



**EuroHPC**  
Joint Undertaking

# The EuroHPC Infrastructure Pillar

*EuroHPC BoF, EuroHPC Summit Week*

*Poznan, 14 May 2019*

*Evangelos FLOROS*

*Policy Officer*

*European Commission*

# Issues at stake

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



Weak integration of EU technology in HPC machines

Increasing funding Gap vis-a-vis USA, JP, CN



Insufficient coordination of national investments

Advanced Skills/ Expertise required

Weak EU supply chain

HPC strategy implementation by MS is inefficient

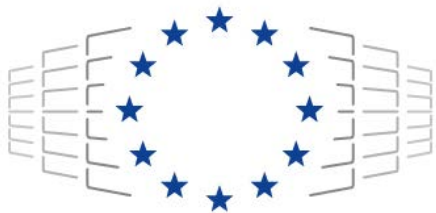
## A world-class European HPC, Big Data and Cloud Ecosystem

### **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**





**EuroHPC**  
Joint Undertaking

<https://eurohpc-ju.europa.eu/>

### A legal funding entity

- 28 Participating States + EC
- Site: Luxembourg
- Budget (2019-2020): ~1 B€ (half from EU)
- Operational: 11/2018 to 2026

### 28 Participating States

Austria, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and Turkey.



# The EuroHPC JU Governance



**Governing Board**  
Public Members (Participating States + European Commission)

The decision making Board

28 MS + EC

**Executive Director**

**Industrial and Scientific Advisory Board**  
(Advisory role)

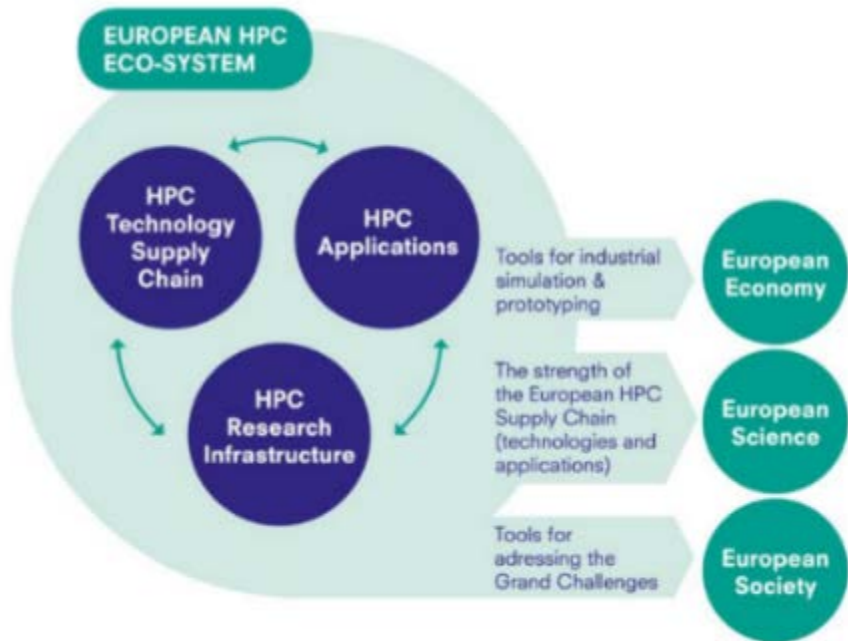
**Infrastructure Advisory Group**

**Research & Innovation Advisory Group**



# The European HPC strategy

*The overall strategic goal is to develop a thriving European HPC ecosystem :*



**Infrastructure:** Capacity of acquiring leadership-class computers

**Technology:** Securing our own independent HPC system supply

**Applications:** Excellence in HPC applications, and widen HPC use

# EuroHPC Activities 2019-2020

Infrastructure &  
Operations

R&I: Tech, Apps  
& Skills

HPC  
Ecosystem

## ■ Infrastructure + Operations

- *Acquisition & operations of at least 2 precursor-to-exascale systems*
- *Acquisition of at least 2 petascale systems*

## ■ Applications & Skills + R&I

Technology and applications for exascale (incl. low-power processor);  
HPC Competence Centres

EC	486 M€
Participating States	486 M€
Total	~1 B€
<i>Private Members (in kind)</i>	422 M€

# The Infrastructure Pillar: Supercomputers

## *Precursors to exascale*



*At least 2 Pre-exascale*



*Per machine (approx.):  
125M€ CAPEX +  
125 M€ OPEX*

*EU contribution:*

*≤50% of CAPEX and ≤50% of OPEX*

*MAX EU budget: 250 M€*

## *Petascale*



*At least 2 Petascale*



*Range of cost: to be agreed  
with the Governing Board*

*EU contribution:*

*≤35% of CAPEX*

*MAX EU budget: 30 M€*





# Ongoing Call for Expression of Interest for the Selection of Hosting Entities

**Precursors to Exascale  
Supercomputers**

**Published 21/1/2019**

**Petascale  
Supercomputers**

**Published 15/2/2019**

Call texts available in <https://eurohpc-ju.europa.eu/participate.html>

# Calls: General Considerations

## ***Objective:***

- Select Hosting Entities for the JU pre-exascale and petascale supercomputers
- First step of the acquisition process

## ***Contractual Outcome:***

- Hosting Agreement
- Operating Grant

## ***Overall philosophy***

- Fair, non-discriminatory and transparent procedure

## ***Input***

- EuroHPC Preparatory WGs
- EuroHPC INFRAG Multiannual Strategic Agenda
- European Supercomputing Centres
- EC projects (PPI4HPC, PRACE)

**Drafted according to JU Regulation and EU Financial Regulation**

## Precursors to Exascale

- ✓ A capability computing system
- ✓ Aggregated performance at least 150 Petaflops (LINPACK Rmax)
- ✓ Wide range of applications
  - ✓ key/grand challenge applications that demonstrably require the capability usage of the supercomputer
- ✓ The hosting site:
  - ✓ 10 to 15 MW total consumption
  - ✓ At least 700 m<sup>2</sup> of contiguous floor
  - ✓ 100 Gbit/s connectivity GEANT Network

## PetaScale

- ✓ Performance level: 2 Petaflops - 100 Petaflops (LINPACK Rmax)
- ✓ Hosting site:
  - ✓ 50 Gbit/s connectivity GEANT (link capacity)
  - ✓ At least 150 m<sup>2</sup> of contiguous floor space

# Proposals' technical content

- *How specifications will be met, for both the EuroHPC supercomputer and the site.*
  - **Description of Supercomputer architecture and Site that will host it.**
  - **Expected performance.**
  - **Type of nodes and their configuration (e.g. accelerated, CPU, High memory, etc.)**
  - **Ratio of different node types within the system (accelerator/CPU, memory size, ...)**
  - **What type of applications will be optimised for? (e.g. computational, big data, AI, ...)**
  - **Other related software/services (containers, virtualisation, workflow management,...)**
  - **Acceptance tests and benchmarks to be used for the acceptance of supercomputer**
- *Description and evaluation of an optional proposal part targeting the development of an advanced experimental platform towards exascale systems*

# Proposals received

## *Pre-exascale: Call closed April 4*

- Proposals received: **3**, from Finland, Italy and Spain, with a total value of more than € 650 million
- Hosting entities that submitted a proposal: CSC, CINECA, BSC
- Number of participating countries involved in the proposals: 14 countries in three consortia.

## *Pre-exascale: Call closed April 15*

- Applications received: **5**
- Hosting entities that submitted a proposal: LuxConnect S.A.(**Luxembourg**); Institute of Information Science (**Slovenia**); Petascale Supercomputing Consortium Bulgaria (**Bulgaria**); IT4Innovations National Supercomputing Centre (**Czech Republic**); Fundação para a Ciência e a Tecnologia (**Portugal**)
- Number of participating countries involved in the proposals: 6

## ■ ***Step1: Individual evaluation***

- by Independent experts
- Preliminary Evaluation Summary Report
- Questions for hearings
- Following H2020 rules
- Observers during complete evaluation

## ■ ***Step2: Hearings***

- Clarify the questions of the evaluation panel
- Oral presentation + Responses to the questions

## ■ ***Selection procedure***

- Executive Director EuroHPC JU presents final ranked list
- Executive Director may suggest to the GB to deviate from the ranked list proposed by the experts with a justification, for consideration of GB

# Timelines of the Calls

## Precursors to exascale

Selection of HE milestones	Date and time or indicative period
<b>Call for Expression of Interest Publication</b>	
Publication of Call for Expressions of Interest	21-01-2019
<b>Submission of applications</b>	
Deadline to submit questions about the Call	15-02-2019 - 11:00 AM
Publication of the last answers to questions	22-02-2019
Call Deadline	04-04-2019 - 12:00 AM
Application Opening day (open of envelopes with expressions of interest)	09-04-2019
<b>Evaluation</b>	
Sending questions for the hearings	06/05/19
Hearings	20-22/05/19
Notification of results to applicants	07/06/19
<b>Signature of the hosting agreement</b>	
Period for additional Participating States to join Consortium	07/06/2019-05/07/2019
Signature of hosting agreement	July 2019

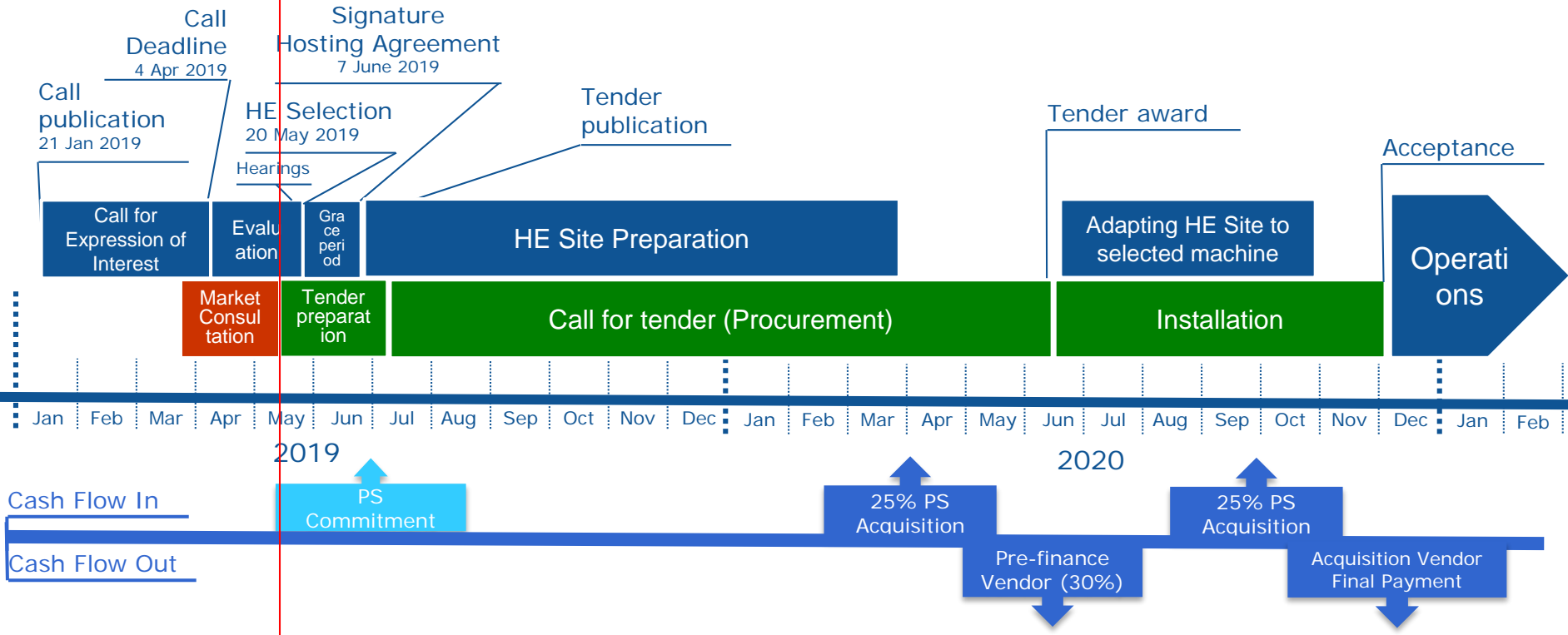
## PetaScale

Selection of HE milestones	Date and time or indicative period
<b>Call for Expression of Interest Publication</b>	
Publication of Call for Expressions of Interest	15-02-2019
<b>Submission of applications</b>	
Deadline to submit questions about the Call	07-03-2019 - 11:00 AM
Publication of the last answers to questions	14-03-2019
Call Deadline	15-04-2019 - 12:00 AM
Application Opening day (open of envelopes with applications)	23-04-2019
<b>Evaluation</b>	
Sending questions for the hearings	06/05/19
Hearings	20-24/05/19
Notification of results to applicants	07/06/19
<b>Signature of the Hosting Agreement</b>	
Period for additional Participating States to join Consortium	07/06/2019-05/07/2019
Signature of Hosting Agreement	July 2019

More info: <https://eurohpc-ju.europa.eu/participate.html>

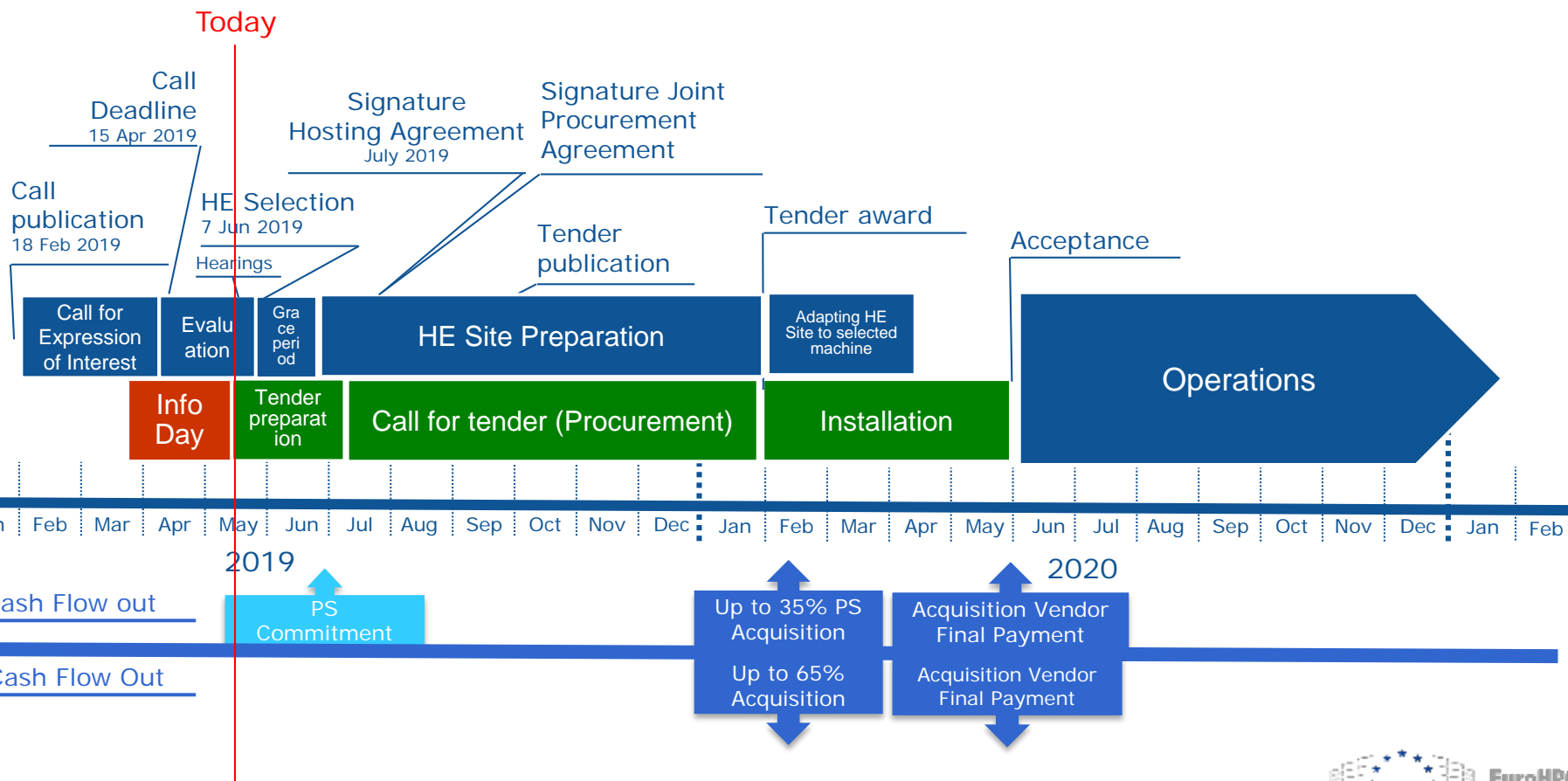
# Acquisition Pre-exaScale – Indicative timeline

Today





# Acquisition Petascale – Indicative timeline





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# Thank you!

Visit the EuroHPC JU website at: <https://eurohpc-ju.europa.eu/>

