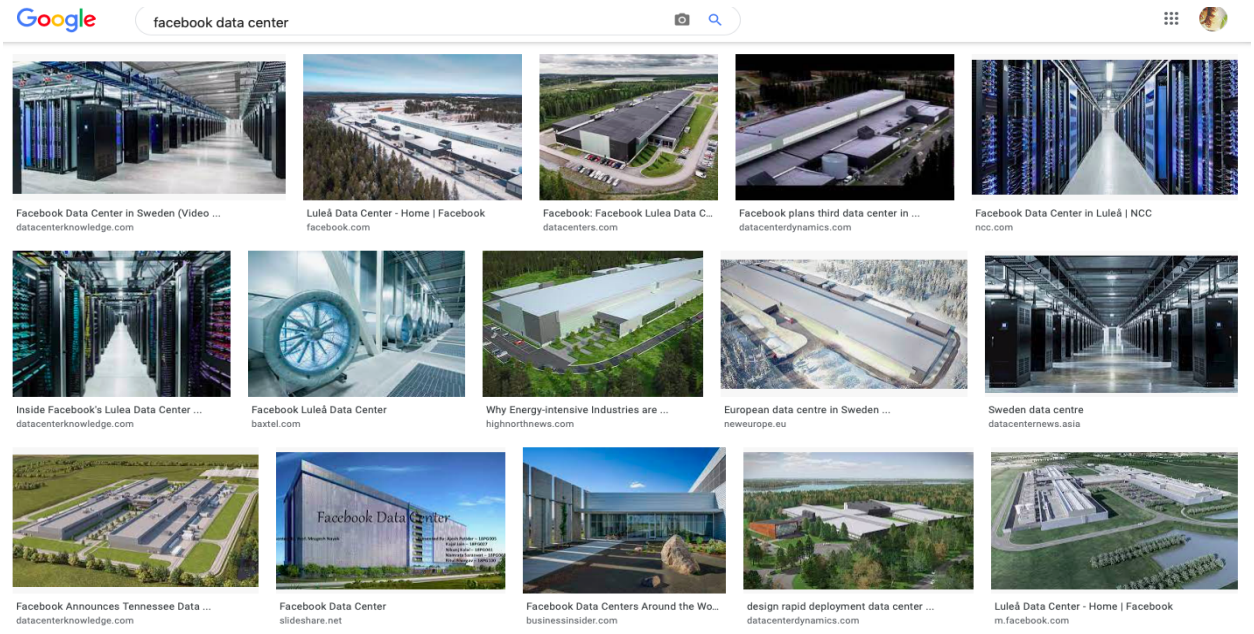

Fig. 2. Screenshot of a google search for 'Facebook data center.'

These images and shifting tech narratives can ultimately be connected to another shift in infrastructure studies – from "repressed public developmentalism to an academic environment … saturated with market-centered messages and logics" (Anand et al 2018, p. 13). Academic interest in data centers has increased over time, and data centers are beginning to occupy a niche in several academic disciplines.

In placing data centers within larger academic inquiry as tangible sites of meaning-making, I have chosen to organize the literature review in a way that foregrounds the discussion of data centers with Sámi research participants and gives insight into the contemporary debate related to the research questions of this research. This section, therefore, attempts to outline and simultaneously delimit the perimeters of the current inter-disciplinary literature on *what data (and consequently data center) is, where the home of the data center is located* and *how data centers come to be sites of meaning, embedded with politics, power and promise that inform agency.* Due to the nature of these questions, I address both the materialities of data and data centers – generally covered in *what* and *where* – and the representational practices; and how they inform power and promise– largely covered in *how*. This division is conditional in cultural studies, as the literature and the subsequent critical analysis demonstrates that data center materialities and representations are ultimately inter-related and intertwined. I rely heavily and draw on the multi-disciplinary scholarship's insights on how data center narratives and representational practices are constructed in my analysis of Sámi experiences of data centers.

While the complete reference list is cited on the reference page, I want to highlight three contemporary publications from which I have drawn deep insights on data centers: Imaginations Journal of Cross-Cultural Image Studies' 2017 *Location and Dislocation: Global Geographies of Data,* Culture Machine's 2019 special edition *The Nature of Data Centers* and the 2021 Canadian Journal of Communication's *Materials and Media of Infrastructure.* These publications have helped shape and expand how I think of data centers, and are, therefore, crucial for this research.

6.2. What is data? The ethereal non-thing

In one of the seminal works about data and the cloud, *A Prehistory of the Cloud,* Tung-Hui Hu (2015) argues that data centers reveal "the politics of digital culture" (p. 1). Hu outlines the

contradiction between the 'airy,' 'placeless cloud' and the heavy, bunker-like place where the cloud exists - the data center. This juxtaposition of the notion of placelessness and the actual site of data is a widely accepted angle at the core of studies of media infrastructure through which data centers are conceptualized.

At the very least, data has initially been constructed to be void of a connection to a physical place. The "data aura" (Mayer 2019, p. 6) is "ephemeral, ethereal," simultaneously "here and not here" (Mayer 2019, p. 2), working through people and, at the same time, far away. While "aura" may, at first glance, seem out of place in a critical academic context, it captures precisely the "omnipresence" of data, as Mayer describes, prevalent in the popular imagination and tech imaginaries. Further expanding on the "data aura," Vonderau pinpoints how tech companies rely on "global virtual visibility while downplaying the role of local infrastructural sites" (Vonderau 2019, p.708) as a key strategy to move away from "local materialities," making the cloud "an ostensible non-place obscuring agency and power inherent within it" (Bowker et al. 2010, 6 in Vonderau 2019, p. 708). These scaling practices – keeping data and the cloud global – are not coincidental but rather deliberate attempts to seem everywhere and nowhere simultaneously. While these practices are not unique to data companies and resemble what Hanna Appel (2012) describes as "zonal capitalism" about, for example, offshore oil companies' strategy of distancing themselves from specific local contexts, keeping the cloud global comes with its own set of challenges.

Historically, the strive for invisibility is characteristic of infrastructures' ways of maintaining dominance (Holt and Vonderau 2015), for instance, the elaborate underground world of cables (Staroesielski 2015) and hidden cell phone towers (Parks, 2010). However, as the "underbelly" (Hogan 2013) of the "internet's archive" becomes increasingly visible, so do the parameters of its discursive formations.

As the physicality and materiality of data gain broader traction in both popular imagination and academia, tech companies increasingly portray data centers as an inalienable part of nature. Allison Carruth (2014) scrutinized the tendency of not only digital industries but also media and media

studies to rely on ecological metaphors to describe digital cultures, for instance, *media ecology* or *media environment.* Carruth makes the following observation:

> "We have server farms and the hive mind, mountains of data and streaming content. Within this array of high-tech metaphors, the most ubiquitous of all is *the cloud*. Reporting on a recent unprecedented visit to a Google server farm (or data center), journalist Steven Levy disturbs the light and airy image of a digital cloud by taking readers into 'the throbbing heart of the Internet.' There he encounters the walls of concrete warehouses, endless racks of servers, a morass of electrical circuitry, and water-hungry cooling systems, all of which, in his terms, make "the ephemeral real." Yet even so, the pull of metaphor directs one's attention away from the materiality of information. As Levy imagines the Internet in not ecological but biological terms—with the data center as its "throbbing heart" and the "blinking blue lights" of servers as its nervous system—the real fades back into the ephemeral" (Carruth 2014, p.339).

Since Carruth's work, several scholars have raised the ecological metaphors used in describing data and data centers as contributing to *neutralizing* and *naturalizing* the environmental impact of data and the internet. In *Scaling the Cloud*, one of the articles on the Meta data center in Luleå, Vonderau (2019) calls the ecological metaphors "an additional brand asset which helps to cloud the data center's actual resource and energy needs and problematic environmental effects" (p. 704).

So, at its core, data and data centers are conceptualized as a metaphor by the tech industry – ever-changing, negotiated and interpreted – where data centers are the pages (cages) within which the metaphor is to be contained. The idea of data as a nature (and natural) metaphor comes into stark contrast with testimonies from Sámi communities, where the metaphor outflows into the everyday lived realities of Sámi communities and into the politics that shape a future for Sámi. Data and the data center are stripped of neutrality through interaction with (and exploitation of) nature, and the data center becomes a site of (environmental) politics and power.

6.3. Where is data? Data and the material site

As mentioned earlier, the academic and popular curiosity in data centers is increasingly forcing the hand of tech companies to shift to new forms of representation for the cloud: from a discourse of *nowhere and everywhere* to specific sites with new representations, where 'greenness' and "hosting culture" (Brodie 2021) of particular countries and peoples at the site is a central tenant of representation.

The inter-disciplinary literature on data centers as material sites has focused on several different dynamics. The locality of data and data centers is key to understanding the social, political and economic repercussions of media and site (Johnson and Hogan 2018). The geography and topography of data centers have been fundamental in understanding the tensions prevalent within and around media and infrastructure. From occupying industrial building areas and "factories of the past" in Chicago (Pickren 2018) to bunkers with a promise of "power, preservation and resurrection" (Fish & Garett 2019, p. 11) to transforming the cold air in the north of Sweden into an exciting commodity (Vondearau 2018, 2019) to occupying old military infrastructure (Hu 2015), data centers are "impermanent infrastructures" (Velkova 2019) that change the topography of not only a specific site, region or a country, but force consideration of a new "earth-writing" (Kaminska and Ruiz 2021, p. 144). Looking closely at sites and locations of data centers on local, regional and global levels, several - often varying - patterns emerge.

At their immediate sites, data centers often replace or are built on already-existing industrial areas or abandoned infrastructure (Hu 2015, Vonderau 2019, Pickren 2018) that emplaces a new, "clean" narrative to replace the former, "dirty" industries (Vonderau 2019). By the virtue of not being the previously old, exploitative and unsustainable industries, data centers gain meaning of the novel, green and sustainable despite necessitating the exploitation of old infrastructures and land through production (Levenda and Mahmoudi 2019, p. 4). Although there are some established practices of data centers in cities, often attaching the heat waste to the local grid, which, as Julia Velkova (2016) argues "extend the sphere of capitalist production and the digital economy by redefining waste into a desirable commodity," data centers are, as a rule, placed in rural areas; in colder climates and near rivers and lakes that provide the sources for renewable energy – a feature firmly embedded in the strategies of the tech industry on the global scale (Pasek 2019). Data centers use

electricity to run the servers, air and water to cool them down and produce heat as a result of their functioning, and by doing so "reconfigure the systems of energy and heat supply" (Velkova 2016).

As such, on the intra-regional level, data centers contribute to new configurations of "connections, displacements and inequalities" (Levenda and Mahmoudi 2019, p. 10) in rural versus urban areas and raise questions about "slow (or light) violence that data centers might exercise" (Vonderau 2019, p. 10) through "infrastructuring (local) cold air" (ibid) at the sites of data centers in favor of global aspirations.

Data drives "dense urbanization" (Levenda and Mahmoudi 2019, p. 9) while oversimplifying and "reducing" nature in rural environments down to "nature that digital capital finds useful: cheap energy, cheap water, cheap land, and green imagery" (ibid, p. 2). Holt and Vonderau P. further expand on the relationship between nature and data centers by arguing that, from a tech industry vantage point, data centers often "showcase the natural environment'' (2015, p. 76). This appears to both bind the nature and data centers together in a nature-culture hybridity and neutralize data centers as a natural part of the environment.

"There are portraits of lush wildflowers, mist rising above the Columbia River gorge, and even deer grazing outside a data center, oblivious to the hulking steel building in their midst" (Holt and Vonderau 2015, p. 76). In other cases, where the expansive skies and land surrounding the buildings are in focus, data centers have been portrayed as inconsequential - only a small part of nature.

Further expanding on the dynamic between urban and rural areas, Levenda and Mahmoudi (2019) argue that digital capitalism forces and relies on different patterns of extractivism in rural versus urban regions: urban areas are extracted of accumulation of user data as rural areas are extracted of natural resources. While the disparities between urban and rural developments may be understood as occurring naturally, Levenda and Mahmoudi argue that these "uneven development" are triggered by digital capitalism and its reliance on "cognitive dispossession" and "urbanization of infrastructure" and "urbanization of general intellect" (Levenda and Mahmoudi 2019).

Therefore, on the global scale, data center imaginaries are derived from an urban point of view on largely rural infrastructures, invisiblizing the extraction of materials – the ways in which they relate to new configurations of heat production (Velkova 2016), "dependency on local resources" (Vonderau 2018) – on the rural sites of data centers. Data centers help shape ideas of a place, a region or a country on a global scale; as for instance, the data center industry's insistence on Iceland as its ostensible home which "activates long-standing and imperial imaginaries" of Iceland (Johnson 2019, p. 1) or *naturalizing* Ireland as an apparent home for data centers by commodifying its "hosting culture" (Brodie 2021). The data center is neutralized on a global scale by **naturalizing the local site.**

These "constantly contested' geographies and narratives are fundamental for the (in)visibility politics of data and cloud processing (Parks 2014, Holt and Vonderau 2015). Staying with the trouble of the specific site of networked communication, Pasek (2019) argues, allows for new possibilities of holding tech companies accountable not on a generic, global level – which is not always effective for local communities – but to hold "each node accountable to the communities and ecologies in which they are located" (ibid, p. 10).

Consequently, looking closer into *where* data centers exist reveals not only material locations but also the employed *naturalizing* and *neutralizing* narratives used for the specific tangible materialities and sites, as well as opens up for an analysis of power relations that occur in christening data centers with these particular metaphors.

In looking at the specific nodes – local sites – of data centers in global networked communication, the *naturalized* home of the data center comes in stark contrast in Sápmi, where the Sámi struggle for recognition of land, cultural rights and sovereignty visibilizes the data centers' relationship to the creation of new (human) geographies and poses critical questions on the social, political and economic repercussions of data centers as media sites.

6.4. How data centers become techno-social assemblages of power, promise and agency

In continuing with the *naturalized* home narrative for data centers and returning to Zuckerberg's highlighting of the Arctic location and cold-air-as-an-essential-element of data center functionality

in Sweden, another element of data center homes – "stable institutions and political climate" (Rone 2021) or in other words, hosting culture (Brodie 2021) – emerges as not by chance, but rather as a crucial element for the PR strategy of embedding data centers with sustainability and democratic responsibility.

From an industry perspective, modalities of expansion – with a focus on green and renewable energy – are essential, where Sweden and Northern Europe are increasingly seen as hotspots of data centers (Barker 2020). Green, renewable energy in Sweden is one of the reasons cited for attracting tech giants (Nyteknik.se 2019). Currently, Sweden hosts data centers of Google, Apple, Meta, Microsoft, Amazon and Bitcoin.

As "infrastructural imaginaries, always in negotiation with the environment" (Hogan 2020), data centers' representational practices are central to understanding the inherent power dynamics and agency built into infrastructuring the air and re-appropriating the land in the Arctic/Sápmi context (Vonderau 2019). In her study of "fungible forms of mediation in the cloud" Anne Pasek (2019) unpacks "semiotic strategies that serve to translate local relations into generic commodities that can be bought and sold at a distance, obfuscating the question of accountability in favor of the formal logics of accounting" (p. 2) in relation to green policies of tech companies. In other words, green politics becomes central to the data center narrative.

These policies are often based on "assumptions about the permanence and profitability of data center infrastructure," resulting in government concessions to tech companies by ways of tax advantages and cheap land (Velkova 2019, p.1). However, the inherent "impermanent infrastructure" (2019) of data centers can have a "significant impact on local communities in many locations in Nordic countries, where the search for fossil fuel alternatives has, for example, led governments to connect local energy distribution systems to the supply of heat from data centers" (Velkova 2019, p. 2). The continuous infrastructuring of the air (Vonderau 2019) in the Arctic and near-Arctic region to attract data centers have placed Sápmi at the heart of the discussion. Server halls rely on inherent 'greening' in stable economies and countries as a frequent feature of establishing industry in the Arctic region (Normann 2020).

A vital contribution to a relational view of infrastructure that perhaps could have similarly warranted a separate section in this literature review - *when is data center* - is the temporality of infrastructure. In this thesis, I have chosen to include temporality as a part of the *how* as the two are largely intertwined in informing issues of power and agency, as demonstrated in the analysis section. Most notably, *The Promise of Infrastructure* explores the issue of time and infrastructure in depth. Nikhil Anand, Akhil Gupta and Hanna Appel (2018) argue that "infrastructures configure time, enable certain kinds of social time while disabling others, and make some temporalities possible while foreclosing alternatives" (p. 15). Appel describes "infrastructure time" as the construction of time, rooted in a false premise of linear progression of modernity. A case in point are the high-rise buildings in Equatorial Guinea. Appel argues that while signaling optimistic aspirations for the future, the high-rises down-prioritize the importance of the presence in favor of an "anticipatory time" (p. 49) with a possible "promise of infrastructure." Akhil Gupta (2018), in turn, describes infrastructures as ultimately in decay - bound to race against time both in terms of delays in construction and in ways that it is in a state of ruination as it begins to age from the moment of building.

Time and ruination are ultimately related to the material conditions of the infrastructure – in decay, aspirational, embedded with meaning and based on natural resources. As "forms of mediation that are shaped by their material constitution" (Kaminska and Ruiz 2021, p. 143), data centers are, therefore, inalienably shaped by and help shape time.

I view data centers in this research as relational practices and material places. Data centers promise connectivity with minimum damage to the environment, and strong traditions of transparency are the guarantors of tech practices' legitimacy. The "promise of the infrastructure," from the vantage point of the tech industry, is, therefore, not only sociality but also built-in accountability and transparency. On the other hand, as many scholars have argued, states "often build infrastructures not to meet felt needs, but because those infrastructures signify that the nation-state is advanced and modern" (Anand et al.). And from a third perspective – the vantage point of local communities who live near data centers – the materialities of data centers are most relevant, where tensions between representations of the state's aspiration for modernity and the tech aspiration for sustainability can be challenged through lived realities of local communities. Kaminska and Ruiz

(2021), among others, argue that data centers are "invariably and most often extractive, drawing from the land in the sense of taking space and making use of materials and resources" (p. 143).

Therefore, the question of how data centers come to be techno-social assemblages embedded with power combines the metaphor of what data and data centers are, where they are situated and *what they signal about the past, present and future*. The interaction of sustainability narratives – by industry and state – and the representations and materialities of land, water and air and wind at the site of data centers allows for an examination of power and agency embedded in data centers.

7. Sámi and Sweden

7.1. Overview

Before moving into how data centers relate to lived realities of Sámi in Sweden, a brief overview and introduction to Sámi history and contemporary debate are due. It is not my intent to provide a comprehensive account of Sámi history, culture and debate – which would not be feasible or within the frames of this research - but rather to provide some facts to contextualize the relevant debate about and for Sápmi and Sámi and the relations that occur at the nexus of Indigenous struggle and lived realities with state and industry.

Sámi are an Indigenous people who have lived on the territory of modern-day Northern Europe and Russia since time immemorial. The beginnings of Sápmi have been a topic of contentious debate. According to the Sámi Parliament website definition, Indigenous people "have held together through identity, cultural expression, language and tradition. Identity always goes hand in hand with a geographical area and the historical bond with the environment the people have lived in, made use for and used[3]" (Kvarfordt 2004, p.2).

[3]Translated from Swedish: hålls samman genom sin identitet, uttrycket för kulturen, språket och traditionen. Identiteten hör alltid samman med ett geografiskt område, de historiska banden med den miljö som folken levt i, använt och brukat.

The territory, home to Indigenous Sámi people – Sápmi, also called Sábme, Sábmie, Saepmi – currently extends over four nation-states: the Kola Peninsula in Russia, the northern-most part of Finland, the northern coast of Norway, and northern parts of Sweden. (Sápmi 2022). There are three main Sámi language areas: East Sámi, Central Sámi and South Sámi, and together, these areas comprise of at least 9 languages (Sápmi 2022). In Sweden, the predominant Sámi languages are Northern Sámi (nordsamiska), Lule Sámi (lulesamiska), Pite Sámi (pitesamiska), Ume Sámi (umesamiska) and South Sámi (sydsamiska).

Language has been a central issue historically and in contemporary Sámi debate and struggle, where Sámi demand concrete steps from Sweden in ensuring meaningful efforts to protect and promote Sámi language and the right to language (Språk – Sametinget 2022). Although national and European legislations aim at "guaranteeing access to learning Sámi at school, the implementation of the law and the conditions for ensuring such education have proven inadequate repeatedly" (Cocq and Dubois 2020, p. 275). I have chosen to use Northern Sámi spellings and references in this research, translated into English.

In Sweden, Sápmi extendss over four regions: Norrbotten, Västerbotten, Västernorrland and Jämtland. According to Sametinget's estimations, there are currently between 20 000 and 40 000 Sámi in Sweden. However, the correct estimates are hard to come by as the Swedish state does not collect statistics based on ethnicity (SamernaiSverige – Sametinget 2022). While the Sámi have been recognized as an Indigenous people in Sweden since 1977, the Sámi "history, culture, languages, traditions are to a large extent erased from academia, from the books of the whole school system, within museums, and the society in general" (Öhman 2015, p. 6-7). In the few cases where the Sámi are represented, it is often within the dichotomy of "*either victims or the Other"* (ibid 6-7). Several scholars have proclaimed these strategies as leading to a justification of the exploitation of lands and water with disregard to the relationship to land for Sámi Indigenous communities (Sehlin-MacNeil, 2018, Kuokkanen, 2007, Öhman, 2015). Sehlin-MacNeil (2015) argues that the Sámi bonds with nature and land that are often "not linear but stretch far back into the past as well as forward into the future" challenge Western knowledge-production perspectives and practices (Sehlin-MacNeil 2018, p.86).

The connection to land and water is central to Indigenous Sámi realities, as expressed by both the participants of this research and Indigenous studies, and is explored in later sections of this research. However, a singular focus on the connection to land, water and animals as the cornerstone of Sámi identities would be a crude oversimplification in describing the Sámi struggle for self-determination. I adopt May-Britt Öhman's (2015) understanding of Indigenous identities of experiences as similar to that of Donna Haraway's *cyborg* – an interconnected assemblage of nature and machine – where the constructed dichotomy between Sámi connection to land and Sámi relationship to technology is rejected as false and exploitative.

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Fig. 3. Map of Sápmi from samer.se

7.2. Sámi and self-determination

In a 2007 United Nations Declaration on the Rights of Indigenous People, Articles 4 and 5 explicitly outline the right to self-determination for Indigenous peoples. Article 4 states that Indigenous people "have the right to autonomy or self-government in matters relating to their internal and local affairs, as well as ways and means for financing their autonomous functions" (United Nations General Assembly 2007). Article 5 states that Indigenous peoples "have the right to maintain and strengthen their distinct political, legal, economic, social and cultural institutions,

while retaining their right to participate fully, if they so choose, in the political, economic, social and cultural life of the State" (p. 9).

The colonization of Sápmi meant a new reality for Sámi not only in terms of borders but also in terms of preservation of identity, culture and language, as citizenship in the four new nation-states "became a tool for a stronger control and eventual assimilation of the Sámi (Lantto 2010, p. 553 in Öhman 2015)." Sámi were forced into assimilation and segregation by establishing new borders and states. From signing over lands owned by Sámi to the state in the 19th century (Öhman 2015) to Swedish Church-sanctioned destruction of Sámi religious practices and state-sanctioned segregation of Sámi in the 20th century into compulsory nomadic schools (Lundmark2008), Swedish history is ripe with a history of marginalization of Sámi. Öhman (2015) describes the historical and current colonizing practices as "destruction of both lands and waters, destruction of reindeer grazing lands, and a destruction of our cultural identity through, amongst other State-led policies, the removal of children from their families into boarding schools, and intentional destruction of our Sámi cultural expression such as yoiking and our language" (p. 15).

Sámi resistance and agency took on different forms. In *Sámi Media and Indigenous Agency in the Arctic North* Coppéllie, Cocq and Thomas A. Dubois (2020) describe over a century of efforts by Sámi activists, groups and artists' resistance against exploitative practices – mining, forestry and building hydropower plants, to name a few – both in relation to issues that are relevant to Sámi rights to cultural heritage and language and meaningful Sámi representation and participation in media. Sámi have self-organized over time to protect the cultural identity and have often used technologies of communication – establishing newspapers, using cellular technology as pioneer users and establishing social networks, such as SameNet – as a central tool for the Sámi-led struggle for self-determination from the early 20th century (Cocq and Dubois 2020).

As a milestone for recognition of Sámi rights, in 1993, a Sámi Parliament was inaugurated in Sweden with "the primary task of monitoring issues concerning the Sámi culture in Sweden" (Sametinget 2022). Parliament representatives are elected by Sámi voters every fourth year. However, the Parliament also functions as a state agency. It has a dual and often conflicting role both as a popularly-elected body and an agency adjacent to the state, tasked with carrying out and

operationalizing decisions of the Swedish Parliament. Elaborated as an important "step along the way" (Sametinget2022) at the time of its passing, the creation of the Sámi Parliament not only did not guarantee the Sámi right to self-determination but, in cases of conflicting interests for Sámi and Swedish state policies and practices, further complicated the role of the Sámi Parliament.

7.3. The right to cultural heritage

In a study prepared by the Expert Mechanism on the Rights of Indigenous Peoples on the *Promotion and protection of the rights of Indigenous peoples concerning their cultural heritage* for the 2015 United Nations General Assembly meeting, the right to cultural heritage is defined as including "tangible and intangible manifestations of their ways of life, world views, achievements and creativity, and should be considered an expression of their self-determination and their spiritual and physical relationships with their lands, territories and resources" (United Nations, p.4).

To delineate the scope of the inquiry to align with exploring the main topics of the thesis, I focus on the material aspects of cultural heritage – primarily, land and water – although they are inalienably interconnected to the Sámi relationship to and understanding of nature as a central cultural and often spiritual practice (Öhman 2015, MacNeil 2018). While I understand that this may be interpreted as running the risk of exotification of Sámi culture, I want to emphasize that my intent is not to hierarchize the importance of other aspects of Sámi culture, livelihood and cultural rights but rather to align these important material tenants of Sámi livelihoods and manifestations of Sámi culture with the materialities of data centers, as they intersect.

Within this discussion, reindeer grazing areas, water and nature as a whole emerge as central themes. Reindeer husbandry is legally protected as a part of cultural heritage through the Reindeer Grazing Act, or rather a series of acts over more than a century, the first of which was introduced in 1886. Over time, the legislation has become more restrictive. While the first act de-facto guaranteed all Sámi the right to reindeer herding, fishing and hunting, currently, only those who are members in a *sameby* – Sámi administrative unit – have the right to reindeer husbandry (Riksdasgen 1971). Currently, in Sweden there are 51 *samebys*–also colloquially called Sámi villages – and around 4 600 reindeer owners (Samebyar – Sametinget 2022).

Reindeer grazing areas are also classified as *riksintresse* - areas of state interest – the same designation as for protected areas of mineral resources, cultural heritage sites and access to outdoor life[4] (Riksdagen2018). Reindeer herding is outlined as "the most important area for *riksintresse*" in the Law on Natural Resources (Riksintresse – Sametinget 2022).

Despite the formal legal protections for reindeer grazing lands, and largely due to unclarity of land ownership, reindeer grazing areas and, by extension, Indigenous livelihoods are a topic of highly-contested debate in Sweden. Sweden has not ratified ILO-169, the convention on the rights of Indigenous peoples (International Labor Organization 1989) which would guarantee the right to land to Sámi. With global warming and industry expansion, land ownership and use has become more acute and apparent, where winter pastures especially have often become a battleground between Sámi communities, private land-owners and the state. A 2011 Supreme Court verdict upheld earlier court decisions, ending a 13-year legal battle between private landowners and guaranteed the customary right to reindeer grazing and winter pastures for 3 Sámi villages, marking the first legal victory for the Sámi right to reindeer husbandry as an integral part of cultural heritage and livelihood for Sámi in Sweden (Sasvari and Beach 2011). However, disputes and contestation for land are ongoing, accelerated partly by the rapid growth of the non-fossil-fuel energy industry.

In her 2021 article examining how Sámi are affected by hydropower, Åsa Össbo begins by outlining that 34 out of 51 *samebys* are affected by "at least one hydropower plant or dam" (p. 17) and examines the effects on Sámi communities. Several findings emerge in Össbo's examination of the effects of hydropower plants and the relationship to Sámi communities, including the psychological impacts on Sámi communities as "bereavement following loss of land and the legacy of forced dislocations, the devastation of the migration routes of reindeer herding, and the loss of traditional knowledge surrounding the lost routes and routines; …fear and constant worries that

[4]Translated from Swedish: Rennäringen räknas som ett riksintresse på samma sätt som exempelvis mineralresurser, kulturmiljövård och friluftsliv.

occupy the participants, caused by the changed and changing landscape; … reconciliation and strategies for the future" (p. 20).

Ultimately, despite some legal protections, multidisciplinary critical studies scholars have concluded time and again that extractive industries – in this category I include mining, hydropower plants and most recently also, wind power parks – have adverse effects on Sámi livelihoods, lived realities and rights (see for example Koivurova 2015, Furberg 2011, Öhman, Sehlin-MacNeil). Kristina Sehlin-MacNeil (2018) defines these extractive practices as *extractive violence,* "a form of direct violence against nature, and/or people and animals, caused by extractivism, which predominantly affects peoples closely connected to land" (Sehlin-MacNeil, p. 39).

While there are some recent positive developments – most notably perhaps the Girjas decision (Högsta domstolen 2020) in January 2020 – where the High Court ruled that the Girjas*sameby* has the exclusive right to fishing and hunting – the right to land is still highly contested, as neither the Girjas decision nor the 2011 Supreme Court verdict have ruled on property rights. Continuous contested clashes have been ongoing over the right to land. Three of the most notable current conflicts include the establishment of wind power parks throughout Sápmi; constant encroachment of the forestry industry; and, most recently, a mining project in Gallók that gained national and international traction through Sámi resistance in 2013 and is relevant again in 2022 where the Swedish state announced a highly-controversial decision that mining plans would resume, against a strong public outcry not only from Sámi communities but also public at large.

8. Data centers in Sápmi: a Sámi perspective

8.1. Analytical Framework

In this section, ordinarily, a theoretical framework is offered, often comprised of one canonical media theory that would help unpack data centers through a specific media theory lens. In this research, I have chosen to rather synthesize an analytical model, comprising of several theories and approaches that set out to first unpack data center materialities and representations as they relate to Sámi realities and then examine how the materialities - representation continuum relates to issues of power and promise of data centers for Indigenous self-determination. I view data

centers as infrastructures of communication with material sites (Velkova 2019, Holt and Vonderau 2015; Parks and Starosielski 2015) with representation and meaning embedded in politics and power. I set out by analyzing the interviews and the archival materials through bridging elements from several media theories to map out and critically examine data centers from the perspective of Sámi community leaders.

As this thesis aims to both **map out and outline** central tenants of the materialities - representation continuum of data centers and **to critically examine how they relate to power, politics and promise,** the analytical framework itself is divided into two parts. In the first part, I draw on the broad field of representation and infrastructure studies of data centers in deconstructing materialities of data centers to address the *what and where of* data center narratives and representations, while in the second part *the how* of power, politics and agency of data center, a combination of infrastructure studies, political economy and postcolonial critique is used to understand Sámi experiences of data centers. After establishing these fundamental materialities and practices – in large part corresponding to the first two question of my research and in line with the *What and Where* sections – I employ Lisa Park's (2020) *contrapuntal node* as a central framework for critical analysis of data center as a node with inherent power dynamics in networked communication to unpack the politics, power and agency of data centers, corresponding to the third question of this research.

In her article on the Mercury earth station in Zanzibar, Parks employed the *contrapuntal node* to understand the politics and power embedded in the earth station through visibilizing and historicizing the colonial struggle and resistance that resulted in 'geopolitical and sociotechnical relations' brought upon by the earth station, established by the US and brokered by the British Protectorate (Parks 2020, p.43). Given Zanzibaris' resistance and lack of involvement, Parks defines the earth station as a contrapuntal node – a "site opposed by local publics" (p.43) to complicate and raise questions about the Global North narratives for some of the first real-time computing nodes in networked communication. Parks "excavates the social struggles that give life to global networking" (p.43) and calls into question the colonial imaginaries, narratives and powers that the earth station is infused with. This is in line with Hu's (2018) argument that cloud-processing, and by extension, data, while relying on "cloudlike" dispersed power, saturates digital

communication with older, historical ways of exerting and maintaining control over populations, as, fiber-optic cables emulating the same routes as 19th-century railroads and data centers often occupying military bunkers. Other scholars have established infrastructure as entangled with the colonial power, such as the US oil pipes in Equatorial Guinea (Appel 2012) and undersea fiber-optic cables in Guam (Starosielski 2015).

Parks leads that studying one specific node, rather than focusing on how the different nodes in global networked communication relate to one another, opens up questions on the nature of other nodes and how they relate to configuring power and resistance of local communities. This is in line with my contemplation for this research: what are the Indigenous experiences of data centers – both the existing Meta and the one planned in Östersund – in Sápmi on the Swedish side and what can they reveal about possible other sites specifically, and, in turn, what insights can be drawn on global networked communication generally.

While in the case of the Mercury earth station Park unpacks colonial narratives and anti-colonial resistance in Africa in the 1950s and 60s, which is not directly transferrable to the context of this thesis, I argue that the framework of the contrapuntal, while not fully transferrable to Indigenous Sámi struggle for self-determination in Sweden, is a valuable tool to unpack the power dynamics inherent in data centers in examining the relationship of industry, state and Sámi.

I draw on existing literature on infrastructure and Indigenous-led sovereignty to ensure that Indigenous experiences are not overlooked in the contrapuntal framework that has primarily described Global North/Global South dynamics. There's considerable research on infrastructures as forms of extractive capitalism, infusing Indigenous lands with new (and old) colonial imaginaries (Öhman 2015, 2020; Anand et al. 2018, McNeil 2018, 2019).

Incorporating insights from the *contrapuntal* and insights from inter-disciplinary studies of infrastructures and Indigenous self-led sovereignty, I hope to address how data centers in Sápmi fit into the academic discussion on infrastructure and how they configure new (and re-enforce old) power dynamics in relation to Indigenous Sámi communities in Sápmi.

Like Parks, I have used several methodological approaches to study the node, as outlined earlier in Approaches, Methodologies and Materials. I follow the logic of the literature review in earlier sections to address the reflections at the end of every section, as Sámi research participants describe them. Below is an overview of the different parts of the analytical model.

What **do Sámi lived realities of data center materialities tell us about data centers as neutral metaphors and natural sites?** To understand the materialities of data centers, as seen through a people-centric, Indigenous perspective, the specific and actual materialities of data centers are outlined and discussed. Therefore, the first part of the analysis and findings focuses on establishing the fundamental tensions in the material characteristics of data centers and their representations.

Where **does the** ***naturalized*** **home of the data intersect with Sámi lived realities**? In this section, I establish the ***discursive whereabouts*** of data as it relates to Sámi in Sweden before delving into the entangled strategies of **representations of power**.

After establishing and critically examining these ***materialities – representation continuum*** – the ways in which data center materialities relate to their representations and how representations then re-enforce specific ideas and ideals – this analysis ventures into putting data centers to test as nodes in networked communication through the **lens of the** ***contrapuntal node***. The framework poses questions about the power, politics and promise of data centers through strategies of industry and state and Indigenous sovereignty.

8.2. Findings, analysis and discussion

8.2.1. What are the key tensions in materialities and representations of data centers, as they relate to the Sámi struggle for self-determination? Contesting the nature metaphor of neutral materialities of data centers in Sápmi

As we zoom into the Meta data center in Luleå, the global imaginations of the "data aura" (Meyer 2019) meet the local site with their materialities. Before delving into the discussion of how these materialities relate to the Sámi lived realities and livelihoods, a brief overview is due to the existing Meta data center and the specifics of the data center that was planned in Östersund municipality in 2017 but eventually put on hold.

The Audit Statement, *Granskningsutlåtande,* from 2017, on the planned data center in rural Jämtland, near Midskog in Östersund municipality, states that the new industry area requires a large area of land – 338 hectares – of which 150 are planned for industrial purposes. The document states that the remaining space requested by the tech company is primarily designed for natural land. In the general Environmental Impact Analysis*, Miljökonsekvensbeskrivning,* that assessed the environmental consequences at the "planned site and its nearest area,[5]" the nearby Indalsälven river and Sännsjön lake are described as the water sources needed for the data center, where further examination would be necessary to establish the effects on drinking water, depending on the specifics of the planned industry.

In Luleå, the Meta data center, since breaking ground in 2011, has expanded twice, currently occupying 94000 square meters of land (Meta data centers 2022) and estimated to draw one terawatt hour of electricity, which is a substantial amount compared to the entirety of the Swedish industry at 55 terawatt hours (Eriksson 2013). In its formal introduction of the data center in Luleå, Meta describes it as running on "100 percent renewable energy" (Meta data centers 2022). The remainder of the short, official description of the data center reads:

> "Meta partners with utilities and other stakeholders to develop renewable energy resources on the same power grid as the data centers they support. The Luleå Data Center is supported by a blend of local hydropower**,** generated on the nearby Lule River, and wind from two new Nordic projects. We partner with Vattenfall to integrate the new wind energy into the Nordic grid to support our Luleå and Odense, Denmark, data centers with renewable energy" (Meta data centers 2022).

This description of the Meta data center as an environmentally-friendly, 'green' industry and emphasis on the proximity to and use of renewable sources of energy is central to and consistent with industry narratives of positioning the data center in harmony with nature, as demonstrated in the literature section. Meta, thereby, positions the data center as **a neutral industry on the local site** when the strategy of keeping data as the "ethereal non-thing" clashes with the actual materiality of the data center in Luleå. As outlined in the post, the environmental neutrality is

[5]Translated from Swedish "inom planområdet och dess närmaste omgivning"

central in the brief summary description introducing the data center. This is in line with cloud-computing industries, where environmental neutrality is not a constructed after-thought to adapt to current concerns for the climate and sustainability but rather an integral part of data center policies from the beginning to adjust to the logic of woke capitalism of the digital economy (Pasek 2019, Hurt 2022). Case in point, studying the Microsoft carbon-neutrality policy, Pasek (2019) concludes that environmental policies deliberately occur alongside data-based tech companies transitioning into cloud-based computing, establishing renewable energy as the fundamental core of data and data center narratives in contrast to other – extractive – industries.

In these policies of data centers as green industries, specific materialities – such as the amount of energy consumed – are underemphasized while, simultaneously, the environmental-friendly materials and practices of data centers are highlighted. Instead, the policies and practices create narratives of data neutrality and maintain the **"**data aura" (Meyer 2019) when a connection to a physical place is unavoidable. **Nature, therefore, becomes the very means necessary in upkeeping data as the neutral "ethereal non-thing" (Meyer 2019), and by extension, becomes a metaphor and materiality.**

In my interviews with Sámi research participants, data centers were understood and experienced primarily through their specific materialities as they relate to Sámi livelihoods and customary rights, mainly relating to reindeer grazing areas, but also to the larger plight in the relationship of land and Sámi self-determination. From these perspectives, all Sámi research participants raised critical questions about materials needed and extracted to support the existence and functioning of data centers. To contextualize and visualize the discussion with Sámi research participants, I share the following word cloud of the 50 most used words by the research participants during the interviews (Fig. 3).

As evident from the word cloud, tangible manifestations of data centers – **land, landscape, wind, water** – occupied some of the central themes of discussions. These became crucial topics for exploration. There was a significant concern and criticism among the research participants about how these materialities currently relate to and can potentially inform developments in Sápmi. Drawing on previous experiences of the contested Sámi rights to land and water – and the impact

that earlier struggles for land and water have had on Indigenous rights in Sweden – the research participants raised critical questions in relation to the establishment of data centers. How will data centers impact *land and landscape* in Sápmi? Are there already *power* lines leading up to the data center that interfere with *reindeer* grazing areas? How will this affect the *water* in Sápmi? How will data centers impact *reindeer grazing* areas? Is there/will there be a need to dig new roads to sites of data centers, and will this, in turn, cause damage to *reindeer husbandry*?

These questions helped further categorize data center materials, as they pertain to Sámi lived realities. Based on the discussions, it became apparent that the materials of data centers themselves vary and can be viewed as distinctly different in the specific role they play in both discursive and material manifestations of data centers. There are the materials at the immediate sites – buildings – of data centers that are perhaps more apparent to the invisible eyes, and the materials necessary beyond the actual locations that keep the data centers functional.

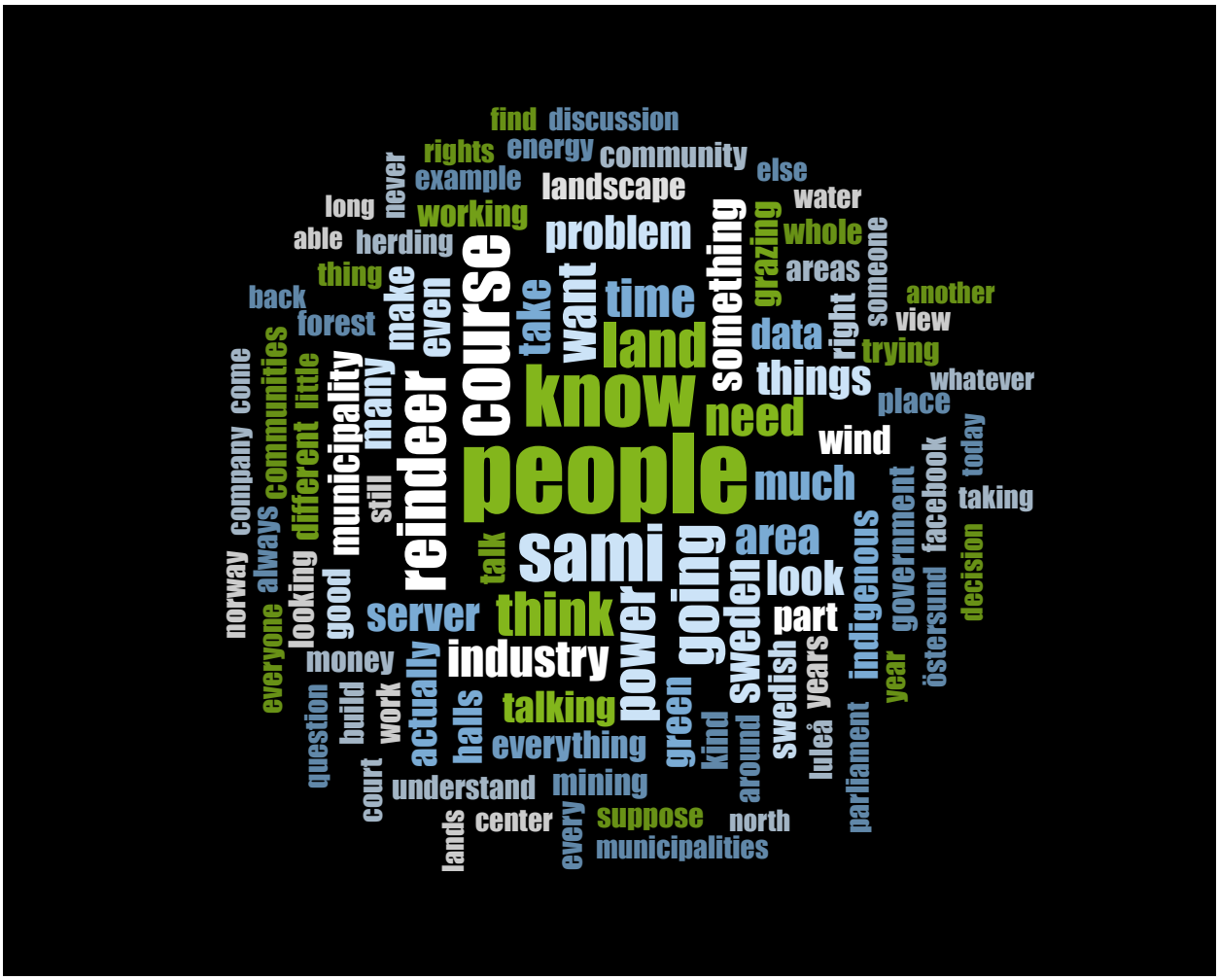

Fig. 3. Top 100 most used words during the interviews with Sámi research participants

I have categorized these materialities as ***site materialities*** and ***supporting infrastructure*** to understand the specific and distinct roles they play in the narratives around and representations of data centers. I define *site materialities* as the natural matter needed at the particular locations of data centers – land that data center budlings occupy and energy consumed and produced at the immediate site of the data center. I define *supporting infrastructure* – water and wind that generate electricity off-site and land around the data centers that are needed for continuous logistics, such as the transfer of electricity and other materials to data centers. **Categorizing the materialities in this way helps establish the relevance of the specific materialities** for data center functionality as well as how they relate to Sámi lived realities. I argue that while ***site materialities*** are often the place of primary tensions, the ***supporting infrastructures*** of data centers, although a fundamental

part of the data center functionality, are more likely to be overlooked as directly connected to and sometimes necessitated by data centers (Pasek 2019).

Nature

Before delving into a discussion on ***site materialities*** and ***supporting infrastructures***, a closer examination of *natural matter – or nature* – included in **site materialities and supporting infrastructure of data centers** is needed**.** To explore data centers as a nature metaphor – and by extension, the notion that data centers are a neutral industry – it is crucial to establish some parameters on how ***nature*** itself is understood in this thesis. In the popular imagination, nature is understood as "all the plants, animals, and things that exist in the universe that are not made by people" (Nature 2022). In the description of the Meta data center, *nature* is employed as a resource to signal the data center's neutral or, at the very least, friendly relationship to the environment, as Meta describes hydropower and wind power as renewable energy (Meta 2022).

Discussions on nature-as-resource emerged as one of the central and contended topics in relation to industries in general and data centers in particular. Sámi research participants emphasized the spiritual importance of nature and the relationship to nature for Sámi identities, culture and tradition and strongly challenged the idea of nature-as-a-resource. All research participants raised the significance of land and nature to Sámi as a central tenant of Sámi way of life, paramount not only to the survival of Indigenous culture and tradition but also, most recently, of the planet in light of global warming. The relationship between nature and Sámi is at the very core of the Sámi way of knowing and at the heart of the Sámi struggle for self-determination, as articulated both by research participants during the interviews and, indeed, in Indigenous-led academia. Knowledge of land is "inherent in Sámi culture and "Indigenous ways of being and knowing" (Öhman2015, 2020).

Research Participant E said the following about the holistic Sámi view of the relationship between human and nature:

> "We as a Sámi people, we recognize ourselves as being a part of nature… People have to recognize nature as a living being and recognize their part within that landscape. The

> European Landscape Convention is really good at that matter, because they really talk about (that) for modern humans to really see the whole landscape, you have to have close dialogues between politicians, organizations, myndigheterna, länsstyrelse, and even individuals, so that everyone sees their part within this landscape and takes responsibility for their part as well" (Interview RPE 2021).

All participants stated that over the course of history, Sámi communities have had to struggle to maintain Indigenous sovereignty and a way of life as the "nature-as-a-resource" argument has been continuously employed to contest and limit Sámi rights to land in favor of industrial exploitation. Research Participant A(RPA) :

> "We are our lands, and we are connected to nature. You cannot talk about people and landscape as resources when it's going to be an industry. Talking about people and nature as resources, when you talk about the industry, is just saying that this is disposable for us to make money. … We are our lands; we are connected to nature. So, when they say they have land resources, which means disposable resources, they are also talking about us as disposable" (Interview RPA 2021).

The nature-as-resource rhetoric has often played a crucial role in exerting colonial and imperial imaginaries over Indigenous lands around the world. Critical studies have established that capitalist realities have isolated lands as resources often alienating and further disenfranchising Indigenous communities. Infrastructures and industry "have mediated the dispossession of Indigenous lands, the sundering of relations redefined as 'resources,' and erasure of Indigenous legal orders and jurisdiction, as well as resistance to these injustices," as Barney (2021, p. 226) acutely summarizes, drawing on the works of Deborah Cowen and Shiri Pasternak.

Most research participants indicated, to one degree or another, that industrial development is often prioritized over the need for the protection of Indigenous lands and safeguarding Indigenous ties to nature and land. Indeed, multi-disciplinary scholarship has established the (disastrous) effects that industries have had on Sámi livelihoods and sovereignty through appropriating Indigenous

lands to mining (Koivurova 2015) as well as the impact the climate change has on Sámi lands and reindeer husbandry (Furberg 2011).

Kristina Sehlin MacNeil(2018) describes the accumulation of appropriating and diminishing Sámi lands to mining as *extractive violence*. Opposing appropriation of nature and land, is therefore, hardly ever about opposing only industry itself but primarily how it "threatens languages and cultures, social systems and livelihoods" (Sehlin-MacNeil 2018, p.98). To meaningfully address and combat *extractive violence* Indigenous voices must be meaningfully included and taken into account and the Indigenous knowledge given its due weight, which means employing a holistic view on industrial and infrastructural impact on Indigenous lands, Sehlin MacNeil (2018) argues.

While *extractive violence* was coined and used primarily in relation to mining industries, the term also describes the worries Sámi research participants expressed for preservation of cultural rights – specifically the right to reindeer grazing – in relation to data center materialities. Data centers follow the logic of extractivist exploitation in their use of nature, land, proximity to and exploitation of lakes and rivers as hydroelectricity and the use of cold air as a disposable natural resource.

This holistic view of extractive practices in relation to nature and land is crucial for how *nature* is discussed in this research, as we continue discussing **site materialities and supporting infrastructure** of data centers. Nature and land should be understood not only as matter but also as a central manifestation of the Sámi right to self-determination.

In the following section, I focus on three aspects of nature: land, water and wind. I have chosen to emphasize land when discussing **site materialities**, and wind and water when discussing **supporting infrastructure**, to follow the logic of the discussions and insights from Sámi research participants. Although I approach these materialities one by one, to zero in on the distinctions and similarities, the subsequent discussions show that, by and large, all three components are relevant for both site materialities and supporting infrastructure and are ultimately viewed holistically by Sámi research participants, where discussions on **land** take a center stage due to the underlying issue of land rights.

Site materialities: Land on-site

"Land/lands" was the 7th most commonly occurring word in interviews, sometimes used interchangeably[6] with "landscape." Three of the research participants themselves had first-hand experience with the sites of data centers either through an active role in the planning process or due to the data center's vicinity to and interaction with their reindeer grazing area.

As mentioned in an earlier section, although reindeer grazing areas have been established as *riksintresse,* land rights and use has been under constant contestation and a fundamental pillar for Sámi in the struggle for self-determination. The Sámi right to land and water has been an unresolved issue, for which Sweden continuously receives international criticism, such as for instance, not ratifying ILO-169 on the rights of Indigenous people that would guarantee Sámi the right to lands in Sápmi on the Swedish side. Therefore, while reindeer husbandry is legally protected as a cultural right, the land itself needed for reindeer herding may be used for other purposes so long as it doesn't cause "considerable disadvantage for reindeer husbandry" (Sametinget.se). In other words, state or private land owners are allowed to use the lands of *samebys* if this does not result in a "considerable disadvantage" for reindeer herding (Riksdagen 2022). Tensions and conflicts occur as the openness of the formulation often causes disputes between Sámi, state and industry, as research participants articulated.

In relation to data centers, concerns and grief for the (on-going and potential) loss of Indigenous land and energy production were the two most common discussions that came up. For those who had first-hand experiences with data centers, land at the immediate sites of data centers– **site materialities –** was the first association.

For Research Participant B (RPB), the Meta data center in Luleå formally constitutes the outer edge of the winter grazing area for their *sameby,* and the gradual expansion of the data center poses a risk for reindeer grazing. However, the legal designation of the Meta data center location in Luleå

[6]This is my interpretation, as all but one interview was carried out in English, which is not a first language for the interviewees.

as an *urban planning area*[7] means that there is no formal requirement for the state to consult with Sámi communities, as the area is not designated as *riksintresse*. This poses a number of challenges for reindeer herding. RPB continues:

> "They are on my land. Luleå is my grazing area. I'm sitting on the border of the sameby. It (data center) is not even spoken with the Sámi community. It is the same old as saying that they will produce environmentally-friendly iron ore in Boden, but they still do not speak with us about it. They are always going out in the newspaper first and promise like 1000 new jobs. It is the same with Facebook. They promise, you know, 1000 new jobs, they predict it. They get this out first, and then maybe they hear with us or don't hear with us. But then we have a much worse position to discuss this problem because everything is taking land from our land. And if they promise 1000 more than we say no, then we get all the population against us that live up here" (Interview RPB 2021).

Other research participants with an immediate relationship to the planned data center in Midskog, a rural area, shared slightly different but similar concerns on considerations for reindeer grazing areas. One research participant (RPC) considered the data centers as green industry and a better alternative to possible other industries, such as mining, so long a proper process was in place to ensure that data centers did not interfere with reindeer grazing areas, while the other research (RPD) considered the vastness of required land and the hinted aspirations of expansion by the municipality as detrimental for the future of Sámi reindeer herding in the area. Both research participants mentioned that the size of required land was one of the first things they noticed when presented with the request from the tech company, looking to establish a data center in Jämtland.

The proposed area for the data center by the business administration in Östersund municipality overlapped with an area of *riksintresse* for reindeer husbandry*,* where the municipality is obligated to consult samebys to ensure that establishing industries will not cause "considerable disadvantage" to reindeer husbandry. The territory was in the heart of a shared area between three samebys - Jovnevaerie, Jijnjevaerie, Ohredahkeand in a gathering area for the Raedtievaerie

[7]Translated from Swedish: stadsplaneringsområde

sameby. One of the samebys, Jovnevarie, expressed opposition to the zoning suggestion, as they used the area as winter pastures.

In the Audit Statement, *Granskningsutlåtande* (2017), the Östersund municipality contested the opposition to establishing a data center in Midskog from Sametinget, stating, among other things, that Sametinget's maps were from 1990s and therefore, outdated. The Audit Statement (2017) recognized the "great importance" of the information provided by Jovnevarie sameby as "those who have the best knowledge of reindeer husbandry needs are individual reindeer herders and Sámi villages" (p. 2), however went on to contest if reindeer husbandry was "obstructed enough" (p.2) by establishing a new business, citing the regulation for *riksintresse* for reindeer herding, 3 Section 5 of the Environmental Code[8] (Riksdagen 1998). Both research participants, closely familiar with the case, testified that although there was a formal consultation process, there were significant shortcomings in municipality administration's consultation with Sámi as not all opinions were heard and meaningfully taken into consideration when it came to the specific site for the possible data center.

What became apparent during these discussions, is that for the research participants with first-hand experiences with data centers, the initial concern is, first and foremost, how **site materialities** of data centers relate to reindeer grazing areas in the vicinity.

For other research participants without first-hand encounters with data centers, the deep distress about loss of Indigenous lands is connected not (only) to the specific sites of data centers – and, in some cases not data centers at all – but rather as accumulated effects of all industries and experience of contested geographies with the Swedish state in general. Research participants raised concerns about how data centers fit into a larger ecosystem of extractive industries, and in turn, how the use of land and nature impacts the legally-protected Sámi cultural right to reindeer herding. Research Participant F said:

[8] Translated from Swedish3 kapitel 5 § Miljöbalken

> "You have the forest industry, you have mining and, and so this has been an ongoing growing conflict for many years, and even if the legal situation and understanding is much better now, compared to, if you go back 50 years, the total accumulated pressure is very high."

Site materialities of data centers**,** therefore, transcend their physical site and gain meaning as representations of further appropriation of Indigenous lands and a threat to Sámi culture and livelihoods in favor of industrial exploitation. RPE observes:

> "A major problem is that when you're talking about server halls[9], you're sort of only looking at that building. And that building is, of course, only one small part of the vastness of the landscape. And you have to, of course, within this calculus, look at what this will do to the landscape in the long term … Swedish planning is sort of looking at a really small part" (Interview RPE 2021).

Data centers, therefore, come into Sápmi as already a part of an existing, accumulated concern for survival for Sámi communities. Although the impact of land on the site of data centers on reindeer grazing appears to be the first instance of concern for some Sámi research participants, the context and fear of extractive violence and colonial expansion extends beyond the immediate sites into shrinking Sámi agency within a larger landscape of unclear legal frameworks and sociopolitical environment.

Supporting infrastructure: Wind (power) and water (power)

As discussed earlier, the proximity to and use of renewable energies was central in Meta's description of its data center in northern Sweden/Sápmi. As the discussion matured, all research participants raised energy production – specifically the production of green energy – as a central tension of contested practices relevant to Sámi livelihoods and central to Sámi agency. As Sweden strives for the production of alternatives to the fossil fuel industry in general and the establishment

[9]During the interviews 'data centers' and 'sever halls' were used interchangeably as the latter is a direct translation from the Swedish 'severhallar,' as referred to data centers.

of more wind power plants in particular in northern Sweden/Sápmi, so does the necessity to protect reindeer grazing areas in Sápmi become more prevalent for Sámi communities.

While two research participants viewed data centers themselves as less invasive at their immediate sites in their impact on nature and a preferred alternative to mining, so long it takes into consideration reindeer husbandry, most considered all forms of detachment from land in Indigenous areas as a threatening practice in and of themselves. In considering the planned data center in Midskog, RPC raised energy production. RPC said:

> "We have a lot of hydropower in the area that is considered as green electricity, and many of these data centers want green energy, sustainable energy. There was a place that was found; it was big enough for the data center; it was close to the power source, so we didn't have to build large *ledningar.*[10]"

Wind power plants, as one of the most recent developments, were at the top of the concerns for Sámi advocacy, as articulated by research participants. Participants raised concern and stark criticism not only about the production of energy, but also the transportation and the conditions they create and the impact they have on reindeer herding communities specifically and the contestation of lands in Sápmi generally. 4 out of 7 research participants named 'green colonialism' as high on the priority list for the preservation of Sámi lands and cultural rights in Sweden. Research Participant F said:

> "I have quite many years ago said that this is kind of a green colonialism. It is the same name of the game. But the problem is not actually the production of energy itself but it's the framework, you know, the legislation: not recognizing Sami land rights; not recognizing hunting and fishing rights, and that has been the story since the industrialization of the world, 100-150 years ago; and, actually, it's the same game. And even in Sweden, if it's quite civilized, we have, you know, formerly, we have rights, and

[10]Power lines

> they are protected, but in the end, it is difficult to have that implemented" (Interview RPF 2021).

Three other research participants raised that Sweden's aspirations for green energy are in stark tension with the unresolved issue of land rights in the contemporary debate. RPG said:

> "Det känns som att desto mer el måste Sverige producera och då vet vi ju att de vill placera vindkraftsparkerna i renskötselområden. Det motiveras med att det 'är lättare, det bor inte så mycket folk här som protesterar mot vindkraften" (Interview RPG 2021).[11]

However, while discussions often circulated around wind power plants and hydropower plants as central in Sámi advocacy, participants did not always directly connect the industries to data centers. While all research participants articulated that the accumulation of wind power plants and hydropower plants posed a risk to Sámi livelihoods, due to the lands and areas that these plants occupy in relation to reindeer grazing areas, only 4 out of 7 participants directly connected wind power plants to data centers. RPB saw these supporting infrastructures to data centers at large.

> "The worst is that they (data centers) take a lot of power. And they want green power, so they want water power or wind power. And wind power is taking our lands and it's destroying everything for us. The water power is killing a lot of reindeers every year on the ices because the ice is so bad when they are using the water power" (Interview RPB 2021).

While all research participants brought up hydropower plants, the focus was largely on wind power parks, which can be attributed to the recent state aspirations for building new and more power plants in northern Sweden/Sápmi. Research participants often led the discussion into wind power plants where opinions varied on the root of the issue. Some participants saw the very practice of encroaching on Indigenous lands as colonial, detaching and uprooting. Other participants sited that the root of the issue was the lack of rights and legislation based on the Sámi self-determination.

[11] Translated from Swedish: "It feels like the more electricity Sweden has to produce … and then we know that they want to place the wind farms in reindeer husbandry areas. It is justified by the fact that it's easier, there aren't that many people living here who will protest against wind power."

Some of the latter research participants also focused on the lack of a mandatory, legal consultation process with Sámi as the fundamental root of the issue.

Regardless, the production of renewable energy – most relevantly wind power – is at the center of the Sámi struggle for self-determination. Research participants brought up wind power plants, electrical power lines as pertaining to a larger extractivist struggle, but the majority of research participants did not immediately trace these materialities directly to data centers or elaborate on the role of the data centers in these materialities. In my discussions about data centers specifically, it appeared that although data centers consume at least 3 percent of the world's energy production as of 2017 (Vonderau 2017) – and the number has likely increased since the continuous expansion of the data center industrial complex – they do not stand out in their own right as a renewable-energy-related industry for Sámi. They have managed, at least to some degree, to maintain the distance to their **supporting infrastructure.**

Data centers, at least at this point, are primarily experienced and contested through their specific **site materialities**, while the **supporting infrastructure** – the production of green energy for data centers through wind power and hydropower – has maintained some degree of anonymity in relation to data centers, despite the fact that **supporting materialities** of data centers are of the highest concern for the Sámi.

Communication and materialities

Lastly, in an attempt to address data centers as media infrastructures through a narrower lens of communication, I asked Sámi research participants whether they saw data centers differently in relation to their materialities, as cloud-computing facilitates communication on the Facebook platform. As early adopters of communication technologies – from printed press with the first Sámi newspaper in 1906 to helping develop some of the first cellular technology by testing prototypes in remote reindeer grazing areas to establishing SameNet, a pioneer social network in 1990s for Sámi people (Cocq and Dubois 2020), Sámi have been on the forefront of technological communication. While recognizing the importance that technology plays in contemporary Sámi realities – including the importance of GPS tracking that is widely used by Sámi reindeer herders to keep track of reindeers in remote, difficult-to-access areas – research participants did not

consider data centers as different from other extractivist practices and industries. There was a clear, articulated distinction between data centers as an industrial form and communication technologies that facilitate sociality. RPD said:

> "I didn't think about it any differently than any other exploiter: wind turbines, or mines, the forest industry or whatever. This industry, whether or not it was communication, it was still wanting to be land-grabbing. I don't think that the Sámi community think of is as any different than any other exploiter" (Interview RPD 2021).

Other research participants voiced similar sentiments in relation to the product of the industry. While some research participants were radically against capitalist expansion, others stated that it is not the necessity or the usefulness of the industry that is contested but rather the extractive violence against and unclear legal protections for Sámi livelihoods.

Consequently, data centers themselves were seen neither as infrastructures, nor technologies, but rather as material, industrial sites. The product of that industry is, therefore, detached from itself and, by extension, abstract. The data center becomes greater than the sum of its parts: neither technology, nor infrastructure; neither visible, nor invisible.

In discussing the question of ***what the key tensions, embedded in materialities of data centers from Sámi perspectives*** are, I conclude that data centers are largely seen by Sámi research participants as another industry in an accumulation of extractive industries in Sápmi in direct conflict with nature, as understood by the Sámi plight for self-determination. **Site materialities** of data centers are the primary sites of conflict, tension and resistance, whereas **supporting infrastructures,** while central to the struggle for self-determination, appear, to some degree, disconnected from the discourse of data centers themselves. The data center ***infrastructuring of nature*** to keep data ubiquitous – to borrow and expand on Asta Vonderau's definition – places yet another renewed claim on land and water in Sápmi, and data centers, by and large, become another manifestation for detachment and uprooting from Indigenous lands. The natural metaphor to neutralize data center materialities, is therefore, in dialectical tension with the deeply spiritual Indigenous experience of nature.

8.2.2. How do data center materialities relate to the imaginaries of Sápmi? Deconstructing the neutralized/naturized home

Everywhere and nowhere in Sápmi

As discussed in the literature review, not only do the site materialities and infrastructures of support help understand the tensions in relation to tangible materialities of data centers and deconstruct the *neutral/natural* narrative, but they also help provide insights into the **representational whereabouts** of data as it relates to Sámi on the Swedish side.

In order to establish the perimeters of the discussion, the interviews with research participants always began with gauging the knowledge of data centers and placing data centers within the Sámi discourse. When asked about the presence of data centers in Sámi realities and struggle, all 7 research participants stated that data centers have been present in larger societal debate in recent years but had not been central in discussions for the Sámi struggle for self-determination and had largely remained at the peripheries of extractivist concern, as briefly mentioned in the earlier section addressing the place of data centers in the increased concern for wind power plants.

The two research participants, who, through different roles, had been closely familiar with the initial plans to build data centers in Midskog, indicated that they had first meaningfully come across data centers because of that specific case, and their knowledge about data centers was shaped by their experiences in association with the 2017 case to build a data center near Östersund. One research participant also had first-hand experience of the Meta data center in Luleå as the data center interfered with the reindeer grazing area of their *sameby*.

Another research participant - a politician and a thought leader with several decades of national and international expertise of Indigenous advocacy - noted that data centers were briefly discussed in the Sámi Council, a non-governmental organization comprised of Sámi organizations and members across Sápmi in Sweden, Finland, Norway and Russia, although the focus had largely been on data centers in Norway rather than Sweden. Sámi civil servants indicated that data centers had not been a large part of their work, and the familiarity with the specifics of data centers varied but remained surface-level and largely derived from national news. One research participant – a

high-profile Sámi activist – stated that the Meta data center in Luleå was what called their attention to the data center industrial complex.

When asked specifically if data centers are relevant or prioritized in the Sámi struggle for self-determination, RPA said:

> "It's not that one thing is more important than the other. You can never compare struggles by what is more important because then you're still in the thought process of putting people and things into hierarchies. But it is often about what is most critical right now. Who is hungry right now? Who is dying right now? What forest are they cutting down right now? So, it's not about what is most important, but rather where is the violence the most extreme right now" (Interview RPA 2021).

RPB stated that data centers as such had, so far, been "low on the agenda" at Sametinget and the larger political discourse and added:

> "We have the one in Luleå, but it was quite close to the main city, and, of course, they were building new power lines and such, but this area is so difficult to use (for reindeer herding) as the whole area is urbanized" (Interview RPF 2021).

The relatively low profile and invisibility of data centers can be partially attributed to the relative new nature of data centers and, arguably, lower number of data centers in Sápmi, as compared to other, more established industries, such as mining and forestry that have occupied the Indigenous struggle for self-determination and land rights.

While future academia should further examine the nuances of data center visibility to Indigenous and other local peoples as they become more established in Sápmi, the findings on the (lack of) meaningful visibility of data centers as a digital and communications industry are in line with the larger themes of the visibility dilemma of data centers. Several media scholars have pointed out that data centers deliberately operate under and thrive at the crossroads of "invisibility and hypervisibility" (Rone 2021): the ever-present "mystical aura" of Google coming to Groningen

while simultaneously remaining "invisible to the spectator" (Benjamin 2015, 224 in Mayer 2019, 4); Facebook's (now Meta) strategy of "global virtual visibility" (Vonderau 2018, 708) and "local infrastructural site" invisibility in Luleå from the global perspective.

Similar to RPA, one explanation offered by some other research participants was the lack of resources to respond to all extractivist violence. Research participants stated that due to an accumulation of extractive concerns, they had to make hard prioritizations on where to focus energy and resources.

Nevertheless, data centers emerge, by and large, as having retained some level of invisibility in the current Sámi debate and discourse. Although tech companies with data processing moving to areas with renewable energy tends to accelerate and scale up the production of energy at the specific site (Pasek 2019), the relative discursive distance of data centers to their *supporting infrastructures*, as established in the earlier section, has allowed data centers to maintain a certain level of invisibility in Sápmi and Sámi discourses.

The neutralized/naturized home - Sápmi

Having 'grounded' the cloud in Sápmi, another question arises as to how the choice of data center location relates to making the imaginaries of Sápmi/northern Sweden from a global perspective. What does examining the material presence of data center in the particular location of Sápmi tell us about the imaginaries of Sápmi and the north of Sweden?

In her long-standing research into data centers in the north of Sweden, Asta Vonderau (2017) has already conceptualized ***infrastructuring cold air*** in the north of Sweden as an integral part of data center strategies and stories. Several research participants recognized commodifying cold air in Sápmi as a common practice. One research participant mentioned that the Swedish expression *luften är fri* (the air is free) is highly contested under global capitalism. Another research participant, RPC, said:

> "If you look at it globally, if you have to place a data center somewhere where it can use as little energy as possible it should be quite a cold place. So, our climate is nice for a sever hall" (Interview RPC 2021).

It appears through these reflections that *infrastructuring of the air* is a familiar practice to the research participants. Vondearu establishes that *infrastructuring* is "not a linear process," but rather a set of cultural and political stories that are "facilitated by means of imagination" (ibid 2017), while the material sites of data centers have social and environmental effects. Therefore, technologies of imagination are employed in making a place the natural home of the data center.

So, what are the specific practices that contribute to naturalizing the infrastructuring the cold air in northern Sweden/Sápmi and making northern Sweden/Sápmi the natural home for data centers?

Alix Johnson (2019), building on Vonderau's insights, charted how data centers' narratives of Iceland as a "natural fit" were based not only on Iceland's climate and energy but also stories of Iceland's "wildness," therefore participating in producing and reproducing imperial imaginaries of Iceland.

The imaginations of the vastness of unused lands in the north of Sweden/Sápmi was a narrative that research participants recognized as a historical and contemporary explanation for establishing extractive industries. Perhaps most notably, at an international conference in Stockholm in 2011, the chairperson of Beowulf mining Clive Sinclair-Poulton announced its plans to start drilling in Gallók/Kallak. When asked what the local people think of the project, Sinclair-Poulton then showed a picture of empty, deforested lands, and asked, "What local people?" While this kind of de-peopled sentiments had been used before and garnered Sámi resistance, this particular case galvanized not only Sámi but also international backlash. The following year, the annual market in Jokkmok featured a wall of portraits of Sámi people, titled *Us Local People,* and a website was created with the same name. In 2012, then-prime minister Fredrik Reinfeldt announced that the mining industry was for Sweden what oil was for Norway (Sveriges Radio 2012) and that the Swedish government would strive to increase its efforts to create favorable conditions for mining. Research Participant A, an activist who was involved with the *Us Local People* movement said:

> "(With *Us, local people*) we said that we, we are the local people. They do this again with mining, with military and they honestly don't give a f*ck about us. So no, I don't know too much about that in particular (server halls), but I do know that no matter the business, they're going to place it on our lands, claiming that it's for the greater good and that people need jobs, which creates a lot of racism (toward Sámi), because people don't know that much about us. Because the Swedish government doesn't want people to know about us, obviously, otherwise, they would have taught their actual history in school, making it look like Sámis want to have special rights when it's the exact opposite."

The Sámi resistance temporarily placed a hold on the plans of the mining company, highlighting the people and the lived experiences of Indigenous Sámi communities. Studying the documents from the planned data center in Midskog – an area of *riksintresse for reindeer herding* – showed that the references to *sameby*s were in large part in the context of the municipality's legal obligation of consulting the samebys in relation to reindeer grazing areas. As mentioned earlier, the municipality disagreed with the information provided by one of the samebys that the proposed swaths of land were necessary for reindeer herding. There are only two references in all studied documents to *samisk* (adjective, pertaining to Sami) in relation to Sámi culture and the Sámi right to reindeer herding in the Audit Statement.

Although the municipality conducted a consultation process with *sameby*s, the documents and the following process show that the perspectives of Sámi and *sameby*s – that some of the proposed areas were considered winter pastures for one of the samebys – were not considered as decisive, as discussed in an earlier section, as the municipality administration went on to propose to the Östersund Municipal Council to continue with the planned data center. The project was eventually put on hold after significant media attention and litigation. In regards to the Meta data center in Luleå municipality, no consultations were carried out due to the designation of the building site as an area of urban planning.

The majority of research participants raised that improvements to the legal obligation of the state in relation to *riksintresse* on reindeer grazing, specifically *konsultationsordning* – the order of

consultation with Sámi communities – would be essential to ensure that Sámi perspectives are meaningfully and seriously taken into consideration. The intricacies of *konsultationsordning* will be discussed in later parts of this thesis.

Nonetheless, what becomes apparent in the discussions of Sápmi representations as a natural fit for data centers appears to be the reliance on existing technologies of imagination that have been employed for the establishment of other industries over time: representations of de-peopled lands ripe with a promise of renewable energies for a new type of industry. The reproduction of these ideas that is present in Zuckerberg's post even for the urban Luleå data center site further solidifies northern Sweden/Sápmi as the home of a new industry. As in the case study of Iceland the vast, idle lands of northern Sweden/Sápmi, lakes and rivers are given (new) meaning through the presence of data centers in these imaginaries.

8.2.3. How do the data center materialities - representations relate to Indigenous agency? Making of the contrapuntal node

Hosting Cultures

As mentioned in the Literature Review section, the reliance on democratic institutions – hosting cultures, to borrow Brodie's terminology – is a crucial part of policies embedded in the tech narratives of data centers. While the local people – including Indigenous peoples – are not explicitly visible in Zuckerberg's post, the formal description of the Meta data center or indeed, in the archival documents for the data center in Midskog (beyond the legal obligation under the *riksintresse*), the Plan Description explicitly outlines the importance of "attracting businesses and establishing a niche industry" with data centers, positioning Östersund as an important area for the data center industrial complex.

As Alix Johnson argues, tech companies are "attracted by and participate in shaping of" Iceland's remote and wild imaginaries. While the narrative of a neutralized and a naturalized home for data centers in Sápmi employs and simultaneously participates in the making of northern Sweden/Sápmi as a distant, vast, cold wilderness without people, as demonstrated in previous sections, a rhetorical divide occurs on the global level between representations of the wilderness

of northern Sweden/Sápmi and the entirety of Sweden as a progressive, democratic state with strong institutions and a climate of innovation (Node Pole 2021, Nordic Council of Ministers).

On the local level, research participants experienced that historically northern Sweden/Sápmi has been deprioritized in the politics of the Swedish state and has been viewed as an area economically reliant on Southern Sweden and the capital. Some research participants rejected the premise of focusing on economic growth as a colonial and non-viable option for sustainable development as it doesn't take into account a holistic view of the environment. Others raised that due to its natural resources – and most recently also the potential for renewable energies – northern Sweden/Sápmi has recently gained broader traction within national discourse. Two of the research participants, with insights into the planned Midskog data center, emphasized the municipality's investment in attracting a new kind of industry in the area. One of the research participants described the municipal council's aspirations as striving to bring innovation in the area through, not the least, possible partnerships with local universities.

So, while northern Sweden/Sápmi has been "crucial for the development of the Swedish nation-state and its technological modernity" (Sörlin 2002 in Vonderau 2019, p. 698), the imaginaries of Sweden as a whole and northern Sweden/Sápmi, in particular, appear to differ from national and global perspectives. On the one hand, the established tradition of values and narratives pertaining to western liberal democracies lends a sense of proximity and credibility to Sweden as a whole to largely US-based tech companies, while imaginaries of northern Sweden – Sápmi – as distant and cold – solidify the distance of the data center from the data on the global level.

In my analysis, this distinction between hosting cultures' representations of Sweden as a whole and northern Sweden/Sápmi can be attributed to at least three factors: prescriptions of modernity and tradition; permanence and impermanence; and the relationship between state, industry and local – Indigenous – populations.

Modernity and tradition

While both infrastructure and Indigenous peoples are often ascribed permanence, infrastructures are often described as future-in-modernity – simultaneously describing modernity and providing a

promise of the future (Anand et al, 2018); while Indigenous communities are often perceived as historical and persistent to time and change. Data centers are seen as "promissory infrastructures" (Annand et al 2018) that signal modernity in the present and envision a future of fast communication and technological advancement. Both of these ideas are put to a test in this research.

In order to discuss the data center's future-in-modernity, this section will address its two components – modernity and promise of the future – separately. Modernity in relation to data centers and communication is understood in this thesis as society's current use of and aspiration for technological advancement and innovation. Modernity is at the foundation of technological developments and communication narratives.

Research participants raised that in majority societies, Indigenous traditions and ways of life are often (mis)understood as contradictory to modern aspirations for technological advancement. Because of the Sámi relationship to nature and environment and traditional livelihoods, the western narratives generalize the Indigenous way of life as incompatible with modernity. Participants rejected these colonial imaginaries of the dichotomy between tradition and modernity in relation to Indigenous communities. Sámi have often been pioneers and early users of technology. Research participants raised several examples where Sámi livelihoods are not only intertwined with but also informed by modern technologies of communication. One research participant, RPF, a reindeer herder, recalled that reindeer herders in Sweden were among the first users to test cellular technologies in the mountains to quality assure the functionality of the new devices in remote areas. Another research participant, RPC, raised the ongoing efforts of Sámi decision-makers in ensuring digital communication for reindeer herders to access healthcare while in remote areas. RPF also raised that Sámi have been using digital education solutions to teach Sámi languages across the different nation-states in Sápmi. RPE explained that GPS tracking is essential in Sámi lived realities and politics in order to visualize reindeer movement patterns. This helps to create maps of reindeer movements to be used by reindeer herders, community leaders and politicians; identify when reindeer is in distress; and predict upcoming patterns and needs.

Perhaps most notably, Sámi people were early adapters of the internet and created SameNet, a pre-social network social networking platform, on a FirstClass server and a web browser to "provide a collaborative social networking environment that supports the already existing cultural interaction and democratic structure of Sámi people" (Cocq and Dubois 2020, p. 224). SameNet further facilitated Sámi communication and was crucial in ensuring the inclusion of Russian Sámi people into the communications infrastructures across Sápmi as Russian Sámi communities often face higher thresholds of communication with the Scandinavian Sámi peoples, as RPF testified.

Modernity, therefore, emerges as an essential part of Sámi lived realities. Then, a fundamental question arises as to how Sámi communities are included in the modern promise of the future of data centers.

The data centers' promise of the future is understood in this thesis, as established in the Literature Review section, as continued sociality, and accountability and transparency through communication infrastructures. As discussed in earlier sections, the data center infrastructure itself is reliant on representations of neutrality of renewable energies as a sustainable industry. These can be seen as a manifestation of "desires and fantasies" of the data center infrastructure (Larkin 2013, p. 329), as described by Larkin in reference to the *poetics of infrastructure*. The poetics of infrastructure "allows us to understand how political can be constituted through different means," Larkin argues. In other words, infrastructures, their politics and geographies are discursive and relational. Vonderau conceptualizes data centers as "contested and fundamentally relational techno-social configurations" (Vonderau 2017, p. 10) and proceeds to define data centers as a form of "continuous bringing together, relating, and coordinating of technologies, communities of actors, organizational structures, and moral values" (ibid, p. 10).

While Sámi communities certainly benefit from the sociality of communication, facilitated by data centers, data centers' poetics and promise are challenged through the lived experiences of their materialities. Data centers' site materialities and supporting infrastructures – the foundations for renewable energies – are in conflict with and further complicate the contested right to land and water for Sámi communities. The promise of the infrastructure fails to include Sámi communities

as the supporting infrastructures and site materialities of data centers clash with the unresolved issue of land rights, and by extension, Sámi self-determination in Sápmi. RPB observed:

> "For me, all the exploiters are the same. Anything that's taking land, I don't want. Whatever it is… it's taking land from my reindeer. No one pays me extra to buy some food that they (reindeer) need because for example, they don't have food enough because we have too many exploiters on our land" (Interview RPB 2021).

Permanence/Impermanence

Another aspect of hosting cultures relates to ascribed permanence of infrastructure. As Julia Velkova has established in her work on data centers, government concessions are often made in favor of data centers based on assumptions of permanence. Velkova (2019, 2021) contests the idea of data centers as permanent, ultimately making the case for the discursive rather than material nature of the permanence of data centers.

In my analysis, tech aspirations and strategies of embedding data center representations and functionality with renewable energies are ultimately related to larger representations of a sustainable, permanent industry and future. Representations of greenness are ultimately connected with representations of permanence. In relation to northern Sweden/Sápmi, some research participants raised that politics of greenness – and ultimately permanence – should take into consideration for how infrastructures of green politics will affect Indigenous realities in the long-term. These research participants raised questions about the infrastructure surrounding green energy, such as its distribution and expressed deep worries about the transfer of energy and the potential impact additional power lines and energy grids might have for reindeer grazing areas and patterns of movement. Not only do the actual sites of green industries – wind power plants and hydropower plants – declare a claim on land, water and air, but so does the distribution infrastructure – power lines and roads. As recent as October 2020, the Energy Market Inspection Agency, *Energimarknadsinpsektionen*, raised the alarm about the country's electricity infrastructure's capacity to handle data centers (Mossige-Norrheim 2020).

And while the Swedish government and Nordic Council of Ministers are invested in creating further competitive advantages for data center expansion in Nordic countries (Nordic Council of Ministers 2018), the lack of recognition for Indigenous land and water rights has adverse effects on Indigenous agency.

Infrastructural permanence in relation to Indigenous agency has long been a topic of activism and academic inquiry. Barney describes infrastructure as "settler colonial invasion … that are meant to destroy Indigenous life to make way for capitalist expansion … a system that is fundamentally at odds with the cycles and systems that make Indigenous survival possible" (Barney 2021, p.7). Hanna Appel has similarly described infrastructure as exposing "imperial time" (2018, p. 12). Susanne Normann (2020) uses the term 'green colonialism' to mark the "renewal of historical processes of dispossession through accumulation and colonialism" (p. 8) in relation to the Sámi experiences of wind energy development in Norway.

In my conversations with Sámi community leaders in Sweden, some participants expressed anger, frustration, worry and fear in relation to wind power development in Sápmi where Sámi perspectives are not meaningfully taken into consideration. When discussing sustainability, several research participants raised that the Sámi relationship with nature allows Sámi to see early signs of changes in climate and biodiversity. The holistic Indigenous view on nature and biodiversity is, therefore, crucial in creating permanent, sustainable change for the planet.

The global communities and academia have long established the threat that climate change poses to Indigenous populations, including traditional livelihoods such as reindeer herding across Sápmi (Roosvall and Tegelberg 2016). As climate change disproportionately affects Indigenous communities, the promise of permanence for the Indigenous way of life is increasingly contested. Although renewable energies are fundamental in fighting the climate crisis, the development of these infrastructures poses additional risks to Indigenous livelihoods and the permanence of Indigenous communities through contested lands and failure to meaningfully involve Indigenous communities in renewable energies discourse. In their promise of permanence, data centers create detachment from the land for Sámi communities.

State, industry and Sámi

So far, this research has largely discovered the tensions in the dematerialized, or at the very least, striving-to-be-neutral representations of data centers and their materialities as they relate to Sámi lived realities and the making of Sápmi in Sweden, while sporadically mentioning the politics and power inherent in the making of the data center as a techno-social infrastructural assemblage.

Armed with green energy arguments, data centers are increasingly situated in the Arctic Circle. The Node Pole, a public-private company that manages the data center in Luleå, markets northern Sweden/Sápmi as a place of "surplus renewable energy at a low cost," with a "stable industrial economy with a high level of innovation" (Node Pole 2020). State and industry interests merge in the message, raising the question of how politics of innovation informs Indigenous agency.

This section explores the politics and power of data centers and how they relate directly to Sámi agency, delving into a deeper exploration of the data center as a contrapuntal node in networked communication.

During my conversations with Sámi research participants, a historical upholding of green colonialism was attributed to both state and industry. The Sámi research participants often used 'they' to refer to state and industry interchangeably to describe the colonizing practices in relation to the establishment of new industries, including the renewable energies industry. While industries always have had a vested interest in profit, states have an obligation to protect the livelihoods of Indigenous communities. All research participants were deeply critical of a lack of meaningful consultation process with Sámi communities by government institutions that denies Sámi agency in relation to Indigenous lands. One of the central themes of the conversations, raised directly by 6 out of 7 research participants, was the legal framework and the state praxis of establishing wind power parks and hydropower plants. As RPF acutely summarized:

> ”Kommunen kan om de vill samråda direkt med Sametinget med enligt lag är det endast Länsstyrelsen de behöver samråda med. Om kommunen t.ex. vill bygga ett industriområde så ska de redogöra för hur de tar hänsyn till rennäringen och det kommer att påtagligt skada

> rennäringen/om det är ett område av riksintresse för rennäringen, vilket det ofta är" (Interview RPG 2021).

A consultation process – where the government meaningfully engages with and takes into consideration Sámi perspectives – in relation to Indigenous realities and livelihoods was at the heart of the discussion for some research participants. At the time of conducting the interviews in March-April 2021, no formal, comprehensive consultation process was in place which allowed municipalities (*kommunen)* to not require a consultation with Sámi communities on issues that affected them, such as land rights. The obligation lay with the County Administration (Länsstyrelsen) to hear the perspectives of Sámi communities.

Meaningful legal protections for Sámi lived realities and livelihoods in relation to data center materialities imply that Sámi communities would have the chance to weigh on the supporting infrastructures of data centers – the location and scope of wind power and hydropower plants – and site materialities – the land where data centers would be built, should these materialities interfere with Sámi livelihoods.

In late January 2022, the government passed legislation on consultation order on questions that affect Sámi communities. The new legislation mandates that effective March 1, 2022, the government and state agencies are obligated to consult with Sámi communities on matters that have significant importance for Sámi communities before decisions are made. The legislation will only enter into force for municipal and county administrations from March 1, 2024 (Regeringen 2022).

While an important step toward ensuring meaningful Sámi agency, the legislation comes up short of recognizing the Indigenous rights to land and water, in accordance with ILO-169 and international standards, and leaves for future determination to be seen how the legal framework will be implemented.

However, it is clear that state's desire to signal modernity, paired with an industrial promise of sociality and accountability, allows for and encourages accumulation of new, clean industries in

northern Sweden/Sápmi. In this discourse, while data center supporting infrastructures are at the center of the debate, data centers as an industry remain relatively invisible for Sámi communities.

In her 2019 *Storing Data, Infrastructuring the Air: Thermocultures of the Cloud,* Asta Vonderau writes:

> "It seems not only important to ask how and by which means the cloud's infrastructural normalcy and 'invisible visibility' is produced and maintained, but also to analyze that maintenance as a governmental act. It should be the social science's concern to be attentive to the forms of 'slow (or light) violence' that data centers might exercise. Whose sustainability and whose economic effectivity does the new climate of innovation stand for?" (Vonderau 2019, p.10).

Similar to conclusions from critical studies, data centers in this thesis were approached as simultaneously several things: media infrastructures, material sites of data, and representations of the tech industry's and state's aspirations for the future.

Material infrastructure is neither new in Indigenous realities nor is it neutral. Media scholars and anthropologists as early as Harold Innis (Foster and Eccles 2020) have established the relationship between infrastructure – railroads, bridges, pipelines – as not only 'staples' for majority populations (Foster and Eccles 2020) but also fundamental in shaping politics and realities for Indigenous peoples (Anand et al. 2018).

Exploring the current materialities and representations of data centers and examining the relationship between state, the tech industry and Sámi communities reveals historical mechanisms used to establish other industries in northern Sweden/Sápmi. The intentional obscurity of data and attempts to neutralize and naturalize it reveals a *form of politics* (Barney 2021), and the data center itself emerges as a *contrapuntal node* in the way that it visibilizes and simultaneously reproduces past colonial imaginaries of northern Sweden/Sápmi.

9. Conclusion

In this research, I attempted to synthesize elements from and bridge representation studies, infrastructure studies and Indigenous studies to gain a deeper understanding of data centers, the tangible place of the dematerialized representations of data.

Through their materialities and interaction with Sámi lived realities, data centers emerge as a detachment from land and nature, facilitated by historical colonial imaginaries of Indigenous communities in northern Sweden/Sápmi. Within the context of extractive industries, overall, Sámi research participants, by and large, had not considered data centers themselves as a distinct category in their own rights – or at the very least, not one as high on the agenda for contemporary debate – but rather, as a part in a large accumulation of extractivist industries.

Through a deeper look into nature as the ultimate resource for functionality and analysis of the supporting infrastructures of data centers, they emerge as tangible industries that inform and reproduce colonial contestations. The representational strategies and practices of the industry, the lack of recognition for Sámi land rights and previous practices by state and industry raise deep concerns for Sámi communities about expanding infrastructure that encroaches on reindeer grazing areas, and by extension, Indigenous livelihoods.

Ideas of modernity and tradition, permanence and impermanence are employed to differentiate the hosting cultures of democratic responsibility and sustainability of Sweden as a state, while making northern Sweden/Sápmi a de-peopled, cold, distant home of the data centers with renewable industries. Data centers, therefore, become a contrapuntal node, where the nation-state and the tech industry rely on ideas of modernity – liberal democracy and renewable energies – as a way to dismiss the materialities of data centers, entangled with the Sámi right to land and water and Indigenous sovereignty. The promise of the data center industry ultimately fails to meaningfully include Indigenous communities.

This research outlined areas and themes in relation to data centers and Indigenous communities. Future academic work should consider deepening the understanding of the relationship between

data centers and Indigenous peoples in Sweden in regard to the emerging themes, as well as in Sápmi as a whole across nation-state borders to examine a broader Indigenous perspective in varying country contexts.

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11.Annex – Interview Guide

Context/background

1. Would you like to be identified in this research, or would you rather remain anonymous? If would like to be identified, take name and spelling.
2. Age, gender identity.
3. Where do you currently live? Do you now or have you ever had a connection to a Sameby and reindeer herding?
4. What is your occupation?

Research-related questions

Own experience and knowledge

5. How familiar are you with data centers/server halls? What is your knowledge about them?
6. Where does this knowledge come from?
    a. Follow-up, if needed: social media, traditional media, Sámi media, other?
7. Can you share with me your thoughts about data centers/server halls?
    a. Follow-up: What do you see are some challenges and opportunities with data centers?
    b. What, in your opinion, is good, what can be problematic, what are some things you think I should know about them?

Discourse

8. Have data centers/server halls been discussed in your circles and the Sámi community at large, as for instance, at Sametinget/your organization/ among Sámi activists?
   If yes, in what way? Can you tell me more? What are the possible challenges and opportunities for Sámi communities in relation to server halls?
   If not, why do you think that is? Can you elaborate?
9. More specific about the Facebook data center:
    a. What is your take on the Facebook server hall in Luleå. What was the involvement of Sámi communities included in the decision-making process? Do you see any opportunities or challenges with this specific site?
10. More specifically about the case in Jämtland:
    a. Has there been any backlash since the Court appeal? What is the situation with the server hall that was planned in Midskog?
    b. (If talking to an informant from Jämtland): Can you tell me about the process of the server hall decision. Describe the involvement of Sámi communities in the area of the proposed data center/server hall. How have things been since?
11. Data centers make online communication possible. Do you think about data centers as sites of communication? Yes/no. Can you tell me more about how you think?

Future-oriented questions

12. Sweden and other Nordic countries are actively creating competitive advantages to attract the server hall/data center industry. What is your take on this? How do you assess this for Sami communities What do you think is important to keep in mind?
13. Is there any discussion and organizing, in Sámi communities about this?
14. What have I missed? What is an important issue right now that Sámi communities are raising in relation to technology and/or communication that I may have missed?