



European High Performance Computing Joint Undertaking

REF: EUROHPC-2019-CEI-PE-01

CALL FOR EXPRESSION OF INTEREST

for the selection of

**Hosting Entities for Precursors to Exascale
Supercomputers**

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1. INTRODUCTION – CONTEXT AND BACKGROUND

The European High Performance Computing Joint Undertaking (hereinafter "EuroHPC JU") was established by Council Regulation (EU) 2018/1488 of 28 September 2018 (hereinafter "Regulation") and entered into force on 28 October 2018¹.

According to Article 3 of the Regulation, the mission of the EuroHPC JU is to develop, deploy, extend and maintain in the Union an integrated world-class supercomputing and data infrastructure and to develop and support a highly competitive and innovative HPC ecosystem.

The EuroHPC JU has the target of equipping the Union by 2020 with an infrastructure of petascale² and precursors to exascale supercomputers³, and developing the necessary technologies and applications for reaching full exascale capabilities around 2022 / 2023. To this purpose, the EuroHPC JU shall proceed to the acquisition of at least two world-class precursors to exascale supercomputers, funded by the Union's budget stemming from Horizon 2020, the Connecting Europe Facility (CEF) and by contributions from the relevant Participating States to the EuroHPC JU. In accordance with Article 10 of the Regulation, the Union's contribution from Horizon 2020 and CEF funds should cover up to 50 % of the acquisition costs plus up to 50 % of the operating costs of these supercomputers. The EuroHPC JU will be the owner of the supercomputers it has acquired.

The EuroHPC JU has also as target to support a research and innovation programme for developing European technologies and their subsequent integration in exascale supercomputing systems and contribute to developing a competitive European technology supply industry. The EuroHPC JU will implement a procurement framework and operate world-class HPC systems via promotion of technology not existing yet in the market, particularly if it is a competitive European one and thus help research teams and European industries remain at the leading edge in a highly competitive international context.

Pursuant to Article 8 of the Regulation, the EuroHPC JU shall entrust to a hosting entity the operation of each individual precursor to exascale supercomputer it owns in accordance with Article 10 of the Regulation.

The hosting entity shall be selected by the Governing Board of the EuroHPC JU ('Governing Board') following a Call for Expression of Interest evaluated by independent experts.

The present Call for Expressions of Interest is launched for the selection of the hosting entities of precursor to exascale supercomputers the EuroHPC JU will acquire as mandated, on the basis and in accordance with by the Council Regulation (EU) 2018/1488, taking into account the EU Financial Regulation⁴ where relevant.

¹ OJ L 252, 08.10.2018, p. 1-34

² "petascale supercomputer" means a computing system with a performance level capable of executing at least ten to the power of fifteen operations per second (or 1 Petaflop);

³ "precursor to exascale supercomputer" means a computing system with a performance level capable of executing more than 150 Petaflops and less than 1 Exaflop;

⁴ Regulation (EU, Euratom) 2018/1046 of the European Parliament and of the Council of 18 July 2018 on the financial rules applicable to the general budget of the Union, amending Regulations (EU) No 1296/2013, (EU) No 1301/2013, (EU) No 1303/2013, (EU) No 1304/2013, (EU) No 1309/2013, (EU) No 1316/2013, (EU) No 223/2014, (EU) No 283/2014, and Decision No 541/2014/EU and repealing Regulation (EU, Euratom) No 966/2012, *OJ L 193*, 30.7.2018, p. 1–222; ("FR")

2. OBJECTIVES

The overall objective of this call is to select hosting entities for the precursors to exascale supercomputers (or simply for the *EuroHPC supercomputers*), which will be acquired by the EuroHPC JU.

The specific objective of this call is the following:

Selection of hosting entities and conclusion of hosting agreements: The EuroHPC JU will select the hosting entities for the EuroHPC supercomputers and will conclude with each of them a hosting agreement, which will permit to establish a stable and structured partnership between the EuroHPC and the hosting entity for the acquisition and operation of the EuroHPC supercomputer.

By submitting the application, applicants hosting entities provide their prior acceptance with the terms and conditions set in the model hosting agreement. The model hosting agreement is found in Annex 2 of this call.

The hosting agreements will be approved by the Governing Board before signature.

The EuroHPC JU will evaluate, with the help of external experts, the received applications to the call for expressions of interest and will set up a ranking list of potential hosting entities (and their hosting consortia) for the EuroHPC supercomputers. From this ranking list, the EuroHPC JU, by decision of its Governing Board, will make a selection of hosting entities. Inclusion in the list entails no obligation on the part of the EuroHPC JU for the conclusion of any contract.

Following this selection:

- A hosting agreement between the EuroHPC JU and each of the hosting entities will be signed, laying down the terms and conditions for hosting and operating the supercomputer on behalf of the EuroHPC JU, including a service level agreement (Regulation Article 9).
The hosting agreement shall specify the timing of the transfer to the EuroHPC JU of the financial contribution of each selected hosting entity to the acquisition costs of the precursors to exascale supercomputer. The EuroHPC JU will be the sole responsible for implementing the acquisition process. However, the hosting entity will be associated to the process, e.g. for verification of the technical specifications to be met by the suppliers. The hosting agreement is part of the outcome of the Call for Expression of Interest. It is the first contractual arrangement to be signed.
- A second contractual arrangement between the EuroHPC JU and each of the Hosting Entities shall be signed to cover the funding of the supercomputer's operating costs (specifying among others and if applicable any pre-financing of the hosting entity by the EuroHPC JU), which will be covered up to 50 % by the Union contribution. The funding of operating costs must follow a well-defined, jointly agreed (with the hosting entity) and auditable model, which will be part of the contractual arrangement. There will be no transfer of funds from the hosting entity to the EuroHPC JU for the operating costs: the EuroHPC JU will cover its share of the eligible costs, while the hosting entity (or hosting consortium) will cover the remainder of the eligible costs.
- In close cooperation with and supported by the selected hosting entities, the EuroHPC JU shall launch the procedures for the acquisition of the supercomputers. These procedures will, amongst other, aim at ensuring a diversity in the technologies and architectures of the different EuroHPC supercomputers.

(<https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:32018R1046>)

3. BUDGET AVAILABLE

The EuroHPC JU shall acquire at least two EuroHPC supercomputers and shall own them. The Union financial contribution to the EuroHPC JU shall cover up to 50 % of the acquisition costs plus up to 50 % of the operating costs of the supercomputers. The remaining total cost of ownership of the supercomputers shall be covered by the Participating State where the hosting entity is established or by the Participating States in the hosting consortium⁵.

The Union's total financial contribution to the EuroHPC JU for the objective of this call is estimated at a maximum of EUR 250 million.

Grants will be established to cover the operating costs of each individual EuroHPC supercomputer⁶. For each EuroHPC supercomputer, the reimbursement from the EuroHPC JU will be calculated on the basis of the declared costs up to the maximum total contribution of the EuroHPC JU or up to a ceiling of 50 % of the declared eligible costs, whichever is lower.

The costs related to the construction of the hosting site per se (i.e., costs related to the building infrastructure that will host the EuroHPC supercomputer, etc.) shall not be covered by the EuroHPC JU. However, the costs of the preparation and adaptation of the hosting site incurred by the hosting entity that can be directly accounted to the installation of the EuroHPC supercomputer may be considered as part of the TCO and may thus be considered as eligible costs that can be covered by the EuroHPC JU.

4. CONTENT OF THE EXPRESSIONS OF INTEREST

The expressions of interests must be submitted using the application form included as a separate Annex 1 to this call (EuroHPC HE Application Form). Appendix 1 of this document provides information on how to fill the Application Form.

5. ADMISSIBILITY REQUIREMENTS

In order to be admissible:

- a) Applications must be sent no later than the 4th April 2019 at 12:00 AM Brussels time.
- b) Applications must be submitted in writing (see section 11 "Procedure for the submission"), using the application form in the Annex 1 (EuroHPC HE Application Form) and available at <https://eurohpc-ju.europa.eu/participate.html>.
- c) Applications must be submitted in the English language in five copies.

Failure to comply with those admissibility requirements will lead to the rejection of the application.

6. ELIGIBILITY CRITERIA

The call is open to entities or consortia of entities fulfilling cumulatively the following conditions as defined in Article 8 of the Regulation:

⁵ 'hosting consortium' means a group of Participating States that have agreed to contribute to the acquisition and operation of a EuroHPC supercomputer

⁶ The EuroHPC JU Model Grant Agreement can be found on the EuroHPC JU website: <https://eurohpc-ju.europa.eu/>

- a) The applicant hosting entities shall include the facilities to host and operate a supercomputer in a Participating State to the EuroHPC JU that is a Member State. The applicant hosting entity may represent one Participating State that is a Member State or a hosting consortium of Participating States that have agreed to contribute to the acquisition and operation of the EuroHPC supercomputer. The applicant hosting entity and the competent authorities of the Participating State or Participating States in a hosting consortium shall enter into an agreement to this effect.
- b) The coordinating applicant has to be registered as a legal entity in one of the Participating States that is a Member State.
- c) The applicant(s) must have a legal personality on the date of the deadline for submission of applications and must be able to demonstrate their existence as a legal person. In case the application is submitted by several Participant States working together (consortium), this criterion (c) applies to all entities.
- d) Applications should include the provision of appropriate supporting documentation proving the commitment of the Member State where the hosting entity is established and, in the case of a hosting Consortium, of the competent authorities of the Participating States of the hosting consortium to cover the share of the total cost of ownership of the supercomputer that is not covered by the Union contribution as set out in Article 4 of the Regulation or any other Union contribution as set out in Article 5 of the Regulation, either until its ownership is transferred by the EuroHPC JU to that hosting entity or until the supercomputer is sold or decommissioned in case there is no transfer of ownership;

In case of a hosting consortium, the hosting agreement shall take the form of a partnership in Participating States, of which the hosting entity will take the lead and act as coordinator of the hosting consortium. The co-ordinator will act as an intermediary for all communications between the EuroHPC JU and the partners. However, partners are jointly responsible for implementing the action resulting from the awarded hosting agreement. To implement the action properly, they must make appropriate internal arrangements.

The hosting entity shall assume full liability towards the EuroHPC JU for the performance of the agreement as a whole, including financial and operational liability

In accordance with Article 8 of the Regulation, after the selection of the hosting entity, the Participating State where the selected hosting entity is established (in the case of an application including only one Participating State) or the corresponding hosting consortium may decide to include additional Participating States to the EuroHPC JU to join it. The commitment of the joining Participating States shall represent a marginal fraction of the total cost of ownership of the EuroHPC supercomputer until its ownership is transferred by the EuroHPC JU to that hosting entity.

In the case of a joint application, the hosting entity must be given power of attorney to represent the other parties to sign and administrate the hosting agreement (consortium leader).

In order to assess the applicants' eligibility, the following supporting documents are requested:

- The legal entity identification form (http://ec.europa.eu/budget/contracts_grants/info_contracts/legal_entities/legal_entities_en.cfm) duly completed and signed by the person authorised to enter into legally binding commitments on behalf of the applicant organisation(s) to be submitted in original;
- Hosting consortium: in addition to the supporting documents referring to their legal status, the hosting consortium members will submit a signed declaration based on the model Consortium

Agreement/Power of Attorney, appointing a consortium leader and giving a mandate to him (included as annex b).

- Each applicant and Participating States in a hosting consortium must fill-in and provide the duly signed Declaration of Honour (included as annex a).

The following entities will be considered as non-eligible:

- a) natural persons;
- b) entities without legal personality.

7. EXCLUSION CRITERIA

7.1. Exclusion⁷

The Executive Director of the EuroHPC JU shall exclude an applicant from participating in this call for expression of interest where:

(a) the applicant is bankrupt, subject to insolvency or winding-up procedures, its assets are being administered by a liquidator or by a court, it is in an arrangement with creditors, its business activities are suspended, or it is in any analogous situation arising from a similar procedure provided for under EU or national laws or regulations;

(b) it has been established by a final judgment or a final administrative decision that the applicant is in breach of its obligations relating to the payment of taxes or social security contributions in accordance with the applicable law;

(c) it has been established by a final judgment or a final administrative decision that the applicant is guilty of grave professional misconduct by having violated applicable laws or regulations or ethical standards of the profession to which the applicant belongs, or by having engaged in any wrongful intent or gross negligence, including, in particular, any of the following:

(i) fraudulently or negligently misrepresenting information required for the verification of the absence of grounds for exclusion or the fulfilment of eligibility or selection criteria or in the performance of a contract, a grant agreement or a grant decision;

(ii) entering into agreement with other applicants with the aim of distorting competition;

(iii) violating intellectual property rights;

(iv) attempting to influence the decision-making process of the EuroHPC JU during the award procedure;

(v) attempting to obtain confidential information that may confer upon it undue advantages in the award procedure;

(d) it has been established by a final judgment that the applicant is guilty of any of the following:

⁷ Article 136 FR

- (i) fraud, within the meaning of Article 3 of Directive (EU) 2017/1371 of the European Parliament and of the Council and Article 1 of the Convention on the protection of the European Communities' financial interests, drawn up by the Council Act of 26 July 1995;
 - (ii) corruption, as defined in Article 4(2) of Directive (EU) 2017/1371 or Article 3 of the Convention on the fight against corruption involving officials of the European Communities or officials of Member States of the European Union, drawn up by the Council Act of 26 May 1997, or conduct referred to in Article 2(1) of Council Framework Decision 2003/568/JHA, or corruption as defined in the applicable law;
 - (iii) conduct related to a criminal organisation, as referred to in Article 2 of Council Framework Decision 2008/841/JHA;
 - (iv) money laundering or terrorist financing within the meaning of Article 1(3), (4) and (5) of Directive (EU) 2015/849 of the European Parliament and of the Council;
 - (v) terrorist offences or offences linked to terrorist activities, as defined in Articles 1 and 3 of Council Framework Decision 2002/475/JHA, respectively, or inciting, aiding, abetting or attempting to commit such offences, as referred to in Article 4 of that Decision;
 - (vi) child labour or other offences concerning trafficking in human beings as referred to in Article 2 of Directive 2011/36/EU of the European Parliament and of the Council;
- (e) the applicant has shown significant deficiencies in complying with main obligations in the performance of a contract, a grant agreement or a grant decision financed by the Union's budget, which has led to its early termination or to the application of liquidated damages or other contractual penalties, or which has been discovered following checks, audits or investigations by an authorising officer, OLAF or the Court of Auditors;
- (f) it has been established by a final judgment or final administrative decision that the applicant has committed an irregularity within the meaning of Article 1(2) of Council Regulation (EC, Euratom) No 2988/95;
- (g) it has been established by a final judgement or final administrative decision that the applicant has created an entity in a different jurisdiction with the intent to circumvent fiscal, social or any other legal obligations of mandatory application in the jurisdiction of its registered office, central administration or principal place of business;
- (h) it has been established by a final judgement or final administrative decision that an entity has been created with the intent referred to in point (g);
- (i) for the situations referred to in points (c) to (h) above, the applicant is subject to:
- (i) facts established in the context of audits or investigations carried out by European Public Prosecutor's Office after its establishment, the Court of Auditors, the European Anti-Fraud Office or the internal auditor, or any other check, audit or control performed under the responsibility of an authorising officer of an EU institution, of a European office or of an EU agency or body;
 - (ii) non-final judgments or non-final administrative decisions which may include disciplinary measures taken by the competent supervisory body responsible for the verification of the application of standards of professional ethics;

(iii) facts referred to in decisions of persons or entities being entrusted with EU budget implementation tasks;

(iv) information transmitted by Member States implementing Union funds;

(v) decisions of the Commission relating to the infringement of Union competition law or of a national competent authority relating to the infringement of Union or national competition law; or

(vi) decisions of exclusion by an authorising officer of an EU institution, of a European office or of an EU agency or body.

7.2. Remedial measures⁸

If an applicant declares one of the situations of exclusion listed above, it should indicate the measures it has taken to remedy the exclusion situation, thus demonstrating its reliability. This may include e.g. technical, organisational and personnel measures to prevent further occurrence, compensation of damage or payment of fines. The relevant documentary evidence which illustrates the remedial measures taken must be provided in annex to the declaration. This does not apply for situations referred in point (d) of section 7.1.

7.3. Rejection from the call

The Executive Director of the EuroHPC JU shall not conclude a hosting agreement with an applicant who:

- a. is in an exclusion situation established in accordance with section 7.1;
- b. has misrepresented the information required as a condition for participating in the procedure or has failed to supply that information.

The same exclusion criteria apply to affiliated entities.

Administrative sanctions (exclusion) may be imposed on applicants, or affiliated entities where applicable, if any of the declarations or information provided as a condition for participating in this procedure prove to be false.

7.4. Supporting documents

Applicants and affiliated entities must provide a declaration on their honour certifying that they are not in one of the situations referred to above under 7.3., by filling in the relevant form attached to the application form accompanying the Call for Expression of Interest and available at <https://eurohpc-ju.europa.eu/participate.html>

8. EVALUATION CRITERIA

Eligible applications will be evaluated according to the following evaluation criteria (based on the list of criteria in Article 8(5) of the Regulation):

1. Compliance with the general system specifications defined in the call for expression of interest; (0-20 points)

⁸ Article 136 (7) FR

- *Quality and pertinence of the application to comply with the general system specifications defined in this call for both the Supercomputer and the Site.*
 - *Soundness of the concept, and credibility of the application.*
- 2. Estimation of total cost of ownership (TCO) of the supercomputer and methodology to calculate it; (0-20 points)
 - *Clarity and effectiveness of the estimated TCO of the application.*
 - *Appropriateness of the methodology to calculate, report and validate the operating costs.*
- 3. Experience of the hosting entity in installing and operating similar systems; (0-20 points)
 - *Quality and pertinence of experience of the hosting entity in installing and operating similar systems.*
 - *Extent that provided experience is sufficient for supporting the system described in the general system specifications.*
- 4. Quality of the hosting facility's physical and IT infrastructure, its security and its connectivity with the rest of the Union; (0-20 points)
 - *Quality and pertinence of the current and proposed hosting facility's physical and IT infrastructure, its security and its connectivity with the rest of the Union.*
 - *Quality and effectiveness of the proposed plan for the readiness of the site to host the Supercomputer.*
- 5. Quality of service to the users, namely capability to comply with the service level agreement provided among the documents accompanying the selection procedure; (0-20 points)
 - *Quality and pertinence of service to the users, namely capability to comply with the service level agreement provided in the Hosting application.*
 - *Quality of the proposed coordination and/or support measures to ensure requested service level towards EuroHPC JU users.*

Points will be allocated out of a total of 100 on the basis of the above-specified weighting. A minimum threshold of 10 points for each criterion and 60 points for the total will be applied. Applications below these thresholds will be rejected.

For each criterion, if appropriate, applicants must provide detailed information about the role and tasks to be carried out by each consortium member.

9. OVERVIEW OF THE EVALUATION AND SELECTION PROCEDURE

The EuroHPC JU is responsible for the implementation of the evaluation of the received expressions of interest. It shall organise the submission and evaluation procedures and communicates with the applicants.

9.1. Evaluation procedure

The submitted expressions of interest will be evaluated in a procedure by a panel of five independent experts. These experts will be appointed by the EuroHPC JU on the basis of the procedure followed under Horizon2020. For the applications considered admissible according to the section 5, the EuroHPC JU will assess the eligibility and exclusion criteria according to the sections 6 and 7 above. Only eligible applications will be evaluated.

- **Individual evaluations:** In the first step, the independent experts that sit on the panel shall carry out individually the evaluation of expressions of interest on the basis of the evaluation criteria

described in section 8 above. They give a score for each criterion, with explanatory comments. These individual reports form the basis of the further evaluation.

- **Consensus meetings:** After carrying out their individual assessment, all the experts that evaluated the application shall convene in a consensus meeting, to agree on a common position, including comments and scores and prepare a consensus report. The consensus meetings shall be moderated by a Senior Officer of the EuroHPC JU or a Commission official⁹ who shall seek consensus, impartially, and ensure that all applications are evaluated fairly, in line with the relevant evaluation criteria.
- **Panel review:** The review panel shall be chaired by the Executive Director of the EuroHPC JU. The panel will review the scores and comments for all applications to check for consistency across the evaluations. If necessary, it will propose a new set of marks or revise comments, and resolve cases where evaluators were unable to agree. The panel will prepare a preliminary evaluation summary report, including questions to be clarified during the hearings.
 - **Hearings:** Applicants will be invited to hearings with the experts to clarify the questions of the panel. The applicants will receive the relevant questions two weeks in advance of the hearings. Hearings shall consist of oral presentations (approx. 60 minutes) by the applicants of their application and of their responses to the questions of the evaluation panel. The panel may ask further clarifications on the presentation and original questions. The presentation and responses shall not lead to an alteration of the application submitted but shall aim to ensure the proper understanding of the application. The hearing will last a maximum of 120 minutes. A maximum of five representatives from the applicant can participate in the hearing. Members of the EuroHPC JU Governing Board can participate as observers during the hearings. Hearings will be physically held in principle in Luxembourg (unless otherwise specified).
 - **Finalisation of Panel review:** After the hearings, the review panel will reconvene to establish its final ranking list and scores according to the evaluation criteria provided in section 8 above. Only applications above threshold will be ranked by the review panel according to the evaluation criteria total score. If necessary, a priority order for applications with the same score will be determined in the ranked list, according to the following approach:

Applications with the same score: Applications with the same total score will be prioritised according to the scores they have received for the evaluation criterion "*compliance with the general system specifications defined in the call for expression of interest*". When these scores are equal, priority will be based on scores for the evaluation criterion "*experience of the hosting entity in installing and operating similar systems*", then "*total cost of ownership of the supercomputer*" and then "*quality of the hosting's facility's physical and IT infrastructure*". These factors will be documented in the Panel Report.

9.2. Selection

The Executive Director of the EuroHPC JU will review the results of the evaluation panel and will elaborate a final ranking list based on the list proposed by the panel. The Executive Director may suggest to the Governing Board to deviate from the ranking proposed by the panel with a justification, for the consideration of the Governing Board.

⁹ Until the date on which the EuroHPC JU has its own operational capacity in accordance with Article 29 of the Regulation

This final ranking list shall consist of:

- a main list with the applications to be selected as Hosting Entities as proposed by the experts complemented by any suggestion for deviation from this list as proposed by the Executive Director;
- a reserve list, with applications that have passed the evaluation thresholds. Applicants in the reserve list might be offered the possibility to become hosting entities and thus, conclude a hosting agreement, in case for whichever reason a hosting agreement cannot be established with a higher ranked application or additional funds become available.

In addition, the EuroHPC JU will prepare a list with applications that did not pass the evaluation thresholds or were found to be ineligible.

The Executive Director will submit the final ranking list, together with the Evaluation Summary Reports, to the Governing board of the EuroHPC JU with a proposal for selection of the Hosting Entities for their approval.

The Governing Board will make the final selection of the Hosting Entities, which will be invited to establish hosting agreement with the EuroHPC JU.

After the decision of the Governing Board, all applicants will be informed in written by the EuroHPC JU of the outcome of the evaluation in the form of an Evaluation Summary Report (ESR). The EuroHPC JU will also inform about the final selection or rejection of applications.

The EuroHPC JU will invite the selected applicants to the next stages for the signature of the hosting agreement, and the preparation of the acquisition of the EuroHPC supercomputer, but the invitation is not a commitment that the EuroHPC JU will launch the acquisition procedures. The hosting agreement shall be approved by the Governing Board before its signature by the respective parties.

9.3. Communication

The information contained in the present call document provides all the information required to submit an application. Please read it carefully before doing so, paying particular attention to the priorities and objectives of the present call.

All enquiries must be made by e-mail only to:

Contact point for any questions is¹⁰ EuroHPC-JU@ec.europa.eu

Questions may be sent by to the above address no later than the **15-02-2019 - 11:00 AM Brussels time**, defined as “Deadline to submit questions about the Call” in Section 10.

The EuroHPC JU has no obligation to provide clarifications to questions received after this date.

Replies will be given/published no later than the “Publication of the last answers to questions” defined in the Timeline in section 10.

To ensure equal treatment of applicants, the EuroHPC JU will not give a prior opinion on the eligibility of applicants, or affiliated entity(ies), an action or specific activities.

No individual replies to questions will be sent but all questions together with the answers and other important notices will be published (FAQ in EN) at regular intervals on the website under the relevant call: <https://eurohpc-ju.europa.eu/participate.html>

¹⁰ Questions on submission must be sent before the deadline indicated in section 10

The EuroHPC JU may, on its own initiative, inform interested parties of any error, inaccuracy, omission or clerical error in the text of the Call for Expression of Interest on the mentioned website. It is therefore advisable to consult this website regularly in order to be informed of any updates and of the questions and answers published.

No modification to the applications is allowed once the deadline for submission has elapsed. If there is a need to clarify certain aspects or to correct clerical mistakes, the EuroHPC JU may contact the applicant for this purpose during the evaluation process. This is generally done by e-mail. It is entirely the responsibility of applicants to ensure that all contact information provided is accurate and functioning.

In case of any change of contact details, please send an email with the application reference and the new contact details to EuroHPC-JU@ec.europa.eu.

In the case of hosting consortia, all communication regarding an application will be done with the lead applicant only, unless there are specific reasons to do otherwise, where the consortium coordinator should be in copy.

Applicants will be informed in writing about the results of the selection process. Unsuccessful applicants will be informed of the reasons for rejection. No information regarding the award procedure will be disclosed until the notification letters have been sent to the partners.

10. TIMETABLE

The steps and indicative times for the procedure from publication to expected start of the mandate for the selected Hosting Entities are in the table below:

Selection of HE milestones	Date and time or indicative period
Call for Expression of Interest Publication	
Publication of Call for Expressions of Interest	21-01-2019
Submission of applications	
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
Evaluation	
Sending questions for the hearings	06/05/19
Hearings	20–22/05/19
Notification of results to applicants	07/06/19
Signature of the hosting agreement	
Period for additional Participating States to join Consortium	07/06/2019-05/07/2019
Signature of hosting agreement	July 2019

11. PROCEDURE FOR THE SUBMISSION OF APPLICATIONS

Applications **must be sent no later than the 4 April 2019 at 12:00 AM Brussels time.**

Application forms are available at <https://eurohpc-ju.europa.eu/participate.html>

Applications must be submitted in the correct form, duly completed and dated. They must be submitted in 5 (five) copies (one original clearly identified as such, plus four copies, and an electronic copy on CD or USB stick) and signed by the person authorised to enter into legally binding commitments on behalf of the applicant organisation. The electronic version must contain only the pdf versions of the application presented in paper. Other electronic files will not be considered.

Applications must be submitted in a sealed envelope itself enclosed within a second sealed envelope, addressed as indicated above. The inner envelope must bear, in addition to the address indicated above, the words, “CALL FOR EXPRESSION OF INTEREST - EUROHPC-2019-CEI-PE-01– Not to be opened by the mail service.” If self-adhesive envelopes are used, they must be sealed with adhesive tape and the sender must sign across that tape.

Where applicable, all additional information considered necessary by the applicant can be included on separate sheets.

Applications must be sent to the following address:

*European High Performance Computing Joint Undertaking
European Commission CNECT.C2
10, Rue Robert Stumper, L-2557 Luxembourg*

- by post, date as postmark as proof of timely submission;
- in person, date as receipt, to the address above.
- by courier service, date of receipt by the courier service as proof.

Applications sent by fax or e-mail will not be accepted.

Contact point for any questions is¹¹ EuroHPC-JU@ec.europa.eu

All applications will be treated confidentially, as well as any submitted related information, data, and documents. The EuroHPC JU will ensure that the process of handling and evaluating applications is carried out in a confidential manner.

External experts are also bound by an obligation of confidentiality.

Applicants should avoid taking any actions that could jeopardise confidentiality. They must not attempt to discuss their application with persons you believe may act as expert evaluator for the EuroHPC JU.

Your application should not contain any information that is ‘EU classified’ under the rules on security of information in the [Commission internal Rules of Procedure](#) (see also [Guide for classification](#)).

The EuroHPC JU will process personal data in accordance with Regulation (EU) 2018/1725 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC¹².

¹¹ Questions on submission must be sent before the deadline indicated in section 10

¹² <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R1725>

Once the coordinator (or sole applicant) has submitted an expression of interest, an acknowledgement of receipt will be sent by the JU. No other interaction will take place with the EuroHPC JU until the application has been evaluated, unless:

- The EuroHPC JU needs to contact you (usually through the coordinator) to clarify matters such as eligibility or to request additional information.

The list of Annexes included as part of this call is:

- Annex 1: Application form (please fill in the application form, including its annexes, and provide the relevant supporting documents – all listed below). Includes the checklist for applicants included at the end of the application form and the following annexes:
 - Annex a Declaration of honour
 - Annex b Mandate letters (if applicable)
 - Other supporting documents to be provided where applicable: see checklist for applicants
- Annex 2: Model Hosting Agreement

Regarding the compilation of the application file, it is recommended to:

- follow the order of documents as listed in the checklist (and attach a ticked checklist as below to the application);
- print the documents double-sided;
- use 2-hole folders (do not bind or glue; stapling is acceptable).

12. APPENDIX 1: CONTENT OF THE APPLICATION

12.1. Structure of the Application

Applicants must use the application form template for their applications (designed to highlight important aspects and facilitate the assessment against the evaluation criteria).

The application form is structured in two main sections. In the first section, “Information on the applicants”, the application must provide administrative details about the applicants and consortium, including contact details and legal representatives.

The second section “Information on the Action” is divided in five subsections. In the first subsection, applicants must describe how the following general system specifications will be met, for both the EuroHPC supercomputer and the site. In the second subsection “Total Cost of Ownership”, the applicant should include an estimation of the total cost of the acquisition and operations of the supercomputer that the applicant has in mind to host and that has been described in the previous section “general system specifications”. In subsection 3, applicants must provide information on their experience in installing and operating similar systems. In subsection 4, Applicants must provide information on the hosting physical and IT infrastructure, including security and connectivity that the site can provide for the EuroHPC supercomputer. In the last subsection, “Quality of service to the users, namely capability to comply with the service level agreement”, the applicant should specify the benchmarks or deliverables which the applicant intends to employ to achieve the expected results and targets and how they will be used.

The application form includes a guide on how to fill it explanation for all sections.

Character and page limits:

- page limit: 90 pages
- minimum font size — Arial 8 points
- page size: A4
- margins (top, bottom, left and right): at least 15 mm (not including headers & footers).
- pagination instructions: each document from the application must be individually numbered in the bottom right corner.

As part of the application, applicants must provide a formal statement indicating whether the hosting consortium would be ready or not to include additional Participating States if selected. Such statement should also include the indicative amounts of the contribution of the additional Participating States.

12.2. General system specifications

Applicants must describe how the following general system specifications will be met, for both the EuroHPC supercomputer and the site.

The hosting entity will host a supercomputer with the following requirements:

- A capability computing system that is a precursor of exascale computing, with an aggregated performance level capable of executing at least 150 Petaflops (sustained performance measured using linpack benchmark)
- Covering the needs (including substantial performance increase) of a wide range of applications, and in particular of key/grand challenge applications that demonstrably require the capability usage of the supercomputer, i.e. using simultaneously a large part of the resources of the system.

The hosting site should comply with at least the following requirements:

- Power capacity and power quality for hosting a system in the range of 10 to 15 MW total consumption for the pre-exascale supercomputers
- UPS power available to cover the critical systems including storage and access to data of the JU system..
- Adequate capacity of air or liquid cooling for hosting the JU system
- At least 700 m² of contiguous floor space available for hosting the EuroHPC supercomputer and auxiliary systems
- Raised floor able to bear at least 2200 kg/m² distributed load
- 100 Gbit/s connectivity towards the rest of the GEANT Network (link capacity)
- Hosting physical security
- Hosting fire mitigation equipment/procedures
- Hosting IT access security
- Ability to perform at least a Level 1 measurement quality for a Top500 submission
- On call service support teams for IT issues
- Dedicated on-call service team for facilities issues
- Regularly measure the satisfaction of the users with the service via a user survey

Applications must include a description of the proposed supercomputer and hosting site, including features such as:

- Detailed description of the site hosting the system
- Description of the main features of the targeted supercomputer system, including e.g.:
 - Type of nodes and their configuration (e.g. accelerated, CPU, High memory, etc.)

- Memory and storage capacities and architecture
 - Ratio of different node types within the system (accelerator/CPU, memory size, ...)
- Expected sustained performance (linpack and other performance indicators)
- What type of application domains (e.g. computational, HPDA, AI ...) and specific applications (e.g. weather forecasting, climate change, new materials, drugs design, ...) will the system be optimised for? What are the expected performance increases for the targeted applications?
- Acceptance tests and benchmarks to be used for the acceptance of the EuroHPC supercomputer
- Other related software/services (containers, virtualisation, support of workflows, workflow management...)

12.2.1. *Description and evaluation of an optional proposal system targeting the development of an advanced experimental platform towards exascale systems*

As mentioned in Section 1, one of the targets of EuroHPC JU is also promoting the further development of European technologies and their subsequent integration in exascale supercomputing systems and thus contributing to developing a competitive European technology supply industry.

As part of this objective, it is proposed that interested hosting entities may also include in their application an optional system targeting the development of an advanced experimental platform towards exascale systems. The goal of such a platform shall be to develop an exploratory supercomputing infrastructure for the development, integration, testing, and co-design of a wide range of European technologies suitable to be part of the future European exascale systems. The development, installation and operating costs of such platform should be marginal to the overall cost of the proposal.

In case the hosting entity decides to include such optional part in its application, the hosting entity should include a description of such platform, the development targets (milestones) and the time plan as well as a detailed work plan and the cost breakdown for its development and operation. The potential of such platform towards exascale systems should be duly justified in the application and will be evaluated for its own merits for receiving or not financial support. This evaluation shall not affect the overall evaluation of the mandatory part of the application.

In case the hosting entity decides to include such optional system in their application and its application selected, any grant that will be established to cover the operating costs of each individual EuroHPC supercomputer, may also include a part cover up to 50% of the eligible costs for the development of the advanced experimental platform towards exascale. The maximum costs for such platform should not exceed 6% of the overall TCO of the EuroHPC supercomputer.

12.3. Total Cost of Ownership (TCO)

The applicant should include an estimation of the cost of the supercomputer that the applicant has in mind to host and that has been described in the previous section “general system specifications”.

The estimation of the TCO will be based on an estimation of the acquisition costs of a potential system that complies with the general system specifications and on an estimation of its operating costs. The costs related to the construction of the hosting site per se (i.e., the costs related to the building infrastructure that will host the EuroHPC supercomputer, etc.) shall not be covered by the EuroHPC JU. The costs of the preparation and adaptation of the hosting site incurred by the hosting entity that can be directly accounted to the EuroHPC Supercomputer may be considered as part of the TCO.

Applicants must provide their intention with regards to the duration of the operations of the EuroHPC supercomputer in the hosting entity. This should include not only their proposal for the duration of the

operations, but their preference with the ownership of the Supercomputer once the operations are finished (e.g. buy it, decommissioning it ...).

12.3.1. *Site preparation*

The hosting entity must be able to meet the baseline requirements set out herein in time for the anticipated timeline for the delivery of the machine in June 2020. The applicant must provide a plan of how and in what timeline intends to realise the construction of a new or the upgrade of an existing site, including costs of each action (indicating the ones that will be considered as in-kind contribution) and the definitive date at which the site will be ready for the installation of the EuroHPC system.

12.3.2. *Acquisition Costs*

Applicants must detail the estimation for the cost of the acquisition of the EuroHPC supercomputer. Applicants must indicate clearly what costs will be included in this category, how they will calculate them and who will pay for those.

12.3.3. *Operating Costs*

Applicants must provide an auditable methodology to calculate and to verify the operating costs of the supercomputer for the duration of the action. Applicants must describe the model that will be used for calculating the costs of the Operational expenditures (OPEX), detailing the cost elements included in the model and providing estimates for each cost.

The hosting entity should be in position to provide an accurate estimate and to verify the operating costs of the EuroHPC supercomputer, by ensuring, for example, the functional separation, and to the extent possible, the physical separation of the EuroHPC supercomputers and any national or regional supercomputing systems it operates. The applicants must explain the way the EuroHPC supercomputer shares its IT environment and storage.

The method should be used in the operating grant to calculate the operating costs and the amount that will be covered by Union's contribution. Applicants can use the indicative list of cost elements provided in Appendix 2 to consider in the calculation of the operating costs.

Applications must include at least the following information and/ or estimations:

1. Average power usage effectiveness (PUE) for the current data centre over the last 12 months.¹³ And, in the case that the applicant would be upgrading the site to host the EuroHPC supercomputer, what is the planned (design specification) PUE for your upgraded data centre¹⁴
2. Depreciation time for the building, technical building infrastructure and IT investments and method used for the depreciation of the assets (e.g. linear).
3. Average cost of IT on-call service (24/7) (internal or outsourced) over the last 12 months.

¹³ The calculation of the PUE provided must be based on the method defined by ASHRAE Technical Committee 9.9 as set out in their publication "PUE: A Comprehensive Examination of the Metric". $PUE = \text{Total Facility Energy} / \text{IT Equipment Energy}$ (Note: JU reserves the right to check this value.)

¹⁴ The estimated of the PUE provided must be based on the method defined by ASHRAE Technical Committee 9.9 as set out in their publication "PUE: A Comprehensive Examination of the Metric". $PUE = \text{Total Facility Energy} / \text{IT Equipment Energy}$

4. Current electricity price in EUR/kWh (all taxes included) and if available, electricity price in EUR/kWh (all taxes included) at the expected installation time of the EuroHPC supercomputer.
5. Number of system administrators (FTE) expected to dedicate to the running of the EuroHPC supercomputer service (including critical auxiliary services such as storage, scheduling system, etc.), including average Person Month cost.
6. Number of user support staff (FTE) expected to dedicate to the running of the users of the EuroHPC supercomputer and application support including average Person Month cost.
7. IT environment including storage (disks, tapes ...) architecture, capacities and their ability to be extended to serve a pre-exascale supercomputer.

12.4. Experience of the hosting entity in installing and operating similar systems

Applicants must provide information of their experience in installing and operating supercomputers and dedicated high performance storage facilities, including at least:

- 1) Previous experience with installing and operating supercomputers. Provide information in case the applicant's site has experience in hosting very early releases of new systems. If relevant, applicants must provide documentation of their experience in having installed systems in the last 5 years (especially systems that ranked in the top 50 positions of the Top500 at the time of their first listing).
- 2) In the case of installing and operating a supercomputer for a 3rd party (supercomputer is legal title of 3rd party and operated for them at agreed SLA) or operating a supercomputing service or equivalent major infrastructure for a 3rd party (3rd party pays for a service with agreed SLA, supercomputer is the legal title of the hosting site); applicants must provide a description of the service provided as well as at least one contact person from the 3rd party from whom the JU may request a reference for this service.
- 3) Description of the current organizational structure and the teams of people responsible for the supercomputer operation and management (including user support and specialist support of the HPC systems). If available, include current procedures and tools for system management, help desk project management, configuration management, training and education put in place.
- 4) Description of the current procedures adopted by the supercomputing operation and management team to monitor HPC systems. Please indicate which of these are in-house and which are 3rd party solutions; how they have been integrated and customized. List any current Quality Control certifications your organization has obtained for system management, help desk project management, configuration management, training and education.
- 5) Description of the current procedures adopted by the supercomputing operation and management team to trace and resolve issues and communicate them to users and other stakeholders. Include description of current procedures adopted by the supercomputing operation and management team to ensure that service level agreements are met.
- 6) Description of any current continuity procedures the operations team or the Network Operations Center (NOC) has in place and description of current workload management software and methodology (bonus/malus; backfill; etc.) in place.
- 7) Description of previous experience in providing supercomputer access and other related services to users from other member states or pan European environments (e.g. PRACE)

12.5. Quality of the hosting facility's physical and IT infrastructure, its security and its connectivity with the rest of the Union

Applicants must provide information of the hosting physical and IT infrastructure, including security and connectivity that the site can provide for the EuroHPC supercomputer.

For the site preparation, the hosting entity must be able to meet the baseline requirements set out herein in time for the anticipated timeline for the delivery of the EuroHPC supercomputer by mid-2020 and the operations by the last quarter of 2020. The applicants must provide a plan of how and in what timeline intends to realise the upgrade of the site, including the definitive date at which the site will be ready for the installation of the EuroHPC supercomputer. This may include, but is not limited to Gantt charts, contractual timelines, construction permits and work contracts status.

Applicants should include (at least) the following information related to the current and proposed capacities of the hosting facility and how to achieve them:

- 1) Description of the intended hosting entity site and facility, including cooling methods and experience on cooling systems, power measurement facilities, accessibility, possibility to accommodate visitors, courses, possible extendibility of the site (m² and KW) and description of physical security concept, including access control, CCTV, etc.
- 2) Power measurement facilities in place at infrastructure level and where (device type, location of measurement à at rack, pdu, centre) and maximum levels of energy measurement according to the EE HPC HPC Power Measurement Methodology. If available, reference to any memberships of energy efficiency interest groups or codes of conduct (e.g. EE HPC WG , EU Code of Conduct, EMAS, or other); certifications for energy efficiency and sustainability (e.g. ISO / IEC 13273).
- 3) Information about the connection to the power grid, including maximum capacity of connection to the power grid and other characteristics such as redundant connection to the power grid. Information about power grid quality (number of outages from supplier in last 48 months, starting January 1st 2015) and energy procurement method (e.g., long-term contracts, annual market based purchases, other).
- 4) Information about availability of the data centre: expressed as a minimum percentage of uptime or in maximum number of hour's downtime that the HE deem are acceptable per year. Average availability of data centre infrastructure (cooling, power, etc.) (over the last 24 months for current)¹⁵.
- 5) Information about connectivity towards the rest of the GEANT Network (link capacity) and the Network Operating Centre (NOC) and its reachability (e.g. 24/7).
- 6) Facility managers (in-house or outsourced) involved in ensuring the operation of the data centre, and their specialization.
- 7) Total memory and storage capacities of the centre, defining what part would be dedicated to the EuroHPC supercomputer.

¹⁵ Facility is deemed available when no facility issues are affecting the running of the supercomputing service.
Availability = total hours – (scheduled + unscheduled downtime)

12.6. Quality of service to the users, namely capability to comply with the service level agreement

The applicant should specify the benchmarks or deliverables which the applicant intends to employ to achieve the expected results and targets and how they will be used. These should include at least the SLAs in the Hosting Agreement and information related to:

- 1) Access time accounting model that will be used to control the allocation time of the supercomputer. Description of access time policy proposed and how the total number of nodes of jobs in waiting queue ready to run will be measured. Provide historic system uptake and usage for recent HPC systems.
- 2) Availability of main HPC systems over last 12 months if the system has been operational for at least 18 months. If the system has been operational for less, please provide availability numbers based on the duration for which the system has been in full production. This should include hours of scheduled maintenance and hours of unscheduled maintenance.
- 3) Availability of help-desk; number of active projects currently supported. Description of services provided by user support (e.g. 1st level, 2nd level, application support) and of policy regarding response times for level 1, 2 and 3 tickets¹⁶.
- 4) Overview of training course curriculum related to HPC and scientific computing and links towards user documentation pages, user tutorials and webinars¹⁷.
- 5) Description of how the on-call service (24/7) for the supercomputing service and infrastructure facilities are set up and work. Include, if available, results from the user satisfaction surveys for your site for the last 5 years.
- 6) Fraction of time for which the current supercomputing service (supercomputer + all necessary auxiliary services like storage, network, login nodes, etc. + main software services like scheduler, access to file systems, etc.) has been available over the last 12 months?¹⁸
- 7) Do you perform regular regression tests to assess the stability of performance of your current supercomputer service? If yes, please provide a description of the regression test used and the frequency at which it is run.
- 8) Does your site provide any additional services that may not be critical to running the supercomputing service but may provide an additional benefit to the end user? If yes, please provide a description of these services

Applicants must provide details on how these tasks are currently done and how they propose to achieve them for the hosting of the EuroHPC supercomputer. Applicants must indicate subcontracted action tasks (if any) and explain the reasons why (as opposed to direct implementation).

¹⁶ Level 1 => simple request, can be solved in 1 day; Level 2 => more complex request, requires some research, can take up to 5 working days to resolve, Level 3 => request that requires vendor response to resolve, may take longer than 5 working days

¹⁷ or provide electronic copies if these are not reachable online or without a user account

¹⁸ Available = fully up and running and reachable by the users and at least 98% of compute nodes available

13. APPENDIX 2: INDICATIVE LIST OF COST ELEMENTS TO CONSIDER IN THE CALCULATION OF THE OPERATING COSTS

In-kind contributions are marked with coloured fields.

Supercomputer and maintenance

Cost item	Verification	Method	Provider
HPC system	N/A procured by EuroHPC JU	N/A	
High Performance disks/Scratch Storage	N/A procured by EuroHPC JU	N/A	

Equipment and commercial software

Cost item	Verification	Method	Provider	Related equipment
Site preparation	Invoice /Balance sheet	Fraction committed to the EuroHPC JU (JU)	Hosting site only	
Network at data centre level	Invoice /Balance sheet	Fraction committed to JU	Hosting site only	
High Performance disks/Home Storage	Invoice /Balance sheet	Fraction committed to JU	Hosting site / others	
Backup storage	Invoice /Balance sheet	Fraction committed to JU	Hosting site / others	
Level 2 storage/Long term Storage	Invoice /Balance sheet	Fraction committed to JU	Hosting site / others	
Other IT equipment	Invoice /Balance sheet	Fraction committed to JU	Hosting site only	
Supercomputers (SC) room	Invoice /Balance sheet	Fraction of the room occupied by the JU systems		
Building	Invoice /Balance sheet	Fraction of the building occupied by the SC room		
Power supply to the facility	Invoice /Balance sheet	Fraction of MW used by JU	Hosting site only	
Power backup	Invoice /Balance sheet	Fraction of MW used by JU	Hosting site only	
Power distribution	Invoice /Balance sheet	Fraction of MW used by JU	Hosting site only	
Cooling	Invoice /Balance sheet	Fraction of MW used by JU	Hosting site only	

Fire detection and extinction	Invoice /Balance sheet	Fraction of the surface of the SC room occupied by the JU systems	Hosting site only	Other infrastructure services
CCTV, security, access control	Invoice /Balance sheet	Fraction of the surface of the SC room occupied by the JU systems	Hosting site only	
Monitoring, building and facility	Invoice /Balance sheet	Fraction of MW used by JU	Hosting site only	
File system software	Invoice	Fraction of sw used by JU	Hosting site only	
Accounting software	Invoice	Fraction of sw used by JU	Hosting site only	
Compilers	Invoice	Fraction of sw used by JU	Hosting site only	
Debuggers	Invoice	Fraction of sw used by JU	Hosting site only	
Scientific software	Invoice	Fraction of sw used by JU	Hosting site only	

Personnel

Cost item	Verification	Method	Provider
System administration, user support and training	Payroll, and/or invoice when part of the service is subcontracted	Timesheets to show dedication to the JU	Hosting site only
Application enablement	Payroll, and/or invoice when part of the service is subcontracted	Timesheets to show dedication to the JU	Hosting site / others
Facility	Payroll, and/or invoice when part of the service is subcontracted	Timesheets to show dedication to the JU	Hosting site only
Installation	Payroll, and/or invoice when part of the service is subcontracted	Timesheets to show dedication to the JU	Hosting site only
Security	Payroll, or invoice when the service is subcontracted	Fraction according to max. dedication	Hosting site only
Cleaning	Payroll, or invoice when the service is subcontracted	Fraction according to max. dedication	

Operations and maintenance

Cost item	Verification	Method	Provider
Electricity	Invoice/Meters	Fraction used by the JU	Hosting site only
Water	Invoice/Meters	Fraction used by the JU	
Gasoil	Invoice/Meters	Fraction used by the JU	
Network connection	Invoice /Balance sheet	Fraction committed to the JU	Hosting site only
Maintenance of HPC system and the high-performance disks/scratch storage	N/A procured by EuroHPC	N/A	
Maintenance of items under "Equipment and commercial software"	Invoice	According to method in "Equipment and commercial software"	Hosting site / others