

The transformative power of GEFION Denmark's new AI supercomputer

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novo nordisk foundation

Benefiting people and society

The **vision** of the Novo Nordisk Foundation is to improve people's health and the sustainability of society and the planet



The Novo Nordisk Foundation is an independent Danish enterprise foundation with three philanthropic purposes:

- To support physiological, endocrinological, metabolic and other medical research,
- to support research hospital activities within diabetes in Denmark, and
- to support other scientific as well as humanitarian and social purposes.

In addition, the Foundation has a special obligation to safeguard and maintain a controlling influence in the Novo Group companies*.

* The Novo Group comprises Novo Nordisk A/S, Novonesis A/S and Novo Holdings A/S, and companies in which Novo Holdings A/S may hold a material equity interest or over which it may have material influence.

Facts about the Novo Nordisk Foundation

2023



The Novo Nordisk Foundation has its headquarters in Copenhagen with locations in Boston, Brussels, Nairobi and Delhi.

* Primarily A-shares with 10x voting power – year-end 2023

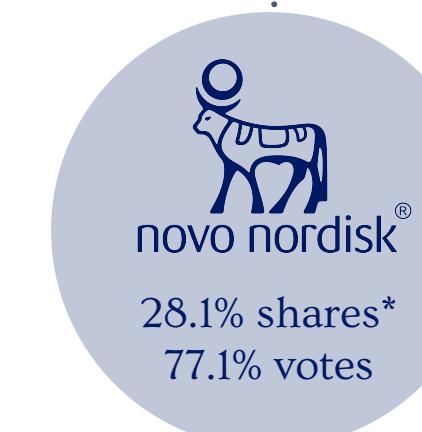
novo nordisk foundation

Benefitting people and society



novo holdings

Investing to benefit people and the planet



Philanthropic grants and investments

EUR **1.2** billion
DKK 9.1 billion

Total assets

EUR **149** billion
DKK 1,114 billion

Investment result

EUR **4.2** billion
DKK 31 billion

The Novo Nordisk Foundation and Novo Holdings are unique in supporting and investing across the entire life science value chain (2022 snapshot)



The Novo Nordisk Foundation Strategy 2030

Health

Progress research and innovation in the prevention and management of cardiometabolic and infectious diseases, regenerative medicine, and equitable health outcomes

The Life science ecosystem

Invest in scientific research, education and innovation to enable a world class life science ecosystem

Sustainability

Advance knowledge and solutions to support the green transition in society

- 1 Preventing and managing cardiometabolic diseases
- 2 Decreasing the burden and threat of infectious diseases
- 3 Advancing and applying regenerative medicine
- 4 Reducing inequity in health

- 1 Fundamental research
- 2 Enabling research infrastructures and technologies
- 3 Translational capacity and societal impact
- 4 Education and science capital

- 1 Sustainable and high-yield agriculture
- 2 Sustainable food for healthy diets
- 3 High-impact climate change mitigation technologies
- 4 Supporting society in the green transition

Ten societal megatrends affecting the implementation of the NNF 2030 strategy

1 We're living in the planetary "overshoot era"

10 The science ecosystem is evolving

2 Climate change calls for urgent action

9 Data, automatization and AI are reshaping the global economy

3 Urbanization and the demographic transition are accelerating

8 There is an increasing need for transitioning the energy sector

4 A new economic and geopolitical balance is emerging

7 The food insecurity situation is worsening

5 Our democratic values are under threat

6 Global health inequities are growing in number and complexity

M. Draghi: ‘The future of European competitiveness’ The starting point



The disposable income has grown almost twice as much in the US as in the EU since 2000.



Europe largely missed out on the digital revolution and the productivity gap between the EU and the US is largely explained by the tech sector, only 4 out of the world's top 50 tech companies are European.



We cannot, at once, be a leader in new technologies, a beacon of climate responsibility, be able to finance our social model, and be an independent player at the world stage



M. Draghi:

Key barriers to innovation in EU



novo nordisk **fonden**

- **EU's lack of innovation** prevent new sectors from emerging. Once companies reach the growth stage, they seek financing from US VCs.
- **Not enough academic institutions achieve top levels of excellence** and the pipeline from innovation into commercialization is weak. EU has 3 universities ranking in top 50 globally, the US has 21 and China 15.
- **Regulatory barriers** to scaling up are particularly onerous in the tech sector, especially for young companies
- **Competition for computing power** and lack of investment in connectivity will translate into digital bottlenecks.
- **AI** requires massive increases in computing power, causing an ongoing global 'AI chip race'. EU's investment in AI / digitization is markedly lower than other major economies.
- **Access to health data** is one of the preconditions for the development of AI in the pharma industry but is constrained by fragmentation and by GDPR legislation.
- **Undersupply of skills:** Educational level in the EU is falling. The leading positions in recent PISA reports are dominated by Asian countries while EU is experiencing an unprecedented decline with large gender disparities being evident.

NNF Funding of Data Science 2023-2027

Purpose: build capacity within data science and AI, and support education and training of the next generation of data scientists

Open competition: Committee for Data Science



Investigator Grants

Funding for excellent independent data science group leaders at different career stages

EUR 10 million/year



Collaborative Research

Grants for collaborative projects involving data science within the Foundation's focus areas

EUR 10 million/year



Data Science Academy

National initiative which supports events, networking, education of the next generation of data scientists.

EUR 24 million over 5 years

NNF+Villum

PhD & post-doc Fellowships

Stand-alone



AI Pioneer Center

State-of-the-art fundamental AI research & education

EUR 47 million over 13 years

DNRF, Villum, Carlsbergfondet, Lundbeckfonden, and NNF

AI Pioneer Centre

- **Purpose**: To address fundamental scientific challenges through artificial intelligence, including explainability, self-supervised learning, novelty detection, and fair AI
- Led by Professor Serge Belongie



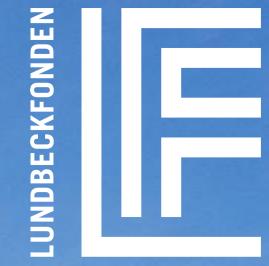
Co-funded by 5 Danish Foundations
EUR 48 (DKK 360) million over 13 years
(NNF contribution: EUR 7 (DKK 54)
million)



CARLSBERG FOUNDATION

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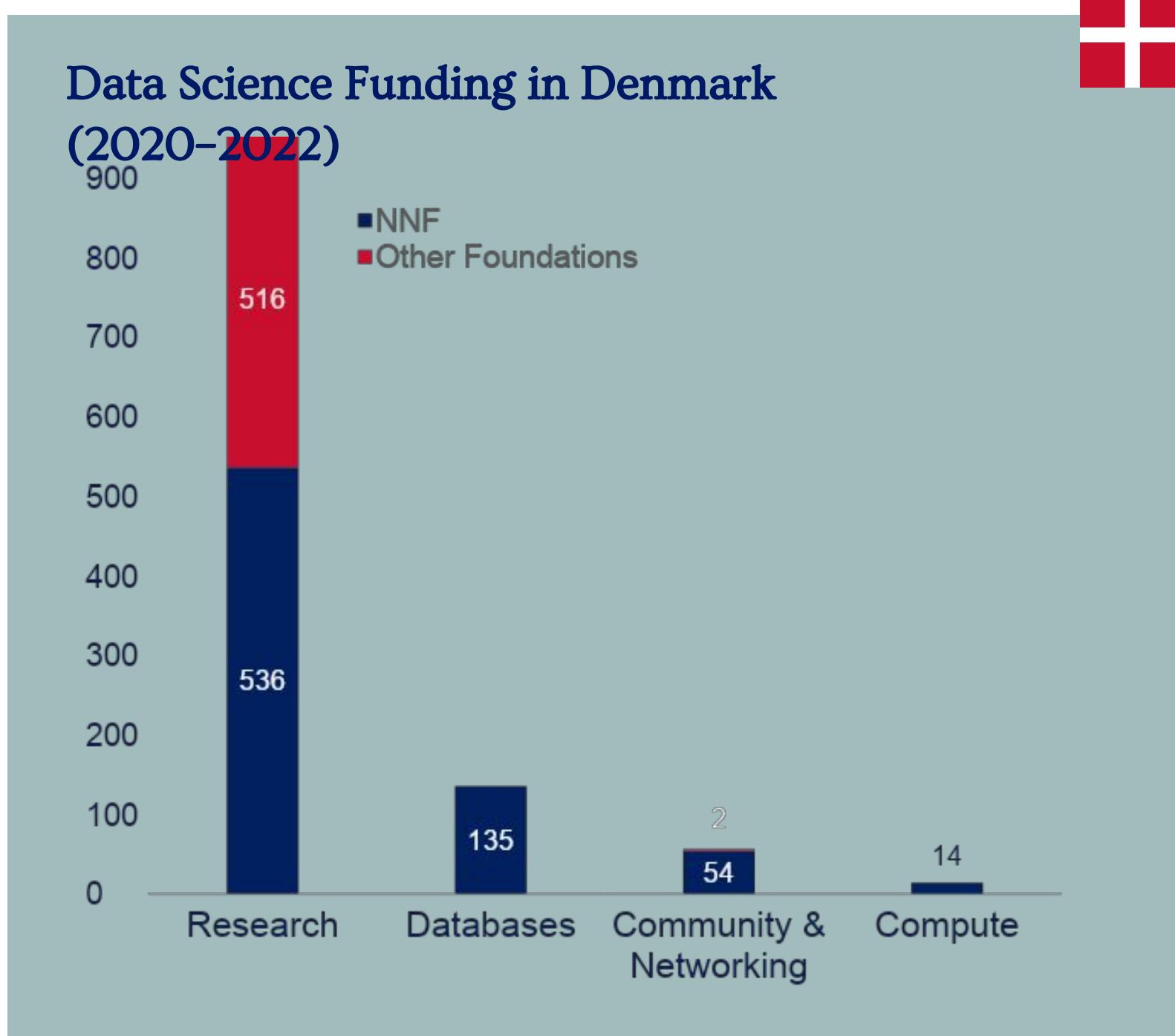
VILLUM FONDEN



Participating Universities
University of Copenhagen, Technical University of Denmark, IT University, Århus University and Aalborg University

Headquartered in Copenhagen
Old observatory at Uni. Copenhagen
(see picture above)

Data Science and AI in Denmark: major gap in compute investments



Wallenberg Foundation's investments in AI and data science

WASP – Wallenberg AI, Autonomous Systems and Software Program

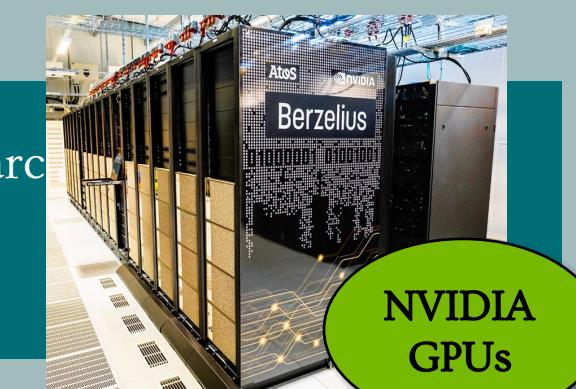
- **Funding:** 4.9 billion SEK over 2015-2031 to research in AI, data science, computer science, math & algorithms
- **Pay out level:** ca. **200 MDKK per year**

Data Driven Life Science Program

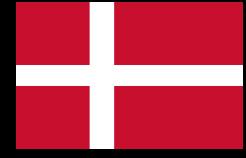
- **Funding:** 3.1 billion SEK from 2020-2032 to SciLife Lab and 10 universities
- **Pay out level:** ca. **180 MDKK per year**

Berzelius – a national supercomputer for AI research

- **Funding:** **300 million SEK** granted in 2020



National AI partnership with NVIDIA



Research

Research collaboration

- Pharmaceuticals and biotechnology
- Human centric AI healthcare solutions
- Acceleration of green transition
- Fault tolerant quantum computing



Infrastructure

Establishment of a national AI Supercomputer in Denmark

- Provides researchers with access to state-of-the-art AI computing services
- NVIDIA DGX SuperPOD reference architecture
- 1528 H100 GPUs and 7 PB storage
- Access to NVIDIA software platforms, training and expertise
- Secure cloud services to be established with DK partners



DCAI
Danish
Centre
for
AI
Innovation

EIFO

EIFO
DKK 100 million
(EUR 13 million)

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NNF initial
commitment
DKK 600 million
(EUR 81 million)

Gefion Pilot Projects running since November 2024

Domain	Organization	Project title	Goals & outcomes
Sustainability and green transition	 DMI	SAPIEN - Skilful Atmospheric Prediction with Intelligent Environmental Networks	<ul style="list-style-type: none"> • Weather forecasting in minutes, instead of hours • Energy savings and better energy planning
Sustainability and green transition	 DTU	Unravelling CO2 reduction in Non-Metal Formate Dehydrogenase using Machine-Learned Force Fields	<ul style="list-style-type: none"> • Discovery of novel materials for the green transition • Turn CO2 into green fuel (Power-to-X)
Healthcare	 Teton	Building an AI Care Companion with Large Video Pretraining	<ul style="list-style-type: none"> • Danish start-up building an “AI Nurse assistant” that helps caregivers monitor fragile patients
Life Science research	 UNIVERSITY OF COPENHAGEN	Multi-modal genomic foundation model	<ul style="list-style-type: none"> • Learn “the language of life” by training a foundational AI model on large amounts of DNA, RNA, etc.
Business automation	 go autonomous	Multi-Modal Document Understanding: Transforming Data Entry with Multi-Modal Precision	<ul style="list-style-type: none"> • Automating human data entry and transcription with Generative AI to free up human resources
Quantum Computing	 UNIVERSITY OF COPENHAGEN	Large-scale distributed simulation of quantum algorithms for quantifying molecular recognition processes	<ul style="list-style-type: none"> • Simulate Quantum Computing (Qbits) using GPUs • Quantum-level understanding of molecules and materials
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'Copenhagen Deep Tech Valley'

