HPC in Germany and Europe

8th bwHPC Symposium
onine, Stuttgart, Germany, November 28, 2022

Michael Resch, HLRS, Stuttgart, Germany


EuroHPC
Joint Undertaking

JU EuroHPC Mission

- develop, deploy, extend and maintain in the EU a world-leading federated, secure and hyper-connected supercomputing, quantum computing, service and data infrastructure ecosystem;
- support the development and uptake of demand-oriented and user-driven innovative and competitive supercomputing system based on a supply chain that will ensure components, technologies and knowledge limiting the risk of disruptions and the development of a wide range of applications optimised for these systems;
- widen the use of that supercomputing infrastructure to a large number of public and private users and support the development of key HPC skills for European science and industry.

JU EuroHPC Members

- Public members:
  - the European Union (represented by the Commission),
  - Member States and Associated Countries that have chosen to become members of the Joint Undertaking: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden and Turkey.
- Private members:
  - representatives from the three participating private partners, the European Technology Platform for High Performance Computing (ETP4HPC), the Big Data Value Association (BDVA) and the European Quantum Industry Consortium (QuIC).

JU EuroHPC Budget

- The EuroHPC Joint Undertaking is jointly funded by its members with a budget of around EUR 7 billion for the period 2021-2027.
- Most of this funding comes from the current EU long-term budget, the Multiannual Financial FrameworkSearch for available translations of the preceding link*EN*••• (MFF 2021-2027) with a contribution of EUR 3 billion, distributed as follows:
  - EUR 1,9 billion from the Digital European ProgrammeSearch for available translations of the preceding link*EN*••• (DEP) to support the acquisition, deployment, upgrading and operation of the infrastructures, the federation of supercomputing services, and the widening of HPC usage and skills;
  - EUR 900 million from Horizon Europe (H-E) to support research and innovation activities for developing a world-class, competitive and innovative supercomputing ecosystem across Europe;
  - EUR 200 million from Connecting Europe Facility-2Search for available translations of the preceding link*EN*••• (CEF-2) to improve the interconnection of HPC, quantum computing, and data resources, as well as the interconnection with the Union's common European data spaces and secure cloud infrastructures.
- The EU contribution is matched by a similar amount from the participating countries. Additionally, private members are contributing an amount of EUR 900 million.
- The Joint Undertaking provides financial support in the form of procurement or research and innovation grants to participants following open and competitive calls.

JU EuroHPC Systems

- LUMI: 550 PFLOPs / HPE / CSC-Finnland
- Leonardo: 323 PFLOPs / Atos / CINECA-Italy
- Mare Nostrum 5: 314 PFLOPs / Bull / BSC-Spain
- VEGA: 10 PFLOPs / Atos / IZUM-Slovenia
- MELUXINA: 18 PFLOPs / Atos / LuxProvide-Luxemburg
- Karolina: 13 PFLOPs / HPE / IT4I-NSC-CZ
- Discoverer: 6 PFLOPs / Atos / Sofia Tech Park – Bulgaria
- Deucalion: 10 PFLOPs / Fujitsu-Atos / MACC-Portugal

https://eurohpc-ju.europa.eu/about/our-supercomputers_en

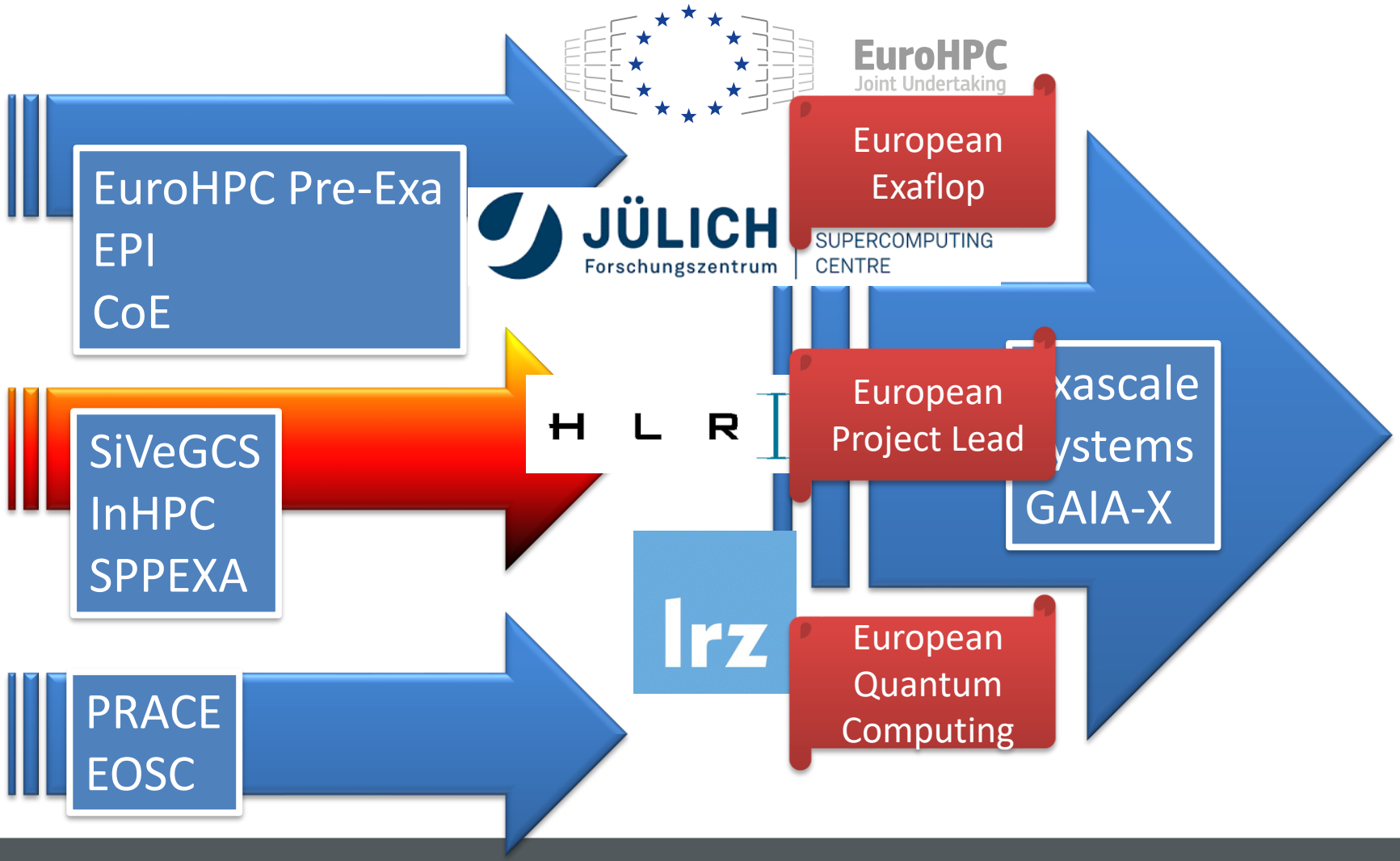
JU EuroHPC Qauntum Computing (>100 M€)

EuroHPC
Joint Undertaking

The EuroHPC JU has selected six sites across the European Union to host and operate the first EuroHPC quantum computers in:

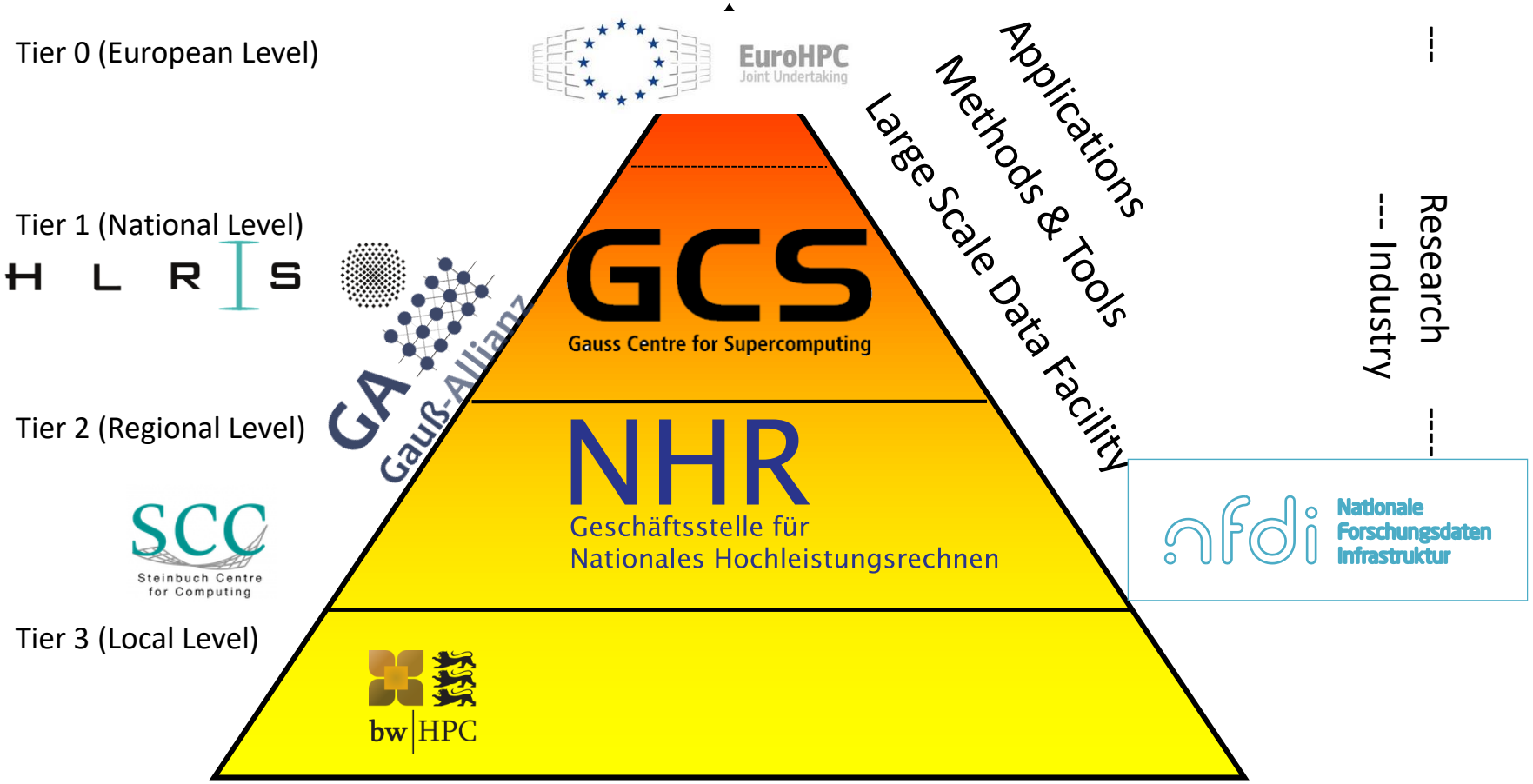
- Czechia
- France
- Germany
- Italy
- Poland
- Spain

Germany and Europe



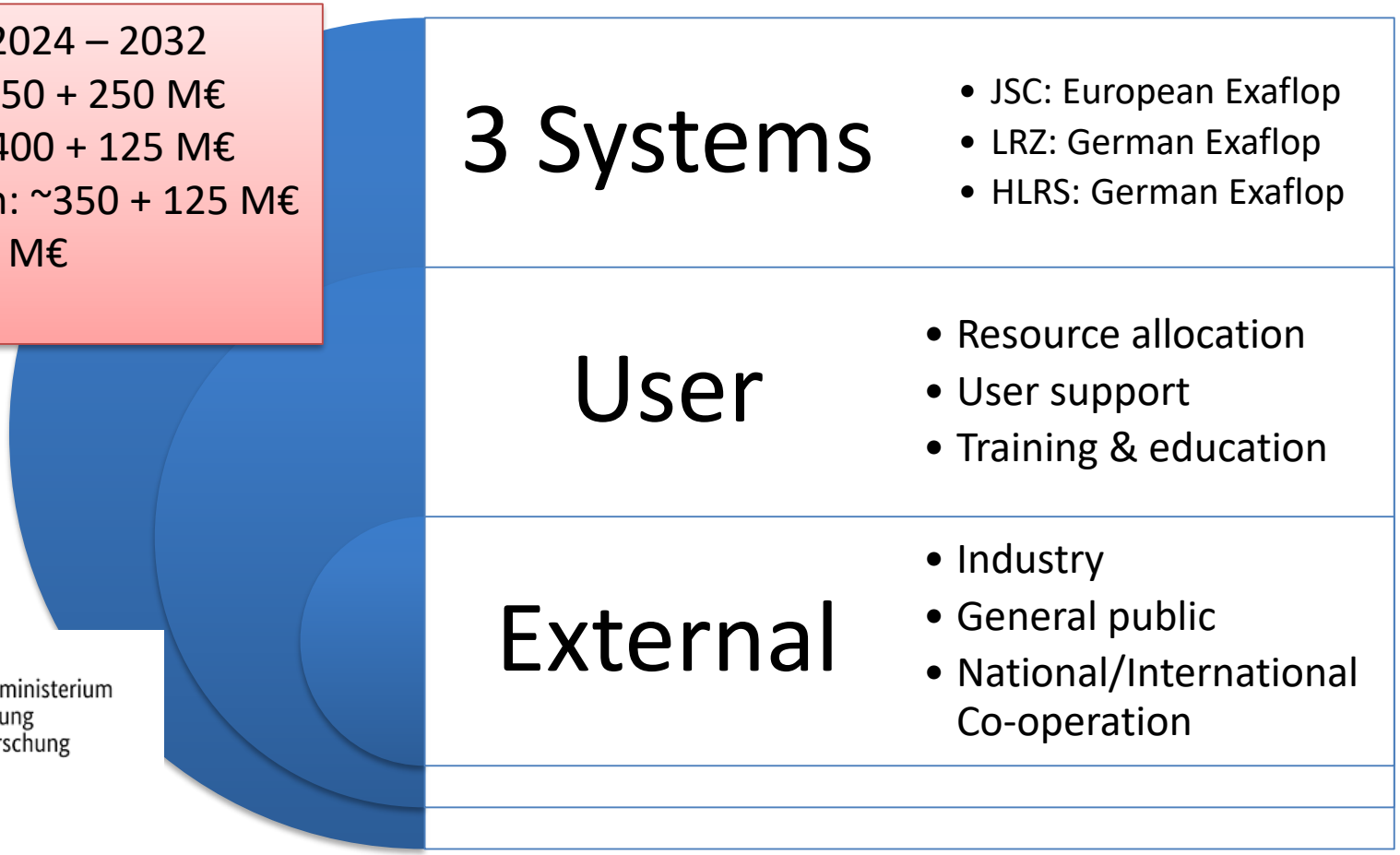

GCS
Gauss Centre for Supercomputing

Pyramid of Performance



German Project SiVeGCS+ (Smart Scaling Strategy)

Duration: 2024 – 2032
Budget: ~750 + 250 M€
Invest: ~ 400 + 125 M€
Operation: ~350 + 125 M€
Staff: ~36 M€



Bundesministerium für Bildung und Forschung

H L R S

HLRS Roadmap

The road towards Exascale

Systems & Research

Preparing for new Systems and for German Research Initiatives

HLRS "Hunter" System

Stepping Stone towards Exascale

New Data Center

Infrastructure for Exascale

HLRS "Herder" System

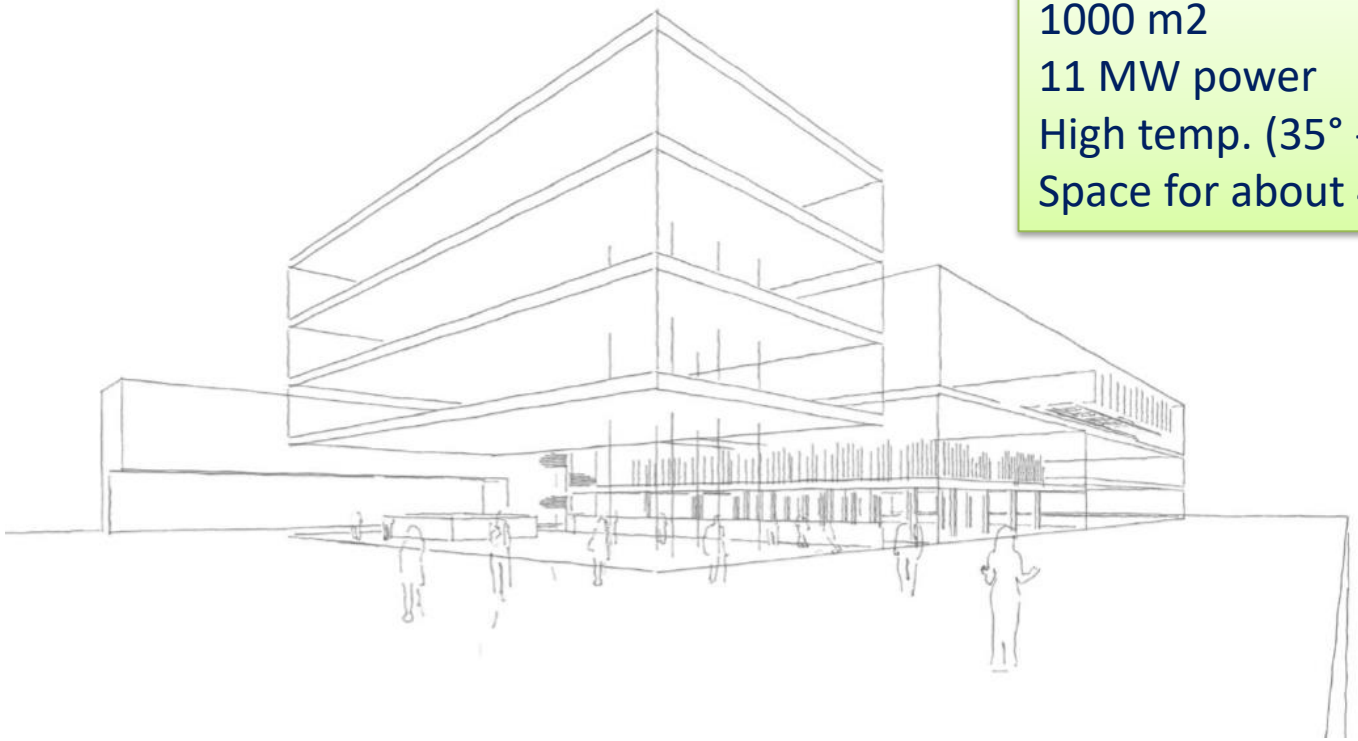
Aiming at Exascale

Focusing on sustained performance

System Upgrade

Upgrading system with most recent technology

New Data Centre 2026/2027



1000 m2
11 MW power
High temp. (35° - 45°)
Space for about 40 staff


Zukunft