Access Policy

of the Discoverer supercomputer

v. 1.0

TABLE OF CONTENTS

PREFACE

SCOPE OF THE DOCUMENT

This document describes the access policy of the Discoverer petascale supercomputer hosted in SofiaTech Park, Sofia, Bulgaria.

The Discoverer supercomputer is part of EuroHPC petascale infrastructure and is juridically represented by the PetaSC consortia. The PetaSC consortia is led and represented by the Chairman of the board, who has final decision-making authority and is supported by the Discoverer Management Team (DMT), consisting of: Operational Manager (OM), Business Development Manager (BDM), chairman of the Scientific and Industrial Advisory committee and technical assistant.

The Discoverer is co-funded 35% by EuroHPC and 65% by PetaSC consortia with funding from the Bulgarian government. As result:

- 35% of the access time will be allocated to European scientific, industrial, and public sector users, matching their demanding application requirements, according to the principles stated in the EuroHPC JU Council Regulation and
- 65% to Discoverer PetaSC consortia for national scientific, industrial, and public sector calls as well to collaborative projects between industry and academia with partners from South-West Europe, Balkans and Middle East countries.

The Discoverer supercomputing infrastructure deployed by PetaSC and EuroHPC, comprises a significant investment of the JU members and the Bulgarian government. Therefore, defining proper rules and procedures for providing access to the system is essential, since a well-defined access policy will ensure optimal allocation of resources and maximise the return of investment of the involved supercomputing systems. Thus, it is essential that the computation time is offered in such way that it maximises the positive impact of these systems on Research and Innovation, as well as commercial, activities in EU and Bulgaria.

Large part of this document is fully or partially based on the text of EuroHPC JU access policy, which in turn has been made with the support of PRACE[1], the EuroHPC JU INFRAG[2] and the EuroHPC JU Governing Board. The text is not being quoted to ease the reading, as relevant adaptations have been made on multiple locations. Nevertheless, the PetaSC team fully acknowledge the authorship and the copyright of the cited document, which considers best practices and established approaches from similar infrastructures around the globe. The document also, capitalises the long-year experience of PRACE in the provision of access time to Tier-0 supercomputer systems in Europe, applying however necessary changes to support the specific strategic goals set out by the PetaSC.

[1] Partnership for Advanced Computing in Europe (https://prace-ri.eu/)

[2] Infrastructure Advisory Group (https://eurohpc-ju.europa.eu/infrastructure-advisory-group-infrag)

1 INTRODUCTION

1.1 PRINCIPLES OF THE ACCESS POLICY

The aim of the Discoverer Access Policy is to provide a transparent and equitable framework that gives all users a fair chance to the PetaSC access time and takes into consideration their needs and the available resources. The guiding principles of this framework are defined in the EuroHPC JU Regulation and its Annexes and recital 31 of the EuroHPC JU Regulation preamble, which outlines these key principles of the procedures described in this policy document:

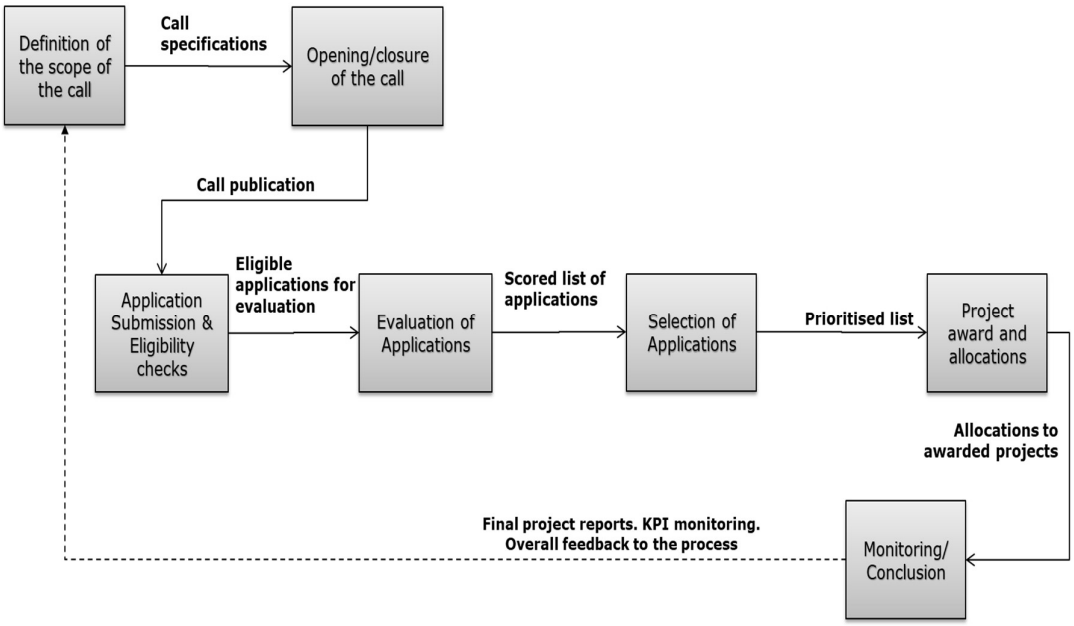
- The use of the Discoverer supercomputer should be primarily for **public** research and innovation purposes, for any user from academia, industry or the public sector.
- User allocation of access time to the supercomputers should primarily be based on open calls for expression of interest launched on behalf of PetaSC consortia and evaluated by independent experts.
- The Discover infrastructure is also allowed to carry out some limited economic activities for commercial purposes, which are limited to maximum 20% of the total Discoverer resource, which is split as 7% for EuroHPC and 13% for PetaSC (reflecting the 35:65 total resource split).
- Access to the supercomputer will be granted to both public or private users and consortia between them. When the results of the computational tasks are open for the public and are for non-profit use, the access will be for free (provided that the user or consortia has applied for the time via regular calls) and paid in the case when the results are to remain for private, for-profit use.
- The access rights should be equitable to any user and allocated in a transparent manner.
- The chairman of PetaSC with the support from the Discover Management Team should define and monitor the access rights to the PetaSC share of access time.

2 DISCOVERER ALLOCATION TIME ACCESS PROCESS

2.1 OVERVIEW OF THE PROCESS

Following the Regulations of EuroHPC and based on established best-practices, the allocation of Discoverer supercomputer will be carried through continuous calls for applications. The general process for the allocation comprises the following steps:

1. Definition of the scope of the call
2. Opening/closure of the call
3. Application submission & Eligibility check
4. Evaluation of applications
5. Selection of applications for allocation
6. Award and allocation of access time for projects
7. Monitoring



Error! Reference source not found.**,** illustrates the main steps for implementing the allocation process, depicting the main outcome of each individual step. The workflow presented in this paragraph is the generic outline for calls. Details like the duration of the call, level of resources available are presented in Section 3.

For the implementation of this process, the Chairman of PetaSC, who represents PetsSC consortia has the overall and final decision-making authority and is supported by the PetaSC Governing Board and by the Discoverer Management Team (DMT).

2.2 DEFINITION OF THE SCOPE OF THE CALL

The Discoverer Business Development Manager (BDM) together with the Chairman of the Scientific and Industrial Advisory Board (SIAC) are tasked to prepare each call, providing at least the following information:

- scope of the call (indicating, if applicable, target specific applications, communities or topics to be addressed, industrial research, etc.)
- the available computing access time, and other information regarding e.g., the architecture, memory, and other relevant technical aspects
- the access modes (see Section 3 Access modes)
- cut-off dates of the continuous calls for the submission of applications (and, if applicable, opening and closure date for non-continuous calls)
- rules for participation, including specific eligibility criteria for applications.
- evaluation criteria for applications, and their relative weight if applicable. In principle, scientific excellence of the problem will be the primary evaluation criterion for access to the Discoverer resources. Other applicable criteria will be clearly outlined in the calls, such as innovation, impact, quality of implementation, etc, which will have lower weights.
- selection and allocation criteria. Without prejudice of the quality of the selected proposals, and based on the provisions of the PetaSC access policy and regulations, the selection and allocation will be based on any additional specific criteria defined by the Discoverer Management Team (e.g., by user organisation type, priority application domains, etc.) or any other technical criteria deemed necessary for the allocation of access time (e.g., technical considerations for the optimisation of supercomputing resources). This will include a procedure to contest the (non)allocation of resources to applications.
- estimated dates for the selection and award of applications.
- reference documents to the Call, such as the Terms of Reference, the Technical Guidelines for Applicants, the templates for Project Scope and Plan, and any other document deemed necessary for providing full information on the Call.

In case that the call addresses several target domains or types of users (e.g., industry, public sector), the call may specify a different set of evaluation criteria and a maximum amount of resources allocated to each target group/domain.

2.3 OPENING/CLOSURE OF THE CALL

The Discoverer Management Team (DMT) can decide on the Calls for proposals prepared by the business development manager (BDM) and chairman of Scientific and Industrial Advisory Committee (SIAC). Following a positive decision, the DMT will publish and disseminate as widely as possible the information of the Call.

For continuous calls, the Call will clearly identify the cut-off dates and if appropriate the closure date. The DMT will provide annual report of their outcome with a proposal for continuation, closure or amendment of the scope and conditions of the calls.

2.4 APPLICATION SUBMISSION & ELIGIBILITY CHECK

The committee formed from BDM, chairman of SIAC and a member of SIAC will establish the operational processes and mechanisms to allow the submission of applications, the communication with the applicants, and perform the eligibility checks of the applications.

Applications will be requested to include, among other points, information on the applicants and a detailed description of the planned activities, the execution plan, the required resources, including computing time, storage requirements, visualization, etc., which will be evaluated by independent experts. For calls that specifically require it, applications must also demonstrate technical readiness and provide performance benchmarks appropriate for the resources requested.

Applications will be checked against the eligibility criteria of the Call (including administrative aspects, rules for participation, scope, etc.). Only the applications deemed eligible by the DMT (will proceed to the next steps. Non-eligible applications will be informed of the reasons for the non-eligibility.

2.5 EVALUATION OF APPLICATIONS

The BDM with the help of the chairman of the Scientific and Industrial Advisory Committee (SIAC) will be responsible for the evaluation process. If this task is delegated to some external organisations to PetaSC, the DMT will ensure an appropriate monitoring and intervention mechanism.

One of the essential components of the PetaSC evaluation process is the evaluation based on peer-review of applications by independent and experienced experts in a comparative process[3]. Experts will base their individual or collective evaluation on the application information submitted. If necessary, a domain panels will be established and to facilitate the evaluation of the applications and to take due account of the specificities of the Call and the different relevant fields and actors (e.g. science, industry, and public sector).

In preparation of the Calls, DMT will rely on SIAC advise to prepare a pool of independent Bulgarian and international experts (with help from EuroHPC and PRACE) to select evaluators and rapporteurs for the evaluation of the applications. Expert selection will be done based on the competencies and the field of expertise of each expert and will depend on the scope of the call and this relates to academic or private sector (industry). This pool of experts should be continuously updated to ensure a good basis for PetaSC Calls. Special measures will be taken to avoid any possible conflict of interest.

The processes and actors involved in the evaluation of the applications are determined by the specific access mode. Access modes and their specific evaluation process are described in Section 3.

The following common principles shall be applied:

1. The Call will establish the range of scores to be used by the experts in the different evaluation criteria during the evaluation process will define. The Call will also establish the minimum threshold (per criteria and overall) to be attained for an application to proceed to the following selection and allocation steps.
2. The evaluation process shall always include the technical assessment made by chairman of SIAC or SIAC members, which will evaluate whether and under which conditions the applications can run on the target system requested by the applicants.
3. During the evaluation process, scientific and technical peer-reviewers may raise questions and request additional input. In such cases applicants may be contacted for questions and clarifications. Applicants must reply within a specific deadline. Communication between the reviewers and applicants will be anonymised and remain confidential.

[3] Some Access Modes will not need the peer-review process because of the simplicity, see section 3 for detailed description.

The outcome of this step will be a ranked scored list of applications with supporting comments (from peer-review experts and from the technical assessment of the hosting entities), and a non-ranked list of applications that fail to pass the evaluation criteria. In case that the Call specifies different types of domains or user groups with specific allocated resources, there will be a ranked scored list of applications per domain/user group.

2.6 SELECTION OF APPLICATIONS FOR ALLOCATION

The BDM, the chairman of SIAC and selected members of SIAC, domain experts in the specific call focus areas will form the Resource Allocation Panel (RAP)[4] for any given Call. RAP will be responsible for elaborating a list of selected applications with associated computing resources and will be chaired by the BDM. In addition:

1. The Resource Allocation Panel will establish a final list of applications, based on the ranked list(s) from the previous step and the proper consideration of the allocation guidelines set by the DMT with the advice of SIAC.
2. The Resource Allocation Panel will proceed with the allocation of access time of the final list of applications on the supercomputer providing resources in the given call aiming **at guaranteeing accessibility of the resources, while at the same time, obtaining the maximum capabilities of the system**. Non-exhaustive examples of considerations for the allocation are the following:
   - Technical feasibility, and compatibility with the performance, architecture and technical characteristics of the Discoverer supercomputer
   - Access to the full system capabilities of the Discoverer supercomputer or allocation in time-shared manner
   - Possible reductions in the final allocation with respect to the requested and available resources
   - Limited oversubscription (i.e., the total time allocated is larger than the available aggregated time offered by the system for a specific call) to optimise the use of the supercomputer.

The outcome of this step is a list of granted applications on the Discoverer supercomputer with a specific resource allocation. **The BDM will submit this list to the DMT for formal approval**.

2.7 AWARD AND ALLOCATION OF ACCESS TIME TO PROJECTS

The BDM is responsible for implementing the allocation of computing time on behalf of the DMT. The BDM or his/her representative will inform applicants on the outcome of the evaluation, and for those selected applications, with the help of OM will establish the appropriate contractual arrangements.
The PetaSC awarding decisions are considered final. However, rejected applicants are eligible to request information regarding the evaluation decision. Furthermore, applicants will have the right to appeal to the decision according to conditions published in the Call.

2.8 MONITORING AND CONCLUSION OF THE CALL

The allocation of the PetaSC access time will be monitored periodically by the BDM and OM and reported to the DMT and PetaSC Governing Board, including the participation per user category, Participating State, field of application/community, etc. (for a complete set of reported KPIs see §4.3). **In addition the OM is tasked to monitor a proper behaviour of the users and in case of detected**

[4] See section 2.9.8 for the composition of the Resource Allocation Panel

violations, he/she has the right to revoke the user's access to the supercomputer. The annual monitoring report will also be made available to the other government bodies of and to the Scientific and Industrial Advisory Committee. A simplified version of the report will be also published on the Discoverer's web site for public access.

The DMT may also include in the monitoring report recommendations for improvement based on other input such as the assessment of the evaluation results of the Calls, the implementation of the projects (as reported in the final reports), and any other analysis or report relevant to the access policy.

Based on the results of this monitoring report, the DMT may define if necessary further guidelines for the allocation of access time in the following Calls or for additional activities supported by the PetaSC consortia, for example:

- re-adapt access times per category of activity or user, with the aim to optimise the use capabilities of the Discoverer supercomputer,
- additional support measures for providing fair access opportunities to users from academia and industry would aim to raise their level of skills and expertise in High Performance Computing systems. This would include for example:
    - Support to non-expert HPC users with adequate supervision and preparation on the usage of resources.
    - Fostering the access to HPC to new users and communities.
    - Training and support activities to overcome the inexperience of new users.
    - Supporting preparatory development work in systems with lower performance.

The DMT and PetaSC Governing Board will foster the communication between the national government authorities and the EuroHPC JU, and the adequate alignment of EuroHPC and PetaSC calls for system access, to achieve the highest synergies and optimal utilization of HPC resources at national and EU level.

2.9 ACTORS OF THE ACCESS POLICY

The following are the actors involved in the access policy process:

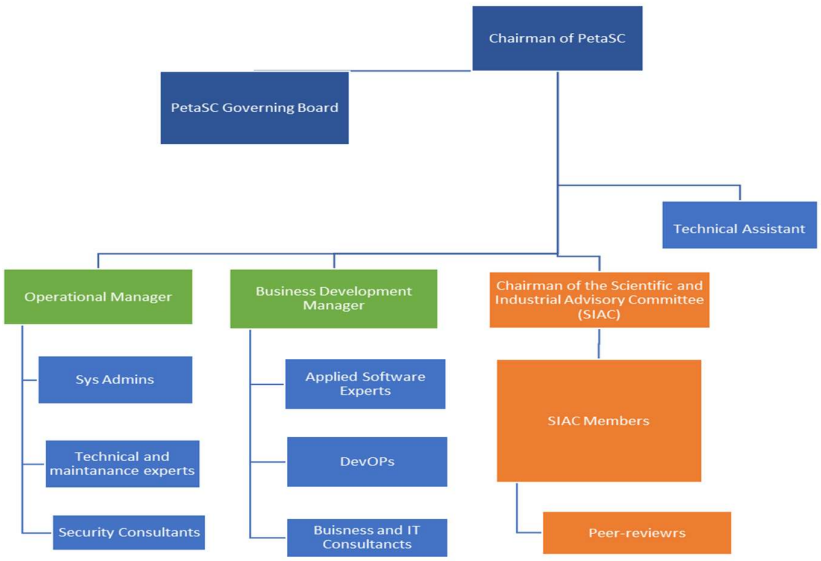


Figure 2, represents the governing structure of the Discover supercomputer.

2.9.1 Governing Board of PetaSC

Is formed by representatives from four founding entities of PestSC and is led by the chairman of PetaSC. The Governing Board of PetaSC is overseeing operations of the Discoverer Management team and is advising the chairman of PetaSC on better utilisation of the Discoverer's resources, future system upgrades, the access policy according to the provisions in the hosting entity agreement and PetaSC governing policies and as described therein.

2.9.2 The Chairman of PetaSC

The chairman of the PetaSC has final decision-making authority for which he is supported by the PetaSC governing board and Discoverer management team. The chairman of PetaSC appoints the members of the Discoverer management team and is responsible for the overall budget allocation of the Discoverer as well approves any future upgrades and changes of access policy. The Chairman of PetaSC can also delegate specific tasks to external actors having established an agreement with the PetaSC for the execution of such tasks. When appropriate these external actors will be members of the Operational or Business Development teams. These agreements will include specific mechanisms to allow the monitoring and intervention of the Chairman of PetaSC or the Discoverer Management team in the tasks.

2.9.3 Discoverer Management Team (DMT)

DMT is comprised from Operational Manager (OM), Business Development Manager (BDM), chairman of the Scientific and Industrial Advisory committee and technical assistant and is chaired by the chairman of PetaSC. DMT role is to support the chairman in day-to-day operation of the supercomputer, to define and execute the access policy as well to advise the chairman on future upgrades and budget allocation.

2.9.4 Operational Manager (OP)

The OM is member of DMT and together with his team is responsible for the day-to-day operation of the Discoverer supercomputer, including security and infrastructure management and is the interface with all the vendors and monitors contract execution. Together with BDM he/she can advise the chairman of PetaSC on future upgrades and any additional capital expenditures. OM also leads operational unit that consists of system administrators, technical and maintenance assistants and a pool of security IT consultants and experts.

2.9.5 Business Development Manager (BDM)

The BDM is member of DMT and together with his team is responsible for the business development, contact with the customers/users of the supercomputer as well for the software installation and performance management of the system. BDM leads the business development team which consists of applied software experts, software and IT developers (DevOps) and business and IT consultants. BDM with support from his team is responsible for proposing and executing the overall business policy, business plans and their execution as well for the business customers selection and for attracting additional funding from external investors and via national and international grants.

BDM and the Chairman of the Scientific and Industrial advisory committee are responsible for defining the scope of the calls, their evaluation and grating access to the supercomputer, after the approval of the DMT.

2.9.6 Chairman of the Scientific and Industrial Advisory Committee (SIAC)

The chairman of the SIAC is member of DMT and chairs SIAC. He/she can propose its members and supports the chairman of PetaSC with its contacts with EuroHPC JU as well with contacts with other EuroHPC hosting entities and with the international HPC community. He/she also supervises the work of the peer reviewers during the call assessment and together with the BDM and the chairman of the

SIAC are responsible for defining the scope of the calls, their evaluation and grating access to the supercomputer, after the approval of the Discoverer Management Team.

2.9.7 Scientific and Industrial Advisory Committee (SIAC)

The Scientific and Industrial Advisory Committee (SIAC) is composed of national and internationally recognized leading scientists and industry representatives who are responsible to:

- Advise the DMT from a scientific and industrial point of view on strategic topics, scientific and industrial domains, user requirements, access schemes, methods, procedures and other issues relevant to the access policy and allocation of the PetaSC share of access time of the Discoverer supercomputer.
- Members of SIAC are also domain experts in their specific HPC and they can propose new members of the peer-reviewer pools and when appropriate can also acts as peer reviewers themselves.
- Supports the BDM and DMT in the outcomes of the Call, including:
    - Periodically analyse, evaluate and report to the BDM via the chairman of SIAC on the quality of the projects and the impact of the awarding process.
    - Establishes a regular dialogue with the Discover's users/communities and other players, from research, industry and academia, to help understand the impact of PetaSC Calls and the potential improvements that need to be applied.
    - Coordination of the different projects awarded access time by the PetaSC (e.g., workshops, events).
- Via its chairman to advice the DMT in regular meetings with their chairs to address challenges and improve processes for the benefit of the academic and industry researchers.

Members of the SIAC can be proposed by the chairman of SIAC and BDM. Candidate members will be submitted by the DMT for discussion and eventual appointment. The term of each member will be 2 years with the possibility of renewal.

2.9.8 Resource Allocation Panel (RAP)

The Resource Allocation Panel (RAP) is responsible for implementing the selection and allocation step that produces the list of selected applications with associated computing resources as described in §2.6 of this document. The RAP is consisted of, the BDM (who chairs the RAP), the chairman of SIAC and selected members of SIAC, which are domain experts in the areas that are also call focus.

2.9.9 Applicants / End Users

Applicants submitting proposal for access time are comprised of HPC user groups coming from academia, public sector and Industry. These also include large groups from Strategic national and EU initiatives and EC and Bulgarian Fund for Scientific Research funded projects, such as the Centres of Excellence, Centres of Competence etc.. They are led by a Principal Investigator (PI) who submits the proposal on behalf of the group. Successful applicants sign an Acceptable Use Policy with the PetaSC in which defines their limits and obligations when accessing the systems as End Users.

3 ACCESS MODES

3.1 OVERVIEW

The PetaSC Access Modes are the different modalities in which the PetaSC share of the Discoverer's resources will be offered to applicants/End Users.

Access Modes are based on those of PRACE and EuroHPC and that have been adapted to meet specific requirements introduced by PetaSC. The PataSC Access Modes are categorised according to several parameters such as the volume of resources that will be offered, the complexity of the evaluation process that is applied, the type and maturity of applications that is targeting, and the periodicity of cut-off dates. Typical values for these parameters are provided in this document but actual values must be defined before the publication of each call taking into considerations the type and percentage of resources available in the Discoverer supercomputer.

Six Access Modes (see Table 1) are taken into consideration for PetaSC

- Regular Access
- Benchmark Access
- Development Access
- Fast Track Access
- Industry Access

In addition small amount of resources could be allocated as the chairman of the PetaSC discretion, upon advice of DMT or PetaSC Governing Board.

Regarding Industry, two types of access to resources can be identified for industrial users:

a) **Open** Research and Innovation (R&I) access (min 80% of the PetaSC resource)
   All access modes are open to users from industry for **open R&I**, which involves publication of the outcome of the use of the resources). The need of industry applicants can be efficiently met by prioritizing a share of the offered resources to applications led by industry[5] in a given call, given that the outcomes are **publicly shared and used for non-profit needs**. For the largest part, the evaluation process covering innovation criteria, can be applied to both academic led and industry led applications.
   Particular attention will be put on the proper alignment of the available distribution of computing and storage resources with access to expert support services and collaboration with academia. This is a key enabler of access by the academia to the PetaSC resources in through the Regular, Development and Benchmark access modes.

b) Commercial Access (max 20% of the PetaSC resource)
   This specific access requires a different approach based on the definition of the pay-per-use services offered and on industrial practices, in which open calls and peer-review processes are not applicable. The specific conditions for Commercial Access are described in 3.6.

[5] Applications whose Principal Investigator comes from industry, having clear industrial exploitation plan.

Access Mode	Regular	Benchmark	Development	Academic Fast Track	Commercial Access
Duration	1y renewable	2 to 3 months	1y renewable	< 6 months	1y renewable
Periodicity	Continuous call, cut-offs every four months (3 cut-offs per year).	Continuous call, monthly cut-offs	Continuous call, monthly cut-offs	Continuous call, cut-offs ev. 2w/1m	Continuous call, cut-offs ev. 2w/1m
Share of resources	60 to 80%	Few %	Few %	~5%	~5-20%
Data storage needs	Large storage for medium to long term	Limited	Data processing environment and platform		
Accessible to industry	Yes – Open R&D With specific track	Yes only for open R&D	Yes only for open R&D	No	Exclusively
External sc. Peer-review	Yes	No	No	No / Pre-identified	No / Pre-identified
Tech. assessment	Yes	Yes	Yes	Yes	Yes
Data Management Plan required	Yes	No	No	Yes	Yes
Application type	Full application	Technical application	Technical application	Light request + support documents	Technical Application
Prerequisite	Benchmark	None	None	Previous allocation or Benchmark	Benchmark or expert assessment
Submission period	> 2 months	N/A	N/A	N/A	N/A
Duration of evaluation process	2 months	≥1 week <2 weeks	≥1 week <2 weeks	≥2 weeks <1 month	≥2 weeks <1 month
Access to the results	Public / Open Access	Public / Open Access	Public / Open Access	Public / Open Access	Confidential
Use of the results	Non-profit	Non-profit	Non-profit	Non-profit	for-profit
Resource allocation	free	free	free	free	Paid – based on competitive prices

Table 1 - PetaSC Access Modes

3.2 REGULAR ACCESS

3.2.1 Description

This access mode, open to all fields of science, will call for applications with a case to enable progress of science in the domains covered. These applications are expected to be able to justify the need for large allocations in terms of compute time, data storage and support resources because they are significantly contributing to the progress in their domain.

This access mode will typically distribute the corresponding resources through a continuously open call for applications associated with three (3) cut-off dates per year.

The allocations are granted for one (1) year with the option for projects to apply for an extension of their allocation. This extension will depend on an assessment of their ongoing awarded project.

Applicants (Principal Investigators or Co-Investigators) can only have one Regular Access awarded at any given time.

The Regular access mode is meant to serve research domains or communities that require large-scale resources or that require more frequent access to substantial computing and storage resources. This access mode distributes between 60% to 80% of the available PetaSC resources.

The applicability of the minimum size for applications is part of the evaluation process under the responsibility of the threshold prioritization panel (see below).

3.2.2 Requirements

Researchers from academia, research institutes, public authorities and industry established or consortia having a PI located in Bulgaria. Applicants will submit a full application supporting the relevance of the application to the call:

- Demonstrate that their application requires the use of large allocations - both in terms of compute and medium and/or data storage - to reach the objective of their application.
- Demonstrate that the method, software, and tools are technically adapted to the Discoverer supercomputer thereby demonstrating the feasibility of the project. To this end, applicants will rely on technical data collected via a Benchmark Access.
- Provide a project plan, with adequate time schedule of the expected resource consumption during the lifetime of the project.
- Commit to publish the results of their project within the frame of one year.

3.2.3 Evaluation process

The evaluation process is structured as follows:

- Call is open continuously, with minimum 2 months between the availability of the (updated) call documentation and the corresponding cut-off date.
- The evaluation process runs over 2 months and includes:
  - Administrative check
  - The RAP appoints a domain panel chair (who automatically becomes RAP member), selected amongst its members having expertise in the specific domain, who selects peer reviewers form a pool of experts or when needed proposes new reviewers (who upon approval from SIAC are included in the pool)
  - Technical assessment of each application by the domain panel chair and assignment of the applications to the reviewers (minimum 2 per application)
  - When the individual reviews are done, the domain chair evaluates them if needed, asks for an additional independent review(s) in the case of very contrasting evaluations.
  - Domain panel chair drafts his domain ranking report, based on the consolidated individual reports (per application) and sends its report to RAP for approval and review
  - The overall ranking prepared by RAP and send for approval to DMT

3.2.4 Access outcome reporting requirements and misuse mitigation

Principal Investigators commit to:

- acknowledge the use of the resources in their related publications.
- contribute to dissemination events.
- produce a full report within 6 months of the completion of an allocation.
- contribute to public reports prepared by PetaSC.

Misuse of resources includes:

- significant under-usage of the allocation without justification
- unethical behaviour or
- any other breach of the Acceptable Use Policy
- any breach of the security access policy as well any attempts to run tasks different from what has been agreed in the proposal and contract

Such misuse will be recorded and considered in future calls and proposals submitted from the same PI and user group.

3.3 BENCHMARK ACCESS

3.3.1 Description

The Benchmark access mode is meant for users to collect performance data on the Discoverer system in order to document the technical feasibility of their applications to be submitted for the Regular Access calls. The corresponding parameters are adapted to fit the given need, limiting and preventing misuse of the resources; these resources represent a limited share of the total resources available.

Benchmark access is provided through continuously open calls with monthly cut-offs. Access periods may be granted for 2 or 3 months.

Typically, this access mode will distribute a very small fraction (some %) of the available resources. Applications granted for benchmark access may use the complete allocated system, if needed, for scalability tests.

3.3.2 Requirements

Researchers from academia, research institutes, public authorities and industry and consortia with PI from in Bulgaria or any other EU Member State or in a country associated to Horizon 2020 are eligible to apply. The resources that can be requested via this mode are limited. Applicants will submit a light access request that will support the relevance of the application to the call.

3.3.3 Evaluation process

The evaluation process runs as follows:

- Call is open continuously.
- At the end of the cut-off date the applications submitted are forwarded for evaluation. The evaluation process will allocate access to resources within maximum 2 weeks (target an average of 1 week) and includes:
  - Administrative check.
  - Technical assessment of the relevance and feasibility of the request on the targeted system by experts of the targeted hosting entity.
- Requests from academia, research institutes and commercial organization (industry) are handled the same way.
- Requested are evaluated by a domain expert and results are send for approval to the chairman of SIAC, who can consult SIAC or addental expert.
- At the end of the process the BDM receives a ranked list of applications to be considered for allocation and upon DMN approval prepares the final list of applications to be awarded.

3.3.4 Access outcome reporting requirements and misuse mitigation

Successful applicants are required to issue a short report on the outcome of their access including outcome of the porting and the tests, issues encountered, and solutions implemented; if applicable, the applicant may simply refer to an application being submitted to other calls for which the application text reports on the data collected under the benchmark access.

Given the small amount of available resources and the short timeframe associated to this access mode, misuse mitigation measures are not needed.

3.4 DEVELOPMENT ACCESS

3.4.1 Description

The Development access mode is meant for projects focusing on code and algorithm development and developing a science portal or other infrastructure software components. The corresponding parameters are adapted to fit the given need, limiting misuse of the resources; these resources represent a limited share of the total available.

Development access is provided through continuously open calls with monthly cut-offs. Access periods may be granted for up to 1 year and, renewable up to 2 times (it is recommended a maximum of 3 year for a given project). Some specific arrangements can be implemented if needed to efficiently support part of the eco-system that would benefit from such access as for instance Centres of Excellence or Competence Centres.

It is anticipated that this access mode will distribute a very small fraction (some %) of the available resources. Applications granted for development access may use the complete system if needed for scalability tests and benchmarking and there is appropriate windows to do so.

3.4.2 Requirements

Researchers from academia, research institutes, public authorities and industry or consortia with PI from Bulgaria or from other EU Member State or in a country associated to Horizon 2020 are eligible to apply. The resources that can be requested via this mode are limited. Applicants will submit a light access request that will support the relevance of the application to the call.

3.4.3 Evaluation process

The evaluation process runs as follows:

- Call is open continuously,
- At the end of the cut-off date the applications submitted are forwarded for evaluation. The evaluation process will allocate access to resources within maximum 2 weeks (target an average of 1 week) and includes:
  - Administrative check
  - Technical assessment of the scientific and/or industrial relevance and feasibility of the project on the targeted system by experts of the targeted hosting entity.
- Requests from academia, research institutes and commercial organization (industry) are handled the same way.
- Requested are evaluated by a domain expert and results are send for approval to the chairman of SIAC, who can consult SIAC or addental expert.
- At the end of the process the BDM receives a ranked list of applications to be considered for allocation and upon DMN approval prepares the final list of applications to be awarded.

3.4.4 Access outcome reporting requirements and misuse mitigation

Successful applicants are required to issue a report on the outcome of their project:

- Achievement of the project compared to the original project objective.
- Description of the technical solutions used, and implementation options followed.
- Description of the issues encountered with the infrastructure.
- Perspectives after this access.

The alignment of the project with the scope of the development access will be evaluated based on the report provided. Misuse of the access mode (for instance using the resources for other purposes than those documented in the request) may lead to ban the applicant from applying during a certain period.

3.5 FAST TRACK ACCESS

This access mode supports needs that are exceptional and cannot be anticipated. One such need is academic users that have a track record of successful application to other access modes willing to get fast access to complement their current research results. That would be typically the case of gathering elements to answer reviewers in the process of publishing a paper.

This access mode should be supported by a continuous call with monthly cut-offs and grant access for less than 6 months. The volume and type of resources that could be claimed via such an access should be similar to the one of a regular access.

Applications submitted for Fast Track access should provide evidence of previous successfully completed (non-fast track) allocation.

A small part (up to 5%) of the available resources would be reserved for this access.

The evaluation process supporting this access would rely on

- Administrative check
- Technical assessment (requiring Benchmark access if needed) with the support of Hosting Entity experts of targeted systems.
- Assessment of the relevance of the request by an ad-hoc panel led by the Access Resource Committee Chair
- Requested are evaluated by a domain expert and results are send for approval to the chairman of SIAC, who can consult SIAC or addental expert.
- At the end of the process the BDM receives a ranked list of applications to be considered for allocation and upon DMN approval prepares the final list of applications to be awarded.

Misuse of this fast track would be mitigated by limiting the number of requests by Principal Investigator to once every three years.

3.6 COMMERCIAL ACCESS

According to the regulation, the PetaSC and EuroHPC will reserve up to 20% of available computing resources for commercial purposes. Essentially, the PetaSC will offer access against payment to anyone wishing to use resources of the Discoverer. Such access does not fall under any peer-review process or access mode as described in the previous sections. The purpose of commercial access is to give the opportunity to any organization be it industrial entity or research/academic entity to gain access to HPC resources without the necessity of following the peer-review based access procedures of the JU and the restrictions (temporal and/or functional) imposed by them. Therefore, any entity can buy

access to the Discoverers resources provided that the usage falls within the PetaSC acceptable usage policy, which will adhere to the regulation provisions of commercial access according to which:

- The commercial usage of supercomputers will be offered exclusively for civilian applications.
- Commercial access is provided to users from eligible countries. These exclude countries or persons under an EU embargo or with other relevant restriction to access to EU resources.

Users that fall within the above categories should be eligible for commercial access provided that resources are available and the allocation limit of 20% has not been exhausted in the given time period. Users will be required to sign an AUP agreement, certifying compliance with the above conditions.

3.6.1 Pricing

The commercial services shall be offered on pay-per-use basis. Pricing should be comparable to market prices and should not disrupt the market (market failure). Pricing will be based on the actual systems' Total Cost of Ownership (TOC) thus taking into account acquisition, installation costs, vendor support, administrative and operational costs. The fees generated by the commercial use of the commercial access time shall constitute revenue to the PetaSC budget and shall be used to cover operational costs of the PetaSC, including depreciation of the infrastructure, future upgrades utility bills and any other third party support, salaries and fees for the permanent, temporary stuff and external consults, additional software development and any other support related costs.

Commercial allocation will be charged separately for computation, storage and network resources, and support services. Service pricing will also take into consideration requirements from users to access commercial software, and the relevant cost for licenses as well as the operational cost of installing and maintaining the software during the duration of usage. The actual prices will be discussed in case-by-case manner with the potential business customers.

3.7 DISCRETIONARY ACCESS PROVIDED BY THE CHAIRMAN OF PETASC

Upon advice from DMT or PetaSC Government Board, the chairman of PetaSC can decide to give a **small percentage** of the PetaSC access time for discretionary allocation without a call, in exceptional cases, such as strategic national initiatives or in emergency and crisis management situations.

3.7.1 Strategic national Initiatives

The DMT and PetaSC Government Board can identify the strategic national Initiatives that will be granted support. Every two years a general review of the activities of these selected initiatives should be foreseen with e.g., the support of the Scientific and Industrial Advisory committee in order to verify fairness and justification for allocating resources to such initiatives. Applications taking advantage of the access mode will be subject to technical review and will have similar obligations for reporting, data management and proper project management planning, as with the rest of the applications accepted in the context of the other calls.

With the very significant increase of resources to be distributed, it is considered that allocating part of the total available resources (up to 10%) permanently to strategic national projects/initiatives would constitute an effective usage of the infrastructure. The DMT will advise the chairman of PetaSC on the amount of resources to be granted and will task BDM to implement the allocation of resources to the identified strategic national Initiatives.

3.7.2 Emergency and crisis management

The DMT and/or PetaSC Government Board can identify the need for urgent access for emergency and crisis management that cannot be appropriately handled by any of the other access modes (for example the Fast-Track Access). The chairman of the PetaSC will determine the level of resources to

be allocated and will establish an ad-hoc urgent procedure to guarantee the proper execution of the necessary applications quickly after the occurrence of the urgent situation. Allocation of resources will be dedicated to computing in support of a crisis government headquarters in urgent situations typically triggered for example by industrial or biological events or natural hazards and disasters, including meteorological or climate hazards, earthquakes, anthropogenic processes, etc. The chairman of PetaSC will task the BDM to implement the allocation of resources in response to these situations.

3.8 QUALITY OF SERVICE AND SUPPORT

3.8.1 Quality of service and support

PetaSC commercial services need to provide, apart from access to computing resources, a range of additional support services, all adhering to a specific Service Level. For example:

- High quality of service in terms of uptime and availability.
- Access to support desk, on (at-least) an 8x5 (09:00-17:00 EET) basis.
- Access to training and support material
- Support for application porting and optimisation

EuroHPC Competence Centres (CC) will also have a key role in local market outreach and client support. Local commercial users should be able to turn to the respective CC in order to seek information on access conditions and pricing. CCs should also provide training and application development support whenever possible.

The PetaSC web site should be extended to provide commercial access section in which interested users should be able to find the necessary information and further be guided for the next steps in getting access. Such information includes pricing, available systems technical information and online support services. The PetaSC should also develop the necessary monitoring and accounting services offering to existing users clear overview of the resources consumed and the fees to be paid.

3.8.2 Access conditions, complete data backup and data retention policy

Access will be provided for a specific period of time (e.g., 1 year) and/or pre-agreed amount of resources (e.g., 1,000 node hours, 500 GB on fast-tier storage). If resources are exhausted while the contract is still in force the user may request extension of the existing contract under the same conditions provided resources are available. If the contract time expires without the user exhausting all agreed resources, the contract may be extended for additional time provided that resources are available in the upcoming foreseen period (i.e., the user will have lower priority in acquiring resources comparing to users with active contracts).

All Discoverer users must perform full tasks backup in every 48h to prevent and minimize the any data loss due to equipment failure. In case of failure users will be compensated with computational time to a maximum of 48h.

Upon completion of the tasks all users will have 3 period of months to download all their data, after which all user data will be automatically removed from the Discoverer storage. In case when user has requirements for a longer data retention period, this needs to be discussed upfront and specifically approved by the Discoverer team[6].

[6] These will be further specified in the Discoverer Use Policy (DUP) and Acceptable Use Policy (AUP) documents.

4 ACCESS POLICY IMPLEMENTATION

4.1 IMPLEMENTATION CONSIDERATIONS

The following guidelines relate to the implementation of the Access Policy procedure. In particular:

1. For the Regular Access calls, the applicant is expected to have the required specialist knowledge to use high-performance computers effectively. This must be demonstrated in the application. Non-expert HPC users should only be eligible with adequate supervision and preparation on the usage of resources. This requirement is relaxed for Benchmark and Development calls.
2. The software and software tools required for the task need to be available. Necessary procurement and licensing will be discussed with the Discoverer's operational team.
3. Submitted applications and reviews must be treated confidentially and may only be used for review purposes.
4. Reviewers must sign a conflicts of interest avoidance declaration.
5. Reviewers remain anonymous.
6. Any deviations from the standard procedure must be reported by the chairman of the SIAC and the BDM, who in turn must report them to the DMT and when necessary ask for approval.

4.2 OBLIGATIONS OF AWARDED PROJECTS

Projects that have been allocated access must:

- In the case of Regular access, the results of the projects must be presented at joint workshops and other events and published in a suitable form. The project must be ensured that the reporting volumes of the centres have a largely uniform format and scientific quality.
- All projects being granted resources from PetaSC must clearly acknowledge in publications and dissemination material, the usage of EuroHPC and PetaSC resources and the type of allocation.

PetaSC should aim for strong presence of major projects at conferences and in the general public.

4.3 KEY PERFORMANCE INDICATORS

The KPIs should be chosen so that it is as easy as possible to measure the achievement of the most important goals:

a. quality of supported scientific projects, (e.g. through publications)
b. quality of supported industrial projects, (e.g. through publications or patents)
c. number of projects of new communities
d. balance of resource utilization:
    - between participating states
    - between the scientific-industrial communities and public sector users
    - between the scientific communities in general

Key Performance Indicator	Purpose
Volume of resources offered vs. volume of resources requested	To evaluate the pressure level of the request and the adequacy of the offered HPC service to the science and business communities
Number of applications vs. number of awarded projects	To evaluate the pressure level of the request and the coverage of a maximum number of projects from the science communities, serving diversity criteria
Volume of resources awarded vs. volume of resources used	To monitor the adequateness of the available resources and associated services to serve the need of the communities
Share of PIs (Principal Investigators) applying for the first time	To evaluate capacity to attract new user and communities on the long term and avoid emergence of "reserved" resources by very strong and influencing domains (different from strategic orientations willing by stakeholders)
Share of projects involving partners from different EU country than Bulgaria	To evaluate the level of collaboration of the Bulgarian scientific community with other EU countries
Share of projects involving partners from a country outside the EU and especially from Southeast Europe	To evaluate the level of collaboration beyond the EU and in the regional countries close to Bulgaria
Share of requested/awarded resources per domain	To evaluate the needs pressure/satisfaction according to scientific diversity criteria; help for anticipating future needs and guiding Bulgarian scientific policies (for instance helping new communities to access HPC services)
Number of applications vs. number of awarded projects led by industry	To evaluate the industry interest and variety of industry needs for HPC services and the level of satisfaction reached by the proposed HPC service offer
Volume of resources requested vs volume of resources awarded to industry led projects	To evaluate the general industry needs satisfaction for HPC services and guide national and European policies in evaluating new needed future effort to satisfy the requests
Volume of resources awarded to SMEs	To evaluate the attraction and impact of HPC allocations on SMEs.
Ratio of actual resource utilization vs the resource demand in the scheduler	To evaluate the resource efficiency and inefficiency due to task scheduler

Table 2 - Key Performance Indicators