EuroHPC Workshop
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EuroHPC strategic initiative – state of play

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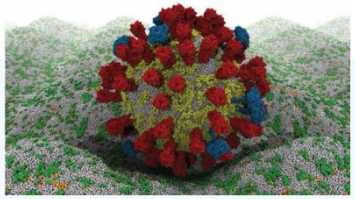
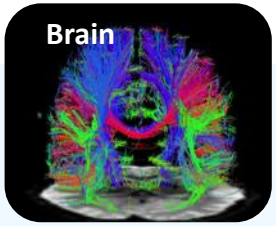
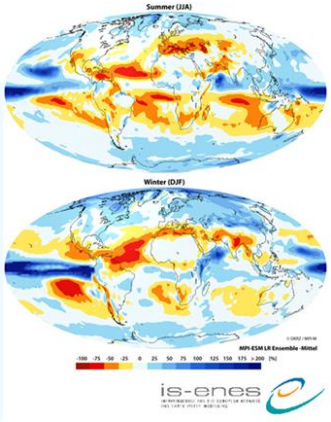
Why invest in HPC?

HPC is at the core of major advances and innovations in the digital age

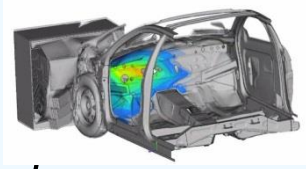


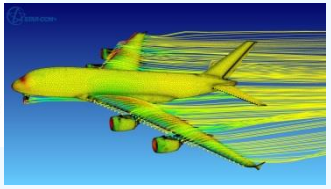




Strategic value for science

HPC enables breakthrough science
disease treatment; new therapies; brain; climate; chemistry; new materials; cosmology, astrophysics; high-energy physics; environment; transportation, earthquakes, etc.,





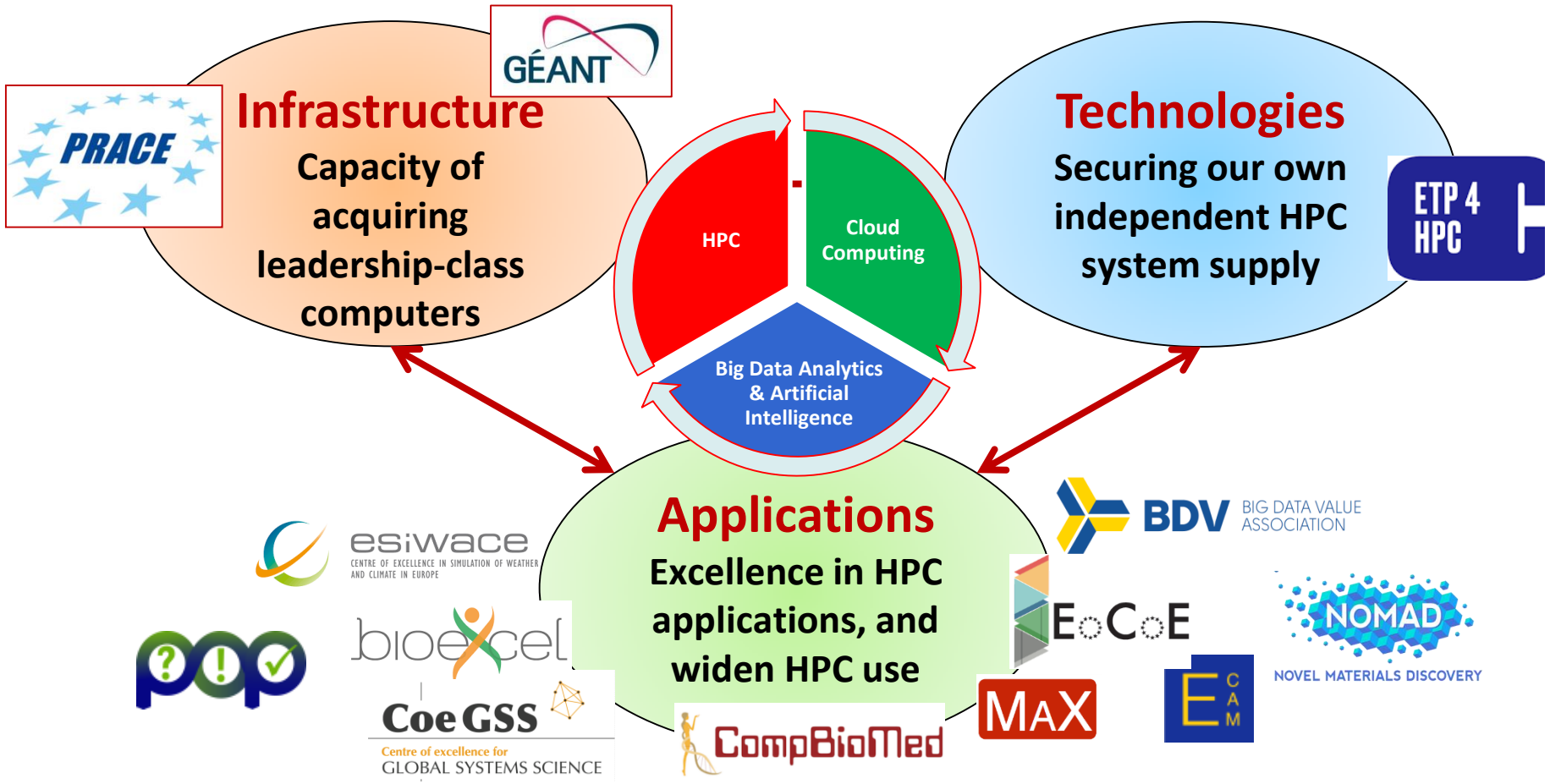
Strategic value for Industry

Market potential: new products, design and production cycles, decision processes, costs, resource efficiency, etc.

National security and defence

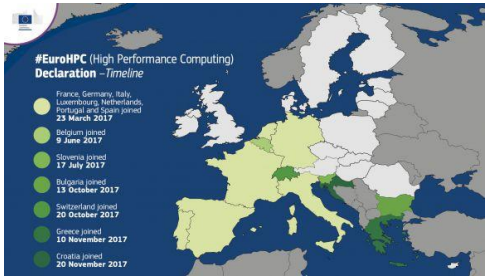
Complex encryption technologies, terrorism, forensics cyberattacks, nuclear simulations

The European HPC strategy in Horizon 2020



Build a thriving European HPC, Big Data and Cloud Ecosystem

Towards an HPC strategic initiative in Europe



- **02/2012 "High performance computing: Europe's place in a global race"** COM(2012) 45 final

  EC, Member States, industry and scientific communities to step up joint efforts to ensure European leadership in the supply and use of HPC systems & services

- **04/2016: European Cloud Initiative** COM(2016) 178

  A world-class HPC, data & network infrastructure and a leading HPC and Big Data ecosystem

- **Since 03/2017 (Rome): EuroHPC Declaration**

  Work towards the establishment of a cooperation framework for acquiring and deploying an integrated exascale supercomputing infrastructure that will be available across the EU for scientific communities as well as public and private partners

- **05/2017: Mid-Term Review of the Digital Single Market Strategy** COM(2017) 228

  by end-2017, propose a legal instrument providing a procurement framework for an exascale supercomputing & data infrastructure

The EuroHPC Declaration

Declaration signed in Rome, March 23rd, 2017 by:

France | Germany | Italy | Luxembourg | Netherlands | Portugal | Spain

8 more countries signed the Declaration:

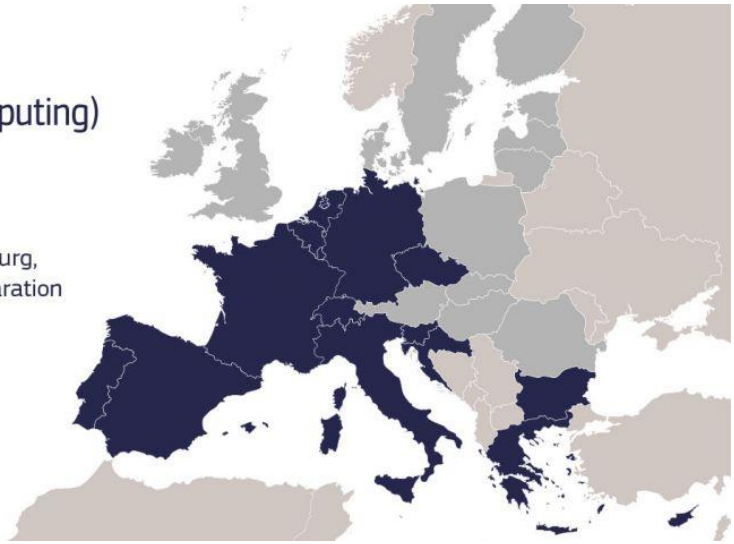
Belgium | Slovenia | Bulgaria | Switzerland | Greece | Croatia | Czech Rep. | Cyprus

#EuroHPC (High Performance Computing) **Declaration**

Signatory European countries

Seven countries – France, Germany, Italy, Luxembourg, Netherlands, Portugal and Spain – signed the declaration in March 2017.

Since then, another eight countries – Belgium, Slovenia, Bulgaria, Switzerland, Greece, Croatia, Czech Republic and Cyprus – have also signed.



Agree to work towards the establishment of a **cooperation framework** - EuroHPC - for **acquiring and deploying an integrated exascale supercomputing infrastructure** that will be **available across the EU** for scientific communities as well as public and private partners

HPC status in Europe today

EU has no top ranked supercomputers and depends on non-EU technology

Funding Gap wrt USA, JP, CN

Weak EU supply chain

Weak integration of EU technology in HPC machines

HPC strategy implementation by EC is inefficient

Insufficient coordination of national investments

Demand is not met

Overall objectives
EuroHPC Joint Undertaking (JU)

Community Body

integrated HPC&BD ecosystem

Procurement framework

HPC+data infrastructure

Coordination pooling resources

Towards the world top HPC powers: EuroHPC Joint Undertaking

Co-invest on a leading HPC and data infrastructure
for our scientists, industry and the public sector and support the development of technologies and applications across a wide range of fields

- **Coordinate EC/MS activities**
- **Pool public and private resources at EU level**
- **Procure world-class infrastructure**
- **Close the chain from R&D to procurement**
- **Become lead Users**
- **Create a competitive supply industry**
- **Lead in Applications**
- **Safeguard EU Interests**
- **Open to private partners**

A world-class European HPC, Big Data and Cloud Ecosystem

EuroHPC JU in a nutshell

High Performance Computing (HPC)

- Follows underlying model of JUs (legal base, reporting, establishment, staff issues, auditing, …)
- Tripartite partnership: EC + Participating States + Private Members
- Implements H2020 + Connecting Europe Facility
- Infrastructure Acquisition AND R&I activities
- Open to in-kind contributions by MS
- Governance adapted to the EuroHPC objectives
- Participating countries entrust JU with their financial contributions
- JU running costs shared → EC, Participating States, Private Members
- Seat = Luxembourg

EuroHPC JU
Membership and Roles

The JU Members

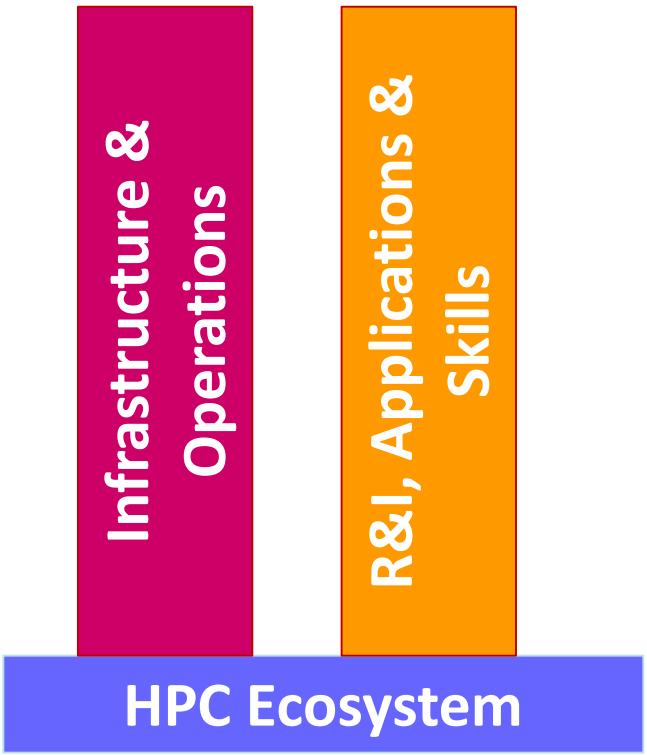
- ***Public Members***: The Union, Member States and Associated Countries that signed the EuroHPC Declaration
- ***Private Members:*** representatives from academia and Industry [representatives from the HPC and the Big Data Value Association PPPs]

➔ JU open to new members

- ***Public Members:*** the decision makers - responsible for funding decisions related to all the pillars of the JU

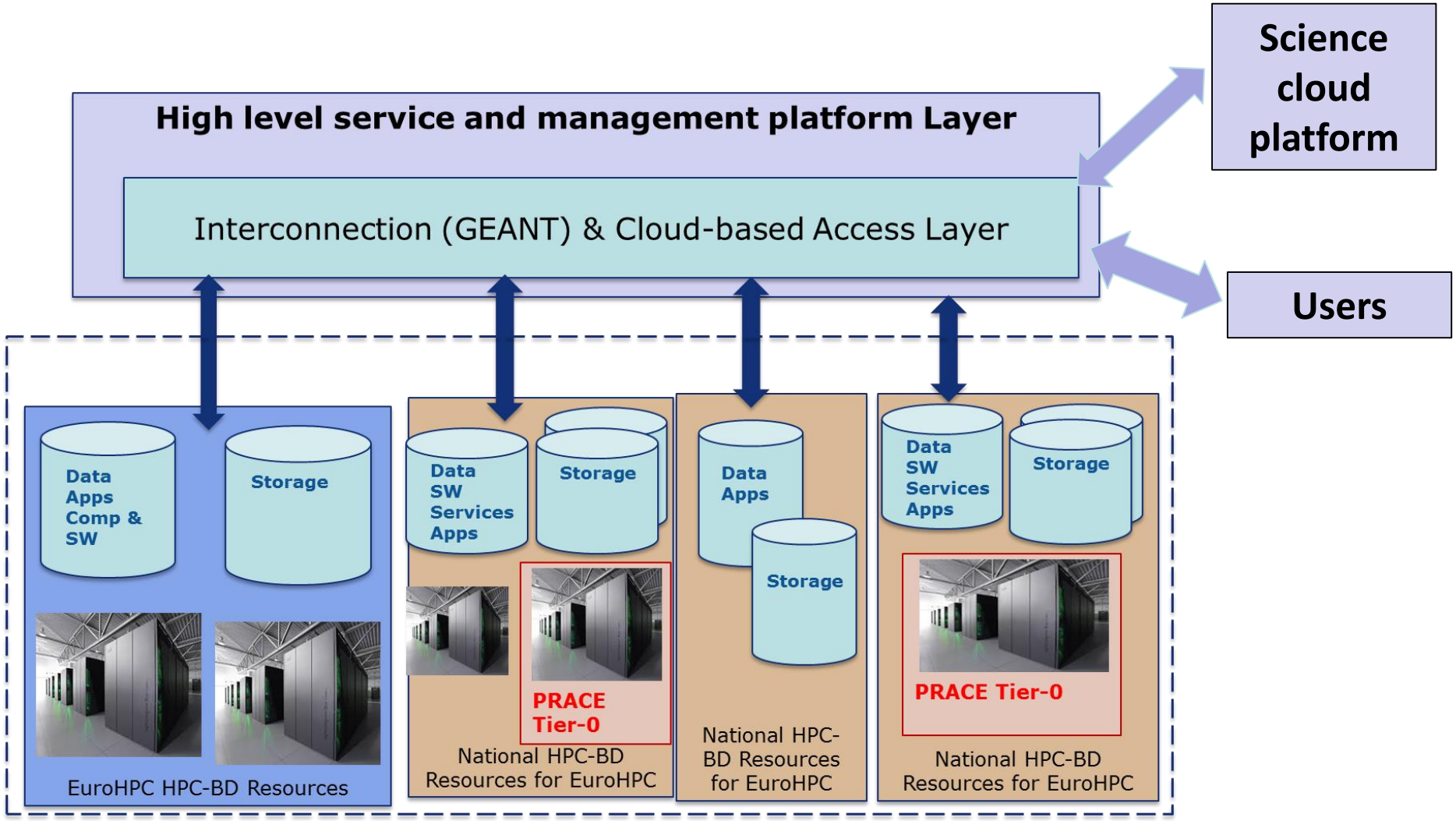
  ➔ ***Voting rights*** based on financial contribution
- ***Private Members***: Advisory role only both for R&I and for procurement

EuroHPC JU: Overall activities



- **Infrastructure & Operations**
  - Acquisition of infrastructure (linked to Research and Innovation)
  - Installation, deployment and operation via hosting entities
  - providing and managing access to users
- **R&I, Applications & Skills**
  - Supporting technologies and systems developed in Europe
  - Excellence in HPC applications; HPC, Centres of Excellence, Supporting HPC competence development in Industry (incl. SMEs); Training and Outreach

The European Data Infrastructure Implementation (long term vision)



The EuroHPC JU
A two-phase Approach

Phase 1: 2019-2020 (Present EU Financial Framework)

[Pillar 1] Pre-exascale machines and petascale machines

[Pillar 2] Applications; technologies for exascale

➔ The JU operates until 2026 with ~1 B€ budget (50% Union; 50% participating countries)

High Performance Computing (HPC)

Phase 2: 2021-2028 (Next EU Financial Framework)?

[Pillar 1] Exascale and post-exascale machines + first hybrid HPC / Quantum Computing infrastructures

[Pillar 2] Applications; technologies for post-exascale

➔ JU operates until 2030+

REMINDER

EuroHPC Activities 2019-2020

Infrastructure & Operations

R&I, Applications & Skills

JU Admin/Running costs

HPC Ecosystem

- **Infrastructure + Operations**

  Procurement of 2 pre-exascale machines and several (tbd) mid-range machines

- **Applications & Skills + R&I**

  R&I, exascale technologies and systems (incl. low-power processor); applications

- **JU Admin/running costs**

Indicative only!

~270	min 180	10
~290	~186	10
560	392	20
0	~420 (in kind)	2

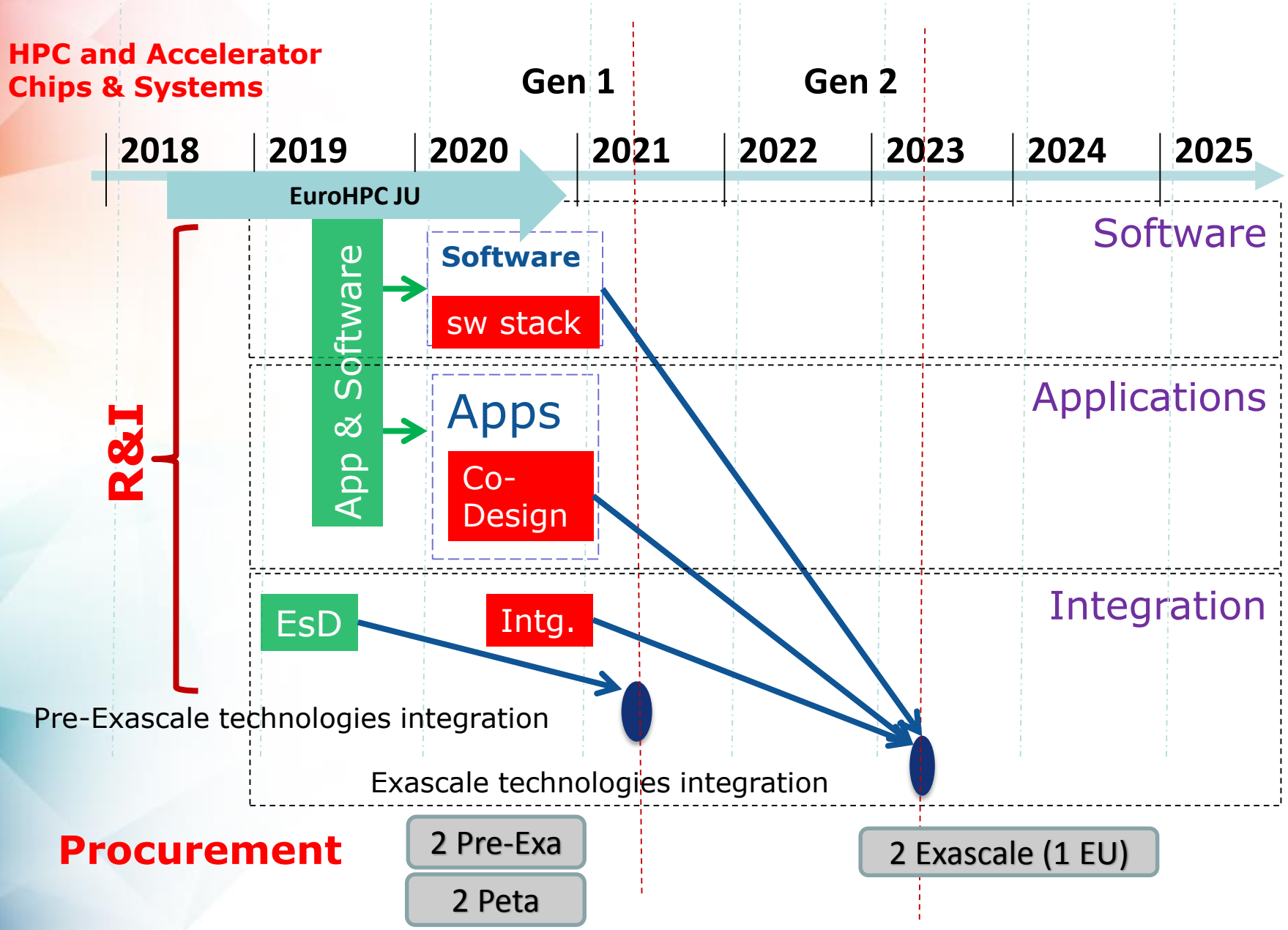
JU Operation: 2019 to 2026

In M€

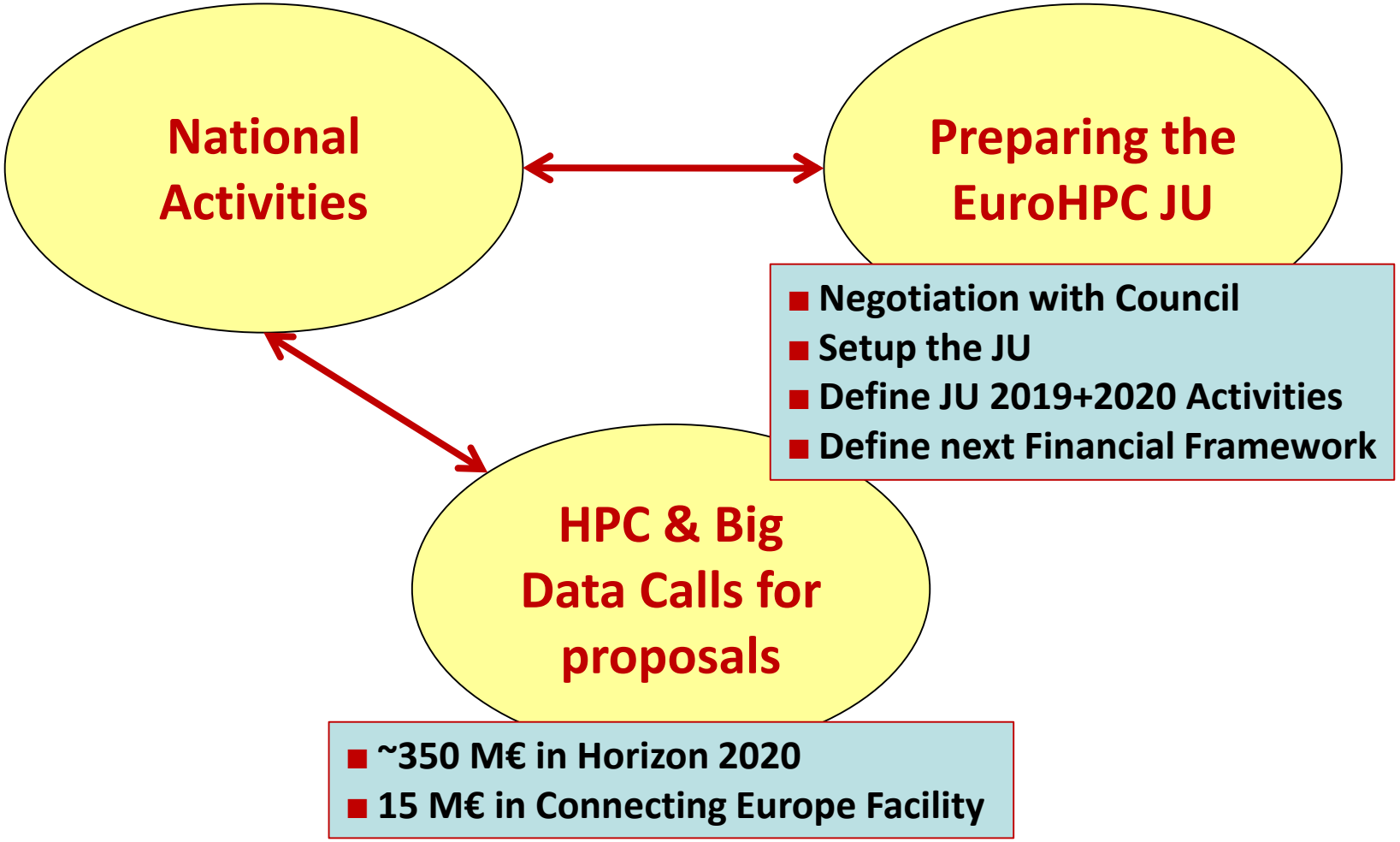
486
486
972
422

EC
Participating States
Total
Private Members

EuroHPC Roadmap



EuroHPC Agenda for 2018



Next Steps

Plans for the JU establishment

1. **JU Start Date: 1.1.2019**
2. **Council negotiations**
   - Agreement by end May'18
   - Adoption: Austrian Presidency (September?)
3. **Sherpa meetings**
   - 20 March, 20 April, 15 May, 19 June
4. **Working Groups**
   - "In-kind contributions"
   - "User requirements" & "procurement process"
5. **Transitional phase**: Q3 2018 – Q4 2019 (?)

EuroHPC Sherpa group

Work with Sherpas for defining the EuroHPC JU 2019-2020 activities, the calls for proposals and the MS budget contributions

THANK YOU!

https://ec.europa.eu/digital-single-market/en/policies/high-performance-computing