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Abstrakt (German)

Inmitten des massiven Hypes um KI (Künstliche Intelligenz) und der parallelen Warnungen vor Untergang und Auslöschung hat sich die Welt gemeinsam dem Wettlauf um die Regulierung der KI angeschlossen. Trotz der wachsenden Aufmerksamkeit für die Umweltauswirkungen der KI hat die Europäische Union beschlossen das politische Ziel der Digitalisierung mit den Bestrebungen der grünen Wende zu verknüpfen, und zwar in einer politischen Initiative mit dem Titel „*Twin Transition*". Diese Arbeit befasst sich mit den nationalen KI-Strategien von drei EU-Ländern – Österreich, Frankreich und Irland –, um nachzuverfolgen, wie das Konzept der Nachhaltigkeit in diesen politischen Dokumenten vorgestellt und neu formuliert wird. Die Arbeit konzeptualisiert politische Dokumente als Arenen, in denen narrative Instrumente eingesetzt werden, um *sociotechnical imaginaries* zu verwirklichen und zu stabilisieren. Unter Verwendung praxisorientierter Methoden und thematischer Analysen verfolge ich die Darstellung von Nachhaltigkeit im Zusammenhang mit dem Aufkommen der KI.

Die strategischen Dokumente versuchen einen Ausgleich zwischen den politischen Zielen der EU zu schaffen, als ethischer und nachhaltiger Akteur aufzutreten und gleichzeitig das Ziel zu verfolgen, eine wichtige Rolle im Bereich der KI einzunehmen. Aufgrund der erheblichen negativen ökologischen (und sozialen) Externalitäten lassen sich diese Ziele nicht ohne Weiteres miteinander vereinbaren. Meine Analyse zeigt vier Rahmenbedingungen auf, die es den Ländern ermöglichen, beide Ziele gleichzeitig zu verfolgen. So vermeiden die Dokumente nach Möglichkeit jeglichen Hinweis auf die Umweltauswirkungen der KI und stellen KI stattdessen als Instrument zur Steigerung der Effizienz und zur Anpassung an den Klimawandel dar. In den seltenen Fällen, in denen Umweltauswirkungen erwähnt werden, wird der Begriff „Umwelt" auf den Energieverbrauch und die CO2-Emissionen beschränkt, wodurch der Umfang des Problems eingegrenzt wird. Schließlich stützen sich die nationalen Strategiepapiere auf Annahmen über zukünftige technische und politische Entwicklungen, um die Lösung aktueller Probleme auf die Zukunft zu verschieben und so zu vermeiden, sich jetzt damit befassen zu müssen. Mit Hilfe dieser narrativen Instrumente sind die drei Länder in der Lage, die beiden widersprüchlichen politischen Ziele gleichzeitig zu verfolgen.

Abstract (English)

In the wave of the massive hype surrounding artificial intelligence (AI), as well as the parallel warnings of doom and extinction, the world has collectively joined the race to regulate AI. Despite the growing attention to the environmental impacts of AI, the European Union has decided to tie the political goal of digitalisation to the aspirations of the green transition, in the policy move titled the Twin Transition. This thesis takes a look at the National AI strategies of three EU countries - Austria, France and Ireland to trace how the concept of sustainability is imagined and reframed in these policy documents. I conceptualise policy documents as arenas where narrative tools are used to perform and stabilize sociotechnical imaginaries. Using the methods of practice oriented method and thematic analysis, I trace the framing of sustainability in relation to the advent of AI.

The strategic documents attempt to balance the political projects of the EU of appearing as an ethical and sustainable actor while pursuing the goal of becoming a major AI player. Due to the notable negative environmental (and social) externalities, these goals do not align easily. My analysis reveals four framings which allows the countries to pursue both goals simultaneously. Namely, the documents avoid referencing the environmental impacts of AI wherever possible, instead reframing AI as a tool to increase efficiency and help adapt to climate change. In the rare case that environmental impacts are mentioned, the scope of what is considered the environment is narrowed to energy usage and CO2e emissions - thus narrowing the scope of the problem. Finally, the national strategy documents rely on presumptions of future technical and policy developments to postpone the solution of current problems to the future, avoiding having to deal with them in the now. Using these narrative tools the three countries are able to simultaneously pursue the two conflicting policy goals.

Abstrakt (Estonian)

Tehisintellekti (TI) arengut ümbritseb tohutu elevus (*AI hype*), aga samaaegselt kõlavad hoiatused kaasnevate, kohati eksistentsiaalsete, riskide kohta. Euroopa Liit, paljude riikide kõrval, on liitunud tehisintellekti reguleerimise võidujooksuga. Euroopa Liidu TI strateegilist lähenemist eristab digipöörde ja rohepöörde sidumine üheks poliitiliseks prioriteediks, mida nimetatakse kaksikületeminekuks (*Twin Transition*). Digitehnoloogia märkimisväärse keskkonna jalajälje tõttu on need prioriteedid omavahel suuresti vastuolulised. Seetõttu tekib küsimus, kuidas riiklikes TI-strateegiates neid prioriteete tasakaalustatakse ja kokkusobivaks formuleeritakse.

Käesolev magistritöö uurib Austria, Prantsusmaa ja Iirimaa tehisintellekti ning digitehnoloogiate alaseid strateegiadokumente. Töö uurib nendes kasutatavaid raamistusi ning narratiive, mille abil pisendatakse tehisintellekti (jm digitehnoloogiate) keskkonnamõjusid või juhitakse nendelt tähelepanu kõrvale, võimaldades seeläbi vastuoluliste poliitiliste eesmärkide seadmist. Kolme riigi poliitilisi dokumente käsitletakse töös areenidena, milles kasutatavad narratiivid teostavad ja stabiliseerivad erinevaid sotsiotehnilisi ettekujutusi *(sociotechnical imaginaries)* TI arengust mõjutatud tulevikust. Uurimismeetodina kasutati praktikale orienteeritud meetodit (practice oriented method) ja temaatilist analüüsi. Analüüsi tulemusena ilmnes neli ühist raamistust, mille abil tehisintellekti jätkusuutlikkuse valguses legitimeeritakse.

Esiteks, vaatamata EL-i kaksikülemineku poliitika tunnustamisele, väldivad uuritud liikmesriikide rahvuslikud strateegiad TI keskkonnamõjude süsteemset käsitlemist ning keskenduvad selle asemel teistsugustele riskidele. Teiseks, kuigi vahel keskkonnamõjudele viidates, kitsendatakse probleemi ulatust oluliselt, viidates vaid TI-ga kaasnevale energiakulule ning süsinikuheitele. Kolmandaks rõhutavad uuritud strateegiadokumendid vastupidiselt hoopis TI potentsiaali kliimamuutustega võitlemisel ning jätkusuutlikkuse edendamisel, näiteks süsteemide energiatõhusust parandades. Neljandaks tuginevad rahvuslikud strateegiadokumendid keskkonnamõju probleemide „lahendamisel" tulevikuootuste loomisele. Näiteks väidetakse, et TI keskkonnasõbralikkuse ja energiatõhususe saavutamine on vaid aja küsimus. Tuleviku tehnouuendustele viidates lükatakse aktuaalsete probleemide lahendamine määratlemata tulevikku. Nende narratiivide abil tasakaalustavad Austria, Prantsusmaa ja Iirimaa vastandlikke poliitilisi eesmärke.

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I am in your debt,
Inge Maas

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List of acronyms

AI	Artificial Intelligence
AIG	Artificial Intelligence Governance
CFDT	l'Union confédérale des ingénieurs et cadres adhérents de la Confédération française démocratique du travail
ChatGPT	Chat Generative Pre-Trained Transformer
CNNum	Conseil national du numérique
CO2	Carbon Dioxide
CO2e	Carbon Dioxide equivalent
CSPLA	Conseil supérieur de la propriété littéraire et artistique
DMA	Digital Markets Act
DSA	Digital Services Act
EU	European Union
LLM	Large Language Model
ML	Machine Learning
FLI	Future of Life Institute
GDPR	General Data Protection Regulation
HPC	High Power Computing
INNORES	Innovation Residues
J	Joule
KI (Beirat)	Künstliche Intelligenz
kWh	Kilowatt Hours
OECD	The Organization for Economic Co-operation and Development
PUE	Power Usage Effectiveness
RRI	Responsible Research and Innovation
RTR	Die Rundfunk und Telekom Regulierungs-GmbH
SI	Sociotechnical Imaginaries
UNESCO	United Nations Educational, Scientific and Cultural Organization
QC	Quantum Computing
SA	Sustainability Accounting
SLM	Small Language Model
STS	Science and Technology Studies
SDG	Sustainable Development Goals
X-risk	Existential Risk
xLSTM	Extended Long Short-Term Memory

1 Introduction

Following the launch of ChatGPT on November 30th 2022, AI has quickly generated a lot of buzz. Countries and tech companies are competing to rule the world of AI, with some comparing this innovation race to the arms race of the cold war (Markelius, et al., 2024). The European Union is no exception regarding this aspiration. Over the last years, the EU has released several strategy plans and action plans aiming to make the EU a "world-class hub for AI" and "enhance Europe's competitiveness" by developing data and computing infrastructure and AI related skills among other promises (European Commission,(b)). The EU has taken the lead in regulating the field, releasing the AI Act in July 2024, constituting the first ever legal framework for AI worldwide (Pham & Davies, 2023).

The European Union has also cultivated an image of a champion for sustainability and responsibility in the global political arena. The European Green Deal aims to make Europe into a modern, resource-efficient and competitive economy by aiming to reduce carbon emissions 50% by 2030, reach climate-neutrality by the year 2050 and thus becoming the first climate-neutral continent (European Commission, (a)).

Although it might not seem evident at first glance, the pursuit of these two policy goals generates significant tensions and several points of friction. Digital technologies might leave the impression of immateriality, using terms such as 'cloud service', the reality is starkly different. Digital technologies in fact have vast material environmental footprints (Brevini, 2020). As more and more companies come out with their own chatbots, AI powered solutions, and existing AI systems are continuously fed additional training data to keep up with competitors, these environmental externalities are expected to grow fast (Malmodin & Lundén, 2018). Europe is home to second most data centers (15%), only behind the United States (45%). Energy in Europe is currently considered relatively low-carbon per unit. However, rising energy demands by data centers are likely to necessitate utilising more fossil fuels to meet the growing demand. Recent estimates by a non-profit organisation Beyond Fossil Fuels foresee Europe's energy demands growing by 160% by the end of the decade. In the likely case that fossil fuels are used to meet this demand, carbon emissions associated with European data centers are expected to grow up to 800% (Desmarais, 2026; Joshi, 2026). The problem is illustrated further by the fact that in the European Union advancing energy efficiency and achieving climate neutrality are political priorities (European Commission, 2020; Cowls et al., 2023; Brevini, 2020). However, this is only the tip of the ice berg, the environmental impact of digital technologies is measured as the sum of the externalities across its life-cycle, including but not limited to the pollution and emissions resulting from mining for the raw mineral components required for producing for microchips and other components of the digital devices and data centers, the energy and fresh water used to cool data centers essential for keeping the internet which the technologies depend on running, as well as the impact of discarding the devices at the end of their life (Brevini, 2020; Malmodin & Lundén, 2018).

The advent of AI is expected to significantly increase the environmental externalities compared to prior digital technologies, as AI relies on machine learning (ML) and large language models (LLMs), requiring immense amounts of data and involving a long and laborious training process (Cowls et al., 2023).

In June of 2022 the EU coupled the political priority of the green transition with its "twin" the digital transition, becoming together the twin transition (European Commission, 2022). The twin transition acknowledges the potential for the two priorities to clash, yet emphasises that digital technologies such as AI "ideally" should reinforce each other (European Commission, 2022).

AI indeed has considerable potential to contribute to sustainability efforts, by enhancing for instance the efficiency of the electrical grid and shipping routes, as well as contributing to efforts of prediction and mitigation of climate related effects. In fact several of such solutions have already been started. Due to the ability of AI to process large sets of complex multi-dimensional data, it can be used to make sense of weather patterns, water levels, for example, to forecast the global mean temperature (Cowls et al., 2023). Although AI systems are already being used as a tool for sustainability, and promise further gains as they are scaled up and integrated into additional systems, scientists are calling for development of systematic and accurate measurement of AI's environmental externalities, to make sure that the positive impacts of AI on sustainability outweigh the negative (Cowls et al., 2023).

Therefore, the two political goals, the green transition and becoming a digital AI superpower are not intrinsically cohesive, rather to a large degree incompatible. Thus we are left with the question, how these two priorities are being simultaneously pursued, especially as the EU has gone to the length of formally coupling these two goals under the political project of the Twin Transitions. Specifically, how the discrepancies are acknowledged and addressed in the national AI strategies where the rubber of EU political priorities hit the road, as they are translated into more concrete political steps.

This thesis will contribute to understanding the processes which articulate the wish to achieve both the digital transition and an environmentally sustainable future. I take inspiration from Kristin Asdal and Hilde Reinertsen (2021) in conceptualising the national AI strategy documents as sites where issues are formulated, framed and modified. Furthermore, I also conceptualise documents as tools being worked with, and finally themselves doing work. My research takes interest in how AI is framed in relation to sustainability, and documents are able to use various narrative constructions to guide the reader through the dissonance between the two political priorities, allowing for them to be pursued simultaneously. I analyse not only what the documents include regarding AI in relation to sustainability but what is left out or deprioritised, and how that impacts the framing of AI. Furthermore, I analyse the composition of national AI advisory bodies in each of the three countries, in order to better grasp what kinds of experts are seen as necessary for providing import for strategic AI regulation.

1.1 Overview of the thesis

This thesis aims to unpack the ways in which the framing of AI makes the political project of the Twin Transition pursuable. Meaning how AI is framed generally and in relation to the environment, in order to minimize the discrepancies between the digital transition and the green transition, in order to present the policy objectives as harmonious. Starting from the vantage point of the documents both as sites where work is being done, documents being tools worked with, and documents themselves as having agency and doing work, the thesis analyses seven national artificial intelligence strategy documents from three European countries - Austria, France and Ireland. Furthermore, I analyse the composition of a national AI advisory body for each country. I begin with providing an overview of the literature in the field relevant to the thesis, including outlining the research on the environmental externalities of digital technologies, the literature on AI policy and governance and the role of sociotechnical imaginaries. The research approach chapter presents the research question, and introduces both the methodological and theoretical frameworks. Using the sensitivities of the practice-oriented method and thematic analysis, I trace how the topics of the environment and sustainability appear in the strategy documents, and how the contradictory political goals of the twin transition, the digital transition and the green transition, are balanced in order to facilitate the pursuing of both goals simultaneously. I take into consideration how narratives are used as tools to form issues, reframe and reposition AI in relation to sustainability, and how sometimes this involves omitting the topic altogether or sidelining the issue into the notes or footnotes of the strategy document where it is easier to overlook and thus ignore. I then compare the narrative tools used to balance the topics of AI ambition and sustainability to the compositions of the national artificial intelligence advisory bodies. I look at the main national Artificial Intelligence advisory/expert committees for each of the countries (Austria, France and Ireland), the KI Beirat for Austria, the Conseil National du Numérique for France and the Artificial Intelligence Advisory Council for Ireland. Looking at how these expert committees are assembled, namely what kind of expertise is thought to be essential for advising the strategy of Artificial Intelligence, allows me to further comprehend what kind of issue AI is formulated to be. Examining the professional and academic backgrounds of the experts included in the advisory committees, as well as the overall composition of the AI committees, allows me to deliberate which kinds of expertise are represented and which disciplines are purposefully deprioritised. The empirical chapter presents my analysis and discussion on the composition of the advisory bodies, as well as the four narrative moves commonly used in the strategy documents in order to make the AI ambitions fit the green transition. Finally, I conclude my thesis by connecting my research questions to the results and deliberate on the gravity of the findings.

2 State of the art

2.1 AI governance and policy

AI governance (AIG) started gaining traction globally as a distinct policy concern in the mid-to-late 2010s, when advances in machine learning, big data analytics, and automation began to generate visible societal, economic, and political impacts beyond research and industrial settings (Ulnicane et al., 2022). Whereas earlier discussions of artificial intelligence focused primarily on technical development and innovation policy, the rapid diffusion of AI into domains such as healthcare, finance, security, and public administration exposed risks related to bias, opacity, accountability, and power concentration, prompting calls for dedicated governance frameworks (Floridi et al., 2018). Even before the release, and consequential diffusion of publicly accessible and widely applicable Large Language Models (LLMs) in late 2022, AI had become a topic urgently demanding increased attention and regulation. With scholars stating that not only are companies and countries 'racing' to develop AI systems but also 'racing' to regulate the emerging field (Smuha, 2021). A critical turning point occurred around 2016–2018, when governments and international organizations began to frame AI not only as an innovation opportunity but also as a regulatory and ethical challenge. The first country to release a comprehensive national strategy on AI was Canada in 2017, the Pan-Canadian Artificial Intelligence Strategy, widely recognized as the first comprehensive national AI strategy, was soon followed by similar initiatives in China, the United Kingdom, and the European Union (Smuha, 2021). At the supranational level, organizations such as the OECD and UNESCO advanced principles for responsible and trustworthy AI, signalling a shift from *ad hoc* ethical debates to coordinated policy responses (OECD, 2019; UNESCO, 2021).

Despite being a relatively new field, the rapid diffusion of AI has also translated into steady growth of the field. Academic scholarship during this period increasingly conceptualized AI governance as a response to the misalignment between rapid technological development and slower institutional adaptation. Scholars described a "regulatory lag," where legal and political systems struggled to keep pace with the speed, scale, and complexity of AI deployment (Smuha, 2021). This lag was understood not merely as a technical problem but as a governance challenge involving questions of legitimacy, enforcement capacity, and the distribution of responsibility across public and private actors.

By the late 2010s and early 2020s, discussions around AI governance concerned primarily topics such as risk-based regulation, ethical principles, and hybrid governance arrangements combining state regulation, self-regulation, and soft law instruments (Radu, 2021). The European Union's proposal of the AI Act in 2021 marked a further institutionalization of AI governance as a policy domain, framing AI as a matter of fundamental rights, market regulation, and public trust (Smuha, 2021).

Perry and Uuk (2019) conceptualise AI governance as a multi-level policymaking process spanning global coordination, national governments, and organisational practices. At the global level, they emphasise the importance of international norms and cooperation to address transboundary AI risks and prevent regulatory arbitrage. The rapid advancement and integration of AI across diverse industries have necessitated the emergence of AI governance as a critical global policy concern. This evolution is driven by the complex regulatory landscape that has formed to address compliance challenges and the practical implementation of ethical standards. They further argue that AI governance should be conceptualised as a distinct subfield concerned with policy cycle dynamics, including agenda setting, actor networks, and regulatory instrument choice. Their work underscores that policy decisions about AI are not merely reactive to technological change, but actively shape the direction of innovation and public risk exposure (Perry & Uuk, 2019). Systematic reviews further corroborate the diversity of governance mechanisms, from organisational-level codes of conduct to national AI strategies and international frameworks, revealing that current governance efforts are heavily oriented toward risk management and ethics principles but lack comprehensive integration across stages of technology development and implementation (Batool, Zowghi & Bano 2023; Kim et al., 2025). Although recent years have seen a boom of articles, the field is often described as still being in its infancy, scattered between various disciplines, leading to inefficiencies as well as overlapping definitions (Birkstedt et al., 2023).

However, Perry & Uuk (2019) argue that nation states play a pivotal role, as they are uniquely positioned to translate high-level principles into binding regulation, enforcement mechanisms, and public accountability structures. National governments are seen as critical intermediaries that balance innovation goals with societal risk mitigation, while also coordinating domestic stakeholders across sectors. Perry and Uuk stress that without strong national policy capacity, legal expertise, institutional coordination, and political commitment, global AI principles and organisational ethics initiatives are unlikely to be effective. Consequently, they frame national AI policymaking as the central locus for reducing AI risk through coherent, anticipatory, and enforceable governance. National AI strategies can extend beyond merely declaring objectives and priorities through ethical principles or identifying sectors that may benefit from AI-led innovation. Crucially, they can also address questions of implementation by defining concrete measures for enforcing standards and values, as well as outlining how the necessary capabilities for AI deployment are to be built. Statelevel AI governance further plays an important role in bringing together diverse stakeholders to responsibly develop AI guidelines in accordance with Responsible Research and Innovation (RRI) principles, while also promoting adherence to shared norms and values (Papagiannidis, Mikalef & Conboy, 2025). Analyses of national AI strategies have provided valuable insights into how individual states, as well as supranational actors such as the European Union, design and envision the roles and responsibilities of the state and other stakeholders within hybrid governance arrangements (Radu, 2021).

In addition to the concrete policy proposals for AI, the national strategies include narrative constructions which effectively "talk AI into being". This general narrative approach, where the idea that AI is necessary to integrate society-wide, is a common theme in national AI strategies around the world (Bareis & Katzenbach, 2022). AI presented as the solution, regardless of the question. The multitude of issues associated with the advent of AI are seen as problems to overcome, and not reasons to look elsewhere for a solution (Bareis & Katzenbach, 2022). Furthermore, as AI is uniformly presented as inevitable as well as hugely disruptive technology, partaking in the technology is not questioned. AI strategies differ significantly on the cultural, political, and economic specifics of the country, for instance when it comes to the particularities of shaping future developments and actually integrating AI into society (Bareis & Katzenbach, 2022).

Some scholars argue that governance efforts confined to the national level are insufficient because AI systems and their impacts are inherently cross-border, complex, and technologically dynamic. Recent systematic reviews highlight that current governance frameworks, often shaped by individual states' regulatory traditions, lack unified standards for core ethical principles like transparency and accountability, leaving gaps that cannot be effectively addressed by nation states alone (Batool et al., 2025). This fragmentation raises questions about whether national governance alone can manage cross-border risks, especially as AI ecosystems operate internationally without harmonised legal standards.

A prominent alternative view in the academic literature is that hybrid or multilevel governance frameworks are needed to capture the complexity of AI's societal impacts. Hybridity in this context refers to an understanding of governance as a process of patterned and orderly interactions between various institutions and actors (Radu, 2021). Rather than privileging state hierarchy or market self-regulation alone, hybrid governance reflects how national governments include stakeholders, such as industry representatives, expert groups, and cross-sector networks into AI policy design, often without clear role demarcations (Radu, 2021). According to Radu, such arrangements are not accidental but deliberate choices which enable flexibility, experimentation, and reflexive responses to the uncertain and rapidly evolving nature of AI technologies, even though they complicate accountability mechanisms and regulatory clarity (Radu, 2021). She emphasises that hybrid AI governance thus embodies a pluralistic and non-hierarchical ordering of authority where the 'public' and 'private' co-produce governance outcomes, and traditional regulatory boundaries become permeable in practice (Radu, 2021). This conceptualisation insists that to understand AI governance fully, scholars must look beyond legal texts and consider the sociopolitical processes and actor networks that shape how strategies are articulated, implemented, and institutionalised. Ultimately, national AI strategies reveal not uniform regulatory direction but a negotiated assemblage of goals, ethics principles, and stakeholder roles, illustrating how hybrid governance may satisfy multiple constituent logics while leaving core regulatory functions underdetermined (Radu, 2021).

Other scholars propose multilevel governance models, arguing that effective oversight of AI requires coordinated action across international, national, and organisational levels, supported by distributed tools that can shape behaviour, enforce rules, and adapt to technological change in real time. For example, Pöhler, Diepold & Wallach (2024) argue for governance that maps actors across international, national, and organisational levels and enables evolving tools and enforcement mechanisms to emerge in concert. Additionally, concepts such as democratised hybrid governance propose balancing expertise with public participation, blending technocratic oversight with democratic input to ensure policies reflect social values while retaining technical rigor, an approach, which is explicitly positioned against narrow, nation- centric regulation (Ter-Minassian, 2025).

In broader governance debates, there is also a push for international coordination or global governance regimes, especially for high-risk AI systems whose consequences transcend borders. Some argue that supranational frameworks, such as global conventions and shared standards, are necessary to prevent regulatory fragmentation and ensure more uniform accountability and enforcement. Critics of such global governance note that nation states may be reluctant to cede sovereignty or harmonise across diverse legal systems, underscoring the complexity of balancing state power with transnational governance needs (Coeckelbergh, 2025).

In sum, AI governance emerged as a policy concern when AI systems became infrastructural to society and their impacts could no longer be addressed through innovation policy or ethics alone. Its development reflects broader transformations in how governments seek to govern complex, globally distributed technologies under conditions of uncertainty, rapid change, and contested values. This convergence has stimulated interdisciplinary research investigating not only what policies exist, but how they emerge, whose interests they serve, and what normative frameworks sustain them.

Currently, global jurisdictions are transitioning from voluntary frameworks, such as Japan's human-centric principles, to binding legislative instruments like the EU AI Act (European Commission, 2024). These regulatory efforts aim to mitigate systemic risks, including algorithmic bias, data privacy violations under GDPR, and the "human oversight paradox" Furthermore, the emergence of extraterritorial regulations, such as California's AI laws and the EU's reach, signifies a shift toward a globally interconnected accountability structure. However, the current institutional architecture remains fragmented, creating an "accountability paradox" where single AI decisions may simultaneously violate multiple jurisdictional and domain-specific laws. Consequently, AI governance has moved to the forefront of international policy to harmonize these overlapping controls and ensure the trustworthy deployment of autonomous systems (Kyrychenko, Mudryi & Chaklosh, 2025).

The European Union has pursued a comparatively strict regulatory approach and positioned itself as a global hub for trustworthy and human-centric AI, as well as a moral leader in international geopolitics (Pham & Davies, 2025). Central to this effort is the Artificial Intelligence Act (AI Act), adopted through a multiyear legislative process culminating in provisional agreement in December 2023 and

moving toward phased implementation from 2024 onwards. The AI Act represents the world's first comprehensive horizontal AI regulation, intended to govern the development, deployment, and use of AI systems across the EU's internal market while embedding constitutional values such as human dignity, privacy, and non-discrimination into governance practice (Hulok, 2025; Kim et al., 2025). What distinguishes EU's approach from others, is its risk-based regulatory design, which classifies AI systems according to their potential harms, adjusting requirements proportionally: the higher the risk, the stricter the obligations on providers and developers. This structure aims to balance innovation incentives with protections against unsafe, discriminatory, or rights-infringing AI outcomes. This system attempts to bridge the gap between ethical guidelines and enforceable standards (Hulok 2025). Within this framework, primary responsibility for ensuring compliance is placed on both private companies and the state.

Beyond the Act itself, scholars analyse the broader governance architecture of the EU, emphasising how AI policy intersects with related frameworks such as the GDPR, Data Governance Act, Cyber Resilience Act, and Digital Services Act. This integration seeks to establish a holistic digital governance ecosystem where data protection, cybersecurity, platform accountability, and AI ethics are interconnected. Such an ecosystem is critical in preventing regulatory fragmentation and ensuring coherent enforcement across member states, although it also introduces complexity and requires sophisticated coordination among institutions and enforcement bodies (Kim et al., 2025). Scholars have also applied foresight and expert consensus methods to explore the EU's capacity to govern rapid technological change. In a Policy Delphi study focused on European AI governance, Ojanen and colleagues (2025) highlight key tensions between desirable policy directions such as increasing citizen participation, and what experts perceive as feasible or probable regulatory developments. Suggesting that the key to effective governance is implementation and enforcement capacity, rather than technical specificity of regulation. Furthermore, the study identifies a desirability–probability gap, where desirable policies that might strengthen democratic legitimacy, such as inclusive public engagement, are deemed difficult to realise in practice (Ojanen et al., 2025).

However, high levels of regulation do not come without drawbacks, and the EU has faced substantial criticism in this regard. One frequently cited concern is that stringent regulatory standards may stifle innovation and ultimately undermine international competitiveness (Butcher & Beridze, 2019). Other scholars argue for the benefits of regulation (e.g. Smuha, 2021), while regulation may initially slow innovation and implementation, in the long term, it can strengthen the AI sector. Globally operating companies require international standardization of AI governance. Therefore, if European policymakers take a leading role in shaping such standards, they may be able to gain greater influence over regulatory trajectories. Furthermore, European companies could benefit from an early advantage in compliance, thereby potentially further enhancing competitiveness. As AI systems become increasingly complex and interconnected, and as societal dependency on AI-based solutions deepens, the potential consequences of failure grow accordingly. This dynamic further reinforces the need for

robust global governance of AI (Butcher & Beridze, 2019). Strong regulatory standards are also seen as essential for fostering public trust in AI, which is a prerequisite for the widespread diffusion of the technology. A subfield of Artificial Intelligence Governance focuses on the organisational level, specifically it examines the various rules, tools, solutions, and processes used to influence the deployment of AI-based systems in order to promote more value-oriented and ethical forms of AI within the private sector (Mäntymäki et al., 2022). Research has found that AI governance to date has relied primarily on ethics-oriented guidelines rather than rule-based regulatory systems (Radu, 2021). Furthermore, scholarship has demonstrated a persistent gap between the normative ethical principles articulated in such guidelines and their realization in practice (Hagendorff, 2020; Mäntymäki et al., 2022). This discrepancy has prompted scholars to argue that states can play an important role in bridging this gap through the development and implementation of national AI strategies.

Science and Technology studies (STS) has played a central role in critiquing AI and its governance. Scholars in the field have highlighted knowledge gaps in regard to AI regulation (White & Lidskog, 2022), and the ways in which the usefulness of AI ethics falls short (Munn, 2023). STS offers various conceptual tools to unpack how governance structures are socially constructed, politically negotiated, and mediated through institutional processes. For instance, Ulnicane and colleagues (2021) illustrate how analysing AI policy documents through policy framing and governance concepts reveal differences in governance models and narratives of risk across jurisdictions, revealing that governance frameworks are performative, and do not merely respond to technology but actively construct the problems and solutions that governance will address by privileging certain narratives over others (Ulnicane et al., 2021). Furthermore, STS approaches to AI governance emphasise the sociotechnical nature of AI, meaning that governance cannot be understood solely through technical or legal frameworks but must account for how social values, norms, and expectations are embedded in technological systems. For instance, Oldenburg and Papyshev (2025) examine how competing narratives about AI risk shape governance decisions. They identify three dominant narratives: existential risk proponents, accelerationists, and critical AI scholars. Each articulates distinct visions of desirable futures, diagnoses of present social orders, and conceptions of human agency in shaping AI governance. These sociotechnical imaginaries influence policy by framing AI as an inevitable force or a catastrophic threat, thereby narrowing the space for alternative governance approaches and privileging deterministic narratives in policy deliberations. Their analysis stresses that governance frameworks often reflect underlying cultural assumptions about technology and risk, showing that sociotechnical imaginaries matter in shaping regulatory agendas, political priorities, and institutional designs. Thus, STS perspectives call for governance strategies grounded in pragmatism and reflective engagement with diverse social values rather than speculative or dogmatic visions of AI futures (Oldenburg and Papyshev, 2025). This topic will be discussed further in depth in the following subchapter.

Much has also been written about the risks associated with AI, such as lack of transparency, reproduction of biases, misinformation and hallucinations, unfair distribution of power and wealth and environmental impacts (Pham & Davies, 2025). STS scholarship has further sought to describe and map out the national differences and variations of governance of AI (Schmitt, 2022; Ossewaarde & Gülenç, 2020). One of the variations in AI governance concerns the allocation of governing power. Scholars have contrasted expert-led governance models with more democratic approaches to governance, including variations of participatory and deliberative democratic governance. Historically, technological innovations have been governed by concentrated expert bodies, without major influence from the public. This tendency has been increasingly criticized by scholars, who argue that due to the variety of sectors of society which are impacted by AI, it should be governed in a more democratic fashion (Ter-Minassian, 2025). A balanced governance model has been proposed that emphasizes transparency, diversity, and adaptive regulation in order to ensure that AI governance reflects societal values while maintaining technical rigor (Ter-Minassian, 2025) Within the European Union, the key problem representation in the AI regulation revolve around 'missing out' on AI's technological benefits and AI as a threat to European values. These perceived problems are addressed within the European Commission documents through the policy solutions such as the risk-based categorization, and the 'trustworthy AI' policy discourse. (Pham & Davies, 2025). In this framing, both the potential benefits of AI and the risks it poses to European values are simultaneously mobilized to justify the chosen regulatory approach.

2.2 Expertise and scientific advice in AI governance

STS literature on expertise and expert committees seems to agree that consulting expert committees has become an increasingly common practice in politics (Wynne and Lynch, 2015; Felt et al., 2007). This development is closely associated with wider transformations in the production and use of scientific knowledge, often described through the concepts of Mode 2 science (Gibbons et al., 1994) and Post Normal Science (PNS) (Funtowicz, and Ravetz, 1993). Both frameworks challenge the traditional notion of science as a closed, discipline-bound activity producing certain and universally valid knowledge, instead emphasising uncertainty, contextuality, and the growing importance of transdisciplinarity. Scholars have for example written about the role of scientists and the ways in which scientists are allowed to act as experts (Spruijt et al., 2014). Several typologies have been proposed by different authors, focusing on slightly various aspects, such as modes of interaction between scientists (Pielke, 2007), the different responsibilities and commitments in fostering change (Wittmayer and Schäpke, 2014) or how experts act as knowledge brokers and interact with each other (Turnhout et al., 2013) and differentiating between contributory expertise and interactional expertise (Collins, 2016). One of the lines of research examines the different types of experts that are consulted. Some papers consider particular types of experts and the impact of their expertise, such as: technical experts (Wynne and Lynch, 2015), ethisists and policy experts (Jasanoff, 2006; 2011) and social scientists and humanities representatives (Grundmann, 2017). There have been calls to diversify expert bodies (Lidskog and Sundqvist, 2015; Jasanoff, 2005), particularly by including lay expertise, marginalized voices (Cath et al., 2018) and disciplines often excluded such as sociologists, anthropologists and historians (Grundmann, 2017).

Transdisciplinarity has been promoted in particular as a response to so-called wicked problems, a concept originally developed by Rittel and Webber (1973) to describe policy challenges that are difficult to define, lack definitive solutions, and are characterised by complex interdependencies. Additionally, wicked problems affect multiple stakeholders with conflicting values, such that improvements in one dimension may produce negative consequences in another (Lee, 2023). AI governance is an example of such a wicked problem, such as it spans technical, ethical, economic, legal, and societal domains, making it resistant to purely technical or single-disciplinary solutions (Lee, 2023). Wicked problems have been a common object of study in sustainability research (Lönngren, 2017). Several scholars have questioned the usefulness of the concept of wicked problems (Noordegraaf et al., 2017).

In response to these challenges, transdisciplinary expert committees have increasingly been mobilised to inform policymaking but also enhance political legitimacy (Jasanoff, 1998; Spruijt et al., 2014). However, STS research consistently demonstrates that the relationship between policy and expert advice is far from linear (Wynne & Lynch, 2015). Expert knowledge is neither neutral nor detached from its social context, rather, the work of expert bodies is shaped by political priorities, economic

interests, institutional constraints, and personal or disciplinary commitments. As a result, expertise functions not simply as an input into policymaking but as a negotiated and contested resource.

The findings challenge the idealised model of "Science-for-Policy", which assumes that scientific advice flows directly to inform rational political decision makers. STS scholars (e.g. Funtowicz & Ravetz, 1993) have illustrated that this process is far more complex in reality: policy makers often ignore or bend the recommendations from the experts to align with their preexisting agendas (Collingridge & Reeve, 1986; Jasanoff, 1998). Furthermore, Collingridge and Reeve argue that scientific advice is ignored if it contradicts predetermined policy or in the case of scientific "dissensus" (Collingridge & Reeve, 1986). STS disputes the assumption that science can always deliver a single, definitive truth. Uncertainty is understood as an intrinsic feature of scientific knowledge, particularly in contexts of high stakes and limited empirical evidence, such as emerging technologies. Similarly, STS research has found that experts often disagree not only on the solutions but also on problem definitions, framings, and relevant evidence (Collingridge & Reeve, 1986). There have been several works in the field that aim to open the black box examining how facts are produced, stabilised, and sometimes dismantled when expert opinions clash. Furthermore, scholars have written about who is considered an expert, and the various ways one gathers expertise (Collins, 2018). In the context of AI governance, these insights underscore that scientific advice does not merely inform regulation but actively shapes how risks, responsibilities, and futures of AI are constructed and governed.

STS perspectives on expertise are directly applicable to the governance arrangements surrounding AI expert committees and the European Union's AI Act. The development of the AI Act relied heavily on advisory bodies such as the High-Level Expert Group on Artificial Intelligence (HLEG), which played a central role in defining concepts like trustworthy AI and shaping the ethical and risk-based framing later embedded in legislation (European Commission, 2019). From an STS viewpoint, these expert committees do not merely transmit neutral scientific knowledge but actively participate in problem framing, boundary-setting, and the stabilization of particular policy imaginaries (Wynne & Lynch, 2015). The AI Act's risk-based approach reflects post-normal conditions of high uncertainty and high stakes, where expert disagreement, value conflicts, and incomplete evidence are unavoidable (Funtowicz & Ravetz, 1993). Consistent with STS findings, expert advice within the AI Act process has been selectively translated into policy, balancing ethical ambitions against political feasibility and economic competitiveness. This illustrates how expertise in AI governance functions as a negotiated resource rather than a linear and neutral input, shaping not only regulatory outcomes but also the limits of legitimate debate surrounding AI risks and responsibilities.

One of the central assumptions of STS is the social construction of knowledge. Similarly STS has developed an interest in the social construction of ignorance. Research on willful ignorance, also known as agnotology, has identified tactics through which actors, often industry-aligned, actively obscure risks, delay regulation, or manufacture uncertainty to protect economic interests (Proctor &

Schiebinger, 2008). In the context of AI governance, these dynamics help explain why certain risks remain under-researched or politically sidelined despite growing public concern. In addition to analysing the kinds of science that are produced and the forms of expertise that are mobilised in policymaking, STS and neighbouring fields have also focused on knowledge that is systematically absent, marginalised, or ignored. The study of so-called undone science highlights the norms and values of a society by making visible which questions are considered unworthy of investigation or irrelevant for funding and policy attention (Hess, 2016). Furthermore, systematic absence, low research volume, or suppression of particular topics or findings may result from industrial, political, or strategic interests, rather than epistemic considerations alone (Hilgartner, 2017). The concept of undone science thus points beyond simple underfunding, drawing attention to deeper hierarchies of power, wealth, and institutional priorities that shape research agendas (Kleinman, 2024). This perspective is particularly relevant to AI governance, where extensive resources are devoted to performance optimisation and commercial deployment, while comparatively little attention is paid to long-term social harms, environmental costs, labour impacts, or the experiences of marginalised groups. The study of undone science fits into the broader STS analysis of ignorance.

2.3 Sociotechnical imaginaries of AI and the work that narratives do

In the 20th century the field of AI went through several cycles of AI summers, characterised as periods of time where AI received ample attention and funding. AI summers were intercepted by so-called AI winters, where innovation slowed, and the inability to fulfill the progress promised led to disillusionment and subsequent reduction of funding (Markelius et al., 2024).

Sociotechnical imaginaries (SIs) refer to "*collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology.*" (Jasanoff, 2015) Although, conversations about what futures AI might bring about used to be primarily limited to expert discussions behind closed doors and imaginative descriptions in science fiction, recent developments in the field have also brought these discussions into the mainstream (Bareis, Ackerl & Heil, 2025).

The current dominating narrative is one conceptualising AI as a transformative technology, leading to a global fixation to a higher degree than ever before, which can be described as AI hype, spanning parts of academia, geopolitics and the private sector (Markelius et al., 2024; Cath et al., 2018). Scenarios that can be described by AI hype or sociotechnical optimism, frame AI through narratives of enhanced control, positive transformative potential, innovation leading to economic growth and increase in productivity (Brynjolfsson & McAfee, 2017). AI systems are often presented as holding tremendous potential in countless fields, promising to improve quality of life, reduce risks, speed up disaster recovery and boost economic growth by enhancing productivity and innovation (Büthe et al., 2022; Cath et al., 2018). AI enthusiasts see AI providing solutions to all matters of social issues, from addressing societal inequalities by lowering the barrier of entry and empowering people with reduced mobility or sight, to reducing environmental harm by increasing efficiency of electrical grids. These sociotechnical imaginaries enrapture a wide array of sectors and disciplines. For instance, AI advocates in healthcare tie AI to the future promise of increasingly individualised and preventative healthcare, faster drug discovery and improved diagnostics. AI has also been promoted as a way to reach the UNs Sustainable Development Goals (SDGs), for example by increasing energy efficiency, aiding in flood and general disaster prediction and driving sustainable agriculture. (Vinuesa et al., 2020). AI is also often framed as enhancing human capabilities in creativity, education and accessibility (Schneiderman, 2020), for instance by lowering barriers for entry and democratising access to knowledge. Furthermore, AI is often framed through the lens of geopolitics: becoming a leader in AI and related technology such as microchips, is associated not only with considerable economic gains but also gains in geopolitical relevance as well as soft power. Due to the vast potential benefits of AI highlighted above, governments are incentivised to support policies that lead to more innovation and facilitate uptake and integration of the technology. Such overly optimistic visions of the future powered by AI can be called technosolutionist. Technosolutionism refers to the belief that

problems stemming from complex social phenomena can ultimately be solved by a technological solution (Godin & Vinck, 2017).

Although, AI hype as of now is the dominant narrative, the dust is far from settled. The battle over which imaginaries of the future alongside AI prevail is still very much ongoing. Narratives of AI's potential are continuously challenged by alternative visions of AI's negative consequences. These can be described as visions of undesirable futures. The warnings vary from the bursting of the AI bubble to scenarios of killer robots and human extinction, akin to stories of science fiction (Hudson, Finn & Wylie 2023).

The less extreme versions of an undesirable future stems from the rapid and potentially radical changes to the workplace, and consequently the labour markets, due to the threat of many jobs being partially or wholly replaced by AI powered, "intelligent" machines. Whereas technological innovation has for a long time replaced workers, it has mainly affected lower-skilled or more manual labor. The changes posed by AI are especially striking, as they threaten to replace jobs that require highly skilled workers, such as examining x-ray images or creative endeavours such as writing texts or music. A counternarrative to the claim that AI helps tackle inequality and discrimination by lowering barriers to entry is countered by claims that widespread AI adoption and integration has the potential opposite effects. The field of safety and security is another that is seen as ripe for innovation stemming from the AI revolution, but use of AI is more or less necessitated by the increasingly sophisticated scams and hybrid security threats enabled by AI. For instance, AI based systems enable virtually anyone to generate hyperrealistic images, videos and audio, as well as convincing documents or general false information which can be used to manipulate people for monetary, personal or political gains.

The undesirable visions of the future with AI sometimes involve extreme warnings of AI going rogue leading to robots taking over control, eventually leading to the downfall of humanity (X-risk) (Bareis, Ackerl & Heil, 2025). Despite or perhaps because of the extreme nature of such narratives, they have made it to the mainstream discussions around AI (e.g. Future of Life Institute (FLI) request to press pause for 6 months on AI development or Elon Musk's repeated warnings) (Bareis et al., 2025). However, such narratives have received ample criticism, such as making overly emotional, speculative and sensationalist claims, as well as being so-called "wishful worries", unlikely future scenarios distracting from real problems surrounding AI (Bareis et al., 2025). In addition to the common binary of technosolutionist or technooptimist narratives and doomsday warnings, some scholars have called for a more balanced approach. One that would acknowledge both the possibilities that AI allows for as well as the negative side effects that accompany its arrival. One such approach has been to observe the entanglements of AI and society, one such approach by Felt (unpublished) uses Serres' notion of the parasite to encapsulate these mutual dependencies. This approach acknowledges the ways in which AI exploits human labor and infrastructure, its socioecological harms and its ability to speed up innovation. This approach also brings attention to the two way nature of such a relationship, highlighting how people have come to rely on AI for fulfilling many of their everyday tasks.

Furthermore, Serres' notion of the parasitic relationship is one that is not set in stone but rather has the potential to be rewritten, with the potential that the role of the parasite might in the future instead better describe humans (Felt, unpublished). Attempts to curb the hype around AI have also for example drawn attention to the planetary limits associated with AI as well as its tendency to increase inequality, calling for a more sociotechnically grounded perspective on AI (Markelius et al., 2024).

According to Jasanoff and Kim (2009), the state level plays an essential role in sustaining socio-technical imaginaries, as decisions such as allocating funding, determining developing priorities, and establishing crucial infrastructure, happen at the state level. Others have noted further ways that states shape SIs, such as by assembling institutions that end up defining the potentials and dangers of technologies (Bareis & Katzenbach, 2022). Corresponding to the oscillation between hype and warnings of AI going rogue, competing voices are calling for the increasing and decreasing of regulation in AI (Han et al., 2020). A common example of this is the risk-based approach, laid out in the European AI Act, presents a hierarchy of AI uses and based on the potential for risk, outlaws certain uses of AI, such as social scoring of people. Other less harmful but still risky uses of AI are allowed but more strictly regulated. This helps Europe walk the line between overregulation and underregulation. On one hand Europe sees itself as the regulatory role model for the rest of the world. This phenomenon has been nicknamed the *Brussels effect* (Bradford, 2020), which is similar to the term *California effect* associated with David Vogel. Both of the effects refer to the general tightening of consumer and environmental regulation as a result of stricter regulatory standards in one area (The European Union and the State of California respectively). While these regulatory responses rely heavily on particular narrative constructions, scholars have also examined how such narratives function more broadly as tools of governance.

Bareis and Katzenbach (2022) reveal that AI strategies across the world commonly share a few narrative constructions. These common narrative moves portray the advent of AI as an overwhelmingly positive, and also inevitable change, allocating agency to the technology, and thus away from humans. This adds to the unquestionable image of AI, creating a path dependency. The role of humans is reduced to addressing the negative side effects associated with the AI boom. AI is portrayed to arrive both as a mythical revolutionary break, and a logical continuation to decades of historical excellence simultaneously.

The sense of inevitability and urgency is further strengthened with the help of discourse about global competition, and warnings of threats to those who fall behind. Technodeterminism describes the formulation of AI innovation as an unstoppable force which consequently equates failure to adopt with losing (Markelius et al., 2024). Innovation is linked to social resilience and political power, and considered, in a way, a signifier of civilization itself. AI strategies often go as far as framing access to AI as an essential societal good, that every member of society must have access to. Finally, the strategies claim that without the advancement in AI technology, there is no way to maintain current ways of life, or hope for improvements in the future (Bareis & Katzenbach, 2022). Paradoxically, in

addition to being framed as the only way to maintain the current way of life, AI is also framed as a major transformative force (Markelius et al., 2024).

These narratives serve several purposes. Firstly, governments are able to inform the society, entrepreneurs and other governments of its priorities, funding schemes and governing structures. Strategies also allocate the power between different actors, legitimizing some and delegitimising others. The narratives also help establish the (im)possibilities of discourse, and frame main points of discussion. Agenda setting allows to disguise and avoid uncomfortable topics such as undesirable societal and environmental impacts. By using the narrative tools highlighted above, strategies enable political action, even at less than ideal situations or in the case of less favourable decisions (Bareis & Katzenbach, 2022).

Oldenburg and Papyshev (2025) largely complement and sharpen the arguments found in earlier research rather than contradict them. While earlier studies conceptualise sociotechnical imaginaries primarily as state-anchored visions embedded in policy strategies, Oldenburg and Papyshev extend this perspective by demonstrating how imaginaries also operate as competing narrative coalitions across academia, industry, and public discourse, particularly through divergent framings of AI risk. They add analytical precision by identifying distinct narrative clusters (existential risk, accelerationist, and critical imaginaries), and show how these stories actively constrain governance options by making certain futures appear inevitable while rendering others implausible. In doing so, their article deepens insights by foregrounding the political power of narratives themselves, not only as reflections of state strategies but as contested sites that shape which forms of AI governance come to be seen as legitimate, urgent, or feasible.

AI Ethics and Responsible AI

Another subset of the scholarship focuses on the topic of responsible AI. Responsibility in regards to AI can for example be defined as the “set of practices for developing, deploying, and monitoring AI applications in a safe, trustworthy, and ethical manner that ensures appropriate functionality of AI over the entire lifecycle” (Papagiannidis et al., 2025). In recent years, much attention has been spent on talking about responsible and ethical AI: private companies, research institutions, and various public sector organizations have developed and realised guidelines and principles oriented towards ethical AI (Jobin, Ienca, & Vayena, 2019). This growing emphasis is closely linked to a rising number of publicised cases in which AI-based systems have produced undesirable or discriminatory outcomes, such as banks assigning lower credit scores to female clients through algorithmic decision-making or Amazon’s recruitment algorithm favouring male applicants due to biased historical training data rather than merit-based evaluation (Papagiannidis et al., 2025).

Although there appears to be broad agreement on the desirability of “ethical” or “responsible” AI, the literature repeatedly notes that there is little consensus on what concrete standards, criteria, or

institutional arrangements an AI system must meet in order to qualify as such (Jobin et al., 2019). Several scholars have therefore attempted to map the ethical and regulatory landscape and categorise the variations across sectors and jurisdictions (Bareis & Katzenbach, 2022; Viljanen & Parviainen, 2022; Stratmann et al., 2025). While algorithms and AI are often portrayed as purely mathematical systems that operate beyond human bias or error, research has demonstrated that machine learning systems frequently reproduce and reinforce historical patterns of discrimination embedded in training data. Moreover, processes of black-boxing render algorithmic decision-making opaque and difficult to contest, further complicating accountability (Birhane, 2021).

In response to these findings, AI ethicists have called for algorithmic fairness, which aims to reduce discrimination by diversifying the data sets on which AI is trained as well as fine-tuning specific models in order to improve the fairness of the outcomes (Birhane, 2021). Over time, however, the understanding of ethical AI has shifted from a primarily technical focus on bias mitigation and explainability toward a more holistic perspective that incorporates broader societal and environmental impacts. This broader framing is reflected, for example, in the European Commission's High-Level Expert Group on AI, which defines "trustworthy AI" as AI that is lawful, ethical, and robust, and which explicitly includes accountability, non-discrimination, data protection, technical robustness, safety, human oversight, and social and environmental well-being as core requirements (Papagiannidis et al., 2025). Scholars have critiqued innovation societies, as they tend to foreground the promises of technological progress while rendering the residues innovations leave behind politically invisible. This dynamic is also evident in AI strategies, which emphasize AI's potential contributions to sustainability while largely overlooking the environmental externalities of digital infrastructures (*INNORES | Innovation Residues*, n.d.).

Despite the boom of ethical guidelines, scholars have questioned the extent to which normative principles influence real-world decision-making. This concern has been conceptualised as an "ethics to governance gap," highlighting the limited enforceability of voluntary ethics frameworks and prompting calls for stronger institutional and regulatory mechanisms (Hagendorff, 2020). As an alternative to both technosolutionism and abstract ethical principles, the literature on responsible innovation, often referred to as Responsible Research and Innovation (RRI), has proposed governance frameworks that address the entire lifecycle of research, development, and deployment. RRI aims to integrate responsibility into innovation processes more fundamentally by emphasising anticipation, reflexivity, inclusion, and responsiveness (Stilgoe, Owen, & Macnaghten, 2013). Within this strand of scholarship, researchers distinguish between different stances toward responsibility. These include the deferral of responsibility to future actors, more orthodox approaches to technology assessment, and integrative models of responsible research and innovation that actively shape technological trajectories (Guston, 2014; Sarewitz, 2011). Analytical frameworks further differentiate between the degree to which responsibility is incorporated into governance strategies, the extent to which rights, freedoms,

and legitimate societal interests are safeguarded, and the level of meaningful participation afforded to those affected by technological development (Wilsdon & Willis, 2004).

2.4 Environmental impacts of Big Data and Artificial Intelligence

The environmental effects of digital technologies have been widely discussed in STS, related literature and activism (Lehuedé, 2025; Brevini, 2020). Digital technologies have a discernible environmental footprint at every stage of its life. Lehuedé's *elemental ethics* seeks to pay attention to the elements that AI systems depend on, emphasising instead the our obligation to care more about our communities and the environment (Lehuedé, 2025). Studies focusing on the relationship between AI and the environment, referred to as *sustainable AI.* Scholars have critiqued the field for focusing overly on the development of 'green' AI applications, failing to appropriately acknowledge the environmental impacts of AI itself (Lehuedé, 2025; Brevini, 2020).

Already the sourcing of the materials needed for making digital devices: such as phones, computers but also the microchips found in every other device in the Internet of Things (IoT), puts a considerable burden on the environment (Felt, 2025). There is considerable pollution and exploitation associated with sourcing the various metals and minerals needed to fulfill the ever growing hunger for more and faster devices. Digital technologies use various rare earth metals for their unique magnetic and conductive properties. Rare earths are not rare as their name suggests. However, there is another problem when it comes to their procurement, namely the rare earth metals are often deposited in the earth alongside various elements that can be hazardous to the people who are tasked with mining them, such as arsenic and uranium. (Klinger, 2017). Considering the hazardous nature of mining and its polluting effects on the environment it does not come as a surprise that the mining of these materials is often outsourced to places with less money, power, and laws protecting its workers and the environment (Brodie, 2023). Such as the Chinese hinterland or the Amazon. In STS literature these places are sometimes referred to as frontiers due to the narrative work done to present these places as distant, bare, fit for scientific exploration and civilizational progress (Klinger, 2017).

In addition to the materials used to produce the digital devices themselves, materials are needed to build data centers to keep those devices running and in communication with each other. Data is often talked about as if it were immaterial, for example 'storing pictures in the cloud'. STS literature has focused on the materiality and tangibility of data, for example by observing data centers and undersea cables. By focusing on the materiality of data and data flows it quickly becomes apparent that data centers have environmental footprints far greater than the image held by the public.

The field focusing on the environmental impacts of AI, has been increasingly focusing on water usage (Lehuedé, 2025). Extensive amounts of water is used to cool the data centers, this amount is expected to grow rapidly, as the computational capabilities of AI systems grow. A study by Li and colleagues

estimate that by 2027 the global water use of AI might equate to half of that of the UK (Li et al., 2025). The amount used depends on how much data is processed and where the data center is positioned. A data center in a high temperature location will use more water and energy than one that is located in a cooler location, adding to the water and power hungry data centers that often gobble up the resources at the expense of the local people,

The disposal of digital devices is another way digital technologies impact the environment. Digital devices that are often unlawfully sent to countries unfit to deal with the burdens of recycling the artifacts, ending up polluting the water, soil and people at the dump site (Ádám et al., 2021). The increasing prevalence of AI is expected to translate into a significant increase in e-waste, with initial estimates putting the number around five million tonnes by 2030 (Wang et al., 2024). Estimates vary due to lack of transparency regarding e-waste streams and changing estimates on the average life-span of digital devices (de Vries-Gao, 2026).

The ways in which digital technologies impact the environment mentioned above do not disappear with the AI boom as some over optimistic sources like to claim. Instead, the recent advent of artificial intelligence has further increased the pressure on the environment. The development and training of AI is incredibly data exhaustive, which requires vast amounts of energy. The energy consumption of AI remains high across its life cycle (Brevini, 2021; Brevini, 2020). Scholars have called for the urgent mitigation of the environmental impacts associated with AI, for example by powering data centers with renewable energy, improving energy efficiency of AI systems (Hagendorff, 2024).

Understanding and grasping the impact of digital technologies can be difficult. Recently some researchers have focused on measuring the environmental impacts of AI systems, particularly in terms of carbon emissions, energy use and water consumption. In research papers these impacts are measured and quantified using technical units such as kilowatt-hours (kWh), joules (J), power usage effectiveness (PUE) and carbon dioxide equivalents (CO2e). Researchers such as Lannelongue and colleagues (Lannelongue, Grealey & Inouye, 2020) and Strubell and colleagues (Strubell, Ganesh & Mccallum., 2019) have developed frameworks like the Green Algorithms to measure the environmental footprint associated with the training and deployment of AI systems.

Although these frameworks are useful for scientists to measure and compare the impacts of different models, these numbers can be difficult to interpret for non-specialist audiences, such a s lay people or policy makers. This has led to a trend in which researchers and science communicators translate technical units to more familiar everyday terms. For instance, water usage of a query could be compared to pouring out a bottle of water, energy usage has been compared to running a household item for X amount of seconds. However, AI companies have been rather opaque about realising the numbers regarding computation, perhaps as transparency might open them up to critique. A number of studies argue that AI developers often disclose information only in a partial or inconsistent manner, leaving researchers, policy makers and users without reliable data on the resource demands of AI systems. Researchers have found that as the AI systems grow more complex, the transparency around

the environmental impacts has declined (Luccioni et al., 2025; Brevini, 2020). Although some companies share targeted metrics about energy or water usage per query, this does not include the full extent of the system's impact, leaving out impacts from the supply chain, as well as overhead cooling. By highlighting these selective data points, companies are able to downplay the full environmental footprint. This has led to calls for more standardized, comprehensive and verifiable reporting frameworks to make the life cycle environmental costs visible, and allow for informed use and AI governance. Some researchers have questioned the greenwashing accusations against AI companies, and have instead blamed the specific approach, calling for the acknowledgement of sustainability accounting (SA) as a wicked problem (Letiche & Boucaud, 2024; Gabriel, Pijnenburg & Tekinerdogan, 2026).

2.5 Datafication and the ever growing data body

The contemporary race to develop artificial intelligence is inexplicably tied to the expansion of what scholars describe as the ever growing data body (Felt, 2025; Brevini, 2020). AI systems, especially machine learning (ML) models and large language models (LLMs) require vast amounts of data for training and updating the systems. Thus the accumulation of digital traces has become both a prerequisite and a by-product of AI development. The "feeding" of AI systems is fundamentally data-intensive, and in turn AI reshapes society to continuously generate, prepare, clean and maintain data for algorithmic consumption (Felt, unpublished).

At the core of this process lies *datafication*. Mayer-Schönberger and Cukier define datafication as the transformation of social action into quantified digital data, enabling real-time monitoring and predictive analytics (as cited in van Dijck, 2014). Van Dijck (2014) situates datafication within broader political-economic transformations, where everyday activities, from communication to mobility, are rendered into machine-readable formats. This transformation is closely aligned with *dataism*, understood (Felt, 2025) as an extended trust in data-driven decision-making and the delegation of social authority to public institutions and corporations that collect, analyze, and monetize personal data. In this sense, data and metadata function as a form of currency that individuals exchange for convenience, access, and participation in digital services. Felt, in turn, conceptualizes the data body as the continuously expanding accumulation of digital traces, ranging from consciously curated research datasets to incidental residues of everyday digital life, for instance search histories, and social media interactions (Felt, 2025). Data bodies are by no means incidental nor neutral, these practices are deeply political and value-laden. AI-related visions of innovation and disruptions shape the kinds of data that are collected, what kinds of data are valued and which forms of knowledge are rendered legible (Bowker & Star, 1999; Ruppert, Isin & Bigo 2017; Felt, 2025). Scholars (e.g. Felt, 2025; Barrowman, 2018) emphasize that data is never "raw", rather it is actively produced through classifying, grouping,

labeling and continuously maintained. The upkeep of data infrastructures includes processes such as cleaning the data, annotation, repair, and governance, which often remain invisible.

The demand for ever-expanding data sets are fueled by the scaling logic of contemporary AI. Scholars have been warning about the significant ethical, environmental and social impacts associated with the mindless pursuit of scale, for decades (Bender et al., 2021; Crawford, 2021; Horn & Felt, 2025). Data flows are governed by regulatory frameworks such as the General Data Protection Regulation (GDPR) in Europe, as well as open data policies, further highlighting the political nature of data flows (Kitchin, 2014). AI systems are becoming increasingly hungry as they grow in size and complexity. In parallel, the struggles over access, ownership, and control of the data are also intensifying. In response to data scarcity and data privacy related regulatory concerns, synthetic data has emerged as one of the solutions. This has received considerable backlash, notably due to not appropriately addressing issues such as infrastructural dependencies and reproduction of existing biases embedded in training data.

Keeping the data body "alive" is also materially demanding: data infrastructures require continuous inputs of energy, water, raw materials, and human labor, linking datafication directly to environmental concerns (Lehuedé, 2025). With the diffusion of AI across sectors, the scale of data maintenance expands exponentially, amplifying resource extraction and infrastructural strain. Recognizing data bodies as socio-technical, political, and ecological assemblages is therefore crucial for understanding the long-term implications of AI-driven datafication and for rethinking governance beyond purely technical solutions (Ter-Minassian, 2025).

3 Research approach[1]

3.1 Research question

Following decades of alternating AI hype and loss of interest, the technology is now available to the masses. Those cycles have also led to the formation of socio-technical imaginaries speaking to both extremes: the near-magical ability of AI to solve every problem ailing society, from climate change to medical revelations, to the stark contrast of fears of the end of humanity brought on by a run-away technology. In the past few years, the world has seen a *quasi* race for the governance of AI. From international organisations to individual nation states to the regional level. Furthermore due to the countless applications that AI systems are accredited with, this governance has not only been multilevel but also interdisciplinary.

AI strategy documents such as white paper, roadmaps and governance frameworks do more than just respond to the problems arising from developments in the field, they also shape it. Governing AI involves deciding on issue formations - what counts as a problem, as well as what constitutes an appropriate solution, painting a picture of a desired future. Furthermore, governance texts assign responsibility and diffuse accountability.

On the other hand, environmental research adds another pressure point: AI systems have a considerable environmental footprint across their life cycle, from extraction, to fabrication to training, deployment and finally disposal, constituting considerable material and societal consequences. Yet, the reporting of these environmental impacts by industry is often fragmented, selective and difficult to verify. Furthermore, under banners like the “Twin Transition,” national AI strategies promise to put AI in the service of the environment, helping to solve the climate crises or at least tackle the difficulties arising from climate change. These strategies often present a rather narrow image or the "environment”, operationalising it purely via CO2 emissions or energy expenditure, sidelining impacts of resource extraction, water used for cooling, e-waste and other transboundary externalities.

This thesis takes this point of tension as a starting point, and asks *How do national AI strategies (re)imagine sustainability?* Rather than taking the claim of sustainable AI at face value, I treat national strategy documents as sites where sustainability as a concept is defined, delimited, and instrumentalised. My inquiry is further organized into two subquestions. Firstly, *How are environmental concerns addressed in national AI strategies?* Specifically, I examine which externalities the documents acknowledge, such as which life cycles of the AI systems are taken into considerations, how gaps in evidence are handled, and where environmental risks and impacts are prioritised and where minimized or deferred. Additionally, I look at the composition of national AI

[1] I developed and reformulated my research approach within the course of “Analysing and Reporting Qualitative Data” (233050). Subsequently, there is notable overlap between the corresponding seminar paper and parts of my thesis. In particular the research questions, research approach and empirical chapter.

advisory bodies, analysing what kinds of experts are represented and which kinds of expertise are sidelined. Secondly I ask, *How do the strategic documents portray AI as a tool for sustainability?* Meaning, I will analyse the promises, metaphors, and policy devices that position AI as indispensable for sustainability and ecology related goals, such as how narratives are used to reconcile the expansion of AI with sustainability and climate commitments. I address these questions based on empirical materials from Austria, France and Ireland. These three countries are the subject of research of the INNORES project, my specific interest in understanding the ways that these three contexts are similar and in which ways they differ.

3.2 Methodological approach

As outlined in the Research Question chapter, the goal of this thesis is to understand how the relationship between AI and the environment is portrayed and negotiated in national AI strategic documents in Austria, France and Ireland. I also analyse the compositions of AI expert bodies, to further grasp which topics and consequently what kinds of expertise are deemed relevant in national level AI governance in each of the countries. My analysis is informed by the practice-oriented method described by Kristin Asdal and Hilde Reinersten in 2022, especially in regards to my conceptualisation of documents as analytically rich sources providing a valuable insight into how issues are introduced and formulated. Additionally, I utilise the method of thematic analysis as described by Virginia Braun and Victoria Clarke first in 2006 and later in 2021. The combination of the methods allows me to analyse the documents, both the national AI strategies and the descriptions of the compositions of the AI expert committees, as having active agency and participating in helping to depict and subsequently constitute particular realities, rather than just acting as mere containers for content (Pham & Davies, 2025).

3.2.1 Practice-oriented method

I use the Practice-Oriented Method as the first of my two methods guiding my analysis of the seven AI strategy documents analyzed in this thesis (Asdal & Reinersten, 2022). My approach is guided by the insights provided by Kristin Asdal and Hilde Reinertsen in the 2022 book “Doing Document Analysis: A Practice-Oriented Method”. The book introduces a novel framework for doing document analysis by employing a practice-oriented method. In addition to seeing the document as text, this method allows me to more deeply explore the documents, and the hidden power struggles that they entail (Asdal & Reinertsen, 2022). The authors understand documents as being parts of larger sites, such as parliaments or archives, they describe documents often playing a part in both producing the sites themselves as well as facilitating the work that they do. The documents themselves are considered sites that can be analysed by doing what they call document ethnography (Asdal & Reinertsen, 2022).

This method aligns closely with the aims of my thesis. I am unable to access and thus analyse the closed negotiation processes that shaped the national AI strategies via traditional ethnographic methods, nor am I able to conduct interviews with the responsible experts to the necessary extent needed to draw salient conclusions. Thus, document analysis and document ethnography enable me to trace signs of negotiation, conflict and grand visions as they are materialized in the documents, offering a glimpse of the political processes behind closed doors (Asdal & Reinertsen, 2022).

An important step in a practice-oriented approach is clarifying the authorship and audience of a particular document (Asdal & Reinertsen, 2022). I examine whom each of the documents addresses as its intended public, which is generally indicated in the foreword or introduction of a particular document. Where necessary, the audience can also be deduced via other sources, such as governmental websites, as well the general style and voice of the text (Asdal & Reinertsen, 2022). The authors of the document could usually also be found on the first pages of the document, at times, additional background research was required to understand the reasoning for why they were chosen, and the kind of expertise they would be contributing to the document. Another detail to note, is the (government) organization that has ordered or commissioned the report, which can signal the document's purpose, mandate, institutional positions and intended trajectory.

The analysis according to Asdal and Reinertsen extends beyond the text, including textual devices such as the structure, authority, credibility and meaning (Asdal & Reinertsen, 2022). For instance, I attend to details such as the visual layout, colours, graphical elements, templates and forms, the architecture of specific sections and the placement of certain types of information in either the main body of text versus the footnotes or appendix (Asdal & Reinertsen, 2022). Numerical devices such as tables, figures, estimates and counts, often present themselves as scientific and thus neutral and objective "hard numbers", however, the way they are represented, including what reality they are said to 'prove' warrants scrutiny. Thus, I have examined the handling of uncertainty and conflict, and how quantitative numerical devices are presented among narrative claims to present credibility, legitimacy and urgency. I've found it relevant to not only analyse what can be found in the main body of the text but also critically examine what has been pushed to the margins of the documents or has been left out all together, considering how these editorial choices have shaped the document's framing of what the problems regarding AI are, what solutions are viable and which trade-off do they introduce.

I adopt a hermeneutic approach to interpret how the documents tell their stories, the ways in which arguments are structured, risks and promises are framed and conflicting ideas are managed (Asdal & Reinertsen, 2022). For example, I will analyse how the AI strategy documents present the promises and perils of the spread of this technology, which of the problems are foregrounded and which are brushed aside, how they convey urgency, and how external expertise is utilized to signal authority. The language and style are central to practice-oriented methods, for instance examining prior assumptions of the document, choice of wording, whether they seek to persuade the reader or simply present their

version of the truth, as well as the document relies on active or passive constructions, that indicate the haves and have-nots of agency (Asdal & Reinertsen, 2022).

Another one of the core concepts of the Practice-Oriented method is the document issue. Drawing on issue formation scholarship, this concept aims to show how documents not only reflect reality but also actively shape it, by actively formatting, establishing and reaffirming issues, constructing arguments and presenting as well as excluding alternatives to action (Marres, 2007; Marres, 2014). For instance, documents can form issues or transform them into non-issues, converting controversial matters into routine cases not warranting particular attention, naturalizing them and turning them into fact.

In my analysis I ask: what are the issues articulated in each document? What is at stake? How do issues emerge, evolve, and change? And who is included or excluded in their formulation? Using this lens helps me reveal how AI policy documents shape the debate around the relationship of AI and the environment by defining problems, bounding solutions, and allocating authority.

Document ethnography, as used here is useful as it does not require my physical presence at the organizational sites. Rather I was able to follow the documents across locations, through websites, related publications as well as one informative interview, allowing me to reconstruct the work that these materials do (Asdal & Reinertsen, 2022).

3.2.2 Thematic analysis

In addition to the practice-oriented method, my methodological approach is shaped by thematic analysis as described by Clarke & Braun in 2006. Thematic analysis is a flexible method especially suited for identifying and interpreting patterned meaning across qualitative materials. It is often described as a tool that can be used across different types of methods (Braun &Clarke, 2006). As the materials for my thesis include both documents in the traditional sense as well as websites outlining the backgrounds of experts included in the advisory committees, such a flexible approach is particularly well suited for the analysis. However, the flexibility is both its strength as well as a source of critique, as in the absence of strict rules, the method can appear too vague or “anything goes.” A rigorous application of the method therefore requires clarity about analytic choices and transparency regarding the positionality and agency as the researcher. Any theoretical framework or methodological approach carries certain assumptions about the nature of data and what they represent about “the world” or “reality”, according to Braun & Clarke what separates a good thematic analysis from a bad one is the commitment to make these assumptions explicit (Braun & Clarke, 2006).

The methodological approach of my thesis consists of two parts. The thematic analysis compliments the practice-oriented method of document analysis. The practice-oriented method (Asdal & Reinertsen, 2022) treats documents as sites that do work, constituting and inhibiting larger arenas such as parliaments and archives, allowing the researcher to discover the power relations and issue formations embedded within. Thematic analysis adds to this approach by allowing for a systematic yet

flexible search across the dataset or various documents and websites for repeated patterns of meaning. Where the practice-oriented method approach helps reveal negotiation, conflict and "grand visions", thematic analysis helps the researcher trace the way these visions and conflicts recur, diverge and become patterns across the data corpus. In short the combination of the methods helps me to attend to both what the documents do and how patterned meanings travel across texts.

Thematic analysis involves finding or perhaps more precisely assembling patterns of meaning or themes in and across the documents. A theme is border than codes, capturing something about the data in relation to the research question. Frequency alone does not determine the importance of a particular theme. (Braun & Clarke, 2006). Analytically, my approach resembled an inductive approach, meaning I developed the themes based on patterns found from the documents, instead of trying to fit the findings into preexisting frames. Braun and Clarke also acknowledge that the analytical process is never as straightforward as most scholarship would suggest, and that researchers can never fully free themselves of their theoretical and epistemological commitments, therefore no approach is ever fully "inductive" or "data-driven."

My analysis followed the six-phase framework laid out by Braun and Clarke. Although the structure of the framework is relatively straightforward, the process actually includes many iterations and moving back and forth through the entire data set and between the steps of the framework. The writing occurs in parallel to coding rather than after the fact. The process moves from description of the content, to organising the content to find patterns, to interpreting the significance and broader implications. The first step of the framework involves familiarising oneself thoroughly with the data. I actively read each of the documents, while searching for meanings and patterns. In parallel to this process I started writing notes in the form of memos of the patterns I noticed, these memos were written, rewritten and renamed multiple times during the analytic process. This is followed by generating initial codes. This step involves determining the most basic segments or codes, and organizing them in order to be assessed in a meaningful way. The method encourages the researcher to embrace contradictions, and to code for as many potential patterns as time permits. It is also important to code in a way that takes note of the surrounding context (Braun & Clarke, 2006). I attempted to attend to both the implicit mentions of environmental concerns as well as notable omissions and inconsistencies. The following step involved searching for or establishing themes. This was a rather iterative process, involving collecting all of the codes for the various documents, using alphabetized lists and visual representations, as well as the memos I wrote, to aid the process along. Furthermore, I found it helpful to try to explain my findings to a friend and use an AI system to help me find alternative ways to group my codes. Achieving internal coherence and external distinction within the themes required more back-and-forth than I originally anticipated (Braun & Clarke, 2006). The next step is reviewing and refining candidate themes, such as splitting themes and dropping those without sufficient data, as well as assessing the validity of the themes regarding the entire data set. The next formal step is to define and name themes, although I found it more fruitful to continuously do so. This involves identifying the "essence" of each

theme. I followed the advice of Braun and Clarke to name the themes in a "punchy" way that would immediately reveal the meaning of the theme. In the case of particularly large or complex themes, I found it helpful to divide the themes into sub-themes. The final step in the framework is writing the report of the findings, although I have been writing throughout the process. Even during the final steps of writing, I would refer back to the documents in order to check the validity and context of my claims. The report goes beyond description, instead attempting to make an argument regarding the research questions. The report also interrogates the underpinning assumptions of the documents, its implications as well as the conditions that may have given rise to the themes. Braun and Clarke encourage one to go beyond "the surface" of the data (Braun & Clarke, 2006).

3.2.3 Analysis on the expert bodies

The analysis of the expert bodies largely followed the same sensibilities, taking into consideration the structural differences in the source documents. The coding process started with finding the updated membership lists from each of the respective websites of the national AI committees, and thoroughly familiarising myself with the data. For instance, I found that the membership had changed in Ireland with a call for additional expertise. Each member then needed a short summary, describing the kind of expertise they would be able to provide in the committee, based on their academic and professional backgrounds. In the cases of Austria and Ireland, a summary with notable academic and professional experience was already included on the website of the committee. The French website only included a list of the experts, which I added a similar summary to based on what could be found about the members online. I relied on the information provided on the member's LinkedIn profiles, in case the LinkedIn profile was not sufficient, i.e had not been updated in a long time, had not been filled in fully, I used university or company websites to supplement missing information. Once the updated board member lists were all in one document, I started the coding process. Initially I would find one or several fields that would describe the members' experience and the expertise that they would likely provide in the committee, using those as my codes. Each of the members are experts in artificial intelligence and an intersecting field. After the initial identification of the types of expertise present they were grouped. I found it interesting to compare the representation of one type of expert to others, for example finding out that there tends to be an overrepresentation of a particular type of expertise. After analysing each of the committees separately, I also reflect on how they compare to one another.

It was rather difficult to decide how to code a lot of the experiences. I tried two methods, one resembling a more inductive approach of looking at the summaries, and trying to code the types of experiences that were highlighted there. I found this somewhat difficult, as many of the experiences are quite interdisciplinary, or abstract. Certain positions could require knowledge and expertise that is difficult to determine from the outside. Therefore, even though I had decided that experts can represent multiple types of expertise, it was challenging to decide where to draw the lines and where to allocate

a separate category for an intersection of disciplines. The second approach I tried was more deductive, namely I tried to find how the expert bodies themselves describe the variety of expertise that the committee represents. The websites provided a short description of the expert body which included a very general description of the types of experts included, for example the website for the Irish council described the experts representing “experience and expertise from academia, business, law, security, social sciences, economics and civil society” (Membership of the AI Advisory Council, 2025). The Austrian KI Beirat described the members as representing ethics, research, economics as well as the legal and technical fields (Die Mitglieder des KI-Beirats, 2024). The french committee on Artificial intelligence described its members to represent the cultural, economic, technological, and research sectors (Comité de l'intelligence artificielle générative, 2023). I took these descriptions and deducted a list, which can be seen below. It was somewhat difficult to determine for example if ethics and social sciences should be coded the same or separately, or where to place the expert category listed in the French description. I included the category of others in order to leave room for any experiences that do not fit these strict categories. Ultimately, I once again found that the most effective analytic tool is writing. By assembling memos and trying to make sense of the descriptions and constructions of the committees, I was eventually able to construct an interpretation that felt authentic to the materials.

3.2.4 Background research

During the summer of 2024, I worked as a dossier for the INNORES project. My work involved collecting, reading and summarizing different policy documents such as white papers, recommendations, strategies and communications. I mainly worked with documents from the countries of Austria, France and Ireland but also analysed some documents from international organizations such as the European Union, UNESCO and the OECD. This process ultimately informed my document selection for the thesis, as I searched websites for each of the countries, reading through all of the AI regulatory documents. To find the documents I looked through the websites of AI affiliated institutions of a given country. While reading each document I kept an eye out for any documents referred to and included them on my reading list. Finally, I also used NGOs such as OECDs AI watch to double check that I had not missed any important documents.

My prior research allowed me to select the documents for each country that were most relevant to analyze, for example I prioritized documents that were general rather than ones that addressed a specific area like education. The length and contents also indicated importance, with longer more substantive documents being more likely to be chosen. Finally, if a follow-up or update document followed any of the original publications that also indicated the importance of the document. I ended up including seven documents in the analysis, three from Austria, two from France and Ireland each (Table 1). The table below (p.39-41) includes an access link to each document or the website where

the document is embedded, as well as a description and a justification for why I have chosen to include each document in my empirical work.

3.3 National particularities of the Austrian, French and Irish AI regulation

The regulatory landscape in each of the three countries share considerable similarities. Perhaps most notably they are all derivatives of the EU AI Act, and therefore cannot divulge from core European commitments. For instance, the use the risk-based framework for accessing risk: a framework which prohibits certain uses of AI deemed especially risky such as biometric surveillance, and subjects high risk systems to stricter oversight. The national AI strategies must also adhere to other EU regulations, such as the GDPR for data protection or DSA and DMA for shaping online platforms.

All three countries, Austria, France and Ireland, share a recognition that AI requires proactive governance, and thus have released individual national AI strategies. Further commonalities include reliance on expert/advisory bodies, which aim to translate technical evidence into informed policy, and the tension between promoting competitiveness and digital sovereignty, while protecting public goods, such as data privacy, energy security, and fundamental rights (European Commission, 2024). Each of the three countries is also shaped by national discretion, based on its national history, political climate and priorities as well as their current and prospective economic situation.

Austria's policy style can be described as pragmatic and centred on coordination, monitoring and stakeholder engagement rather than unilateral industrial policy moves (Digital Austria; KI-Beirat info, 2023–24). For instance, Austria puts an emphasis on coordination and capacity building through inter-ministerial forums and a formal AI Advisory Board (KI-Beirat) which is linked to a national AI service desk.

France's approach, on the other hand, at times comes across as more of an activist state strategy, with strong normative claims about technological sovereignty and focus on public infrastructure, such as computing power and data access (Conseil de l'intelligence artificielle). The high-profile national roadmaps and advisory bodies explicitly tie AI policy to the national industrial strategy and rights-based evaluation infrastructures (French government, "Our Ambition for France", 2024).

The Irish approach reflects the country's attempt to balance industry facilitation with the urgent energy grid related infrastructural limits, which complicate the laissez-faire innovation rhetoric (Daly, 2024). Ireland, therefore, frames AI governance through an innovation-friendly lens shaped by the significant presence of multinational technology companies. In order to enable and speed up innovation, the AI Advisory Council emphasizes the importance of developing AI skills and expertise, securing a trustworthy nation-wide deployment and uptake as well as enabling conditions for industry. These ambitions, however, must be balanced with infrastructural realities, such as the datacentre boom and its notable impacts on the already overburdened energy infrastructure, as well as the climate (Ireland AI Advisory Council, 2025; Daly, 2024). The empirical chapter will discuss each of the national AI

strategies in further detail, as well as reveal particularities of the expert bodies participating in shaping the approach to AI related political priorities.

3.4 Document selection

In this thesis I analyze in total seven policy documents outlining the national AI policy strategies for Austria, France and Ireland. This selection does not claim to represent the complete picture of the national strategies of the three countries, nor attempt to provide a systemic comparative analysis of the three. Instead the selection of documents should be described more as an informed probe into the AI strategies of three EU member states. Aiming to trace some of the narratives that can be found in AI strategies on the nation state level. Furthermore, the comparison between the documents is designed to highlight the similarities and differences between documents from different years and different countries. My empirical chapter also includes a summary and analysis of the most important AI expert body for each of the three countries, as well as a description of their involvement in shaping the national AI strategy.

For Austria I ended up analysing more documents than for the other countries. In addition to the national AI strategy and its update also a document describing the practical and ethical guidelines for digital administration. This document allows me to probe for potential differences in framings between documents intended for different target audiences and fits the wider logic behind my document selection, as I explore various strategic documents for differing narratives, rather than conduct a systematic comparative overview between the three countries. The initial national strategy came out in 2021 (Strategy of the Federal Ministry for Artificial Intelligence (Strategie der Bundesregierung für Künstliche Intelligenz) and was refreshed in 2024 (Strategy for the Federal Government for Artificial Intelligence Implementation Plan (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024)), finally, the practical guidelines for applying digital technologies was released in 2023 (Practical Guide to Digital Administration and Ethics (Praxisleitfaden „Digitale Verwaltung und Ethik“)). As Austria did not have the same documents available in English, I used translation software such as Google Translate and DeepL to help me translate the documents. Additionally, my knowledge of German is sufficient for understanding the documents for the most part.

For the French strategy documents, I had the choice of picking between the French or the English language versions of the documents. During the initial stages of the analysis I did in fact read through both versions, using translation programmes such as Google Translate and DeepL to supplement my limited knowledge of the French language. After careful consideration, I chose to work with the official English versions for the extended empirical process. This decision was made for several reasons. First, while I reviewed both the French and English versions, I found the official translation to closely align with my initial DeepL-assisted translation. Second, analyzing the English version minimizes the risk of misinterpretation due to my limited proficiency in French. Finally, the official

English version is still considered an official communication on behalf of France, whereas when I translate the document it would go through an additional step of interpretation. The data body for France consisted of two documents: “the Roadmap on Digital Technology and the Environment - 50 measures for a national and European agenda on responsible digital technology” (Feuille de route sur l'environnement et le numérique) published in 2020 and AI: Our Ambition for France” (IA: NOTRE AMBITION POUR LA FRANCE) published in 2024.

For the Irish strategy documents, I analysed two documents: AI - Here for Good: A National Artificial Intelligence Strategy for Ireland (2021) as well as the updated version Ireland’s National AI Strategy (2024 refresh). The Irish document selection was perhaps the most straightforward, both in terms of the original document being released in English as well as the two documents constituting the initial and updated national AI strategies. During the desk research phase, I identified various other documents discussing AI. However, I decided to limit the scope of the documents considered to strategy documents which deal with a broad spectrum of topics. The two documents that fit this criteria were analysed as part of the thesis.

Table 1 (Document selection).

	Document name and link	Aim and authors
AT (2021)	Strategy of the Federal Ministry for Artificial Intelligence (Strategie der Bundesregierung für Künstliche Intelligenz)	**Aim of the document** Lays out the strategy for governing AI, that is already said to be present in our lives. The aim of the document is to ensure compliance with EU level regulation and that AI is used for good. Mainly focuses on societal benefits, leadership in AI innovation and ensuring economic competitiveness in the field of AI. **Authors** The strategy is the result of a broad stakeholder process in which over 160 experts from various disciplines were involved. Coordination with the various disciplines, departments involved, companies and the involvement of the general public will also be the heart of the AIM AT 2030 in its implementation. The Austrian strategy for AI was published by the Federal Ministry of Climate protection, Environment, Energy, Mobility, innovation and Technology (BMK) and by the Federal Ministry of Digital and Economic Affairs (BMDW).
AT (2023)	Practical Guide to Digital Administration and Ethics (Praxisleitfaden „Digitale Verwaltung und Ethik“)	**Aim of the document** The document aims to guide public servants in the planning, design, creation, use and evaluation of digital, but especially AI-based applications. It further extends its aim to the public affected by administrative action. The document is mainly concerned with the societal effects of AI. The document contains introductions to various subject areas, recommendations for procedures, a set of criteria and measures for ethical and legal discussions, as

		well as a checklist for AI applications. **Authors** PD Dr. Peter Biegelbauer (project manager), Caroline Lackinger, BA, Dr. Sven Schlarb, Edgar Subak, BA, Pia Weinlinger, MA. The ministry associated with the document is BMKÖS (The ministry for Art, Culture, Public Service and Sport).
AT (2024)	Strategy for the Federal Government for Artificial Intelligence Implementation Plan (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024)	**Aim of the document** The AI strategy from 2021 is defined as an agile strategy. This implementation plan is to be understood not only as a first interim report, but also as a substantive supplement to AIM AT 2030. The implementation plan provides an overview of 47 measures from all twelve federal ministries that are already being implemented or are currently being planned as part of the AI strategy for the period from 2024. Further operationalises the priorities outlined in the 2021 document by assigning concrete tasks for ministries. **Authors** The role of the 11 members of the AI advisory board is to revise the initial document for the release of the revised version in 2024. The ministry associated with the document, the media owner, publisher and editor is the Federal Ministry for Climate protection, Environment, Energy, Mobility, Innovation and Transport (BMK).
FR (2020)	Roadmap on Digital Technology and the Environment- 50 measures for a national and European agenda on responsible digital technology. (Feuille de route sur l'environnement et le numérique).	**Aim of the document** To provide the Government with a pragmatic and actionable plan for bringing about responsible and sober digital technology. The aim is putting digital technologies in service to people and the planet. The referral has two main pillars: for digital technology itself to be more environmentally friendly (Sober AI) and for digital technology to aid in the ecological and inclusive transition in order to meet the European Commission's Green deal proposals and the United Nations' Sustainable Development Goals for 2030. **Authors** The Minister of Ecological and Inclusive Transition, Élisabeth Borne and Secretary of State for Digital Affairs, Cédric O contracted the National Digital Council (CNNum) and the High Council for Climate (HCC).
FR (2024)	AI: Our Ambition for France" (IA: NOTRE AMBITION POUR LA FRANCE)	**Aim of the document** The document outlines 25 recommendations for advancing France's position in the world of AI to ensure digital sovereignty and make the most out of the socio-economic benefits and political benefits expected from the AI revolution. The strategy aims to prevent France (and Europe) from falling behind in AI innovation. The document is formally aimed at the French President. **Authors** The members of the Commission of the Artificial

		Intelligence
IE (2021)	AI - Here for Good: National Artificial Intelligence Strategy for Ireland	**Aim of the document** The National AI Strategy lays out the strategy for Ireland to be an international leader in using AI. The document aims to build public trust in AI, promote Ireland as a location for AI research and innovation, expand its data, digital and connectivity infrastructure and prepare the workforce for adopting AI. **Authors** Department of Enterprise, Trade and Employment (DETE), Department of Children, Equality, Disability, Integration and Youth (DCEDIY), The Department of Further and Higher Education, Research, Innovation and Science (DFHERIS), Science Foundation Ireland (SFI) and stakeholder consultations
IE (2024)	Ireland's National AI Strategy AI – Here for Good Refresh 2024	**Aim of the document** The document builds on the 2021 strategy, refreshing it based on advancements in technological capacity and regulation (AI Act). The strategy addresses both public and private sectors. The document aims to establish Ireland as a global leader in AI implementation,encourage AI adoption within Irish enterprise and public sector, extend necessary infrastructure, prepare workforce and ensure public trust in AI. **Authors** Department of Enterprise, Trade and Employment.

3.5 Ethical considerations and personal reflections

During the various analytic steps I attempted to remain aware of certain pitfalls of the method that Braun and Clarke warn of, such as stringing together extracts with minimal narrative and excessively paraphrasing. As I got more familiar with the method, I also gained confidence to interpret more. Furthermore, I tried hard to follow the rule of internal cohesion and external dissection of the themes. Another common pitfall is anecdotalism, where one or a few instances get reified as an overarching theme, to avoid this I critically analysed my themes and crossreferenced them with the documents. Tying the claims to the documents directly also helps to avoid this.

In addition to remaining aware of the various methodological limitations in my research, I also took several steps to adhere to the ethical standards of the department and the university. Although the one interview I conducted ended up serving more of an informative role rather than yielding empirical relevance. I informed the interviewee about the purpose and the relevant details, such as the purpose and objectives of the study and the methods used, prior to the interview. The interviewee also signed a consent form.

Furthermore, during the analytical process I have reflected on my positionality regarding my research in order to attempt to remain aware of my influences on the interpretation. For instance, I considered both the preassumptions I was raised with as well as those shaped by my education and role in the research project. Growing up in Estonia, a country that prides itself on being digitally savvy, I witnessed its transformation from a post-Soviet state to a prosperous nation credited with digital excellence through initiatives like Tiigrihüpe (Tiger Leap) in the late 1990s. This has impacted both the "grand narrative" in the media as well as my own ideas about the potential impacts of digital transformation socially and economically.

In contrast, STS as a discipline and the INNORES research project take a critical perspective on such claims, questioning their broader impacts, particularly on the environment. This dual perspective places me in a unique position: on one hand, I am inclined to believe in such aspirations, while on the other, I must critically examine their downsides. I hope to turn this into an advantage, resulting in a more nuanced and complex argument.

3.6 Conceptual framework

My empirical approach is derived from the conceptual understanding of documents as having agency and contributing to making certain future worlds possible while negating others. In the following chapter I present the main theoretical concepts that I have used to think and analyse the documents with.

This thesis examines how AI is framed in relation to the environment within national AI strategy documents in Austria, France and Ireland. Rather than treating strategy documents as neutral descriptions, I approach them as performative scripts that assign roles, sequence interventions, and cue movements, making a complex topic such as AI appear coherent and governable. This thesis thus examines the process behind how the environmental dimension of AI is framed and consequently rendered governable in the national AI strategy documents of Austria, France and Ireland.

As a starting point I conceptualise AI's environmental dimension as a *wicked problem* (Rittel & Webber, 1973). By conceptualizing the relationship between AI and the environment as wicked, I acknowledge that the relationship is not simple nor straightforward. Referring to the various ways that AI has been described as on one hand enabling increased sustainability, and on the other hand placing an increasingly large burden on the environment via various externalities throughout its lifecycle. The environmental dimension of AI further fits the definition of a wicked problem, as there are no universally agreed upon metrics to measure success, in this case for instance a net impact on the environment. Wickedness further signals complex constellations of valuations, constantly changing baselines, and the transboundary nature of externalities.

Additionally, I use *sociotechnical imaginaries* to analyse visions of desirable futures that are voiced in the strategic documents (Jasanoff & Kim, 2013; Felt, 2015). I employ sociotechnical imaginaries as a lens to observe the process behind the performance of making the topic of AI's environmental aspects governable. Sociotechnical imaginaries as defined by Jasanoff and Kim are "collectively held, institutionally stabilized and publicly performed visions of desirable futures (or of resistance against the undesirable), animated by shared understandings of forms of social life and social order, and supportive of advances in science and technology" (Jasanoff and Kim, 2013). National AI strategies script the performance of governability by articulating desirable futures, defining morality via ethical guidelines, setting priorities, and dividing responsibility between actors and institutions. National AI strategies can be seen as articulations of visions of desirable futures: sustainable, progressive, high-tech, competitive and prosperous. Furthermore, the strategy documents lay out the roadmap of steps that need to be taken in order to reach such a future. Strategy documents might also include visions of an undesirable future: economic and technical stagnation, plundering political power, a society that is ill-equipped to cope with change, thus missing out on opportunities and burdened by undesirable side effects. Such visions further enable the steps outlined to avoid such a horrid fate.

That is not to say that desirable visions of future are singular, to the contrary Felt (2015) describes the existence of *multiple* and *competing imaginaries* held by different assemblages. The different assemblies are sometimes described as *dominant* and *alternative*. I use these concepts to examine the process of institutional stabilization of the competing values regarding AI and the corresponding imagined desired futures that emerge from the expert committee discussions and appear in the final documents. This concept will also allow me to compare the different competing imaginaries, and perhaps assign the labels of dominant and alternative to the narratives of different types of experts. The process through which a sociotechnical imaginary is created is described through terms such as assemblages of human and non human entities who create a first draft of a shared imaginary which then is still fragile and needs to be rehearsed again and again to be stabilized. A sociotechnical imaginary can be considered stable if it is widely recognized and referred to, this state of stability is, however, not permanent (Felt, 2015). The process is also described as gradual, long-term and bottom up, even if stable it needs to be continuously rehearsed (Felt, 2015).

Similarly, using the lens of *framing* (e.g. Callon, 2009; Chailleux, 2020)**,** I follow the process of how AI gets framed in relation to the environment, and gets repackaged as a governable straight forward topic. Framing allows for the simplification of an otherwise complex issue, allowing governance to attend to specific aspects while being relieved of the burden of others. The way that a problem is framed presupposes or defines how it will need to be solved. Framing determines what is included and what is left out in the issue definition. It suggests that policy documents do not merely describe the world but stage it. Meaning the documents make certain futures appear coherent or even inevitable, while making others appear unthinkable. This is done for instance by defining priorities and goals, outlining risk scenarios, setting reporting requirements, benchmarks and timelines. The documents are

able to frame what counts as a problem, which metrics are used to measure success and which actors are authorized to act. Framing also allows me to attend to the politics of expertise, as by framing an issue also determines who is seen as responsible but also credible to address the issue of how to take a wicked problem and make it governable. Although each of the national strategies have been developed or in some cases later revised with the help of a multi-disciplinary advisory body, it is interesting to observe the types of expertise that are deemed credible and necessary to direct the governance of AI. The wickedness of the environmental dimension of AI is also reflected in the multitude of sectors of life that it affects, having an effect on the social, cultural, political, economical, ecological, legal and many other dimensions. This means that the deliberation process on how to govern the development and use of Artificial Intelligence requires the inclusion of diverse expert committees or advisory boards to ensure that Artificial Intelligence will not short-sight society, and we can be appropriately prepared. The complex nature of sustainability in regards to Artificial Intelligence also means that most likely there are many aspects where experts have opposite and contradictory opinions and recommendations. Due to the complex nature of AI, it is perhaps even more telling what kinds of expertise are not included in the expert bodies, especially as some types of expertise are represented by multiple members. Compositions of advisory committees can thus be very telling for determining the framing of issues and the objectives that the strategy documents seek to accomplish. However, the recommendations developed by the expert bodies require the controversies and contradicting opinions to be settled, at least to a degree. The omission of certain types of expertise from the advisory committee can thus be seen as the production of *ignorance*: the lack of representation is likely to translate to a deficit of *knowledge* and even *non-knowledge*, as certain vital disciplines remain unrepresented, problems and complexities known in the specific fields are likely to be sidelined (Koch, 2018). Ignorance is not necessarily an impediment to the governance process, on the contrary the collective willingness to ignore uncomfortable facts can instead improve efficiency, at least in the short term (McGoey, 2012). The thesis is not only interested in what appears or is mentioned in the strategy documents but also what strategically is not, meaning what is 'forgotten' or deliberately left out. In cases where these issues might otherwise stand in the way of development, the omission of an expert could be seen as a deliberate strategy (McGoey, 2012). The study of *strategic* or *willful ignorance* is also referred to as *agnotology* (Proctor & Schiebinger, 2008; Chailleux, 2020). Strategic ignorance is difficult to distinguish from ignorance, and is most powerful when it retains plausible denyability (McGoey, 2012). Specifically I am concerned with the ignorance of scientific and ethical perspectives calling attention to the environmental impact of digital technologies, especially AI within the national strategy documents, as well as the exclusion of certain types of expertise from the AI advisory committees, which I see to be strongly interlinked.

My theoretical approach is further sensitised by time and expectation, in particular *politicized time* as described by (Esposito & Becker, 2023). Politicized time refers to the instrumentalization of time, portraying time as a way to legitimize or justify certain politics and discrediting others. Time and

temporality (e.g. Sareen et al., 2021; Morais, 2024) are an integral part of politics but are often overlooked in policy analysis, attending to how time appears in policy objectives or strategies allows me to observe for example how certain futures are brought into being while others are prevented from materializing (Esposito & Becker, 2023). The future is valorized and portrayed as the source of infinite innovation and definite resolutions. The expectation of future innovation is used to legitimize shortcomings in the present. Expectations are by definition strongly tied to the future-making practice. Scholars from the field of sociology of expectation note that the excitement and hype that often describes the early stages of technology, are frequently later met with disappointment, these patterns often repeat in a cyclical pattern, what is often referred to as the hype-cycle (Borup, Brown, Konrad & Lente 2006). They further suggest that generating hype is intentional, helping to attract attention and thus funding. Policy documents contain narratives that can dictate the tact of the performance: making certain problems seem especially urgent while neglecting others, pushing their resolution into the indefinite future. Scholars (e.g. Borup et al., 2006) have noted that expectations are often 'self-fulfilling prophesies' as they have the ability to generate certain social and material path-dependencies, where past decisions are used to justify future ones. Furthermore, expectations, especially ones cultivated by those with the appearance of greater authority such as national strategy documents, often have a normative framing of expectations. For instance, staging the inevitability of innovation, necessitating acceptance and buy-in in order to best adapt to the changes (Bareis & Katzenbach, 2022; Borup et al., 2006).

The strategy documents are able to set the tempo of the performance by setting deadlines and defining deliverables. By fine tuning the framing of certain topics and wording of narrative, the documents are able to instill a sense of urgency, mandating immediate action and allowing to push certain responsibilities into the undefined future where presumably there will be more time, more clarity and innovative solutions. Sareen and colleagues differentiate between two dimensions of temporality, as on one side encompassing *materiality* (such as timelines) and on the other generating *relational affect* (a sense of urgency). Timeframes and deadlines speak to concrete plans and priorities, corresponding to roadmaps and concrete measurements (target-based timing), whereas topics such as climate change create an urgency to act (Sareen et al., 2021). Ambiguous wordings hint at a less attentive approach, revealing how uncomfortable topics the documents play with the temporalities of the issues. Using the analytic tool of temporalities, I show how by creating momentum, the document is able to justify postboning sustainability into the future to ensure innovation today. More specifically, I observe how solutions for issues regarding inefficiencies and environmental externalities of digital technologies are postponed into the indefinite future.

4 Empirical findings and discussion

The empirical findings chapter includes an analysis of the composition of the national AI advisory body from Austria, France and Ireland as well as a discussion of its implications for the strategic framing of AI, particularly in relation to the environment. The second half of the chapter presents four common narrative moves that the AI national strategies use to balance the often contradictory nature of the political priorities of sustainability and AI adoption, thus enabling the simultaneous pursuit of both.

4.1 Composition of the national advisory committees on Artificial Intelligence

The question of who is given the burden and privilege of governing AI is not merely a question of administrative responsibility, it also gives us valuable insight into who is given a voice to speak on AI, and how problems and priorities are framed (Wynne & Lynch, 2015). Jasanoff (1998) and Spruijt et al., (2014) have found that transdisciplinarity has been used particularly when governing wicked problems, to enhance political legitimacy. However, Collingridge and Reeve (1986) have noted that scientific advice does not always translate directly into decision-making, arguing that the advice of scientists is often ignored when it does not neatly support the preexisting agenda. According to Grundmann (2017) certain disciplines are commonly excluded from expert bodies altogether, such as anthropologists and historians. Examining who governs AI allows us to better grasp the domains in which AI is perceived to operate in, and the values that have guided the development of the AI strategies under study. On one hand, who gets to govern AI could be deemed a question of perception. On the other hand, it is also a question of strategy: governing AI ultimately also allows the framing of AI-related issues, determining which concerns are prioritised and which perspectives get marginalised. I find that national AI advisory committees deprioritise, and thus exclude expertise tied to the environmental impacts of digital technologies, its strain on infrastructure and the corresponding risk.

4.1.1 Austria - KI-Beirat

The Austrian national expert body on artificial intelligence is called the KI-Beirat. The KI-Beirat is the newest of the three committees. The HLEG on AI was established on the 28th of February of 2024. The committee was assembled by the Austrian Federal Chancellery (Bundeskanzleramt) and the Ministry of Finances (Finanzministerium). The KI-Beirat is also strongly affiliated with the Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR), which provides operational support and houses the AI Service Center. The committee is set up to act as an advisory body to the federal government, in order to effectively leverage the opportunities that AI would bring about. The website also lays out the framework of how the aim of best leveraging these opportunities, the tasks of the committee are divided into four tasks of the KI-Beirat: consulting the RTR and the Federal

Government on the technical, ethical and societal advancements associated with AI; analysing the risks and opportunities that global technological advancement in AI pose to Austria within and outside the European Union; prioritizing key aspects of AI, in order to help the Federal Government and the RTR concentrate of key ares of action; advising the federal government on the development of the national AI strategy, for example in goal setting, priority definition as well as concrete measures. This paints the picture of the committee having a rather high level of power in creating the narrative around AI, such as which topics are relevant and need to be prioritised and which can be deprioritised, as well as which technological developments are seen as being worthwhile for Austria. Furthermore, it is interesting that the aim of the committee has been framed to actively leverage the opportunities provided by AI. From the outset this frames AI as a solution, before the problems are even defined. Even if the tasks of the AI committee also involves assessing the ethical and social risks associated with AI, this feels like an after-thought. Such framing predetermines the necessity of widespread AI adoption by the society, and allows for opting out more or less only if it poses a serious enough problem. Whether AI is needed or if it is the optimal or even an appropriate solution in any specific case is not taken as the starting point, threatening to lead to the overuse of AI. An alternative could be to shift the purpose of the KI-Beirat to determining the sectors in which AI actually could prove to be the optimal solution, sectors in which lower tech solutions are unable to produce comparable results. This shift would help limit unnecessary, environmentally straining and potentially socially dangerous applications of AI.

The committee consists of 11 members, and is chaired by the rector of the Technical University of Graz, Univ.-Prof. Dipl.-Ing. Dr. Horst Bischof and co-chaired by Dr. Jeannette Gorzala who works at the EU AI office as an independent expert. The website for the committee describes its members as having "*exceptional expertise in ethics, research, economy, law and technology*" (Die Mitglieder des KI-Beirats, 2024). The analysis of the members of the KI-Beirat reveals that most members (7) have a notable background in academia. This refers to experts with noteworthy careers in academia, such as professors or rectors as well as PhD's. An affinity towards academic background is also visible in the choice for the chair of the committee being the rector of the Technical University of Vienna.

A large majority of the members have either a background in economics, consulting or are founders, owners or managers of technology companies. This hints at a predominately economically minded logic to the composition of the KI-Beirat and subsequently the kind of problem AI is envisioned to be. Viewing the technology through an economic prism is likely to prioritise resolving issues like economic competitiveness, impact on the labor market and the GDP.

Similarly, people with technological expertise play a considerable role in the committee. They can be expected to understand the particularities of the advancements in the field of AI, as well as be able to advise the government how to best make the dream of wide spread AI come to life, as well as advising on the topic of potential applications for AI. There are experts for example in computer science, computer vision, and software development

Another prominent group of experts who have been tasked with advising the Federal Government are lawyers. Out of the eleven members, four work in the field of law, for instance in technology law, legal implementation of the digital transformation or intellectual property. Much of what are considered ethical questions in the AI strategic documents, are presented through the eyes of law, such as data privacy, discrimination or even the risk based approach stemming from the European AI act. The field of law tends to concern itself primarily with what is allowed within the bounds of law but not so much with the normative dimensions of ethical questions, leading to a rather flat account of ethics.
A more critical account of the potential negative societal and environmental effects could come from social scientists, who seem to be underrepresented in this particular expert committee. The committee includes an expert in technology assessment, a member with a "classical humanitarian education", "the world of work", finally there is an entrepreneur who works in an initiative aiming to better the gender balance in technology. The Austrian KI-Beirat does not include any representatives of the civil society and culture, who would be able to vouch for further societal impacts of large scale AI roll out. Finally, and perhaps most tellingly, there are no committee members with specific experience in energy production, electrical or civil engineering or environmental sciences - that would be able to adequately assess the challenges associated with the increased demand for energy, resource and infrastructure that would need to be built to bring Austria's AI aspirations to fruition

Table 2 (Overview of the KI-Beirat -Austrian AI Advisory Committee)

Institutional affiliation	Number of members	Expertise represented as	Particularities	Aim of advisory body
Austrian Federal Chancellery Austrian Ministry of Finances Austrian Regulatory Authority for Broadcasting and Telecommunications (RTR) Austrian Federal Government	11	Ethical Research/academic Business/entrepreneurial Legal Technical	Strong academic backgrounds (including chair of the committee). Likely reflecting ambitions in becoming a central location for AI research. Strong ties to the private actors (consulting, business owners etc.) Likely tied to ambitions of becoming a central location for AI entrepreneurship. Notable legal presence. Topics often correspond to what is referred to as the responsible or ethical approach to AI (legal - ethical). Technical expertise likely for assessing usefulness and keeping up with the technical	Leveraging AI related opportunities. Consulting on technical, social and ethical advancements, risks and opportunities. Identifying key aspects of AI (framing AI). Aiding in strategy development.

			advancements in the field. Social impacts seem to be limited to changes in the job market and limiting discrimination and ensuring representation, particularly of women. Lack of expertise in sustainability, environmental, electrical or civil engineering.	

4.1.2 France- Comité de l'intelligence artificielle générative

The national advisory committee in France is the Comité de l'intelligence artificielle générative. The committee is the oldest of the three, and was already established on the 19th of September 2023 by the Prime Minister, Elisabeth Borne. Previously that year the Prime Minister had promised the creation of the committee at the meeting of the French Entrepreneurs. This seems to hint at the entrepreneurs requesting or suggesting the creation of a national expert body, as a way to set France up for success and boost its international competitiveness. The committee is tasked with advising the government, and submitting amendments for the national AI strategy, with the ultimate aim of positioning France at the forefront of the AI revolution. AI is framed as recently having arrived at the center of people's lives, and subsequently leading to questions regarding "ethics, economics, productivity, work, business organization, and the industrial and digital sovereignty of states, which the committee is tasked with answering" (Comité de l'intelligence artificielle générative, 2023).

The council consists of 15 members including the co-chairs, Philippe Aghion, a professor in economics and Anne Bouverot, a business executive, engineer and AI researcher. The choice of chair and co-chair having a background in economics and business management further point at AI being framed as a primarily an economic endeavour, hinting that AI is likely to be governed from an economical perspective, obscuring alternative definitions of risks and priorities. Both the chair and co-chair also have strong ties to academia, which points at valuing a science based approach.

What is interesting is that instead of framing them as experts, the members of the committee are instead said to be stakeholders. Which would mean that instead of contributing expertise, and advising the government from a normative standpoint, the advice is based on the perceived potential and negative effects on a field or a sector of society that the members of the committee represent. Instead of selecting which disciplines and areas of expertise are relevant and necessary for governing AI, this formulation would supposedly instead take into account the relevant parts of the society whose interests are at stake with the AI revolution. The sectors listed are the following: "cultural, economic,

technological, and research" (Comité de l'intelligence artificielle générative, 2023). The list of members are each presented with one or two titles of experience which represents the experience qualifying them to be part of the committee. It is probable that the wording of the qualifications is submitted by the members themselves and not by establishers of the committee, as the same qualification of expert in generative AI is used to describe two members but is formulated differently. This leads me to believe that the choice is likely to be based on notable people rather than a predetermined field that needs to be represented in such a committee.

In analyzing the composition of the committee, several things stand out. Going off of the brief self description provided on the website, the experience seems to be based on three main sources: already being considered an expert elsewhere, such as the National Digital Council (CNNum), at the CSPLA (Ministry of Culture) or the OECD AI expert group; having a background in the science, either in a private tech firm, research institute or simply as a computer scientist; finally an outstanding number of the members have strong ties to the private sector, as founders, managers or consultants. Finally, the list also includes a Union leader (CFDT Cadres) and one law professor. This list seemingly leaves out several types of experience that would expectedly be there. For instance, this committee doesn't include any experts on infrastructure, which would be necessary in order to be able to estimate to what extent the grandiose plans of becoming a leading nation in AI are feasible, and how to assess the extent of the environmental impacts stemming from widespread integration of AI into society. Furthermore, the list does not seem to include ethicists, experts who would be able to address and foresee ethical questions associated with the advent of AI. Neither does the list seem to include any social sciences, who would be able to understand the complex impacts that the widespread AI roll out could have for the education system or in the work place, for example, and how it may reinforce discrimination or bias.

However, researching each of the members more in depth, some of these gaps are filled to a certain extent. For example, Gilles Babinet who represented himself as the President of the National Digital Council has written a book about Green AI. Babinet, although acknowledging the negative environmental impact of AI, concludes that with the help of certain strategic decisions to limit the environmental impacts, AI can instead play a crucial part in enabling sustainability. His stance on the AI-climate nexus has been deemed technocentric and reductionist by some, arguing that he too easily glosses over issues such as the EU outsourcing the polluting mining sector and thus failing to address the true financial and environmental costs of pursuing a robust indigenous AI (Hunter, 2024). Similarly, one of the co-presidents, Anne Bouverot co-founded a foundation called Abeona which promotes a responsible approach to AI. The foundation words its mission as "*guiding collective intelligence along the path of a sustainable and inclusive digital transition*"(*Mission*, n.d.).The foundation seems to include sustainability in its conceptualisation of responsible AI but not frame the digital transitions to be conflicting with the ideals of sustainability. Another member, Martin Tisne has emphasised the importance of the AI revolution prioritising benefitting public interests over corporate

interests, additionally he has led initiatives about transparency and accountability in AI and helped set up the AI Ethics & Governance Fund (*Martin Tisné*, n.d.). Several other members also have experience with topics such as the trustworthiness of AI, transparency, and accountability. It is interesting that this type of expertise is relatively prominent but remains undeclared in the official list. The reason for this is unclear. For instance, it could be that this kind of experience is seen as less important compared to leadership experience or technical knowledge of AI. It could be tied to the aim of the committee being to help France become a leader in AI globally, where too much consideration of ethics, social and environmental impacts could undermine this goal. This omission of various types of expertise makes sense for the goal of securing a leading position for France in the global AI race, as considerations for the social and environmental impacts of such a race would most definitely slow down the progress, if not limit it entirely. Therefore, the committee is not so much concerned with the question of whether AI should be adopted in France or in which areas it should be deployed. Instead, reaching such a position would most likely demand integrating AI based solutions to as many sectors as possible, in order to generate demand and justify further investment. The high concentration of economically minded expertise in the French AI advisory body combined with the down-playing of ethics and sustainability related expertise reflects the primarily economic and geopolitical framing of AI in the French national AI strategy.

Table 3 Overview of the Comité de l'intelligence artificielle générative -French AI Advisory Committee

Institutional affiliation	Number of members	Expertise represented as	Particularities	Aim of advisory body
Prime Minister, Elisabeth Borne La Rencontre des Entrepreneurs de France (the meeting of the Entrepreneurs of France) Government of France	15	Stakeholders rather than experts: cultural, economic, technological, and research background.	Co-chaired by economics professor Philippe Aghion, and business executive/ AI researcher/ engineer Anne Bouverot. Indicating strong focus on business interests. Strong ties to private sector Framing members as stakeholders rather than experts. Notably shorter descriptions of backgrounds	Informing government's decisions, positioning France at the forefront of the AI revolution. Catching up with Chinese and American development. Analyzing impact of artificial intelligence on economy, employment, growth, and the fight against inequality.

			No explicit mention of ethics background Experts already on other similar boards	Submitting amendments for the national AI strategy.

4.1.3 Ireland - The Irish Artificial Intelligence Advisory Council

The highest advisory body in Ireland on the topic of artificial intelligence is The Irish Artificial Intelligence Advisory Council. The council was first established on the 24th of January 2024, and expanded in November of the same year to include additional expertise on economics and AI engineering. The advisory committee has been initially set up to operate for two years.

The administrative support to the advisory council is provided by the Department of Enterprise, Trade and Employment. The council was established by Dara Calleary, the Minister of State with responsibility for Digital. The council is described as an independent advisory body tasked with providing AI related expert advice, insights and recommendations to the Irish government. It is explicitly mentioned that the expertise is provided as a response to specific requests from the government on emerging issues in the field of AI. The advisory council is also tasked with developing its own work plan that would alert the government to policy issues arising in the current or future field of AI, taking into account trends, opportunities and challenges. Finally, the advisory council is also tasked with engaging with the public, for instance by appearing in media interviews and taking part in various events. The aim of this communication seems to be building public trust towards AI by demystifying the technology, as well as promoting the ideal of trustworthy, ethical and person-centered AI.

The Irish Artificial Intelligence Advisory Council has 14 members, who are said to represent a "spectrum of experience and expertise from academia, business, law, security, social sciences, economics and civil society" (Membership of the AI Advisory Council, 2025). The website also provides a short paragraph describing the expertise of each council member. Each of the paragraphs describes a relatively wide array of experiences from professional and academic endeavors to public appearances, painting a picture that the expert advice given by the council members would similarly be more holistic rather than strictly tied to their academic field or leadership role. As the Irish AI Advisory Council also has a public facing role, it does not come as a surprise that this type of experience is mentioned in the summaries. For instance, the council includes the former head of communications and media relations at Fórsa, the largest Irish trade union. Furthermore, the summaries mention third party acknowledgements such as the Forbes' Top 50 Women in AI and the TIME100 Most Influential People in AI list in 2023. This seems to hint at the importance of name recognition in assembling the AI advisory committee, including experts, who are well known in the

world of AI. Additionally, being a member on one or more AI advisory boards is also a common feature.

The committee is chaired by Dr Patricia Scanlon, who is a technologist and an entrepreneur. Entrepreneurship is a common background for experts on this committee; entrepreneurs with a technology or AI specific background are especially common. Such is the background of the Council chair, Dr. Patricia Scanlon, it is also important to note that she has not only founded and led an AI based company but has researched a global leadership position and attracted considerable investment. This notably aligns with the ambition of Ireland in becoming a global leader in AI and attracting investments to Ireland. Many of the other members also have similar backgrounds. Another relatively common background is law with several members having a degree or professorship in law. Not surprisingly the law background is more specifically in technology law, regulatory policy or even specifically AI law.

The academic backgrounds of the council members are rather diverse, from global business of AI and robotics, to computing, constraint programming and operations research, as well as AI ethics and public policy. However, there seems to be a particular emphasis on technical and business related academic backgrounds. There are no members who have a singularly ethics background. Although, it is notable that each of the members are difficult to fit into one box based on their included summary. However, ethics are listed several times in the summaries, together with affiliations to law, academic research and sometimes enterprise. *"She [Prof. Deirdre Ahern] is a member of the Royal Irish Academy's Ethics, Politics, Law and Philosophy Committee and a Fellow of the Information Society Law Centre at the University of Milan. Her research interests have a focus on regulatory policy and corporate governance of new technologies, in particular AI, on which she is a regular speaker."* (Membership of the AI Advisory Council, 2025) Her membership in a committee that among other topics also is concerned with ethics is mentioned, however research interests focus on technology regulation and governance, not on ethics. This hints at ethics being seen as perhaps a beneficial experience but not important enough to include an expert solely dedicated to the field. Similarly underrepresented are social sciences, although they are explicitly mentioned in the description of the advisory council. The member whose description is most closely aligned to ethics is Dr. Abeba Birhane, who is working in the field of AI accountability. The concept of accountability is closely tied to the ideals of human oversight and opening the "black box", referring to the idea that AI should be developed in a way where responsibility for undesirable outcomes can be assigned to liable partners (Carnegie Council: *AI Accountability*.)

In the analysis of the summaries provided I found two experts whose description included social sciences, but what exactly is meant by social sciences is rather unclear. Although the exact field of social science is not mentioned, one of the experts with this background is an assistant professor at the School of Information and Communication Studies at University College Dublin, and the other is the director of the Technologies, Law and Society Research Group at the School of Law, Trinity College

Dublin. Although both of these experts work at the intersection of social sciences, the group lacks researchers to further assess the potential impact that the AI revolution could have in work places or schools, or how AI might reinforce discrimination or biases. Finally, the advisory council seems to also lack representation of expertise in the topics of the environment and infrastructure. Although the advisory body includes an expert with a background in computing, these topics do not seem to be a priority for the expert body. The Irish AI advisory body seems first and foremost to run the AI revolution like a business, including technology leadership and technical AI related expertise. Accessing the societal and environmental impacts of the revolution is rather an afterthought or an individual choice of a member.

Table 4 Overview of the Irish Artificial Intelligence Advisory Council

Institutional affiliation	Number of members	Expertise represented as	Particularities	Aim of advisory body
Established by Dara Calleary, the Minister of State with responsibility for Digital. Department of Enterprise, Trade and Employment.	14	Academic Business/entrepreneurial Legal Security Social sciences Economics Civil society AI ambassador.	Chaired by technologist and entrepreneur Dr Patricia Scanlon. Focus on interaction with the public (AI ambassador), likely tied to the priority of increasing public trust. Very strong representation of the private sector, (CEOs of tech firms). Likely tied to the priority of representing and furthering business interests in Ireland, strengthening Irish competitiveness and attracting international companies. Strong representation of legal expertise. Explicit mention of ethical background but always in combination of other expertise. Expanded to include additional economic and AI engineering expertise. Being mentioned on international lists seen as relevant. Lower representation of social sciences, although expliciting	Consulting government on request basis. Developing an independent workplan, providing insight into trends, opportunities and challenges. Public engagement aimed at demystifying and promoting AI.

			claiming to include.	

4.2 Sustainability through framing: four narrative constructions aligning AI expansion with the Green Transition

The following subchapter presents four narrative constructions found in the national AI strategies of Austria, France and Ireland that are used to present AI on one hand as inevitable and hugely disruptive but also as desirable, necessary and aligned with commonly shared cultural values. Bareis and Katzenbach (2022) have referred to the performative function of such future visions as "talking AI into being", as they are justifying large-scale investment and reinforcing the imperative to scale (Bareis & Katzenbach, 2022; MacKenzie, 2026). Ulnicane and colleagues (2021) have admitted that the reality of governing emerging technologies includes a high level of risk and uncertainty, highlighting the performative impact that framing and in particular the generation of hype can play by generating interest and securing investments. Thus expectations of the future have material consequences in the present by describing priorities, allocating credibility and prescribing policy solutions (Mager & Katzenbach, 2021).

Although Bareis and Katzenbach found that the narrative constructions tend to be rather uniform across national borders, the particular sociotechnical imaginaries of AI vary depending on the cultural, economic and political particularities of the nation state. Several scholars have emphasised the critical role of the nation-state level policymaking in translating high-level international guidelines into concrete and enforceable regulation and clear public accountability structures in line with the principles of RRI and other shared values (Perry & Uuk, 2019; Papagiannidis, Mikalef & Conboy, 2025; Radu, 2021). Thus in addition to highlighting the common narrative constructions found across the three countries, I have highlighted in each section how the narratives stabilize a wider national-level sociotechnical imaginary of a desirable future achieved through investment in and adoption of AI (Jasanoff and Kim, 2013).

AI presents among others serious environmental challenges. However, the framings of AI commonly strategically deprioritizes and marginalises AI's environmental impact, instead focusing on the ways AI can be applied to enhance sustainability (Felt, 2025). The European Union has chosen to formulate its AI strategy to embrace the conflicting priorities of AI expansion and the Green Transition by coupling them into one policy, called the Twin Transition. Pham and Davies (2025) have pointed out how examining these policy developments reveals how AI is framed to be thinkable and do-able, thus rendering the complex wicked issue governable. National AI strategy documents play the role of arenas for reconciling technological expansion with environmental considerations. Horn and Felt (2025) have highlighted how individual European nation states have strategically utilized the coupling

of the two transitions to justify and accelerate the digitalisation process by pointing out the positive "collateral transitions".

4.2.1 Limiting the scope of the environment

One of the more tangible changes that the AI revolution will bring about is the large-scale infrastructure development that it necessitates. As it is virtually impossible to build the necessary infrastructure for AI without the corresponding enormous environmental footprint, it is insightful to analyse how these two topics are discussed and balanced in the strategic documents. The first of the common narrative moves I identified in the strategy documents is limiting the scope of what is spoken about when talking about the environment. I traced how environmental externalities are acknowledged or attempted to be solved as well as what are sustainable or environmentally friendly initiatives imagined to be. Strategy documents, especially ones with the underlying objective of ensuring a successful, swift and widespread rollout of AI based solutions, tend to only sparingly mention the environmental externalities of digital technologies. Moreover, when the environmental impact is mentioned, its scope is generally limited to increased energy expenditure and CO2e emissions. Chailleux (2020) emphasises framing as a medium of persuasion, stating that framing not only simplifies complex issues but also prescribes a fitting policy solution. Thus in the case that the framing of AI's environmental impacts is restricting its energy expenditure and carbon emissions, the complex and wicked issue is made governable.Especially as the EU already has a way to deal with carbon emissions via the European Union Emissions Trading System, rendering the issue more or less governable. The two documents (Austria 2023 and France 2021) have a different underlying objective from the rest. Namely they address the ethical dimension of the environmental impact of digital technologies, thus they are less concerned with facilitating the widespread roll-out of AI. Subsequently, they include a more comprehensive account of environmental externalities. However, it is important to note that framing is a persistent reality of strategic policy documents, meaning that these documents with differing underlying objectives also simplify the topic of AI thus obscuring its other aspects, such as AI's role in economic and geopolitical security.

Austria

Although the 2021 strategy document is written in collaboration with the BMK (Austrian Federal Ministry of Climate Protection, Environment, Energy, Mobility, Innovation and Technology) the depiction of the environment remains largely one dimensional and rather narrow. The environment is depicted as the setting in which the climate crisis takes place, and AI is framed as the key tool of the generation that will provide the answers tackling the climate crises. The climate crisis is to be solved

alongside the negative remains of the COVID-19 pandemic, the impacts of which include economic and a general societal slow down. AI is framed as a way to boost innovation, as it carries the potential to be applied in various fields including agriculture and climate protection. The question of whether AI is the best tool to approach these issues, or even which aspects of the climate crises AI promises to solve, is never asked and much less grappled with. AI is proposed as a *quasi* universal technosolution, for boosting Austrian innovation and providing the tools to finally address the complex problem brought on by climate change. Sustainability is framed as something that requires high tech solutions, much like all our other ailments, thus justifying digitalization and warranting increased investments into AI and the tech-sector in general. Although AI is portrayed as the saving grace in many aspects, the document also acknowledges that AI comes with certain dangers, but also implies that those dangers are not only solvable but are outweighed by the positive potential of AI. "*For all the positive potential of artificial intelligence, potential dangers must also be resolutely countered*." **(**Strategie der Bundesregierung für Künstliche Intelligenz, 2021:3)[2]

However, it is never explicitly spelled out, what these dangers might be exactly. Thus it remains unclear what the scope of risk is portrayed to be, how the problems are specifically formulated and how one would go about solving them. The strategy document wastes no time discursively "solving" the downsides of AI, already in the introduction of the vague problems that AI might bring about, are we presented with the conclusive statement that these problems must be solved. And they must be solved in the name of all the benefits promised. Such resolve is difficult to believe when the document fails to spell out which of the plethora of AI risks it might be referring to. The structure of the text offers a clue, as the potential dangers are mentioned in proximity to stating that AI would be useful for furthering environmental goals, can it be deduced that the potential dangers would most likely refer to AI's environmental footprint. Which of the environmental externalities from across the life cycle of AI this might entail is also up for interpretation. Furthermore, framing these dangers as only "potential" further undersells the grave importance of addressing these questions.

The updated 2024 document provides somewhat more nuance. Similarly to the original 2021 strategic document, AI remains a cross-cutting device that can be applied to countless fields in the updated 2024 document. The 2024 strategy goes the extra step of acknowledging the importance of climate neutrality of AI itself, thus acknowledging, and at least hinting at addressing the environmental externalities of AI. Climate neutrality and sustainability of and through AI are included as part of the four horizontal priorities. The narrative has thus shifted from discussing AI as just a tool to further acknowledging that AI systems themselves should also align with the principle of sustainability. The horizontal principles specifically call for both climate neutrality as well as sustainability. The specific term used in this case, climate neutrality, seems to primarily speak to the CO2e emissions of the systems, and less to the water, soil or even noise pollution and other externalities that accompany the

[2] "Bei allem positiven Potential der Künstlichen Intelligenz gilt es auch möglichen Gefahren entschlossen entgegenzutreten." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:3)

advent of AI. Although sustainability is not explicitly defined here, it could be seen as somewhat of an umbrella term encompassing universal resolve for all possible environmental externalities. Alternatively the term climate neutrality could arguably fit into a narrative where there are climate positive and climate negative actions and objects, and environmentalism entails a kind of balancing act, where a careful equilibrium is found. In terms of AI, this could mean that the lifecycle environmental footprint of an AI system is calculated and needs to be dealt with. This might be compensated by the same AI itself, if its application is one that is deemed climate positive or by something analogous to the practice of carbon offsetting. Alternatively, the entire sector of AI could be measured, represented with a number of indicators such as carbon emissions, water use, rare earth metals use etc. The more indicators are measured and used, the more thorough the understanding of the environmental footprint is but also the harder it is to reach the defined goal of climate neutrality. Ambiguity in this case serves a strategic purpose; by not clearly defining the scope of sustainability or climate neutrality, the state is able to adjust this definition depending on the needs of the digital transition. In some instances the scope has already been narrowed: instead of talking about the life-cycle emissions of AI, which would include construction, training, use and disposal, only the training and use phases are specifically mentioned. This also hints that the impact of sourcing the resources necessary for building all the material infrastructure necessary for training and keeping the system running, such as the mining of rare earth metals, are not really appropriately taken into consideration. Furthermore, the document also seems to disregard the disposal phase of the same material components. Both of these processes can be extremely costly both in terms of environmental impact but also the health and wellbeing of the people involved. However, the lack of definition and detail conveniently blur the lines of responsibility.

The 2023 strategy document takes a slightly different approach by framing sustainability of AI as a question of ethics and responsibility. In particular the strategy tasks the government specifically with the responsibility to enforce higher ecological standards for the development and application of AI systems (Praxisleitfade „Digitale Verwaltung und Ethik”, 2023:32). Furthermore, the document introduces a wider scope of the environment. Namely, in addition to drawing attention to the usual culprits of energy consumption and the subsequent CO2e emissions, the document sheds light on further dimensions of environmental impact, by referring to resource expenditure rather than energy usage, which seems to also encompass the use of water, land and raw materials. The 2023 document addresses the life-cycle of the system, therefore taking a more comprehensive view on the footprint of the system. The document also mentions hardware infrastructures, the necessity of maintenance and cooling the data centers, all of which are topics that tend to be underdiscussed and deprioritised in these contexts. The strategy document further seeks to make these externalities tangible for the target audience, for instance by including graphs where the CO2 emissions of AI are compared to other emissions heavy activities such as a transatlantic flight. Although of course these discussions could always be more nuanced and detailed, the 2023 strategy document is a rather positive example of how

AI can be positioned in relation to the environment in a responsible manner. This could be due to the fact that the document is targeting primarily bureaucratic staff and governmental institutions. The target audience is for instance conveyed in the foreword where the authors address coworkers before and separately from other readers "Dear coworkers, dear readers," (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:5)[3]. The audience thus influences the way in which problems are introduced and formulated, and how much nuance and conflicting complexities can be included. If we conceptualise the scope of the problem to dictate the perception of governability, perhaps those tasked with governance are seen as more apt to handle the discrepancies of governance.

France

The French documents represent a particularly wide divergence between the representation of the environment in the two strategic documents. In the case of France, the scope of the environmental externalities could be said to be narrowing rather than widening in the later document. The 2021 document represents perhaps the most extensive and detailed outline of what is considered to be entailed in the environmental impacts of AI out of the entire dataset. The 2021 document positions "digital sobriety" as a critical policy for addressing the environmental footprint of digital technologies. Tracing the concept back to political initiatives before the COVID-19 pandemic, the document centers the importance of achieving France's environmental ambitions and meeting the goals of the Paris Climate Agreement. Digital sobriety is framed as both possible and desirable, with a focus on reducing emissions by optimizing the manufacturing and distribution of digital technologies in terms of least possible emissions, as well as limiting usage, extending the lifespan of devices, and encouraging the use of low-tech in place of high-tech solutions whenever possible.

The document further explains in detail the methodology used to determine the environmental footprint of digital technologies, acknowledging even that measuring this footprint is not a straightforward endeavour. It highlights the need to assess various categories, such as CO2 emissions, energy consumption, and resource extraction, to gain a comprehensive understanding of the environmental impact. The document warns that, without significant changes, CO2 emissions associated with digital technologies are estimated to skyrocket in France.

The document highlights that digital sobriety is not a binary concept but rather a scale, requiring continuous effort for maintaining 'sobriety' throughout the entire lifecycle of the technologies. However, the document acknowledges the paradoxical nature of its two-fold environmental approach: while digital sobriety aims to reduce the environmental footprint of technologies, the application of these same technologies to address environmental challenges introduces complexities. The document challenges the myth that any immediate savings made by an AI system automatically render it and all other AI systems sustainable. By explaining this paradox of sustainability, the document underscores the need for a balanced and nuanced approach. However, the document also acknowledges that digital

[3] "Liebe Mitarbeiter:innen, liebe Leser:innen," (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:5)

sobriety alone is insufficient, it must be complemented by applying digital technologies to address various environmental challenges. This dual approach underscores the necessity of deploying digital sobriety policies as part of a comprehensive strategy to mitigate the environmental impacts of AI and other digital technologies.“*This roadmap is based on three pillars: the first calls for reducing the environmental footprint of digital technologies, the second intends to harness the potential of digital technologies as an instrument for the ecological transition, and the last aims to support the whole of society towards a responsible digital society*. (Roadmap on Digital Technology and the Environment, 2021: 7)”

The strategy document from 2024 offers a drastically different story, the document outlining the “shared” ambition of France for the AI revolution all but omits the topic entirely. Although the document declares the intention to take into consideration various risks associated with AI, these almost feel like they are mentioned in passing or as a necessary check list to tick before getting down to business. The risks are formulated as topics to consider in order to ensure that the innovation contributes to the “*collective project*” (Our AI: Our Ambition for France, 2024:5). The document remains extremely vague about the scope of the environmental externalities but mentions that the environmental impact is expected to grow as digital technologies, specifically AI, increase in use (Our AI: Our Ambition for France, 2024:5). The document does not include any considerations of water usage, raw materials, CO2e emissions or pollution of any kind. The notion that AI is predominately beneficial and thus should be adopted prevails. The document specifically differs in its conceptualisation of responsibility when compared to the 2021 French AI document. Instead of prioritising so-called digital sobriety, the narratives of geopolitical “arms race” and power speak to a new priority - digital sovereignty. By framing nimble and wide-spread AI adoption as the way to realise French and European potential, thus righting past inadequacies, bringing prosperity for all French people, and increasing equality, the little that is said about the environmental impact is drowned out and obscured. The past policy of digital sobriety, although not in name or spirit, is referred to as a potential to establish a competitive advantage. *“It's not a question of chasing behind technological advances, but of creating our own comparative advantages. Targeting and concentrating resources will therefore be key to establishing our superiority in certain segments of the value chain, and thus being able to speak on an equal footing with our competitors and partners. Targeting must go hand in hand with the gradual emergence of AI innovation ecosystems in France and Europe. The path to differentiation could focus in particular on the environmental dimension, by targeting new generations of AI, from hardware architecture to the choice of models, that will consume less energy ”*(Our AI: Our Ambition for France, 2024:7).

Ireland

In the two Irish national AI strategies the conceptualisation of the environment in relation to AI is more stable than in the French documents or Austrian documents. In both of the documents, the

environmental externalities of AI are mentioned but not framed as a major problem that would call into question the AI revolution. Whereas in both France and Austria at least one of the documents provided a considerably more nuanced detailed account of the environmental impact, this is not so much the case for Ireland. However, this is not to say that such a document does not exist for Ireland but rather that as a result of my document selection I was not able to find such an account from the Irish documents that I analysed. The environment as a topic does appear several times within the Irish strategic documents. Climate change is acknowledged as a legitimate issue warranting a real solution. However, it is depicted as a general issue, and not as an AI specific problem or even technology specific problem. Thus, AI is framed as a helpful tool to help address environmental problems, and tackle challenges stemming from climate change, but is certainly not burdened with the responsibility of being seen as a relevant culprit or major contributor to the problem.

Much like the other two countries, Ireland does not shy away from a chance to present itself as a responsible and environmentally conscious country. Becoming a greener, more sustainable society and finding a solution to the climate crises is part of the aspirations that the document paints for Ireland. The foreword of the document establishes the goal of becoming a greener society but not only: productivity and technological responsiveness are further listed as aspirational values (AI: Here for Good, 2021:2). This approach largely mirrors the priorities set out in the Twin Transition, similarly the largely conflicting nature of the two aspirations is not acknowledged, let alone addressed or solved.

The initial Irish strategic document (2021) calls into question the legitimacy of some of the critique of AI, calling it unrealistic and lacking in nuance (AI: Here for Good, 2021: 4). Curiously, the document does not address the critique of environmental impacts, instead rebutting and addressing risks and concerns of negative social and economic impacts. Critique of the environmental footprint of digital technologies is far from uncommon, raising the question of why only economic and social risk critique is questioned. One could argue that, in general, calling into question the reliability and legitimacy of critique of AI allows them to discredit the critics while retaining the plausible deniability to not disagree with any specific critique. The strategic document turns the AI critique on its head, stating that provided the recommendations of the strategic roadmap are followed, AI will instead be a crucial tool for improvements in the fields of the environment, social and economic wellbeing. *"Continued advancements in AI, enabled by sustained investment in areas of national importance, offer opportunities to improve our socioeconomic performance and productivity, as well as our environmental and social wellbeing."(AI: Here for Good, 2021: 14)*. Thus implying that continued advancements in AI are necessary for achieving these objectives, necessitating the continued pursuit of a wide-spread roll-out.

The Irish documents seem to have a rather high-tech conceptualisation of the environment. Meaning, that in categorizing something as sustainable, it would often be manipulated in a way that is artificially optimized for sustainability. By framing the environment as something that should be highly engineered and optimized in order to attain sustainability, it justifies further tech-innovation and

widespread roll-out of technologies like AI. Subsequently, the lack of innovation and tech-solutions to environmental problems seem inefficient and unsustainable, rendering sufficient and potentially more useful low-tech solutions unthinkable or undesirable. The 2021 document outlines strategic actions for optimising AI's usefulness for the environment, which includes identifying climate and environment related datasets in order to facilitate AI based solutions for tackling climate change (AI: Here for Good, 2021:67). This kind of depiction of sustainability can be contrasted with an opposite view where low-tech solutions are preferred. Subsequently, this framing discounts, and makes it easier to avoid acknowledgements of the environmental impacts of digital technologies, as they are framed to be essential for achieving sustainability. This is a way to perform sustainability all the while reframing the concept of the environment and sustainability to fit the predetermined path of widespread AI uptake.

What further sets Ireland's approach apart from that of France or Austria is its comprehensive focus on the necessary infrastructure required for AI. Both of the documents make references to the need to further develop infrastructure in order to facilitate the AI ambitions of Ireland. The 2021 Irish AI strategy dedicates the second to last chapter to AI infrastructure. The document acknowledges the fundamental nature that infrastructure plays in the AI boom. Stating that a secure data, digital and connectivity infrastructure is essential for both the use and further development of AI in Ireland. The document lists properties such as high-speed and high power computing capacities as well as sufficient storage capabilities. Thus it can be said that even though the documents selected for Ireland do not include one that explicitly attends to assuring the sustainability of AI, by discussing the necessary expansion of infrastructure, the Irish AI strategy provides a more comprehensive account of the material impacts of digital technologies compared to similar French or Austrian documents.

Despite dedicating an entire relatively long chapter to AI infrastructure, the topic of its unavoidable and enormous environmental impact is almost completely left out. For instance, the high speed and high power computing (HPC) capacities mentioned just above, also need high amounts of energy to run. The more AI is integrated into every aspect of our daily lives, the more supercomputers are built and LLMs trained the more data centers are needed. This is energy that needs to be produced. Unless the energy grid is significantly expanded, the energy security of regular Irish people is put at stake. The document mentions that as AI evolves, the models are likely to become increasingly energy exhaustive, subsequently it is important to improve the energy and cost efficiency of the systems in order to counterbalance this change. The lack of efficiency of the systems is therefore not framed as problematic due to the expectation of future innovation considerably improving efficiency.

Similarly the 2024 document also dedicated an entire chapter to AI infrastructure. As the strategy update is shorter in length, so is the chapter dedicated to infrastructure. The updated infrastructure chapter focuses on five themes: computing capacity, data, cybersecurity, data centers and energy infrastructure. The 2024 refresh builds on previous discussions on AI infrastructure by distinguishing between "hard" and "soft" infrastructure. Hard infrastructure includes computing capacity, storage, and

networks, while soft infrastructure refers to large, quality-controlled datasets required for training trustworthy AI systems. Both types of infrastructure are energy intensive, and it is rather difficult to separate them in real life. It might seem that the "soft infrastructure" is somehow immaterial and exists in the "cloud" but in reality even data takes a material form, as it moves around and is stored in data centers which demand a great degree of energy to run and water to cool the system. The "soft infrastructure" cannot run without the "hard infrastructure". Although this might hint at a more nuanced understanding of AI infrastructure, it remains unclear what exactly is achieved by this distinction.

Both of the AI strategies to a degree acknowledge the high demand for energy and computing capacity of AI systems, however the discussion of the problem remains largely one-dimensional and is quickly repackaged as an opportunity to green the data center industry instead. The prior presence of multinational tech-companies in Ireland already necessitates the presence of many data centers on the island. The energy used by data centers equated to about 21% of all metered energy in Ireland, making the IT sector's share of national energy usage the largest within the EU. The number is expected to rise to 36% by 2027, largely thanks to the increased energy consumption of the AI systems (Miller, AL-Marri & Rigg, 2025). Unsurprisingly, the ever growing presence of data centers in Ireland has not been without local opposition (Bresnihan & Brodie, 2021). For instance, the opposition has stated that the impacts of increased energy demands by data centers have considerable negative impacts on the resilience of the national energy grid and on the energy security of the Irish people (Miller et al., 2025). A 2024 article by the Associated Press (AP) brings attention to the weakening public opinion towards data centers and their AI related expansion. According to the article, data centers in Ireland use around one third of the country's energy, which is more than all of the urban homes in the country. Data centers have over the years proved to increase energy prices for the local population, with Irish households paying one of the highest prices for electricity across the EU. The number of data centers has also been linked to increasingly frequent black outs, and are associated with nitrogen oxide pollution (O'Brien, 2024). None of these issues are discussed in either document, indicating a concerning disregard towards the very tangible environmental and social impacts that the Irish people are already experiencing. Of course the implications grow even more dire when one extends the same consideration to the impacts that can be felt outside of Ireland and the continent of Europe.

Similar themes continue in the updated document. Although the 2024 document mentions the growing energy demand associated with the AI revolution, the strategy attempts to repackage the issue as an opportunity to secure investments into Ireland's off-shore wind infrastructure. This appears to be a common strategy, but it is yet to be seen whether the development of off-shore wind capacity would be sufficient to off-set the rising energy needs, the corresponding high costs and black-outs. Furthermore, in the likely case that wind energy will remain insufficient, the rising energy demands have to be met with burning fossil fuels, as they have been in the past. Scholars have heavily criticised the attempt to green the data center crises, pointing out that despite the investments into wind energy, the increased

demand for energy and other structural factors likely means that Ireland will continue to heavily rely on fossil fuels (Boyd-Madsen, 2025). By avoiding the topic of negative social and environmental impacts of the AI boom and the shortcomings of the national grid, Ireland is able to continue attracting investments and big tech companies, thus solidifying its position as a major player in AI. Furthermore, by implying that the AI boom is likely to bring about the collateral green transition in the energy supply, Ireland further justifies its growing data center industry (Horn & Felt, 2025).

This attempt at "greening" the growing energy demands remains more or less the only environmental dimension associated with the AI boom that the strategy discusses. Meaning that impacts such as increased demand for fresh water used to cool data centers are not discussed. Ireland, like many Northern countries, is presented as a place especially apt for data centers. This is due to the comparably cold climate which is able to cool the data centers naturally, in some cases even providing heating to surrounding houses (Bresnihan & Brodie, 2021). However, this attempt at greening is left out of the particular strategy documents.

Similarly to most European countries Ireland is not exactly known for being a major mining location. This means that the supply of critical raw materials, necessary for each and every digital device, comes primarily from third countries, conveniently shielding the Irish population from the realities of dangerous and polluting extraction and processing. The purring of the data center is perhaps less ominous than the shrill of the drill. Finally, the EU also exports much of its digital waste to be dealt with in third countries, places which often lack the necessary environmental regulations or infrastructure to dispose of it safely. Therefore, Ireland, like other EU countries, have the privilege of being relatively divorced from the dirtier and more immediately dangerous steps of the AI life-cycle.

With a few notable exceptions, the national AI strategies tend to formulate sustainability via a very narrow definition, referring practically only to energy usage and sometimes CO2e emissions, strategically leaving out various other considerations, such as water usage, pollution or raw materials. The strategy largely ignores the life-cycle analysis approach, thus wiping their hands clean of any externalities associated with AI usage in the early stages of the life cycles as well as end of life. According to McGoey (2012) ignorance is most powerful when it retains plausible deniability. In this case mentioning the energy usage does just that, it allows to perform environmental concern while strategically ignoring those AI's externalities which may delegitimize the imperative to scale (MacKenzie, 2026).

National AI strategies strategically frame digital sovereignty as the responsible approach, in the place of digital sobriety. This framing of AI prescribes and legitimises certain policy solutions: digital sovereignty necessitates developing indigenous European AI capabilities, warranting massive investment into the industry. The strategies mainly focus on capacity building in terms of education, training and standard setting, and ways to out-innovate their global competitors. However, the more material forms of capacity, such as data centers, extensions to energy production and other essential

infrastructure, which would highlight the true extent of the environmental impact of AI, are generally ignored. The instances where infrastructure is mentioned, it is framed as an opportunity or a desirable side effect, such as access to shared computing capacity through the EU or as securing investments for greening the grid. Similarly to what Horn and Felt (2025) have referred to as collateral transitions.

By narrowing the scope of the definition of sustainability, the scope of the problem is also narrowed, making it thinkable and do-able (Pham & Davies, 2025). The way that AI is framed in relation to the environment, meaning how the topic is introduced and scope of the environment is established, subsequently determines the lengths at which one must go to in order to protect it, thus prescribing fitting policy solutions. If AI's impact is solely discussed in terms of the CO2 output associated with the data centers, then by transitioning to more energy efficient data centers or using renewable fuel to power them, the problem can be regarded as "solved". The narrow conceptualisation of environmental impacts and sustainability leaves many if not most of the externalities unsolved, it is able to present the topic as more straightforward and governable than it is in actuality. This narrow framing further serves the role of presenting the Twin Transitions to be aligned, even mutually reinforcing, while obscuring the various ways in which the two political priorities clash, enabling the simultaneous pursuit of the conflicting priorities together.

4.2.2 Drowning out sustainability by competing priorities

According to Mager and Katzenbach (2021) sociotechnical imaginaries serve an important, materially tangible role in co-producing the very futures they envision. Bareis and Katzenbach (2022) have noted that national AI strategies use similar narrative framings to envision said futures. For instance, the strategies imply that AI's role in our future is inevitable, coupled with its rapid arrival and hugely disruptive potential, immediate and huge investments for capacity building and developing an indigenous AI are made to appear as the singular appropriate solution. Furthermore, a future with AI is envisioned as economically prosperous, geopolitically safe and powerful (Brynjolfsson & McAfee, 2017; Godin and Vinck, 2017; Cath et al.,2018; Büthe et al., 2022). AI is also presented as a technofix to a multitude of problems impacting our world today, such as helping achieve the SDGs and improving accessibility (Vinuesa et al., 2020; Schneidermann, 2020).

The framings simplify AI, rendering it do-able (Pham & Davies, 2025). However, streamlining the AI, may lead to oversimplification and obscuring of certain topics. Bareis and colleagues (2025) warn that extreme and dystopic future visions, so-called "wishful worries" tend to distract from more genuine risks. Furthermore, prioritising interests such as economic growth, digital sovereignty and AI potential application for achieving the SDGs, the strategies draw attention away from the social and environmental toll that the innovation will take (Felt, 2025).

Austria

Each of the three Austrian strategy documents presents itself as being concerned with sustainability and mitigating the effects of the climate crises. However, as the national AI strategy documents start addressing concrete strategies to limit various potential negative impacts associated with AI, the strategy largely falls flat and in some cases omits discussion about the environment entirely. Instead alternative risks and problems are prioritised and dissected at length. The 2021 National AI Strategy and the 2024 Updated National AI Strategy is to lay out the aspirations that the country has around AI: ensuring that AI is applied in the pursuit of 'common good', making Austria a central location for research and innovation in artificial intelligence, as well as increasing competitiveness in technology and business. The strategy ties carving out a spot in the global AI field to securing digital sovereignty. Rather than placing the main focus on economic gain, both of the strategies emphasize the objective of cultivating additional AI expertise. These objectives speak to the underlying objective of the documents to facilitate a wide-spread roll-out and integration of AI. The 2023 Austria outlines a slightly different objective, aspiring to improve the efficiency and accessibility of its public services with the help of artificial intelligence while ensuring the efficacy of the AI roll-out.

At first glance the 2021 National AI Strategy of Austria leaves the impression of placing environmental concerns at a central position within the document, but in reality the topic of environment is only mentioned sporadically. The document starts off in a very promising manner: one of the two forewords written by Leonore Gewessler who was at the time the Minister for Climate Action, Environment, Energy, Mobility, Innovation and Technology (from now on the BMK). The ministry is one of the two governmental bodies who were tasked with assembling the strategy. In theory, this could have meant that the environmental aspect of AI would be addressed especially thoroughly, as one would expect the ministry of climate to not only be more aware of the significant environmental footprint associated with the technology but also understand the importance of tackling it head on. However, this is not the case.

The document outlines three central goals which are to be achieved with the help of the AI strategy. Firstly, the document states that the roll-out of AI in Austria should contribute to the common good: *"Objective 1: The Federal Government aims to ensure that AI is used in Austria for the common good."*(Strategie der Bundesregierung für Künstliche Intelligenz, 2021:22)[4]. The strategy document then outlines what AI for common good would look like. The strategy states that AI should only be rolled out in a responsible way. Although responsibility as such is not explicitly defined, the general direction can be derived from the context. The notion of "common good" seems to be strongly tied to European fundamental rights and values, which hints at a strong focus on societal risks, such as avoiding discrimination, and prioritising data protection and privacy. The values of transparency, trustworthiness and legal compliance are explicitly mentioned. The other central factor that the

[4] "Ziel 1: Die Bundesregierung strebt für Österreich einen auf das Gemeinwohl orientierten Einsatz von KI an. KI soll dort einsetzt werden, wo diese den Menschen nutzt und ausschließlich in verantwortungsvoller Weise und auf Basis europäischer Grundwerte und Grundrechte zum Einsatz kommen." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:22)

strategy explicitly mentions is the necessity of achieving digital sovereignty which is framed as a prerequisite for being able to set standards and pursue AI that is in line with the aforementioned European rights and values. Digital sovereignty as a goal necessitates high levels of expertise, strong infrastructure and widespread adoption. Thus the very ability of pursuing a so-called responsible AI is tied to the rapid development of AI capabilities enabling a comprehensive roll-out of the technology.

The second aim of the strategy specifically involves developing AI capabilities. *"Objective 2: Austria should become an internationally recognised research and innovation location for AI."* **(**Strategie der Bundesregierung für Künstliche Intelligenz, 2021:25)[5]. This aim is to be reached by building AI specific ecosystems, where relevant actors are able to interact. Furthermore, the capacity building includes the education and training of experts in AI as well as promoting AI as a topic in academia and arts, expanding expertise. Large sections of the strategic document are dedicated to discussing funding schemes for universities and other research institutions. This goal outlines the creation of supply, in terms of educated workforce, demand, in terms of growing interest in science and academia.

Business interests take a secondary, yet still important standing in the strategy. For example, in the Irish context, engaging academia was framed as a means to the end of producing experts and expertise in order to ultimately give Irish businesses a competitive edge on the global AI market. In the Austrian context the justification for wide-scale AI roll-out is tied to cultivating recognition of importance in the field of AI, instead of focusing on GDP or other economic indicators.*"A strong ICT and AI sector also creates numerous advantages and positive impulses for Austria as a business location - such as job creation, economic growth, attracting investment, and faster digitalization of other sectors"* (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan, 2024:38)[6]. Although prosperity might ultimately be the motivating force of Austria too, the framing used is notably different. Where Ireland frames the areas of application for AI, agriculture, sustainability and crisis prevention, as potential markets where Irish businesses might thrive, Austria instead frames the same fields as important academic pursuits in need of funding. The solutions that such research and innovation would yield, are directed more so towards domestic areas of concern, rather than being exported for economic gain (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:15). Although economic gain is cited several times it does not seem to be the main argument used in the Austrian AI strategy. This is in many ways connected to the first aspiration of becoming an important location for research and innovation in the field of AI, as these goals largely reinforce each other.

The third aim of the strategy specifically ties AI to the competitiveness of Austria as a location for technological innovation and business: *"Goal 3: AI should help to secure the competitiveness of*

[5] "Ziel 2: Österreich soll ein international anerkannter Forschungs- und Innovationsstandort für KI werden." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:25)

[6] "Auch für den österreichischen Wirtschaftsstandort entstehen durch eine starke IKT- und KI-Branche zahlreiche Vorteile und positive Impulse – wie Schaffung von Arbeitsplätzen, Wirtschaftswachstum, Anziehung von Investitionen sowie schnellere Digitalisierung anderer Branchen." (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan, 2024:38

Austria as a technology and business location." **(**Strategie der Bundesregierung für Künstliche Intelligenz, 2021:25)[7] This goal includes providing support to small and medium businesses in order to help them adopt AI based solutions that would generate added value. Furthermore, this objective includes enhancing the AI knowledge or literacy of the general population, specifically emphasizing the introduction of possible uses of AI.

All of the three objectives outlined in the Austrian AI strategy necessitate the wide-spread roll-out of AI, and thus requires a robust digital infrastructure (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:10). Furthermore, developing one's own AI models based on one's own data and operating AI applications with one's own infrastructure ("on-premises") can help reduce dependencies and strengthen one's own power. (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:38). Developing expertise and a leading position in AI serves the wider purpose of digital sovereignty and avoiding technological dependence (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:37). This is also framed as a way to ensure the various ethical, safety and security related standards that Austria sets for "trustworthy" AI. Remaining independent of global monopolies is framed as a way to avoid undesirable developments in technology. Similarly to the contexts of France and Ireland, the EU is framed as a reliable partner, and the rest of the world as competition, ready to go rogue as soon as the leash is let go.

Notably, the capacity building focuses on "soft infrastructures" and not on the building of data centers or the necessary expansion of energy production to support the planned growth of computing capacity. The reality that such an ambitious approach to AI would require major expansion to digital infrastructure, including the building of additional data centers which need ample energy to run is interestingly not mentioned. Moreover, recent discussions on where the necessary energy might come from, have increasingly looked towards nuclear energy, which Austria has famously rejected (Felt, 2015).

The document does discuss various challenges and potential areas of concern related to the advent of AI, but these discussions touch on topics such as security, protecting fundamental rights and data protection, ensuring equality and the prohibition of discrimination (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:12). Conversely, the strategy does not seem to concern itself much with addressing the environmental impact and risks of the widespread roll-out it aims to facilitate. The document does hint once that if we are not careful enough AI might have some less than desirable effects on the environment but remains incredibly vague in terms of what the effects might be. Such lack of nuance and detail appears to solely describe the topic of environmental protections, whereas topics such as security, safety and data privacy are described in detail. The topic of environmental risks and sustainability are deliberately deprioritised, despite claiming to be wholeheartedly concerned with fighting climate change. Furthermore, on the rare occasion that the environment does get brought up,

[7] "Ziel 3: KI soll helfen, die Wettbewerbsfähigkeit des österreichischen Technologie- und Wirtschaftsstandorts zu sichern." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:25)

the account is simplistic at best: discussions almost entirely focus on how AI will be essential for finding solutions to the climate crisis, failing to mention the enormous impact that the AI revolution would have on the environment. Although the foreword makes a reference to needing to stay vigilant about dangers surrounding AI, nothing specific is mentioned.

The exact reason for this unproportional approach is unclear, however, it is very likely not accidental nor innocent. Namely, strategic documents play a role in establishing public discourse, performing and rehearsing visions of desirable futures which are to be achieved with the help of technology. Creating expectations for AI's role in the future, as well as defining potential negative consequences that need to be addressed. The document frames AI from a specific angle, acknowledging and prioritising some topics, and leaving others out. Considering the consequences of specific framings helps to theorize about the motivations behind the decisions. For example, if it has already been decided that AI will play a significant role in the future of the country, then the strategic document is likely to be framed from a perspective that does not call into question whether AI should be adopted or not. Instead, the document would most likely discuss the best ways to go about rolling out the technology. For instance, such a document would likely leave out issues and perspectives that cannot be solved easily, as this might go against the aim of facilitating the roll-out.

What all three of these objectives have in common is that the prerequisite for reaching them is the widespread roll-out and adoption of AI to the highest extent possible, in other words the imperative to scale (MacKenzie, 2026). The strategy deals with AI as if the benefits of the technology are given, and risks negligible or at least solvable. Becoming a major AI player is not just desirable but also seemingly the only way to continue living according to human rights and fundamental European values. Although the alternative is not explicitly mentioned, the strategy hints at an undesirable future of succumbing to the domination of tech-companies and countries with the monopoly of AI who thus according to this logic possess overwhelming power over the European digital dimension. This is a future of falling behind, losing control and failing the people and businesses of Austria. Consequently the document assigns the responsibility of preventing this undesirable future to the various ministries and governmental institutions that it addresses: by creating a reliable regulatory ecosystem, and generating enough know-how and interest, the benefits will ensue naturally.

The topic of environmental considerations gains traction in the 2024 update. The updated document includes a list of priorities, one of which is "*Climate Neutrality and Sustainability of and through AI"* (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:5). The updated version acknowledges that in addition to the innovative uses and benefits of AI, it also carries various potential risks, among which climate neutrality is also mentioned (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:18) It is similar to the initial 2021 version so far as it aims to utilize AI to fight problems related to the climate crises but the wording has changed in small but not insignificant ways. What sets it apart from the 2021 version is for instance the subtle but

impactful addition of the word "*of*", which serves as an acknowledgement of the environmental impact of AI based systems and subsequently hints at the promise to at least attempt to curb such impact. Climate neutrality as a term also hints towards a stance that in addition to the positive impact on the environment that AI can have in specific applications, the negative impacts would also be taken into account. Furthermore, the updates strategy goes so far as to call into question the future of generative AI if the issue of resource intensity is not tackled to a sufficient degree, setting it further apart from the initial 2021 strategy. The updated document goes even further by outlining potential solutions that may help curb the environmental impact, such as reducing the size of the models (SLM), extended short term memory (xLSTM) or creating fewer but bigger models instead of many individual ones (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:20). Furthermore, the document points out that the growing ecological footprint of AI based systems is associated with both the training and the use phase. As 'Climate Neutrality and Sustainability of and Through AI' is designated as one of the priorities in the 2024 updated National AI strategy for Austria, it is given a separate sub-chapter, giving insight to the plan which would allow to achieve climate neutrality and sustainability. As the title of this sub-chapter hints at, it addresses the conflicting nature of AI being on one hand energy exhaustive but on the other offering promising new solutions to various environmental problems.

This change seems to have come about due to the growing discussions around the challenges posed by AI, including "*ethical issues, human rights, democracy, security, and energy consumption*" (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:17)[8]. Despite this, the document continues to praise AI as a useful tool for sustainability: "*digitalization and sustainability should be considered together to find crucial synergies, rather than pushing the two topics forward as conflicting developments*" (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:36)[9], pointing to the Twin Transition strategy of the European Commission. Therefore, the paradoxical nature of these two aims is mentioned but politely requested to be ignored. Certainly several steps can be taken to lower the environmental footprint of AI technologies, either in the building, training or use phases, several of which are also mentioned throughout the document. Yet, it remains questionable whether the goal of reaching climate neutrality in Austria by 2040 is plausible given the planned AI rollout outlined in these documents, especially given the grand aspirations around becoming a location for AI research and innovation, and particularly if AI would be able to do more good than harm in this case.

[8] "Gleichzeitig hat die Debatte über die Bewältigung von Herausforderungen, die durch den Einsatz von KI entstehen, an Fahrt aufgenommen. Dies betrifft insbesondere ethische Fragen, Menschenrechte, Demokratie, Sicherheit und Energieverbrauch." (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:17)

[9] "Zentraler Gedanke hierbei ist, dass Digitalisierung und Nachhaltigkeit zusammengedacht werden müssen, um entscheidende Synergien zu finden, statt die beiden Themen als widerstreitende Entwicklungen voranzutreiben." (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:36)

Despite the acknowledgement of growing concerns about AI, the expansion of the AI ecosystem is still regarded as a positive development, the document continues with the same ambition of the 2021 strategy. Although some discrepancies between sustainability and an ambitious AI strategy are acknowledged, they are not framed as incompatible. The critical perspective on the growing environmental footprint is not carried much further but instead gets replaced by the familiar technosolutionist tone familiar from the 2021 document: "*The Austrian AI ecosystem has grown significantly in recent years. Urban technologies, green tech, clean tech, manufacturing, digital business, data protection technologies, health tech, med tech, and geoAI are applications that an increasing number of established companies and startups are pursuing*" (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:22)[10]. AI is therefore again framed as a critical tool for fighting climate change, and a number of other ailments plaguing society.

The topic of environmental effects and sustainability is also mentioned relatively often in the third document, the Practical Guide to Digital Administration and Ethics (Praxisleitfaden „Digitale Verwaltung und Ethik") released in 2023. This document is specifically directed towards ensuring that digitalisation, and in particular AI are adopted by the public service in an ethical manner. The discussion around the sustainability of AI seems considerably less performative in this document. What sets this document apart from the other two is that it bases its discussion directly on academic discussions. For instance referencing Coeckelbergh (2021) in the context of ethical and responsible AI. This seems to improve the depth of the discussion. Whereas in the 2024 Updated National AI Strategy writes about taking into account the energy use and greenhouse gas emissions associated with the training and the use of AI systems, this document also includes the creation phase (Praxisleitfaden „Digitale Verwaltung und Ethik", 2023:30). Furthermore, it goes into detail explaining how the increased use of statistical language models and computer clusters, processing large amounts of text data has resulted in high levels of energy consumption and emissions. Several other attempts are made to illustrate the environmental impacts and make them more tangible for the reader, for instance by including a graph comparing the lifetime emissions of an AI system to the greenhouse gas emissions of a flight between New York and San Francisco, the yearly emissions of an average American, and the lifetime emissions of a car in the US (Praxisleitfaden „Digitale Verwaltung und Ethik", 2023:31).
The document also includes some ideas about how to decrease the environmental footprint of AI, proposing for instance to consider compromising on accuracy where plausible, creating generalized models instead of hyper specific ones, reducing redundancies, pooling resources nationally and internationally, prioritising open access solutions and reusability of data. Stating for example that data centers should be designed with a focus on energy efficiency in mind and consider using renewable

[10] "Das österreichische KI-Ökosystem ist in den vergangenen Jahren stark gewachsen. Urban Technologies, GreenTech, CleanTech, Manufacturing, Digital Business, Datenschutztechnologien, HealthTech, MedTech und GeoAI sind Anwendungen, mit denen sich eine zunehmende Zahl an etablierten Unternehmen wie auch Startups beschäftigt."(Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:22)

energy sources in their energy mix (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:32). The document integrates discussions on sustainable AI better than either of the two National AI strategies. Regardless, the consideration could certainly go further. For instance, it comes as quite the surprise that after these discussions, they do not make it into the check list for determining the digital sobriety of AI at the end of the document (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:75-80).

France

The differing priorities in the two French documents are perhaps best illustrated by the dramatically different conceptualisation of responsibility. Namely, what is the responsibility directed towards and who it is assigned to. In the 2021 document, responsibility is framed as a moral obligation to mitigate the environmental footprint of digital technologies. The document acknowledges that digital technologies have a huge environmental impact, tying it to meeting the commitments made in the Paris Climate Agreement. Furthermore, it strongly questions the narratives of digital technologies benefitting the environment and furthering sustainability goals. "*While the preservation of our environment is one of the major challenges facing humanity, digital technologies have so far not positively contributed to the ecological transition. Far from immateriality and cleanliness wrongly attributed to it, digital technologies cause environmental harm: in the exploitation of non-renewable natural resources, pollution due to metal extraction and waste, and energy consumption"*. (Roadmap on Digital Technology and the Environment, 2021: 5). The document underscores the need for a comprehensive and science-backed policy of digital sobriety required to reduce emissions and preserve the environment, which is described as one of the central causes of our time. Digital sobriety is placed at the center of the strategy, as it is framed as a prerequisite for a "responsible" approach to the digital transition. The document also challenges the myths of digital immateriality and cleanliness, highlighting the environmental harm caused across the life-cycle of digital technologies, from resource extraction to disposal. Environmental responsibility is the central focus of the strategy document. In addition to its ability to mitigate the environmental burden, digital sobriety is portrayed in the 2021 document as a means for France to carve out an international image of excellence in sustainability. By positioning itself as a leader in digital sobriety France aims to establish a competitive advantage within the European and global digital sectors. The document suggests that integrating an environmental perspective into AI development could differentiate France from other nations, allowing it to stand out with a unique, sustainability-focused approach to digital technologies.

The comprehensive approach to sustainability does not come as a big surprise as the document is specifically dedicated to addressing the issue. However, if compared to the document from Austria, Ireland, and the 2024 French AI strategy, the 2021 French document stands out both due to its undeniably comprehensive account of the environmental externalities of digital technologies (such as AI), as well as the fact that instead of growing more conscious in later documents, French AI strategy might be moving the opposite way. It is necessary to mention that the 2021 French strategy document

does not address the topic of AI but digital technologies in general. This suggests that as AI became the focus of the digital transition, France chose to dilute its environmental ambitions in order to allow the AI revolution to go ahead.

As briefly mentioned, the 2024 document shifts the focus of responsibility away from digital sobriety, instead setting the aim of digital sovereignty at the center of its AI strategy. The new framing of responsibility abandons sustainability as its north star, instead centering digital sovereignty. The discourse equates a slow and deliberate approach to AI adoption to the "wasting" of France's and the EU's potential to become global leaders in AI, deprioritising digital sobriety and prioritising digital sovereignty.

This "wasted potential" partially refers to the missed economic opportunities, with the document warning that Europe's diminished market share has already cost it dearly. However, it remains optimistic, presenting AI as a second chance to reclaim a competitive position in the global digital market. The 2024 document emphasizes AI's potential to bring economic prosperity, framing it as a collective dream for France and Europe. It argues that failing to invest in AI now would cost France much more in the long run, both economically and socially. The document highlights how past delays in the digital transition have left Europe's digital economy lagging behind, with its market size now two and a half to three times smaller than that of the United States. Despite Europe's strong foundation such as being one of the largest markets for digital technologies and producing a high number of researchers and engineers, these advantages have not translated into global leadership. Only 10% of the top 100 digital companies are European, furthermore, the region lacks a significant presence even among second-and third-tier companies. The document suggests that the AI market is still in its early stages, meaning that with the right investments and policies, France and Europe can position themselves as leaders. Additionally acknowledging that Europe currently has companies positioned all across the value chain of AI, and is therefore well positioned to carve out a piece of the market for themselves. The document predicts that AI could almost double France's GDP, though it acknowledges that this initial economic boost from automation would be a one-time benefit. AI is also portrayed as a driver of innovation, with the potential to generate lasting economic growth. Such economic growth is also alluded to benefit the French society as a whole. "*For several decades, the trend has been for our continent to fall behind technologically and economically, jeopardizing its prosperity and independence. At a time when the United States and China have made mastery of AI one of the pillars of their national strategies, we must rise to the challenge of AI, or risk losing the control of our future"*(OUR AI: Our Ambition for France, 2024:3)". This further exemplifies that the shift in responsibility away from environmental preservation, is aimed at ensuring that France and the EU do not miss opportunities for economic prosperity which is directly tied to political influence.

Responsible AI policy no longer refers to digital sobriety but protecting France's political influence and geopolitical power from the systemic risks that AI introduces. "*They [AI systems] are a source of systemic risk, particularly in terms of the potential for technological concentration in the hands of a*

small number of countries, companies or individuals." The 2024 document positions AI as a critical tool for securing France's and Europe's leadership in the global digital landscape. It frames acquiring AI competence as a strategic security move, essential for maintaining digital sovereignty and decision-making power. The document argues that Europe must become a world leader in AI, with France leading the EU in this effort, or risks losing control. To achieve this, the document emphasizes the importance of making France a hub for computing power, which it sees as vital for becoming an AI superpower, as well as the importance of securing an independent energy supply to support AI infrastructure. It also stresses the need for home-developed AI to ensure control over its future. These measures are presented as strategically non-negotiable for France's and Europe's competitiveness and sovereignty.

Acknowledgement of the environmental burden created by digital technologies is virtually absent in the 2024 AI strategy document. This absence is rather concerning, as AI is far more energy and resource intensive than the digital technologies described in the 2021 document, meaning that the negative effects described therein have also increased manyfold. The 2024 document makes two direct references to the environmental footprint of digital technologies, framing them as part of the challenges associated with AI but not presenting it as a reason to limit AI use. Instead of the strategy familiar from the 2021 document, encouraging digital sobriety within the society as well as the private sector, the AI strategy actually calls for widespread rollout of AI with a "public guarantee of usage" to secure investments into computing power. The 2024 document does also mention "*the environmental dimension*[of AI]" but mainly as a way to create a competitive advantage for France. No real solutions are offered to reduce the environmental footprint of AI, and the issues gradually appear as they in fact need no solution at all.

Although digital sovereignty is largely deprioritised, and no longer dictates the direction of France's digitalisation strategy, the 2024 AI strategy attempts to reframe it as a competitive advantage. The document links AI to the "twin transition", the simultaneous pursuit of digital and ecological transformation, arguing that succeeding in this transition will enhance France's and Europe's decision-making power on the global stage. It warns that failing to act could lead to a concentration of power in the hands of non-European actors, making it essential to mobilize European competition policy to prevent this outcome.

Framing the 'AI revolution' in this way makes it plausible to largely ignore the environmental commitments so diligently outlined in the 2021 document, perhaps as the risks associated with climate change remain less tangible for the French population, than imminent economic slow down, especially as many of the environmental externalities happen across borders. Making market leadership in AI effectively a question of security and sovereignty distracts the reader from the environmental sacrifices that achieving such a position demands. The document warns that failing to capitalize on AI development will cost France political capital, financial opportunities, and the ability to embed 'European values' into AI systems. This shift reflects a broader reimagining of responsibility, where

environmental concerns are deprioritized and economic and geopolitical ambitions take the central stage.

Ireland

What sets Ireland apart from the other national contexts is that the large-scale presence of multi-national tech companies is nothing new. The strategy is thus not so much concerned with becoming a location for AI related innovation and business like Austria but preserving and enchanting the presence of big tech in the country. Much like the other two countries, the driving vision is (eventually) being "*an international leader in using AI to the benefit of our population, through a people-centred, ethical approach to AI development, adoption and use*" (AI Here for Good, 2021:16). Similarly to the other countries this aim necessitates wide-spread roll-out of AI and subsequent expansion of expertise and infrastructure, however, instead of representing a change in direction in the country's digitalisation policy, it can instead be seen as doubling down. This could explain why the economically minded narratives between the two iterations of the national AI strategy do not change dramatically.

Ireland's claims of playing a leading role in AI are supported by several indicators. In the European Union, Ireland is a popular location for large digital firms and has subsequently been ranked 5th in the European Union for the number of "digital Unicorns", especially impressive considering the small size of the country and its population. Ireland also aspires to play an active role in the regulation of AI within the European Union. Unsurprisingly, Irish AI strategy aligns with broader European and international frameworks for AI regulation, reflecting its integration into global and regional AI governance networks. The Irish AI strategy makes several references to European level advisory and regulatory documents, such as the European Commission's Green Deal and the 2030 Digital Compass, and the Communication on Artificial Intelligence for Europe. These documents point towards the EU's dual commitment to driving innovation while ensuring ethical and sustainable AI development.

Already in 2021 Ireland was ahead of the rest of the EU in most enterprises having adopted AI based solutions (AI Here for Good, 2021:30). The document predicts this number to only grow with time. However, 52% of the businesses surveyed had not and more importantly did not plan to adopt AI based technology in the future, this was framed as a problem in the document. The AI strategy refers to earlier studies that had blamed lack of clarity and expertise in addition to lack of appetite for this "shortcoming". The role of the government is framed to play a supportive role to facilitate widespread adoption of AI. One of the ways this is done is by setting up a cohesive AI environment and by adopting so-called Digital Innovation Hubs that are designed to act as "one stop shops" for anything AI related. Including skills and training, data protection, ethics, regulatory compliance, research facilities etc. (AI Here for Good, 2021:32). Ireland also hopes to boost AI adoption and innovation by working with various national agencies such as CeADAR (Centre for Applied Artificial Intelligence, EI (Enterprise Ireland) and IDA (Ireland's Foreign Direct Investment Agency). In addition to making

it straightforward and desirable for businesses to adopt AI, the strategy also emphasises the importance of wide-spread uptake of AI within the general population of Ireland. This widespread uptake or buy-in is seen as an imperative for enjoying any of the positives that the AI revolution promises "*AI offers transformative potential for tackling many societal, environmental and economic challenges. However, for this to be successful, widespread societal buy-in is required*" (AI: Here for Good, 2021:6).

The Department of Enterprise, Trade and Employment (DETE) plays a central role in preparing the Irish AI strategy, determining the structure, framing and contributors of the strategy. Thus, the perspectives and priorities of DETE, an institution primarily concerned with topics of Enterprise, Trade and Employment unsurprisingly dominate the strategy. Subsequently Ireland's AI governance prioritises business interests, often at the expense of other perspectives, such as environmental sustainability. Especially, as pursuing the alternative goals would come at a cost to previously mentioned business interests. Technological prowess is not a dream for the future but Ireland's current stabilised image. Thus it should not come as a surprise that the Irish AI strategies emphasize further strengthening Ireland's image as a desirable business location, enhancing integration of the technologies as well as uptake. The economic framing of the Irish national AI strategy is also apparent in the individuals and institutions involved in the development of the documents. For instance, in the case of both documents, the foreword was written by the Minister of State for Trade Promotion, Digital and Company Regulation, at the time. Robert Troy T.D in 2021 and Dara Calleary T.D in 2024. The role of the Minister of State for Trade Promotion, Digital and Company Regulation is closely tied to enterprise and digital innovation. Furthermore, the Minister of State for Trade production, Digital and Company regulation chairs the Enterprise Digital Advisory Forum, further reinforcing the likelihood that the strategy is shaped to support the pro-business perspective. This institutional arrangement highlights how the question of governance is likely to shape AI strategy, in this case the strategic prioritisation of economic competitiveness and technological leadership in Ireland's AI strategy.

Ireland's AI strategy is not only shaped by domestic governing bodies but also by its position within Europe and the global digital and AI markets. Namely, Ireland prides itself on already having achieved a leading position in the field of big tech and AI despite its small size. Such a position, however, can not be taken for granted. In order to maintain and even strengthen its position in the global AI race, Ireland must be strategic, this is also clearly reflected in the vision statement from the 2021 document: "*Ireland will be an international leader in using AI to the benefit of our population, through a people-centred, ethical approach to AI development, adoption and use*." (AI: Here for Good, 2021: 5).

The Irish AI strategies place enhancing public trust towards AI at the center of the approach. Ensuring a high level of public trust towards AI is seen as a prerequisite for large-scale uptake of AI within the population. "*The more people who understand and trust in the potential of AI, the more who will embrace it. The Government recognises the need to have meaningful engagement with the public on*

the development, governance and use of AI." (AI: Here for Good, 2021:6). To establish public trust, the strategy places a huge emphasis on protecting human rights and promoting "*diversity, inclusion, equality and nondiscrimination*."(AI: Here for Good, 2021:6). In addition to discussing the necessity to expand the physical infrastructure in order to facilitate large-scale take-up, such as expanding energy production and pooling resources within EU to have access to HPC the strategy also outlines having access to good quality data as a prerequisite in order for AI to "*serve the public*" (AI: Here for Good, 2021:38). Ireland positions itself as a leading digital nation with strong know-how in data governance, which is framed as a strategic competitive advantage and a way to enhance prosperity "*AI is part of a suite of digital technologies which will play a major role in shaping global competitiveness and productivity over the coming decades, granting early adopters significant societal, economic and strategic advantages*." (AI: Here for Good, 2021:4). AI is also framed as a way for businesses to unlock the full economic potential of AI. The 2021 document goes further, outlining various sectors in which AI has shown potential, or which Irish businesses are already successfully applying AI in. For example, the document mentions applying AI in public services, bringing the examples of using AI to improve bicycle lanes in Dublin (AI Here for Good, 2021:39), and AI powers bots aiding citizens with declaring taxes (AI Here for Good, 2021:43). Other potential applications that the document mentions are in the health sector, justice sector and agricultural sector.

The involvement of governing bodies or voices speaking for environmental sustainability or climate activism is rather limited. While Ireland, as a member of the European Union has made several commitments to meeting climate goals such as lowering emissions, incorporating environmental concerns seems to be secondary to economic objectives. This does not mean the complete omission of environmental protection but rather that any environmental issues are framed to support the pro-innovation and pro-business agenda, for instance how increases in energy demand was reframed as an opportunity to secure investments into the Irish off-shore wind sector. The strategies do mention environmental challenges at times but focus on solutions which support economic growth and widespread adoption of AI instead of calling it into question or risking slowing it down. Many of the sectors that are seen to be fit for AI innovation have a sustainability or environmental focus. This hints at the kind of environmental technosolutionism which largely disregards the environmental impact of digital technologies including AI, and instead focuses on the ways it can be used to address environmental challenges, misleadingly calling it *green tech*. In addition to the examples I have already referenced, another case study referred to in the 2021 document "*Terrain A': Data Platform for Sustainable Land Use*" which aims to use Earth Observation data to improve our understanding of land management, allowing to manage carbon emissions arising from the landscape, and "*enabling more sustainable land management*"(AI Here for Good, 2021:63). This theme is already rather prevalent in the 2021 document but becomes predominant in the updated 2024 document.

AI strategy documents deliberately deprioritise the “climate issue” and omit it from future imaginaries. In particular environmental impacts are omitted from dystopian visions of undesirable futures, obscuring the risks that unchecked digital expansion would bring about. Instead AI strategies invoke dystopian future imaginaries that focus on geopolitical risks, economic stagnation or the inability to ensure that AI will be aligned with values such as fundamental human rights and nondiscrimination.. Visions of such dystopian futures play the preformative role of legitimizing and solidifying AI development as necessary for avoiding dystopian futures. Meanwhile visions of desirable futures are invoked in parallel to showcase the role that AI will play in creating a prosperous and secure world, while providing innovative solutions in sectors ranging from drug development to agriculture. Thus both dystopian and desirable futures are used to legitimise the imperative to scale.

The negative environmental impacts of AI, although briefly mentioned, are minimised, deprioritised and largely left out of the strategy documents. Sustainability and the climate are discussed primarily in oversimplified and streamlined ways that seem easily solvable, providing plausible deniability for criticisms of environmental indifference while not endangering AI as the legitimate course of action. The strategy documents spend ample time discussing other important risks associated with AI, such as discrimination and data privacy, even at times acknowledging the controversial nature of AI. While, environmental externalities associated with AI are oftentimes mentioned only in passing or cleverly repackaged as bringing about desirable “collateral transitions”, such as acting as financial incentives for “greening” the energy grid. The difference between these risks is that the solution to discrimination and endangerment of human rights is developing an indigenous AI, i.e more innovation and more investment will translate to fewer risks. While more innovation is likely to translate to higher environmental impacts. Furthermore, when environmental risks are mentioned alongside others, such as economic stagnation or losing control over one’s own society, the issue of environmental externalities might seem distant or intangible, especially when the document fails to appropriately grasp the full magnitude of the issue.

The 2021 French document, as well as the 2023 Austrian document serve as notable exceptions. Both include a considerably more comprehensive scope of the environmental impacts of digital technologies and AI respectively. Calling for careful consideration of how the environmental footprint can be minimized, for example suggesting lower tech alternatives or less accurate models where appropriate.

4.2.3 Framing AI as a powerful tool for the environment

AI has proven useful in various efficiency and sustainability related cases (Vinuesa, 2020). However, scholars have urged caution, calling for the development of a comprehensive system for weighting the sustainability benefits of AI against its downsides (Lannelongue et al., 2020; Strubell et al., 2019). Despite ample calls from academia to pay attention to the negative environmental impacts of AI, this topic remains largely unexplored in the strategic documents. Bareis and Katzenbach (2022) have found

that governments often contribute to the hype around AI developments, rather than acting as a watchdog to predict and mitigate risks. As noted by Lehuede (2025) and Brevini (2020) there is tendency to overly focus on the development of "green AI" whilst failing to adequately take into account the negative impacts on the environment.

I find that the documents that share the underlying objective of facilitating AI roll-out, tend to focus on the potential to use AI as a tool to mitigate climate change and improve efficiency, largely neglecting to balance this account with acknowledging the corresponding environmental externalities. Bareis and Katzenbach (2022) note that governmental documents generally aim to mitigate risks by "fixing" AI, rather than considering alternative approaches. However, this does not describe the documents that do not set the facilitating of the wide-spread roll-out of AI as its priority. These documents deliberate on the suitability of digital solutions for sustainability, instead of taking it as a given.

Furthermore, I find that in the later documents, when AI has already been widely integrated and accepted within society, the balance between acknowledging the benefits and the downsides of such solutions tends to improve to some extent. Although, this could be tied to increasing calls from academia and civil society. I argue that this change can at least in part be accredited to what the sociology of expectation refers to as the hype-cycle, in which technologies in their early stages are often hyped in order to generate interest and investments. The cultivation of hype around emerging technologies is often believed to be a strategic move to generate the necessary interest and investments (Ulnicane et al., 2021). Thus, as our societies and policy becomes increasingly path-dependent on AI, the unbounded hyping up of AI starts to slowly subside, leaving room for a more balanced perspective.

Austria

Austrian strategy documents do not acknowledge the negative environmental impact of AI to a large degree, with the notable expectation of the 2023 document, which is directed at Austrian institutions and bureaucratic staff. Instead, the national strategy documents frame AI as a useful and oftentimes irreplaceable tool for tackling climate change. AI's relation to the environment is framed differently based on the intended audience, the deprioritisation of AI's environmental impacts in the national AI strategy can thus be seen as strategic ignorance, intended to render AI, as Pham and Davies (2025) put it, do-able. The 2021 national strategy frames AI as critical for enhancing sustainability and taking action against the climate crisis, dedicating one of the two forewords almost entirely to this topic. AI is framed as a transformative force enabling new kinds of prediction mechanisms and solutions previously impossible. However, despite this strong focus on environmental issues, the foreword almost entirely omits discussions of the negative environmental impacts associated with AI. Felt (2025) has argued that by drawing the focus to what AI can do for the environment, our attention is diverted from the ways AI does impact the environment. Themes of framing AI as a tool for fighting climate change, is carried throughout the strategic document and consistently tied to the European Union's Twin Tradition strategy as illustrated by the following quote. "*...in addition to digital*

transformation, the reduction of greenhouse gas emissions and thus the protection of the environment, climate, resources, and the preservation of biodiversity will be key challenges for the Union in the coming years and decades – the use of AI will be of particular importance in both areas." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:55)[11].

AI is framed almost as the swiss army knife of technologies - providing solutions to various problems and in countless fields. Already the second sentence of the foreword alludes to the numerous new possibilities of climate protection enabled by AI. "*For example, AI-based innovations can advance the expansion of renewable energies, contribute to increasing the efficiency of freight logistics, or support the transition to sustainable mobility*." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:3)[12]. It is implied that as time goes on, the number of possible applications for the technology will only grow. Accelerating this process is the goal of the BMK, and the strategy that it proposes for mitigating the climate crises. The BMK has already supported many research projects "*in the area of AI for Green*". By framing environmental protection as an important area of application, AI becomes a strategic tool of sustainability and climate protection. By focusing on the benefits of such application, AI effectively gets divorced from its negative environmental impact, allowing the strategy not to unpack this unsavory topic. The coupling of AI with sustainable solutions lends a climate positive image for AI as a technology in general, helping to shield it from sustainability related critique. Furthermore, this makes it possible to still position Austria as a champion for fair and ethical AI, and as a location for AI without acknowledging the paradoxical nature of those two aspirations

France

Unlike other documents analysed in this thesis, the 2021 French document calls into question the benefit and applicability of using AI to further sustainability "*While the preservation of our environment is one of the major challenges facing humanity, digital technologies have so far not positively contributed to the ecological transition. Far from immateriality and cleanliness wrongly attributed to it, digital technologies cause environmental harm: in the exploitation of non-renewable natural resources, pollution due to metal extraction and waste, and energy consumption"*(Roadmap on Digital Technology and the Environment, 2021: 5). The document suggests that digital technologies could in the future become useful for tackling environmental challenges, in which case it should be applied as such. However, the document maintains a tentative stance, underlining the importance of weighing the benefits against the drawbacks.

[11] "...stellen neben der digitalen Transformation auch die Reduktion der Treibhausgasemissionen und damit der Schutz von Umwelt, Klima, Ressourcen und der Erhalt der Artenvielfalt zentrale Herausforderungen der kommenden Jahre und Jahrzehnte der Union dar – bei beiden wird der Einsatz von KI von besonderer Bedeutung sein. (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:55)

[12] "So können KI-basierte Innovationen etwa den Ausbau erneuerbarer Energien voranbringen, zur Steigerung der Effizienz der Güterlogistik beitragen oder den Umstieg auf nachhaltige Mobilität unterstützen."(Strategie der Bundesregierung für Künstliche Intelligenz, 2021:3

The 2024 document takes a drastically different approach. Instead of questioning the benefit of AI based systems for pursuing environmental goals, it embraces them, framing AI as a tool for addressing environmental challenges, even presenting it as an obvious and planned solution for benefiting the climate. This marks a shift from the 2021 document, where AI was part of a two-pronged sustainability strategy that prioritised digital sobriety. In the 2024 document, however, AI's role in sustainability is presented as more or less sufficient on its own, with no mention of "sober AI" or specific efforts to mitigate its environmental impact. Instead, the focus is on using AI to enhance efficiency and develop solutions to climate-related challenges. For example, the document highlights specific potential applications such as weather pattern monitoring to improve efficiency of farming practices, thus portraying the applications of AI for sustainability as certain and advantageous. The document argues that qualifying AI's opportunities is more difficult than recognizing its downsides, leading to undervaluation of the potentials of the technology. The document further expresses the conviction that, in time, AI will prove to be a powerful tool for sustainability and eventually become a force for good. By positioning AI as a tool for sustainability, the document aligns France's environmental ambitions with its economic and geopolitical goals discussed above, reinforcing the narrative that widespread AI adoption is essential for France's success both within the EU and globally. "I*t's not a question of chasing behind technological advances, but of creating our own comparative advantages…The path to differentiation could focus in particular on the environmental dimension, by targeting new generations of AI, from hardware architecture to the choice of models, that will consume less energy*" (OUR AI: Our Ambition for France, 2024:10). Thus instead of underscoring sober AI as a driving principle, thus likely inhibiting the goal of wide-spread AI roll-out, efficiency is framed as a competitive advantage.

Ireland

The Irish AI strategies similarly frame AI as an vital tool for addressing climate change related challenges and improving sustainability and efficiency of systems, thus obscuring the negative environmental impacts of AI (Felt, 2025). The 2021 document (AI -Here for Good: A National Artificial Intelligence Strategy for Ireland) makes several references to the potential of AI to be used as a solution to various environmental problems. For example, the document suggests that AI can be a helpful tool for monitoring and reducing energy consumption, bringing an example of the case study from the ESB's Smart Energy Services, which demonstrated how AI-based analytics and IoT technologies helped Tesco Ireland reduce its annual energy bills by 25%, with refrigeration savings alone totaling 10 GWh. By providing examples of how AI has already proven applicable for improving efficiency, the document is able to assure the reader of the validity of such aims. Furthermore, AI based solutions are suggested for risk management via real-time environmental monitoring. AI is framed as helping both to predict and prevent environmental crises, which are becoming increasingly more frequent. The descriptions of such applications are not weighed against

the environmental footprint of the AI systems, nor are they compared to other potential lower tech solutions. The 2021 document also makes reference to prior national and EU legislation that frame digital technologies as a tool for solving environmental and sustainability related problems. Most notable of these references is to the European Union's "Twin Transition" strategy. The tile refers to the "twin" digital and green transitions, particularly framing digital technologies as a way to enable the green transition. By coupling the two transitions together the validity of the green transition helps to further legitimise the digital.

Solutions such as applying AI for environmental monitoring, familiar already from the 2021 document remain relevant also in the refreshed 2024 version. For instance, the document mentions the CAMEO project, which aims to develop the Earth Observations (EO) sector in Ireland, hoping to provide solutions in areas such as "*climate, agriculture, and the marin*e", having already developed an early warning systems for populations at high flood-risk areas around Ireland (Irish AI Strategy Refresh, 2024:22). However, there is a notable increase of this theme in the later, 2024 document, suggesting a further integration of AI related technologies into Ireland's climate and energy strategies. AI is framed as beneficial for the climate, as the increased energy usage of AI is said to incentivise and secure investments into Ireland, most importantly in the Irish off-shore wind energy sector. The Irish national AI strategy tries solving the problem by reframing AI as a way to funnel investments into off-shore wind energy in a project called Powering Prosperity. The energy exhaustive nature of AI is reframed to be a benefit, as high and stable demand makes for a secure investment opportunity, which will help fulfill Ireland's ambitions of reaching 80% renewable energy by 2030 if directed towards off-shore wind power. Therefore promising the digital sector sufficient energy supply while simultaneously greening the entire energy sector, making data centers and AI enablers for the green transition. Horn and Felt (2025) have conceptualized the Twin Transitions functioning as a justificatory tool for the Irish data center industry, as the AI transition is framed as bringing about the "collateral" green transition.

Whereas the plan for AI to green the grid was present already in the original 2021 national AI strategy but could be found only in the footnote. In the 2024 refresh however it seems to have solidified its spot in the strategy, moving into the main body of the text and being allocated a sizable section. This change could come as a response to criticism, for example in the form of anti-data center protests or increasingly frequent black-outs.

12. The Government Statement on the Role of Data Centres in Ireland's Enterprise Strategy (2018), together with the Climate Action Plan, outline the opportunity that Renewable Energy Corporate Power Purchase Agreements provide in increasing the amount of renewable energy being used by data centres in Ireland (and consequently the amount of renewable energy being used to power certain types of AI in Ireland). The Sustainable Energy Authority of Ireland (SEAI) is currently undertaking policy research in this area. See https://enterprise.gov.ie/en/Publications/Government-Statement-Data-Centres-Enterprise-Strategy.html

Picture 1. Screenshot from AI - Here for Good A National Artificial Intelligence Strategy for Ireland 2021 , p17)

Although every document analysed within the thesis at least alludes to the potential of AI proving apt for tackling sustainability related issues and helping to mitigate crisis brought on by climate change, a notable difference appears when comparing documents concerned with facilitating national adoption of AI with ones that adopt a different focus such as ensuring that the adoption is ethical or environmentally sound. Thus demonstrating how AI is framed differently, depending on the intended audience and the predetermined policy direction, helping to disguise unsavory aspects of AI and enable political action in less than ideal situations (Bareis & Katzenbach, 2022).

The documents that can be described as laying out the national strategy for AI (2021 and 2024 Austrian documents, 2024 French document and 2021 and 2024 Irish documents) consistently frame AI as a tool to fight climate change related hurdles and increase efficiency, thus reframing AI as a climate-positive tool. This formulation is further stabilised by referring back to the EU's Twin Transition approach, which could be described as an Union-wide attempt to rehearse and stabilize the sociotechnical imaginary of a future where sustainability is achieved via high-tech, predominately AI based solutions, thus necessitating further investment and innovation (Jasanoff & Kim, 2013). Consideration of the environmental impacts of AI systems remains minimal and is at times reframed instead as an opportunity for securing investments, consequently accelerating the arrival of the promised future (Felt, 2025). Narratives of the merit of AI in matters of sustainability tend to grow more assured as the technology becomes increasingly common. This trend is accompanied by the increasing willingness to also recognize AI's environmental burden. The budding of transparency could be a sign of confidence that the material structures such as funding schemes combined with the collectively held sociotechnical imaginary of AI's role in achieving a desirable future have been stabilised enough, that admitting to the downsides no longer endangers investments and the imperative to scale (Bareis & Katzenbach, 2022) .

Alternatively, it could instead indicate that the environmental impacts are becoming harder to ignore, as the climate crises becomes increasingly pressing, thereby representing the emergence of a competing narrative, one perhaps which eventually becomes disillusioned with the overwhelming AI hype, and signaling the bust of the AI bubble and potentially even a start of the next AI winter.

4.2.4 Delegating and shifting responsibility

Although ensuring ethical and responsible AI has warranted a lot of attention both in academic as well as in regulatory circles, scholars such as Hagendorff (2020) have highlighted the issue of the "ethics to governance gap", where normative principles often fail to influence real-world decision making. National strategy documents contain processes of defining responsibility as well as taking and assigning accountability. These documents often accredit experts and institutions, rendering them

thereby (partly) responsible for the facilitation of a specific policy, in this case the adoption of AI. Responsibility is a term that appears in all of the documents, however, what is exactly meant by responsibility or who should embody it changes between the documents. Due to the complex hybrid and multi-level governance structures common to AI governance, the accountability mechanisms have a tendency to become muddled (Radu, 2021). Radu (2021) has argued that this is a deliberate and strategic choice to deal with and navigate the uncertain and fast-growing world of AI, yet another way that AI strategies work to make the complex topic of AI thinkable and do-able (Pham & Davies, 2025). Furthermore, Collingridge and Reeve (1986) have found that policy-makers have the tendency to strategically ignore scientific advice and findings if it contradicts the predetermined policy direction. As the environmental externalities are becoming increasingly well documented and thus harder to ignore, national AI strategies dispense across complex governance structures, reassign and shift responsibility across borders and into the future, in order to enable political action in less than perfect circumstances (Bareis & Katzenbach, 2022).

My analysis finds that the responsibility and resolve regarding the environmental externalities differ greatly depending on the underlying objective of the strategy document as well as its intended audience. Namely, the documents with the imperative to scale and maximise AI adoption tend to greatly limit any implication of responsibility regarding environmental impacts of AI, despite taking responsibility for other potential impacts, such as risks related to data protection. The documents which do not share this underlying objective, i.e. ones explicitly aiming at facilitating sustainable and ethical approach to the digital transition are much more likely to assign responsibility regarding digital sobriety or sustainability of the digital/AI transition to the state. Such allocation is possible, as it does not contradict the underlying political aim. Furthermore, it seems that updated documents are also more likely to assign more responsibility to the state, although still remain relatively conservative in this regard. This could be due to the lock-in effect, as described by Bareis and Katzenbach (2022) as AI becomes increasingly normalised and stabilised in the sociotechnical imaginary, accepting responsibility for the environmental impacts no longer presents as a threat to change the course of innovation. This strategic framing and deferral of responsibility away from the here-and-now allows for the predetermined policy direction of the pursuit of AI despite underlying concerns and uncertainties (Pham & Davies, 2025; Bareis & Katzenbach, 2022; Collingridge & Reeve, 1986). This also explains the different framings depending on the audience and underlying policy objective, state employees are given directions rather than convinced of the legitimacy of a specific policy.

Austria

Within Austria the topic of AI is divided between many responsible bodies. For example, the two National AI strategies (Austria 2021 and 2024) analysed in this section are both written in a collaborative process between two ministries and as a result of extensive consultations with diverse stakeholders. Individual AI related aspirations and projects are also divided between multiple

ministries. Such disbursement of responsibility is said to "*ensure a high probability of implementation of the individual measures…*" (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:30)[13]. Several other expert bodies have been assembled with the goal of producing and corralling high quality expertise, some examples of this are the AI Advisory Board for Artificial Intelligence (KI Beirat) and the AI Stakeholder Forum. As mentioned, interdisciplinary consultations were part of the writing process for this document. Over 160 stakeholders were consulted. The diversity and large number of consultations is designed as a way to overcome issues posed by the 'wickedness' of AI as a technology, as well as the fast evolving pace of the field. "*Due to this complexity in AI implementation, a diverse landscape of AI strategies, rules, committees, and other AI governance measures is developing*" (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:42)[14].

The 2023 Practical Guide to Digital Administration and Ethics (Praxisleitfaden „Digitale Verwaltung und Ethik") largely follows the same patterns, such as relying on supranational definitions of ethical and trustworthy AI. What sets this document apart from the other two is that even those scientists from various disciplines were consulted for each of the documents, the 2023 Practical Guide makes some of those recommendations more visible, by directly referencing academic papers. On one hand this gives more credit to the academic community but changes somewhat how epistemic authority is distributed: instead of the considerations being the result of consultations between stakeholders, the academics are given the word directly. Although stakeholder consultations serve the noble goal of compromise between various parts of the society, including policy makers, scientists, business owners etc. However, the discussions held in these forums are difficult to observe and are impacted by unfair power dynamics, meaning that the outcome can as result be overly watered down and still unfairly serve the more powerful actors. This could be one of the explanations why the 2023 practical guide document has a more extensive and detailed overview of the negative environmental impacts.

The most common conceptualisation of responsibility in the Austrian documents could be described as social responsibility. Social responsibility seems to primarily entail ethical considerations such as ensuring data and human rights protection, prevention of discrimination and general standard-setting for artificial intelligence development, and utilising AI in order to prevent discriminatory outcomes and undesirable societal impacts associated with AI. "*The federal government will support and promote the development of a secure data ecosystem for the responsible exchange of data for the further development of AI systems based on fundamental ethical principles and legal*

[13] "Um eine hohe Umsetzungswahrscheinlichkeit der einzelnen Maßnahmen zu gewährleisten, wurden die verantwortlichen Ressorts der Bundesregierung von Anfang an intensiv eingebunden. Alle Bundesministerien wurden eingeladen, Vorhaben für ihre jeweiligen Wirkungsbereiche zu entwickeln und diese in die Erarbeitung des Umsetzungsplans einzubringen." (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:30)

[14] "Aufgrund dieser Komplexität bei KI-Umsetzungen entwickelt sich eine vielfältige Landschaft von KI-Strategien, Regeln, Gremien und anderen KI-Governance Maßnahmen." (Strategie der Bundesregierung für Künstliche Intelligenz Umsetzungsplan 2024:42)

foundations."(Strategie der Bundesregierung für Künstliche Intelligenz, 2021:40)[15]. One of the case studies that is repeatedly referenced to exemplify the potentially devastating outcomes of irresponsible AI application is the case of automated childcare benefits in the Netherlands, where thousands were accused of fraudulent benefit claims. This case study paints horrifying picture or how irresponsible automation can lead to terrible consequences such as bankruptcy, loss of custody and even several suicide cases (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:19). Examples of discriminatory outcomes are often associated with biased training data. As LLMs grow more powerful, they also require increasingly more data to be trained. This has led to AI being trained on entire websites, which has resulted in AI systems picking up sexist, racist, antisemitic or otherwise discriminatory biases (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:8). Responsibility in these terms is often tied to protecting human rights and aligning with fundamental EU values (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:46). Furthermore, the strategy of the risk based approach stemming from the EU AI Act is also mainly tied to this account of responsibility.

In the Austrian case responsibility is generally allocated to the state. This is exemplified for instance by framing the aims regarding responsible AI, as the aspirations of the federal government "*Goal 1: The federal government aims to ensure that AI is used in Austria for the common good. AI should be used where it benefits people and only in a responsible manner and on the basis of European fundamental values and fundamental rights*." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:22)[16]. Furthermore, in the 2023 document at several occasions public administration is asked to act as a positive example and standard setter for the wider population and AI adopters in the business world. Austria also sees itself (and Europe in general) as an actor responsible for developing standards for responsible or trustworthy AI in supranational organizations. Furthermore, Austria emphasises the importance of developing international guidelines for AI, often referring back to the vocabulary and guidance to shape its own policy. Austria also actively expresses the desire to play a role in shaping such international conversations about ethical AI both within the EU and in supranational organisations such as the OECD and UNESCO. "*The aim is for a broad use of AI that is oriented towards the common good carried out responsibly on the basis of fundamental and human rights, basic European values and the upcoming European legal framework*." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:9)[17]

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[15] "Die Bundesregierung wird den Aufbau eines sicheren Datenökosystems zum verantwortungsvollen Austausch von Daten für die Weiterentwicklung von KI-Systemen auf Basis ethischer Grundprinzipien und rechtlicher Grundlagen unterstützen und vorantreiben." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:40)

[16] "Ziel 1: Die Bundesregierung strebt für Österreich einen auf das Gemeinwohl orientierten Einsatz von KI an. KI soll dort einsetzt werden, wo diese den Menschen nutzt und ausschließlich in verantwortungsvoller Weise und auf Basis europäischer Grundwerte und Grundrechte zum Einsatz kommen." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:22)

[17] "Es wird ein am Gemeinwohl orientierter, breiter Einsatz von KI angestrebt, der in verantwortungsvoller Weise auf Basis von Grund- und Menschenrechten, europäischen Grundwerten und des kommenden europäischen Rechtsrahmens erfolgt." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:9)

Digital sovereignty is seen as critical for a responsible approach to AI. In addition to participating in the decision making processes for establishing the guidelines for ethical AI, Austria (and the EU) find it critical to develop its own AI capacity in order to reduce dependencies on AI systems that do not meet the ethical and responsible aspirations outlined in the documents, this is used as one of the reasonings for pursuing wide-spread roll-out of AI. "*AI should be developed and used in Austria while maintaining the greatest possible sovereignty. Dependence on global monopolies should be reduced or avoided*."(Strategie der Bundesregierung für Künstliche Intelligenz, 2021:22)[18].

AI literacy is framed as the basis for responsible AI. It is spoken about in all the documents, and allocated a lot of importance. In addition to AI literacy that allows the regular user to navigate the digital landscape in a safe and secure manner, widespread AI literacy is also vital for the population to be able to act in a responsible and self aware manner. "*Promoting AI teaching and research at universities and colleges is an important factor in strengthening Austria's position as a centre of science and innovation. The aim is to enable students to apply, design and develop trustworthy AI. To this end, AI should be more firmly anchored in curricula and AI research should be strengthened. This involves, in particular, the interdisciplinary linking of humanities, social sciences, cultural studies and ethical issues with technical contexts and vice versa.*" (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:53). It can therefore also be assumed that responsible use of AI would therefore be included in a curricular teaching AI literacy. "*The term refers to the ability to understand and use AI. Safe, self-determined, and responsible use of AI is only possible with a sufficient understanding of how this technology works, its possibilities, and its challenges*" (Praxisleitfade „Digitale Verwaltung und Ethik", 2023:20). Furthermore, AI literacy among public administration would also help Austria achieve the goal of improving efficiency and accessibility of its services.

One of the values continuously repeated for AI governance in all of the three documents is agility. Agility is an AI governance strategy meant to enable keeping up with the faced paced and everchanging world of AI thus continuously updating the guidelines for responsible and trustworthy AI. Agility is also part of the larger AIM AT 2030 project that encompasses the national AI strategy and the update. This strategy not only foresees the strategy changing due to the developments in the AI systems themselves but also builds in flexibility to deal with academic and societal developments, continuously updating the strategy. "*The strategy is intended to be open to adjustments, additions, and clarifications, and to involve as many stakeholders as possible in its further development*" (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:18). Although, it is important to update rules and regulations as the field develops it is also important to make sure that agility is not used as an excuse watered down regulation in the areas where sound critical research already exists, excusing it by saying that it could be included in future updates. Furthermore, the flexibility of the strategy could also

[18] "KI soll in Österreich unter Wahrung größtmöglicher Souveränität entwickelt und eingesetzt werden. Die Abhängigkeit von globalen Monopolen soll reduziert oder vermieden werden." (Strategie der Bundesregierung für Künstliche Intelligenz, 2021:22)

work in the opposite direction, where in the case of change in power, ethical considerations could potentially be subject to being abandoned. Although such thinning out of ethical aspirations could very well happen even if agility wasn't a strategy point for Austria, it could be used as an argument to justify negative change.

France

In comparison to the Austrian documents where responsibility was mainly framed as the way for the government to approach AI, the 2021 French document emphasizes the need to create "responsible digital actors" by encouraging behaviors that reduce the environmental footprint of digital technologies. This hints at a shared sense of responsibility, framing each person as having agency in using digital technologies in a responsible way. As this paper strongly ties responsibility to environmental preservation and sustainability, personal responsibility entails limiting one's usage of the technology, for instance by considering low-tech options. Furthermore, individuals are urged to extend the lifespan of their devices, and be mindful of energy consumption. Businesses are similarly encouraged to prioritize sustainability in their operations. This framing aligns with the document's overarching goal of reducing the environmental impact of digital technologies and supporting society in becoming digitally responsible.

The idea the government is promoting is that its population ought to limit one's usage of digital solutions in order to act with responsibility, which is completely absent in the 2024 AI strategy document. Furthermore, limiting the usage of digital technology or using low-tech solutions is rather in opposition to the aims of the 2024 AI strategy. In contrast, the 2024 document redefines desirable behavior in line with its vision of France as a digital superpower. Responsibility is framed less as environmental stewardship and more as digital literacy. A "responsible user" is portrayed as someone who is fluent in AI, capable of using it ethically, meaning is aware of its potential social risks, such as discrimination or sophisticated scams. However, in order to become AI literate, and thus become responsible one must presumably continuously engage with AI systems and receive education regarding AI. "*We also need to invest in training for everyone, at every age: young people in school and afterschool, specialized and non-specialized students, employees, the self-employed and public sector workers, retirees*" (OUR AI: Our Ambition for France, 2024: 6). This shift in responsibility also extends to other actors. For instance, the 2024 document argues that France and the EU must become AI superpowers to ensure that European social values are embedded in AI systems. While this reasoning highlights the importance of ethical AI, it also reflects a prioritization of geopolitical and social goals over environmental concerns. The evolving definition of responsibility across the two documents again underscores a significant shift in priorities, moving from environmental sustainability to prosperity and power. This example showcases how documents are able to reframe concepts such as responsibility, in order to fit the objective of the particular policy direction. While digital literacy is undoubtedly of vital importance, achieving it on a national scale would necessitate significantly

increased AI adoption, which contradicts the notion of responsibility in the sense of the 2021 strategy, as it would in turn exacerbate the environmental footprint of the digital sector.

Both of the documents frame the future as fast-approaching, forecasting imminent danger unless immediate action is taken. However, these temporal framings necessitate very different actions. The 2021 French document relies on the affective power of temporal framing, climate change related issues are framed to be imminent and thus warranting swift action. The environmental impacts of digital technologies are not pushed into the uncertain future, where they might be solved by innovation. Rather innovation is seen to likely intensify the problems further necessitating an immediate response. As innovation is not framed to be a certain solution, the immediate action primarily constitutes limiting use of technology. The 2024 document uses a similar image of time running out but instead of being met with ecological collapse, the future instead involves France becoming geopolitically obsolete. This harsh future can be prevented only with ensuring wide-spread adoption of AI so that France can finally fulfill its potential of becoming an AI superpower. Excessive deliberation and moderation are framed as dangerous inaction impeding France's pursuit of AI prowess.

Ireland

The Irish approach to responsible AI does not differ much from other national AI strategies so far as responsibility is largely defined through adherence to international guidelines for AI ethics and trustworthy AI, which tend to focus on values such as safeguarding human rights, human oversight promoting diversity and data protection. Such a conceptualisation of responsibility does not attempt to limit AI usage but instead focuses on avoiding undesirable and harmful social outcomes. The Irish AI strategy lays out the role of the state to promote and facilitate responsible AI, for instance by means of advising businesses "*Government's approach to driving AI adoption by businesses will have ethics at its heart. This will be assisted by the National AI Innovation Hub which (together with the other European Digital Innovation Hubs) will provide advisory support to businesses to help them in assessing the trustworthiness of AI systems. This will include providing case studies and toolkits for SMEs to implement ethical and trustworthy AI.* "(Ireland's National AI Strategy AI – Here for Good Refresh, 2024:24). The government seems to view its role primarily in the facilitation of responsible AI by the means of creating proper incentives and shaping the policy environment. "*Government will also aim to facilitate and stimulate AI innovation through the regulatory and policy environment and by using public procurement as a catalyst for ethical and innovative AI. Furthermore, the Public Service will aim to act as an exemplar of responsible AI innovation, building trust through the delivery of quality public services.*" (Ireland's National AI Strategy AI – Here for Good Refresh, 2024: 38)

The Irish AI strategies also take a shared approach of responsibility, framing responsibility as something that can only be achieved if all parties work together. "*Through this Strategy, AI – Here for Good, Government aims to ensure a responsible, rights-respecting and inclusive approach to*

developing, applying and adopting AI. This will require a strong partnership between Government, our enterprises and innovators, our research communities and civil society; we are all responsible for responsible AI." (Ireland's National AI Strategy AI – Here for Good Refresh, 2024:15). One could argue that the more divided responsibility is, the less accountability any one person, enterprise or governmental institution bears, thus in the case that something goes wrong, it is easier to wash one's hands clean.

Ireland puts a notable emphasis on enhancing public trust towards AI, as it is seen as critical for maximizing uptake and integration of the technology. Pursuing responsibility and trustworthy AI are further seen as essential for ensuring public trust and subsequently can be seen as furthering the aim of widespread AI adoption.

The national AI strategy from 2021 or 2024 only seldom acknowledges the environmental footprint of digital technologies, instead underscoring their application for ecological transformation and sustainability. The 2024 AI strategy notably stresses the importance of understanding the temporalities of environmental impact, particularly in the context of AI. The document claims temporality is key for accurately comprehending AI's long-term impacts, as the positive effects are slower to materialize leading to a gap where the investments into AI are yet to pay off. This can be seen as a way of justifying initial environmental sacrifices for long-term benefits. This framing demands patience and faith that technological innovation will certainly find the solution to the environmental externalities of AI before it is too late. Much like the Austrian policy of agility in AI governance, this is a way to postpone responsibility into the future so as to avoid having to deal with uncomfortable topics in the present.

Both the 2021 document and the 2024 refresh acknowledge the fact that future AI systems, or at least the most powerful AI models will require very high amounts of computing capacity to run. Similarly, the two documents share another common theme, namely the hopeful view towards the future, that continuing innovation will result in faster and more efficient AI systems, alleviating current problems associated with expansive energy. This allows to avoid actually dealing with the issue of ever increasing carbon emissions and resource use while still leaving the impression of having a plan and being in charge.

Ireland also references the plan for supercomputers to be shared between the European member states. The documents propose three concrete solutions for more efficient AI: pooling resources across the EU, High-Performance Computing (HPC) and Quantum Computing (QC). The 2021 strategy frames High-Performance Computing as a means to increase AI adoption in Ireland. By 2024, the updated strategy expands on this vision, proposing that both HPC and quantum computing (QC) are essential for driving AI innovation in the country. The refreshed document also highlights the benefits of pooling resources across Europe, enabling access to more advanced AI systems. For example, Irish businesses and researchers could leverage the European Union's supercomputing ecosystem, which includes three of the ten most powerful supercomputers in the world. This collaborative approach

reduces the need for individual countries to build and maintain their own supercomputers while still providing access to cutting-edge computational resources.

HPC and quantum computing are presented as key solutions to the increasing computational demands of AI. The EU's investment in supercomputers and its development of "AI Factories" are seen as opportunities for Ireland to access shared resources. Although it is not seen as an alternative to national supercomputers but rather an addition to developing national capacities. Ireland wants to "exploit" resources made available by the European Union as a way to help Irish businesses and researchers to further advance on the global market. "*The EU currently has three of the ten most powerful supercomputers in the world and continues to invest in its High-Performance Computing ecosystem - in part through its development of AI Factories.*"(Ireland's National AI Strategy AI – Here for Good Refresh 2024: 29). This collaborative model seems particularly beneficial for countries struggling to meet the growing energy demands of AI, and with limited resources for building their own supercomputing infrastructure. Although this is not discussed, by pooling resources across the EU, it is plausible that data centers and supercomputers would be strategically placed to enhance efficiency. For instance, placing data centers in cooler areas, where less energy is needed for cooling, and placing energy exhaustive data centers and supercomputers in areas with stable low-carbon energy supply, where the increased demand is also less likely to lead to black outs for locals.

Ireland also emphasises the need for AI literacy but frames it rather as a responsible move on behalf of the government ensuring that no one gets left behind in the economy and society changed by AI. Thus it is implied that one will benefit most by keeping up with changes of AI, and not participating in it fully would leave one vulnerable. Once again connecting responsibility to boosting uptake, AI education is also framed as a way to mitigate potential harms that AI might have on the job market. The value and necessity of extensive AI rollout is virtually unquestioned in the document. This is already reflected in the title of the document "AI Here for Good" which points at two ideas: the fact that AI is already here and it is not a matter of deciding whether it should come or not, and the second idea that the coming of AI either is already a good thing or that as a result of the national AI strategy AI will mainly be a force for good. Subsequently the numbers of AI uptake and AI based innovation need to be improved. Furthermore, boosting adoption of AI in Ireland is vital in order to maintain its role in the EU as the top location for tech-investment and digitalization (AI Here for Good, 2021: 31). Notably, what sets the Irish AI strategy apart from those of France and Austria, is that becoming a major AI player is not tied to the sovereignty of the country. Thus the Irish AI strategy stands out by not using narratives of fear. It is plausible that Ireland does not feel the need to use such extreme narratives, as pursuing AI is not seen as changing the course of policy, like it is in France.

The framing of responsibility largely depends on the overarching objective of the policy document, and consequently can change dramatically from one document to another even within one national context. Responsibility as a term both assigns agency and assumes accountability for any outcomes,

thus who is framed to be responsible is expected to act in ways that further the overarching objective of the document. As national AI strategy documents (in that excluding France 2021 and Austria 2023) share the common ambition of ensuring wide-spread AI roll-out and uptake, responsibility is framed in a way that would ultimately facilitate this aim.

The Austrian documents commonly conceptualise responsibility as avoiding negative social outcomes such as discrimination and data privacy breeches, with the 2023 document standing out due to expanding responsibility to also avoiding the negative environmental impact of AI. Furthermore, Austria notably puts a strong emphasis on the government's role in ensuring responsibility of the AI roll-out. Austria strongly ties AI literacy to the aim of becoming a central location for AI related research and innovation. AI literacy thus becomes a prerequisite for facilitating the wide-spread roll-out and adoption of AI.

Frances' documents showcase considerable contrast in the conceptualisation of responsibility regarding AI. Notably the 2021 document ties responsibility to the environmental impacts of digital technologies, whereas the 2024 AI strategy pivots to cautionary tales of lost potential, leading to economic stagnation and loss of sovereignty, digital sobriety is replaced by digital sovereignty. Digital literacy in the 2021 document is framed as a way to instill environmental responsibility in the general population. AI literacy in the 2024 French document is similar to the conceptualisation in the Austrian documents. AI literacy is framed as being necessary for avoiding the negative social impacts of AI and thus everyone should be educated in AI, subsequently necessitating large scale uptake as well as integrating AI into education.

In the Irish case the relationship between AI literacy and responsibility is flipped, however ultimately the underlying objective remains the same. The Irish documents frame AI literacy through the potential of people not possessing AI skills falling behind, thus assigning responsibility to the government in helping them to keep up. Responsibility in the AI strategies is framed primarily as the government's responsibility in creating a reliable and trustworthy AI ecosystem that would continue to attract business into Ireland and enable competitiveness for Irish enterprise.

Table 5 Overview of the narrative tools used to balance AI ambitions with sustainability commitments

	Austria	France	Ireland
Limiting the scope of the environment	**2021** Despite being written by the Austrian Ministry of Climate Protection, Environment, Energy, Mobility, Innovation and Technology the scope of AI's environmental externalities acknowledged is narrow and one dimensional Extremely vague reference to "potential dangers" of AI which must be resolved in order to benefit from AI's potential Strong AI infrastructure necessary for digital sovereignty **2023** Sustainability of AI is framed as an ethical question. Comparatively wider scope of environmental impacts: resource expenditure instead of just CO2e or energy usage Addresses life-cycle of AI Mentions infrastructure maintenance, cooling data centers Graphs illustrating environmental impact **2024** Somewhat more nuanced than 2021 but still vague Emphasising the climate neutrality of AI. Primarily referring to Co2 output. Only mentions training and	**2021** Remarkably comprehensive scope of the environment, as the document addresses specifically the environmental impact of digital technologies Life-cycle approach Digital sobriety as guiding principle Sustainability of digital technologies and digital technologies for sustainability **2024** Sustainability is deprioritised Very vague acknowledgment of environmental externalities increasing with the increasing use of AI. Narrow scope of environmental impact (energy efficiency). Environmental efficiency of AI as a potential strategy to increase competitiveness of France. Questions critique of AI	**2021** Environmental externalities not presented as a major problem Climate change is presented as a legitimate issue but separate from the advent of AI Presenting Ireland as sustainable and environmentally conscious but also productive and technologically responsive Questions critique of AI High-tech conceptualisation of sustainability Acknowledgement of need for increased infrastructure for AI (increased computing and storage capacity) Limited acknowledgment of the increased energy demand of the Irish grid. **2024** Acknowledges need for increased infrastructure because of AI (computing capacity, data, cybersecurity, data centers and energy infrastructure) Differentiating between hard and soft infrastructure. Recognises AI's demand for computing capacity. Looks to the future for increased efficiency; shared EU supercomputers. Reframes increased energy

	use phases of AI life cycle		demand of AI as a way to green the grid (stabilized compared to 2021). Narrow scope of environmental externalities (increased energy demand)
Drowning out sustainability by competing priorities	**2021** Ensuring AI is used for common good (avoiding discrimination and ensuring protection of fundamental rights and data privacy Fostering expanding AI expertise Making Austria a central location for research and innovation in AI Business interests and hopes for economic prosperity Increasing competitiveness in technology and business Becoming a major AI player and protecting digital sovereignty **2023** Ensuring digital technologies are adopted in an ethical manner by the public service Environmental considerations of digitalisation Proposing ideas to curb environmental impacts. Does not include sustainability criteria in the ethical check list. 2024 Becoming an important location for AI. Business interests are important but secondary to	**2021** Sustainability and digital sobriety is framed as the central priority and a moral obligation Digital sobriety is framed as a way to achieve competitiveness **2024** The deliberative approach which described the 2021 paper is now equated to wasting potential Prioritising geopolitical power and economic prosperity Digital Surveignity as a guiding principle, the way to ensure ethical AI.	**2021& 2024** Preserving and enhancing the presence of Big Tech in Ireland Ensuring public trust in AI Transformative potential of AI for tackling societal, environmental and economic challenges Ensuring AI “serves the public” AI revolution as a way to “green the grid”, (especially in 2024)

	capacity building, more of a positive side effect. Digital sovereignty, own AI capacity as a way to ensure standards for ethical, safe and secure AI. Increasing competitiveness in technology and business		
Framing AI as a powerful tool for the environment	**2021 & 2024** AI presented as transformative technology for tackling climate change and related challenges AI enabling reduction of greenhouse gas emissions **2023** Acknowledges both potentials for AI to benefit or harm the environment.	**2021** Calls in the question the ability of AI to benefit the environment Acknowledges that AI might prove to be a useful tool for environmental causes in the future **2024** Presents AI's ability to benefit the environment as definite Emphasizes AI's ability to analyse complex data sets, proving useful for climate change mitigation States that the benefits of AI take longer to materialise whereas negative side effects become apparent sooner Convinced that innovation in AI will solve the problem of energy consumption Presents digital sobriety as a competitive advantage	**2021 & 2024** Presenting advancements in AI as a prerequisite for achieving social, environmental and economic objectives Provides case studies of AI based tools helping to improve energy efficiency and attain other sustainability objectives AI is presented as a way to secure investments into off-shore energy, thus "greening the grid"(Especially in 2024) AI presented as important for predicting and preventing environmental crises
Delegating and shifting responsibility	**2021 & 2024** Responsibility is divided between multiple ministries and institutional bodies, this is presented as a strategy to improve implementation Strategy is developed with the consultation of over 160 stakeholders, this is presented as a way to overcome the complexity and	**2021** Responsibility is framed through environmental sustainability The state must inform the citizens so they can make sustainable choices in technology use Responsibility can be achieved through digital sobriety,	**2021 & 2024** Responsibility is framed through avoiding social risk, human rights and human oversight, ensuring diversity and data protection Government along with the National AI innovation hub and other European digital innovation hubs promoting

	the fast evolving pace of the field. Responsibility of the state to protect human rights and fundamental EU values Austria is responsible for developing international frameworks for responsible and trustworthy AI AI literacy necessary for applying, designing and developing trustworthy AI Agile AI policy as responsibility **2023** Refers to international ethical guidelines and academic papers to define a responsible approach. (science as direct input) Responsibility both towards sustainability and avoiding discriminatory outcomes Responsibility of the state to act as a good example and standard setter AI literacy necessary for safe, self-determined and responsible use of AI	limiting tech use **2024** Responsibility is achieved through more tech use as it is seen as a way to improve France's competitiveness in the international tech scene and achieve digital sobriety In this reframing the meaning of fostering responsibility in the population also changes. The documents with the underlying aim of facilitating a widespread uptake instead frame responsible users as those who are AI literate, thus the role of the state which in the 2021 document was to inform its citizens about the environmental impact of AI is instead to help them master the technology and increase uptake	responsibility by consulting businesses + creating incentives/shaping policy environment + leading by example Shared/diffused approach to responsibility Responsible and ethical AI is seen as a prerequisite for facilitating uptake Environmental protection not included in the scope of responsibility Temporality, framing understanding AI's benefit for the environment as a question of time Setting expectations for the future for innovation that will solve the issue of increasing computing capacity etc. + diffusing responsibility by referencing shared EU computing infrastructure HPC and QC Improving AI literacy to not leave anyone behind - improving uptake is responsible

5 Conclusion

This thesis reveals how the environmental impact of AI is routinely deprioritised in AI strategy documents and expert bodies, shaping the ways in which AI is developed and deployed (Bareis & Katzenbach, 2022; Mager & Katzenbach, 2021). Sustainability of AI is continuously framed to be of lesser concern, thus not warranting neither specific expertise, comprehensive consideration nor immediate action. This framing makes the EU policy of Twin Transition doable, rendering both the digital and green transition simultaneously pursuable and at times even reinforcing (Felt & Horn, 2025; Pham & Davies, 2025). Across seven policy documents from Austria, France and Ireland, and in the composition of their national AI expert bodies, I found that environmental expertise is commonly excluded from AI advisory committees and sustainability questions are not absent, but rather are strategically simplified, narrowed and displaced in ways that legitimate rapid scaling and rollout of AI.
I identified two types of documents: those oriented to enabling massive AI deployment, and those aimed at governing the ethics of the digital transition. My analysis traced how these underlying objectives shape the positioning of AI *vis-à-vis* the environment and the conceptualisation of responsibility and ethics. Four recurring narrative moves structure this legitimation.
Firstly, the documents narrow the scope of "the environment" to energy expenditure and CO2e emissions. Acknowledgement of environmental externalities is generally limited to AI training and data-center energy usage, which omits the impacts of upstream extraction, water used for cooling, land and air pollution, and the end-of-life disposal. This oversimplified and one-dimensional framing obscures the full material footprint of the technology and insulates AI deployment agendas from more complex debates where trade-offs are sharper and solutions less straightforward.
Secondly, strategy documents with the imperative to scale AI shift the focus away from environmental externalities, focusing on visions of geopolitical prowess and economic prosperity. Indigenous AI is thus positioned as a prerequisite for sovereignty, ethical oversight and economic competitiveness. This framing renders wide-scale AI deployment imminent and desirable. The specific sociotechnical imaginaries vary by national context (Horn & Felt, 2025). Austria envisions a future of academic and technical excellence, France emphasises strategic competitiveness and geopolitical power, while Ireland focuses on attracting international investments. Despite the different future visions, generating expectations of a future with AI has the same effect, by comparison AI's environmental footprint is made to seem insignificant.
Thirdly, AI strategy documents highlight AI's potential for tackling climate change, while ignoring the environmental footprint of AI itself (Felt, 2025; Lehuede, 2025; Brevini, 2020). Documents stress AI's potential for increasing energy efficiency, climate analytics and risk management, thus aligning AI with environmental problem-solving. These benefits are rarely weighed against AI's material costs, helping to stabilise a paradox wherein accelerated digitalisation and AI rollout proceeds under the banner of environmentalism.

Finally, the documents shift responsibility across time and space, deferring substantive environmental accountability to future innovation and allocates responsibility across complex muddled accountability structures, including opaque stakeholder meetings, multilevel governance structures and personal responsibility. Such moves legitimate present-day deployment by promising future safeguards and shifting responsibility. AI advisory bodies mirror these themes: legal, technical and entrepreneurial expertise prevails while environmental and social expertise is underrepresented or omitted altogether, simplifying the true complexity of the issue at hand.

AI is already having very tangible material impacts all across the world. The case of Ireland shows that neither relative wealth nor internationally recognized AI excellence is enough to shield its people from the environmental impacts of AI. Rapid digitalisation has strained national energy grids, raised consumer prices and contributed to noise and air pollution, leading to local outrage. As AI scales rapidly, renewable energy production is unable to keep pace, threatening to deepen fossil fuel reliance, amplify water scarcity and heighten energy and supply-chain insecurity. More broadly, neglecting AI's material consequences threatens to undercut the very geopolitical sovereignty and economic rationales invoked to accelerate its adoption. Although the environment suffers from the "tragedy of the commons", by disregarding planetary limits we are actively creating a world that is more difficult for all of us to live in and impossible for some.

This thesis contributes an STS-informed account of how strategy documents and advisory bodies reframe the relationship between AI and the environment, showing how strategic ignorance and narrative constructions enable the massive deployment of AI to proceed despite planetary limits. Building on literature describing the performative effect of AI strategy documents (e.g. Pham & Davies, 2025; Bareis & Katzenbach, 2022; Ulnicane et al., 2021). The thesis extends sociotechnical imaginaries literature by detailing how imaginaries of economic competitiveness and geopolitical security co-produce futures illprepared for the environmental consequences of digitalisation. These narrative patterns showcase how a wicked problem, such as the sustainability of AI, which is characterised by complex transboundary externalities as well as scarce and opaque data is transformed into thinkable and do-able policy. The strategy documents present AI's environmental impact as legible, measurable and compatible with AI deployment. The thesis reiterates the multiple and contested nature of sociotechnical imaginaries, showcasing how visions of ethical and responsible futures are reimagined in order to make predetermined policy directions appear desirable (Mager & Katzenbach, 2021) My analysis of the AI advisory bodies further showcases how omitting environmental expertise from decision-making allows to obscure environmental concerns and stabilise AI as a sustainable technology.

These findings carry implications for AI ambitions more broadly. If sustainability is primarily imagined as the outcome of AI, without appropriate attention to the sustainability of AI, not only do we risk stabilizing a paradox: accelerating computing and infrastructure development under the guise of environmentalism but also we leave ourselves vulnerable to be blindsided by the plethora of

corresponding environmental consequences. Acknowledging and seriously considering the material impacts of digital technologies in AI strategies is far from being a purely ethical deficit but also a question of strategic preparedness. The thesis echoes many scholars (e.g. Felt, 2025; Perry & Uuk, 2019; Papagiannidis et al., 2025; Radu, 2021) calling for a more comprehensive and balanced account of the environmental footprint of AI when discussing its potential applications and arguing for wide-spread roll-out. Governing emerging technologies such as AI with planetary limits in mind requires standardised, verifiable life-cycle reporting; a comprehensive scope of environmental and social externalities, extending beyond CO2e emissions and efficiency indicators, including environmental expertise in decision-making as well as the willingness to embrace digital sobriety by accepting sustainability as a constraint on where and how AI expands.

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Table 6 Declaration of AI Usage

AI Tool	Work Phase	Task	Reason for Usage	Comment and Reflection on the Results
Chat GPT (v.4)	Sorting the Codes	After I had tried to sort the codes myself I decided to also see how AI would sort them. I submitted the list of my codes to the AI as well as some of the categories or themes I had noticed and asked it to suggest alternative categories and themes.	I found the list of codes quite overwhelming at times and therefore thought that using AI in this way might point out some patterns that I might have missed by myself as well as highlight some of the inconsistencies in my work.	I found it helpful as a way to think. However, I didn't find the AI suggestions especially interesting, and wouldn't use them in the initial form without reworking them. It did give me some ideas about how to structure the themes but I ended up moving around codes, renaming and regrouping themes several times.
Chat GPT (v.4)	Exploring literature	During the writing of the state of the art I occasionally asked AI to help me understand the literature in various fields.	It gave a starting point to look into the literature, helping me approach the field from different perspectives	I found it helpful in discovering terms and papers I was previously unaware of but it also hallucinated plenty of papers that did not actually exist, meaning I would sometimes spend time looking for a paper that did not exist and had to systematically check all the papers to make sure no fake papers would accidentally slip in
Chat GPT (v.4)	Rewriting sections of text	At various points during the thesis writing process I would consult AI for helping me plan the structure of text as well as help with wording.	AI would help me structure my arguments based on the given query. Allowing me to compare different argument structures with ease. Furthermore, at times it would help me come up with better wording.	I found this use of AI most useful. Although I had to provide a detailed query and always rewrite the section, it was a helpful tool for thinking.