



EuroHPC
Joint Undertaking

EuroHPC Joint Undertaking - Calls 2019

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2019 Calls for Research & Innovation



EuroHPC
Joint Undertaking

Call 1: Extreme Scale Technologies and Applications

- Extreme scale computing technologies (hardware, software, methods and algorithms for key applications)
- HPC applications to ensure European leadership

Call 2: Innovating and Widening the HPC use and skills base

- Increase the knowledge and human capital and upgrade HPC capabilities through the creation of national HPC Competence Centres and their networking and coordination across the Union
- Support to SMEs



Call 1: Towards Extreme Scale Technologies and Applications

H2020-JTI-EuroHPC-2019-1

Budget: 55 EUR million

Opening: 25 July 2019 - Deadline: 14 Jan 2020

Extreme scale computing and data driven technologies

EuroHPC-01-2019 (RIA)

HPC and data centric environments and application platforms

EuroHPC-02-2019 (IA)

Industrial software codes for extreme scale computing environments and applications

EuroHPC-03-2019 (IA)

Extreme scale computing and data driven technologies

- Develop world-class extreme scale, and **energy-efficient HPC and data driven technologies**, that use software engineering techniques, programming tools and libraries that can be adapted and retargeted to rapidly evolving HPC architectures, in view of **maximising application performance and efficiency** in next generation supercomputers.
- Actions should allow leveraging the efforts on the **European low power processing technologies** as well as the **Centres of Excellence** and **build a sustainable exascale HPC ecosystem in Europe**

Extreme scale computing and data driven technologies

What are we looking for?

- Development of **extreme scale computing technologies and system architectures**, programming models and tools, resource management, fault tolerance, and mathematical methods and algorithms
- The approaches should respond to critical demands of **application performance, energy efficiency**, scale, resilience, scheduling, programmability, etc., **across the levels of the compute stack**, including compute elements, networking, data storage and data handling.
- A **co-design approach should be followed**, covering from the application to the hardware, answering user challenges of industry and research centres/academia and involving the work on **the European low power processing technologies and results of Centres of Excellence**
- Contribute to the **realisation of future exascale system architectures based on European technologies**. Align with the efforts of European low power processing technologies.
- Proposals should address **one or more of the 5 sub-topics** proposals should clearly indicate the sub-topic which is their main focus



Extreme scale computing and data driven technologies

Sub-Topic	Description	Max JU Contribution
a	Technologies to increase sustained application performance at node and system level, improve energy efficiency and open new usage domains	EUR 4 million
b	Technologies to manage data volumes generated and consumed, to minimize data movement and to increase flexibility to store, manipulate and access extremely large data sets	EUR 4 million
c	Networking capabilities allowing low latency and high bandwidth communication between large numbers of extreme computing and data components	EUR 4 million
d	Programming models, associated run-time systems, system software and compilers	EUR 7.5 million
e	New mathematical methods and algorithms to ensure efficient usability and improve energy efficiency, featuring high robustness and enhanced scalability.	EUR 1.5 million

EuroHPC-01-2019



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Extreme scale computing and data driven technologies

Impact – RIA



- Contribution to the realisation of the **EuroHPC overall and specific objectives**
- Strengthening scientific leadership, competitiveness and innovation potential of European industry, contributing to a **sustainable exascale HPC supply ecosystem in Europe and ensuring European technological autonomy** in this field
- Leveraging the efforts on the European low power processing technologies (in particular the **European Processor Initiative**) and contributing to the realisation of future **exascale system architectures** based on such technologies
- Creation and promotion of **European IP**
- Maturity of solutions and potential for **commercial exploitation in future European exascale HPC systems**



HPC and data centric environments and application platforms

- Support the **development of HPC and data driven HPC** software environments and application oriented platforms to...
...generate innovation and value creation in sectors of societal and industrial **relevance for Europe.**

HPC and data centric environments and application platforms

What are we looking for?

- Development of energy-efficient HPC solutions supporting the adoption of applications with **industrial and societal relevance for Europe** on evolving HPC hardware and system software/programming environments.
- **Use of HPC solutions** to generate innovation and value creation should be clearly demonstrated and aimed at providing secure and simple access and service provisioning to relevant stakeholders based on such HPC solutions.
- Developments driven by **complex application workflows** (HPDA, AI & Simulation, Cloud integration) and offer solutions to key application areas including industrial use cases.
- Developments may promote **efficient use of platforms and architectures** best suited for the targeted use cases and applications (e.g. accelerated platforms).
- The required and available **data assets should be clearly described**

HPC and data centric environments and application platforms

Impact – Innovation Action



- Contribution to the realisation of the **EuroHPC overall and specific objectives**
- Demonstrated relevance of the main target sector for European industry or society and in ensuring **European technological autonomy** in this field and in the Digital Single Market
- **Demonstrated innovation and productivity** enhancement in the main target sector
- **Effective integration of HPC technologies** in the main target sector with measurable end-user metrics such as accessibility, scalability, performance, energy efficiency, reliability, and cost
- Widening the use of and facilitating the **access to advanced HPC, big data and cloud infrastructures** stimulating the emergence of the data economy in Europe

Industrial software codes for extreme scale computing environments and applications

- To efficiently **enable the industrial applications fully exploit the evolving HPC** hardware and software landscape
- Seek **synergies with open-source components**, including the use of novel mathematical methods and algorithms.

Industrial software codes for extreme scale computing environments and applications

What are we looking for?

- To improve **industrial software and codes for industrial users** to fully exploit the **new capabilities of extreme performance HPC** environments
- Novel algorithms, efficiency, scalability, refactoring, porting and optimisation to novel HPC hardware and software architectures of increased performance
- Proposals should clearly **identify the target software and codes to be improved**. These software and codes should be used in areas of significant demonstrable market impact, where Europe is leader or should achieve leadership.
- Contribution from the **JU of up to EUR 2 million**, matched by the Participating States with a similar amount.

Industrial software codes for extreme scale computing environments and applications

Impact – Innovation Action



- Contribution to the **realisation of the EuroHPC overall and specific objectives**
- Achieving **European leadership in the areas of application** of the target software and codes and creating value in Europe
- Enabling a demonstrably more competitive and innovative **European industry, including SMEs**, and maximising market impact of the project's results
- **Significant improvements in the target software and codes**, e.g. efficiency, scalability, refactoring, adaptation to new software engineering and programming environments and tools, and optimisation for novel HPC hardware and system software
- Accelerate the **time to market** products & services based on HPC codes & software
- Support a **sustainable industrial HPC software capability in Europe**

Conditions of the Call



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Call	Budgets (EUR million)	Duration Projects	Opening	Deadline	Min JU contribution (EUR million)
EuroHPC-01-2019 (RIA)	55	3 years	25 July 2019	12 January 2020	20
EuroHPC-02-2019 (IA)					16
EuroHPC-03-2019 (IA)					8

- **Information on the outcome of the evaluation:** Maximum 5 months from the final date for submission
- **Indicative date for the signing of grant agreements:** Maximum 8 months from the final date for submission.
- **Eligibility and admissibility conditions as well as the evaluation criteria (incl. scoring and threshold)** are described in the General Annexes of the Horizon 2020 Work Programme 2018-2020 (Annex B,C,H).
- **Evaluation Procedure:** The procedure for setting a priority order for proposals with the same score is given in General Annex H of the Horizon 2020 Work Programme 2018-2020.



Innovating and Widening HPC use and skills base

H2020-JTI-EuroHPC-2019-2

Budget: 40 EUR million

Opening: 25 July 2019 - Deadline: 14 Nov 2019

HPC Competence Centres

RIA - EuroHPC-04-2019

**HPC Competence Centres
Coordination & Support
Action**

CSA - EuroHPC-04-2019

**Stimulating the innovation
potential of SMEs**

RIA - EuroHPC-05-2019



HPC Competence Centres (RIA) – National HPC Competence Centres

- Support **existing or the creation** in a maximum number of countries of up to **one national HPC Competence Centre** in each of the EU Member State and EuroHPC JU Participating State.
- HPC CC should **provide HPC services to industry** (including to SMEs), **academia and public administrations**, delivering tailored /modular solutions for a wide variety of users, wider uptake of HPC in Europe.
- Focal point **coordinating all national initiatives**, facilitating access of national stakeholders to European HPC competence and opportunities in different industrial sectors and domains.

HPC Competence Centres (RIA) - National HPC Competence Centres

What are we looking for?

- **Set-up and operate** one HPC CC associated to national supercomputing centres.
- Provide innovative solutions **taking into account national HPC needs and requirements from different users** (industry, academia, public administrations), and develop the necessary expertise and applications know-how close to the users.
- Implement a **flexible and modular approach in the services** to be provided, taking into account the degree of maturity of the national HPC infrastructure.
- Formally designated and mandated by the national authorities of the EU MS or PS
- EUR **1 million per national CC**, matched by the PS
- Duration of **2 years**

What are we **NOT** looking for?

- Proposals that propose **more than one HPC CC per country**
- Proposals that have not be designated by designated and mandated by the **national authorities of the EU MS or PS**
- Proposals not taking into account the **degree of maturity of the national HPC infrastructure**
- Proposals **not promoting the use of HPC solutions**

HPC Competence Centres (RIA) - National HPC Competence Centres

Impact



- Contribution to the realisation of the EuroHPC overall and specific objectives
- Promoting the **use of HPC at national** level by identifying relevant users and matching their needs with the available expertise in the HPC CC
- Effective establishment of a **wide range of HPC services**
- Provision of leading-edge, innovative solutions for **targeted regional/national industries/ applications**
- Provision of **support to interested end users that are/will use HPC and HPDA** in their daily business
- Contribute in ensuring **European technological autonomy** in this field



Networking and coordination of national HPC Competence Centres

- Maximize existing **European HPC knowledge and expertise across Europe.**
- Establish a single focal point at European level responsible for:
 - the **coordination** of the national Competence Centres,
 - the **exchange of best practices**, know-how and information,
 - networking and training
- Across national HPC Competence Centres.

Networking and coordination of national HPC Competence Centres

What are we looking for?

- **Coordinate and be a reference point** for national HPC initiatives
- Ensure specific “vertical” expertise & solutions of national CC provide coordinated support on a local level to other CC, facilitating **cross-domain expertise**
- Coordinate centrally programmes with the aim to accelerate the development of ‘new’ HPC CC and build strong collaborations across HPC CC with similar interests
- **Sharing existing HPC codes libraries** and facilitate access to upgraded HPC application codes to help close the experience gap between countries.
- EU Contribution up to **EUR 2 million** and a duration of **2 years**

EuroHPC-04-2019 CSA



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Networking and coordination of national HPC Competence Centres

Impact



- Contribution to the realisation of the EuroHPC overall and specific objectives
- Effective **coordination and exchange of best practices** and information among the networked HPC Competence Centres
- Facilitate **access to services and training** offered at national level to interested HPC Competence Centres and other potential users (from industry, academia or public sector)
- Maximise **visibility and outreach of national HPC CC**, in particular to industry
- Improved **coordination and increased availability of training** activities on HPC across HPC Competence Centres



Stimulating the innovation potential of SMEs

- Providing an **effective mechanism for inclusion of innovative, agile SMEs**
- **Lowering the barriers for small actors to enter the HPC market**
- **Exploit new business opportunities.**

Stimulating the innovation potential of SMEs

What are we looking for?

- Approach for **Identifying and attracting SMEs** as users of advanced HPC services, and a mechanism involving financial support to third parties
- Aim at **European engineering and manufacturing SMEs**.
- **Define the process of selecting SMEs for which financial support** will be granted. (EUR 50 000 – 150 000 per party). At least 80% of the JU funding should be allocated to financial support for these third parties.
- **Collaborate with the future national HPC Competence Centres** and the related coordination action (EuroHPC-04-2019), DIH.
- JU contribution between **EUR 8 and 10 million** and a duration of 3 years

EuroHPC-05-2019



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Stimulating the innovation potential of SMEs

Impact – Innovation Action



- Contribution to **realisation of the EuroHPC overall and specific objectives**
- Improving European competitiveness and productivity, by supporting the **innovation in SMEs through the use of HPC** and ensuring European technological autonomy in this field
- **Widening the HPC user base by attracting new users of HPC in different application domains** (with a preference focus on engineering and manufacturing, or any other fast growing sector of the economy)
- More competitive European service providers through **provisioning of new types of HPC services**

Conditions of the Call



Call	Budgets (EUR million)	Duration Projects	Opening	Deadline	Min JU contribution (EUR million)
EuroHPC-04-2019 (RIA)	28	2 years	25 July 2019	14 November 2019	
EuroHPC-04-2019 (CSA)	2	2 years			
EuroHPC-05-2019 (RIA)	10	3 years			

- **Information on the outcome of the evaluation:** Maximum 5 months from the final date for submission
- **Indicative date for the signing of grant agreements:** Maximum 8 months from the final date for submission.
- **Eligibility and admissibility conditions as well as the evaluation criteria (incl. scoring and threshold)** are described in the General Annexes of the Horizon 2020 Work Programme 2018-2020 (Annex B,C,H).
- **Evaluation Procedure:** The procedure for setting a priority order for proposals with the same score is given in General Annex H of the Horizon 2020 Work Programme 2018-2020.



Weitere Informationen zu den Calls:

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