PRACE Project Access

Terms of Reference – 24th Call for Proposals

Important Dates:

Opening date:	**09 September 2021**
Closing date:	**02 November 2021, 10:00 CET**
Applicants' reply to scientific reviews:	Mid-January 2022
Communication of allocation decision:	End of March 2022
Allocation period for awarded proposals:	**01/04/2022 – 31/03/2023**
Type of Access [†]	Single-, Multi-Year Project Access

[†] **All proposals** consist of 2 parts: an online form and the '*Project scope and plan*'. Please note that if you wish to continue work on a project that has finished or is ongoing, **a new proposal** (i.e. a continuation proposal) needs to be submitted **in addition to** a final/progress report. Final/progress reports need to be uploaded on the submission online form in the process of submission.

PRACE systems available:

System	Architecture	Site (Country)	Core Hours (node hours)	Minimum request (core hours)
HAWK*	HPE Apollo	GCS@HLRS (DE)	345.6 million (2.7 million)	100 million
Joliot-Curie KNL	BULL Sequana X1000	GENCI@CEA (FR)	37.5 million (0.6 million)	15 million
Joliot-Curie Rome	BULL Sequana XH2000	GENCI@CEA (FR)	195.3 million (1.5 million)	15 million
Joliot-Curie SKL	BULL Sequana X1000	GENCI@CEA (FR)	52.9 million (1.1 million)	15 million
JUWELS Booster*	BULL Sequana XH2000	GCS@JSC (DE)	85.2 million (1.78 million)	7 million Use of GPUs
JUWELS Cluster*	BULL Sequana X1000	GCS@JSC (DE)	35.04 million (0.73 million)	35 million
Marconi100	IBM Power 9 AC922 Whiterspoon	CINECA (IT)	165 million (0.47 million)	35 million Use of GPUs
MareNostrum 4*	Lenovo System	BSC (ES)	TBA	30 million
Piz Daint	Cray XC50 System	ETH Zurich/CSCS (CH)	510 million (7.5 million)	68 million Use of GPUs
SuperMUC-NG*	Lenovo ThinkSystem	GCS@LRZ (DE)	91 million	35 million

At the time of opening the call, the volume of resources offered on the corresponding system cannot be definitively confirmed. The final volume is expected to be similar to previous calls and will be announced later.

Industry Access: Call 24 offers Principal Investigators from industry the possibility to apply to a special Industry Track which prioritises 10% of the total resources available (see Eligibility Criteria on page 8).

Resources from the European ICEI project (Fenix research infrastructure)

Applicants to this call may additionally request for allocation of compute and storage resources provisioned from the Fenix Research Infrastructure, funded by the European ICEI project (https://fenix-ri.eu/). The ICEI resources include scalable computing services, Interactive computing services, VM services, Archive and Active data repositories. Applicants interested in using the additional ICEI resources are requested to submit their proposals to the dedicated call (https://prace-ri.eu/hpc-access/collaborative-calls/).

Introduction

The Partnership for Advanced Computing in Europe (PRACE) is an international non-profit association (aisbl) with its seat in Brussels. The mission of PRACE is to enable high impact scientific discovery and engineering research and development across all disciplines to enhance European competitiveness for the benefit of society. PRACE seeks to achieve this mission by offering world class high performance computing (HPC), computing and data management resources and services for scientists and researchers from academia and industry in Europe through a peer review process.

The Implementation Phase of PRACE receives funding from the EU's Horizon 2020 Research and Innovation Programme (2014-2020) under grant agreement 823767.

The computer systems (called Tier-0 systems) and their operations that are accessible through PRACE are provided for this 24th call by 5 PRACE hosting members: BSC representing Spain, CINECA representing Italy, ETH Zurich/CSCS representing Switzerland, GCS representing Germany and GENCI representing France.

Scientists and researchers can apply for access to PRACE resources. Industrial users can apply if they have their head offices or substantial R&D activity **in Europe**.

The Call is open to:

***Project Access**: Proposals can be based on a 12-months schedule (**Single-Year Projects)**, or, on a 24- or 36-months schedule (**Multi-Year Projects**). The allocation of awarded resources is made 1 year at a time with provisional allocations awarded for the 2nd and 3rd year.

IMPORTANT NOTICE FOR MULTI-YEAR PROPOSALS:

Please note that PRACE is in a transition phase and cannot guarantee that requested HPC systems in the 24th Call for Project Access will be available for multi-year access (allocations for the 2nd and/or 3rd year).

Additionally, the Call:

*reserves **0.5% of the total resources available** for this call for **Centres of Excellence** (CoE) as selected by the European Commission under the E-INFRA-5-2015 call for proposals.

*includes an Industry Access track that prioritises 10% of the total resources available for this call for proposals with a Principal Investigator from industry.

The PRACE Access Committee, composed of leading international scientists and engineers, ranks the proposals received and produces a recommendation to award PRACE resources based on scientific and technical excellence.

Further details on the standard application procedure can be found on the PRACE website ("How to apply" menu).

1   Scope of the Call

The PRACE 24th Call for Proposals is intended for large-scale projects of excellent scientific merit and for which a significant European added-value and major impact at international level is anticipated.

Applications to PRACE computing resources must use codes that have been properly tested, and that demonstrate either high performance and scalability on the PRACE systems requested or a need for ensemble simulations that require a very large amount of CPU time overall. The focus should be on approaches (parallelization, architectures and software) and memory requirements that should be justified in terms of time-to-solution and the suitability of the hardware requested, e.g. the fraction of peak performance that can be attained.

The need for PRACE Tier-0 computing performance must be clearly spelled out in the proposal.

Further details on the **minimal requirements** for using each system are available in the **'Technical Guidelines for Applicants'** document which can be found on the PRACE website.

Proposals for code testing and optimisation are outside of the scope of this call. A separate call for **Preparatory Access** is continuously open for such purposes (see the PRACE website for further details about Preparatory Access calls).

Proposals must demonstrate **scientific excellence** and include **elements of novelty and transformative aspects**. They must have a recognised scientific impact, validated in a coherent dissemination plan. Possible practical and timely applications are therefore desirable. The proposal should demonstrate the potential of achieving results, which should be published in high impact peer reviewed scientific journals and conferences (please see **Section 4 Terms of Access**).

Resources can be requested on a single system, or on more than one system when justified. Please request resources on more than one system only if your project proposal needs an additional system; **do not request resources on more than one system as alternative(s) to the preferred system**. It is strongly recommended that your production code is tested in the requested machine (it is mandatory to test the code if applying to Piz Daint at ETH Zurich/CSCS). Following the recommendation of the PRACE Access Committee and availability of resources, proposals may be awarded in their entirety, awarded with a reduced scope or rejected.

Please respect the minimum request for each system listed on Page 1**; proposals that do no respect the minimum request will be administratively rejected.**

1.1 Project Access

Project Access provides access to PRACE Tier-0 computing resources for projects that use codes that have been previously tested and have demonstrated high scalability and optimisation in the systems requested.

Proposals for Project Access must be based on computer codes and data ready to run on the Tier-0 systems from the start of the allocation. The need for Tier-0 resources must be demonstrated.

Applicants requesting access as a follow-up to a running or finished PRACE Project Access have to present the corresponding **progress** or **final** reports, following the templates available on the PRACE website ("Information for PRACE Awardees"). The PRACE Access Committee will use them to evaluate the status of the on-going access and whether the need for the follow-up project is recommended or not.

1.1.1 Single-Year Project Access

Allocations for standard Single-Year Access will start on the **1st of April, 2022** for a period of **12 months**, until the **31st of March, 2023**.

1.1.2 Multi-Year Project Access

This PRACE 24th Call for proposals is open to Multi-Year Project Access also, inviting applications for 2 or 3-year projects. Multi-Year Project Access is subject to the same eligibility and assessment criteria as applications for standard Single-Year Project Access. In addition, proposals must demonstrate their need for a resource allocation of more than a year.

Allocation of resources is **made for one year at a time**, with **provisional allocations** awarded for the 2nd and/or 3rd year. **All Multi-Year Access Projects are subject to annual peer review, based on a progress report and a presentation by the project Principal Investigator (PI) to the PRACE Access Committee. The presence of the PI in the mid-term evaluation is mandatory. If the PI does not appear, in person, in the mid-term evaluation presentation, there will be an automatic cut of 25% of resources recommended by the AC. Only PIs with medical issues or serious issues accepted by the AC Chair are excused. Allocation of resources shall be adjusted accordingly, based on the amount of resources requested in the proposal, the resources effectively used, and the amount of resources (and systems) available in the Call(s) corresponding to the 2nd and/or 3rd year.**

Future calls will reserve 10% of the resources for Multi-Year projects awarded in previous calls. PRACE Access Committee will decide how this reserve is distributed among the existing Multi-Year projects.

IMPORTANT NOTICE FOR MULTI-YEAR PROPOSALS:

Please note that PRACE is in a transition phase and cannot guarantee that requested HPC systems in the 24th Call for Project Access will be available for multi-year access (allocations for the 2nd and/or 3rd year).

1.2 Support to CoE

0.5% of the total resources available for this call is reserved for CoE as selected by the European Commission, under the E-INFRA-5-2015 and INFRAEDI-02-2018 calls for proposals. Resources will be equally distributed among the CoE. They will be asked to provide a description of their usage of the resources for technical validation, and a final report with the obtained results.

CoE will be directly informed about the process and requirements to access these resources.

The CoE will have the same rights and obligations as any other user, as stated in Section 4 (Terms of Access).

1.3 Industry Access Track

The 24th Call for proposals includes an Industry Access track that aims at improving the Open R&D access for industry included in previous PRACE Project Access calls.

Principal Investigators from industry, see also Section 3.1.2 Eligibility criteria for commercial companies, are offered the option to submit their proposal to this Industry Access Track. They are strongly encouraged to also involve collaborators from academia in their proposals.

The proposals submitted to that track will follow the same peer review process as any other proposal. The PRACE Access Committee will rank the proposals submitted to this track separately but according to the same scientific excellence criteria than those applied to other proposals. This Industry Access Track ranked list of proposals will then be processed (during the PRACE Resource Allocation Session) for allocation of up to 10% of the total resources available for the present call. Resources remaining unallocated from the Industry Access Track (assuming such proposals have passed the scientific excellence threshold of the Access Committee and do not amount to more than the 10% reserve) will be used for allocation under the standard process (Academic Track).

The Industry Access Track is meant for open R&D research purposes. As a consequence, the Principal Investigator commits to publishing the results obtained thanks to the awarded resources with an acknowledgement of the received PRACE grant in compliance with Section 4 Terms of access.

Applying for this specific track is an option given to researchers from industry; they may alternatively apply for resources under the standard process.

The Industry Access Track is only available for Single-Year Access.

2 Tier-0 Systems

The PRACE HPC Tier-0 systems available for the 24th Call are:

- **"HAWK"**   HPE Apollo   (GCS@HLRS, Germany)
- **"Joliot-Curie KNL"**   Bull Sequana system   (GENCI@CEA, France)
- **"Joliot-Curie Rome"**   Bull Sequana system   (GENCI@CEA, France)
- **"Joliot-Curie SKL"**   Bull Sequana system   (GENCI@CEA, France)
- **"JUWELS Booster"**   Bull Sequana system   (GCS@JSC, Germany)
- **"JUWELS Cluster"**   Bull Sequana system   (GCS@JSC, Germany)
- **"Marconi100"**   GPU Cluster   (CINECA, Italy)
- **"MareNostrum 4"**   Lenovo System   (BSC, Spain)
- **"Piz Daint"**   Cray XC50 System   (ETH Zurich/CSCS, Switzerland)
- **"SuperMUC-NG"**   Lenovo ThinkSystem   (GCS@LRZ, Germany)

All systems are available for Single-Year Access, Multi-Year Access and CoE.

- ***HAWK*** – HPE System – hosted by GCS in HLRS, Stuttgart, Germany.
  Details and terms of usage can be found here.

HAWK is the new HPC system at HLRS. HAWK provides 5632 nodes, each one equipped with 2nd generation AMD EPYC 7742 processors (Rome), offering 128 cores and 256 GByte of main memory per node. The nodes are connected with an Infiniband HDR network (200 Gb/s per node). The network topology as an enhanced 9D-Hypercube. Disk storage is a DDN Lustre system with 25 PB capacity. For pre- and post-processing there are several nodes with high memory capacity available.

- ***Joliot-Curie*** – Bull Sequana system – hosted by GENCI in TGCC/CEA, Bruyères-Le-Châtel, France.
  Details and terms of usage can be found here.

The successor of Curie, Joliot-Curie is a BULL Sequana X1000/XH2000 system based on 14 compute cells integrated into 3 partitions:

- The KNL partition is composed of 3 cells each containing 276 nodes with one Intel Knights Landing 68-core 7250 1.4 GHz manycore processor with 16 GB of high-speed memory (MCDRAM) and 96 GB of main memory. These 3 cells are interconnected by a BULL BXI 100 Gb/s high speed network. A KNL node provides 64 cores for user jobs and keeps 4 cores for the system. A node is configured in quadrant for the cluster node and in cache mode for the memory.
- The Rome partition is composed of 5 cells containing 2292 nodes with two 64-core AMD Epyc 2nd gen (Rome) processors 2.5 GHz, 2 GB/core (256 GB/node). These cells are interconnected by an Infiniband HDR 100 Gb/s high speed network.
- The SKL partition is composed of 6 cells, each containing 272 compute nodes with two 24-core Intel Skylake 8168 processors 2.7 GHz, 4 GB/core (192 GB/node). These 6 cells are interconnected by an Infiniband EDR 100 Gb/s high speed network.

This configuration is completed with 5 fat nodes for pre/post processing (3 TB of memory each and a fast local storage based on NVMe) and 20 hybrid nodes used for remote visualisation and 32 nodes (each with 4 GPUs nVIDIA V100) for HPDA/AI workloads.

These resources are federated across a multi-layer shared Lustre parallel filesystem with a first level (/scratch) of more than 5 PB at 300 GB/s.

The peak performance of this system is 23 petaflops.

- **JUWELS** - *Bull Sequana system hosted by GCS in JSC, Jülich, Germany.*
  Details and terms of usage will be made available here

JUWELS (Jülich Wizard for European Leadership Science) is designed as a modular system. The JUWELS Cluster module, supplied by Atos, based on its Sequana architecture, consists of about 2500 compute nodes, each with two Intel Xeon 24-core Skylake CPUs and 96 GiB of main memory. The compute nodes are interconnected with a Mellanox EDR InfiniBand interconnect. The peak performance of this CPU based partition is 10.4 petaflops.

A Booster module, also based on the Sequana platform by Atos and optimized for massively parallel workloads, is added in 2020. It offers 936 nodes, AMD EPYC host CPUs and the latest generation on NVIDIA Ampere A100 GPUs. The Cluster and Booster are tightly integrated in the same InfiniBand fabric.

To apply for the JUWELS Booster **use of GPUs is a must**. For the calculation of the necessary core hours, each node hour on the JUWELS Booster is considered as 48 core hours, which represents the number of host CPUs per node (even if these are not used for the calculation itself).

- **Marconi100** – GPU Cluster – hosted by CINECA, Italy.
  Details and terms of usage can be found here

Marconi100 is an IBM machine with 980 nodes (+ 8 login). Each node is equipped with 2 IBM POWER9 AC922 at 3.1 GHz (32 cores per node), 4 NVIDIA Volta V100 GPUs, Nvlink 2.0, 16GB, 256 GB of DDR4 RAM and 1.6 TB of NVMe Memory. The used network is a Mellanox Infiniband EDR with DragonFly+ topology.

To apply for Marconi100 **use of GPUs is a must**. Scalability, performance and technical data have to be sufficient to justify the resource request. We will accept benchmarks performed only on very similar machines (Power9+V100). In any case the scalability at least up to the same number of GPUs to be used for production runs must be reported. A detailed description of the method used to estimate the requested budget must be reported.

IMPORTANT REMARK: Due to the concurrent presence of 32 cores on Power9 CPUs and 320 streaming multiprocessor on the GPUs, the Marconi100 cluster is considered to have 352 equivalent physical cores per node. This number of cores must be used in the budget estimation following the formula: Cumulative Core hours = 352*Node hours = 352 * (GPU hours / 4). Please do not use standard core hours, and report in the detailed document, when possible, also the estimation in NODE hours or in GPU hours.

- **MareNostrum** – Lenovo System – hosted by BSC in Barcelona, Spain.
Details and terms of usage can be found here.

MareNostrum 4 consists of 48 Compute Racks with 72 compute nodes per rack. Each node has two Intel Xeon Platinum 8160 next generation general purpose Xeon E5 processors with 2.1 GHz, 24 cores per socket (48 cores/node) and 96 GB of main memory (2 GB/core), connected via Intel Omni-Path fabric at 100 Gbits/s.

There is a subset of 200 fat nodes available that have 384 GB of main memory (8 GB/core). **Their use is restricted to a maximum of 50% of their hours for all projects combined during each PRACE call.**

Requests below **30 million compute core hours** will not be considered.

- **Piz Daint** – Cray XC50 System – hosted by ETH Zurich/CSCS in Lugano, Switzerland.
Details and terms of usage will be made available here.

Named after Piz Daint, a prominent peak in Grisons that overlooks the Fuorn pass, this supercomputer is a hybrid Cray XC50 system and is the flagship system for national HPC Service. Piz Daint has compute nodes Intel® Xeon® E5-2690 v3 @ 2.60GHz (12 cores, 64GB RAM) and NVIDIA® Tesla® P100 16GB. The nodes are connected by the "Aries" proprietary interconnect from Cray, with a dragonfly network topology.

Requests below **1 million compute node hours (68 million compute core hours)** and where the usage of GPU accelerators is not proven will not be considered. Please note that all technical data on Piz Daint must be provided in node hours.

Technical data needs to be provided on the Cray XC50, Piz Daint. To apply for Piz Daint **use of GPUs is a must**. Scalability, performance and technical data have to be sufficient to justify the resource request (≥1 million node hours). All technical data on Piz Daint must be provided in **node hours** therefore the breakdown of the resource request linked to the benchmark data of Piz Daint must be provided in node hours within the proposal. The equivalent number of core hours required in the PRACE submission form can be obtained multiplying the resource request expressed in node hours by the conversion factor 1 node hour = 68 core hours.

- **SuperMUC-NG** – LenovoThinkSystem – hosted by GCS in LRZ, Leibniz, Germany.
Details and terms of usage will be made available here.

SuperMUC-NG provides 6480 Lenovo ThinkSystem dual-socket nodes equipped with 24 core Intel Skylake Xeon Platinum 8174 processors and 96 GB of main memory. A subset of 144 fat nodes yields 768 GB of main memory each. The nodes are connected via a fat-tree Omni-Path network.

The peak performance is at 26.7PF.

> **IMPORTANT REMARKS:**
>
> - Please note that any of the Tier-0 systems **may be upgraded** during the <u>Single-Year</u> or <u>Multi-Year allocation period</u>. The awarded projects will be given access to the new machine for the remaining part of the budget with appropriate technical support.
>
> - Please ensure that **the core hour consumption is regular throughout the allocation period**, or provide a requested schedule after consultation with the centres.

3   Eligibility criteria

Scientists and researchers from academia and industry can apply for access to PRACE resources. To be eligible for the Industry Access Track in Call 24, proposals must be led by a Principal Investigator affiliated with industry, see Section 3.1.2.

Only proposals with a civilian purpose will be eligible to participate in PRACE calls for proposals. Only proposals written in English will be eligible. Double-awarding is not allowed; proposals already granted in any other HPC programme will be rejected.

As resources will be provided under the PRACE 2 Programme in which restrictions apply, we strongly urge applicants to be aware that:

a) proposals requesting resources on several systems have lower chances of receiving the expected allocations, especially when this resource distribution is a requirement for their project; conversely, applicants providing technical evidence that their project can accommodate being awarded on other systems than the one(s) requested raise the chances of their project being awarded;

b) applicants based in countries not contributing to the PRACE 2 Programme (see PRACE website) are invited to collaborate with Principal Investigators based in contributing countries; even though this is not an exclusion criterion, applicants raise their chances of being awarded by teaming up this way.

PRACE HPC centres may have further restrictions on who is eligible to access their own systems. It is the responsibility of the applicant to ensure that they are eligible to access the system(s) they have applied for. In case of doubts, the applicant is advised to contact the HPC centre(s) for clarifications prior to applying (see contacts at https://prace-ri.eu/hpc-access/hpc-systems/).

3.1   Eligibility criteria for Project Access (Single-Year and Multi-Year)

3.1.1 Eligibility criteria for academia and public research organisations

Researchers from academia and public research organisations are eligible to apply as long as:

a) The Principal Investigator has an employment contract as a researcher in the organisation at the time of proposal submission.

b) The employment contract of the Principal Investigator must be valid for at least 3 months after the end of the allocation period.

3.1.2 Eligibility criteria for commercial companies

Commercial companies may apply on their own or in collaboration with academia/public research organisations (as principal investigators or collaborators).

In case the proposal is submitted to the Industry Access Track, see Section 1.3, the Principal Investigator **must be** from a commercial company (collaborators from academia are allowed and strongly encouraged for this track).

Commercial companies are eligible to apply if:

  a) The company has its head office or substantial R&D activity **in Europe**.
  b) The employment contract of the Principal Investigator is valid when the proposal is submitted and for at least 3 months after the end of the allocation period.
  c) Access is devoted solely for open R&D research purposes.

4   Terms of access

The Principal Investigator shall lead the project and is expected to be an essential participant in its implementation. The PI will have the overall responsibility for the management of the project and interactions with PRACE. Please make sure that the contact details for the PI are consistent in the different forms to be completed and that **all e-mail addresses used are professional e-mail addresses**.

The usage of PRACE resources needs to be acknowledged for all data produced through PRACE allocations, both in publications and when depositing the data to other infrastructures.

The **PI commits to**:

  a) **Provide** to PRACE a **final report within 6 months** of the completion of an allocation, using the proper PRACE template, with the results obtained through the access to the PRACE Research Infrastructure, as well as a qualitative feedback on the use of the resources.
  b) **Acknowledge** the role of the HPC Centre and PRACE in all publications which include the results above mentioned. Users shall use the following wording in such acknowledgement in all such papers and other publications:

  "We acknowledge PRACE for awarding us access to [resource-name hosted by at site]"

  Use as many instances of the pattern [resource-name hosted by at site] as the number of systems awarded via PRACE. Please acknowledge in the following way:

  - HAWK at GCS@HLRS, Germany
  - Joliot-Curie KNL at GENCI@CEA, France
  - Joliot-Curie Rome at GENCI@CEA, France
  - Joliot-Curie SKL at GENCI@CEA, France
  - JUWELS Booster at GCS@JSC, Germany
  - JUWELS Cluster at GCS@JSC, Germany
  - Marconi100 at CINECA, Italy
  - MareNostrum at Barcelona Supercomputing Center (BSC), Spain
  - Piz Daint at ETH Zurich/CSCS, Switzerland
  - SuperMUC-NG at GCS@LRZ, Germany

Respecting the words in bold above is very important since PRACE will use this word pattern when searching for bibliographic references in scientific articles.

c) **Allow** PRACE to publish the mentioned report as of one year from the termination of the allocation period.

d) **Contribute** to PRACE dissemination activities, including active participation in the annual PRACE Scientific and Industrial Conference (PRACEdays) and presentations at the PRACE booth at other HPC events. Selected awardees are expected to contribute to and attend such events at least once over the two-year period starting from the end of the allocation period. Awardees will also be expected to reply favourably when asked to be interviewed for PRACE publications and/or send visualisations or other materials for promotional purposes.

Access to PRACE resources is for **open R&D research purposes and is free of charge** provided that the eligibility criteria and terms of access described herein and in the online Application Form are fulfilled/respected. If this differs from the terms of access that the relevant Centre may have in place, it is the terms of access of the relevant Centre that will prevail.

Users will not hold liable PRACE or the relevant Centre, including their Directors and staff, with regard to any claim and expense arising out of the use of the resources.

From the start to the end of the access period, the applicant should direct questions and requests for support to the user support of the HPC Centre(s) where resources have been allocated.

Applicants must inform promptly the peer review office (peer-review@prace-ri.eu) and the centre where the resources are allocated of any changes to a successful proposal, namely a decrease in the amount of resources needed or on the distribution of the usage of the resources within the agreed time plan with the centre.

Requests for the extension of the allocation period need to be fully justified, and sent to the HPC centre where the resources are allocated. They will be analysed by PRACE on a case by case basis. Extensions will only be considered in the event of unforeseen technical issues at the HPC hosting site which would prevent the user from accessing the awarded HPC resources. The awarded resources (total computer time) cannot be increased.

5   Process details and deadlines

5.1   How to Apply

All proposals must be submitted via the PRACE Peer-Review Tool, https://pracecalls.eu/.

All proposals must be fully completed and submitted by the closing date. The submission website will not accept applications that are submitted after this time. In the case of technical difficulties, the decision of PRACE as to whether an application can be accepted is final.

Applicants are advised to make sure that they submit proposals as early as possible before the given deadline in order to ensure that all mandatory fields are completed and submission is accepted.

Further details on the standard application procedure can be found on the PRACE website ("How to Apply" and "Information for Applicants".

5.1.1 Applications for Single-Year and Multi-Year Project Access

All proposals for Single-Year and Multi-Year Project Access consist of 2 parts: an online form and the '**Project scope and plan**', to be submitted via the **PRACE Peer-Review Tool, https://pracecalls.eu/.**

The template of the **'Project scope and plan'** (Please save it as a .pdf to be attached to the online application form) must be <u>carefully respected</u> (Headings, length, tables and figures). **Proposals that do not follow the template or that are incomplete will be *administratively rejected and will not be further evaluated*.** The PRACE peer review team is available to answer questions by email while the Call is open (peer-review@prace-ri.eu).

All mandatory fields of the online application form must be completed before it can be submitted. **Please note that <u>only submitted proposals will be put forward for peer review</u>**.

Proposals requesting access as a follow-up (continuation proposals) to a running/completed project have to submit a progress/final report of the ongoing/finished project. These reports need to be uploaded in the submission online form in the process of submitting the new proposal.

PRACE Access Committee will use these reports to recommend or not the follow-up project.

The **template** document for these reports are **available on the PRACE website** ("**Information for PRACE Awardees**") and it must be **carefully respected.**

5.2   Peer Review assessment procedure

The assessment procedure (peer review process) abides to the PRACE peer review principles stated on the PRACE website ("The Peer Review Process"). The peer review process encompasses 4 phases.

Administrative check (phase I). Proposals <u>not complying with PRACE eligibility criteria will be rejected at this stage and will not continue to the next phase</u>.

Technical Assessment (phase II). Proposals will be technically reviewed by technical experts of PRACE Hosting Member sites. During this phase, **applicants may be contacted by technical experts in case of questions or concerns raised during the review.**

Scientific Assessment (phase III). Proposals will be peer reviewed by recognised independent scientific experts. Individual reports will be made available to applicants. Applicants are strongly recommended to use the opportunity to comment on these assessments during the right to reply period.

Access Committee Assessment (phase IV). The reviewers' reports and the applicants' responses will be analysed by the PRACE Access Committee who will produce the final ranking list. The Access Committee may agree on a scientific quality cut-off threshold. Proposals ranked under this threshold will not be awarded, even if there are resources available on the systems.

By **end of March 2022,** all applicants can expect to be notified of the outcome.

5.2.1 Criteria for assessment

Only fully completed proposals will be subject to the peer review evaluation process.

5.2.1.1 Technical review

It is essential that proposals submitted are at a high level of technical maturity and demonstrate the need for Tier-0 resources. Further details on the minimal requirements for using each Tier-0 system are available on the PRACE website (document titled '**Technical Guidelines for Applicants**').

Technical reviewers are asked to evaluate:

1. Application performance and scalability on the PRACE systems required. The focus should be on time-to-solution, efficiency of the solution for the scientific problem, as well as overall resource utilization, in addition to strong and weak scaling. There should be explicit comparisons with relevant codes in each scientific domain in terms of time-to-solution, percentage of peak, and weak and strong scalability for the sizes that are to be performed in the projects.
2. Suitability of the requested PRACE platform.
3. Whether or not the applicant provides a suitable breakdown of the resources requested to carry out the simulations.
4. Whether or not the resource request is consistent with the simulations proposed in the project plan.

During the technical review, technical experts may contact the applicants in case of questions or concerns raised during the review.

5.2.1.2 Scientific review

Successful proposals must demonstrate scientific excellence and focus on topics of major relevance for European research, explaining the **novelty, transformative aspects** and expected scientific impact. A dissemination plan should also be included. The results of the project should be published in high-quality journals and conference papers.

The identification of possible practical and timely applications resulting from the project is desirable and must be made clear in the application.

The scientific reviewers are particularly asked to evaluate:

1. The significance of the proposed research for the solution of challenging scientific and societal problems.
2. The soundness of numerical methods, algorithms and computational tools. Reviewers must specify the strengths and weaknesses of the proposed research. They must include comparisons with respect to the state-of-the-art in the field in terms of computing, methodology and expected outcomes.
3. The appropriateness of project timeline and resources (Is the project plan realistic, are requested resources sufficient and fully justified, is a Tier-0 system/allocation necessary?).
4. If the requested resources are justified and if a reduction can be made.

5. If the research plan is realistic within the given time and resources requested.
6. The qualifications, expertise and track record of the PI and team (Does the background and experience of the PI and her/his team make a successful outcome of the project likely?).
7. In the case of continuation of finished projects, the reviewers will be asked to review the added value of the new project and the advances over the previous one.
8. The provided dissemination plan of the results in scientific journals and conferences.

6 Tips and examples

This section includes a few tips and examples of common mistakes or misunderstandings in the preparation and submission of proposals:

a) **Submission deadline.** A research team faces last-minute problems, not related to the submission system, in the submission of their proposal and is not able to submit it completely before the deadline. *The application is not considered for the current call.*

b) **Submission completeness.** An application is received incomplete, i.e.: missing documents or documents with missing sections. *The application is administratively rejected*, and it will not be evaluated.

c) **Application exceeding limits.** A research team submits a proposal exceeding the page limits. *The exceeding pages will not be considered as part of the application.* Reviewers will be instructed not to consider the exceeding pages, and this may even imply that the application is administratively rejected.

d) **Minimum allocation of resources.** A research team estimates that 54 million core hours are needed to develop their project. In the application, they introduce "54", instead of 54,000,000. *The application is administratively rejected*, since the request is under the minimum allocation of the desired PRACE system.

e) **Technical readiness.** A research team submits an application lacking the scalability data of their codes, assuming that they will be able to provide this data during the evaluation of their proposal. *The application is administratively rejected*, since this data is mandatory at the time of submission.

f) **Technical data.** A research team uses their local HPC system to prepare the benchmarks required to support the request of resources. This system is somehow related but not completely representative of the PRACE system requested. *There is a risk that the application is technically rejected*, depending on the architecture used and the criteria of the technical reviewers, whose decision is final.

g) **Multi-Year allocations.** A research team is preparing a project that will consume 300 million core hours during three years. The application is submitted as a Multi-Year project, requesting 100 million core hours for each year. *There is a risk that the second and/or third year cannot*

be granted, since there is a limit to up to 10% of the resources of the system for Multi-Year projects (from 10 million to 60 million core hours, depending on the system). *This kind of projects are encouraged to prepare and submit follow-up Single-Year applications, which would allow them (if successful) to concatenate allocations.* [Note: Multi-Year access is not available via the Industry Access Track].

7 Terminology

Core hour: Elapsed time (wall clock time) in which a computing core is allocated to the user.

Node hour: Elapsed time (wall clock time) in which a computing node is allocated to the user.

8 Contacts

For any queries related to applications, please contact: peer-review@prace-ri.eu.