INDUSTRY REPORT
AI LANDSCAPE IN GERMANY THE NETHERLANDS & BELGIUM

MINISTRY OF FOREIGN AFFAIRS OF DENMARK
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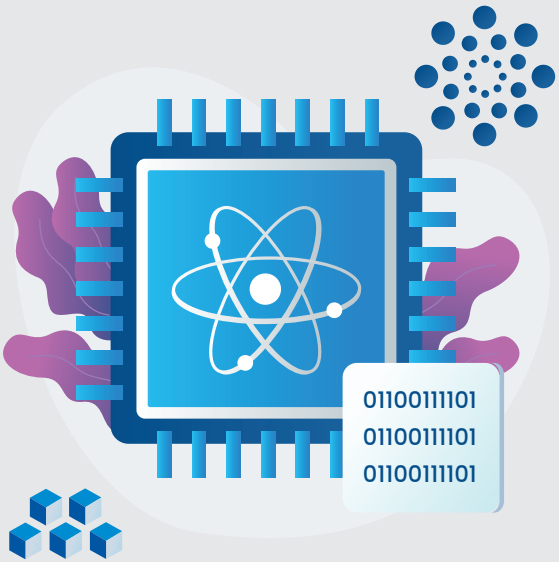

INTRODUCTION

This report provides an in-depth analysis of the competitive advantages, challenges, and sector opportunities within the Artificial Intelligence (AI) landscape across Germany, the Netherlands and Belgium (Northwest Europe (NWEU). It aims to list the region's current opportunities in alignment with Denmark's National Tech Strategy, The Danish AI Task Force and the Danish AI Strategy.

Across Northwest Europe, developments in AI are happening rapidly in research and innovation across industries. The application of AI has implications for geopolitical, technological and economic strategy. Here, robustness and competitiveness go hand in hand, securing citizens and setting up businesses for success in the great unlock that AI presents for Europe as a whole.

This report consists of three parts: first, it presents an introduction to AI in NWEU and EU policy implications for companies. Second, it provides short country-specific overviews and sector-specific analyses of opportunities. Lastly, it offers recommendations based on how Danish companies may benefit from collaboration with partners in the region.

AI IN NWEU

The AI-ecosystem in Denmark shares fundamental similarities with the rest of Europe. The use of **ethical AI** is key as EU member states seek to align themselves with the AI Act (June, 2024). In the Netherlands, algorithm registries have emphasized the importance of enhanced transparency, allowing the public to understand how AI is put to use in government. Similarly in Belgium, citizens' privacy are

protected through transparency in AI development procedures. Here, the EU AI Act creates a fundamental framework and affects all companies developing or deploying AI within the EU, setting compliance standards. Penalties for not adhering to these standards range from €7.5 million to €35 million.

In terms of **investment** Germany has secured the greatest chunk by far, with €3 billion allocated in its national AI strategy and additional state and federal funding, setting ambitious targets for AI application whilst still working on a patchy national digital infrastructure. The Netherlands and Belgium boast smaller budgets, but especially the Netherlands has made significant investment in its public-private sector.

While application areas of AI are manyfold, health, telecommunications, research and manufacturing present many opportunities in the region. Germany anchors its AI ecosystem in **AI competence centers**, the Netherlands through **AiNED** and **NL AIC** initiatives and finally, Belgium aligns its activities such as AI4Health and AI4Gov within the scope of **AI4 Belgium**.

As the government structures in the region differ, the countries' approach to AI strategy presents varying degrees of centralization, both in terms of policy, operations and funding. Germany and the Netherlands have a more centralized policy approach, while the former leverages its federal structure to activate local AI efforts. In Belgium, each region funds its own AI initiatives.

GERMANY

Germany ranks among the global leaders in AI research. Its AI ecosystem emphasizes European and international cooperation, strengthening ties within both business and academia.

The **German National AI Strategy was first introduced in 2018**. It aims to secure the country's global competitiveness, focusing on education, research, application in businesses, and civil society engagement. In late 2023, the **KI-action plan** kicked off with an investment of €1.6 billion by 2025, aiming to reinforce research, explore AI in education, with €500 million earmarked for international collaboration. The executive federal responsibility for the AI Strategy lies with the Federal Ministry of Digital Affairs and Transport (BMDV). Its implications affect several ministries, making the enforcement of a coherent strategy at times challenging.

Since 2017, Germany has filed **27,333 patents in the field, ranking fifth globally**, following the United States, South Korea, Japan, and China. The majority of German patents are attributed to leading companies such as Siemens Healthineers, Robert Bosch, Siemens, and BASF's technology subsidiary, Trinamix. The country boasts initiatives like **Cyber Valley Stuttgart** and the **German Research Center for Artificial Intelligence** driving innovation and collaboration. The German AI start-up scene is thriving with firms like **DeepL** and **Aleph Alpha** gaining international recognition. The start-up scene is particularly prominent in **Berlin**, while many companies and research institutions are based in

Munich, such as Fraunhofer research centre. An AI innovation Park in Heilbronn is planned to be established in 2025 with more to come.

Despite the great investments, German AI projects suffer from high operational costs and fragmented investments. Small and medium-sized enterprises (SMEs), which make up the majority of the German economy, struggle to adopt AI technologies due to limited funding, high costs of skilled labor and the lack of technological infrastructure. This is in part due to Germany's tradition of bureaucracy and personal data protection which is known to halt much needed digital progression.
The government's ambition however presents great opportunities. A significant portion of German AI investment is earmarked for building AI in government services. With its large share of EU investment, German AI efforts also include ethical AI, AI in industry, education, workforce training and international cooperation.

AI ECO SYSTEM

AI development and application in Germany happen in several sectors leading to different entry points for foreign businesses. The following sections present a selection of the main sectors utilizing AI as well as important actors and initiatives within them.

HEALTH

The German government is promoting AI research in the health sector, attracting AI scientists and talent, expanding and modernizing data infrastructure to improve the availability of biomedical data for AI applications.

Brilliantly showcasing these activities, the state of Bavaria is far in operationalizing AI investment. Here, the so-called **BioM health cluster** is working on AI, funded by the region's **High Tech Agenda Bayern**, a wide-reaching programme, including AI and quantum investments. Neighbouring state **BadenWürttemberg has established an AI**

innovation park and a Health AI innovation cluster. Both states house strong centres for research and entrepreneurship in Health AI. Highlights include Technological University of Munich's (TUM) **Lab for AI in Medicine, Venture Labs Health and AI, the Ludwig Maximilian University's Centre for Advanced Studies and Klinikum**, which are working on medical **data processing and AI solutions for patient care**, respectively. In the city of **Erlangen, home to "Medical Valley"**, Bavaria has fostered a thriving environment of various tech-partners. The German Federal Ministry of Education and Research supports the use of AI in academia and industry in the healthcare sector through the German AI Action plan.

FINANCE

AI is mainly used for regulatory technology (RegTech) helping financial institutions staying compliant, including fraud detection, cybersecurity measures, automated credit assessment and robo-advisory. Key players like Deutsche Bank already drive AI initiatives and financial institutions and collaborate with leading research institutions like Fraunhofer and Max Planck in AI innovation. The largest deal percentage within the VC sector in H1/2024 was made in Fintechs that evolve around AI.

Danish companies may encounter regulatory and competitive challenges when entering the German finance sector. Access to training data is sometimes difficult due to strict data privacy laws. The key could be forming strategic partnerships with financial institutions and FinTech start-ups. Germany has progressive incumbents on the market such as Deutsche Bank and strong FinTech companies. Denmark has a strong, citizen-centric approach and digital-first customer engagement supported by AI. Danish companies can share learnings and mature solutions within cyber security.

TELECOMMUNICATIONS

Within telecommunications, the legacy company Telekom is using AI to become more climate friendly. The cell service giant has developed a technology which lets its cellular service connections go into

sleep mode when not in use. The same technology is used to detect network failures and maintenance. The general infrastructure in Germany is patchy with stability issues, the improvements of which are costly and time sensitive. There is an opportunity for Danish companies to participate in the development of transnational large language models (LLMs) within areas of customer service and call analysis. Together with Telekom, Vodafone is equally investing in AI.

AGRICULTURE

In 2021, the German ministry for agriculture funded the first AI-Pilot project specifically for agriculture for a total of €44 million. The outcome amounted to 36 AI research projects which explore precision farming, water optimization, various automation technologies, pesticide use and livestock management systems that monitor animal health and behaviour. AI in agriculture is particularly used for pattern recognition, machine - and deep learning and robotics for smart farming technologies. Germany faces significant infrastructure challenges due to limited mobile connectivity, especially in rural areas. High initial investments, heavy bureaucracy and the need for technical training equally present challenges. Even data-privacy concerns become an issue as agricultural data is sensitive, including operational or geographic information linked to specific fields or livestock.

ENERGY

Germany has been one of the first countries to recognize the potential of AI in environmental sustainability in its national strategy from 2018. Its potential is found **in predicting the production and demand of renewable energies** to optimally use for power generation, trading and optimizing grid operations. The German Research Center for Artificial Intelligence (DFKI), has developed a **forecasting method to add data for electricity for Solar PV installations.** Schleswig-Holstein Netz AG is using AI to **analyse and predict power cuts**, an application which was developed and implemented with the support of large German energy supplier

E.ON. A general lack of expertise with AI technologies remains, as actual experience is scarce.

DEFENCE

The German defence industry and defence-related academia are exploring the potential of AI. The Munich-based company Helsing has high ambitions for applying AI in the battlefield for quicker target detection. The same company has secured the biggest European investment into defence-related AI yet (€450m in series C funding). The broader industry is investing in AI and observing political and technological developments concerning the application of AI in high-risk environments and critical (combat) situations.

At the University of the German armed forces in Munich, Bavaria, AI research potential in Germany can roughly be summed up in four areas: **1) self-protection, 2) battle tactics and decision support, 3) resource management and planning 4) image analysis**. Most investments happen within image analysis. Known as probably the most known area within defence and AI, it is a great lever for decision-support. German development of further AI Defence applications is slowed down by a potential lack of energy, processing power, GPUs and talent.

KEY PLAYERS IN GERMANY

ALEPH ALPHA

German AI start-up based in Heidelberg, specialising in providing access to its advanced large language models to enterprises and governments. In the full calendar year of 2023, Aleph Alpha reported revenue of €945,000. Often hailed as a European rival to OpenAI, Aleph Alpha distinguishes itself with a strong emphasis on data protection, security, and transparency.

HELSING

Helsing, a defence technology start-up based in Munich, specialising in AI software designed for defence applications, processing data generated by sensors and weapon systems to enable real-time battlefield operations. Helsing has received the biggest European investment into defence-related AI yet (€450m in Series C funding).

Key players across Germany industry and in AI development also involve Deutsche Bank, Bosch, and Siemens, SAP and Deepl.

THE NETHERLANDS

The Dutch cabinet emphasises generative AI and AI in general with great importance, and monitors developments, innovation and regulations closely. Ongoing initiatives include the development of a **country-specific open GPT-NL** and the public-private partnership **AiNed, which is a programme for knowledge, innovation and application of Dutch AI systems**. These programs have received contributions of € 13,5 million and € 204,5 million respectively from the Ministry of Economic Affairs and Climate policy and the National Growth Fund. Furthermore, the country is developing its own open language model, the GPT-NL with public funding.

At Dutch Universities the number of publications on AI research increased from 5.500 publications in 2013 to 9.900 publications in 2023. The use of AI by the Dutch government is using 1,5 times more AI applications in 2023 compared to 2021. The municipalities are at the forefront of use cases with 39% of the applications. Many applications are developed in collaboration between public sector organisations.

The Netherlands aligns itself with international regulation like the AI Act. The Ministry of Interior and Kingdom Relations (BZK) collaborates with other Dutch governmental bodies to develop national-level legislation for digitalisation. There is a focus on **responsible use of AI** both within and outside the government with an ambition for Dutch society to optimally utilise AI whilst safeguarding public values and human rights, including **non-discrimination, privacy and autonomy**. With the increased focus on AI, the Dutch government has taken the initiative for **a national algorithm registry** to monitor potential negative externalities.

The register is used by the public sector to publish information about the algorithms they use to process information. The algorithms are legally checked for compliance with public values and legal standards.

AI ECO SYSTEM

The public-private partnership, **The Netherlands AI Coalition (NL AIC)**, established in 2019, aims to create a strong AI ecosystem in the Netherlands. It is a national AI network and with seven AI hubs spread out in different regions of the country. This creates better opportunities for connecting local businesses, knowledge institutions and other organisations within AI development.

The NL AIC consists of 486 participants within government, industry, educational and research institutions and civil society organizations committed to accelerate AI development. **Within three years, the NL AIC has a goal to achieve impactful AI innovations in minimum 10 economic and social sectors.**

One initiative by the NL AIC is the **AiNed program**, which has been allocated a budget of € 204,5 million by the National Growth Fund. The AiNed programme helps Dutch companies and public institutions within AI activities that have great economic and social importance. Other initiatives such as Innovation labs and responsible generative AI application will be launched in government services, including national AI validation teams.

In 2019 the Dutch government made a call through its Small Business Innovation Research (SBIR) agency to develop AI for public services. Examples of some of the projects include **handwritten text recognition for automatic transcription of old text from the Amsterdam City Archives** by Aincient B.V., **a Blue Ops solution that gives a customized action perspective to prevent flooding** by Nelen & Schuurmans B.V., and a deep learning algorithm that issues **real-time alarms when violence occurs in the public** by Oddity.ai.

CHALLENGES & CONCERNS

Brainport Eindhoven, a think tank and innovation centre, is concerned that the Netherlands might fall behind in the field of AI,compared to other countries if investments are not substantially increased. Philips, the country's (and one of Europe's) patent application frontrunners is decreasing its research capacity. To face competition from China, Taiwan, South-Korea and Saudi-Arabia, the Netherlands must sustain high tech investments in its thriving innovation ecosystem.

Adding to the challenges in the Netherlands are previous scandals, which still negatively affect the view on the use and regulation of AI in the Netherlands. In the Social Benefits Scandal from 2018 (Toeslagenaffaire), the Dutch tax authorities wrongly accused thousands of parents of fraud due to discriminatory algorithms. A scandal that led to the fall of the Rutte III government. Therefore, more transparency around AI has been highlighted and promoted, partly to overcome negative views and opinions.

KEY PLAYERS IN THE NETHERLANDS

PHILIPS

A major Dutch manufacturer of consumer electronics, electronic components, medical imaging equipment, household appliances, lighting equipment, and computer and telecommunications. Globally the company has approx. 70.000 employees. In 2022 their global revenue was € 17,83 billion.

NXP

NXP manufactures and designs semiconductors. The company headquarters is located in Eindhoven, and present in 30+ countries. Globally NXP has 32.738 employees. It is the third largest European semiconductor company by market capitalization as of 2024. NXP actively engages with start-ups to develop innovative solutions. In 2023, the company's revenue was €13,28 billion.

ASML HOLDING N.V

ASML produces lithography technology for mass production of semiconductor chips. Headquarter is located in Veldhoven and the organization has 26.614 employees. In 2020, its revenue was €13,98 billion.

ORTEC INTERNATIONAL B.V.

With its decision support software and data science expertise, Ortec helps to make better data-driven decisions. Ortec International B.V.'s headquarter is located in Zoetermeer and has 1.065 employees. The revenue for 2023 was € 162 million.

BELGIUM

In Belgium, economic policy is a regional competence. This means there are very few programmes at the federal level regarding digitalisation and/or AI, or that they are limited in scope. Each has its own administrative bodies and programmes with budgetary discretion.

The federal agency for digitalisation and public administration SPF BOSA functions as a coordinator for **AI4Belgium, a network of public, private, academic and civil society actors who comprise the AI ecosystem in Belgium.** AI4Belgium is primarily a knowledge sharing and communications platform with the goal of supporting the development of Belgian AI.

The federal government adopted a national convergence plan for the development in 2022. The convergence plan focuses on promoting AI solutions in the **healthcare sector (AI4Health) and public administration (AI4GOV)**. These working groups are a work in progress as of 2024. A governance council established by the national convergence plans functions as a single point of contact regarding AI at the federal level.

The Flemish government has taken up AI with more enthusiasm than the rest of the country. In Flanders, the governmental agency Digitaal Vlaanderen is responsible for digitalisation and tech in the region. **The Flemish action plan for AI has an annual budget of €32 million to invest in businesses and research.** One of their initiatives, the Flanders AI Expertise Centre promotes the use of AI in the regional and local governments, informs citizens on Flemish AI initiatives and facilitating collaboration between the regional government and Flemish businesses in the sector. Earlier this year, the AI Expertise centre ran a trial for Microsoft Co-pilot for use in Flemish public administration.

As part of the Walloon government's strategy for digitalisation, the programme **DigitalWallonia4.AI** has funded the development of the AI ecosystem in Wallonia with around €50 million since 2019. There is no specific plan for AI in the Brussels-Capital regional digital strategy. Innoviris, a publicly funded start-up platform, supports AI projects in the region and is also involved **in FARI, an interuniversity research project on AI ethics.** Belgium is home to a few AI companies, mostly start-ups, providing a range of products such as conversational AI services (campfire.ai), computer vision for industry (PolyPerception, Robovision) and text analysis (LegalFly, textgain).

CHALLENGES

Belgium's AI landscape faces several challenges. The country has limited investment in AI, a small number of software companies, and weaker connectivity and IT infrastructure compared to the rest of the region. Belgium's market is highly fragmented due to significant regional differences in policy, infrastructure, and language. For example, the tech and start-up ecosystem centred around Ghent and Leuven has stronger connections with the Netherlands than with French-speaking regions of Belgium. This complex, fragmented system can make market entry more difficult and complicate access to Belgian government support programs for SMEs.

KEY PLAYERS IN BELGIUM

B12 CONSULTING

B12 Consulting is one of Belgium's leading companies offering AI consultancy and software development services with a broad range of applications ranging from healthcare and biotech, to energy and mobility. B12 is part of the Benelux-based digitalisation consultancy group Yuma, and is the only company in this list based in Wallonia. B12 has an annual turnover of around € 4 million.

CRONOS GROEP

Cronos Groep, Belgium's largest tech firm is a start-up incubator as well as a horizontal governance structure comprising of hundreds of smaller tech firms. Under their structure, Cronos Public Services and Cronos.AI develop GovTech and AI solutions with a focus on the Flemish and Dutch markets. Cronos AI also offers EU AI Act readiness assessments and AI Compliance services.

ML 6

ML6 is a Ghent based tech company and consultancy specialising in custom machine learning and AI solutions for a broad variety of industries. ML6 has worked on computer vision systems, recommendation engines for e-commerce, predictive maintenance for industrial equipment and developing NLP systems.

IMEC

Interuniversity Microelectronics Centre: world-leading nanoelectronics and semiconductor R&D, with capacity for fundamental AI Research.

RECOMMENDATIONS AND KEY MARKET ENTRY POINTS IN NWEU

The market developments in Northwest Europe offer different opportunities for Danish companies both within academia and with companies in the region. The main areas of opportunity are summarized below. Please reach out to The Trade Council if you wish to explore some of these opportunities.

AI COMPLIANCE AND ETHICS

Danish companies should proactively engage in regulatory sandboxes and prioritize **ethical AI practices** such as compliance assessments, bias testing, and ethics audits. This approach, similar to Belgium's ML6 and Germany's AI Cloud Policy, will enhance their reputation and competitiveness.

STRATEGIC PARTNERSHIPS

Focus on **public-private collaborations with initiatives like AI4Industry (Germany), AInED (Netherlands), and AI4Belgium (Belgium).** Danish businesses should also partner with local start-ups, research institutions, and government agencies to co-develop AI solutions.

RESEARCH AND INNOVATION

Leverage **national funding** from Belgium's Flanders and Wallonia regions and Germany's AI hubs (e.g., Cyber Valley). Collaborating with local universities, incubators, and innovation labs will support AI R&D, especially in areas like **deep learning, autonomous systems, and robotics**.

DATA PRIVACY

Participate in data **protection initiatives like the National Algorithm Register** in the Netherlands. Adopting explainability, audits, and bias assessments will demonstrate **commitment to ethical AI**, particularly in sectors like healthcare and public administration.

SECTOR-SPECIFIC OPPORTUNITIES

In Germany there is focus on **AI solutions for manufacturing** (e.g., automation, predictive maintenance) and healthcare (e.g., medical imaging). In Belgium and the Netherlands, opportunities exist in medical AI and digital health records.

OPEN LANGUAGE MODELS

Collaborate on **multilingual AI models,** particularly in Dutch and Danish. Danish companies can join initiatives like GPT-NL (Netherlands), DFKI (Germany), and AI4Belgium (Belgium) to co-develop open language models for European languages.

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