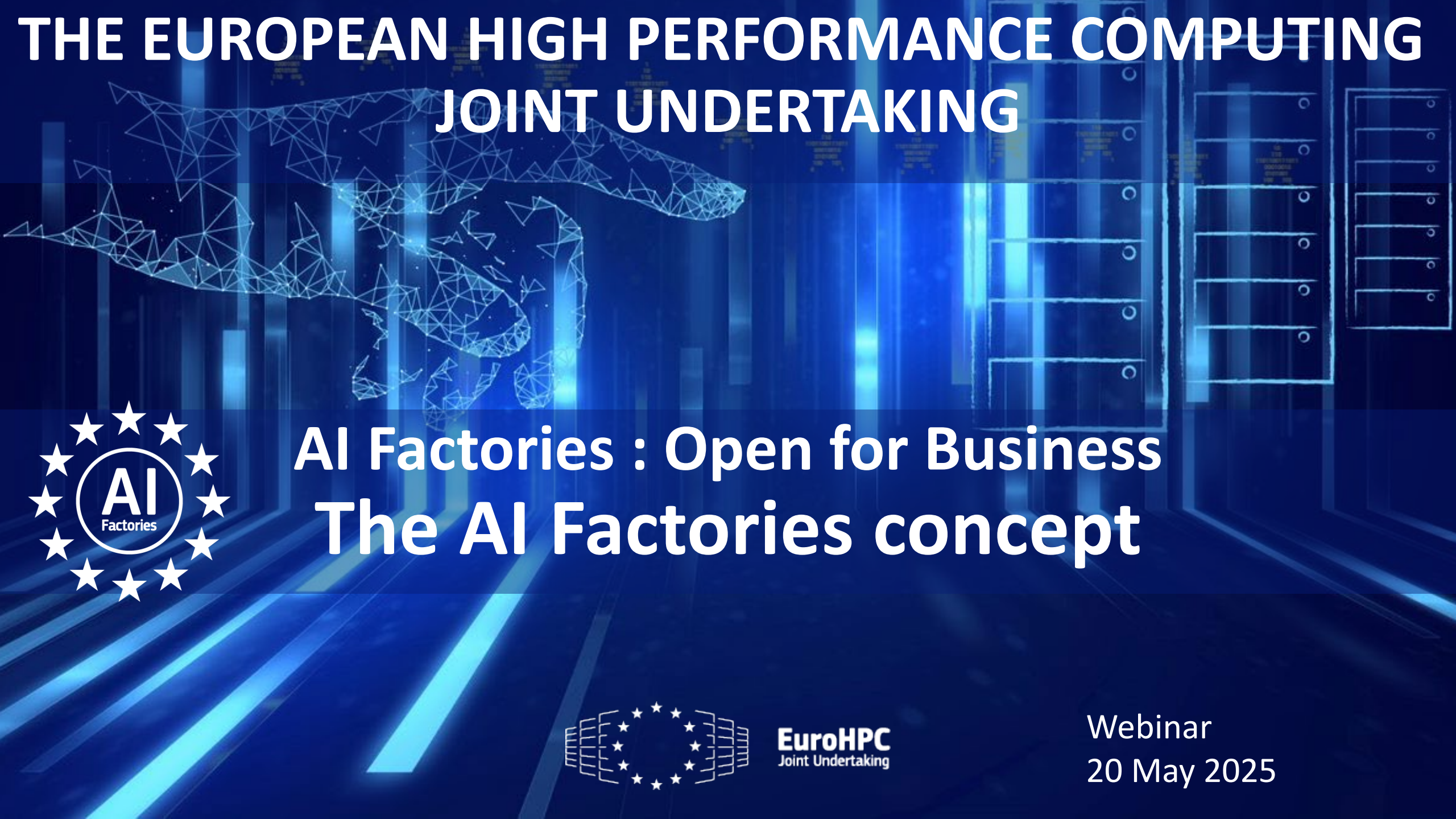
THE EUROPEAN HIGH PERFORMANCE COMPUTING JOINT UNDERTAKING



AI Factories : Open for Business

The AI Factories concept

EuroHPC Joint Undertaking

Webinar
20 May 2025

The EuroHPC Joint Undertaking 2021-2027

- EU body and funding entity, established in 2018, based in Luxembourg
- Governed by a Board composed of the EC, 35 Participating States and 3 Private Members
- Mission:
  - Acquire, deploy and maintain a HPC and quantum Infrastructure in Europe
  - Fund R&I projects to develop HPC applications, software and hardware and foster a European supply chain
  - Provide access to HPC and quantum users across Europe and support the development of skills
  - Develop and operate AI Factories to support the growth of a competitive and innovative AI ecosystem in Europe

Global standing of EuroHPC supercomputers

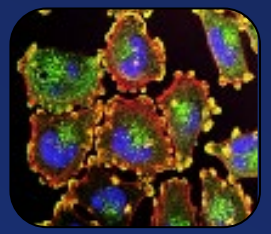
Supercomputer	Top 500	Green 500
LUMI	#8	#25
Leonardo	#9	#48
MareNostrum 5	#11	#30
JETI (JUPITER)	#18	#6
MeluXina	#112	#55
Karolina	#165	#165
Discoverer	#223	#223
JEDI (JUPITER)	#224	#1
Deucalion	#259	#94
Vega	#266	#268

TOP500, Nov 2024

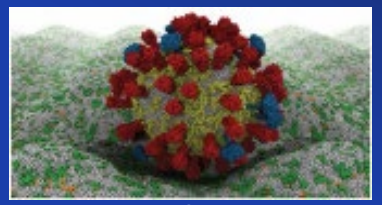
HPC fuels major innovations and scientific advances

Science

Personalised health

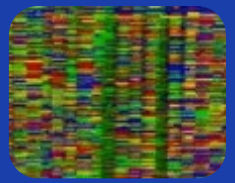


Cancer



Drug discovery

Drug design



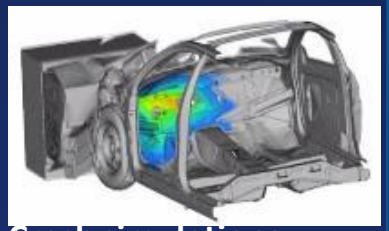
Genomics

Weather & climate

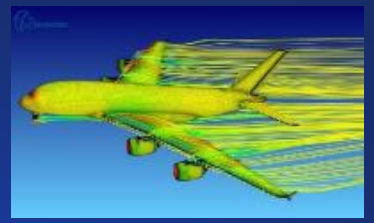
Industry

Wind plant modelling

Oil & gas exploration



Crash simulations

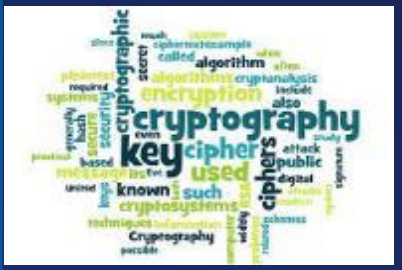


Aerodynamics & structural analysis

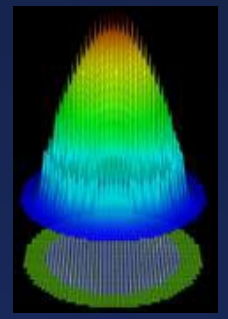
Pharmaceutics

Security

Cybersecurity



Complex encryption technologies



Nuclear reactor simulations

More than 800 scientific and industrial applications

Enabling European Research & Innovation

12+ **Centres of Excellence**, to improve performance of algorithms in strategic domains, and adapt applications to exascale and future post-exascale supercomputing

e.g., Solid Earth; Biomolecular Research; Weather and Climate; Engineering; Materials Design; Astrophysics; Plasma; Global Challenges

30+ **National Competence Centres**, acting as point of access for HPC in each country, supporting adoption of HPC, delivering trainings, mapping skills, interacting with industry, etc.

Hardware and software, with projects like **DARE (RISC V)** developing the first European chip for HPC, that will power future EuroHPC supercomputers

Training courses for the next generation of European HPC experts: **EUMaster4HPC**, **HPC SPECTRA**, **FFplus**, **EPICURE** and more in the future

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European Commission

AI Factories

AI Factories announcement

"Thanks to our investment in the last years, Europe has now become a leader in supercomputing [...].

We need to capitalise on this.

This is why I can announce today a new initiative to ***open up our high-performance computers to AI start-ups to train their models****."*

Ursula von der Leyen, 14 September 2023

2023 State of the Union Address by President von der Leyen

"Through our ***Artificial Intelligence (AI)****, Europe is already leading the way on making AI safer and more trustworthy, and on tackling the risks stemming from its misuse.*

We must now focus our efforts on becoming a global leader in AI innovation.

In the first 100 days, we will ensure access to new, tailored supercomputing capacity for AI start-ups and industry through an ***AI Factories initiative****.*

We will also develop with Member States, industry and civil society an ***Apply AI Strategy*** *to boost new industrial uses of AI and to improve the delivery of a variety of public services, such as healthcare."*

Ursula von der Leyen, 18 July 2024

Political Guidelines for the Next European Commission 2024–2029

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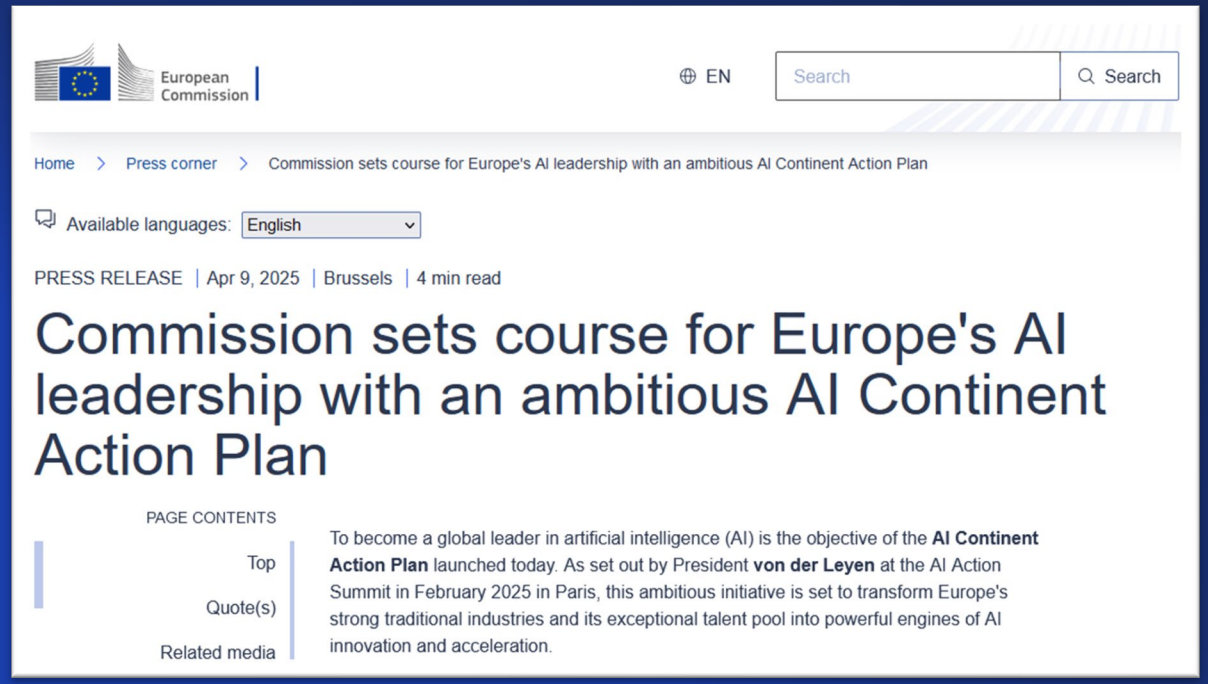
AI Factories

Towards the creation of the AI Continent



European Commission

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Available languages: English

PRESS RELEASE | Apr 9, 2025 | Brussels | 4 min read

Commission sets course for Europe's AI leadership with an ambitious AI Continent Action Plan

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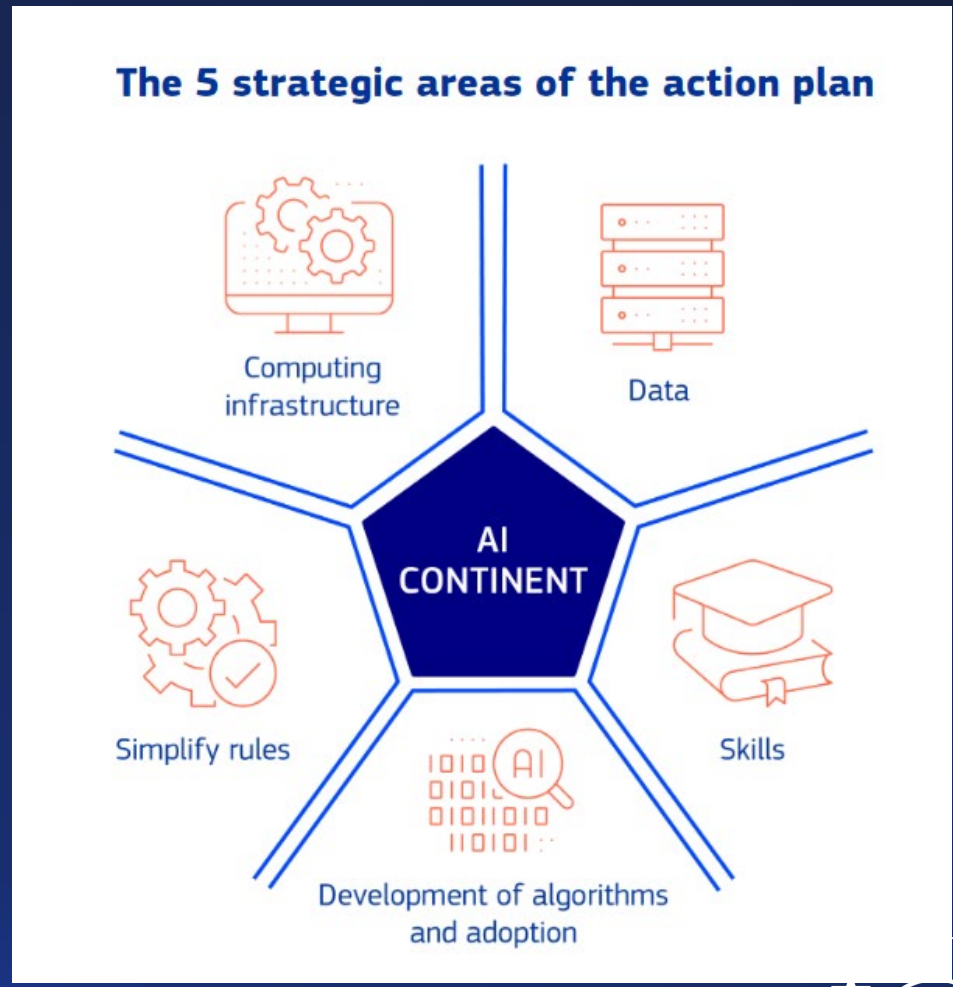
Quote(s)

Related media

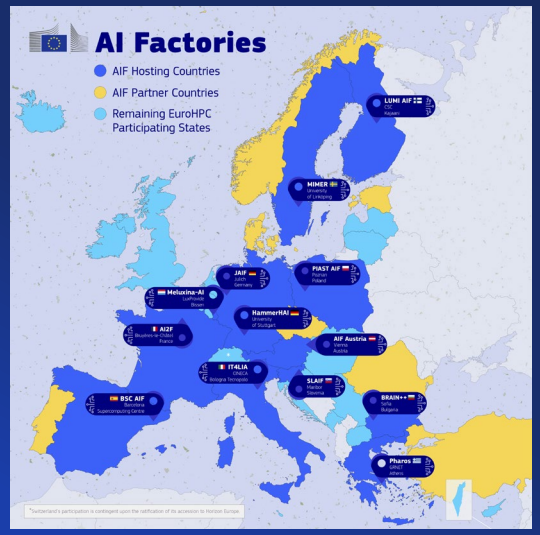
To become a global leader in artificial intelligence (AI) is the objective of the **AI Continent Action Plan** launched today. As set out by President **von der Leyen** at the AI Action Summit in February 2025 in Paris, this ambitious initiative is set to transform Europe's strong traditional industries and its exceptional talent pool into powerful engines of AI innovation and acceleration.



European Commission

AI Factories

Computing infrastructure



AI Factories

- Dynamic innovation ecosystems, connecting **supercomputing centres**, start-ups, research organisations, industry
- **13 AI Factories** set up throughout the EU
- AI Factories **access policy**
- AI Factories **Antennas call**

Cloud and AI Development Act

- At least **triple the EU data centre capacity within the next 5 to 7 years**
- **Incentivise European investments** in cloud and edge capacity – e.g. **simplifying the permitting process**

Up to 5 AI Gigafactories

- Large-scale facilities **developing** and **training complex AI models**
- Massive computing power (over **100,000 advanced AI processors**)
- **InvestAI Facility** to mobilise **EUR 20 billion** for AI Gigafactories
- **Call for expression of interest** for interested consortia launched

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AI Factories

Data Union Strategy

- Deploy **Data Labs** within the AI Factories that will:
  - **Bring together and organise data** from different sources for AI developers
  - Link to **Common European Data Spaces**
  - Provide **data-related services** (e.g., cleaning and enriching datasets)
- Promote the development of a **shared cloud software to make it easier to manage and connect data spaces**
- Build a repository of high-quality language resources under the **Alliance for Language Technologies** (ALT-EDIC) initiative
- Investigate ways to **reduce unnecessary bureaucracy**, listening attentively to the needs of stakeholders

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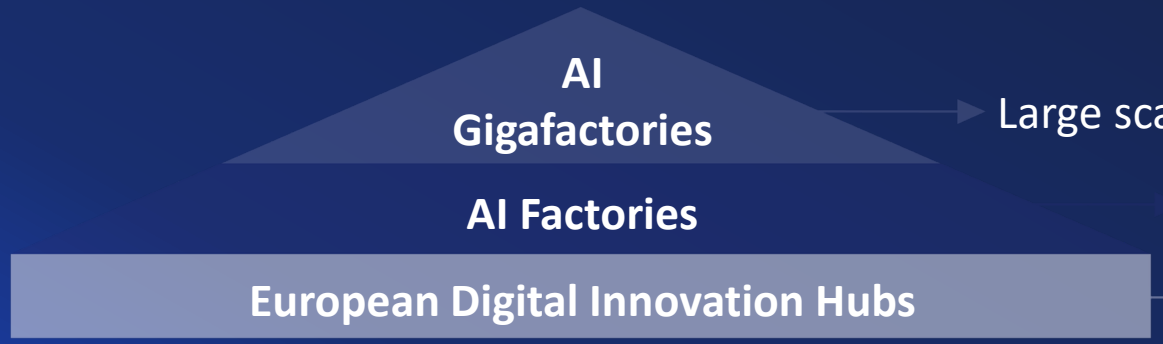
AI Factories

Algorithms: The Apply AI Strategy



Large scale facilities for the training of frontier AI models

Leveraging supercomputing,
data and talent for the AI ecosystem

Supporting AI adoption in organisations

Industrial sectors

Public sector
(incl. Healthcare)

Science
European AI
Research Council

Single Market for AI

The **Apply AI Strategy** will cover the way EU strategic sectors will benefit most from AI solutions

AI Factories in service of Apply AI Strategy

Academia

Startups

AI Factories

Regulatory simplification

Completing the EU ecosystem of support for AI Act compliance

Central EU support

In-depth guidance, standards, code of practice

Engaging with AI Office through **AI Pact**

Free advice from AI Act Service Desk

Local support

European Digital Innovation Hubs as local contacts

Engaging with authorities in **AI regulatory sandboxes**

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AI Factories

Skills

Enlarging the EU's pool of AI specialists

- Facilitate **legal migration pathways** for highly skilled third-country nationals
- Incentivise the **return of EU AI talent**
- **Educate and train** the next generation of AI experts based in the EU, notably through the **AI Skills Academy**

Upskilling and reskilling the EU workforce and population

- Capitalise on the network of European Digital Innovation Hubs (**EDIHs**), which will increase their **skills and training services**
- Promote **AI literacy**

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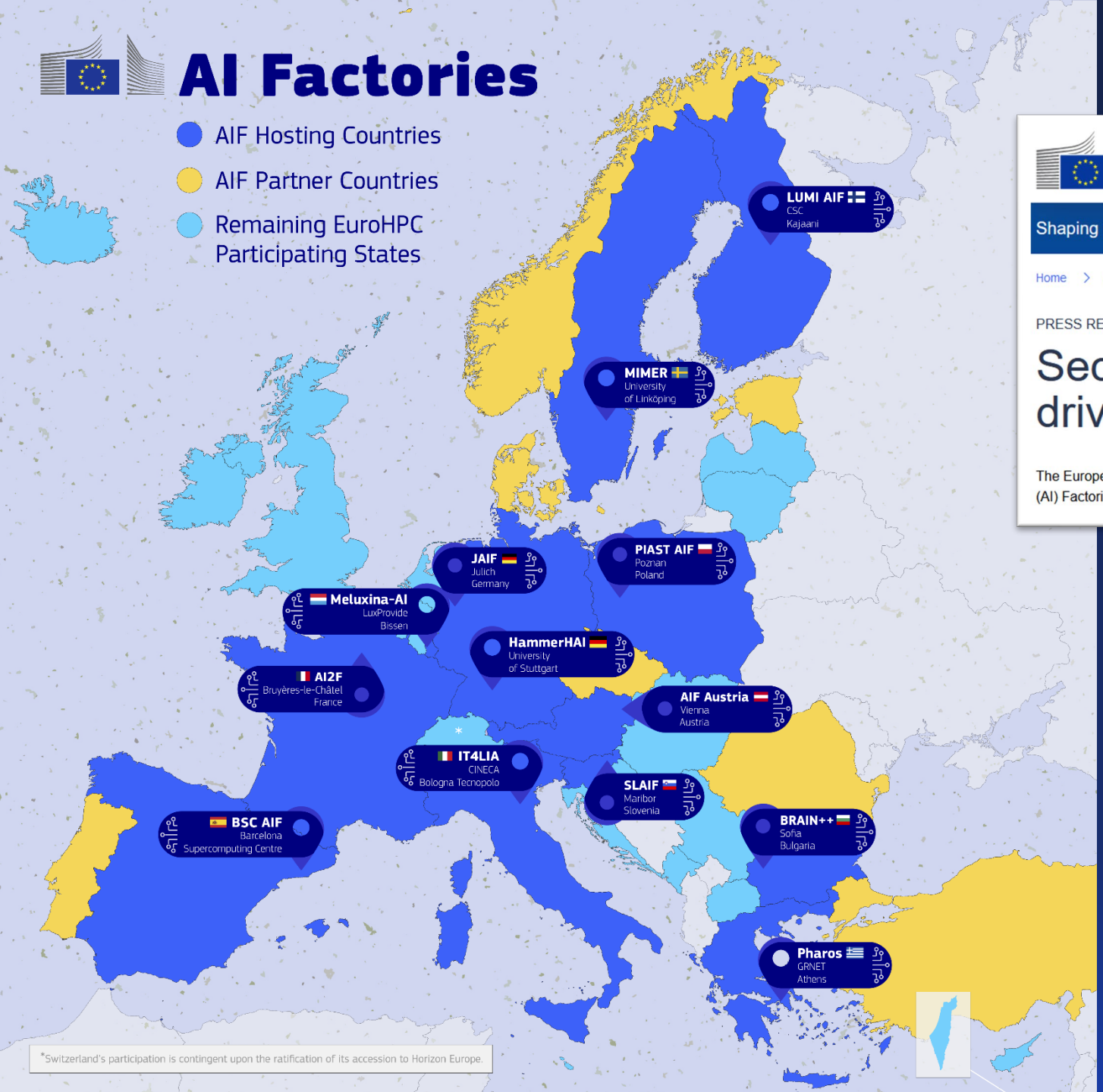
AI Factories

AI Factories

- AIF Hosting Countries
- AIF Partner Countries
- Remaining EuroHPC Participating States

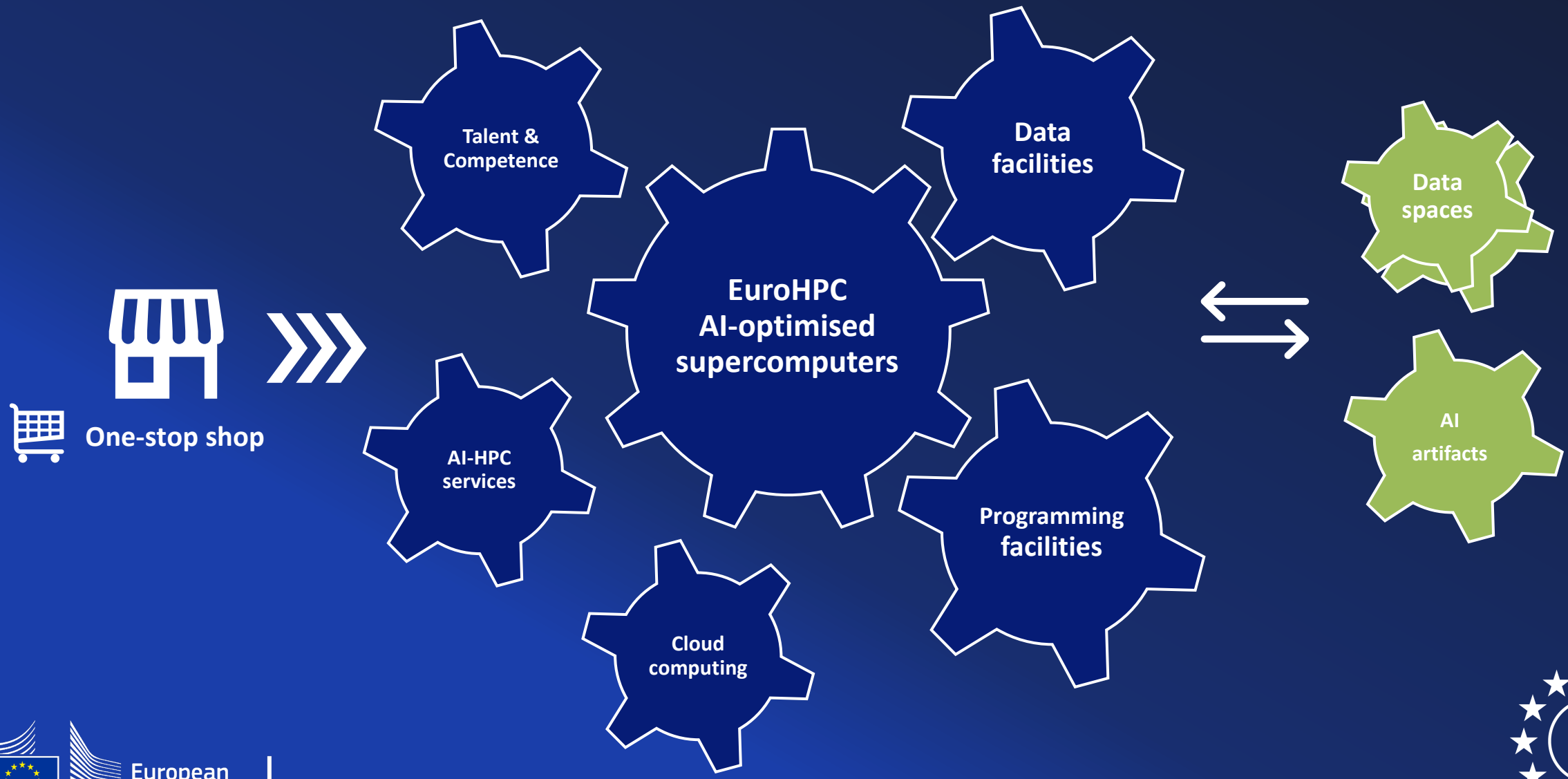


- **13 AI Factories** across 17 Member States and two EuroHPC Participating States
- Nine new **AI-optimised supercomputers** and one **upgrade**
- Overall investments in supercomputing infrastructures and AI Factories in the EU will reach **EUR 10 billion** over 2021-2027
- AIFs will be **interconnected** and establish a collaborative framework for effective networking

AI Factories

- **Dynamic ecosystems, including AI-optimised supercomputers, data capacities, programming and training facilities, and human capital** to support the EU AI industrial and research ecosystems in developing large AI models and applications.
- Novel approach to AI innovation based on a **network of public supercomputers providing an open environment to AI developers**.
- At least **15 AIFs + several AIF Antennas** expected. Operational as of 2025 – 2026.
- **Strategic sectors**: Health/Life Science; Manufacturing; Climate/Environment; Space; Finance; Cybersecurity; Agri-tech/Agrifood; Education/Arts/Culture; and more.
- Largest AIFs expected to have each around **25 000 advanced AI processors**.
- Overall investments in supercomputing infrastructures and AI Factories around **EUR 10 billion** (2021-2027).

AI Factories components



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AI Factories

Other AI Factories key ingredients

Data Labs

- Access to **high-quality** data
- Wide availability of **open public AI-ready** data
- Access to **Common European Data Spaces**
- **Trusted/secured** access to and reuse of **industrial data**

Skills and talent

- Development and retention of **talent in Europe**
- Comprehensive **AIF's skills plan**, including tailored activities and educational initiatives (workshops, MOOCs, hands-on training, training sandboxes, etc.)

Cloud

- Access to **sovereign cloud capabilities**
- Crucial for **further model development (AI inference), finetuning, and deployment, application development and for scaling up**

Networking

- Collaboration and networking **among AIF Factories** (knowledge sharing, resource optimisation, domain specialization, etc.)
- Links to **EU and National (AI) initiatives**

AI Factory strategic approach

EU strategy on AI Factories

Networked AIF Ecosystem

- **New/upgraded AI supercomputers**
- Dedicated HPC/AI services
- Application support
- Access policy to supercomputers
- Access to data / common EU data spaces
- Support to AI EDIC (ALT-EDIC)
- Human talent and skills
- Collaboration with AI Office – EU values

National strategy on AI Factories

Invest in an AI ecosystem

- ❑ AI-supercomputer
- ❑ Data centre(s)
- ❑ Access to data + open gov. data
- ❑ Dedicated services
- ❑ Human talent and skills, incl. investing in housing facilities
- ❑ Cooperation with Universities
- ❑ Local GPU clusters
- ❑ Digital Innovation Hubs
- ❑ AI start-up policy (access to capital, tax incentives, etc.)

Data spaces | Access to supercomputers | HPC for AI services | TEFs for AI | Data centre | Talent | Cooperation with universities | Digital Innovation Hubs for AI

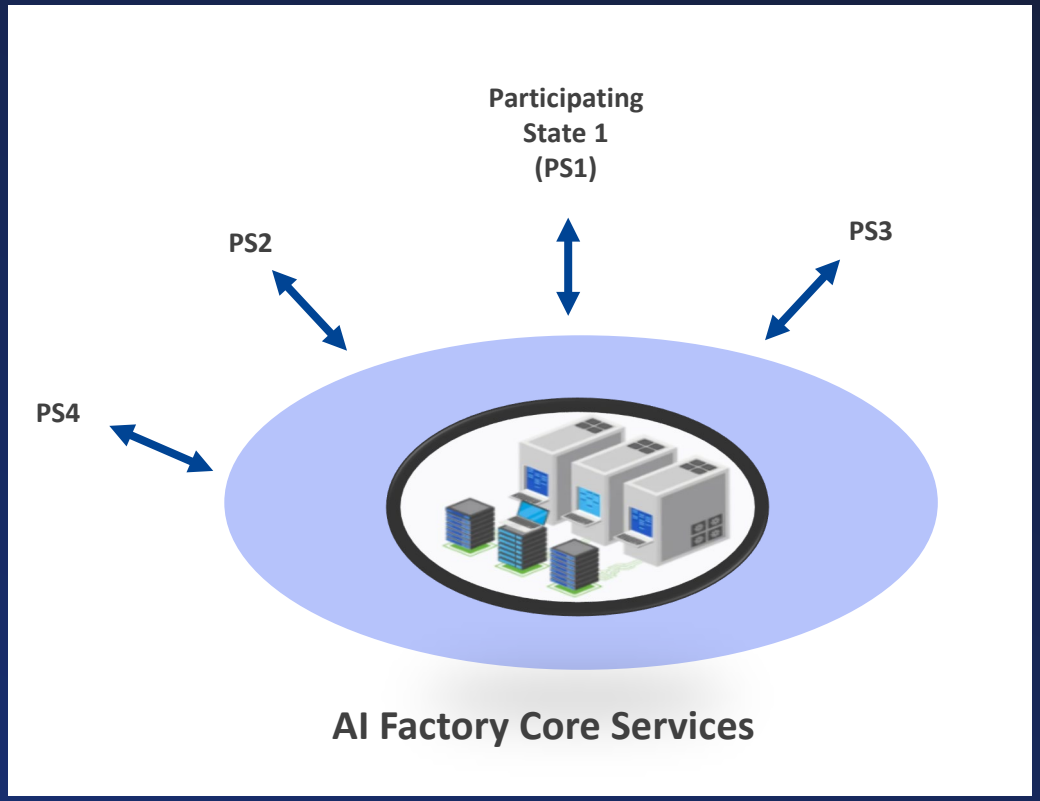
AI Factories' strategic sectors

Key Sectors	AT	BG	DE	EL	ES	FI	FR	IT	LU	PL	SE	SI
Health & Life Sciences	●		●	●	●	●	●	●		●	●	●
Technology & Digital		●		●	●	●	●	●	●	●	●	●
Environment & Sustainability		●	●	●	●		●	●	●	●	●	●
Education & Culture	●	●	●	●	●		●	●			●	●
Manufacturing & Engineering	●	●	●			●	●				●	●
Finance & Business	●		●		●		●	●	●		●	
Agriculture & Food	●				●		●	●			●	●
Cybersecurity & Dual use							●	●	●			
Space & Aerospace		●					●		●	●		
Public Sector	●		●		●					●		

AI Factories bring unique strengths and specialised focus areas, playing a pivotal role in advancing AI applications across strategic sectors.

AI Factory Antennas

- **National AIF Antennas** associated to the Hosting AIF (AI-optimised supercomputer and core services)
  - A way to create a **network of AIFs** all over the EU **without having to invest in a dedicated supercomputer** every time
  - Provide services and algorithmic support to the **national AI ecosystem**
  - **Ensure access** to enhanced AI-optimised computing capacity (remote)



Revised EuroHPC Access Policy

Traditional HPC				AI	
BENCHMARK	**DEVELOPMENT**	**REGULAR**	**EXTREME SCALE**	**SCIENCE AND COLLABORATIVE EU PROJECTS**	**INDUSTRIAL INNOVATION**
- For scaling tests & benchmarks - Fixed amount of allocation for 2 or 3 months - Continuously open with monthly cut-offs - Results and access to system: 2 weeks from cut-off date	- For code and algorithm development - Fixed amount of allocation for 6 or 12 months - Continuously open with monthly cut-offs - Results and access to system: 2 weeks from cut-off date	- For projects that require large-scale HPC resources - Allocation duration: for 12 months - Continuously open with 2 cut-offs per year - Peer-review process duration: 4 months	- For high-impact, high-gain projects that require extremely large-scale HPC resources - Allocation duration: for 12 months - Continuously open with 2 cut-offs per year - Peer review process duration: 6 months	- For scientific and collaborative EU projects intending to perform artificial intelligence and data-intensive activities - Fixed allocation for 6 months - Bimonthly cut-offs - Peer-review process duration: 1 month	- Playground - Fast Lane - Large Scale Selection (Large Scale): AIF Industrial Innovation Group

EuroHPC Access Policy for AI Industrial Innovation

EuroHPC AIF Industrial Innovation Access Track

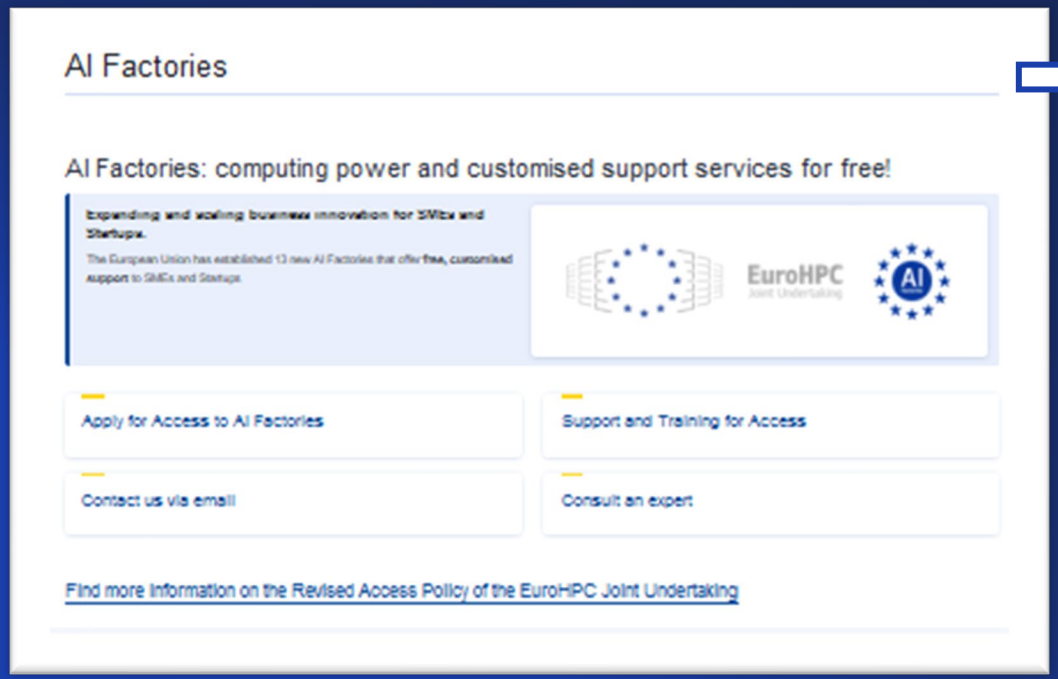
- Accommodating to what can be offered by existing EuroHPC supercomputers, including (onboarding) expert user support.
- Long term: Full set of services and access modalities once AIF computational capabilities are operational. **AI Factories services** to be defined after ad-hoc working groups.

AIF Industrial Innovation Access Modes
1. Playground – Entry-level users / small resources - "plug and play“ – Very fast FCFS access (no cut-off dates) – Onboarding support provided by the hosting AIF
2. Fast Lane – Users familiar with HPC / requiring a medium amount of GPU time – Fast FCFS access (no cut-off dates) – Expert support provided by the hosting AIF
3. Large Scale – AI models and applications requiring a large amount of GPU time – Access calls with a cut-off date – Selection based on evaluation by EuroHPC panel of experts – Onboarding expert support provided by the hosting AIF

EuroHPC Access Policy for AI for Science

- Support AI applications for science, with a focus on ethical artificial intelligence, machine learning, and cutting-edge foundation models and generative AI.
- Users from academia, research institutes, public authorities and industry, established in a Member State, or in a third country associated to Horizon 2020, the Digital Europe Programme or to Horizon Europe, are eligible to apply to the Union's share of access time to EuroHPC supercomputers.
- All types of scientific users (whether funded or not by national or European programmes), users from public sector, as well as industrial users participating in R&I projects funded by EU Programmes such Horizon Europe or the Digital Europe Programme.

Single gateway to AI Factories



AI Gigafactories

*"**Artificial Intelligence (AI)** will improve our healthcare, spur our research and innovation and boost our competitiveness. We want AI to be a force for good and for growth.*

*We are doing this through our **own European approach – based on openness, cooperation and excellent talent**. But our approach still needs to be supercharged.*

*This is why, together with our Member States and with our partners, **we will mobilise unprecedented capital through InvestAI for European AI Gigafactories**. This unique **public-private partnership**, akin to a CERN for AI, will enable all our scientists and companies – not just the biggest – to develop the most advanced very large models needed to make Europe an AI continent."*

Ursula von der Leyen, 11 Feb 2025

AI Action Summit in Paris

AI Gigafactories

- Building on the concept of AI Factories, taking it to the next level by **integrating coherently** massive computing power, **beyond 100 000 advanced AI processors**.
- Large-scale facilities designed to **develop, train, and deploy the next generation most complex AI models at an unprecedented scale** (e.g., hundreds of trillions of parameters).
- Targeting up to **4-5 gigafactories** across Europe
  - Cost of 1 Gigafactory: **€3-5 bn**. Each being powered by around 100-150 MegaWatts
  - Total investment cost for infrastructure up to **€20 bn**
- Essential for Europe to be able to **compete on the global level** and ensure its **strategic autonomy in science and in critical industrial sectors**.
- Focus on **power capacity**, **supply chain**, **cutting-edge networks**, **energy-efficiency**, and **AI-driven automation**.
- Need for **public-private partnerships** given the magnitude of the required investments.

EuroHPC Joint Undertaking

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AI Factories

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THANK YOU

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AI Factories