THE ARCTIC AND AI DATA CENTRES

Achieving sustainability in the Arctic

(Image taken from southafricatoday.net)

The Arctic and AI data centres:
Achieving sustainability in the Arctic

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1.0) Introduction

My interest of Artificial Intelligence (AI) began when I started to use AI to aid me through my daily life answering small questions I was doubtful about. I would admire the efficiency of generative AI in particularly as it would provide seemingly robust and instantaneous solutions to various doubts and questions I had. However, this changed when I began to discern the allegedly detrimental impacts AI data centres have on the planet and various communities around the world. I had, then, viewed a video about Nscale, a company that is working towards advanced systems, infrastructures and deployment of Artificial Intelligence (AI) systems as well as AI data centres, who work with companies such as Dell, Nvidia, OpenAI and so on (Nscale, 2025). The video and their website promoted the use of sustainable AI. As well as Nscale, many corporations promote a green, sustainable AI data centres that supposedly decreases the detrimental impacts on the environment while producing many socially sustainable opportunities benefitting the people and the local community. Dell Technologies are purportedly working with policy makers to create a sustainable access to AI (Dell Technologies, 2025). Google purports their action of reducing carbon emissions through AI (Google, 2026). Meta supposedly portrays the potential for AI to accelerate decarbonisation and create models to mitigate effects of climate change. Meta states that their AI will be run by 100% renewable energy and that these AI systems will help and I quote, “optimize water and fertilizer usage” (Schroepfer, 2022). Microsoft states that implementing AI can solve “humanity’s biggest problems” and wish to achieve the goal of understanding how to create sustainable solutions through AI and working on reducing the use of water to improve the water scarcity and accessibility to water and sanitation (Microsoft, 2025). They specify a goal to “provide clean water and sanitation to 1.5 million people” (Microsoft, 2025). They further iterate the use of renewable energy sources to power the data centres and construct them too (Microsoft, 2025).

These are some of globally leading corporations implementing AI into our everyday lives and promoting that the adoption of sustainable AI data centres will essentially work on reducing climate change and work to reduce the environmental impacts. With Meta specifically quoting that AI optimises water usage, this can be presumed to be heavily paradoxical, as there have been many studies denoting the detrimental consequences of AI data centres i.e. water bankruptcy. Water “is fundamental to our ability to live” yet the rise of AI data centres only cause scarcity of ‘fresh’ and ‘clean’ water available to humans (Gordan, 2024). This is due to the need for freshwater to cool down computers in AI data centres with low recycling rates therefore affecting the livelihoods of the local community residing near data centres (Gordan, 2024). Although companies such as Google, Microsoft and Meta aim to replenish more water and therefore promise to mitigate climate change, with Google referring to the “fresh, clean water” as Earth’s most precious resource, the data centres constructed by these corporations consume the very fresh, clean water, that cannot be recycled back to civilian homes (Gordan, 2024). The large consumption of water is essentially leading to water bankruptcy with the world entering an era with potentially “irreversible consequences” (Paddison, 2026). Furthermore, it may be necessary to call this water bankruptcy rather than a water crisis as calling it a water crisis is like assuming it is possible to mitigate this crisis

which is a complex issue when AI data centres are involved. Therefore an augmented argument would be to call the water crisis water bankruptcy instead. The reason for this is that, as CNN denotes (Paddison, 2026), the nature provides rain and snow as a source of water income, however what is problematic is the use of such water. It is being overconsumed by the world, putting us in debt and thus making us (water) bankrupt (Paddison, 2026). Furthermore, the already problematic global challenge i.e. climate change is causing an increase in global temperature thus reducing the availability of water. Henceforth, the consumption of water by AI data centres fundamentally adds to the water bankruptcy at an immense, rapid rate. It is also important to note that while there are social and environmental consequences of AI, corporations continue to profit and grow economically.

Therefore, corporations turn to Arctic regions in hopes that the cool, cold climate can be utilised to cool down the data centres as an alternative, sustainable solution. With the rise of AI data centres, many global challenges are surging rapidly with limited opportunities and time to establish changes and reduce these challenges such as continuous exploitation of minerals, water shortages, job displacements, climate change. On this note, I aim to study AI data centres in connection with sustainable development and study how it contributes to social, economic and environmental global challenges. Therefore, my research will aim to study the implementation of AI data centres within the Arctic regions and the social, economic and environmental implications it has within the local community and environment of the Arctic regions as well as the international community and environment. I aspire to work with the Arctic regions because these territories are vulnerable to the future employment of AI data centres as the ice caps in these territories continue to melt.

Problem Formulation and Research questions

AI data centres are rising and enhancing at an uncontrollable rate creating social and environmental problems, while corporations continue to grow and benefit from them economically. Furthermore, the rise of AI reinforces uneasiness over whether sustainable AI data centres truly produce sustainable effects to help mitigate climate change and contemporary water bankruptcy as well as other relevant global challenges that have heavy implications on the people and the ecosystem. The Arctic region is gradually becoming the next target territory to construct more AI data centres. Therefore, there is the need to understand the true nature of sustainable AI data centres, to comprehend whether it generates threats or provides security for the Arctic regions. Based on these problems, I formulate the following research question and two sub-questions to aid my research and analysis:

To what extent are AI data centres within the Arctic regions sustainable?

1. What are the social, economic and environmental benefits and threats produced by sustainable AI data centres within the Arctic region?
2. Do sustainable AI data centres create uneven social, economic and environmental development?

2.0) Literature Review

There has been an increase in the global discussion regarding AI data centres all over news outlets and social media. However, I contest that the discussion regarding AI data centres within Arctic regions is not prominent. I will begin the literature review by briefly outlining the notion of sustainability and its connection to International Relations (IR), which is the course I have studied. The literature review will then lead on to outlining 4 different articles I have identified that are closely linked to my research question yet with gaps that I plan to fill in my research.

Sustainability within the IR field focuses on the long-term social equity, the ecological security and the economic interests of the states and corporations (United Nations, 2026a). Additionally, IR focuses on global challenges and so the relevance of sustainability to the IR field is that it addresses global challenges i.e. ecocide, climate change, scarcity and exploitation of resources and minerals, water bankruptcy, and forced displacement of local communities, poverty etc (Sustainability Directory, 2024 FIND BETTER SOURCE). In fact, the United Nations Sustainable Development Goals (SDGs) clearly denote the global challenges they wish to tackle to improve social needs such as health, equality and education while preserving the forests and oceans alongside economic growth (United Nations, 2024). They essentially cover challenges falling within the social, economic and environmental factors, which is important within the IR field too. With the rise of AI and its potential dangers, the international community would assume sustainable AI mitigates and reduces these global dangers and challenges. But to what extent is this truly the case…

There is the need for the international community, alongside international corporations and governmental organisations, to attempt and strive for equal social, economic and environmental sustainable development. Within the academic field, IR scholars raises awareness of global challenges to communities, corporations and governmental organisations. Therefore, I postulate that it is important to examine the social, economic and environmental implications of AI data centres within the Arctic region as corporations target more available land thus making the Arctic territories essentially more vulnerable. By doing so, I will examine the implementation of AI data centres and the social, economic and environmental implications with connections to how they generate the various global challenges listed above. Examining these sustainable factors will allow me to research the potential disconnection between the factors as, I contend, sustainable development will be plausible if all these factors work together to be able to preserve social equity, ecological security alongside economic growth and overall find resolutions to the global challenges stated above, which the IR field seeks to work and find resolutions to. The four research below were the closest I could get to my questions and connote research on AI and AI data centres with relevance to the Arctic regions, sustainability:

Reseach 1: ‘Opportunities For Sustainable Business Model Innovations in the Context of AI- Ready Data Centers in the Nordic Region’ by Luukka, A.

- Core claim: The research aims to study the opportunities the Arctic region, within the Nordic areas, has on AI data centres and how these data centres use sustainable business models to work towards sustainability.
- Finding: AI data centres create opportunities for new sustainable business model innovations in the Arctic region, and they can potentially deliver environmental and social sustainability within the data centre ecosystem. The cold climate of the Arctic region can essentially replace the use of water to cool the data centre systems. Furthermore, the wasted heat produced by the centres can be transferred to the local communities or other industries to warm up the infrastructures, as heat is in high demand due to the cold region.
- Method: The research employed semi-structured interviews to collect the data and a qualitative analysis framework incorporating, the Nordic AI data centre context that highlights the advantages and disadvantages of AI data centres within the Arctic, Nordic region. Thematic analysis is employed to analyses the data collected from interviews.
- Data: The data collected is qualitative from directors and managers operating the data centres, and directors and managers working with sustainable business models.

Research 2: 'Digital Support for Sustainable Development of the Arctic Zone' by Gorbacheva, A., & Levina, A.

- Core claim: The research investigates how digitalisation, particularly the adoption of AI, can engage in sustainable development within the Arctic region.
- Finding: AI creates economic benefits by creating more fishery business opportunities within the different regions of the Arctic, thus more labour opportunities for the community, and creates an efficient socioeconomic ecosystem within the Arctic region, although there are concerns over data protection, cybersecurity as well as the overreliance on foreign AI technologies as well as concerns of preserving the Arctic by incorporating AI technology in the region.
- Method: The research conducts literature reviews and synthesis.
- Data: They use articles written by Russian and Swedish scientists based on digital transformation of the Arctic region within the Russian Federation as well as sustainable development of the Arctic.

Article 3: 'The Cloud Beneath The Ice: Environmental and Socio-Economic Impacts of Iceland's Data Center Boom' by Bonthu, S., & Unnthorsson, R.

- Core claim: The research challenges the narrative that Iceland, falling within the Arctic region, is transforming and offering renewable energy as well as creating political stability and natural cooling. These narratives obscure the true socioeconomic and environmental issues they face due to artificial intelligence.
- Finding: The research found that AI and the data centres have an impact on the ecosystem, the local community and the energy systems. Although there is the

narrative suggesting that Iceland is an ideal arctic region to implement data centres due to the cold climate, the reality is that it still consumes a lot of electricity, lowers employment rates and affects the development and livelihoods of the local community. They further state that Iceland's efforts to carry out sustainable developments may be undermined due to these data centres.

- Method: The research uses mixed methods which includes sociopolitical analysis and media discourse analysis to examine the hidden impacts of the data centres in Iceland and the voices and opinions provided by indigenous perspectives, local journalists and fishing communities.
- Data: They analysis reports and statistics as well as statements by the local community.

Article 4: 'The "whole systems" energy sustainability of digitalization: Humanizing the community risks and benefits of Nordic datacenter development' by Sovacool, B. K., Upham, P., & Monyei, C. G.

- Core claim: The research examines the environmental impacts and the social impacts of data centres on the local Arctic communities in Greenland, Iceland and Norway.
- Finding: The findings of the research suggest that data centres create issues within the local communities, which includes causing conflict between the farming and healthcare sector, environmental degradation, displacement of local Arctic communities, exploitation of minerals and materials used to construct the data centres and disruption of marine life. While it economically profits corporations implementing the data centres, there is a lack of economic benefits for the local community.
- Method: The research uses mixed methods which is a combination of qualitative and quantitative assessments. They use semi-structure interviews when interrogating stakeholders.
- Data: The data used are information from interviews, corporate benchmarking information, information from site visits and focus groups.

The above four research study the social, economic and environmental benefits as well as threats of AI data centres within the Arctic region, which will be an important aspect of my study. Nevertheless, the contradicting research about benefits and threats of AI data centres raises questions and ambiguity, which I wish to study. In particular, this concerns the ambiguity of sustainable AI data centres, and whether they embrace sustainable principles.

In fact, I am yet to find a research paper, within the IR field, that studies the ambiguity around sustainable AI data centres within the Arctic region and whether they generate social, economic and environmentally benefits equally to preserve the livelihoods of people and the ecosystem alongside economic growth. I believe that global challenges can be mitigated by producing social, economic and environmental benefits equally. This the case as the IR field through the lens of sustainability, as indicated earlier, seeks to preserve long-term social equity, the ecological security and the economic interests of the states and corporations to

mitigate global challenges. Therefore, this gives me the opportunity to study the true nature of sustainable AI data centres within the Arctic regions and whether the rise of sustainable AI equally creates social, economic and environmentally sustainable development.

3.0) Theory

Integrated reporting (IR) and sustainability reporting (SR) are new reporting methods of corporate reporting practices that examines and shows the social, economic and environmental factors (Lakhani & Herbert, 2022, p. 1). Whereas SR practices focus on the impact organisations have on the environment and society, IR practices does substantially more (Lakhani & Herbert, 2022, p. 1). IR practices allows for the analysis of sustainability and financial disclosure with a focus on the organisation's performance, strategy, governance and prospects, therefore making SR practices an integral part of IR practices (Lakhani & Herbert, 2022, p. 1). The reason for defining these practices is because the theories I aim to use embrace these practices and I aim to also analyse the social, economic and environmental impacts caused by organisations, as well as their strategy and performance, that implement sustainability AI data centres in the Arctic regions, with a particularly focus on Greenland and Iceland. With reference back to the problem formulation, I aim to study to what extent AI data centres are sustainable, which will be studied by adopting legitimacy theory and stakeholder theory.

3.1) Legitimacy theory

Legitimacy theory is a theory adopted to analyse the "social responsibility and sustainability disclosures by organisations" (Lakhani & Herbert, 2022, p. 3). This theory builds on the theory of political economy, which is about acknowledging how between the different societal groups there are different power dynamics and various conflicts that may emerge (Lakhani & Herbert, 2022, p. 3). This theory explains that "society, politics and economics are interconnected". Therefore, to make financial assessments of projects, it is substantive that considerations to political, social and institutional factors are made. (Lakhani & Herbert, 2022, p. 3). Additionally, the theory focuses on "the interactions between an organisation and society at large" as the idea is that organisations must acquire a legitimate position in society to continue their practices. If they acquire an illegitimate position, this means their practices are regarded as inconsistent to societal values as well as detrimental to the individuals and communities in the (Lakhani & Herbert, 2022, p. 3). Henceforth, for organisations to prove that they uphold societal values and ideals and therefore maintain a legitimate position, they must public a sustainability report entailing these information (Lakhani & Herbert, 2022, p. 3).

What is substantive about the legitimacy theory and its application to my research is the notion that organisations are required to receive approval by the society to lead a legitimate position to be able to construct AI data centres they deem sustainable. So I will analyse my data and determine whether these organisations construct sustainable AI data centres that uphold societal values, therefore incorporating and considering social factors of sustainability when building the data centres alongside the economic interests of the organisation.

3.2) Stakeholder theory

Stakeholder theory is used to explain sustainability reporting practices. It is a theory that also builds on the theory of political economy and complements the legitimacy theory whereby examining how organisations should acknowledge the stakeholders' interests and their influence on the organisation's success and longevity of their practices (Lakhani & Herbert, 2022, p. 3). Therefore, for organisations to survive and essentially be able to carry out their practices, they must manage and comply with various stakeholders' values that may in fact be different to the "expectations of an organisation" with considerations to ethical and managerial aspects (Lakhani & Herbert, 2022, p. 3). The ethical aspects include the importance of stakeholders being treated fairly and equally and that organisations shall be held accountable for their actions if their actions hinder the individuals and communities. The managerial aspects include managing the stakeholders differently depending on their expectations and the need for organisations to accommodate to these expectations (Lakhani & Herbert, 2022, p. 3). Regarding the social and environmental aspect within sustainability reporting and integrated reporting practices, the managerial aspects seem to be more effective. Organisations are required to adopt sustainability reporting and integrated reporting practices to disclose information about the economic, social and environmental impact of their practices (Lakhani & Herbert, 2022, p. 3).

This theory is important for my research as I will be analysing various stakeholders and their interests, who are part of or involved indirectly or directly with the AI data centre projects in the Arctic regions.

4.0) Contextualisation

This chapter will be a contextualisation chapter of sustainability as this is an important framework I will be addressing and using to analyse my data in the analysis section along with the theories I have selected and discussed in the theory section. As my research question aims to answer to what extent AI data centres are sustainable in the Arctic regions, I believe it is therefore important to discuss about sustainability in this chapter as a framework that can be used as a tool. I will explain in the methodology section how I will use sustainability as a tool in my analysis section.

The term sustainability in a broader context is denoted as sustaining or maintaining anything for a long or unlimited period. But in the case of my research, sustainability refers to the long-term sustenance of the livelihoods of people, the economy of the countries and corporations and the health and integrity of the eco-system. The key idea of sustainable development as Kazmi & Kirkulak-Uludag indicated in their book chapter is "to meet the current needs without destroying the ability of the future generations to meet theirs" and this was proposed by the United Nations' World Commission on Environment and Development (2023, p. 3222). The United Nations had then adopted the Millennium Declaration at the Millennium Summit in September 2000, which led to the 8 Millennium Development Goals to focus initially on tackling education, poverty and health (Sustainable Development Council, 2025). However, there was of course a lack of focus on governance, inequality, sustainability and the climate, which lead to the establishment of the 17 Sustainable Development Goals (SDGs) (Sustainable Development Council, 2025). The newer framework established and reflected a clear relationship between the social wellbeing of the humans, the economic growth of a nation and various organisations and the health of the environment (Sustainable Development Council, 2025).

I contend, as the UN also indicate on their website, it is eminent that the notion of sustainable development or sustainability make considerations to these social, economic and environmental factors on an equal scale. By doing so, it can potentially improve social needs such as health, equality, and education while preserving the forests and oceans alongside economic growth (United Nations, 2026a). In fact, an article by Islam (2025) portrays this substantive conception of the multi-dimensional interaction between social, economic and environmental factors and the lack of comprehensive analysis on this interaction with existing research studying these factors in solitude (p. 2). For this reason, it is paramount to scrutinise, with deliberation to the United Nations – an international organisation with 193 Member States that seeks to gather together nations to mitigate and resolve social and environmental global challenges alongside economic growth – (United Nations, 2026b), that it is insufficient to mitigate these very global challenges unless they are studied and mitigated with equal considerations to the social, economic and environmental factors.

Therefore, sustainability is this notion of ensuring that long-term social equity and ecological security is preserved alongside economic interests of the states and corporations. This is plausible by addressing social, economic and environmental factors on an equal level because making considerations to only one or two of these factors cannot be said to lead to sustainable

development. These specific factors, which will be explained further below, will help analyse the collected data and determine to what extent sustainable AI data centres are in fact sustainable and whether these AI data centres uphold notions of sustainability i.e. equally embrace social, economic and environmental factors. I will therefore use sustainability as a tool to analyse the data.

4.1) Social sustainability

Pareja-Eastaway defines social sustainability with reference to the Housing and Sustainable Communities Indicators project as an sustainable element that encompasses the following aspects: "equity or equitable opportunities and outcomes for all; diversity or inclusiveness of different groups; interconnectedness of availability procedures inside and outside the community that allow communication at a formal, informal, and institutional level; quality of life or acceptable level of individual self-esteem and community equality of work, income, and standard of living; and democracy and governance or existence of democratic processes and well-performing governance" (Pareja-Eastaway, 2012, p. 502).

Adding on to these elements of social sustainability, Kahn also addresses similar principles of social sustainability whereby explaining that it encompasses elements of equity, empowerment, accessibility, participation, cultural identity, institutional stability and sharing. Based on Kahn's and Pareja-Eastaway's principles, I, as the researcher, feel the need to address the following principles of social sustainability – equity, empowerment and community engagement, accessibility, and institutional trust and social stability – to analyse the collected data and, therefore, the extent to which sustainable AI data centres within the Arctic regions (list territories) encompasses social sustainability elements. I believe using these elements I can analyse the social sustainability impacts of sustainable AI data to determine whether sustainable AI data centre projects incorporate social sustainability principles therefore upholding sustainability – to preserve 'long-term social equity, the ecological security and the economic interests of the states and corporations' as construed by the United Nations.

Equity

Pareja-Eastaway describes this aspect as the need to uphold ethical values and social norms and these elements as summarised into social justice and social equity (Pareja-Eastaway, 2012, p. 502). In other words, social sustainability ensures that the people and the local communities receive equal and equitable opportunities to socioeconomic status, education, public transportation, health care, and tools and equipment to adapt to environmental threats, thus maintaining the principle of fairness (Michael & Salleh, 2023, pp. 899-902). This aspect is important my study as I will study whether the sustainable AI data centre projects hinders the individuals and local communities quality of life and access to education, public transportation, health care and so on.

Empowerment & Participation

Empowerment and participation can be seen to be interconnected as participation and community engagement of individuals and local communities in a project is the vital aspect of both empowerment and participation. To be able to achieve "socially just and ecologically sound long-term sustainability" it is importance that individuals and communities are provided the opportunity to participate, which means taking action towards various goals and objectives in a project implemented by corporations and businesses. These projects have a huge impact on the people and the communities and so providing them this opportunity gives them this sense of empowerment. Henceforth, when individuals and communities embrace empowerment, their self-reliance is increased, they have control over their own life, they are more independence and have control over their capacity building of the projects and can take collective take action as a community without any hindrance (Dushkova & Ivlieva, 2024).

Thus, the principle of participation is very similar to empowerment. Participation pays crucial attention to community engagement and the importance of community and individuals to be involved openly to address concerns and establish solutions to these concerns (Mittal & Bansal, 2024, p. 2). Participation embraces aspects of social cohesion and inclusion. This means providing the individuals and communities an opportunity a sense of belonging and identification so trust and confidence in institutions, identification and fairness (Dragolov et al, 2013, p. 31, as cited in, Moustakas, 2023, p. 1030). Such an opportunity creates equality and preserves the equality of life of individuals and communities (Moustakas, 2023, p. 1031). These individuals and communities include business, schools, government agencies, NGOs, and various social groups and so on (Mittal & Bansal, 2024, p. 3).

Empowerment and participation are important in my study as I will study whether the sustainable AI data centre projects give individuals and the local communities living in Arctic regions, Greenland and Iceland, the opportunity to participate in the projects and provide their own opinions in these projects to ensure that the implementation of these projects does not hinder their livelihood. This means corporations ensuring that individuals and communities can trust them and their practices and are treated with fairness.

Accessibility

Accessibility element of social sustainability is as Pareja-Eastaway describes the need to for equal access to income, work and standard of living for individuals and communities (Pareja-Eastaway, 2012, p. 502). When corporations implement their projects that affects individuals and communities, they must ensure these individuals communities can continue to obtain the services they need, which includes going to work, having accessing to public transport and healthcare and various other public services without any issues (Pitarch-Garrido, 2015). It is important to use this element in my analysis to as there may or may not be potential occurrences of sustainable AI data centres hindering the individuals and communities' accessibility to work and various public services in the Arctic regions (list territories).

4.2) Economic sustainability

Economic sustainability is all about the 'growth and development' of the economy, which includes "improving human well-being, providing decent jobs, reducing inequalities, tackling poverty and preserving the natural capital" we all depend on without hurting the environment or essentially "avoiding environmental degradation as Paiva & Mijatovic define (2023, p. 1756). By doing so, growth and development of the economy can be achieved in a sustainable manner as economic sustainability incorporates itself with social and environmental aspects of sustainability, therefore achieving sustainable development. Jeronen & Mikkilä also defines economic sustainability as economic development of a state or organisation "without any loss of ecological or social sustainability" (2023, p. 1258). It is substantive to note that sustainability is plausible when no harm is done to the environment or the people by an organisation when they profit of their actions financially. I presuppose that this aspect of economic sustainability is important to use in my research as I will be analysing whether the AI data centres many corporations deem sustainable in fact increase equality, improve human well-being, increasing and provide long-term job opportunities all while safeguarding the Arctic eco-system particularly in Greenland and Iceland.

4.3) Environmental sustainability

Environmental sustainability is a matter of protecting the integrity of the eco-system and preserving the biodiversity (Roche & Campagne, 2017, p. 65). In my research, I postulate the use of these two elements as my research focuses on the Arctic territories, particularly Iceland and Greenland and the potential vulnerabilities that arise to these territories because of the construction of AI data centres. Protecting the integrity of the eco-system as well preserving the biodiversity means to protect the environment or the nature without impairing it due to human activities and therefore taking extra steps using various practices and materials to preserve the eco-system and biodiversity (Roche & Campagne, 2017, p. 65). In my project, the proposed human activity would be the construction of AI data centres promoted as sustainable in Iceland and Greenland and the extent to which these AI data centres have an affect on the eco-system and bio-diversity.

5.0) Methodology

5.1) Theory of Science

Critical realism is the notion of executing an inference about the causal mechanism that fall behind and is responsible for various regularities that are observed in the social world by researchers (Bryman, 2016, p. 25). It is substantive to note that this essence of critical realism was developed by Bhasker (1944-2014), who was an English philospher (Bhaskar, 1975/2008, as cited in Chirkov, 2025). Essentially, critial realists ascertain a conclusion (inference) hiding under the stage (behind), using the knowledge and observed data already available (regularities) and analysing these data present in the social reality. This is done to understand the external reality, that is not unclear.

Through the critical realism lens, this research aims to make an inference about the social, economic and environmental implications of AI data centres within the Arctic region. The research will specifically analyse the implementation of sustainable AI data centres and whether they aim to reduce social and environmental costs. Such an inference will determine to what extent construction of sustainable AI data centres within the Arctic region make equal considerations to social, economic and environemental implications. This will determine whether these data centres imply that there is a connection or disconnection between the three pillars of sustainability. I believe that global challenges can be mitigated by producing social, economic and environmental benefits equally. This is the case as the IR field through the lens of sustainability, as indicated earlier, seeks to preserve long-term social equity, the ecological security and the economic interests of the states and corporations to mitigate global challenges. Therefore, this gives me the opportunity to study the true nature of sustainable AI data centres within the Arctic regions and whether the rise of sustainable AI equally creates social, economic and environmentally sustainable development.

5.2) Research Design

The research I will be conducting will be a qualitative case study employing multiple qualitative methodological tools and data sources (George & Bennett, as cited in, Ndame, 2023, p. 67). It would be a case study analysing the extent of which AI data centres are sustainable and particularly focusing on the impact of these data centres within Arctic regions. Since the focus will be on the Arctic regions, I will undertake a single case study that will allow me to analyse a particular or specific setting i.e. the Arctic region (Baxter & Jack, 2008, p. 549). The reason for selecting the Arctic region is due to the contemporary issues of these regions and territories becoming significantly vulnerable to the implementation of various digital technologies and buildings constructed by international corporations as I indicated in the introduction. While they may promote these implementations as sustainable, there is, to some extent, ambiguity regarding whether these developments are in fact sustainable and therefore safeguarding the social, economic and environmental aspects of the

Arctic region. Thus, I would be focusing on the sustainable principles adopted with implementing AI data centres and to what extent these data centres are sustainable. Furthermore, since the implementation of sustainable AI data centres is a global phenomenon that requires more time to study in my research, I will narrow down the focus to Arctic regions particularly focusing on Greenland and Iceland. More information regarding the justification of selecting these countries will be provided in section 5.5.

Henceforth, the case study will focus on the Arctic regions and the implementation of sustainable AI data centres within these regions. Since I will be undertaking qualitative research, the research will employ document analysis and stakeholder analysis to analyse the primary and secondary data, which will be discussed further in section 5.3. I will mainly be using secondary data which will be a combination of academic articles by academic scholars and various experts working with sustainable AI data centres within the Arctic regions. These will be discussed further in section 5.5.

5.3) Method of Analysis

5.3.1) Document analysis

Qualitative document analysis, according to Altheide, is the privilege given to researchers to analyse and identify the "meanings, patterns, themes in texts" (Altheide, 1996, as cited in, Kutsyuruba, 2023, p. 139). Therefore "as a qualitative method, document analysis is defined as a systematic procedure for reviewing and evaluating documents that entails finding, selecting, appraising (making sense of), and synthesizing the data contained within theme" (Bowen, 2009, as cited in Kutsyuruba, 2023, p. 140). In the case of my research, I will be analysing social, economic and environmental themes within the secondary data in connection to sustainable AI data centres within the Arctic regions, Greenland and Iceland. To do this, I have will use the social, economic and environmental sustainability and the factors that fall within these elements of sustainability as discussed in the contextualisation chapter. Various data can be used to be interpreted and examined through document analysis. These data include drafts and proposals of internal perspectives by various organisations and governmental institutions, and, articles and various publications that provides and official perspectives of an issues, topic or some form of process (Kutsyuruba, 2023, p. 140). In the case of my research, I will mainly be focusing on articles. More details regarding the specific choses of data will be provided in section 5.5.

The table below will be used as a guide to collect and gather the data whereby outlining the social, economic and environmental benefits and threats of sustainable AI data centres. I will then use the table with the information to guide me when analysing to what extent AI data centres in Greenland and Iceland embrace and incorporate social, economic and environmental factors to then answer the main research question which is to what extent are AI data centres within the Arctic regions sustainable. Since the table below will be used as a guide to aid me in my analysis, I feel it is not necessary to provide a completed table in my research.

	Benefits	Threats
Social		
Economic		
Environmental		

5.3.2) Stakeholder analysis

(Sustainable) stakeholder analysis is another tool used to examine various ethical considerations and power dynamics as well the notion of corporate responsibility within a world that is constrained by sustainability (Bridoux & Stoelhorst, 2022). This can be done by identifying various stakeholders and their interests, influence as well as concerns over the implementation of sustainable AI data centres. By identifying the stakeholders, their interest, influence, needs and potential conflicts, I believe these aspects align with the social, economic and environmental benefits whereby analysing which stakeholders benefit from sustainable AI data centres as well are threatened due to it socially, economically and environmentally. This leads to studying whether the implementation of sustainable AI data centres equally creates social, economic and environmental sustainable development.

Through the adoption of stakeholder analysis, the following will be identified and the data will be inputted in the table below:

- Stakeholder identification: Internal Stakeholders (individuals or groups working within an organisation) & External Stakeholders (individuals or groups falling outside of organisations) affected by an organisation's action, the very action being the development of sustainable AI data centres within the Arctic regions
- Stakeholder's interest
- The potential conflicts arising in relation to the stakeholders

(Bridoux & Stoelhorst, 2022)

Internal Stakeholders (Organisations, Employees, Managers, Executives, Shareholders etc)	**Their interests**	**The potential conflicts**	**External Stakeholders (Customers, Suppliers, Communities, Individuals, Governments, Regulators, NGOs, the Media)**	**Their Interests**	**The potential conflicts**

I will input data in the analysis section to provide an overview of the type of stakeholders I will be referring to when analysing the social, economic and environmental impacts of AI data centres in Greenland and Iceland. By indicating the stakeholders present among the projects of AI data centres, I hope to aid the reader in my analysis section when indicating which stakeholders are impacted by the AI data centres and how – if they benefit or are threatened by it.

5.3.3) Theory

This section will explain my chose of theories and why I have decided to use the following theories in connection to my research question: legitimacy theory and stakeholder theory. I will aim to provide a brief history and evolution of these theories to delineate why it is important in my research.

So I wish to study sustainable AI data centres and to what extent these data centres based in the Arctic regions, Greenland and Iceland, are sustainable. To study the sustainable aspect of AI data centres, I will be analysing the social, economic and environmental benefits and potential threats of these data centres and whether the implementation of these centres equally incorporates these three factors of sustainability. These factors will be analysed using legitimacy theory and stakeholder theory to help answer my research question.

Legitimacy theory

Weber defined legitimacy as the need for order to have validity and this form of validity is based on "the consent and voluntary obedience of followers" of the order (Weber, 1978, p. 31, as cited in, Langley & Ariel, 2024, p. 15). "Weber identifies three ideal types of legitimate domination that he terms 'charismatic', 'traditional', and 'legal-rational', considered necessary for the continued exercise of domination." (Langley & Ariel, 2024, p. 15).

- "Charismatic authority reflects justification based on the exceptional or exemplary qualities of the holder of power, which are not accessible to an ordinary person."
- "Traditional authority is justified because it is acquired and exercised in a manner consistent with societal customs and norms."
- "Legal-rational authority is justified based 'on the belief in the legality of the enacted rules and the right of those elevated to authority under such rules to issue commands." (Langley & Ariel, 2024, p. 15).

Despite Weber's contribution to the definition of legitimacy as a theoretical framework, there were certain aspects that weren't covered in Weber's definitions of legitimacy. It was important to also cover that legitimacy is about "the cultivation of self-belief and self-confidence of rulers in the rightness of their own authority" (Tankebe, 2007, p. 47, as cited in, (Langley & Ariel, 2024, p. 15-16). Most frequent definitions refer to legitimacy as the power that is exercised by government for having the "right to govern" or a "sense of moral rightness" to govern a population (Sternberger, 1968, p. 244, as cited in, Langley & Ariel, 2024, p. 16). "It appears that general legitimacy theory is firmly grounded within political

science and centred on the relationship between 'ruler' and 'ruled'" (Langley & Ariel, 2024, p. 16). "The benefits identified and associated with this set of legitimacy-based relationships are intrinsically human, social, and economic" (Langley & Ariel, 2024, p. 17).

This links very well with the current notion of legitimacy theory whereby the ruler would be regarded as the organisation implementing sustainable projects and the ruled would the individuals and local community being affected by these projects and the organisation's practices. It is important to learn about the social and economic aspects between the community and organisation to determine whether the organisation has a legitimate position to continue their practices.

Henceforth, the reason for picking the legitimacy theory is because the theory focuses on the interactions between the society and the organisations implementing their projects that affects the society. The project and practices by the organisation raise potential social, economic and environment benefits and threats that impact the society at large. When the level of threats is higher than the level benefits, then it cannot be said that the organisation has a legitimate position to practice their projects in the same territory the society lives in. Therefore, it is eminent for organisations to uphold societal values without hindering the lives of the society to maintain a legitimate position and continue implementing their projects. This means incorporating social, economic and environmental factors into their practices and projects. In the case of my project, I will be focusing particularly on the AI data centres implemented by organisations and the social, economic and environmental effects on the society.

Stakeholder theory

Stakeholder theory was developed as a theory rather than a perspective of strategic management (Freeman, 1984, as cited in Bridoux & Stoelhorst, 2022, p. 797). Nevertheless, various adoptions of work that followed this area did not embrace the strategy field due to concerns by scholars to cultivate their work within economic theories and concepts (Rumelt et al., 1991, as cited in Bridoux & Stoelhorst, 2022, p. 797). Now there has been more adoptions on stakeholder perspectives rather than strategic perspectives.

The notion of stakeholder theory was derived by Freeman in his book about Strategic Management, taking on a stakeholder approach (Bridoux & Stoelhorst, 2022, p. 798). The book was written through a strategic management perspective – essentially how corporates implement and evaluate their decisions to obtain their goals – and therefore took on an economic theorising form. However later stakeholder theory contrasted element of strategic management and economic theory (Freeman et al., 2010, as cited in Bridoux & Stoelhorst, 2022, p. 798). This is because stakeholder theory placed importance of elements of interests and cooperation among and between stakeholders while economic theory was more concerned with maximising market value and profits (Jensen, 2002, as cited in Bridoux & Stoelhorst, 2022, p. 798). Scholars came to notion that the general idea of stakeholder theory is the need to build a "fair and durable relationship" between the stakeholders and the organisation, and this form of "social and moral dimensions" was ignored by the economic theory/strategic perspective. Therefore, there was the need to bridge the gap between economic theory and the stakeholder theory as scholars realised during the financial crisis in

the early 2000s there was “societal pressure on firms to embrace their social responsibility, which has culminated in initiatives such as the UN’s 17 Sustainable Development Goals” (Aims et al., 2020, as cited in Bridoux & Stoelhorst, 2022, p. 799). Hence the stakeholder theory that many scholars use focuses on the need for organisations to embrace these societal values and social responsibility when they carry out their practices as they should cooperate with the stakeholders to fulfil these values and responsibilities.

This links very well to the current notion of stakeholder theory I have discussed in the theory section, which entails the need for organisations to comply with various stakeholders’ values and carry out practices in and ethical manner that does not hinder the lives of communities. It is equally important for them to disclose the social, economic and environmental impacts of their practices. This is why I will be using the stakeholder theory as I will be analysing the extent of the various organisations’ actions when implementing AI data centres and how these data centres have a social, economic and environmental impact. It is therefore important that I analyse whether or not the organisations practices align with the values and norms of the local community in the Arctic regions of Greenland and Iceland.

5.3.4) Sustainability as a tool

I intend to use the framework of sustainability as a tool rather than as a theory to analyse my data. The reason being is that sustainability can be said to be a framework that provides various perspectives or ideas in various public administration, governance and policy development i.e. the United Nations Sustainable Development Goals (Omair et al., 2023, p. 377). Since sustainability has numerous amounts of definitions and distinctive viewpoints, sustainability can therefore be categorised into two main perspectives: the anthropocentric perspective which focuses on the human interest and needs while considering the protection and conservation of the environment all while achieving economic and social development; the biocentric perspective which focuses mainly on the protecting on the environment, with the environment having its own rights to therefore seek protection over the earth and the ecosystem for its own sake (Omair et al., 2023, p. 380). What is therefore a substantive notion of sustainability is that it can be used in a more practical manner as a practical tool to allow organisations and various governmental institutions to adopt practices and policies that promote sustainability (Omair et al., 2023, p. 384). This allows for long-term social, economic and environmental developments. As a result, it can be said that sustainability is not a theory but rather a tool that possesses social, economic and environmental principles. Henceforth, I will be using sustainability as a tool in my research to identify the social, economic and environmental impacts of AI data centres in Greenland and Iceland.

5.4) Data Collection

As indicated in section 5.2, the qualitative data used will be reports & other official documents as primary data, including policies and regulations in connection to the implementation of AI data centres, and articles as secondary data that all indicate social,

economic and environmental implications of sustainable AI data centres within the Greenland and Iceland. Therefore, the selection of these data will be carried out using the following keywords and phrases: sustainability, sustainable AI data centres, benefits and threats, social, economic and environmental factors, and the Arctic regions (Greenland and Iceland).

The reports, documents and articles will be a culmination of data about Greenland and Iceland. While northern parts of Sweden, Finland, Russia, Alaska and Canada also fall within the Arctic regions, which I would most definitely be interested in analysing, my research will focus only on Greenland and Iceland, firstly due to the time limit and secondly, because there are an adequate amount of information available regarding AI data centres in Greenland and Iceland compared to the other Arctic territories. I understood the importance of considering the distinct policies and regulatory frameworks falling within Greenland and Iceland and the need to understand the effects of policies and frameworks in connection to AI data centres.

The reports and articles will be collected from various international institutions and news outlets and agencies. A limitation to indicate when searching the reports and articles to use in my research is that it was difficult to find information specifically about sustainable AI data centres in Greenland and Iceland from prominent institutions and new agencies such as BBC News and the Guardian. I had to resort to local new outlets and agencies such the Greenlandic news outlet, Sermitsiaq, and news agencies such Observer. However, I can substantiate that the selection of the data was narrowed down using the specific keywords outlined above in order to avoid focusing on a broader theme. I have further cross-checked certain contextual information in the articles ensuring the basic context about AI data centres in Greenland and Iceland is the same and ensuring citations have been used within the articles to support validity of the information.

The following data are lists of reports, documents and articles, which will be written in the following format: Author, Year, Title, link to website:

Adam, D. (2026). ‘AI is ‘technological societal’ revolution’ https://www.ruv.is/english/2026-01-13-ai-is-technological-and-societal-revolution-463597

Alessa., L, Bielby., M & Wall., C. (2022) ‘Artificial Intelligence and the Arctic’ https://www.csis.org/analysis/artificial-intelligence-and-arctic

Arctida, Farkhatdinov, N., Ivanova, M. (2025). ‘The Arctic is becoming a hot spot for data centers’ https://www.arctictoday.com/the-arctic-is-becoming-a-hot-spot-for-data-centers/

Bonthu, S., & Unnthorsson, R. (2025). ‘The Cloud Beneath the Ice: Environmental and Socio-economic Impacts of Iceland’s Data Center Boom’ https://www.researchgate.net/publication/398095711_THE_CLOUD_BENEATH_THE_IE_ENVIRONMENTAL_AND_SOCIO_ECONOMIC_IMPACTS_OF_ICELAND'S_DATA_CENTER_BOOM

Christensen, J. D., et al. (2018) ‘Data centre opportunities in the Nordics: An analysis of the competitive advantages’ https://doi.org/10.6027/TN2018-553

Fourrage, L. (2025). ‘How AI Is Helping Government Companies in Iceland Cut Costs and Improve Efficiency’ https://www.nucamp.co/blog/coding-bootcamp-iceland-isl-government-how-ai-is-helping-government-companies-in-iceland-cut-costs-and-improve-efficiency

Garen., M & Grapevine., R. (2022). ‘Artificial Iceland: Data Centres Use Up Much Of Iceland’s Energy, But For What’ https://grapevine.is/mag/articles/2025/07/24/artificial-iceland-data-centres-use-up-much-of-icelands-energy-but-for-what/

GlobalData. (2026). ‘Is Greenland the next frontier for AI Infrastructure?’ https://www.worldconstructionnetwork.com/analyst-comment/greenland-next-frontier-ai-infrastructure/

Greenland Institute of Natural Resources. (2025). ‘Greenland Institute of Natural Resources launches new AI server’ https://natur.gl/2025-en/greenland-institute-of-natural-resources-launches-new-ai-server/?lang=en

Guðmundsson, E. F. (2025) ‘Why Iceland Is Becoming a Model for Renewable-Powered High Performance Computing’ https://observer.com/2025/11/iceland-renewable-ai-infrastructure/

Hedge, G. (2024). ‘Discharge from AI Data Centers and How to Mitigate Contamination’ https://ketos.co/discharge-from-ai-data-centers-and-how-to-mitigate-contamination

Johnson, A. (2019) ‘Data centers as infrastructural in-betweens: Expanding connections and enduring marginalities in Iceland’ https://anthrosource.onlinelibrary.wiley.com/doi/abs/10.1111/amet.12735

Joshi, K. (2026). ‘The AI Climate Hoax: Behind the Curtain of How Big Teach Greenwashes Impacts’ https://ketanjoshi.co/2026/02/17/big-tech-greenwashing-report/

Khalili, J. (2026). ‘The Data Centers Have Arrived at the Edge of the Arctic Circle’ https://www.wired.com/story/ai-supremacy-data-center-expansion-arctic-circle/

Nicol-Schwarz., K. (2026) ‘A former Trump official wants to build a massive data center in a remote corner of Greenland. Will it work’ https://www.cnbc.com/2026/01/23/greenland-data-center-trump-greenmet.html

Tinah, R. (2026). ‘Greenland and the Infrastructure Foundations of AI competition’ https://bisi.org.uk/reports/greenland-and-the-infrastructure-foundations-of-ai-competition

The Tech Buzz. (2026). ‘AI Labs Push Data Centers to Arctic Circle for Cheap Energy’ https://www.techbuzz.ai/articles/ai-labs-push-data-centers-to-arctic-circle-for-cheap-energy

5.5) Limitations & Considerations

There were many limitations I faced while writing my thesis and this was particularly the case when collecting my data. As my focus is the Arctic and particularly Greenland and Iceland, the opportunity to interview the local Greenlandic and Icelandic community would

have been ideal for my data collection as I focus on the impacts of AI data centres on the local community at large. My data in this case may have been more authentic which could potentially have increased by validity and therefore be able to generalise my research findings to the general population of the Arctic community. However, I was aware of my limited time and capital as well as the language barrier I may have faced when transcribing and translating the interviews I may have conducted. Therefore, I resorted to articles that cover the impact AI data centres have on the local community, which has undeniably aided me to write up my project and provided me with substantive data and knowledge. Perhaps if I had more time and money, I would consider taking on a more field-work approach and interviewing the local communities next time.

The use of the data was to some extent problematic as I had to ensure the information I was using was reliable too. I tried to use as much data as I could find on the internet in relation to the Arctic regions, Greenland and Iceland, as it was difficult to find large amounts of data specifically addressing the social, economic and environmental impacts of AI data centres in Greenland and Iceland. However, I took this positively as that meant that there was potentially large gap in this area of research that I took the initiative to study particularly in the International Relations subject. However, I affirm that my attempt has allowed be to find enough data from articles discussing involvement of local agencies, experts and the government of Greenland and Iceland and therefore did not feel the need to conduct any interviews with them. Nevertheless, I deliberated that interviews and quotes directly from experts working in local agencies and governmental departments may have provided my results for authenticity and therefore validity.

6.0) Analysis

As we can see from the contextualisation chapter, I conjecture that sustainability is the notion of preserving long-term social equity and ecological security alongside economic interests and growth of the states and corporations and that without considering all three factors – social, economic and environmental – it is difficult to create sustainable development. Therefore, I argue it is essential for social, economic and environmental factors to be considered equally to uphold sustainability and create positive sustainable development. The analysis section will display the social, economic and environmental benefits and threats produced by sustainable AI data centres in Iceland and Greenland. From my research, it is equally important to identify and discuss about the stakeholders that are affected by these AI data centres in Greenland.

The first part of the analysis section will analyse the social, economic and environmental benefits and threats produced by sustainable AI data centres within the Arctic region, with a particular focus on Greenland and Iceland. I will be analysing these three factors using the legitimacy theory and stakeholder theory. The second part of the analysis section will analyse if and how AI data centres adopting sustainable principles create even or uneven social, economic and environmental impacts based on the findings in the first part of the section. This will help me lead to answering the main research question: To what extent are AI data centres within the Arctic regions sustainable?

Since I will be using the stakeholder theory to analyse the stakeholders and their interests and actions, I will be indicating who the stakeholders are in the table below.

Internal Stakeholders (Organisations, Employees, Managers, Executives, Shareholders etc)	**Their Interests**	**The potential conflicts**
OpenAI, Microsoft, Google, Meta, Oracle	They need to handle the large population of ChatGPT users as well as deliver large compute resources i.e. GPUs (Khalili, 2025). Also need to expand their AI data centres due to the large usage of electricity, which a small amount of AI data centres cannot handle. (Arctida, Farkhatdinov & Ivanova, 2025)	Local communities protesting against the AI data centre developments as they consume the very energy and water the community need for their homes and local businesses etc.

	All need to increase AI data centres to handle the large energy consumption as well as wasted heat energy which is possible in cooler territories of the Arctic (The Tech Buzz, 2026) (Nicol-Schwarz, 2026) Google's interest to create sustainable AI data centres 'Emerging AI Trends for Sustainable Data Centers by Venkat Sharma Gaddala https://research.google/pubs/emerging-ai-trends-for-sustainable-data-centers/ Microsoft's interest to create sustainable AI data centres – 'Advance the sustainability of AI' https://learn.microsoft.com/en-us/industry/sustainability/advance-sustainability-ai Meta's interest to create sustainable AI data centres – 'Sustainability: Data centers' https://sustainability.atmeta.com/data-centers/ OpenAI & Oracle's interest to create sustainable AI data centres – 'Inside OpenAI & Oracle's Dream of a Green Data Centre Campus' by Georgia Collins https://sustainabilitymag.com/news/openai-oracle-and-vantage-forge-green-energy-partnership	
AI Green Bytes (Icelandic data-centre start-up)	Also seek cooler territories to submerge their computers in the non-corrosive liquid i.e. the cold water (Garen & Grapevine, year)	
COMBY A/S (local company in Greenland)	Collaborated with Dell Inc. and NVIDIA Inc. to install AI data centres in Nuuk to essentially modernise their data storage, mange data workflows and secure a computing powerhouse (Greenland Institute of Natural Resources, 2025)	
Employees of AI data centres built	Increase in job opportunities but mostly temporary as AI data centres run remotely	The corporations and organisations listed above

by the corporations and organisations listed above	most of the time without needing individuals to be present every day.	come with many promises in regard to providing jobs and improving the livelihoods of the local Arctic community yet these promises may not be upheld by these corporations and organisations leading to protests.

External Stakeholders (Customers, Suppliers, Communities, Individuals, Governments, Regulators, NGOs, the Media)	**Their Interests**	**The potential conflicts**
Greenlandic and Icelandic community	Job opportunities and a stable environment to live on with stable food and water resources and availability	Protests against corporations who cause problems to the Greenlandic and Icelandic communities' interests.
Greenland Department of Business, Mineral Resources, Energy, Justice and Gender Equality	To potentially safeguard the Greenland environment as they have not provided approval to various AI data centre projects brought it by the US government and the CEO of GreenMet as of January 23 2026 (Nichol-Schwarz, 2026).	Protests and potential risks of these corporations being sued if they work against these disapprovals or rejections as these corporations do not have a legitimate position to construct the AI data centres.

(Greenlandic local department)		
Greenland Institute of Natural Resources (Greenlandic local department)	To build AI data centres to achieve high performing AI server systems and therefore advance in scientific computing in Greenland (Greenland Institute of Natural Resources, 2025).	Protests caused by local communities if long-term jobs are not in place and if corporations and organisations hire employees with a background in IT or computer from outside of Greenland instead of teaching the Greenlandic computers about the AI data centres they will be living around.
Icelandic government	In favour of AI data centres as they cut costs and improve efficiency starting with public servers and help policymakers to review and submissions and various other proposals leading to potential economic and political security as well as autonomy (Fourrage, 2025)	Protests against the Icelandic government caused by the Icelandic community if the achievement of economic and political security and autonomy does not favour the local communities or if they suffer consequences of AI data centres.
USA government and GreenMet	Benefit economically from AI data centres in Greenland. They target Greenland to save money on energy and use the cold temperatures to cool AI data centres down.	Protests and potential conflicts arising against US governments and the people.
Greenlandic government	Economic benefits such as economic and political security and autonomy (Tinah, 2026)	Protests against the Icelandic government caused by the Icelandic community if the achievement of economic and political security and autonomy does not favour the local communities or if they suffer consequences of AI data centres.

6.1) What are the social, economic and environmental benefits and threats produced by sustainable AI data centres within the Arctic region?

6.1.1) Social benefits and threats:

Social factor or social sustainability as explained in the contextualisation chapter is an element of sustainability ensures equity and inclusiveness of different groups of people as well as availability of various services for the community. Social sustainability is also about ensuring that various practices does not hinder the equality of life of communities with equal access to health and public services, education and so on. This is therefore the case when it comes to organisations implementing AI data centres that attempt to incorporate sustainable principles, where it is substantive that they consider social factors of sustainability.

Equity

Equity is the need to uphold ethical values and social norms, giving the community equal and equitable opportunities to public services without being hindered by the implementation of AI data centres that attempt to incorporate sustainable principles. It is a matter of maintaining and sustaining fairness for communities and individuals.

One part of equity means to consider the social norms or dynamics as a central aspect when implementing AI data centres however implementing these data centres have been criticised for removing humans from the scenario, as indicated by Alessa, Bielby & Wall in their article focusing on the Arctic and AI (2022, p. 5). However it is important to make considerations to humans and in the case of the Arctic regions, Greenland and Iceland, to focus on the local communities residing in these regions. This is because they suffer the consequences of the implementation of AI data centres whereby these data centres create a change in permafrost, which in fact leads to the melting of permafrost as well as loss of freshwater (Alessa, Bielby & Wall, 2022, p. 5). This connects well with the legitimacy theory where it is substantive for organisations to acquire a legitimate position in society or within the Arctic community by achieving approval from the community to build AI data centres on the very land they reside on. However, the removal of the community from the picture depicts the lack of approval received by the organisations from the community. This means the position they have acquired is somewhat illegitimate as they are inconsisent with the community and individual values for not taking their concerns into consideration as the legitimacy theory. I further state this notion of acquiring an illegitimate position as it can be presupposed that they have not complied with the various stakeholder's values as the stakeholder theory indicates. In this case, the stakeholder's values are the Arctic communities social dyanmics and the way of living among these AI data centres yet the lack of acknowledgement towards these values by organisations depict further the potentially illegitimate position they have gained.

Alessa, Bielby & Wall also indicate the possibilities of AI generated models aiding policymakers to understand permafrost in the Arctic regions and develop various

technologies to help Arctic communities face environmental threats as this can maintain their quality of life (2022, p. 2). However, they also proved that such potentials have not been "completely proven" as they must "compete with more established and orthodox methodologies". Furthermore, as indicted in the previous paragraph, the deployment of AI data centres has a physical effect on the Arctic lands, which further indicate how they become a hinderance to the lives of the Arctic communities. Alessa, Bielby & Wall stated in their article that the Arctic consists of a population of only around 4 million people and has "global significance due to its strategic geography, exploitable natural resources, and rapid rate of climate and environmental change" (2022, p. 4). This means that the Arctic regions and the small population are vulnerable to corporate exploitation and the construction of AI data centres by these corporations. In an article by Nicol-Schwarz, focusing on Trump's interest in Greenland to build AI data centres, they particularly refer to Noah Ramons, a strategist, who states that permafrost in Greenland are particularly vulnerable as the AI data centres and the heat released from these data centres melts these permafrost, the very permafrost many buildings providing public services as well as homes sit on (2024). This affects the quality of the life of the population as they slowly lose equitable access to various health services and public services etc as well as potentially being compelled to move to a different location all due to AI data centres, which many organisations claim to be sustainable, who should incorporate social sustainability principles.

What is problematic about this is that there is also a lack of transparency around AI data centres therefore communities feel a sense of unfairness and inequality not knowing what is happening yet having to suffer the consequences of the AI data centres. In an article by Garen & Grapevine, focusing on what AI data centres use Iceland's energy for, they referred to a data centre called the "Borealis Data Center" based in the north of Iceland with a population of around 800 people (2025). There is tension showcased by the local communities and experts. Garen & Grapevine refer to expert from the Icelandic conversation organisation, namely Björg Eva Erlendsdóttir, who states, "we don't like that they are building these data centres and using more energy, and we don't know what the data centres are used for" (2025). What can be delineated from this is the evidently clear disapproval towards AI data centres as well as the lack of transparency around these data centres as the communities lack any form of knowledge regarding these AI data centres. This again raises ethical issues as organisations do not follow the societal values of the communities and take on the responsibility to disclose to them about these AI data centres according to the stakeholder theory. What is problematic about this is that organisations, based on the stakeholder theory, are required to disclose information about social, economic and environmental impact of their practices and in this case the implementation of AI data centres, yet the lack of transparency suggests that this is not the case in Iceland. This only creates more confusion within the communities leading to the lack of approval by the communities to build the AI data centres, which many corporations promote as sustainable. Therefore, they most definitely acquire an illegitimate position and I contend that the social factors, particularly the equitable opportunities, are not incorporated through the organisations' practices when constructing the data centres although the legitimacy theories clearly states the need for social principles as well as the economic values to be considered simultaneously.

As well as the lack of transparency, organisations do not seem to meet the expectations of the communities leading to essentially unethical practices. The stakeholder theory portrays the need for organisations to carry out practices in a fair and equitable manner for their stakeholders i.e. the local communities and local agencies and so on however in an article by Easmussen, focusing also on Trump's interest towards Greenland and making investments using it, they state that "Greenlanders have seen a parade of speculators make lofty promises on large investments in their homeland's natural riches – only to later disappoint" (2026). In other words, promises have not been fulfilled. Furthermore, according to Global Data, whom focus on Greenland's potential for holding AI infrastructure in the future, many critics argue that the "soaring power and water demand" caused by AI data centres based in Greenland could have potentially detrimental impacts on the local communities as these demands raise electricity and water prices, which the local Greenlandic communities bear the cost of (2026). This is further supported by Global Data where they stated that "electricity costs for areas situated closer to data centre hubs have increased by considerably more" than normal electricity costs in residential areas in 2025 (2026). On top of electricity costs, Global Data indicated that water consumption will increase drastically where "data centres are expected to need 170% more water by 2030" with residents living near AI data centres bearing the burden of paying for water used by the centres (2026). This can be depicted as an unfair and therefore as an unethical practice on behalf of the organisation although the stakeholder theory clearly indicates the need for organisations to "comply" with the values of stakeholders i.e. the Arctic community and in this case the Greenlandic communities. Yet I propose based on this information that this is not the case.

To further support this argument indicating the lack of promises kept by organisations, an article by Johnson, focusing on AI data centres in Iceland, stated:

> "[…] many hoped that redevelopment would make the plateau more available to Icelanders, more integrated with the coastal communities; it would be the kind of place they could finally use. Stefán explains that "there were huge expectations" for data storage; "people believed it would help the community after the closure of the base." Local media coverage at the time fed into these conversations, echoing the state's faith in a future of IT, and predicting hundreds of high-paying local hires (Víkurfréttir 2009). But almost 10 years later, these hopes have not come to fruition: although some Icelanders have been employed (mostly in construction and security), there are few skilled positions at Arctera to fill. Today, data centers are often run mostly remotely: there is little to attend to every day" (2019, p. 83).

He indicates partciularly the promises by organisations to provide employment opportunities for communities and individuals in Iceland only to be disappointed later as he quotes that AI data centres do not require many people to work at these data centres every day – most likely not even once a week or once a month. According to the stakeholder theory, it is important for organisations to disclose information about the social, economic and environmental impacts of their AI data centres as an important ethical practice, yet from these statements and data I have collected, I argue that organisatoons provide false disclosure about the impacts. This makes the organisations' practices unethical giving them an illegitimate

position, therefore lacking approval by the community to construct AI data centres. I contend that these unethical practices create a inequitable and unfair opportunities, which show that the equity aspect of the social sustainability is not preserved.

Empowerment & Participation

Empowerment and participation as principles of social sustainability can be seen as interconnected principles as I discussed in the contextualisation chapter where both address the importance of community engagement of the local communities and individuals. It is important that the community and the individuals can express their own concerns and solutions regarding projects and practices implemented by organisations and that they are able to independently take action and have control over their own lives if the organisation's practices have any impact on the community and the individuals.

In an article by Guōmundsson, focusing on AI data centres in Iceland, they explain the importance of community engagement which requires the organisations to present themselves as a "trusted brand" that is achieved when around "81 percent of consumers…trust a brand before considering a purchase – the same principle extends to regional decision-making that directly affects the lives of local people" (2025). These effects include supporting "local education, charities and community projects through volunteer support and financial donations", which leads to support and giving training to individuals to work in AI data centres. Providing these opportunities to the local communities gives them a sense of empowerment over their own lives without being hindered by the implementation of AI data centres. Yet while there are such possibilities and these are practices that could be adopted by the various corporations and organisations, the reality is that there appears to be continual lack of approval by the local community to build AI data centres as stated in an article by Nicol-Schwarz, focusing on Greenland, due to the lack of opportunities. Adding on to the lack of approval by the local community in Greenland, an article by Vergara, who also focuses on Greenland, further states, as well Nicol-Schwarz, that organisations planning to construct AI data centres are yet to "secure land" and even apply for a permit despite securing "binding investor commitments to finance half of the center's initial phase of development, and half of the final phase". What is ironic about the last quote is that while organisations may have secured financial investments, they are yet to secure approval from the local communities and local agencies to legally build AI data centres in a sustainable manner as they promote. This correlates well with the legitimacy theory, which as I indicated earlier, connotes the need for organisations to seek approval from the society i.e. the local community to gain a legitimate position and continue their practices if they are consistent with the societal values. However, the lack of approval by the Greenlandic community means that the organisations do not have a legitimate position as well as the legal rights to construct AI data centres. I, therefore, argue that there is a lack of empowerment and participation by the local communities as organisations attempting to implement AI data centres in Greenland seem to be working against the local communities' desires.

Henceforth, the empowerment and participation aspect of social sustainability can be seen as not being preserved.

Accessibility

Accessibility gives local communities equal access to income, work and standard of living as well as equal access to various other services. I dispute that the standard of living aspect is especially crucial in my research. Guōmundsson addresses as a benefit of AI data centres that the heat produced by these centres are reused by the local communities to heat their homes. This is particularly useful in a region with a cold climate almost all year round (2025). Guōmundsson specifically addresses atNorth organisation whom are working with Akureyri municipality in Iceland to, as Guōmundsson states:

> "[…] channel waste heat into a new community-run greenhouse, which will provide a space for schoolchildren to explore ecological farming practices and sustainable food production. These initiatives reduce carbon emissions for both the data center and the receiving organization while addressing specific local needs, such as fresh vegetable production in a country that imports 80 percent of its fresh produce" (2025).

Based on this information, I contend that giving accessibility to waste heat energy improves the standard of living for local communities as they can conserve and save their money by using the wasted heated energy. This is particularly the case during winter seasons when prices for heating can be extortionate.

Yet again, what is problematic about the waste heat energy produced by AI data centres is that they lead to the defrosting of permafrost and cold lands, which many buildings and homes in Greenland and Iceland sit on as I indicated earlier in the social equity section. What this means is that while the wasted heat energy may be a beneficial resource, it becomes pointless if there are no buildings present due to lands being eradicated by the AI data centres. What I mean here is that the heat energy produced by the AI data centres caused the permafrost to change by melting them. Not only does this lead to the dissipation of land but it also leads to loss of freshwater (Alessa, Bielby & Wall, 2022, p. 5). Access to freshwater is crucial for the local community as water "is fundamental to our ability to live" (Gordan, 2024). Yet the possibilities of AI data centres reducing such accessibility is incredibly immense. This puts the local community at a vulnerable position being compelled to migrate to a different location unwillingly for a better quality of life. Social sustainability all about preserving the quality of life of the people too yet I contest that AI data centres are hindering the livelihoods of the local communities leading to the lack of accessibility being preserved within the social sustainability principle.

6.1.2) Economic benefits and threats:

Growth & Development

Economic sustainability is a matter of growth and development of the economy of a state or organisation without hurting the environment. As indicated in the contextualisation chapter, I will therefore be focusing on the following four elements of economic sustainability to understand if organisations implementing AI data centres through sustainable methods

develop their economy without harming the environment. The following elements are: resource efficiency, circular economy, social equity, and innovation. I have already analysed the social equity aspect in the previous section, however to make it clear, social equity falling under economic sustainability particularly focuses on the equitable distribution of economic opportunities where as social equity as a social sustainability principle is the overall need for organisation's to provide fair and equitable opportunities without hindering the livelihoods or quality of life of the local community and individuals.

So the economic benefits of AI data centres in the Arctic regions are that many Nordic regions that cover Arctic territories are "high on indicators such as political stability and absence of the likelihood that the governments will be destabilized or overthrown by unconstitutional or violent means." Such political stability, as quoted by Christensen, Therkelsen, Georgiev and Sand, attracts foreign investments, which is also another reason why many organisations seeks investment in these Arctic regions. As well as the cold environment being an attractive feature for the construction of AI data centres, the political stability provides organisations a sense of security and stability for their AI data centres. However, I argue that this benefit is only favouring organisations and not so much the Arctic community at large. To further prove that AI data centres in Arctic territories are mainly or only in the interest of the organisations, in an article by Adam, focusing on Icelandic data centres, he quotes with reference to Sigríður Mogensen's statement (Director of Intellectual Property and Industry at Samtök iðnaðarins) that "data centres are the pathway through which Iceland can take part in the artificial intelligence race" and "she, [Sigríður Mogensen], believes that by taking steps in this direction it is possible to strengthen Iceland's cooperation with both European countries and the US, in terms of both commercial interest and the country's security interests." Again from these statements, I contest that AI data centres in Arctic regions are constructed in the interest of corporations and the governments with little regard to the Arctic community particularly in Iceland in this case. In fact, an article by Bonthu and Unnthorsson, focusing on data centres in Iceland, they stated:

> "in 2023, even as data centers became the third-largest electricity consumers in the country, their total employment footprint remained well below 1,000 jobs nationally, many which are associated with temporary construction or foreign contractors… data centers, by contrast, often operate with remote management, automated systems, and low operational staffing needs, further reducing their local economic multipliers."

So, the reality of AI data centres, which many organisations promote as sustainable, is that they do not create long-term employment and so long-term economic benefits for the local Icelandic community in the Arctic. What's more interesting is that tourism and fishing industries in Iceland create more long-term labour opportunities compared to AI data centres. With AI data centres taking up large portions of the Arctic land as well as energy, tourism and the fishing industry cannot thrive as AI data centres use the very materials and resources needed by the tourism and fishing industries. This particularly links to the social equity aspect of economic sustainability whereby there is a lack of equitable distribution of economic opportunities and benefits as only organisations seemingly benefit from AI data centres while individuals and local communities suffer the consequences of the

implementation of AI data centres. Correspondingly, this also links well with the stakeholder theory which addresses the ethical importance of stakeholders needing to be treated fairly and equally by organisations and that organisations should be held accountable for their actions. Yet I conceive that that the stakeholders i.e. the local Icelandic are not treated fairly on a financial level, yet organisations do not seem to be held accountable by the Icelandic government who have the power to do so. This is especially the case when AI data centres are implemented on the interest of the corporation and Icelandic government as stated earlier. As a result, I contend that while AI data centres may contribute economically to organisations, there is a lack of economic benefit for the local Arctic community.

6.1.3) Environmental benefits and threats:

Integrity of the eco-system and preserving of the biodiversity

As I stated in the contextualisation chapter, environmental sustainability concerns protecting the eco-system which various practices and materials without being impaired by human activity. The human activity in the case of my project is the construction of AI data centres in the Arctic regions and the effect on the environment particularly in Iceland and Greenland.

Many corporations attempt to seek cold territories to implement their AI data centres in an eco-friendly manner to reduce the impact these data centres have on the environment. Guōmundsson indicated that organisations therefore seek to implement their AI data centres in Arctic regions such as Iceland and Greenland. Iceland in particularly, according to Guōmundsson, is recognised as leaders in clean energy, generating 71% of its power from hydropower energy and 29% from geothermal energy. What this means for AI data centres in Iceland is that they can use these forms of renewable energy with the natural cooling temperatures to achieve energy efficiency without impairing the environment of Iceland. An article by Garen & Grapevine, focusing on data centres in Iceland, further state Icelandic temperatures as an attractive feature for corporations when constructing AI data centres. These temperatures are seemingly stable and have a low probability of fluctuating, which means AI data centres can operate at a lower cost. While these traits of the Arctic regions may seem attractive for corporations to construct AI data centres on, I argue that there is more evidence to suggest the detrimental impacts AI data centres have on the environment despite being adopted through sustainable methods.

Garen & Grapevine refer to AI data centres constructed by the startup corporation called AI Green Bytes whereby these data centres are “submerged in a non-corrosive liquid, eliminating the needs for fans”. This statement can be delineated as ambiguous as the very non-corrosive liquid could be water – non-corrosive liquid meaning a substance that do not cause any damage due to a chemical action with an example of the substance being water (Cambridge Dictionary, 2026). There are many cases on an international level connoting the detrimental impacts of AI data centres on the water system particularly based near residential areas. AI data centres consumer large amounts of water, leading to a decrease in water

availability for residents, causing water scarcity (Gordan, 2024). Furthermore, the water used by AI data centres does not get recycled either meaning many toxic elements and substances from the computers get mixed with the water and remain in the water (Hegde, 2024). This makes the drinking water inedible and harmful. Despite all this, corporations continue to economically benefit from AI data centres while the communities and the environment suffer social, economic and environmental consequences. This links very well with the stakeholder theory where organisations must disclose information about their practices and the effects it has on their stakeholders to determine whether they align with the values and interest of the stakeholders. However, and as indicated earlier, there seems to be a lack of transparency and disclosure of such substantive information by many organisations, which can be considered as an unethical practice. Furthermore, the lack of action taken to align with the values of the stakeholders and these being the residents/local community suggests, according to the legitimacy theory, that the organisations lack any form of legitimate position to implement AI data centres. Yet they seem to ignore all this and continue implementing AI data centres despite the deficits. The water scarcity and contamination impacts the people and the eco-system i.e. the plants and the animals, which I contest is an environmental threat to the Arctic environments as these territories, beginning with Greenland and Iceland, become the future targets of to construct AI data centres.

Earlier, I stated that Iceland is recognised as leaders of clean energy however Bonthu and Unnthorsson found that the use of hydropower dams and geothermal plants to create renewable energy may not be regarded as "green", renewable energy as, and they quote, "their expansion introduces significant environmental trade-offs: hydropower disrupts river ecosystems and alters landscapes, while geothermal exploitation can cause land subsidence and degrade local air quality." Adding on to these quote, Bonthu and Unnthorsson further connotes AI data centres impeding marine eco-systems particularly in "cold, low-energy environments" whereby the "localized warming" caused by the AI data centre creates a rise in temperature, as I indicated earlier regarding the permafrost, which leads to the disruption of "biogeochemical cycles, species settlement patterns, and nutrient fluxes" and detrimental impacts on the North Atlantic seabed. This is the case in Iceland. I also contend that the impacts caused by AI data centres in Greenland is no different to the impact caused by AI data centres in Iceland. This is the case as an article by Expert Minds refer to Greenland facing challenges of "balancing technological growth with environmental and social responsibility" with mining operations posing "risk to the island's fragile ecosystem", which includes melting the very grounds home to many Greenlandic species and communities as indicated by Nicol-Schwarz in his article who refers to Noah Ramons, strategist at investment research firm Alpine Macro.

What is interesting is that it is already a globally known subject that renewable energy is supposedly a better, sustainably, green option compared to non-renewable/fossil energy. Yet when perceiving such an unforeseen information, it may raise uncertainty over the information organisations share with the community when adopting sustainable practices, which again adds on to the lack of transparency by organisations. This again links well with the stakeholder theory whereby the disclosure of information in this case is not accurate and

therefore does not align with the stakeholders' values living in Greenland and Iceland as well as not protecting the environment. As I explained, environmental sustainability is the need to preserve the eco-system without being impaired by human activities yet the implementation of AI data centres can be said to impair the eco-system.

To conclude my findings for this section, I purpose that while there are social, economic and environmental benefits to AI data centres, these benefits are supposedly short-term and impractical. I contend that AI data centres generate more threats than benefits harming the people and the environment while only benefiting the interest of organisations and corporations.

6.2) Do sustainable AI data centres create uneven social, economic and environmental development?

So now that I have identified the social, economic and environmental impacts of AI data centres in Greenland and Iceland, I will be answering the second sub-question which is if AI data centres that claim to be sustainable create uneven social, economic and environmental development. Based on the data I have collected and analysed, I would like to deliberate that AI data centres do create uneven social, economic and environmental development. To understand what I mean by uneven social, economic and environmental development, we will need to refer back to the contextualisation chapter. As I explained, I contend based on various academic scholars and the United Nations that sustainability or sustainable development is plausible when social equity and ecological security is preserved alongside economic interests of the states and organisations. Therefore, the social, economic and environmental factors must be preserved simultaneously for sustainability to work. Because as I denoted, sustainability is not such about the economic benefit of an organisation or the social well-being of humans. It concerns both aspects alongside the health of the eco-system or the environment. By preserving all three aspects, I argue we can all live in peace with access to enough resources to harbour a long-term, healthy life.

In the case of my research, for social well-being and the environment to be preserved on the long-run in the Arctic territories, it is important that organisations implementing AI data centres equal incorporate and embrace all three principles of sustainable – social, economic and environment. However, I am certain based on the data that organisations have failed to incorporate all three principles in their practices.

As I began to discuss the social element of sustainability, it was already transparent that organisations have failed to implement AI data centres in Greenland and Iceland while considering the values and norms of the Greenlandic and Icelandic community. There is a lack of consideration to the very lands they live on and buildings providing public services to the people. What is even more alarming, based on the legitimacy theory, is the lack of approval by the local community for organisations to construct AI data centres. Many organisations have ignored these disapprovals and have continued to adopt their practices, whereby their actions could be regarded as illegal. What is problematic is that this is at

present a prominent issue faced by local communities in the US. Therefore, it is of utmost importance that the Arctic communities, particularly the Greenlandic communities, are accustomed to what AI data centres are and the issues they bring as it has long-term effects on the community.

Adding on to this, as explicitly connoted from the previous section, I also deliberate that organisations fail to also incorporate environmental principles of sustainability into their practices when implementing AI data centres. Despite the lack of consideration towards the social values of the Arctic community in Greenland and Iceland as well as the eco-system in these two Arctic regions, organisations still continue benefit from the AI data centres economically or only seem to favour economic profits over social and environmental benefits. The lack of concern towards the latter reveal the unequal social, economic and environmental sustainable development caused by AI data centres.

7.0) Discussion

In the discussion section, I want to highlight that it may be impossible to halt the use of AI on a global scale and that is an understandable impossibility. However, I posit that AI data centres constructed for generative AI induce more harm on the people and the environment compared to data centres supporting traditional AI, I therefore believe we should all take action on a global scale to reduce the use of generative AI, which leads the reduction of AI data centres running generative AI. Therefore, this section will portray the differences between the two to understand why the impacts I have addressed in the analysis section is caused mainly by AI data centres for generative AI rather than by traditional data centres running traditional AI.

Traditional AI

Traditional AI is more focused on learning from data and making decisions based on those data rather than inventing new solutions (Marr, 2023). Examples of traditional AI that we have been living with for many years is voice assistants such as Siri or Alexa, search engines such as Google or Bing search algorithm and even recommendation engines on Amazon or Netflix (Marr, 2023). These sets of traditional AI have been formed to follow specific set of rules and not establish anything new and essentially utilise human knowledge to solve various issues as well as carry out tasks (Aggarwal et al., 2025). “The rules and knowledge base that the AI system will utilize to make judgements are defined by this expert” (Aggarwal et al., 2025).

Traditional AI are run by traditional data centres and these data centres have “remained consistent” for many years undergoing basic functions such as archiving and retrieving information, supporting emails and websites and various business applications as well as safeguarding data and services and so on (RED, 2026). These data centres produce steady, reliable performance rather than “short bursts of intensive computation” therefore not using up high levels of energy when performing an action (RED, 2026).

Generative AI

Generative AI is more focused on forming new information and almost behaving human-like (Marr, 2023). It generates information based on information you have provided on top of information that is already available and can therefore create new products and various content such as a movie or a piece of art and so on (Marr, 2023). Examples of generative AI include, ChatGPT, Google Gemini.

Generative AI are run by AI data centres that are built to meet the demands of AI generated answers. These demands tend to be heavy and require more energy and power, leading difficulties to manage the energy usage as well as the heating production (RED, 2026).

Differences

While traditional data analyse existing data to make solutions and predictions, generative AI creates new forms of data to provide solutions. What this means is that traditional AI make

decisions and provide solutions by interpreting and analysing existing data to enhance efficiency and decision-making (Office of Communications, 2024). Therefore, traditional AI require only smaller sets of data to operate effectively. On the other hand, generative AI is a matter of generating new pieces of information and so require larger sets of data (Office of Communications, 2024). Adding on to this, there is a difference in transparency between the two (Office of Communications, 2024). Unlike with traditional AI, there is a lack of transparency around generative AI and the information they generate, which presupposes the information generated as unreliable and lacking certainty (Office of Communications, 2024).

What this means in regard to data centres is that traditional AI data centres are essentially for general IT workloads and therefore only consume around 5-15kW (RED, 2026). Therefore, they only require a standard air-cooling system that you find in your computers (CaTECH, 2025). On the other hand, AI data centres requires more power, drawing around 50-100kW or more of energy, more materials to support their heavy equipment, and more natural resources such as liquid i.e. water to manage the overheating as traditional air-based cooling is ineffective and insufficient for generative AI workloads (CaTECH, 2025). What is a substantive distinction between traditional AI and generative AI is that traditional AI do not possess common sense reasoning in their decision-making processes, which means they do not use a lot of power to produce a solution (Aggarwal et al., 2025). But generative AI do possess this quality, which means they require high amounts of computing power to analyse huge sets of data when taking a common sense reasoning approach (Aggarwal et al., 2025).

What this means for the future of the planet and the people is that, it is essential for AI data centres to adopt sustainable practices to reduce the social and environmental impacts. I indicated in the analysis section the number of globally known corporations that presumably adopt sustainable practices when implementing their AI data centres and while there may be studies to suggest that this is plausible, these are only theoretical practices that with problematic physical practicalities. In fact, a report by Joshi denotes this idea that corporations promoting sustainable practices are in fact an AI climate hoax and simply greenwashing (2026). He indicates that corporations promise to take on a sustainable method is their greenwashing tactics to hide the true emission levels of AI data centres, deliver empty promises and empty ambitions (2026, p. 10). Joshi further delineates that traditional AI data centres “are not linked to rapid growth in AI infrastructure today, not to the corresponding climate and environmental impacts” and that the climate impacts are caused by “consumer generative tools” or generative AI “such as Copilot, Gemini or ChatGPT” (2026, p. 4). AI data centres have been proved to utilise more fossil fuels and “cause acute non-climate impacts, such as harming biodiversity or sequestering vast volumes of water in water-stressed regions” (Joshi, 2026, p. 7) Yet it seems many of these corporations deny these global, climate impacts. This is the case as Joshi provides a data outlining how much global emissions corporations emit as a result of their AI data centres compared to how much assume they emit when disclosing information about their sustainable practices:

Google produce around 24 megatons of CO2, however they have claimed to only produce around 12 megatons of CO2.

Amazon produce around 33 megatons of CO2, however they have claimed to only produce around 17 megatons of CO2.
Meta produce around 6 megatons of CO2, however they have claimed to only produce around 0.1 megatons of CO2.
Microsoft produce 25 megatons of CO2, however they have claimed to only produce around 15 megatons of CO2.

(Joshi, 2026, p. 8).

As discussed in the analysis section, there is this continual lack of transparency. Yet it is important to learn what the true statistics are to understand the level of harm AI data centres have on the planet and communities. Henceforth, by explaining the difference between traditional data centres and AI data centres, I hope I have made a clear inference about why I chose to talk about AI data centres in particularly over just normal data centres as AI data centres have an immensely more impact on the people and the environment compared to traditional data centres that we have all lived with for many decades. AI data centres are becoming more extrusive on a global scale, yet I contend not enough is done to mitigate the detrimental impacts of AI data centres. It is therefore important to discuss about AI data centres in the Arctic regions as these territories are steadily becoming vulnerable to AI data centres compared to traditional data centres used for traditional AI.

8.0) Conclusion

To conclude my research, I will be answering my main research question which is: To what extent are AI data centres within the Arctic regions sustainable?

To recap, I will explain what I mean by sustainability in my research. As I delineated, sustainability is the need to preserve long-term social equity and ecological security alongside economic interest of the states and various organisations and corporations. To clarify what this means is that the practices of states and organisations/corporations should not impair or damage the eco-system which includes the plants, the animals and the marine life, and hinder the well-being and livelihoods of the people, so essentially impair how they live everyday. Therefore, I contend that sustainability or sustainable development can be achieved when all these facts are taken into consideration on an equal level. In such manner, I argue it is necessary that the social, economic and environmental factors are interconnected as a result.

Now that I have provided a recap of what sustainability is in my research, I will now answer the research question. From what has been analysed, I conclude that although AI data centres in the Arctic regions presumptively adopt sustainable practices to some extent, the reality is that they still fail to reduce the detrimental impacts it has on the Arctic community in Greenland and Iceland as well as the Arctic environment. This means that the sustainable practices adopted by the corporations to establish more positive sustainable impacts when implementing AI data centres have not been sustainable. This is evidently the case as AI data centres in Greenland and Iceland create negative social and environmental impacts, with economic benefits being advantageous mainly for corporations and organisations and not so much for the communities. The lack of transparency has led to disapprovals by communities to have AI data centres. This has deemed the organisations' practices as unethical for implementing AI data centres despite the disapprovals. Adding on to this, there is a lack of empowerment opportunity and participation by the local communities during the implementation of AI data centres as they are provided insufficient information about AI data centres and as well as their societal values being ignored by the organisations. As a result, the social factor of sustainability is not preserved. This is also the case with economic sustainability as corporations make promises to provide economic opportunities for the local communities yet fail to equitably distribute the economic opportunities. What it is meant by the lack of equitable distribution of economic opportunities is that theoretically organisations and stakeholders affected by the organisations' practices must equitably profit from the practices, yet organisations continue to profit from the AI data centres built in the Arctic regions while stakeholders, i.e. communities, suffer economic consequences. What is important to note here is that the reality of AI data centres as I analysed is that they work mostly remote meaning they do not require human participation on a daily basis. Yet such information is not disclosed to the community and instead they are conveyed false promises that are not upheld, leading to the lack of perseverance of economic sustainability. Ultimately, environmental sustainability is also not preserved as AI data centres immensely impair the eco-system of the Arctic, in Greenland and Iceland.

As the social, economic and environmental sustainability are not preserved, this showcases the lack of interconnectedness between the factors of sustainability and why such inadequacy is problematic for the future of the Arctic regions, not just Greenland and Iceland. I contend that all three factors need to be taken into consideration for there to be positive sustainable development and to therefore preserve the social well-being of the people as well as the health of the eco-system so that the Arctic can keep thriving in the long haul. But the lack of interconnectedness could potentially lead to the Arctic regions becoming more vulnerable to the potentially illegitimate and unsustainable practices of organisations as they construct their AI data centres on these Arctic regions – thus an unpredictable, flourishing future for the Arctic.

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