



HYPERION RESEARCH

Hyperion Research: **HPC and AI-for-Science Market Update**

October 2026

www.HyperionResearch.com
www.hpcuserforum.com

Earl Joseph

Who is Hyperion Research?

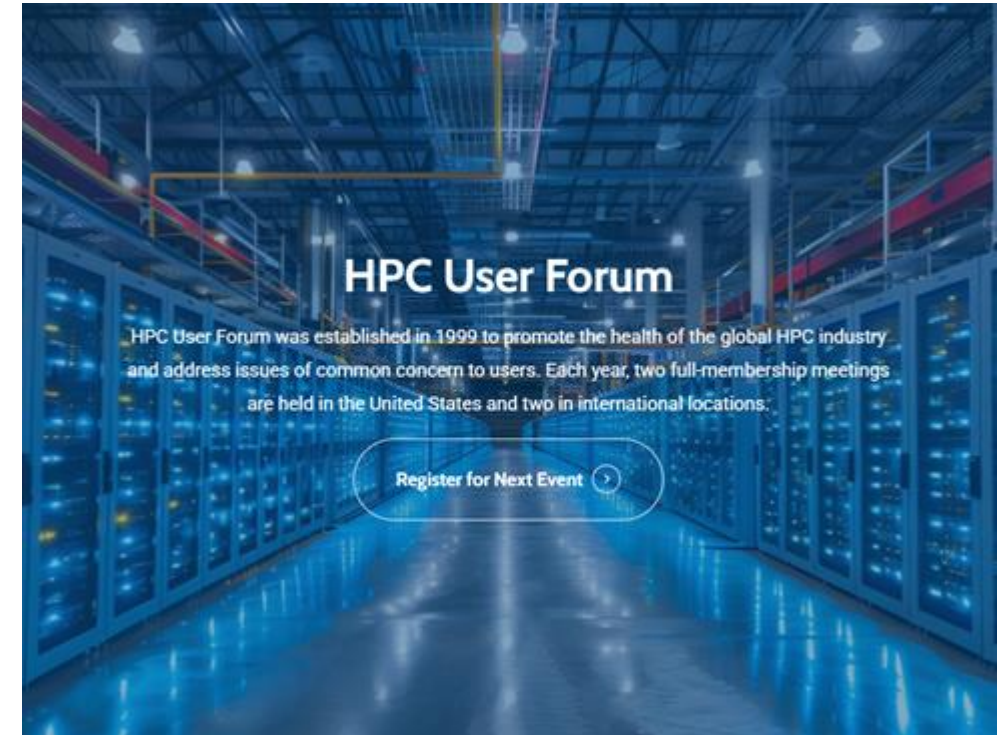
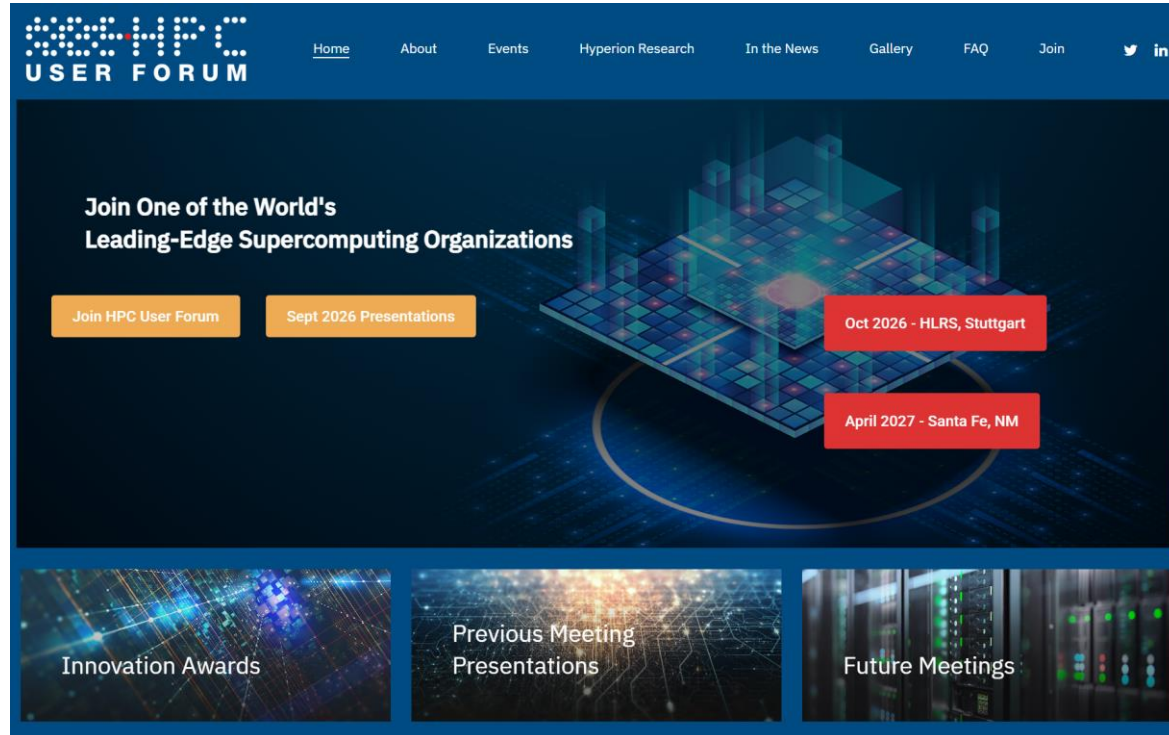
(www.HyperionResearch.com & www.HPCUserForum.com)



- Provides timely, in-depth mission-critical insights across broad portfolio of relevant topics including HPC, AI, quantum, storage and interconnects, data centers assessment, and ROI
- Delivered through variety of services consisting of custom projects, advisory, white papers, webinars, panel participation, and subscription

The HPC User Forum

(www.HyperionResearch.com & www.HPCUserForum.com)



- **Promote the health of the global HPC industry**
- **Address issues of common concern**
- **Hold multiple membership meetings throughout the year; typically, 2 in the U.S. and 2 globally**



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HPC and AI-for-Science Update

2025 Showed Strong Growth For HPC & AI-for-Science

Major growth in worldwide spending!

Worldwide overall growth in spending:

- **15.0% growth in on-premises servers**
- **29.7% growth in the use of clouds**
- **Note: Europe is ~91% of the EMEA numbers**

Total Server Sales By Region (US\$M)		
	2024	2025
North America	\$13,645	\$15,932
EMEA	\$6,122	\$6,741
Asia/Pacific w/o Japan	\$4,540	\$5,269
Japan	\$969	\$1,129
Rest-of-World	\$278	\$305
Total	\$25,554	\$29,376
Source: Hyperion Research, 2026		

The Last Five Years Showed Strong Growth in EMEA for HPC & AI-for-Science

Major EMEA growth in spending!

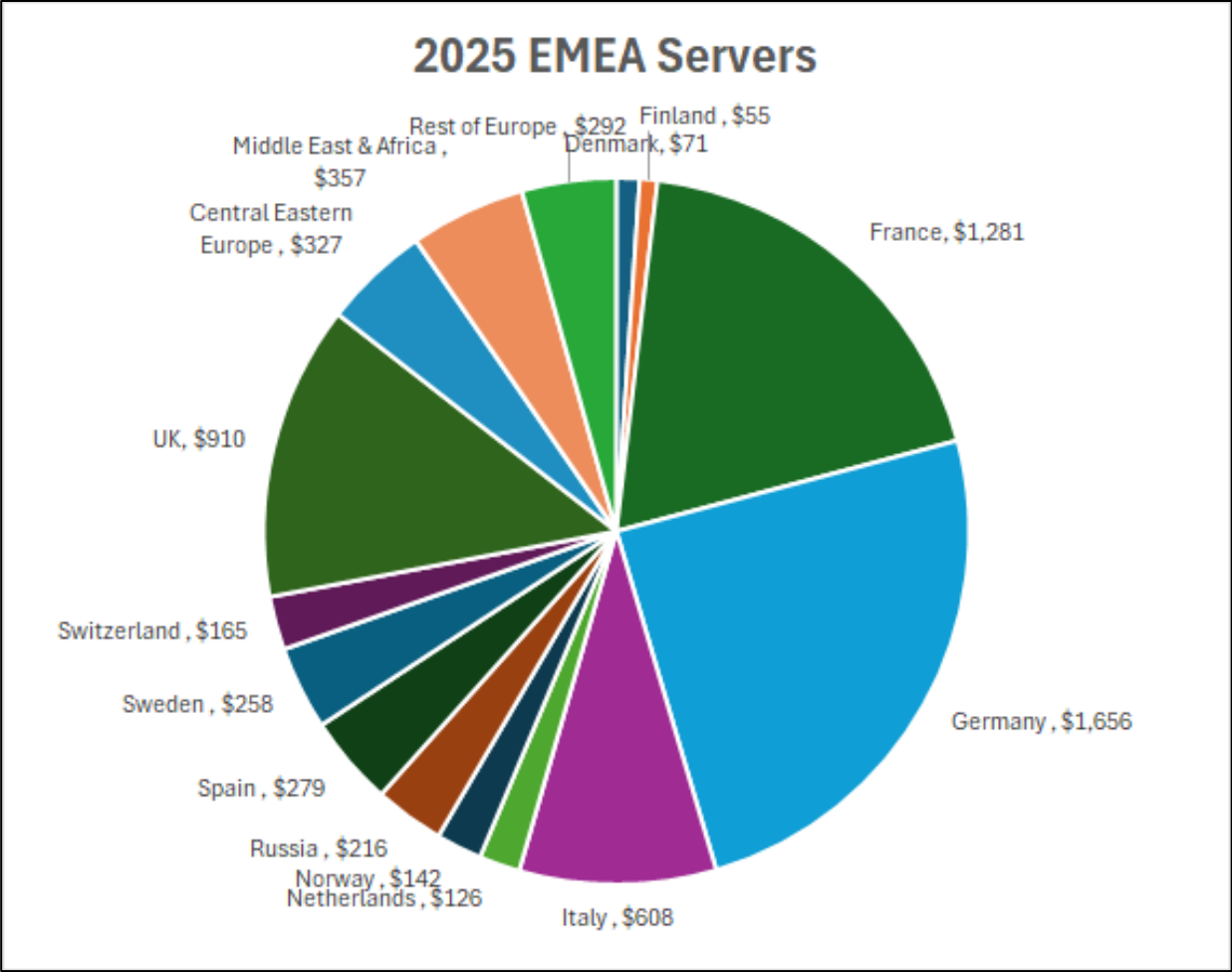
Note: The AI factories aren't in these numbers

EMEA Revenues by the Broader HPC Market Areas (US\$M)							
	2020	2021	2022	2023	2024	2025	2020-25 CAGR
Server	\$3,720	\$4,350	\$4,613	\$5,080	\$6,122	\$6,741	12.6%
Storage	\$1,409	\$1,662	\$1,827	\$2,047	\$2,547	\$2,865	15.2%
Middleware	\$421	\$496	\$529	\$587	\$712	\$784	13.2%
Applications	\$1,202	\$1,382	\$1,441	\$1,561	\$1,849	\$2,036	11.1%
Service	\$549	\$619	\$633	\$672	\$781	\$860	9.4%
Total Revenue	\$7,301	\$8,508	\$9,042	\$9,947	\$12,011	\$13,285	12.7%
Source: Hyperion Research, 2026							

EMEA On-prem Server Purchases for HPC & AI-for-Science by Country

Germany, France, UK and Italy are the top five

EMEA HPC Revenues By Country (US\$M)		
	2024	2025
Denmark	\$65	\$71
Finland	\$50	\$55
France	\$1,083	\$1,281
Germany	\$1,585	\$1,656
Italy	\$552	\$608
Netherlands	\$115	\$126
Norway	\$129	\$142
Russia	\$196	\$216
Spain	\$253	\$279
Sweden	\$234	\$258
Switzerland	\$150	\$165
UK	\$827	\$910
Central Eastern Europe	\$297	\$327
Middle East & Africa	\$324	\$357
Rest of Europe	\$265	\$292
EMEA Total	\$6,122	\$6,741
Source: Hyperion Research, 2026		



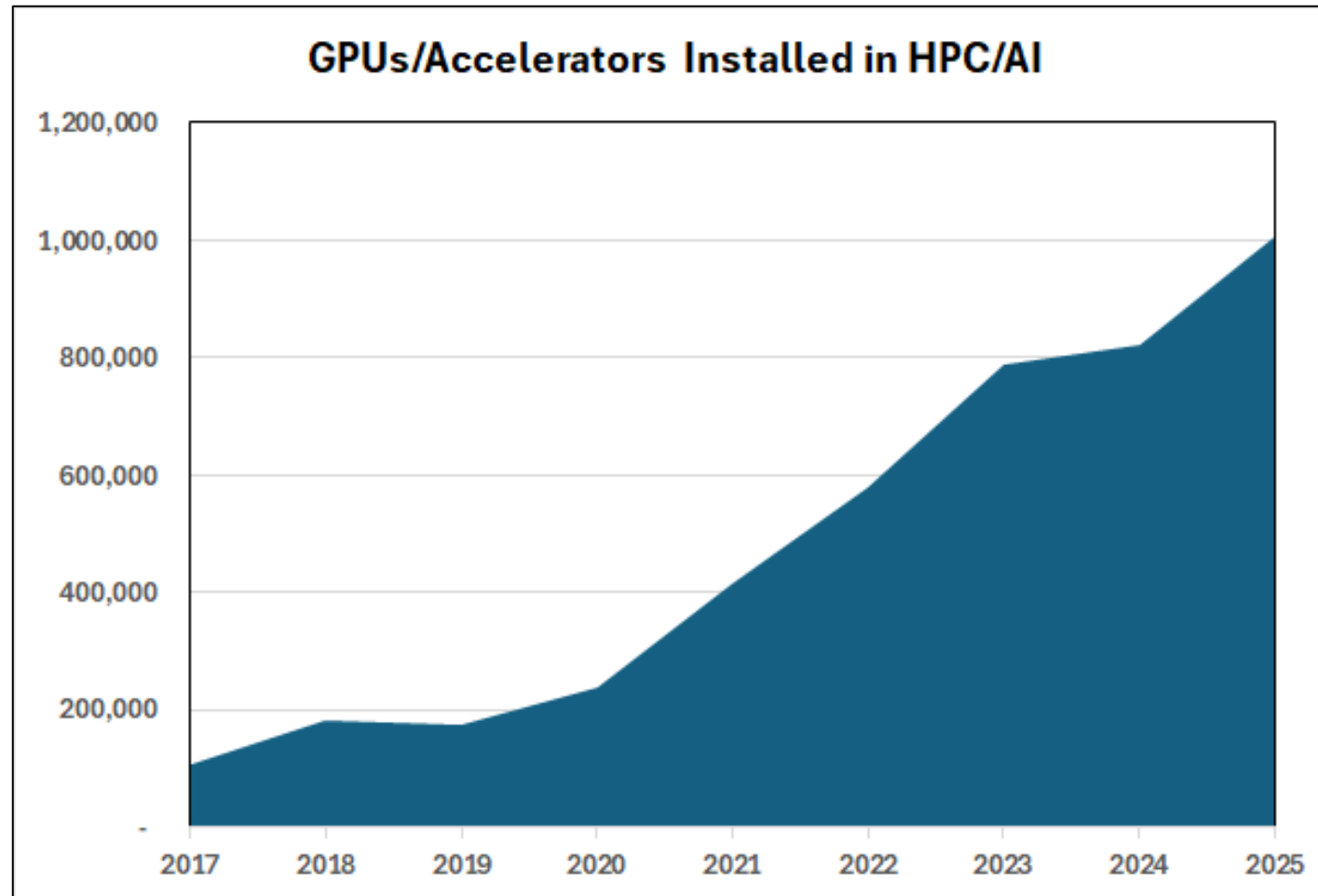
2025 HPC/AI-for-Science EMEA Market by Vertical

Six verticals are now over \$500 million (US\$), and two are over \$1 billion (US\$)

HPC& AI-for-Science Server Industry/Application Segments for EMEA							
	2020	2021	2022	2023	2024	2025	2024-25 CAGR
Bio-Sciences	\$379	\$449	\$469	\$511	\$618	\$680	12.4%
CAE	\$511	\$578	\$591	\$652	\$785	\$866	11.1%
Chemical Engineering	\$14	\$16	\$17	\$19	\$23	\$25	12.6%
DCC & Distribution	\$13	\$16	\$17	\$18	\$22	\$24	12.7%
Economics/Financial	\$86	\$100	\$144	\$160	\$194	\$211	19.7%
EDA	\$119	\$133	\$145	\$158	\$190	\$209	11.9%
Geosciences	\$364	\$408	\$402	\$442	\$534	\$585	10.0%
Defense	\$343	\$379	\$410	\$447	\$536	\$643	13.4%
Government Lab	\$1,021	\$1,241	\$1,345	\$1,499	\$1,811	\$2,008	14.5%
University/Academic	\$660	\$774	\$797	\$873	\$1,048	\$1,096	10.7%
Weather	\$147	\$172	\$181	\$199	\$240	\$261	12.2%
Other	\$64	\$83	\$94	\$102	\$121	\$135	16.0%
EMEA Total	\$3,720	\$4,350	\$4,613	\$5,080	\$6,122	\$6,741	12.6%
<i>Source: Hyperion Research, 2026</i>							

Worldwide GPU Installations: Over 1 Million Units in 2025

In HPC & AI-for-Science = 33.3% CAGR over the last 5 years



HPC/AI-for-Science Should See Major Growth in 2026

The first half of the year is showing over 20% growth

... but there are some major concerns

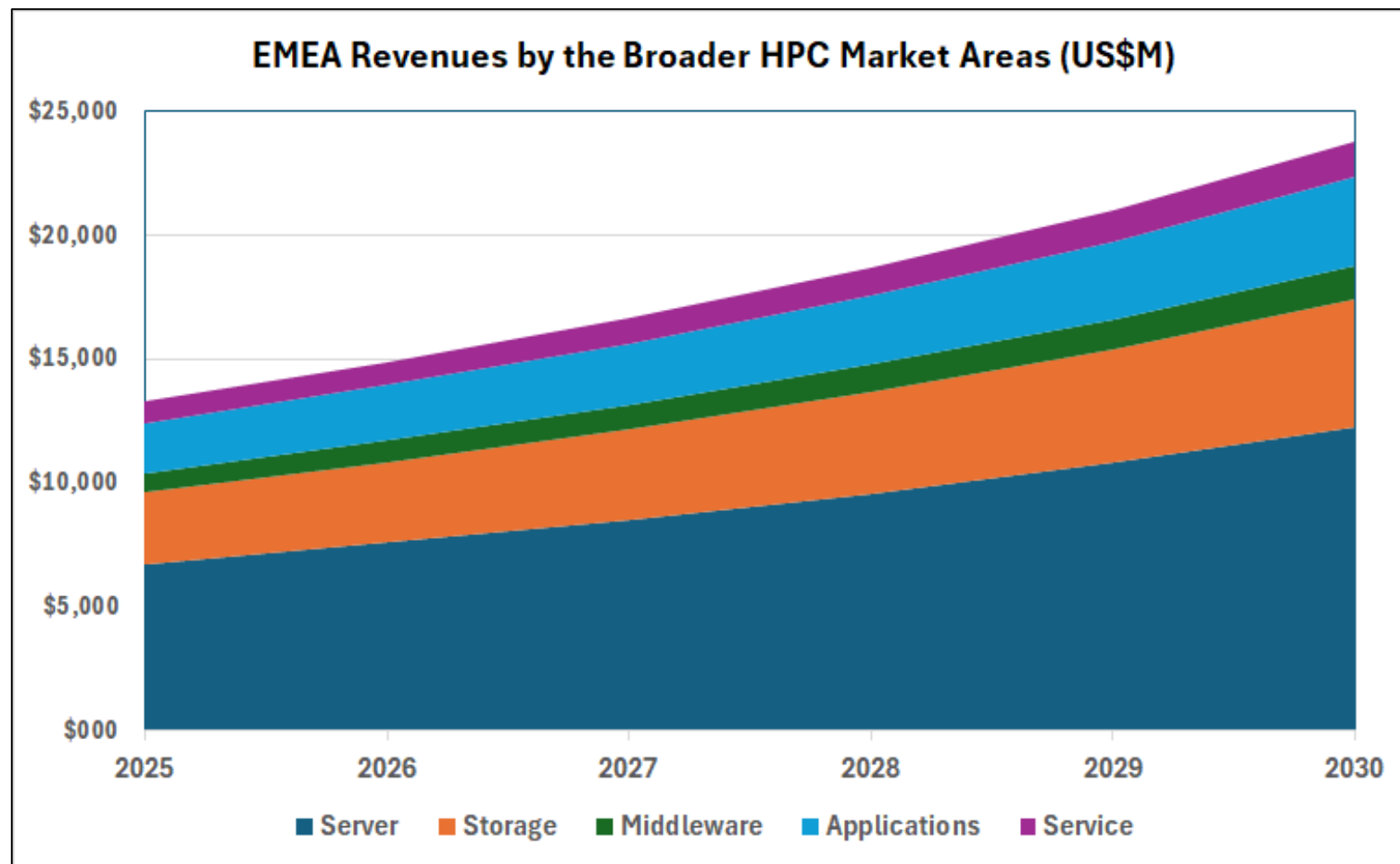
- **Supply chain issues & costs are impacting installations (e.g., GPUs, memory & SSDs)**
- **The global economic situation and changing trade rules could have a major impact to IT build outs in 2026**
- **Non-science AI systems are getting major attention and funding**
- **Exascale system acceptances are seeing delays**
- **The lower end of the on-premises market continues to struggle**
- **Growth drivers include:**
 - New use cases especially in AI are providing new areas for users to advance their research
 - Countries and companies around the world continue to recognize the value of being innovative and investing in R&D to advance society, grow revenues, reduce costs, and become more competitive

EMEA HPC/AI-for-Science On-Prem Server Forecast

On-prem server spending is projected to exceed \$12 billion by 2030 (US\$)

Broader HPC/AI on-prem market is projected to reach \$24 billion (US\$)

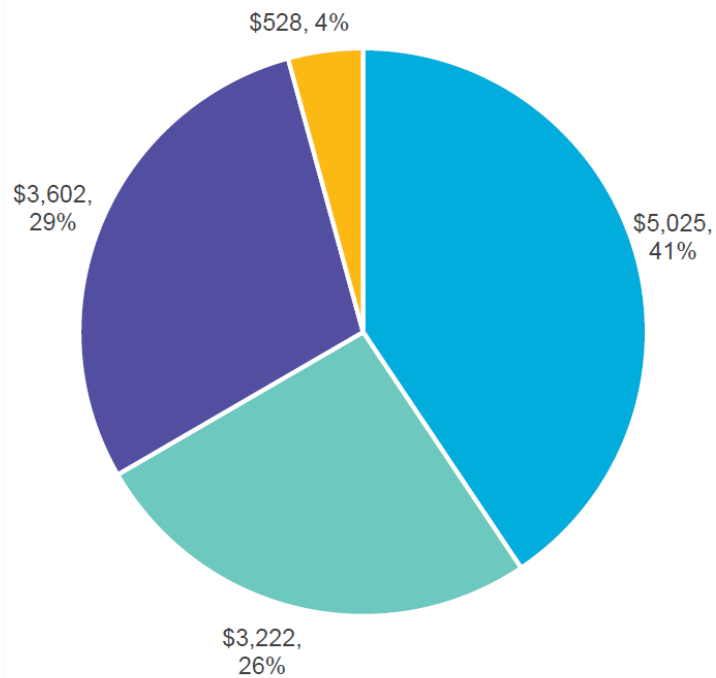
Note: The AI factories aren't yet fully in these numbers – will add to the growth



HPC & AI-for-Science Cloud Spending

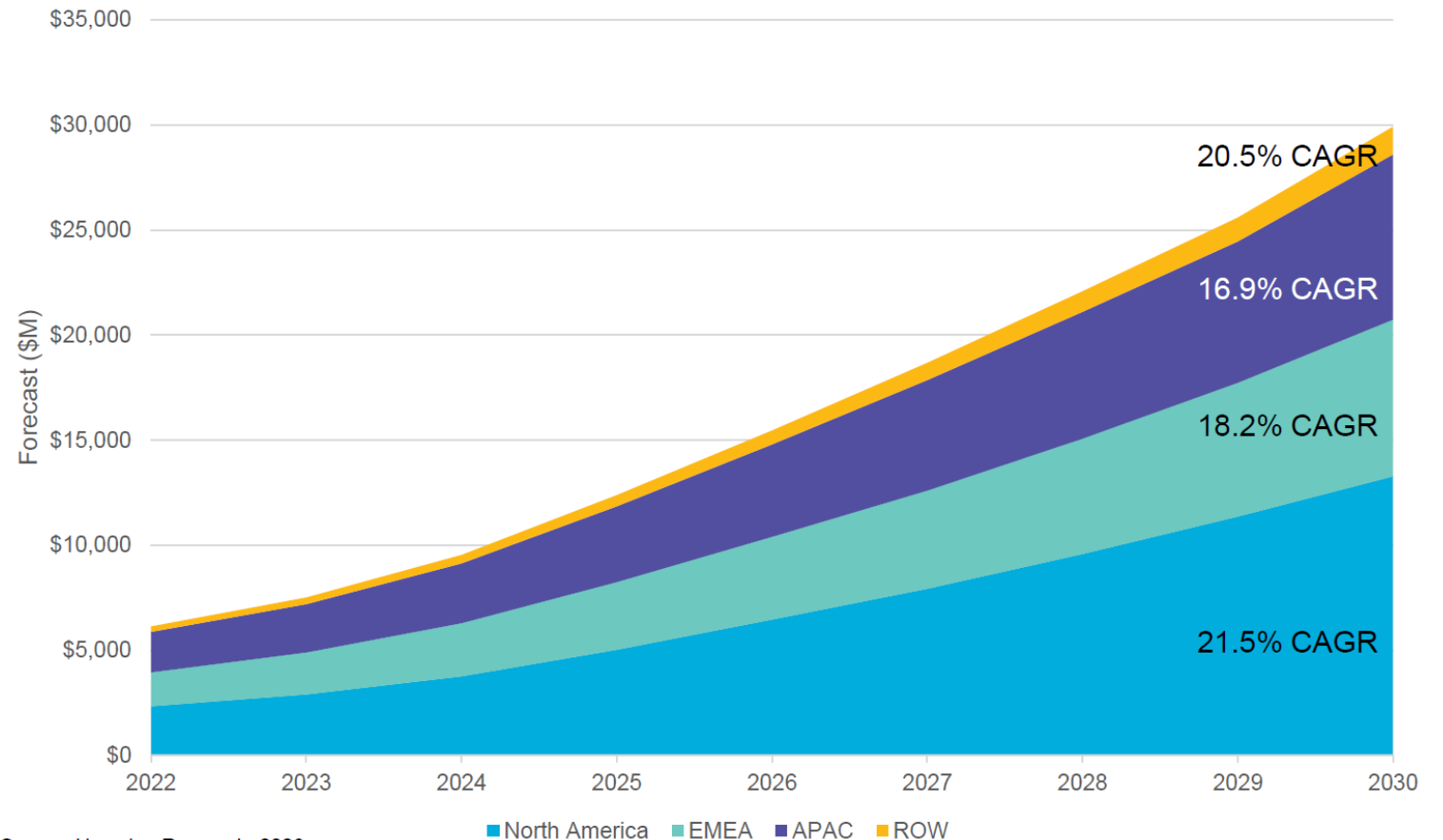
Cloud spending is expected to grow from \$12 billion in 2025 to reach \$30 billion by 2030 (US\$)

2025 Global HPC-AI Spending in the Cloud by Region - \$12,376 Total (\$M)



■ North America ■ EMEA ■ APAC ■ ROW
Source: Hyperion Research, 2026

2026-2030 Global HPC-AI Forecast in the Cloud by Region (\$M)

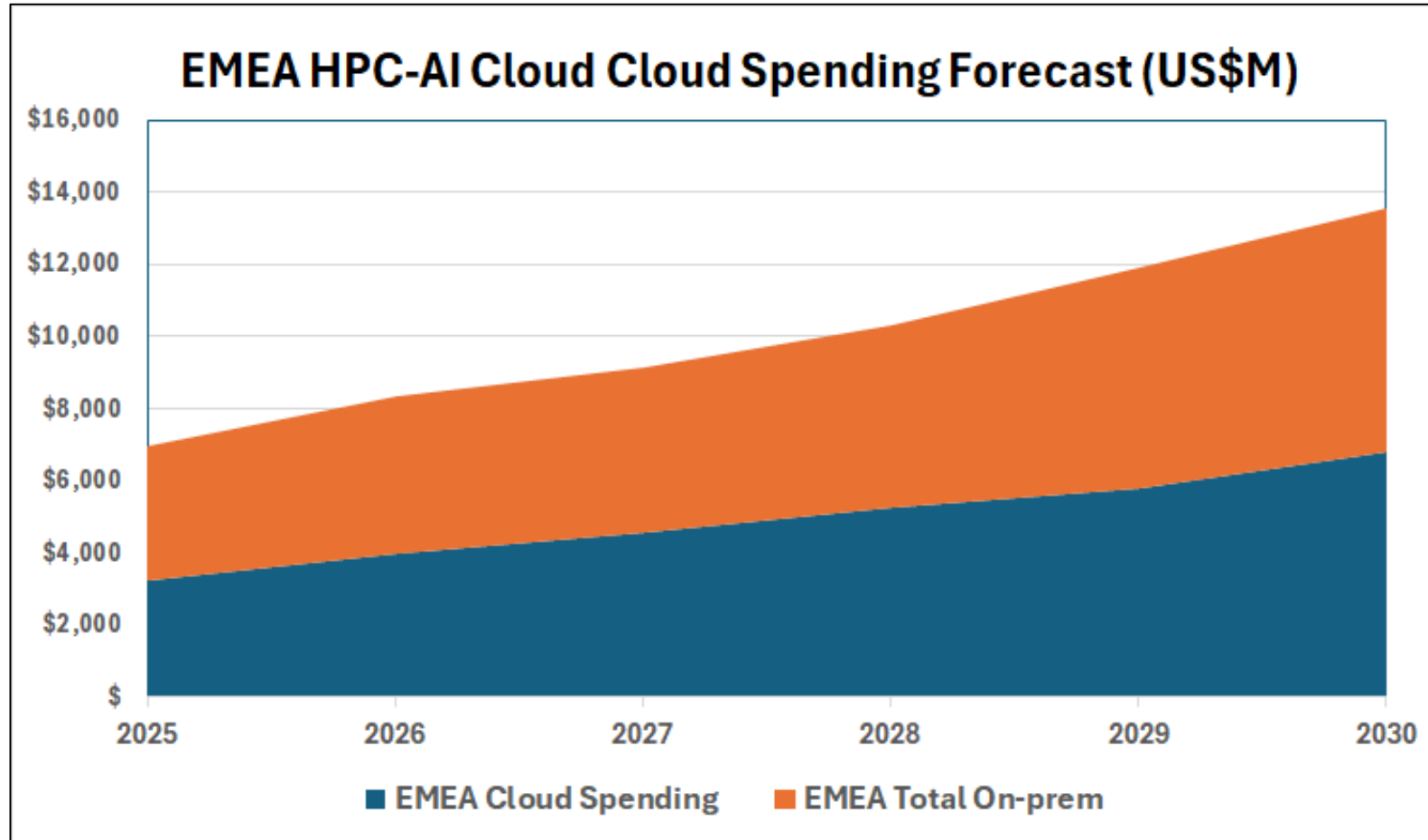


Source: Hyperion Research, 2026

HPC & AI-for-Science On-Prem Plus Cloud Forecast

The EMEA market is projected to exceed \$13.5 billion by 2030 (US\$)

Doubling over the next 5 years



Trends in AI-for-Science

Europe and the US are Leaders in AI-for-Science

*From the EU's AI Factories, AI Antennas and AI Gigafactories to the DOE Genesis Mission
The DOE Genesis Mission and Europe's AI Factories are seen as critical game-changing investments, but with very different focus areas*

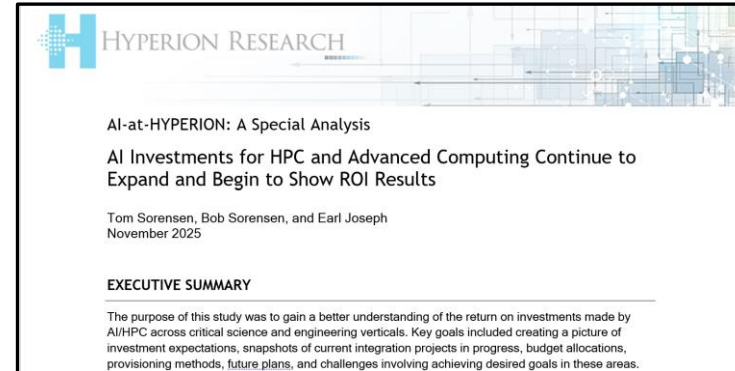
- **DOE Genesis Mission: federated scientific computing at national scale**
 - High interest in connecting systems across national laboratories
 - Enables easy sharing of compute between laboratories
 - Expected to produce new AI capabilities for researchers
 - Includes access for international researchers
 - Focus: federated scientific computing at a national scale
- **Europe's AI Factories: sovereign AI compute infrastructure across the EU**
 - Many are already online or soon to be operational
 - High interest at ISC in European Giga AI Factories
 - Strong curiosity around size, locations, and architectures
 - Focus: sovereign AI compute infrastructure across the EU
 - Complementary to national HPC investments across EU member states

Success in Using AI-for-Science

“AI Investments for HPC and Advanced Computing Continue to Expand and Begin to Show ROI Results”

Highlights from the study:

- **75.8% of the sites felt that their AI projects met or exceeded expectations**
- **74.9% of respondents indicated plans to moderately or significantly expand generative AI to support HPC workloads**
 - Less than 3% expect to contract their use of AI, none of which would characterize that contraction as significant
- **Roughly 40% of respondents are already using agentic AI models**
- **However, technical challenges continue to bring hesitation when it comes to broad adoption:**
 - Hallucinations, lack of explainability, and integration complexity are persistent concerns
 - This signals a transition from reactive adoption to more measured, application-specific onboarding



2026 MCS Study Findings: AI Strategies

94.8% are using or will soon be using AI/LLMs

But 8.2% plan to stop using them

Characterizing AI/LLM Strategy	
Q. Which of the following best describes your generative AI/LLM strategy?	
Strategy Characterization	Percentage of Sites
We use generative AI/LLMs today and plan to continue using it over the next 12-18 months	71.1%
We do not use generative AI/LLMs today but plan to start in the next 12-18 months	15.5%
We use generative AI/LLMs today but plan to stop using it within the next 12-18 months	8.2%
We do not use generative AI/LLMs today and do not plan to within the next 12-18 months	5.2%
n = 97	
Source: Hyperion Research, 2026	



Study Findings: Barriers to AI Growth

Expertise, quality of training data, dealing with complexity and high costs are the top barriers

Barriers to AI Capability Growth	
Q. Are any of the following barriers to furthering your AI capabilities? Please select all that apply:	
Barrier	Percentage of Sites
Level of in-house AI expertise	36.7%
Quality of available training data	35.0%
Complexity with integrating AI models into existing HPC workloads	30.0%
High/uncertain development costs	28.3%
Concerns with technical issues (i.e., scaling, hallucinations, ease of maintenance)	21.7%
High/uncertain operational costs	20.8%
Scale of available training data	19.2%
Access to specialized hardware	17.5%
The technology is moving too fast for credible assessment of value	17.5%
Lack of demonstrated return on investment	16.7%
Level of AI vendor or 3rd party expertise	10.8%
Access to specialized software	10.0%
Confusion/uncertainty with vendor selection	8.3%
Other (please specify)	3.3%
n = 120	
Notes: Respondents could select multiple options	
Source: Hyperion Research, 2026	



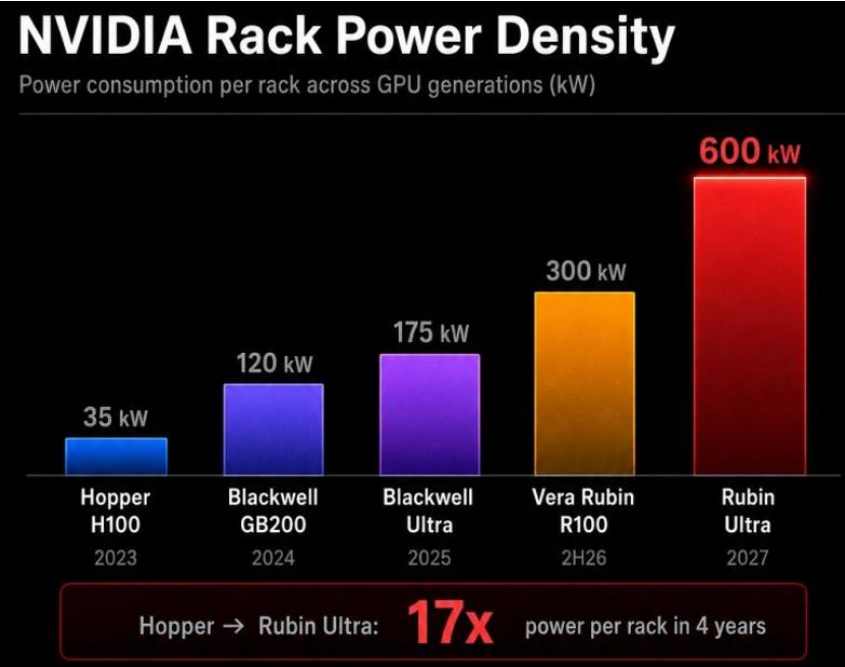
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Market Changes: Nodes Per System

Rack Power Requirements

Drives major increases in the price per rack

Note: these slides are from Prejean Consulting, May 2026



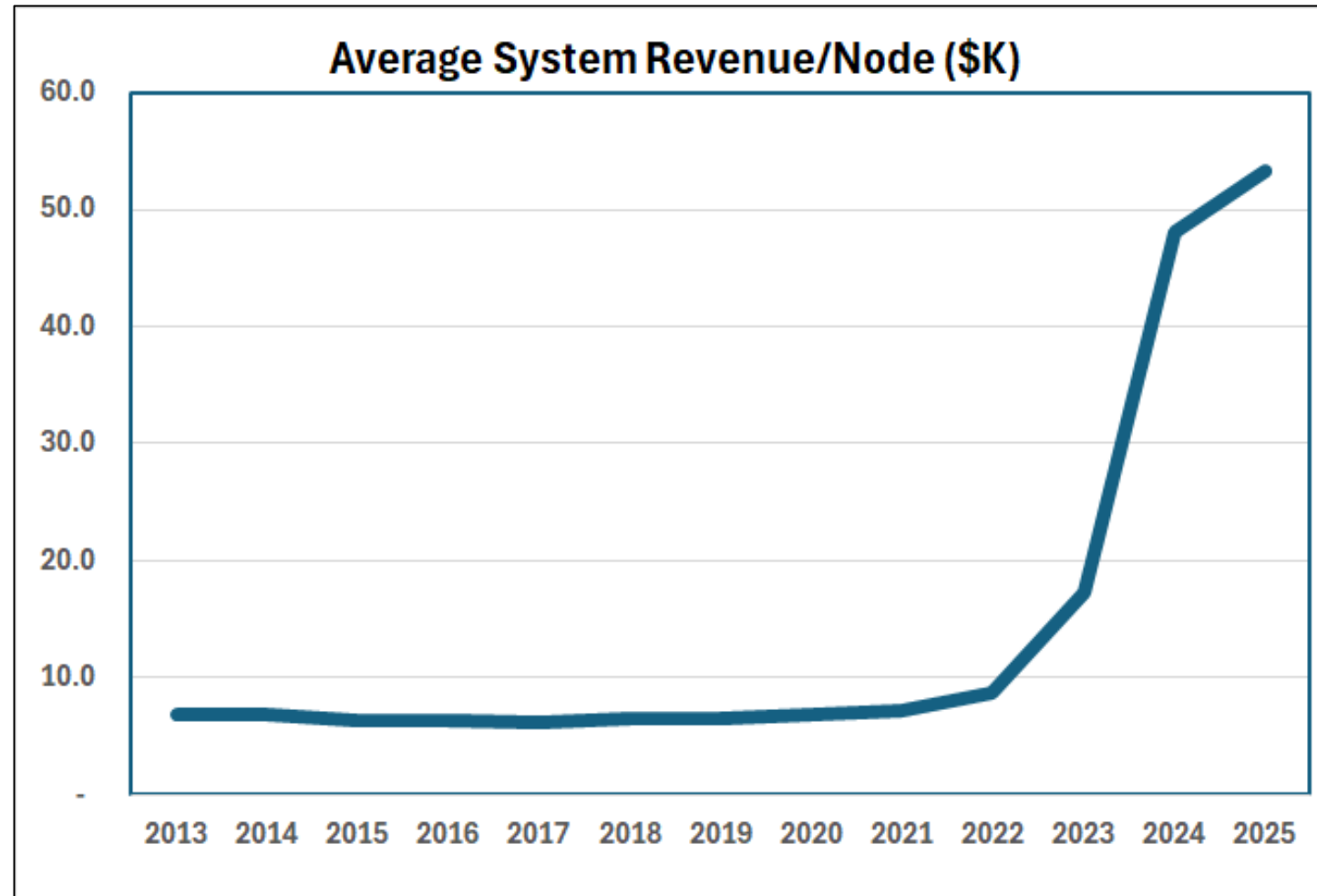
WHAT 600kW PER RACK MEANS FOR INFRASTRUCTURE			
	CONSTRAINT	HOPPER ERA (35kW)	RUBIN ULTRA (600kW)
	Cooling	Air Cooled	Direct-to-Chip Liquid Only
	Power per 10K racks	350 MW	6,000 MW (6 GW)
	Transformer demand	Baseline	~17x baseline

The bottleneck isn't chips. It's everything downstream: cooling, transformers, grid connections, and time. Jensen said NVIDIA will be **"supply constrained through the entire life of Vera Rubin."** The constraint he's talking about isn't silicon. It's infrastructure.

Prejean Consulting | May 2026

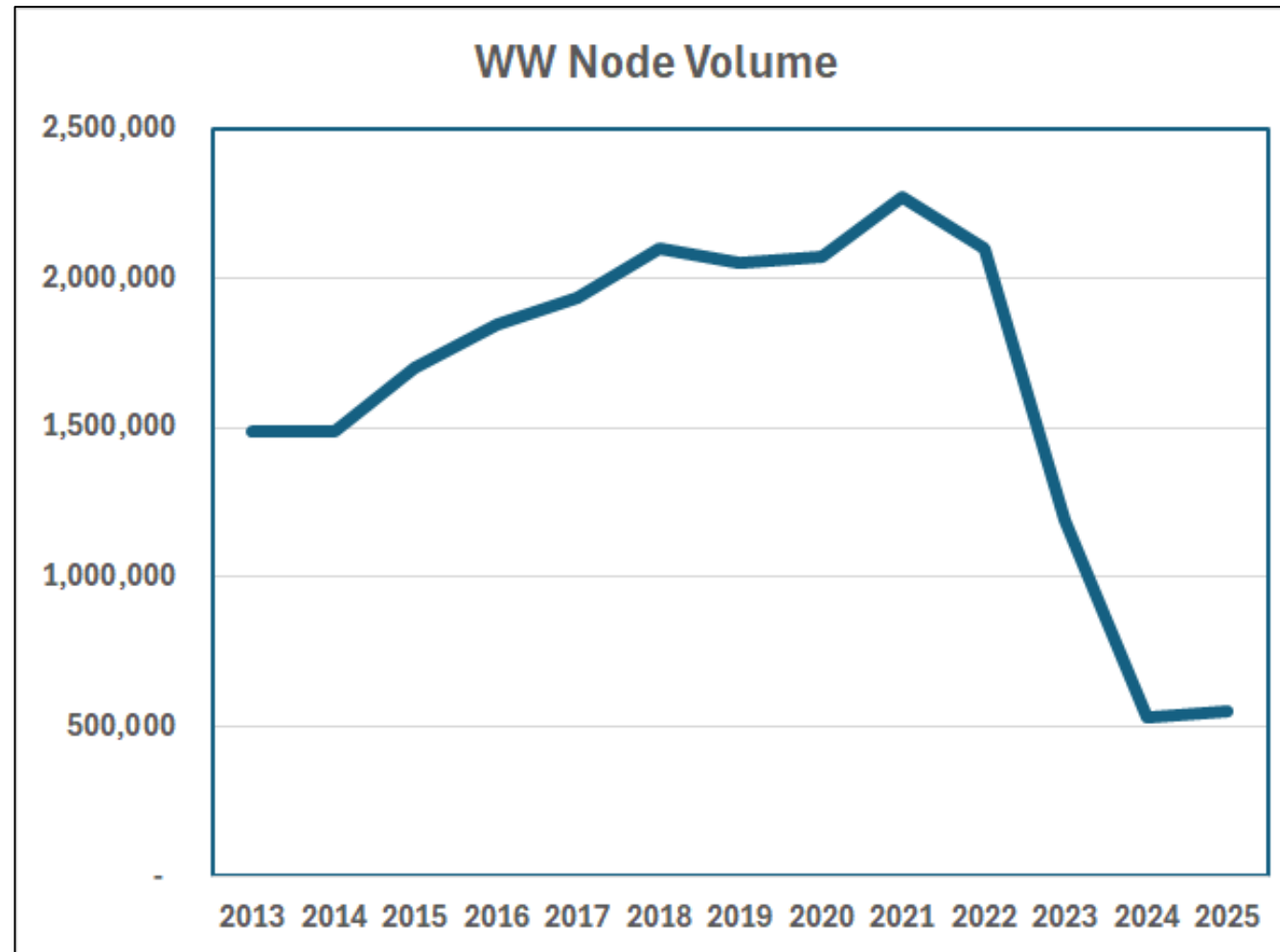
A Major Market Shift: High Node Costs

Driven by more systems having GPUs, higher GPU costs and higher node costs (memory, liquid cooling, higher power)



A Major Market Shift: Fewer Node Purchases

Driven by more systems having GPUs, higher GPU costs and higher node costs (memory, liquid cooling, higher power)



HPC/AI-for-Science Conclusions

Expecting strong growth, but there are some growing concerns...

- **2025 was a strong growth year**
 - AI-for-Science, GPUs, and cloud are high growth areas
 - New quantum computing (QC) systems are being installed around the world
 - 2026 looks like a healthy growth year
- **Memory, storage and GPU prices are rising quickly**
- **A large number of new technologies are entering the market:**
 - Agentic AI, Generative AI, smarter AI, LLMs and SLLs are fueling a new level of growth
 - Processors, AI hardware & software, memories, new storage approaches, etc.
- **The cloud has become a viable option for many HPC workloads**
- **Storage will likely see major growth driven by AI, big data and the need for much larger data sets**
- **There are growing concerns around system costs, supply chains, power, AI impacts, data centers push-back, talent and political changes**



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A New Study: Measuring the Value of Science, R&D, Engineering and HPC/AI-for-Science

October 2026

www.HyperionResearch.com
www.hpcuserforum.com

Earl Joseph, Bob Sorensen, Mark Nossokoff,
Jaclyn Ludema, Tom Sorensen, and Mike Thorp

The Study's Goal: Create a Way to Measure the Value of Science and R&D Results

- **We thank DOE/NNSA for supporting and guiding this research!**
- **The need to apply a rigorous method for measuring the value of science is important, but complicated...**
 - ... and any approach is highly debatable
- **We invite you to participate in the study once we have the survey guides finalized!**

Why It's Important Today

There is a growing requirement to show the value and return from large-scale computing investments

- **The cost of computing is growing very quickly, and often requires major justification from funding bodies**
 - New technologies like AI and large-scale HPC require substantial investments in systems, data, and people
- **The returns are typically known by those within the scientific community, but often less clear to broader audiences**
 - But in many cases it's hard to assign a dollar value to the results
- **To be competitive in advancing science & engineering now requires substantial increases in investments in computing**
 - Sites, nations and companies around the world are expanding their investments in HPC/AI at a rate not seen before
 - Time-to-solution is critical in fast moving technology areas

The Research Approach

The approach is designed to leverage existing data, reports, papers from leadership sites ... then collect consistent results from successful projects

- 1. Update the Hyperion Research framework that measures the value of scientific computing projects**
 - First create the updated framework to better estimate the value of scientific research results
 - Then create the initial survey guide & projects to be studied
- 2. Measure the historic value by surveying individual projects/accomplishments at sites**
 - Requires surveying many different projects at each site
- 3. Hyperion Research will then analyze the results, create value estimates and compare the results to other projects & sites**
 - The report will show the value and scientific ROI of the different projects and an overall picture of the site's total contributions
- 4. Develop an initial estimate of the total value of the research projects**
 - A macroeconomic view of the scientific ROI

Categories for the Projects

1. Advancing Science

- Measurements of scientific discovery, innovations and research results

2. Advancing Engineering

- Designing and building things like aircraft, rockets, cars, bridges, power plants, accelerators, cell phones, chips, etc.
- Engineering leadership computing (hardware, software, AI, etc.) for first of its kind technologies

3. Economic Growth

4. Saving Lives

- Weather and disaster reduction projects, finding cures for diseases

5. National Security

- Create a framework that can be used without external help (e.g., in a classified mode)

The main goal is to clearly articulate the value that comes from investments in leadership computing.

Metrics for the Framework

Example types of values from computing projects:

1. Advancing Science

- Measurements of the value of scientific discoveries, innovations and research results
 - The level of importance of the research results and how broadly useful it is to other researchers/organizations
 - Enhancing fundamental science as a prerequisite for advancements in applied research and development
 - Number of scientific discoveries/results/publications & how often the results are used or cited by others
- Better understanding of how things work
- Speeding up the time-to-solution on critical large problems – “Accelerate Science”
- Testing otherwise untestable theories, either due to physical limitations or undesirable (potentially adverse) human impact
- Finding ways to reduce climate change impacts, improving the health of our planet, improving energy efficiency, and creating more sustainable products and approaches
- Increasing the productivity, efficiency and success of scientists and researchers -- this can allow each researcher to be more productive

Metrics for the Framework (continued)

Example types of values from computing projects:

2. Advancing Engineering

- Creating better products and developing new types of products
 - Speeding up the time from discovery to building products
- Designing better physical devices
 - e.g., Designing better computers and making them more useable (e.g., GPUs)
- Testing otherwise untestable theories, either due to physical limitations or undesirable (potentially adverse) human impact
 - The ability to predict how things will work before building them or where its difficult or impossible to test e.g., landing a new spacecraft on Mars
- Technology innovation transfer to industry
- Engineering leadership computing (hardware, software, AI, etc.) for first of its kind technologies
 - As a tool for leadership in science
 - Creation of better software, data libraries/repositories and computing tools for broader use
 - For example: Improving the design and safety of power plants and developing technologies to exploit alternative energy sources

Metrics for the Framework (continued)

Example types of values from computing projects:

3. Economic Growth

- Helping to increase jobs and grow the nation's GDP
- Technology innovation transfer to industry
- Speeding up the time from discovery to products
- Improved understanding of how to build better products and services
- Developing new types of products
- Developing new technologies/tools and making them more accessible and easier to use
 - Finding ways to take advantage of the revolutionary changes from AI
 - Developing better ways to take advantage of new technologies like GPUs, and computing at a large scale in industry
- Reducing risk
- Avoiding costs/saving money, e.g., simulation vs. high-cost testing can save substantial funds and have a faster time-to-solution
- Building a more diverse and stronger scientific workforce

Metrics for the Framework (continued)

Example types of values from computing projects:

4. Saving Lives

- Weather and disaster reduction projects, finding cures for diseases
- Providing accurate daily/weekly weather forecasts needed by the transportation, agricultural, and tourism industries
- Emergency response to natural disasters
- Improving healthcare
 - Addressing major diseases and widespread pandemics (e.g., cures, vaccines) and reducing overall impacts
- Designing safer systems, products, infrastructure, etc.

5. National Security

- Creating a framework that can be used within classified boundaries without external help
- Improvements in cyber security, making AI more reliable and trustworthy, tracking bad players, etc.
- Energy independence
- Economic security
- Military and intelligence missions
- Homeland security areas

The Expanded Scientific Value Categories

Initial ideas: to be updated throughout the study

1. How large of a discovery was the accomplishment (in a given field)?

- a) E.g., one of the top 2 in the last 10 years, top 10, top 50, ...

2. How broadly useful to other organizations are the results?

- a) 2, 10, 100, 1,000, ... organizations

3. How useful are the results to larger societal (or national) goals?

- a) Does it address any of the UN 17 sustainable development goals and how much? (https://sdgs.un.org/#goal_section)
- b) Does it make a country more economically strong?
 - i. Does it create jobs? Does it add to GDP? Does it make a country more competitive?
- c) Does it make a country more secure?

4. Does it significantly help increase the overall intelligence of humanity?

- a) Does it rewrite textbooks?
- b) Is it a Nobel class discovery?
- c) Does it provide a major advancement to help other scientific projects/studies?

3) How Useful Are The Results To Larger Societal (Or National) Goals?



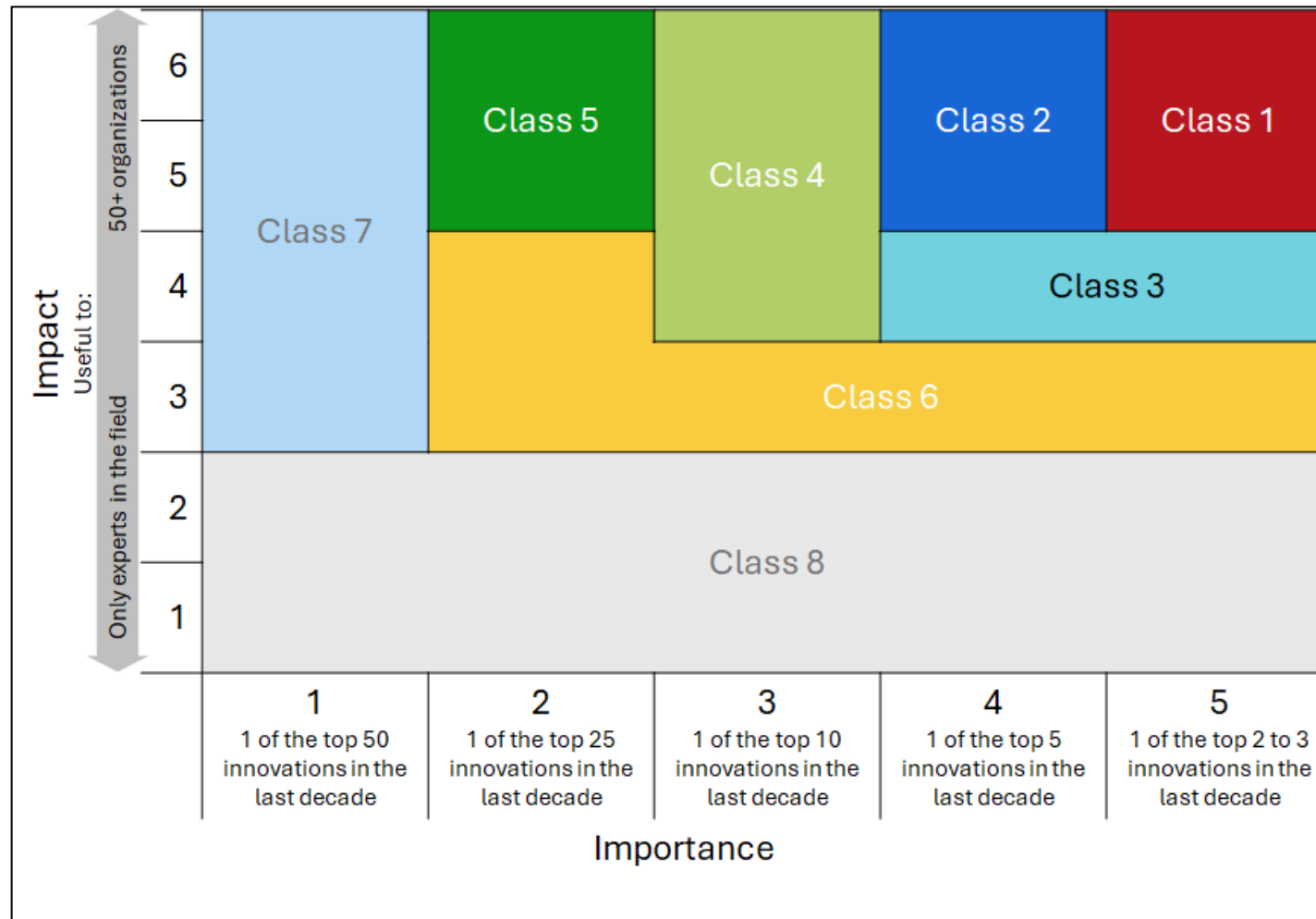
The UN 17 sustainable development goals

Plus:

- Does it make a country more economically strong?
 - i. Does it create jobs?
 - ii. Does it add to GDP?
 - iii. Does it make a country more competitive?
- Does it make a country more secure?

The Previous Approach

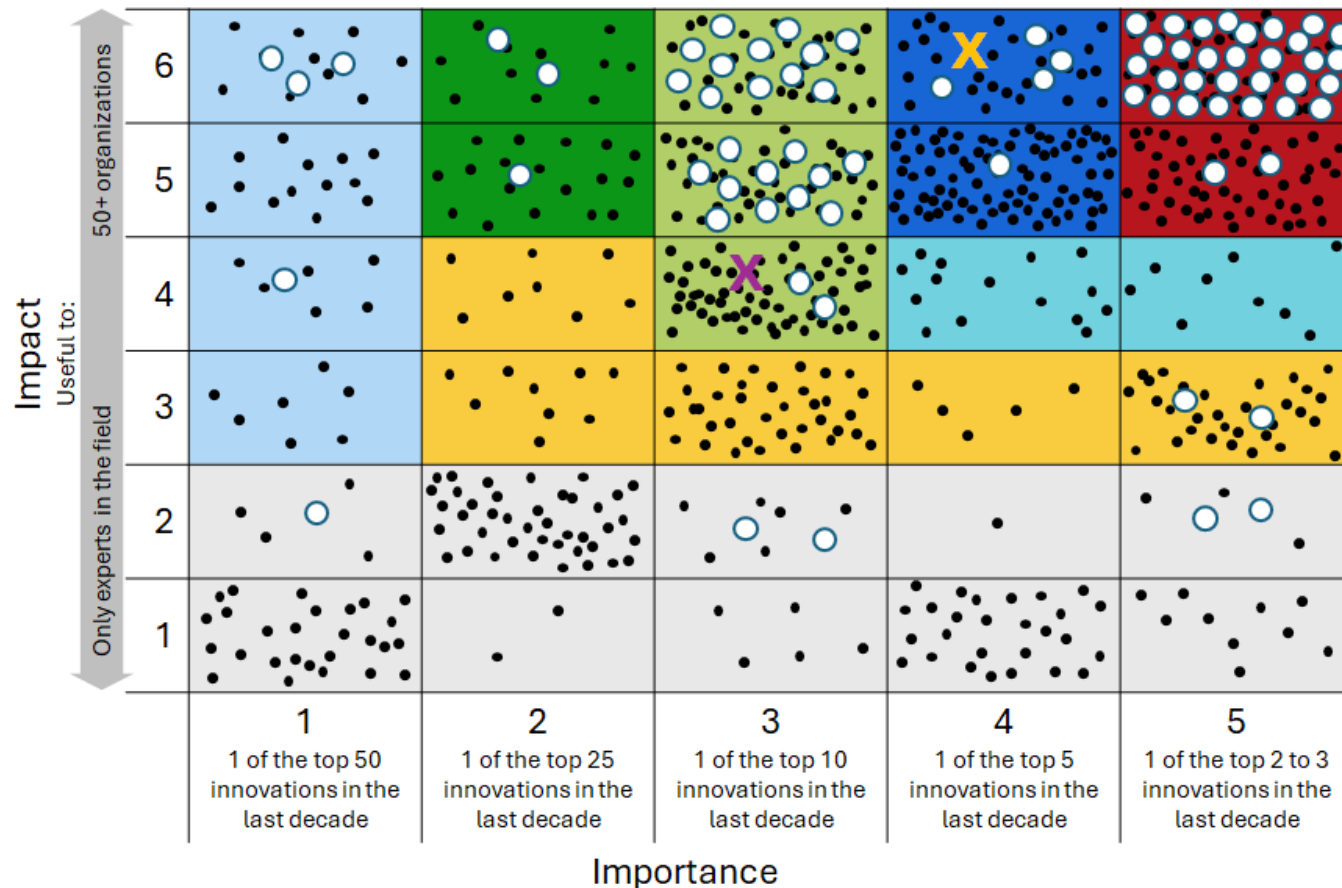
Using two scales: innovation importance level, and how broadly impactful are the results



Showing the Value of Leadership Computing: RIKEN

An example from a 2024 study compared to 650 other projects

When applied to key societal goals, the increased value generated is impressive



The K computer exceeded 9 times its investment.

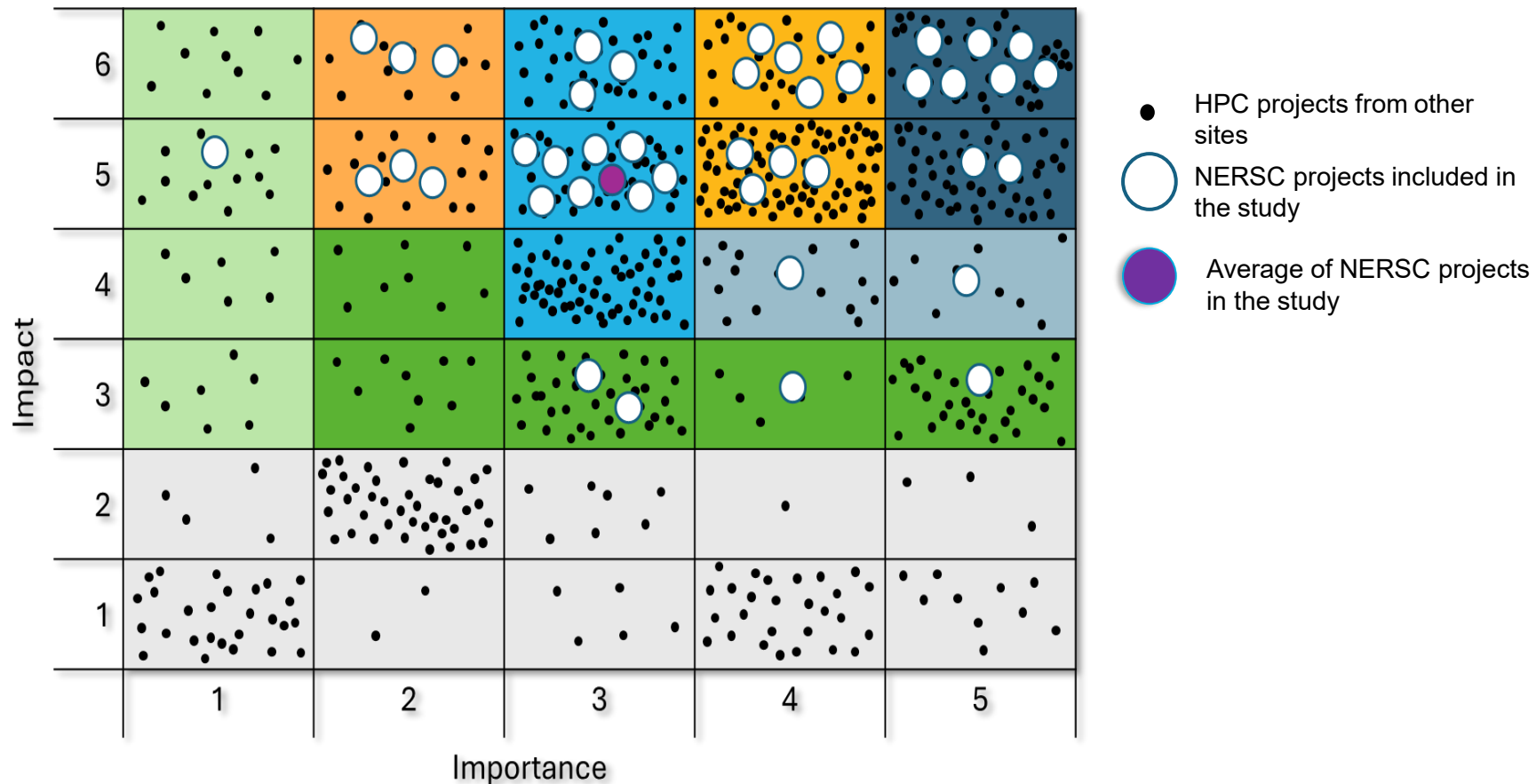
If Fugaku delivers similar returns as the K computer, plus the added returns from addressing major societal issues, the returns could exceed 68 to 90 times the investment in the Fugaku system.

- Addressing the UN 17 Sustainable Development goals can have very high impact.

Showing the Value of Leadership Computing: NERSC

An example from a 2024 study compared to 650 other projects

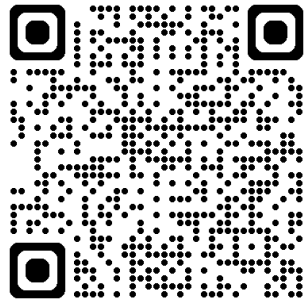
Innovation Class Mapping: Showing Participating NERSC projects





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Questions?



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